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.

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. Forecasts and the projects that they justify should be revisited periodically for this reason. The Master Plan will examine the facility requirements based on anticipated aviation demand for the 20-year planning period, concluding the investigation phase of the Master Plan, and initiating the solutions phase to accommodate future aviation demand on airport facilities.

The projections of aviation demand documented in this chapter were prepared during a period of sustained growth in commercial airline passenger enplanements. Within the last eight years DRO was handling just half of the traffic now traveling through the airport. This occurred during a period dubbed the Great Recession, when airlines were slashing capacity in response to softening demand for air travel and high fuel prices. While it may not be certain that this growth trend will continue at current levels, it is reasonable to project that by the end of the forecast period in 2035, between 300,000 and 400,000 passengers will be boarding flights out of terminal facilities at DRO. The following sections provide detail on the forecast analysis, methodologies employed, and the conclusions that led to the selection of the preferred forecast.

3.1 DATA SOURCES

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

- **FAA Terminal Area Forecast (TAF), Published February 2014**[1] - The TAF is updated annually and is used by the FAA to determine budget and staffing needs and serves as a resource for airport operators, the general public, and other interested parties. The TAF methodology employs a top-down approach to determine forecasts in order to maintain a nationwide perspective. The TAF provides a framework for developing forecasts, and is utilized for comparison of scenario-driven forecasts with forecasts developed by the FAA. Comparison of the two forecasts serves as a general requirement for FAA's approval of an airports master plan forecast. [2]

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

[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

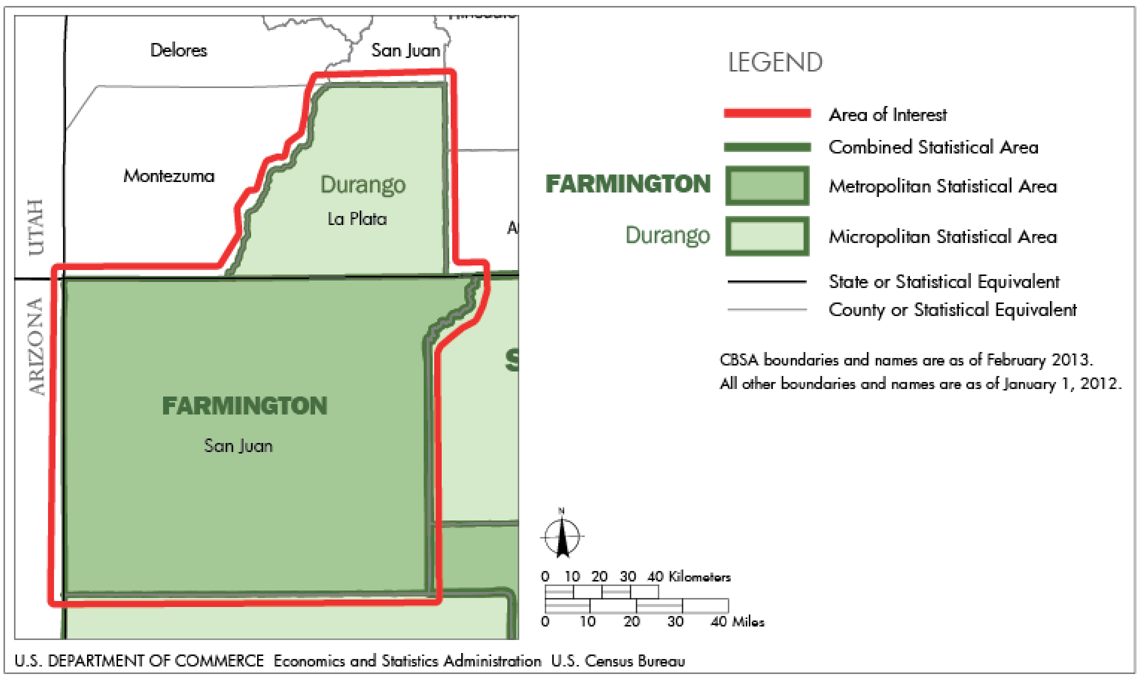
- **FAA Advisory Circular 150/5070-6B, Airport Master Plans** - This document establishes the framework for forecasts that are prepared as part of master plans. AC 150/5070-6B provides a flexible approach to master planning that aims guidance towards critical issues for consideration and resource utilization. It contains 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.
- **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 airport traffic control tower (ATCT).
- **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. The ACRP report also identifies common aviation metrics, issues in data collection and preparation, and data sources.
- **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.
- **FAA Form 5010-1, Airport Master Record** - Form 5010-01 provides historical, operational, and enplanement data for DRO, as compiled by the FAA, and is utilized primarily to cross-reference other data sources.
- **FAA Aerospace Forecasts, Fiscal Years 2014-2034**[6] - The FAA annually prepares this document to explain current economic and aviation outlooks, as well as macro level forecasts of aviation activity and the U.S. aircraft fleet.
- **Woods & Poole Economics**[7] - Use of Woods & Poole Economics as a data source is recommended by the FAA in the document "Forecasting Aviation Activity by Airports." Woods & Poole is an independent firm that specializes in long-term economic and demographic projections. It maintains a current database for every U.S. county, with forecasts through 2040, using more than 900 variables. Historical and forecast socioeconomic data for Durango and La Plata County (and surrounding areas) was obtained from Woods & Poole, including historical economic data for the Farmington Metropolitan Statistical Area (MSA) and the Durango Micropolitan Statistical Area (**Figure 3-1**). Note that the Farmington, NM Economic Area includes Archuleta, CO; Dolores,

[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
[5] FAA Aviation Data & Statistics, http://www.faa.gov/data_research/aviation_data_statistics/index.cfm?print=go
[6] FAA Aerospace Forecasts FY 2014-2034, http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts
[7] Woods & Poole Economics: 2013 Data Pamphlet. http://www.woodsandpoole.com/

CO; Hinsdale, CO; La Plata, CO; Montezuma, CO; San Juan, CO; and San Juan, NM.[8] Data is provided from year 1970 forward, with forecasted economic data up to year 2040. The Durango Micropolitan Statistical Area and the Farmington NM MSA were used because they broadly encompass the market area for aviation activity at DRO, and also provide useful statistical data.

Colorado Department of Transportation, Aviation System Plan, 2011 - Additional information was obtained from the Colorado Department of Transportation Aviation System Plan, 2011 to support the data needs described throughout this chapter.

FIGURE 3-1 – DURANGO MICROPOLITAN STATISTICAL AREA AND FARMINGTON METROPOLITAN STATISTICAL AREA



Source: U.S. Department of Commerce Economics and Statistics Administration, U.S. Census Bureau

3.2 DEMOGRAPHIC AND ECONOMIC FACTORS

Aviation demand is largely a function of demographic and economic activity, provided there is a causal relationship. When preparing forecasts, planners should consider socioeconomic data, demographics, disposable income, and geographic attributes. Potential correlations between local socioeconomic data with an airport's forecast for future aviation demand is considered through this forecasting effort.

In order to support Woods & Poole data with other specific industry sectors for additional trends and correlation, an analysis of local and regional socioeconomic data in an airport's forecast for future aviation demand. Socioeconomic data was also collected from the U.S. Census Bureau and the Bureau of Labor Statistics. Oil and gas activity was also reviewed due to its favorable impact on the economy. Although

[8] Woods & Poole Economics: 2013 Data Pamphlet, Appendix 6. http://www.woodsandpoole.com/

Woods & Poole data is used in the forecast analysis, the following sections highlight the existing economic characteristics of La Plata County, as indicated by the U.S. Census Bureau, the Bureau of Labor Statistics.

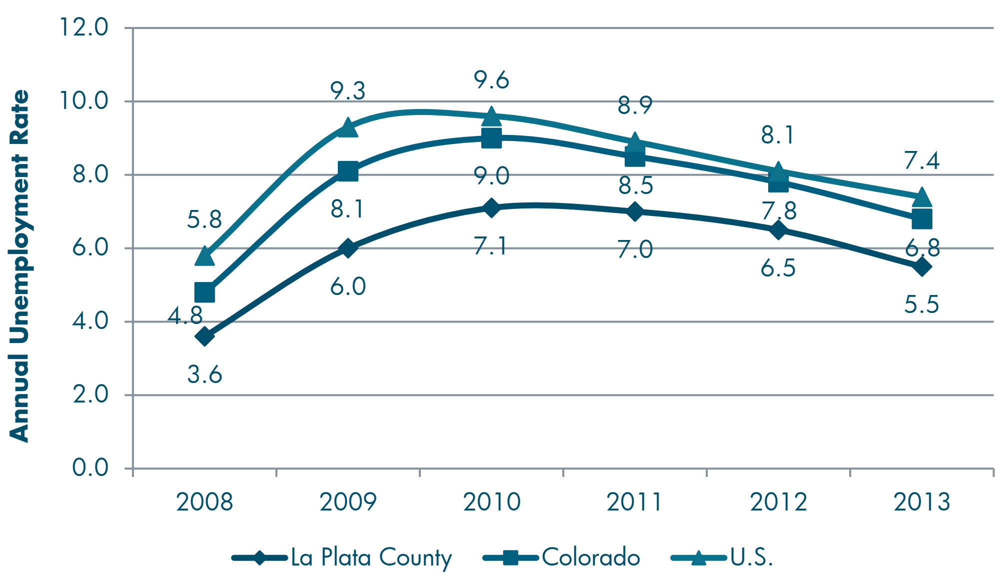
3.2.1 Employment

The five-year (2008-2012) estimate for the number of civilians employed in La Plata County was approximately 27,400, which is roughly 52 percent of the population in 2012. The top five industries include:

- Educational services, and health care and social assistance (19 percent)
- Arts, entertainment, and recreation, and accommodation and food services (14 percent)
- Retail trade (12 percent)
- Construction (11 percent)
- Professional, scientific, and management, and administrative and waste management services (11 percent)

The Bureau of Labor Statistics reports that La Plata County's unemployment rate has historically been lower than that of Colorado and the nation. The most recently reported (2013) unemployment rate for La Plata County was 5.5 percent, a significant decrease from 2010, when the County's unemployment rate peaked at 7.1 percent. The County's current unemployment rate remains below Colorado's and the U.S. unemployment rates, as depicted in **Figure 3-2**.

FIGURE 3-2 – 5-YEAR HISTORICAL UNEMPLOYMENT RATES



Source: U.S. Bureau of Labor Statistics

3.2.2 Community Socioeconomic Overview

According to Woods & Poole data, the Western region, consisting of the Southwest, Rocky Mountain (including Colorado), and the West regions 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 percent of all Americans are expected to reside in the West; this is up from 24 percent in 1970 and 33 percent 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 percent. Moreover, Woods & Poole predicts that the population of La Plata County, Colorado, specifically, will grow between 1.01 percent and 1.30 percent annually through 2040.

3.2.3 Oil and Gas Activity

La Plata County has approximately 3,000 producing oil and gas wells operated by 33 companies[9]. The region's economy receives support from annual tax revenues generated by this oil and gas activity. Oil and gas accounted for 37 percent of taxable dollars in 2013, and its value of property taxes accounted for over $683.9 million in assessed values.[10] The prior two years yielded higher taxable dollars at 48.4 percent for 2011 and 45.9 percent in 2012, with its value of property taxes over one billion for both years. Overall, the oil and gas industry has averaged over 40 percent of property taxes from 1998 through 2013 and continues to economically impact the region.

3.3 National Aviation Outlook

3.3.1 FAA Aviation Forecasts[11]

Each year the FAA prepares a national aviation forecast to project estimated commercial and GA activity levels. The FAA references the data to determine funding needs for its various operational arms. The current forecast document is for Fiscal Years 2014-2034. The major forecasting trends and conclusions are provided in this section to set the overall framework for the aviation industry and contain some concepts, acronyms, and categories that have not yet been defined in this chapter. The reader is encouraged to refer to the table of contents and the glossary to identify sections of the forecast where they are thoroughly discussed.

The commercial air industry endured several major events since the year 2000. They include September 11, a spike in fuel prices, debt restructuring in the U.S. and Europe, and a global recession. The Great Recession reversed a trend of sustained growth for the commercial airline industry. In spite of that, airlines adapted and long-term forecasts for the aviation industry remain positive. To manage extreme instability, airlines have streamlined their business models by lowering operating costs, eliminating unprofitable routes, grounding older and less fuel-efficient aircraft, and introducing (ancillary) charges for services that were traditionally bundled with the price of a ticket. Industry improvements and movement toward rapidly developing markets have resulted in more capacity management and consolidation since 2010.

In its Aerospace Forecast for Fiscal Years 2014-2034, the FAA predicts overall system capacity to increase modestly (up 1.5 percent) in 2014. In the domestic commercial carrier market, the mainline carrier

---

[9] Drilling Edge, www.drillingedge.com/colorado/la-plata-county, accessed September 2014.

[10] Colorado Department of Local Affairs (DOLA), Colorado Assessed Values 1999-2013, www.colorado,gov/cs/Satellite/DOLA-Main/CBON/1251594648177

[11] FAA Aerospace Forecast Fiscal Years 2014-2034. http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts

capacity growth is projected to expand 8.0 percent in 2014, while regional carriers are expected to post a 2.2 percent increase, its first increase since FY 2011. Overall domestic commercial carrier capacity for the entire forecast period (2014-2034) is projected to increase at an compound annual growth rate (CAGR) of 2.1 percent, which is slower than economic growth. Regional carriers are to grow faster than mainline carriers at 2.3 percent and 2.0 percent, respectively. Enplanements are forecasted to grow by 0.6 percent in 2014 whereas domestic, mainline, and regional carrier enplanements are predicted to grow by an annual average of 1.9 percent through 2034.

However, for GA growth, the FAA appears cautiously optimistic that demand for business jet aircraft will remain attractive relative to commercial air travel due to reliability, safety, and security concerns. The FAA forecasts strong growth for business aviation demand over the long-term driven by 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 percent each year through 2034. More expensive and sophisticated turbine-powered fleets are projected to grow by 2.6 percent annually, with the turbine jet fleet growing at 3.0 percent annually until 2034.

The number of piston-powered aircraft in the GA market are forecasted to decrease from 141,325 in 2013 to 131,615 by 2034. The smaller category of piston-powered rotorcraft is growing at 1.7 percent annually. Single-engine fixed-wing are projected to decline at a rate of 0.4 percent, similar to multi-engine fixed wing aircraft which post a 0.5 percent decline each year. The number of GA hours flown is anticipated to increase by 1.4 percent yearly through 2034, reflecting strong growth in rotorcraft and turbine jet fleets in the medium term.[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. These methodologies were used in developing forecasts for DRO passenger enplanements, commercial and GA 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, are not considered in the result.

[12] FAA Aerospace Forecast Fiscal Years 2014-2034.
http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts

3.4.2 Regression Analysis

Regression Analysis is a statistical technique that ties aviation demand (dependent variable), such as aircraft operations, to economic measures (independent variables), such as population or 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. Most regression models for aviation use gross economic measures like income, population, or employment to forecast activity levels.

The Regression Analysis measures used in this forecast study include population, employment, total earnings, total personal income, and total retail sales in Durango and the Farmington MSA, as reported by Woods & Poole.

3.4.3 Market Share Analysis

Market Share Analysis assumes a top-down model. It 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 is 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. The market share analysis approach to forecasting is not without weaknesses. National forecasts are composed of airports that are growing fast, growing slowly, and not growing. Since this analysis is based upon a 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 DRO'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 apply DRO's historical market share within Colorado and the ANM as the independent variable to forecast future growth, while GA operations and based aircraft market share variables utilize the TAF's predicted 20-year growth for ANM and CO from 2015-2025.

3.5 FORECASTING AVIATION ACTIVITY MEASURES AND METRICS

Forecasting parameters are determined by the level and type of aviation activity expected at DRO. As a commercial service airport, the forecast for DRO focuses on commercial passenger enplanements, as well as GA aircraft operations, and based aircraft activity levels. Demand for aviation is primarily a function of demographic and economic activity, not only in the region that the airport is located, but also regions where the airport is the destination. Data sources for these metrics are fully identified in **Sections 3.1.8** and **3.1.9**.

3.5.1 Commercial Aviation

Commercial aviation consists of all scheduled and unscheduled air service where passengers are flown on commercial aircraft for fare or for hire. 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.

Passenger Enplanements

An important activity measurement at airports served by commercial air carriers 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 DRO, enplanements and deplanements are equal since most passengers have round trip itineraries. For the purposes of this forecast, only enplanements are considered when forecasting. Enplanements are important for forecasting at a commercial service airport because they help determine terminal size and the number of gates needed. Deplaning passengers are also considered for various calculations in terminal facilities. They are assumed to be equal to enplanements. Annual forecasts are also supplemented with peak demand forecasts that are used in determining needs to meet peak hourly demand for various airport facilities.

Commercial Aircraft Operations (Takeoffs or Landings)

Commercial activity is 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 air carrier operators as either a large air carrier aircraft, designed to accommodate 31 or more passenger seats, or a small air carrier aircraft, designed to accommodate between nine and 31 passenger seats.[13] Air carrier capacity is also measured by passenger load factors. The commercial aircraft operations forecast also determines fleet mix by size and type of commercial aircraft used, as well as annual and peak month.

3.5.2 General Aviation

General Aviation (GA) consists of aircraft activity that is not considered commercial or military. Forecasting metrics of GA activity normally consist of aircraft operations and the number of based aircraft.

GA Aircraft Operations

A GA aircraft operation is defined as the take-off or the landing of a GA aircraft. Taken all together, the projection of an airport's aircraft operations also identify critical aircraft and how adequate the airfield is to serve such aircraft and those aircraft with similar characteristics. The critical aircraft for an airport is defined by the largest, heaviest aircraft in the fleet mix that conducts at least 500 operations annually. The projected critical aircraft is used to define future airfield design requirements as well as other facilities used by various aircraft on a regular basis.

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

Because DRO is a non-towered airport (not serviced by an Airport Traffic Control Tower), there are no actual traffic counts. Activity levels (operations) are estimated based on input from airport management, airport tenants, and Colorado Department of Transportation (CDOT). The TAF estimates historical operations at DRO, as well as projects future activity. The FAA's TAF is developed based on previous master plans, state airport system plans, and input from airport management, airport tenants, and state aeronautical departments. As a result, data from the 2013-2035 TAF was used as a baseline for operational counts. **Table 3-4** summarizes the TAF for Base Year and forecast of aircraft operations and **Section 3.11.3** has forecast of GA operations

Based GA Aircraft

The based GA aircraft analysis identifies how many GA aircraft are currently and will be stored/parked at DRO. The data is used to calculate need for specific hangar types and tiedown space requirements of aircraft parking aprons. The 2013-2035 FAA TAF, as well as the FAA's National Inventory of Based Aircraft, were used to confirm the Airport’s estimate that 70 aircraft were based at DRO in the base year of 2013. See **Section 3.11.1** for the forecast of based aircraft.

3.6 Review of Historical and Existing Forecasts

There are four previous or existing forecasts for DRO that are relevant to this master planning effort . Each of these forecasts are reviewed in the sections below.

3.6.1 2004 Master Plan Forecast

The purpose of presenting the 2004 Aviation Activity Demand Forecast is to provide a ten-year historical review of the direction of aviation demand at DRO. The passenger enplanements, total operations, and based aircraft, as indicated in the 2004 Master Plan Update are presented in **Table 3-1**.

TABLE 3-1 – 2004 AVIATION ACTIVITY DEMAND FORECAST

	2000	2006	2011	2016	2021
Enplanements	90,556	108,129	125,351	145,316	168,461
Commercial Operations	9,986	9,930	10,380	11,310	11,510
Total Operations	48,106	52,001	56,063	60,922	65,397
Based Aircraft	53	58	65	75	82

Source: 2004 Master Plan Update

Upon review of the historical forecasts, the existing passenger enplanements (192,797) and commercial operations (11,854), as indicated by the TAF and FAA audited enplanement records, exceed the 2004 Master Plan’s projected enplanements and commercial operations for 2016. However, the 2004 Master Plan’s base year forecasts for total operations (48,106) exceeds the Airport’s existing 47,068 operations, as indicated in the 2013 TAF. The existing number of based aircraft (70) is below the forecast of the 2004 Master Plan, as DRO was forecasted to have 75 based aircraft by 2016.

3.6.2 CDOT Aviation Forecast

In 2011, the Colorado Department of Transportation (CDOT) Aeronautics Division completed the Colorado 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 DRO as part of this study.

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

	2010	2015	2020	2030
Enplanements	163,600	198,700	228,800	279,300
Commercial Operations	8,410	9,000	9,800	11,070
Total Operations	29,020	30,320	31,860	34,690
Based Aircraft	70	70	71	72

Source: 2011 CDOT Aviation System Plan

3.6.3 2012 Terminal Area Master Plan

In 2012, a Terminal Area Master Plan (TAMP) was completed for DRO in support of an effort to add capacity to terminal facilities due to the observed strong growth in enplanements. As shown in **Table 3-3**, enplanements for 2013 were projected to be 175,400, with a 2.12 percent CAGR through 2030. In fact, actual 2013 enplanements reached 192,797, surpassing the TAMP forecast for the same year by 9.9 percent, or at a level not projected by the TAMP until sometime in 2017. Airlines continue to view Durango as a growth market and additional flights and larger aircraft indicate that this trend will continue.

TABLE 3-3 – 2012 TERMINAL AREA MASTER PLAN FORECAST

Year	Enplanements
2013	175,400
2014	179,800
2015	184,200
2020	206,300
2025	228,500
2030	250,700

Source: DRO Terminal Area Master Plan (2012)

For the purposes of the current master planning forecast effort, it is important to identify the factor(s) that may have led to DRO's actual demand deviating so significantly from the TAMP forecast. After a thorough review of the forecast methodology, it appears that the most likely reason was a faulty assumption that a particular factor would remain constant throughout the forecast period, and an underestimation of its potential impact. The forecast approach chosen within the TAMP was a regression analysis that correlated the historical relationship between the La Plata County population and DRO enplanements (the R-squared value of 0.95 suggested a very strong correlation). Based on that relationship, the Woods & Poole projected CAGR for the La Plata County population was utilized as the basis for DRO's preferred enplanement forecast.

However, as noted above, the observed demand quickly outpaced even the strong growth within the preferred forecast. The reason for this is not with the assumed average annual growth rate correlations, but in the ratio of DRO enplanements to La Plata County population, which rose from 2.13 enplanements per resident in 2005 to 3.04 enplanements per resident by 2010 (a 7.4 percent average annual increase). This trend continued from 2010 through 2013, albeit a lesser 6.0 percent average annual increase. From a practical standpoint, this simply means that the regional population utilized DRO more frequently, which makes sense, given the expanded services being offered at the Airport. While the TAMP acknowledged this trend, it dismissed its potential impact within the preferred forecast. This resulted in an implied assumption that the historical ratio of enplanements to population would remain static throughout the forecast period. Based on the results of comparing the forecast to actual activity, it is reasonable to conclude that this assumption was incorrect, and that the continuing trend of increasing enplanements to population ratio caused the TAMP growth rate to underestimate demand levels.

3.6.4 FAA Terminal Area Forecast

The FAA prepares an annual TAF for each airport in the NPIAS. It identifies all U.S. airports that are considered significant to the national aviation infrastructure network. The TAF that was used for DRO was published February 2014 and is presented in **Table 3-4**. The TAF indicates that airports the size of DRO will experience marginal growth. However, these forecasts are not always site-specific, and the FAA traditionally uses a conservative approach when site-specific data cannot be obtained.

TABLE 3-4 – FAA TAF FORECAST SUMMARY - DRO

	2013 Base Year	2015	2020	2025	2030	2035	CAGR[a]
Commercial Enplanements							
Total Enplanements	192,797	208,476	231,186	253,344	277,797	304,784	1.9%
Itinerant Operations							
Air Carrier	8,615	8,632	8,962	9,414	9,889	10,388	
Air Taxi & Commuter	3,239	3,265	3,330	3,397	3,468	3,543	
GA	13,265	13,445	13,907	14,389	14,889	15,404	
Military	500	500	500	500	500	500	
Total Itinerant	25,619	25,842	26,699	27,700	28,746	29,835	
Local Operations							
GA	21,449	21,754	22,537	23,347	24,185	25,053	
Total Local GA	21,449	21,754	22,537	23,347	24,185	25,053	
Total Operations	47,068	47,596	49,236	51,047	52,931	54,888	0.7%
Total Based Aircraft	70	71	75	80	85	90	1.2%

Note: [a]Compound Annual Growth Rate (2015-2035)
Source: FAA Terminal Area Forecast 2013-2035, published 2014

3.7 DRO COMMERCIAL SERVICE ACTIVITY

3.7.1 Scheduled Airline Service

Currently, DRO is served by four airlines[14]. Service to Denver is provided by United Airlines and Frontier airlines, while direct Phoenix service is provided by US Airways, as detailed in **Section 2.5.1**. American Airlines offers flights from DRO direct to Dallas-Fort Worth. **Table 3-5** and **Table 3-6** show the scheduled airline departures and arrivals at DRO, including aircraft types and frequencies.

TABLE 3-5 – DRO SCHEDULED AIRLINE DEPARTURES - WEEKDAYS

To	Airline	Time	Aircraft Type
Denver	United Express-SkyWest	5:45a	Bombardier Q400
Phoenix	US Airways	6:15a	CRJ-200, CRJ-900
Denver	Frontier[/a/]	7:02a	Airbus A-319
Denver	United Express-Republic	7:50a	Bombardier Q400
Denver	United Express-Republic	10:15a	Bombardier Q400
Denver	United Express-Republic	11:48a	Bombardier Q400
Dallas	American Eagle	12:20p	Embraer ERJ-140
Phoenix	US Airways	12:30p	CRJ-200, CRJ-900
Dallas	American Eagle	3:00p	Embraer ERJ-140
Phoenix	US Airways	3:25p	CRJ-200, CRJ-900
Denver	United Express-Republic	3:47p	Bombardier Q400
Denver	United Express-Republic	5:38p	Bombardier Q400

Note: Schedules and aircraft at time of publication may vary from actual airline schedules; check airline schedules for use. Not all months furnished schedules at time data was obtained, November 2014.
[/a/]Service is seasonal
Source: DRO Airport Management Records, July 2014

[14] The merger of American Airlines and US Airways will reduce the number of airlines that service DRO to three once consolidation of the two companies is complete.

TABLE 3-6 – DRO SCHEDULED AIRLINE ARRIVALS - WEEKDAYS

From	Airline	Time	Aircraft Type
Denver	United Express-Republic	9:36	Canadair CRJ-200
Denver	United Express-Republic	11:13	Bombardier Q400
Phoenix	US Airways	11:19	CRJ-200, CRJ-900
Dallas	American Eagle	11:53	Embraer ERJ-140
Phoenix	US Airways	2:33	CRJ-200, CRJ-900
Dallas	American Eagle	2:33	Embraer ERJ-140
Denver	United Express-Republic	3:12	Bombardier Q400
Denver	United Express-Republic	5:00	Bombardier Q400
Phoenix	US Airways	5:36	CRJ-200, CRJ-900
Denver	United Express-Republic	8:22	Bombardier Q400
Denver	Frontier[/a/]	10:25	Airbus A-319
Denver	United Express-Republic	11:20	Bombardier Q400

Note: Schedules and aircraft at time of publication may vary from actual airline schedules; check airline schedules for use. Not all months furnished schedules at time data was obtained, November 2014.
[/a/]Service is seasonal
Source: DRO Airport Management Records, July 2014

Figure 3-3 graphically depicts the top 25 origin and destination markets from Durango, with the number of passengers enplaned in 2013.

FIGURE 3-3 – TOP 25 ORIGIN & DESTINATION MARKETS FROM DRO

Rank	Market	Passengers
1	Denver, CO (DEN)	65,467
2	Ft. Worth, TX (DFW)	26,191
3	Houston, TX (IAH)	24,210
4	Phoenix, AZ (PHX)	17,318
5	Chicago, IL (ORD)	10,262
6	Austin, TX (AUS)	10,076
7	San Francisco, CA (SFO)	8,756
8	Seattle, WA (SEA)	8,727
9	Minneapolis, MN (MSP)	8,370
10	Atlanta, GA (ATL)	8,124

Sources: Passenger Demand Analysis, Boyd Group International, Durango-La Plata County Airport, November 2013, and Jviation

3.8 PASSENGER ENPLANEMENT FORECAST

Projections of commercial passenger enplanements are an important part of the forecasting task. In particular, forecasts of commercial enplaned passengers are a critical input for identifying future requirements for the Airport's terminal building and other facilities in the terminal area. For this Master Plan, the process to develop a projection for this demand component started with reviewing the Airport's historical enplanements.

Between 2000 and 2013, enplaned commercial passengers at DRO grew from 85,738 to 192,797, a CAGR of 6.4 percent over that 13-year period. Note that this growth rate was significantly above the 1.4 percent CAGR for all commercial airports within the FAA's ANM over the same period, as well as the 2.2 percent rate for commercial airports within the State of Colorado.

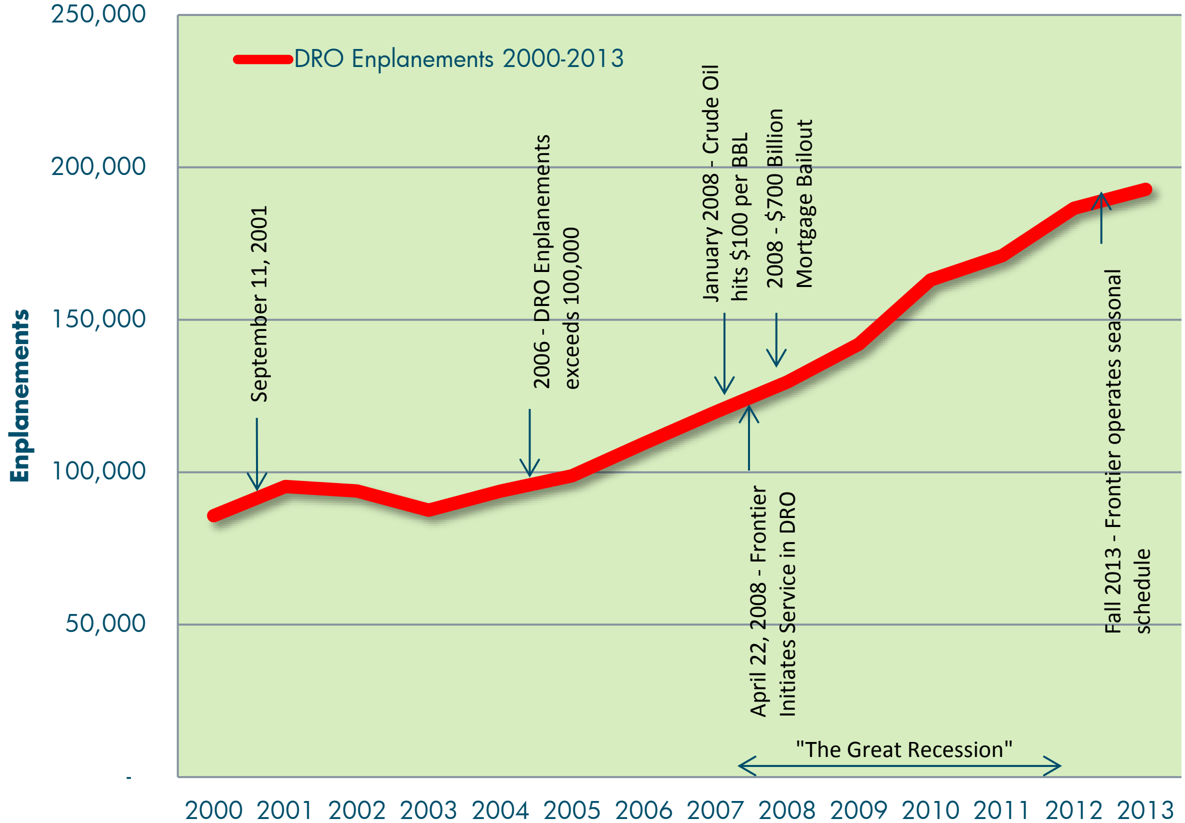
When focused on the most recent five-year timeframe, DRO's enplanements have experienced an even more robust growth (129,584 to 192,797), a CAGR of 8.3 percent. Historic enplanements for the DRO and combined enplanements for all commercial airports in the Northwest Mountain Region are presented in **Table 3-7**. Clearly, DRO's actual growth in commercial enplanements has far exceeded what has been experienced for most commercial airports in the Region. **Figure 3-4** shows DRO's historic growth in enplaned commercial passengers between 2000 and 2013.

TABLE 3-7 – HISTORICAL DRO AND ANM ENPLANEMENTS 2000-2013

Year	DRO	ANM[a]	CO
2000	85,738	57,090,075	20,350,167
2001	95,341	56,349,274	20,157,745
2002	93,837	51,983,741	18,493,568
2003	87,548	53,387,198	19,332,432
2004	93,775	57,352,050	21,950,311
2005	98,858	60,896,618	22,664,012
2006	109,413	63,436,986	24,497,749
2007	119,730	66,185,320	25,781,438
2008	129,584	67,655,054	26,499,159
2009	142,008	64,247,237	25,844,543
2010	163,052	65,451,243	26,774,067
2011	171,067	67,510,844	27,604,652
2012	186,567	67,852,291	27,575,845
2013[b]	192,797	68,154,544	27,132,377
CAGR[c]	6.4%	1.4%	2.2%

Notes: [a] FAA Northwest Mountain Region Includes: CO, ID, MT, OR, UT, WA, and WY
[b] FAA Air Carrier Activity Information System (ACAIS) audited enplanements, CY 2013
[a] Compound Annual Growth Rate
Source: FAA TAF, published February 2014

FIGURE 3-4 – DRO HISTORIC AIRPORT ENPLANEMENTS



Note: FAA Air Carrier Activity Information System (ACAIS) audited enplanements, CY 2013
Source: FAA TAF, published February 2014

As discussed at length in the 2012 Terminal Area Master Plan (TAMP), there are many factors that could contribute to the sustained growth rate in passenger enplanements at DRO. It is very likely a combination of several or all of the following factors:

- Increased competition and choice of direct destinations
- A “low fare” airline offering A319 service to Denver
- Other airports losing market share to DRO
- Isolation – the time and distance by road to competing airports like Denver or Albuquerque
- Growth in tourism and other industry sectors
- Increased capacity by airlines, increasing seats per departure, and use of jets
- Low operating costs for airlines

It should be noted that just as there is no single factor that fully explains the increase in activity at DRO, it is unlikely that any one factor would cause this trend to reverse, particularly the longer growth continues to occur. That said, the current rate of sustained growth being experienced at DRO over the recent five-year planning period (8.4 percent CAGR) is unlikely to continue unabated. The task for this analysis is to examine historical data in search of relationships that can best help forecast the enplanement demand for the next 20 years.

The following sections present overviews of the various forecast methodologies considered for the DRO passenger enplanement forecast, as well as the presentation of the preferred forecast.

3.8.1 The FAA Terminal Area Forecast

The process to develop a projection for enplanements started with a review of FAA's TAF for DRO. As shown in **Table 3-4**, the FAA projected a robust CAGR from 2013 to 2015 of 3.99 percent, and then moderating to 1.92 percent through 2035. This ultimately results in enplanements increasing to 304,784 by the end of the forecast period in 2035. For the sum of all airports within the Northwest Mountain Region, the FAA projects enplanements to increase from approximately 68 million (2015) to 105 million (2035), a CAGR of 2.0 percent. So, despite the fact that growth in enplanements at DRO has clearly outpaced growth in enplanements at other commercial airports in the Region, the FAA's collective rate of anticipated growth for enplanements is actually higher in the Region than it is for DRO. Given the Airport's actual growth between 2000 and 2013, and an even higher growth rate in the most recent five-year period, the TAF projection of enplanements for DRO appears to be too conservative. As a result, other means to develop a projection of enplanements that considers the Airport's actual historic growth were investigated.

3.8.2 Linear Trend Analysis

For commercial service enplanements, linear trend analyses were considered as a projection technique. As noted above, the Airport's commercial enplanements increased at a 6.4 percent CAGR between 2000 and 2013, with an increased rate of 8.3 percent being experienced between 2008 and 2013. To put those rates into perspective, if the Airport's enplanements were to continue to grow at 6.4 percent annually throughout the forecast period, they would reach approximately 754,770 by 2035, while continuous growth at 8.3 percent would result in 1.1 million enplanements by 2035. Clearly, these future demand scenarios exceed that which may be considered to be "reasonable." Despite the fact that the Airport has experienced significant enplanement increases in recent years, it is not realistic to project that growth will sustain these rates over the next 20 years. Therefore, these linear projections were excluded from further consideration.

3.8.3 Multiple Regression Analysis

For this method of forecasting, various socio-economic and demographic characteristics for the Durango area were reviewed, as were anticipated growth rates for these indicators. **Table 3-8** presents the Woods and Poole economic/demographic metrics for the Durango Micropolitan Statistical Area (MpSA), and **Table 3-9** presents similar data for the Farmington MSA. In addition to showing historic growth for various socio-economic and demographic indicators, both tables also present their respective historic and projected average annual growth rates. These growth rates for the various indicators were used to support the development of various enplanement projections for DRO discussed in this section. It should be recognized that the City of Durango's socioeconomics are included in both the Farmington MSA, and the more narrowly focused MpSA. In comparing the two tables, it is worth noting that while historical growth rates for each category appear to be relatively similar, projected growth rates for the MpSA are markedly higher. This would reasonably imply that the area more narrowly focused on Durango itself is expected to experience significantly higher growth pressures than that of the surrounding region.

TABLE 3-8 – DURANGO MICROPOLITAN STATISTICAL AREA
HISTORICAL & PROJECTED ECONOMIC GROWTH

Year	Total Population (in thousands)	Total Employment (in thousands of jobs)	Total Earnings (in millions of 2005 dollars)	Total Personal Income (in millions of 2005 dollars)	Total Retail Sales, Including Eating and Drinking Places Sales (in millions of 2005 dollars)
2000	44.23	31.26	980.736	1390.906	676.511
2005	47.58	35.35	1244.540	1672.235	790.184
2010	51.44	37.10	1362.848	1974.466	785.703
2015	59.22	40.68	1608.475	2330.445	995.224
2020	68.66	48.09	2041.315	2961.157	1204.921
2025	78.36	56.61	2577.835	3772.225	1438.099
2030	88.22	66.34	3237.904	4788.003	1697.103
2035	98.18	77.35	4043.852	6045.025	1984.553
Historic Average Annual Rate of Growth 2000-2013	1.77%	1.51%	3.11%	3.36%	2.37%
Projected Average Annual Rate of Growth 2015-2035	2.56%	3.27%	4.72%	4.88%	3.51%

Source: Woods & Poole Economics, 2013 Data Pamphlet - Durango Micropolitan Statistical Area (MpSA)

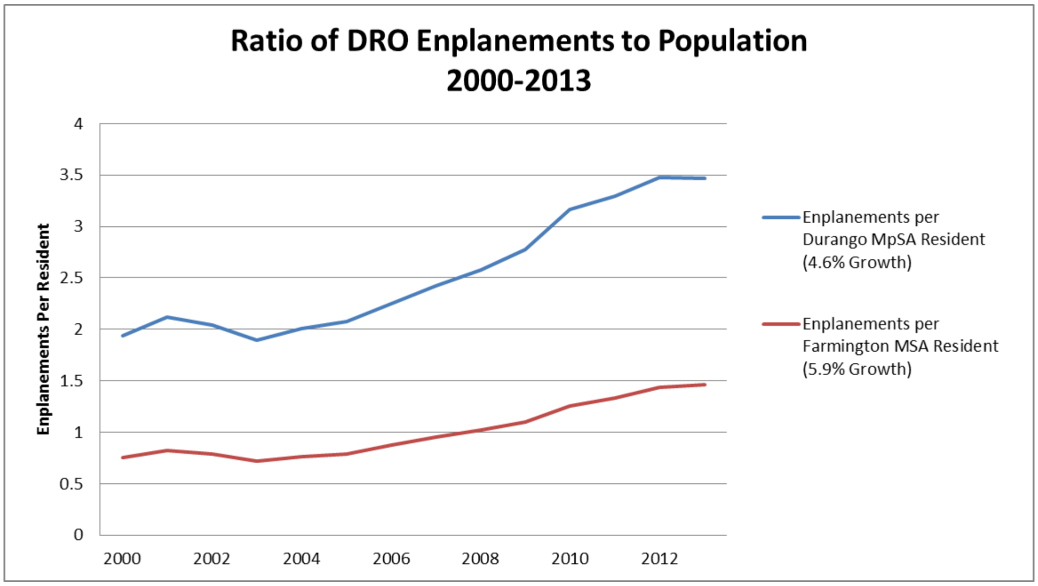
TABLE 3-9 – FARMINGTON METROPOLITAN STATISTICAL AREA
HISTORIC & PROJECTED ECONOMIC GROWTH

Year	Total Population (in thousands)	Total Employment (in thousands of jobs)	Total Earnings (in millions of 2005 dollars)	Total Personal Income (in millions of 2005 dollars)	Total Retail Sales, Including Eating and Drinking Places Sales (in millions of 2005 dollars)
2000	114.13	54.432	1,951.782	2,430.091	1,444.808
2005	124.80	62.147	2,426.692	3,043.813	1,701.524
2010	130.18	62.508	2,608.549	3,449.736	1,657.858
2015	135.97	66.188	2,884.333	3,829.708	1,903.941
2020	145.79	70.503	3,250.69	4,384.720	2,129.608
2025	155.56	74.85	3,648.813	5,043.848	2,374.553
2030	165.17	79.227	4,079.866	5,806.929	2,641.133
2035	174.60	83.637	4,545.297	6,683.385	2,931.814
Historic Average Annual Rate of Growth 2000-2013	1.13%	1.31%	2.66%	3.18%	1.79%
Projected Average Annual Rate of Growth 2015-2035	1.26%	1.18%	2.30%	2.82%	2.18%

Sources: Woods & Poole Economics, 2013 Data Pamphlet; Farmington MSA

With respect to the master plan forecast effort (and similar to the TAMP), this analysis found there to be a strong correlation (R2 = 0.93) between the Durango MpSA population and DRO enplanements. However, as shown in **Figure 3-5,** and described in **Section 3.6.3**, DRO is in fact experiencing an increasing ratio of enplanements to population, suggesting that the actual demand will grow at a higher rate than the respective growth rates of the Farmington MSA (1.3% CAGR) or the Durango MpSA (2.6% CAGR) population forecasts. This means that if this trend were to continue, use of either of these forecasted growth rates would likely undershoot actual demand.

FIGURE 3-5 – RATIO OF ENPLANEMENTS TO POPULATION



Sources: Jviation; Woods and Poole Economics, 2013; Durango MpSA; Farmington MSA; FAA TAF

To explore this possibility further, the growth trends associated with the enplanements to resident ratio were applied to the broader Farmington MSA population forecast in order to determine the resulting enplanement forecast. As shown below in **Table 3-10**, in adding just over one enplanement per Farmington MSA resident by the end of the forecast period could result in over 444,000 enplanements by 2035, a CAGR of more than 4.1 percent.

TABLE 3-10 – ENPLANEMENTS VS POPULATION GROWTH
WITH GROWTH IN ENPLANEMENTS PER FARMINGTON MSA RESIDENT

Year	Farmington MSA Population	Linear Extrapolation Enplanements/Resident	Resulting Enplanement Forecast
2015	135,978	1.45	197,679
2020	145,791	1.73	251,680
2025	155,565	2.00	310,953
2030	165,175	2.27	375,181
2035	174,609	2.54	444,200
CAGR[/a/]	1.26%	2.9%	4.1%

Note: [/a/]Compound Annual Growth Rate
Sources: Jviation; Woods and Poole Economics, 2013 – Durango Micropolitan Statistical Area; FAA TAF

It should also be acknowledged that tourism plays a primary role in the MpSA economy and that of Durango in particular. Both local employment and retail sales are directly influenced by visitor spending levels. While there is an assumed relationship between the number of area visitors (and their associated retail spending) and enplanement growth at the Airport, it is difficult to quantify that relationship in that visitors arrive in Durango by transportation modes other than aircraft. Nevertheless, it is important to recognize that the projected growth rate in total retail sales for the Durango Micropolitan Statistical Area is

3.51 percent per year, although, considering the weaker relationship between this growth and DRO activity, this should only serve as a benchmark and not the basis of a forecast scenario.

3.8.4 Market Share Analysis

Market share approaches were also considered to develop enplanement projections for the Airport. The Airport's historical market share of total enplanements for all commercial airports in the ANM and its share of total enplanements for all commercial airports in Colorado were calculated. Total historical and projected enplanements for all commercial airports in the Region and Colorado were obtained from the TAF. Based on historical market shares, the DRO's anticipated market share of total enplanements for the Region is 0.29 percent, and its anticipated market share for all Colorado enplanements is 0.76 percent.

A summary of all enplanement projections developed using anticipated growth rates for socio-economic and demographic factors is shown in **Table 3-11**, as well as the enplanement projections developed using the Airport's market share of regional and state enplanements. As reflected in this table, the various projections produced enplanement totals in 2035 that ranged from a high of 550,117 to a low of 211,000. A simple averaging of these high and low projections results in enplanements for the Airport that approaches 400,000 by 2035.

TABLE 3-11 – DRO ENPLANEMENT FORECAST COMPARISON

Year	Durango MpSA Population	Farmington MSA Population	Durango MpSA Employment	Durango MpSA Total Personal Income	Durango MpSA Total Retail Sales	FAA Terminal Area Forecast
2013 (Base Year)	192,797	192,797	192,797	192,797	192,797	192,797
2015	202,795	197,679	205,594	212,078	206,573	208,476
2020	230,118	210,431	241,427	269,145	245,477	231,186
2025	261,122	224,006	283,505	341,567	291,706	253,344
2030	296,303	238,456	332,917	433,477	346,642	277,797
2035	336,224	253,839	390,941	550,117	411,923	304,784
CAGR[a]	2.56%	1.26%	3.27%	4.88%	3.51%	1.92%

Note: [a]Compound Annual Growth Rate (2015-2035)
Sources: Jviation; Woods and Poole Economics, 2013 – Durango Micropolitan Statistical Area (MpSA), Farmington MSA; FAA TAF

3.8.5 Local Airline Trends

An important consideration with respect to DRO's forecast is to also examine the Airport's projected airline capacity. The airlines that currently serve Durango are opting to retire their smaller regional aircraft and progressively replace them with larger, higher seating capacity aircraft. Thus, based on the existing flight schedule and without even adding any new destinations or frequency, DRO would experience an increase in the availability of total annual airline seats. Specifically, when considering the potential of existing capacity to larger capacity aircraft conversions as related only to DRO's existing departure schedule (as shown earlier in **Table 3-5**), the Airport would realize an additional 617 daily airline seats by 2035. The reason that this is important is that along with the increase in seat availability is an implication that at least a percentage of those seats will have to be occupied by passengers for the airlines to continue to offer that service. Assuming just a 50 percent load factor for only those 617 new daily airline seats would net DRO over 112,000 additional annual enplanements.

Beyond simple aircraft capacity changes, there reasonably should also be an expectation that growth in commercial markets will continue to occur within the next 20 years through the addition of new destinations and/or increased frequency to existing destinations. This assumption is based on overall regional growth trends, as well as historical and projected growth patterns specific to Durango. For illustrative purposes, **Figure 3-6** below presents a potential flight schedule for 2035. This example maintains DRO's existing schedule while adding just one daily departure to Houston using a 737-800 and one daily departure to Chicago using a CRJ-900, yielding an additional 240 seats each day. (Note that both of these cities are a top-ten market to/from DRO and it would not be unreasonable to presume such a limited expansion of service within the 20-year planning horizon.) Assuming the completion of the aircraft fleet replacement described previously and the addition of two routes, DRO would have over 537,000 seats available per year by 2035. Applying a conservative load factor of 80 percent, the annual enplanement level at DRO could easily exceed 430,000 (a 3.5 percent CAGR).

FIGURE 3-6 – SAMPLE DAILY DEPARTURES

2015-2019			
To	Aircraft	Seats	ENP
DEN	CRJ-200	50	40
DEN	CRJ-200	50	40
DEN	CRJ-200	50	40
DEN	Q400	76	61
DEN	Q400	76	61
DEN	Q400	76	61
DEN	Q400	76	61
DEN	A319	138	111
PHX	CRJ-900	76	61
PHX	CRJ-200	50	40
PHX	CRJ-200	50	40
DFW	ERJ-140	44	36
DFW	ERJ-140	44	36
	Daily Seats-Pax	**856**	**688**
	Per Departure	71.33	57.33
	Monthly	25,680	
	Annual	312,440	251,120

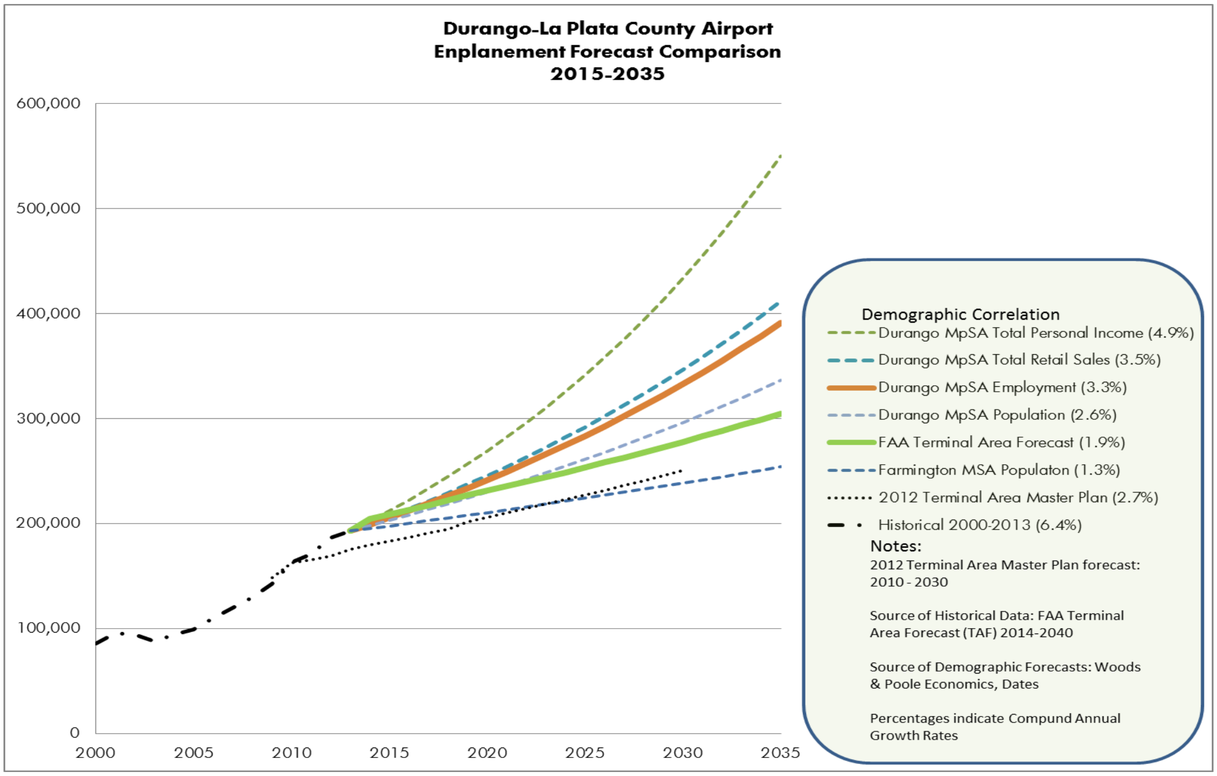
2035			
To	Aircraft	Seats	ENP
DEN	CRJ-900	76	61
DEN	CRJ-900	76	61
DEN	EMB-175	80	64
DEN	EMB-175	80	64
DEN	EMB-175	80	64
DEN	EMB-175	80	64
DEN	A319	138	111
DEN	A319	138	111
PHX	ERJ-190-E2	97	78
PHX	ERJ-190-E2	97	78
PHX	ERJ-190-E2	97	78
DFW	ERJ-190-E2	97	78
DFW	ERJ-190-E2	97	78
HOU	737-800	150	120
ORD	CRJ-900	90	72
	Daily Seats-Pax	**1,473**	**1,182**
	Per Departure	98.20	78.80
	Monthly	44,190	
	Annual	537,645	431,430

Note: Not a forecast; for illustration purposes only showing relationships between Daily airline activity, equipment changes, and annual enplanement levels over time.
Source: Jviation

3.8.6 Preferred Enplanement Forecast

The previous sections presented an assortment of standard practice forecasting approaches that are typically utilized in airport master planning efforts. Selecting a preferred forecast from those various models is critical in that this forecast will ultimately result in specific facility requirements whose scope and magnitude will be driven by those projections. Because of the importance to the rest of the master plan, it is imperative that the preferred forecast be reasonable, defensible, and thoughtfully determined. **Figure 3-7** provides a graphical representation of all potential enplanement forecasts for DRO. These various methodologies have resulted in potential enplanement growth ranging from a low of 253,000 to a high of over 550,000 by 2035.

FIGURE 3-7 – DRO (FY) ENPLANEMENT FORECASTS



Sources: Jviation; Woods and Poole Economics, 2013 – Durango Micropolitan Statistical Area (MpSA); FAA TAF

In reviewing the potential forecast scenarios, it was first determined that the reasonable range of forecasts should be greater than the 1.3 percent CAGR based on the Farmington MSA population forecast, but no greater than the 4.1 percent CAGR established by the revised enplanement to resident ration reflected in **Table 3-10**. This general range supports the current FAA TAF of 1.9 percent CAGR, and is consistent with conservative area airline trends that anticipate a 3.5 percent CAGR based on the addition of just two additional flights, and the natural conversion of existing airline fleets. Additionally, the range supports enplanement projections developed using the anticipated rate of growth for employment (3.27 percent) in the Durango area and the projection developed using the anticipated rate of growth for retails sales (3.5 percent) for the area.

With respect to identifying the specific preferred forecast scenario, it was determined through coordination with various project stakeholders that the best fit for socioeconomic forecasts within this range was Employment in the Durango MpSA, at 3.27 percent CAGR. This growth rate falls within the high-low range of 1.3 percent and 4.1 percent CAGR, while also representing an average of forecasted population growth, employment growth, and airline capacity growth. Based on these considerations, the 3.27 percent per year has been selected as the preferred forecast growth rate. In addition, a low forecast has also been selected to establish a refined range of expected enplanement activity through 2035. This low forecast will be based on the existing FAA TAF enplanement projection of 1.9 percent CAGR. The totals associated with the preferred high growth scenario and the low growth scenario are presented in **Table 3-12**.

TABLE 3-12 – DRO ENPLANEMENT FORECAST COMPARISON

Year	High Scenario (Preferred)	Low Scenario
2013	192,797	192,797
2015	205,594	208,476
2020	241,427	231,186
2025	283,505	253,344
2030	332,917	277,797
2035	390,041	304,784
CAGR[/a/]	3.27%	1.9%

Note: [/a/]Compound Annual Growth Rate (2015-2035)
Sources: Jviation and FAA TAF

Note that the preferred enplanement projection will be the primary input for developing the projection of commercial aircraft operations discussed in the next section of this chapter.

3.9 PEAKING CHARACTERISTICS

Forecasts of aviation activity on an annual basis are limited when it comes to sizing facilities that have peak activity within a season, a month, or even within the day. This is especially true for terminal facilities that have fluctuations throughout the day as passengers arrive and depart on specific flights that may be operating within the same hour of one or more other flights. For that reason, forecasts are also broken out to identify peak activity.

When considering the peaking characteristics in planning, there are a number of approaches that can be used. At very large airports the analysis can involve extensive modeling to evaluate a future flight schedule to see the various banks of passenger activity flow through the airport. At smaller facilities like DRO, assumptions are made about the activity experienced on the average day in the busiest month of the year.

For this analysis, a combination of approaches was used to validate the results of each. The first approach involves calculating the Peak Hour Enplaned Passenger level for the base year, 2013. This relationship is expressed as the percentage of the total enplanements on the Average Day of the Peak Month. For DRO in 2013, the peak month was July and the total was 19,875 enplaned passengers. With 31 days in July the average day is calculated as 641 enplaned passengers. Consulting the flight schedule for actual seats and average load factor, the peak hour represented 41.0 percent of the average day's enplanements.

In 2013, DRO's peak hour contained a departing flight by Frontier to Denver in the Airbus A319 with 138 seats[15]. The departure was moved to the early morning, outside the original peak hour. Several other flights also depart early and thus the peak hour has moved to a morning departure bank. This phenomenon is expected to continue to grow over time as the average size of aircraft increases and as additional early morning departing flights could be scheduled.

As enplanement levels grow, the peak month activity will account for less of the annual total as enplanements in the off-peak months continue to increase proportionally, which is expected as seasonal

[15] Jviation will provide updates to major passenger airline schedule changes for the final report.

airline emphasis tapers in favor of continuous year round service. The current ratio of the peak month to the annual enplanements in 2013 was 10.3 percent and this is projected to decrease over time.

Table 3-13 shows the relationships between the numbers discussed in this section. Peak Hour Enplaned Passengers are forecasted to rise from 263 in 2015, to 340 in 2025, and to 425 in 2035. It is important to point out that there may be fluctuations in annual enplanement levels without a corresponding effect on peaking activity if the actual flight schedule in the busy hour does not change. These relationships are determined here only as a means to plan for future activity levels. They are directly linked to actual flight schedules as they are adjusted by airlines on a continual basis and without regard to this planning forecast.

TABLE 3-13 – DRO PEAK HOUR ENPLANED PASSENGERS

Year	Annual Enplanements	Ratio Peak Month to Annual	Peak Month	Average Day Peak Month	Ratio PHEP to ADPM	Peak Hour Enplaned Passengers
2013	192,797	10.3%	19,875	641	41.0%	263
2015	*205,594*	10.3%	21,194	684	38.5%	263
2025	*283,505*	9.7%	27,377	883	38.5%	340
2035	*390,941*	8.8%	34,221	1,104	38.5%	425

Source: Jviation

For terminal planning purposes, Planning Activity Levels (PALs) have been established to quickly describe a level of activity that is to be accommodated with passenger processing facilities such as the terminal building. Once these levels are correlated to facilities that will be needed to accommodate these activity levels, the PALs will describe those required facilities as well. This will be further described in the next chapter as these facilities are identified. For simplicity, the PALs are evenly divided into 10-year intervals for 2025 and 2035. Thus PAL 1 corresponds to the activity projected for 2025 and PAL 2 corresponds to the activity projected for 2035, as shown in **Table 3-14**.

TABLE 3-14 – PLANNING ACTIVITY LEVELS (PALS)

	Year	Annual Enplanements	Peak Hour Enplaned Passengers
Current Level	2013	192,797	263
PAL 1	*2025*	*283,505*	*340*
PAL 2	*2035*	*390,941*	*425*

Source: Jviation

3.10 AIRCRAFT OPERATIONS FORECAST

3.10.1 Commercial Airline Operations

Unlike many of the demand components discussed in this chapter, commercial airline operations have little, if any, relationship to a market area's socio-economic and demographic characteristics. Commercial aircraft operations, however, do have a direct correlation to an airport's level of annual enplanements.

Table 3-15 provides information that shows historic commercial operations for the Airport. The source of the information presented in the table comes from the FAA's Air Carrier Activity Information System (ACAIS) database that receives official reports submitted directly by airlines. Information shown correlates the preferred enplanement forecast to the aircraft that carry the passengers. Rather than express this relationship using specific aircraft, the information is aggregated to yield annual averages that are shown to grow continuously. In reality, changes will be magnified as larger aircraft or new flights are added in and the market adjusts to the new levels.

Annual commercial airline operations at DRO have actually fallen. While enplanements increased at a healthy average annual rate of growth, over this same time frame, commercial airline operations decreased.

In the domestic commercial airline environment, it is fairly typical to see airports with increasing levels of enplanements and corresponding decreasing levels of commercial airline operations. There are two factors that account for this. Over time, the size (seating capacity) of commercial aircraft serving most communities has continued to increase. For the data shown in **Table 3-15**, carriers began transitioning from commercial planes that had a seating capacity for 19 or 30 passengers in favor of larger aircraft reducing frequency to match actual demand and attain a profitable yield. In the base year 2013, DRO is primarily served by commercial planes seating 66 to 138 passengers.

In addition to aircraft with higher seating capacities, carriers have also found that to be profitable on the routes they serve, their load factor (ratio of passengers to available seats) needs to be upwards of 80 percent. During years where carriers in the U.S. were losing money, their load factors were often not high enough to cover their operating costs. DRO has seen the Average Load Factor rise above 80 percent over the past several years, a level that airlines find to provide good yields.

Larger commercial aircraft, in terms of seating capacity and higher passenger load factors, have contributed to decreasing levels of commercial airline operations at the Airport, despite the fact that enplanements have experienced significant growth. Over time, DRO can expect the size (seating capacity) of the aircraft serving the airport to increase and for the load factor on these planes to also continue to rise.

3.10.2 Commercial Operations Forecast

As noted in the previous section, the preferred enplanement projection for the Airport calls for enplanements to reach an estimated 390,941 in 2035. Relating that growth to the type and frequency of airline flights will result in the Commercial Operations Forecast. Because the size of airline aircraft is expected in increase, the rate of growth in operations will be substantially smaller over the same period.

A review of the Terminal Area Forecast shows a discrepancy between the historical operations data between 2000 and 2013 when compared to the operations reported by the airlines. The TAF reported 11,854 commercial operations for 2013. This equates to 5,927 airline departures and 5,927 airline arrivals. However, the ACAIS reported 7,128 commercial operations or 3,564 airline departures for the same year. After consulting with FAA, this forecast will utilize the ACAIS data because it reflects documented airline flights.

Table 3-15 provides historical data from 2008-2013 along with the preferred Commercial Operations Forecast for 2015-2035. The data shows the gradual increase in the number of seats per departure during the forecast period. The data also shows that there has been an increasing historical trend in Load Factor, which is the percent on average that total available seats that are filled by fare-paying passengers. This will certainly fluctuate above and below 80 percent over the forecast period but is considered to represent the trend within this healthy airline market. By 2035 commercial departures are projected to be 5,090 per year, which is an increase over the 2015 activity level by approximately three daily departures.

TABLE 3-15 – FORECAST OF COMMERCIAL AIRLINE OPERATIONS
INCLUDES AIR CARRIER AND COMMUTER

	Year	Enplanements	Average Seats per Departure	Average Load Factor	Commercial Departures	Commercial Operations
Historical	2008	129,584	47.7	63%	4,322	8,644
	2009	142,008	48.0	69%	4,270	8,540
	2010	163,052	53.9	72%	4,203	8,406
	2011	171,067	52.4	74%	4,402	8,804
	2012	186,567	60.3	78%	3,972	7,944
Base Year	2013	192,797	60.0	83%	3,564	7,128
Forecast	*2015*	*205,594*	*62.4*	*81%*	*3,982*	*7,965*
	2020	*241,427*	*68.9*	*83%*	*4,236*	*8,471*
	2025	*283,505*	*76.1*	*83%*	*4,505*	*9,010*
	2030	*332,917*	*84.0*	*83%*	*4,792*	*9,583*
	2035	*390,041*	*92.8*	*83%*	*5,096*	*10,192*

Sources: FAA Air Carrier Activity Information System (ACAIS), 2014; Airport Records, and Jviation

3.11 PROJECTIONS OF GA BASED AIRCRAFT & BASED AIRCRAFT FLEET MIX

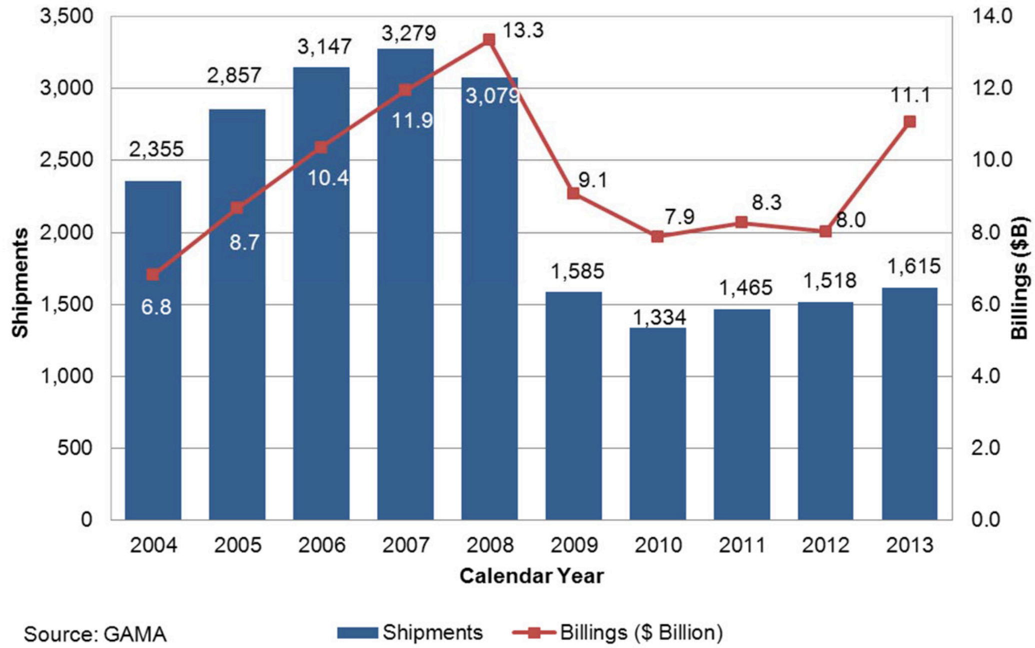
3.11.1 Projections of Based Aircraft

Based aircraft are planes that are parked and/or stored at an airport. Based aircraft may either be stored in various types of hangars or, in areas that have more moderate climates, they may also be parked on outdoor "tiedowns" on paved or unpaved aprons. A number of airports also have shade hangars for based aircraft that provide protection from hail and other weather conditions. Shade hangars are a combination of tiedowns and hangars. Projecting future based aircraft is important to the master planning process because it serves as the basis to identify the need/demand for additional hangar storage facilities and/or aircraft tiedown (apron) areas.

As discussed in **Section 3.5.2.2**, there were 70 based aircraft at DRO in 2013. That number is consistent with airport management records. In recent years, GA has been characterized as being generally stable to showing slight improvement. There are, however, national statistics that show fewer individuals own and operate GA aircraft, although use of GA aircraft to improve business efficiency has grown. In addition, fewer individuals are pursuing a license to fly as a private pilot; and the average age of private pilots in the U.S. is now over 44.

Perhaps the most telling statistic related to GA is shipments of GA planes by U.S. manufacturers. **Figure 3-8** summarizes information from the General Aviation Aircraft Manufacturers Association (GAMA) on GA aircraft units that have shipped and the cost of these units.

FIGURE 3-8 – GENERAL AVIATION AIRCRAFT MANUFACTURING SHIPMENTS AND BILLINGS IN THE U.S.



Source: FAA Aerospace Forecasts, 2014-2034

The number of GA aircraft manufactured in the U.S. increased from 2,355 in 2004 to 3,079 in 2008. The number of GA planes manufactured in the U.S. in 2009 experienced a precipitous drop to 1,589 units. In 2011, 1,465 GA aircraft were shipped by U.S. manufacturers, less than 47 percent of the number reported in 2008. Between 2011 and 2012, GA manufacturing experienced a modest rebound, with the number of units shipped increasing from 1,465 to 1,514.

Shipments for GA aircraft have increased in all categories, piston and turbine, with a higher rate of decrease reported for single and twin-engine aircraft in the piston category. This information helps to set the context for what the Airport might anticipate in terms of future based GA aircraft.

Table 3-16 provides information that shows changes in DRO’s based GA aircraft between 2000 and 2013. As shown, there was reported growth in DRO’s number of based aircraft between 2000 and 2006. After 2006 based aircraft remained constant for a few years and then decreased slightly. Over the entire 13-year historic period, based aircraft at the Airport increased at an average annual rate of 2.2 percent. Over this same time frame, for all airports with FAA TAF projections in the FAA's Northwest Mountain Region, based aircraft increased at an average annual rate of 0.5 percent. For all airports included in the FAA's TAF in Colorado, between 2000 and 2013, based aircraft increased at an annual average rate of 0.9 percent. Even with the downturn in based aircraft growth in recent years, DRO's historic growth in based GA aircraft has been more robust than it has been for FAA TAF airports in the FAA’s Northwest Region, or for TAF airports in Colorado.

TABLE 3-16 – DRO HISTORIC BASED AIRCRAFT

Year	Based Aircraft
2000	53
2001	59
2002	65
2003	65
2004	63
2005	65
2006	73
2007	73
2008	73
2009	73
2010	73
2011	70
2012	70
2013	70

Source: FAA TAF, published February 2014

According to FAA data from their *2013 National Aerospace Forecasts,* between 2000 and 2012, all active GA aircraft in the U.S. increased at an average annual rate of growth of only 0.1 percent. During this time frame, the number of piston GA aircraft in the U.S. fleet actually decreased at an average annual rate of -0.9 percent. Turbine GA aircraft in the U.S. feet increased at an average annual rate of 4.3 percent between 2000 and 2012. It was primarily this increase that resulted in the reported growth the total U.S. GA fleet.

Single-engine and multi-engine piston aircraft, the largest segment of the GA fleet in the U.S., are expected, over this timeframe, to actually decrease at an average annual rate of -0.6 percent. Aircraft in the sport classification are expected to increase at an average annual rate of 2.0 percent, and aircraft in the experimental classification are expected to grow at an average annual rate of about 1.0 percent. Both of these two groups, however, account for a relatively small percentage of the total active GA fleet. Turbine powered aircraft are expected to increase at an average annual rate of 2.8 percent over the next 20-years. It is essentially growth in this segment of the GA fleet that accounts for the overall positive rate of growth of 0.5 percent for all GA aircraft in the U.S. over the next twenty years. Almost all of the Airport's current based GA aircraft are classified within the piston category. Given conditions for the GA industry in the U.S., it is not likely that over the 20-year forecast period that based aircraft at the Airport will continue to grow at an average annual rate similar to what the Airport experienced historically (estimated at 2.2 percent average annual growth).

There is often a positive correlation between one or more socio-economic and demographic indicators and an airport's based GA aircraft. Recognizing this relationship, a series of based aircraft projections were developed using economic and demographic data for the market area that was presented earlier in this chapter of the report. Among those examined, the best correlation of the based aircraft data set was to the Farmington Metropolitan Statistical Area Employment. Woods & Poole projects 1.2 percent growth annually for Farmington MSA employment. Applying that to the based aircraft, DRO would see an additional 20 aircraft by 2035. This projection exactly mirrors the FAA Terminal Area Forecast over the same period. By contrast, the Colorado Aviation System Plan projects a much smaller rise through 2030, adding just two aircraft between 2010 and 2030. The final methodology presented shows a rise in based aircraft proportionate to the total increase in based aircraft for the entire state of Colorado as projected in the Colorado Aviation System Plan. In other words, the share of the state's increase in based aircraft would be maintained through the planning period.

TABLE 3-17 – SUMMARY OF TOTAL BASED AIRCRAFT FORECASTS

	Methodology			
Year	**Farmington MSA Employment Projection** (Preferred)	**FAA Terminal Area Forecast**	**Colorado Aviation System Plan**	**Market Share of Colorado Commercial Airports**
2013	70	70	70	70
2015	*72*	*71*	*70*	*70*
2020	*77*	*75*	*71*	*72*
2025	*82*	*80*	*71*	*74*
2030	*87*	*85*	*72*	*75*
2035	*93*	*90*	*(not forecasted)*	*(not forecasted)*
CAGR[/a/]	1.3%	1.2%	0.19%	0.50%

Note: [/a/]Compound Annual Growth Rate
Sources: Jviation; Woods and Poole Economics, 2013 – Farmington MSA; Colorado Aviation System Plan, 2012

The TAF projection for the Airport indicates based aircraft will increase to 90 in 2035. The Compound Annual Growth Rate for based aircraft in the Total Based Aircraft projection is 1.3 percent. This growth rate is supported by the expected growth in employment in the Farmington MSA. While this rate of growth is below what the Airport supported historically, it still is above the rate of growth expected for all GA aircraft in the U.S. Therefore this projection of based aircraft for DRO was selected as the preferred demand component for this sector of demand.

3.11.2 Based Aircraft Fleet Mix

Fleet mix refers to specific types of aircraft. There are currently 70 GA aircraft based at the airport. Information on GA aircraft currently based at the Airport for 2013 along with the projected fleet mix throughout the planning period is shown in **Table 3-18**.

The preferred projection of based aircraft for the Airport indicates that over the planning period, the Airport can expect to attract 21 additional based aircraft.

TABLE 3-18 – BASED AIRCRAFT FLEET MIX FORECAST SUMMARY

Year	Single	Jet	Multi-Engine	Helicopter	Other	Total
2013	61	0	8	1	0	70
2015	63	0	8	1	0	72
2020	67	0	9	1	0	77
2025	71	1	9	1	0	82
2030	75	2	9	1	0	87
2035	79	3	10	1	0	93

Source: Jviation

The FAA's National Aerospace Forecast projects not only total active GA aircraft for the U.S., but also projects how individual components of the GA fleet are expected to grow. The FAA's National Aerospace Forecast indicates that the single-engine and multi-engine piston aircraft categories will actually experience a negative average annual rate of growth over the next 20-years. On the other hand, turbine turboprop and jet aircraft, collectively, are expected, according to the FAA, to increase over the next 20 years. Aircraft in the experimental and sport categories are also expected to have positive rates of growth.

FAA's anticipated average annual rates of growth for various components of the national GA fleet were considered when developing a projected based aircraft GA fleet mix for the Airport. The projected based GA fleet mix for the Durango-La Plata County Airport for 2035 is shown in **Table 3-18.**

It is anticipated that the number of single-engine piston aircraft based at the Airport as a percent of total based aircraft will decrease over the 20-year forecast period. Multi-engine aircraft are expected to remain at 11 percent of total based aircraft.

The majority of the change in the Airport's based fleet mix will be in jet aircraft. It is expected that over the 20-year forecast period three out of the 20 additional based aircraft that the Airport will attract will be in the jet category. This Master Plan Update has included jet aircraft in the Airport's based GA fleet based on consideration of all of the following:

- This change is consistent with trends implied in the FAA's most recent National Aerospace Forecast.
- Other comparable airports in Colorado such as Montrose, Eagle, and Grand Junction have based jets in their fleet.
- There is a direct correlation between income indicators and the propensity to own and operate GA business jets; for the study area, total earnings for residents of the study area are expected to increase at an average annual rate of 4.72 percent and total person income is expected to grow at an average annual rate of 4.8 percent. These robust rates of growth indicate that is very likely that the Airport will see the introduction of business jets into its fleet of based GA aircraft over the next 20 years.

3.11.3 General Aviation Operations

GA operations are conducted by aircraft that are based at an airport, corporate and privately-owned aircraft that visit an airport (transient operators), and charter aircraft that operate under 14 CFR Part 135 including fractional ownership providers such as NetJets and Flexjet. Since the Airport does not have an ATCT, reported annual takeoffs and landings by all GA planes are based on airport management records, including annual fuel sales and lease agreements. **Table 3-19** provides information on DRO's historic total annual GA operations as reported by the 2014 TAF.

TABLE 3-19 – HISTORIC TOTAL ANNUAL GENERAL AVIATION OPERATIONS

Year	GA Operations
2000	36,179
2001	35,725
2002	35,996
2003	36,268

Year	GA Operations
2004	36,538
2005	36,810
2006	37,068
2007	37,327
2008	34,000
2009	34,000
2010	34,000
2011	34,237
2012	34,714
2013	34,959

Source: FAA TAF, published February 2014

As this information indicates, total annual GA operations (landings and takeoffs) have been reported as showing a slight decline in recent years. Reported total annual GA operations at the Airport, however, have remained fairly consistent, ranging from 34,000 annual operations to over 37,000 annual operations.

By contrast, the 2012 Colorado Aviation System Plan reports a much smaller number of GA operations for that report's base year, showing only 20,100 GA operations for 2010. Both forecasts are shown in **Table 3-20.**

TABLE 3-20 – GA OPERATIONS EXISTING FORECAST COMPARISON

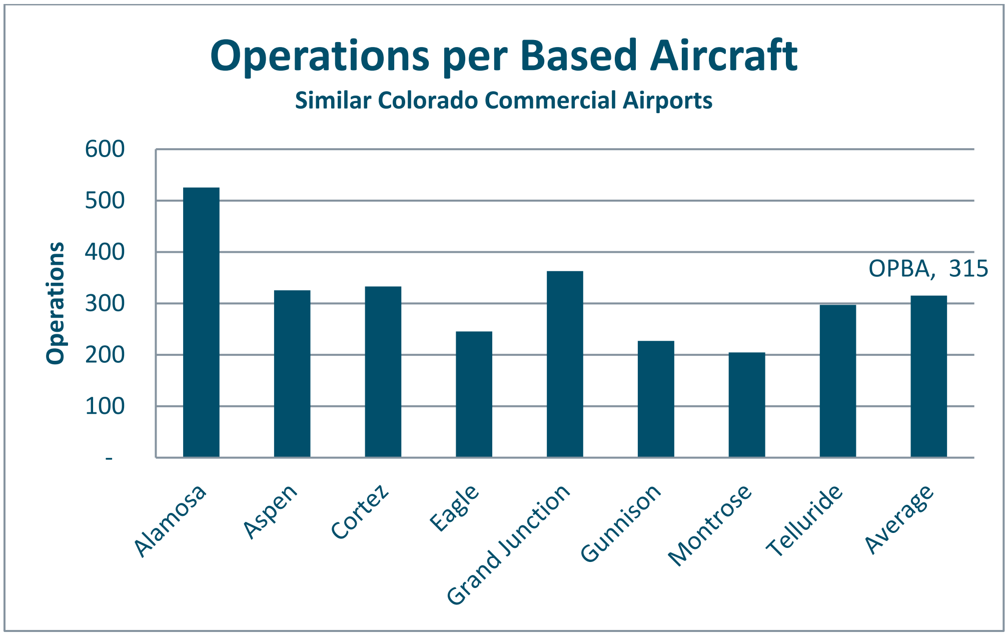
Year	FAA TAF (0.7%)	Colorado Aviation System Plan
2010	34,000	20,110
2013	34,714	(Not Forecasted)
2015	35,199	20,820
2020	36,444	21,560
2025	37,736	(Not Forecasted)
2030	39,074	23,120
2035	40,457	(Not Forecasted)

Sources: FAA Terminal Area Forecast, 2014; Colorado Aviation System Plan, 2012

According to the technical report for the System Plan, the reasonableness of the forecasts for airports like DRO where the number of annual operations is estimated were tested using another methodology. The reasonableness of reported total annual GA operations was established by determining the Operations Per Based Aircraft ratio (OPBA) and benchmarking it against other airports in the state. **Figure 3-9** provides this comparison to similar airports on Colorado utilizing the System Plan's data for each airport.

With 70 based aircraft at the Airport in 2013, the 2013 OPBA when using the TAF projection is 495 operations for each based aircraft at DRO. This ratio reflects operations by both based and visiting aircraft. However the same analysis using the adjusted 2010 operations shown in the System Plan yields an OPBA of 287.

FIGURE 3-9 – OPERATIONS PER BASED AIRCRAFT AT SIMILAR COMMERCIAL AIRPORTS



Sources: Colorado Aviation System Plan, 2012; Jviation

An airport's total annual GA operations are influenced by many factors. These factors include the following:

- Presence or absence of active flight schools or pilot training programs at the airport or nearby airports
- Frequency at which aircraft based at the airport are flown
- Local attractions or businesses that attract visiting GA planes

Based on the benchmarking analysis and that there is not a flight school at DRO and a nearby airport that accommodates GA operations, it seems reasonable to choose an OPBA that places DRO closer to the average OPBA. Thus, the System Plan's adjusted 2010 operations level of 20,100 total annual GA operations was selected for this forecast.

To develop a projection for the Airport's future GA operations, the projection for this demand component was first examined. The System Plan's base year for total annual GA operations at the Airport was calculated. As shown in **Table 3-21**, the GA Operations projection indicates that total annual GA operations will increase to 29,297 by 2035. With 93 based aircraft in 2035, this would increase DRO's OPBA from the current level of 287 to the benchmarked average of 315.

TABLE 3-21 – GA OPERATIONS FORECAST 2015-2035

Year	GA Operations (Preferred)	Based Aircraft (Preferred)	OPBA
2010	20,110	70	287
2013	20,300	70	290
2015	20,975	72	292

Year	GA Operations (Preferred)	Based Aircraft (Preferred)	OPBA
2020	22, 987	77	300
2025	24,929	82	305
2030	27,028	87	310
2035	29,297	93	315

Source: Jviation

The growth shown in **Table 3-21** is primarily driven by an expanding business aviation market. The strength of the DRO economy indicates that growth in GA operations will be primarily in the business aviation segment, which is largely flown by business jets and turboprops aircraft. The piston aircraft segment at DRO will likely grow at a smaller rate, especially due to the fact that nearby airports such as Animas Airpark also offer services to the piston GA pilot.

3.11.4 Itinerant and Local GA Operations

Aside from projecting total annual GA operations, it is also important to identify the portion of this activity that is "local" versus what portion of the activity is "itinerant." For reporting purposes, an aircraft operation is one take-off and one landing. On an annual basis, GA aircraft operations are divided into three categories: local, itinerant, and total, with total being the combination of annual local and itinerant operations. FAA's Air Traffic Control Handbook defines a local operation as one that operates generally within sight of the airfield. In most instances, local operations are training operations which are also often referred to as touch-and-goes. Itinerant operations are all others; itinerant operations can be associated with aircraft based at an airport or with visiting aircraft.

For planning purposes it is important to project annual GA operations that are local versus those that are itinerant. The distinction between the two categories of operations is important to determine apron/ramp areas at the Airport that are needed to serve both based and visiting aircraft.

Information from the FAA's 5010-1, *Airport Master Record*[16] for the Airport shows that the current split in total annual GA operations is 34 percent itinerant and 66 percent local. Because the business aviation segment, which is largely itinerant operations, will be growing at a faster rate than the local flying, over time the split will change to where itinerant operations account for 40 percent of GA operations. Based on this assumption, **Table 3-22** provides the preferred projection for local and itinerant GA operations.

TABLE 3-22 – ITINERANT AND LOCAL GA OPERATIONS FORECAST

Year	Preferred GA Operations Forecast (1.3%)	Itinerant	Percent Itinerant	Local	Percent Local
2013	20,300	6,902	34%	13,398	66%
2015	20,975	7,132	34%	13,844	66%
2020	22,987	8,045	35%	14,942	65%

[16] The FAA Form 5010-1 itinerant and local general aviation operations ratio was selected over the FAA TAF's ratio, which showed an itinerant/local split of 38 percent and 62 percent. The 5010's operations ratio more accurately reflects actual conditions at DRO, with a greater percentage of local operations.

Year	Preferred GA Operations Forecast (1.3%)	Itinerant	Percent Itinerant	Local	Percent Local
2025	24,929	8,974	36%	15,955	64%
2030	27,028	10,271	38%	16,757	62%
2035	29,297	11,719	40%	17,578	60%

Source: Jviation

3.11.5 Military Operations

Historically, military operations have not significantly contributed to the number of operations at DRO. Military operations are not dependent on the same stimuli as GA or commercial activity. Airport management records reported that military operations at DRO are unpredictable and have significantly fluctuated from year to year. The TAF indicates that military operations will remain constant with 500 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 500 operations annually throughout the forecast period.

3.12 CARGO

Currently, FedEx is the primary cargo carrier operating out of DRO and UPS the secondary. Freight is also commonly carried on passenger flights. The Bureau of Transportation Statistics indicated that freight coming in and leaving DRO has increased over the past five years. In 2013, approximately 2,208,000 pounds of freight were flown through DRO, while in 2008, approximately 2,153,000 pounds were handled. This is an increase of 2.6 percent over the last five years.

Based on the method that the cargo carriers employ to handle the cargo and the fact that the aircraft are small and the carriers are not requesting to lease a building for their operations, this growth is expected to remain minimal throughout the planning period. This activity should be monitored going forward in order to anticipate any large change in cargo facility needs at DRO.

3.13 CRITICAL AIRCRAFT

DRO accommodates a wide variety of commercial, GA, military, and special activity aircraft, including U.S. Forest Service (USFS) fire-fighting aircraft. DRO's current airfield facilities meet the design standards to accommodate FAA's Airport Reference Code (ARC) D-IV aircraft such as the B-757-200, DC-10-10, and Lockheed C-130 (L-100). The prior airport master plan had determined that ARC D-IV was the appropriate standard for DRO airfield facilities based on the fleet mix operating at the airport.

The FAA's airport design criteria are largely based on the critical design aircraft using the airport. The FAA states that the critical design aircraft can either be an individual airplane, or a 'family grouping of aircraft' with similar characteristics.

FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airports*, states that aircraft must generate a minimum number of takeoffs and landings per year (i.e. substantial use threshold) in order to qualify as critical design airplanes:

> "**Substantial Use Threshold**. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport. Two examples are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs."

At non-towered airports such as DRO there are relatively few activity counts by specific types of aircraft. The FAA tracks aircraft arrivals and departures by type at specific airports based on instrument flight plans filed with and clearances issued by FAA Air Traffic Control (ATC). FAA tracks that data through their Traffic Flow Management System Counts (TFMSC). The TFMSC activity records for DRO for CY 2013 are included in the **Appendix H**. ARC/RDC C-III aircraft are highlighted in light brown, and ARC/RDC C-II aircraft are highlighted in light green.

FAA TFMSC records indicate that Airport Reference Code (ARC) and Runway Design Code (RDC) C-III aircraft generated more than 500 operations per year. C-III aircraft include the Airbus A-319, A-320, Bombardier CRJ-900, Embraer ERJ-190, and Gulfstream G-V. There were also 4,102 operations by ARC/RDC C-II aircraft, which included numerous corporate jets, as well as the ERJ-145.

However, FAA's TFMSC data does not capture visual (VFR) aircraft – those that did not file flight IFR plans nor received FAA ATC clearances. As a result, the FAA's data does not capture all (or even most) of the activity at DRO, although it provides actual data on certain users at non-towered airports.

ARC C-III and C-II aircraft typically file IFR flight plans and are in contact with FAA ATC, particularly when compared to smaller piston engine airplanes that operate predominantly under visual flight rules (VFR). As a result, FAA's TFMSC data likely captures a high percentage of C-III and C-II aircraft operations at DRO.

It should be noted, however, that a variety of aircraft larger than C-III operate to/from DRO, including fire fighting, charter, and military aircraft. Charter aircraft at DRO have included the B-757-200 (ARC=C-IV), and the DC-10 (ARC = D-IV).

The U.S. Forest Service (USFS) bases a number of aircraft at DRO in response to fire fighting needs, including C-130s (ARC = C-IV). Most of the USFS aircraft operations are conducted under VFR, and are therefore not captured by FAA TFMSC. As noted in a press release issued by the USFS on May 20, 2014:

> "In the face of what is shaping up to be a catastrophic fire season in the Southwest, the U.S. Forest Service is adding four additional aircraft to its next-generation fire fighting fleet, bringing the total amount of aircraft to 21 large air tankers (with opportunities to add additional aircraft, if needed) and more than 100 helicopters. The new aircraft will enter

service in the coming weeks and support over 10,000 fire fighters for the 2014 wildfire season.

The Forest Service is bringing into duty the first time this fire season a second DC10, and three BAe-146s. The DC10 cruises at 430 mph and can carry up to 11,600 gallons of retardant. Both the BAe-146 and a C130 originally brought on last fall cruise at roughly 350 mph and can carry more than 3,000 gallons of retardant. Eight C130s equipped with Modular Airborne Fire Fighting Systems (MAFFS) are also now completing their recertification and training for this season. The Forest Service will also bring additional large air tankers in from Canada if needed. Air tankers drop fire retardant that reduces the intensity and rate of spread of wildfires so that fire fighters can construct fire lines safely."

Based on FAA TFMSC data, there are more ARC C-II and C-III aircraft operations at DRO than D-IV activity, but FAA data does not capture all activity at DRO. It is recommended that D-IV remain as the existing and future ARC for the following reasons:

- ***DRO has a single runway that accommodates a wide variety of aircraft.*** Maintaining airfield facilities that meet ARC D-IV design standards provides additional safety margins during crosswind and low visibility conditions. While the need for a crosswind runway is not justified by statistical analysis, this extra margin can be very beneficial during the infrequent periods when crosswinds are strong. The runway at Animas Airpark to the west of DRO is aligned in a very similar direction and thus there is no nearby alternate airport that may offer reduced crosswinds.
- **There are no other airports in the Four Corners region that meet ARC D-IV design standards**. Airports that have the ability to safely accommodate ARC D-IV aircraft are not commonly found in the Four Corners region. This capability provides a critical safety benefit for ARC D-IV aircraft that may urgently need an airfield capable of safely meeting their requirements.
- **The Boeing 757-200 (ARC C-IV) is used regularly to serve airports throughout Colorado.** It is still widely used by both scheduled air carriers as well as charter operators. The ability for DRO to also receive Boeing 757-200 scheduled or charter service or to provide a critical alternate destination for aircraft intending to land at other Colorado mountain airports is an important capability within the state's system of airports.
- **USFS is increasing their fleet of large fire fighting aircraft**, including DC-10, and working closely with the USAF to use the Lockheed C-130J. Although the USFS does not generate enough large aircraft activity to achieve "substantial use" on an annual basis, the fleet of aircraft that fire fighting contractors are deploying to the various regions to respond to wild fire events are changing. Some of these aircraft are large enough to require the existing DRO airfield capability to safely execute their missions. Western states and the federal government are increasing their fire fighting budgets in response to climate warming and larger wild fires, which may result in additional large fire fighting aircraft operations at DRO and other USFS bases.

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 3-24 summarizes the forecast comparison to the TAF as recommended in **Appendix I** of the FAA document, *Forecasting Aviation Activity by Airport*. A forecast is considered to be consistent with the FAA TAF if it:

- Differs by less than 10 percent in the 5-year forecast and 15 percent in the 10-year forecast, or
- Does not affect the timing or scale of an airport project, or
- 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 Compound Annual Growth Rate (CAGR) of 1.92 percent, with an enplanement forecast of 304,784 in 2035. For this Master Plan, the recommended 20-year forecast results in 390,941 enplanements in 2035, and is based on the moderate annual growth rate of 3.27 percent projected for Employment in the Durango Micropolitan Statistical Area. At the request of the Planning Advisory Committee, a low forecast scenario was also adopted, matches the TAF forecasted annual growth rate of 1.9 percent.

The recommended enplanement forecast differs from the five-year forecast by 4.4 percent, the 10-year forecast by 11.9 percent, and the 20-year forecast by 28.3 percent. A primary factor driving forecasted passenger enplanement growth is the continued trend in larger regional aircraft that will serve markets such as DRO, the conversion of existing seasonal frequency in favor of year round service, plus the probable addition of one or more new destinations and additional frequency to existing destinations in the future.

3.14.2 Aircraft Total Operations Forecast

Currently FAA forecasts show low to moderate growth in total operations for DRO, with an operations forecast of 47,596 from 2015 to 54,888 in 2035 (CAGR of 0.72 percent). For the purposes of this Master Plan Update, the recommended 20-year forecast results in 61,566 operations in 2035, and is based on the different growth rates for commercial operations and GA operations. The recommended operations forecast differs from the five-year forecast by 1.0 percent, the 10-year forecast by 6.4 percent, and the 20-year forecast by 12.2 percent. This difference is primarily due to the FAA TAF showing a low growth rate for GA operations (0.7 percent) and no growth for military operations, whereas the recommended growth rate for GA operations is 1.4 percent.

TABLE 3-23 – DRO TOTAL OPERATIONS FORECAST

Year	Itinerant Commercial	Itinerant GA	Itinerant Military	GA Local	GA Total	Total Operations
2013	7,128	6,902	500	13,398	20,300	27,928
2015	7,965	7,132	500	13,844	20,976	29,441
2020	8,471	8,045	500	14,942	22,987	31,958
2025	9,010	8,974	500	15,955	24,929	34,439
2030	9,583	10,271	500	16,757	27,028	37,111
2035	10,192	11,719	500	17,578	29,297	39,989

Source: Jviation

3.14.3 Based Aircraft Forecast

The FAA TAF predicts 90 based aircraft at DRO by 2035. The preferred forecast projects 93 aircraft by 2035, which is slightly higher. This forecast was selected to match the strongly correlated growth projected for employment in the Farmington Metropolitan Statistical Area of 1.3 percent average annual growth through 2035.

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, as shown in **Table 3-24**.

Airport activity is affected and determined by many factors. Strong markets in today's airline environment are experiencing the retirement of equipment with fewer than 50 seats. New models in delivery and development indicate that manufacturers are phasing out jets in the 50-70 seat category as they reach life cycle limits by 2025. These changes to the airline fleet serving DRO over the forecast period have the potential to generate a growth rate of nearly 3.0 percent as average seats per departure increase even just assuming small increases to DRO's current flight schedule. As introduced in **Section 3.0**, the Airport's growth is indicative of a strong regional market. Its demonstrated success over the decade leading up to 2015 suggests retention and possible development of its existing tier of airlines.

Realizing additional airline service strongly supports airport growth. Addition of a once-daily flight to another market could further increase the growth curve to 3.3 percent. Such service by 2035 assumes a 90-seat regional jet at 83 percent load factor. Based upon industry trends, it is reasonable to deduce that if there is any future reduction in frequency for the DRO market, it will occur on larger regional and mainline jets during the forecast period. Any lower growth rate does not detract from airline operations competing for a preferred flight schedule with other airlines. Such competition is advantageous to DRO and generates peak hour activity that must be met by an adequate terminal facility.

TABLE 3-24 – DRO FORECAST COMPARISON TO TAF

	Year	DRO Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements				
	2013	192,797	192,797	0.0%
Base year	2015	205,594	205,594	0.0%
Base year + 5 years	2020	241,427	231,186	4.4%
Base year + 10 years	2025	283,505	253,344	11.9%
Base year + 15 years	2030	332,917	277,797	19.8%
Base year + 20 years	2035	390,941	304,784	28.3%
Commercial Operations				
	2013	7,128	11,854	-39.9%
Base year	2015	7,965	11,825	-32.6%
Base year + 5 years	2020	8,471	11,897	-28.8%
Base year + 10 years	2025	9,010	12,292	-26.7%
Base year + 15 years	2030	9,583	12,811	-25.2%
Base year + 20 years	2035	10,192	13,357	-23.7%
Total Operations				
	2013	27,928	47,068	-40.7%
Base year	2015	29,441	47,596	-38.1%
Base year + 5 years	2020	31,958	49,236	-35.1%
Base year + 10 years	2025	34,439	51,047	-32.5%
Base year + 15 years	2030	37,111	52,931	-29.9%
Base year + 20 years	2035	39,989	54,888	-27.1%
Based Aircraft				
	2013	70	70	0.0%
Base year	2015	72	71	1.4%
Base year + 5 years	2020	77	75	2.7%
Base year + 10 years	2025	82	80	2.5%
Base year + 15 years	2030	87	85	2.4%
Base year + 20 years	2035	93	90	3.3%

Notes: TAF data is on a U.S. Government fiscal year basis (October through September)
AF/TAF (% Difference) column has embedded formulas
Source: Jviation and FAA Template