Chapter 3: Aviation Forecasts

Introduction

The Aviation Forecasts chapter of the Airport Master Plan analyzes current and future airport activity at the Rapid City Regional Airport (RAP). Forecasting provides an airport with a general idea of the magnitude of growth, as well as fluctuations in activity anticipated over a 20-year forecast period. They assist the Airport in determining existing and planned future facility needs based on airport activity level estimates and projections. Forecasts attempt to develop a realistic estimate of future changes. When conditions dramatically change, forecasts should be reviewed and updated.

The forecasts developed for the Airport will be important to adequately plan, size, and sequence development of future facilities to meet future projected growth. Development at airports, however, is demand-based from actual numbers rather than forecasts.

To thoroughly analyze and develop a probable aviation forecast, a technical review has been completed using several methods to help quantify the potential aviation activity over the next 20 years.

Forecast Rationale

Forecasting the demand for airport services is a critical step in the development of an airport. It allows an airport to examine its ability to satisfy the needs of the aircraft and people it serves, and to determine the approximate timing of necessary improvements by projecting airport user activity levels.

Forecasts developed for airport master plans and/or federal grants must be approved by the Federal Aviation Administration (FAA). It is the FAA's policy, listed in Advisory Circular 150/5070-6B, *Airport Master Plans*, that FAA approval of forecasts at non-hub airports with commercial service should be consistent with the Terminal Area Forecasts (TAF). Master plan forecasts for operations, based aircraft and enplanements are considered to be consistent with the TAF if they meet the following criteria:

1. Forecasts differ by less than 10 percent in the five-year forecast and 15 percent in the 10-year or 20-year period, or
2. Forecasts do not affect the timing or scale of an airport project, or
3. Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems*.

The TAF model used for this report is from the 2013 FAA TAF available in January 2014. This is latest data available when the forecasting effort began for this airport master plan.

Furthermore, in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, states forecasts should be:

1. Realistic
2. Based on the latest available data
3. Reflect the current conditions at the airport
4. Supported by information in the study
5. Provide an adequate justification for the airport planning and development

Factors Affecting Forecasts

FAA provides general guidance in evaluating factors that affect aviation activity. FAA AC 150-5070-6B, *Airport Master Plans*, states:

> *Planners preparing forecasts of demand or updating existing forecasts should consider socioeconomic data, demographics, disposable income, geographic attributes, and external factors such as fuel costs and local attitudes towards aviation.*

For purposes of this forecast, the following defining factors have been used to develop the forecast:

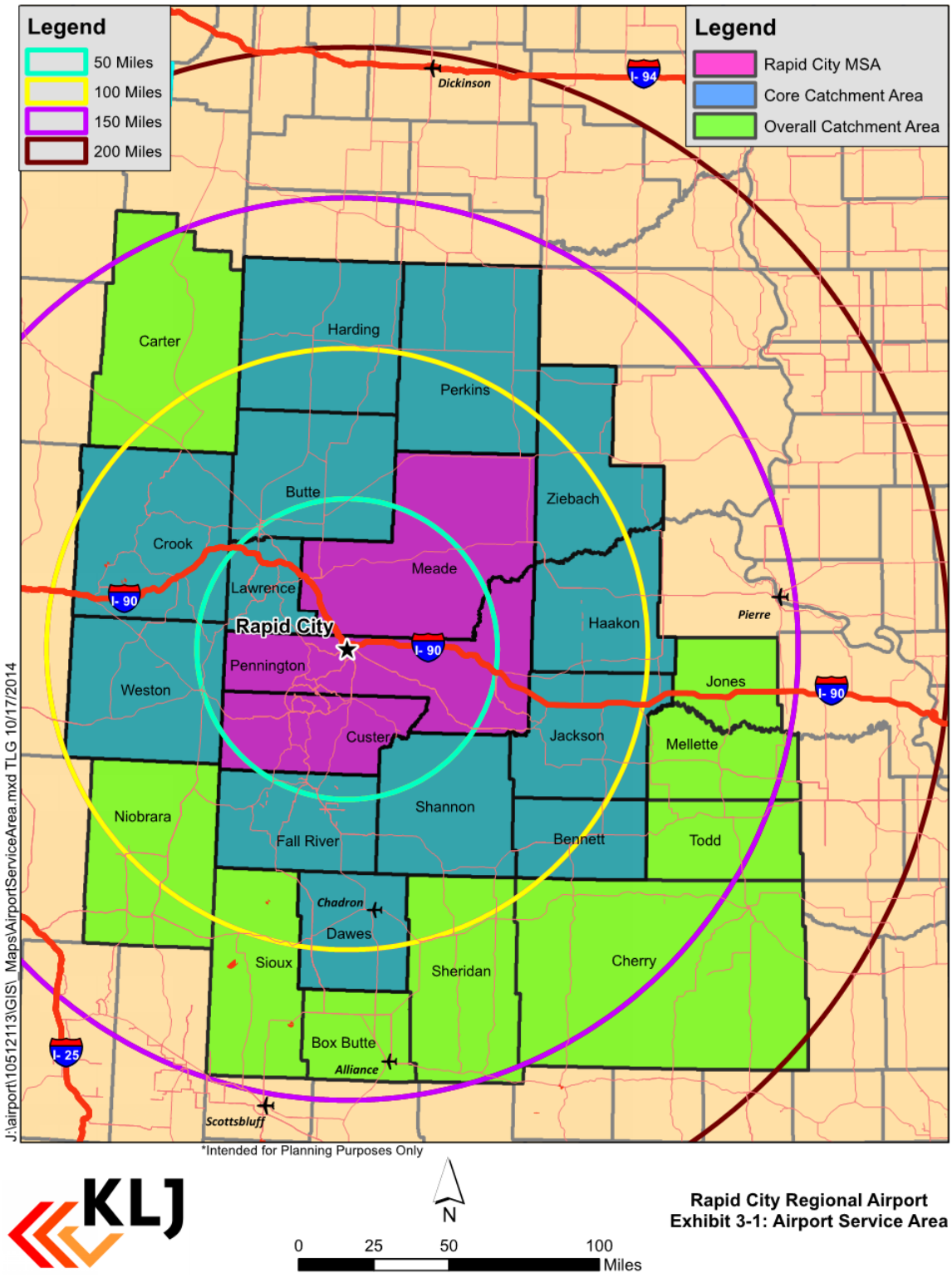
1. Fiscal year 2013 has been used as the base year for most of the aviation forecast projections.
2. The most recent 2013 estimates and future projections of population, employment and income trends have been utilized.
3. The "core" catchment area for RAP has been developed using data from the Rapid City Metropolitan Statistical Area (MSA). This includes the following counties: Pennington, Meade and Custer County.

The broader RAP catchment area covers a 58 county area over eastern South Dakota, southwestern Minnesota and northwest Iowa as defined by previous air service studies. The Rapid City MSA was used because 76 percent of commercial passenger trips, as well as other commercial and general aviation activity are generated from within the Rapid City MSA.

The forecasts prepared for the airport assume an unconstrained scenario where facilities are available for use to meet demand. Any constrained forecasts prepared will be noted throughout the document. Time periods include short-term (5-year), mid-term (10-year) and long-term (20-year) resulting in forecasts for year 2018, 2023 and 2033. Forecasts may be developed using a composite of methodologies over the planning period.

Because aviation activity fluctuates due to unforeseen changes to demand and the industry, the forecasts developed in this section will be developed into Planning Activity Levels (PALs) in future chapters to identify activity demand triggers for future facility improvements.

Exhibit 3-1 – Airport Service Area



Commercial Aviation Forecasts

Commercial aviation consists of civil aviation that involves operating an aircraft for hire to transport passengers or cargo. The forecast elements evaluated in this report applicable to RAP include:

- Passenger Airline Forecasts
- Air Cargo Forecasts
- Other Commercial Forecasts

Passenger Airline Forecasts

Passenger airline forecasts include passenger enplanements and operations. Passenger airline enplanements at an airport represent the number of revenue passengers boarding commercial service aircraft that depart an airport. An operation is a takeoff or a landing of an aircraft conducting a passenger carrying operation on a scheduled or unscheduled basis. As defined by FAA, passengers are carried in air carrier aircraft (scheduled service in more than 60 seat aircraft), air taxi aircraft (scheduled service of four or fewer flights per week or on-demand service, in 60 or fewer seat aircraft) or commuter "regional" aircraft (scheduled service of five or more round-trip flights per week on a route in 60 or fewer seat aircraft).

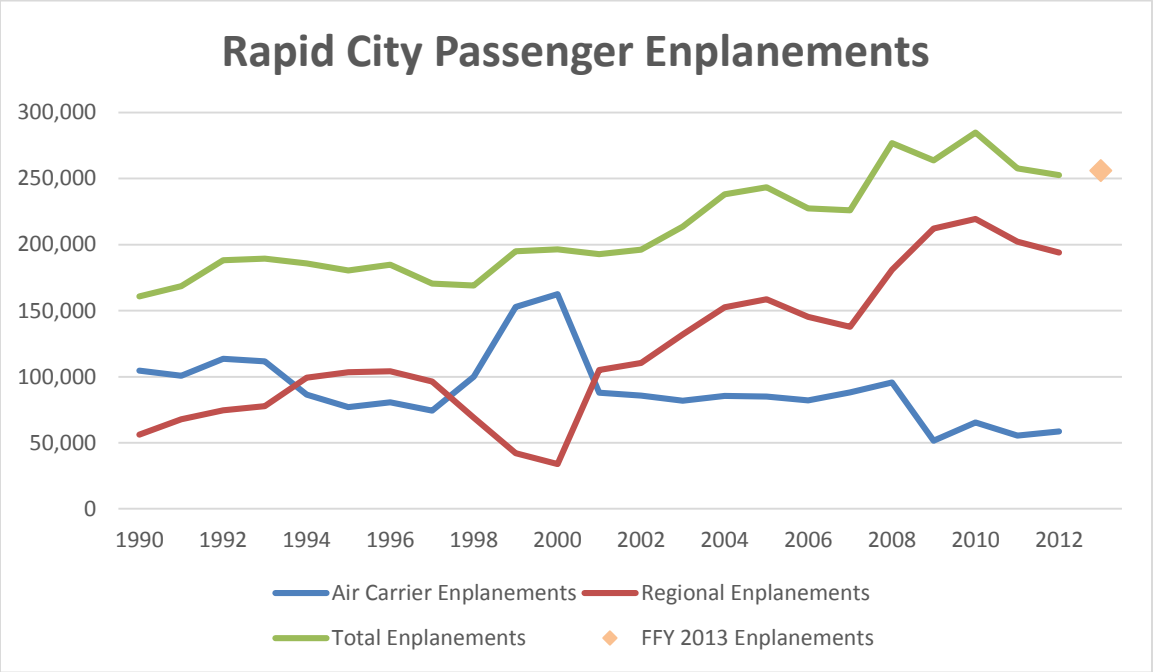
Airport Trends

Enplanements

On average since 1990, passenger enplanements at Rapid City have been increasing, but there have been fluctuations which are likely attributed to economic slowdown in the early 2000's and most recently during the recession of 2009. Population and employment since 2000 has increased at a steady rate.

Historically the passenger enplanements at RAP have been carried by regional type aircraft. Since the advent of widespread use of regional jets, RAP has seen the majority of passenger enplanements carried by regional airlines in these aircraft types.

Figure 3-1 – Passenger Enplanements



*Source: FAA Terminal Area Forecast (January 2013), RAP Monthly Passenger Records, Bureau of Transportation Statistics (BTS) T-100 Segment (All Carriers) *2013 Data through August 2013*

Table 3-1 – Passenger Enplanements

Passenger Enplanements Table			
Year	**Air Carrier**	**Air Taxi/Commuter**	**TOTAL**
1990	104,547	56,220	160,767
1995	77,081	103,376	185,457
2000	162,544	33,787	196,331
2005	84,869	158,617	243,486
2010	65,455	219,502	284,957
2012	58,625	193,983	252,608
Historical CAGR	*-2.60%*	*5.79%*	*2.08*

Source: FAA Terminal Area Forecast

In addition to the economic recovery, the level of passenger airline service at Rapid City has grown in the last few years to contribute to the enplanement growth. New service includes additional service to seasonal destinations and frequency through Allegiant Airlines, twice-daily service to Dallas/Fort Worth on American Airlines, seasonal service to Atlanta on Delta Airlines, seasonal service to Chicago on American Airlines and seasonal service to Houston on United. As of July 2014, the airport now provides 147 weekly departures to eight non-stop destinations on four airlines and related regional partners.

Rapid City's location has allowed it to typically capture most of the travel within its catchment area with the only significant leakage to Denver which is more than a 6 hour drive. As mentioned above the fluctuation in enplanements is primarily from changes in the national economy which impacts the tourism element. While tourism will remain a major part of the Rapid City's economy, the area is diversifying, which will only help if another national economic downturn occurs.

Operations

Overall commercial operations are tracked by FAA for all scheduled and unscheduled passenger and air cargo flights. A departure is a flight leaving the airport for another destination.

The number of scheduled passenger departures were reviewed since 1990. Scheduled departures have increased at a slower rate of 1.29 percent annually as compared to passenger enplanements. This has to do with the use of larger regional aircraft over the past several years; this trend is anticipated to continue as the 50 seat regional aircraft are replaced by 70-90 seat aircraft.

The most current December 2013 and July 2014 flight schedules were reviewed to determine the current scheduled passenger service fleet mix. The compiled schedules indicate a significant use in 50-seat regional jet aircraft with 72 percent of departures, followed by 4 percent of departures each in 61 to 90-seat, 22 percent in 121 to 150-seat aircraft types, and less than 1 percent of departures in 151 seat or greater aircraft

Non-Stop Destinations from Sioux Falls[1]	Weekly Flights[2]
o Las Vegas, NV - LAS	2 (G4)
o Denver, CO - DEN	42 (AA)
o Phoenix/Mesa, AZ - AZA	3 (G4)
o Dallas/Ft. Worth, TX - DFW	21 (DL)
o Atlanta, GA (seasonal) - ATL	7 (DL)
o Chicago, IL (seasonal) - ORD	7 (AA), 21 (UA)
o Minneapolis/St. Paul, MN - MSP	35 (DA)
o Huston, TX (seasonal) - IAH	7 (UA)

[1]**Source:** Rapid City Regional Airport Flight Schedules

[2]**Air Carriers:**
G4 = Allegiant Airlines
DL = Delta Airlines
UA = United Airlines
AA = American Airlines

N

0 125 250 500 Miles

*Intended for Planning Purposes Only

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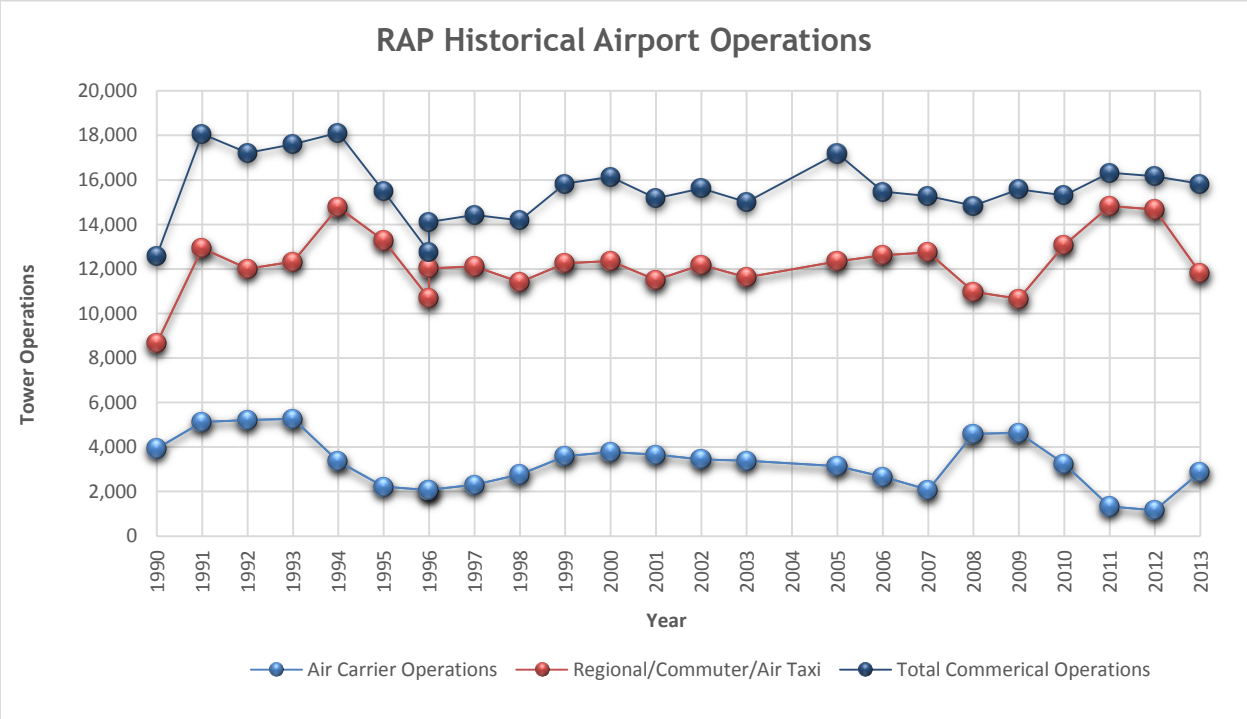
Rapid City Regional Airport
Exhibit 3-2: Passenger Air Service

Figure 3-2 – Commercial Operations



Source: FAA Terminal Area Forecast

The number of air carrier and commuter passenger airline departures were also reviewed since 1990. Air carrier departures have increased at a slower rate of decreased 1.35 percent annually from 1990 to 2012 as compared to air taxi commuter operations which have increased by roughly the same amount (1.36 percent) over the same period. In 2012, 81 percent of the passenger-carrying departures performed were in aircraft operated by regional carriers.

Table 3-2 – Commercial Departures

Passenger Departures Table			
Year	**Air Carrier**	**Air Taxi/Commuter**	**TOTAL**
1990	2,935	8,664	12,599
1995	2,218	13,275	15,493
2000	3,583	12,251	16,143
2005	3,144	12,336	15,480
2010	3,245	13,077	16,322
2012	2,878	11,808	15,828
Historical CAGR	*-1,35%*	*1.36%*	*1.04%*

Source: Airport Traffic Air Activity System, 2013

Scheduled departure data was further analyzed for operational trends over the past five years. Departures in regional aircraft less than 40 seats are virtually nil as a result of regional airlines turboprop aircraft phasing out smaller turboprop aircraft. Departures in the 40 to 60-seat regional jet are the highest category at RAP with peaks achieved in 2010. For air carrier

aircraft, the 61 to 90-seat aircraft types are increasing in use along with the introduction of new 91 to 99-seat aircraft types. Departures in 121 to 150-seat aircraft have dramatically decreased over the past five years, however operations in 151-seat and greater aircraft have slightly increased in use.

Table 3-3 – Passenger Aircraft Fleet Mix

Passenger Aircraft Fleet Mix & Operations					
Seating Capacity	**2008**	**2009**	**2010**	**2011**	**2012**
Air Taxi/Commuter					
40-60 Seats	69.07%	77.03%	86.29%	90.73%	88.87%
Air Carrier					
61-99 Seats	8.06%	9.46%	.056%	0.21%	1.55%
100-120 Seats	7.34%	0.18%	4.55%	2.21%	3.04%
121-150 Seats	15.25%	13.05%	8.41%	6.29%	6.31%
151+ Seats	0.28%	0.27%	0.20%	0.56%	.023%

Source: Bureau of Transportation Statistics (BTS) T-100 Segment (All Carriers), KLJ Analysis
Note: Regional is 60 seats or less, Air Carrier is greater than 60 seats

Airlines have increased using the 40-60 seat aircraft to help maintain frequency and preserve load factors which have hovered around 75 percent over the past ten years.

Proposed Forecast

A new Master Plan forecast of enplaned passengers and related metrics has been prepared using available data several methodologies and professional judgment based on experience. The forecasts prepared are unconstrained and represent forecast demand.

Assumptions made for this Master Plan forecast include:

- The local Rapid City economy will remain strong and resilient. Population, employment and income growth will generally follow projections.
- Rapid City Regional Airport will continue air service development efforts.
- There will be no reduction to the current 2013 flight schedule. Air service recently started to new destinations will remain through the long-term.
- Enplanement demand will be met by the airlines through adding flight frequency, aircraft capacity and airline destinations to meet the need at existing hub airports.
    - Potential new service is explored in separate air service studies rather than this master plan.
- No considerations were made for airline mergers.
- The 50-seat regional jet aircraft type will begin to be phased out because it is less profitable than larger regional aircraft. There will be a significant reduction in usage of ERJ-135/145 and CRJ-200 aircraft for short-haul routes in the near term and be replaced by larger 70-100 seat regional jets such as the CRJ-700/900 series aircraft, Embraer E-series jets, and new Mitsubishi MRJ90 aircraft on order to SkyWest Airlines. The 50-seat Embraer ERJ-145 aircraft will still continue to be used by other regional carriers such as ExpressJet.

- Routes currently served by regional jets for Delta Air Lines will see replacement with larger 110 seat Boeing 717 aircraft in the mid-term.

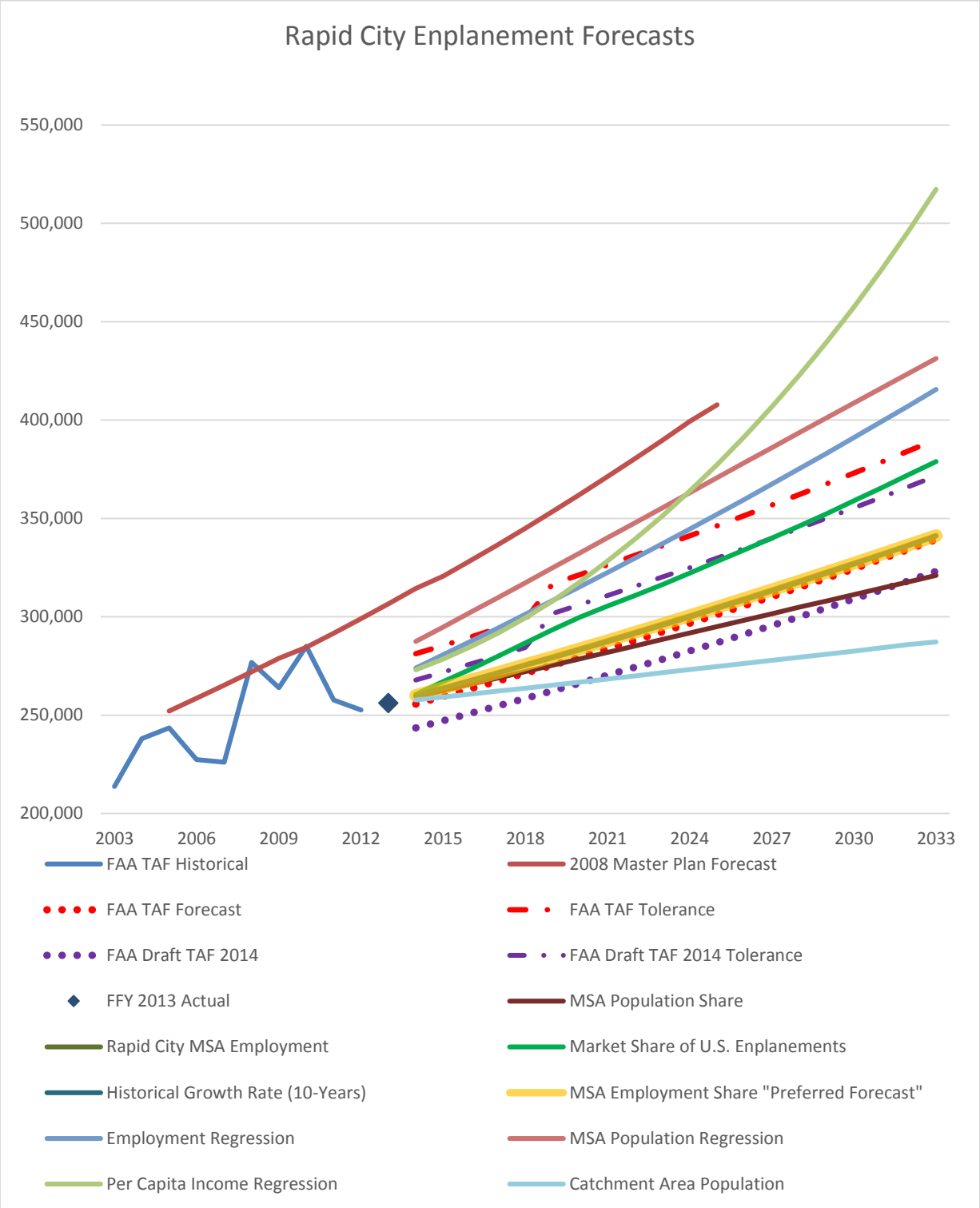
Airports Cooperative Research Program (ACRP) Synthesis 2: *Airport Aviation Activity Forecasting* demonstrates changes in the commercial airline industry have occurred in the last 25 years but have not been reflected in FAA definitions for air carrier, air taxi and commuter operations. The study notes the distinction between scheduled and unscheduled service to be most relevant. To be consistent with the industry trend of regional carriers operating larger aircraft for facility planning, a revised definition for air carriers as aircraft with 100 seats or more and regional/commuter/air taxi aircraft with less than 100 seats was proposed. This would more accurately separate traditional air carrier and regional airlines. However the traditional 60 seat definition is used for this forecast to be consistent with current FAA forecast approval guidelines.

Selected Forecast

Various forecast methods and professional experience were used to develop a preferred forecast, which is based on the MSA Employment Share.

The preferred forecast yields 341,298 forecast total enplanements in year 2033 for an average annual growth rate of 1.44 percent. The enplanements are split into an estimated 79,208 for passenger air carriers (23.21 percent of total) and 262,090 for regional airlines (76.79 percent of total) based the projected aircraft fleet mix. *The preferred forecast is consistent with the TAF and tracks well with historic population and growth trends*.

Figure 3-3 – Passenger Enplanements Forecast Methods



Source: KLJ Analysis, FAA Terminal Area Forecast (January 2013), Rapid City Regional Airport, 2008 Airport Master Plan, City of Rapid City Planning Department (2012), FAA Aerospace Forecasts (2013-2033), Woods & Poole Economics

Table 3-4 – Preferred Forecast Enplanements

Forecast Enplanements				
Enplanements	**2013**[1]	**2018**	**2023**	**2033**
Air Carrier	59,457	63,969	68,754	79,208
Regional	196,734	211,665	227,499	262,090
TOTAL	**256,191**	**275,634**	**296,254**	**341,298**

Source: KLJ Analysis, CAGR = Compounded Annual Growth Rate

Table 3-5 – Preferred Forecast Enplanements by Type

Preferred Forecast Enplanements by Type					
Metric	**2013**	**2018**	**2023**	**2033**	**CAGR**
Air Carrier (>60 seats)					
Total Enplanements	220,835	398,117	483,555	602,182	*5.14%*
Air Taxi/Commuter (≤60 seats)					
Total Enplanements	253,283	149,822	121,317	154,639	*2.27%*

Source: KLJ Analysis, CAGR = Compounded Annual Growth Rate

Airline Fleet Mix

The type of passenger service aircraft that utilize the airport defines the operations needed to serve the forecast enplanements. Flight schedules from December 2013 and July 2014 were reviewed to develop an annual schedule and current aircraft fleet mix. Projected fleet mix is developed based on known industry trends. The phase-out of the 50-seat regional jet is significant to the overall fleet mix at Rapid City as 72 percent of the current flights are in this type of aircraft.

Table 3-6 – Passenger Aircraft Fleet Mix

Passenger Aircraft Fleet Mix				
Seating Capacity	**2013**	**2018**	**2023**	**2033**
Less Than 40 Seats	0%	0%	0%	0%
40-60 Seats	72%	70%	64%	60%
61-99 Seats	4%	7%	8%	11%
100-120 Seats	0%	1%	5%	4%
121-150 Seats	22%	20%	19%	21%
150+ Seats	.5%	0%	2%	2%
TOTAL	**100%**	**100%**	**100%**	**100%**

Source: Rapid City Regional Airport, KLJ Analysis
Note: Due to rounding numbers do not equal 100 percent

The projected fleet mix is combined with the enplanement forecasts to determine flight metrics including average seats per departure and enplanements per departure. Passengers per regional airline departure is forecast to increase to accommodate the loss of the 50-seat

[1] *Fiscal Year 2013 Enplanements are based on monthly airport passenger reports. Air carrier and regional enplanements are estimated based on fleet mix metrics.*

regional jet and air carrier passengers per departure will decrease as lower capacity air carrier aircraft are used and some flights are transferred to larger regional aircraft.

The current load factor of 74.9 percent was determined from the latest year's average from the Bureau of Transportation Statistics for Rapid City. The load factor is projected to stay at roughly 75 percent throughout the planning period. While national averages are anticipated to stay in the low 80's, RAP has shown the ability to maintain (and attract) service because of the relative distance of other commercial service airports and the proximity of tourism related activity. As mentioned previously the Rapid City economy is diversifying, which will only help maintain and attract airline service.

Table 3-7 – Passenger Data Per Departure

Passenger Data Per Departure				
Metric	**2013**	**2018**	**2023**	**2033**
Air Carrier (100+ seats)				
Average Seats Per Departure	120.6	119.0	120.1	120.1
Average Load Factor	74.45%	74.00%	74.00%	74.00%
Enplanements Per Departure	89.8	88.1	88.9	88.8
Regional (<100 seats)				
Average Seats Per Departure	42.7	46.5	46.9	52.4
Average Load Factor	76.15%	75.00%	75.00%	75.00%
Enplanements Per Departure	32.5	34.9	35.1	39.3
Total				
Average Seats Per Departure	50.2	53.7	56.1	62.2
Average Load Factor	74.88%	75.00%	75.00%	75.00%
Enplanements Per Departure	61.2	61.5	62.0	64.1

Source: KLJ Analysis

Airline Operations

Passenger airline operations are determined from the average enplanements per departure from the fleet mix determinations. An operation is a considered an aircraft departure or an arrival.

Overall operations will remain steady or decrease slightly in the short-term as overall seats per departure increase. Regional operations will decrease as larger aircraft and/or reduced frequency are used to accommodate demand on routes to replace the 50-seat regional jet. Air carrier operations will increase in the short-term to accommodate additional flights then stabilize as flights in regional aircraft begin to increase again with new 61-99 seat aircraft types are introduced.

Table 3-8 – Passenger Airline Operations

Passenger Airline Operations				
Metric	**2013**	**2018**	**2023**	**2033**
Departures				
Air Carrier	1,074	688	910	1,094
Regional	5,934	6,162	6,129	6,218
Operations				
Air Carrier	2,148	1,376	1,821	2,187
Regional	11,868	12,323	12,258	12,435
TOTAL	**14,016**	**13,700**	**14,079**	**14,623**

Source: KLJ Analysis

Summary

A summary of the preferred passenger aviation forecasts are provided in the table below:

Table 3-9 – Preferred Passenger Airline Forecasts Summary

Preferred Passenger Airline Forecasts Summary				
Metric	**2013**	**2018**	**2023**	**2033**
Air Carrier	59,457	63,969	68,754	79,208
Air Taxi/Commuter	196,734	211,665	227,499	262,090
TOTAL	**256,191**	**275,634**	**296,254**	**341,298**
Avg. Seats/Departure	61.2	61.5	62.0	64.1
Avg. Load Factor	74.88%	75.00%	75.00%	75.00%
Air Carrier	2,148	1,376	1,821	2,187
Commuter	11,868	12,323	12,258	12,435
TOTAL	**14,016**	**13,700**	**14,079**	**14,623**

Source: KLJ Analysis

Air Cargo

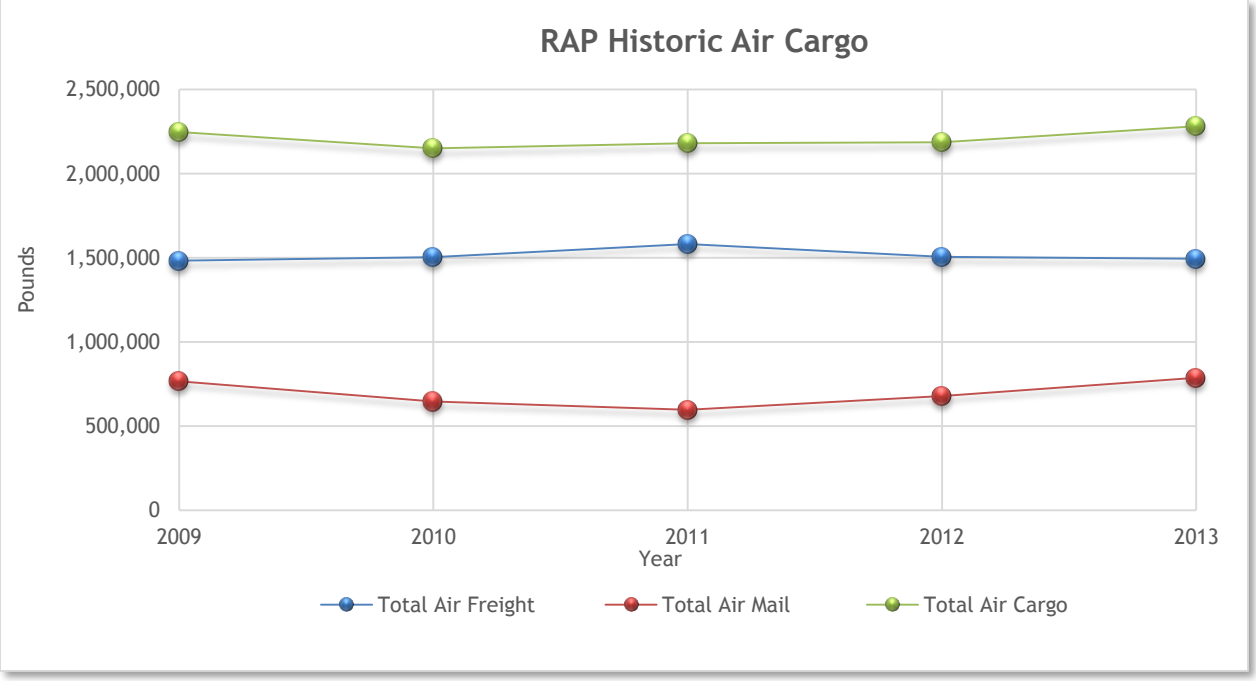
Transporting materials and goods can be accomplished by air, truck, rail, water or a combination of modes. Products that are high value, light weight and time sensitive typically drive air cargo demand. Cargo can be carried on dedicated air freight aircraft or in the belly of commercial service aircraft.

Airport Trends

RAP serves as a feeder for FedEx and UPS from their destination cargo hubs (Sioux Falls). Air cargo arrives in the morning from Sioux Falls on feeder aircraft such as the ATR-42, Cessna 208 Caravan, or Beechcraft 1900 and then is transported via trucks to areas within the service areas. At night the air cargo that is scheduled to be flown out to Sioux Falls arrives and is loaded onto the aircraft for nighttime departures.

Total enplaned and deplaned air freight and mail at RAP has increased 0.3 over the past five years. Over the past five years air cargo operations have dropped from 987 to 728, as both cargo carriers have consolidated flights and removed smaller cargo carrier aircraft from their fleets.

Figure 3-4 – Historic Air Cargo Weight



Source: Rapid City Regional Airport

Table 3-10 – Historical Air Cargo

Historical Air Cargo Table			
Year	**Freight**	**Mail**	**TOTAL**
2008	1,482,698	765,360	2,248,058
2009	1,503,519	646,290	2,149,809
2010	1,582,280	597,541	2,179,821
2011	1,506,055	679,466	2,185,521
2012	1,493,526	787,867	2,281,393
Historical CAGR	*0.14%*	*0.56%*	*0.30%*

Source: Rapid City Regional Airport

Proposed Forecast

Freight & Mail

The recommended forecast assumes growth over the next 20 years representing an increase in weight through RAP to Sioux Falls, SD (FSD). This growth is based on the feeder system currently used by both UPS and FedEx and the population growth forecasted for the air cargo service area.

It is anticipated that the current fleet of aircraft (ATR-42, Cessna 208 Caravan, and the Beechcraft 1900) operating at RAP will continue to operate in the future. These aircraft are perfectly suited to handle the existing and forecasted air cargo for the Rapid City service area. The amount of operations of air cargo aircraft is anticipated to rise back to 2008 numbers as weight increases, up to 1,064 operations in 2033.

Table 3-11 – Forecast Air Cargo

Forecast Air Cargo	
Year	**TOTAL (lbs.)**
2013	2,281,393
2018	2,438,523
2023	2,718,382
2033	3,378,139
Forecast CAGR	*1.91%*

Source: Rapid City Regional Airport, KLJ Analysis

Summary

A summary of the air cargo freight & mail and operations are provided in the following table.

Table 3-12 – Air Cargo Aviation Forecasts Summary

Air Cargo Aviation Forecasts Summary				
Metric	**2013**	**2018**	**2023**	**2033**
Total Cargo (lbs)	2,281,393	2,438,523	2,718,382	3,378,139
Total Operations	728	800	880	1,064

Source: Rapid City Regional Airport, KLJ Analysis

Commercial Forecast Summary

A summary of the commercial aviation forecasts is shown in the following table.

Table 3-13 – Commercial Forecast Summary

Commercial Forecast Summary				
Metric	**2013**	**2018**	**2023**	**2033**
Air Carrier	59,457	63,969	68,754	79,208
Air Taxi/Commuter	196,734	211,665	227,499	262,090
Total Enplanements	256,191	275,634	296,254	341,298
Total Cargo (lbs)	2,281,393	2,438,523	2,718,382	3,378,139
Operations				
Air Carrier	2,148	1,376	1,821	2,187
Air Taxi/Commuter	11,868	12,323	12,258	12,435
Total Commercial Operations	14,016	13,700	14,079	14,623
Avg. Seats/Operation	50.2	53.7	56.1	62.2
Average Load Factor	74.88%	75.00%	75.00%	75.00%

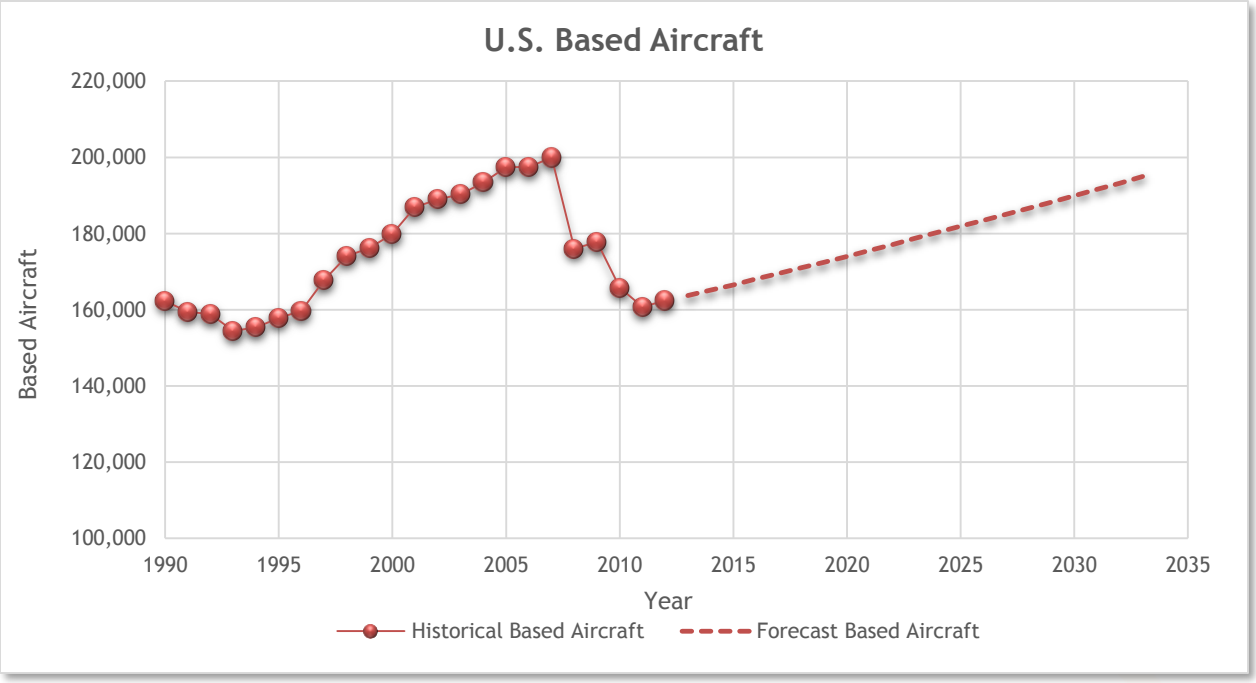
Source: KLJ Analysis

Based Aircraft Forecasts

A based aircraft is an operational and airworthy aircraft based at the airport for a majority of the year. These are generally non-commercial general aviation and commercial air taxi aircraft.

Based aircraft is the count of aircraft that claim a specific airport as its home base. Civil (non-military) based aircraft at Rapid City are used for primarily general aviation (GA) and some Air Taxi (AT) operations. On a national basis, the FAA TAF nationally reports based aircraft hit a 15-year low in 2011 after highs were achieved in 2007. The economic recession contributed to the number of based aircraft declining nearly 20 percent between 2007 and 2011. National forecasts show a modest growth rate of 0.88 percent annually over the next 20 years. Based aircraft had been increasing steadily with decreased growth during economic downturns. The most recent economic recession demonstrates the new sensitivity based aircraft has with the overall economy.

Figure 3-5 – U.S. Based Aircraft



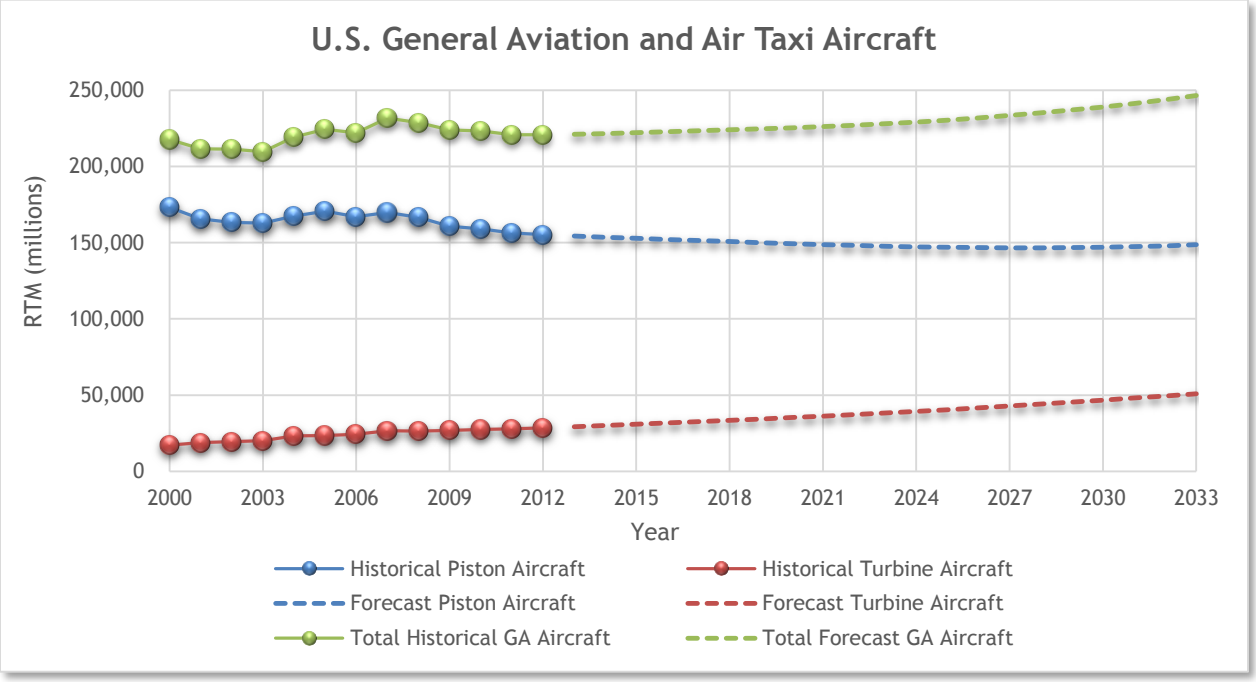
Source: FAA Terminal Area Forecast

Nationally, the total number of general aviation and air taxi active aircraft has cumulatively increased by 1.4 percent since 2000. Events affecting the number of aircraft include increased security regulations since 9/11, the economic downturn of the early 2000s and the recession of the late 2000s. Aircraft types are evolving to include more turboprop and turbojet aircraft and fewer multi-engine piston aircraft.

Within the GA and AT activity category there has been increased demand for the use of turbine powered aircraft. These aircraft include turboprop and turbojet aircraft primarily used for corporate business travel. More operators are using GA aircraft to travel to save

travel time and cost. The number of turbine aircraft has increased an average of 4.3 percent annually. Helicopter, experimental and light sport aircraft (new aircraft category since 2006) have seen steady increases. On the contrary, the number of piston powered aircraft has decreased 1.0 percent annually. These aircraft types are used for recreational and flight training purposes. Decreases can be attributed higher ownership costs, increased fuel prices, economic downturns and a decreasing pilot population. Multi-engine piston aircraft have particularly seen a reduction with decreases of 2.5 percent annually. These aircraft types are being replaced by newer technology turboprop aircraft for business travel.

Figure 3-6 – U.S. General Aviation and Air Taxi Aircraft

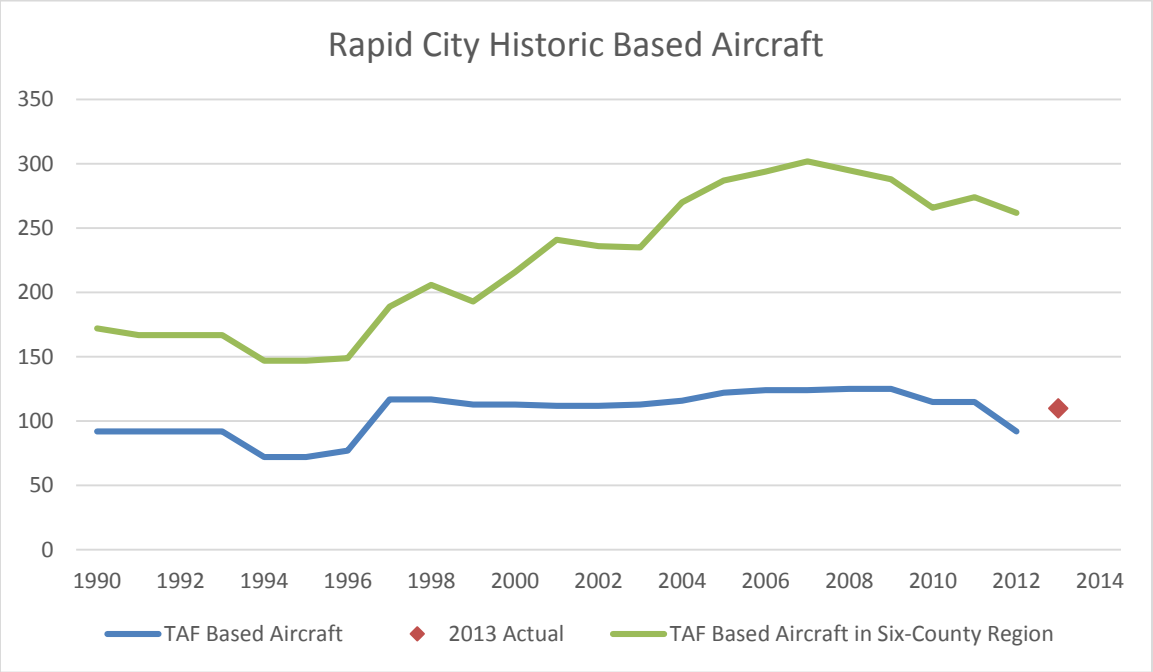


Source: FAA Aerospace Forecasts (2013-2033)

Total 2013 reported Rapid City based aircraft according to FAA Form 5010-1 *Airport Master Record* consists of 70 single-engine, 31 multi-engine, 8 jet aircraft, 1 helicopter and 1 glider for a total of 110 aircraft.

The historic TAF for Rapid City showed a downturn of based aircraft in 2011 to 2012 from 115 down to 92 aircraft. In discussions with Rapid City airport staff it was learned that the based aircraft information for 2012 was gathered by sending mailings to all aircraft known to be based at the airport. The 2012 based aircraft numbers were recorded as a result of those aircraft owners' responding. If an aircraft owner did not respond or was otherwise not known to airport, it was not recorded as a based aircraft in 2012. As a result, the 2012 based aircraft number of 92 aircraft appears to be an error in data collection and not a correct representation of the aircraft at the airport in that year.

Figure 3-7 – Rapid City Based Aircraft



Source: FAA Terminal Area Forecast, RAP Airport Master Record (2013), Six-County Region is Butte, Custer, Fall River, Lawrence, Meade and Pennington Counties with Belle Fourche, Custer, Hot Springs, Rapid City, Spearfish, Sturgis and Wall airports.

Forecasts

Based aircraft forecasts measure the number of aircraft that claim Rapid City as their home airport. Forecast methodologies evaluated include time series (trend) and market share analysis. Not enough accurate historic data is available for a regression analysis. Data used include based aircraft data from the airport records, FAA TAF, FAA Aerospace Forecasts, demographic and socioeconomic data.

The 2013 FAA TAF published for Rapid City reports 93 based aircraft with a future growth rate of 1.64 percent annually. Based aircraft figures vary from source to source. FAA Form 5010-1 *Airport Master Record* reports 111 based aircraft in 2013 which is determined to be the baseline figure.

Regional

An important local and regional consideration is the stagnant level of based aircraft at Rapid City in comparison to the six-county. Increases occurred in the region in 1998, 2001 and 2007 but did not occur at Rapid City. This has resulted in based aircraft locating at surrounding airports other than Rapid City. This will have an effect on the forecast based aircraft at Rapid City. There were two particular airports mentioned most in discussions about where pilots are basing aircraft.

- Black Hills Airport (SPF): SPF is in Spearfish, SD located 41 nautical miles northwest of RAP. This facility has a 6,401 foot long runway with two non-precision GPS approaches.

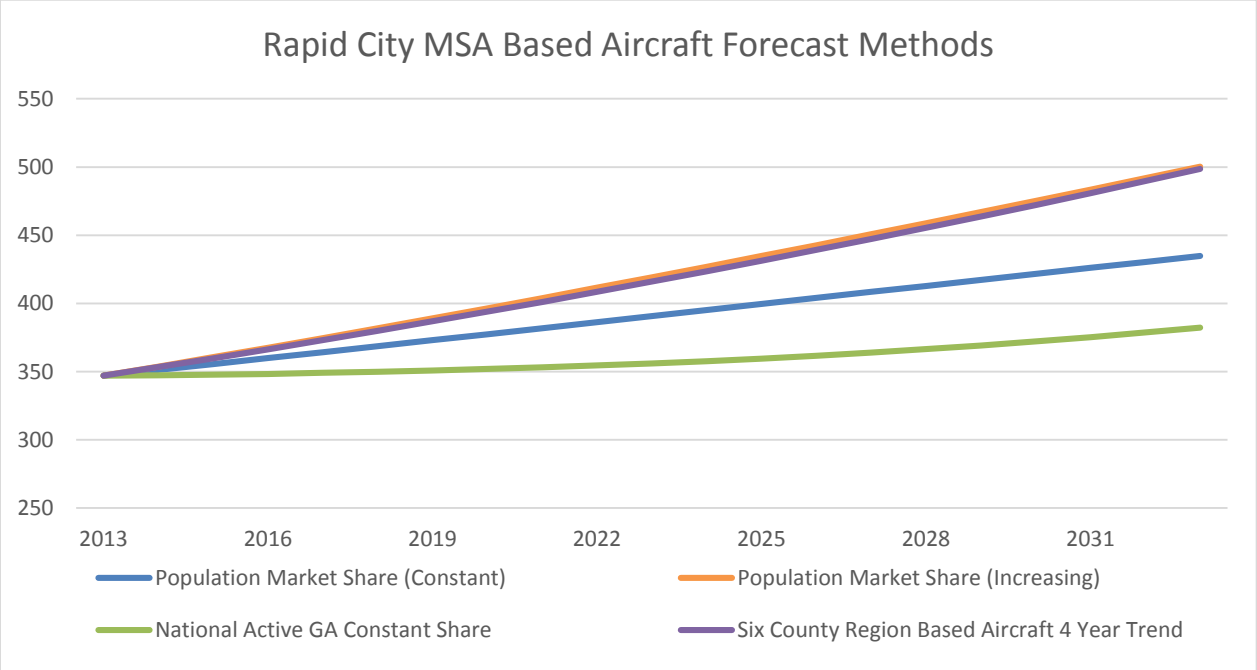
According to the FAA TAF, based aircraft at SPF has increased rapidly from 52 to 72 over the past 20 years for an average growth rate of 1.64 percent annually. From Rapid City it is a 45 mile (47 minute) drive.

- Hot Springs Airport (HSR): HSR is in Hot Springs, SD located 42 nautical miles south of RAP. This facility has a 4,506 foot long runway and 22 based aircraft with two non-precision GPS approaches. According to the FAA TAF, based aircraft at HSR has increased rapidly from 10 to 22 over the past 20 years for an average growth rate of 4.02 percent annually. From Rapid City it is a 54 mile (54 minute) drive.

- In comparison Rapid City Regional Airport is east of the city. It is a 10 mile (15 minute) drive to Rapid City Regional Airport from the central business area.

There are three factors which are believed to have limited based aircraft growth at Rapid City. These are first the lack of space to develop, since the airport is on a low plateau with additional cost to fill and level land for hangar development. Second is the airport is now in the City of Rapid City and recently, as of 2005, was required to abide by city building codes. Third is the change in security as a result of 9-11. If the first two factors are addressed it is believed that additional based aircraft will quickly be added.

Figure 3-8 - Rapid City MSA Based Aircraft Forecast Methods



Source: FAA TAF, KLJ Analysis

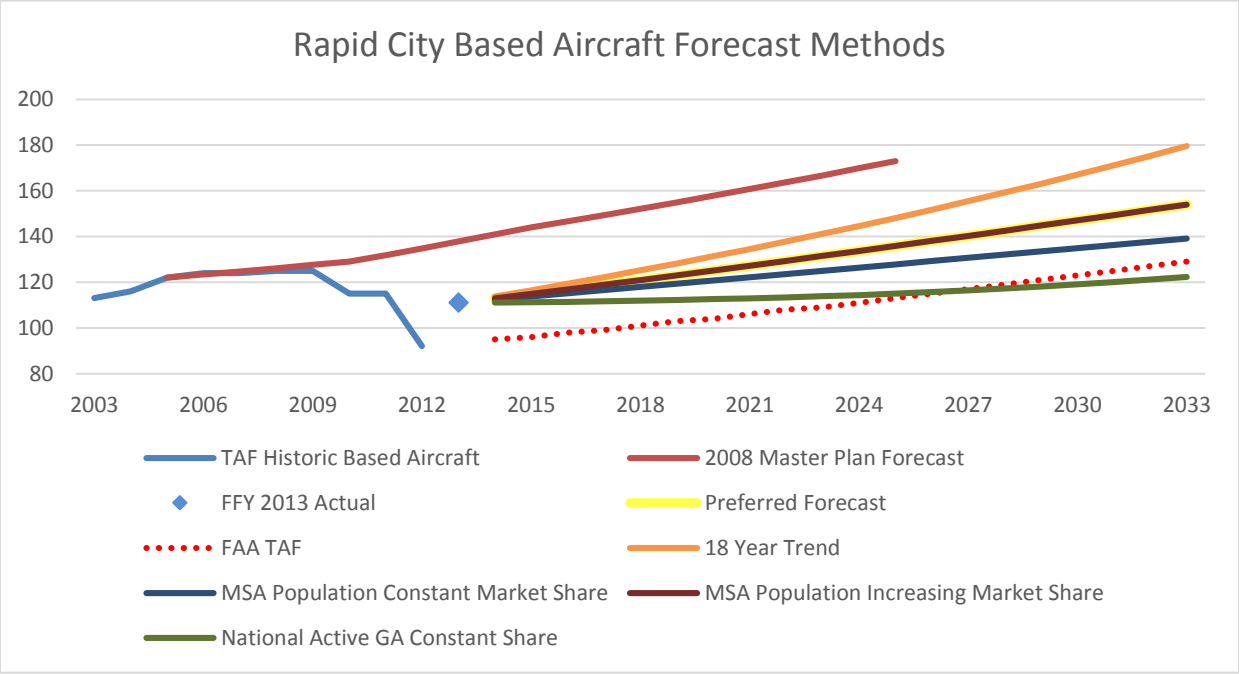
Rapid City MSA regional based aircraft forecasts were first developed to determine the regional demand for based aircraft facilities. Using FAA records there were 347 registered aircraft within the MSA. Several market share methods were reviewed to estimate future

registered aircraft including constant population market share, increasing population market share, national active GA and AT aircraft market share and historical regional trends using available data.

Local

To determine the forecast based aircraft at Rapid City for the next 20 years the airport's share of total registered aircraft was considered since Rapid City is currently the base for approximately 32 percent of the MSA's registered aircraft. This implies that a large number of aircraft could choose Rapid City as their base if space was available. Forecasts for based aircraft used MSA population projections and a constant share of the national active GA fleet.

Figure 3-9 – Rapid City Based Aircraft Forecast Methods



Source: KLJ Analysis, Rapid City Airport Master Record (2013), FAA Terminal Area Forecast

Various methods were used for the preferred forecast. It is estimated Rapid City based aircraft will grow at a marginal growth rate for the short-term following historical trends. New based aircraft will include a variety of aircraft types. Rapid City based aircraft is forecast to grow from 111 currently to 154 at the end of the forecast period for an average annual growth rate of 1.84 percent.

Table 3-14 – Based Aircraft Forecast

Based Aircraft Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Total Based Aircraft	111	121	132	154

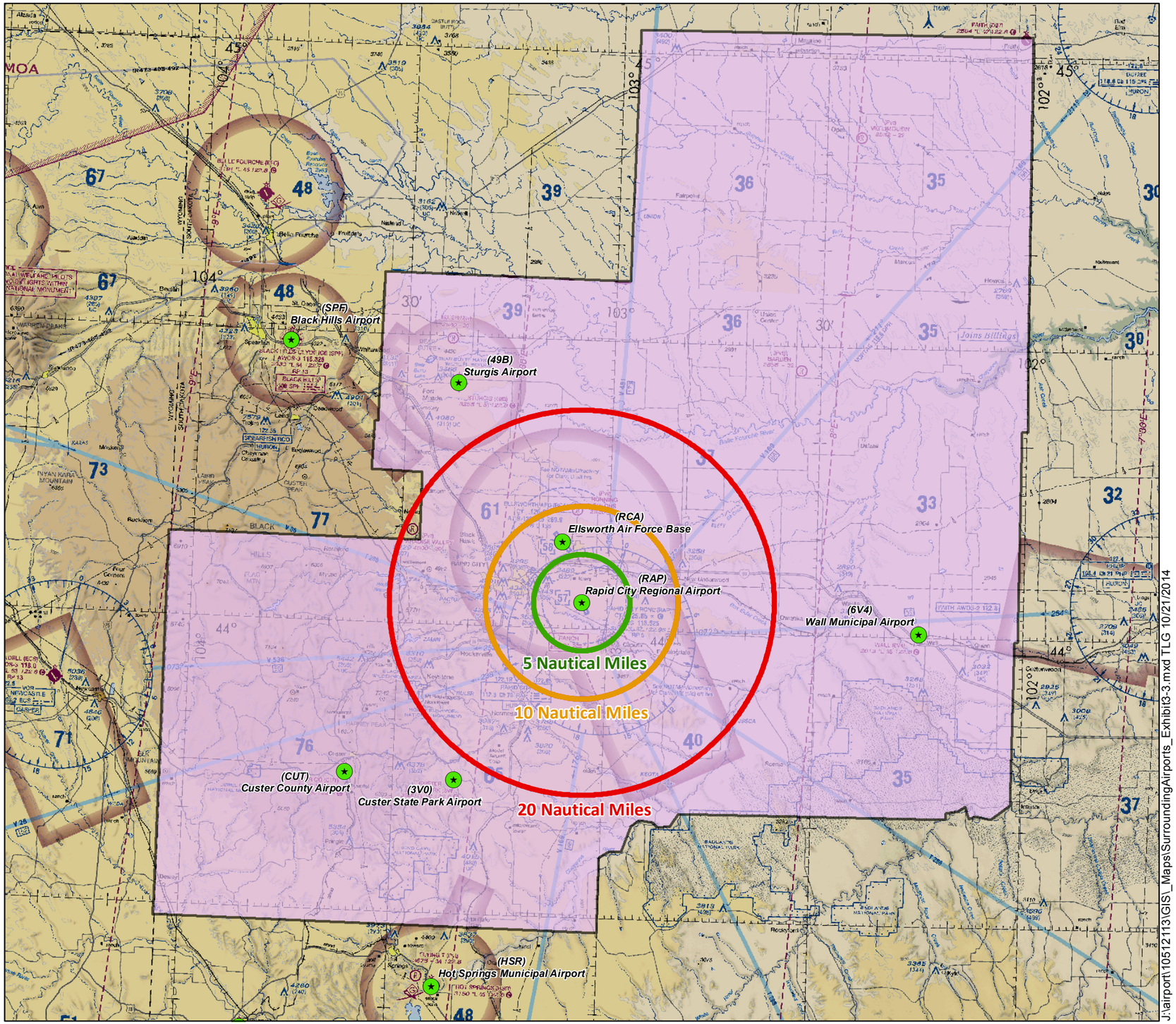
Source: KLJ Analysis

As Rapid City and the industry see more turboprop and turbojet aircraft, the airport's based aircraft fleet mix will also change. It is forecast multi-engine and jet aircraft types will increase at a faster rate than single-engine aircraft. Single engine growth will be tempered at 1.32 percent, multi-engine aircraft will grow at 2.10 percent and jet aircraft will grow at 3.48 percent through the forecast period. *The based aircraft forecasts are considered consistent with the TAF*.

Table 3-15 – Rapid City Based Aircraft Fleet Mix Forecast

Rapid City Based Aircraft Fleet Mix Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Single-Engine*	70	75	75	91
Multi-Engine*	31	34	36	47
Jet	8	10	11	15
Helicopter	1	1	0	0
Other	1	1	1	1
Total Based Aircraft	**111**	**121**	**125**	**154**

Source: KLJ Analysis
**Includes both piston and turboprop driven aircraft for FAA reporting purposes*



Legend

Rapid City MSA

Rapid City Regional Airport (RAP)
-111 Based Aircraft
- 8,701 - foot Primary Runway, Runway 32 ILS
- Commercial Service Airport

Ellsworth Air Force Base (RCA)
- 13,497-foot Primary Runway, ILS Approaches
- Military Airport

Black Hills Airport (SPF)
-72 Based Aircraft
- 6,401-foot Primary Runway, ILS Approaches
- General Aviation Service Airport

Hot Springs Airport (HSR)
- 22 Based Aircraft
- 4,506-foot Primary Runway
- General Aviation Service Airport

N

0 5 10 20 Miles

*Intended for Planning Purposes Only

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KLJ

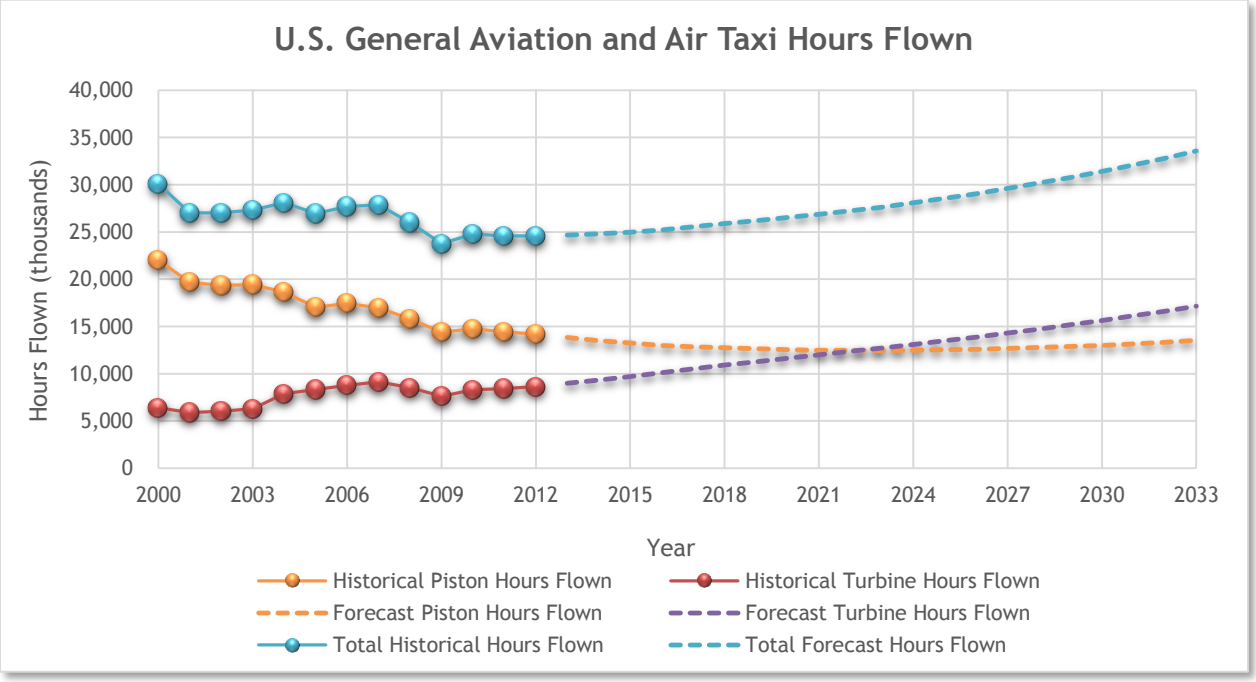
Rapid City Regional Airport
Surrounding Airports Map
Exhibit 3-3

General Aviation Operations Forecast

Historic Aviation Activity & Trends

General aviation (GA) is defined as aviation activities other than for commercial purposes. These are typically recreational or private transport flights. Nationally, the number of general aviation and air taxi hours flown has decreased by 18 percent since 2000. This downturn can be attributed to the economic downturn of the early 2000s, the recession of the late 2000s and increasing operating costs including fuel prices.

Figure 3-10 – U.S. General Aviation and Air Taxi Hours Flown



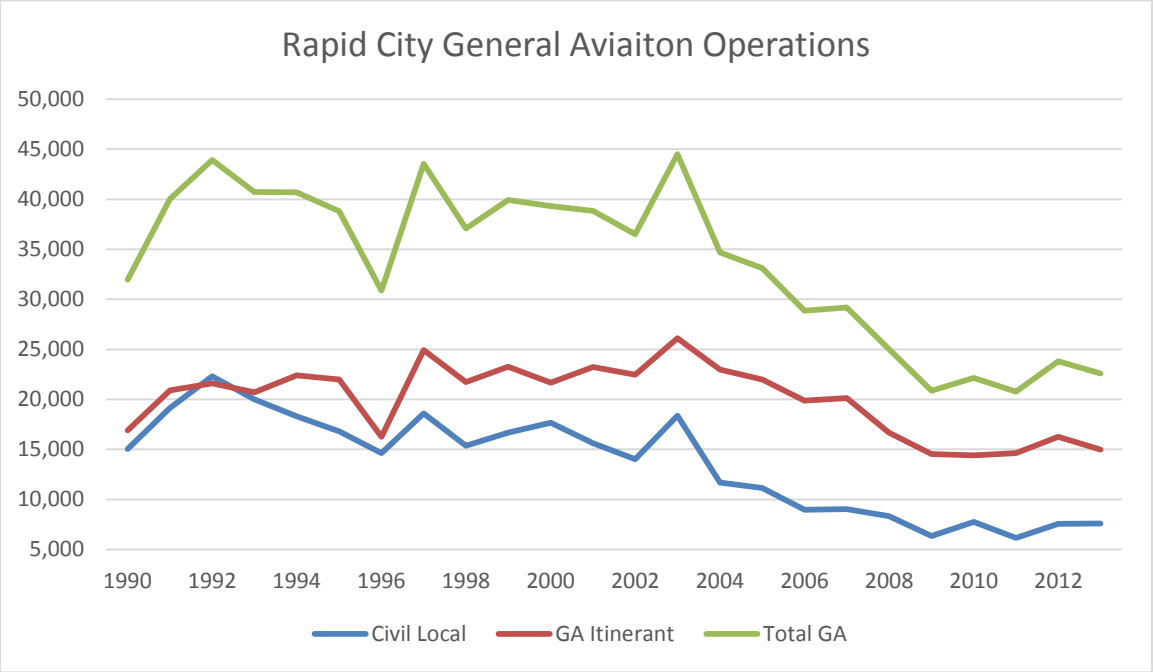
Source: FAA Aerospace Forecasts (2013-2033)

Within the GA and AT activity category there has been increased demand for the use of turbine powered aircraft. These aircraft include turboprop and turbojet aircraft primarily used for corporate business travel. More operators are using GA aircraft to travel to save travel time and cost. The number of turbine aircraft has increased an average of 4.3 percent annually. Helicopter, experimental and light sport aircraft (new aircraft category since 2006) have seen steady increases. On the contrary, the number of piston powered aircraft has decreased 1.0 percent annually. These aircraft types are used for recreational and flight training purposes. Decreases can be attributed higher ownership costs, increased fuel prices, economic downturns and a decreasing pilot population. Multi-engine piston aircraft have particularly seen a reduction with decreases of 2.5 percent annually. These aircraft types are being replaced by newer technology turboprop aircraft for business travel.

The trend of strong growth in corporate aircraft and steady or decreased use of piston aircraft is expected to continue over the planning period. This forecast may fluctuate with new unleaded fuel engines potentially reducing the cost of flying. The number of turbojet aircraft

is expected to increase 3.5 percent annually with hours flown increasing at a 4.3 percent rate. Larger corporate GA aircraft types is forecast to grow in number and activity levels. Piston aircraft is expected to decrease at a rate of 0.3 percent annually with activity decreasing at a 0.5 percent annual rate. This decrease can be attributed in part to upgrades to new aircraft type but also to the increased cost of flying and activity sensitivity to economic conditions.

Figure 3-12 – Rapid City General Aviation Operations Breakdown



Source: FAA Air Traffic Activity Data System (ATADS) *Assumes Civil local operations are all general aviation

At Rapid City, GA operations have decreased since peaks occurred in 1992, 1997 and 2003.

Forecasts

Local Operations

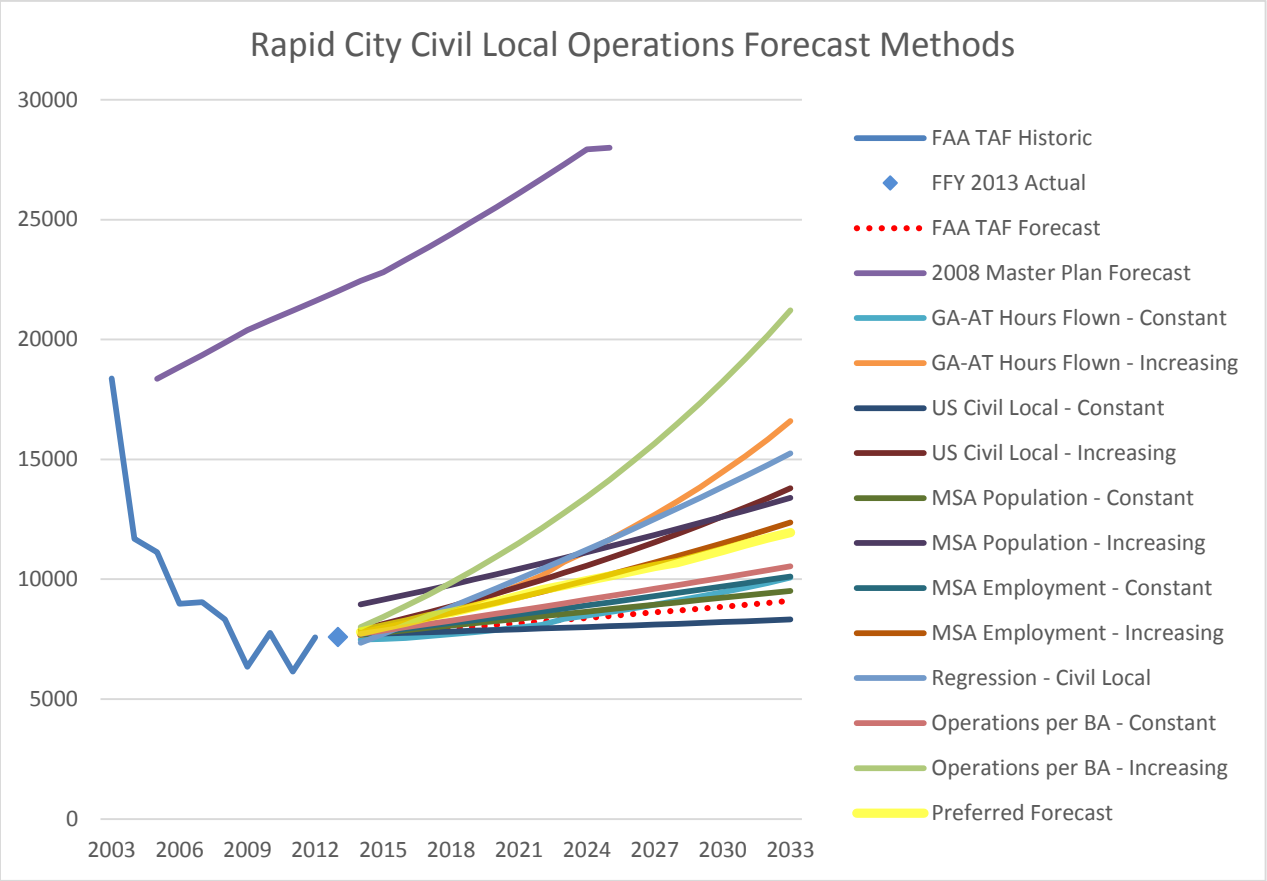
A local operation is defined as a takeoff or landing of a flight conducted within 20 miles of an airport. These operations typically include practice landings, touch-and-go's, practice approaches and maneuvering in the local area. Civil local operations are usually conducted by recreational and flight training aircraft.

Civil local operations have been declining in the recent years with a low figure achieved in 2011 with 6,148 operations. There was a drop of over 12,000 operations from 2003 to 2011. The FAA TAF projects future operations will steadily grow at about a 0.9 percent annual rate.

Several forecast methods were evaluated to estimate future operations including share analysis and regression. Share analysis reviewed historical civil local operations to various

metrics including Operations Per Based Aircraft (OPBA), total U.S. GA and AT hours flown, total U.S. civil local operations, MSA population and MSA employment in an attempt to develop a realistic forecast.

Figure 3-13 – Rapid City Civil Local Operations Forecast Methods



Source: FAA Terminal Area Forecast, 2008 Airport Master Plan, KLJ Analysis

The preferred forecast assumes Civil Local operations at Rapid City will be consistent with the MSA population share. This method yields an average annual growth rate of 2.28 percent. *The local operations forecast is considered consistent with the TAF*.

Itinerant Operations

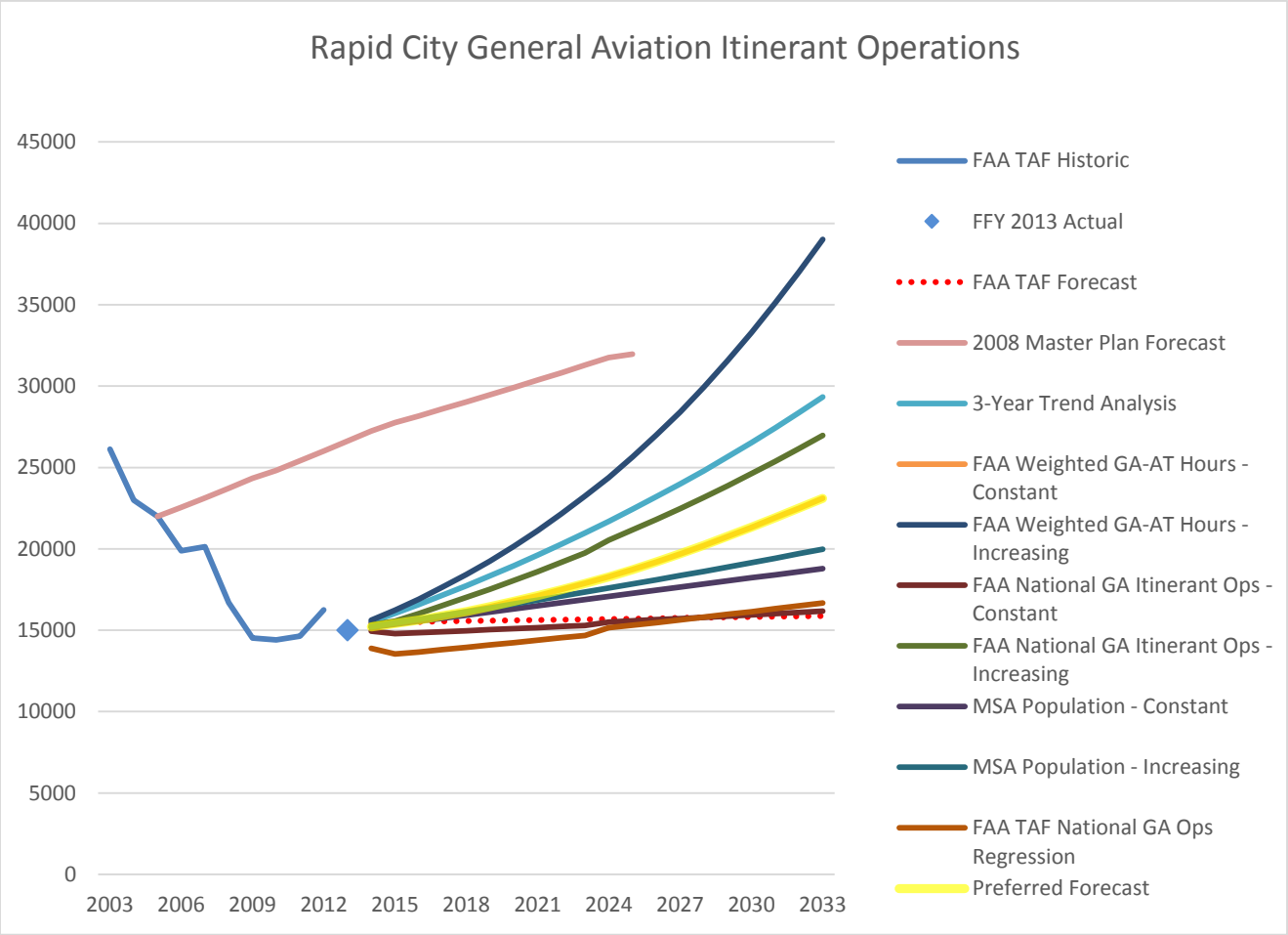
A GA itinerant operation is defined a takeoff or landing of a flight conducted beyond 20 miles of an airport, usually from another airport. GA itinerant operations are conducted by all types of aircraft. Commercial flights are almost exclusively considered itinerant operations.

GA itinerant operations have been declining in the recent years with a low figure achieved in 2010 with 14,402 operations. This can be attributed in part to the decrease in overall GA activity as a result of higher operating costs and the loss of the local flight school. The FAA TAF projects future operations will steadily grow at about a 0.28 percent annual rate.

Several forecast methods were evaluated to estimate future operations including trend analysis, share analysis and regression. Trend analysis reviewed trends over the past three,

five and ten years. Share analysis reviewed historical GA itinerant operations to various metrics including total U.S. GA and AT hours flown, total U.S. GA itinerant operations, MSA population and MSA employment to develop a realistic forecast considering available metrics.

Figure 3-14 – Rapid City General Aviation Itinerant Operations Forecast Methods



Source: FAA Terminal Area Forecast, 2008 Airport Master Plan, KLJ Analysis

The preferred forecast is based on a midpoint between the National Weighted GA and AT Hours Flown – Increasing and the MSA Population Share – Increasing. This method yields an average annual growth rate of 2.18 percent. *The itinerant forecast is considered consistent with the TAF*.

Fleet Mix

The overall general aviation operations fleet mix combines local and itinerant operations using estimated percentages.

Turbojet operations make up the majority of forecast general aviation operations at Rapid City with approximately 42 percent followed by turboprop at 23 percent.

Table 3-16 – Total Operations Fleet Mix Forecast

General Aviation Operations Fleet Mix Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Single-Engine Piston	7,270	8,220	9,360	10,450
Multi-Engine Piston	3,320	3,490	3,720	3,940
Turboprop	7,800	8,420	9,330	10,540
Turbojet	17,670	17,740	18,630	19,710
Helicopter	1,200	1,300	1,450	1,630
Other	80	90	100	110
Total Operations	**37,340**	**39,260**	**42,590**	**46,380**

Source: KLJ Analysis

Forecast Summary

A summary of the civil local and general aviation itinerant forecasts is shown in the following table.

Table 3-17 – General Aviation Operations Forecast Summary

General Aviation Operations Forecast Summary				
Metric	**2013**	**2018**	**2023**	**2033**
Local Operations	7,593	8,604	9,750	11,941
Itinerant Operations	14,997	16,153	17,878	23,102
Total Operations	**22,590**	**24,757**	**27,628**	**35,043**
Local Share	33.61%	34.75%	35.29%	34.07%
Itinerant Share	66.39%	65.25%	64.71%	65.93%

Source: KLJ Analysis

Military Operations

Proposed Forecast

Military missions are difficult to predict but the local SDANG base is expected to remain at RAP for the foreseeable future. Total, local and itinerant military operations were forecast to remain steady and follow average figures from the last 10 years assuming the same type of mission will occur at RAP. Total operations are forecast to remain at 4,024 for the planning period. Itinerant operations make up about 67 percent of the total with local operations at 33 percent based on historical trends.

Military based aircraft is forecast to remain steady at 13 (six UH-72 Lakota helicopters, six UH-60 Blackhawk helicopters, and one C12 Huron aircraft) through the planning period.

The preferred forecast for military operations is considered consistent with the 2013 FAA TAF.

Annual Instrument Approaches

Annual instrument approaches (AIAs) are defined as an approach to an airport conducted in actual instrument meteorological conditions. For purposes of this definition, an approach initiated when the observed visibility is less than 3 miles or the cloud ceiling is less than the decision altitude over the final approach fix (3,100 feet mean sea level for RAP) is considered an instrument approach. AIA figures for RAP are no longer tracked by the local Air Traffic Control Tower but are required element to an FAA forecast.

To determine AIAs, the number of itinerant operations are totaled from the estimates and forecasts and compared to annual operations. The number of instrument flights are determined. Approximately 80 percent of all RAP itinerant flight operations are conducted under instrument flight rules (IFR) according to FAA records. Local weather conditions are then reviewed. A total of 13.23 percent of the hourly weather observations are in instrument conditions for an instrument approach.

Table 3-18 – Annual Instrument Approach Forecast

Annual Instrument Approach Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Annual Operations	41,358	43,280	46,610	54,753
Itinerant Operations	32,111	33,340	35,524	41,476
% IFR Itinerant Operations	84.00%	84.00%	84.00%	84.00%
IFR Itinerant Operations	26,973	28,006	29,840	34,840
IFR Approaches	13,486	14,003	14,920	17,420
Instrument Approach Weather	13.23%			
Annual Instrument Approaches	**1,784**	**1,853**	**1,974**	**2,305**
AIA as Percent of Itinerant	**5.56%**	**5.56%**	**5.56%**	**5.60%**

Source: National Climatic Data Center, FAA Air Traffic Activity Data System (ATADS), KLJ Analysis

Total AIAs for RAP are forecast to increase from 1,784 currently estimated to 2,305 at the end of the planning period for an average annual growth rates of 1.29 percent annual rate.

Peak Activity

Peak periods evaluated include the peak month, design day and design hour characteristics for passenger enplanements and airport operations. The results of the peak activity forecasts will be used to determine the airport facility requirements. The methodology developed is derived from the Airports Cooperative Research Program (ACRP) Report 25: *Airport Passenger Terminal Planning and Design*, which emphasizes the use of design periods to forecast use patterns rather than individual absolute peak periods.

Local data used includes these aviation forecasts, FAA Air Traffic Activity Data System (ATADS), as well as RAP flight schedules from February and July 2014 along with monthly activity reports provided by the airport.

Passenger Airlines

Peak Month

The peak month of passenger airline activity was determined by reviewing the prior three years of monthly passenger enplanement figures for the airport. This method evaluates historic patterns of passenger activity to identify the peak month. The peak month was determined to be July 2014 with 12.22 percent of the annual enplanements for fiscal year 2011, consistent with the fiscal year periods evaluated in this forecast effort. This figure applies to both passengers and operations.

Table 3-19 – Peak Month Passenger Airline Activity Forecast

Peak Month Passenger Airline Activity Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Annual Enplanements	256,191	275,634	296,254	341,298
Peak Month (12.22%)	31,255	33,627	36,143	41,638

Source: KLJ Analysis

Design Day

The average peak weekday during the peak month is considered the design day. Design day activity is determined by evaluating actual flight schedules rather than using a pure average or an individual daily peak. Reviewing the average day during the peak month allows for planning for a peaking period rather than a single event which may cause overestimating. Peak days occur on weekdays for the sample periods at RAP.

There are currently 14 airline departures during the average peak weekday. Using the July 2014 flight schedule, this consists of 14.28 percent of the overall weekly departures. This baseline figure matches up to current design day operations for the peak summer months.

The average weekday percentages are annualized based on 12 months and 52 weeks per year to determine the design day forecasts. The enplanements forecast for the design day is summarized in the following table.

Table 3-20 – Design Day Passenger Airline Activity Forecast

Design Day Passenger Airline Enplanement Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Peak Month Enplanements (12.22%)	31,255	33,627	36,143	41,638
Avg. Week Peak Month Enplanements	7,213	7,760	8,341	9,609
Design Day (14.3%) Enplanements	1,031	1,110	1,193	1,374
Peak Month Operations	1,713	1,674	1,720	1,787
Avg. Week Peak Month Operations	395	386	397	412
Design Day (15.0%) Operations	59.6	58.3	59.9	62.2

Source: KLJ Analysis

Design Hour

The design hour is based on the flight schedules during a design day. Using the terminal planning guidance from ACRP Report 25, peak hour assumes passengers arrive to the airport 60 minutes prior to departure and remain at the airport up to 60 minutes after arrival. The July 2014 flight schedule was used to review a rolling peak in 10 minute intervals.

There are four airline flight operations (four departures) during the design hour. The design hour makes up 9 percent of the 60 actual design day airline flight operations. The passenger and operations forecast for the design hour are summarized in the following table.

Table 3-21 – Design Hour Activity

Design Hour Activity Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Peak Month Design Day Enplanements	1,031	1,110	1,193	1,374
Design Hour Enplanements (19.5%)	201	216	233	268
Design Day Operations	59.6	58.3	59.9	62.2
Design Hour Operations (9.0%)	5.4	5.2	5.4	5.6

Source: KLJ Analysis

Design hour passenger activity determinations are especially important for terminal space planning. This will be evaluated further in the Facility Requirements chapter.

Airport Operations

Peak Month

The peak month of airport operations was determined by reviewing the prior three years of monthly airport operations figures from the Air Traffic Control Tower. This method evaluates historic patterns of airport operations activity to identify the peak month. The peak month was determined to be July 2014 with 10.19 percent of the annual operations for fiscal year 2014, consistent with the fiscal year periods evaluated in this forecast effort. Peak month airport operations forecast based on the three year historic operations peak outlined in the following table.

Table 3-22 – Peak Month Operations Forecast

Peak Month Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Annual	14,016	13,700	14,079	14,623
Peak Month (12.22%)	1,713	1,674	1,720	1,787

Source: KLJ Analysis

Design Day

Using the July 2012 Air Traffic Control Tower peak data, the top 10 peak days consist of 2,081 operations for an average of 208.1 daily operations. The average of the top 10 days in the peak month will be considered the design day. This consists of 4.94 percent of the monthly operations.

Table 3-23 – Design Day Operations Forecast

Design Day Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Peak Month	4,214	4,410	4,750	5,579
Design Day (4.94%)	208	218	235	276

Source: KLJ Analysis

Design Hour

The design hour is based on the average hourly operations during a design day. To determine this figure, the average hourly operations were reviewed for the peak month, July 2012.

Table 3-24 – Design Hour Operations Characteristics

Design Hour Operations Characteristics		
Design Hour Operations	**Daily Average**	**Percent of Daily**
21	208	10.0%

Source: FAA Enhanced Traffic Management System Counts (FTMSC), RAP ATCT, KLJ Analysis

Using the design hour methodology developed, the design hour operations forecast is then developed and identified below.

Table 3-25 – Design Hour Operations Forecast

Design Hour Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Design Day	218	235	235	276
Design Hour (10.0%)	21	22	23	28

Source: KLJ Analysis

General Aviation Peaking Tendencies

Peak Month

The peak month of general aviation operations was determined by reviewing the prior three years of monthly airport operations figures from the Air Traffic Control Tower. This method evaluates historic patterns of airport operations activity to identify the peak month. The peak

month was determined to be July 2013 with 10.98 percent of the annual general aviation operations for fiscal year 2013.

Table 3-26 – Peak Month GA Operations Forecast

Peak Month GA Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Annual	22,590	24,757	27,628	35,043
Peak Month (10.98%)	2,480	2,718	3,034	3,848

Source: KLJ Analysis

Design Day

Using the July 2013 Air Traffic Control Tower peak data, the top 10 peak days consist of 814 operations for an average of 81.4 daily operations. The average of the top 10 days in the peak month will be considered the design day. This consists of 4.19 percent of the monthly operations.

Table 3-27 – Design Day Operations Forecast

Design Day Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Peak Month	2,480	2,718	3,034	3,848
Design Day (4.19%)	104	114	127	161

Source: KLJ Analysis

Design Hour

The design hour is based on the average hourly operations during a design day. Discussions with the Air Traffic Control Tower determined that approximately 20 percent of total daily activity would be a good estimate.

Using the design hour methodology developed, the design hour operations forecast is then developed and identified below.

Table 3-28 – Design Hour GA Operations Forecast

Design Hour Operations Forecast				
Metric	**2013**	**2018**	**2023**	**2033**
Design Day	104	114	127	161
Design Hour (20.0%)	21	23	25	32

Source: KLJ Analysis

Forecast Summary

The FAA templates to compare the proposed forecasts to the 2013 published FAA Terminal Area Forecast follow. The Aviation Forecasts were approved by the FAA on April 16, 2015 for use in this master planning effort.

Rapid City Regional Airport (RAP)							Airport Master Plan Forecast		
Rapid City, SD									10/21/2014
Aviation Forecasts									
A. Forecast Levels and Growth Rates									
		Specify base year:		2013	(Federal Fiscal Year)				
						Average Annual Compound Growth Rates			
	2013	2018	2023	2028	2033	2018	2023	2028	2033
Passenger Enplanements									
Air Carrier	59,457	63,969	68,754	73,832	79,208	1.47%	1.46%	1.45%	1.44%
Commuter	196,734	211,665	227,499	244,301	262,090	1.47%	1.45%	1.44%	1.42%
TOTAL	256,191	275,634	296,254	318,133	341,298	1.47%	1.46%	1.45%	1.44%
Operations									
Itinerant									
Air Carrier	2,148	2,177	2,701	2,841	3,251	0.26%	4.41%	1.02%	2.73%
Commuter/Air Taxi	12,596	12,323	12,258	12,617	12,435	-0.44%	-0.27%	0.01%	-0.06%
Total Commercial Operations	14,744	14,500	14,959	15,458	15,686	-0.33%	0.63%	0.66%	0.29%
General Aviation - Fixed Wing	13,947	15,022	16,626	18,801	21,485	1.50%	1.77%	2.01%	2.18%
General Aviation - Rotorcraft	1,050	1,131	1,251	1,415	1,617	1.50%	2.05%	2.49%	2.71%
Military	2,688	2,688	2,688	2,688	2,688	0.00%	0.00%	0.00%	0.00%
Total Itinerant Operations	32,429	33,340	35,524	38,361	41,476	0.56%	1.28%	1.55%	1.57%
Local									
General Aviation - Fixed Wing	7,441	8,432	9,555	10,484	11,702	2.53%	2.53%	2.31%	2.29%
General Aviation - Rotorcraft	152	172	195	214	239	2.53%	2.53%	2.31%	2.29%
Military	1,336	1,336	1,336	1,336	1,336	0.00%	0.00%	0.00%	0.00%
Total Local Operations	8,929	9,940	11,086	12,034	13,277	2.17%	2.19%	2.01%	2.00%
TOTAL OPERATIONS	41,358	43,280	46,610	50,396	54,753	0.91%	1.20%	1.33%	1.41%
Annual Instrument Approaches	1,784	1,853	1,974	2,132	2,305	0.75%	1.02%	1.19%	1.29%
Peak Hour Operations	21	22	23	25	28	0.91%	1.20%	1.33%	1.41%
Cargo/mail (enplaned + deplaned tons)	2,281,393	2,438,523	2,718,382	3,030,358	3,378,139	1.34%	1.77%	1.91%	1.98%
Based Aircraft									
Single Engine	70	75	75	86	91	1.41%	0.70%	1.35%	1.32%
Multi Engine	31	34	36	44	47	1.78%	1.58%	2.36%	2.10%
Turbojet	8	10	11	13	15	4.48%	3.77%	3.40%	3.48%
Helicopter	1	1	1	0	0	-	-	-	-
Other	1	1	1	1	1	-	-	-	-
TOTAL	111	121	125	143	154	1.70%	1.17%	1.72%	1.66%
B. Operational Factors									
	2013	2018	2023	2028	2033				
Average aircraft size (seats)									
Air Carrier	120.6	119.0	120.1	120.1	120.1	-0.27%	-0.04%	-0.03%	-0.02%
Commuter	42.7	46.5	46.9	49.6	52.4	1.73%	0.93%	1.01%	1.02%
Average enplaning load factor									
Air Carrier	74.45%	74.00%	74.00%	74.00%	74.00%	-0.12%	-0.06%	-0.04%	-0.03%
Commuter	76.15%	75.00%	75.00%	75.00%	75.00%	-0.30%	-0.15%	-0.10%	-0.08%
GA operations per based aircraft	204	205	221	216	227	0.15%	0.85%	0.39%	0.55%

Table 3-30 – Aviation Forecast Comparison to FAA TAF

Rapid City Regional Airport (RAP)			Master Plan Forecast	
Comparing Airport Planning and FAA TAF Forecasts				10/21/2014
	Year	Airport Forecast	FAA Terminal Area Forecast (TAF)	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2013	256,191	251,883	1.71%
Base yr. + 5yrs.	2018	275,634	271,337	1.58%
Base yr. + 10yrs.	2023	296,254	292,302	1.35%
Base yr. + 15yrs.	2028	318,133	314,894	1.03%
Base yr. + 20yrs.	2033	341,298	339,237	0.61%
Growth Rate		*1.44%*	*1.50%*	
Commercial Operations				
Base yr.	2013	14,744	14,686	0.39%
Base yr. + 5yrs.	2018	14,500	15,420	-5.97%
Base yr. + 10yrs.	2023	14,959	16,194	-7.63%
Base yr. + 15yrs.	2028	15,458	17,016	-9.16%
Base yr. + 20yrs.	2033	15,686	17,874	-12.24%
Growth Rate		*0.31%*	*0.99%*	
Itinerant Operations				
Base yr.	2013	32,429	32,661	-0.71%
Base yr. + 5yrs.	2018	33,340	33,961	-1.83%
Base yr. + 10yrs.	2023	35,524	34,840	1.96%
Base yr. + 15yrs.	2028	38,361	35,767	7.25%
Base yr. + 20yrs.	2033	41,476	36,730	12.92%
Growth Rate		*1.24%*	*0.59%*	
Total Operations				
Base yr.	2013	41,358	41,908	-1.31%
Base yr. + 5yrs.	2018	43,280	43,558	-0.64%
Base yr. + 10yrs.	2023	46,610	44,804	4.03%
Base yr. + 15yrs.	2028	50,396	46,116	9.28%
Base yr. + 20yrs.	2033	54,753	47,482	15.31%
Growth Rate		*1.41%*	*0.63%*	