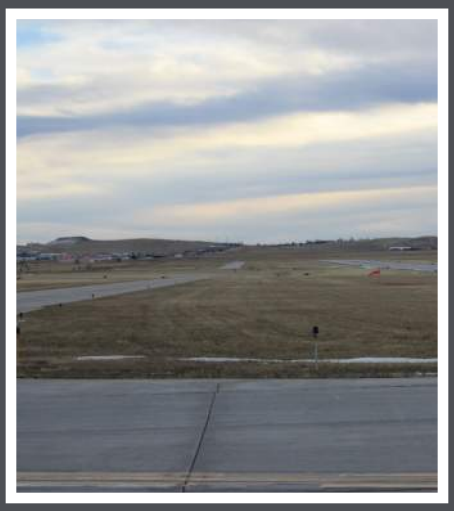
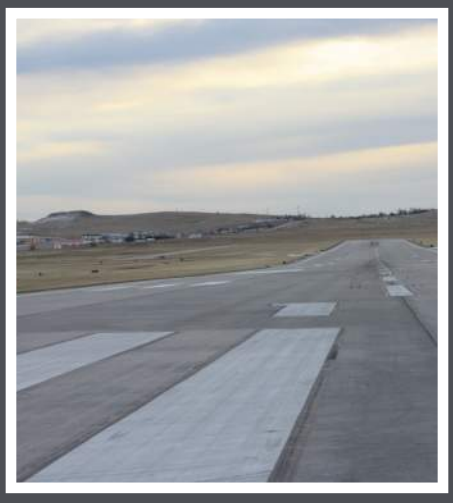
Gillette
CAMPBELL COUNTY
AIRPORT





GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

Morrison Maierle
engineers • surveyors • planners • scientists

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GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

CHAPTER ONE:
INVENTORY

Morrison Maierle
engineers • surveyors • planners • scientists

1.0 INVENTORY

1.1 History of Gillette-Campbell County Airport

The City of Gillette began developing the airport when they purchased 320 acres northwest of Gillette in 1934. The City of Gillette used approximately 150 acres closest to U.S. Highway 14-16 as a municipal golf course, while the remaining 170 acres were designated for the airport. The original airport included a turf runway, east of existing runway 16/34, private hangars and an office. In 1939, James Fulkerson began Fulkerson Aviation at the airport.

The City of Gillette expanded the airport for the first time in the 1950's, initially by acquiring 75 acres of land in 1950 to the north of the existing airport, and 40 acres to the south in 1957. The expansion led to the construction of a 4,138 foot runway, taxiway and a small apron.

The continued growth of the airport lead to a joint resolution between the City of Gillette and Campbell County in 1962. The Airport Board was established to oversee the operation, maintenance and construction of airport facilities. The City of Gillette maintained ownership of the airport land after the joint resolution. The airport continued to grow, constructing additional facilities, crosswind Runway 2/20 with supporting taxiways and aprons.

The 1970's brought a great deal of growth and change to the Gillette Airport. The Airport Board elected to purchase 10 acres of land to the south in 1972. Including the land purchase, $250,000 was spent on runway and lighting improvements and extending the runway 1,362 feet. The City of Gillette transferred ownership of the airport over to Campbell County in July of 1978. The airport was renamed Gillette-Campbell County Airport and Campbell County became solely responsible for the maintenance and development of the airport. The County obtained financial involvement from the Wyoming Aeronautics Commission and the FAA to aid in the improvements to both runways. Construction on the crosswind Runway 2/20 included drainage and riding surface improvements. Construction improvements to Runway 15/33 included installing an ILS localizer for runway end 33, a parallel taxiway for the southern end of the runway with a length of 3,600 feet and a width of 40 feet, drainage program and asphalt repair with a 3 inch overlay. Additional improvements included the construction of storage, office space and additional hangars.

In 1982, the voters of Campbell County approved the issuance of an $8 million bond to extend the main runway, install an instrument landing system and pave the crosswind runway. The 75 foot by 4,500 foot crosswind runway was paved with Portland Concrete Cement Pavement in the summer of 1982 before construction shut down for the winter. During the winter shutdown, the runway was in operation. The remaining 1,300 feet was paved in late spring of 1983.

Incremental changes in the magnetic north relation to true north required the runway designations to change. Runway 15/33 is now designated as Runway 16/34 and Runway 2/20 is now designated as 3/21.

Figure 1-1 shows a satellite image of Gillette-Campbell County Airport in 1994.

Table 1-1 shows the variety of airport development projects undertaken at the Gillette-Campbell County Airport over the past 20 years, since the 1994.

Figure 1-1. Gillette-Campbell County Airport, Google Earth Image from 1994

Table 1-1. Airport Development Projects 1994-2015

Year	Description	FAA Grant	State Grant	Total Funds
1994	Terminal Building Site Prep & Misc.	AIP-15	256	$2,071,735
1995	Expand Air Carrier Apron, Parking Lot & Lighting	AIP-16	256	$626,556
1997	Replace Failed Taxiway Area		759	$95,762
1998	Taxiway & Runway Lighting	AIP-17	727	$855,437
1998	Route Joints/Crack Seal		243	$102,804
1998	Route Joints/Crack Seal		285	$181,636
1998	Route Joints/Crack Seal		605	$7,850
1998	General Aviation Building Remodel		851	$36,500
1998	Disabled Passenger Lift		832	$25,000
1999	Taxiway & Runway Relighting	AIP-18	818	$415,073
1999	Rehab Medium Intensity Taxiway Lights	AIP-19	907	$127,749
1999	General Aviation Tiedown Ramp		867	$30,000
1999	Master Plan Update & Install Wildlife Fence	AIP-20	901	$349,453
2000	Pavement Markings		2030	$72,000
2000	Joint/Spall Repair Taxiway E		2035	$50,000
2000	Install Wildlife Fence	AIP-20	950	$372,571
2000	Install Wildlife Fence, Security Gates & Land Acquisition	AIP-21	2000	$268,375
2000	Acquired SRE	AIP-22	2033	$476,230
2001	Pavement Markings		860	$5,750
2001	Pavement Rehab SRE/ARFF		2095	$76,012
2001	Design Rehab Shoulders 16/34 Grove 21 and Relocate “C”	AIP-23	2086	$487,893
2001	ILS		2154	$260,000
2002	West GA Apron Phase I		2170	$164,000
2002	North Hangar Apron Rehab		2198	$162,000
2002	Taxiway Striping		2201	$15,000
2002	Construction Shoulders, Grove 21, Relocate “C”, Remove Hangar	AIP-24	2165	$3,550,324
2003	West GA Apron Phase II		2258	$99,000
2003	Design/Construction T-Hangar Apron & Design ARFF/SRE Blg	AIP-25	2287	$1,111,112
2004	Construct ARFF/SRE	AIP-26	GCC-01X	$2,413,816
2005	Amended Grant to Install (3) 48 Inch Culverts	AIP-24	2165	$356,634
2005	PAPI’s		GCC-02X	$154,744
2005	Acquired SRE (2) Snow Plow Trucks (PFC)		GCC-06X	$162,684
2005	Statewide Sealing Cracks		AERPMP	$85,865
2005	Replace DME		GCC-10X	$7,000
2006	ARFF/SRE Access Road & Master Plan/Wildlife Study	AIP-27	GCC-05X/12X	$871,578
2007	Statewide Sealing Cracks		APMP05	$60,991
2007	Acquire ARFF Truck	AIP-28	GCC-07X	$615,790
2007	Rehab. Approach Lighting System	AIP-29	GCC-11X	$704,079
2008	Rehab. Runway & Taxiway Markings, & Replace Signs	AIP-30	GCC-20A	$1,004,491
2008	Improve Passenger Security Area	AIP-31	NONE	$184,211
2009	Restripe Markings Sch. I/Signs & Windcones Sch. II	AIP-30	GCC-12X	$785,991
2009	Passenger Parking Lot Phase I	AIP-32	GCC-23A	$385,598
2009	Passenger Parking Lot Phase II	AIP-33	GCC-23B	$754,817
2009	Statewide Sealing Cracks		APMP08X	$40,671
2010	North GA Apron Design & Hangar Acquisition	AIP-34	GCC-29A	$601,315
2010	Land Acquisition Lot 1		GCC-29B	$22,368
2011	Design North GA Apron Sch II, Hangar Acquisition	AIP-35	GCC-35A	$605,000
2012	North GA Road Relocation Sch. I	AIP-36	GCC-34A	$1,271,131
2012	Utility Relocation		GCC-39A	$256,756
2012	Construct North GA Apron Sch. II	AIP-37	GCC-34B	$1,154,099
2012	Replace DME and Shelter		GCC-46A	$200,000
2012	Airfield Markings		GCC-41A	$397,187
2013	Construct Phase IV of North General Aviation Apron	AIP-38	GCC-34C	$928,000
2014	Re-Alignment of Airport Access Road	AIP-39	GCC-50A	$834,195
2015	Acquire SRE	AIP-40	GCC-55X	$618,467
2016	Master Plan	AIP-41	GCC-56X	$482,000
Totals				$29,164,654

1.2 Existing Facilities

Gillette-Campbell County Airport has two active runways: 16/34 and 3/21. Runway 16/34, designated the primary runway, is a precision instrument runway that is 7,500 feet long and 150 feet wide. Runway 3/21, designated the crosswind runway, is 5,803 feet long and 75 feet wide.

The National Plan of Integrated Airport Systems is a federal planning document which defines the service level and role of all airports in the federal airport system. NPIAS defines Gillette-Campbell County Airport's service level as a Primary Commercial Service Airport.

An essential element of the master planning process is identifying existing aviation facilities, noting the location of these facilities and analyzing the ability of these facilities to meet the airport's needs. The inventory of existing facilities at Gillette-Campbell County Airport was accomplished through physical inspection of the airport, discussion with airport staff, and review of existing airport layout drawings and related studies. An overview of the Airport layout is provided on **Figure 1-2**.

Airside facilities consist of runways, taxiways and apron areas along with associated markings, lighting systems and instrumentation. The airport reference point, which defines the midpoint of the airfield is located at latitude 44˚22' 56.10" N and longitude 105˚32'21.70" W. The airport elevation, the highest point on the airfield pavement, is 4,364 feet above Mean Sea Level (MSL).

1.2.1 Airport Reference Code

An airport is designed to serve the most demanding aircraft utilizing the airport with 500 or more annual operations. An operation is defined as either a takeoff or a landing.

The **Airport Reference Code (ARC)** is a coding system used to relate airport design criteria to operational and physical characteristics of the airplanes intended to operate at the airport. For airports with two or more runways, it is generally most practical to design some components for a less demanding ARC. For example, at Gillette-Campbell County, Runway 16/34 has a more demanding ARC than Runway 3/21. Taxilanes for GA aircraft are designed using an ARC that relates to the size of airplanes that use the area while the parallel system and Runway 16/34 are designed using an ARC relating to larger, more demanding commercial airplanes.

The ARC has two components relating to the design aircraft. The first component is the **Aircraft Approach Category** (ACC). The Approach Category relates to the aircraft approach speed. According to the FAA Advisory Circular (AC) 150/5300-13A, Airport Design, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at the aircraft's maximum certified weight. Approach Categories are represented by a letter to designate the aircraft approach to landing speed and are as follows:

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

The second component of an ARC is the **Airplane Design Group (ADG)**. The ADG relates to the airplane wingspan,

represented by a roman numeral and is listed below:

- Group I: Up to but not including 49 feet.
- Group II: 49 feet up to but not including 79 feet.
- Group III: 79 feet up to but not including 118 feet.
- Group IV: 118 feet up to but not including 171 feet.
- Group V: 171 feet up to but not including 214 feet.
- Group VI: 214 feet up to but not including 262 feet.

The ARC is further subdivided into those airports serving large and small airplanes. A small airplane is an airplane of 12,500 pounds or less maximum certified takeoff weight. A large airplane includes all airplanes with a maximum certified takeoff weight greater than 12,500 pounds.

Generally, runway standards are related to aircraft approach speed, airplane wingspan, and designated or planned approach visibility minimums. Taxiway and taxilane design standards are related to the airplane's wingspan or airplane design group. Listings of common airplanes and their associated airport reference code are shown in **Figure 1-3**.

Currently, the AAC/ADG for Runway 16/34 at Gillette-Campbell County Airport is C-III. The AAC/ADG for Runway 3/21 and its associated Taxiways is B-II. Although the facilities are designed to the standards of a particular AAC/ADG, the runways and taxiways can be utilized by larger and heavier aircraft on occasion.

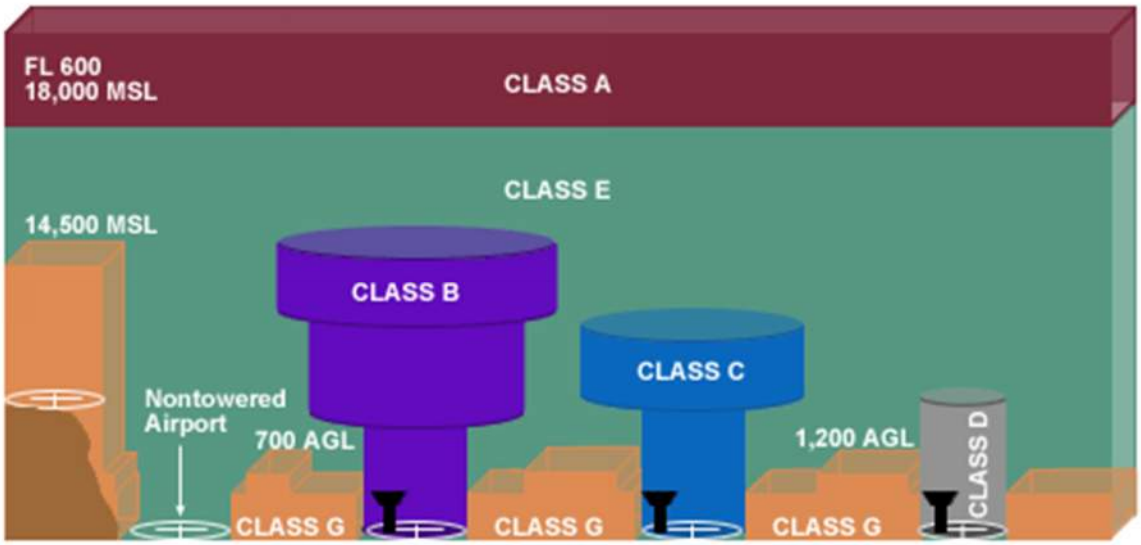
Under former guidance, taxiway design was based on Airplane Design Groups (ADG). In the updated Advisory Circular AC 150/5300-13A, taxiway design is based on newly established Taxiway Design Groups (TDG), which are based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance. This study will assess the appropriate current and future TDG for the Gillette-Campbell County Airport in Chapter 3 *Facility Requirements*.

Figure 1-2. Aerial View of Gillette-Campbell County Airport Layout

Figure 1-3. Airport Reference Code

1.2.2 Airspace

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G. **Figure 1-4** generally illustrates each airspace type in three-dimensional form.



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

Courtesy of FAA

Figure 1-4. Airspace Classification

Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high capacity commercial service airports. Class C airspace is controlled airspace surrounding lower activity commercial service and some military airports. Class D airspace is controlled airspace surrounding airports with an air traffic control tower. All aircraft operating within Class A, B, C, and D airspace must be in contact with the air traffic control tower facility responsible for that particular airspace.

Class E is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways, including Gillette-Campbell County Airport when the tower is open. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating within Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility.

For aircraft arriving or departing the Gillette-Campbell County Airport using VOR facilities, a system of Federal Airways, referred to as Victor airways, has been established. Victor airways are corridors of airspace eight miles wide that extend upward from 1,200 feet Above Ground Level (AGL) to 18,000 MSL and extend between Very High Frequency Omnidirectional Range beacons (VOR) navigational facilities. There are several Victor airways in the Gillette-Campbell County Airport area. The Victor airways and local airspace is depicted on **Figure 1-5**.

Several types of navigational aids are available for aircraft enroute to the Airport: VOR, nondirectional beacons (NDB), area navigation (RNAV), and the global positioning system (GPS).

VORs provide azimuth readings to pilots, allowing them to navigate along Victor airways.

NDBs transmit low/medium frequency signals that are processed into a bearing indicator. RNAV is commonly used to VORTAC-based area navigation. It allows you to fly to predetermined points without overflying VOR/DME or VORTAC Facilities by setting intermediate points to navigate toward.

The latest enroute navigational aid available to pilots is GPS. GPS is being increasingly used in civilian aircraft navigation. GPS differs from ground-based navigation systems, such as VORs and NDBs, in that pilots are not required to navigate using a specific ground-based facility. Instead, GPS uses a system of satellites placed in orbit around the earth that transmit electronic radio signals. Pilots of properly equipped aircraft can use these signals to determine altitude, speed, and other navigational information. Using GPS, pilots can navigate directly to any airport in the country without the use of ground-based navigational facilities. Under NextGen, the FAA is proceeding with a program to gradually replace traditional ground-based enroute navigational aids with GPS.

Aircraft operating to or from an airport do so under either Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). VFR governs the procedures for flying under visual conditions, when a pilot is able to safely control and navigate an aircraft by visual reference to the environment outside of the cockpit. Meteorological conditions that meet the minimum requirements for VFR flight are

called visual meteorological conditions (VMC). Conditions that do not meet the minimum requirements for VFR flight are called instrument meteorological conditions (IMC), under which a flight may only operate under IFR. IFR are a set of regulations and procedures for flying aircraft whereby navigation and obstacle clearance is maintained with reference to aircraft instruments only, while separation from other aircraft is provided by the air traffic control.

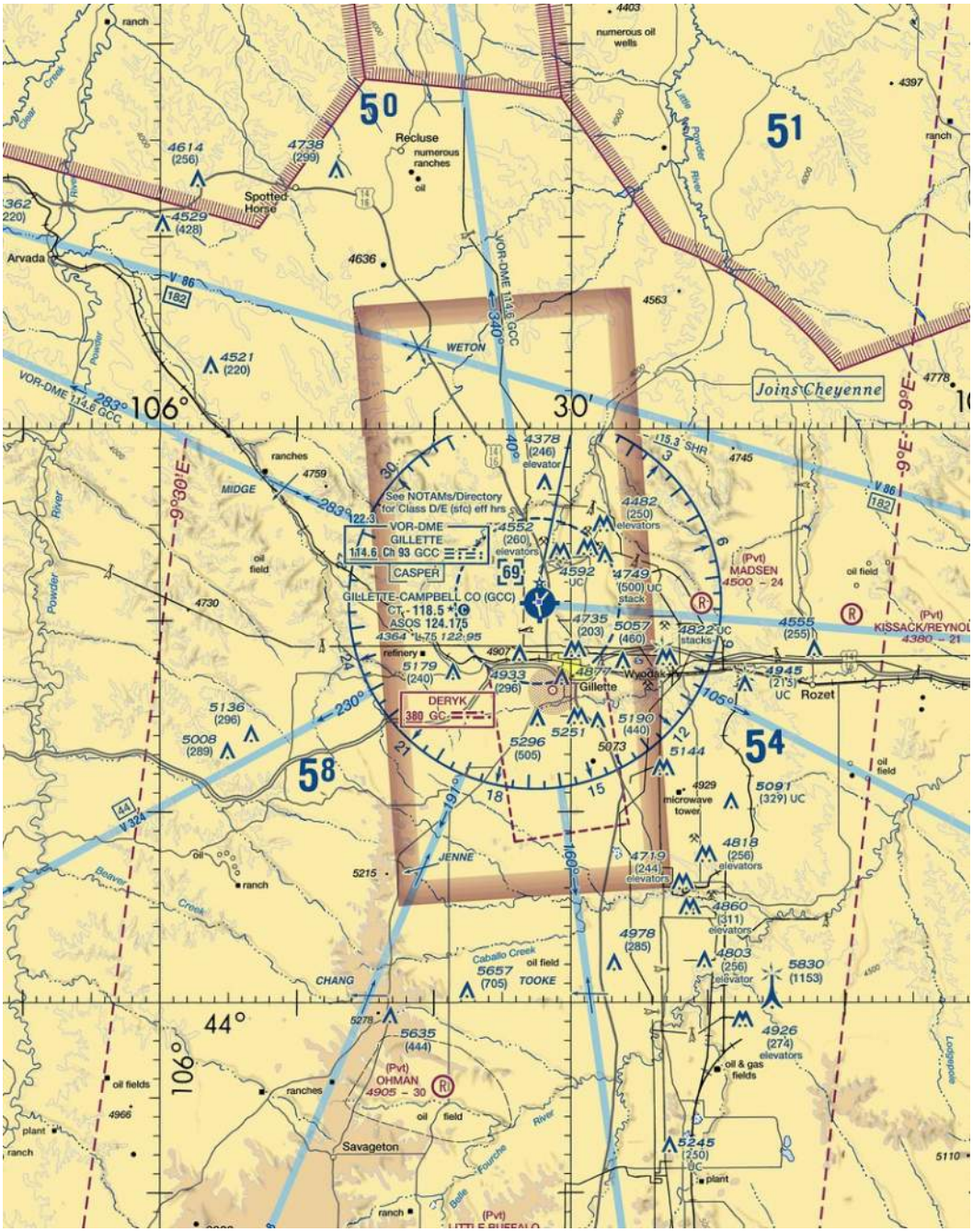


Figure 1-5. Gillette-Campbell County Airport Air Space

1.2.3 Air Traffic Control

The air traffic control tower is owned by the airport. Campbell County operates the tower with controllers. One controller is present per shift. Gillette-Campbell County's air traffic control tower is shown in **Figure 1-6**.

The airport is classified as Class D airspace from 6:00 am to 10:00 pm daily by the FAA. The tower is only staffed during these hours. Outside of these hours, the airport is considered a non-towered airport. Aircraft use the Common Traffic Advisory Frequency (CTAF) to announce their position when the tower is not staffed.

Figure 1-6. Air Traffic Control Tower

1.2.4 FAR Part 77 Surfaces and Runway Protection Zones

FAR Part 77 Objects Affecting Navigable Airspace applies to all civil airports under the jurisdiction of the FAA and provides standards to determine obstructions in navigable airspace.

Figure 1-7 shows the existing Part 77 airspace surface structure at Gillette-Campbell County Airport.

Subpart C of FAR Part 77 defines obstruction standards and establishes imaginary surfaces with relation to an airport and each runway. The size of each imaginary surface is based on the category of each runway and the type of approach available or planned for that runway.

Runway 34 at Gillette-Campbell County Airport is categorized as Precision Instrument Runway. Runway 16 is categorized as a Non-Precision Instrument Runway. Runway 3/21 is considered a visual runway for larger than utility aircraft by Part 77 definitions. The imaginary surfaces that apply to Gillette-Campbell include the Primary, Approach, Horizontal, Transitional and Conical surfaces. The following paragraphs define these surfaces.

The Primary Surface is longitudinally centered on the runway. For runways with a specially prepared hard surface, it extends 200 feet beyond each runway end. For all other runways with no hard surface it ends at the end of the runway. The primary surface for Runway 16-24 at Gillette-Campbell County Airport is 1,000 feet wide. Additionally, the primary surface for Runway 3/21 is 500 feet wide.

The Approach Surfaces are trapezoidal in shape, are longitudinally centered on the extended runway centerline and extend outward and upward from each end of the primary surface. The beginning width of the Approach Surfaces is the same width as the primary surface. The approach surface for Runway 34 extends to a width of 16,000 feet at a distance 50,000 feet from its beginning. The Runway 16 approach surface has a width of 3,500 feet and extends a distance of 10,000 feet. Additionally Runways 3 and 21 have approach surfaces that extend to a width of 1,500 feet at a distance 5,000 feet from its beginning. The approach slope for Runways 3 and 21 extend outward and upward at a slope of 20:1. The approach slope for Runway 16 is 20:1 and the approach slope for Runway 34 is 50:1. See

Table 1-2 for individual runway clear slopes.

The Horizontal Surface is a horizontal plane 150 feet above the established airport elevation or 4,514 feet MSL (4,364 + 150). Each runway at Gillette-Campbell County Airport has its own horizontal surface. For Runway 3/21, the perimeter of the surface is constructed by swinging 5,000 foot arcs from the center of the end of the primary surfaces and by connecting each arc with tangent lines. For Runway 16/34, the perimeter of the surface is constructed by swinging 10,000 foot arcs from the center of the end of the primary surfaces and by connecting each arc with tangent lines.

The Transitional Surfaces extend outward and upward at right angles from the primary and approach surfaces at a slope of 7:1 to 150 feet AGL.

The Conical Surface extends outward from the Horizontal Surface 4,000 feet at a slope of 20:1.

Each runway end has a “Runway Protection Zone” (RPZ) which is trapezoidal in shape and centered on the extended runway centerline. The RPZ’s function is to enhance the protection of people and property on the ground. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ. The FAA recommends that the airport sponsor own these designated land areas in fee simple terms.

The RPZs for Runway 16/34 and 3/21 are depicted on **Figure 1-8**. The RPZ for Runway 16 is 500 feet wide at its narrow end, 1,010 feet wide at its wide end and is 1,700 feet long. The RPZ for Runway 34 is 1,000 feet wide at its narrow end, 1,510 feet wide at its wide end and is 1,700 feet long. The RPZ for Runways 3 and 21 is 500 feet wide at its narrow end, 700 feet wide at its wide end and 1,000 feet long.

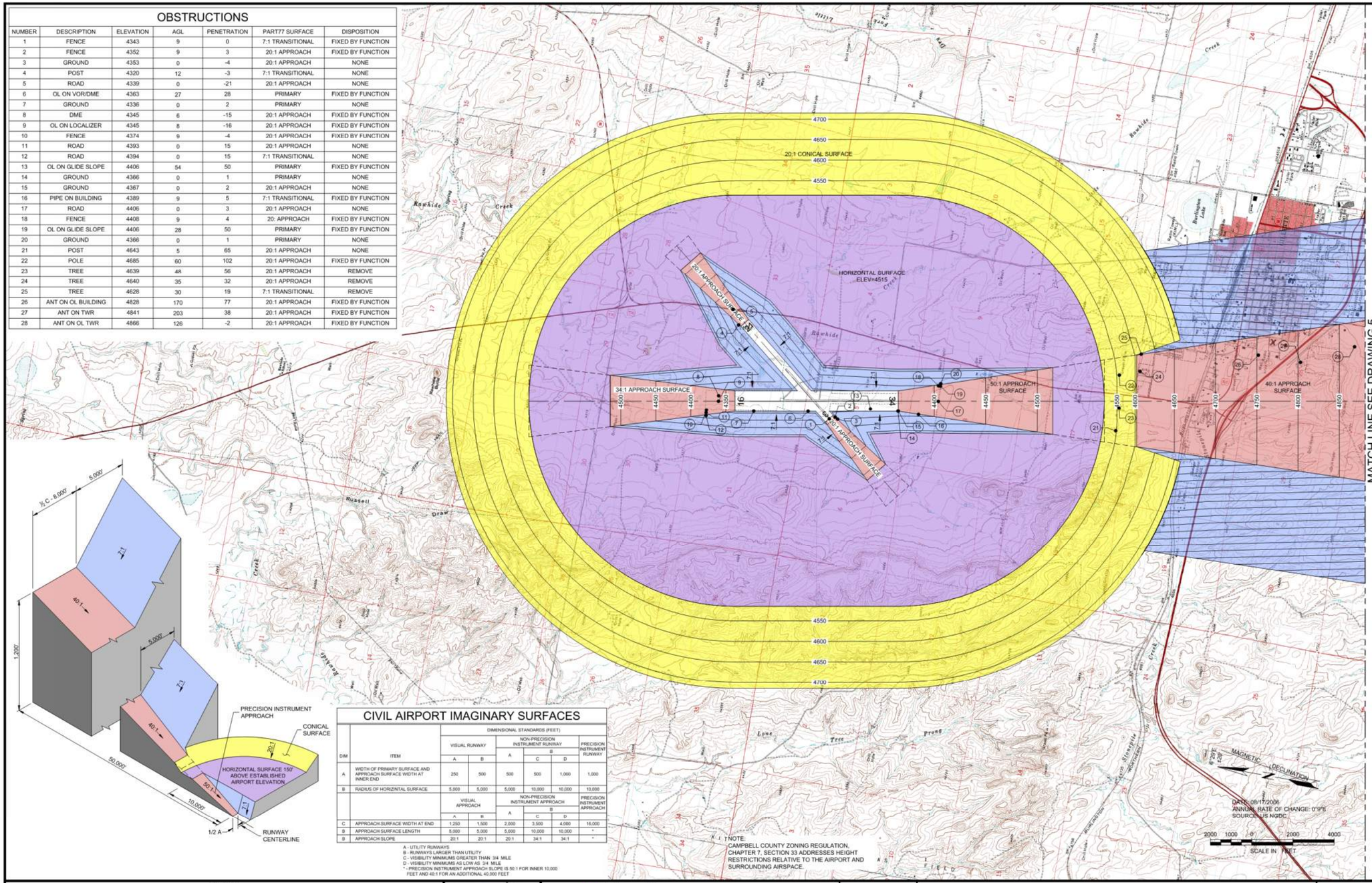
Table 1-2. Airport Surface Data

ITEM	DIMENSIONAL STANDARDS (FEET)					
	VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
	A	B	A	B		
				C	D	
WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
	VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
			A	B		
	A	B		C	D	
APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	α
APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	α

A – Utility Runways
B – Runways Larger than Utility (Existing Visual)
C – Visibility Minimums greater than ¾ Mile
D – Visibility Minimums as Low as ¾ (Ultimate)
α – Precision Instrument Approach Slope is 50:1 for Inner 10,000 Feet and 40:1 for an Additional 40,000 feet

OBSTRUCTIONS

NUMBER	DESCRIPTION	ELEVATION	AGL	PENETRATION	PART77 SURFACE	DISPOSITION
1	FENCE	4343	9	0	7:1 TRANSITIONAL	FIXED BY FUNCTION
2	FENCE	4352	9	3	20:1 APPROACH	FIXED BY FUNCTION
3	GROUND	4353	0	-4	20:1 APPROACH	NONE
4	POST	4320	12	-3	7:1 TRANSITIONAL	NONE
5	ROAD	4339	0	-21	20:1 APPROACH	NONE
6	OL ON VOR/DME	4363	27	28	PRIMARY	FIXED BY FUNCTION
7	GROUND	4336	0	2	PRIMARY	NONE
8	DME	4345	6	-15	20:1 APPROACH	FIXED BY FUNCTION
9	OL ON LOCALIZER	4345	8	-16	20:1 APPROACH	FIXED BY FUNCTION
10	FENCE	4374	9	-4	20:1 APPROACH	FIXED BY FUNCTION
11	ROAD	4393	0	15	20:1 APPROACH	NONE
12	ROAD	4394	0	15	7:1 TRANSITIONAL	NONE
13	OL ON GLIDE SLOPE	4406	54	50	PRIMARY	FIXED BY FUNCTION
14	GROUND	4366	0	1	PRIMARY	NONE
15	GROUND	4367	0	2	20:1 APPROACH	NONE
16	PIPE ON BUILDING	4389	9	5	7:1 TRANSITIONAL	FIXED BY FUNCTION
17	ROAD	4406	0	3	20:1 APPROACH	NONE
18	FENCE	4408	9	4	20: APPROACH	FIXED BY FUNCTION
19	OL ON GLIDE SLOPE	4406	28	50	PRIMARY	FIXED BY FUNCTION
20	GROUND	4366	0	1	PRIMARY	NONE
21	POST	4643	5	65	20:1 APPROACH	NONE
22	POLE	4685	60	102	20:1 APPROACH	FIXED BY FUNCTION
23	TREE	4639	48	56	20:1 APPROACH	REMOVE
24	TREE	4640	35	32	20:1 APPROACH	REMOVE
25	TREE	4628	30	19	7:1 TRANSITIONAL	REMOVE
26	ANT ON OL BUILDING	4828	170	77	20:1 APPROACH	FIXED BY FUNCTION
27	ANT ON TWR	4841	203	38	20:1 APPROACH	FIXED BY FUNCTION
28	ANT ON OL TWR	4866	126	-2	20:1 APPROACH	FIXED BY FUNCTION



CIVIL AIRPORT IMAGINARY SURFACES

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B C	B D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B C	B D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
B	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
B	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

REVISIONS

NO.	DESCRIPTION	DATE	BY

Gillette CAMPBELL COUNTY AIRPORT

Morrison Maierle
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DRAWN BY: KDK
DSGN. BY: TTW
APPR. BY: TTW
DATE: 5/2018

Y:\5289\000-MASTER\ALP\Sheets\GCC-04-AIRPPORT-AIRSPACE.dwg Plotted by duane schmitz on May/23/2018

GILLETTE-CAMPBELL COUNTY AIRPORT
GILLETTE WYOMING
AIRPORT AIRSPACE DRAWING

PROJECT NO. 5289.004
DRAWING NUMBER 4

Figure 1-7. FAR Part 77 Imaginary Airspace Surfaces

AIRPORT FACILITIES LIST

NO.	(E)-EXISTING (F)-FUTURE (U)-ULTIMATE (R)-TO BE REMOVED
1	TERMINAL BUILDING (E)
2	FIXED BASE OPERATOR HANGARS (E)
3	COUNTY OWNED HANGAR (E)(F)(U)
4	PRIVATELY OWNED HANGAR (E)(F)(R)
5	AIR TRAFFIC CONTROL TOWER/BEACON (E)
6	ARFF / SRE BUILDING (E)
7	ELECTRICAL VAULT (E)
8	FUEL FARM (E)
9	SEGMENTED CIRCLE & WIND TEE (E)
10	WIND CONE (E)
11	VOR / DME (E)
12	SELF-FUELING FACILITY (E)
13	STORAGE SHED (E)
14	AIR CARGO BUILDING (E)
15	AIRPORT OWNED HOUSING (E)(R)
16	RENTAL CAR SERCIVE FACILITY (E)(F)
17	WATER TREATMENT FACILITY (E)
18	AIRPORT SEWAGE LAGOON (E)
19	AIR CARGO BUILDING (E)
20	STORM WATER DETENTION POND (E)(F)
21	ANEMOMETER (E)
22	AUTO PARKING (E)
23	LOCALIZER ANTENNA (E)(F)
24	LOCALIZER EQUIPMENT SHELTER (E)(F)
25	MALSR (E)
26	MIDDLE MARKER BEACON (E)
27	GLIDE SLOPE (E)
28	ASOS (E)
29	PAPI (E)(F)
30	REIL (E)(F)
31	FBO FRONTAGE ROAD (E)(F)

AIRPORT REFERENCE POINT

	EXISTING (E)	FUTURE (F)	ULTIMATE (U)
LATITUDE (NAD83)	44°20'56.070"N	44°20'58.450"N	44°21'02.610"N
LONGITUDE (NAD83)	105°32'21.720"W	105°32'22.950"W	105°32'24.790"W

MAGNETIC DECLINATION 8°29'E 8°30'E

DATE: 08/17/2006
ANNUAL RATE OF CHANGE: 0°9'E
SOURCE: US NGDC

400 200 0 400 800
SCALE IN FEET

EXISTING AND FUTURE RPZ
500'x1000'x700'
20:1 APPROACH SURFACE NOT
>1 MILE; CAT. A & B AIRCRAFT
OWNED IN FEE & EASEMENT

EXISTING RUNWAY 21 END
STA 58+03 EL=4316.4
LAT. 44° 21' 27.85"
LONG. 105° 31' 47.83"

LOW POINT
STA 46+28 EL=4315.7
LAT. 44° 21' 18.75"
LONG. 105° 31' 57.85"

TOUCHDOWN ZONE ELEV
STA 28+03 EL=4326.8
LAT. 44° 21' 04.62"
LONG. 105° 32' 13.15"

FUTURE RPZ
500'x1700'x1010'
34:1 APPROACH SURFACE NOT
<1 MILE; CAT. C & D AIRCRAFT

ULTIMATE RUNWAY 16 END
TOUCHDOWN ZONE ELEV
STA 102+51.93 EL=4345.8
LAT. 44° 21' 49.50"
LONG. 105° 32' 44.20"

EXISTING RPZ
500'x1700'x1010'
34:1 APPROACH SURFACE NOT
<1 MILE; CAT. C & D AIRCRAFT

FUTURE RUNWAY 16 END
TOUCHDOWN ZONE ELEV
STA 87+59.05 EL=4340.3
LAT. 44° 21' 35.09"
LONG. 105° 32' 40.53"

EXISTING RUNWAY 16 END
TOUCHDOWN ZONE ELEV
STA 77+50.17 EL=4336.6
LAT. 44° 21' 25.29"
LONG. 105° 32' 36.04"

LOW POINT
STA 57+18.28
EL=4329.27
LAT. 44° 21' 05.64"
LONG. 105° 32' 33.04"

EXISTING RUNWAY 34 END
TOUCHDOWN ZONE ELEV
STA 2+50 EL=4364.5
HIGH POINT
LAT. 44° 20' 12.44"
LONG. 105° 32' 19.53"

EXISTING RUNWAY 3 END
TOUCHDOWN ZONE ELEV
STA 0+00 EL=4342.2
HIGH POINT
LAT. 44° 20' 42.90"
LONG. 105° 32' 37.35"

EXISTING AND FUTURE RPZ
500'x1000'x700'
20:1 APPROACH SURFACE NOT
>1 MILE; CAT. A & B AIRCRAFT

EXISTING AND FUTURE RPZ
1000'x1700'x1510'
50:1 APPROACH SURFACE
NOT <3/4 MILE; CAT. C & D AIRCRAFT

RUNWAY 3/21 75' X 5803' (EXISTING) 38°19'22.280"

RUNWAY 16/34 150' X 7500' (EXISTING) 150' X 8500' (FUTURE) 150' X 10,000' (ULTIMATE) 169°40'01.857"

US HWY 14-16

FUTURE BUSINESS PARK (A)

GA APRON

GA APRON EXPANSION (F)

COMMERCIAL APRON

COMMERCIAL APRON EXPANSION (F)

TERMINAL BUILDING EXPANSION

VEHICLE APRON EXPANSION (F)

RUNWAY INTERSECTION
STA 41+50 R/W 16/34
STA 9+56 R/W 3/21
EL=4336.3
LAT. 44° 20' 50.34"
LONG. 105° 32' 29.16"

ULTIMATE 1500' RUNWAY AND TAXIWAY EXTENSION

PROPOSED 1000' RUNWAY AND TAXIWAY EXTENSION

500' RUNWAY SAFETY AREA

800' OBJECT FREE AREA

LOCALIZER CRITICAL AREA

VOR CRITICAL AREA (1000' RADIUS)

GLIDE SLOPE CRITICAL AREA

TWY A TWY B TWY C TWY D TWY E

LEGEND

	FUTURE	ULTIMATE
AIRPORT PROPERTY BOUNDARY		
FENCE (8')		
BUILDING RESTRICTION LINE		
AIRFIELD PAVEMENT		
TO BE REMOVED		
LAND ACQUISITION		
ROAD		
CONTOURS		
OFA/RPZ BOUNDARY		
PRIMARY AND SECONDARY AIRPORT CONTROL POINTS (PACS/SACS)		
PROPERTY SECTION CORNERS		

FAA APPROVAL	SPONSOR APPROVAL	STATE AERONAUTICS APPROVAL
SUBJECT TO LETTER DATED:	ACCEPTED: GILLETTE-CAMPBELL COUNTY AIRPORT	ACCEPTED: STATE OF WYOMING
FEDERAL AVIATION ADMINISTRATION DENVER AIRPORTS DISTRICT OFFICE	DATE	DATE
DATED:		
CASE NO:		

REVISIONS

NO.	DESCRIPTION	DATE	BY

Gillette CAMPBELL COUNTY AIRPORT

Morrison Maierle
engineers • surveyors • planners • scientists
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Gillette, WY 82716
307.685.3780
www.m-m.net
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DRAWN BY: KDK
DSGN. BY: TTW
APPR. BY: TTW
DATE: 5/2018

Y:\5289\000-MASTER\ALP\Sheets\GCC-03-AIRPORT-LAYOUT-PLAN.dwg Plotted by duane schmitz on May/23/2018

GILLETTE-CAMPBELL COUNTY AIRPORT
GILLETTE WYOMING

AIRPORT LAYOUT PLAN

PROJECT NO. 5289.004

DRAWING NUMBER 3

Figure 1-8. Airport Layout Plan

1.2.5 Runway Navaids & Approaches

Gillette-Campbell County Airport has two runways. Runway 16/34 is the primary air carrier runway and is a precision instrument runway. Runway 3/21 is the crosswind runway. Runway 16/34 is 7,500 feet long and 150 feet wide. Runway 3/21 is 5,803 feet long by 75 feet wide. **Figure 1-2** depicted the general airfield layout. **Table 1-3** depicts the design strength of the grooved concrete pavement.

Runway 16/34 is equipped with High Intensity Runway Lighting (HIRL). Runway 34 is also equipped with a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). The MALSR provides horizontal guidance to the runway in low-visibility conditions using an array of lead in lights. Runway 16 is equipped with flashing Runway End Identifier Lights (REILs). Runway 16 and 34 are both equipped with 4-box Precision Approach Path Indicators (PAPIs). The PAPIs provide vertical guidance to the aircraft. Runway 16/34 has precision instrument runway markings as well.

Runway 3/21 is equipped with Medium Intensity Runway Lighting (MIRL). The air traffic control tower controls the lighting when it is staffed. Pilots can operate the lights when the tower is not in operation by keying in a certain frequency into the aircraft microphone. Runway 3 and 21 are both equipped with REILs and PAPIs and marked with non-precision markings.

Runway 34 has three published instrument approaches and Runway 16 has two. These approaches are published in the Terminal Procedures Publications produced by the National Aeronautical Charting Office. These approaches are listed below and copies of the Instrument Approach Procedures are found in Figures 1-9 through 1-13.

- ILS or LOC RWY 34 Figure 1-9
- RNAV (GPS) RWY 16 Figure 1-10
- RNAV (GPS) RWY 34 Figure 1-11
- VOR/DME RWY 16 Figure 1-12
- VOR/DME RWY 34 Figure 1-13

Runway 3/21 does not have a published approach at this time.

Table 1-3. Runway Characteristics

	16/34		3/21	
RUNWAY WIDTH X LENGTH (feet)	150 x 7500		75 x 5803	
% GRADIENT	.4 UP	.6	.5	.4 UP
AIRPORT REFRENCE CODE (ARC)	C-III		B-II	
INSTRUMENT & APPROACH AIDS	VOR/DME RNAV ILS (34) LOC (34)			
VISUAL AIDS	MALSR		None	
LIGHTING	High Intensity		Medium Intensity	
MARKING	Precision Instrument		Non-Precision	
SURFACE	Concrete – Grooved		Concrete - Grooved	
SINGLE WHEEL (lbs)	60,000		40,000	
DUAL WHEEL (lbs)	110,000			
DUAL TANDEM (lbs)	160,000			
PAVEMENT CLASSIFICATION NUMBER (PCN)	35/R/C/W/T		13/R/D/W/T	

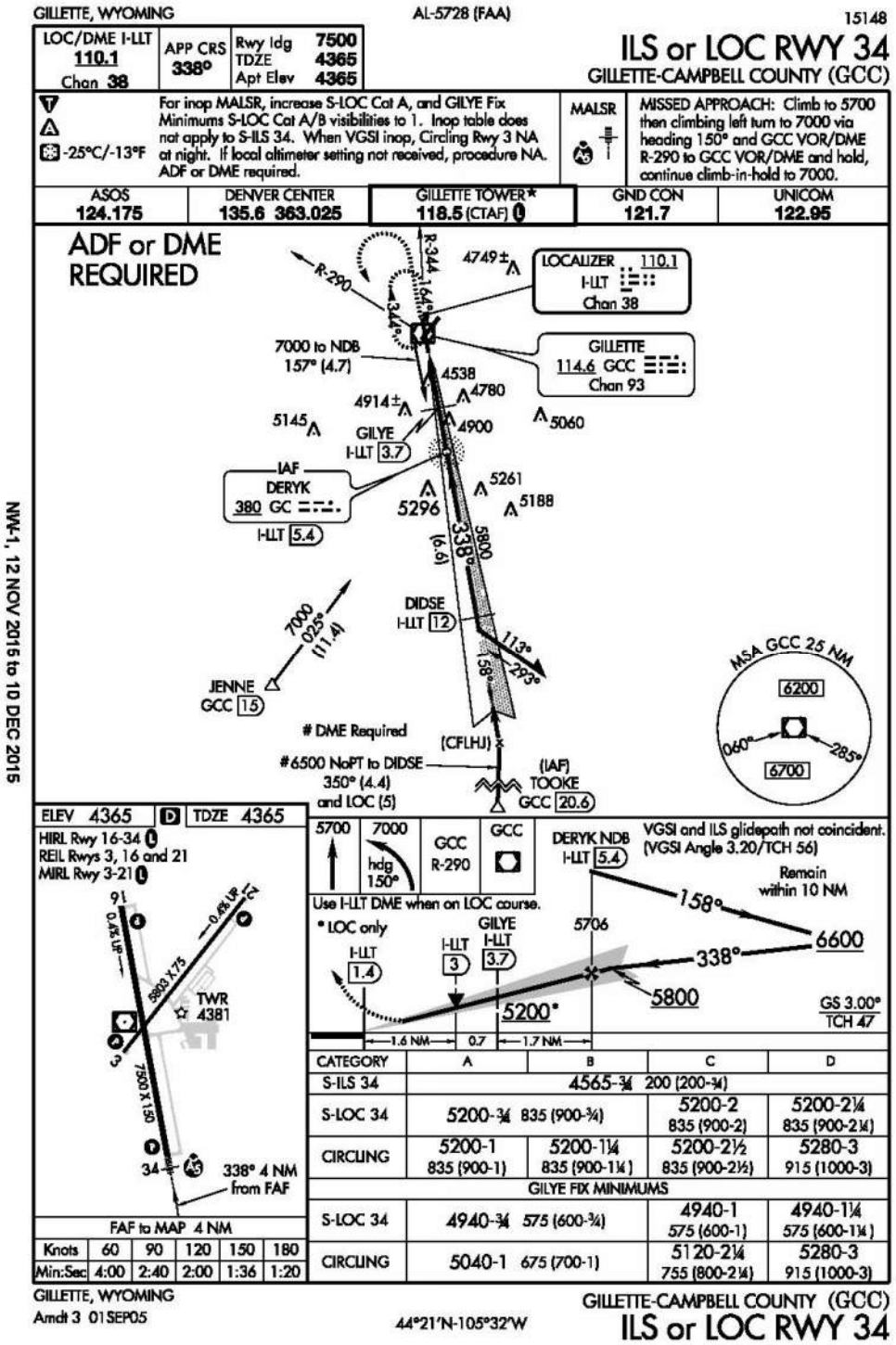


Figure 1-9. ILS or LOC RWY 34

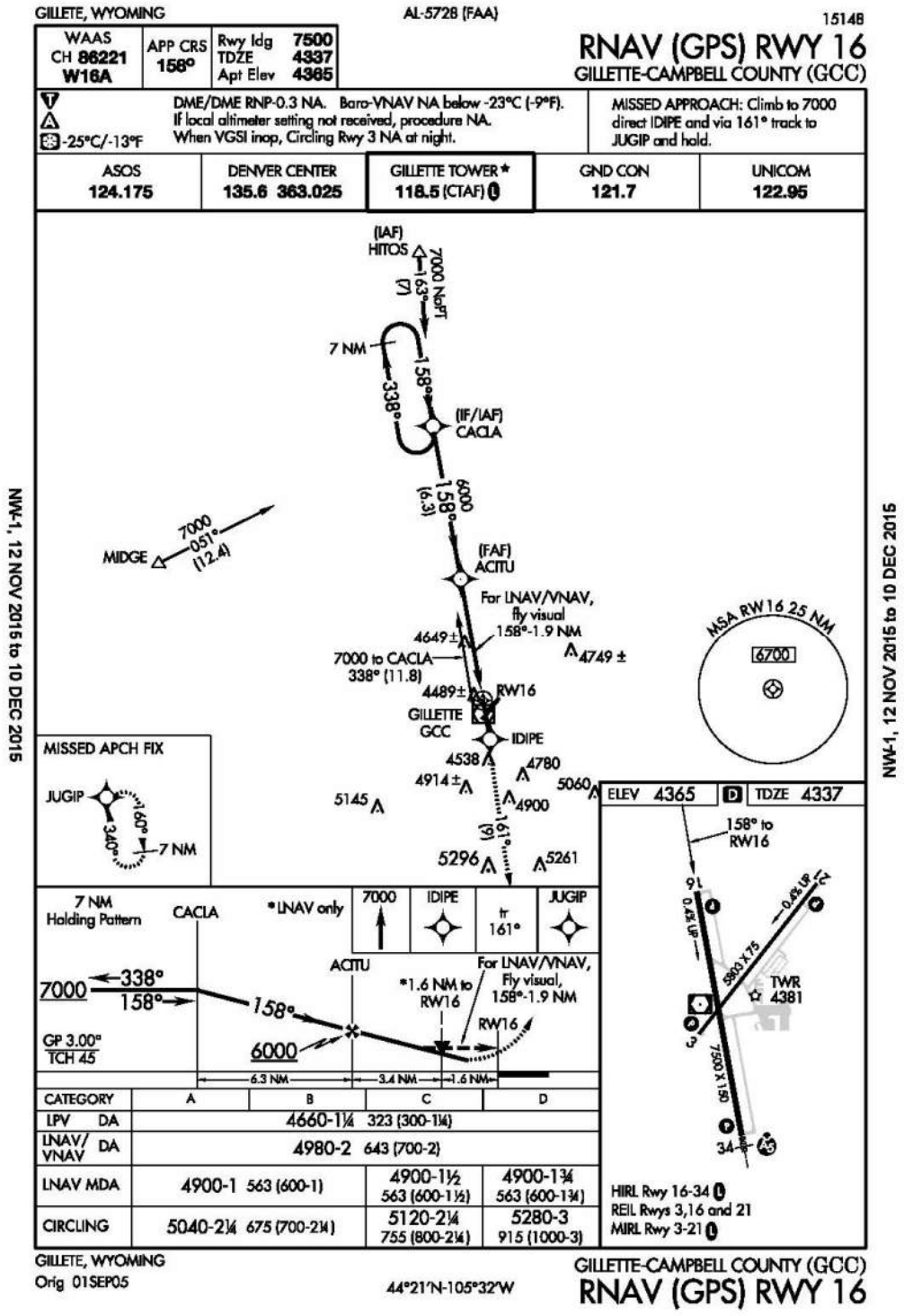


Figure 1-10. RNAV (GPS) RWY 16

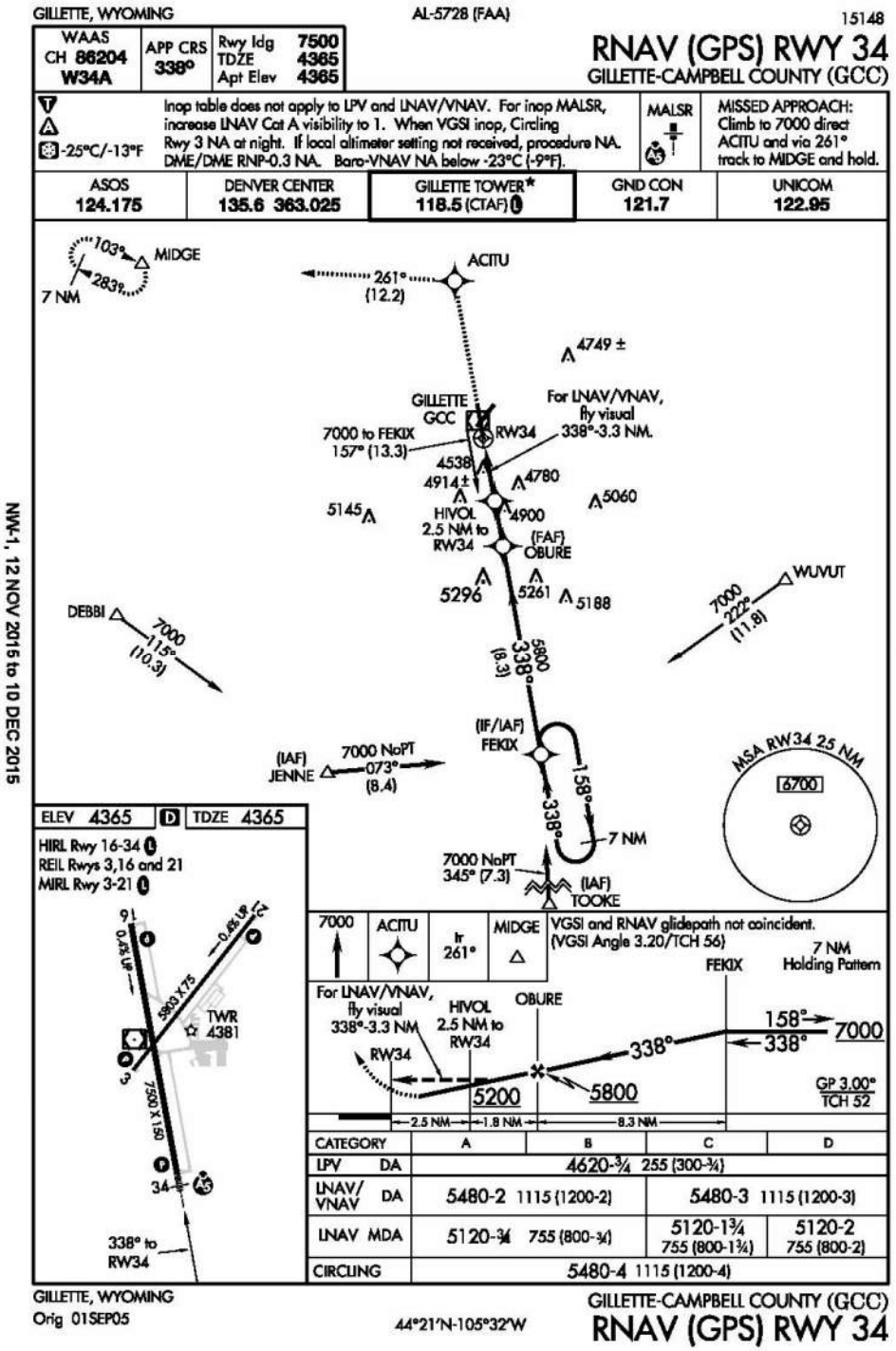


Figure 1-11. RNAV (GPS) RWY 34

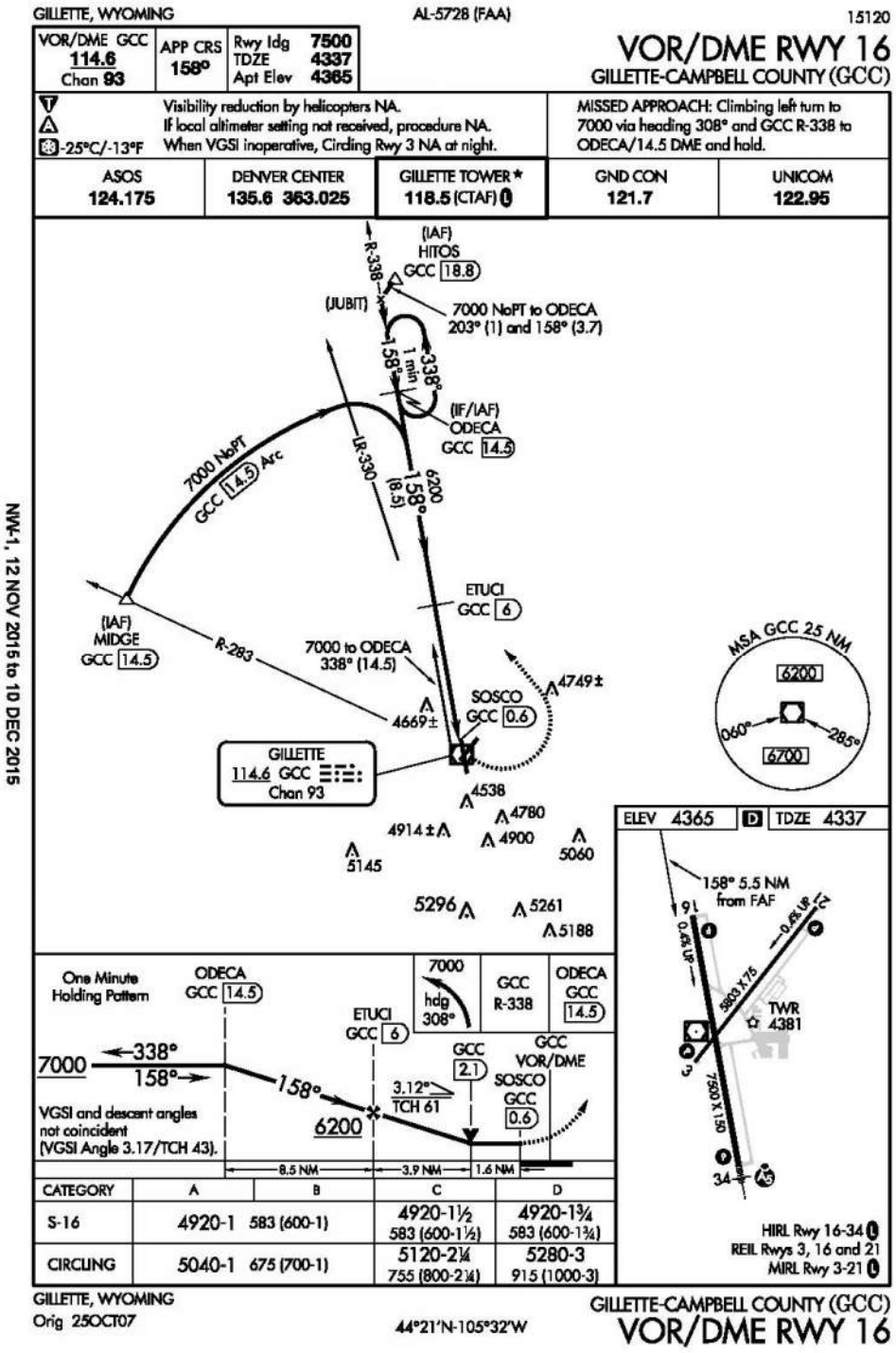


Figure 1-12. VOR/DME RWY 16

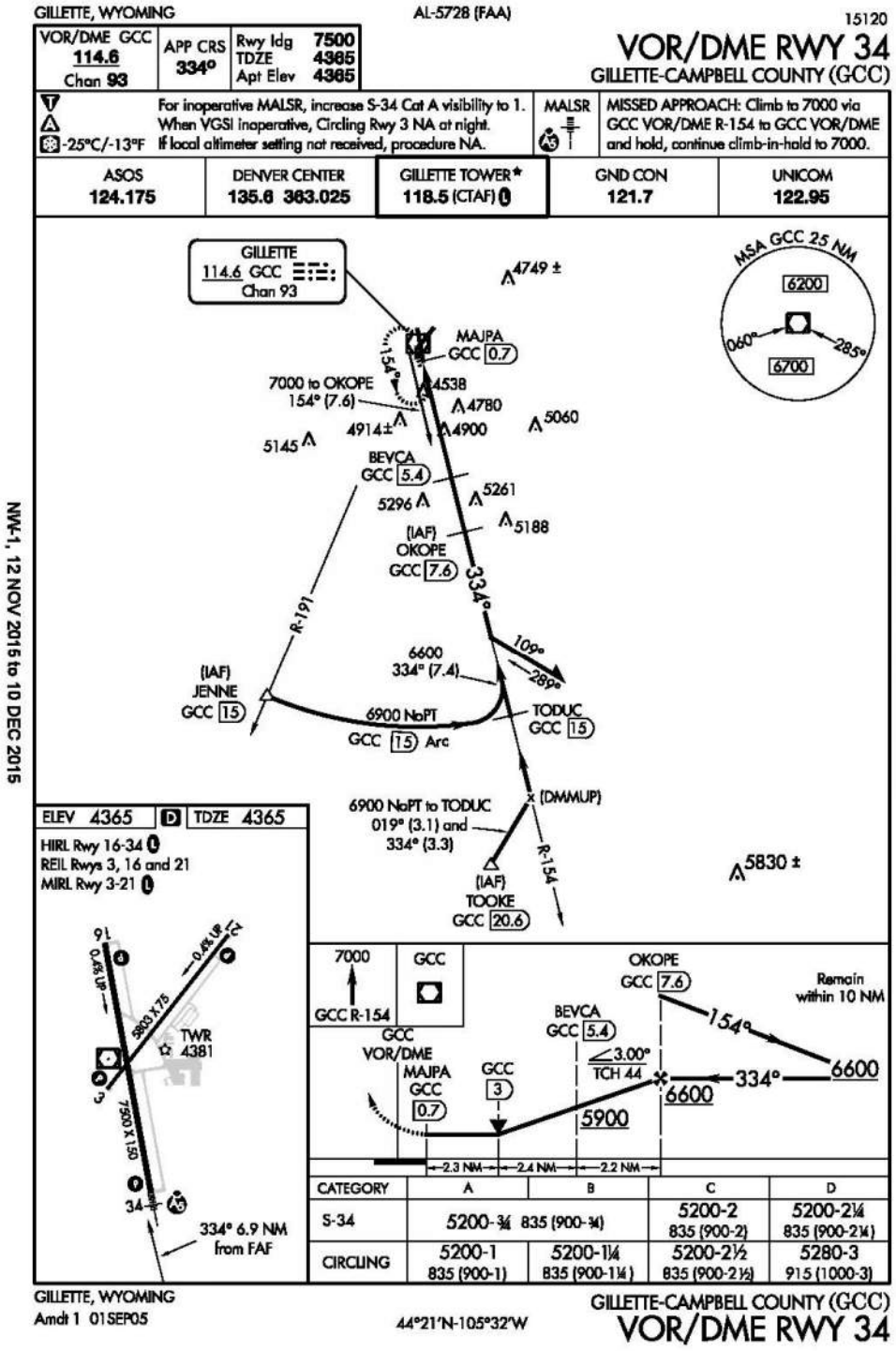


Figure 1-13. VOR/DME RWY 34

1.2.6 Taxiways & Taxilanes

The Gillette-Campbell County Airport utilizes partial parallel taxiways to access both Runway 16/34 and 3/21. **Figure 1-2** seen previously, shows the runway and taxiway layout.

Taxiway A services Runway 16. Taxiway E services Runway 34. Taxiway A and Taxiway E centerlines are both spaced 400 feet from the runway centerline.

Taxiway C services Runway 3/21. The centerline for Taxiway C is 300 feet from the runway centerline. The taxiway connects to the runway, approximately 710 feet from the end of Runway 21.

Taxiway B and Taxiway D are connector taxiways, connecting Taxiway A, Taxiway E and Taxiway C to the hangar and terminal areas. Taxiway B intersects Runway 3/21 and the end of Taxiway A before ending at Runway 16/34. Taxiway D intersects the end of Taxiway E before ending at Runway 16/34.

As previously depicted in **Figure 1-2,** the existing taxiways for Runway 16/34 are partial parallel taxiways. Runway 16/34's two taxiways are Taxiway A and Taxiway E, for each end of the runway. The taxiway centerlines are spaced at a distance of 400 feet from runway centerline, and are constructed to a width of 50 feet. Taxiway B and Taxiway D are connector taxiways from the terminal and hangar areas to Runway 16/34. Taxiway B is constructed at a width of 50 feet, crosses Runway 3/21, connects to the end of Taxiway A and ends at Runway 16/34. Taxiway D is constructed to a width of 65 feet, which is greater than standard, connects to the end of Taxiway E and ends at Runway 16/34. **Table 1-4** shows the taxiway characteristics.

Figure 1-14. Runway 16/34 in the background with partial parallel Taxiway A. Runway 3/21 in the center of the picture with partial parallel Taxiway C.

Table 1-4. Taxiway Characteristics

Taxiway	Width (Design Group)	Safety Area Width	Pavement Strength
TW A	50’ (III)	118’	70,000 (S) 110,000 (D) 160,000 (DT)
TW B	50’ (III)	118’	70,000 (S) 110,000 (D) 160,000 (DT)
TW C	35’ (II)	79’	40,000 (S) 60,000 (D)
TW D	65’ (III)	118’	70,000 (S) 110,000 (D) 160,000 (DT)
TW E	50’ (III)	118’	70,000 (S) 110,000 (D) 160,000 (DT)

1.2.7 Apron Areas

The Gillette-Campbell County Airport has two main apron areas. The first is the commercial apron which is located in front of the terminal building. The second is the general aviation apron which is located in front of the Fixed Base Operator Hangar and the County Owned Hangar. **Table 1-5** shows the apron information and parking locations.

1.2.8 Commercial Apron

The commercial apron is located in front of the terminal building. There are three spaces with lead-in lines to accommodate commercial aircraft. The apron contains a glycol recovery drainage system to capture deicing fluid and is approximately 13,985 square yards. **Figure 1-16** and **Figure 1-17** show the commercial apron.

Figure 1-15. Commercial Apron

Figure 1-16. Commercial Apron view from the tower

Table 1-5. Available Aircraft Apron Area and Parking Locations

	Apron Area (Square Yards)	Parking Locations
Air Carrier Apron	13,985	3
General Aviation (GA) Apron	14,000	21
TOTAL	27,985	25

Figure 1-17. General Aviation Apron in front of the county hangar, view from the tower.

Figure 1-18. General Aviation Apron in front of the Fix Based Operator building

1.2.9 General Aviation Apron

The General Aviation (GA) Apron, pictured in **Figure 1-17** and **Figure 1-18**, is used for transient GA parking and large aircraft parking.

1.2.10 Fuel Facilities and Sales

The airport fuel farm contains three, 12,000 gallon tanks shown in **Figure 1-19**. The farm is located north of the county hangar, outside the perimeter fence. Two of the tanks contain Jet-A fuel for turbine and turboprop aircraft. The third tank contains 100 octane low-lead (100LL) aviation gasoline for reciprocating engine propeller-driven aircraft. The airport also owns and manages a 500 gallon 100 LL self-service credit card fueling station. The station offers discounted fuel prices over the FBO's retail prices.

Tracking the fuel sales data is used to determine the peak periods for airport activity as well as validating activity forecasts. **Figure 1-20** depicts the total annual fuel sales for the airport from January 2005 through December 2015. **Figure 1-21** depicts usage on a monthly basis, and clearly shows that the highest level of airport operations occurs during summer months.

Figure 1-19. Fuel Farm

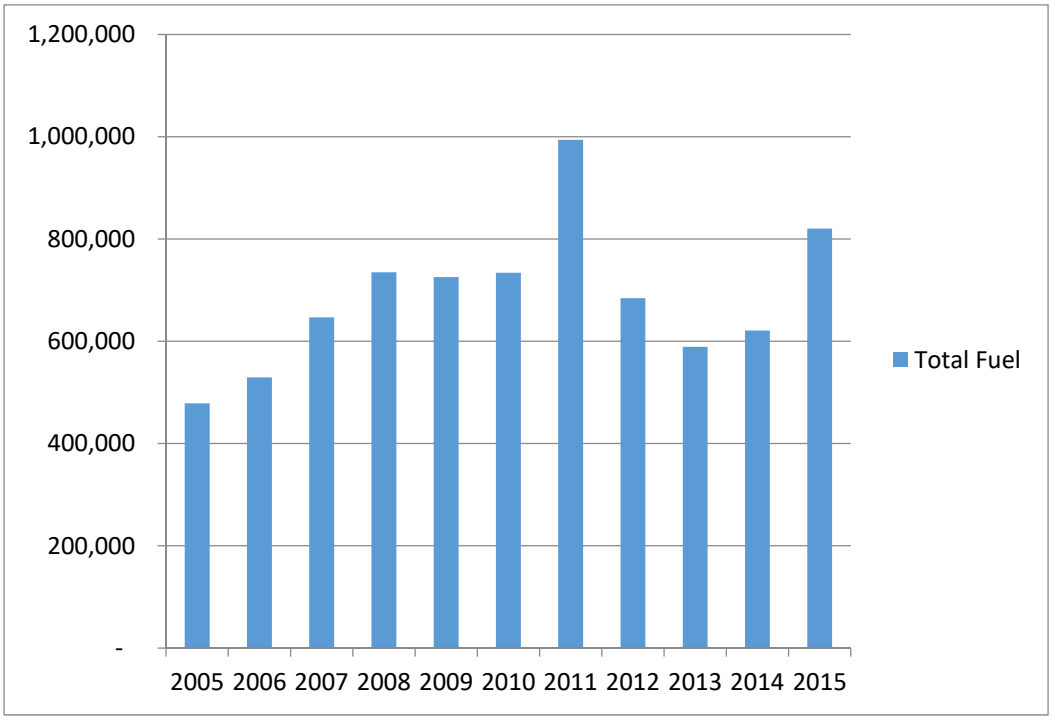


Figure 1-20. Annual Fuel Sales by Year; 2005 through 2015

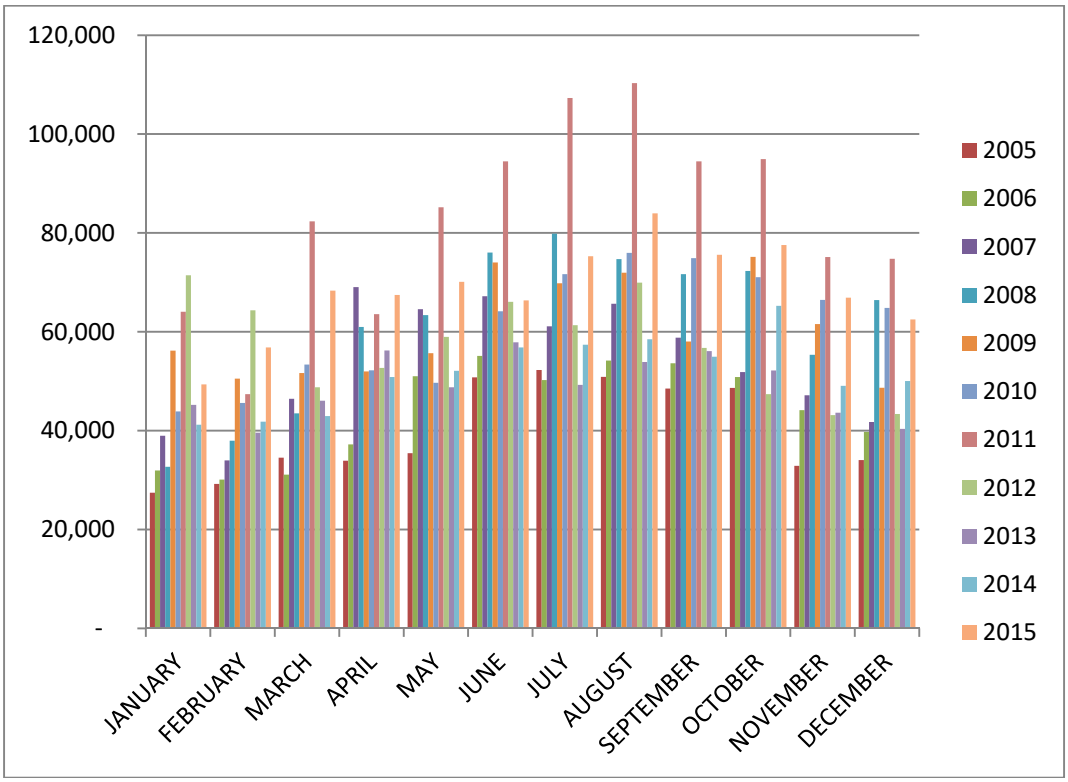


Figure 1-21. Total fuel sales by month; 2005 through 2015

1.2.11 Hangar and Tie-Down Leases

The airport has several airport-owned hangars, as well as individually owned hangars. Presently, all of the based aircraft are located in hangars. The airport typically has a wait-list for hangars that fluctuates with up to ten (10) aircraft owners looking for space. In 1979, the airport had over 100 based aircraft. Currently, 50-55 aircraft are based at Gillette-Campbell County Airport.

Figure 1-22. Private Hangars and T-Hangars

1.2.12 Airport Rescue and Fire Fighting/ Snow Removal Equipment Building

Figure 1-23 shows the Aircraft Rescue and Fire Fighting (ARFF)/Snow Removal Equipment (SRE) building was completed in 2005. The facility has nine climate controlled vehicle bays, seven for maintenance equipment storage, one for vehicle maintenance and one for the ARFF truck. The vehicle maintenance bay and ARFF truck bay are separate from the other seven bays. In addition to the vehicle bays, the building contains a kitchen, locker room, office space and a day room to accommodate the airports maintenance needs.

Figure 1-23.ARFF/SRE Building

1.2.13 Airport Security

The airport is secured by fencing. Adjacent to the terminal, an eight foot tall chain-link security fencing is in place. The rest of the airport is secured by an eight foot tall wildlife fencing. **Figure 1-24** shows the wildlife fencing in between Runway 34 and Runway 21.

Figure 1-24. Eight Foot Tall Wildlife Fencing

1.2.14 Commercial Passenger Terminal Facilities

The terminal is comprised of a passenger ticketing area, holdrooms for screened and unscreened passengers, airline operations, baggage pick-up, maintenance room, café, meeting room and airport administration offices. The terminal is about 26,000 square feet and was completed in 1997. The terminal processes all passengers through a single screening point into a sterile holdroom leading to the three gates to access the apron. Unique wildlife displays are featured in the center of the terminal and murals are painted on the walls leading up to the skylights.

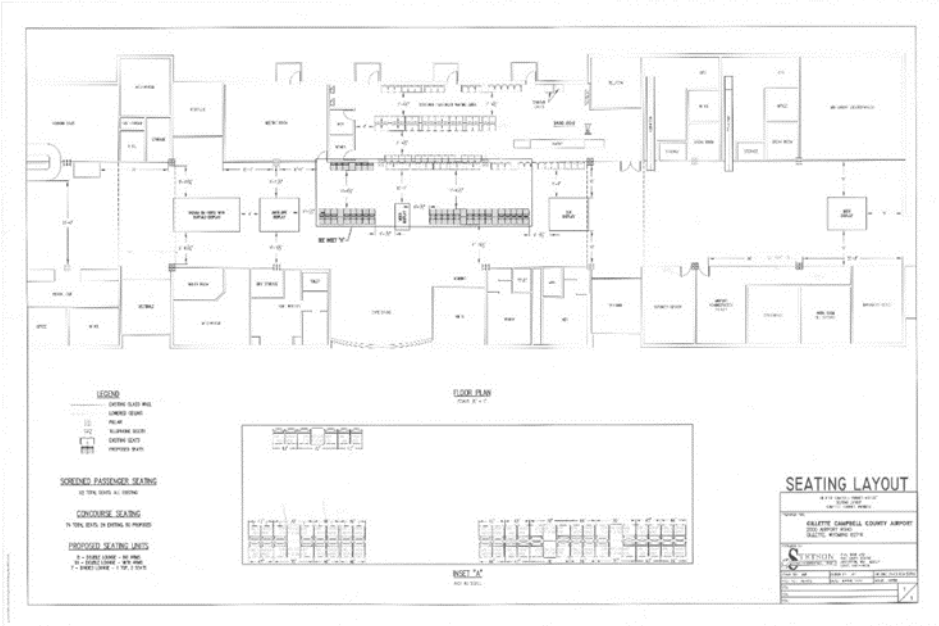


Figure 1-25. Terminal Layout

Figure 1-26. Passenger Ticketing Counters

Figure 1-27. Wildlife Exhibit

1.2.15 Fixed Base Operator (FBO)

Flightline Aviation, Inc. is the sole Fixed Base Operation (FBO) providing general and commercial aviation services. Flightline currently offers the following services: aircraft maintenance (airframe and power plant), aircraft parts (new and used), aircraft rentals, car rentals, catering, charters, courtesy transportation, crew cars, flight school/flight training, free parking and hangars (for transient aircraft), oxygen, passenger terminal and lounge, pilot lounge/restroom, pilot supplies, public telephone, retail sales of aviation fuel and sightseeing tours/rides.

Figure 1-28. FBO Building Airside

Figure 1-29. FBO Building Landside

1.2.16 Access and Parking

The airport has one vehicle access road from U.S. Highway 14/16. Passenger pickup, dropoff and parking is accessed via a loop road that circles the parking lot and provides curb-side drop off and pickup. The parking lot is provided free of charge and currently has approximately 277 parking spaces. There is a parking lot adjacent to the north side of the terminal that is used for airport employees, a parking lot adjacent to the south side of the terminal that is used for rental cars, and a non-paved parking area located directly east of the FBO building with the newly constructed car wash on the edge of the parking lot for the rental cars.

Figure 1-30. Free Passenger Parking Lot

Figure 1-31. Rental Car Parking Lot

Figure 1-32. Car Wash

1.2.17 Other Airport Buildings

The airport also has its own water treatment facility and sewage treatment lagoons. The water treatment facility is fed via a well and includes a pump house, a treatment building and a storage tank, which are shown in **Figure 1-33**.

1.2.18 Airport Support Equipment

The airport has equipment that has been purchased using state and federal funds. Additionally, the airport also utilized county purchased equipment.

Figure 1-33. On Site Water Supply and Distribution System

Table 1-6. Federal and State Subsidized Equipment

Vehicle Make	Vehicle Year	Vehicle Description
Michigan L-140	1989	Front End Loader w/ 12' reversible plow
Kodiak Carrier	2001	22' reversible plow, 18' sweep, 4k ton per hour snow blower
International 7600	2005	Plow Truck
International 7600	2005	Plow Truck
Rosenbauer	2006	ARFF Truck

Table 1-7. County Subsidized Equipment

Vehicle Make	Vehicle Year	Vehicle Description
Ford F-150	1996	Pickup
Freightliner	1999	Bucket Truck
Chevrolet	2002	Tahoe
Ford F-150	2006	Pickup
Ford F-150	2006	Pickup
John Deer 7320	2007	Tractor w/ snow blower and pallet forks
John Deer 1420	2007	Lawn Tractor/Mower w/ plow, broom and snow blower
Bobcat 5600	2011	Skidsteer with broom, snow blower, box plow, angle plow and pallet forks
Ford F-250	2016	Pickup

1.3 Regional Setting and Land Use

The Gillette-Campbell County Airport services the commercial and general aviation needs for the northeast corner of Wyoming. Gillette is in the center of the Powder River Basin. The Powder River Basin is known for its coal deposits and supplies about 40 percent of coal produced in the United States. Along with coal, oil and coalbed methane gas are the two other prominent natural resources that are harvested for the use of the rest of the United States. **Figure 1-34** depicts Eagle Butte Coal Mine which is located north and east of the airport.

Gillette is a semi-arid climate that averages 59.3 degrees Fahrenheit for an annual high temperature, 33 degrees Fahrenheit for an annual low temperature, 16.9 inches of rain per year and 59 inches of snow per year. A summary of climactic data for the City of Gillette is presented in **Table 1-8**.

Figure 1-34. Eagle Butte Coal Mine

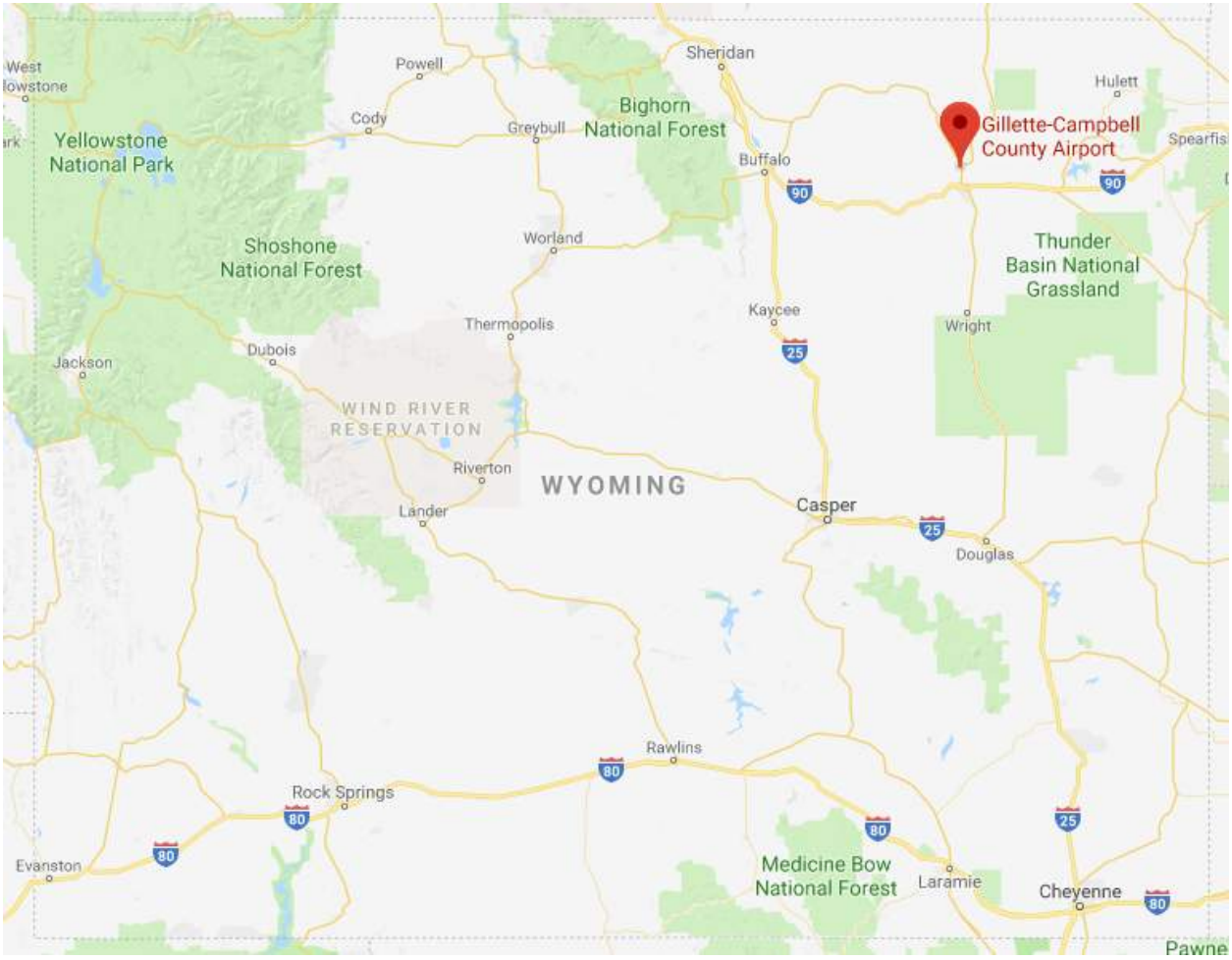


Figure 1-35. Airport Location

Table 1-8. Gillette, WY Climate Data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High Temp Avg. (F)	37	39	48	57	67	77	87	86	74	60	45	35
Low Temp Avg. (F)	14	16	23	31	40	49	56	55	44	33	22	13
Precip. Avg. (in.)	0.47	0.59	1.06	1.85	3.15	2.56	1.81	1.30	1.34	1.50	0.67	0.63
Snowfall Avg. (in)	7	8	11	10	2	0	0	0	1	4	7	9
Wind Speed (mph)	14	13.2	12.9	12.5	11.6	11	10	10.1	11	11.5	13	13.8
Sunshine (%)	56	60	63	61	60	65	74	73	70	67	53	55

Source: http://www.usclimatedata.com/climate/gillette/wyoming/united-states/uswy0067
http://www.city-data.com/city/Gillette-Wyoming.html

1.3.1 Population

Table 1-9 shows the Wyoming Department of Administration & Information Economic Analysis Division Population Projections for the State of Wyoming, Campbell County and the City of Gillette. The projections reflect U.S. Census estimates and were obtained from the Wyoming Department of Administration & Information Economic Analysis Division website.

Historical estimates indicate an annual growth rate for the State of Wyoming of 1.15% between 1990 and 2014 and an annual growth rate for Campbell County and the City of Gillette of 2.58% and 3.25% respectively. The forecasts represent an average 0.8% compounded annual growth rate for the State of Wyoming and 1.26% compound annual growth rate for Campbell County and the City of Gillette over the twenty-year planning period.

Table 1-10 shows the age distribution of the Campbell County population and **Table 1-11** shows the racial composition of the Campbell County population.

Table 1-9. Population Trends for the Years 1990-2035

	State of Wyoming	Campbell County	City of Gillette
Historical			
1990	453,588	29,370	17,635
2000	493,782	33,705	19,646
2010	563,626	46,133	29,087
2014	584,153	48,320	31,971
Projected			
2015	587,660	48,550	30,611
2020	616,140	51,140	32,244
2025	642,870	54,450	34,331
2030	665,670	57,910	36,512
2035	686,020	61,390	38,707
Historical			
% Increase 1990-2014	28.78%	64.52%	81.29%
A.A.G.R. 1990-2014	1.15%	2.58%	3.25%
Projected			
% Increase 2015-2035	16.7%	26.4%	26.4%
A.A.G.R. 2015-2035	0.80%	1.26%	1.26%

A.A.G.R. = Average Annual Growth Rate

Sources: http://eadiv.state.wy.us/demog_data/cntycity_hist.htm\
http://www.city-data.com/city/Gillette-Wyoming.html
http://quickfacts.census.gov/qfd/states/56/5631855.html
http://eadiv.state.wy.us/pop/wyc&sc40.htm - Population forecasts to 2030

Table 1-10. Age Distribution within Campbell County Households

Age	Number	Percent
0-4	4,063	8.81%
5-17	8,919	19.33%
18-65	30,535	66.19%
65+	2,616	5.67%

Source: http://censusviewer.com/county/WY/Campbell

Table 1-11. Population Composition of Campbell County

Race	Number	Percent
White	42,974	93.15%
Native American and Alaska Native	531	1.15%
Asian	256	0.55%
Native Hawaiian/Pacific Islander	22	0.05%
Black/African American	159	0.34%
Other	1,233	2.56%
Two or More Races	968	2.10%
No Hispanic or Latino Origin	42,522	92.17%
Hispanic or Latino Origin	3,611	7.83%

Source: http://censusviewer.com/county/WY/Campbell

1.3.2 Employment

The mining and energy sectors are by far the largest employment growth sectors in Wyoming, with much of that growth occurring in the Powder River Basin. As discussed, it is envisioned that this sector will continue to grow. As it grows, ancillary sectors, such as construction, retail services, etc. will develop as well.

1.3.3 Income

Table 1-15 shows median household income levels for the United States, Wyoming and Campbell County. The median household income is less than the State of California, but greater than the Unites States figures.

Table 1-12. Civilian Labor Force and Unemployment Rate

	State of Wyoming	Campbell County	City of Gillette
2012			
Labor Force	307,542	26,137	16,647
Unemployment Rate	5.3	4.6	4.0
2013			
Labor Force	306,767	25,710	16,474
Unemployment Rate	4.7	4.2	3.7
2014			
Labor Force	306,928	26,328	16,918
Unemployment Rate	4.3	3.5	3.2

Source: https://doe.state.wy.us/lmi/laus/toc.htm

Table 1-13. Employment by Sector

	Campbell County		
	2012	2013	2014
Trade, Transportation and Utilities	5,301	5,266	5,438
Education & Health Services	1,048	1,062	1,045
Leisure & Hospitality	2,060	2,203	2,291
Other Services	960	814	740
Natural Resources & Mining	8,327	7,913	8,103
Construction	2,330	2,210	2,685
Manufacturing	518	535	562
Information	207	206	194
Financial Activities	702	704	702
Professional and Business Services	1,723	1,689	1,733

Source: Bureau of Labor Statistics

Table 1-14. Major Employers in Campbell County

Employer	Employment Type
Campbell County School District	Government
Peabody Energy	Coal Company
Thunder Basin Coal	Coal Company
Campbell County Memorial Hospital	Medical
Cloud Peak Energy	Coal Company

Source: Campbell County Economic Development Corporation - http://www.energycapitaled.com/

Table 1-15. Effective Buying Income per Median Household, in Dollars

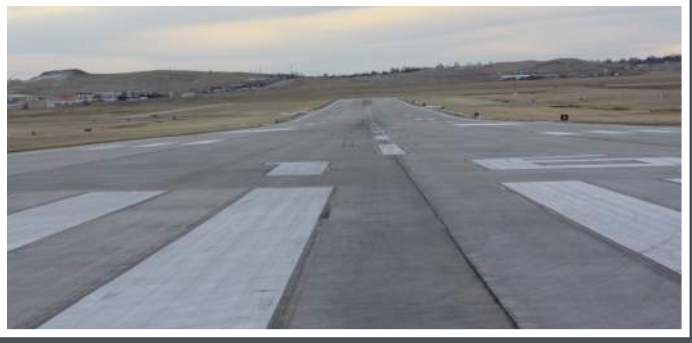
	United States	Wyoming	Campbell County
2012	51,914	55,569	74,233
2013	52,250	58,752	77,740

Sources:https://www.census.gov/content/dam/Census/library/publications/2014/acs/acsbr13-02.pdf
http://pediacities.com/county/campbell-county-wy-05000US56005/median_household_income

Gillette
CAMPBELL COUNTY
AIRPORT

GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

CHAPTER TWO:
AVIATION DEMAND FORECAST



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2.0 AVIATION DEMAND FORECAST

2.1 Introduction

The first step in planning for future facilities is to define the level of demand that can be reasonably expected to occur over the planning period. In the airport master planning process, this involves preparing forecasts of key aviation activity indicators that define the level of airport demand. Forecasts of commercial service and general aviation are used as the basis for facility planning, financial projections, and environmental analysis.

Aviation activity can be affected by a variety of unforeseeable and unpredictable influences such as competition; local, regional, national and global economies; fuel supply volatility and pricing; and the implementation of effective airport sales and marketing programs. Because of this, it is important to understand that forecasts are to serve only as guidelines. Planning must remain flexible enough to respond to unforeseen facility needs and service demands. Reviewing the airport's activity on a regular basis to determine if changes to the guidelines are necessary is a way to stay current with changing conditions and demands.

The following forecast analysis examines recent developments, historical information, and current aviation trends for the Gillette-Campbell County Airport (GCC) to provide an updated set of passenger and operational projections. These in turn may drive the need for facility upgrades or modifications. As stated previously, the intent of the Master Plan is to assist the Gillette-Campbell County Airport Board in making the adjustments necessary to ensure that the facility meets projected demands in an efficient and cost effective manner.

2.2 National Aviation Trends

The Federal Aviation Administration (FAA) publishes its national aviation forecast each year, which includes forecasts for major air carriers, regional/commuters and general aviation. The forecast uses the economic performance of the United States as an indicator of future aviation industry growth. The edition at the time of this chapter's preparation was FAA Aerospace Forecast Fiscal Years 2015-2035.

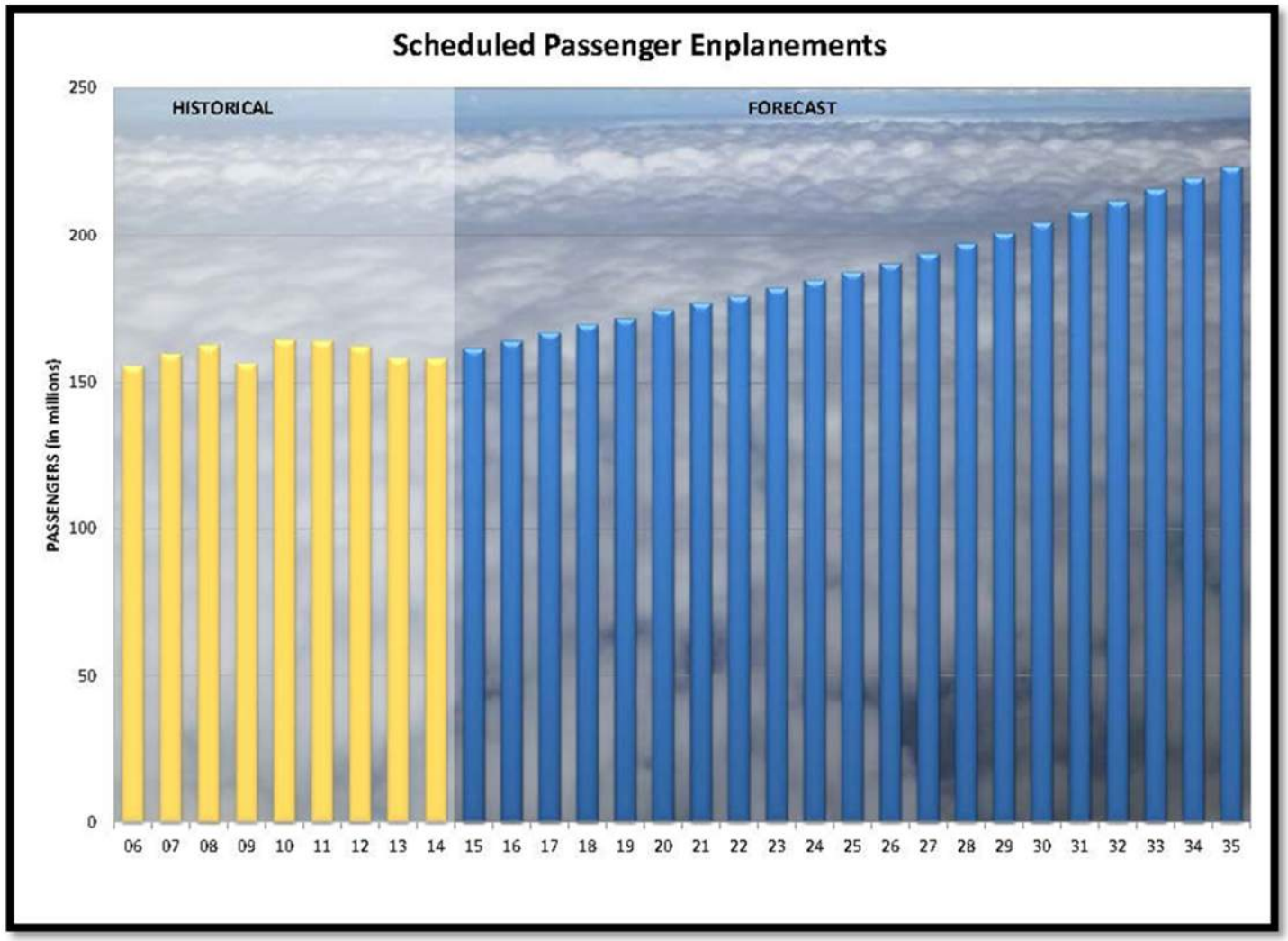
The FAA forecast notes that a fundamental change has taken place in the operations and finances of U.S Airlines following the great recession of 2007-09. Air carriers have fine-tuned their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel efficient aircraft. To increase operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The industry experienced an unprecedented period of consolidation with four major mergers in five years. These changes along with capacity discipline exhibited by carriers have resulted in a fifth consecutive year of profitability for the industry in 2014. Looking ahead there is optimism that the industry has been transformed from that of a boom-to-bust cycle to one of sustainable profits.

The FAA forecasts that as the economy recovers from the most serious economic downturn since World War II and the slowest expansion in recent history, aviation will continue to grow over the long term. The 2015 FAA forecast calls for U.S. carrier passenger growth over the next 20 years to average 1.7 percent per year with regional carriers growing at the same rate as mainline carriers. Regional carrier aircraft size is projected to grow with a wave of 70-90 seat

regional jet aircraft entering the fleet with reductions in the 50 seat and under jet fleet. The changing aircraft fleet mix is narrowing the gap between the size and aircraft types operated by the mainline and regional carriers. **Figure 2-1** depicts passenger forecasts and **Figure 2-2** depicts fleet mix forecasts for Regional/Commuter Airlines.

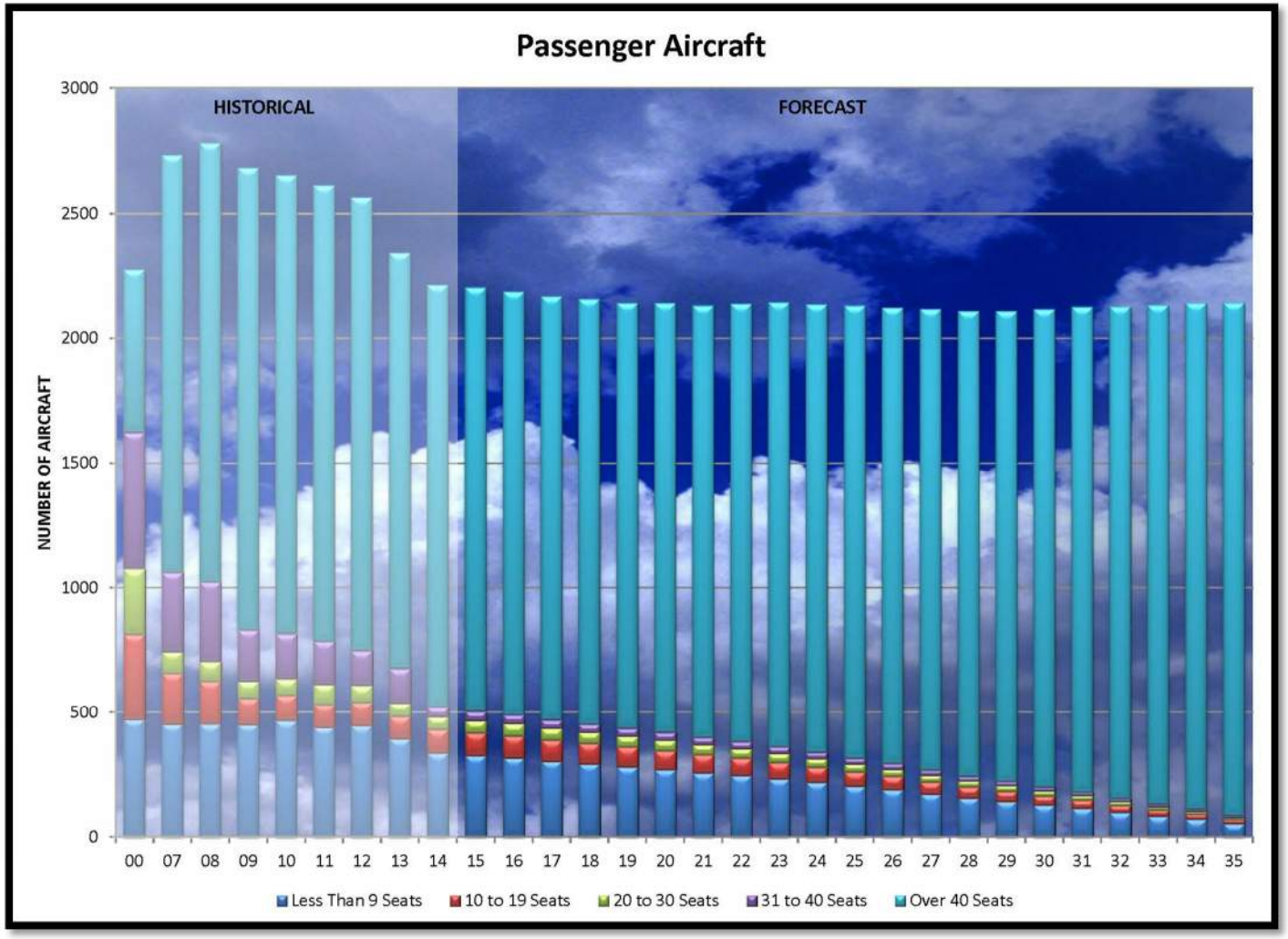
Figure 2-3 depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation active aircraft to increase at an average annual rate of 0.4 percent over the next 20 years. The growth in business jet aircraft is expected to outpace that of personal/recreational use aircraft. The turbine-powered fleet (including rotorcraft) is projected to grow at an average of 2.2 percent a year over the forecast period with the turbine jet portion increasing at 2.8 percent a year.

The significance of these national trends is that they point to a general, but modest growth within all sectors of the aviation industry and provide the basis for forecasting growth at the Gillette-Campbell County Airport.



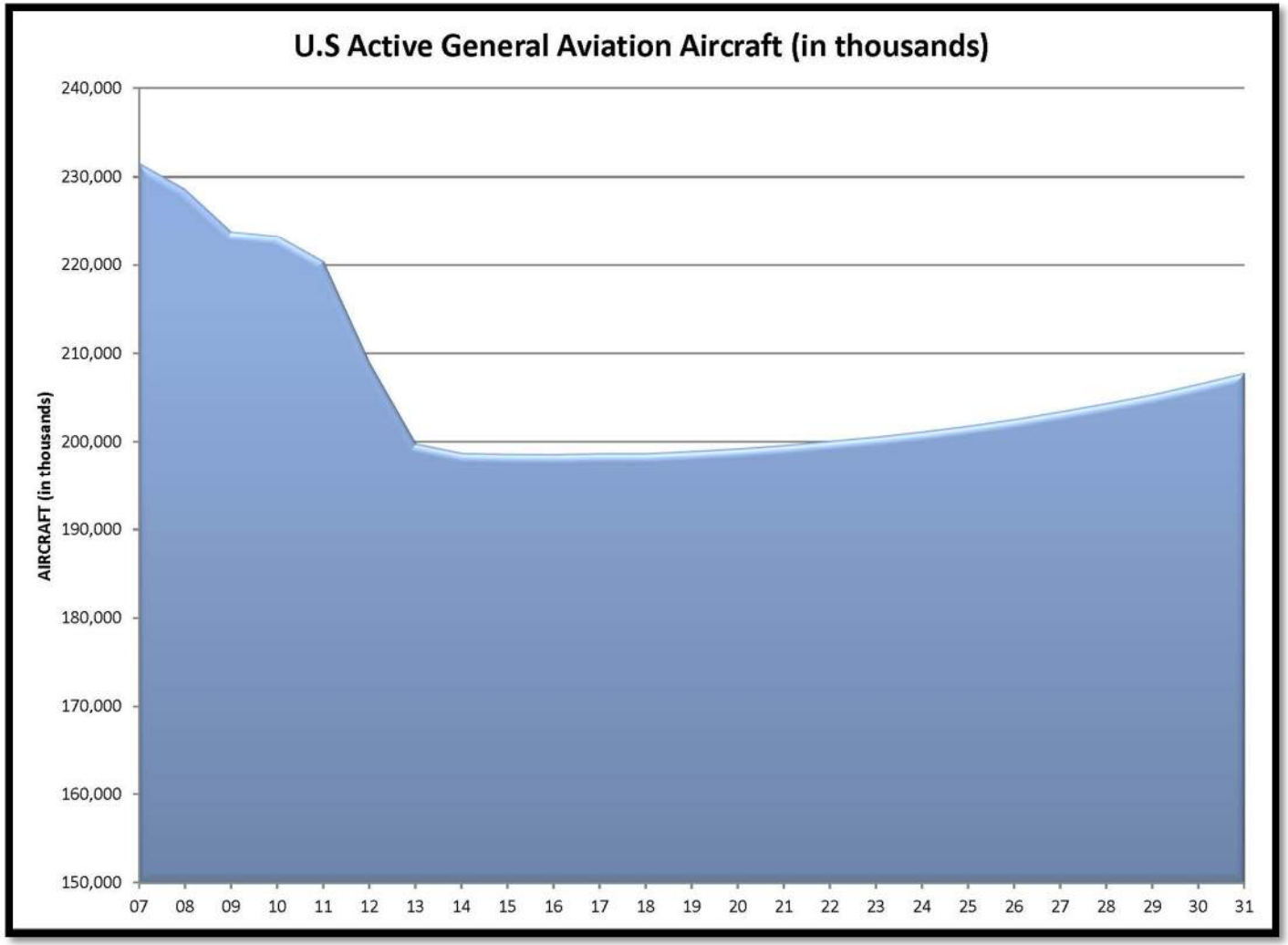
Source: FAA Aerospace Forecast, FY 2015-2035

Figure 2-1. United States Regional/Commuter Enplanements Forecast



Source: FAA Aerospace Forecast, FY 2015-2035

Figure 2-2. United States Regional/Commuter Aircraft Forecast



Source: FAA Aerospace Forecast, FY 2015-2035

Figure 2-3. United States General Aviation Aircraft Forecast

2.3 Local Demographics/Airport Service Area

The airport service area is generally defined by the proximity of other airports providing similar services. In practice, airport service areas are difficult to define. The airport service area may be different for passengers considering Gillette-Campbell County Airport for a short-haul flight to Denver compared to the airport service area boundary for passengers wishing to fly to Boston or San Francisco. For general aviation, the service area is generally more closely defined around the airport but will depend on the level of service and facilities needed by the specific user such as longer runways, air traffic control services and instrument capability.

The analysis of the airport service area contained within this chapter focuses on the commercial service aspects. Gillette's service area is shaped by competing airports in the region. Sheridan, 1½ hours away, has an airport that serves its local community with service to Denver. Casper, 2 hours away, offers service to Denver and Salt Lake City on United and Delta Airlines. Rapid City, South Dakota, is also 2 hours away and offers services to Chicago-O'Hare, Dallas-Ft. Worth, Denver, Minneapolis, Phoenix and Las Vegas on Allegiant, American, United and Delta airlines. Billings, Montana (Alaska to Seattle, Alaska to Portland, Allegiant to Phoenix, Allegiant to Las Vegas, Delta to Salt Lake, Delta to Minneapolis, United to Denver, Cape Air to Wolf Point, Havre, Glasgow, Glendive, Sidney), is 3 ½ hours travel time from Gillette and provides service to major hubs by Alaska, Allegiant, Delta, and United. Denver, about 6 ½ hours travel time is a major hub served by low cost carriers such as Southwest Airlines.

The airport service area has been defined to include Campbell, Crook and Weston County. While the passenger service area may extend outside the boundaries of Campbell, Crook and Weston County, these three counties provide the source for the majority of locally originating passengers

.

Beyond geography, community initiatives can influence the level of market demand and growth at an airport. Gillette-Campbell County Airport is involved in the state of Wyoming's Small Community Air Service Enhancement Program, which provides revenue guarantees to airlines at four of the state's commercial airports. These contract guarantees reduce the risk to airlines and can result in improved passenger retention, air fares, and load factors.

In addition, the Gillette-Campbell County Airport is in the process of establishing a new passenger van shuttle service which will transport passengers to and from Sundance, Buffalo and Sheridan, Wyoming.

2.3.1 Local Population and Economy

Table 2-1 shows the Wyoming Department of Administration & Information Economic Analysis Division Population Projections for the Gillette-Campbell County Airport Service Area. The projections reflect U.S. Census estimates and were obtained from the Wyoming Department of Administration & Information Economic Analysis Division website. In 2010 the U.S. Census reported the population of Campbell County at 46,133 persons, and that of Crook County and Weston County at 7,083 and 7,208 respectively. In 2014, the population estimates for the Gillette service area were:

Campbell County	48,320
Crook County	7,248
Weston County	7,201
July, 2014 Service Area Population	62,769

Projections provided by the Wyoming Department of Administration & Information Economic Analysis Division reflect a population for the Airport Service Area of

about 78,000 in the year 2035. This represents an average annual growth rate of 1.2 percent over the planning period.

Located in a major energy producing part of the country known as the Powder River Basin, the economy of the Gillette-Campbell County Airport service area is dominated by coal extraction and coal-bed methane (CBM) gas production.

As noted in Chapter 1, the Gillette-area has experienced significant growth over the past two decades, primarily due to the expansion of raw coal and coal-bed methane extraction. This is a trend, which according to the U.S. Department of Energy (D.O.E.), should continue for at least the next 25 years as technological improvements at coal-fired power plants allow near-zero emissions outputs.

The forecast growth in the extraction of these resources will continue to result in a strong population base and economic growth for the region.

Table 2-1. Gillette-Campbell County Airport Service Area Population Projections

	Actual			Projected		
Area	1990	2000	2010	2020	2030	2035
Campbell Co.	29,370	33,705	46,133	51,140	57,910	61,390
Crook Co.	5,294	5,886	7,083	7,730	8,490	8,780
Weston Co.	6,518	6,643	7,208	7,460	7,710	7,740
TOTAL	41,182	46,234	60,424	66,330	74,110	77,910
% Change Between Census Years	12%	12%	31%	10%	12%	5%
State of Wyoming	453,588	493,782	563,626	616,140	665,670	686,020
% Change Between Census Years	-3%	9%	14%	9%	8%	3%

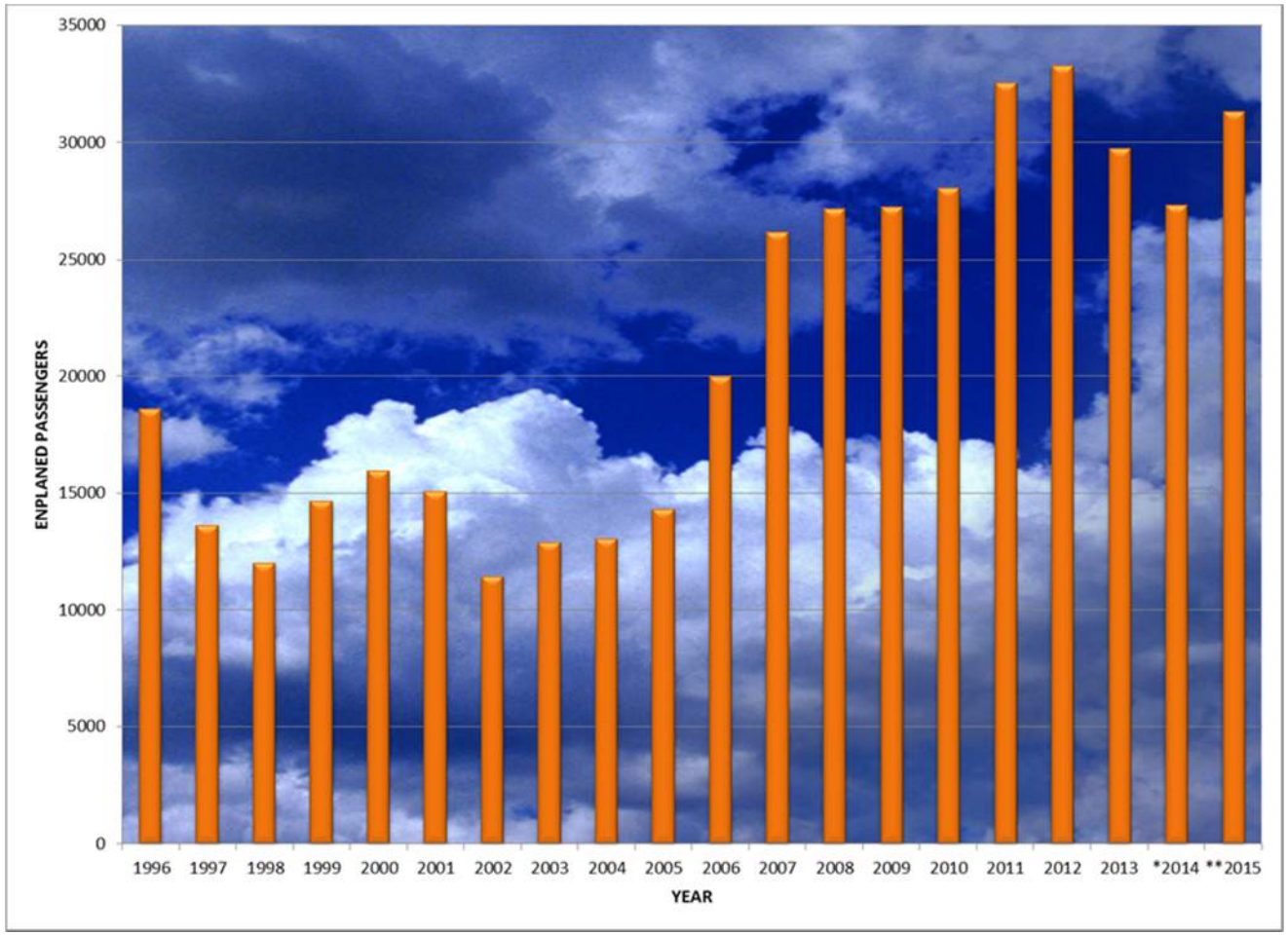
Sources: U.S. Bureau of Census Estimates, Wyoming Department of Administration & Information Economic Analysis Division

2.4 Historical Enplaned Passengers

Figure 2-4 shows the historical enplaned passengers at the Gillette-Campbell County Airport for the last 20 years, from 1996, when the airlines enplaned 15,739 passengers, through 2015, when an estimated[1] 31,335 passengers were enplaned.

The expansion of raw coal and coal-bed methane extraction has led to sustained economic growth in the Airport's service area. While most airports in the US experienced high volatility over the past decade, the Gillette-Campbell County Airport has experienced sustained growth. Through the "Great Recession" years of 2007 through 2009, where most airports experienced sharp declines in passenger enplanements, the Gillette-Campbell County Airport experienced steady increases. Passenger counts doubled between 2005 and 2012. Over the last 20 years, the average annual growth rate has been 3.9 percent, while over the last ten years, growth has averaged 4.8 percent.

[1] Estimated based on airport records through December, 2015



Sources: FAA Terminal Area Forecast, FY 2014-2040;
* Airport Records;
** Estimate based on airport records through December 2015

Figure 2-4. Historical Enplaned Passengers

2.5 Enplanement Forecasts

Several analytical techniques have been used to examine trends in passenger growth. These have included time-series "linear trend" extrapolation, regression analysis, and market share analysis. While the potential timeframes used for time-series can be rather extensive, the past twenty year period was considered to be a good reflection of recent trends.

2.5.1 Time-Series Linear Tend Extrapolation

The acceptability of time-series projections is based upon the correlation between the data. The correlation coefficient (Pearson's "r") measures the association between changes in the dependent and independent variables. If the r-squared value (coefficient of determination) is greater than 0.95, it indicates good predictive reliability, with an r-squared value of 0.90 generally identified as a threshold of statistical reliability. Values lower than that become increasingly unreliable. Because the last decade of enplanements has been characterized by high volatility tied to unprecedented system shocks, lower r-squared values, which reduce statistical reliability, are expected. This proved to be the case.

Initially, a linear time-series regression analysis was performed on historical enplanement data for the 1995-2014 time period. This yielded an r-squared value of 0.71.

A regression analysis was also performed on enplanements vs. population (for the three county area). This provided a better correlation (r-squared = 0.83). Adding per capita income to the model did not improve the correlation (r-squared 0.63). While not in the optimal range, the population based analysis proved to be the best correlation.

2.5.2 Market Share Analysis

A market share projection was also developed using a static share of GCC's historical share of the national regional/commuter market.

Historical passenger enplanements, US regional/commuter passenger enplanements and local market share have been summarized in **Table 2-2** for the period beginning in 1996 and extending through 2015. The market share has increased from a low of 0.010 percent in 2004 to a high of 0.021 percent in 2012.

The average market share for the latest five year period between 2011 and 2015 of 0.019 percent was used, along with FAA projections for national regional /commuter traffic to develop a market share projection.

Table 2-2. Historical Passenger Enplanements and Market Shares

Year	GCC Passenger Enplanements	U.S. Regional / Commuter Passenger Enplanements	GCC Share of U.S Enplanements
1996	18,608	60,000,000	0.031%
1997	13,642	61,600,000	0.022%
1998	12,036	64,600,000	0.019%
1999	14,658	72,300,000	0.020%
2000	15,971	82,800,000	0.019%
2001	15,099	83,600,000	0.018%
2002	11,434	91,500,000	0.012%
2003	12,886	108,600,000	0.012%
2004	13,035	130,000,000	0.010%
2005	14,306	149,700,000	0.010%
2006	20,004	155,700,000	0.013%
2007	26,211	159,700,000	0.016%
2008	27,203	162,600,000	0.017%
2009	27,265	156,600,000	0.017%
2010	28,078	164,400,000	0.017%
2011	32,537	164,100,000	0.020%
2012	33,262	162,100,000	0.021%
2013	29,742	158,400,000	0.019%
2014	*27,326	158,100,000	0.017%
2015	**31,335	161,500,000	0.019%

Sources: 2014 FAA Terminal Area Forecast
FAA Aerospace Forecast, FY 2015-2035
* Airport Records
** Estimate based on airport records through December 2015

2.5.3 FAA Terminal Area Forecast & Wyoming Statewide Airport Inventory and Implementation Plan:

FAA's Terminal Area Forecast and Wyoming's Statewide Airport Inventory and Implementation Plan provided comparative forecasts, and have been included in the summary of enplanement forecasts presented in in **Figure 2-5** and in **Table 2-3**. The FAA's Terminal Area Forecast shows a scenario of no growth in enplanements at GCC over the planning period. This is not considered reasonable given historical trends at the airport and the sustained economic growth in the airport's service area.

Table 2-3. Summary of Passenger Enplanement Forecasts

	2020	2025	2030	2035
Linear Trend	38,102	43,889	49,677	55,465
Market Share	32,690	35,067	38,288	41,808
Regression -Population (Preferred Forecast)	34,601	38,621	42,599	46,505
FAA Terminal Area Forecast	28,054	28,054	28,054	28,054
Wyoming Statewide Plan (Low)	29,911	31,733	33,667	35,718
Wyoming Statewide Plan (High)	33,177	36,630	40,443	44,652

2.6 Enplanement Forecast Summary

Figure 2-5 clearly shows the spread, or envelope, created by the different forecasting methods. The spread between the high and low forecasts is a reasonable window within which actual enplanement numbers may fall in the future, based upon a number of factors: number of local airlines, frequency, equipment, fares, non-stop destinations, and the local economy.

For planning purposes, a mid-range forecast is generally chosen, if it provides a reasonable growth rate. When all of the forecasting methods are compared, as shown in **Figure 2-5**, the Regression Analysis Forecast based on population represents the mid-range forecast, and the forecast with the greatest statistical reliability for GCC. This mid-range forecast is consistent with FAA's national forecast assumption that regional/commuter carriers will continue to exhibit strong growth in the future.

2.7 Based Aircraft Forecasts

The number of general aviation aircraft which can be expected to base at an airport facility is dependent on several factors, such as airport communication practices, available facilities, airport operator's services, airport proximity and access, and similar considerations.

Table 2-4 presents the based aircraft at the Gillette-Campbell County Airport between 1983 and 2015 by category based on FAA 5010 report data as recorded in the FAA's Terminal Area Forecast. The historical counts show that based aircraft counts have fluctuated from a high of 87 in 1983 and 1984 to a low of 39 in 1990. The last 10 years have seen based aircraft counts rise from 44 to 64, representing an average annual growth rate of 4.6 percent. In the last five years based aircraft counts have increased from 52 to 65, an average annual growth rate of 5.0 percent.

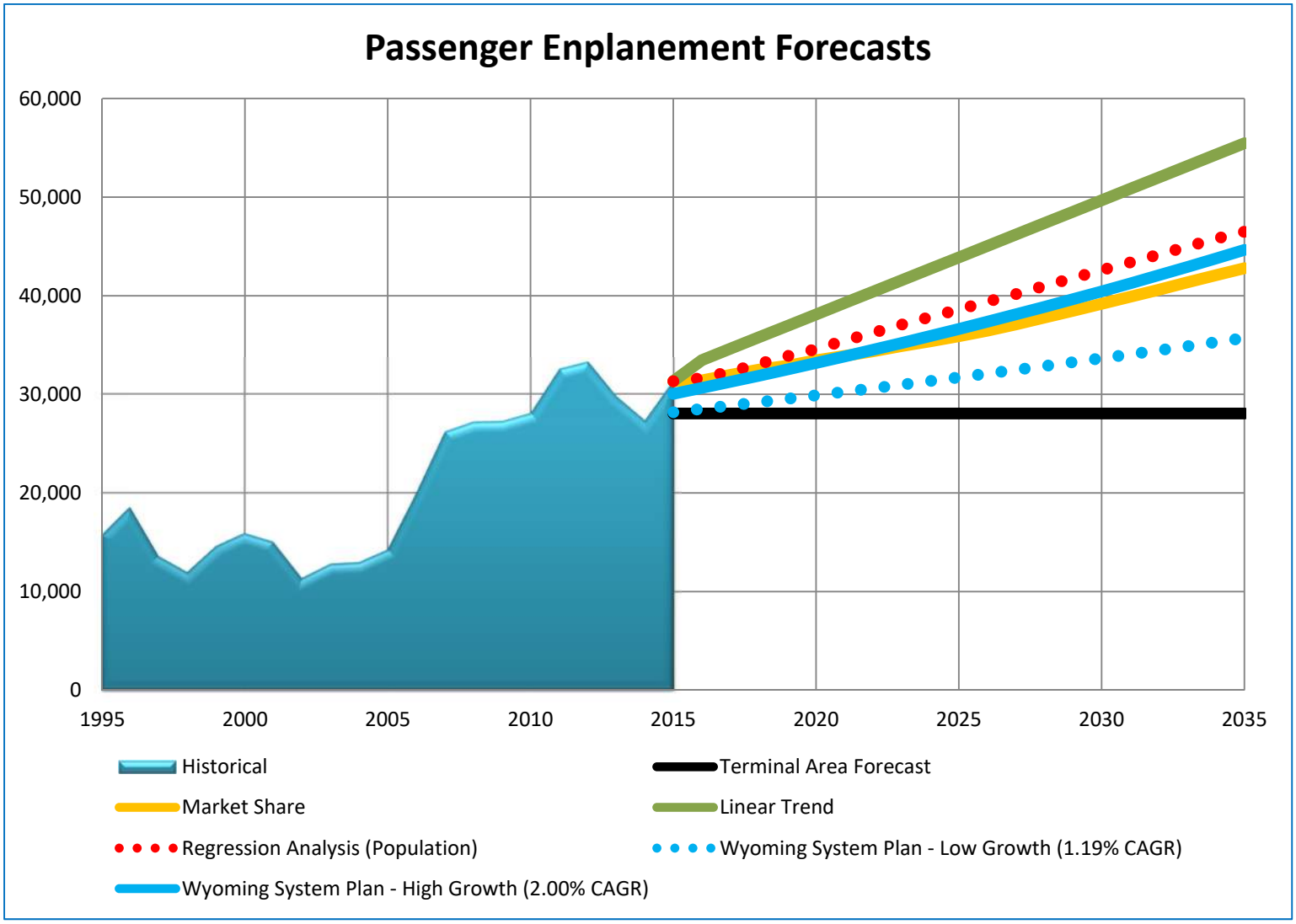


Figure 2-5. Passenger Enplanement Forecasts

The FAA's Terminal Area Forecast (TAF) for Gillette-Campbell County Airport is presented in **Table 2-5**. Adjustment has been made to account for 2015 based aircraft which were not reflected in the 2014 TAF. The TAF forecasts an average growth rate of 1.06 percent for the twenty year planning period.

Table 2-6 presents a based aircraft forecast using a time series regression for the ten year period from 2006 to 2015. This period saw an average annual increase of 4.62 percent based aircraft per year.

Table 2-7 presents a based aircraft forecast using a time series regression for the five year period from 2011 to 2015. This period saw an average annual increase of 4.62 percent based aircraft per year. A regression analysis of based aircraft as compared to the Gillette-Campbell County Airport service area population (Campbell, Crook and Weston Counties) was considered, however no correlation was found between historic population growth and the based aircraft trends at the airport. Similarly, a regression analysis found no correlation between historic based aircraft and the size of the national general aviation fleet.

The mid-range based aircraft forecast (**Table 2-6**) based on linear growth over the last decade (since 2006) has been selected as the preferred forecast.

Table 2-4. Historic Based Aircraft

ACTUAL	Single Engine	Jet	Multi	Helicopter	Other	TOTAL
1983	70	0	16	1	0	87
1984	70	0	16	1	0	87
1985	56	0	15	1	0	72
1986	45	0	14	1	0	60
1987	40	0	10	1	0	51
1988	40	0	10	1	0	51
1989	35	0	6	0	0	41
1990	35	0	4	0	0	39
1991	43	0	5	0	0	48
1992	48	0	5	0	0	53
1993	48	0	5	0	0	53
1994	48	0	5	0	0	53
1995	57	0	4	0	0	61
***1996**	57	0	4	0	0	61
1997	52	0	3	0	0	55
1998	52	0	3	0	0	55
1999	41	1	4	0	0	46
2000	41	1	4	0	0	46
2001	45	1	5	0	0	51
2002	49	1	6	0	0	56
2003	49	1	6	0	0	56
2004	49	1	6	0	0	56
2005	39	0	5	0	0	44
2006	39	0	5	0	0	44
2007	43	1	6	0	0	50
2008	43	1	6	0	0	50
2009	43	1	6	0	0	50
2010	45	1	6	0	0	52
2011	45	1	6	0	0	52
2012	45	1	6	0	0	52
2013	45	1	6	0	0	52
2014	45	1	6	0	0	52
****2015**	57	1	7	0	0	65

Source: FAA 2014 Terminal Area Forecast
* 1996 data missing in TAF. 1995 data carried forward
** 2015 Data Source FAA 5010 Form

Table 2-5. FAA Terminal Area Forecast*

	Based Aircraft
Base Year	
2015	65
Forecast	
2020	67
2025	70
2030	75
2035	80

* Adjusted to reflect FAA 5010 data for 2015

Table 2-6. Based Aircraft Projections Based on 2006 to 2015 Linear Trend

	Based Aircraft
Base Year	
2015	65
Forecast	
2020	72
2025	78
2030	85
2035	92

Table 2-7. Based Aircraft Projections Based on 2011 to 2015 Linear Trend

	Based Aircraft
Base Year	
2015	65
Forecast	
2020	78
2025	91
2030	104
2035	117

2.8 Operations Forecast

Table 2-8 summarizes fleet mix and operations projections for commercial service airlines at Gillette Campbell County Airport. The fleet mix projections have been used to calculate the average seats per departure, which (after applying a load factor) were used to project annual departures. The two airlines currently operating at the airport, United Express (operated by Sky West) and Delta Connection (also operated by Sky West) are currently utilizing 50 seat Canadair Regional Jets exclusively. These airlines have recently transitioned from 30-seat Embraer 120 aircraft at the airport. In accordance with national trends, it is expected that the airport will continue to see utilization of regional jets of 50 seats and more.

Table 2-9, **Table 2-10** and **Table 2-11** present aircraft operations forecasts for the low-growth, mid-range and high-growth scenarios.

Airline operations are carried forward in all three scenarios from the above analysis.

General aviation local operations projected under the all growth scenarios assume an Operations per Based Aircraft (OPBA) of 142 which is comparable to what exists today at the airport. (Operations per based aircraft are derived by dividing the number of local operations cited in the Terminal Area Forecast by the number of based aircraft). The projection of local operations under the low growth scenario utilizes the low growth based aircraft forecast, the mid-range operations forecast utilizes the mid-range based aircraft forecast and the high growth scenario utilizes the high based aircraft forecast.

The projection of general aviation and air-taxi itinerant operations for the low-growth and the high-growth scenarios utilize the low

growth rate (0.12 percent) and the high growth rate (1.54 percent) forecasted for Wyoming aircraft operations in the Wyoming Statewide Airport Inventory and Implementation Plan. The mid-range forecast uses a growth rate midway between two (0.83 percent). Military operations are held constant.

Overall, the total annual operations at the airport are projected to increase over the forecast period under the low, mid-range and high forecasts at average annual growth rates of 0.7 percent, 1.4 percent and 2.7 percent respectively. Because it represents a balanced view of growth in airport activity, the mid-range forecast will be carried forward as the preferred forecast.

Table 2-8. Scheduled Airline Fleet Mix and Operations Forecast

		Forecast			
Fleet Mix Seating Capacity	Existing 2015 (1)	2020	2025	2030	2035
< 40		--	--	--	--
40 - 59	100%	100%	100%	90%	90%
60-99	--	--	--	10%	10%
>100	--	--	--	--	--
Average Seats Per Departure	50	50	50	55	55
Annual Enplanements	31,335	34,601	38,621	42,599	46,505
Annual Departures	1,072	1,214	1,355	1,359	1,483
Annual Operations	2,143	2,428	2,710	2,718	2,967
(1) Estimate using Jan-Dec 2015 enplanement figures and airline schedules					

Table 2-9. Operations Scenario 1: Low Forecast

			Itinerant Operations					Local Operations			
	Based Aircraft	OPBA	Air Carrier	Air Taxi / Commuter	GA	Military	Total Itinerant	GA	Military	Total Local	Total Ops
2020	67	142	2,428	1,423	10,843	25	14,719	9,514	0	9,514	24,233
2025	70	142	2,710	1,431	10,908	25	15,075	9,940	0	9,940	25,015
2030	75	142	2,718	1,440	10,974	25	15,156	10,650	0	10,650	25,806
2035	80	142	2,967	1,448	11,040	25	15,480	11,360	0	11,360	26,840

Table 2-10. Operations Scenario 2: Mid-Range Forecast

			Itinerant Operations					Local Operations			
	Based Aircraft	OPBA	Air Carrier	Air Taxi / Commuter	GA	Military	Total Itinerant	GA	Military	Total Local	Total Ops
2020	72	142	2,428	1,474	11,233	25	15,160	10,172	0	10,172	25,332
2025	78	142	2,710	1,536	11,707	25	15,978	11,115	0	11,115	27,093
2030	85	142	2,718	1,601	12,201	25	16,544	12,057	0	12,057	28,601
2035	92	142	2,967	1,668	12,716	25	17,376	13,000	0	13,000	30,375

Table 2-11. Operations Scenario 3: High Forecast

			Itinerant Operations					Local Operations			
	Based Aircraft	OPBA	Air Carrier	Air Taxi / Commuter	GA	Military	Total Itinerant	GA	Military	Total Local	Total Ops
2020	78	142	2,428	1,526	11,634	25	15,614	11,076	0	11,076	26,690
2025	91	142	2,710	1,648	12,558	25	16,941	12,922	0	12,922	29,863
2030	104	142	2,718	1,778	13,555	25	18,076	14,768	0	14,768	32,844
2035	117	142	2,967	1,920	14,631	25	19,543	16,614	0	16,614	36,157

2.9 Peaking Characteristics

Most facility planning relates to levels of peak activity. The following planning definitions apply to the peak periods:

- Peak Month: The calendar month when peak passenger enplanements or aircraft operations occur.
- Design Day: The average day in the peak month.
- Busy Day: The busy day of a typical week in the peak month.
- Design Hour: The peak hour within the design day.

The design day is normally derived by dividing the peak month operations or enplanements by the number of days in the month. However, since commercial activity is heavier on weekdays, a 10 percent adjustment has been applied to the average day figures to reflect the peak weekday activity.

It is important to recognize that only the peak month is an absolute peak within a given year. All of the others will be exceeded at various times during the year. However, they represent reasonable planning standards that can be applied to future facility needs.

The peak month for passenger enplanements in 2015 was August with 11.4 percent of the annual total. This percentage has been applied to the forecasts of annual enplanements. The design day has been calculated at 10 percent above the average day figures.

The design hour enplanements were estimated at 40 percent of design day after reviewing the peak hourly departures, aircraft seating capacity and average load factors.

Peak monthly airline operations were projected at 10 percent of annual operations. Design hour operations were calculated upon review of current schedules.

The peak month for general aviation operations in 2015 was September with 10.2 percent of the annual total. The forecast of busy day operations was calculated as 1.25 times design day activity. Design hour operations were estimated at 15 percent of design day operations.

Table 2-12 summarizes peak activity forecasts for Gillette-Campbell County Airport.

2.10 Forecast Summary

This chapter has outlined the key aviation demand levels anticipated over the planning period. Long term growth at the Gillette-Campbell County Airport will be sustained by local promotion of the airport trends experienced at the national level. The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield or landside facilities which will create a more functional facility. The preferred aviation forecasts have been summarized in **Table 2-13**.

Table 2-12. Gillette-Campbell County Airport Peaking Characteristics

	*Actual	Forecasts			
	2015	2020	2025	2030	2035
Airline Enplanements					
Annual	31,335	34,601	38,621	42,599	46,505
Peak Month (11.4%)	3,572	3,945	4,403	4,856	5,302
Design Day	127	140	156	172	188
Design Hour	51	56	62	69	75
Airline Operations					
Annual	2,199	2,428	2,710	2,718	2,967
Peak Month	220	243	271	272	297
Design Day	8	9	10	10	11
Design Hour	2	2	3	3	3
General Aviation Operations					
Annual	20,023	21,405	22,822	24,258	25,715
Peak Month (10.2%)	2,042	2,183	2,328	2,474	2,623
Design Day	68	73	78	82	87
Busy Day	85	91	97	103	109
Design Hour	10	11	12	12	13

* Actual 2015 counts estimated using Airport data for January – November, 2015

Table 2-13. Aviation Demand Forecast Summary

	* 2015	2020	2025	2030	2035
Enplanements	31,335	34,601	38,621	42,599	46,505
Based Aircraft	65	72	78	85	92
Annual Operations					
Airline	2,199	2,428	2,710	2,718	2,967
Air Taxi	1,113	1,474	1,536	1,601	1,668
Military	25	25	25	25	25
General Aviation					
Itinerant	9,244	10,172	11,115	12,057	13,000
Local	10,778	11,233	11,707	12,201	12,716
Total	23,360	25,332	27,093	28,601	30,375

* 2015 counts estimated using airport data for January – November, 2015

2.11 Comparison with the Terminal Area Forecast (TAF)

The FAA annually updates a Terminal Area Forecast (TAF), which forecasts enplanements, based aircraft and operations. The 2014 TAF was the version available at the time of the preparation of this forecast. The FAA requires that forecasts be consistent with the TAF or include sufficient documentation to explain the difference. The FAA generally considers a forecast consistent with the TAF if it differs by less than 10 percent in the five year forecast and less than 15 percent in the ten year forecast.

Table 2-14 compares the preferred Master Plan forecasts with the TAF as recommended in Appendix C of the FAA document, Forecasting Aviation Activity by Airport. With TAF forecast levels less than actual current levels for enplanements, operations and based aircraft and TAF forecasts of no growth for operations and enplanements, the TAF does not appear to accurately reflect the future conditions at the Gillette Campbell-County Airport.

The methodology for determining Master Plan forecasts is detailed in previous sections of this chapter. In summary, the differences between the Master Plan and the TAF include:

- In 2015, the TAF forecasts report 28,054 passenger enplanements. The Master Plan uses 31,335 based on current airport records.
- The TAF forecasts no growth in passenger enplanements over the planning horizon. The Master Plan forecasts growth in passenger enplanements based on historical trends and predicted population growth in the airport service area.
- In 2015, the TAF forecasts report 20,446 total operations. The Master Plan uses 28,601 based on current tower records.
- The TAF forecasts no growth in operations over the planning horizon. The Master Plan forecasts growth in operations based on historical trends and consistent with growth rates found in the Wyoming Statewide Airport Inventory and Implementation Plan.
- In 2015, the TAF forecasts report 52 based aircraft; the Master Plan uses 65 based aircraft relying on current FAA 5010 data.
- The TAF forecasts a 1.3 percent average annual growth rate in based aircraft, while the Master Plan forecasts a 2.0 percent average annual growth rate based on historic trends at the airport over the last ten years.

Table 2-14. Comparison of Master Plan and TAF Forecasts

	Year	Airport Forecast (AF)	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2015	31,335	28,054	11.7%
Base yr. + 5yrs.	2020	34,601	28,054	23.3%
Base yr. + 10yrs.	2025	38,621	28,054	37.7%
Base yr. + 15yrs.	2030	42,599	28,054	51.8%
Total Operations				
Base yr.	2015	23,663	20,446	15.7%
Base yr. + 5yrs.	2020	25,332	20,446	23.9%
Base yr. + 10yrs.	2025	27,093	20,446	32.5%
Base yr. + 15yrs.	2030	28,601	20,446	39.9%
Based Aircraft				
Base yr.	2015	65	52	25.0%
Base yr. + 5yrs.	2020	72	54	32.7%
Base yr. + 10yrs.	2025	78	57	37.3%
Base yr. + 15yrs.	2030	85	62	37.0%

Note: 2015 counts estimated using airport data for January – November, 2015

2.12 Critical Aircraft and Airport Reference Code

Federal Aviation Administration (FAA) Advisory Circular AC150-5325-4B, *Runway Length Requirements for Airport Design*, indicates that critical aircraft, upon which runway design is based, are required for federally funded projects to "have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes." The AC also states that adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport.

The FAA has established aircraft classification systems that group aircraft types based on their performance and geometric characteristics. These classification systems, described and illustrated in **Table 2-15**, are used to determine the appropriate airport design standards for specific runway, taxiway, apron, or other facilities, as described in FAA AC 150/5300-13A *Airport Design*. The Aircraft Approach Category (AAC) represents a grouping of aircraft based on approach reference speed, typically 1.3 times the aerodynamic stall speed. Approach speed drives the dimensions and size of runway safety and object free areas. The Airplane Design Group (ADG) classification

of aircraft is based on wingspan and tail height. The ADG drives the dimensions of taxiway and apron object free areas, as well as apron and parking configurations.

Aircraft weight criteria is considered in airport capacity and runway length calculations. FAA AC 150/5060-5 *Airport Capacity and Delay* classification of aircraft is shown in **Table 2-17**.

At Gillette-Campbell County Airport, Runways 16/34 and 3/21 are designed for different aircraft types. The previous ALP listed the critical aircraft for Runway 16/34 as the MD-87 (C-III), and the critical aircraft for Runway 3/21 as the Cessna 560 Citation V Encore (B-II).

In order to gain an understanding of the most demanding aircraft utilizing the airport, existing air traffic data was analyzed to determine the approximate makeup of aviation traffic. Data was retrieved from the FAA's Traffic Flow Management System Counts (TFMSC) database. TFMSC data provide specific air traffic movement details including aircraft type, date and occurrence for flights for which a plan had been filed, and that are radar-detectable. TFMSC data is built largely upon flight plan filings, in addition to data provided by aircraft with radar-detectable equipment. General aviation operators frequently do not have the equipment necessary to be captured by the NAS, and commonly opt not to file flight plans. Additionally, flight plans do not capture practice operations, such as touch-and-go's, that are likely to be performed by GA and military operators. Therefore, GA operations are under-represented in the TFMSC database.

Table 2-16 depicts a representation of aircraft types observed at the airport over the year 2015. The data presented in **Table 2-16** also represents a summary of TFMSC operations counts by Aircraft Design Group.

Table 2-17 defines the aircraft weight classification.

Table 2-15. Airfield Classification Systems

Aircraft Approach Category (AAC)		
AAC	Approach Speed (1.3 X Stall Speed)	
A	Less than 91 knots.	
B	91 knots or more but less than 121 knots.	
C	121 knots or more but less than 141 knots.	
D	141 knots or more but less than 166 knots.	
E	166 knots or more.	
Airplane Design Group (ADG)		
ADG	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'

Table 2-16. Instrument Flight Plans by Type Gillette-Campbell County Airport

Aircraft Type	Operations	ADG
AC90 - Gulfstream Commander	16	B-II
B190 - Beech 1900/C-12J	401	B-II
B350 - Beech Super King Air 350	24	B-II
BE20 - Beech 200 Super King	262	B-II
BE30 - Raytheon 300 Super King Air	2	B-II
C25A - Cessna Citation CJ2	86	B-II
C25B - Cessna Citation CJ3	32	B-II
C25C - Cessna Citation CJ4	9	B-II
C550 - Cessna Citation II/Bravo	84	B-II
C56X - Cessna Excel/XLS	90	B-II
C680 - Cessna Citation Sovereign	8	B-II
CL30 - Bombardier (Canadair) Challenger 300	74	B-II
CL60 - Bombardier Challenger 600/601/604	37	B-II
E120 - Embraer Brasilia EMB 120	238	B-II
E135 - Embraer ERJ 135/140/Legacy	44	B-II
E145 - Embraer ERJ-145	4	B-II
E50P - Embraer Phenom 100	9	B-II
E55P - Embraer Phenom 300	51	B-II
F2TH - Dassault Falcon 2000	35	B-II
F900 - Dassault Falcon 900	2	B-II
FA50 - Dassault Falcon/Mystère 50	14	B-II
G150 - Gulfstream G150	4	B-II
H25B - BAe HS 125/700-800/Hawker 800	10	B-II
PC12 - Pilatus PC-12	274	B-II
BE9T - Beech F90 King Air	6	C-I
LJ35 - Bombardier Learjet 35/36	10	C-I
LJ40 - Learjet 40; Gates Learjet	2	C-I
LJ45 - Bombardier Learjet 45	11	C-I
LJ60 - Bombardier Learjet 60	3	C-I
LJ70 - Learjet 70	4	C-I
LJ75 - Learjet 75	2	C-I
PAY2 - Piper Cheyenne 2	6	C-I
PRM1 - Raytheon Premier 1/390 Premier 1	8	C-I
WW24 - IAI 1124 Westwind	2	C-I
C560 - Cessna Citation V/Ultra/Encore	506	C-II
C650 - Cessna III/VI/VII	4	C-II
C750 - Cessna Citation X	67	C-II
CRJ1 - Bombardier CRJ-100	2	C-II
CRJ2 - Bombardier CRJ-200	1,743	C-II
CRJ7 - Bombardier CRJ-700	2	C-II
G280 - Gulfstream G280	2	C-II
GLF4 - Gulfstream IV/G400	4	C-II
HA4T - Hawker 4000	4	C-II
J328 - Fairchild Dornier 328 Jet	16	C-II
A319 - Airbus A319	2	C-III
A320 - Airbus A320 All Series	2	C-III
MD83 - Boeing (Douglas) MD 83	12	C-III
C130 - Lockheed 130 Hercules	95	C-IV
GALX - IAI 1126 Galaxy/Gulfstream G200	2	D-II
GLF5 - Gulfstream V/G500	4	D-III

Source: FAA Traffic Flow Management System Counts (TFMSC) Jan 2015-Jan 2016

The previously approved ALP categorizes Runway 16/34 as having a C-III ARC, and Runway 3/21 as having a B-II ARC. From a review of actual flight data, the ARCs for the two runways are consistent with existing traffic and should be maintained.

Although the airport currently does not have 500 annual operations of Group III wingspan aircraft, the design standard differences between C-II and C-III are currently met by the airport. Since it does not result in an increased capital cost to maintain Group III criteria, it should remain in order to preserve the ability of large aircraft to use the airport and maintain the level of safety for all taxiing aircraft. The use of a C-III aircraft as a critical aircraft also ensures that if larger regional jets, such as the 90-seat Canadair CRJ-900, enter the market, which is likely as national trends shift toward the use of larger regional aircraft, the airport will be able to easily accommodate them. Casino charters are still flown into the airport occasionally and will likely increase as the Campbell County population increases. The aircraft fleets of the primary charter companies, Sun Country Airlines and Allegiant Air were examined to determine a reasonable ARC C-III critical aircraft for Gillette-Campbell County Airport. The MD-83 in use by Allegiant has been chosen to be the critical aircraft for Runway 16/34.

The Cessna 560 Citation V Encore operates in excess of 500 times per year at GCC and represents an average mid-sized business jet. When crosswinds dictate, business jets, such as the Citation, will operate on Runway 3/21. For this reason, the critical aircraft for Runway 3/21 has been maintained as the Citation V which is representative of the most demanding aircraft that will use the runway on a routine basis.

A detailed forecast by ARC was accomplished with the use of fleet mix data from 2005-2006 and applying it to the operations forecast. The results of this forecast are shown in **Table 2-19**.

Table 2-17. Aircraft Weight Classifications

Aircraft Classification	Maximum Takeoff Weight (MTOW)	Number of Engines	Wake Turbulence
A	< 12,500 lbs,	Single	Small (S)
B		Multi	Small (S)
C	12,500-300,000 lbs.	Multi	Large (L)
D	>300,000 lbs	Multi	Heavy (H)

Table 2-18. Critical Aircraft

Type	Wingspan	Max Takeoff Weight	Approach Speed
Boeing (Douglass) MD-83	107.75’	160,000 lbs	140 Kts
Cessna Citation V	52.1’	15,900 lbs	110 Kts

Table 2-19. Gillette-Campbell County Forecast by ARC

Year	A-I	B-I	B-II	C/D-I/II	C/D-III	Total
2020	1687	5029	7787	10351	478	25,332
2025	1804	5379	8329	11071	511	27,093
2030	1904	5678	8792	11687	539	28,601
2035	2022	6031	9337	12412	573	30,375

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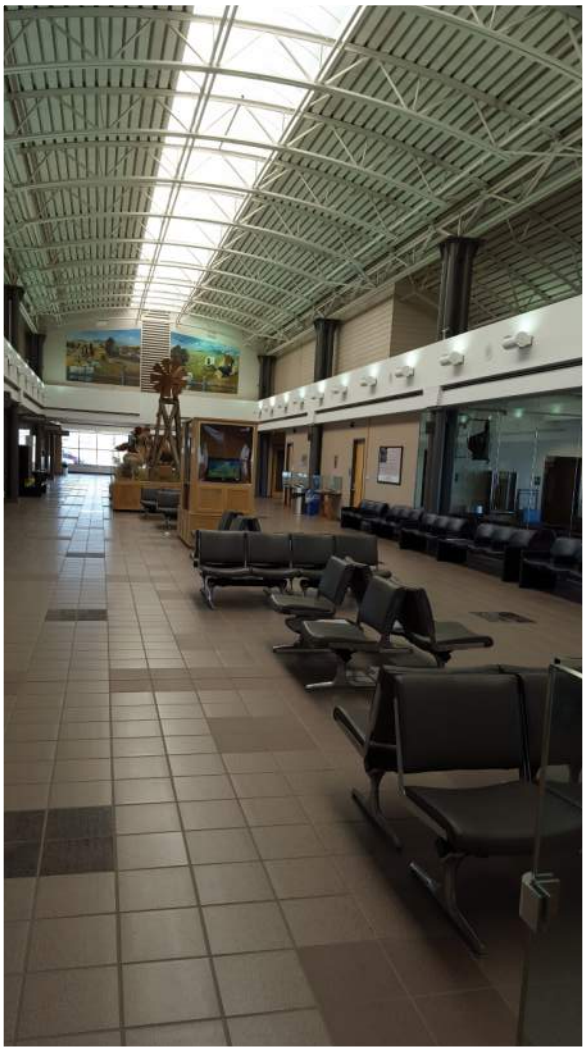
CHAPTER THREE:
FACILITY REQUIREMENTS



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3.0 FACILITY REQUIREMENTS

3.1 Introduction

The previous chapter forecasted the levels of aviation demand that could reasonably be expected to occur at the Gillette-Campbell County Airport (GCC) through the 20-year planning period (2035). This chapter will assess whether or not the existing facilities are adequate to meet that demand, identify what types and quantities of new facilities may be needed and establish when these facilities may be needed to accommodate demand.

Essential facilities fall into the following categories:

- Runways
- Taxiways
- Aprons
- Navigational Aids
- Terminal Building and Associated Facilities
- Airport Access and Automobile Parking
- Airport Support Facilities

The Federal Aviation Administration (FAA) has recently introduced the new Advisory Circular (AC) 150/5300-13A, "Airport Design" with Change 1, dated February 26, 2014 which includes clarifications, revisions and the introduction of new terms. As always, the planning and design of airfield facilities is based primarily on the types of aircraft using the airport. As stated in Chapter 2 – Aviation Demand Forecasts, GCC has a different Aircraft Approach Category (AAC) / Airplane Design Group (ADG) and Critical Aircraft for each runway. The AAC/ADGs and Critical Aircraft for the Airport are summarized on **Table 3-1**.

In this section, requirements for new facilities will be expressed in Planning Activity Levels (PALs) rather than solely in years. This is because the need to develop facilities is determined by demand, rather than a point in time. Activity levels for PALs 1-4 correlate to five-year, ten-year, fifteen and twenty-year time frames in the forecasts. Future facility needs will be tied to these activity levels rather than a specific year in order to retain flexibility in the plan.

Table 3-1. Runway Design

	AAC/ ADG	Critical Aircraft
Air Carrier Runway 16/34	C-III	McDonnell Douglas MD83
Runway 3/21	B-II	Cessna 560 Citation V Encore

Figure 3-1. Cessna 560 Citation V

Figure 3-2. MD-83

3.2 FAA Design Standards

One of the key considerations of any airport planning effort is to evaluate the dimensional standards for airfield layout established by the FAA. Table 3-2 presents a summary of significant FAA design standards that need to be compared with existing conditions to evaluate whether GCC meets criteria for the aircraft currently being served. The application of these design standards establishes airport geometry.

As can be seen by reviewing **Table 3-2**, GCC currently meets the runway and taxiway requirements for a C-III classification on Runway 16/34 and a B-II classification on Runway 3/21. These design standards and others are described in more detail later in this section.

Table 3-2. FAA Design Standards

	RW 16/34		RW 3/21	
	Existing RW 16/34	FAA Standards for C-III	Existing RW 3/21	FAA Standards for B-II
Runway Object Free Area				
Width	800’	800’	500’	500’
Length Beyond Runway End	1000’	1000’	300’	300
Runway Safety Area				
Width	500’	500’	150’	150’
Length Beyond Runway End	1,000	1,000	300	300
Runway Obstacle Free Zone				
Width	400’	400’	400’	400’
Length Beyond Runway End	200’	200’	200’	200’
Taxiway Object Free Area				
Width	186’	186’	131’	131’
Taxiway Safety Area				
Width	118’	118’	79’	79’
Design Criteria				
Runway Width	150’	150’	75’	75’
Taxiway Width	50’	50’(TDG 3/4)	35’	35’ (TDG 2)
Runway Centerline to Parallel T/W Centerline	400’	400’	300’	240’
Runway Centerline to Holdline	293’	293’	200’	200’
Runway Centerline to Edge of Aircraft Parking	>500’	500’	>250’	250’
Taxiway centerline to Fixed or Movable Object	93’	93’	65.5’	65.5’

3.2.1 Runway Object Free Area (OFA)

An OFA is defined as a two dimensional ground area surrounding the runway. The runway OFA clearing standard precludes parked airplanes and objects, except those whose location is fixed by function such as a navigational aid. In order to meet the standard for AAC/ADG C-III for Runway 16/34 and B-II for Runway 3/21, the OFA for Runway 16/34 must be 800 feet wide and extend 1,000 feet beyond each runway end and the OFA for Runway 3/21 must by 500 feet wide and extend 300 feet beyond each runway end.

The existing OFA for Runway 16/34 and Runway 3/21 meet the FAA design standards for AAC/ADG C-III and B-II.

3.2.2 Runway Safety Area (RSA)

The RSA is a defined surface surrounding the runway, prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. The RSA should be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations. The RSA associated with C-III is 500 feet wide and extends 1,000 feet beyond the runway end. The RSA associated with B-II is 150 feet wide and extends 300 feet beyond the runway end.

The existing RSAs for Runway 16/34 and Runway 3/21 meet the FAA design standards for AAC/ADG C-III and B-II.

3.2.3 Runway Obstacle Free Zone (OFZ)

The runway OFZ is a defined volume of airspace centered above the runway centerline. The runway OFZ is the airspace above a surface whose elevation at any point is the same as the elevation of the nearest point on the runway centerline. The standard OFZ for aircraft over 12,500 pounds is 400 feet wide and extends 200 feet beyond the runway end.

The OFZs for Runway 16/34 and Runway 3/21 meet the required OFZ standards.

3.2.4 Taxiway Object Free Area (TOFA)

A TOFA is defined as a two dimensional ground area adjacent to taxiways. The TOFA clearing standard precludes vehicle service roads, parked airplanes, and objects except those whose location is fixed by function such as a navigational aid. The FAA standard TOFA for Group II aircraft is 131 feet and for Group III aircraft is 186 feet wide, centered on the taxiway centerline. This indicates that, for Group II, parked aircraft need to be at least 65.5 feet from the centerline of the nearest taxiway and for Group III, parked aircraft need to be at least 93 feet from the centerline of the nearest taxiway.

The provided TOFA for taxiways associated with Runway 16/34 meets required FAA design standards for Group III and Group II for Runway 3/21.

3.2.5 Taxiway Safety Area (TSA)

A TSA is defined as a surface alongside the taxiway prepared or suitable for reducing risk of damage to an airplane unintentionally departing the taxiway. The minimum standard TSA for Group III is 118 feet and is 79 feet for Group II.

The provided TSA for taxiways associated with Runway 16/34 meets standards for Group III and the TSA for taxiways associated with Runway 3/21 meets the FAA design standard for Group II aircraft.

3.3 Design Criteria

3.3.1 Runway Width

The design standards for runway width take into account not only aircraft approach category, but also consider operations conducted during reduced visibility. The FAA design standard for AAC/ADG C-III aircraft is 150 feet for aircraft weighing less than 150,000 pounds. Runway 16/34 is 150 feet wide and meets the runway width standards. Runway 3/21, at 75 feet wide, meets standards for AAC/ADG B-II.

3.3.2 Line of Sight (LOS)

FAA line of sight standards requires that two points, five feet above the centerline of a runway without a parallel taxiway, must be mutually visible for the entire runway. For runways with a full parallel taxiway, the standard requires that two points five feet above the centerline must be mutually visible for one half of the runway length. Further, there is a requirement that for intersecting runways, points five feet above the centerline must be mutually visible within the Runway Visibility Zone (RVZ).

Line of sight requirements are currently met. However, care must be taken not to create a problem in the course of future development.

3.3.3 Taxiway Width

Taxiway width is correlated to the physical characteristics of the aircraft design group without respect to the operational characteristics of the airport approach category. Previous guidance on taxiway design was based only on Airplane Design Groups (ADG). ADGs are based on wingspan and tail height, but not the dimensions of the aircraft undercarriage and related turning radii. Because the design of pavement fillets must consider such undercarriage dimensions, the new guidance established Taxiway Design Groups (TDG), based on the overall Main Gear Width (MGW) and the Cockpit to Main Gear Distance (CMG) for standards related to taxiway geometry.

A medium sized business jet, such as the Cessna Citation Jet CJ2, falls into the TDG 2 category, while an ADG-III aircraft associated with the airport's design aircraft will typically fall into the TDG 3 or TDG 4 category. The TDG 2 width standard is 35 feet, and the TDG 3 / TDG 4 width standard is 50 feet.

Currently, taxiways serving Runway 16/34, (A, B, D and E), are at least 50 feet in width. Taxiway C, serving Runway 3/21, is 35 feet wide. These widths should be utilized in the design of future taxiways serving the respective runways.

3.3.4 Runway Centerline to Parallel Taxiway Centerline

This design criteria establishes the minimum separation between the centerline of the runway and the centerline of the parallel taxiway. This separation is determined based upon the AAC/ADG. The separation standards for Runways and Parallel Taxiways with an AAC/ADG for C-III is 400 feet and for B-II is 240 feet.

The distance between the centerlines for Runway 16/34 and partial parallel Taxiways A and E is 400 feet, appropriate for a C-III runway. The separation between Runway 3/21 and partial parallel Taxiway C is 300 feet, which exceeds the standard for a B-II runway.

3.3.5 Runway Centerline to Holdline

This standard provides for markings on pavement and placing signs at locations on taxiways where aircraft hold prior to receiving clearance to enter the runway. These locations are chosen to ensure that aircraft are clear of the RSA and OFZ during operations by other aircraft on the runway. The standard holding positions for AAC/ADG B-II aircraft are located 200 feet from the

runway centerline. For AAC/ADG C-III the hold position distance is increased above 250 feet by 1 foot for every 100 feet above sea level. For GCC, this equates to 293 feet from the runway centerline.

A holdline position of 293 feet of separation is provided for Runway 16/34. This meets the standard for AAC/ADG C-III. The holdlines for Runway 3/21 are set at 200 feet from the runway centerline, the standard for AAC/ADG B-II.

3.3.6 Runway Centerline to Edge of Parking Area

This standard is designed to allow additional clearance between aircraft parking areas and aircraft operations on the runway, while protecting space between these areas for a parallel taxiway. The FAA standard for AAC/ADG B-II is 250 feet and for AAC/ADG C-III is 500 feet.

The existing aircraft parking separation currently exceeds standards for both runways. No construction of aircraft parking aprons should be permitted within the designated area.

3.4 FAR Part 77 – Objects Affecting Navigable Airspace

The Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace* defines airport imaginary surfaces. Although not specifically "design standards," these surfaces are geometric shapes which surround every airport and are an important planning tool for location of runway and taxiway support facilities, such as terminal buildings and hangers.

These surfaces determine, in part, the approach minima and compliance to standards for each airport. The imaginary surfaces are defined relative to the runway, the established airport elevation, elevation of the approach runway ends, and type of existing or planned approaches for each runway end. Any object, whether natural or manmade, which penetrates FAR Part 77 surfaces should be recommended for marking, lighting, or removal. All obstructions to FAR Part 77 surfaces are identified in the Airport Layout Plan set of drawings.

Runway 34 corresponds to dimensional standards for a runway with precision instrument approach visibility minimums greater than 3/4 mile. Runway 16 has a non-precision approach (RNAV-GPS) with visibility minimums greater than 1 mile. Runway 3/21 has dimensional standards for a visual runway.

3.4.1 Primary Surface

A surface longitudinally centered on a runway. When the runway has a paved surface, the Primary Surface extends 200 feet beyond each end of the 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 Primary Surface width is 1,000 feet for Runway 16/34 and 500 feet for Runway 3/21.

3.4.2 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 runway end based on the planned approach. The inner edge of the Approach Surfaces for Runway 3-16 are the same width as the Primary Surface, 1,000 feet. The Approach Surface for Runway End 34 expands uniformly at an upward slope of 50:1 at a distance of 10,000 feet then at an upward slope of 40:1 for an additional 40,000 feet to a width of 16,000 feet. The Approach Surface for Runway End 16 extends uniformly at an upward slope of 34:1 for 10,000 feet. The Approach Surfaces for both ends of Runway 3/21 extend uniformly at an upward slope of 20:1 for 5,000 feet.

3.4.3 Horizontal Surface

The Horizontal Surface is defined as a horizontal plane 150 feet above the established airport elevation. Arcs set the plan dimensions of the horizontal surface from the runway end to the primary surfaces which are connected by tangents. The radii of the arcs are determined by the runway type. The radius for a visual runway measures 5,000 feet and for all other runways the radius is 10,000 feet. The Horizontal Surface for Runway 16/34 has a radius of 10,000 feet and the Horizontal Surface for Runway 3/21 has a radius of 5,000 feet. The established airport elevation is 4,365 feet MSL, therefore, the elevation of the Horizontal Surface is 4,515 feet MSL.

3.4.4 Conical Surface

An inclined surface at a slope of 20:1 extending upward and outward from the periphery of the Horizontal Surface for a distance of 4,000 feet. The elevation of the outer edge of the Conical Surface for GCC is 4,715.

3.4.5 Transitional Surface

These surfaces extend outward and upward at right angles to the runway centerline extended at a slope of 7:1 from the sides of the Primary Surface and approach surfaces until intersecting with the Horizontal Surface and the precision approach surfaces that extend beyond the limits of the Conical Surface. The transitional surfaces extend over a horizontal distance of 5,000 feet at right angles to the runway centerline.

The width of the Primary Surface impacts the setback requirement for the Building Restriction Line (BRL), depicted on the Airport Layout Plan. The BRL provides the airport with the minimum setback from the runway centerline for permanent structures, such as hangars. Typically, the BRL is located where the height of the Transitional Surface reaches the planned maximum height of buildings closest to the runway. The BRL for Runway 3/21 is set at 390 feet from the runway centerline, for a maximum structure height of 20 feet. The BRL for Runway 16/34 is set at 745 feet from the runway centerline for a maximum structure height of 35 feet. Each structure sited on the airport is evaluated on an individual basis with regards to the perpendicular distance it is from the runway centerline and the proposed finished elevation of the top of the structure.

3.5 Airfield Capacity

The FAA's standard method for the analysis of airfield capacity can be found in FAA AC 150/5060-5, "Airport Capacity and Delay". There are two key measurements of airfield capacity that assist planners in evaluating the adequacy of airfield facilities. The first is hourly capacity, which considers the throughput (airplanes landing or taking off) during a typical busy hour. Factors such as percentage of arrivals, runway crossings, and taxiway exit locations are utilized to arrive at an hourly number of aircraft that can use the airfield without undue delays.

The other measure is Annual Service Volume (ASV), an estimate of the number of aircraft operations that can be accommodated in one year. This measure is used to program the need for additional runways, and/or modified taxiway exits. Airfield capacity improvements are typically programmed when actual annual operations reach 60 percent of ASV.

3.5.1 Hourly Capacity

This approach utilizes the projections of annual operations by the specified fleet mix as projected in the Aviation Activity Forecasts (Chapter 2) while considering a variety of other factors including airfield layout, meteorological conditions, runway conditions, runway use, aircraft mix, percent arrivals, percent touch-and-go's, and exit taxiway locations. The following sections review those items that limit the hourly capacity.

3.5.2 Airfield Characteristics

Airfield characteristics, particularly the layout of the runways and taxiways, directly affect airfield capacity. The location and orientation of the runways, the percent of time that a particular runway or combination of runways is in use and the length, width, weight bearing capacity, and instrument approach capability of each runway at the airport all factor in to hourly capacity analysis. The location and orientation of exit taxiways also has a direct bearing on hourly capacity. Properly placed exit taxiways will allow an aircraft to clear the runway environment in a minimum of time and allow for the following arrival or departure procedure.

3.5.3 Weather

Weather also plays a key role in determining hourly capacity. When weather conditions are such that there are low clouds and/or reduced visibility, arriving and departing aircraft operate under different flight rules which have an impact on hourly capacity. The general conditions for each set of rules are listed here:

Visual Flight Rules (VFR)

Conditions necessary to operate under VFR are a cloud ceiling that is equal or greater than 1,000 feet above the ground level (AGL) and the visibility is equal to or greater than 3 statute miles. This does not cover every situation, however these are the most common criteria used at most commercial service airports with instrument approaches.

Instrument Flight Rules (IFR)

Conditions requiring operation under IFR are complicated, but in general are conditions that do not qualify as VFR. Weather that is worse than the minimum requirements for instrument approach procedures at an airport will preclude any operation at the airport and can cause cancellations or diversions to other airports. These conditions vary by operation type, type of aircraft, and aircraft equipment.

When operating in VFR conditions, pilots are responsible for the separation of their aircraft from other aircraft and obstacles. However, when IFR operations are required, Air Traffic Control is responsible for the separation of aircraft and obstacle clearance. This is done through the use of Radio Detection And Ranging (RADAR), where available, and through the use of Standard Instrument Procedures. Large margins are built into the system, which further limits the capacity in the airspace surrounding the airport, as well as the hourly capacity of the airfield.

3.5.4 Aircraft (Fleet) Mix

The demand characteristics that are relevant to calculating airfield capacity are the mix of aircraft types that utilize the airport in the busy hour along with the percentage of arrivals and the percentage of touch-and-go operations. Aircraft types are classified according to size as shown below.

Class A: Small single engine aircraft weighing less than 12,500 pounds

Class B: Small twin engine aircraft weighing less than 12,500 pounds

Class C: Aircraft weighing between 12,500 pounds and 300,000 pounds

Class D: Aircraft weighing more than 300,000 pounds

According to FAA *AC 150/5060-5, "Airport Capacity and Delay"*, the airfield configuration at GCC should yield an hourly capacity of approximately 77 aircraft per hour in VFR conditions and 57 per hour in IFR conditions.

Based on the above information, the approximate annual capacity of this airfield configuration is 200,000 operations. This far exceeds the demand projections for the 20 year period and, therefore, no capacity related airfield improvements are necessary.

3.6 Airside Facility Requirements

In consideration of the forecast of future aviation activity, the existing runway, taxiways, aprons, markings, lighting, and signage was analyzed from several perspectives. These include airfield capacity, orientation, runway length, pavement strength, and compliance with applicable FAA design standards. The analysis for these various aspects pertaining to the runway, taxiway, and electrical system design, is discussed in detail below, and is the basis for airside improvement recommendations.

3.6.1 Runway Length

Adequate planning for runway configuration requirements is very important as runway projects can affect the community beyond the property line. Runway projects are large in magnitude and can require many resources and long lead times for planning, environmental review and funding allocation. The design approach identified in *FAA AC 150/5325-4B, "Runway Length Requirements for Airport Design"* was used to determine runway length calculations for GCC.

Aircraft Less than 60,000 Pounds

Chapter 2 of *FAA AC 150/5325-4B "Runway Length Requirements for Airport Design"* provides the guidance to determine recommended runway lengths for aircraft of 12,500 pounds or less, while Chapter 3 provides the guidance to determine recommended runway lengths for aircraft weighing more than 12,500 pounds and less than 60,000 pounds. Figures 3-1 and 3-2 from that chapter provide runway length recommendations based on the assumption of no obstructions, zero wind, dry runway surfaces, and zero effective gradient. The runway lengths for GCC utilize an elevation of 4,364.5 feet MSL, a mean maximum temperature of 86.3°F., and an effective runway gradient with an overall elevation change of 35 feet.

Utilizing this information results in the recommended runway lengths summarized in **Table 3-3**.

Table 3-3. FAA Runway Lengths

Airport and Runway Data	
Airport Elevation	4,364.5 Feet
Mean Daily Maximum Temperature of the Hottest Month	86.3 °F
Runway Lengths Recommended for Airport Design	
Small airplanes with approach speeds of less than 30 knots	430 Feet
Small airplanes with approach speeds of less than 50 knots	1,150 Feet
Small Airplanes with less than 10 passenger seats	
95 percent of these small airplanes	5,400 Feet
100 percent of these small airplanes	5,700 Feet
Small airplanes with 10 or more passenger seats	5,700 Feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	6,650 Feet
75 percent of these large airplanes at 90 percent useful load	8,950 Feet
100 percent of these large airplanes at 60 percent useful load	8,750 Feet
100 percent of these large airplanes at 90 percent useful load	10,150 Feet

Reference: Chapter 2 of AC 150/5325-4b, "*Runway Length Requirements for Airport Design*", no changes included.

At 7,500 feet in length, Runway 16/34 can accommodate 100 percent of the small aircraft and 75 percent of large aircraft under 60,000 pounds at 60 percent useful load. As indicated in the table, by altering the amount of useful load (i.e. passengers, cargo or fuel), large aircraft that, under full loading would require longer runways, could adjust their loads to operate on a shorter runway. Reduced loads translate into reduced fuel, passenger and/or cargo loads.

Aircraft More than 60,000 Pounds

Runway Length calculations for regional jets and aircraft over 60,000 pounds are based on the requirements of the most demanding aircraft that regularly uses the runway. Currently, the commercial aircraft that most regularly uses the airport is the Canadair Regional Jet 200 (CRJ200). Nationally, regional airlines are in the process of transitioning from 50 seat CRJ200s to larger CRJ700s and CRJ900s. It is anticipated that these larger regional jets will be incorporated into the commercial fleet mix at GCC within the planning period. Future planning should also consider the possibility of entry into the Gillette market by Allegiant Airlines. Allegiant's business model targets leisure travelers in smaller cities, particularly those in colder northern climates, going to warm-weather tourist destinations such as Tampa Bay, Las Vegas, Orlando, or Phoenix. Western US flights generally connect smaller cities with Los Angeles (LAX), Las Vegas (McCarran) and Phoenix (Mesa Gateway). Allegiant's fleet is comprised of McDonnell Douglas MD83s, Airbus A319s and Airbus A320s.

A runway length analysis was performed for GCC using the manufacturer's Aircraft Planning Manuals and other available performance data. Figure 3-3 shows takeoff length requirements for the Canadair Regional Jet CRJ200, as well as the CRJ700, and the CRJ900. Stage lengths within 600 nautical miles and 80 percent useful load are assumed for these aircraft. This accommodates Delta and United destinations of Salt Lake City (356NM), Denver (270NM) and Minneapolis (528NM).

Takeoff length requirements are also shown for Allegiants fleet: the MD83, the A319 and A320. Stage lengths within 900 nautical miles and 95 percent useful load are assumed for these aircraft to accommodate Allegiant's Las Vegas (663NM), Phoenix (720NM) and Los Angeles (865NM) destinations. Temperatures as near to the mean maximum temperature for Gillette's hottest month (86.3 degrees Fahrenheit) as available in the aircraft manufacturers' data were assumed.

The figure shows that the current runway length of 7,500 feet is not adequate for the designated current critical aircraft (CRJ200) to operate without weight restrictions on hot summer days for haul lengths within 600 nautical miles. An extension to 8,500 feet is justified in the near-term time horizon to accommodate these aircraft.

There are changes that could trigger the need for a runway longer than 8,500 feet in the future. These changes, which would require 500 annual operations of activity, include:

- Transition to larger regional jets – CRJ900 aircraft require a longer runway than the CRJ200 aircraft currently in use by regional carriers at GCC. Additional runway length would be required to allow fully loaded operations by CRJ900 aircraft on hot summer days.

- Entry of Allegiant Air into GCC Market - Allegiant's fleet of A319, MD83s require a longer runway than aircraft currently using GCC. If aircraft such as these serve GCC to typical Allegiant destinations in the future a longer runway would be required in order for the aircraft to operate fully loaded.

- International/Further Domestic Destinations – in order to fly non-stop to most international destinations or further domestic destinations a longer runway would be required. The amount of runway length required will be dependent upon the aircraft type.

When combined operations by aircraft begin to approach 500 annual operations, the cost and benefit of extending the runway to allow fully loaded operations should be evaluated. It is recommended that clearances be reserved to allow an ultimate runway length of 10,000 feet if and when it is needed in the future.

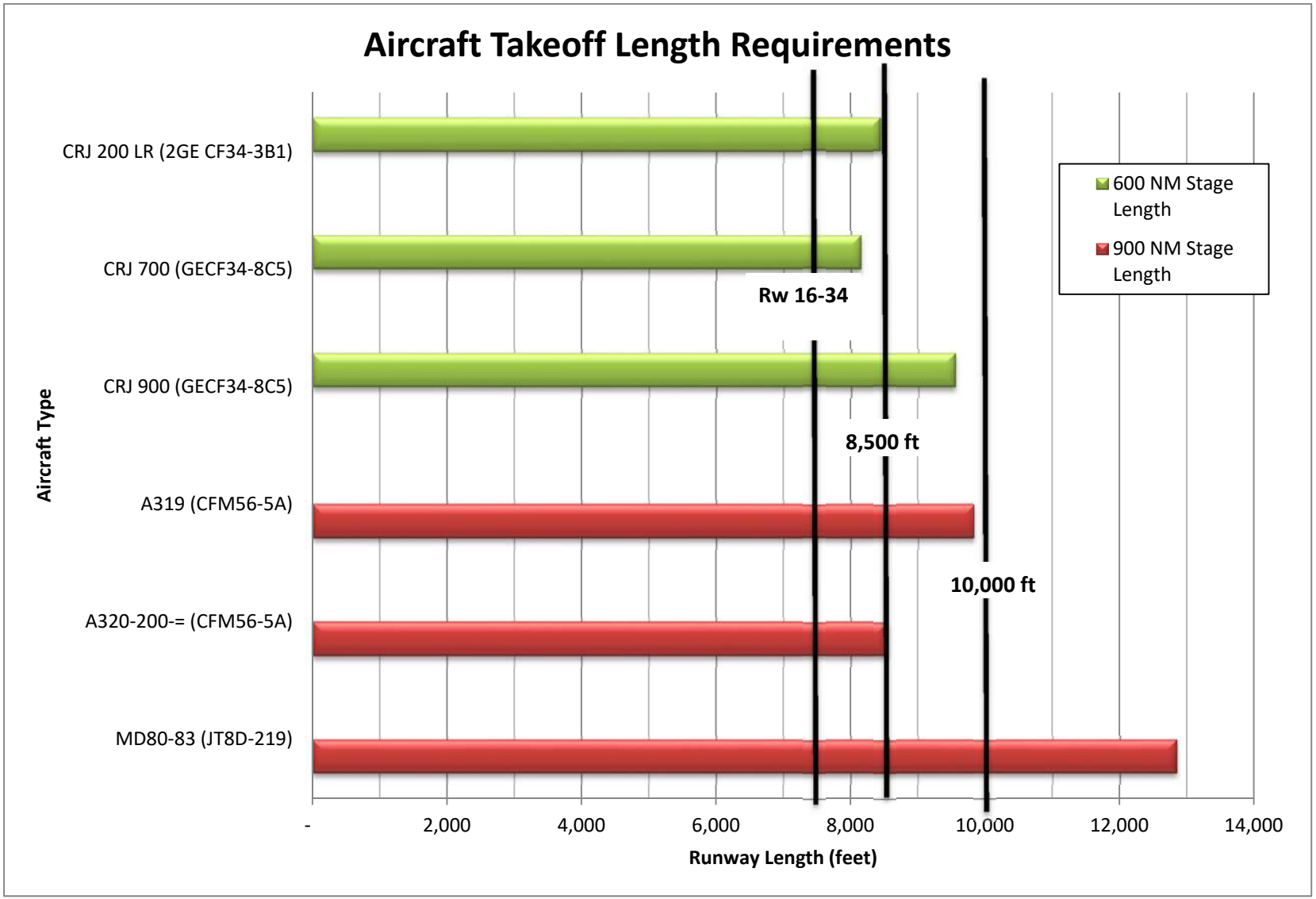


Figure 3-3. Aircraft Takeoff Length Requirements

Assumptions:
Takeoff weight assumes 95% useful load for 900 NM and 80% useful load for 600 NM
Runway Elevation 4365 feet MSL
Aircraft Manufactures Data
CRJ200, CRJ700, CRJ900 ISA+20C (80.78F)
A319, A320, MD80 ISA + 15C (71.78F)

3.6.2 Runway Orientation and Additional Runways

FAA design standards recommend additional runway orientations when the primary runway orientation provides less than 95 percent wind coverage. Runway orientation was analyzed according to various crosswind components and calculated for all-weather conditions. Crosswind limitations are a function of an aircraft's stall speed, pilot proficiency and other factors. For general planning purposes, the FAA has established crosswind limits of 10 knots for general aviation A-I and B-I aircraft, 13 knots for A-II and B-II general aviation aircraft and 16 knots for transport aircraft A-III, B-III and C-I through D-III. Aircraft in approach category IV (A-IV through D-VI) have a crosswind limit of 20 knots.

Wind data was obtained from the National Climatic Data Center (NCDC) through the FAA Airport GIS webpage windrose file generator. The data is from the Automated Surface Observing System (ASOS) Weather Station ID: KGCC at Gillette-Campbell County Airport, for years 2006 through 2015.

Three separate sets of data were obtained from the site, All Weather Wind Data, IFR Wind Data, and VFR Wind Data. The all data weather set includes all wind observations in the data set, the IFR Wind Data includes only observations when instrument flight rules apply, and the VFR Wind Data Set includes observation under visual flight rules.

The three sets of wind data were analyzed for each runway and each runway combination. For each runway an allowable crosswind component is used depending on the AAC/ADG. The allowable crosswind components are shown in **Table 3-4** and the results of the analysis are shown in **Table 3-5.**

Table 3-4. Allowable Crosswind Components

Runway	AAC/ADG	Allowable Crosswind Component
RW 16/34	C-III	16 knots
RW 3/21	B-II	13 knots

Table 3-5. Wind Coverage Summary at Gillette-Campbell County Airport

Runway Combination	True Bearing (deg. From true north)	Crosswind Component	All Weather	IFR	VFR
Runway 16/34	170	16	97.31%	98.96%	96.83%
Runway 16/34	170	13	92.08%	96.07%	90.86%
Runway 16/34	170	10.5	86.22%	93.16%	84.22%
Runway 3/21	38	16	98.91%	99.61%	98.70%
Runway 3/21	38	13	95.22%	97.54%	94.62%
Runway 3/21	38	10.5	89.85%	94.47%	88.60%
Combined	170 / 38	16	99.52%	99.84%	99.40%
Combined	170 / 38	13	98.02%	98.99%	97.78%
Combined	170 / 38	10.5	94.97%	97.05%	94.29%

The analysis based on AAC/ADG shows the wind coverage for the three sets of weather data as well as all of the possible combinations for existing runway configuration. The results of the analysis indicates that the design aircraft (able to use the runway with a 16 knot crosswind component) is accommodated on Runway 16/34 during all weather conditions with airfield wind coverage exceeding the required 95 percent. For small aircraft that have a 10.5 knot crosswind threshold, these airplanes can be accommodated 94.97 percent of the time with the current two-runway configuration.

During IFR conditions, the design aircraft is accommodated on Runway 16/34 with airfield wind coverage exceeding 95 percent. For small aircraft that have a 10.5 knot crosswind threshold, these airplanes can be accommodated 97.05 percent of the time with the current two-runway configuration in IFR conditions.

3.6.3 Runway Pavement Strength

The existing pavement strength of Runway 16/34 is 70,000 pounds for Single Wheel Gear (SWG), 110,000 pounds for Dual Wheel Gear (DWG) and 160,000 pounds for Dual Tandem Gear (DTG) loading. The heaviest DWG aircraft utilizing the airport on a regular basis is the Gulfstream GV, which has a maximum takeoff weight (MTOW) of 85,100 pounds, and the occasional DWG aircraft Gulfstream GVSP, which has a MTOW of 91,000 pounds, are well within the capacity of the runway. The critical design aircraft is a DTG MD83, having a MTOW of 160,000 pounds, is also within the limits of the runway pavement strength. At this time no additional runway strengthening will be required. The pavement strength of Runway 3/21 is 40,000 pounds for SWG and 60,000 pounds for DWG. Based on the utilization of this runway no additional strengthening will be required.

The FAA began using the standardized International Civil Aviation Organization (ICAO) method, to report airport runway strength in 2014. The standardized method is used to determine a Pavement Classification Number (PCN) which represents the load carrying capacity of a pavement for unrestricted operations. The PCN is a five-part code, describing the piece of pavement. The first part is the PCN numerical value which indicates the load-carrying capacity of the pavement in thousands of pounds. The second part calls out whether the pavement is rigid or flexible. The third part is a code that indicates the strength of the subgrade. The fourth part calls out the maximum tire pressure the pavement can support. The fifth part describes how the first part, the load-carrying capacity, was determined, either technical evaluation or a physical test. The PCN for Runway 16/34 is 35/R/C/W/T. The PCN for Runway 3/21 is 13/R/D/W/T.

A Pavement Condition Index (PCI) survey conducted in 2015 found all airport pavements at GCC to be in “very good” to “excellent” condition. A regular pavement maintenance program is recommended for all GCC airfield pavements. Based on the current condition of existing pavements, a general schedule for major and preventative maintenance items is presented in **Table 3-6**. Actual project timing will depend on the availability of funding and actual wear on pavement. The primary elements are listed, followed by their typical useful life.

3.6.4 Taxiways

Taxiways are primarily constructed to facilitate aircraft movements to and from the runway system. Parallel taxiways greatly enhance airfield capacity and are essential to aircraft movement about an airfield.

The existing taxiways are partial parallel taxiways to both runways. As noted in Section 3.3, design standards for taxiway

width and runway separation distance are met for the taxiways serving both Runway 16/34 and Runway 3/21. The present taxiway system includes two parallel taxiways to Runway 16/34. An extension to join the two would give the runway a full parallel taxiway and increase the operational efficiency of aircraft ground movement.

The partial parallel taxiway serving Runway 3/21 does not extend to the runway ends. This arrangement requires aircraft to back-taxi to the runway threshold for takeoff. Extension of the northern and southern ends of the parallel taxiway will remove the process of back-taxiing on the runway.

Although it may not be possible to provide a full parallel taxiway to Runway 3/21, additional extension of unconnected portions of Taxiway C would allow for increased aircraft movement on the airfield.

Holding aprons and bypass taxiways can improve the efficiency of the taxiway system. Holding aprons allow aircraft to prepare for departure in an area off of the taxiway. Bypass taxiways allow traffic ready for departure to bypass aircraft preparing for departure. There are currently no holding aprons or bypass taxiways on the airfield. Consideration should be given for holding aprons or bypass taxiways to serve the existing runway system.

An analysis of potential taxiway layouts will be provided in Chapter 4 *Alternatives*.

Table 3-6. Airfield Pavement Maintenance

Recommended Maintenance Program			Approximate Life Expectancy (2)	
Pavement Overlays			**15 to 20 years**	
Spall Repair			**4 years**	
Cracksealing/Joint Repair			**4 years**	
Pavement	Condition (1)	Reconstruction	Spall Repair (3)	Cracksealing/Joint Repair (3)
Runway 16/34	Excellent	2024	4 year cycle	4 year cycle
Runway 3/21	Very Good	2024	4 year cycle	4 year cycle
Taxiway A	Excellent	2024	4 year cycle	4 year cycle
Taxiway B	Very Good	2024	4 year cycle	4 year cycle
Taxiway C	Excellent	2024	4 year cycle	4 year cycle
Taxiway D	Excellent	2024	4 year cycle	4 year cycle
Taxiway E	Excellent	2024	4 year cycle	4 year cycle
Commercial Apron	Excellent	2035	4 year cycle	4 year cycle
North GA Apron	Excellent	2024	4 year cycle	4 year cycle
South GA Apron	Very Good	2024	4 year cycle	4 year cycle

Note: Maintenance on exit and connecting taxiways should be done as part of related runway, parallel taxiway, or apron projects.
(1) Based on 2015 Pavement Condition Index (PCI) study.
(2) Based on industry norms. Life expectancy may be longer for GCC due to abbreviated annual usage.
(3) All airfield pavements were cracksealed and spall repaired in spring 2016.

3.6.5 Airfield Marking, Lighting and Signage

Pavement markings, lighting and signage facilitate the safe movement of aircraft about the airfield by directing pilots to their destinations. Runway markings are designed according to the type of instrument approach available on the runway. *FAA AC 150/5340-1L "Standards for Airport Markings"*, provides the guidance necessary to design an airport's markings.

Runway 34 has the necessary markings for the ILS instrument approach that serves the runway. Runway 16 has Non-Precision Instrument (NPI) markings. Besides routine maintenance of the runway markings, these markings will suffice through the planning period. Runway 3/21 has Basic markings which should be upgraded to NPI markings as instrument approaches to the runway are added. The airside pavement system was restriped in entirety in the summer of 2016, with the exception of the aprons.

Taxiway and apron areas also require markings. Yellow centerline stripes are currently painted on all taxiway surfaces at the airport to provide this guidance to pilots. Apron, taxiway and taxilane markings should be repainted during routine maintenance of the pavement surface.

Airport lighting systems provide critical guidance to pilots at night and during low visibility operations. Runway 16/34 is equipped with high intensity runway edge lighting (HIRL) and Runway 3/21 is equipped with medium intensity runway edge lighting (MIRL).

Effective ground movement at night is enhanced by the availability of taxiway lighting. Medium intensity taxiway lighting (MITL) is in place on all taxiways and exits.

The existing airfield lighting systems, while adequate in intensity, will need routine maintenance during the planning period. An ultimate upgrade of conventional airfield lighting to more efficient and durable LED lighting would be desirable. Taxiway lights were upgraded to LED lights in the summer of 2016.

Airfield signage provides another means of notifying pilots as to their location on the airport. A system of signs placed at several airfield intersections on the airport is the best method available to provide this guidance. Signs located at intersections of runways and taxiways provide crucial information to avoid conflicts between moving aircraft. Directional signage instructs pilots as to the location of taxiways and terminal aprons.

The airfield signage system was replaced in the fall of 2016. Airfield signage at GCC reflects current FAA standards and should be adequate through the planning period. The partial parallel taxiway serving Runway 16/34 is made up of two segments designated Taxiway "A" and Taxiway "E". If these segments are connected in the future to form a full parallel taxiway, the Taxiway "E" segment would be redesignated Taxiway "A" and signage changed accordingly. This could also be completed prior to the construction of a full parallel taxiway as funding allows.

3.7 Navigational and Approach Aids

Electronic and visual approach aids provide guidance to arriving aircraft and enhance the safety and capacity of the airfield. Such facilities are vital to the success of the airport and provide additional safety to passengers using the air transportation system. These are further described below.

3.7.1 Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. Global Positioning System (GPS), Automatic Dependent Surveillance-Broadcast a Non-Directional Beacon (NDB), VHF omnidirectional range (VOR) and distance measuring equipment (DME) are available for pilots to navigate to and from GCC. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are necessary at this time or projected to be necessary in the future. Advancements in technology may require improvements to navigational aids on the airport and should be monitored for appropriate implementation.

3.7.2 Instrument Approach Procedures

While instrument approach aids are especially helpful during poor weather, they are often used by commercial pilots when visibility is good. Instrument approaches are categorized as either precision or non-precision. Precision instrument approach aids provide an exact alignment and decent path for an aircraft on final approach to a runway while non-precision instrument approach aids provide only runway alignment information. Most existing instrument approaches in the United States are global positioning systems (GPS) or instrument landing systems (ILS).

With the advent of GPS, stand-alone instrument assisted approaches will eventually be established that provide vertical guidance down to visibility minimums currently associated with precision runways. As a result, airport design standards that formerly were associated with a type of instrument procedure (precision/non-precision) are now revised to relate instead to the designated or planned approach visibility minimums.

ILS instrument and RNAV/GPS approaches are available to Runway 34. The Category I approach to Runway 34 may be flown with cloud ceilings as low as 200 feet and visibility reduced to 3/4 mile. An RNAV GPS approach to Runway 16 has also been established, which may be flown with ceilings as low as 300 feet and visibility reduced to 1 1/4 miles.

There are currently no published instrument approaches to Runway 3/21. Provision should be made for the addition of GPS procedures to the approaches of both ends of Runway 3/21.

3.7.3 Approach Lighting

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. The existing Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) system on the Runway 34 approach is adequate for future instrument approaches to Runway 34. Advancements in technology may require improvements to navigational aids on the airport and should be monitored for appropriate implementation. The Runway 16 approach should also be protected in the event it is developed for a precision approach.

3.7.4 Visual Approach Aids

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings, electronic visual approach aids are commonly provided at airports. The existing visual approach aids on Runway 16/34 consist of four light Precision Approach Path Indicators (PAPI-4) on both ends and Runway End Identifier Lights (REIL) on Runway 16. Runway 34 is served by MALSR approach lighting as noted above. Runway 3/21 has PAPI-4 and REIL on both ends. The PAPI and REIL systems were upgraded in the summer of 2016 to more efficient LED systems. These

visual approach aids are adequate for the planning period, but will require routine maintenance and replacement as they near the end of their useful life.

3.7.5 Air Traffic Control

The airport owned and operated air traffic control tower (ATCT) is located on the western edge of the developed terminal area approximately centered on Runway 16/34. The facility is centrally located with poor visibility to the Taxiway C movement area (see **Figure 3-6**). Taxiway C is not visible between the two arrows indicated in the figure. The control panels inside the tower cab are at the end of the end of their lifespan and should be replaced with current technology. Controllers must ascend and descend ladders to access the cab.

Replacement of the ATCT to provide acceptable access, updated control panels and a clear line of sight to all taxiways and runways is recommended within the planning period.

Remote and virtual tower (RVT) systems are currently under development, and may offer an alternative to a traditional manned control tower in the near future. RVT systems utilize video-sensor based surveillance instead of the "out of the window" view from a traditional tower. A live feed to a Remote Tower Control (RTC) center enables ATC personnel to simultaneously monitor multiple medium and low traffic level airports. RVT systems offer cost savings through more efficient use of human resources serving multiple airports from a single location and by eliminating the need to build and maintain control tower buildings and facilities at local airports.

Figure 3-4. Existing Tower

Figure 3-5. Existing Tower Access

Figure 3-6. Taxiway C Visibility from the Air Traffic Control Tower

Table 3-7. Airfield Facility Requirements

RUNWAYS AND TAXIWAYS		
EXISTING	SHORT TERM (2020)	LONG TERM (2025)
Runway 16/34 **150' X 7,500'** **60,000 lbs SWL** **110,000 lbs DWL** **160,000 lbs DTL** **Partial Parallel TW A & E** **Runway 3/21** **75' X 5,803'** **40,000 lbs SWL**	**Runway 16/34** 150' X 8,500' Full Length Parallel TW A 60,000 lbs SWL 110,000 lbs DWL 160,000 lbs DTL **Runway 3/21** same	**Runway 16/34** Same **Runway 3/21** 75' X 5,803' 40,000 lbs SWL Parallel Taxiway
NAVIGATIONAL AIDS		
EXISTING	SHORT TERM (2020)	LONG TERM (2025)
Runway 16/34 **VOR/DME** **RNAV** **ILS (34)** **LOC(34)** **4- Box PAPI** **Runway 3/21** **4 Box - PAPI**	**Runway 16/34** Same **Runway 3/21** GPS 4 Box PAPI	**Runway 16/34** Same **Runway 3/21** Same
LIGHTING AND MARKING		
EXISTING	SHORT TERM (2020)	LONG TERM (2025)
Runway 16/34 **Precision Markings** **HIRL, MITL** **MALSR (34)** **REIL (16)** **Runway 3/21** **Basic Markings** **MIRL, MITL** **REIL**	**Runway 16/34** Same **Runway 3/21** Precision Markings MIRL, MITL REIL	**Runway 16/34** Precision Markings HIRL, MITL MALSR(34) MALSR (16) **Runway 3/21** Same

3.8 Terminal Area Requirements

Components of the terminal area complex include the terminal apron, airline gate positions, and the various functional elements within the terminal building. In addition, the terminal area is served by various access, auto parking, and rental car facilities. This section identifies the terminal area facilities required to meet the airport's needs through the planning period.

The terminal facility was constructed in 1997 and is comprised of a passenger ticketing area, holdrooms for screened and unscreened passengers, airline operations, baggage pick-up, maintenance room, café, meeting room and airport administration offices. Since passenger demand is expected to increase over the planning period, the nature of airline service at the airport may change during the next twenty years. Therefore, it is timely to examine terminal area needs within this planning effort.

The various terminal complex functional areas were evaluated using FAA AC 150/5360-13A "Planning and Design Guidelines for Airport Terminal Facilities", AC 150/5360-9 "Planning and Design of Airport Terminal Facilities at Nonhub Locations" and professional judgment. These documents, along with updated forecasts, were used to prepare estimates of various terminal building requirements. Facility requirements were developed for the planning period based upon enplanement levels of 35,000, 39,000, 43,000 and 150,000, which roughly coincide with existing, short-, and long-term needs. It should be noted that actual need for construction of facilities will be based upon enplanement levels and airline service characteristics, rather than a forecast year.

Airline terminal area requirements were developed for the following functional areas:

- Airline Gates/Ramp
- Departure Areas
- Ticketing Lobby
- Public Lobby
- Airline Ticket Counters
- Airline Office and Support
- Baggage Claim (Public Areas)
- Rental Car Area
- Administration/Conference Area Concessions

The main functional use areas of the terminal include ticketing, airline operations, baggage claim, and departure lounges. As passenger enplanements increase, each of these areas can be expected to experience further demand.

3.8.1 Airline Gates

At the present time, there are three marked positions on the terminal ramp, which can be served through three gate/departure areas. All gates are at ground level.

The minimum number of gates at an airport is based on the peak hour activity. Additional contingency metrics are also used to determine the required gates. Currently, at peak hour, there is one scheduled aircraft loading for departure. One contingency gate is added to accommodate unscheduled charter flights or long-term delayed flights. It is projected that three gates (two for regular departures and one contingency gate) will be required within the intermediate planning horizon.

Future utilization by large regional and narrowbody aircraft may require aircraft parking to be reconfigured but is feasible within the current gate positions and terminal structure.

Figure 3-7. Holdroom and Airline Gates

3.8.2 Terminal Apron

The terminal apron consists of the area facilities used for aircraft gate parking and aircraft support and servicing operations. In addition to actual gate positions, sufficient room must be provided for aircraft servicing, taxilanes leading to the airfield, and service/fire lanes. The current configuration of the terminal apron provides adequate space for ground servicing vehicles and equipment at each gate. Expansion of the terminal apron will likely be required within the planning period to accommodate larger aircraft, remain overnight (RON) commercial aircraft parking and aircraft deicing.

Figure 3-8. Terminal Apron

3.8.3 Departure Areas

The departure lounge is the designated waiting area used by passengers immediately prior to boarding an aircraft. Departure lounge (holdroom) requirements are based on design hour activity, gate requirements, and fleet mix projections. One holdroom is available serving the three ground level gate locations. The departure lounge currently provides approximately 1,992 square feet of space.

The holdroom size is adequate to accommodate the current peak occupancy of one 50 seat CRJ200. Holdroom requirements will increase as regional carriers' transition to larger aircraft and as additional gates are utilized simultaneously.

Table 3-8 (inserted at the conclusion of the terminal requirements section) contains a summary of the departure lounge requirements over the planning period. The analysis assumes 675 square feet per utilized gate. The TSA administrative offices are currently housed in a former conference room adjacent to the holdroom. The holdroom could be expanded into this space relatively simply with the removal of an interior wall shown with a red arrow in Figure 3-9. The airport is currently in discussions with an architect to move TSA administrative office and remodel the space to allow for overflow in the event additional space is needed.

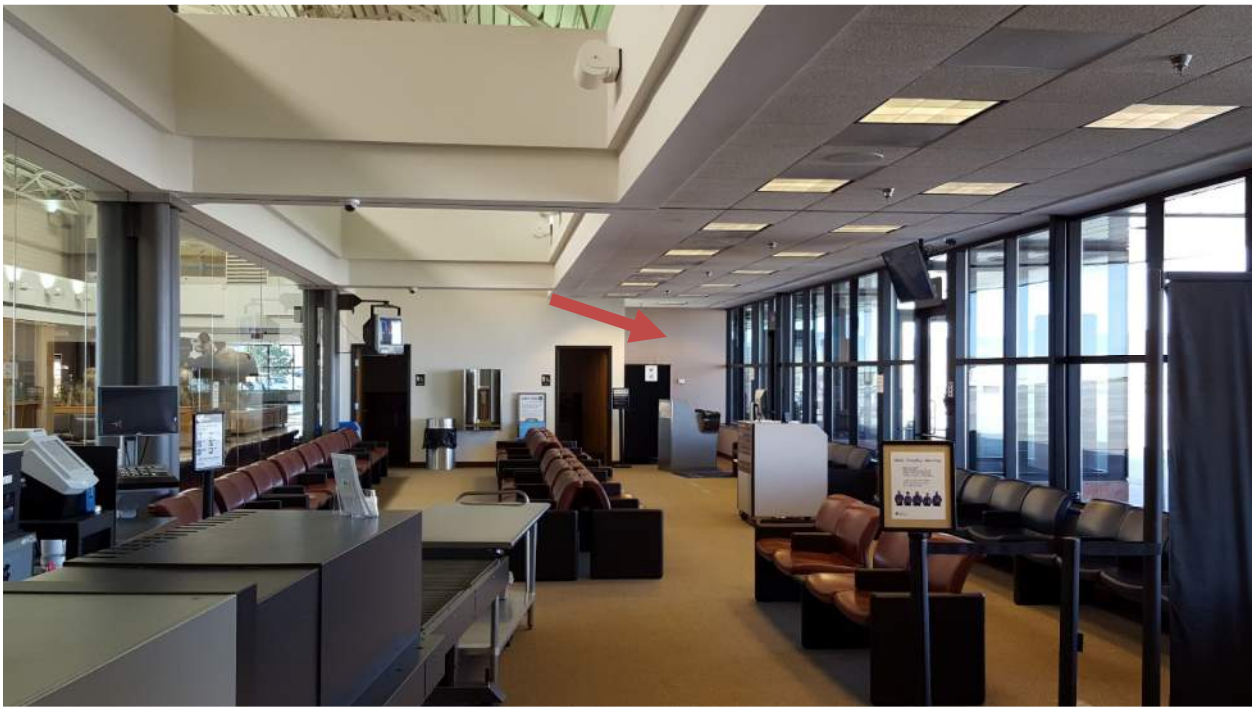


Figure 3-9. Holdroom Configuration

3.8.4 Security

Security requirements were examined based upon the current screening procedure which takes place inside the walkway. The capacity of a single unit station should be adequate for the planning period. The queuing space for the passenger security screening area currently extends into the public corridor. During peak periods this space can become congested. In addition, the passenger screening area is located inside the departure hold room, which limits capacity, especially when multiple flights are using the hold room simultaneously. TSA is currently in the process of acquiring new screening equipment which is anticipated to arrive in early 2017. The new equipment will be reconfigured to be adjacent to the west wall. It is recommended that options for reconfiguring the security screening area be considered to reduce its impact on the usable space in the hold room and does not interfere with general circulation within the terminal.

Currently, there are two glass doors that allow access from the terminal waiting area into the security screening and hold room. The doors are securely locked utilizing a deadbolt into the floor. Other secure areas on the airport also utilize a deadbolt system, with the exception of the vehicle access gates onto the airfield. The gates are operated utilizing garage door openers or key pads. An upgrade to a card access control system is recommended.

As noted previously, the TSA administrative offices are currently housed in a former conference room adjacent to the holdroom. The analysis indicates that additional space for TSA administrative offices is justified. Further the current space will likely be needed for holdroom expansion.

Figure 3-10. Current Security Check Point Setup

3.8.5 Airline Ticketing Counter and Support Space

The first destination for enplaning passengers in the terminal building is the airline ticket counters. The ticketing area consists of the ticket counters, queuing area for passengers to approach the counters, and the ticket lobby. The ticket lobby should be arranged so that the enplaning passenger has immediate access and clear visibility to the individual airline ticket counters upon entering the building (which is true of the current layout). Circulation patterns allow the option of bypassing the counters with minimal interference.

Airline ticket counter frontage, counter area, ticketing lobby, airline office and baggage make-up requirements were calculated. Requirements for these areas is based upon passenger enplanement design hour activity, number of airlines and ticket agent positions. It was assumed that a third airline would enter the market in the long term timeframe. **Table 3-8** summarizes airline ticketing requirements.

There is currently approximately 700 square feet of area behind the three ticketing counters dedicated for airline offices and baggage makeup. There are a total of 3 airlines spaces available in this arrangement. Currently, Skywest is utilizing one ticket counter to handle both United and Delta.

There is currently only one baggage screening facility which is located in a cordoned off area between two ticket counters. This equipment is operated by TSA to screen checked bags for explosives. Bags are fed through the Explosive Detection System (EDS) machine or screened with the Explosive Trace Detection (ETD) station. Since the equipment is positioned separately, there is limited ability to handle peaks from individual flights or redirect baggage when equipment is out of service. Once bags are cleared they are sent by baggage belt to the airlines bag make-up area to be carted to the aircraft. This arrangement of baggage screening is not recommended for the long term as it requires extra baggage handling, personnel and is unable to efficiently handle any surges. An in-line baggage screening arrangement is recommended as soon as practicable. The amount of space that will be required for this in-line baggage screening should be 1,200 square feet since this is the amount of space projected to be needed by the end of the planning period, see **Table 3-8.**

The analysis indicates that the ticketing lobby and airline ticket counter frontage should be adequate through the planning period while there appears to be a shortage of airline ticket office space. Each of these requirements may vary, however, depending upon the number of airlines and ground handling companies serving GCC in the future, as well as individual airline needs.

Figure 3-11. Unused ticket counter

Figure 3-12. Current Ticket Counter and Baggage Screening Arrangement

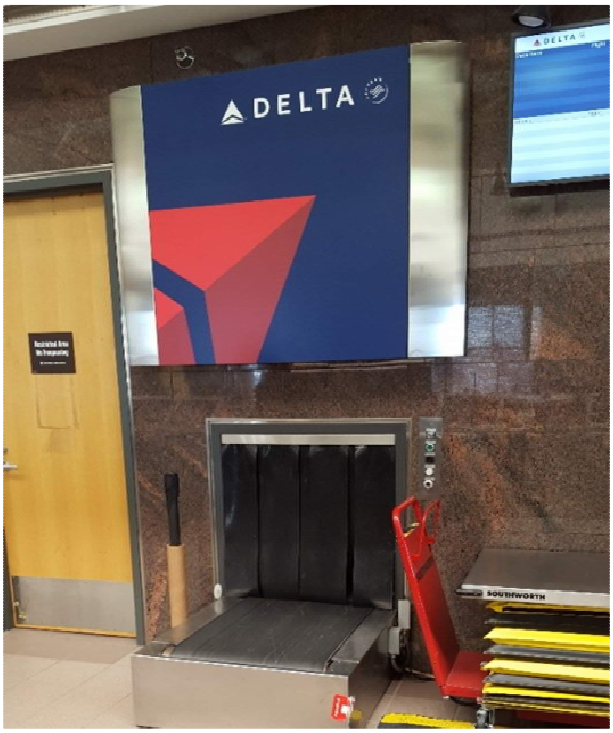


Figure 3-13. Baggage Belt to Make-Up Area Behind the Middle Ticket Counter

3.8.6 Baggage Claim and Handling Facilities

A flatbed oval shape device that feeds from the baggage input area is the only mechanized baggage claim device in the baggage claim area. A shelf for oversized luggage is adjacent to the mechanized bag belt. The baggage handling and claim facilities include the baggage claim device, baggage claim lobby, and input area. **Table 3-8** outlines baggage claim facility requirements.

Requirements for the bag claim area are based upon the number and size of aircraft arriving during the peak twenty minute period of the design hour. The analysis indicates that additional bag claim display and bag claim lobby area will be required within the planning period.

The baggage handling area is approximately 1,152 square feet in size. The analysis indicates that additional space in the baggage handling area may be warranted within the planning period. The baggage handling area requires a baggage tug drive lane, offloading zone and bypass lane. Multiple flights arriving near the same time will also require additional space to drive around active unloading operations. The existing depth is 24 feet and is adequate for the planning period.

Total percentage of passengers checking bags dramatically changes the baggage claim requirements. Baggage trends should continue to be monitored by the airport with space needs updated. Over the past several years airline fee structures have charged for checked baggage reducing demand. The trend is for airlines to charge for carry-on bags as well which may cause the number of checked bags to increase again.

Figure 3-14. Baggage Claim Area

Figure 3-15. Baggage Claim Handling Area

3.8.7 Concessions

Terminal services include passenger and visitor-oriented amenities, and concessions. This includes the rental car counters, gift shops and restaurant. **Table 3-8** outlines these requirements.

At the present time, the food/beverage concessions are located in the non-secure area of the terminal. Having the concession area outside of the secure area at airports like GCC was not a problem prior to 9/11 when security screening was faster. Passengers could stay in the non-secure area longer, or easily return to the non-secure area if a flight was delayed. With slower, more intensive screening and the prohibition of visitors past security, passengers are reluctant to stay in the non-secure area as long. Unless a delay is of a known, long duration, passengers are also reluctant to leave the holdroom to use the concessions in the non-secure area. For most airports it is recommended that concessions be available on the secure side of the terminal. This will be a continuing problem for small airports such as GCC which may not be able to support concessions in both areas.

Figure 3-16. Café/Gift Concessions

3.8.8 Rental Car

Opposite of the baggage claim in the public area, there are two utilized rental car counters at GCC totaling about 586 square feet. The size of the offices are sufficient. The queue area is not designated but is a portion of the 25 foot wide corridor in the baggage claim area. Both of the rental car spaces are occupied. This should be sufficient for the planning period.

Figure 3-17. Rental Car Counters with Rental Car Parking Lot Seen Through the Window

3.8.9 Airport Administration

The Airport Administration terminal areas include staff operations, offices and a conference room. This includes a 1,536 square foot office and conference room space and 1,040 square feet of operations space including mechanical, electrical and storage rooms. A reconfiguration of airport administrative space will likely be necessary within the planning horizon, particularly if the existing TSA office space is displaced by the need for additional holdroom space.

3.8.10 Public Spaces

Public spaces include non-revenue generating areas of the terminal building used for restrooms, circulation, seating and waiting areas. Including sterile and non-secure areas, 868 square feet is dedicated to public restrooms. The number of restrooms is based on the design hour passengers in the public area and on the number of equivalent aircraft within the secure area. Restrooms are located in appropriate locations within the sterile and non-secure areas.

The greeting area is located just outside the secure holdroom between the ticketing and baggage claim areas and is adjacent to the restaurant area. The restaurant area is open seating and has a view of the secure holdroom exit, so greeters can conveniently use this area.

General circulation within the terminal is adequate but includes some narrow areas adjacent to the wildlife displays. A general minimum corridor width standard of 15 feet is considered minimally acceptable. The corridor adjacent to the wildlife displays narrows to 10 feet, but is currently functioning adequately. The corridor adjacent to ticketing and rental provides 25 feet of width including queuing and is generally adequate.

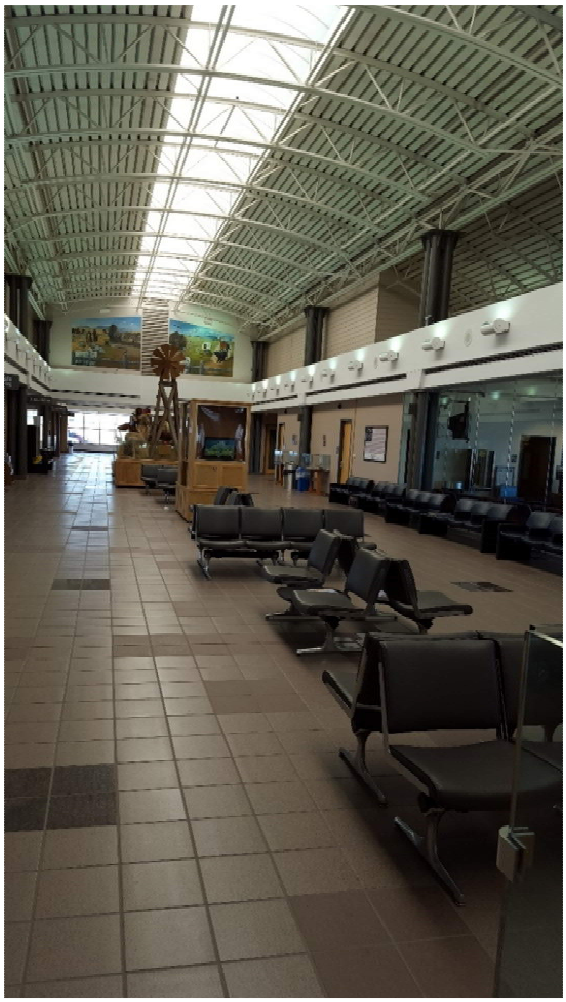


Figure 3-18. Terminal Waiting Areas with Seating

Table 3-8. Terminal Area Requirements by Functional Area

	Exist.	Suggested Base	PAL 1 (2020)	PAL 2 (2025)	PAL 3 (2030)	PAL 4 (2035)
Enplanements		32,000	35,000	39,000	43,000	47,000
Ticketing						
Counter positions	7	4	4	4	6	6
Counter (LF)	74	40	40	40	60	60
Counter Area (SF)	740	400	400	400	600	600
Queuing Area (SF)	2,880	600	1,400	1,400	2,100	2,100
Airline Office (SF)	528	1,000	1,000	1,000	1,500	1,500
Baggage Make up (SF)	700	1,400	1,400	1,400	2,100	2,100
Airline Operations (SF)	180	800	2,000	2,000	3,000	3,000
Baggage Screening (SF)	700	800	800	800	1,200	1,200
Hold Rooms						
# of Gates	3	2	2	3	3	3
Hold Room Waiting (SF)	1,992	1,350	1,350	2,025	2,025	2,025
Baggage Claim						
Claim Lobby Frontage (LF)	36	41	45	50	55	60
Claim Lobby Area (SF)	896	1,025	1,125	1,250	1,375	1,500
Baggage Drop Off (SF)	1,152	1,025	1,125	1,250	1,375	1,500
Rental Cars						
Agencies	2	2	2	2	3	3
Counter Frontage (LF)	36	20	20	20	30	30
Counter Area (SF)	300	160	160	160	240	240
Queuing Area (SF)	360	200	200	200	300	300
Office/Storage (SF)	286	240	240	240	360	360
Concessions						
Food/Gifts secure (SF)	0	383	420	465	518	563
Food/Gifts non-secure (SF)	1,152	383	420	465	518	563
Public Restrooms						
Total (SF)	868	510	560	620	690	750
Public Lobby (seating)						
Total (SF)	1,235	510	560	620	690	750

*Red text indicates deficiency.

Table 3-8 Continued. Terminal Area Requirements by Functional Area

	Exist.	Suggested Base	PAL 1 (2020)	PAL 2 (2025)	PAL 3 (2030)	PAL 4 (2035)
Enplanements		32,000	35,000	39,000	43,000	47,000
Security						
Passenger Screening (SF)	570	306	336	372	414	450
Security Queuing (SF)	176	153	168	186	207	225
TSA Office Support (SF)	713	1,500	1,500	1,500	1,500	1,500
Meeter Greeter Waiting (SF)	1,235	153	168	186	207	225
Administration						
Office/Conference (SF)	1,536	1,020	1,120	1,240	1,380	1,500
Gross Terminal Area						
Existing	26,000					
Low		18,000	18,000	27,000	27,000	27,000
High		21,000	21,000	31,500	31,500	31,500

*Red text indicates deficiency.

Table 3-9. Public Parking and Terminal Curb Frontage Requirements

	Exist.	Suggested Base	PAL 1 (2020)	PAL 2 (2025)	PAL 3 (2030)	PAL 4 (2035)
Enplanements		32,000	35,000	39,000	43,000	47,000
Auto Parking						
Public short term/long term # of spaces	277	112	123	137	151	165
Rental Car # of spaces	60	38	42	47	52	56
Employee # of spaces	38	26	28	31	35	38
Curbside Frontage (LF)	340	89	98	109	121	131

3.8.11 Terminal Automobile Parking

Vehicle parking in the terminal area includes public parking (combined long-term and short-term), employee and rental car space. In the main parking lot there are 277 long-term spaces. In addition there are 30 rental car spaces. An employee parking lot on the same level accommodates 16 cars. An overflow, coarse surface parking area was constructed in 2014 to accommodate additional rental cars and employee vehicles. The area was paved with a 4" asphalt overlay in the summer of 2016 and added 52 parking areas for rental cars and employee vehicles.

Table 3-9 presents public, rental and employee parking requirements. As this analysis indicates, adequate public parking exists at the airport through the planning period. Additionally, "car condos" are a desirable feature for the high value

customer, but are not necessarily required to be located within the terminal area as arrangements can be made to retrieve vehicles and have them brought to the passenger when needed.

3.8.12 Terminal Curb Frontage

The terminal curb serves as the interface between the terminal building and the ground transportation system. The length of the curb at non-hub airports is usually a function of the length of the building. The length of the curb available should preclude any congestion problems for the planning period.

3.9 Apron and Hangar Facilities

The purpose of this section is to determine the space requirements for general aviation hangar and apron parking facilities during the planning period. In addition, the total land area needed to accommodate general aviation activities through the planning period is estimated.

3.9.1 GA Aircraft Parking Apron

Aircraft parking should be provided for locally-based aircraft which are not stored in hangars and transient aircraft visiting the airport. Nationwide trends for general aviation aircraft, whether single or multi-engine, are toward larger, more sophisticated and expensive aircraft. Owners of these types of aircraft normally desire hangar space to protect their investment.

FAA AC 150/5300-13A, "Airport Design" suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At GCC, the number of itinerant spaces was estimated to be approximately 25 percent of busy day itinerant operations. Additionally, total space requirements also assume 10 percent of the based aircraft are located on the apron for transient purposes.
Aviation forecasts were applied to project future fleet mix. Aircraft types were then split by Airplane Design Group (ADG) classification to determine the necessary parking area with required FAA setbacks. Size requirements were planned for each aircraft type as follows:Single/Multi-Engine Piston (ADG-I) – 800 square yards per aircraft

- Turboprop (ADG-II) – 2,000 square yards per aircraft
- Business Jet (ADG-II) – 2,000 square yards per aircraft
- Business Jet (ADG-III) – 4,100 square yards per aircraft

The results of this analysis are presented in **Table 3-10.** There is currently approximately 14,000 square yards of parking apron in the general aviation area. As shown in the table, additional general aviation apron is justified in the near term.

Table 3-10. General Aviation Aircraft Parking Apron Requirements

	Currently Available	Current Need	PAL 1 2020	PAL 2 2025	PAL 3 2030	PAL 4 2035
Based Aircraft						
10% Utilizing Apron Space		7	7	8	9	9
Tie-down Area (s.y.)		5,200	5,760	6,240	6,800	7,360
Busy Day Itinerant Operations		47	50	53	57	60
Transient Parking Positions		12	13	13	14	15
GA Apron Area (s.y.)		20,120	21,540	22,961	24,379	25,801
Total Parking Apron						
Positions	21	19	20	21	23	24
GA Apron Area (s.y.)	14,000	25,320	27,300	29,201	31,179	33,161

Note: Increase in square yards (s.y.). of apron without an increase in aircraft is due to the fleet mix moving towards larger aircraft

3.9.2 Hangars

The demand for hangar facilities typically depends on the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar and apron facilities based on peak design periods. However, hangar and apron development should be based on actual demand trends and financial investment conditions.

Typical utilization of hangar space varies across the country as a function of local climate conditions, airport security and owner preferences. Although all but two of the based aircraft at the airport are hangered, weather is not the only factor that influences the demand for hangar storage. The trend for general aviation aircraft, whether single or multi-engine, is in larger, more sophisticated and expensive aircraft. Owners of these types of aircraft normally desire hangar space to protect their investment.

Hangar facilities at GCC are in high demand and have a historical waiting list of up to 10 airplanes. As the community and economy expand, this list will grow. The airport currently has a varied selection of hangar buildings, with T-hangars, large hangars for combined space, and additional hangars of various sizes. Some of these hangars are owned by the county and leased to tenants and some are privately owned buildings on land leased from the airport. Airport-owned hangars allow the airport to retain ultimate control over the size, construction and upkeep of the hangars and conduct of the lessees, but require upfront capital expenditures not required with privately owned and developed hangars.

The future allocation of based aircraft storage is presented in **Table 3-11**. Single-engine aircraft use was split evenly between conventional hangars and T-hangars / condos. Only two aircraft are currently stored on apron areas. Given the weather conditions in Gillette, future planning is for all based aircraft to be stored in hangars. Conventional hangar use was assumed for 80 percent of the multi-engine and helicopter fleet and 100 percent of the business jets.

Determining hangar requirements involves estimating the area necessary to accommodate the required hangar space. A planning standard of 2,165 square feet per based aircraft stored in T-hangars was used.

For conventional hangars, a planning standard of 1,500 square feet for single-engines and 2,500 square feet for twin-engine, jet and helicopters was used. Current hangars provide an average of 1120 square feet for each aircraft based on the airfield. Since portions of conventional hangars are also used for aircraft maintenance and servicing, requirements for service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Table 3-12 compares existing hangar availability to the future hangar requirements for the planning period. From the analysis, additional hangar area is justified immediately.

Table 3-11. Based Aircraft Storage Distribution

	Current Need	PAL 1 2020	PAL 2 2025	PAL 3 2030	PAL 4 2035
T-Hangar					
Single Engine	50%	50%	50%	50%	50%
Multi Engine	15%	15%	15%	15%	15%
Jet	0%	0%	0%	0%	0%
Rotorcraft	0%	0%	0%	0%	0%
Conventional Hangar					
Single Engine	50%	50%	50%	50%	50%
Multi Engine	85%	85%	85%	85%	85%
Jet	100%	100%	100%	100%	100%
Rotorcraft	100%	100%	100%	100%	100%

Table 3-12. Hangar Requirements

	Currently Available	Current Need	PAL 1 2020	PAL 2 2025	PAL 3 2030	PAL 4 2035
Based Aircraft						
Single Engine		57	63	68	75	81
Multi Engine		7	8	8	9	10
Jet		1	1	1	1	1
Rotorcraft		0	0	0	0	0
Total Based Aircraft		65	72	78	85	92
Aircraft to be Hangared						
T-Hangar /Condo Positions	24	30	33	35	39	42
Conventional Hangar	39	35	39	42	46	50
Total Aircraft ***	63	65	72	78	85	92
Hangar Area (s.f.)						
T-Hangar/Condo Area	51,892	63,976	70,865	76,771	83,661	90,550
Conventional Hangar Area	43,674	59,250	65,631	71,100	77,481	83,862
Maintenance Area **		18,484	20,474	22,181	24,171	26,162
Total Hangar Area (s.f.)	95,566	141,710	156,971	170,052	185,313	200,574

* May not total due to rounding
** Existing maintenance areas included within conventional hangar area.

3.9.3 Fixed Base Operation (FBO) Facilities

The current FBO facilities consist of two large hangar buildings. The main building, which also houses FBO office and pilot lounge areas, includes a 12,000 square feet large bay hangar. The second hangar immediately to the left in the figure is larger, at 16,860 square feet, but does not contain any office space. Both of these buildings are older, and the operating and maintenance costs, particularly for heating, are becoming excessive.

The FBO has indicated the need to be able to park large business jets (G-IV, G-V, etc) and an EMB-120 in the hangar. Additional storage for based and transient aircraft has also been identified as a potential use for the additional hangar buildings, especially during the winter months. FBO apron expansion would also be desirable to allow for additional aircraft movement, parking, and deicing space.

3.10 Support Requirements and Facilities

Various facilities that do not logically fall within classifications of airfield, terminal building or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport and include aircraft rescue and firefighting, fuel storage, snow removal equipment and airport maintenance facilities.

3.10.1 Aircraft Rescue and Firefighting

The Federal Aviation Regulation (FAR) Part 139 regulates the minimum standards for airports serving scheduled air carrier operations. FAR Part 139 specifies that airports such as GCC Airport provide Airport Rescue and Firefighting (ARFF) capabilities for Index "A". This identification is for airports serving aircraft less than 90 feet in length.

The airport purchased a new ARFF truck in 2007. This truck provides fire-fighting capabilities for Index "B". Index "B" standards are required for airports that serve aircraft up to 126 feet in length and should accommodate all of the likely future air carrier aircraft that the airport can expect. The new truck is built by Rosenbauer America and provides 1,500 gallons of water, 440 gallons of Aqueous Film-Forming Foam (AFFF), and 460 pounds of clean agent. Typically, ARFF vehicles are considered to have a fifteen year life, which would require replacement of the Airport's primary ARFF vehicle during the planning period.

The Airport's ARFF/Snow Removal Equipment (SRE) building was constructed in 2005. This facility was constructed in accordance with FAA design guidance to meet the existing storage requirements, while at the same time considering the future needs of the airport. The facility has nine climate controlled vehicle bays, seven for maintenance equipment storage, one for vehicle maintenance and one for the ARFF truck. The vehicle maintenance bay and ARFF truck bay are separate from the other seven bays. In addition to the vehicle bays, the building contains a kitchen, locker room, office space and a day room to accommodate the airport's maintenance needs.

3.10.2 Snow Removal and Airport Maintenance Facilities

The FAR Part 139 specifies the adequate snow removal equipment needs that airports provide. For a commercial service airport, the airport must have enough equipment to remove one inch per hour from the primary runway, primary taxiway, and the commercial service apron. The airport

acquired a new piece of SRE in 2016, and no new major purchases are anticipated in the short-term. As airport surfaces are expanded and existing equipment ages, new purchases will be required.

The existing storage facility is expected to provide the necessary storage for the new snow removal equipment. Should conditions dictate, or new equipment is obtained, consideration for wider overhead door openings and additional bay storage may be necessary.

The airport's maintenance facilities are also located in the ARFF/SRE building. The airport currently has a maintenance fleet that consists of several pickups, an SUV, a bucket truck, two tractors, a skid steer, and snow removal equipment.

3.10.3 Fuel Storage

The airport fuel farm is currently located outside of the airport perimeter fence north of the terminal area. The fuel farm has three 12,000 gallon tanks, two of which contain Jet-A fuel for turbine and turboprop aircraft, and the remaining tank contains 100 octane low-lead (100LL) aviation gasoline for use in reciprocating engine propeller-driven aircraft. A 500 gallon 100LL self-service credit card fueling station was installed off of the main apron entrance taxiway. This operation is owned and managed by the airport and offers fuel at a discount over the FBO retail prices. The fuel farm has sufficient capacity for the planning horizon.

3.10.4 Airport Miscellaneous Infrastructure

Existing electric, natural gas, and telephone infrastructure is provided by local utility companies. The airport has four on-site diesel generators to provide backup support to the control tower and electrical vault, ARFF/SRE Building, water distribution system and approach lighting. The diesel generators are located adjacent to the structure they support and maintained on a weekly basis. The terminal has a natural gas generator in place to provide backup support which is also maintained on a weekly basis.

The airport water supply is fed by a well system with adequate volumes. The sewer system for the airport is made up three lagoons located north of the fuel farm. It is not expected that the existing sewer system facilities will be beyond the system's capacity within the planning period.

3.11 Summary

The facility needs evaluation has identified several requirements on the airfield, in the terminal, and in general aviation segments. Key recommendations in each of these areas are summarized below.

3.11.1 Runways and Taxiways

- An extension of primary Runway 16/34 to 8,500 feet is justified in the near-term time horizon to accommodate the CRJ 200.
- It is recommended that clearances be reserved to allow an ultimate Runway 16/34 length of 10,000 feet if and when it is needed in the future.
- The present taxiway system includes two parallel taxiways to Runway 16/34. An extension to join Taxiway A and Taxiway E would give the runway a full parallel taxiway and increase the operational efficiency of aircraft ground movement.
- Extension of the northern and southern ends of partial parallel Taxiway C will remove the process of back-taxiing on the runway.
- Additional extension of unconnected portions of Taxiway C would allow for increased aircraft movement on the airfield.
- There are currently no holding aprons or bypass taxiways on the airfield.

Consideration should be given for holding aprons or bypass taxiways to serve the existing runway system.

- An ultimate upgrade of conventional airfield lighting to more efficient and durable LED lighting would be desirable. Taxiway lights are scheduled to be upgraded to LED lights in the summer of 2016.

3.11.2 Instrument Approaches, Lighting, Visual Approach Aids, Air Traffic Control

- Provision should be made for the addition of GPS procedures to the approaches of both ends of Runway 3/21.
- The Runway 16 approach should be protected in the event it is developed for a precision approach.
- Routine maintenance and replacement of lighting and visual approach aids as they near the end of their useful life.
- Replace or renovate air traffic control tower to provide acceptable access, updated control panels and a clear line of sight to all taxiways and runways.

3.11.3 Terminal

- Expansion of the terminal apron will likely be required within the planning period to accommodate larger aircraft, remain overnight (RON) commercial aircraft parking and aircraft deicing.
- Holdroom requirements will increase as regional carriers transition to larger aircraft and as additional gates are utilized simultaneously.
- It is recommended that options for reconfiguring the security screening area be considered to reduce its impact on the usable space in the hold room and does not interfere with general circulation within the terminal.
- An in-line baggage screening arrangement is recommended as soon as practicable.
- Expand baggage claim.
- Provide concessions on the secure side of the terminal.
- Add and/or reconfigure airport administrative space and TSA office space to accommodate holdroom expansion.

3.11.4 General Aviation

- Additional Hangars
- Additional GA Apron
- FBO apron expansion / access

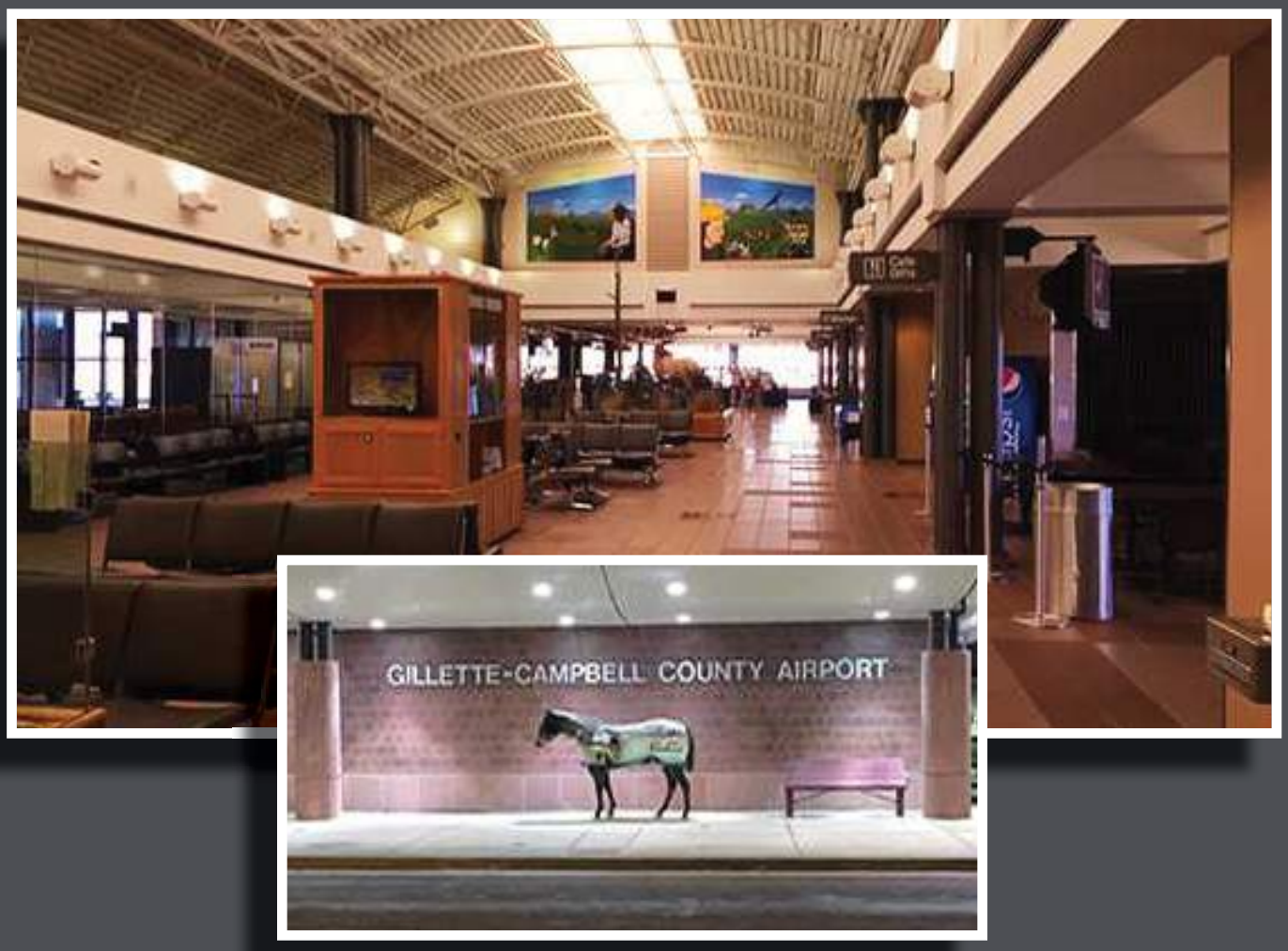
3.11.5 Support

- ARFF vehicle replacement at end of useful life

Each of these functional areas will be given consideration in the following evaluation of airport development alternatives. The next chapter will provide analysis and recommend the best alternative for the future development of the airport, taking into consideration other factors such as access, highest and best use of airport property.

GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

CHAPTER FOUR:
AIRPORT IMPROVEMENT ALTERNATIVES



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4.0 AIRPORT IMPROVEMENT ALTERNATIVES

4.1 Introduction

Chapter 3, Facility Requirements, identified the airside and landside facilities needed to accommodate current and projected demand over a twenty-year planning period. In this chapter, a series of airport improvement alternatives will be presented for comparison which meet airfield, terminal, general aviation, and air cargo needs. The chapter will also discuss the potential for other improvements on the airport property which can provide revenue support. Subsequently, a master plan concept will be recommended.

The alternatives presented in this chapter provide a series of options for meeting short- and long-range facility needs. Since the levels of commercial and general aviation activity can vary from forecast levels, flexibility must be considered in the plan. If activity levels vary by significant levels within a five year period, the Gillette-Campbell County Airport (GCC) should consider updating the plan to reflect the changing conditions.

The alternatives presented in this chapter were reviewed with the GCC Airport staff for further refinement. Then, a master plan concept was recommended in conjunction with airport layout plans and capital improvement programs (CIP). While the evaluation of airport improvement alternatives may always include the "no action" or "no build" alternative, this alternative will eventually reduce the quality of services provided to the public and potentially affect the Gillette area's ability to accrue additional economic growth. However, a final decision with regard to pursuing a particular improvement plan which meets the needs of commercial and general aviation users rests with the GCC Airport Board. While this study does not deal with the potential relocation of services to other airports, this option also exists. It would be difficult to duplicate the services and convenience of the current facility at a nearby airport and the economic and environmental costs of new site development are generally far greater than the cost of developing the existing site. It is sometimes possible to relocate, or encourage the relocation of some services. However, most of the services which local users find attractive are not easily met at nearby airports. Therefore, the master planning process must attempt to deal with the facility needs which have been identified in the previous chapter, providing a logical decision path which the GCC Airport Board can follow in meeting projected needs. Through coordination with GCC Airport Staff, the Airport Board, and the public, the alternatives will be refined and modified as necessary to shape the recommended improvement program. The alternatives presented in this chapter can be considered a beginning point for formulating the updated master plan improvement program, and input will be necessary to define the resulting program.

4.2 Initial Considerations

It is the overall objective of this effort to provide for a balanced airside and landside complex to serve forecast aviation demands. However, prior to defining specific alternatives, improvement objectives should be defined as follows:

- Develop an attractive, efficient, and safe aviation facility.
- Promote increased use of the airport for transportation of air passengers while providing for increased commercial airline competition to stimulate growth.
- Provide the means for the marketing and improvement of the airport and available land as unique business opportunities for both aviation related

and non-aviation related commercial businesses.

- Target local economic growth through the improvement of available airport property for industrial and commercial uses.
- Encourage increased general aviation use of the airport by promoting increased business and corporate use of the airport.

In attempting to meet these objectives, improvement of facilities should be undertaken in such a manner as to minimize operational constraints. Flexibility is essential to assure adequate capacity while minimizing financial commitments until market potential is realized.

4.3 Airfield Alternatives

Airfield facilities are, by nature, a focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the critical factor in the determination of a viable airport improvement program. Analysis in the previous chapter indicated the need to continue to maintain the current runway length and width. Other factors to be considered include taxiway circulation and the potential to provide additional runway length if needed in the future.

4.3.1 Runways

The facility needs evaluation for runways at the airport recommended the following:

- Increasing the length of Runway 16/34 to a length of 8,500 feet is needed for the existing fleet mix. The need for the 1,000 foot extension is driven by the mix of aircraft using the airfield, including the commercial flights.
- Preserve the option for extension of Runway 16/34. The ability to ultimately extend the runway to 10,000 feet should be preserved for the long term future through land acquisition and airspace zoning. Future changes to the airline fleet utilizing GCC could trigger the need for a runway longer than 8,500 feet. These changes could include a transition to larger regional jets, the entry of an airline, such as Allegiant, that utilizes full-sized A319 and MD83 jets, into the GCC market, or the introduction of long haul domestic or international flights. Any combination of factors that results in 500 operations or more of aircraft requiring a runway longer than 8,500 feet would justify a runway extension.

Two alternatives were evaluated for increasing the length of Runway 16/34. In Alternative 1, as shown in **Figure 4-1**, Runway 16/34 is extended 1000 feet to the south. As illustrated, an extension to the south creates a conflict with FAA line of sight requirements between Runway 16/34 and Runway 3/21 due to the location of hangars. In addition, extension of the runway to the south does not appear to be feasible due to unlikely land acquisitions.

Alternative 2, shown in **Figure 4-2**, depicts a proposed 1,000 foot extension of Runway 16/34 to the north in orange, and an ultimate extension of an additional 1500 feet to the north. As shown, this alternative does not create a line of sight conflict. All other FAA standards are met with a north extension. This is consistent with recommendations from previous Master Plans

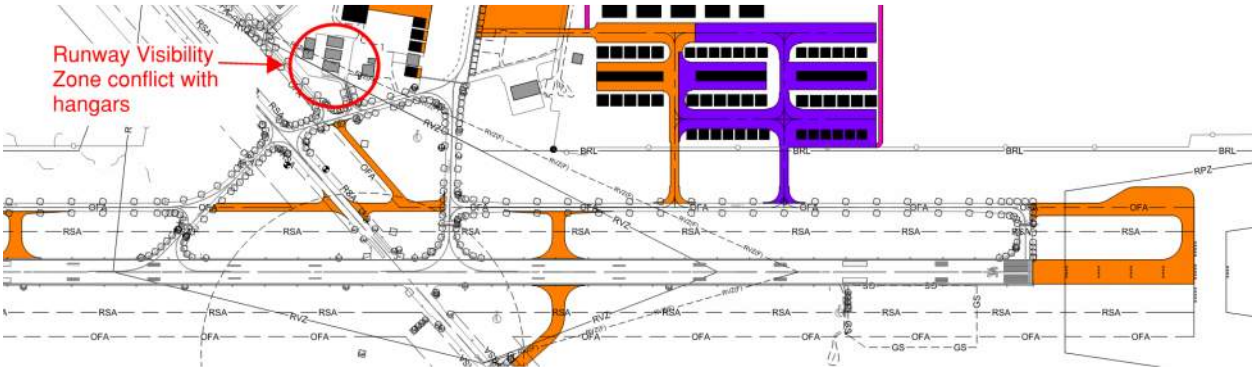

Figure 4-1. Runway 16/34 South Extension

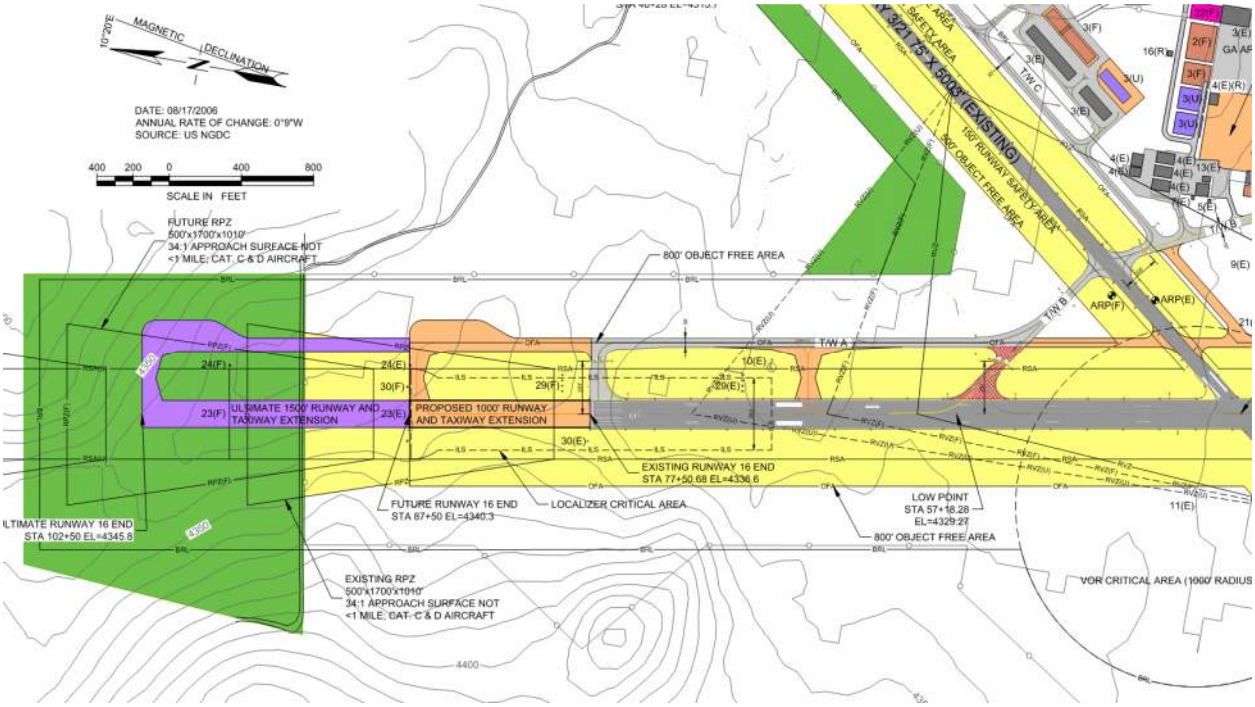

Figure 4-2. Runway 16/34 North Extension

4.3.2 Taxiways

The facility needs evaluation for taxiways at the airport recommended a number of targeted improvements to improve operational efficiency. These improvements have limited alternatives beyond build / no build.

- An extension to join Taxiway A and Taxiway E, which both service Runway 16/34 as partial parallel taxiways, is recommended in the near future. Extending the taxiway to create a full parallel taxiway would increase the operational efficiency of aircraft ground movement.
- Extension of the northern and southern ends of partial parallel Taxiway C will remove the process of back-taxiing on the runway. This would also allow for increased aircraft movement on the airfield.
- Consideration should be given for holding aprons or bypass taxiways to serve the existing runway system. Currently, there are no holding aprons or bypass taxiways on the airport.
- Upgrading the airfield lighting to more efficient and durable LED lighting would be desirable.
- Removing the perpendicular Taxiway D segment from in between Taxiway E and Runway 16/34 would reduce direct access from the aprons to the Runway. Removing Taxiway B segment from in between Taxiway A and Runway 16/34 and relocating both segments to split the runway into thirds would be ideal to increase the operational efficiency of aircraft ground movement.

Targeted taxiway improvements are recommended to be undertaken as funding availability allows.

4.3.3 Instrument Approaches, Lighting and Visual Approach Aids

The facility needs evaluation recommended the following improvements for the instrument approaches, lighting and visual approach aids:

- Provision should be made for the addition of GPS procedures to the approaches of both ends of Runway 3/21.
- The Runway 16 approach should be protected in the event it is developed for a precision approach.
- Routine maintenance and replacement of lighting and visual approach aids as they near the end of their useful life.

Figure 4-3. Potential Taxiway Extensions and Removals

4.3.4 Airport Traffic Control Tower

The facility needs evaluation indicated that the current air traffic control tower is equipped with aging technology and is located in an area with poor visibility to the Taxiway C movement area. The FAA is generally responsible for siting, constructing and maintaining an Airport Traffic Control Tower (ATCT) for an airport, therefore actions related to the ATCT are typically initiated by the FAA. The purpose of discussion within the context of this master plan is to protect land use and guide development so that future ATCT sites remain feasible should a tower relocation prove warranted.

The Gillette-Campbell County Airport ATCT is currently owned and operated by Campbell County. The cost to Campbell County and the Airport Board of operating the tower is approximately $350,000 annually. Campbell County wishes to turn operation of the tower over to the FAA as a part of the contract tower program.

Options for addressing the deficiencies of the existing air traffic control tower include:

- Renovate existing tower in place
- Remove existing tower, and
    - Replace with standard tower, or
    - Replace with new technology Remote Virtual Tower / Remote Tower Center (RVT/RTC)

Renovating the existing tower, would require bringing the tower up to code, which includes a requirement for an elevator to meet Uniform Federal Accessibility Standards. Additionally, 3 private hangars would have to be acquired and demolished, or the tower cab would have to be raised to provide a clear line of site to Taxiway C.

The cost of a new tower would also be in the range of $1 to $1.5 million. The estimated cost of demolishing the existing tower is $1 million.

To replace the existing tower with a Remote Virtual Tower system, the capital cost is estimated to be upwards of $2 million. The program cost itself, including system development and implementation (not including construction) is estimated at $500,000. To operate and maintain an RVT, the estimated cost is $500,000 per year. The system would allow Air Traffic Controllers to utilize cameras and potentially radar equipment in a building, such as the terminal or ARFF building, instead of building a new tower and having direct sights on the airfield. This system is still in the testing stages and not yet approved by the FAA, nor is it eligible for FAA funding.

Currently, the contract tower program is not accepting new applications for airports to join the program. There is a bill tabled in congress that modifies the benefit-cost analysis used to determine if an airport is eligible for the contract tower program. Until the bill is addressed by congress, the contract tower program will remain on hold.

It is recommended that discussions occur between the Gillette-Campbell County Airport and the FAA regarding ATCT operations and future construction or renovation of the facility. If the airport can be included in the contract tower program, the current tower will need to be upgraded or replaced with a new tower that meets all specifications and design standards of the FAA.

The air traffic control tower recommendation for the airport is to continue maintaining and operating the current ATCT until the contract tower bill is addressed by congress. Once the bill is addressed, the budget-cost analysis can be completed for the Gillette-

Campbell County ATCT to determine if the tower will be accepted into the contract tower program.

4.4 Terminal Alternatives

Considerations relative to the passenger terminal and access into the passenger terminal area include:

- Provision for holdroom expansion. Holdroom requirements will increase as regional carriers transition to larger aircraft and as additional gates are utilized simultaneously.
- Provision for security reconfiguration. It is recommended that options for reconfiguring the security screening area be considered to reduce its impact on the usable space in the holdroom and does not interfere with general circulation within the terminal.
- Provision for in-line baggage screening arrangement is recommended as soon as practicable.
- Provision for expanding baggage claim.
- Provision for parking expansion. Increasing parking demands will require that the parking lots be expanded.

Relocating TSA's CT-80 machine to the empty airline space in the northwest corner of the terminal increases the cueing area for airline ticketing. Also, relocating TSA's passenger screening area outside of the holdroom would allow for additional seating. The communication room can be reduced in size to allow for additional seating. **Figure 4-4** shows possible passenger screening, holdroom, and CT-80 alternatives. The CT-80 does not allow enough room for a roller belt in the baggage make-up area as the roller belt would not allow room for a tug to maneuver through the makeup area.

Figure 4-5 shows a second alternative for the CT-80 machine and passenger screening area. GCC currently utilizes one ground handling company for their two operating airlines. This arrangement is not anticipated to change at the airport, therefore only one airline office is necessary. Moving the passenger screening area into the location of the existing southernmost ticket counter opens up the holdroom for additional seating and opens up the corridor for additional cueing and space for greeters. The CT-80 does not meet TSA design standards as there is not enough belt length to achieve the height required for the CT-80.

Figure 4-6 shows a third alternative for the CT-80 machine and passenger screening area. The third alternative extends the baggage makeup area to the west 20 feet, into the apron. This option allows the current airline areas and baggage makeup area to be converted into passenger screening and baggage screening areas, back to back. Two airline ticket counters will be maintained. As shown in **Figure 4-7**, CRJ-700's would be able to move around the apron with this new configuration, ensuring additional apron would not be needed when the airlines upgrade to the 70 passenger CRJ-700's. This is the recommended alternative.

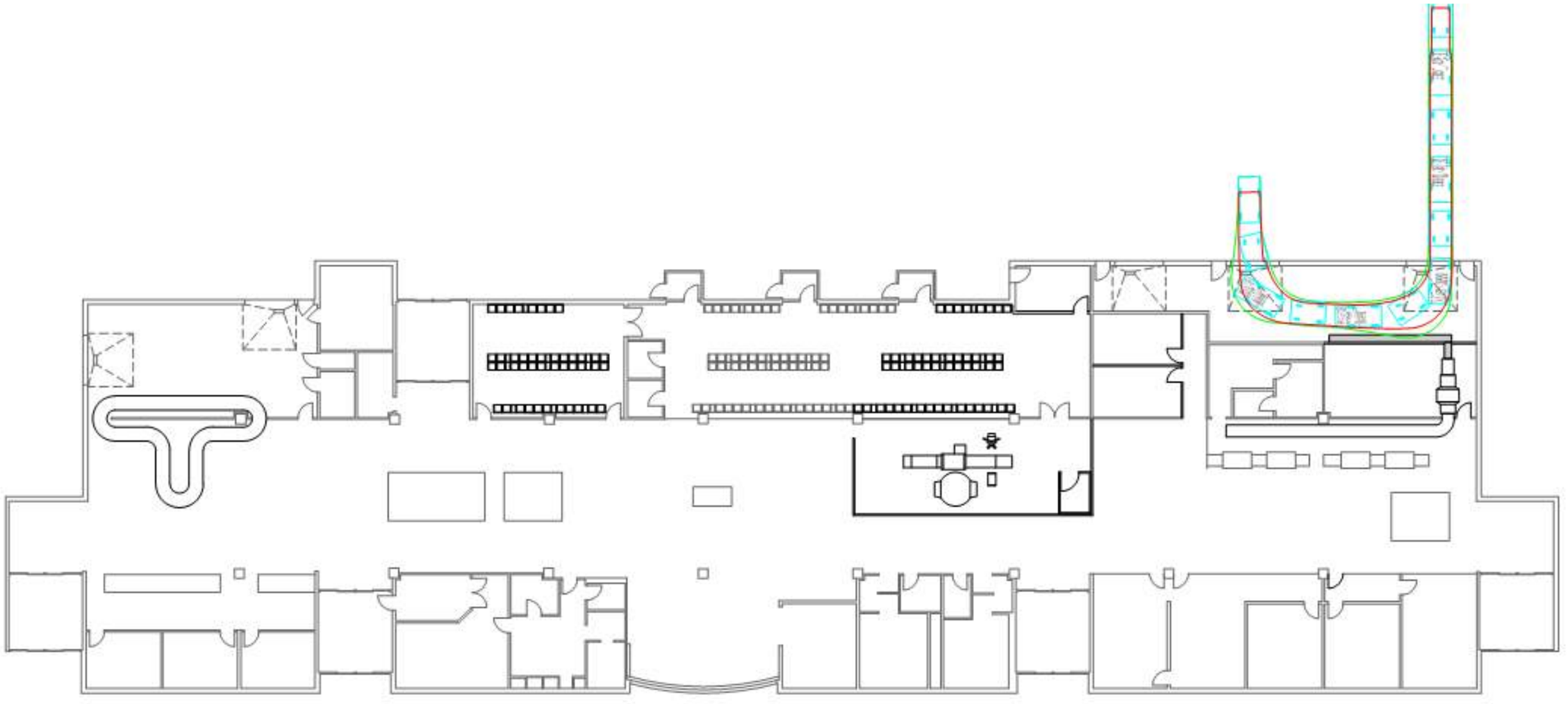

Figure 4-4. Terminal Layout Alternative 1

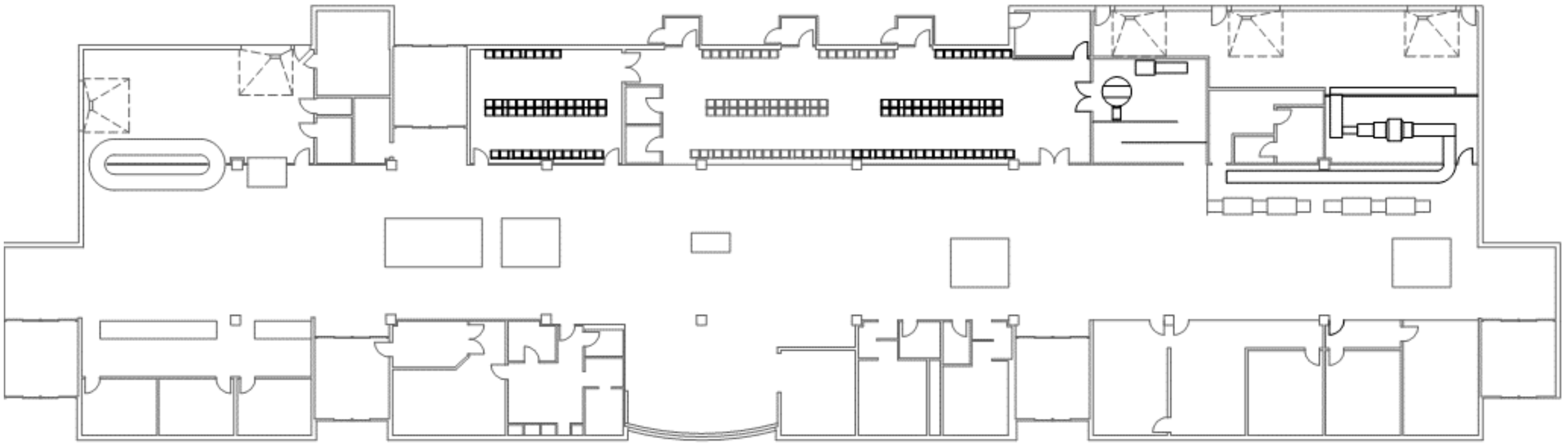

Figure 4-5. Terminal Layout Alternative 2

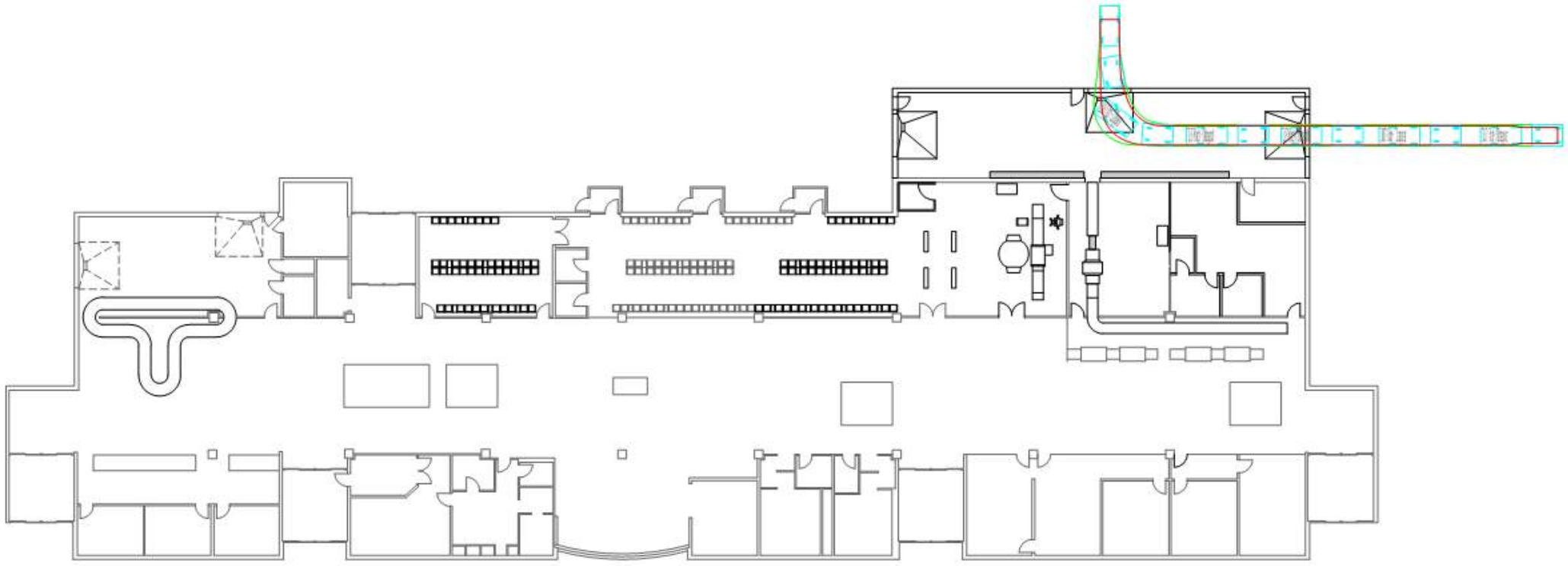

Figure 4-6. Terminal Layout Alternative 3

Figure 4-7. Apron Layout Terminal Alternative 3

4.5 Apron and Hangar Alternatives

4.5.1 Apron

The facility needs evaluation for apron and hangars at the airport recommend the following:

- Reserve future area for aprons serving commercial, general aviation and corporate aircraft.
- Area along the commercial apron should be reserved to accommodate larger aircraft, remain overnight (RON) commercial aircraft parking and deicing, and should future terminal expansion and aviation-related uses require the construction of additional apron space.
- Area along the FBO and general aviation apron should be reserved for additional apron space.

The existing apron areas are already lined to a certain extent with existing structures. These buildings occasionally constrain the development of the apron area and related facilities. **Figure 4-8** shows possible apron expansion alternatives. With the identification of development areas, the aprons can be expanded appropriately and related facilities buildings can be added as expansion occurs and the new space is needed. It is essential to identify early on these areas to limit the need to remove structures and ultimately reduce the need to relocate tenants.

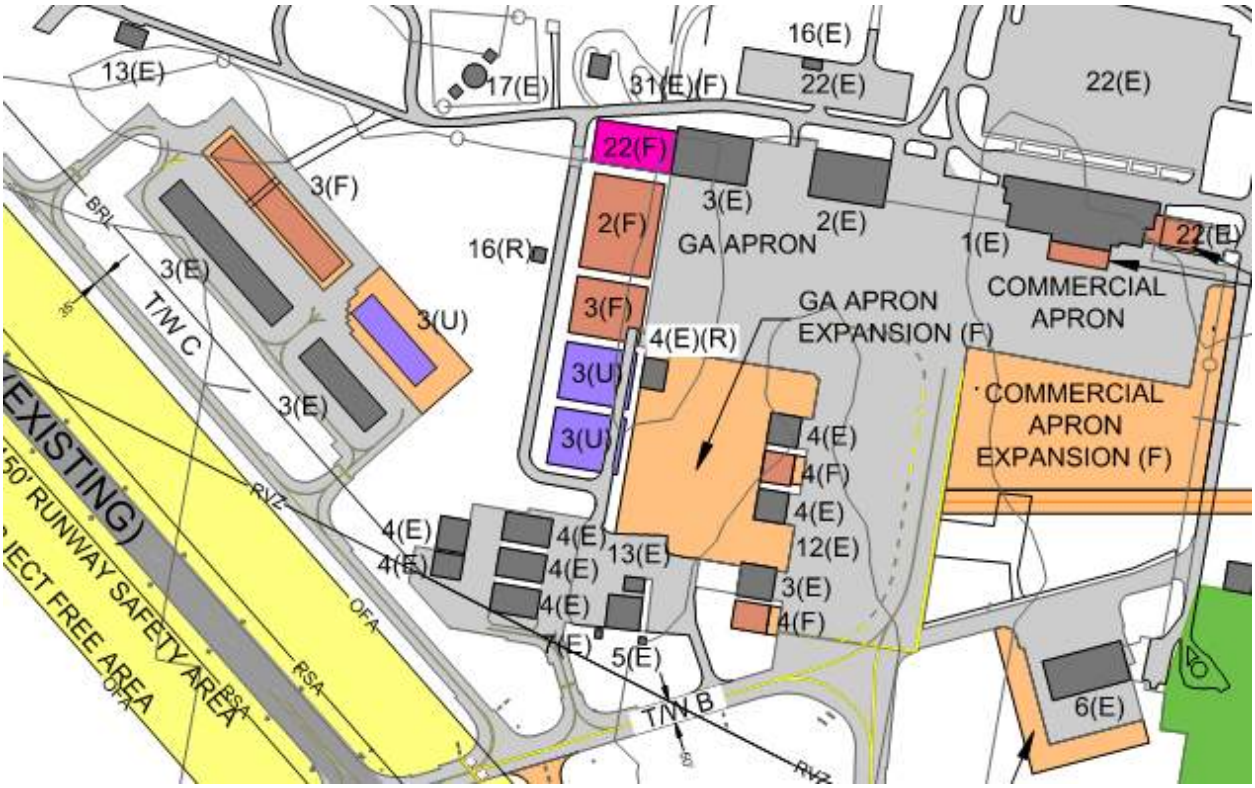

Figure 4-8. GA and Commercial Apron Area

4.5.2 Hangars

The facility needs evaluation has projected the need for as many as 29 additional storage positions, for both small and large aircraft.

There are two primary hangar areas currently, a "box" hangar area and a t-hangar area. These areas have limited room for expansion and alternatives for layout arrangements are, therefore, limited. **Figure 4-8** depicts a conceptual layout of the box and t-hangar areas that incorporates a mixture of hangar sizes and types.

Once the existing development area is built out, additional hangar development area has been identified to the south of the ARFF/SRE building. This site allows for maintaining the building development in close proximity to present facilities. **Figure 4-9** presents an alternative layout for this development area. The taxilane infrastructure and vehicle incursion road will be eligible for AIP funding, however the hangars and apron between the hangars and taxilane will not be AIP eligible.

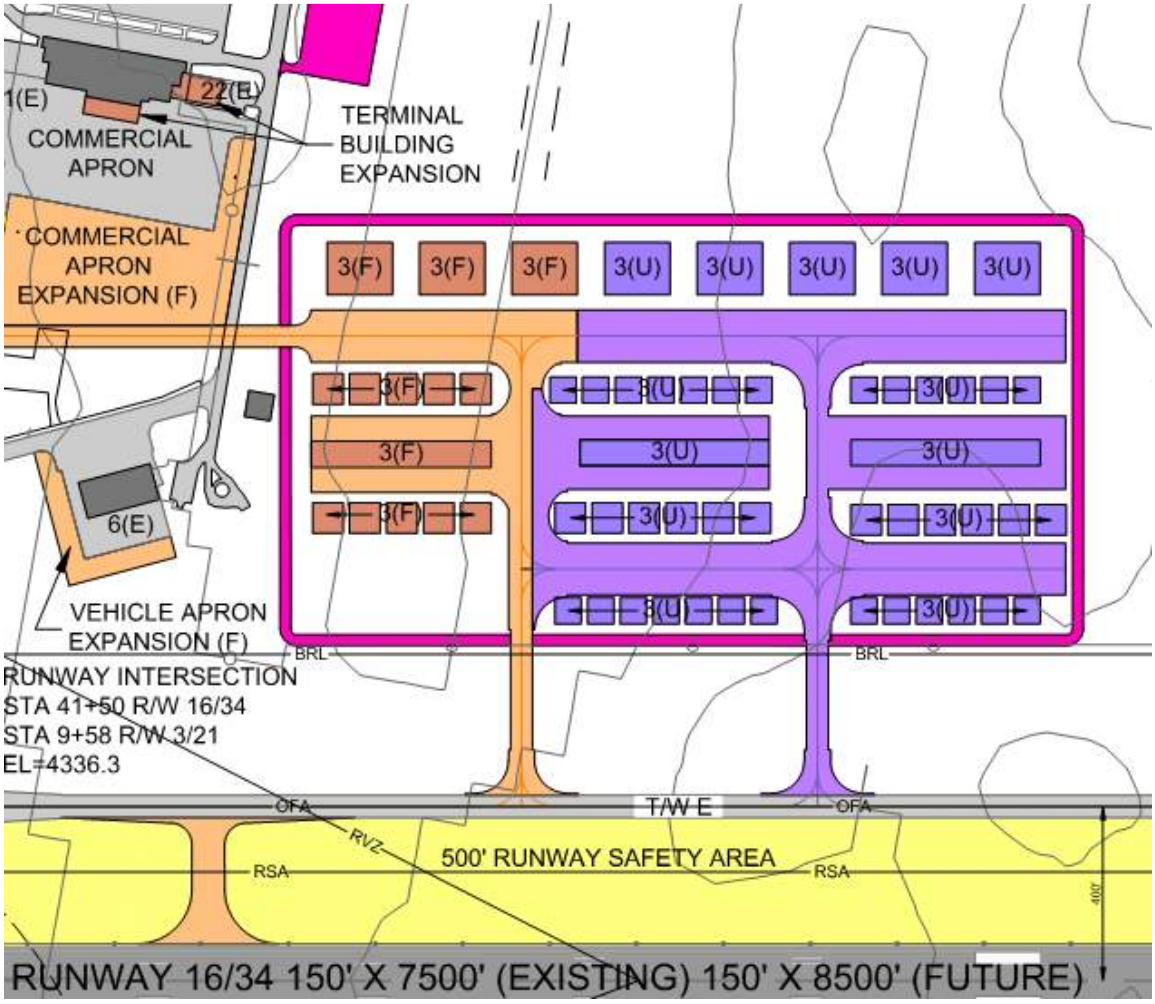

Figure 4-9. Future Hangar Development Alternative

4.5.3 FBO Facilities

The current FBO facilities consist of two large hangar buildings. The main building, which also houses the FBO office, and two pilot lounge areas, includes a 12,000 square foot large bay hangar. The second hangar immediately to the north is larger, at 16,860 square feet, but does not contain any office space.

Campbell County and the Airport Board hired an architect in 2016 to evaluate the current FBO building, specifically the office area. The architect evaluated and proposed three alternatives to improve the office space. The first alternative would replace finishes, portions of the exterior of the building, and any equipment reaching its end-of-life in order for the building to continue to function as is. The second alternative would be a major renovation including the alternative one options in addition to upgrading the building to meet code and accessibility compliance. The third alternative would be to replace the office portion of the FBO and building a new, smaller office space that would have room for the FBO as well as airport administration and a board room. A decision on which alternative to move forward with has not been determined for the FBO office.

The FBO has indicated the need to be able to park large business jets (G-IV, G-V, etc.) and an EMB-120 in the hangar. Additional storage for based and transient aircraft has also been identified as a potential use for the additional hangar buildings, especially during the winter months. This new hangar space is depicted in **Figure 4-12** with an apron expansion to allow for additional aircraft movement, parking and deicing space.

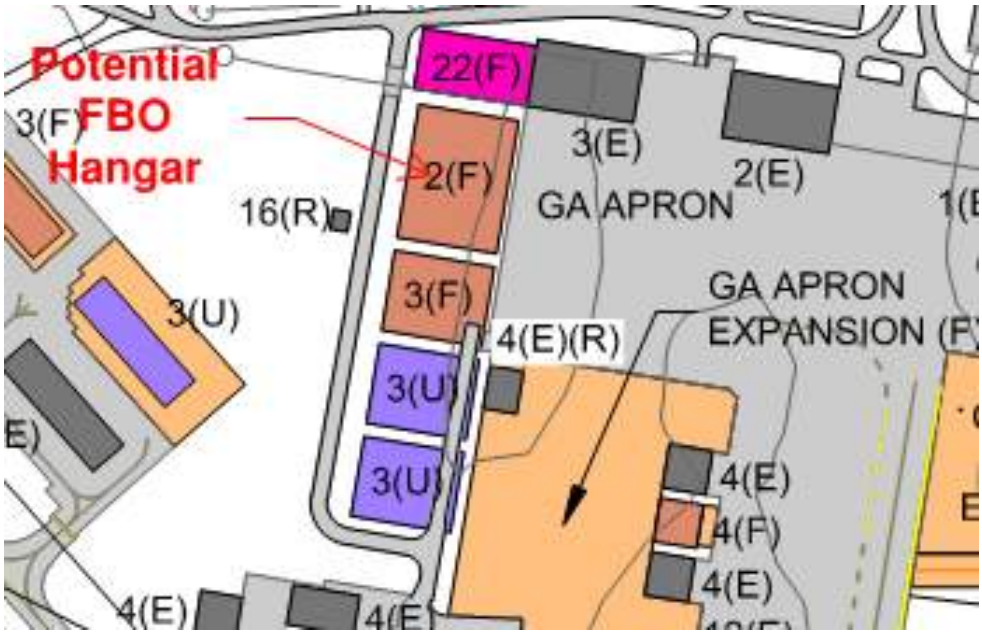

Figure 4-10. FBO Development Area

4.6 Summary

Following evaluation and review with airport staff, the range of alternatives was reduced to a group of improvements recommended for implementation within the planning period. **Figure 4-11** presents a summary of projects from the alternatives analysis that are recommended for implementation within the master planning period.

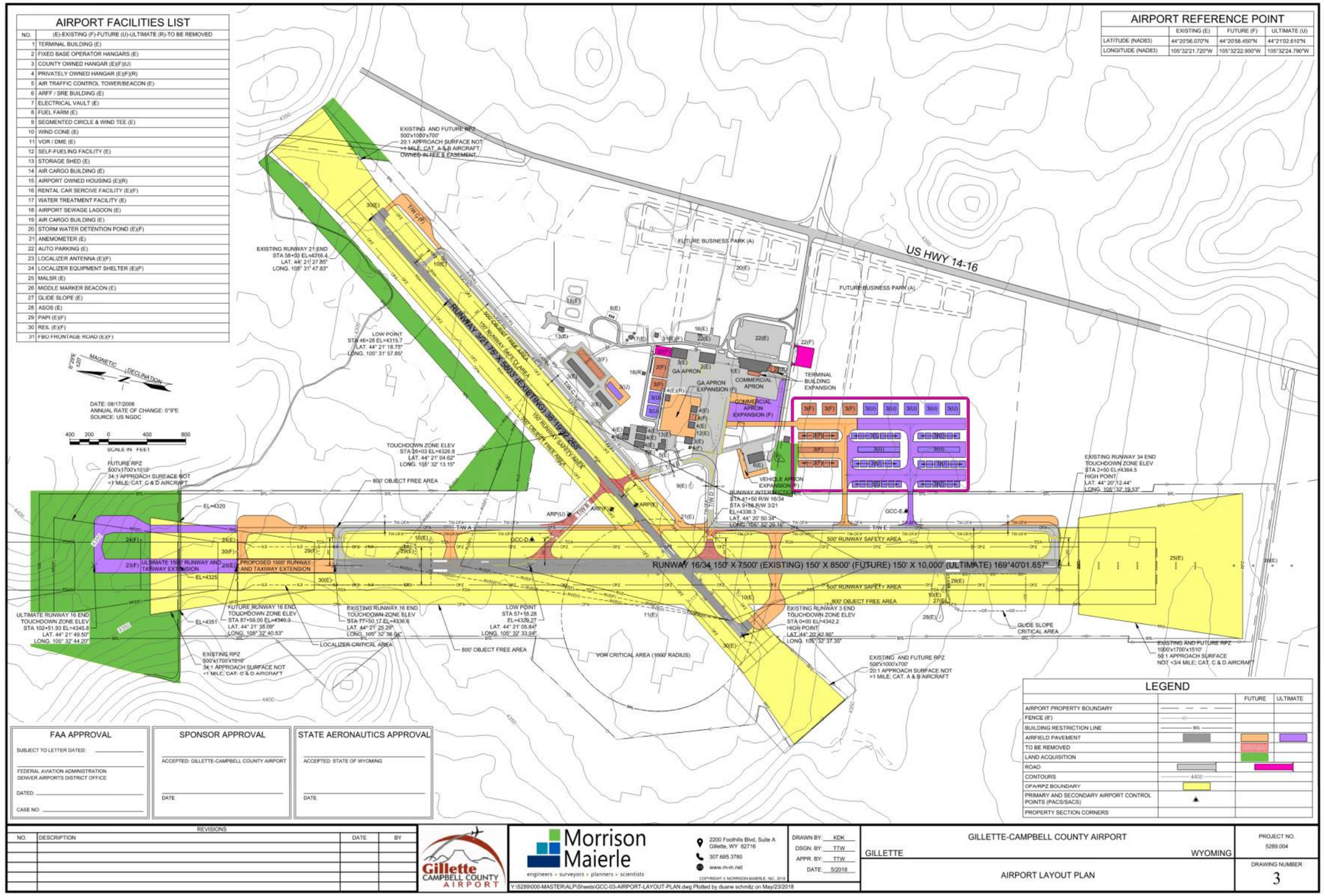

Figure 4-11. Overview of Recommended Alternatives

GILLETTE-CAMPBELL COUNTY AIRPORT
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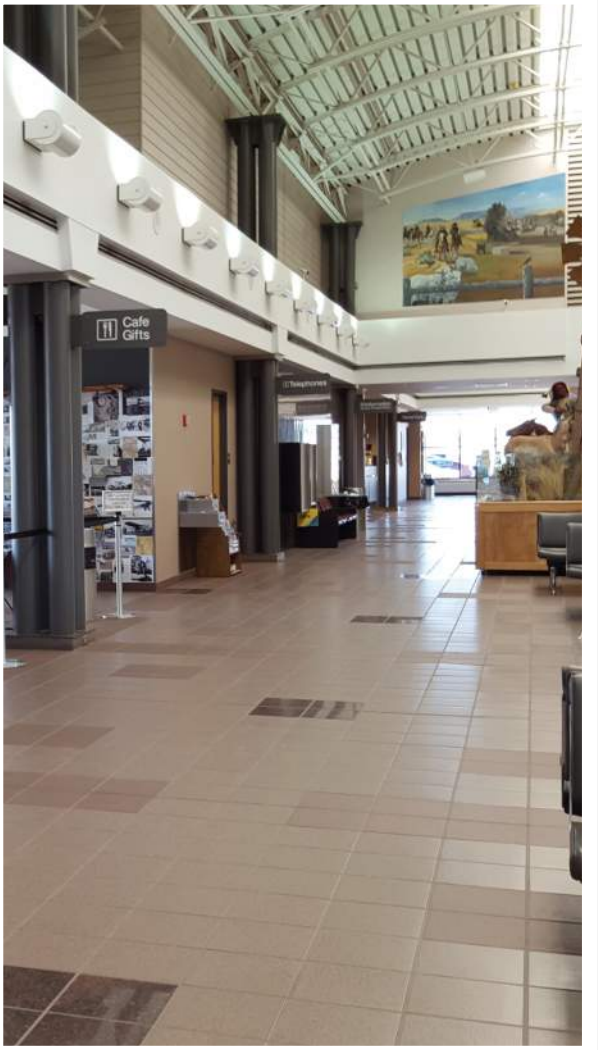
RECOMMENDED CONCEPT



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5.0 RECOMMENDED CONCEPT

5.1 Introduction

In the last chapter, airfield and landside development alternatives were assessed using a process that considered short and long term needs as well as future growth potential. Safety, both in the air and on the ground, was given high priority in the analyses and current airport design standards were considered in evaluating each scenario. Through meetings and discussions with the Gillette Campbell County Airport Board and staff, as well as the public, a recommended concept has evolved.

The recommended development concept for Gillette Campbell County Airport represents a means by which the airport can grow in a balanced manner to accommodate commercial and general aviation demand over the planning period. In addition, the plan provides the flexibility to meet activity growth beyond the long range planning horizon.

Table 5-1. FAA Design Standards

	Runway 16/34 C-III	Runway 3/21 B-II
Runway Object Free Area		
Width	800’	500’
Length Beyond Runway End	1000’	300
Runway Safety Area		
Width	500’	150’
Length Beyond Runway End	1,000	300
Runway Obstacle Free Zone		
Width	400’	400’
Length Beyond Runway End	200’	200’
Taxiway Object Free Area		
Width	186’	131’
Taxiway Safety Area		
Width	118’	79’
Design Criteria		
Runway Width	150’	75’
Taxiway Width	50’(TDG 3/4)	35’ (TDG 2)
Runway Centerline to Parallel T/W Centerline	400’	240’
Runway Centerline to Holdline	293’	200’
Runway Centerline to Edge of Aircraft Parking	500’	250’
Taxiway centerline to Fixed or Movable Object	93’	65.5’

5.2 Airport Design Standards

Airport design and safety standards are primarily based on the characteristics of the critical design aircraft expected to use the airport. The critical design aircraft is the most demanding aircraft or "family" of aircraft which will conduct 500 or more operations (take-offs and landings) per year at the airport. The primary reference for the design of airfield facilities is FAA Advisory Circular 150/5300-13A, Airport Design. Within this advisory circular, a coding system, referred to as the Aircraft Approach Category (AAC) / Airplane Design Group (ADG) has been established that identifies an airport's critical design aircraft for each runway. This code is a function of the critical design aircraft's approach speed and wingspan. The AAC/ADG was previously discussed in Chapter Three.

The current AAC/ADG for air carrier Runway 16/34 at Gillette Campbell County Airport is C-III and the current AAC/ADG for crosswind Runway 3/21 is B-II. This AAC/ADG is adequate for the current level of activity at the airport. Planning forecasts suggest that it should also be sufficient for the 20 year planning horizon. All airfield facilities associated with Runway 16/34, therefore, should comply with C-III design and safety standards and all airfield facilities associated with Runway 3/21 should comply with B-II standards. **Table 5-1** summarizes the planning standards used in the ultimate design and layout of Gillette Campbell County Airport.

5.3 Master Plan Concept

The recommended master plan concept, as depicted on **Figure 5-7,** proposes the following elements as outlined in the previously proposed planning alternatives:

- Extension of Runway 16/34 1,000 feet to the north
- Extension to join Taxiway A and Taxiway E into full length parallel taxiway
- Extension of north and south ends of Taxiway C to eliminate the need to back-taxi on the runway
- Addition of holding aprons
- Upgrading the airfield lighting to more efficient and durable LED lighting
- Removal of perpendicular Taxiway D segment from in between Taxiway E and Runway 16/34 to reduce direct access from the aprons to the Runway
- Removal of Taxiway B segment from in between Taxiway A and Runway 16/34 and relocating both segments to split the runway into thirds to increase the operational efficiency of aircraft ground movement
- Providing for the addition of GPS procedures to the approaches of both ends of Runway 3/21
- Protecting the Runway 16 approach in the event it is developed for a precision approach
- Terminal holdroom expansion
- Terminal security reconfiguration
- Terminal in-line baggage screening
- Expanded baggage claim
- Terminal parking expansion
- Commercial, GA and corporate apron expansions
- Additional storage hangars
- FBO expansion

The recommended master plan concept provides for anticipated aviation facility needs for the Gillette / Campbell County area throughout the 20-year planning horizon. The following sections provide a brief discussion of the major improvements planned for the airport throughout the planning period.

5.4 Airside Recommendations

5.4.1 Runway 16/34

Runway 16/34 is the primary runway with a length of 7,500 feet and a width of 150 feet. As shown in **Figure 5-1**, the master plan recommends extending Runway 16/34 to a length of 8,500 feet to the north in the near-term time horizon. The ability to ultimately extend the runway to 10,000 feet will be preserved by protecting future approach and departure clearances. Preferably, this would include acquiring the land that encompasses future Runway Protection Zones. Runway pavement strength is planned to be maintained at its current level of 70,000 pounds single wheel loading (SWL), 110,000 pounds dual wheel loading (DWL) and 160,000 pounds dual tandem gear loading (DTG). The approach to Runway 16 should be protected in accordance with precision approach geometry to allow for the development of a precision approach in the future.

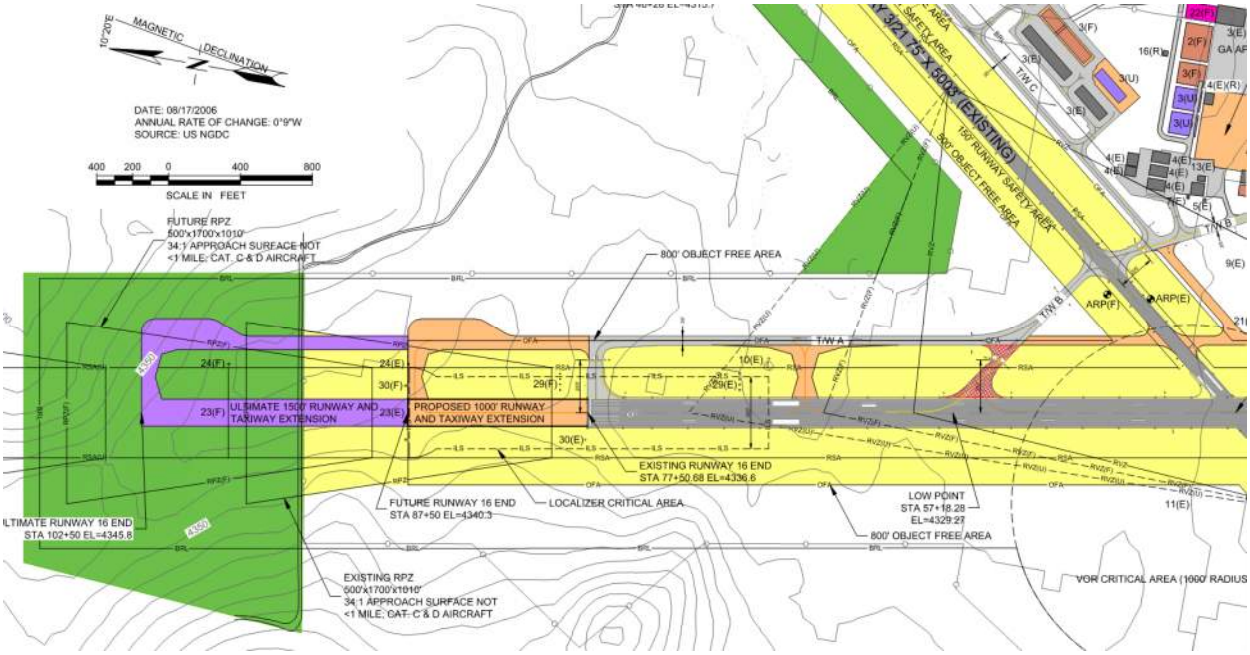


Figure 5-1. Runway 16/34 North Extension

5.4.2 Runway 3/21

Runway 3/21 is 5,803 feet long by 75 feet wide and serves as the airport's crosswind runway. It is primarily used by general aviation. Analysis conducted in Chapter Three indicated that Runway 3/21 should be maintained in its current condition throughout the planning period. Approaches to both ends of the runway are planned to be protected in anticipation of the addition of GPS procedures. The runway pavement strength of 40,000 pounds SWL and 60,000 pound DWL will be adequate for the planning period.

5.4.3 Taxiways

Taxiway A and Taxiway E, which both service Runway 16/34 as partial parallel taxiways, are planned to be connected to create a full parallel taxiway. This will

increase the operational efficiency of aircraft ground movement.

In order to remove the process of back-taxiing on the runway, the northern and southern ends of partial parallel Taxiway C will be extended.

Holding aprons are planned near all runway ends to allow aircraft to bypass other aircraft when needed. The segment of Taxiway D between Taxiway E and Runway 16/34 will be removed to eliminate the direct taxi route from the aprons to the runway. This is to reduce the potential for runway incursions. The Taxiway B segment in between Taxiway A and Runway 16/34 will be removed and relocated to reduce potential for runway incursions and to increase the operational efficiency of aircraft ground movement. Taxiway improvements are summarized in **Figure 5-2**.

Figure 5-2. Taxiway Extensions and Removals

5.4.4 Airfield Lighting/Visual Approach Aids

Runway lighting will be upgraded to more efficient and durable LED lighting. Visual approach aids will be maintained and replaced as they near the end of their useful life.

5.4.5 Air Traffic Control Tower

The airport will continue maintaining and operating the current Air Traffic Control Tower (ATCT) until the contract tower bill is addressed by congress. Once the bill is addressed, a budget-cost analysis should be completed for the Gillette-Campbell County ATCT in order to determine if the tower will be accepted into the contract tower program.

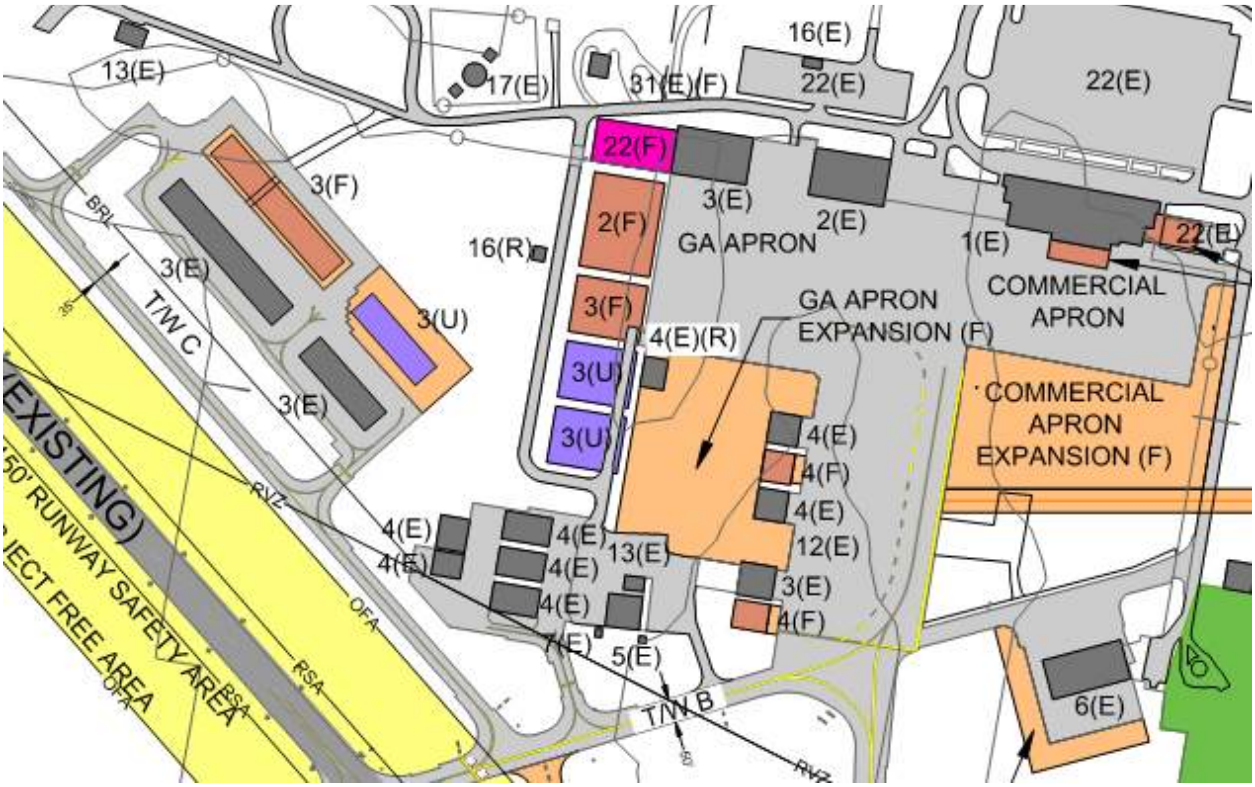


Figure 5-3. GA and Commercial Apron Area

5.4.6 Aircraft Parking Apron/Tiedown Area

As shown in **Figure 5-3**, aprons serving commercial, general aviation and corporate aircraft will be expanded as needed. Area along the commercial apron will be reserved to accommodate larger aircraft, remain overnight (RON) commercial aircraft parking and deicing operations. Area along the FBO and general aviation aprons will be reserved for future expansion.

5.4.7 Aircraft Storage Hangar Facilities

The two existing primary hangar areas will be built out with conventional and multi-unit hangars as shown in **Figure 5-3**.

Once the existing development area is built out, an additional hangar area will be constructed to the south of the ARFF/SRE building as shown in **Figure 5-4**.

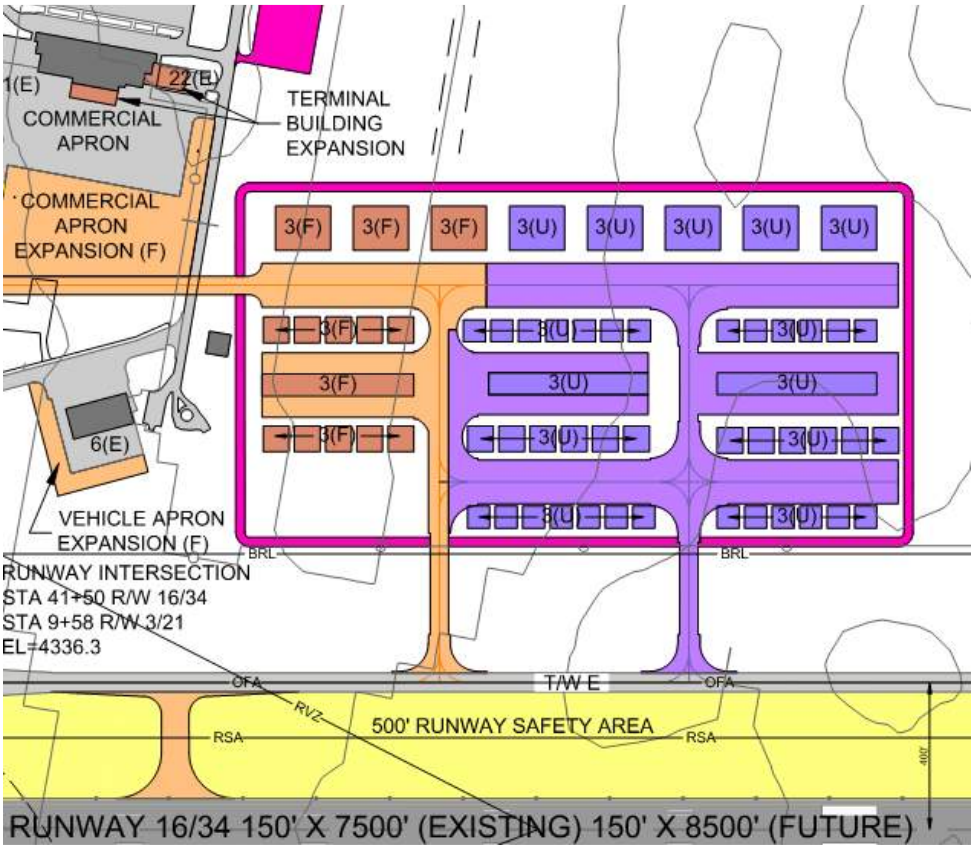


Figure 5-4. Future Hangar Development Area

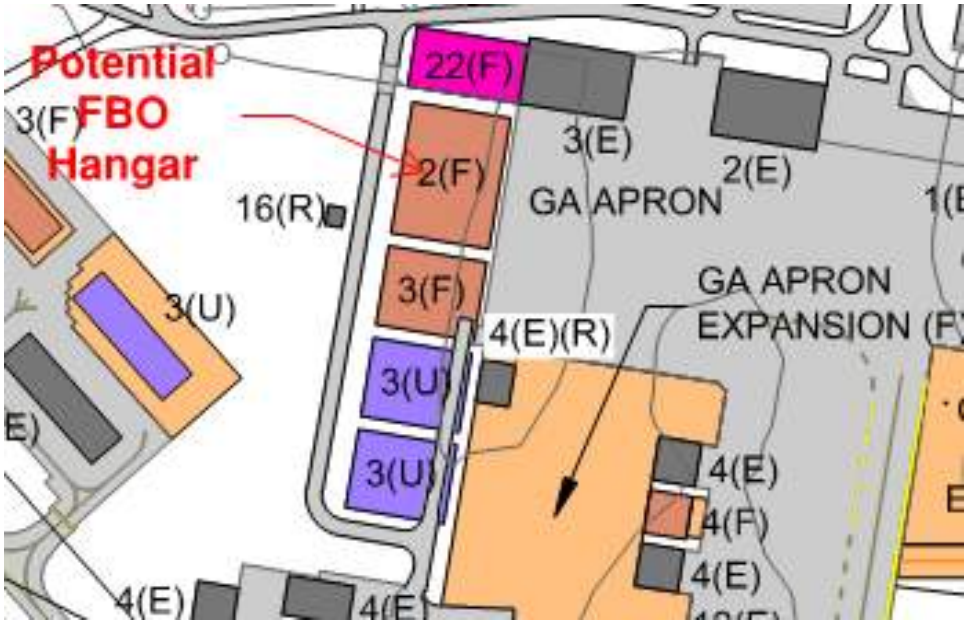


Figure 5-5. FBO Development Area

5.4.8 FBO Facilities

The current FBO facilities will be expanded to allow for parking for large business jets (G-IV, G-V, etc.) and an EMB-120 in the hangar. As shown in **Figure 5-5**, the FBO apron will be expanded to allow for additional aircraft movement, parking and deicing space. Spaces for additional large FBO hangars will be reserved to accommodate future demand.

5.5 Landside Recommendations

Landside recommendations include the passenger terminal, aircraft parking aprons, tiedown areas, and aircraft storage hangar facilities. Planned improvements to landside facilities are summarized as follows:

5.5.1 Passenger Terminal

The preferred passenger terminal layout is shown on **Figure 5-6**. As regional carriers transition to larger aircraft and as additional gates are utilized simultaneously, the terminal holdroom will be expanded. The security screening area, which currently occupies space in the holdroom, will be reconfigured to reduce its impact on the usable space in the holdroom and to improve general circulation within the terminal. In the ticketing area, an in-line baggage screening arrangement will be provided to streamline the TSA screening process. In baggage claim, a higher capacity "T" shaped baggage belt will be installed in lieu of the small oval device and underutilized oversized luggage shelf currently in use.

5.6 Recommended Master Plan Concept

Figure 5-7 presents an overview of projects recommended for implementation within the master planning period to accommodate the previously identified requirements for airport facilities. From this concept, the GCC Airport Layout Plan (ALP) set will be updated to depict the planned improvements to the airfield and terminal area.

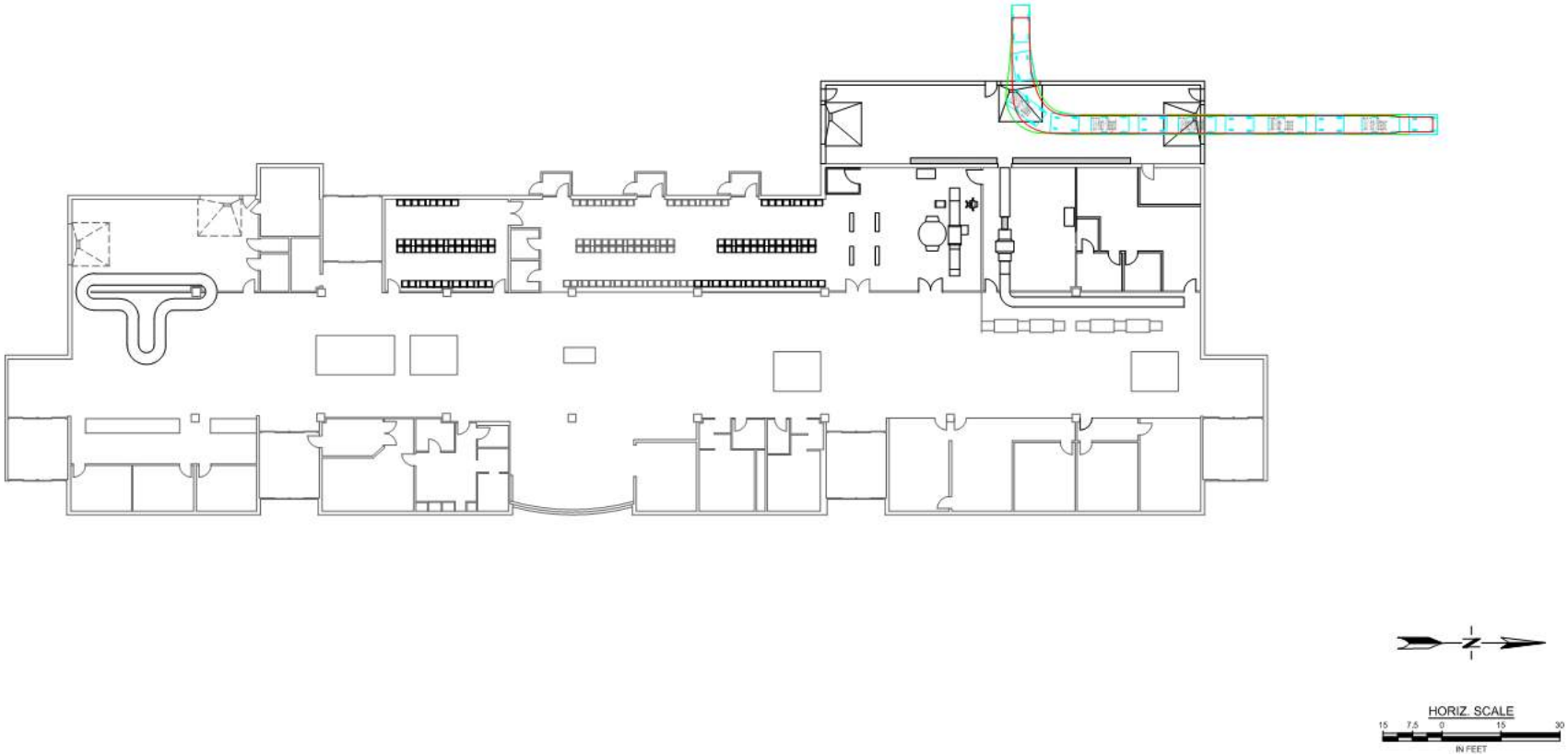


Figure 5-6. Preferred Conceptual Terminal Layout

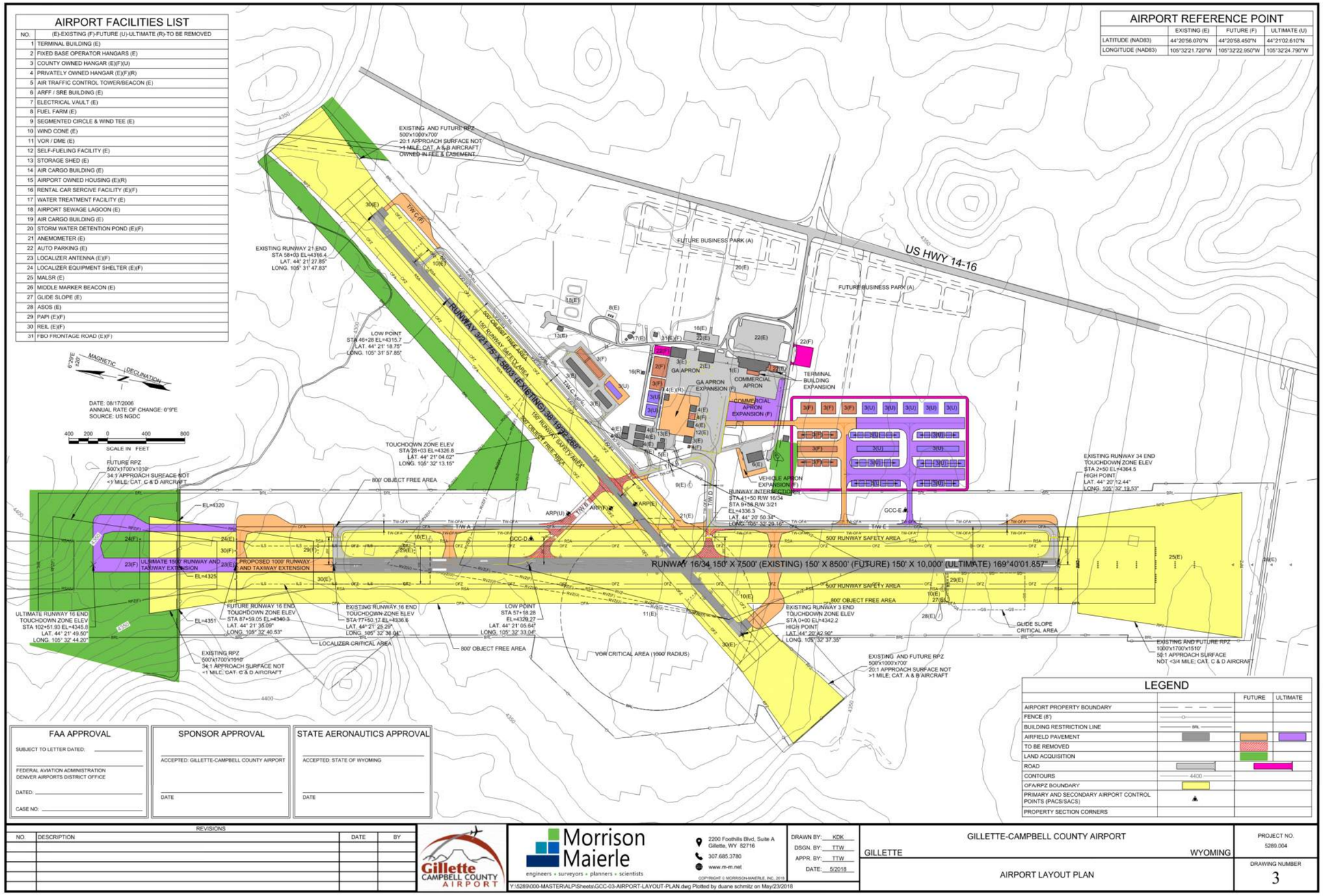
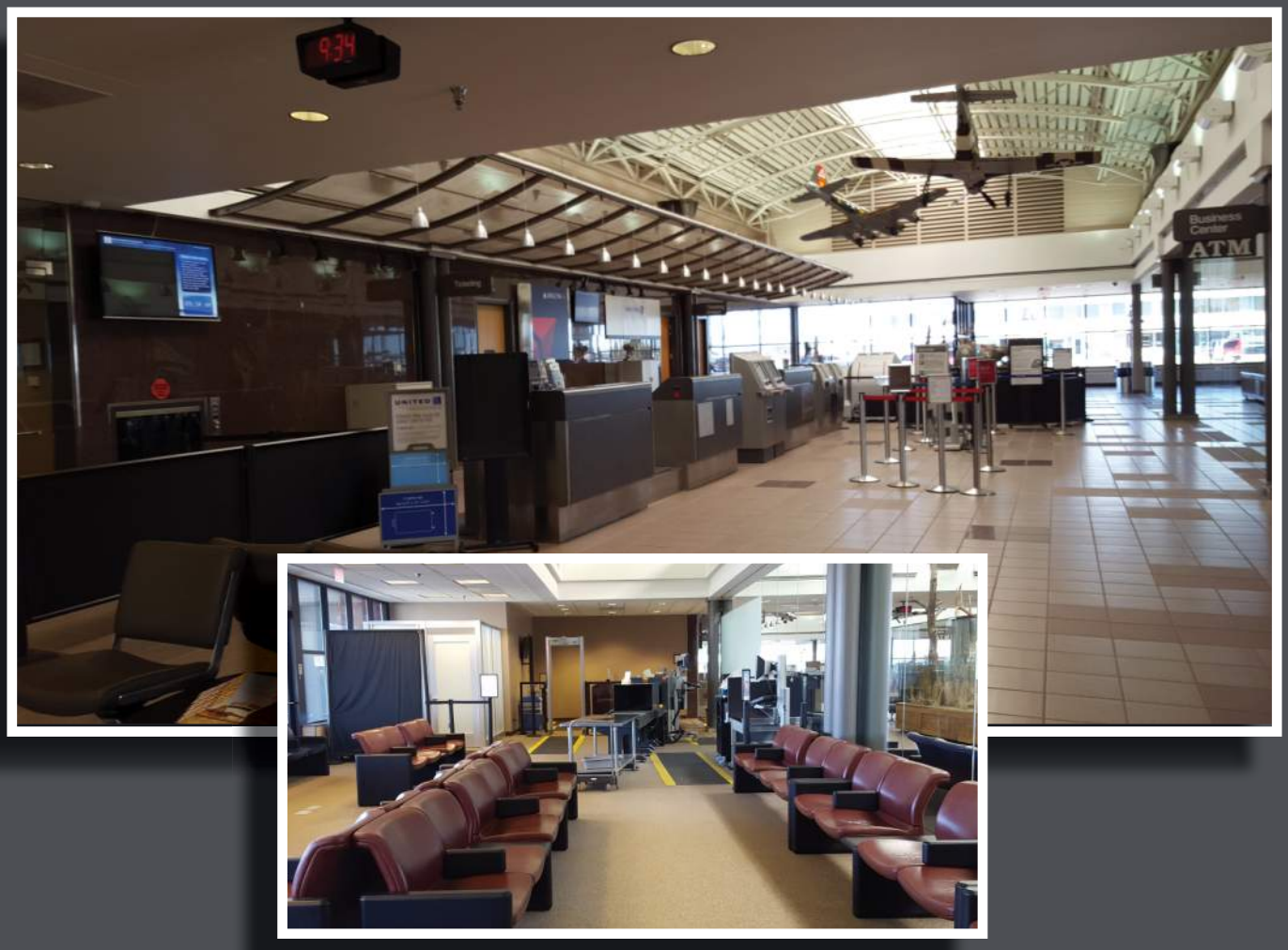


Figure 5-7. Recommended Master Plan Concept

GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

CHAPTER SIX:
FINANCIAL ANALYSIS



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6.0 FINANCIAL ANALYSIS

6.1 Introduction

The analysis conducted in the previous chapters evaluated airport improvement needs based upon forecast activity changes and operational efficiency. However, the most important element of the master planning process is the application of basic economic, financial, and management rationale to each improvement item so that the feasibility of implementation can be assured. The purpose of this chapter is to provide financial management information and tools which will make the master planning recommendations achievable.

This chapter provides a financial plan and examines the economic feasibility of developing the proposed improvements at Gillette-Campbell County Airport (GCC). The use of airport revenue, federal and state grant programs and Passenger Facility Charges (PFC) is evaluated in considering the ability of the Gillette-Campbell County Airport Board to finance the proposed capital improvements. Implementation of the improvements will be on an "as required" basis consistent with the financial capability of the Board.

The presentation of the financial plan and its feasibility has been organized into three sections. First, airport improvement funding sources on the federal, state, and local levels are identified and discussed. Secondly, the airport improvement schedule is presented. Finally, the airport's cash flow is examined for its ability to support future capital improvements.

6.2 Airport Improvement Funding Sources

Financing capital improvements at the airport will not rely exclusively upon the financial resources of the Gillette-Campbell County Airport Board. Capital improvements funding is available through various grant-in-aid programs administered by the FAA, the State of Wyoming and local passenger facility charges.

6.3 Federal Grants

The United States Department of Transportation, through the Federal Aviation Administration, provides a portion of development costs for eligible airport projects. This program is the Airport Improvement Program (AIP).

The source for AIP funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Under the AIP, eligible projects (such as airfield, apron, terminal, and access roads) in Wyoming currently can receive up to 93.75 percent federal participation with the airport sponsor responsible for the other 6.25 percent. (The Wyoming State Department of Transportation Division of Aeronautics typically provides a grant for 60 percent of the sponsor's share or 3.75 percent of the total grant amount, which reduces the sponsor's share to 2.5 percent.) Projects that are undertaken for security, safety, operational efficiency, or environmental reasons are generally eligible for funding. Projects that have the potential to generate revenue or benefit a private individual or company are generally ineligible. Examples of ineligible projects include the construction of revenue producing parking lots and garages, general aviation terminals, hangars and fuel farms. Funds are distributed each year by the FAA under authorization from Congress.

Commercial service airports which enplane 10,000 or more passengers are considered primary airports and currently receive a minimum of $1,000,000 annually in "entitlement" funds from the FAA based upon enplanement levels. Airports enplaning .01 percent or more of the nation's passengers are entitled to additional funds. Gillette-Campbell County Airport's enplanement forecasts through the twenty year period do not reach a level that would create this larger entitlement. Entitlement funds for primary nonhub airports like Gillette can be carried over to the three fiscal years immediately following the year for which the amount was apportioned.

Remaining AIP funds are distributed by the FAA based upon the priority of the project for which they have requested Federal assistance through discretionary apportionments.

6.4 Passenger Facility Charges

Passenger facility charges (PFCs) were authorized by Congress through the Aviation Safety and Capacity Act of 1990. Authorized agencies are allowed to impose a charge of as much as $4.50 for each enplaned passenger. Congress is currently considering an increase in the PFC cap. PFCs can only be used on approved projects. However, they can be used to fund all of a project, or to match other AIP funds. They can also be used to service debt and financing costs of bonds for eligible improvements. Gillette-Campbell County Airport is currently collecting $4.50 in PFCs to fund federally ineligible projects as well as the local share of identified eligible projects.

6.5 FAA Facilities and Equipment Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program, funding is provided for FAA approved airport traffic control towers, enroute navigational aids, on-airport navigational aids, and approach lighting systems. A number of items included in the program could potentially qualify for funding under this program.

6.6 State Aid to Airports

In support of the state airport system, the State of Wyoming also participates in airport improvement projects, through the Wyoming Department of Transportation.

State grants have slightly broader eligibility than the federal AIP, therefore projects deemed ineligible for FAA funding may be eligible for a standalone WYDOT grant. State grants for airport development without AIP funds are typically at a 90 percent state, 10 percent local cost share. The Wyoming Aeronautics Commission match percentages are set by commission policy, however airports can submit a deviation request pending commission approval to alter the match percentages on a project. GCC currently receives state funding for regular maintenance of airfield markings in this manner.

WYDOT Aeronautics also provides grants to cover a portion of the sponsor share on federal AIP funded projects. The Aeronautics Commission has funded 60 percent of most sponsor shares for the past several years. This leaves the airport sponsor with a forty percent cost on the eligible AIP project cost.

In addition, the Wyoming Aeronautics Commission Loan Program is available to public use airports for revenue generating facilities including the construction, development and improvement of facilities. Loans are maxed out at a 10 million dollar aggregate and have an interest rate of five percent with a repayment term that cannot

exceed 20 years. GCC does not have any loans through this program.

Another financing resource in the State of Wyoming is the Wyoming Business Council (WBC). The WBC is a State of Wyoming program that provides financing for publicly owned infrastructure that serves the needs of businesses and promotes economic development within Wyoming communities. Many aeronautical and non-aeronautical development proposals at the airport could potentially be eligible candidates for these grants.

6.7 Local Funding

The balance of project costs, after consideration has been given to grants and PFCs, must be funded through local resources. General fund contributions at the local level can vary greatly from airport to airport. This is due in part to varying community characteristics and tax base sizes.

There are several alternatives for local financing of airport projects, including airport revenues, bonds, and leasehold financing.

6.7.1 Airport User Fees

Airport revenue is also generated by users of the airport. Airline landing fees, fuel flowage, hangar rental, terminal rent, rental car concession fees, restaurant rent and FBO operating fees are the major sources of user fees at Gillette-Campbell County Airport. Airport user fees and revenues are established in order to reduce the need for county tax support.

6.7.2 Car Rental Customer Facility Charge

The operation of an airport as a public facility attracting airline passengers who use car rental facilities imposes a financial responsibility on the Airport to provide car rental facilities in and adjacent to the terminal building, parking lots, and access roads. Many airports have established a Customer Facility Charge (CFC) collected by a rental car company upon a car rental customer arriving at the airport and renting a vehicle from an on-airport car rental company serving the Airport.

The CFC's are typically used to pay or reimburse the airport for the costs associated with the design, planning, and construction of facilities or improvements exclusively used by the rental car companies serving the airport. Any or all of the CFCs collected may be pledged to the punctual payment of debt service on obligations issued by or on behalf of the airport for the cost of the rental car portion of a parking garage expansion, car wash facility, or parking lots established for the rental car companies.

CFCs are typically collected by the rental car company and remitted to the Airport on a monthly basis. According to the 2011 WYDOT Rates and Charges Survey, the average charge imposed by airports that collect a CFC in Wyoming and neighboring states is $3.56 per rental car day.

The Gillette-Campbell County Airport does not currently collect a CFC.

6.7.3 Private Investment

The airport has a valuable resource in its land holdings. While a portion of these holdings will need to be reserved for aviation-related improvements, considerable land can be developed for additional commercial/industrial uses to increase airport revenues. Typically, this entails a ground lease upon which private investment is made.

The FAA's policy is that an airport can lease land which was not acquired with federal or state aid for non-aeronautical revenue production, as long as the development does not interfere with aeronautical activities.

Non-aeronautical leases are required to be at fair market value. Typically, leases have a reversionary clause whereby the structures become airport property after 20 or 30 years.

6.7.4 General Obligation Bonds

General obligation (G.O.) bonds are a common form of municipal bonding which are issued by voter approval and secured by the full faith and credit of the city or county. Community tax revenues are pledged to retire the debt. As instruments of credit, and because the community secures the bonds, G.O. bonds reduce the available debt level of the community. Due to the community pledge to secure and pay G.O. bonds, they are the most secure type of municipal bond and are generally issued at lower interest rates. The primary disadvantage is that they require voter approval and are subject to statutory debt limits. This requires that they have broad support among the voters, and that they be reserved for projects that have highest public priorities.

6.7.5 Limited Obligation Bonds

In contrast to G.O. bonds, limited obligation bonds (sometimes referred to as self liquidating bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and therefore are considered, for the purpose of financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on municipal bonds.

6.7.6 Revenue Bonds

There are several types of revenue bonds, but in general they are a form of municipal bond which is payable solely from the revenue derived from the operation of a facility that was constructed or acquired with the proceeds of the bonds. For example, a lease revenue bond is secured with the income from a lease assigned to the repayment of the bonds. Revenue bonds have become a common form of financing airport improvements. In fact, they have become the preferred method of financing new airport construction, expansion, and improvements over the past two decades.

Financing airport facilities under the “Airport Authorities Act” Title 67-11 MCA (2005) allows an airport authority to sell bonds payable out of any revenues to the authority, including revenues derived from: airport facilities, taxes levied, grants or contributions from the federal government or other sources. Issuance of revenue bonds by the airport authority does not require an election, but is subject to the limitation of the airport authority that annual pledged revenues meet the total bond payment.

Revenue bonds present the opportunity to provide the improvements without direct burden to the taxpayer. Revenue bonds normally carry a higher interest rate because they lack the guarantees of general and limited obligation bonds.

The Airport Authority Act also states that if insufficient revenues are available to pay the principal and interest due on a revenue bond, that a general tax can be levied to pay for the deficiency. This, however, requires approval of a majority of the voters voting on the question.

6.7.7 Certificate of Participation

Another source for funding is a certificate of participation. Certificates of participation are similar to lease revenue bonds, except that they normally do not constitute indebtedness under constitutional or statutory debt limits. In general, they are a form of security which

allows the purchaser of the certificate to participate in the income stream of the improvement.

6.7.8 Leasehold Financing

Leasehold financing refers to developer or tenant financing of improvements under a long-term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private construction of facilities on a ground lease, particularly on property owned by a municipal agency, produces a unique set of problems. In particular, it is more difficult to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default.

6.8 Airport Financial Structure

A summary of the historical revenues and expenses at the airport for the years 2013-2016 has been included in **Table 6-1**. Revenues and expenses are classified into a number of separate cost centers based on the financial activity centers of the airport. Revenue cost centers include passenger airline revenue (landing fees, terminal arrival fees, rents and utilities), non-passenger aeronautical revenue (FBO revenue, cargo and hangar rentals, aviation fuel tax, fuel sales), non-aeronautical revenue (land and non-terminal facility leases, terminal services, rental cars). Included in the expenditure accounts: personnel compensation and benefits, communications and utilities, supplies and materials, and contractual services.

The categories under the revenue accounts are rather broad, and include a number of diverse sources of revenue on the airport. Sources from within the terminal building originate from the airlines, the rental car companies, the restaurant, terminal advertising, and various vendors. Landing fees are collected from the airlines. The airport collects building and hangar rental from a number of aviation operators on the airfield. With the amount of property currently available, it is anticipated that the airport can continue to grow these various accounts during the planning period, from both the aviation and non-aviation related categories.

Operating costs at non hub primary commercial service airports are not typically offset by revenues generated on the airport. Nonhub airports must meet the same safety and security requirements of larger airports without the ability to generate nearly as much revenue. For this reason, operational costs not covered by airport revenues are funded through the County General Fund. The local share of capital improvement projects are generally funded by PFCs.

Table 6-1. Historic Operating Revenues and Expenses: Gillette-Campbell County Airport

	Fiscal Year 2013	% of Total	Fiscal Year 2014	% of Total	Fiscal Year 2015	% of Total	Fiscal Year 2016	% of Total
Passenger Airline Aeronautical Revenue								
Passenger airline landing fees	40,513	7.2%	43,843	8%	42,078	7%	48,910	8%
Terminal arrival fees, rents and utilities	49,558	8.8%	8,851	1.6%	50,014	8.4%	49,069	8.4%
Total	**90,071**	**15.9%**	**52,694**	**9.8%**	**92,092**	**15.5%**	**97,979**	**16.7%**
Non-Passenger Aeronautical Revenue								
FBO revenue, contract or sponsor operated	58,389	10.3%	64,529	12.0%	65,613	11.1%	71,579	12.2%
Cargo and hangar rentals	77,358	13.7%	76,603	14.3%	83,841	14.1%	88,389	15.1%
Aviation fuel tax retained for airport use	21,782	3.9%	23,964	4.5%	26,930	4.5%	29,584	5.0%
Fuel sales net profit/loss or flowage fees	25,805	4.6%	23,170	4.3%	28,285	4.8%	23,833	4.1%
Other non-passenger aeronautical revenue	8,152	1.4%	26,876	5.0%	32,428	5.5%	18,479	3.1%
Total	**191,486**	**34%**	**215,142**	**40%**	**237,097**	**40%**	**231,864**	**40%**
Total Aeronautical Revenue	**281,557**		**267,836**		**329,189**		**329,843**	
Non-Aeronautical Revenue								
Land and non-terminal leases and revenues	23,203	4.1%	17,869	3.3%	14,164	2.4%	2,700	0.5%
Terminal services	51,136	9.0%	51,286	9.6%	51,422	8.7%	51,468	8.8%
Rental cars	77,194	13.7%	78,939	14.7%	84,271	14.2%	76,496	13.0%
Total	**151,533**	**61%**	**148,094**	**68%**	**149,857**	**65%**	**130,664**	**62%**
Total Revenue	**565,121**	**100.0%**	**536,713**	**100.0%**	**592,826**	**100.0%**	**586,705**	**100.0%**
Operating Expenses								
Personnel compensation and benefits	931,290	48.3%	965,805	70.7%	1,036,403	72.7%	1,055,149	72.8%
Communications and utilities	160,259	8.3%	169,673	12.4%	182,649	12.8%	172,710	11.9%
Supplies and materials	37,255	1.9%	35,418	2.6%	20,695	1.5%	15,287	1.1%
Contractual services	35,219	1.8%	33,650	2.5%	41,250	2.9%	43,853	3.0%
Other	762,256	39.6%	161,017	11.8%	143,866	10.1%	161,431	11.1%
Total Operating Expenses	**1,926,279**	**100.0%**	**1,365,563**	**100.0%**	**1,424,863**	**100.0%**	**1,448,430**	**100.0%**
Operating Income (Loss)	**(1,493,189)**		**(949,633)**		**(945,817)**		**(987,923)**	
Non-Operating Revenue								
Interest income	238		243		357		508	
Grant receipts	4,418		2,785		-		-	
Pasenger Facility Charges	127,375		117,755		109,384		119,585	
Other					4,039		6,105	
Total	**132,031**		**120,783**	**-**	**113,780**		**126,198**	
Change in net assets	**(1,361,158)**		**(828,850)**		**(832,037)**		**(861,725)**	

6.9 Airport Improvement Schedule and Cost Summaries

With the establishment of the specific needs and improvements for the airport in Chapters 3 and 4, the next step is to determine a realistic schedule and costs for implementing the plan. This section examines the overall cost of improvement and presents a development schedule. The recommended improvements are grouped into three planning horizons: short, intermediate, and long-term. **Table 6-2** summarizes the key activity milestones for each planning horizon.

Table 6-2. Planning Horizons at Gillette-Campbell County Airport

	PLANNING HORIZONS		
	Short Term (2017-2021)	Intermediate Term (2022-2026)	Long Term (2027-2036)
AIRFIELD			
Annual Operations			
Air Carrier	2,267	2,544	2,819
Commuter/Air Taxi	1,438	1,498	1,562
General Aviation	20,565	21,970	23,394
Military	25	25	25
Total	24,295	26,036	27,800
AIRLINE			
Enplanements	32,309	36,246	40,173
GENERAL AVIATION			
Based Aircraft	68	74	81
Itinerant Operations	10,958	11,420	11,902
Local Operations	9,607	10,549	11,492

The short-term planning horizon covers items of highest priority. These items are coordinated with the FAA on a yearly basis, as they update short-term capital program information and assign potential funding sources and priorities to individual projects. Each year, the airport will need to re-examine the priorities for funding in the short-term period, bringing projects which were originally included in intermediate or long-term planning horizons, onto the FAA's capital programming list. While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. In putting together a listing of projects, an attempt has been made to include anticipated rehabilitation and capital replacement needs through the planning period. However, it is difficult to project with certainty the scope of such projects when looking 20 years into the future.

The airport improvement schedule is presented in **Table 6-3**. An estimate has been included with each project of federal funding eligibility, although this amount is not guaranteed. For larger capital projects, it may be necessary for the Board to apply for federal discretionary funds.

Table 6-3. Capital Improvement Program at Gillette-Campbell County Airport

Year	Project Description	FAA AIP Funds		State Funds	Local Funds	Total Project Cost
		Entitlement	Other			
SHORT-TERM PLANNING HORIZON (FY2017-2021)						
2017	Electrical Vault Upgrade, Concrete Panel Replacement, Airfield Gate Replacement, Terminal Building Upgrade	$ 1,200,000		$ 48,000	$ 32,000	$ 1,280,000
2018	Airfield Markings			$ 144,000	$ 16,000	$ 160,000
2018	Relocate Taxiways "D" & "B" and Connect Parallel Taxiway "A" to "E", Design	$ 500,000		$ 20,000	$ 13,333	$ 533,333
2019	Relocate Taxiways "D" & "B" and Connect Parallel Taxiway "A" to "E", Construction	$ 1,500,000	$ 3,500,000	$ 200,000	$ 133,333	$ 5,333,333
2020	New GA Terminal	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
2020	Airfield Markings			$ 144,000	$ 16,000	$ 160,000
2021	Replace SRE Equipment - Loader Tractor and Blower	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
	Subtotal	**$ 5,200,000**	**$ 3,500,000**	**$ 636,000**	**$ 264,000**	**$ 9,600,000**
INTERMEDIATE-TERM PLANNING HORIZON (FY2022-2026)						
2022	Replace ARFF Equipment	$ 700,000		$ 28,000	$ 18,667	$ 746,667
2022	Aircraft Deicing Apron Design	$ 150,000		$ 6,000	$ 4,000	$ 160,000
2022	Airfield Markings			$ 144,000	$ 16,000	$ 160,000
2023	Aircraft Deicing Apron Construction	$ 1,850,000		$ 74,000	$ 49,333	$ 1,973,333
2024	Airfield Markings			$ 150,000	$ 16,000	$ 160,000
2024	Hangar Development - Taxilanes & Aprons	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
2025	Runway 34 Run-Up Area	$ 1,300,000		$ 52,000	$ 34,667	$ 1,386,667
2026	Airfield Markings			$ 144,000	$ 16,000	$ 160,000
	Subtotal	**$ 5,000,000**	**$ -**	**$ 638,000**	**$ 181,333**	**$ 5,813,333**
LONG-TERM PLANNING HORIZON (FY2027-2036)						
2027	Major Maintenance Runway 16-34 & Assoc. Taxiways	$ 1,000,000	$ 1,500,000	$ 100,000	$ 26,667	$ 2,626,667
2028	Major Maintenance Runway 3-21 & Assoc. Taxiways	$ 1,000,000	$ 1,500,000	$ 100,000	$ 26,667	$ 2,626,667
2029	Taxiway C Extension to RW 21 Design	$ 150,000		$ 6,000	$ 4,000	$ 160,000
2029	Taxiway C Extension to RW 21 Construction	$ 1,850,000		$ 74,000	$ 49,333	$ 1,973,333
2029	Airfield Markings			$ 144,000	$ 16,000	$ 160,000
2031	Taxiway C Extend to TW A	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
2032	Extend Taxiway D to Runway 3	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
2033	Airport Master Plan Update	$ 500,000		$ 20,000	$ 13,333	$ 533,333
2034	Extend R/W 16/34 & T/W A, EA	$ 300,000		$ 12,000	$ 8,000	$ 320,000
2035	Land Acquisition for Runway 16 Extension (2,500')	$ 600,000		$ 24,000	$ 16,000	$ 640,000
2036	RW 16 Extension (1,000") Design	$ 250,000		$ 10,000	$ 6,667	$ 266,667
2036	RW 16 Extension (1,000') Construction	$ 2,350,000	$ 8,000,000	$ 414,000	$ 276,000	$ 11,040,000
	Subtotal	**$ 10,000,000**	**$ 11,000,000**	**$ 984,000**	**$ 496,000**	**$ 22,480,000**
	Program Totals	**$ 20,200,000**	**$ 14,500,000**	**$ 2,258,000**	**$ 941,333**	**$ 37,893,333**
BEYOND PLANNING HORIZON						
	Major Maintenance - Terminal Apron	$ 1,000,000	$ 500,000	$ 60,000	$ 40,000	$ 1,600,000
	Perimeter Road	$ 1,000,000	$ -	$ 40,000	$ 26,667	$ 1,066,667
	Expand North GA Apron, Phase V	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
	Runway 16 By-Pass Taxiway	$ 1,000,000		$ 40,000	$ 26,667	$ 1,066,667
	Re-arrange Passenger and baggage screening	$ 1,000,000	$ 300,000	$ 52,000	$ 26,667	$ 1,378,667
	South Hangar Development Infrastructure	$ 1,000,000	$ 1,500,000	$ 100,000	$ 26,667	$ 2,626,667

Due to the conceptual nature of a master plan, capital projects should undergo further refinement prior to requesting funds from the FAA. Capital costs presented in **Table** 6-3 are in current (2017) dollars. Adjustments will need to be applied over time as construction costs or capital equipment costs change

6.10 CIP Feasibility Analysis

Projections of airport revenues and expenses, presented in **Table 6-4** and **Table 6-5** were based on the following assumptions:

- Constant 2017 dollars were used, and no inflationary factor was included.
- All relevant time periods were assumed to coincide with each other. That is, the airport's fiscal year and the federal fiscal year were brought into phase with the calendar year to coincide with the collection of airport activity data (enplanement levels, number of operations, etc.).
- Aviation activity and passenger forecasts will be realized, as projected in Chapter 2 of this study.
- The PFC program will not be repealed. An assumption is made that the $4.50 per boarded passenger level will remain.
- The AIP program will not be repealed.
- CIP projects to be undertaken during the forecast period include those presented in this study in **Table 6-3.**
- Effective financial management of the airport's operations will continue throughout the forecast period.

When expected AIP funds are subtracted from CIP Requirements, on both the annual and 5-year cumulative basis, the net deficiency and surplus of AIP eligible portion of CIP projects is identified in each table. If a shortfall results, the airport can apply for an FAA Discretionary single-year or multi-year grant, defer a project or projects, or use internally generated funds to fund its CIP needs.

The total Local Share shown in **Table 6-4** and **Table 6-5** include the Sponsor's share of AIP eligible projects and ineligible projects or ineligible portions of eligible projects. PFCs are assumed to be the primary source for funding local costs and grant ineligible projects.

Table 6-4 shows cash flow projections that are projected for the short-term CIP (2017-2021). The table indicates that during the 5 year period there is a net shortfall of available FAA AIP Entitlement funds, of $3,500,000 versus total AIP eligibility of projects. The airport can apply for discretionary grants to cover this shortfall. Potential PFC revenue, based on forecast passenger enplanements, should be sufficient to cover the local share funding requirement of identified projects.

Table 6-5 shows the cash flow projections for the intermediate term CIP (2022-2026) and the long term CIP. There is a net deficiency in available FAA funds of $9,593,498 in the intermediate term and of $11,000,000 in the long term. The airport has the option to obtain FAA AIP discretionary grants, defer projects or cover the costs from internally generated funds. Potential PFC revenue, based on forecast passenger enplanements, should be sufficient to cover the local share funding requirement of identified projects for the long term.

Table 6-4. Short Term Horizon Cash Flow

	2017	2018	2019	2020	2021
Capital Improvement Program - Total	1,280,000	693,333	5,333,333	1,226,667	1,066,667
Capital Improvement Program - AIP Eligible	1,200,000	500,000	5,000,000	1,000,000	1,000,000
AIP Carry Forward	200,000		500,000		
Expected FAA AIP Entitlement Funds	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Net Surplus (Defecit) AIP Entitlement Funds - (AIP Discretionary Required)	-	500,000	(3,500,000)	-	-
Capital Improvement Program - AIP Ineligible		160,000		160,000	
State Share	48,000	164,000	200,000	42,667	40,000
Local Requirement					
CIP Local Share	32,000	29,333	133,333	42,667	26,667
Potential PFC Collection	142,430	145,390	148,906	152,514	155,706

Table 6-5. Intermediate and Long Term Horizon Cash Flow

	Intermediate Term (2022-2026)	Long Term (2027-2036)
Capital Improvement Program - Total	5,813,333	22,480,000
Capital Improvement Program - AIP Eligible	5,000,000	21,000,000
Expected FAA AIP Entitlement Funds	5,000,000	10,000,000
Net Surplus (Defecit) AIP Entitlement Funds - (AIP Discretionary Required)	-	(11,000,000)
Capital Improvement Program - AIP Ineligible	480,000	160000
State Share	638,000	984000
Local Requirement		
CIP Local Share	181,333	496,000
Potential PFC Collection	833,623	1,934,157

The Gillette-Campbell County Airport should be capable of accomplishing its Capital Improvement Program over the master planning period provided that sufficient local match funds can be generated through PFC's or other revenue sources.

6.11 Plan Implementation

The successful implementation of the Gillette-Campbell County Airport Master Plan will require sound judgment on the part of Board management with regard to implementation of projects to meeting future activity demands, while maintaining the existing infrastructure and expanding this infrastructure to support new improvements. While the projects included in the capital program have been broken into short, intermediate, and long-term planning periods, the Board will need to consider the scheduling of projects in a flexible manner, and add new projects from time to time to satisfy safety or design standards, or newly created demands. As new buildings or pavement is added, the as-built information should be reflected on the Airport Layout Plan drawings, and the revised drawings resubmitted to the FAA for approval.

In summary, the planning process requires that the Gillette-Campbell County Airport Board continually monitor the need for new or rehabilitated facilities, since applications (for eligible projects) must be submitted with the FAA each year. The Board should also continually monitor with FAA the projects which are required for safety and continued certification under F.A.R. Part 139.

GILLETTE-CAMPBELL COUNTY AIRPORT
2016 MASTER PLAN UPDATE

CHAPTER SEVEN:
ENVIRONMENTAL CONSIDERATIONS

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7.0 ENVIRONMENTAL CONSIDERATIONS

7.1 Introduction

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this section is to review the proposed improvement program at Gillette Campbell County Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly affect the quality of the environment.

Construction of the improvements depicted on the Airport Layout Plan will require compliance with the National Environmental Policy Act (NEPA) of 1969, as amended, to receive federal financial assistance. For projects not "categorically excluded" under FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). Instances in which significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the Master Plan is not designed to satisfy the NEPA requirements for a categorical exclusion, EA, or EIS, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA process. This evaluation considers all environmental categories required for the NEPA process as outlined in FAA Order 1050.1F and Order 5050.4B, National Environmental Policy Act (NEPA) Implementation Instructions for Airport Actions.

Upon preliminary evaluation, most of the projects identified in the Master Plan for development during the planning period will be able to proceed with a Categorical Exclusion under FAA Order 5050.4B. The extension of Runway 16/34, which is identified in the long term planning horizon will require an EA. Final determination of the extent of environmental evaluation required under NEPA will be made by the responsible FAA official.

7.2 Environmental Analysis

Table 7-1 provides a description of the environmental resources which could be impacted by the proposed airport development as discussed in the preceding chapters.

Table 7-1. Environmental Evaulation

Environmental Resource	Potential Resource Impacts
Air Quality. The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O_3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Particulate matter (PM10 and PM 2.5), and Lead (Pb). Potentially significant air quality impacts, associated with an FAA project or action, would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed. Various levels of review apply within both NEPA and permit requirements.	No projects within the planning horizon are located within non-attainment areas for criteria pollutants. A number of projects planned at the airport could have temporary air quality impacts during construction. Emissions from the operation of construction vehicles and fugitive dust from pavement removal are common air pollutants during construction. Best management practices (BMPs) during construction will need to be implemented in order to reduce impacts to air quality during construction.
Coastal Resources. Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resource Act (CBRA), the Coastal Zone Management Act (CZMA), and E.O. 13089, Coral Reef Protection.	No impacts. The airport is not located within a Coastal Management Zone or Coastal Barrier Area.
Compatible Land Use. The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Typically, significant impacts will occur over noise-sensitive areas within the 65 DNL noise contour.	The Master Plan is not recommending capacity enhancement projects that would lead to increased noise levels on noise sensitive uses. The City of Gillette and Campbell County have established overlay zoning to ensure compatibility with FAR Part 77 imaginary surfaces and aircraft noise.
Construction Impacts. Construction impacts typically relate to the effects on specific impact categories, such as air quality or noise, during construction.	The use of BMPs during construction is typically a requirement of construction related permits such as a National Pollution Discharge Elimination System (NPDES) permit. Use of these measures typically alleviates potential resource impacts. Construction-related noise impacts may be experienced during development of the proposed facilities. However, these impacts typically do not arise unless construction is being undertaken during early morning, evening, or nighttime hours.

Environmental Resource	Potential Resource Impacts
Department of Transportation Act, Section 4(f). A significant impact would occur when a proposed action involves more than a minimal physical use of a Section 4(f) property, (publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance) or is deemed a "constructive use", substantially impairing the Section 4(f) property where mitigation measures do not reduce or eliminate the impacts. Substantial impairment would occur when impacts to Section 4(f) lands are sufficiently serious that the value of the site, in terms of its prior significance and enjoyment, is substantially reduced or lost.	No impact. No park, recreation area, federal park, state park or wildlife refuges will be affected by anticipated development.
Farmlands. Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and take into account the adverse effects of federal programs on the preservation of farmland to consider appropriate alternative actions which could lessen adverse effects and to assure that such federal programs are, to the extent practicable, compatible with state or local government programs and policies to protect farmland. The FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.	The acquisition of land for approach protection to Runway 16 could potentially impact prime and unique farmland if the property is not allowed to remain in agricultural use. The National Resources Conservation Service (NRCS) would need to be contacted to determine if prime or unique farmlands would be impacted. If so, the Farmland Protection Policy Act form AD-1006 would need to be completed to determine whether the impact exceeds the threshold.
Fish, Wildlife, and Plants. The Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) determines that a significant impact will result when the proposed action would likely jeopardize the continued existence of a species in question or would result in the destruction or adverse modification of federally designated critical habitat in the area. Lesser impacts, as outlined by agencies and organizations having jurisdiction, may result in a significant impact.	According to the U.S. Fish and Wildlife Service Wyoming County List of Threatened, Endangered, Proposed and Candidate Species, two federally listed species may be located in the vicinity of the airport: the northern long-eared bat and ute ladies' tresses. Four Species of Concern are identified within the county: the black tailed prarie dog, bald eagle, greater sage-grouse and mountain plover. It is not believed that sensitive habitats or habitats that would harbor threatened or endangered species are located in project areas. These findings would need to be confirmed through consultation with the U.S. Fish and Wildlife Service.

Environmental Resource	Potential Resource Impacts
Floodplains. Significant impacts to floodplains occur when a proposed action results in notable adverse impacts on natural and beneficial 100-year floodplain values.	According to the Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA), Rawhide Creek is a Zone A Flood Hazard Zone. Zone A identifies an approximately studied special flood hazard area for which no base flood elevations have been provided. No projects have been identified that are believed would impact the floodplain associated with Rawhide Creek. Any future development in the vicinity of Rawhide Creek will need to be evaluated to determine the effects of any encroachments on the "base" floodplain.
Hazardous Materials, Pollution Prevention, and Solid Waste. The airport must comply with applicable pollution control statutes and requirements. Impacts may occur when changes to the quantity or type of solid waste generated, or type of disposal, differ greatly from existing conditions.	A Stormwater Pollution Prevention Plan (SWPPP) will be required for construction projects to address storm-water runoff during construction. Temporary barriers, (silt fenced, hay bales, etc.) should be placed around the perimeter of construction areas to prevent silt and sediment due to construction from leaving the project site. As a result of increased operations at the airport, solid waste output may slightly increase; however, these increases are not anticipated to be significant.
Historical, Architectural, Archaeological, and Cultural Resources. Impacts may occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance.	As a part of an Environmental Assessment for initiation of turbojet service to the airport in 2012, an analysis of National Register of Historic Places (NRHP) listed properties in Campbell County, Wyoming and the Gillette area was completed which found only one property within the vicinity of the airport. The Gillette Post Office was added to the NRHP is 2008 and is located approximately 3 miles southeast of GCC. The nature of the project was such that impacts could be evaluated through a records search. No cultural resource study was conducted, nor on-site inventory of airport property to determine if any such facilities exist on airport property. The projects listed in the 20 year CIP primarily reflect construction of facilities within environments that have been previously disturbed. Development of any non-aeronautical use areas in areas that have not been previously disturbed may require that a cultural resource study be conducted to determine impacts. In addition, development of undisturbed areas could necessitate coordination with the Montana State Historic Preservation Office to ensure that there are no significant impacts to historical, architectural, archeological and cultural resources.

Environmental Resource	Potential Resource Impacts
Light Emissions and Visual Impacts. Impacts occur when lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities. Aesthetic impacts relate to the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable.	Proposed projects at the airport will introduce new light sources. The lengthening of the runway and development in the general aviation area will result in new lighting in the area. The proposed development is not anticipated to create an annoyance among people in the vicinity or interfere with their normal activities as the area of proposed development is not located adjacent to a population center.
Natural Resources and Energy Supply. In instances of major proposed actions, power companies or other suppliers of energy will need to be contacted to determine if the proposed project demands can be met by existing or planned facilities.	Increased use of energy and natural resources are anticipated as the operations at the airport grow. None of the planned development projects are anticipated to result in significant increases in energy consumption.
Noise. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the FAA, EPA, and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility. The threshold of significance for noise, as indicated in FAA Order 5050.4B, is when an action, compared to the no action alternative for the same timeframe, would cause noise sensitive areas located at or above DNL 65 dB to experience a noise increase of at least DNL 1.5 dB.	The Master Plan does not propose any capacity enhancement projects that would cause increased noise impacts as compared with no action. A noise analysis will be required as a part of the Environmental Assessment associated with the lengthening of Runway 16/34.
Secondary (Induced) Impacts. These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by airport development.	Significant shifts in patterns of population movement or growth or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is also expected to encourage tourism, industry, and trade, and to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development are anticipated to be primarily positive in nature.

Environmental Resource	Potential Resource Impacts
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks. Impacts occur when disproportionately high and adverse human health or environmental effects occur to minority and low-income populations; disproportionate health and safety risks occur to children; and extensive relocation of residents, businesses, and disruptive traffic patterns are experienced.	The proposed projects will not result in disproportionately high or adverse impacts to human health, nor will it result in disproportionate health and safety risks to children.
Water Quality. Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, solvents, etc.	A Stormwater Pollution Prevention Plan (SWPPP) will be required to address storm-water runoff during construction projects. Temporary barriers, (silt fenced, hay bales, etc.) should be placed around the perimeter of construction areas to prevent silt and sediment due to construction from leaving the project site.
Wetlands. Wetlands are defined by Executive Order 11990*, Protection of Wetlands*, as those areas that are inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances, does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.	No wetlands have been identified in areas identified for construction projects. Field surveys may be required prior to development in areas which have not been previously surveyed. Further coordination with the U.S. Army Corps of Engineers may be required.
Wild and Scenic Rivers. Wild and scenic rivers (WSR) are designated by the Wild and Scenic River Act. A National Rivers Inventory (NRI) is maintained to identify those river segments which are protected under this act.	There are currently two designated Wild and Scenic Rivers in Wyoming. The closest segments are the headwaters of the Snake River located in the Teton Wilderness Area and the Clarks Fork of the Yellowstone River. These areas are over 200 miles west of the airport and will not be impacted by project development.