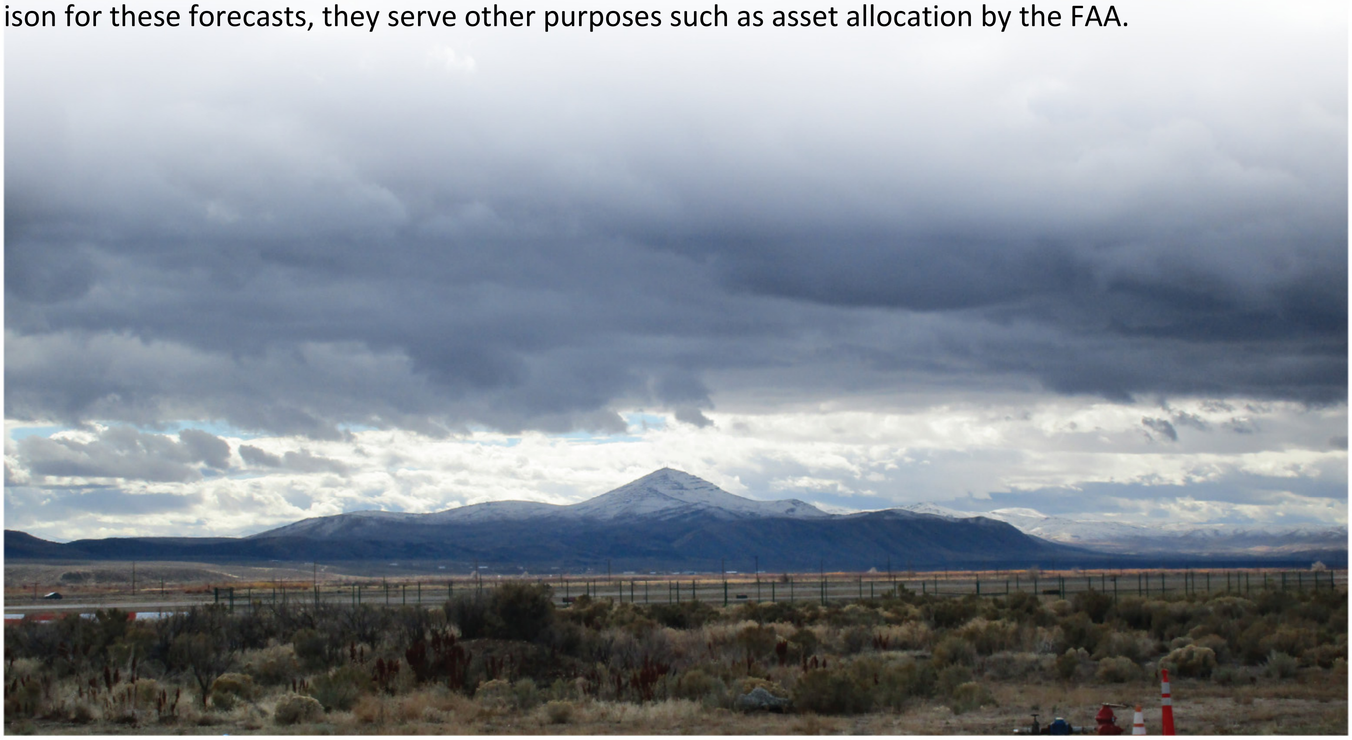
Chapter 2
Forecasts

Projections of future aviation demand will have an impact on the future needs of the Airport. The most recent aviation demand forecasts were completed in association with the Master Plan dated 2019 which had a base year of 2015. Since that time, the COVID-19 pandemic has had a significant impact on the aviation industry and on commercial passenger service specifically. In response, many airlines made significant changes to their flight schedules. As of this writing (February 2022), passenger activity appears to be returning. This chapter will present new aviation demand forecasts for Elko Regional Airport that take into consideration the numerous changes to the aviation industry since 2015.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. In addition, aviation activity forecasts may be an important input to future analyses associated with planned airport development.

The FAA will review individual airport forecasts with the objective of comparing them to its *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). Even though the TAF is updated annually, in the past there was almost always a disparity between the TAF and local airport planning forecasts. This is primarily because the TAF forecasts are the result of a top-down model that does not consider local conditions or recent trends. While the TAF forecasts are to be a point of comparison for these forecasts, they serve other purposes such as asset allocation by the FAA.



The FAA Southwest Region Airport District Office is responsible for forecast approval. When reviewing a sponsor's forecast (from this), FAA must ensure that the forecast is based on reasonable planning assumptions, uses current data, and is developed using appropriate forecast methods. As stated in FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS)* and *Airports Capital Improvement Plan (ACIP)*, forecasts should be:

- Realistic;
- Based on the latest available data;
- Reflective of current conditions at the airport (as a baseline);
- Supported by information in the study; and
- Able to provide adequate justification for airport planning and development.

Ultimately the forecasts of total passenger enplanements, total operations, and based aircraft must be compared to the TAF for consistency. The forecasts are considered consistent with the TAF if they meet the following criteria:

- Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period, or
- Forecasts do not affect the timing or scale of an airport project, or
- Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.5, *Formulation of the National Plan of Integrated Airport Systems (NPIAS)* and *Airports Capital Improvement Plan (ACIP)*.

If the study forecast is not consistent with the TAF, differences must be resolved if the forecast is to be used in FAA decision making. This may involve revisions to the forecasts submitted, adjustment to the TAF, or both.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with any certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for the Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation demand projections for the Airport that will permit airport management to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

SOCIOECONOMIC TRENDS

Local and regional forecasts of key socioeconomic variables, such as population, employment, and income, provide an indication of the potential for growth in aviation activities at an airport. In 2021, the base year for these forecasts, there were an estimated 53,590 residents of Elko County. **Table 2A** summarizes the socioeconomic history and projections for Elko County, Nevada.

TABLE 2A I Socioeconomic History and Forecasts

Socioeconomic Elements Elko County	HISTORY			FORECAST			
	2001	2021	CAGR 2001-2021	2026	2031	2041	CAGR 2021-2041
Population	45,063	53,590	1.16%	55,907	58,152	62,289	0.72%
Employment	23,991	29,308	1.34%	30,424	31,457	33,306	0.61%
Income (PCPI)	$32,102	$44,673	2.23%	$46,839	$49,100	$53,916	0.90%

CAGR: Compound annual growth rate
PCPI: Per capita personal income ($2012)
Sources: Woods & Poole Economics 2021

The population in Elko County had robust growth from 2001-2021 increasing by approximately 8,000 residents for an annual growth rate of 1.16 percent. Employment and per capita personal income also grew substantially during this period. The population and other socioeconomic factors are projected to continue to grow but at a lower average annual growth rate. By 2041, population is projected to reach more than 62,000 residents.

NATIONAL AVIATION TRENDS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, general aviation, and FAA workload measures. The forecasts are prepared to the meet budget and planning needs of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was FAA *Aerospace Forecasts – Fiscal Years 2021-2041*. The FAA primarily uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets. The following discussion is summarized from the FAA Aerospace Forecasts. The following is the Forecast Highlights for 2021-2041 from the FAA:

> "Since its deregulation in 1978, the U.S. commercial air carrier industry has been characterized by boom-to-bust cycles. The volatility that was associated with these cycles was thought by many to be a structural feature of an industry that was capital intensive but cash poor. However, the great recession of 2007-09 marked a fundamental change in the operations and finances of U.S Airlines. Since the end of the recession in 2009, U.S. airlines revamped their business models to minimize losses by lowering operating costs, eliminating unprofitable routes, and grounding older, less fuel-efficient aircraft. To in-crease operating revenues, carriers initiated new services that customers were willing to purchase and started charging separately for services that were historically bundled in the price of a ticket. The industry experienced an unprecedented period of consolidation with three major mergers in five years. The results of these efforts were impres-sive: 2019 marked the eleventh consecutive year of profitability for the U.S. airline industry.
>
> "The outbreak of the COVID-19 pandemic in 2020, however, brought a rapid and cataclysmic end to those boom years. Airline activity and profitability tumbled almost overnight and without the financial and competitive strength built up during the boom, airlines would have faced even greater

challenges. As it was, they were able to slash capacity and costs, and then, relying on their balance sheets, credit ratings and value inherent in their brands, to raise capital through borrowing and restructuring fleets allowing them to withstand the period of losses into 2021. Although several small regional carriers ceased operations in 2020, no mainline carriers did.

“The business modifications necessitated by the downturn will shape the industry for years to come. Primarily, airlines will be smaller having retired aircraft and encouraged voluntary employee separations. Fleets, however, become younger and more fuel-efficient as retirements targeted the oldest and the least efficient aircraft. As airlines carry high levels of debt, capital spending and investment will be restrained which in turn holds back future growth. And even the unbundling of services took a small step backwards as carriers eliminated change fees for all but Basic Economy tickets.

“In the medium-term, airlines will be focused on trying to foretell the recovery in demand and position themselves to meet it. To date, that demand recovery has been extremely uneven, driven by COVID-19 case counts, vaccinations, governmental restrictions and the degree of pent-up demand experienced by consumers. As expected, domestic leisure traffic has led the recovery and domestic business travel should begin to pick-up later in 2021. International activity will lag somewhat as individual country experience with the pandemic is varying so widely. As a result, airlines have initially shifted flights and routes to outdoor recreation areas but as the recovery progresses, their focus will gradually return to traditional markets and segments.

“Long-term, the strengths and capabilities developed over the past decade will become evident again. There is confidence that U.S. airlines have finally transformed from a capital intensive, highly cyclical industry to an industry that can generate solid returns on capital and sustained profits.

“Fundamentally, over the long-term, aviation demand is driven by economic activity, and a growing U.S. and world economy provides the basis for aviation to grow. The 2021 FAA forecast calls for U.S. carrier domestic passenger growth over the next 20 years to average 4.9 percent per year. This average, however, includes three double-digit growth years during the recovery from a very low base in 2021. Following the recovery period, trend rates resume with average growth through the end of the forecast of 2.3 percent. Domestic passengers are forecast to return, on an annual basis, to 2019 levels in early 2024. Oil prices averaged $43 per barrel in 2020 and are forecast to fall to $36 per barrel in 2021 before rising steadily to $94 by the end of the forecast period.

“System traffic in revenue passenger miles (RPMs) is projected to increase by 5.5 percent a year between 2021 and 2041. Domestic RPMs are forecast to grow 5.1 percent a year while International RPMs are forecast to grow significantly faster at 6.6 percent a year. These figures are, of course, boosted by several years of high growth rates during the recovery after which the annual rates return to more moderate long-term trends. The strong growth rates return system RPM, on an annual basis, to 2019 levels in 2024, with domestic RPM returning early that year but international RPM recovering a year later in 2025. System capacity as measured by available seat miles (ASMs) is forecast to grow somewhat slower than RPM during the recovery period as airlines seek to restore load factors but, subsequently, ASM grow in line with the increases in demand.

"The FAA expects U.S. carrier profitability to remain under pressure for several years due to depressed demand and competitive fare pressures. As carriers return to levels of capacity consistent with their fixed costs, shed excess debt, and see rising yields, profitability should gradually return. Over the long term, we see a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than overall inflation, reflecting growing U.S. and global economies.

"The general aviation (GA) sector was less affected by the COVID-19 crisis than the airlines. There are newcomers in the high-end business jet segment as a result of flying privately due to concerns of the virus. At the lower end newcomers included student, private and commercial pilots, joining the existing GA pilot population. They are flying piston aircraft in and out of small airports as well as larger airports that do not have as many commercial flights due to the pandemic. The long-term outlook for general aviation thus is more promising than before, as growth at the high-end offsets continuing retirements at the traditional low end of the sector.

"The active GA fleet is forecast to increase slightly by 0.1 percent between 2021 and 2041, after recording a decline of 2.8 percent in 2020 from the year before (active fleet shrinks one percent by 2041 from its 2019 level). Turbine aircraft, including rotorcraft is estimated to not experience a decline between 2019 and 2020, while the total of piston fleet is estimated to have decreased by 1.1 percent in 2020 from the previous year. While steady growth in both GDP and corporate profits results in continued growth of the turbine and rotorcraft fleets, the largest segment of the fleet – fixed wing piston aircraft will continue to shrink over the forecast period. Against the marginally declining active GA fleet between 2019 and 2041, the number of GA hours flown is projected to increase by a total of 14.8 per-cent from 2019 to 2041 (an average of 0.6 percent per year), as growth in turbine, rotorcraft, and experimental hours more than offset a decline in fixed wing piston hours. When the period of 2021 to 2041 is compared, the total hours flown by the GA aircraft fleet is forecast to increase by an average of 1.0 percent per year, after declining by 9.7 percent between 2019 and 2020, and recovering partially, with a growth of 4.9 percent in 2021 from the previous year.

"With the expected robust air travel demand growth between 2022 and 2026 due to the U.S. economy recovering from the impact of COVID, we expect increased activity growth that has the potential to increase controller workload. Operations at FAA and contract towers are forecast to grow 1.9 percent a year over the forecast period (FY2021-41) with commercial activity growing at approximately five times the rate of non-commercial (general aviation and military) activity. The COVID recovery growth in U.S. airline activity is the primary driver. The U.S. commercial aviation sector has been hit by the pandemic much harder than the non-commercial sector. The pent-up demand is expected to drive the commercial operations back to the pre-COVID level, hence leading to the stronger growth in the commercial sector. In particular, large and medium hubs will see much faster increases than small and non-hub airports, largely due to the commercial nature of their operations."

Table 2B presents the FAAs national forecasts of aviation activity for demand indicators relevant to activity at Elko Regional Airport. Nationally, passenger enplanements on regional carriers are forecast to rebound to pre-pandemic levels by 2024 and then to continue to increase throughout the 2020s. Overall, enplanements on regional carriers are projected to increase 5.4 percent from 2021-2041. Operations by commuter/air taxi aircraft are projected to increase modestly over the same periods with an overall increase of 1.1 percent from 2021-2041.

TABLE 2B I FAA Activity Forecasts

Year	US Regional Carriers - Domestic Revenue Enplanements	Air Taxi/Commuter Operations	GA Aircraft Fleet	GA Operations
2010	162,000,000	9,410,000	223,370	26,580,000
2020	94,000,000	5,472,000	204,980	24,941,000
2021	86,000,000	5,013,000	205,870	25,943,000
2026	177,000,000	5,336,000	207,075	28,770,000
2031	198,000,000	5,646,000	207,070	29,210,000
2041	247,000,000	6,287,000	208,790	30,131,000
Compound Average Annual Growth Rate				
2010-2020	-5.3%	-5.3%	-0.9%	-0.6%
2020-2021	-8.5%	-8.4%	0.4%	4.0%
2021-2031	8.7%	1.2%	0.1%	1.2%
2021-2041	5.4%	1.1%	0.1%	0.8%

Source: FAA Aerospace Forecasts - Fiscal Years 2021-2041

The number of total active aircraft in the general aviation aircraft fleet is projected to grow 0.1 percent annually through 2041. This modest growth is driven largely by increasing numbers of turboprops (+0.6%), business jets (+2.3%), and helicopters (+1.4%) while the total number of piston aircraft are forecast to decline by 0.9 percent over the same period.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast. The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line/time-series projections, correlation/regression analysis, and market share analysis.

Trend line/time-series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures statistical relationships between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in the dependent variable and the independent variable(s). If the "r^2" value (coefficient determination) is greater than 0.95, it indicates good predictive reliability. A value less than 0.95 may be used, but with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of the airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined, providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections but can provide a useful check on the validity of other forecasting techniques.

Forecasts will age, and the further one is from the base year, the less reliable a forecast may become, particularly due to changing local and national conditions. Nonetheless, the study will include a 20-year forecast of aviation demand. Facility and financial planning usually require at least a ten-year view since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

Future facility requirements, such as airline terminal complex component spaces and general aviation hangars and apron areas, are derived from projections of various aviation demand indicators. Using a broad spectrum of local, regional, and national socioeconomic and aviation information and analyzing the most current aviation trends, forecasts are presented for the following aviation demand indicators:

- Commercial Passenger Service
    - Annual Enplaned Passengers
    - Operations and Fleet Mix

- General Aviation
    - Based Aircraft
    - Based Aircraft Fleet Mix
    - General Aviation Operations
    - Air Taxi and Military Operations

- Peaking Characteristics
    - Airline Enplanement Peaks
    - Operations Peaks

This forecasting effort was completed in February 2022 with a base year of 2021.

FAA TERMINAL AREA FORECAST (TAF)

On an annual basis, the FAA publishes the *Terminal Area Forecast* (TAF) for each airport included in the *National Plan of Integrated Airport Systems* (NPIAS). The TAF is a generalized forecast of airport activity used by FAA for internal planning purposes. It is available to airports and consultants to use as a baseline projection and important point of comparison while developing local forecasts.

Table 2C presents the 2021 TAF for the Airport (published in May 2021). The TAF anticipated 12,629 passenger enplanements in 2021 which was a decline over previous years due to the pandemic. Ultimately, the TAF reflects a return to growth with 22,724 enplanements by 2041. The annual growth rate for enplanements from 2021-2041 is 2.98 percent. Total operations were projected to grow 1.94 percent annually. As noted, the TAF was published in May of 2021, and the total impacts of the pandemic were not known at the time. Nonetheless, the FAA will compare the forecasts developed for this study to the TAF for consistency.

TABLE 2C I Terminal Area Forecast

	2010	2021	2026	2031	2041	CAGR 2021-2041
ENPLANEMENTS						
Air Carrier	5	0	0	0	0	
Commuter	21,252	12,629	14,629	16,944	22,724	
Total Enplanements	**21,257**	**12,629**	**14,629**	**16,944**	**22,724**	**2.98%**
ANNUAL OPERATIONS						
Itinerant Operations						
Air Carrier	2,940	2,350	2,350	2,350	2,350	**0.00%**
Air Taxi/Commuter	3,544	3,926	4,177	4,454	5,078	**1.29%**
General Aviation	8,000	10,723	12,140	13,742	17,601	**2.51%**
Military	120	135	135	135	135	**0.00%**
Total Itinerant	**14,604**	**17,134**	**18,802**	**20,681**	**25,164**	**1.94%**
Local Operations						
General Aviation	4,000	5,038	5,543	6,106	7,411	**1.95%**
Military	0	0	0	0	0	**0.00%**
Total Local	**4,000**	**5,038**	**5,543**	**6,106**	**7,411**	**1.95%**
Total Operations	**18,604**	**22,172**	**24,345**	**26,787**	**32,575**	**1.94%**
BASED AIRCRAFT	**75**	**77**	**81**	**86**	**96**	**1.11%**

CAGR: Compound Annual Growth Rate

Source: FAA EKO Terminal Area Forecast (May 2021)

MASTER PLAN FORECASTS 2016

The airport undertook a Master Plan update in 2016. Forecasts for that study were developed and approved by the FAA. The base year of those forecasts was 2015 (Note: 2014 numbers were substituted because the runway was closed for a period of time in 2015 for repairs). **Table 2D** summarizes the primary demand indicators as forecast in that study.

TABLE 2D I Master Plan Forecasts (2015 base year)

	2015*	2021	2026	2031	2036	CAGR 2015-2036
Enplanements	18,200	29,784	29,970	30,156	30,342	2.46%
Total Operations	19,990	22,352	25,325	27,991	30,904	2.10%
Based Aircraft	86	91	95	99	103	0.86%

CAGR: Compound Annual Growth Rate
*Due to runway closure for repairs in 2015, 2014 figures used.
Source: EKO Master Plan (2016)

Enplanements were projected to increase annually 2.46 percent, increasing from 18,200 in 2015 to more than 30,000 in 2036. Total operations were also projected to increase from 19,990 in 2015 to nearly 31,000 in 2036 for an annual growth rate of 2.10 percent. The number of based aircraft were projected to increase from 86 in 2015 to 103 in 2036 for an annual growth rate of 0.86 percent.

The forecasts from the 2016 Master Plan did not take into consideration the enormous impact of the COVID-19 pandemic on the commercial aviation sector since it had not occurred yet. Therefore, new forecasts are developed for this study. However, the Master Plan forecasts do provide an indication of growth rates that were FAA approved during relatively normal times for the aviation industry.

COMMERCIAL SERVICE FORECASTS

To evaluate commercial service potential at the Airport and the facilities necessary to properly accommodate present and future airline activity, two basic elements must be forecast: annual enplaned passengers and annual airline operations. Annual enplaned passengers serve as the most basic indicator of demand for commercial passenger service activity. The combination of enplanements and deplanements generally equals the total passengers using an airport. The annual number of enplanements is the figure utilized by the FAA to determine various entitlement funding levels for commercial service airports.

> Enplanements are passenger boardings and are the basis for FAA entitlement funding for commercial service airports.

The term "enplanement" refers to a passenger boarding an airline flight. Enplaning passengers are then described in terms of either "originating" or "connecting/transferring." Originating passengers depart a specific airport for a destination or hub airport to connect/transfer to another flight. Connecting/transferring passengers are those who have departed from another location and are using the airport as an intermediate stop. These passengers may disembark their originating flight to wait in the terminal for their next flight or could simply remain on the aircraft at an intermediate stop as a "through" passenger. Elko Regional Airport, and airports similar to it, tend to have mostly originating passengers, while larger hubs like those in Las Vegas or Salt Lake City, will have a more significant percentage of passengers who are connecting/transferring.

As indicated earlier, an important resource utilized in aviation demand forecasting is the annual FAA aviation forecasts. The most recent available version is *Aerospace Forecasts – Fiscal Years 2021-2041*, published in March 2021. The FAA forecasts a variety of aviation demand indicators on an annual basis. In the most current edition, fiscal year 2019 is presented as the baseline, with 2020 showing as an estimate and years 2021 through 2041 as projections. Many forecasting elements utilized in this analysis will consider the history and projections presented by the FAA in its annual forecast.

HISTORICAL ENPLANEMENT ACTIVITY

Table 2E provides a history of passenger enplanements at the Airport since 2001. In 2021, the airport had 15,625 enplanements which was a 51 percent increase over the previous year when the pandemic so negatively impacted commercial aviation. In 2019, the last full year before the pandemic, there were nearly 20,000 enplanements.

Airports that exceed 10,000 annual enplanements receive at least $1.0 million in FAA funding.

TABLE 2E I Historic Passenger Enplanements

Year	Total Annual Enplanements	% Change Year over Year	Casino Express Enplanements	Total Without Casino Express
2021	15,625	50.95%	-	15,625
2020	10,351	-48.19%	-	10,351
2019	19,979	8.80%	-	19,979
2018	18,363	7.29%	-	18,363
2017	17,115	14.92%	-	17,115
2016	14,893	8.70%	-	14,893
2015	13,701*	-24.72%	-	13,701*
2014	18,200	-6.71%	-	18,200
2013	19,510	-41.43%	-	19,510
2012	33,310	30.41%	-	33,310
2011	25,543	16.83%	-	25,543
2010	21,863	5.78%	-	21,863
2009	20,668	-19.02%	-	20,668
2008	25,523	-10.52%	-	25,523
2007	28,523	-16.50%	-	28,523
2006	34,158	-54.83%	2,613	31,545
2005	75,618	5.74%	43,712	31,906
2004	71,513	-14.70%	42,178	29,335
2003	83,837	-23.02%	56,164	27,673
2002	108,909	48.88%	61,987	46,922
2001	73,152	NA	51,435	21,717

* Runway closed part of the year for repairs.

Source: FAA Enplanement Data for U.S. Airports accessed on 9.14.21 at: http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/

As can be seen in the table, the early 2000s were the boom years for passenger activity at the Airport. In 2002, there were more than 100,000 enplanements. Much of this activity was attributable to operations by Casino Express which operated 737 aircraft bringing tourists to the casinos. That service ceased in 2006. Since 2006, the peak enplanement year was 2012, when there were approximately 33,000 enplanements. Over the last five years the Airport has averaged slightly more than 16,000 annual enplanements.

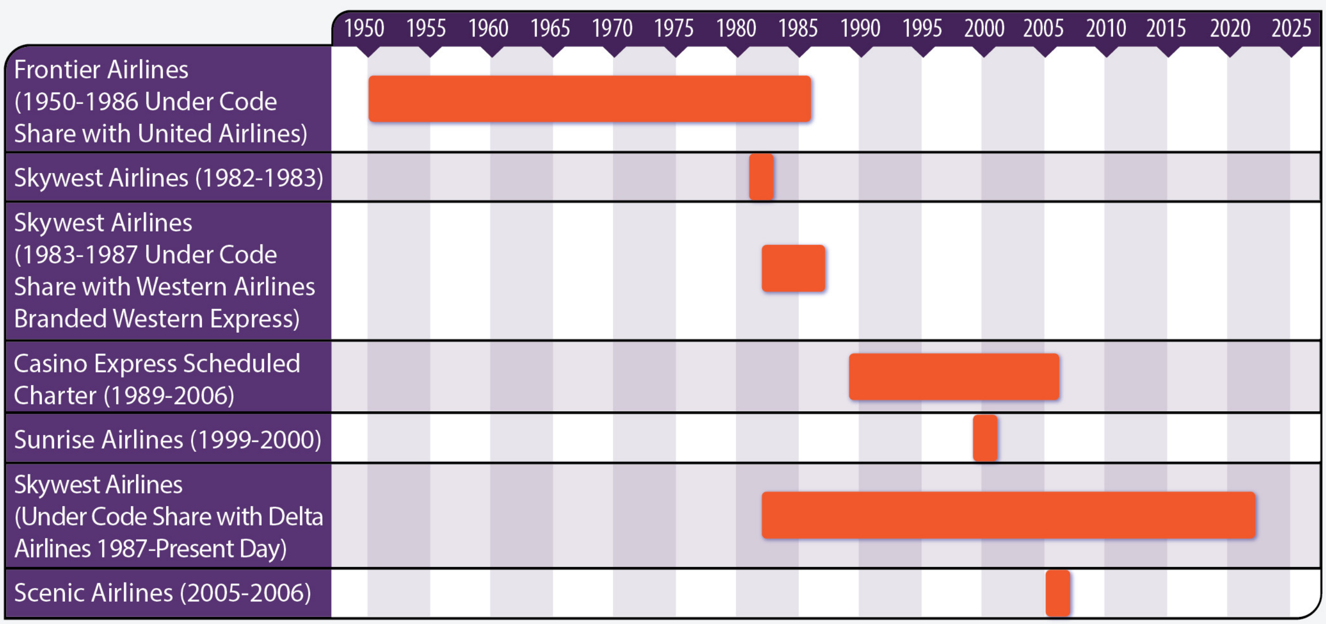
Since 2006, the year over year change in enplanements can be significant. For example, from 2012 to 2013, enplanements decreased 41.43 percent and continued to decrease through 2016. Some of this decrease is attributable to the 2015 closure of the runway for repairs. Beginning in 2017, enplanement levels were on the rise, increasing by more than 10 percent year over year through 2019. 2020 enplanements decreased 48 percent due to the pandemic, however enplanements increase by 51 percent in 2021. This is an airport that experiences big swings in enplanements levels from year to year, but overall total enplanements tend to remain within a fairly tight range between 15,000 and 30,000 (excluding the 2020 pandemic year).

Every year over the last 20 years, the Airport exceeded the 10,000 annual enplanement threshold. This is an important benchmark because those airports that exceed 10,000 annual enplanements are entitled to a minimum of $1.0 million in capital development grant funds from the Airport Improvement Program (AIP) as administered by FAA.

AIRLINE SERVICE HISTORY

Figure 2A shows the continuous history of airline service at Elko Regional Airport since 1950. Most of the routes have been regional in nature with destinations such as Reno, Las Vegas, and Salt Lake City. Other cities have been served as part of a route hopping schedule such as Ely, NV. Casino Express operated from 1989-2006 with Boeing 737 aircraft. These flights originated all over the country to shuttle gaming tourists to Elko, and their operations had a significant impact on passenger levels during that time period.

Figure 2A – Air Carrier Operators at EKO (1950-2022)



Source: Airport Records

SkyWest Airlines, a regional airline that code shares with Delta, has served the airport since 1982 and has been the only carrier since 2006. In 2021, SkyWest offered twice daily departures and arrivals. In early 2022, SkyWest announced that they would be reducing service to one daily departure. SkyWest has utilized the 50-seat CRJ200 for that last decade. **Table 2F** summarizes the history of commercial activity and destinations served.

TABLE 2F I EKO Airline Routes		
Airline	**Dates of Service**	**Routes Offered**
Frontier Airlines	1950-1986	SFO-RNO-EKO-SLC
SkyWest Airlines	1987-1992	SLC-EKO-RNO
Casino Express	1989-2006	Across the country
Sunrise Airlines	1999-2000	RNO-EKO-SLC-ELY-LAS; RNO-EKO-SLC-ELY-VGT
Scenic Airlines	2005-2006	EKO-ELY-VGT; EKO-RNO
SkyWest Airlines	1982-Present	EKO-SLC

Source: Airport records.

ENPLANEMENT FORECAST

As discussed in this chapter's introduction, the first step involved in updating an airport's forecasts include reviewing previous forecasts to determine recent trends. After that, comes the consideration of any new factors that could impact the forecasts, such as changes in the socioeconomic climate or the effects of changes in air carrier services.

Previous Enplanement Forecasts

There are two existing forecasts of enplanement activity at the Airport to consider:

- Those generated for the Master Plan (2016)
- Those generated from the FAA Terminal Area Forecast (2021)

The enplanement forecasts from these sources are listed on **Table 2G**. The forecasts from the Master Plan had a baseline year of 2015. These forecasts are six years old and do not reflect the significant impact to the aviation industry by the COVID-19 pandemic. As noted, the TAF is a generalized FAA forecast that is a lagging indicator because it does not reflect current year activity. In fact, there were 15,635 enplanements in 2021, and this TAF estimated there would be 12,629. These two forecasts will serve as a guideline, but neither appears to reflect the current situation at the Airport, therefore new forecasts of enplanements will be developed for this study.

TABLE 2G I Previous Enplanement Forecasts	
Year	**2016 Master Plan**
2015	18,200
2021	29,784
2026	29,970
2036	30,342
CAGR	**2.46%**
Year	**Terminal Area Forecast (2021)**
2021	12,629
2026	14,629
2031	16,944
2041	22,724
CAGR	**2.98%**

CAGR: Compound annual growth rate

Travel Propensity Enplanement Forecast

There are a variety of local factors that affect the potential for passengers within an area. A key statistic to consider is the relationship of the airport's enplanements with the populace it serves. The ratio of enplanements to population is termed the Travel Propensity Factor (TPF). **Table 2H** presents a historical review of the TPF for the Airport since 2010.

TABLE 2H I Historical Travel Propensity Factor

Year	EKO Enplanements	Elko County Population[1]	Travel Propensity Factor
2010	21,863	49,088	0.4454
2011	25,543	49,442	0.5166
2012	33,310	50,969	0.6535
2013	19,510	52,334	0.3728
2014	18,200	52,531	0.3465
2015	13,701*	51,728	0.2649
2016	14,893	52,082	0.2860
2017	17,115	52,357	0.3269
2018	18,363	52,539	0.3495
2019	19,979	52,778	0.3785
2020	10,351	53,128	0.1948
2021	15,625	53,590	0.2916

*Runway closed part of the year for repairs.

[1] *Source: Woods and Poole Economics, Inc.*

The TPF is predominantly impacted by the proximity of an airport to other regional airports with higher levels of service or "hub" airports. Regional airports with higher TPF ratios tend to be located farther from hub airports in relatively isolated areas, like EKO. These airports generally have a service area that extends into adjacent, well-populated regions or have some type of air service advantage that attracts more of those passengers that might otherwise choose to drive to a more distant hub airport. Generally, the higher the travel propensity factor, the more likely air travelers are to utilize the local airport.

From 2010 through 2021, the TPF for EKO has ranged between a high of 0.6535 and a low of 0.1948. The high TPF in 2012 occurred as the overall economy was finally emerging from the Great Recession of 2008-2009, and the low in 2020 was the pandemic impact. Lower TPF in 2015 and 2016 was the result of the runway being closed for repairs for a time in 2015.

Three enplanement forecasts based on the TPF have been developed and are presented in **Table 2J**. the first considers applying the average TPF for the last five years as a constant in relation to forecast population growth. This forecast results in an annual growth rate of 1.03 percent and 19,185 enplanements by 2041. The second TPF forecast considers the 10-year TPF average which results in 21,520 enplanements in 2041 for an annual growth rate of 1.61 percent. The third forecast considers a recapture of the 2019 TPF by increasing the current TPF moderately over time. This forecast results in 23,579 enplanements by 2041 and an annual growth rate of 2.08 percent.

TABLE 2J I Travel Propensity Enplanement Forecasts			
Year	EKO Enplanements	Elko County Population	Travel Propensity Factor
2010	21,863	49,088	0.4454
2011	25,543	49,442	0.5166
2012	33,310	50,969	0.6535
2013	19,510	52,334	0.3728
2014	18,200	52,531	0.3465
2015	13,701	51,728	0.2649
2016	14,893	52,082	0.2860
2017	17,115	52,357	0.3269
2018	18,363	52,539	0.3495
2019	19,979	52,778	0.3785
2020	10,351	53,128	0.1948
2021	15,625	53,590	0.2916
Constant TPF 5-Year Average (CAGR = 1.03%)			
2026	17,219	55,907	0.3080
2031	17,911	58,152	0.3080
2041	19,185	62,289	0.3080
Constant TPF 10-Year Average (CAGR = 1.61%)			
2026	19,315	55,907	0.3455
2031	20,091	58,152	0.3455
2041	21,520	62,289	0.3455
Increasing TPF - Recapture 2019 TPF (CAGR = 2.08%)			
2026	17,611	55,907	0.3150
2031	19,190	58,152	0.3300
2041	23,579	62,289	0.3785

Source: Coffman Associates analysis.

Market Share of Domestic Enplanements Forecast

The next forecasting method employed considers the Airport's historic market share of U.S. domestic regional airline enplanements. National forecasts of U.S. domestic regional airline enplanements are compiled each year by the FAA and consider the state of the economy, fuel prices, and prior year developments. According to the most recent publication, FAA *Aerospace Forecasts, Fiscal Years 2021-2041*, domestic passenger enplanements are forecast to increase at an average annual rate of 5.4 percent over the 20-year forecast period.

Three enplanement forecasts have been developed as a market share percent of national regional airline enplanement forecasts, as shown in **Table 2K**. The first considers the Airport maintaining its 2021 percent of national enplanements (0.0182%) which results in 32,158 enplanements by 2041. This forecast would represent a very high possibility that does not take into consideration the local circumstance of losing a daily flight. It is based on the FAA forecast that predicts that regional airlines will rebound rapidly from the pandemic.

The second forecast attempts to smooth out the rapid growth of the first forecast by applying the average market share of national regional airline enplanements that EKO has experienced over the last five years (0.127%). This forecast appears more reasonable in the long term but does reflect a significant increase in the first five years.

A third forecast based on the FAA forecast of regional airline enplanements is a modification of the second forecast. In this forecast, the short term and intermediate term enplanement market share percentages have been adjusted to account for the reduced service in early 2022. Ultimately, this forecast considers a return to a more normal schedule and growth in enplanements.

Table 2K I Forecasts Based on US Regional Enplanement Estimates

Year	EKO Enplanements	US Regional Airline Enplanements (Millions)	EKO Market Share
2010	21,863	162.0	0.0135%
2011	25,543	162.0	0.0158%
2012	33,310	159.0	0.0209%
2013	19,510	155.0	0.0126%
2014	18,200	154.0	0.0118%
2015	13,701	153.0	0.0090%
2016	14,893	151.0	0.0099%
2017	17,115	149.0	0.0115%
2018	18,363	154.0	0.0119%
2019	19,979	159.0	0.0126%
2020	10,351	94.0	0.0110%
2021	15,625	86.0	0.0182%
Constant Market Share of U.S. Regional Enplanements (CAGR = 5.42%)			
2026	32,158	177.0	0.0182%
2031	35,974	198.0	0.0182%
2041	44,876	247.0	0.0182%
Constant Market Share of U.S. Regional Enplanements - 5-Year Average (CAGR = 3.55%)			
2026	22,479	177.0	0.0127%
2031	25,146	198.0	0.0127%
2041	31,369	247.0	0.0127%
Modified Constant Market Share of U.S. Regional Enplanements - 5-Year Average (CAGR = 3.55%)			
2026	17,700	177.0	0.0100%
2031	22,176	198.0	0.0112%
2041	31,369	247.0	0.0127%

Regression Analysis Enplanement Forecast

Several analytical techniques were examined for their applicability to projecting airline enplanements at Elko Regional Airport. These include time-series extrapolation and regression analysis using several variables, including aviation and socioeconomic factors. While the potential timeframes used in regression and time-series analysis can be endless, the experience of the consultant was used to narrow the potential variables to those that reflect recent trends at the airport. Primarily because of the inconsistent historical enplanement levels (due to recessions and pandemic), none of these methods resulted in reliable correlations. Thus, these forecasting methods were not considered further in the enplanement forecast.

Flight Schedule Enplanement Forecast

A common method of forecasting commercial enplanements is through an examination of the existing and potential future flight schedule and airplane equipment. Throughout 2021, the base year of these forecasts, SkyWest Airlines provided twice daily arrivals and departures to Salt Lake City utilizing the 50-seat CRJ-200 aircraft. Therefore, under optimal conditions that assume no flights were cancelled, 700 departure seats were available each week. With a total enplanement level of 15,625, approximately 43 percent of the seats were filled (a board loading factor of 43 percent).

In January of 2022, SkyWest announced they were changing the schedule to one departure per day, due to financial reasons. That will make only 350 departure seats available per week, and the one flight departs in the mid-afternoon making same day connections in Salt Lake City challenging. The City of Elko and the Airport are working hard to provide incentives to the airline to provide at least two flights a day and to space those flights in such a manner that is convenient to the flying public.

The key factors to developing an enplanement forecast utilizing the flight schedule are the planned schedule, the seating capacity of the aircraft, and the board loading factor. The number of potential scenarios is practically limitless. Two scenarios are presented and outlined on **Exhibit 2A**.

Scenario 1: Scenario one applies the following assumptions:

- SkyWest will continue to operate at the airport.
- SkyWest will operate a once daily flight for the foreseeable future (5 years).
- SkyWest will continue to utilize the 50-seat CRJ-200 aircraft (or similar 50 seat aircraft).
- The boarding load factor will be at least 50 percent.

This scenario takes into consideration the immediate circumstance of SkyWest reducing their flight schedule from two daily departures to one daily departure. That schedule change will have an impact on the flying public. The one remaining flight is in the mid-afternoon, which significantly reduces the possible connection opportunities out of Salt Lake City. This schedule will likely cause travelers who might normally fly out of EKO, to strongly consider driving to SLC for their flight. Once the flying public gets used to a stable schedule, even if it is once a day, the board loading factor should begin to increase.

In this scenario enplanements will decline from the 2021 level down to 9,100 in the short term (years 1-5). In the intermediate term, this scenario considers the return of a second flight to SLC and a BLF of 50 percent. This results in a return to growth and a total of 18,200 enplanements by the intermediate term (years 6-10). The long term (years 11-20) considers a third flight and a 50 percent BLF. One challenge to this forecast is that the CRJ-200 is getting older and may not be around in 20 years so this assumes a CRJ-200 or comparable 50 seat aircraft.

Scenario 2: Scenario 2 applies the following assumptions:

- SkyWest will continue to operate at the airport.
- SkyWest will operate a once daily flight for the immediate future.
- SkyWest will transition to the CRJ-700 aircraft within five years.
- The boarding load factor will ultimately increase to at least 60 percent.

This scenario also recognizes that enplanements are likely to decline in the immediate future but considers the return of a second flight in the near future. That second flight could return as a result of overwhelming passenger demand or direct subsidies to the airline. In the intermediate term this scenario

2021 Baseline Condition											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	42.9% BLF	ANNUAL ENPLANEMENTS
CRJ-200/50	Salt Lake City	2	2	2	2	2	2	2	700	300	15,625
								TOTAL	700	300	15,625

SCENARIO 1

Short Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	50% BLF	ANNUAL ENPLANEMENTS
CRJ-200/50	Salt Lake City	1	1	1	1	1	1	1	350	175	9,100
								TOTAL	350	175	9,100

Intermediate Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	50% BLF	ANNUAL ENPLANEMENTS
CRJ-700/70	Salt Lake City	2	2	2	2	2	2	2	700	350	18,200
								TOTAL	700	350	18,200

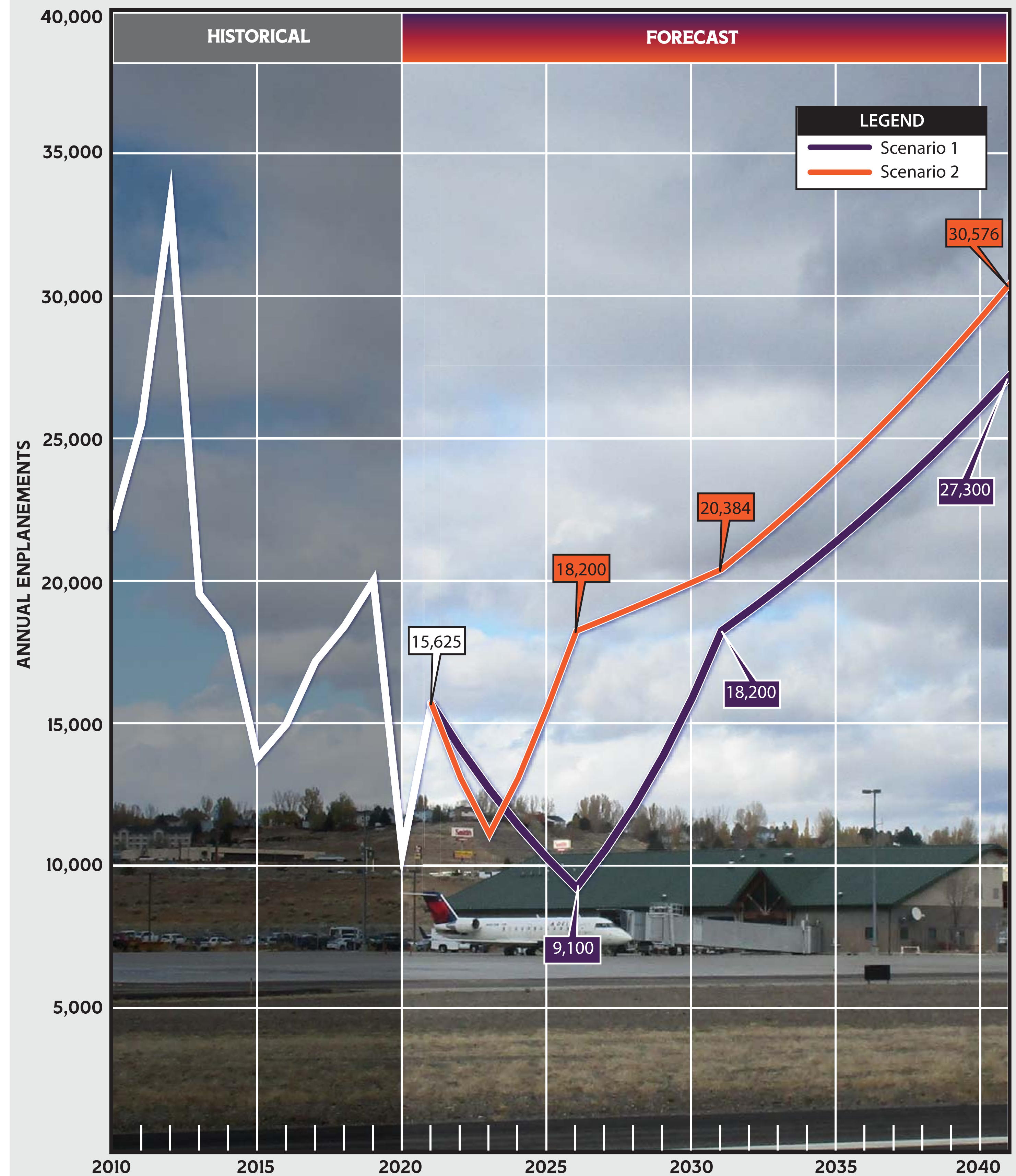
Long Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	50% BLF	ANNUAL ENPLANEMENTS
CRJ-700/70	Salt Lake City	3	3	3	3	3	3	3	1,050	525	27,300
								TOTAL	1,050	525	27,300

SCENARIO 2

Short Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	50% BLF	ANNUAL ENPLANEMENTS
CRJ-200/50	Salt Lake City	2	2	2	2	2	2	2	700	350	18,200
								TOTAL	700	350	18,200

Intermediate Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	40% BLF	ANNUAL ENPLANEMENTS
CRJ-700/70	Salt Lake City	2	2	2	2	2	2	2	980	392	20,384
								TOTAL	980	392	20,384

Long Term											
AIRCRAFT/ SEATS	DESTINATION	M	TU	W	TH	F	SA	SU	SEATS PER WEEK	60% BLF	ANNUAL ENPLANEMENTS
CRJ-700/70	Salt Lake City	2	2	2	2	2	2	2	980	588	30,576
								TOTAL	980	588	30,576



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considers a change in the aircraft used for service to EKO from the CRJ-200 to the 70 seat CRJ-700. In the long term, the CRJ-700 is still the operating aircraft, but the BLF is increased. This scenario considers a long-term return to more than 30,000 enplanements.

ENPLANEMENT FORECAST SUMMARY

Three different approaches to forecasting enplanements have been presented. The first considered the relationship of historical enplanements to the service area population. Three different forecasts directly related to population were developed. Another set of three forecasts were developed which are based on the FAA forecast for regional airline enplanements. The third set of forecasts considered two scenarios based on a potential flight schedule.

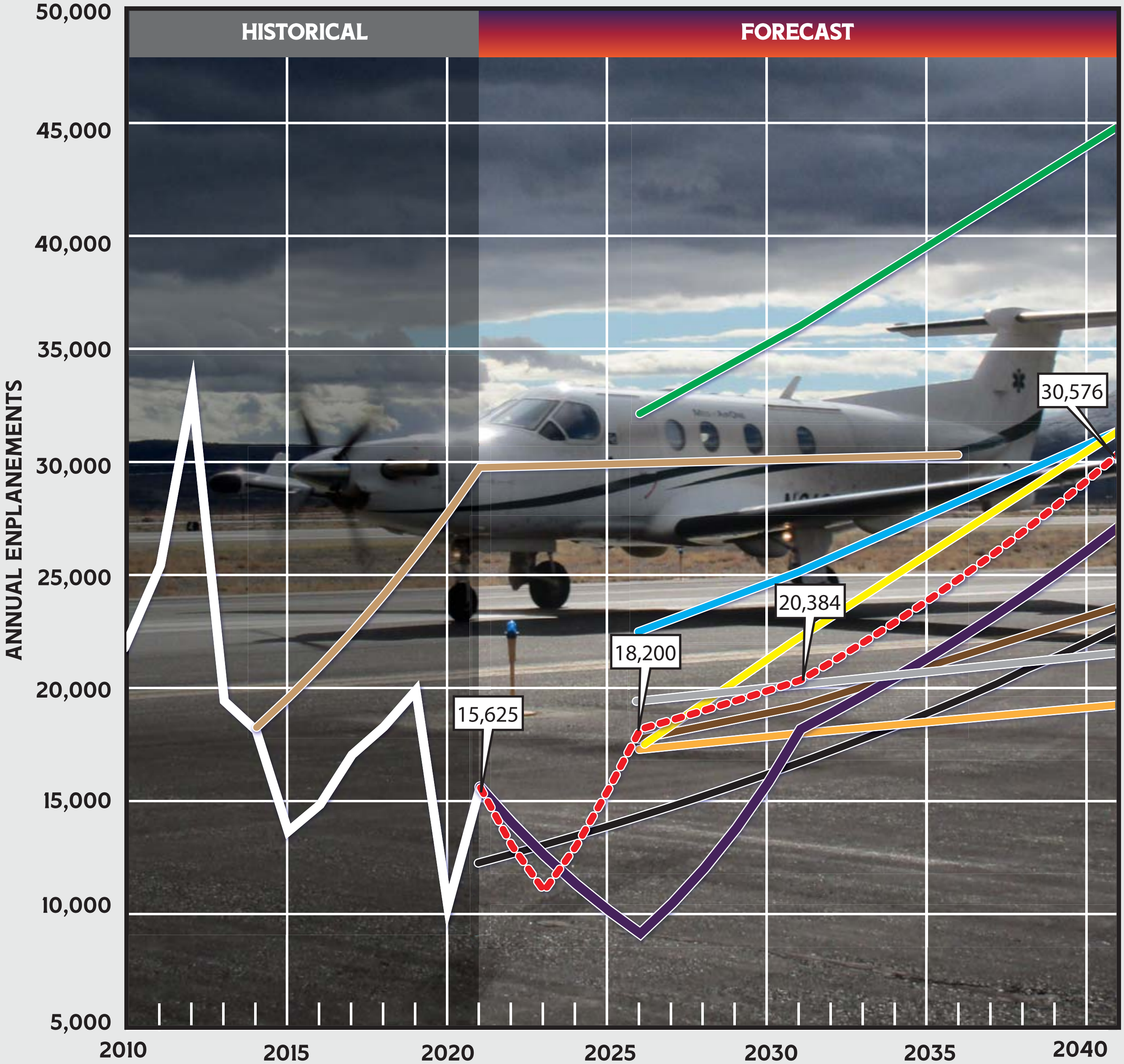
A total of eight new enplanement forecasts has been developed. It is the judgement of the forecast analyst that the forecasts based on a potential flight schedule are the most probable. It does appear that the airport will see a decline in enplanements in 2022 because of the loss of one of two daily flights and the fact that the one remaining flight departs in the mid-afternoon, making connections in Salt Lake City challenging.

The selected forecast recognizes that in the immediate next few years, enplanements are likely to decline due to the flight schedule change. By the intermediate term (years 6-10), it is assumed that a second flight will be added, and then ultimately the board loading factor will increase as the schedule stabilizes. **Table 2L** and **Exhibit 2B** summarize the enplanement forecast and highlight the selected enplanement forecast.

TABLE 2L I Enplanement Projection Summary

2021 Enplanements - 15,625	2026	2031	2041	AAGR 2021-2041
Travel Propensity Factor (TPF) Projections				
Constant TPF 5-Year Average	17,219	17,911	19,185	1.03%
Constant TPF 10-Year Average	19,315	20,091	21,520	1.61%
Increasing TPF - Recapture 2019 TPF	17,611	19,190	23,579	2.08%
Market Share of U.S. Regional Carrier Enplanements				
Constant Market Share of U.S. Regional Enplanements	32,158	35,974	44,876	5.42%
Constant Market Share of U.S. Regional Enplanements - 5-Year Average	22,479	25,146	31,369	3.55%
Modified Constant Market Share of U.S. Regional Enplanements - 5-Year Average	17,700	22,176	31,369	3.55%
Flight Schedule Enplanement Forecast				
Scenario 1 - CRJ200	9,100	18,200	27,300	2.83%
Scenario 2 - CRJ200/CRJ700 (Selected Forecast)	18,200	20,384	30,576	3.41%
SELECTED FORECAST	**18,200**	**20,384**	**30,576**	**3.41%**

AAGR: Average Annual Growth Rate



LEGEND	AAGR
Travel Propensity Factor (TPF) Projections	
Constant TPF 5-Year Average	1.03%
Constant TPF 10-Year Average	1.61%
Increasing TPF - Recapture 2019 TPF	2.08%
Market Share of U.S. Regional Carrier Enplanements	
Constant Market Share of U.S. Regional Enplanements	5.42%
Constant Market Share of U.S. Regional Enplanements - 5-Year Average	3.55%
Modified Constant Market Share of U.S. Regional Enplanements - 5-Year Average	3.55%
Flight Schedule Enplanement Forecast	
Scenario 1 - CRJ200 (Selected Forecast)	2.83%
Scenario 2 - CRJ200/CRJ700(Selected Forecast)	**3.41%**
Existing Forecasts	
Terminal Area Forecast (TAF)	2.98%
Draft Master Plan (2016)	2.35%

AIRLINE OPERATIONS FORECAST

The commercial service aircraft fleet mix defines several key parameters in airport planning including terminal complex layout, maximum stage length capabilities (affecting runway length evaluations), and in some cases, the critical aircraft (for pavement design and ramp geometry). A projection of the fleet mix for the Airport has been developed by reviewing equipment used by the carrier serving the Airport and is presented in **Table 2M**.

TABLE 2M I Commercial Airline Fleet Mix and Operations Forecast

Fleet Mix Aircraft Seats	Projected Aircraft	HISTORICAL	FORECAST		
		2021	2026	2031	2041
50	CRJ-200	100%	0%	0%	0%
70	CRJ-700	0%	100%	100%	100%
Average Seats per Departure		50.0	70.0	70.0	70.0
Boarding Load Factor		50%	50%	55%	60%
Enplanements per Departure		25.0	35.0	38.5	42.0
Annual Enplanements		15,625	18,200	20,384	30,576
Annual Departures		625	520	529	728
Annual Operations		**1,250**	**1,040**	**1,058**	**1,456**

SkyWest currently utilizes the 50-seat CRJ-200 aircraft. Since they are the only operator at the Airport, the average number of seats per departure is 50. Based on the 2021 flight schedule, there were approximately 1,250 commuter operations for the year. The CRJ-200 is an older, less efficient, commuter aircraft that is rapidly being removed from service across the industry and being replaced by the more efficient CRJ-700 type aircraft. The CRJ-700 has 70 seats which means in certain markets these aircraft may provide more seating capacity than is necessary to meet demand. At this time, there is not a 50-seat aircraft in production that could replace the CRJ-200 and provide the efficiencies realized by other larger aircraft.

While it is challenging to predict what aircraft equipment changes may be applied to specific markets, recent trends show that smaller non-hub and small hub airports are seeing their 50-seat aircraft being replaced by the larger 70 seat aircraft. If the market cannot support the additional seating capacity, then service could be lost altogether.

An additional factor is the current shortage of qualified pilots. For many years there have been fewer and fewer new pilots entering the profession. The FAA forecasts active pilots by type certificate, and through 2041, Commercial Pilots are forecast to decline by 0.1 percent annually. In addition, in 2013, the FAA increased the qualification requirements for first officers (co-pilots), requiring them to hold an Airline Transport Pilot (ATP) certificate rather than the previous requirement for a Commercial Pilot certificate. ATP pilots are required to have at least 1,500 hours of flight time as compared to 250 hours for pilots holding a Commercial Pilot certificate. Co-pilots must also have an aircraft type rating, which involves additional training and testing specific to the airplanes they fly. These requirements have hit the regional airline industry especially hard, as this is often the training ground for new pilots. The good news is that ATP pilots are projected to increase 0.7 percent through 2041 which will offset the loss of pilots in the Commercial category to some degree.

The boarding load factor (BLF) is defined as the ratio of passengers boarding an aircraft to the seating capacity of the aircraft. The BLF at the Airport has varied over time, but it has generally averaged between 40 and 50 percent. Typically, airlines need to have a BLF greater than 60 percent for that flight to be profitable.

The airline operations forecasts assumes that the CRJ-200 aircraft will be replaced with a CRJ-700 aircraft for operations at EKO. Two daily flights will be available, and the BLF will gradually increase from 50 percent to 60 percent over the planning period. This translates to a decline in commercial operations in the short and intermediate term and then an increase to 1,456 operations in the long term.

GENERAL AVIATION FORECASTS

General aviation encompasses all portions of civil aviation except commercial service and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity at the Airport, certain elements of this activity must be forecast. These indicators of general aviation demand include based aircraft, aircraft fleet mix, and annual operations.

BASED AIRCRAFT FORECAST

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft for the Airport, other demand indicators can be projected. The process of developing forecasts of based aircraft begins with an analysis of aircraft ownership in the primary general aviation service area through a review of historical aircraft registrations.

Currently, there are 77 based aircraft at the airport comprised of 63 single engine piston, five (5) multi-engine pistons, three (3) turboprops, and six (6) helicopters. The Terminal Area Forecast (TAF) for the Airport also reflects the current number of based aircraft. The TAF shows an annual growth rate of 1.11 percent and a total of 96 based aircraft in 2041. For purposes of this Focused Planning Study, the TAF growth in based aircraft will be utilized.

It is important to understand the current and projected based aircraft fleet mix at an airport. This will ensure the planning of proper facilities in the future. For example, the addition of one or several larger turboprop or business jet aircraft to the airfield can have a significant impact on the separation requirements and on runway length needs. Therefore, the future fleet mix is expected to continue to be dominated by single engine piston aircraft with moderate increases in turboprop and jet aircraft. Multi-engine piston aircraft are planned to gradually decrease in number in-line with national forecasts. **Table 2N** presents the forecast fleet mix for based aircraft at Elko Regional Airport.

TABLE 2N I Based Aircraft fleet Mix

	EXISTING[1]		FORECAST					
Aircraft Type	2021	%	2026	%	2031	%	2041	%
Single Engine	63	81.82%	64	79.01%	66	76.74%	69	71.88%
Multi-Engine	5	6.49%	5	6.17%	5	5.81%	5	5.21%
Turboprop	3	3.90%	4	4.94%	4	4.65%	7	7.29%
Jet	0	0.00%	1	1.23%	2	2.33%	4	4.17%
Helicopter	6	7.79%	7	8.64%	9	10.47%	11	11.46%
Totals	**77**	**100.00%**	**81**	**100.00%**	**86**	**100.00%**	**96**	**100.00%**

[1] Airport Records; FAA Form 5010

GENERAL AVIATON OPERATIONS

General aviation operations include a wide range of activity from recreational use to business and corporate uses. Military operations include those operations conducted by various branches of the U.S. military. Air taxi operations are those conducted by aircraft operating under FAR Part 135, otherwise known as “for-hire” or “on-demand” activity. Air taxi operations typically include commuter, air cargo, air ambulance, and many fractional ownership operations.

Aircraft operations are further classified as local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of an airport, or which executes simulated approaches or touch-and-go operations at an airport. Generally, local operations are characterized by training activity. Itinerant operations are those performed by aircraft with a specific origin or destination away from an airport. Typically, itinerant operations increase with business and commercial use since business aircraft are used primarily to transport passengers from one location to another.

Elko Regional Airport is a non-towered facility. This means that actual operational counts are not available. Therefore, estimates must be made based on interviews with airport operators and management, as well as from historical documentation and studies. The FAA TAF estimates 15,761 general aviation operations for 2021 so this figure is utilized for the baseline.

Three additional forecasts have been developed that are based on the growth rate of various demand indicators. The first forecast considers the FAA projection of a 0.72 percent growth in general aviation operations across the country. The TAF for the entire state of Nevada estimates a growth rate of 1.67 percent. The third considers maintaining a constant number of operations per based aircraft. In 2021, there were 205 general aviation operations per based aircraft. By maintaining this as a constant, an operations forecast results.

Table 2P presents the several general aviation operations forecasts as well as the TAF. For this study, the TAF will be used for general aviation operations.

TABLE 2P I General Aviation Operations Forecasts

Year	FAA National Growth Rate[1]	Statewide TAF Growth Rate[2]	Operations Per Based Aircraft[3]	2021 TAF (SELECTED FORECAST)
2021	15,761	15,761	15,761	15,761
2026	16,337	17,122	16,375	17,683
2031	16,933	18,600	17,194	19,848
2041	18,193	21,950	18,627	25,012
CAGR 2021-2041	**0.72%**	**1.67%**	**0.84%**	**2.34%**

[1] FAA National GA Operations Growth Rate
[2] State TAF Growth Rate for GA Operations
[3] 205 GA Operations Per Based Aircraft
CAGR: Compound Annual Growth Rate

Other Air Taxi and Military Operations Forecast

Air taxi operations are those with authority to provide "on-demand" transportation of persons or property via aircraft with fewer than 60 passenger seats. Air taxi includes a broad range of operations, including some smaller commercial service aircraft, some charter aircraft, air cargo aircraft, many fractional ownership aircraft, and air ambulance services. The commuter airline operating at the Airport is considered an air taxi operator rather than an air carrier (which have more than 60 seats).

A forecast of operations by the commuter airline was previously presented. This effort will address the remaining "other" air taxi operations at the Airport. Based on interviews with airport operations staff and on an examination of flight plans to and from the Airport, it was determined the commuter airline accounts for approximately 25 percent of total air taxi operations. Since the airline accounted for approximately 1,250 operations in 2021, the "other air taxi" operations are estimated at 3,750 operations. These operations include the air cargo activity, charters, and fractional operations. In the future, the "other air taxi" operations are projected to grow at 2.00 percent annually to account for increasing charter and fractional activity locally and nationally.

Military aircraft can and do utilize civilian airports across the country. Elko Regional Airport does on occasion have activity by military aircraft. Forecasts of military activity is inherently difficult because of the national security nature of their operations and the fact that their mission can change on a daily basis. Thus, it is typical for the FAA to plug in a flat line number for military operations. At Elko Regional Airport, the FAA TAF has 135 itinerant annual military operations. This figure will be utilized in this planning study.

Total Operations Forecast Summary

Each operational element has been forecast individually. **Table 2Q** presents a summary of the operations forecast to be utilized in this Focused Planning Study. These forecasts take into account the impact of the COVID-19 pandemic and the commercial carrier flight schedule that was reduced from two daily flights to one daily flight in February 2022.

TABLE 2Q I Total Operations forecast

Year	Commuter/ Air Carrier	Local GA Operations	Itinerant GA Operations	Other Air Taxi	Military	Total Operations
2021	1,250	5,038	10,723	3,750	135	20,896
2026	1,040	5,543	12,140	4,140	135	22,998
2031	1,058	6,106	13,742	4,571	135	25,612
2041	1,456	7,411	17,601	5,572	135	32,175
AAGR 2021-2041	**0.77%**	**1.95%**	**2.51%**	**2.00%**	**0.00%**	**2.18%**

FORECAST COMPARISON TO THE FAA TAF

The FAA will review the forecasts presented in this Focused Planning Study for comparison to the *Terminal Area Forecast*. The forecasts are considered consistent with the TAF if they meet the following criteria:

- Forecasts differ by less than 10 percent in the 5-year forecast period, and 15 percent in the 10-year forecast period, or
- Forecasts do not affect the timing or scale of an airport project, or
- Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.5, *Field Formulation of the National Plan of Integrated Airport Systems*.

If the forecasts are not consistent with these parameters, then the forecasts must be forwarded to FAA headquarters in Washington, D.C. for further review. Deviation from these thresholds will require specific local documentation, which is included in this chapter. **Table 2R** presents the direct comparison of the Focused Planning Study forecasts with the TAF published in May 2021.

TABLE 2R I Forecast Comparison to the 2021 FAA Terminal Area Forecast (TAF)

	2021	2026	2031	2041	CAGR 2021-2041
Passenger Enplanements					
Focused Study Forecast	15,625	18,200	20,384	30,576	3.41%
FAA TAF 2021	12,629	14,629	16,944	22,724	2.98%
% Difference	21.2%	21.8%	18.4%	29.5%	
Total Operations					
Focused Study Forecast	20,896	22,998	25,612	32,175	2.18%
FAA TAF	22,172	24,345	26,787	32,575	1.94%
% Difference	5.9%	5.7%	4.5%	1.2%	
Based Aircraft					
Focused Study Forecast	77	81	86	96	1.11%
FAA TAF	77	81	86	96	1.11%
% Difference	0.0%	0.0%	0.0%	0.0%	
CAGR: Compound annual growth rate					

Source: Coffman Associates analysis

Enplanements: The base year enplanement number of 15,625 is what actually occurred in 2021, while the TAF number of 12,629 was an estimate developed more than a year before. Therefore, it is not unexpected that there would be a difference between the two. In the short term, the Focused Planning

Study is anticipating a decrease in enplanements primarily because of the change to the flight schedule where there is now only one daily flight instead of the two daily flights that were available throughout 2021. In the next few years, this enplanement forecast anticipates a transition from the CRJ-200 aircraft to the CRJ-700 (or similar) and a return to a more stable twice daily flight schedule. Under these assumptions, the enplanements will increase overall within the next five years. Modest growth in enplanements continues from there.

Total Operations: The total operations forecast is within the TAF tolerance of 10 percent in the five-year term and 15 percent in the 10-year term. Each of operations (commuter, other air taxi, general aviation, and military) were forecast individually and then combined to establish the total operations forecast. This approach allowed the forecast analyst to take into consideration the COVID-19 pandemic impact and the flight schedule change.

Based Aircraft: The TAF baseline figure of 77 based aircraft is the same as what the airport records show. For this study, the TAF growth rate for based aircraft is used which results in 96 based aircraft by 2041.

TOTAL OPERATIONS PEAKING FORECAST

Many aspects of facility planning relate to levels of peaking activity – times when an airport is busiest. For example, the appropriate size of terminal facilities can be estimated by determining the number of people that could reasonably be expected to use the facility at a given time. The following planning definitions apply to the peak periods:

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

The peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. The peak period forecasts represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

Without the availability of records from a control tower, peak operations periods must be estimated. The forecast of peak month operations assumes approximately 12 percent of annual operations. This is typical for an airport that may have some seasonal changes to activity levels, such as winter snow events that occur in Nevada. The design day was then calculated by dividing the peak month operations by 30. Design hour operations were calculated at 15 percent of design day operations. **Table 2S** summarizes the general aviation peak activity forecasts.

TABLE 2S I Peak Operations Forecast

	2021	2026	2031	2041
Annual Operations	20,896	22,998	25,612	32,175
Peak Month (12%)	2,508	2,760	3,073	3,861
Design Day	84	92	102	129
Design Hour (15%)	13	14	15	19

OPERATIONS BY FLEET MIX

Developing an understanding of the operational fleet mix including the approximate volume of operations by aircraft type is utilized in airfield capacity analysis, fuel storage capacity analysis, and pavement utilization determination. The approximate number of operations by certain aircraft types is available from the FAA Traffic Flow Management System Count (TFMSC) database. This database captures flight plans filed to and from airports. Not all flights are required to file a flight plan, and therefore this database does not capture all activity; however, the FAA indicates that for turboprops and jets, the capture rate is better than 95 percent. **Table 2T** presents the historical TFMSC database of operations for jets and turboprops.

TABLE 2T I Jet and Turboprop Activity at EKO

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Jets	682	666	706	1,684	1,930	2,052	2,050	2,110	1,674	2,022
TP	4,358	4,412	4,330	2,442	2,706	2,186	2,880	4,056	3,612	3,864
Total	**5,040**	**5,078**	**5,036**	**4,126**	**4,636**	**4,238**	**4,930**	**6,166**	**5,286**	**5,886**

Source: FAA TFMSC 2011-2021, Data normalized annually

By identifying the number of operations by turboprops and jets, it is then possible to deduce an estimate of operations by remaining aircraft types. In addition, experience at other airports has shown that general operational estimates can be made by multiplying the number of based aircraft by utilizations factors. For this analysis, multiengine piston aircraft are estimated to account for 200 operations annually. With five based multi-engine piston aircraft at the Airport, an estimate of 1,000 annual operations by these aircraft is made. Based turboprops are estimated at 250 annual operations per aircraft, and based business jets are estimated at 300 annual operations. Helicopters typically have a higher utilization rate and are estimated at 400 operations per based helicopter. It should be noted that these operational estimates account for all operations by that aircraft type, not just those based at an airport. **Table 2U** presents the operational fleet mix forecast estimate for the Airport.

TABLE 2U I Fleet Mix Operations Forecast

	2021	2026	2031	2041
Local Operations				
Piston	4,538	5,043	5,606	6,911
Helicopter	500	500	500	500
Total Local	**5,038**	**5,543**	**6,106**	**7,411**
Itinerant Operations				
Single Piston	7,058	7,955	9,106	12,164
Multi-Piston	1,000	1,000	1,000	1,000
Turboprop	3,800	4,000	4,200	4,800
Jet	2,000	2,300	2,800	3,800
Helicopters	2,000	2,200	2,400	3,000
Total Itinerant	**15,858**	**17,455**	**19,506**	**24,764**
Total Operations	**20,896**	**22,998**	**25,612**	**32,175**

Source: Coffman Associates analysis

ANNUAL INSTRUMENT APPROACHES

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach, aircraft must land at the airport after following one of the published instrument approach procedures in less than visual conditions. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities, such as an instrument landing system. Practice or training approaches do not count as AIAs.

During poor weather conditions, pilots are less likely to fly and rarely would perform training operations. As a result, an estimate of the total number of AIAs can be made based on a percent of itinerant operations regardless of the frequency of poor weather conditions. Generally, AIAs total between three and seven percent of itinerant operations. An estimate of five percent of itinerant operations is utilized to forecast AIAs at the Airport. This results in a 2021 estimate of 793 AIAs and 873, 975, and 1,238 in years 2026, 2031, and 2041, respectively.

It should be noted that the AIA calculation is only an estimate of those operations taking place utilizing an instrument approach procedure in less than visual conditions. Many operators, especially commercial operators, will fly an instrument procedure in visual conditions.

FORECAST SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period. **Exhibit 2C** is a summary of the aviation forecasts prepared in this chapter. Actual activity is included for 2015, which was the base year for these forecasts.

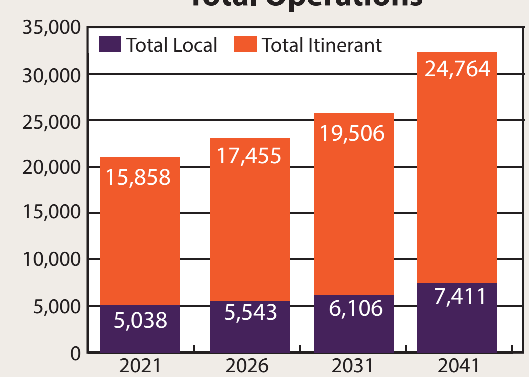
In 2021, the Airport had 15,625 passenger enplanements. This represented a significant increase over 2020 when the Airport had only 10,351. The decline was due to the aviation restriction that applied during the COVID-19 pandemic. The Airport is forecast to continue to see increasing enplanement over the planning period, provided the scheduled service stabilizes to a regular schedule. By 2041, enplanements are forecast to reach 30,576.

Overall, Airport operations are forecast to grow moderately at an average annual rate of 2.18 percent with fluctuation in commercial operation due to potential changes in aircraft and schedules. Based aircraft are forecast to grow from 77 in 2021 to 96 by 2041.

Projections of aviation demand will be influenced by unforeseen factors and events in the future. In the recent past, factors such as terrorist attacks, economic recession, and the pandemic have impacted aviation demand. Nonetheless, the forecasts developed for this planning effort are considered reasonable for planning purposes. The FAA will review and, if acceptable, approve these forecasts for planning purposes.

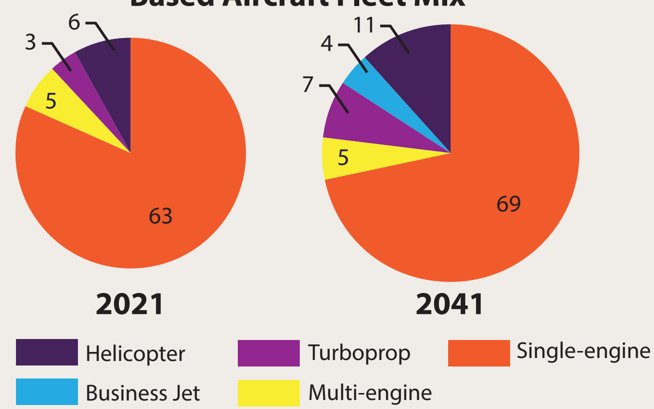
	Base Year	Forecast		
	2021	2026	2031	2041
TOTAL ENPLANEMENTS				
Annual Enplanements	15,625	18,200	20,384	30,576
ANNUAL OPERATIONS				
Itinerant Operations				
Air Carrier (Part 121; 60+ Seats)	0	1,040	1,058	1,456
Commuter (Part 121; <60 Seats)	1,250	0	0	0
Other Air Taxi (Part 135)	3,750	4,140	4,571	5,572
General Aviation	10,723	12,140	13,742	17,601
Military	135	135	135	135
Total Itinerant Operations	**15,858**	**17,455**	**19,506**	**24,764**
Local Operations				
General Aviation	5,038	5,543	6,106	7,411
Military	0	0	0	0
Total Local Operations	**5,038**	**5,543**	**6,106**	**7,411**
TOTAL OPERATIONS	**20,896**	**22,998**	**25,612**	**32,175**
BASED AIRCRAFT				
Single Engine	63	64	66	69
Multi-engine	5	5	5	5
Turboprop	3	4	4	7
Business Jet	0	1	2	4
Helicopter	6	7	9	11
Total Based Aircraft	**77**	**81**	**86**	**96**
PEAKING CHARACTERISTICS				
Enplanement Peaking				
Total Enplanements	15,625	18,200	20,384	30,576
Peak Month	1,562	1,820	2,038	3,058
Design Day	52	61	68	102
Design Hour	50	70	70	70
Operations Peaking				
Total Operations	20,896	22,998	25,612	32,175
Peak Month	2,508	2,760	3,073	3,861
Design Day	84	92	102	129
Design Hour	13	14	15	19
ANNUAL INSTRUMENT APPROACHES	**793**	**873**	**975**	**1,238**

Total Operations



Source: Coffman Associates

Based Aircraft Fleet Mix



AIRCRAFT/AIRPORT/RUNWAY CLASSIFICATION

The FAA has established several aircraft classification systems that group aircraft types based on their performance (approach speed in landing configuration) and design characteristics (wingspan and landing gear configuration). These classification systems are used to determine the appropriate airport design standards for specific airport elements such as runways, taxiways, taxilanes, and aprons.

AIRCRAFT CLASSIFICATION

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or a composite aircraft representing a collection of aircraft with similar characteristics. The design aircraft is classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13A, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 2D**.

Aircraft Approach Category (AAC): A grouping of aircraft based on a reference landing speed (V_{REF}), if specified, or if V_{REF} is not specified, 1.3 times stall speed (V_{SO}) at the maximum certificated landing weight. V_{REF}, V_{SO}, and the maximum certificated landing weight are those values as established for the aircraft by the certification authority of the country of registry.

The AAC generally refers to the approach speed of an aircraft in landing configuration. The higher the approach speed, the more restrictive the applicable design standards. The AAC, depicted by a letter A through E, is the aircraft approach category and relates to aircraft approach speed (operational characteristic). The AAC generally applies to runways and runway-related facilities such as runway width, runway safety area (RSA), runway object free area (ROFA), runway protection zone (RPZ), and separation standards.

Airplane Design Group (ADG): The ADG, depicted by a Roman numeral I through VI, is a classification of aircraft which relates to aircraft wingspan or tail height (physical characteristic). When the aircraft wingspan and tail height fall in different groups, the higher group is used. The ADG influences design standards for taxiway safety area (TSA), taxiway object free (TOFA), taxilane object free area, apron wingtip clearance, and various separation distances.

Taxiway Design Group (TDG): A classification of airplanes based on outer-to-outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance. The TDG relates to the undercarriage dimensions of the design aircraft. The taxiway design elements determined by the application of the TDG include the taxiway width, taxiway edge safety margin, taxiway shoulder width, taxiway fillet dimensions, and, in some cases, the separation distance between parallel taxiways/taxilanes. Other taxiway elements such as the taxiway safety area (TSA), taxiway/taxilane object free area (TOFA), taxiway/taxilane separation to parallel taxiway/taxilanes or fixed or movable objects, and taxiway/taxilane wingtip clearances are determined solely based on the wingspan (ADG) of the design aircraft utilizing those surfaces. It is appropriate for taxiways to be planned and built to different TDG standards based on expected use.

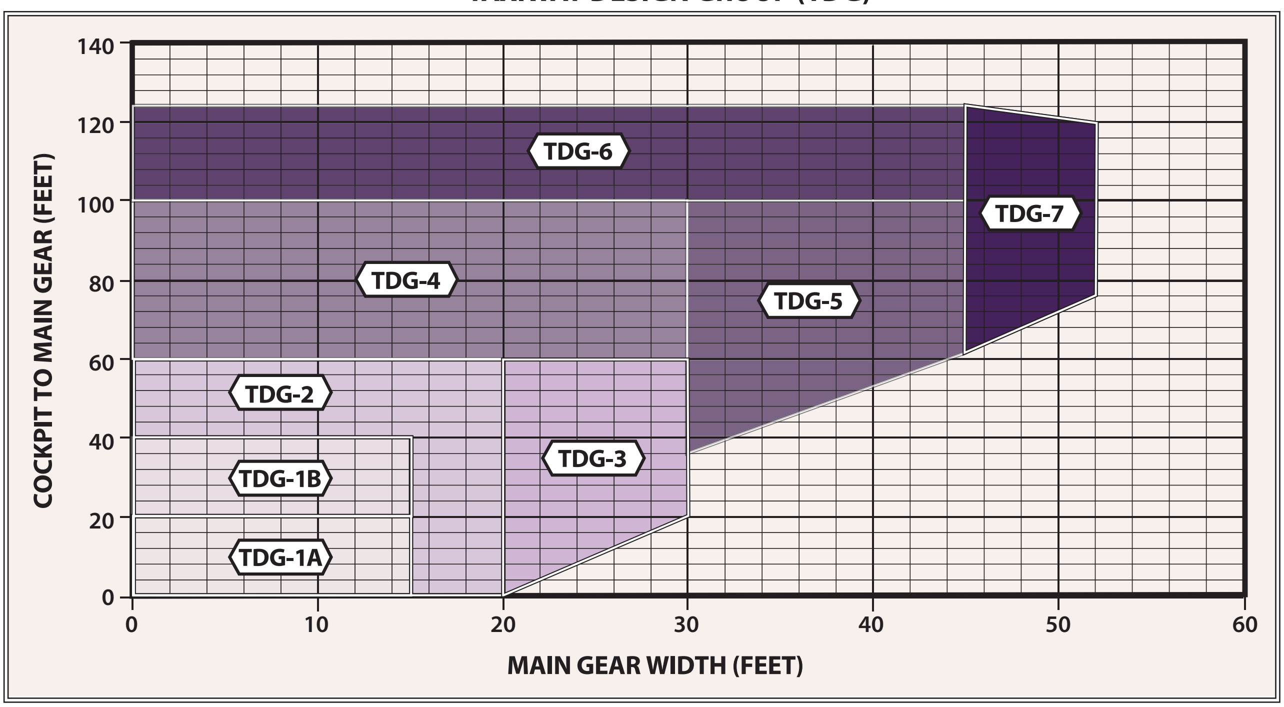
AIRCRAFT APPROACH CATEGORY (AAC)	
Category	**Approach Speed**
A	less than 91 knots
B	91 knots or more but less than 121 knots
C	121 knots or more but less than 141 knots
D	141 knots or more but less than 166 knots
E	166 knots or more

AIRPLANE DESIGN GROUP (ADG)		
Group #	**Tail Height (ft)**	**Wingspan (ft)**
I	<20	<49
II	20-<30	49-<79
III	30-<45	70-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

VISIBILITY MINIMUMS	
RVR* (ft)	**Flight Visibility Category (statute miles)**
VIS	3-mile or greater visibility minimums
5,000	Not lower than 1-mile
4,000	Lower than 1-mile but not lower than ¾-mile
2,400	Lower than ¾-mile but not lower than ½-mile
1,600	Lower than ½-mile but not lower than ¼-mile
1,200	Lower than ¼-mile

***RVR**: Runway Visual Range

TAXIWAY DESIGN GROUP (TDG)



Source: FAA AC 150/5300-13A, Airport Design

Exhibit 2D
AIRCRAFT CLASSIFICATION PARAMETERS

Exhibit 2E summarizes the classification of the most common aircraft in operation today. Generally, recreational and business piston and turboprop aircraft will fall in AAC A and B and ADG I and II. Business jets typically fall in ACC B and C, while the larger commercial aircraft will fall in AAC C and D.

AIRPORT AND RUNWAY CLASSIFICATION

Airport and runway classifications, along with the aircraft classifications defined previously, are used to determine the appropriate FAA design standards to which the airfield facilities are to be designed and built.

Runway Design Code (RDC): A code signifying the design standards to which the runway is to be built. The RDC is based upon planned development and has no operational component.

The AAC, ADG, and runway visual range (RVR) are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the available instrument approach visibility minimums expressed by RVR values in feet of 1,200 (⅛-mile), 1,600 (¼-mile), 2,400 (½-mile), 4,000 (¾-mile), and 5,000 (1-mile). The RVR values approximate standard visibility minimums for instrument approaches to the runways. The third component reads "VIS" for runways designed for visual approach use only.

Approach Reference Code (APRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. Like the RDC, the APRC is composed of the same three components: the AAC, ADG, and RVR. The APRC describes the current operational capabilities of a runway under particular meteorological conditions where no special operating procedures are necessary, as opposed to the RDC which is based upon planned development with no operational component. The APRC for a runway is established based upon the minimum runway to taxiway centerline separation.

Departure Reference Code (DPRC): A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to takeoff operations. The DPRC represents those aircraft that can takeoff from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operating conditions. The DPRC is similar to the APRC, but is composed of two components, ACC and ADG. A runway may have more than one DPRC depending on the parallel taxiway separation distance.

***Airport Reference Code (ARC)*:** An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely at an airport. The current Airport Layout Plan (ALP) for the Airport, which will be updated as part of this planning effort, identifies an ARC of C-III currently and in the future.

A-I

Aircraft	TDG
• Beech Baron 55	1A
• **Beech Bonanza**	**1A**
• Cessna 150, 172	1A
• Eclipse 500	1A
• Piper Archer, Seneca	1A

B-I

Aircraft	TDG
• **Beech Baron 58**	**1A**
• Beech King Air 90	1A
• Cessna 421	1A
• Cessna Citation CJ1 (525)	1A
• Cessna Citation 1(500)	2
• Piper Cheyenne III	2

B-II *12,500 lbs. or less*

Aircraft	TDG
• Cessna Caravan 208 (A-II)	1A
• Pilates PC-12 (A-II)	1A
• Cessna 441 Conquest	1A
• **Beech Super King Air 200**	**2**
• Cessna Citation CJ2 (525A)	2

B-II *over 12,500 lbs.*

Aircraft	TDG
• Falcon 10, 20, 50	1B
• Hawker 800, 800XP, 850XP, 4000	1B
• **Cessna Citation CJ4 (525C)**	**1B**
• Beech Super King Air 350	2
• Beech 1900	2
• Falcon 900, 2000	2
• Cessna Citation CJ3(525B), Bravo (550), V (560)	2

A/B-III

Aircraft	TDG
• Bombardier Dash 7 (A-III)	3
• Bombardier Dash 8	3
• **Bombardier Global 5000,** 6000, 7000, 8000	**2**
• Falcon 6X, 7X, 8X	2
• ATR 72	2

Note: Aircraft pictured is identified in bold type.

C/D-I

Aircraft	TDG
• **Lear** 25, 31, 45, 55, **60**	**1B**
• Israeli Westwind	1B
• Learjet 35, 36 (D-I)	1B
• Piaggio Avanti II	2

C/D-II

Aircraft	TDG
• Cessna Citation VII, X+	1B
• Lear 70, 75	1B
• Gulfstream II	1B
• CRJ-200	1B
• Gulfstream III	2
• ERJ-135, 140, 145	2
• CRJ-700	2
• **Gulfstream IV**, 350, 450 (D-II)	2

C/D-III *less than 150,000 lbs.*

Aircraft	TDG
• Gulfstream V	2
• CRJ-900, 1000	2
• Boeing 737-700, BBJ	3
• ERJ-170, 175, 190, 195	3
• **Gulfstream** G500, 550, 600, **650 (D-III)**	**2**
• MD-81, 82, 87 (D-III)	4

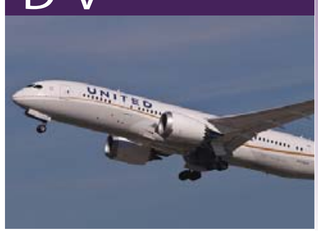
C/D-III *over 150,000 lbs.*

Aircraft	TDG
• Airbus A319-100, 200	3
• **Boeing 737 -800**, 900, BBJ2 (D-III)	**3**
• MD-83, 88 (D-III)	4

C/D-IV

Aircraft	TDG
• Airbus A300-100, 200, 600	5
• Boeing 757-200	4
• **Boeing 767**-300, **400**	**5**
• MD-11	6

D-V



Aircraft	TDG
• Airbus A330-200, 300	5
• **Boeing 787-8**, 9	**5**
• Airbus A340-500, 600	6
• Boeing 747-100 - 400	5
• Boeing 777-300	6

CRITICAL DESIGN AIRCRAFT

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using or are expected to use an airport. The critical design aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft or a composite aircraft representing a collection of aircraft classified by the three parameters: AAC, ADG, and TDG. In the case of an airport with multiple runways, a design aircraft is selected for each runway.

The first consideration is the safe operation of aircraft likely to use an airport. Any operation of an aircraft that exceeds design criteria of an airport may result in either an unsafe operation or a lesser safety margin; however, it is not the usual practice to base the airport design on an aircraft that uses the airport infrequently.

The design aircraft is defined as the most demanding aircraft type, or grouping of aircraft with similar characteristics, that make regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. Planning for future aircraft use is of particular importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the reasonable long range potential needs of the airport.

According to FAA AC 150/5300-13A, *Airport Design*, "airport designs based only on existing aircraft can severely limit the ability to expand the airport to meet future requirements for larger, more demanding aircraft. Airport designs that are based on large aircraft never likely to be served by the airport are not economical." Selection of the current and future critical design aircraft must be realistic in nature and supported by current data and realistic projections.

AIRPORT CRITICAL AIRCRAFT

The Airport experiences frequent activity by both commuter aircraft and business jets. For many years the commuter aircraft has been the CRJ-200. Casino Express utilized the Boeing 737 until they ceased operations in 2006. Some of the largest business jets including the Gulfstream V operate at the Airport currently.

The FAA maintains the Traffic Flow Management System Count (TFMSC) database which documents certain aircraft operations at airports. Information is added to the TFMSC database when pilots file flight plans and/or when flights are detected by the National Airspace System, usually via radar. It includes documentation of commercial traffic (air carrier and air taxi), general aviation, and military aircraft. Due to factors such as incomplete flight plans, limited radar coverage, and VFR operations, TFMSC data does not account for all aircraft activity at an airport by a given aircraft type. Therefore, it is likely that there are more operations at an airport than are captured by this methodology. FAA indicates that for turboprops and jets, the capture rate is better than 95 percent because operators of these types of sophisticated aircraft generally file flight plans. TFMSC data is available for activity at the Airport and was utilized in this analysis.

Exhibit 2F presents the TFMSC annual activity for jets and turboprops from 2012 through 2021. Aircraft in AAC C accounted for 1,408 operations in 2021 and have averaged 1,372 since 2015. Aircraft in ADG II accounted for 5,528 operations in 2021 and have averaged 4,411 since 2015. Both of these categories exceed the 500 operations threshold. Aircraft classified in AAC D/E and in ADG III/IV do occasionally operate at the Airport, but total combined operations by these aircraft have not reached the FAA's critical aircraft threshold in the past ten years. Therefore, the first two elements of the critical aircraft classification are C-II.

The third element of the critical aircraft classification is the TDG. An examination of the TFMSC shows specific aircraft types which have been cross references with the FAA's aircraft characteristics database (https://www.faa.gov/airports/engineering/aircraft_char_database). Most of the aircraft operating at the Airport have a TDG of 1A or 1B which includes many of the business jets. Several common turboprop aircraft have wider wheelbases which fall in TDG 2. According to the TFMSC data, there were more than 500 combined operations by TDG 2 aircraft including the King Air 200/300/350, Beech 1900, and Cessna Citation CJ2/CJ3/CJ4/V.

The current design aircraft for the Airport, based on actual historical activity, is C-II-2. A representative family of aircraft would be the CRJ-200 (C-II) and the Beech 1900 (TDG 2).

Future Critical Aircraft

Determining the future critical aircraft can be challenging as fleet mixes change over time. EKO used to have regular passenger service from Casino Express which utilized the Boeing 737 (C-III). That service stopped in 2006, and the Boeing 737 has not represented the critical aircraft since then; however, the Airport has continued to meet the design standards associated with that aircraft. The CRJ-200 (C-II) have been in service at the airport for more than 15 years however, it is possible this aircraft will be phased out and replaced by the CRJ-700 which is also a C-II aircraft. Therefore, it is not likely that a C-III commercial aircraft will service the airport, however, numerous large business jets do operate at the airport and have ADG III wingspans including the falcon 7X, Bombardier Global 5000, 6000, 7000, and 8000. In the future activity by these business jets may exceed the 500 operations threshold. **Therefore, the future critical aircraft for the Airport is planned as C-III-2.** A representative aircraft would be the Bombardier Global Express 5000.

RUNWAY DESIGN CODE

Each runway is assigned an RDC. The RDC relates to specific FAA design standards that should be met in relation to each runway. The RDC takes into consideration the AAC, ADG, and the RVR. In most cases, the critical design aircraft will also be the RDC for the primary runway.

Current RDC

Runway 6-24 should be designed to accommodate the current and future critical design aircraft. This runway is 7,454 feet long and 150 feet wide and has GPS instrument approach providing visibility minimums as low as ¾-mile for approaches to Runway 24. Based on current operations obtained from the TFMSC, **the RDC for Runway 6-24 is C-II-4000**.

Runway 12-30 is the crosswind runway measuring 3,015 feet long and 60 feet wide. This runway has no straight-in instrument approach procedures and is designed for small aircraft (<12,500 pounds) exclusively. **The RDC for Runway 12-30 is B-I(s)-VIS.**

Future RDC

The future RDC for each runway determines what design standards the runways are to be planned. As noted, the critical aircraft is planned to be C-III-2 in the future. Due to the surrounding hills and mountains, visibility minimums are not planned to be lower than the current ¾-mile, therefore **the future RDC for Runway 6-24 is C-III-4000**. No change to the design aircraft or instrumentation is planned **for Runway 12-30, therefore the future RDC is planned to remain B-I(s)-VIS**.

APPROACH AND DEPARTURE REFERENCE CODES

The approach and departure reference codes (APRC and DPRC) describe the current operational capabilities of each runway and the adjacent parallel taxiways, where no special operating procedures are necessary. Essentially, the APRC and DPRC describe the current condition at an airport in runway classification terms when considering the parallel taxiway.

Taxiways A is 400 feet from Runway 6-24, centerline to centerline. The lowest instrument approach visibility minimum to the runway is ¾-mile. The APRC for Runway 6-24 is D-IV-4000 and D-V-4000. This essentially means that the runway could accommodate regular use by up to D-V aircraft without the need for any physical changes to the runway/taxiway system. The DPRC for Runway 6-24 is D-IV and D-V. The APRC for Runway 12-30, with 150-foot separation to parallel Taxiway B and no straight in instrument approaches, is B-I(s)-VIS, and the DPRC is B-I(s).

CRITICAL AIRCRAFT SUMMARY

Table 2V summarizes the airport and runway classification for the current and future condition. Based upon current activity levels, the Airport is best classified as ARC C-II; however, the Airport has long been planned to ARC C-III standards. These more restrictive standards are planned to be maintained to accommodate the potential transition to C-III.

ARC	Table Grouping	Type	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A-I	CA36 Bonanza (Turbine)	T	2	4	4	4	0	0	0	2	0	0
	Cessna 206/207/210	T	0	0	0	6	2	0	2	0	0	0
	Cirrus Vision Jet	J	0	0	0	0	0	0	6	4	0	8
	Eclipse 400/500	J	4	6	4	2	16	30	22	18	18	0
	Epic Dynasty	T	2	0	0	0	6	0	0	4	8	0
	Kodiak Quest	T	2	0	0	0	0	0	0	0	4	0
	Lancair Evolution/Legacy	T	0	0	0	0	4	0	0	0	0	2
	Piper Malibu/Meridian	T	52	82	98	68	30	22	28	14	14	16
	Socata TBM 7/850/900	T	18	16	22	22	26	8	18	26	18	48
	Total		80	108	128	102	84	60	76	68	62	74
A-II	CASA Aviocar	T	2	0	0	0	2	0	0	0	0	0
	Cessna Caravan	T	0	2	4	0	4	0	2	0	2	4
	Pilatus PC-12	T	1,060	1,182	1,200	1,108	1,074	706	1,872	3,052	2,714	2,938
	Total		1,062	1,184	1,204	1,108	1,080	706	1,874	3,052	2,716	2,942
B-I	Beechjet 400	J	38	20	20	10	14	10	4	22	6	16
	Cessna 425 Corsair	T	10	8	6	10	2	2	0	2	0	2
	Citation CJ1	J	82	82	68	60	64	60	94	86	68	62
	Citation I/SP	J	4	4	6	4	4	0	2	4	2	2
	Citation M2	J	0	0	0	0	0	0	8	20	14	10
	Citation Mustang	J	6	12	8	6	4	28	24	30	12	4
	Hawker 1000	J	4	0	0	0	2	0	0	0	0	0
	Honda Jet	J	0	0	0	0	0	18	24	16	20	10
	King Air 90/100	T	112	108	76	36	56	352	180	26	40	40
	L-39 Albatross	J	0	0	8	4	0	2	0	0	0	0
	Mitsubishi MU-2	J	0	0	6	10	6	16	4	4	4	10
	Phenom 100	J	4	30	16	16	12	4	8	6	2	2
	Piaggio Avanti	T	0	2	2	4	0	4	2	0	0	0
	Piper Cheyenne	T	134	56	220	376	648	258	0	2	0	6
	Premier 1	J	4	6	4	4	10	78	102	88	70	46
	Rockwell Sabre 40/60	J	0	10	2	0	4	0	0	2	2	18
	T-6 Texan	T	0	4	0	0	0	0	8	10	0	0
	Total		398	342	442	540	826	832	460	318	240	228
B-II	Aero Commander 690	T	20	2	48	42	62	50	44	20	8	0
	Beech 1900	T	682	610	496	440	484	504	496	684	702	656
	Cessna Conquest	T	18	12	6	82	2	50	4	6	4	6
	Challenger 300	J	10	4	10	14	14	14	10	18	26	28
	Citation CJ2/CJ3/CJ4	J	78	72	98	82	96	54	68	58	28	34
	Citation II/SP/Latitude	J	62	38	44	36	42	52	38	36	74	64
	Citation V/Sovereign	J	32	36	40	36	50	72	48	50	52	150
	Citation X	J	34	42	16	8	12	6	8	18	12	16
	Citation XLS	J	48	50	70	56	84	68	52	52	14	26
	Dornier 328	T	0	2	0	0	2	0	0	0	0	0
	Embraer EMB-110/120	T	1,996	2,106	1,924	30	0	0	0	0	0	0
	Falcon 20/50	J	16	36	42	38	54	44	48	48	16	26
	Falcon 2000	J	2	4	2	8	0	2	2	4	0	4
	Falcon 900	J	14	2	0	14	2	2	2	0	0	2
	Hawker 4000	J	0	0	0	0	4	0	0	0	4	0
	King Air 200/300/350	T	200	124	174	180	234	182	192	154	88	130
	King Air F90	T	18	8	4	8	18	6	2	0	2	0
	Phenom 300	J	0	2	0	4	8	0	14	8	18	4
	Shorts 330/360	T	0	0	0	0	2	0	0	0	0	0
	Swearingen Merlin	T	28	80	44	22	44	34	26	50	6	14
	Total		3,258	3,230	3,018	1,100	1,214	1,140	1,054	1,206	1,054	1,160
B-III	Bombardier Global 5000	J	0	2	0	0	0	0	2	0	0	2
	Bombardier Global 7500	J	0	0	0	0	0	0	0	0	0	2
	Bombardier Global Express	J	0	2	0	2	0	0	4	8	0	6
	Falcon 7X/8X	J	0	0	2	2	0	2	2	4	6	0
	Grumman E-2 Hawkeye	J	0	0	0	0	0	0	0	0	0	0
	Total		0	4	2	4	0	2	8	12	6	10
C-I	BAe HS 125 Series	J	0	2	2	0	0	0	0	0	0	0
	Learjet 20 Series	J	2	6	2	0	0	0	2	0	0	0
	Learjet 31	J	2	0	6	0	8	2	4	4	0	2
	Learjet 40 Series	J	64	82	120	42	14	8	18	2	6	6
	Learjet 50 Series	J	2	0	2	0	0	4	8	4	0	2
	Learjet 60 Series	J	16	16	12	14	10	6	16	4	8	6
	Total		80	60	46	1,180	1,358	1,418	1,376	1,456	1,174	1,388
C-II	Bombardier CRJ 100/200/700	J	0	0	0	1,116	1,260	1,312	1,288	1,350	1,094	1,346
	Challenger 600/604	J	6	16	18	22	22	24	10	14	10	2
	Citation III/VI	J	4	8	8	0	4	0	6	4	4	2
	Embraer 500/450 Legacy	J	0	0	0	0	2	4	2	2	2	0
	Embraer ERJ-135/140/145	J	0	0	2	0	4	2	0	0	2	4
	Gulfstream 100/150	J	14	14	4	2	0	0	0	2	0	2
	Gulfstream G-III	J	0	0	0	2	4	0	0	0	0	0
	Hawker 800 (Formerly Bae-125-800)	J	56	22	12	16	10	12	2	2	2	22
	Learjet 70 Series	J	0	0	2	22	52	64	68	82	60	10
	Total		80	60	46	1,180	1,358	1,418	1,376	1,456	1,174	1,388
C-III	Airbus A319/320/321	J	0	0	0	0	2	0	2	0	0	0
	BAe 146	J	0	0	0	0	0	2	0	2	0	0
	Boeing 737 (200 thru 700 series)	J	0	0	0	0	0	4	0	0	0	0
	Mcdonnell Douglas DC-9	J	0	0	0	0	2	0	0	0	0	0
	Total		1,062	1,184	1,204	1,108	1,080	706	1,874	3,052	2,716	2,942
C-IV	Boeing 757-200	J	0	0	0	0	0	0	2	0	0	0
	Boeing C-17	J	0	0	0	0	0	2	6	0	0	2
	C-130 Hercules	T	2	4	2	4	4	8	4	4	2	2
	Total		2	4	2	4	4	10	12	4	2	4
C-VI	C-5 Galaxy	J	0	0	0	0	0	0	0	0	0	0
	Total		0	0	0	0	0	0	0	0	0	0
D-I	F-15 Eagle	J	0	2	0	0	0	0	0	2	0	0
	Learjet 35/36	J	26	16	14	0	2	2	0	4	0	0
	Total		26	18	14	0	2	2	0	6	0	0
D-II	Gulfstream 200	J	4	8	6	2	2	0	2	4	2	2
	Gulfstream 450	J	34	10	24	12	10	14	18	8	6	36
	Total		38	18	30	14	12	14	20	12	8	38
D-III	Boeing 737 800/900	J	2	0	0	0	2	0	0	0	0	0
	Gulfstream 500/600	J	8	4	6	18	16	28	0	16	10	26
	Mcdonnell Douglas MD-83/88	J	0	0	0	0	2	0	0	0	0	0
	Total		10	4	6	18	20	28	0	16	10	26

APPROACH CATEGORY

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
A	1,142	1,292	1,332	1,210	1,164	766	1,950	3,120	2,778	3,016
B	3,656	3,576	3,462	1,644	2,040	1,974	1,522	1,536	1,300	1,398
C	168	170	192	1,240	1,398	1,454	1,438	1,476	1,190	1,408
D	74	40	50	32	34	44	20	34	18	64
Total	5,040	5,078	5,036	4,126	4,636	4,238	4,930	6,166	5,286	5,886

AIRPLANE DESIGN GROUP

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
I	590	574	728	698	944	914	584	406	316	318
II	4,438	4,492	4,298	3,402	3,664	3,278	4,324	5,726	4,952	5,528
III+	12	12	10	26	28	46	22	34	18	40
Total	5,040	5,078	5,036	4,126	4,636	4,238	4,930	6,166	5,286	5,886

ENGINE TYPE

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Jet	682	666	706	1,684	1,930	2,052	2,050	2,110	1,674	2,022
TP	4,358	4,412	4,330	2,442	2,706	2,186	2,880	4,056	3,612	3,864
Total	5,040	5,078	5,036	4,126	4,636	4,238	4,930	6,166	5,286	5,886

Source: FAA TFMSC 2011-2021, Data normalized annually

Exhibit 2F
HISTORICAL JET AND TURBOPROP OPERATIONS

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TABLE 2V I Airport and Runway Classifications

	CURRENT	FUTURE
Airport Reference Code (ARC)	C-II	C-III
Airport Critical Aircraft	C-II-2	C-III-2
Runway Design Code (RDC)		
Runway 6-24	C-II-4000	C-III-4000
Runway 12-30	B-I(s)-VIS	B-I(s)-VIS
Approach Reference Code (APRC)		
Runway 6-24	D-IV-4000/D-V-4000	D-IV-4000/D-V-4000
Runway 12-30	B-I(s)-VIS	B-I(s)-VIS
Departure Reference Code (DPRC)		
Runway 6-24	D-IV/D-V	D-IV/D-V
Runway 12-30	B-I(s)	B-I(s)

Source: Current Airport Layout Plan; FAA AC 150/5300-13A, Airport Design

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the planning period as well as the critical aircraft for the Airport. Airline passenger enplanements are forecast to grow from 15,625 in 2021 to 30,576 by 2041, an annual growth rate of 3.4 percent. Total operations are forecast to grow 2.18 percent annually. Based aircraft are forecast to grow from 77 currently to 96 by the long term for an annual growth rate of 1.11 percent.

The critical aircraft for the Airport was determined by examining the FAA TFMSC database of flight plans to and from the Airport. Based on 2021 data, the current critical aircraft is described as ARC C-II-2 which is represented by the CRJ-200 (C-II) and turboprops such as the Beech 1900 and King Air (TDG 2). The future critical aircraft is described as ARC C-III-2, to which the airport is currently designed, and which would be represented by the combination of a larger commercial aircraft and larger business jets as well as turboprops for the TDG classification.

The next step in the planning process is to assess the capabilities of the existing facilities to determine what improvements may be necessary to meet future demands. The range of forecasts developed here will be taken forward in the next chapter as planning horizon activity levels that will serve as milestones or activity benchmarks in evaluating facility requirements. Peak activity characteristics will also be determined for the various activity levels for use in determining facility needs.