Chapter Two
Forecasts of Aviation Activity

Steamboat Springs
Airport Master Plan

Chapter Two
Forecasts

INTRODUCTION

Forecasts of aviation activity serve as a guideline for the timing required for implementation of airport improvement programs. While such information is necessary for successful comprehensive airport planning, it is important to recognize that forecasts are only approximations of future activity based upon historical data and viewed through present situations. Therefore, they must be used with careful consideration as they may lose their validity with the passage of time and should be continuously monitored and periodically updated.

For this reason, an ongoing program of examination of local airport needs and national and regional trends is recommended and encouraged in order to promote the orderly development of aviation facilities at the Steamboat Springs Airport.

The Steamboat Springs Airport does not have an air traffic control tower and at airports not served by air traffic control towers, estimates of existing aviation activity are necessary in order to form a basis for the development of realistic forecasts. Unlike towered airports, it is difficult for non-towered general aviation airports to accurately track or maintain comprehensive logs of aircraft operations. Estimates of existing aviation activity are based upon a review of based aircraft, available historical data, available FBO logs and regional, state and national data to form the baseline to which forecasted aviation activity trends are applied.

Activity projections are made based upon estimated growth rates, area demographics, industry trends and other indicators. Forecasts are prepared for the Initial-Term (0-5 years), the Intermediate-Term (6-10 years) and the Long-Term (11-20 years) time frames. Utilizing forecasts within these time frames will allow the construction of airport improvements to be timed to meet demand, but not so early as to remain idle for an unreasonable length of time.

There are four types of aircraft operations considered in the planning process. These are termed “local, based, itinerant and transient.” They are defined as follows:

Local operations are defined as aircraft departures or arrivals for the purpose of training, pilot currency or pleasure flying within the immediate area of the local airport. These operations typically consist of touch-and-go operations, practice instrument approaches, flights to and within local practice areas and pleasure flights that originate and terminate at the airport under study.

Itinerant operations are defined as aircraft arrivals and departures other than local operations that generally originate or terminate at another airport. These types of operations are closely tied to local demographic indicators, such as local industry and business use of aircraft and usage of the facility for recreational purposes. Itinerant operations may be conducted by based or transient aircraft.

Based aircraft operations are defined as the total operations made by aircraft based (stored at the airport on a permanent, seasonal or long-term basis) at the study airport, with no attempt to classify the operations as to purpose.

Transient operations are defined as the total operations made by aircraft other than those based at the airport under study. These operations typically consist of business or pleasure flights originating at other airports, with termination or a stopover at the study airport.

The terms transient and itinerant are sometimes erroneously used interchangeably. This study will confine analysis to local and itinerant operations to correlate with FAA and State Aeronautics forecasting criteria.

NATIONAL AND REGIONAL TRENDS

As the Steamboat Springs Airport is an airport that primarily serves general aviation aircraft, general aviation industry trends were analyzed in the development of the airport's forecasted activity. According to factors such as aircraft production, pilot activity and hours flown, general aviation reached a peak in the late 1970s. This peak was followed by a long downturn that persisted through most of the 1980s and the early 1990s and has been attributed to high manufacturing costs associated with product liability issues as well as other factors. The General Aviation Revitalization Act (GARA) of 1994 was enacted with the goal of revitalizing the industry by limiting product liability costs. The Act established an 18-year statute of repose on liability related to the manufacture of all general aviation aircraft and their components. According to a 2001 report to Congress by the General Accounting Office (GAO), trends in general aviation since GARA was enacted suggest that liability costs have been less burdensome to manufacturers, shipments of new aircraft have increased and technological advances have been made. Indicators of general aviation activity, such as the numbers of hours flown and active pilots, have also increased in the years since GARA, but their growth has not been as substantial as the growth in manufacturing.

The terrorist attacks on U.S. aviation in September 2001 had a substantial impact on these positive general aviation industry trends. Significant restrictions were placed on general aviation flying following September 2001, which resulted in a considerable decrease in general aviation activity. Fortunately, most of these restrictions have now been lifted and the Federal Aviation Administration (FAA) is forecasting continued growth in general aviation.

The FAA annually convenes expert panels in aviation and develops forecasts for future activity in all areas of aviation, including general aviation. The FAA's 2006 forecast predicts the general aviation aircraft fleet will increase at an average annual rate of 1.4 percent during the 12-year forecast period, growing from an estimated 214,591 aircraft in 2005 to 252,775 aircraft in 2017. The fleet of turbine aircraft is expected to increase at a greater rate than the fleet of piston aircraft; as a result, the number of piston aircraft, while continuing to increase, is expected to represent a smaller percentage of the total general aviation fleet. Figures 2-1 and 2-2 illustrate this forecasted change to the general aviation fleet.

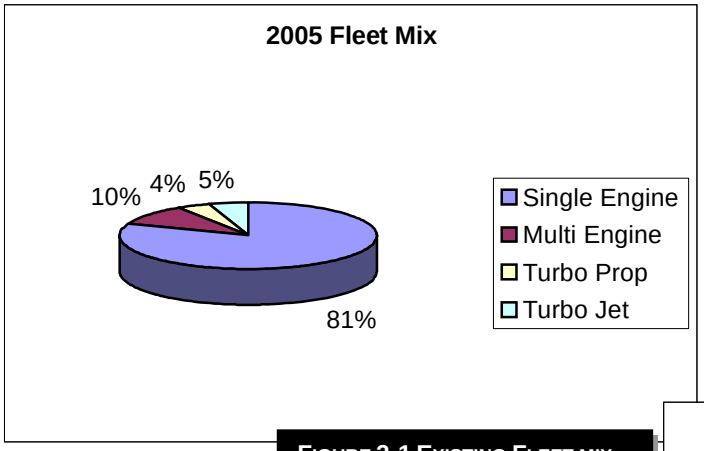

FIGURE 2-1 EXISTING FLEET MIX

SOURCE: GENERAL AVIATION MANUFACTURE'S ASSOCIATION (GAMA) 2005

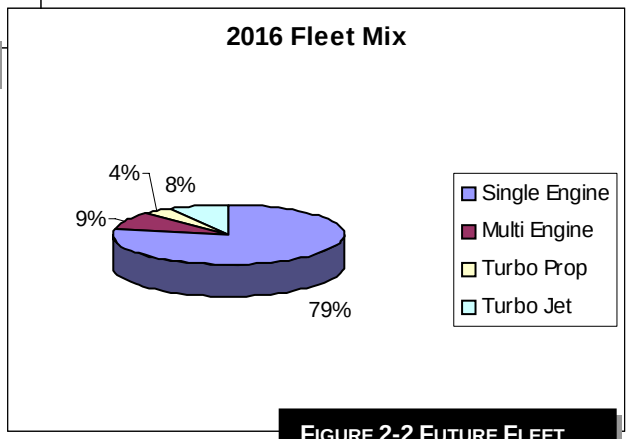

FIGURE 2-2 FUTURE FLEET

The General Aviation Manufacturer's Association (GAMA) produces activity forecasts based on general aviation hours flown. As shown in Table 2-1, the number of turbojet (TJ) hours is forecasted to increase 110 percent from 2005 to 2016.

TABLE 2-1 NATIONAL GENERAL AVIATION FORECAST

	Hours Flown (in millions)				
Year	**SE**	**ME**	**TP**	**TJ**	**Total**
2005	16.5	2.2	1.8	2.9	23.4
2006	16.6	2.2	1.9	3.1	23.8
2007	16.7	2.2	1.9	3.4	24.2
2008	16.8	2.2	1.9	3.6	24.5
2009	16.8	2.2	1.9	3.9	24.8
2010	16.9	2.2	2.0	4.2	25.3
2011	17.0	2.2	2.0	4.6	25.8
2012	17.1	2.2	2.0	4.9	26.2
2013	17.1	2.2	2.1	5.2	26.6
2014	17.2	2.2	2.1	5.5	27.0
2015	17.2	2.2	2.1	5.9	27.4
2016	17.3	2.2	2.1	6.1	27.7

Source: General Aviation Manufacturer's Association 2005 statistical Databook

Another industry trend is the increasing amount of research and development of programs like the Small Aircraft Transportation System (SATS). The National Aeronautics and Space Administration (NASA), FAA, States, industry and academic partners have joined forces to pursue the NASA National General Aviation Roadmap leading to a Small Aircraft Transportation System. This long-term strategic undertaking seeks to bring next-generation technologies and improved air access to small communities. The envisioned outcome is to improve travel between remote communities and transportation centers in urban areas by utilizing a new generation of single-pilot light aircraft for personal and business transportation between the nation's 5,400 public use general aviation airports.

Current NASA investments in aircraft technologies are enabling industry to bring affordable, safe and easy-to-use features to the marketplace, including "Highway in the Sky" glass cockpit operating capabilities which utilize digital displays to provide pilots with terrain, speed and route information, affordable crashworthy composite airframes, more efficient IFR flight training and revolutionary aircraft engines. To facilitate this initiative, a comprehensive upgrade of public infrastructure must be planned, coordinated and implemented within the framework of the national air transportation system. State partnerships are proposed to coordinate research support in key public infrastructure areas. Ultimately, SATS may permit more than tripling aviation system throughput capacity by tapping the under-utilized general aviation facilities, such as the Steamboat Springs Airport, to achieve the national goal of doorstep-to-destination travel at four times the speed of highways for the nation's suburban, rural and remote communities.

The introduction of the Very Light Jet (VLJ) may have an impact on the Steamboat Springs Airport. The small jet (less than 10,000 lbs.) can travel at speeds exceeding 400 knots at altitudes of 41,000 feet and is relatively inexpensive in the jet market (see Figure 2-3). These aircraft are expected to allow people to travel in jet aircraft to virtually any airport in the U.S. due to the small size and the short length required for takeoff and landing.

The demand for these aircraft is beginning to take shape, as the first VLJs certification was achieved in September 2006. Estimates have forecasted as many as 4,500 VLJs flying by 2016. The majority of the VLJ market is expected to be business people who seek flexible traveling schedules and air taxi services. The lack of efficiency in the hub and spoke system is a major contributor to the VJL market which will provide high-speed, low cost, convenient service to desired destinations.

FIGURE 2-3 VLJ

Several airtaxi/commercial operators were contacted about the possibility of operating out of the Steamboat Springs Airport. The companies that were contacted indicated that the possibility of serving a resort community such as Steamboat Springs as an on demand air taxi may be a potential, however, operating an airline into Steamboat Springs with these types of aircraft would be less likely. The VLJs are very small and since many of the people flying into and out of Steamboat Springs would either have skis or golf clubs and some luggage, the available space would be limited. The VLJ airline is setup to provide business travelers with day trips.

The continued growth in fractional ownership arrangements is another significant industry trend that may affect the Steamboat Springs Airport. Fractional ownership arrangements allow

businesses and individuals to purchase an interest in an aircraft and pay for only the time that they use the aircraft. According to the National Business Aviation Association (NBAA), in 1986, there were three owners of fractionally held aircraft. By 1993, there were 110. From 2000 to 2002, the number of companies and individuals using fractional ownership grew by 52 percent, from 3,834 to 5,827 shares; the growth from 1999 (2,607) to 2002 was 124 percent. The number of airplanes in fractional programs grew 11 percent in 2002, from 696 to 776.

The national increase in turbine aircraft use is a result of the success of fractional ownership, the introduction of new types of turbine aircraft and a transition from commercial air travel to corporate/business air travel as a result of increased security measures implement after September 2001.

AVAILABLE ACTIVITY FORECASTS

The first step in preparing aviation forecasts is to examine historical and existing activity levels and currently available forecasts from other sources. The FAA Terminal Area Forecasts (TAF), the forecast from the Colorado State Systems Plan and the previous Airport Master Plan Forecast were reviewed. The FAA TAF (August 2006) indicates 66 existing based aircraft for Steamboat Springs Airport and 22,191 existing annual operations. The TAF numbers are forecasting 95 based aircraft and 25,213 operations in 2025. The Colorado State Systems Plan (October, 2006) indicates 63 existing based aircraft and 21,484 existing annual operations at the Steamboat Springs Airport. The State Systems Plan includes a forecast of 95 based aircraft and 24,214 annual operations for Steamboat Springs by the year 2025. The 1998 Steamboat Springs Airport Master Plan projected 44 based aircraft and 15,405 operations by 2017.

FAA Form 5010-1, *Airport Master Record*, is the official record kept by the Federal Aviation Administration to document airport physical conditions and other pertinent information. The record normally includes an annual estimate of aircraft activity as well as the number of based aircraft. This information is normally obtained from the airport sponsor. The accuracy of these documents for an airport the size of Steamboat Springs Airport is dependent on the accuracy of the airport sponsor's record keeping system. The FAA Form 5010-1 (September, 2006) for the Steamboat Springs Airport indicates 82-based aircraft, 69 single engine and 13 multi engine and 10,698 annual aircraft operations. This form also breaks down the Steamboat Springs operations to 500 Air Taxi, 9,188 GA Local, 1,000 GA Itinerant and 10 military operations.

EXISTING AVIATION ACTIVITY

According to the 2005 airport management records, based aircraft and operations totals at the Steamboat Springs Airport are 92 based aircraft and approximately 10,764 operations as described in Chapter 1.

AIRPORT USER SURVEY

Airport user surveys were sent out to the list of 132 based and frequent airport users and 60 responses were received. The survey requested basic information including the following:

- residency, business ownership or second home ownership;
- the importance of the airport on the decision to live in or have a business in Steamboat Springs;
- the economic impact of the airport users was gathered, including payroll totals and employee totals;

- the number of operations that each user conducted at the airport and the number of touch and go operations from January 1, 2005 to December 31, 2005;
- the greatest needs for improvements at the airport and the importance of the Steamboat Springs Airport to the community;

A copy of the survey and a summary of the results is included in Appendix D of this report.

ANNUAL AIRCRAFT OPERATIONS

The number of touch and go operations[1] from those who responded indicated they conducted approximately 1,940 total touch and go operations. This figure was then doubled as one touch and go consists of two operations (one landing and one takeoff) resulting in 3,880 operations from those who responded. The average number of touch and go operations for those who did not respond was found by taking the total responses and calculating an average. The high number of touch and goes recorded from some of the responses such as flight instructors was not used in calculating the average. The average number of touch and go operations was found to be 17 per response. The 17 touch and goes were multiplied by the number of those who did not respond which was 72. This resulted in approximately 1,224 touch and go operations. The 1,224 touch and go operations were then multiplied by two to calculate the number of operations which equal approximately 2,448. The 3,880 operations and the 2,448 operations were added together giving the airport approximately 6,328 annual touch and go operations. The touch and go operations were added to the 10,764 resulting in 17,092 estimated annual operations at the airport

BASED AIRCRAFT AND OPERATIONS PER BASED AIRCRAFT

There are 92 aircraft based at the Steamboat Springs Airport (as of October, 2006). A copy of the based aircraft model type and tail number can be found in Appendix C of this report. The total annual operations estimate for the Steamboat Springs Airport is approximately 17,092. These totals result in 186 total operations per based aircraft (OPBA). It should be noted that OPBAs include all operations at an airport including transient flights and training. The OPBA ratio does not indicate each based aircraft will actually conduct that number of operations. The OPBA is recognized by the FAA as a method of determining activity at general aviation airports using known variables. According to FAA Order 5090.3C a general guideline is 250 operations per based aircraft for rural general aviation airports with little itinerant traffic, 350 operations per based aircraft for busier general aviation airports with more itinerant traffic and 450 operations per based aircraft for busy reliever airports.

TABLE 2-2 STEAMBOAT SPRINGS AIRPORT BASED AIRCRAFT FLEET MIX (2006)

Single Engine Piston	61
Multi-Engine Piston	14
Turbo-Prop	12
Turbo Jet	0
Rotorcraft	5
TOTAL	**92**

Source: Steamboat Springs Airport Management, October, 2006

The Steamboat Springs Airport is currently an Airport Reference Code (ARC) B-II airport serving predominately single engine piston, multi-engine piston and turbo prop aircraft, with some use by light turbojet aircraft. Typical users include:

[1] A touch and go operation involves an aircraft landing on the runway and then immediately taking off again without coming to a full stop. This type of operation is used for training purposes.

Air Medivac Services: Air medivac provides essential emergency medical transport in life threatening situations and patient transfers from clinics to higher level care facilities. According to airport management there are a number of companies throughout the region that operate helicopters and King Air 200s into and out of the Steamboat Springs Airport. According to Routt County Communications, there were a total of 42 air ambulance flights out of the Steamboat Springs Airport in 2005.

Business/Recreational Transportation: These users desire the utility and flexibility offered by general aviation aircraft. The types of aircraft utilized for personal and business transportation varies with individual preference and resources and generally includes a mix of single-engine, multi-engine and turbojet aircraft. This category also includes skiing and tourism traffic. There are 89 based and frequent use aircraft registered to businesses. These numbers are expected to continue to increase as the community continues to grow and the number of second homes continues to increase.

Wildfire Management: The U.S. Forest Service utilizes the airport for wildfire control and suppression. The number of these operations varies greatly depending on the fire season in the area. According to airport management, during fire season there is a Bell Jet Ranger helicopter and fire crew based at the airport. During a fire, large helicopters are also utilized and the Forest Service sets up a command center at the City-owned maintenance facility, located on the south end of the airport. The Medicine Bow-Routt National Forest fire control officer was contacted regarding the usage of the Steamboat Springs Airport. The fire control officer stated that the airport usage varies anywhere from twenty to several hundred operations per year depending on the fire season.

Flight Training: Two flight instructors conduct fixed-wing training out of Steamboat Springs and flight schools from other airports in the state and region have students perform cross-country flights to Steamboat Springs Airport. Flight training includes instructional flying to obtain a pilot's license or proficiency checks including biennial flight reviews. The majority of aircraft used for flight instruction include single and multi engine piston. Helicopter training is also provided at the airport by Zephyr Helicopters. Appendix C contains the most current information on pilot training activities at Bob Adams Field as reported in the Steamboat Springs Airport Managers Report presented during the Yampa Valley Airport Commission meeting on December 13, 2007.

Search and Rescue: Routt County Search and Rescue utilizes the Steamboat Springs Airport for their operations. Routt County often uses Zephyr Helicopters during emergency situations. The Civil Air Patrol (CAP) also utilizes the Steamboat Springs Airport during search and rescue missions and during flight instruction. CAP currently has one airplane based at the airport.

EXISTING BASED AIRCRAFT DEMAND

The City of Steamboat Springs currently has a list of 21 people waiting for available hangars at the airport. These individuals have indicated a strong interest in basing an aircraft as soon as adequate hangar space is available or land on the airport is made available to lease and allow the aircraft owner to build a hangar at their own expense. According to airport management, the number of based aircraft could increase by 30-50 aircraft if adequate hangar space were made available. There has also been local interest expressed in developing a fly-in residential community adjacent to the airport.

HISTORICAL BASED AIRCRAFT AND OPERATIONS

Airport management has kept a record of based aircraft and operations since 1996. The airport has shown a 15.5 percent average annual increase in based aircraft over the period. Table 2-3 shows the number of historical based aircraft and operations since 1996.

TABLE 2-3 HISTORICAL BASED AIRCRAFT AND OPERATIONS

Year	Based Aircraft	Operations
1996	36	6,102
1997	42	7,912
1998	40	7,996
1999	48	9,190
2000	50	7,996
2001	62	10,698
2002	62	10,706
2003	65	9,718
2004	76	10,682
2005	92	10,764

Source: Steamboat Springs Airport Management

FORECASTS OF AVIATION ACTIVITY

FACTORS INFLUENCING AVIATION DEMAND

There are several factors influencing aviation demand at the Steamboat Springs Airport. These factors include population growth, Steamboat Springs Ski Resort development, additional primary and second home development in the area and the attraction of location-neutral businesses. The economic development taking place in Steamboat Springs is a major factor in the demand for airport facilities. Private recreational, government, business and tourism flying will continue to be factors in the utilization of the airport, as well as flight training, air ambulance, fire fighting and search and rescue.

BASED AIRCRAFT

A comparative analysis of based aircraft forecasts was accomplished using four methodologies to derive a preferred forecast of based aircraft for the Steamboat Springs Airport. The first method utilized a bottom-up per capita approach that projects the number of based aircraft in direct proportion to the projected population for Routt County. This resulted in 150 based aircraft at the Steamboat Springs Airport in 2025 (see Table 2-4). According to FAA Order 5090.3C, when forecast data is not available, a satisfactory procedure is to forecast based aircraft using the statewide growth rate from the TAF and to develop activity statistics by estimating annual operations per based aircraft. The second forecasting method for based aircraft utilized the FAA's Terminal Area Forecast annual growth rate for the State of Colorado which is approximately 1.6% per year. This growth rate of 8% every five years would result in approximately 125 based aircraft in Steamboat Springs in 2026 (see Table 2-5).

TABLE 2-4 PER CAPITA METHOD

Year	Population	Aircraft
2005	21,313	92
2010	24,022	104
2015	27,407	119
2020	30,824	134
2025	34,562	150

TABLE 2-5 STATE OF COLORADO TAF METHOD

Year	Based Aircraft
2005	92
2010	99
2015	107
2020	116
2025	125

The third forecasting method for based aircraft utilized a trend of historical based aircraft growth and projected the percentage of increased based aircraft to continue on the same percentage. According to historical data provided by the airport management, over the last 10 years the number of based aircraft grew from 36 in 1996 to 92 in 2006. This equates to a 15.5 percent average annual increase over the 10 year period. The 15.5 percent annual increase was used to project the number of based aircraft over the 20 year period which would result in 167 based aircraft in 2025 (see Table 2-6).

TABLE 2-6 HISTORICAL TREND METHOD

Year	Based Aircraft
2005	92
2010	107
2015	124
2020	144
2025	167

After reviewing the different methods, it is recommended that an adjusted per capita method be considered as the preferred based aircraft forecast. As previously stated, airport forecasts are not an exact science. Forecasting numbers for a specific year, particularly beyond 10 years in the future, is very difficult. The aviation industry is volatile and susceptible to change with the economy. Figure 2-4 shows the variation in number of based aircraft for each type of forecasting method.

Airport management has a list of airport users waiting for a hangar or space to build hangars. Once additional hangar space is made available, it is expected that there will be a nearly immediate increase in the number of based aircraft. The per capita method would fit as the preferred method if demographics, income, second homes and employment were not changing; however, those items are expected to change and the number of based aircraft is expected to increase at a faster rate beginning with the availability of facilities such as hangars. Therefore, the adjusted method takes the anticipated increase over the first five years then trends toward the per capita method based on the projected population for Routt County. Table 2-7 shows the adjusted per capita method which results in 158 based aircraft in 2025.

TABLE 2-7 ADJUSTED PER CAPITA METHOD (RECOMMENDED METHOD)

2005	**92**
2010	**122**
2015	**130**
2020	**141**
2025	**158**

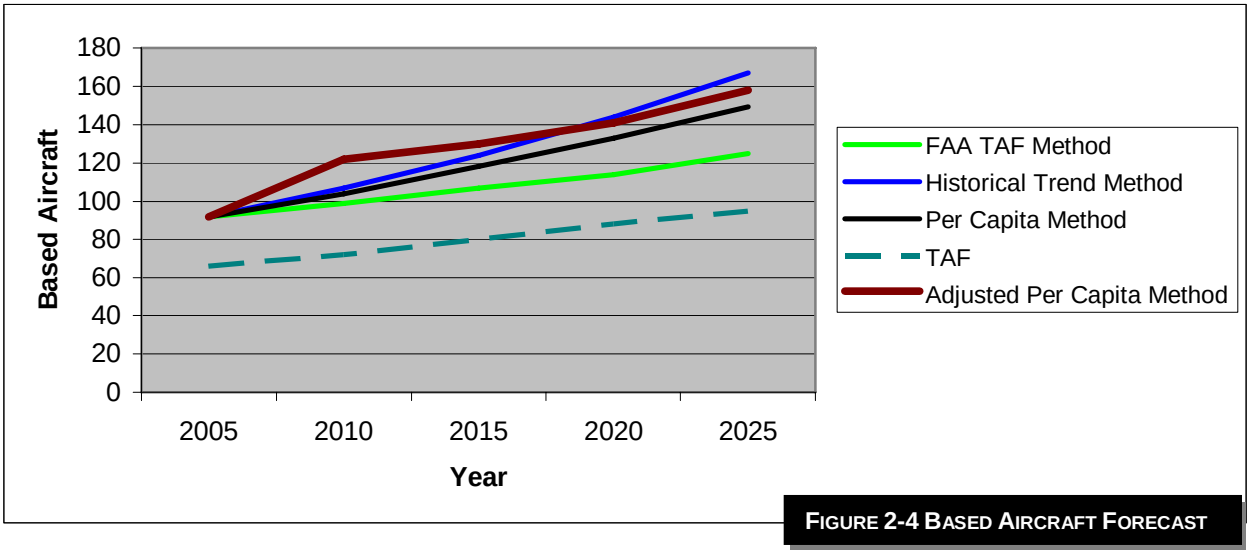

FIGURE 2-4 BASED AIRCRAFT FORECAST

ANNUAL AIRCRAFT OPERATIONS

In order to develop a preferred forecast of aircraft operations at the Steamboat Springs Airport, a number of methods were analyzed. Each method utilizes the recommended based aircraft forecast of 158 based aircraft from 2006 to 2025, then applies an operations per based aircraft (OPBA) to the based aircraft forecast. The methods are summarized as follows:

Method 1: Existing operations per based aircraft (186 OPBA)

Method 2: FAA Order 5090.3C (350 OPBA)

Method 3: FAA TAF (265 OPBA)

For the first method, the base year level of operations per based aircraft of 186 was applied to the recommended based aircraft forecast. Applying 186 OPBA to the recommended based aircraft forecast (see Table 2-7) results in 29,388 annual operations in 2025.

A general guideline from FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)* of 350 OPBA for busier general aviation airports with more itinerant traffic was applied to the based aircraft forecast for Method 2. Applying 350 OPBA to the preferred based aircraft forecast results in 55,300 forecast operations in 2025.

The third method, applied the FAA TAF OPBA (265) guideline to the forecast. This method results in a forecast of 41,870 operations in 2025.

These estimates provide a likely range of activity for future operations at the Steamboat Springs Airport and are shown in Figure 2-5. With improvements to the facilities and services such as enhanced radar coverage, improved approaches and additional hangar space, it is reasonable to anticipate the OPBA to increase over the planning period from 186 existing to 265 in 2025. The increasing OPBA trend was applied to the recommended based aircraft forecast to derive the recommended unconstrained operations forecast.

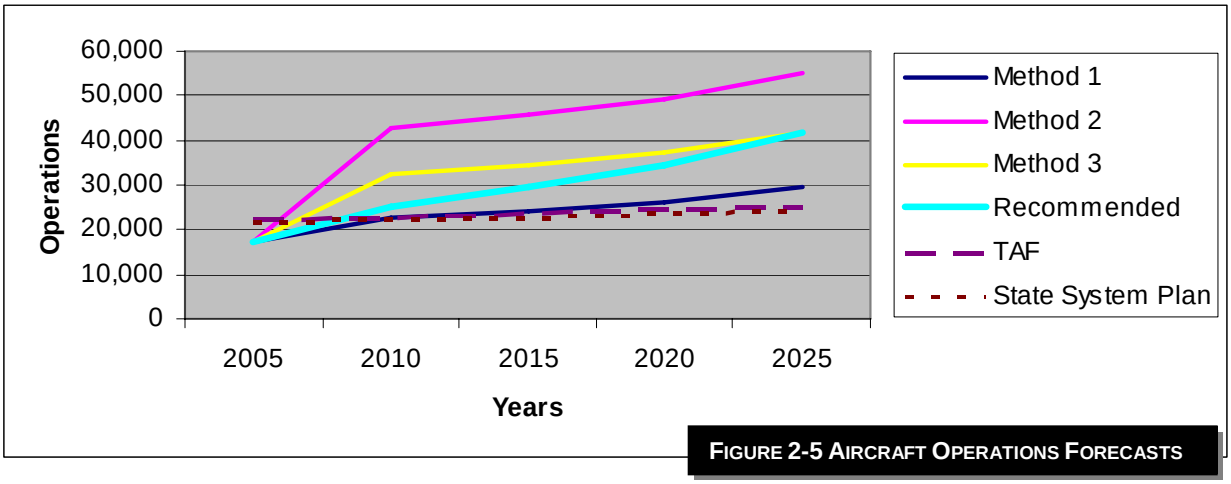

FIGURE 2-5 AIRCRAFT OPERATIONS FORECASTS

ITINERANT AND LOCAL OPERATIONS

Local operations consist primarily of training and recreational flights in the area. The remaining itinerant flights primarily consist of personal transportation, business transportation and recreational flights to and from other airports. Operations that would be considered local include ranchers, aerial observation and surveying, recreation and tourism, fire management and flight

training. The percentage of local versus itinerant operations was determined using the airport user survey results along with information provided by the instrument flight activity database. Instrument flight plans are required to be filed by larger corporate and commercial type aircraft that fly above 18,000 feet means sea level (MSL), along with other general aviation airplanes during inclement weather conditions. All instrument flight plans that are activated into or out of the Steamboat Springs Airport are kept in a database. This data provides fairly accurate information for the jet and turboprop type aircraft; however, it does not reflect the number of small general aviation aircraft that are operating under visual flight rules (VFR) and are not required to file an instrument flight plan. Table 2-8 shows the preferred forecast of aviation activity.

TABLE 2-8 PREFERRED FORECAST OF AVIATION ACTIVITY

Year	Based Aircraft	Local Operations	Itinerant Operations	Total Operations
2005	92	6,428	10,664	17,092
2010	122	8,909	16,193	25,102
2015	130	10,291	19,096	29,315
2020	141	12,053	22,527	34,580
2025	158	14,594	27,276	41,870

Source: Airport User's Survey (October, 2006) Instrument Flight Plan Database (GCR and Associates October, 2006)

AIRPORT USERS AND FLEET MIX

The existing number of operations was based in part on the instrument flight plan data system which tracks all instrument flight plans filed into or out of an airport. Instrument flight plans are primarily used by pilots of jet and turboprop aircraft (as they typically fly above flight level 18,000 feet MSL) and used by some pilots flying piston aircraft during instrument meteorological conditions. The number of turboprop operations was estimated from the instrument flight activity assuming that 20 percent of the turbo-prop aircraft operated VFR. This resulted in 625 annual turboprop operations during 2005. Turbojet operations were also estimated using the instrument flight data assuming that 10 percent of the jet aircraft operated under VFR. This results in approximately 133 turbojet operations. Figures 2-6 and 2-7 illustrate the forecasted change to Steamboat Springs Airport's fleet mix. Figure 2-8 shows a King Air at the Steamboat Springs Airport.

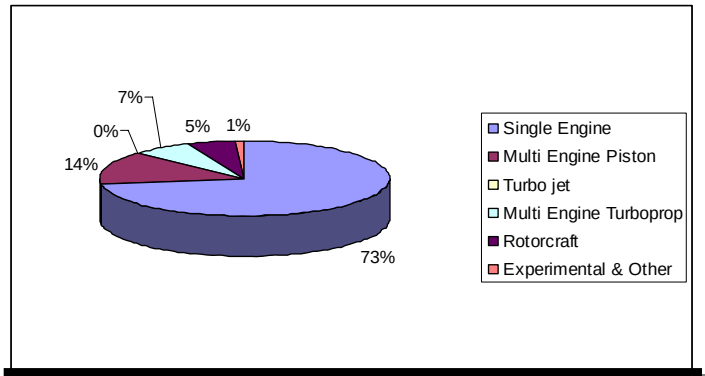

FIGURE 2-6 STEAMBOAT SPRINGS AIRPORT EXISTING FLEET MIX

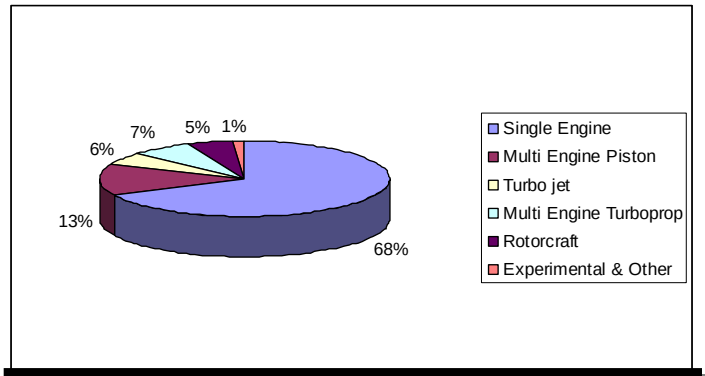

FIGURE 2-7 STEAMBOAT SPRINGS AIRPORT FUTURE FLEET MIX

As previously stated, a user survey was distributed to airport users to gather information on operations including touch and goes. Results from the survey indicated that touch and go operations are mainly attributed to single-engine piston, multi-engine piston and helicopter operations. Based on local fuel sales trends VLJ development, GAMA forecasts and trends in aircraft utilization the operational fleet mix is expected to remain constant during the planning period with the exception of a trend toward having an increase in the number of based jets to closer match the GAMA forecast of 6% jet. These trends were applied to the operations forecast to derive the forecast by aircraft type shown in Table 2-9.

TABLE 2-9 DETAILED FORECASTS BY AIRCRAFT TYPE

		2005	2010	2015	2020	2025
Single Engine Aircraft		67	84	90	96	107
	Itinerant Operations	8,152	11,220	13,022	15,363	18,603
	Local Operations	4,000	5,515	5,909	6,970	8,439
	Total Operations	12,152	16,735	18,931	22,333	27,042
Multi-Engine Piston		13	17	18	19	21
	Itinerant Operations	1,576	2,560	3,011	3,552	4,300
	Local Operations	500	1,000	1,060	1,250	1,514
	Total Operations	2,076	3,560	4,071	4,802	5,814
Turbo Jet Aircraft		0	5	5	7	9
	Itinerant Operations	133	1,000	1,500	1,769	2,142
	Local Operations	0	0	0	0	0
	Total Operations	133	1,000	1,500	1,769	2,142
Multi- Engine Turboprop		6	8	9	10	11
	Itinerant Operations	625	1,200	1,350	1,592	1,928
	Local Operations	0	0	0	0	0
	Total Operations	625	1,200	1,350	1,592	1,928
Rotorcraft		5	6	6	7	8
	Itinerant Operations	178	213	213	251	303
	Local Operations	1,828	2,194	3,000	3,539	4,285
	Total Operations	2,006	2,407	3,213	3,790	4,588
Experimental & Other		1	2	2	2	2
	Operations	100	200	250	294	356
Annual Operations		**17,092**	**25,102**	**29,315**	**34,580**	**41,870**

FIGURE 2-8 KING AIR AT STEAMBOAT SPRINGS

AIRPORT SEASONAL USE DETERMINATION

A seasonal fluctuation in aircraft operations may be expected at any airport. This fluctuation is most apparent in regions with severe winter weather patterns and at non-towered general aviation airports. The fluctuation is less pronounced at major airports, with a high percentage of commercial and scheduled airline activity.

Non-towered airports generally experience a substantially higher number of operations in summer months than off-season months. The average seasonal use trend for FAA towered airports from the 1979-1984 records (total aircraft operations handled by tower facilities nationally from *FAA Statistical Handbook of Aviation*) was used as a baseline for determining seasonal use trends. As discussed above, the seasonal fluctuation is more pronounced at non-towered airports than towered airports. The seasonal use trend for towered airports was adjusted to approximate seasonal use trends at non-towered airports. This is presented in Table 2-10 and in Figure 2-9.

TABLE 2-10 SEASONAL USE TREND

Month	Non-towered	Towered
January	3.5%	7.2%
February	4.0%	8.2%
March	4.8%	8.6%
April	7.5%	9.0%
May	11.3%	9.1%
June	13.5%	9.4%
July	14.8%	9.1%
August	13.0%	8.7%
September	10.0%	8.7%
October	8.0%	7.8%
November	5.8%	7.1%
December	3.8%	7.1%

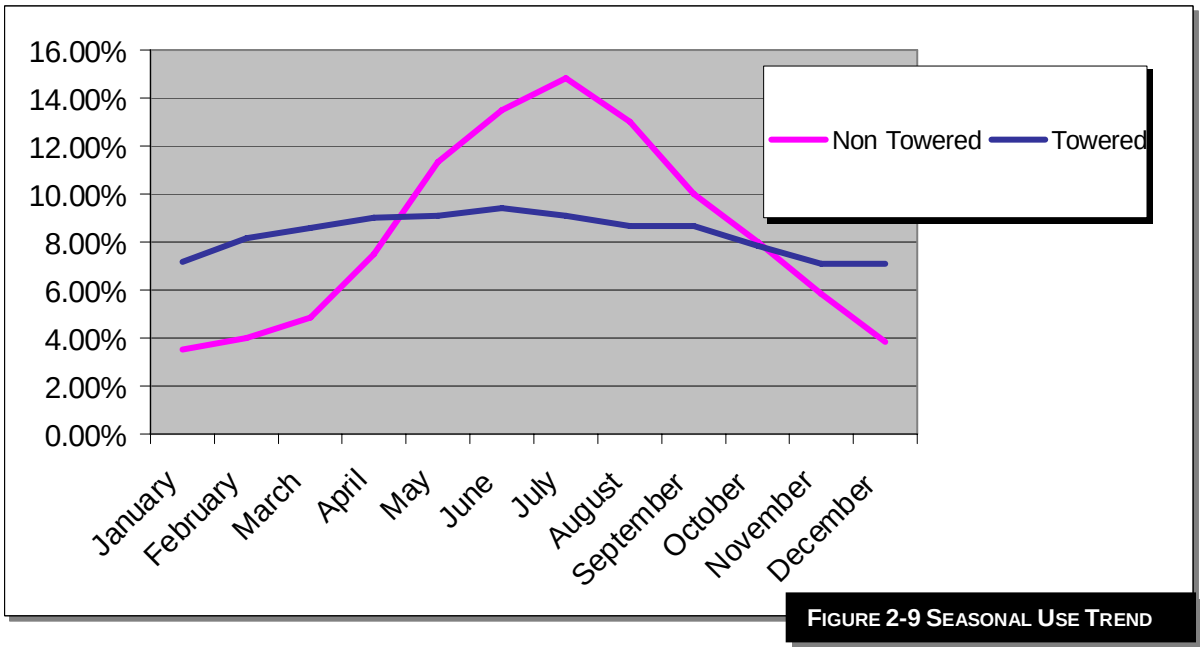

FIGURE 2-9 SEASONAL USE TREND

HOURLY DEMAND AND PEAKING TENDENCIES

In order to arrive at a reasonable estimate of demand at the airport facilities, it was necessary to develop a method to calculate the levels of activity during peak periods. The periods normally used to determine peaking characteristics are defined below:

Peak Month: The calendar month when peak enplanements or operations occur.

Design Day: The average day in the peak month derived by dividing the peak month enplanements or operations by the number of days in the month.

Busy Day: The Busy Day of a typical week in the peak month. In this case, the Busy Day is equal to the Design Day.

Design Hour: The peak hour within the Design Day. This descriptor is used in airfield demand/capacity analysis, as well as in determining terminal building, parking apron and access road requirements.

Busy Hour: The peak hour within the Busy Day. In this case, the Busy Hour is equal to the Design Hour.

The Seasonal Use Trend Curve, as presented in Figure 2-9, was used as a tool to determine the peaking characteristics for the Steamboat Springs Airport. Using the Seasonal Use information, a formula was derived which will calculate the average daily operations in a given month, based on the percentage of the total annual operations for that month, as determined by the curve. The formula is as follows:

$$M = A (T / 100)$$
$$D = M / (365 / 12)$$

Where T = Monthly percent of use (from curve)
M = Average monthly operations
A = Total annual operations
D = Average Daily Operations in a given month

Approximately 90% of total daily operations occur between the hours of 7:00 AM and 7:00 PM (12 hours) at a typical general aviation airport, meaning the maximum peak hourly occurrence may be 50% greater than the average of the hourly operations calculated for this time period.

The Estimated Peak Hourly Demand (P) in a given month was, consequently, determined by compressing 90% of the Average Daily Operations (D) in a given month into the 12-hour peak use period, reducing that number to an hourly average for the peak use period and increasing the result by 50% as follows:

$$P = 1.5 (0.90D / 12)$$

Where D = Average Daily Operations in a given month.
P = Peak Hourly Demand in a given month.

The calculations were made for each month of each phase of the planning period. The results of the calculations are shown in Table 2-11. As is evident in Table 2-11, the Design Day and Design Hour peak demand in the planning year occurs under VFR weather conditions in the month of July (highlighted in bold in Table 2-11).

TABLE 2-11 ESTIMATED HOURLY DEMAND/MONTH

MONTHLY/DAILY/HOURLY DEMAND

Planning Year: 2010
Operations: 25,102

Month	% Use	Operations		
		Monthly	Daily	Hourly
January	3.5	879	29	3.3
February	4.0	1,004	33	3.7
March	4.8	1,205	40	4.5
April	7.5	1,883	62	7.0
May	11.3	2,837	93	10.5
June	13.5	3,389	111	12.5
July	**14.8**	**3,715**	**122**	**13.7**
August	13.0	3,263	107	12.0
September	10.0	2,510	83	9.3
October	8.0	2,008	66	7.4
November	5.8	1,456	48	5.4
December	3.8	954	31	3.5

Planning Year: 2015
Operations: 29,315

Month	% Use	Operations		
		Monthly	Daily	Hourly
January	3.5	1,026	34	3.8
February	4.0	1,173	39	4.4
March	4.8	1,407	46	5.2
April	7.5	2,199	72	8.1
May	11.3	3,313	109	12.3
June	13.5	3,958	130	14.6
July	**14.8**	**4,339**	**143**	**16.1**
August	13.0	3,811	125	14.1
September	10.0	2,932	96	10.8
October	8.0	2,345	77	8.7
November	5.8	1,700	56	6.3
December	3.8	1,114	37	4.2

Planning Year: 2020
Operations: 34,580

Month	% Use	Operations		
		Monthly	Daily	Hourly
January	3.5	1,210	40	4.5
February	4.0	1,383	45	5.1
March	4.8	1,660	55	6.2
April	7.5	2,594	85	9.6
May	11.3	3,908	128	14.4
June	13.5	4,668	153	17.2
July	**14.8**	**5,118**	**168**	**18.9**
August	13.0	4,495	148	16.7
September	10.0	3,458	114	12.8
October	8.0	2,766	91	10.2
November	5.8	2,006	66	7.4
December	3.8	1,314	43	4.8

Planning Year: 2025
Operations: 41,870

Month	% Use	Operations		
		Monthly	Daily	Hourly
January	3.5	1,465	48	5.4
February	4.0	1,675	55	6.2
March	4.8	2,010	66	7.4
April	7.5	3,140	103	11.6
May	11.3	4,731	156	17.6
June	13.5	5,652	186	20.9
July	**14.8**	**6,197**	**204**	**23.0**
August	13.0	5,443	179	20.1
September	10.0	4,187	138	15.5
October	8.0	3,350	110	12.4
November	5.8	2,428	80	9.0
December	3.8	1,591	52	5.9

FORECAST SUMMARY

Recommended forecasts of aviation activity were derived for based aircraft, operations and fleet mix for the airport. These forecasts represent low, medium and high expected activity trends. The interest in basing aircraft at the airport shows the potential demand at the airport. This demand is currently constrained by the lack of available hangar space and the lack of a future terminal area plan at the airport. Once a terminal area plan is developed, the City of Steamboat Springs can begin leasing ground on the airport to allow aircraft owners to construct hangars. Another option for the City of Steamboat Springs is to construct hangars and lease the hangar space to these aircraft owners. This demand for basing aircraft and operating at the Steamboat Springs Airport explains why the master plan preferred forecasts exceed the TAF forecasts by more than 10 percent. The TAF is also incorrect with the number of current based aircraft at the airport due to expired data collected by the FAA. Table 2-12 shows the summary for the recommended Master Plan forecast for the Steamboat Springs Airport.

TABLE 2-12 FORECAST SUMMARY

	Based Aircraft	Enplanements		Itinerant Operations					Local Operations				
Year		AC	COMM	AC	AT & COM	GA	MIL	TOTAL	GA	MIL	TOTAL	TOT OPS	INST OPS
2005	92	0	0	0	1,500	9,164	0	10,664	6,428	0	6,428	17,092	1,112
2010	122	0	0	0	2,000	14,193	0	16,193	8,909	0	8,909	25,102	1,196
2015	130	0	0	0	2,500	16,596	0	19,096	10,291	0	10,291	29,315	1,292
2020	141	0	0	0	3,000	19,527	0	22,527	12,053	0	12,053	34,580	1,401
2025	158	0	0	0	3,500	23,776	0	27,276	14,594	0	14,594	41,870	1,510