3.0 AVIATION ACTIVITY FORECASTS

Aviation activity forecasts are essential for airport master plans because they project future demand activity levels. In the master planning process, forecasts are the second element of the investigation phase of a master plan. Once developed, aviation activity forecasts are used to determine the need for new or improved airport facilities. Per FAA Advisory Circular (AC) 150/5070-6B: *Airport Master Plans*, aviation forecasts should be realistic, based upon the latest available data, reflect current airport conditions, and provide adequate justification for airport planning and development. Additionally, forecasts must be prepared for short- (0-5 year), medium- (6-10 year), and long-term (10-20 year) periods, and specify the existing and future critical aircraft. In partnership with Jviation, Sixel Consulting was retained to prepare the 20-year enplanement forecast of HDN.

While forecasting is essential for a successful master plan, it only serves as an approximation of future activity based on historical data and present conditions. There are many unforeseen factors that can influence forecasts, both positively and negatively, as time progresses. For this reason, forecasts and the projects that they justify should be revisited periodically. Following the aviation forecasts, the Master Plan will examine the facility requirements based on anticipated aviation demand for the 20-year planning period, which concludes the investigation phase of the Master Plan, and initiates the solutions phase to accommodate future aviation demand on airport facilities.

3.1 DATA SOURCES

The following sources of data and guidance were used in the development of the aviation activity forecasts.

3.1.1 FAA Terminal Area Forecast (TAF)[1]

The TAF is updated annually and is used by the FAA to determine budget and staffing needs of the FAA, as well as being a resource for airport operators, the general public, and other interested parties. Due to limited staff resources, the FAA cannot forecast in as great of detail at small airports as they can at large airports. However, the TAF provides a guideline for developing forecasts, and is utilized for comparison of scenario-driven forecasts with the forecasts developed by the FAA. Generally, the requirement for FAA's approval of an airport's master plan forecasts

[1] FAA Terminal Area Forecast, http://aspm.faa.gov/main/taf.asp

is that they are supported by an acceptable forecast analysis consistent with the FAA TAF.[2]

3.1.2 FAA Advisory Circular 150/5070-6B, *Airport Master Plans*

This document provides the methodology employed to produce forecasts that are in compliance with FAA requirements for the development of airport master plans. AC 150/5070-6B provides a flexible approach to master planning that aims guidance towards critical issues for consideration and resource utilization. This AC contains the key guidance that explains the steps required for the development of a master plan, including the preparation of aviation activity forecasts and what elements should be forecasted.

3.1.3 FAA Form 5010-1, *Airport Master Record*

This document provides historical operational and enplanement data for HDN as filed with/by the FAA, and is utilized primarily to cross-reference other data sources.

3.1.4 Airport Cooperative Research Program Report (ACRP): Counting Aircraft Operations at Non-Towered Airports[3]

This 2007 report was prepared for the Airport Cooperative Research Program, a research branch of the Transportation Research Board of the National Academies. This report describes methodologies used across the country to estimate operations at airports without an air traffic control tower.

3.1.5 ACRP Report: Airport Aviation Activity Forecasting[4]

This 2007 report was also prepared by the ACRP. It discusses methods, including different forecast modeling, and practices for aviation activity forecasting. This report identifies ways to evaluate forecast, particularly uncertainty and accuracy in forecasts. This ACRP report also identifies common aviation metrics, issues in data collection and preparation, and data sources.

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[2] FAA AC 150/5070-6B, *Airport Master Plans*, http://www.faa.gov/documentLibrary/media/advisory_circular/150-5070-6B/150_5070_6b_chg1.pdf
[3] Airport Cooperative Research Program Synthesis 4, *Counting Aircraft Operations at Non-Towered Airports*, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_004.pdf
[4] Airport Cooperative Research Program Synthesis 1, *Airport Aviation Activity Forecasting*, http://onlinepubs.trb.org/onlinepubs/acrp/acrp_syn_002.pdf

3.1.6 Forecasting Aviation Activity by Airport[5]

Written by GRA, Inc. under contract to the FAA, this 2001 document provides guidance to individuals, as well as the FAA, when preparing airport activity forecasts as well as those who review the forecasts. Further, the FAA utilizes this guidance when developing the TAF.

3.1.7 FAA Aerospace Forecasts, Fiscal Years 2013-2033[6]

The FAA annually prepares this document to explain the current economic and aviation outlook, as well as macro level forecasts of aviation activity and the U.S. aircraft fleet.

3.1.8 Woods & Poole Economics[7]

Historical and forecast socioeconomic data for Routt County was obtained from Woods & Poole Economics of Washington, DC. Use of this data source is recommended by the FAA in the document "Forecasting Aviation Activity by Airports." Woods & Poole data included historical economic data for Routt County, dating back to 1970, as well as forecasted economic data up to the year 2040.

3.1.9 Local Data Sources

Other sources of data, such as city and county comprehensive plans and economic development information was obtained and researched to understand local economic issues. These data sources include Yampa Valley Data Partners Fast Facts (September 2013)[8], and the Dean Runyan: Economic Impact of Travel on Colorado 1996-2012 for Routt County.[9]

[5] FAA Aviation Data & Statistics, http://www.faa.gov/data_research/aviation_data_statistics/index.cfm?print=go

[6] FAA Aerospace Forecasts FY 2013-2033, http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2013-2033

[7] Woods & Poole Economics, Routt County, Colorado: 2013 Data Pamphlet. http://www.woodsandpoole.com/

[8] Yampa Valley Data Partners, Fast Facts, September 2013, http://yampavalleypartners.com/fast-facts-september-2013/.

[9] Dean Runyan Colorado Travel Impacts, Routt County, http://www.deanrunyan.com/COTravelImpacts/COTravelImpacts.html.

3.1.10 Federal and State Data Sources

Additional information was obtained from the State of Colorado and the U.S. Department of Commerce, Bureau of Economic Analysis to support data needs as necessary and described throughout this section.

3.2 DEMOGRAPHIC AND ECONOMIC FACTORS

The demand for aviation is largely a function of demographic and economic activity, given there is a causal relationship. When preparing forecasts, planners should consider socioeconomic data, demographics, disposable income, and geographic attributes. As mentioned in **Section 3.1.8**, socioeconomic data was collected from Woods & Poole Economics, an independent firm that specializes in long-term economic and demographic projections. Woods & Poole has a database for every county in the United States, with forecasts through 2040, using more than 900 variables.

3.2.1 Local and Regional Socioeconomic Characteristics

It is beneficial to incorporate an analysis of local and regional socioeconomic data in an airport's forecast for future aviation demand. In addition to data collected from Woods & Poole, socioeconomic data was also collected from the U.S. Census Bureau and the Bureau of Labor Statistics. Although Woods & Poole data is used in the forecast analysis, the following sections highlight the existing economic characteristics of Routt County, as indicated by the U.S. Census Bureau and the Bureau of Labor Statistics.

3.2.1.1 Income

According to the U.S. Census Bureau 2007-2011 five year estimate, the average (mean) annual family income of a Routt County resident was $94,396, and the County's average (mean) household income was $80,890.

3.2.1.2 Employment

The five-year (2007-2011) estimate for number of civilians employed in Routt County was approximately 14,091, which is nearly 60% of the population in 2012. The top industries include:

- Educational services/health care/social assistance (17.1%)
- Arts/entertainment/recreation/accommodation/food services (16.1%)
- Construction (14.4%)

- Professional/scientific/management/administrative/waste management services (11.8%)

The Bureau of Labor Statistics reports that the County's unemployment rate historically has been lower than both the nation's and the state's unemployment rate, but exceeded Colorado's unemployment rate in 2009. Routt County's current unemployment rate (7.4%) was a 13.1% decrease from 2011 (8.4%), and remains lower than both Colorado and the U.S., as graphically depicted in **Figure 3-1**.

FIGURE 3-1 – 5-YEAR HISTORICAL UNEMPLOYMENT RATES

Source: U.S. Bureau of Labor Statistics.

3.2.1.3 Regional Socioeconomic Conditions

According to Woods & Poole, the Western region, consisting of the Southwest, Rocky Mountain (including Colorado), and the broad West regions, and the Southeast region will experience the most growth of any region in the nation for the next 30 years. The population in the Western region is forecast to increase by 43.9 million people between 2011 and 2040. By the year 2040, 36% of all Americans are expected to reside in the West; this is up from 24% in 1970 and 33% in 2011. It is also expected to generate 32.5 million jobs from 2010 to 2040,

with a projected total U.S. job gain of 39%. Moreover, Woods & Poole predicts that the population of Routt County, Colorado, specifically, will grow between 1.01% and 1.30% annually through 2040.[10]

3.3 National Aviation Outlook

3.3.1 FAA Forecasts[11]

The FAA prepares a national aviation forecast each year. This forecast attempts to project commercial and GA activity levels so that the FAA can use the data to determine funding needs for various sections of the FAA, such as Airport Traffic Control. The current forecast document is for Fiscal Years 2013-2033.

For the commercial air industry, the recent recession has slowed near-term growth, but the long-term forecast remains encouraging. Since 2000, the commercial air industry has endured several major events, to include September 11, skyrocketing fuel prices, debt restructuring in the U.S. and Europe, and a global recession. To manage this extreme instability, airlines have had to streamline their business models by lowering operating costs, eliminating unprofitable routes, grounding older, less fuel efficient aircraft, and introducing separate charges for services that once were traditionally bundled with the price of a ticket. As a result, the industry managed a profit for a second consecutive year in 2011.

The FAA predicts that the overall system capacity will decline by 0.1% in 2013, but predicts growth for the commercial air carrier market over the long-term due to future growth of the U.S. and world economies. In the domestic commercial carrier market, the mainline carrier capacity growth is projected to remain flat, while the regional carriers are expected to decline by 0.4% in 2013. As the U.S. economy growth increases, overall domestic commercial carrier capacity is anticipated to grow at 2.1% annually with regional carriers growing faster at 3.2% than mainline carriers at 2.0% during the entire forecast period (2013-2033). Enplanements are forecasted to decline by 0.1% in 2013, but are expected to rebound and increase in 2014, with an annual average growth rate of 1.8% through 2033. The domestic enplanements are predicted to grow by an average of 1.9% for mainline carriers and 2.2% for regional carriers annually through 2033.

For general aviation, the FAA is "cautiously optimistic" that the demand for business jet aircraft is recovering from the recent recession. The FAA forecasts

[10] Woods & Poole Economics. Routt County, Colorado: 2013 Data Pamphlet.
[11] FAA Aerospace Forecast Fiscal Years 2013-2033.
http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2013-2033/

strong growth for business aviation demand over the long-term due to higher corporate profits and worldwide GDP growth. The FAA predicts that GA aircraft used for business purposes will increase faster than GA aircraft used for personal or recreational use. The active GA fleet is projected to grow by an average of 0.5% each year through 2033. The more expensive and sophisticated turbine-powered fleet is projected to grow by 2.9% annually, with the turbine jet fleet growing at 3.5% annually through 2033. However, the number of GA piston-powered aircraft is forecasted to decrease from 159,007 in 2010 to 146,615 in 2028, and to increase to 148,660 in 2033. This results in an annual average decline rate of 0.2% for piston-powered aircraft from 2010 to 2033, with single-engine aircraft to decline at an annual rate of 0.2% and multi-engine aircraft declining at 0.6% each year. The number of GA hours flown is anticipated to increase by 1.5% yearly through 2033, mostly as a result of the increase in the turbine-powered and jet fleet. [12]

3.4 Forecasting Methodologies

There are several types of methodologies that can be used when developing aviation forecasts. Each forecast methodology must show short- (5 years), medium- (10 years), and long-term (beyond 10 years) periods, while keeping in mind that a forecast prepared through the use of mathematical relationships must ultimately withstand the test of rationality/judgment. Each of these methodologies were used in developing forecasts for HDN passenger enplanements, commercial and general aviation aircraft operations, and based aircraft operations. The different methodologies are briefly described below.

3.4.1 Time Series Analysis

A Time Series Analysis, also known as a Trend or Linear Analysis, uses historic patterns of activity and projects this trend into the future. The time series analysis is a regression analysis with time as the independent variable. The linear extrapolation uses the least squares method to fit a straight line between the historical points and projects that line into the future. This type of forecasting is widely used and is highly valuable because it is relatively simple to apply. However, its limitation is that it simply uses past historical data and variables that are not present in past data, such as change in fuel prices and the economic downturn, which are not considered in the result.

[12] FAA Aerospace Forecast Fiscal Years 2013-2033.
http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2013-2033/

3.4.2 Regression Analysis

Regression Analysis is a statistical technique that ties aviation demand (dependent variable), such as operations, to economic measures (independent variables), such as population and income. The independent variable is considered the explanatory variable because it "explains" the projected estimated value. The explanatory power of this approach is measured by the R^2 statistic (called the correlation coefficient or the coefficient of determination). An R^2 helps determine if there is a correlation between the dependent and the independent variables; R^2 of 0 means there is no statistical relationship between changes of the variable, while a R^2 of 1.0 means there is a very strong statistical relationship. Regression Analysis should be restricted to relatively simple models with independent variables for which reliable forecast are available. Additionally, most regression models for aviation use gross economic measures like income, population, and employment to forecast activity levels.

The Regression Analysis models used in this forecast study included population, employment, total earnings, total personal income, wealth index, and total retail sales in Routt County, as reported by Woods & Poole. Although these economic indicators have historically fluctuated in Routt County, the compound annual growth rate (CAGR), between the years 2013 to 2033 is 1.19% for population; 1.67% for employment, 2.65% for total earnings; 2.81% for total personal income; 0.01% for wealth index; and, 2.29% for retail sales. Population (1.19%) and total personal income (2.81%) were selected as the independent variables against selected aviation operation forecast scenarios, which are found in **Section 3.9**.

3.4.3 Market Share Analysis

Market Share Analysis assumes a top-down model, and uses a relationship between national, regional, and local forecasts to predict the trends at the Airport. This approach uses the forecast of large aggregates, such as the entire nation, which are used to derive forecasts for a smaller area (e.g. airport). One example is to determine an airport's percentage (market share) of the national enplanements and then forecast the Airport's growth rate based on the national forecast growth rate. However, the market share analysis approach to forecasting is not without weaknesses. The national forecasts are composed of airports that are growing fast, growing slowly, and those with no growth. Since this analysis is based off the regional or larger aggregate, the planner must take into account historical trends, as well as local airport judgment, to better estimate the forecast.

For this forecast study, the market share analysis used HDN's market share within both the FAA Northwest Mountain Region (ANM) (which includes Colorado,

Utah, Wyoming, Idaho, Montana, Washington, and Oregon), and the Airport's market share within the entire state of Colorado as reported by the TAF. Air carrier and commuter operations forecasts applied HDN's historical market share within Colorado and the ANM as the independent variable to forecast future growth, while general aviation operations and based aircraft market share variables used the TAF's predicted 20-year growth for ANM and CO from 2013-2033.

3.5 Forecasting Aviation Activity Measures and Metrics

The forecasting parameters are determined by the level and type of aviation activity expected at HDN. As a commercial service airport, the forecast for HDN focuses on commercial passenger enplanements, as well as general aviation (GA) aircraft operations and based aircraft activity levels. The forecasts must also take into account demographic and economic activity, because demand for aviation is primarily a function of these. As fully identified in the previous section, data sources for these metrics are from the FAA, Woods & Poole socioeconomic data, local socioeconomic data, and airport records.

3.5.1 Commercial Aviation

Commercial aviation consists of all scheduled an unscheduled air service. Unscheduled air service flights, such as air taxi/charter, operate on an on-demand basis. Commercial aviation activity is measured by passenger enplanements and aircraft operations.

3.5.1.1 Passenger Enplanements

At an airport served by commercial air carriers, an important activity measurement is the number of passenger enplanements. A passenger enplanement is the act of a passenger boarding a plane that is departing. A deplanement is the opposite, when a passenger exits an airplane arriving at an airport. At most airports, including HDN, enplanements and deplanements are equal since most passengers have round trip itineraries. For planning purposes, only enplanements are considered when forecasting. Enplanements are important for forecasting at a commercial service airport because they help determine the size of the terminal and the number of gates needed.

3.5.1.2 Commercial Aircraft Operations

Commercial activity is also measured by the amount of commercial aircraft operations conducted annually. Commercial operations include air carrier and air taxi/commuter operations. Air carrier operations are conducted by certificated aircraft operated by an air carrier as either a large air carrier aircraft, which is designed to accommodate 31 passenger seats or more, or a small air carrier

aircraft, which is designed to accommodate between more than nine passenger seats, but less than 31.[13] Air carrier capacity is also measured by passenger load factors, based on seats per departure for scheduled flights. The fleet mix of different sizes and types of commercial aircraft used, as well as annual versus peak month commercial aircraft operations are also determined in the commercial aircraft operations forecast.

3.5.2 General Aviation

Forecasting metrics of GA activity normally consist of aircraft operations and the number of based aircraft.

3.5.2.1 Aircraft Operations

Generally, the most important activity forecast for airfield planning is the level and type of aviation demand generated at the Airport, which is measured by aircraft operations. An aircraft operation is defined as either a take-off or a landing of an aircraft. This activity identifies the critical aircraft and how adequate the airfield serves this and similar aircraft. It is by this demand that the runway and taxiway requirements are defined.

Since HDN is a non-controlled airport, not serviced by an Airport Traffic Control Tower (ATCT), it is more difficult to obtain an exact count of the Airport's current aircraft operations. The existing baseline used was 4,530 total general aviation operations (2012) as reported by airport management.

3.5.2.2 Based Aircraft

Based aircraft forecasts identify the amount of aircraft that are stored at HDN. This data is used to calculate the need for specific types of hangars and aircraft parking aprons. Airport management records were used as the baseline for this forecasting and indicate that nine aircraft are currently based at HDN.

3.6 Review of Historical and Existing Forecasts

Several existing forecasts for HDN were examined. Each of the existing forecasts examined is discussed in the following text.

3.6.1 2003 Master Plan Forecast

The purpose of presenting the 2003 Airport Master Plan Forecast is to provide a ten-year historical review of the direction of aviation demand at HDN. **Table 3-1**

[13] FAA Part 139 Airport Certification, http://www.faa.gov/airports/airport_safety/part139_cert/?p1=definitions

below identifies passenger enplanements, total operations, and based aircraft, as indicated in the 2003 Master Plan.

TABLE 3-1 – 2003 AIRPORT MASTER PLAN FORECAST

	2005	2010	2015	2020
Enplanements	76,760	89,000	100,700	128,900
Total Operations	12,425	15,425	18,740	22,450
Based Aircraft	18	23	26	29

Source: 2003 Airport Master Plan Update

Upon review of the historical forecasts, the existing passenger enplanements (105,309) as indicated on HDN airport management records, exceeds the 2003 Master Plan's projected enplanements for 2015. However, the 2003 Master Plan's 2005 base year forecasts for operations (12,425) and based aircraft (18) exceeds the existing 10,788 operations and the nine current based aircraft. This forecast chapter will be updated to reflect current economic and local conditions and trends.

3.6.2 CDOT Aviation Forecast

3.6.2.1 Colorado 2011 Aviation System Plan

In 2011, the Colorado Department of Transportation (CDOT) Aeronautics Division completed the CDOT Aviation System Plan. This study was conducted to provide CDOT Aeronautics with an updated performance-based airport system plan forecasts for the 76 public-use airports in Colorado. **Table 3-2** shows the forecasts for HDN as part of this study.

TABLE 3-2 – CDOT STATEWIDE AVIATION FORECAST UPDATE FOR HDN

Type	2015	2020	2030	2015-2030 CAGR
Enplanements	119,200	128,300	149,000	1.5%
Commercial Operations	3,500	3,500	3,700	0.37%
Total Operations	9,990	10,320	11,220	0.78%
Based Aircraft	4	4	4	0.00%

Source: Colorado 2011 Aviation System Plan

3.6.3 FAA Terminal Area Forecast

The FAA prepares a TAF for each airport in the NPIAS annually. It identifies all airports in the United States that are considered significant to the national aviation infrastructure network. The latest TAF for HDN was published 2013, and is presented in **Table 3-3**. The TAF currently forecasts that airports the size of HDN will have little or no growth. However, these forecasts are not always site specific, and traditionally the FAA uses a conservative approach when site specific data cannot be obtained.

TABLE 3-3 – FAA TAF FORECAST FOR HDN

	2013	2018	2023	2028	2033
Total Enplanements	**106,289**	**121,699**	**139,343**	**159,554**	**182,691**
Itinerant Operations					
Air Carrier	3,602	3,962	4,360	4,791	5,265
Air Taxi and Commuter	2,649	2,915	3,207	3,725	3,878
GA	3,218	3,383	3,553	3,725	3,907
Military	7	7	7	7	7
Total Itinerant	**9,476**	**10,267**	**11,127**	**12,049**	**13,057**
Local Operations					
GA	1,268	1,332	1,402	1,474	1,553
Military	0	0	0	0	0
Total Local GA	1,268	1,332	1,402	1,474	1,553
Total Operations	**10,744**	**11,599**	**12,529**	**13,523**	**14,610**
Based Aircraft	**4**	**4**	**4**	**4**	**4**

Source: FAA Terminal Area Forecast, published 2013.

3.7 HDN Commercial Activity

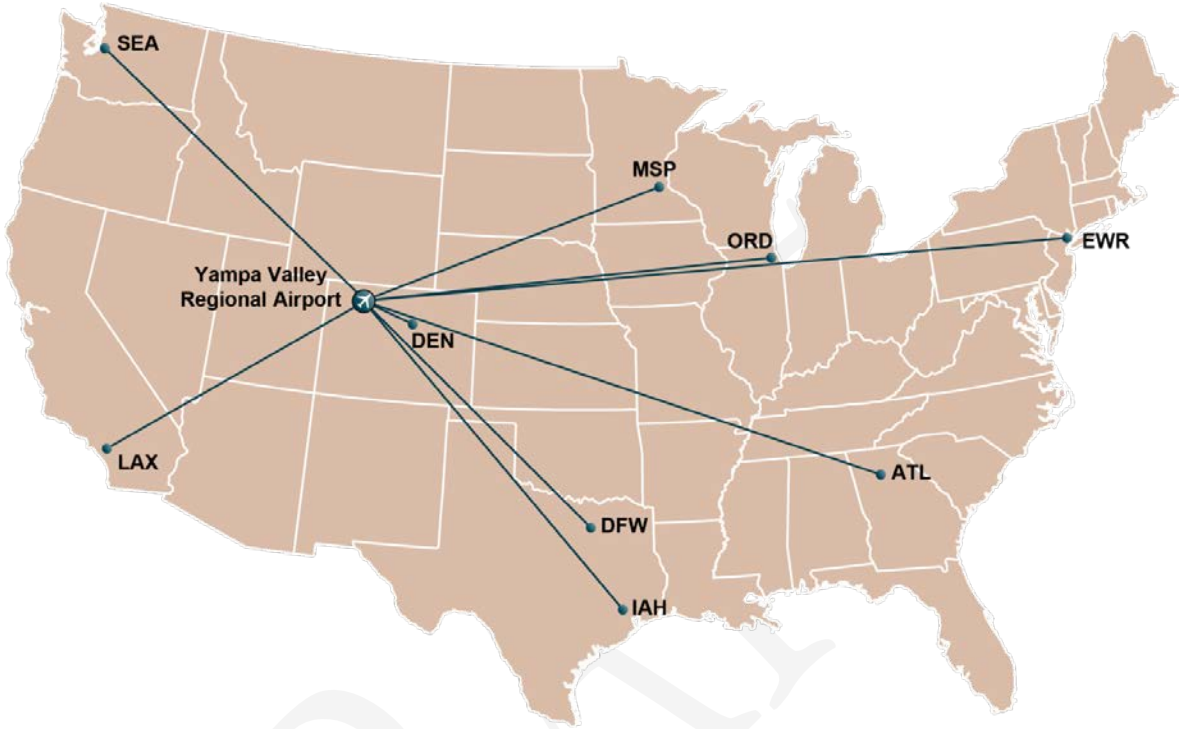
3.7.1 Scheduled Airline Service

Currently, HDN is served by one airline year round, United Airlines, and three additional airlines during the ski season, Delta Air Lines, American Airlines, and Alaska Airlines (new service). United (operated by Skywest or Republic Airlines as United Express) provides turboprop service to and from Denver, once daily year round on a Bombardier Q-400, with three additional flights daily to Denver between November to April on both the Q-400 and the CRJ-700 (regional jet). United also provides jet service to Houston Sunday through Friday on a Boeing 737-800, Wednesdays on an Airbus A319, and Saturdays on a Boeing 757-200 during the winter season. United also provides jet service on Saturdays to Newark on an Airbus A320, and United Express flies to Chicago on Saturdays and to Los Angeles on Thursdays, Saturdays, and Sundays on a CRJ-700 during the ski season.

Seattle is a new market for HDN, with future jet service provided by Alaska Airlines on a CRJ-700. Seattle flights will begin mid-December 2013 through March 2014, with scheduled early evening departures on Wednesdays and Saturdays. Delta flies to two destinations from Hayden, serving Minneapolis once daily on an Embraer EMB-175 (with Compass doing business as Delta connection) and Atlanta once daily from December to March on a Boeing 737-800. American Airlines provides once daily roundtrip and once weekly (Sunday) service to Dallas/Fort Worth on a Boeing 737-800, and once daily roundtrip regional jet service (EMB-175) to Chicago during the winter season, as shown below with scheduled departures in **Table 3-4**

and scheduled arrivals in **Table 3-5**. **Figure 3-2** graphically depicts cities served from Hayden.

FIGURE 3-2 – CITIES SERVED BY HDN



Source: Jviation, Inc.

TABLE 3-4 – HDN AIRLINE SCHEDULED DEPARTURES

Service Duration	Airline	Flight	To	Time	Frequency
Ongoing	United Express	5590, 6328	DEN	6:15 am	Daily
Dec – March	American	398	DFW	8:30 am	Sun
Dec – April	United Express	6390	DEN	11:20 am	Daily
Dec – March	American	4355	ORD	12:05 pm	Daily
Dec – March	United	355	EWR	12:10 pm	Sat
Feb – March	United Express	6221	ORD	12:11 pm	Sat
Dec – March	Delta	880	ATL	12:45 pm	Daily
Dec – April	United Express	3871	DEN	12:54 pm	Daily
Dec – March	American	279	DFW	1:15 pm	Daily
Dec – March	Delta	5782	MSP	1:30 pm	Daily
Dec – April	United	1426, 1187	IAH	2:12 pm	Sun – Fri
Dec – March	United	280, 649	IAH	2:21 pm	Sat
Jan – Feb	United Express	425	IAH	2:20 pm	Wed
Dec – March	United Express	5533	LAX	4:20 pm	Thu/Sat/Sun
Dec – April	United Express	4938	DEN	4:52 pm	Daily
Dec – March	Alaska	3453	SEA	5:25 pm	Wed, Sat

Sources: HDN Airport Management Records, Airline flight schedules, www.united.com, www.aa.com, www.delta.com, www.alaskaair.com, Winter 2013.

TABLE 3-5 – HDN AIRLINE SCHEDULED ARRIVALS

Airline	Flight	From	Time	Frequency
United Express	6390	DEN	10:40 am	Daily
United	355	EWR	11:17 am	Sat
American	4355	ORD	11:25 am	Daily
United Express	6221	ORD	11:36 am	Sat
Delta	880	ATL	12:00 pm	Daily
United Express	4355	DEN	12:28 pm	Daily
American	279	DFW	12:30 pm	Sun
Delta	5782	MSP	1:00 pm	Daily
United	1085, 1187	IAH	1:17 pm	Sun – Fri
United	425	IAH	1:25 pm	Wed
United	283, 649	IAH	1:26 pm	Sat
United Express	5533	LAX	3:40 pm	Thu/Sat/Sun
United Express	4938	DEN	3:52 pm	Daily
Alaska	3452	SEA	4:50 pm	Wed, Sat
American	378	DFW	6:50 pm	Daily
United Express	6203, 6201	DEN	9:28 pm	Daily

Sources: HDN Airport Management Records, Airline flight schedules, www.united.com, www.aa.com, www.delta.com, www.alaskaair.com, Winter 2013.

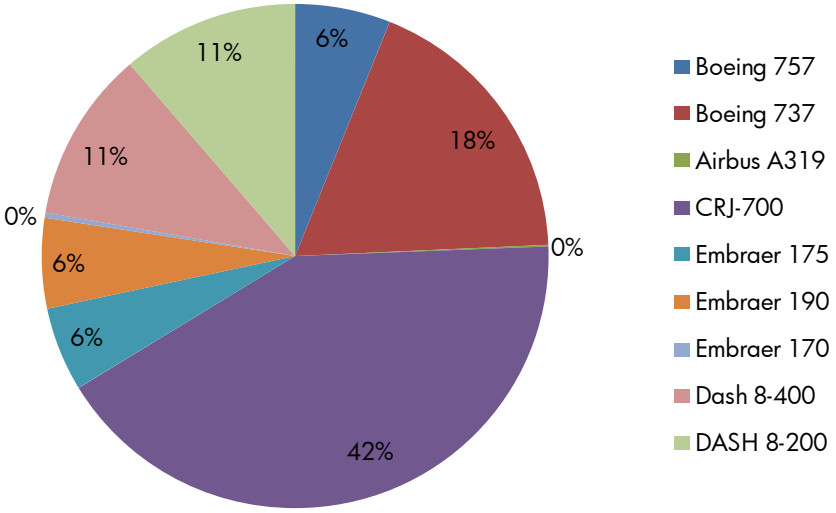
3.7.1.1 Factors Unique to HDN

Yampa Valley Regional Airport is unique due to the seasonal commercial passenger service provided, as well as the influence of the number of passengers that are associated with resort destinations. As stated in **Section 3.7.1**, by mid-December scheduled flights increase from one roundtrip flight daily to eight daily flights, five weekly flights, one twice weekly flight, one flight three times weekly, and one flight six times weekly, which continues until late March/early April, for a total of 72 flights weekly during the ski season.

3.7.2 Commercial Fleet Mix

As mentioned previously, the majority of commercial activity occurs during the peak winter season, due to the inbound leisure market. HDN airport management records indicate that the majority of commercial aircraft operations are conducted by the Bombardier CRJ-700, followed by the Boeing 737, the Dash 8-200, and the Dash 8-400. The largest commercial aircraft operating at HDN is the Boeing 757-200. Historically, 757 service was provided by American Airlines, on a non-stop route to Dallas/Fort Worth. However, as discussed in Section 3.7.1, winter service on the Boeing 757-200 is provided by United Airlines with nonstop service to Houston, beginning in mid-December 2013. **Figure 3-3** below shows the 2012 commercial aircraft fleet mix.

FIGURE 3-3 – HDN 2012 COMMERCIAL FLEET MIX



Sources: HDN Airport Management Records, Jviation, Inc.

3.8 PASSENGER ENPLANEMENT FORECAST

A passenger enplanement is the act of a passenger boarding a plane for departure from HDN. A deplanement is the reverse action, when a passenger arrives in HDN. At most airports, including HDN, enplanements and deplanements are almost equal since most passengers have a roundtrip itinerary. For airport planning purposes, only annual enplanements are considered.

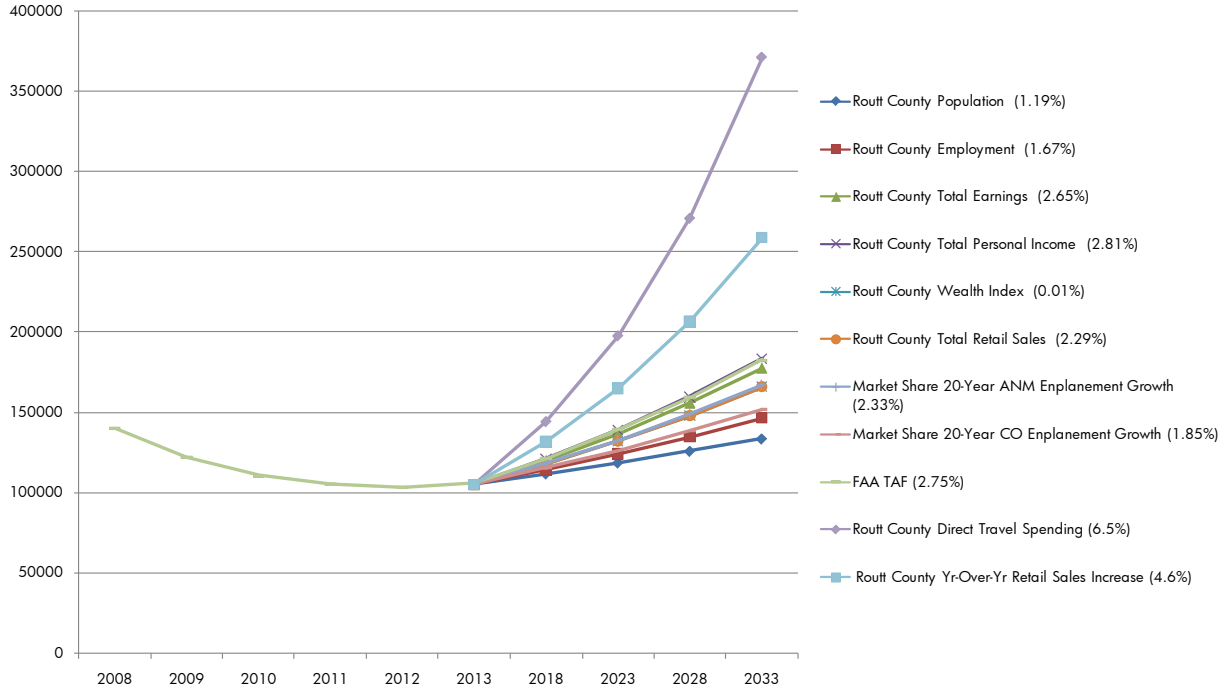
3.8.1 Passenger Enplanement Overview

Different forecasting methodologies were tested; however, scheduled enplanements at HDN have been volatile over the last ten years, with a CAGR of 6.9% between 2003 and 2008, and a CAGR of -4.1% between 2009 and 2012. The drop in enplanements that began in 2009 can be attributed to the economic downturn in 2008. However, any major growth is likely unforeseen and could not be justified.

A socioeconomic forecast was developed applying a regression analysis model to Routt County population, employment, total county earnings, personal income, wealth index, and retail sales. The correlation coefficient was barely positive for the wealth index (0.01%). Population, total county earnings, personal income, wealth index, and retail sales projections were obtained from the Woods & Poole Economics data discussed in **Section 3.2**.

Year-over-year retail sales growth from 2012-2013 for Routt County was also used, which was obtained from the Yampa Valley Data Partners, as well as Routt County direct travel spending, which was obtained from *2013 Colorado Travel Impacts for Routt County* by Dean Runyan Associates. The output from the different forecasting methodologies is shown in **Figure 3-4**. The figure graphically depicts the six different regression analysis models as well as a linear growth projection (based on TAF enplanements), and a market share forecast as a percentage of HDN enplanements to total FAA forecasted enplanements for the Northwest Mountain Region and the State of Colorado. The different scenarios represent a range in enplanements at the completion of the forecast period (2033) from 105,504 to 371,072. **Figure 3-4** also shows the five-year historical trend of enplanements based on the FAA TAF which is used as a comparative guide for the forecast analysis.

FIGURE 3-4 – ENPLANEMENT FORECAST ANALYSIS



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; Dean Runyan Associates, Colorado Travel Impacts, Routt County, June 2013; FAA Terminal Area Forecasts, 2013.

Three forecast scenarios were selected for further analysis, which includes a low, medium, and high forecast scenario. The low forecast scenario is the Routt County population regression analysis (1.19%), the medium-growth forecast scenario is the Routt County total personal income regression analysis (2.81%), which were obtained from Woods and Poole economic data. The high growth forecast scenario is the Routt County year-over-year retail sales increases, as provided by the Yampa Valley Data Partners Fast Facts for September 2013.

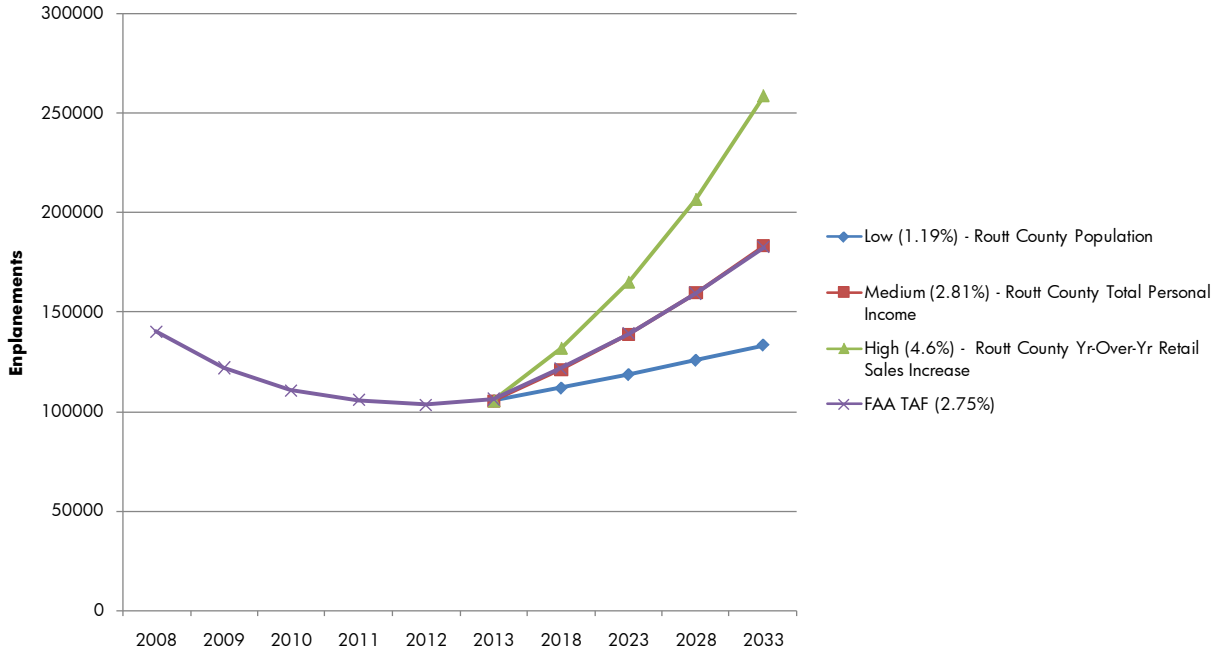
As shown below in **Table 3-6**, and graphically depicted in **Figure 3-5**, the selected forecast scenarios range from 133,489 to 258,880 passenger enplanements by 2033. In comparison, the FAA TAF growth rate for passenger enplanements was 2.75% for the 20-year planning period, which results in 182,691 enplanements by 2033. It is recommended that the medium-growth forecast scenario of 2.81% be used for the 20-year passenger enplanement forecast.

TABLE 3-6 – ENPLANEMENTS FORECAST SCENARIOS

Year	Low – 1.19% Routt County Population	Medium – 2.81% Routt County Total Personal Income	High – 4.6% Routt County Year-Over-Year Retail Sales Increase
2013	105,309	105,309	105,309
2018	111,741	119,996	131,863
2023	118,565	136,732	165,113
2028	125,806	155,802	206,748
2033	133,489	177,532	258,880

Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013.

FIGURE 3-5 – HDN SELECTED FORECAST ENPLANEMENT SCENARIOS



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; FAA TAF, 2013.

3.8.2 HDN Enplanement Analysis

Appendix C, *Yampa Valley Regional Airport Enplanement Analysis*, provided by Sixel Consulting Group, was developed as a means of forecasting demand for airline passenger service. This report examines the market from the airlines' perspective, which supplements FAA methodology in order to determine a preferred forecast growth rate. This analysis reviews the history, current status, and projected growth of airline service at HDN to identify where the Airport fits within the regional air service environment.

3.8.3 Preferred Passenger Enplanement Forecast

This section will be updated following input from the HDN Master Plan Planning Advisory Committee (PAC) and the Routt County Board of County Commissioners.

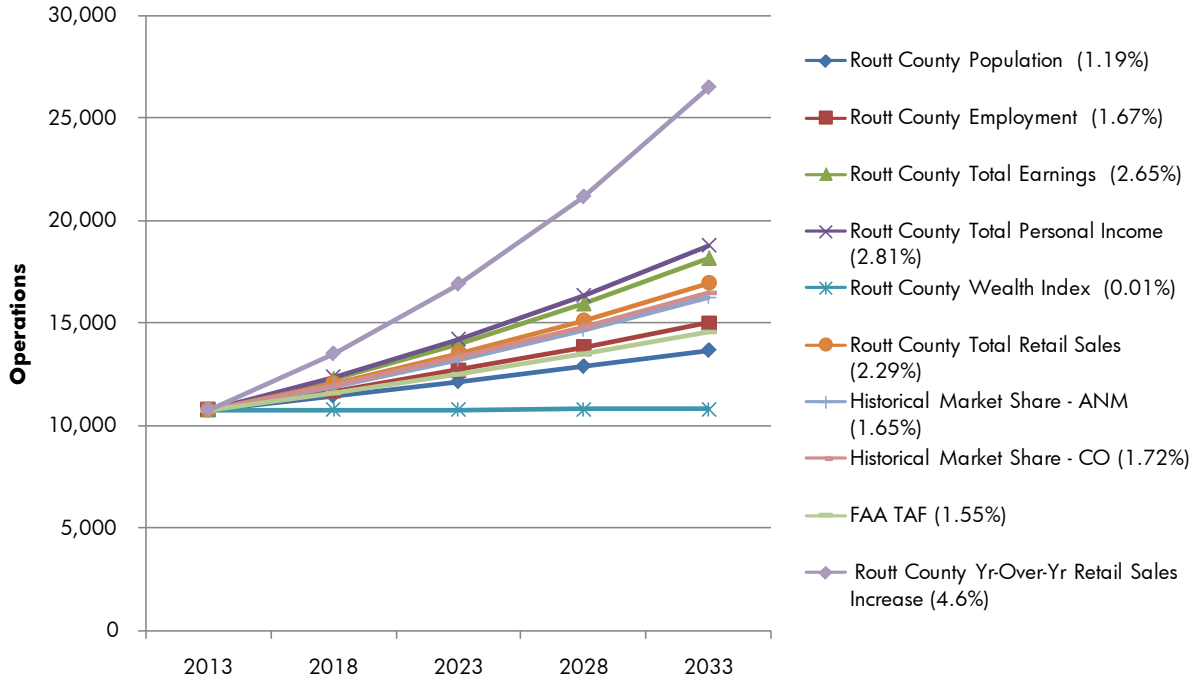
3.9 Aircraft Operations Forecast

Since HDN is a non-controlled airport, meaning that it does not have an ATCT, it is more difficult to obtain an exact count of aircraft operations. The FAA's TAF currently has 6,251

annual commercial operations in 2012, which included 2,649 conducted by air taxi/commuter aircraft, and 3,602 air carrier operations. However, the Airport indicates 3,170 air carrier operations and 2,008 air taxi/commuter operations occurred in 2012, for a total of 5,178. For the purposes of this Master Plan, the commercial operations count will reflect the operations count of the TAF, while the general aviation operations forecast will use the Airport's count as the baseline for forecasting, generating a total operations count (excluding military operations) of 10,781 in 2012 for HDN.

The methodologies used for forecasting aircraft operations include: socioeconomic regression analysis, time series analysis, and market share analysis. Regression analyses were used for population, employment, total earnings, personal income, and retail sales. Market share methodologies were based upon HDN's historical market share of aircraft operations within the ANM region (1.65%) and in Colorado (1.72%). The TAF's growth rate for future aircraft operations at HDN is also included in this analysis, which is 1.55%. The outputs from these methodologies are shown in **Figure 3-6.**

FIGURE 3-6 – HDN AIRCRAFT OPERATIONS FORECAST



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; FAA Terminal Area Forecasts, 2013.

The times series analysis was not used for the operations forecast because it uses historical data and projects those trends into the future, resulting in a projected continual decline in operations through the 20-year forecast period. **Table 3-7** represents the probable high,

medium, and low operations forecasts, and these forecasts are used in this analysis. The lowest forecast is the Routt County population regression analysis (1.19%), the medium is the Routt County total personal income regression analysis (2.81%), which were obtained from Woods and Poole economic data. The high forecast scenario is 4.6%, which is the Routt County year-over-year retail sales growth from 2012-2013, as reported by Yampa Valley Data Partners Fast Facts, September 2013.

The forecasting scenarios represent a range in the total operations of 10,781 to 26,503 in the final year of the forecast period (2033), and are shown in **Figure 3-7**, in comparison to the FAA TAF (1.55%). The FAA TAF growth rate for total operations at HDN (excluding military) for the 20-year planning period is 14,603 total operations by 2033. Because it is a conservative estimate, the medium growth forecast scenario (Routt County total personal income regression analysis with a CAGR of 2.81%) is the recommended growth rate for total operations.

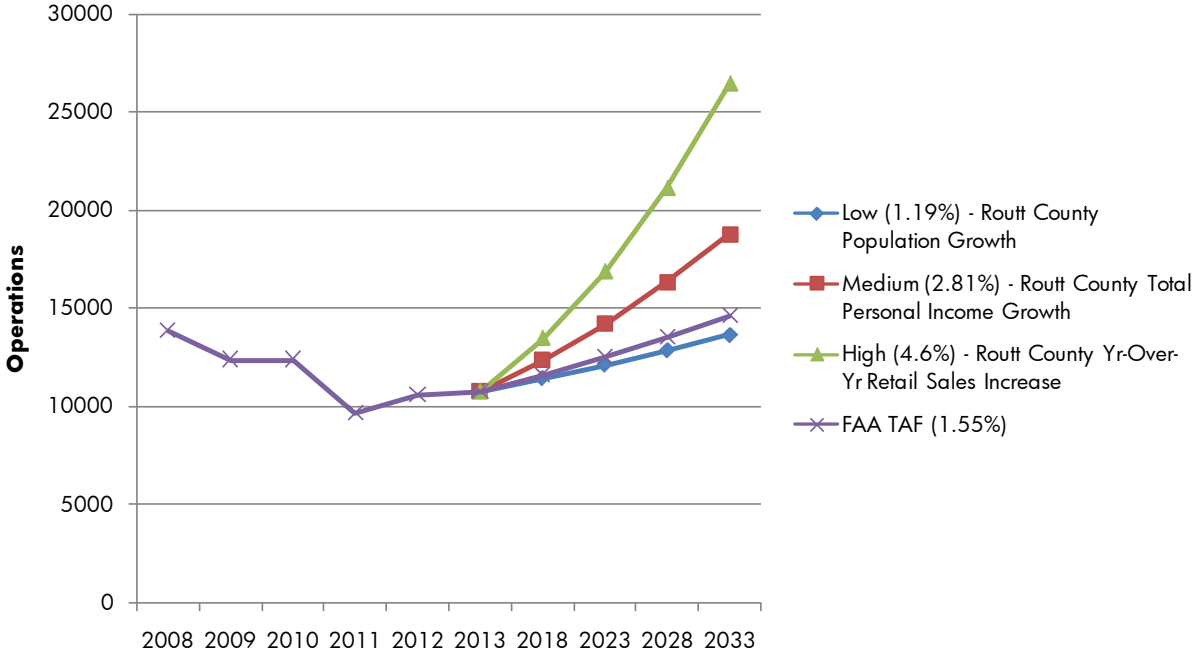
TABLE 3-7 – OPERATIONS FORECAST SCENARIOS

Year	Low – 1.19% Routt County Population	Medium – 2.81% Routt County Total Personal Income	High – 4.6% Routt County Year-Over-Year Retail Sales Increase
2013	10,781	10,781	10,781
2018	11,439	12,386	13,499
2023	12,138	14,230	16,903
2028	12,879	16,348	21,166
2033	13,666	18,781	26,503

Note: Military operations excluded.

Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013.

FIGURE 3-7 – OPERATIONS FORECAST SCENARIOS



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; FAA TAF, 2013.

3.9.1 Preferred Aircraft Operations Forecast

This section will be updated following input from the HDN Master Plan PAC and the Routt County Board of County Commissioners.

3.9.2 Commercial Operations

As discussed in Appendix C, *Yampa Valley Regional Airport Enplanement Analysis*, commercial operations at HDN are anticipated to remain with one daily departure year round and several daily and less-than-daily (LTD) departures during the winter season. Woods and Poole economic data was used for the low and medium growth forecast scenarios for commercial operations, which applies the Routt County population regression analysis (1.19%) and the total personal income regression analysis (2.81%) for moderate growth. The high growth forecast scenarios uses the year-over-year direct retail sales growth in Routt County (4.6%) from Yampa Valley Data Partners Fast Facts, September 2013. These forecast scenarios provide a range from 7,924 to 15,367 commercial operations by 2033. In comparison, the FAA TAF projects 9,143 commercial operations by the end of the planning period. These forecast scenarios are shown below in **Table 3-8**, and graphically depicted in **Figure 3-8** in comparison to the FAA TAF growth rate for commercial operations

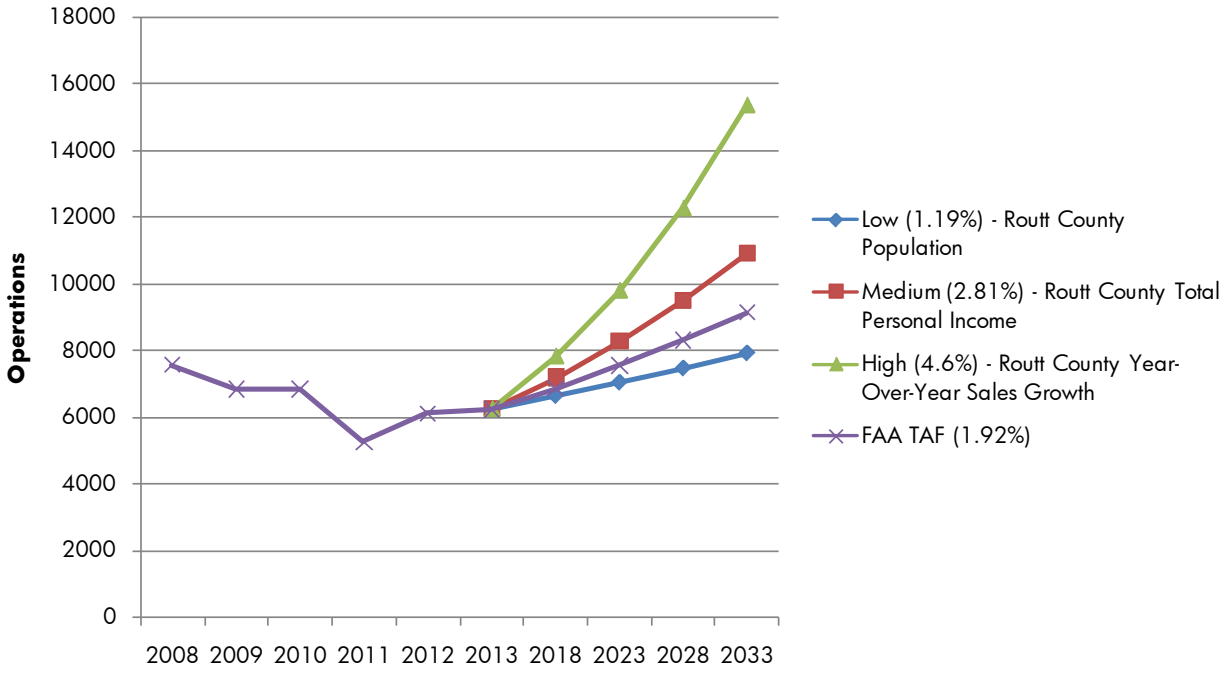
at HDN (1.92%). The medium forecast (2.81%) is the recommended growth scenario for commercial operations.

TABLE 3-8 – COMMERCIAL OPERATIONS FORECAST

Year	Low – 1.19% Routt County Population	Medium – 2.81% Routt County Total Personal Income	High – 4.6% Routt County Year-Over-Year Retail Sales Increase
2013	6,251	6,251	6,251
2018	6,633	7,182	7,827
2023	7,038	8,251	9,801
2028	7,468	9,479	12,272
2033	7,924	10,890	15,367

Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013.

FIGURE 3-8 – COMMERCIAL OPERATIONS FORECAST SCENARIOS



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; FAA TAF, 2013.

3.9.3 Preferred Aircraft Operations Forecast

This section will be updated following input from the HDN Master Plan PAC and the Routt County Board of County Commissioners.

3.9.4 General Aviation Operations

General aviation operations at HDN include all operations not classified as air carrier, air taxi/commuter, or military. Generally, these general aviation operations are conducted by privately-owned aircraft that are used for business, recreation, training, or personal use. As previously discussed, many factors contribute to annual general aviation operations; however, other factors that impact the future level of general aviation operations also include, but are not limited to, the level of aviation-related services provided at the Airport and aircraft owner storage accommodations. Although the TAF indicates historic general aviation operations at HDN have declined in the last five years, operations on average have remained steady with a CAGR of 1.97% from 2000 to 2012[14].

Three growth scenarios were used to forecast general aviation operations at HDN. The low growth scenario incorporates the Routt County population regression analysis rate of 1.19%, Routt County total personal income regression analysis (2.81%) for moderate growth[15], and year-over-year direct retail sales growth in Routt County for a high growth forecast scenario (4.6%)[16], as shown below in **Table 3-9**. **Figure 3-9** also depicts the forecast scenarios with a comparison to the FAA TAF growth rate for future GA operations at HDN (0.99%). The base year GA operations count (4,530) for these forecast scenarios is based on the GA operations total as indicated by HDN airport management records. This differs from the TAF's 2013 GA operations total, which indicates 4,486 for the base year. These forecast scenarios provide a range of 5,742 to 11,136 GA operations by 2033, while the TAF projects 5,460 operations by the end of the 20-year planning period. The medium forecast (2.81%) is the recommended growth scenario for general aviation operations.

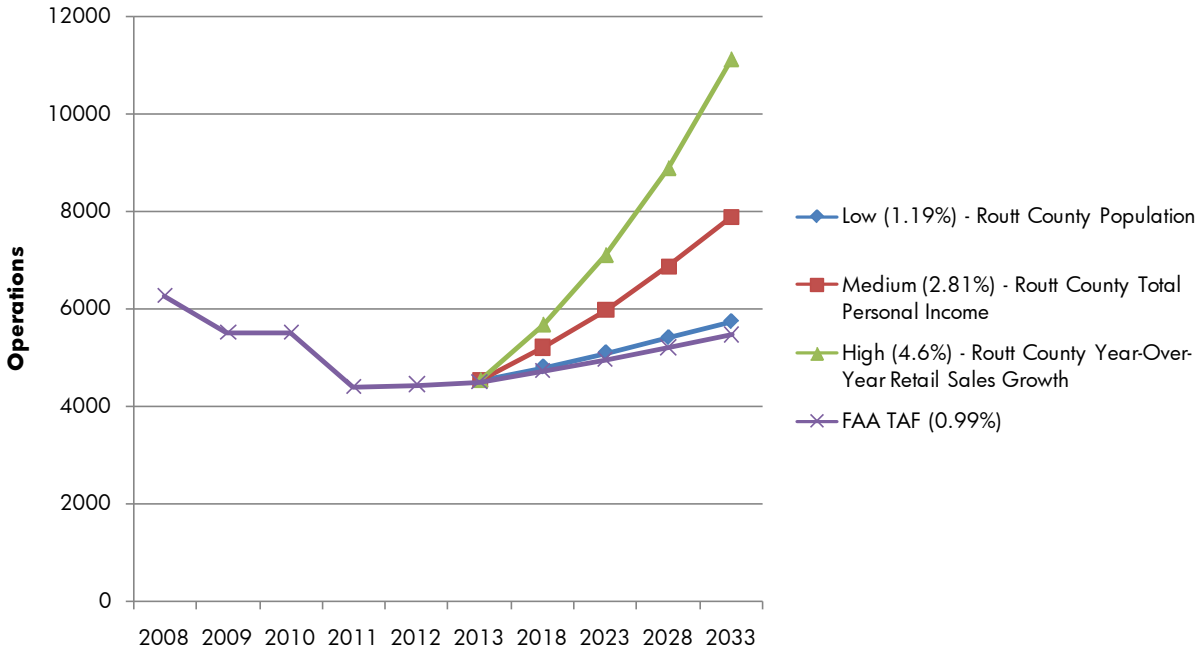
TABLE 3-9 – GENERAL AVIATION OPERATIONS FORECAST

Year	Low – 1.19% Routt County Population	Medium – 2.81% Routt County Total Personal Income	High – 4.6% Routt County Year-Over-Year Retail Sales Increase
2013	4,530	4,530	4,530
2018	4,807	5,204	5,672
2023	5,100	5,979	7,103
2028	5,412	6,869	8,894
2033	5,742	7,892	11,136

Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013.

[14] FAA Terminal Area Forecasts, 2013.
[15] Woods and Poole Economics, 2013 data, Routt County.
[16] Yampa Valley Data Partners, Fast Facts, September 2013.

FIGURE 3-9 – HDN GENERAL AVIATION FORECAST SCENARIOS



Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013; FAA TAF, 2013.

3.9.4.1 Preferred General Aviation Operations Forecast

This section will be updated following input from the HDN Master Plan PAC and the Routt County Board of County Commissioners.

3.9.5 Local/Itinerant Operations

Local operations are operations performed by aircraft that are based at HDN and operate in the local traffic pattern and/or within sight of the Airport. These operations are known to be flights departing to or arriving from local practice areas within a prescribed distance from the Airport, or that execute simulated instrument approaches at the Airport. Itinerant or transient operations are operations by aircraft that leave the local airspace. The majority of operations at HDN are made up of itinerant operations, including commercial and general aviation operations.

The TAF indicates that total itinerant operations (air carrier, air taxi/commuter, military and GA) in 2012 were 88% and local GA operations[17] were approximately 12%. The average itinerant/local split for total forecast operations from 2013-2033 is 86% itinerant and 14% local. Itinerant operations dominate activity at HDN due to the Airport's market for a leisure inbound traffic. Further, only nine aircraft are based at HDN, while nearly 200 aircraft are based at other airports within the Yampa Valley region (see **Section 3.12**). For the purposes of this study, it is anticipated that on average, the large majority of operations at HDN will be itinerant over the next 20 years.

3.9.6 Design Hour Operations

An additional measure of airport activity is design hour operations. The design hour is an estimate of the peak hour of the average day in the busiest month for an airport. Since HDN does not have an ATCT, design hour is estimated.

- Peak Month Operations is the month that has the most operations. The Peak Month for the average ski resort airport is normally in either February or March, at 11% of the annual operations. For HDN, the Peak Month for 2012 was March, with approximately 1,173 peak month operations.

- Design Day is the Peak Month Operations divided by 30 days. The Design Day for HDN in 2012 was 39 operations.

- Design Hour is the average highest amount of operations within the most active hour of the day. Typically, these operations will range between 10% and 15% of the design day operations; for planning purposes, 12.5% was used to determine the Design Hour. The Design Hour Operations at HDN in 2012 is five.

Table 3-10 shows the forecasted Design Hour for the planning period of this report.

TABLE 3-10 – DESIGN HOUR OPERATIONS FORECAST

Operations	2013	2118	2023	2028	2033
Annual	10,788	12,393	14,237	16,355	18,788
Peak Month	1,187	1,363	1,566	1,799	2,067
Design Day	40	45	52	60	69
Design Hour	5	6	7	7	9

Source: Jviation, Inc.

[17] No local military operations are forecasted for the planning period, as indicated in the 2013 FAA TAF for HDN.

3.9.7 Military Operations

Historically, military operations have not significantly contributed to the number of operations at HDN. Military operations are not dependent on the same stimuli as GA or commercial activity. Airport management records reported that military operations at HDN are unpredictable and have significantly fluctuated from year to year. The TAF indicates that military operations will remain constant with seven total operations throughout the 20-year planning period. Due to the fluctuation and unpredictability of military operations, for the purposes of this study, it is projected that military operations will remain constant at seven operations annually throughout the forecast period.

3.9.8 Aircraft Operations Forecast Summary

The preferred forecast is the Retail Sales regression analysis because it is a conservative estimate for the potential operations growth at HDN. This model represents an overall 20-year CAGR of 2.81% of the total operations and is summarized in **Table 3-11**. The forecast data presented in **Table 3-11** reflects a 1.25% higher growth movement than the FAA's national growth rates for each type of operation during the 20-year planning period.

TABLE 3-11 – AIRCRAFT OPERATIONS FORECAST SUMMARY

	2013	2018	2023	2028	2033
Commercial Operations					
Air Carrier	3,602	4,138	4,754	5,462	6,275
Commuter/Air Taxi	2,649	3,043	3,496	4,017	4,615
Itinerant Operations					
Military	7	7	7	7	7
GA Itinerant	3,262	3,747	4,305	4,946	5,682
Local Operations					
GA Local	1,268	1,457	1,674	1,923	2,210
Total Operations	**10,788**	**12,393**	**14,237**	**16,355**	**18,788**

Source: Jviation, Inc.

3.10 INSTRUMENT OPERATIONS FORECAST

According to the data provided by the National Climatic Data Center (NCDC), Instrument Meteorological Conditions (IMC) exists at a rate of 3.6% annually at HDN.[18] When applying this percentage to the base year number of operations, it results in 271 IFR operations for 2013. This figure may be over simplified since no precise count exists for the number of instrument operations; nonetheless, it accounts for a reasonable percentage of

[18] NCDC, HDN AWOS #72571, 2000 to 2009.

current operations. **Table 3-12** details the estimated instrument operations based on the chosen operations forecast.

TABLE 3-12 – FORECAST IMC OPERATIONS

	2013	2018	2023	2028	2033
Instrument Ops	271	311	357	411	472

Source: IMC data from NCDC

3.11 CARGO OPERATIONS

Currently, two cargo carriers operate out of HDN, which include FedEx and UPS. FedEx operations are conducted on Cessna Caravan turboprop aircraft, and UPS operations are conducted with Metroliner turboprop aircraft. The Bureau of Transportation Statistics indicates that landed freight at HDN has decreased by 1% since 2007, which is a reflection of the economic downturn in 2007/2008. However, airport management records indicate that despite the decreased landed freight at HDN, cargo operations have increased by 0.6% since 2010, for a total of 1,523 cargo operations in 2012.

3.12 BASED AIRCRAFT FORECAST

The based aircraft forecast is a valuable indicator in determining the future activity levels and the potential requirement for expanded or improved airport facilities. Airport management records indicated a higher number of current based aircraft (nine) than the FAA TAF (four), which includes one single engine, three turboprops, and five jet aircraft. For the purpose of this forecast, airport records are used as the baseline. The same methodologies used for operations forecasting were used for forecasting based aircraft: socioeconomic regression analysis, time series analysis, and market share analysis were used. Regression analyses were used for population, employment, total earnings, personal income, and retail sales.

Two other airports fall under the Yampa Valley Regional Airport Commission authority, which include Steamboat Springs/Bob Adams Field (SBS) in Steamboat Springs, and Craig-Moffat County Airport (CAG) in Craig, Colorado. FAA Form 5010, *Airport Master Record*, indicates that SBS currently has 83 based aircraft, and CAG has 20 based aircraft. However, over 100 aircraft are based in the Yampa Valley, but less than 10 are based at HDN, as indicated by airport management and the FAA. Based aircraft growth within the Yampa Valley could reach capacity at SBS and CAG, which could increase based aircraft growth at HDN over the next 20 years.

Table 3-13 represents the probable high, medium, and low based aircraft forecasts used in this forecasting analysis. The lowest forecast scenario used is the Routt County Population regression analysis, the medium is the Total Personal Income regression analysis, and the high is the year-over-year Retail Sales growth from 2012-2013 in Routt County. The

forecasting scenarios represent a range in the total based aircraft of 11 to 22 in the final year of the forecast period (2033). This represents a range in CAGR of between 1.19% (Routt County population) and 4.6% (2012-2013 year-over-year retail sales growth regression analysis). The low forecast (Population regression analysis with a CAGR of 1.19%), although optimistic, is the closest to the national growth rate of the general aviation fleet predicted by the FAA (0.5%)[19], and is the recommended forecast growth scenario for based aircraft.

TABLE 3-13 – BASED AIRCRAFT FORECAST

Year	Low – 1.19% Routt County Population	Medium – 2.81% Routt County Total Personal Income	High – 4.6% Routt County Year-Over-Year Retail Sales Increase
2013	9	9	9
2018	10	10	11
2023	10	12	14
2025	11	14	13
2033	11	16	14

Sources: Jviation, Inc.; Woods & Poole Economics, Inc., 2013 Data, Routt County, CO; Yampa Valley Data Partners, Fast Facts September 2013.

Table 3-14 shows the based aircraft distribution for the planning period (2013-2033), based on the recommended growth rate of 1.19% (Population regression analysis), as previously discussed. Although using airport management estimates of the distribution of based aircraft types, the growth for each aircraft type reflects the national aircraft growth as predicted by the FAA.[20] Nationally, the FAA projects strong growth in the business market, including jets and turboprops, with less growth expected for single-engine and multi-engine piston powered aircraft. For HDN, it is anticipated that there will be no growth in single-engine, multi-engine, or helicopter aircraft. The based aircraft are expected to grow to a total of 11 over the planning period.

[19] FAA Aerospace Forecasts, Fiscal Years 2013-2033.
[20] FAA Aerospace Forecasts, FY 2013-2033, Table 28: Active General Aviation and Air Taxi Aircraft. http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2012-2032/

TABLE 3-14 – HDN BASED AIRCRAFT FORECAST SUMMARY

Based Aircraft	2013	2018	2023	2028	2033
Single Engine	1	1	1	2	1
Multi-Engine	0	0	0	0	0
Turboprop	3	3	3	4	4
Jet	5	5	6	6	6
Helicopters	0	0	0	0	0
Other	0	0	0	0	0
Total	**9**	**10**	**10**	**11**	**11**

Source: Jviation, Inc.

3.12.1.1 Preferred General Aviation Operations Forecast

This section will be updated following input from the HDN Master Plan PAC and the Routt County Board of County Commissioners.

3.13 CRITICAL AIRCRAFT

The Critical Aircraft is used to identify the design criteria for an airport. It is determined by the most demanding airplane, or family of airplanes, that accounts for at least 500 annual operations within the planning period. Formerly designated as the Airport Reference Code (ARC), the Runway Design Code (RDC) is a classification given to aircraft based on the maximum approach speed and wingspan of the aircraft. This classification then applies design criteria appropriate to operational and physical characteristics of the aircraft types operating at the Airport. The RDC is applied to each separate airfield facility, and may be different if different Critical Aircraft are identified for each runway or airfield element.

At HDN, Runway 10/28 was designed to accommodate the Boeing 757-200, an RDC C-IV airplane. Boeing 757 operations at HDN have decreased within the last five years. The Airport reported 458 B-757 operations in 2008 (American Airlines); however, operations decreased by 42% in 2010 for a total of 252 operations. Both the Airport and the FAA Traffic Flow Management System Counts (TFMSC) have indicated that there were only 218 Boeing 757-200 operations conducted in 2012. However, there were over 1,000 operations conducted by RDC D-III aircraft, which includes the Boeing 737-800, and the Embraer 170 and 190. Although C-IV operations are below the FAA's required minimum of 500 annual operations by critical aircraft, the Airport is designed to accommodate C-IV aircraft, and it is recommended that the Boeing 757-200 remain as the critical aircraft for the 20-year planning period.

Table 3-15 shows the forecasted operations, broken down by the type of RDC operation. The C-II operations are growing faster than the D-III operations. Using airport management estimates the distribution among the different RDC types are shown in **Table 3-15**.

TABLE 3-15 – RDC AIRCRAFT FORECAST

RDC	2013	2018	2023	2028	2033
A-I, A-II, A-III	1,097	673	1,447	1,663	1,910
B-I (small aircraft)	131	151	173	199	229
B-II (small aircraft)	284	327	375	431	495
B-III	424	487	559	643	738
Subtotal A & B	**1,936**	**1,637**	**2,555**	**2,935**	**3,372**
B-I	1,798	2,066	2,374	2,727	3,133
B-II	1,433	1,646	1,891	2,173	2,496
Subtotal B	**3,231**	**3,712**	**4,265**	**4,900**	**5,629**
C-I	742	852	979	1,125	1,292
C-II	3,020	3,470	3,986	4,580	5,262
C-III	73	84	97	111	128
C-IV	264	303	348	400	460
D-I	105	120	138	159	183
D-II	171	197	226	259	298
D-III	1,238	1,423	1,635	1,878	2,158
Subtotal C & D	**5,614**	**6,449**	**7,409**	**8,512**	**9,780**
Helicopter	0	0	0	0	0
Total Operations	**10,781**	**11,799**	**14,230**	**16,348**	**18,781**

Note: Military operations are excluded. 2013 numbers are based on 2012 operations as reported by HDN airport management records and the FAA Traffic Flow Management System Counts.
Source: Jviation, Inc.

3.14 Comparison to Existing FAA TAF

The FAA requires that study-related forecasts be consistent with the TAF or include sufficient documentation to explain the difference**. Table 3-16** summarizes the forecast comparison to the TAF as recommended in Appendix C of the FAA document, *Forecasting Aviation Activity by Airport*. A forecast is considered to be consistent with the FAA TAF if it:

a) Differs by less than 10% in the 5-year forecast and 15% in the 10-year forecast, or

b) Does not affect the timing or scale of an airport project, or

c) Does 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*.

3.14.1 Passenger Enplanement Forecast

The FAA TAF projects enplanements at a CAGR of 2.75%, with an enplanement forecast of 182,691 in 2033. For this Master Plan, the recommended 20-year forecast results in 183,457 enplanements in 2033, and is based on the mid-range forecast (2.81%), which is slightly higher than the TAF forecasted growth rate. The -0.9% discrepancy between the base year for passenger enplanements is due to the

use of the actual enplanement count (105,309), as recorded by HDN airport management for the forecast.

The recommended enplanement forecast differs from the five-year forecast by -0.6%, the 10-year forecast by -0.2%, and the 20-year forecast by 0.4%. The single largest factor driving forecasted passenger enplanement growth is the winter peak season travel. The HDN to DEN route is currently operated by one daily flight with the Bombardier Q-400 turboprop aircraft, which expands to 72 total flights weekly during the ski season. Because HDN is an inbound leisure market with a large winter peak, it is anticipated that modest growth will occur with the expansion of new routes, as discussed in Appendix C, *Yampa Valley Regional Airport Enplanement Analysis*. The enplanements forecast is consistent with the FAA because it does not affect the timing or scale of an airport project, and does not affect the role of the airport as defined in FAA Order 5090.3.

3.14.2 Aircraft Operations Forecast

Currently FAA forecasts show low to moderate growth in total operations for HDN, with an operations forecast of 10,744 from 2013 to 14,610 in 2033 (CAGR of 1.55%). For the purposes of this Master Plan Update, the recommended 20-year forecast results in 18,788 operations in 2033, and is based on the recommended mid-range forecast. The recommended operations forecast differs from the five-year forecast by 4.4%, the 10-year forecast by 13.6%, and the 20-year forecast by 28.6%. This difference is primarily due to the FAA TAF showing a low growth rate for GA operations (0.99%), a higher growth rate for commercial operations (1.55%), and no growth for military operations, whereas the recommended growth rate for GA operations is 2.81%, which is also the selected forecast growth rate for commercial operations. The operations forecast does not affect the timing or scale of an airport project and does not affect the role of the airport as defined in FAA Order 5090.3, and is therefore consistent with FAA TAF.

3.14.3 Based Aircraft Forecast

The FAA predicts no growth for based aircraft, with four shown for the duration of the forecast, currently below the existing number of based aircraft of nine as reported by airport management. The recommended forecast indicates 11 based aircraft at the end of the planning period, which differs from the TAF because of the difference in the initial baseline number of aircraft, which was provided by HDN airport management, and the projected growth (1.19%). The recommended based aircraft forecast differs from the five-year forecast by 138.7%, the 10-year forecast by 153.3%, and the 20-year forecast by 185.2%. This difference is result of the FAA TAF showing four based aircraft throughout the 20-year forecasting

period. The based aircraft forecast is consistent with FAA TAF because it does not affect the timing or scale of an airport project and does not affect the role of the Airport as defined in FAA Order 5090.3.

TABLE 3-16 – FAA TEMPLATE FOR COMPARING AIRPORT PLANNING AND TAF FORECASTS

Template for Comparing Airport Planning and TAF Forecasts

AIRPORT NAME: Yampa Valley Regional Airport

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
Base yr.	2013	105,309	106,289	-0.9%
Base yr. + 5yrs.	2018	120,985	121,699	-0.6%
Base yr. + 10yrs.	2023	138,995	139,343	-0.2%
Base yr. + 15yrs.	2028	159,686	159,554	0.1%
Base yr. + 20yrs.	2033	183,457	182,691	0.4%
Commercial Operations				
Base yr.	2013	6,251	6,251	0.0%
Base yr. + 5yrs.	2018	7,182	6,877	4.4%
Base yr. + 10yrs.	2023	8,251	7,567	9.0%
Base yr. + 15yrs.	2028	9,479	8,317	14.0%
Base yr. + 20yrs.	2033	10,890	9,143	19.1%
Total Operations				
Base yr.	2013	10,788	10,744	0.4%
Base yr. + 5yrs.	2018	12,393	11,599	6.8%
Base yr. + 10yrs.	2023	14,237	12,529	13.6%
Base yr. + 15yrs.	2028	16,355	13,523	20.9%
Base yr. + 20yrs.	2033	18,788	14,610	28.6%
Based Aircraft				
Base yr.	2013	9	4	125.0%
Base yr. + 5yrs.	2018	10	4	138.7%
Base yr. + 10yrs.	2023	10	4	153.3%
Base yr. + 15yrs.	2028	11	4	168.8%
Base yr. + 20yrs.	2033	11	4	185.2%

NOTES: TAF data is on a U.S. Government fiscal year basis (October through September).

Note: The base year (2013) for enplanements and operations discrepancy with the TAF is based on the actual count for passenger enplanements and general aviation operations, as provided by HDN airport management records. The base year for based aircraft is also based on the current total of based aircraft, as provided by HDN airport management.

Source: FAA; Jviation, Inc.

3.15 FACTORS THAT MAY CREATE CHANGES IN THE FORECAST

A forecast of aviation activity attempts to predict the future based on known factors and conditions. Numerous factors, on a local and/or national scale, can greatly affect the future of the airport and are unknown at this time. Oil prices, local economic activity, disposable income, costs of aircraft owner's insurance, and the potential for national GA user fees are

just a few items that are beyond that airport's control that may change future activity dramatically. For this reason, implementation of development outlined in this report must be validated with the current conditions prior to the commencement of any further action.

3.16 Summary of Preferred Forecasts

Appendix B of the FAA document, *Forecasting Aviation Activity by Airport*, recommends formatting the preferred forecast data into a particular tabular format for ease of readability. This section will be updated following input from the HDN Master Plan PAC and the Routt County Board of County Commissioners.