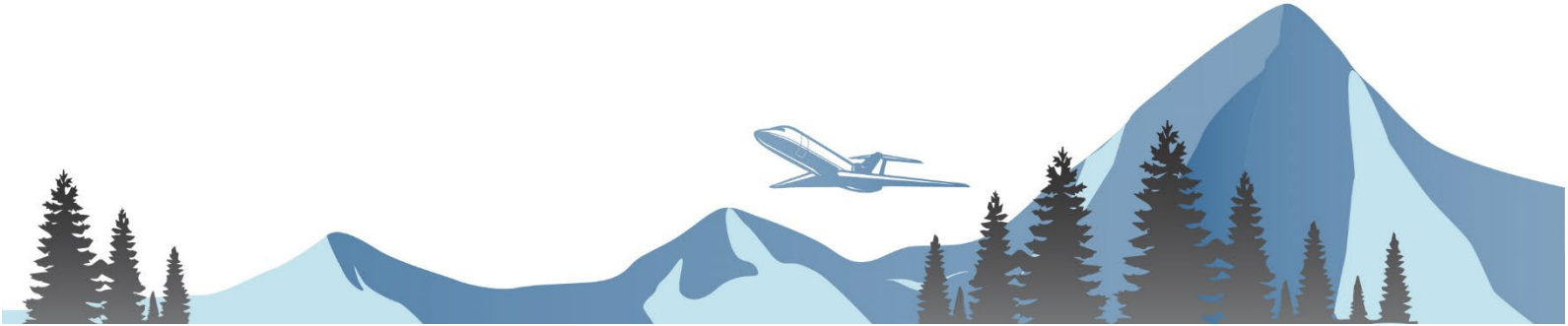
EAGLE COUNTY
Regional Airport

EAGLE COUNTY REGIONAL AIRPORT
MASTER PLAN

CHAPTER 3



3.0 FORECAST OF AVIATION ACTIVITY

3.1 Overview

Forecasts must be both reasonable and defensible since they can serve as the basis of future facility development requirements.

Projecting future aviation demand is a critical element of the Airport Master Plan process. A sound forecast will provide a reasonable and defensible projection that will guide future airport development needs and serve as the basis for many of the projects ultimately recommended by the plan. While forecasting considers the most accurate information available at the time the projections are completed, it is not an exact science. Divergences from a prepared forecast can be caused by any number of factors. However, when reasonably conducted, a forecast will provide an appropriate rationale that will guide the analysis of future airport development needs. The EGE forecasts will be used in subsequent tasks to analyze the Airport's ability to accommodate projected activity and to determine the type, size, and timing of future airside and landside development to meet those needs. In essence, this step acts as the hub for the remainder of the plan in that the decision to proceed with projects is often based on the anticipated levels of aircraft operations, type of aircraft, number of based aircraft, and number of enplaned passengers.

2022 serves as the base year of the EGE Airport Master Plan since it was the last completed calendar year prior to this effort. Forecasts are generated for the near-term (2027), mid-term (2032), and long-term (2042) time frames.

Findings and methodologies used to project aviation demand at EGE for the next 20 years (baseline year of 2022 and forecasting through 2042) are presented in this chapter. Forecasts were largely built upon recent aviation activity trends at EGE and the socioeconomic climate of the community, the region, and the country. If these variables were to change significantly in the future, these forecasts should be revised.

The EGE forecasts are presented for three key aviation activity elements: based aircraft, flight operations, and passenger enplanements. Projections for each have been prepared for the near-term (2027), mid-term (2032), and long-term (2042) timeframes. Additionally, it is beneficial for the reader while reviewing the forecasts to understand that each of these elements can be linked to different physical and operational aspects of an airport (**Figure 3-1**). For example, the enplanement forecast projects the future number of passengers utilizing the terminal and, in turn, drives facility development by indicating how much space future passengers will require.

Figure 3-1: Forecasting Elements and What They May Impact on an Airport

Source: Jviation, a Woolpert Company

3.2 Definitions

Numerous terms utilized throughout this chapter are specific to the FAA and master planning. Some of these terms are summarized in this subsection for easy reference. For additional definitions, see the aviation glossary in **Appendix A**.

The definition for **based aircraft** comes from the FAA's National Based Aircraft Inventory Program.[1] An aircraft is considered to be based at a specific airport if there is an agreement with that airport for storage, if it spends a majority of the year at the airport, if it is operational (capable of performing takeoff and landings), and if it has a current airworthiness certificate. See **Section 3.8** for more information about EGE's based aircraft forecast.

An aircraft **operation** is a takeoff or a landing by an aircraft. Operations can be further split into two categories useful for gauging how much transient traffic an airport serves: **local operations and itinerant operations**. **Local operations** are those aircraft (often based) that operate within an airport's local airspace, including those within the local traffic pattern or within sight of the airport. **Itinerant operations** reflect all aircraft operations other than local operations, but generally reflect those aircraft that leave an airport's local airspace (20 miles or further from that airport). See **Section 3.9** for more information about EGE's operational forecast.

One primary goal of this forecast is to identify the design code for the runway and the overall **Airport Reference Code (ARC)** for the airport. This is done by determining the Critical Aircraft. The **Critical Aircraft**[2] is 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, including both itinerant and local operations but excluding touch-and-go operations. The key component from determining the Critical Aircraft is then applying the relevant design standards to the airport. **See Section 3.9.7** for more information about EGE's Critical Aircraft.

Air Carrier aircraft have seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds, carrying passengers or cargo for compensation.

Air Taxi aircraft have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less, carrying passengers or cargo for compensation.

General Aviation (GA) operations are takeoffs and landings of all civil aircraft (does not include military), except those classified as air carriers or air taxis.

Enplanements are the number of revenue (paid) passengers boarding an aircraft. Passengers landing at EGE and disembarking from an aircraft are called deplanements and are not included in enplanements. See **Section 3.10** for more information about EGE's passenger enplanement forecast.

[1] FAA. National Based Aircraft Inventory Program. https://basedaircraft.com
[2] FAA. Advisory Circular 150/5000-17, Critical Aircraft and Regular Use Determination.

3.3 Impacts of the COVID-19 Pandemic on Aviation

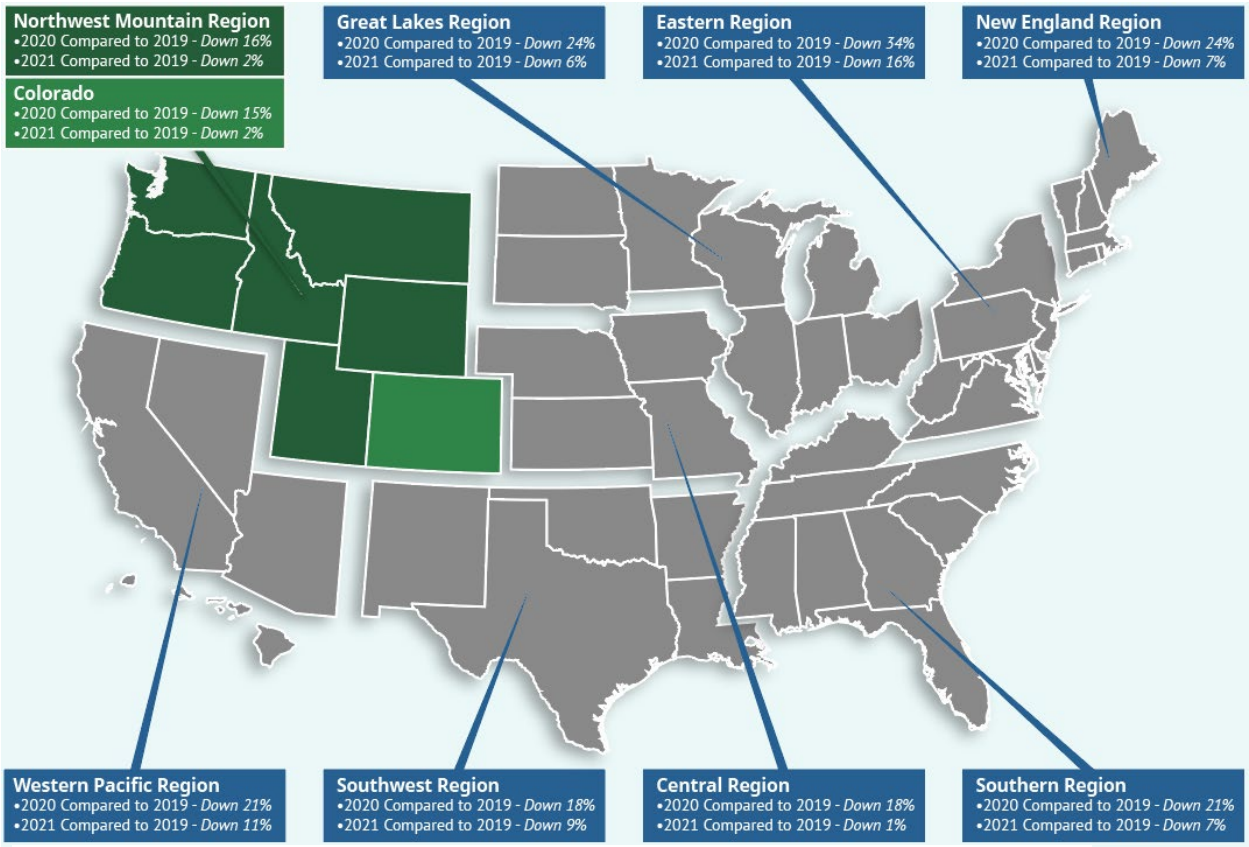
The pandemic had dramatic impacts on the aviation industry and on EGE, many of which are still being experienced today.

Since 2020, the COVID-19 pandemic has dramatically impacted the aviation industry and world economy. During the height of the pandemic, non-essential travel was significantly curtailed, resulting in airlines deeply cutting capacity, grounding fleets, and initiating massive layoffs. Aircraft production largely came to a halt and operational levels were decidedly reduced.

While general aviation activity and aircraft orders slowed drastically, they recovered relatively quickly as these aircraft afforded users the ability to travel while avoiding the inconveniences and delays often associated with commercial service operations. Additionally, after a near lockdown of three months, flight training operations rapidly rebounded and even increased as house-bound individuals pursued flight ratings for personal and professional purposes.

Nevertheless, a comparison of aircraft operational trends since 2019 indicates the aviation industry is still recovering from the negative impacts of the pandemic. **Figure 3-2** presents those operational trends (a take-off or a landing) within each defined FAA region from all towered airports, including EGE, over the last three years. (Note that this does not include non-towered airports as they have incomplete and/or no operational activity data available.)

Figure 3-2: Operations by FAA Region (2019-2021)

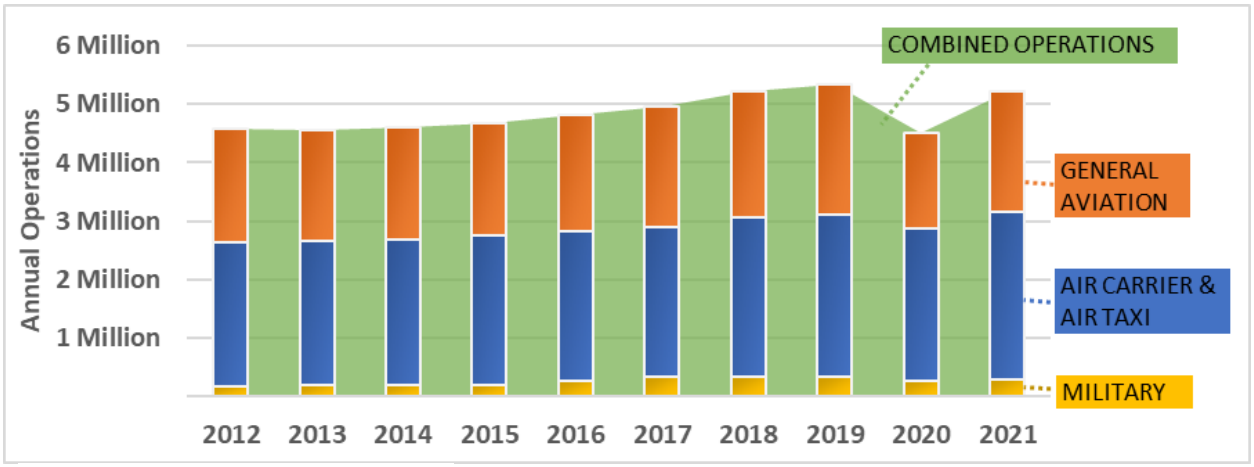


Source: FAA, Jviation, a Woolpert Company

While every region saw a sharp drop in operations from 2019 to 2020 due to the pandemic, the Northwest Mountain Region experienced the smallest percentage decrease with 2020 operations equaling 84% of the 2019 total operations, while other regions across the country ranged from 66% to 82%. Comparing 2021 to 2019 operations, all regions displayed substantial recoveries with the Northwest Mountain Region returning to 98% of its pre-pandemic aircraft operational levels.

A deeper examination of the Northwest Mountain Region operations sheds light on how the various types of flight activity (air carrier/air taxi, general aviation, and military) were impacted differently by the pandemic and have since recovered (**Figure 3-3**). Aircraft operations in this region over the past decade were examined within three categories: general aviation, air carrier/air taxi, and military. Prior to the pandemic, the region's operations had steadily increased year after year with general aviation accounting for the majority of regional operations, followed by air carrier and air taxi. This chart showcases the historic growth and health of the aviation industry in the region as well as the impact of the pandemic and the subsequent recovery.

Figure 3-3: Operations in Northwest Mountain Region (2012-2021)

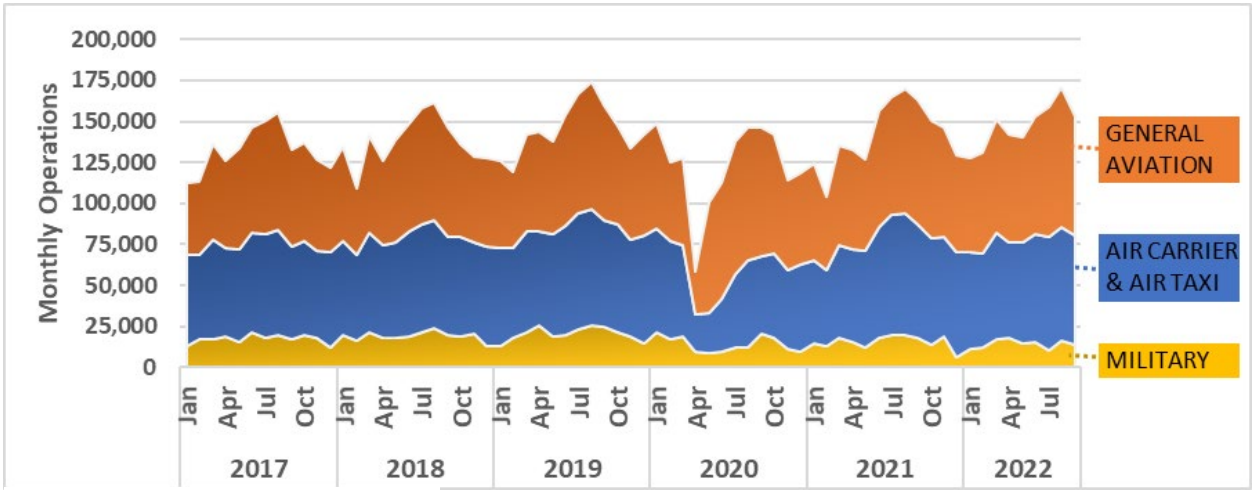


Source: FAA

Specifically focusing on Colorado (**Figure 3-4**), data show that aircraft operations in 2021 were equal to 98% of operations in 2019. Broken down by category, 2021 general aviation operations surpassed previous years in Colorado, equaling 104% of 2019 levels, while air carrier/air taxi and military operations were 98% and 77% of 2019 levels, respectively.

At the time of forecast preparation, the most current operational data available was January through September of 2022. A comparison of similar timeframes in 2019 revealed that Colorado aircraft operations have reached 99% of 2019 operations. Furthermore, general aviation operations equaled 106% of those in 2019, while air carrier/air taxi operations and military operations were 95% and 75% of those levels, respectively. While the recovery of military operations in the Northwest Region still lags that of 2019, general aviation and air carrier/air taxi operations are largely at pre-pandemic levels. Note that the latter two operational types are the primary focus of the master planning effort and this forecast.

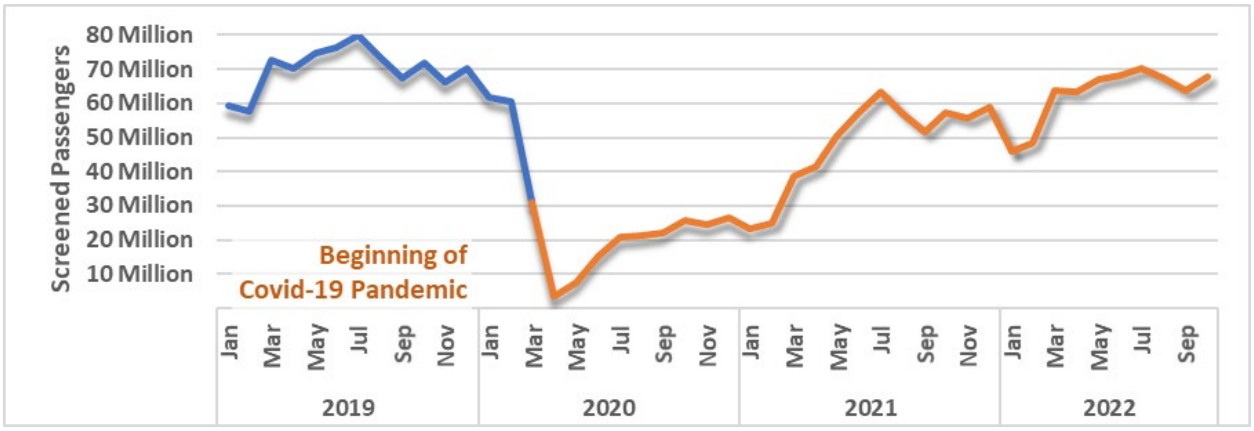
Figure 3-4: Monthly Operations in Colorado (Jan 2017 – Sep 2022)



Source: FAA

With respect to commercial airline passenger enplanements, the Airports Council International-North America (ACI-NA)[3] estimated passenger activity declined 57% in the first half of 2020 compared to previous forecast levels. Commercial airline service recovery and citizens' willingness to fly can be measured through the number of passengers screened by Transportation Security Administration (TSA) Graphed below in **Figure 3-5** are the number of passengers screened by TSA throughout the country on a monthly basis from January 2019 through October 2022.

Figure 3-5: TSA Passengers Screened Nationally (Jan 2017 – Oct 2022)



Source: TSA

In January 2021, TSA screened 60% fewer passengers as compared to the same month in 2019, and by July 2021, TSA screened only 20% fewer passengers. Over the last three months of available data (August 2022 through October 2022) month-to-month screenings equaled 93% of 2019 counts. FAA notes that by the third quarter of 2021, airline industry profitability had returned to near breakeven point and that

[3] Airports Council International-North America (ACI-NA). (2020). Economic Impact of Coronavirus on U.S. Commercial Airports.

passenger levels were projected to return to 2019 levels by 2023.[4] This data supports that air carrier enplanement levels nationally have largely recovered with some pockets of lower levels of service remaining as well as other ongoing complications related to pilot shortages and other labor issues.

At EGE, while passenger levels in 2020 fell to 75% of the 2019 level, they had recovered by 2021 to surpass that of 2019. In fact, the 2021 enplanements were the highest experienced at EGE since 2008. Note the EGE enplanement counts are a comparable metric to TSA passengers screened nationally and demonstrate EGE's commercial service has recovered and has actually grown since the pandemic.

Based on the various statistics referenced above, it is evident that national aviation activities have likewise largely recovered from the COVID-19 pandemic, although some limited categories still trail the high marks set in 2019. The Northwest Mountain Region weathered the storm better than most of the country. Taken together, these data provide high confidence in continued airport usage for all activity types, as well as a return to the consistent growth previously experienced through 2019.

3.4 General Aviation Industry

General aviation aircraft include all aircraft not flown by commercial airlines or by the military. This includes an incredibly diverse array of flying that can range from a personal trip in a small single engine aircraft to an emergency medical evacuation. General aviation encapsulates all those individual, unscheduled aviation activities that enrich, enhance, preserve, and protect the lives of citizens. A report published by the FAA[5] divided general aviation activities into six use categories:

Personal – Personal flights account for about a third of all private flying in the United States (e.g., personal or family travel, personal enjoyment, or personal business).

Instructional – Flight instruction and training, ranging from private pilot to airline pilot.

Corporate – Corporate flights, using aircraft owned by a business and piloted by a professional pilot, account for about 12% of the total private flying. Businesses will often elect to fly, typically using turbine/jet aircraft, to save time and expand their geographic markets. This category includes both national and international destinations.

Self-Piloted Business – An estimated 11% of private flying is done by individuals flying themselves to business meetings or other events. These flights are typically completed in piston or turboprop aircraft.

Air Charter – Charting flights provide businesses and private individuals with flexibility and travel options beyond scheduled air service. When scheduled air service is unavailable to specific destinations or times, air charter provides

[4] FAA. (2022). Aerospace Forecast Fiscal Years 2022-2042.
[5] FAA. (2012). General Aviation Airports: A National Asset.

fast and convenient travel. Chartered aircraft make use of general aviation facilities across the nation.

Other – All other general aviation activities are classified as being "other." Given its diverse nature, this includes aircraft performing a broad range of functions related to, but not limited to, medical-related evacuation and transportation, disaster relief, search and rescue, police operations, news reporting, border patrol, forest fire fighting, aerial photography and surveying, crop dusting, and tourism activities.

Of those various categories, business and corporate aviation are the fastest growing facets of general aviation, contributing $150 billion to U.S. economic output annually and employing more than 1.2 million people. Corporate general aviation is not the exclusive concern of Fortune 500 companies. In fact, only 3% of business aircraft registered in the U.S. are flown by such companies; the remaining 97% are operated by a broad cross-section of organizations including governments, universities, charitable organizations, and businesses of all sizes[2]. Furthermore, 45% of companies that use business aviation have fewer than 500 employees.

Use of general aviation aircraft by business and corporate operators ranges from small, single-engine aircraft rentals to multiple aircraft corporate fleets supported by dedicated flight crews and mechanics. Business aircraft usage by smaller companies has also escalated dramatically as various chartering, leasing, fractional ownership, interchange agreements, partnerships, and management contracts have emerged. Since their inception in 1986, fractional ownership programs offered business aircraft users increased flexibility in the ownership and operation of aircraft, as well as providing a financially viable alternative to flying commercially. Numerous fractional ownership companies operate at EGE.

The FAA Aerospace Forecast 2022-2042[6] provides a summary of the overall condition of the general aviation market:

> *"The general aviation (GA) sector was less affected by the COVID-19 crisis than the airlines. Private aviation continues to attract those who can afford while the pandemic continues. At the lower end of the industry, newcomers to private flying included student, private and commercial pilots, joining the existing GA pilot population. The long-term outlook for general aviation thus is promising, as growth at the higher-end off-sets continuing retirements at the traditional low end, mostly piston-powered part of the sector."*

The FAA expects the active fleet of all general aviation aircraft (including declining piston-engine aircraft, and growing population of turbine, rotor, experimental and light aircraft) to increase 0.1% on average over the next 20 years. The highest growth rates are anticipated to be with turbine aircraft (turboprop and jet), which grew 2.0% annually over the past decade (2010 - 2021). That trend is expected to continue as the active general aviation turbine aircraft fleet is forecast to increase from 26,480 in 2022 to 38,455 by 2042, an average annual growth rate (AAGR) of 1.9%.

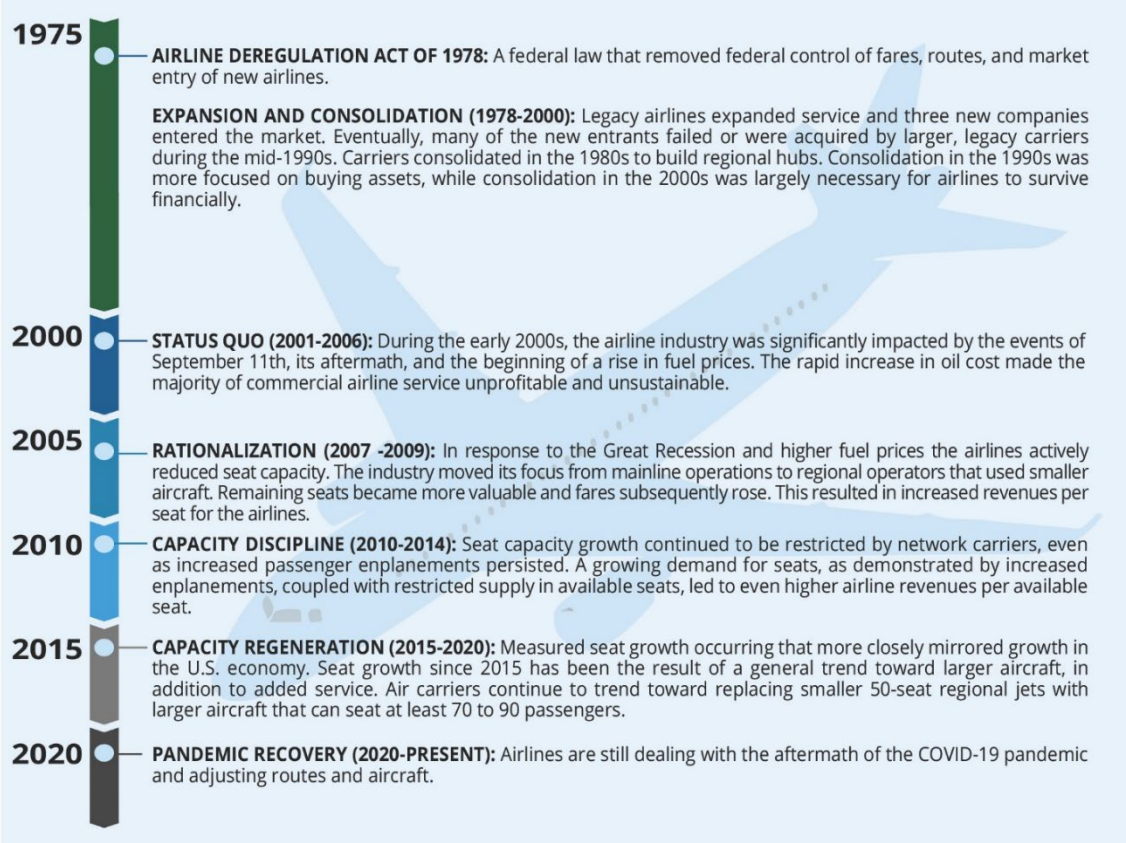
[6] FAA. (2022). Aerospace Forecast Fiscal Years 2022-2042.

In comparison, single- and multi-engine piston aircraft experienced a decline in the number of aircraft in recent years. Although still by far the largest portion of aircraft in the fleet, this group declined an annual average of -1.1% from 2010 to 2021. During that same period, multi-engine piston aircraft experienced a steeper decline, falling from 15,900 aircraft to 11,055, a AAGR of -2.6%. Piston aircraft are expected to have an AAGR of -0.8% over the next two decades.

The FAA tracks and projects an important metric known as Active General Aviation and Air Taxi Hours Flown, which captures several activity-related data including aircraft utilization, frequency of use, and duration of use. From 2010 to 2021 hours flown in general aviation piston aircraft declined (AAGR -0.7%) and that decline is expected to continue over the 20-year planning period (AAGR -0.7%). Conversely, turboprop and jet aircraft hours flown are expected to continue to grow at a relatively high rate of AAGR 2.6% from 2022 to 2042. Total hours flown by general aviation aircraft are estimated to grow at a rate of AAGR 1.0% starting in 2022 and reach 29.5 million by 2042, compared to an estimated 23.4 million in 2021. Over the next two decades, the growth of general aviation hours flown (AAGR 1.0%) is projected to be ten times that of the growth in the number of aircraft, the difference representing an anticipated increase in aircraft utilization. In essence, existing and newly added general aviation aircraft will be flown more in the future.

3.5 Commercial Aviation Industry

A brief timeline of the commercial service industry in the United States is presented below.



There are a number of ongoing trends and market shifts changing the airline industry in the United States and that could reasonably be expected to impact commercial service airports such as EGE.

Pilot Shortage

In 2013, the FAA increased the qualification requirements for first officers (also known as co-pilots) who fly for U.S. passenger and cargo airlines. Per the FAA, for first officers to hold an Airline Transport Pilot certificate requires 1,500 hours total time as a pilot. Previously, first officers were required to have a commercial pilot certificate, which requires a minimum of 250 hours of flight time.

Prior to the pandemic, a U.S. Government Accountability Office (GAO) report indicated airlines in the U.S. will need to hire 1,900 to 4,500 new pilots annually to meet demand. In the past two years, analyses by CAE and Oliver Wyman indicate the pilot shortage has been exacerbated by the pandemic. In fact, a report published by CAE stated that there will be a global need for 27,000 pilots in the short-term. The impact is felt at the regional airline level, due to a decline in qualified entry-level pilots. Entry-level pilots are needed to fill positions vacated by pilots hired by mainline carriers. A lack of qualified pilots is a challenge for airlines to retain their service and attract new service.

Fleet Evolution

There is a national trend among commercial airlines and the smaller aircraft they use. Airlines are migrating from older, smaller (50-seat) aircraft to new, more efficient, and larger (70-90 seat) aircraft. This trend is especially impactful on smaller, non-hub airports since small regional jets have historically been used to serve such markets. This trend is critical for those non-hub airports in that they would now have to generate sufficient demand to support the new, larger aircraft to maintain airline service, profitability, and ultimately preserve airline service for their community. Simply stated, not all smaller airports and markets are capable of demonstrating sufficient demand and may be vulnerable to a potential loss of service. Thus, the trend toward using larger aircraft may threaten to reduce or eliminate existing and/or new air service at non-hub airports. Eventually the aging Boeing 757 and 767 fleet will also require replacement, which will impact airlines that currently fly into airports like EGE. Airlines and analysts point to the Airbus 321Neo as the most likely adopted replacement, however there are other aircraft that may also fit the bill such as Boeing's newer MAX aircraft.

Airport Infrastructure and Connectivity Constraints

Airport infrastructure, particularly access to large- and medium-hub airports, is critical for non-hub airports to thrive (such as the connectivity from EGE to DEN). Passengers leaving non-hub airports generally fly to a larger airport to connect to another flight to reach their final destination. Airline gates at those larger or busier airports are a finite asset and many such airports simply lack available gates to absorb more flights during key times. Consequently, this can result in constraining airlines wishing to expand services from those larger airports to smaller, non-hub airports.

The Rise of Hub Alternatives for Leisure Markets

Air service from most mainline carriers has evolved into a "hub-and-spoke" model, where flights from smaller airports are routed through larger connecting hub airports where passengers make connections to another flight to their eventual destination. This differs from the point-to-point model often used by low-cost carriers to provide flights to leisure-oriented destinations. While hub operations are used to improve airline operating efficiencies, point-to-point operations tend to improve opportunities for destination markets, such as EGE.

The U.S. Economy, Global Trade Tensions, and Wall Street

The airline industry is susceptible to economic disruptions occurring on the national and world stage. Sluggish macroeconomic indicators (such as GDP, unemployment rate, etc.), pandemics, international trade disputes, and little appetite from Wall Street investors for growth in airline service have put additional performance pressures on the airline industry.

The FAA develops forecasts of future levels of commercial passenger activity based on a combination of past commercial airline trends and national/world economic outlooks. Based on these factors, the FAA forecasts overall domestic commercial passenger (mainline and regional carriers) activity to increase 3.6% annually on average from 2022 through 2042.

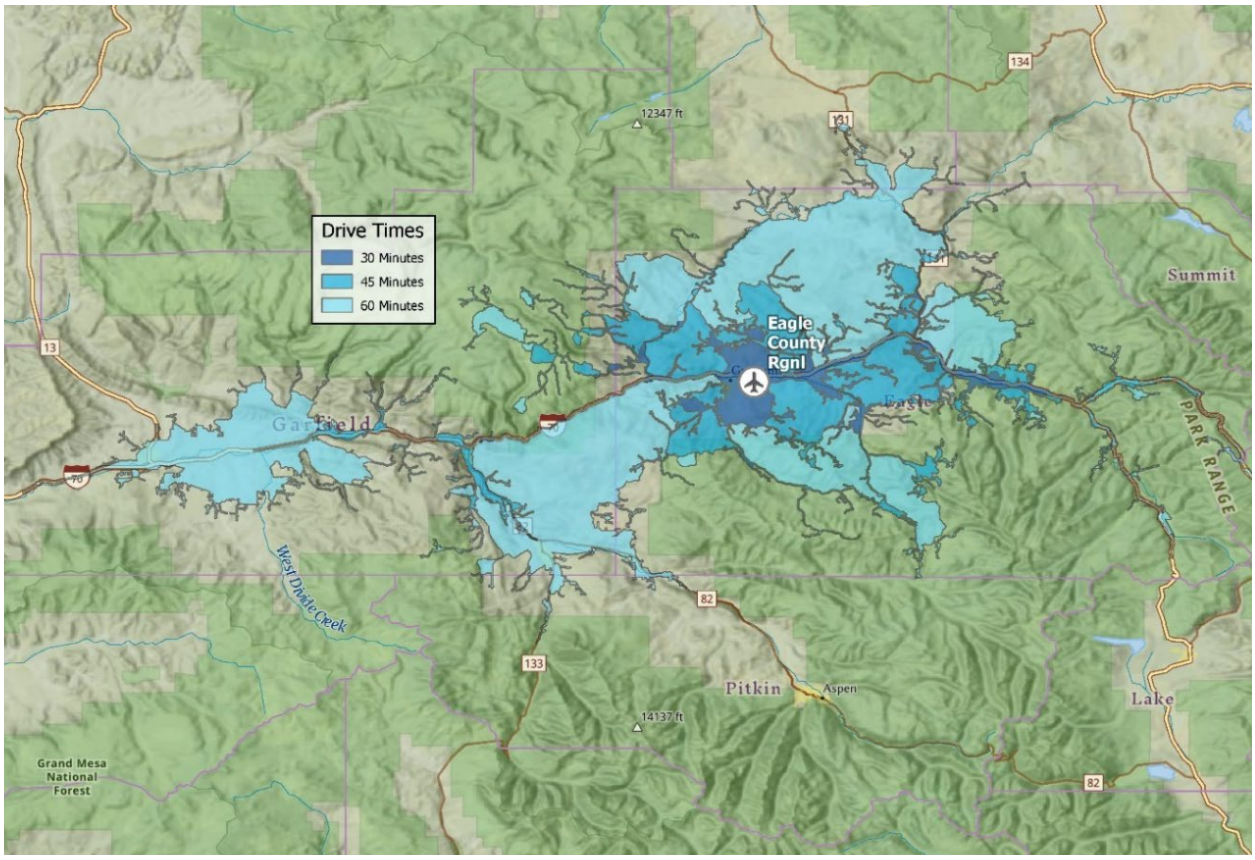
However, this growth is likely to not be uniformly distributed across all airports and markets. In fact, the combination of economic pressures and fleet mix changes are anticipated to have trickle-down impacts on the smaller commercial service markets. These could result in many small and nonhub airports having to provide air service incentives as a cost of entry to initiate new air service or even preserve existing service.

3.6 EGE Market Area

An area's demographic and economic factors influence demand for aviation activities. An airport's market area represents the geographic region from which a significant portion of aviation and commercial passenger demand originates. Based on two recent leakage studies (2019 and 2022), the areas where local ticket purchasing passengers reside are Eagle County (48%), Garfield County (25%), and Summit County (27%).

The leakage study data is corroborated by drive times associated with EGE. The map below depicts the 30-, 45-, and 60-minute drive time areas from EGE. The 30- and 45-minute areas are contained primarily in Eagle County, while the 60-minute area extends east and west along I-70, reaching into Garfield County. Thus, it can reasonably be assumed that most of the aviation-related demand for EGE originates within Eagle County, as well as Garfield and Summit Counties to lesser degrees.

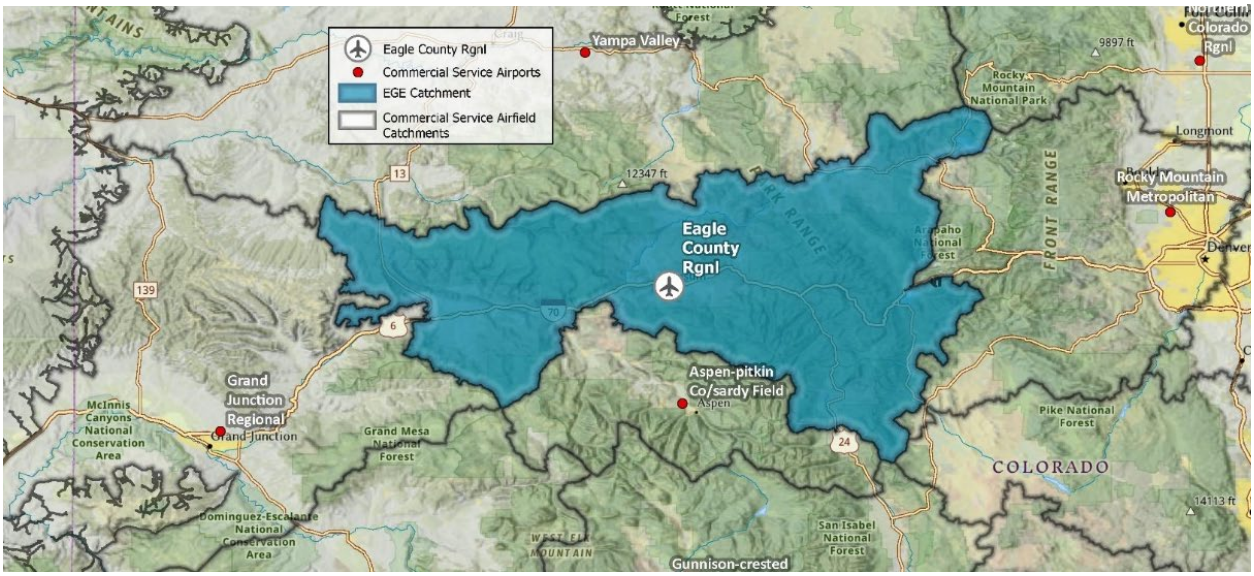
Figure 3-6: EGE Drive Time Map



Source: Jviation, a Woolpert Company

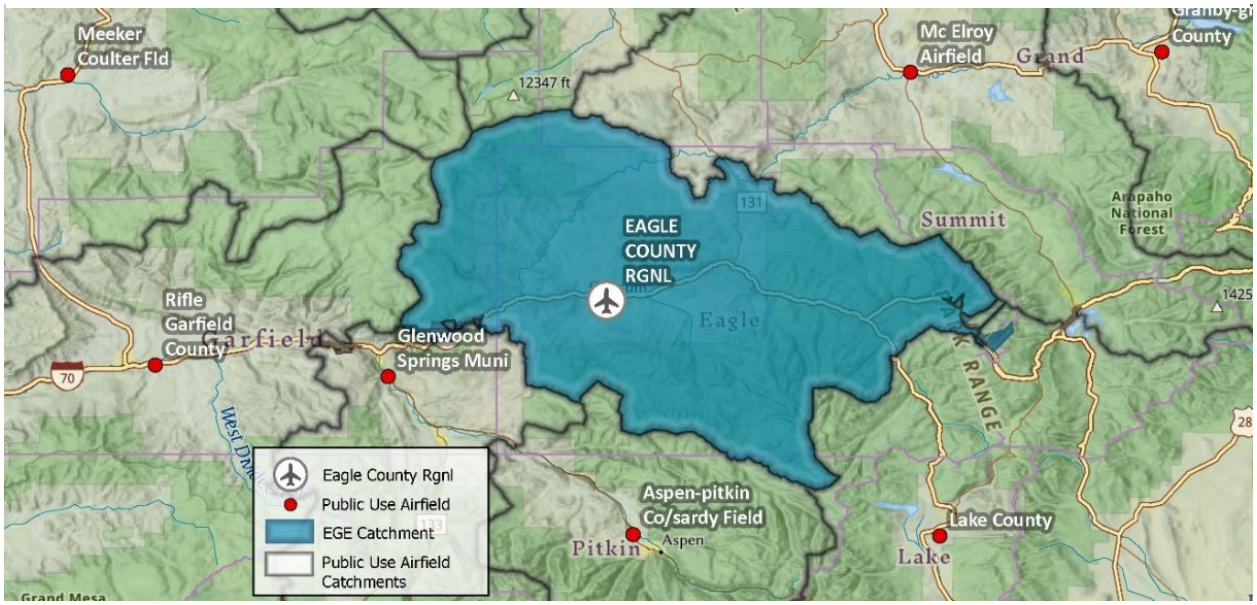
The maps below illustrate EGE's drive time, or catchment area, in relation to other facilities in the region. For people in the shaded blue area, EGE is the closest airport. **Table 3-7** depicts the catchment area for commercial service airports only. Passengers in an airport's catchment area have easier access to, and therefore are more likely to utilize, that facility. The estimated population within EGE's commercial catchment area in 2022 was 135,298.

Figure 3-7: EGE Commercial Air Service Catchment Area



Source: Jviation, a Woolpert Company

Figure 3-8: EGE Paved Runway Catchment Area



Source: Jviation, a Woolpert Company

Figure 3-8 shows the catchment areas for public use airports with at least one paved runway. Like that of the commercial service catchment area, those located within a paved runway catchment area that require the use of a paved runway to operate their aircraft are most apt to use that airport. Estimated population in 2022 for the EGE public use airport catchment area is 47,142. People who live near boundary edges of these areas have two airports that they can drive to in similar amounts of time, and for general aviation users this may impact where they choose to hangar aircraft. Users may consider ticket and fuel pricing, flight schedule, hangar availability, and other factors beyond distance into their decision to use one airport over another.

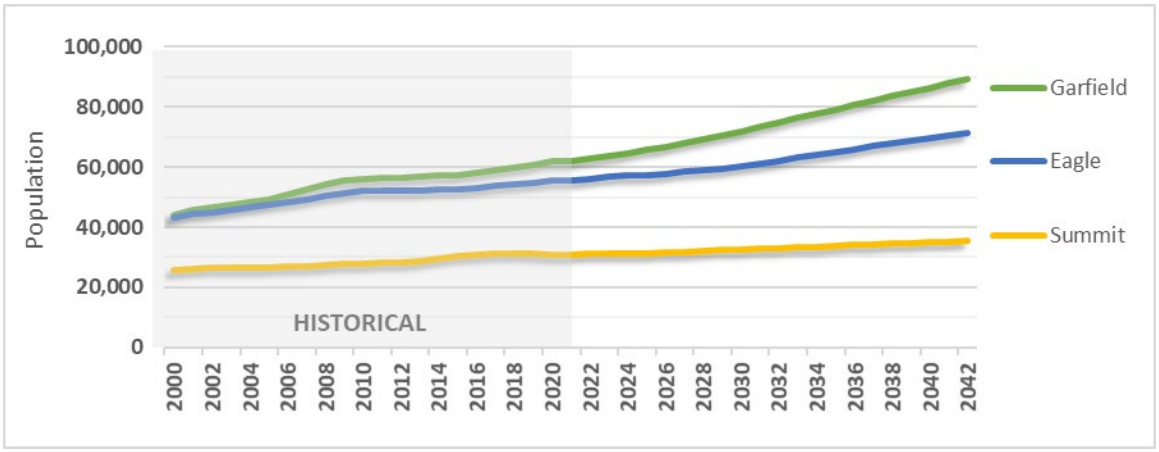
Local demographic and socioeconomic conditions are often strongly correlated to the aviation use within the region. Business and personal spending on aviation is typically discretionary in nature. Data was obtained from Colorado State Demography Office and Woods and Poole Economics, a company specializing in long-term economic and demographic projections. Three socioeconomic indicators traditionally have the potential to influence aviation activity in a region:

- **Population** – the greater the population, the greater the potential for aircraft owners, operations, and passengers
- **Employment** – the higher the employment level, the more potential aircraft owners and commercial flyers
- **Total Personal Income** (income by persons from all sources) – the higher the total personal income, the more potential discretionary income that may be used for aviation-related activities

The following charts illustrate these three metrics for Eagle, Garfield, and Summit Counties. Garfield is the most populous of the three counties, with approximately 63,000 residents in 2022 and projected to increase to 89,000 by 2042. While Garfield has the largest population, Eagle has the highest total number of jobs—although Garfield's total employment is projected to nearly match Eagle by 2042. Summit lags both Eagle and Garfield in both population and total jobs. Eagle has the highest per capita income which is projected to rapidly increase over the next 20 years. Summit has a higher per capita income than Garfield, although both are likewise projected to grow quickly for the next 20 years.

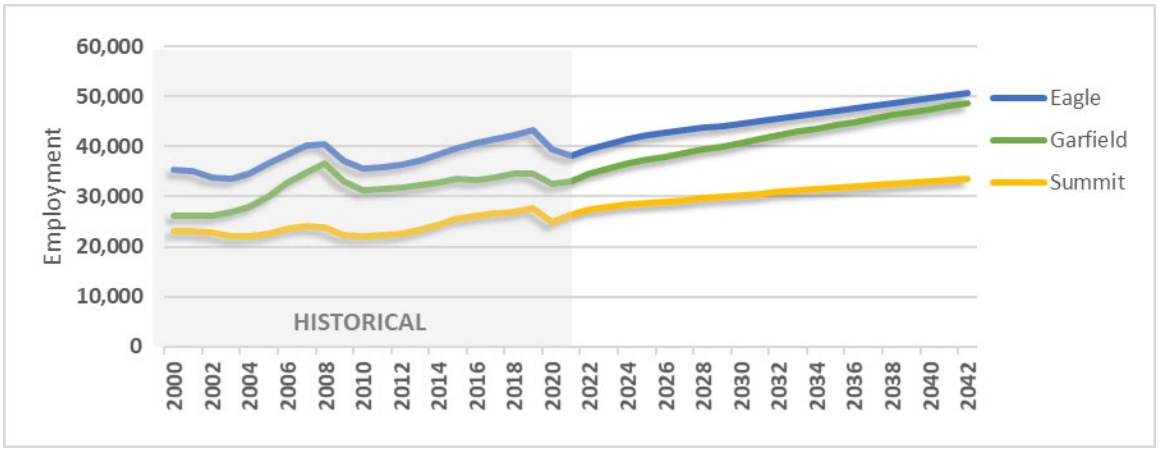
EGE's market area lies in, or abuts, an area of special note for past growth and projected future income. Woods and Poole ranked the top counties in the country based on residential average annual growth from 1970 through 2010; essentially, these are the nation's fastest growing county populations. There are slightly more than 3,000 total counties in the country. In these rankings, Summit County was ranked #10 (AAGR 5.94%) and Eagle was #30 (AAGR 4.90%). Two of the counties within EGE's market were in the 30 fastest growing counties in country over a 30-year span. In conjunction with the rapid population growth, the job markets also increased. In rankings from 1970 through 2010 of employment, Summit was #2 in the nation (AAGR 8.27%), Eagle was #22 (AAGR 6.23%), and Garfield was #80 (AAGR 4.61%). Looking forward, Woods and Poole projects that nearby Pitkin County and Eagle County will have among the highest per capita incomes in all of the United States by 2050, ranking #4 and #46, respectively.

Figure 3-9: County Population



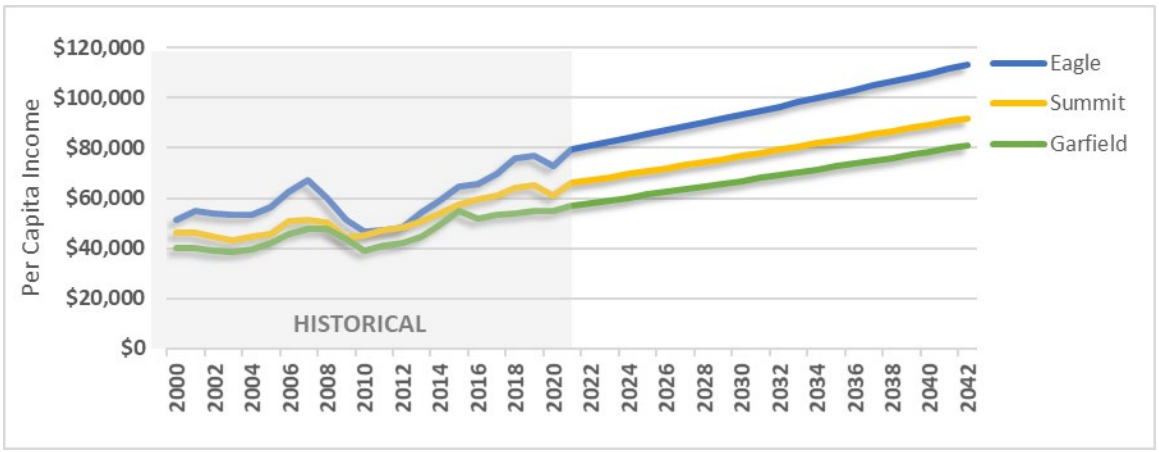
Source: Colorado State Demography

Figure 3-10: County Employment



Source: Colorado State Demography

Figure 3-11: County Per Capita Income

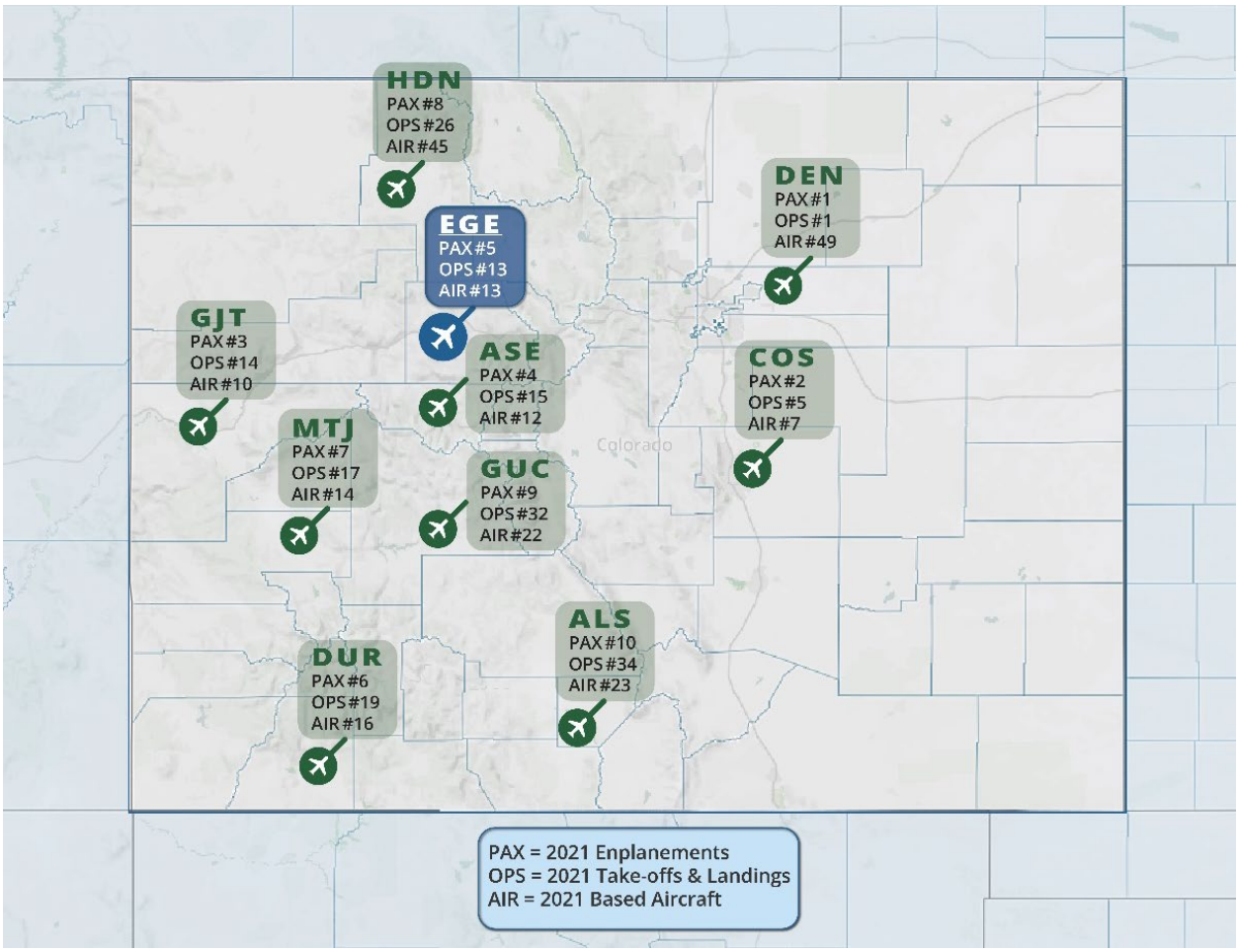


Source: Woods and Poole

3.7 EGE in the State System

Viewing EGE from a statewide perspective highlights the enormous role the Airport plays in the Colorado aviation system. As an aviation asset to Colorado, EGE provides immense value and utility. In 2021, of all the publicly owned airports within the state, EGE ranks 5th in total passenger enplanements, 13th in annual aircraft operations, and 13th in total based aircraft. Rankings of the top ten passenger airports in the state are mapped below. Interestingly, three of the four airports that serve more passengers than EGE have more than one runway: DEN has six runways, COS has three, and GJT has two. Only ASE has a single runway like EGE.

Figure 3-12: State Commercial Service Airport Rankings (2021)



Source: FAA, CDOT, Jviation, a Woolpert

3.8 Based Aircraft

3.8.1 Historical Based Aircraft

As defined previously, a **based aircraft** is one that has an agreement with a specific airport for storage, that spends a majority of the year (i.e., 51% of its time) at that airport, that is operational (capable of performing takeoff and landings), and that has a current airworthiness certificate. Analyzing an airport's based aircraft fleet is important in determining future activity levels, which subsequently help direct planning for expanded or improved aviation support facilities. Aircraft hangars, aprons, and aircraft tie-downs are all facilities that are directly tied to the number of based aircraft on an airfield.

There is limited historical based aircraft information available for EGE; the data that is available is presented below in **Table 3-1**. Specifically, the current 2022 aircraft counts originate from the Airport's 5010 data, while data for the remaining years were pulled from the previous EGE Airport Master Plan. The FAA uses Form 5010 to document airport inspection results including based aircraft.

Table 3-1: EGE Historical Based Aircraft

	Based Aircraft					
Year	Single-Engine	Multi-Engine	Jet	Rotorcraft	Other	***Total***
2000	28	4	10	-	9	51
2005	59	9	19	-	12	99
2010	46	13	20	-	14	93
2022	**48**	**2**	**22**	**13**	**-**	***85***

Source: FAA, Jviation, a Woolpert Company

The single-engine and multi-engine categories include both piston and turboprop aircraft. The Airport has hangar and tie-down space for over 100 aircraft at a given time and is currently constructing additional hangar space to accommodate greater numbers of based aircraft. However, a significant portion of this space is reserved for and occupied by aircraft owners who are classified as transient since they may be present on the airfield for less than half of the year. Those operators' variability in time spent at EGE can lend to the fluctuation in based aircraft counts.

3.8.2 Based Aircraft Forecast

The limited amount of detail and history of EGE's based aircraft data precluded many typical forecasting methodologies, including trend and regression analyses. Ultimately, two based aircraft forecast scenarios were developed for EGE that established a reasonable range and better accounted for forecasting variables. The lower end of that range is classified as the "pessimistic" scenario, while the higher end is the "optimistic" scenario. This phraseology is consistent with national FAA forecast documents.

The *pessimistic based aircraft scenario* began with the 85 aircraft listed on the Airport's current 5010 and then utilized growth rates from the *FAA Aerospace Forecast FY 2022-2042*. The most applicable growth rates from that forecast were applied individually to each based aircraft category and then extrapolated through the end of the planning period (2042). This effort resulted in the total number of based aircraft at EGE being forecasted to increase to 105 over the next two decades (AAGR 1.1%).

The *optimistic based aircraft scenario* is based on the 2022 Terminal Area Forecast (TAF), which is FAA's official forecast of aviation activity for EGE that is updated annually for budgeting and planning purposes. This FAA-derived forecast assumes EGE currently has 96 based aircraft and projects that total to increase to 162 by the year 2042 (AAGR 2.7%).

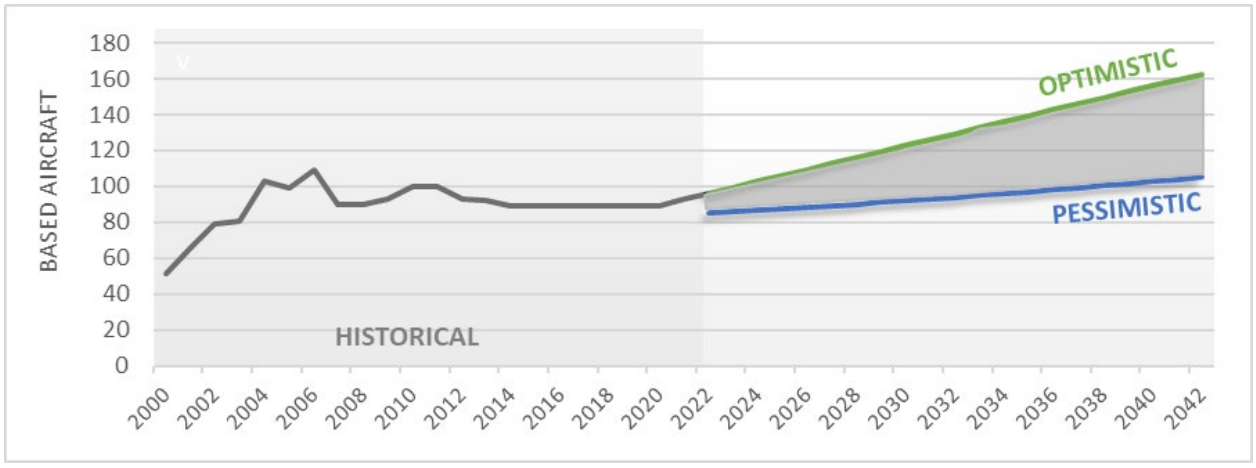
As shown in **Figure 3-13,** these two scenarios diverge significantly in the outlying years of the planning period. When viewed in combination, that growing separation between the two forecasts frames what should be considered a reasonable range within which the actual based aircraft growth is most likely to be realized. Thus, while one of the two forecasts has been identified as being preferred to serve as the basis for planning, it is nevertheless reasonable to assume that the actual growth will ultimately lie somewhere within that range.

EGE represents a based aircraft market that is largely unique in the industry. Aircraft are typically based at airports due to their proximity to their owner's primary residence or place of business. However, a market like EGE's can be atypical in that it has a large destination resort and second home population. This means that while a given aircraft may technically be based elsewhere, it could actually be located at EGE up to 49% of the year while still being classified as transient.

A substantial number of hangars at EGE, on the north and southside of the airfield, are used for these types of transient aircraft. While each aircraft may not be based at EGE per the FAA definition, the consistent transient demand, evidenced by the large volume of existing hangar storage dedicated to them, indicates there is a need to plan and design around these aircraft as if they were based at EGE. Consequently, the *optimistic based aircraft scenario* has been identified as the preferred based aircraft forecast for planning purposes.

*The **Optimistic Scenario** was identified as the preferred forecast for EGE based aircraft.*

Figure 3-13: EGE Based Aircraft Forecast



Source: Jviation, a Woolpert Company

The fleet mix for the based aircraft forecast is detailed in **Table 3-2**. Over the planning period, the majority of based aircraft at EGE are projected to remain single engine. Notably, and consistent with national trends, the number of jets based on the Airport are forecast to increase by 68%, increasing from 25 in 2022 to 42 by 2042.

Table 3-2: EGE Based Aircraft Forecast Breakdown

	Optimistic Based Aircraft Scenario				
Year	Single-Engine	Multi-Engine	Jet	Rotorcraft	***Total***
2022 Baseline	54	2	25	15	96
2027 (+5 years)	64	3	29	17	113
2032 (+10 years)	73	3	33	20	129
2037 (+15 years)	82	3	38	22	146
2042 (+20 years)	91	4	42	25	162
				2022 – 2042 AAGR	2.7%

Source: Jviation, a Woolpert Company

3.9 Operations

3.9.1 Historical Operations

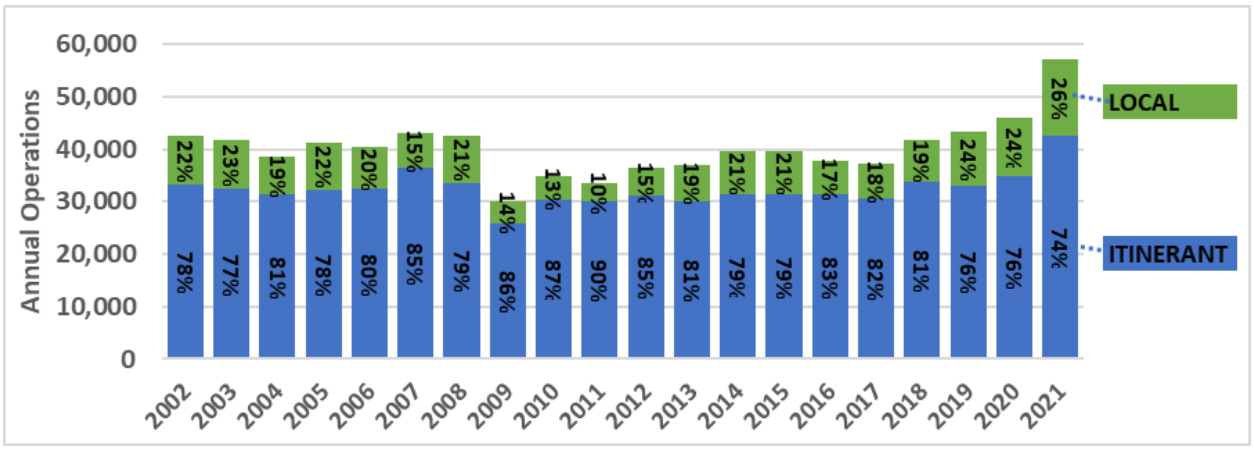
Annual aircraft operations represent the number of takeoffs and landings occurring at an airport during a calendar year. Historical operation counts for EGE, retrieved from FAA OpsNet, are graphed in **Figure 3-14** and tabularly listed in **Table 3-3**. These operations are computed from reports provided by air traffic control tower (ATCT) controllers located on-site.

The recession in 2009 caused a notable dip in flight activity. Since that time, flight activity has incrementally increased with 2021 posting the highest operations total in the past two decades. Outside of the recession dip, annual operations typically ranged between 36,000 and 43,000. Yet during the pandemic in 2020, operational activity increased to 46,000 and then skyrocketed to 57,000 in 2021. Operations in 2021 were 32% higher than in 2019, an increase of nearly 14,000 annual operations (equivalent to an additional 38 operations per day).

The operation counts are split between itinerant and local flights, and then further subdivided among air carrier, air taxi, general aviation, and military.

- **Local operations** are those performed by aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and the operations to or from the airport and a designated practice area within a 20−mile radius of the tower.
- **Itinerant operations** are performed by an aircraft that lands at an airport, arriving from outside the airport area, or departs an airport and leaves the airport area.

Figure 3-14: EGE Historical Annual Operations



Source: FAA

The percentage of local traffic has ticked up since 2018. For forecasting purposes, a five-year average (2017-2021) of 78% itinerant and 22% local was utilized. This average incorporates pre-pandemic data, the immediate impact from the pandemic, as well as the steep rebound and subsequent normalization.

OpsNet data from June 2021 through April 2022 (an 11-month span) were compared to data collected locally through an ADS-B receiver. On the whole, receiver-collected operations equaled 70% of the total OpsNet operations. This signifies that a notable amount of traffic at EGE operates without an active ADS-B out unit. (Note that ADS-B out is not mandated at EGE as the Airport falls under Class D airspace.) Based on activity beyond the ATCT hours captured by the ADS-B unit, it is estimated that less than 3% of aircraft operations occur when the tower is not staffed and therefore not captured in the FAA data.

Table 3-3: EGE Historical Annual Operations (OpsNet)

	Itinerant					Local			
Year	Air Carrier	Air Taxi	General Aviation	Military	*Total Itinerant*	Civil	Military	*Total Local*	*Total Operations*
2002	4,551	6,631	19,134	2,918	*33,234*	6,190	3,145	*9,335*	*42,569*
2003	4,481	6,760	18,252	2,868	*32,361*	6,588	2,903	*9,491*	*41,852*
2004	4,781	6,495	17,550	2,500	*31,326*	4,714	2,552	*7,266*	*38,592*
2005	4,989	6,367	17,855	3,006	*32,217*	6,090	2,925	*9,015*	*41,232*
2006	5,316	6,828	18,067	2,125	*32,336*	5,574	2,407	*7,981*	*40,317*
2007	4,149	8,942	19,328	3,998	*36,417*	3,501	3,089	*6,590*	*43,007*
2008	3,386	8,962	17,023	4,228	*33,599*	6,624	2,192	*8,816*	*42,415*
2009	2,736	6,381	12,467	4,362	*25,946*	3,462	699	*4,161*	*30,107*
2010	4,458	6,731	15,005	4,140	*30,334*	3,173	1,309	*4,482*	*34,816*
2011	4,295	6,714	15,080	3,980	*30,069*	2,531	922	*3,453*	*33,522*
2012	4,092	7,057	15,196	4,699	*31,044*	4,924	418	*5,342*	*36,386*
2013	3,466	7,845	15,134	3,581	*30,026*	6,485	523	*7,008*	*37,034*
2014	3,530	8,396	16,193	3,217	*31,336*	7,421	942	*8,363*	*39,699*
2015	3,609	8,709	16,591	2,400	*31,309*	7,122	1,095	*8,217*	*39,526*
2016	3,649	8,848	15,811	2,971	*31,279*	5,830	552	*6,382*	*37,661*
2017	3,637	8,546	15,762	2,660	*30,605*	5,246	1,351	*6,597*	*37,202*
2018	4,382	8,172	17,965	3,268	*33,787*	6,410	1,580	*7,990*	*41,777*
2019	4,138	8,565	17,403	2,934	*33,040*	7,846	2,359	*10,205*	*43,245*
2020	3,647	10,370	18,821	1,989	*34,827*	9,464	1,545	*11,009*	*45,836*
2021	5,253	12,683	21,962	2,586	*42,484*	13,009	1,650	*14,659*	*57,143*
2022†	5,137	12,650	21,868	2,557	*42,180*	11,630	2,136	*13,764*	*55,974*
5 Year Average % (2017 - 2021)	9%	21%	41%	6%	*78%*	19%	4%	*22%*	

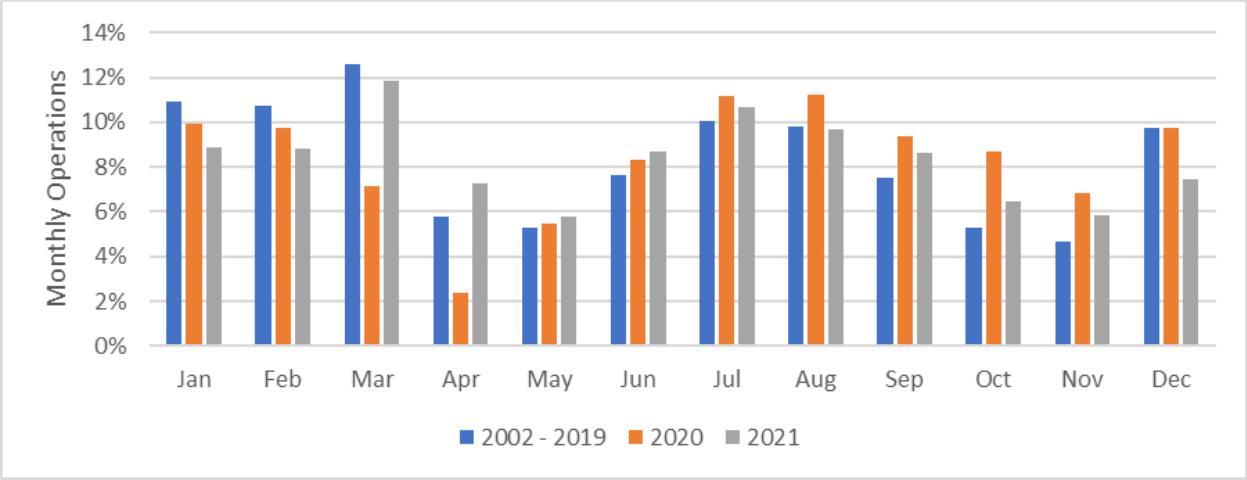
Source: FAA, Jviation, a Woolpert Company

† Operations for November and December 2022 were extrapolated to create a full calendar year baseline operation count.

From 2015 through 2019, EGE averaged 3,883 air carrier and 8,568 air taxi operations a year. Those numbers changed drastically in the following two years with air carrier operations dropping to 3,647 in 2020 as airlines dealt with the pandemic. However, air carrier operations recovered in 2021 and actually grew to the second highest mark in this century at 5,253. Air taxi activity, which includes NetJets and other similar air charter companies, jumped significantly in 2020 to 10,370 annual operations and jumped again in 2021 to 12,683 operations. To date, 2022 is trending to be slightly below the 2021 counts but still greater than 2020.

Monthly aircraft operations from 2002 to 2021 are presented in **Figure 3-15**. Historically about 44% of all flight operations occur from the start of December through the end of March (this four-month span contains 33% of the days in a year). This trend changed in 2020 and 2021, when those winter months accounted for 37% of operations, a seven-percentage point drop even though these two years also experienced an increase in total operations. While much of this difference can likely be classified as a pandemic-generated anomaly, there was a marked percentage increase in operations during April, October, and November in 2021. These months are often the slowest at EGE since they generally constitute the inactive months or shoulder seasons to the peak winter and summer seasons. While this cannot yet be identified, it may be an indicator of operational growth potential at EGE that is currently largely unrealized.

Figure 3-15: EGE Monthly Operations



Source: FAA

3.9.2 Flight Origin and Destination

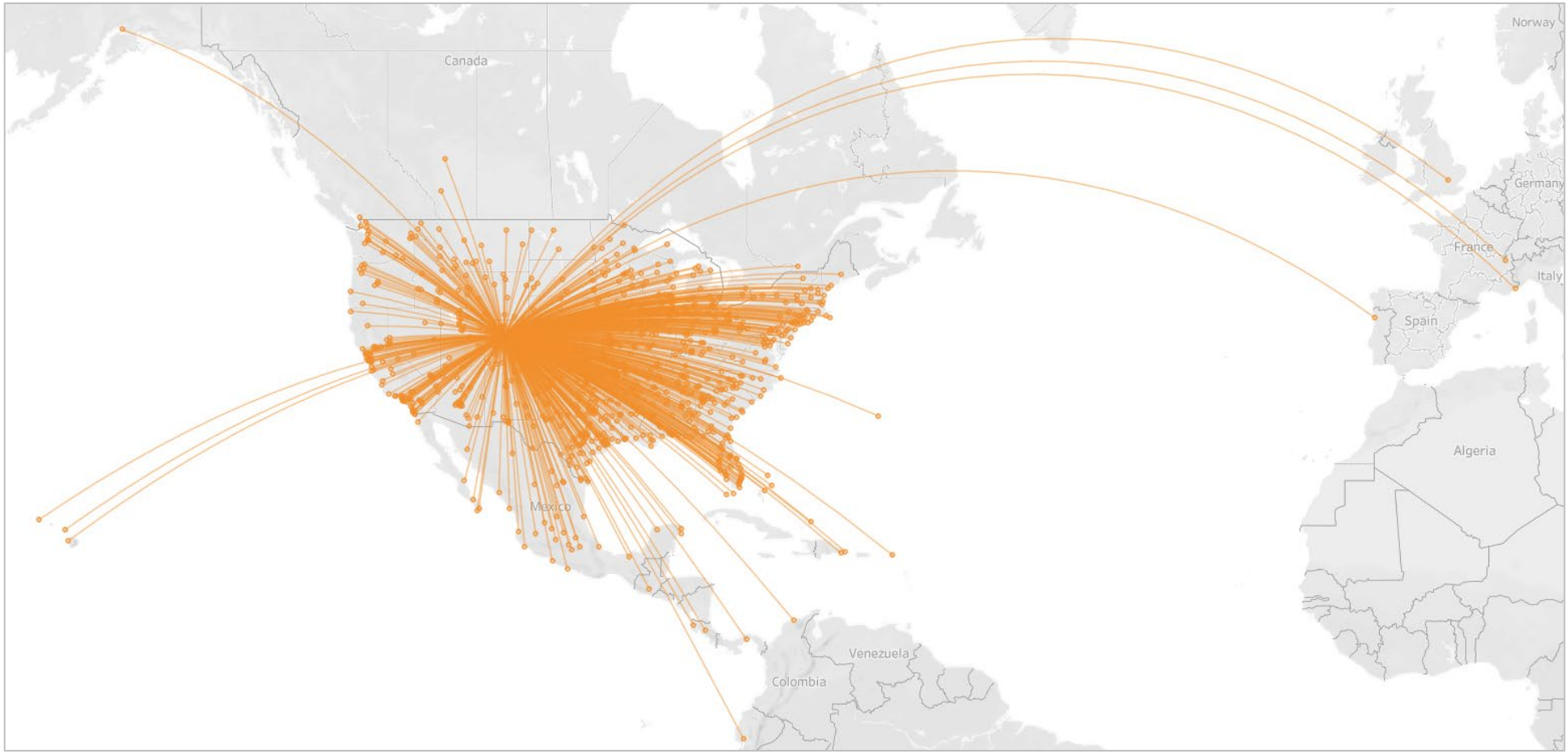
Data from the FAA Traffic Flow Management System Counts (TFMSC) provides insight into the number and type of aircraft that are filing instrument flight plans or detected in the NAS for a given airport. This database includes destination and arrival information for flights (not to be confused with passenger information). Those airports identified as being an operational connection to EGE in 2021 (either as an origin and/or a destination) are mapped in **Figure 3-16** and **Figure 3-17**. These maps reflect all noncommercial airline flights such as air taxi (including fractional ownership companies), general aviation, military, and others.

These data show the regional, national, and even ocean-spanning international reach of EGE. Over this single year span, 10,225 flights departing from EGE were recorded in this database. These flights originated from airports in all 50 states (and Washington DC), Mexico, Central America, Canada, South American, Europe and the Caribbean. The most popular listed states for flights leaving EGE were Texas (1,875), Colorado (1,659), California (899), Florida (503), Arizona (445), Missouri (334), Oklahoma (278), Kansas (266), Utah (245), and Illinois (202).

There were 10,248 recorded flights arriving to EGE. Similarly, these records included every state, Washington DC, Mexico, Caribbean islands, South and Central America, Europe, Canada, and even Korea and Australia. The most popular listed states for flights inbound to EGE were Texas (2,003), Colorado (1,537), California (891), Arizona (453), Florida (448), Kansas (371), Missouri (353), Oklahoma (300), Illinois (214), and Utah (212).

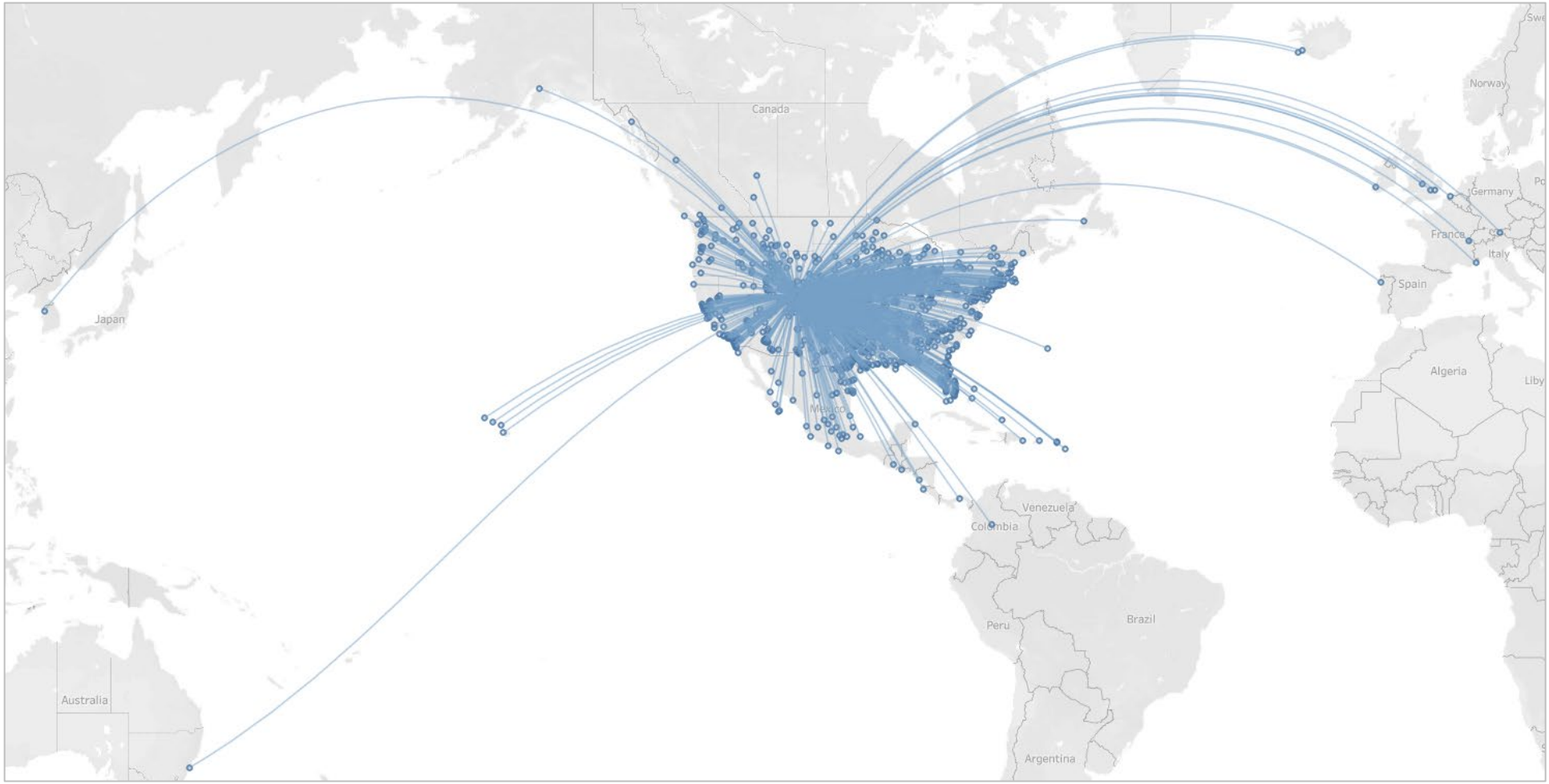
Aircraft types in this dataset encapsulated a wide variety of aircraft including small piston-engines (e.g., Cessna 182, Cirrus SR 22, Beech Bonanza, Mooney M20, etc.), single- and twin-engine turbo props (e.g., Pilatus PC-12, TBM 700, numerous Beech King Air variants, Swearingen Merlin, Aero Commander, Texan, Dash 8, etc.), and a multitude of jets (e.g., nearly every type of Cessna Citation from I through X, Dassault Falcon 10/20/50/900/2000, Gulfstream III/IV/V, Global Express 5000/7500, Learjet 31/45/55/60, Cirrus VisionJet, etc.).

Figure 3-16: EGE Originating Flights 2021



Source: FAA, Jviation, a Woolpert Company

Figure 3-17: EGE Destination Flights 2021

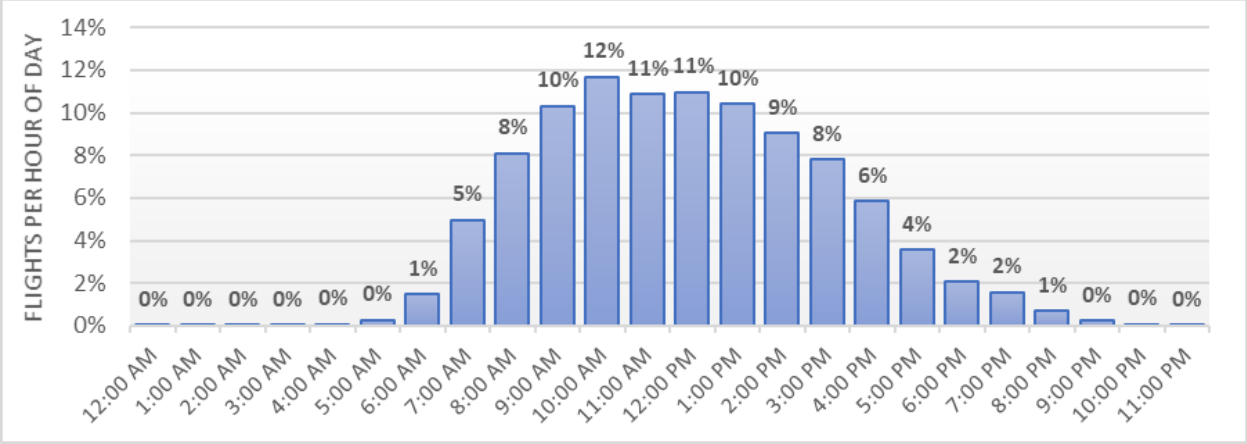


Source: FAA, Jviation, a Woolpert Company

3.9.3 Daily Operational Patterns

Understanding when aircraft generally operate at an airport can be useful for setting staffing levels, such as at an FBO, security, etc. ADS-B data collected as part of this forecasting effort was analyzed to identify any operational patterns or trends. Specifically, all flight operations recorded within the ADS-B dataset (from May 2021 through April 2022) were divided into the one-hour increments of an average day (see **Figure 3-18)**. Based on this, it was noted that 93% of all Airport operations occurred between 7:00 AM and 5:59 PM. Further refined, 62% of all operations occurred between the hours of 9:00 AM and 1:59 PM. Unsurprisingly, less than 2% of recorded operations occurred from midnight to 6:59 AM.

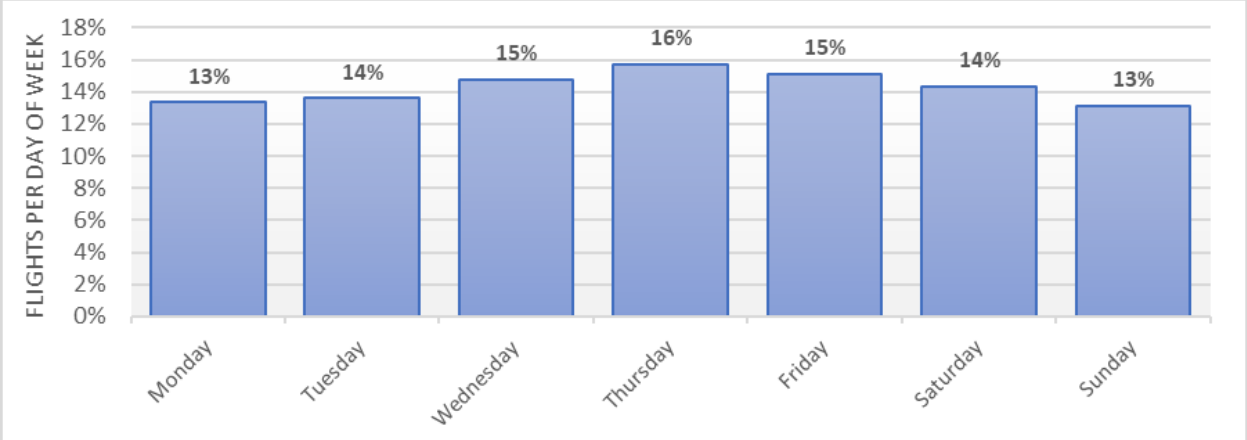
Figure 3-18: EGE Operations by Time of Day



Source: Jviation, a Woolpert Company

Using a different dataset (OpsNet Daily 2021), EGE operations were also divided by the day of the week that they occurred (see **Figure 3-19**). Overall, operations were fairly evenly dispersed throughout the week in 2021 with Thursday (16%) being the most popular day of the week for flying. Weekend operations dipped slightly from the peak range of Wednesday through Friday, with Sunday being the least active day (13%).

Figure 3-19: EGE Operations by Day of Week



Source: FAA

3.9.4 Operations Forecast

Numerous methodologies were explored in creating the EGE forecast of operations including linear trends, simple and multi-variate regressions using demographic and socioeconomic indicators, operations per based aircraft (OPBA), and exponential smoothing. Forecasting based on OPBA was discarded due to a negative correlation between historic operations and based aircraft counts. This is presumedly due to the seasonal peaking characteristics experienced at the Airport as well as the unique based versus transient aircraft dynamic discussed previously. Regressions were likewise found to be unfit for forecasting due to weak correlations with demographic and socioeconomic metrics.

Ultimately, two scenarios were prepared for the aircraft operations forecast, which have been presented in **Figure 3-20**. Similar to the based aircraft forecast, these two forecasts essentially frame a reasonable range to account for unknown variables. Again, the lower end of that range has been classified as the "pessimistic" scenario, while the high end of that range has been classified as the "optimistic" scenario.

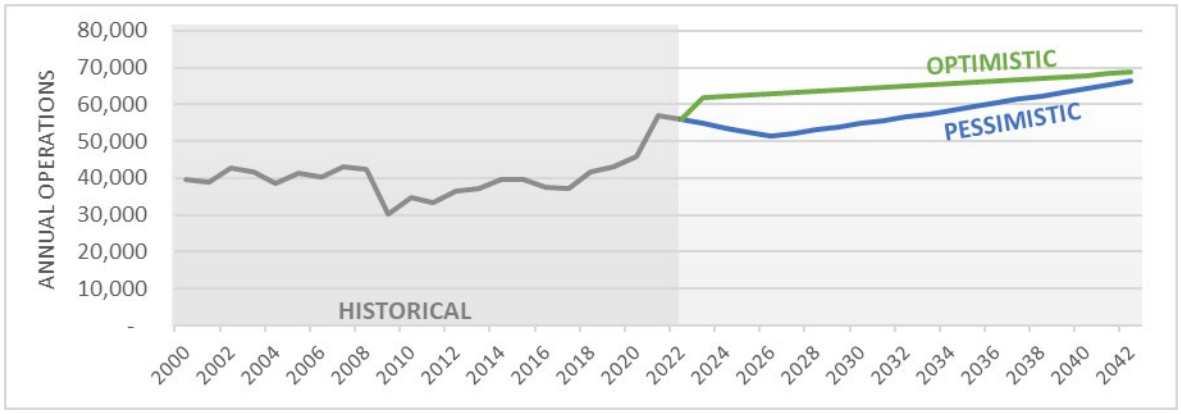
Note that at the time of forecast modeling, the data for baseline year 2022 was only available for January through October (totaling 47,746 operations). The remainder of the year (i.e., November and December) was extrapolated based on the average percentage of operations over the previous five years. This resulted in a baseline operation count total of 55,974.

The *pessimistic operations scenario* assumes flight activity will remain high but continue to slowly decrease over the next five years from the 2021 peak. This conservative scenario assumes that the 2020 and 2021 peaks were largely an anomaly and that EGE operations will trend back to levels experienced prior to the pandemic; however, that regression will ultimately be overtaken by longer-term operational growth. Specifically, by 2027, operational growth is projected to resume an upward trajectory based on the trend (R^2 = 0.72) from the 10-years before the pandemic. This scenario somewhat downplays the immense increase in operations experienced by EGE during the pandemic and presumes that historical growth rates will eventually return. Operations in this scenario are forecast to increase to 66,517 by 2042 (AAGR 0.9%).

The *optimistic operations scenario* was developed by applying the exponential triple smoothing algorithm to historic monthly operation counts (2000 through 2022). This technique smooths data and accounts for the high-level of seasonality at EGE. A time series method of forecasting such as this weights the historical data, placing greater emphasis on more recent data. Thus, this scenario incorporates pre-pandemic activity as well as accounting for changes during the pandemic and subsequent recovery. This scenario acknowledges that operational changes from the pandemic are, to a degree, likely to continue at EGE. Operations in this scenario are forecast to increase to 68,648 by 2042 (AAGR 1.0%). For long-term planning purposes, the *optimistic operations scenario* has been identified as the preferred aircraft operations forecast to ensure the Airport has an appropriate strategy to accommodate the potential higher ranges of future growth.

*The **Optimistic Scenario** was identified as the preferred forecast for EGE aircraft operations.*

Figure 3-20: EGE Operations Forecast



Source: Jviation, a Woolpert Company

3.9.5 Operations Fleet Mix

Breaking down future aircraft operations by category (air carrier, air taxi, general aviation, and military) further defines forecasted operations. By applying historical share percentages, estimated operations by category were established and are shown in **Table 3-4**. The five-year (2017-2021) averages for operational categories were calculated and applied to the optimistic scenario forecast. Overall, general aviation is projected to account for the largest share of operations at EGE over the next two decades. It is also presumed nearly all, if not all, local civil operations are performed by general aviation aircraft.

Air carrier operations are anticipated to increase to levels not previously experienced at EGE. Historically air carrier operations have accounted for 8.0% to 13.2% of all operations at the Airport. Since 2000, air carrier operations peaked at 5,316 in 2006 and 5,253 in 2021, with a low of 2,736 in 2009.

Table 3-4: EGE Operations Forecast Breakdown

	Itinerant					Local			
Year	Air Carrier (9.4%)	Air Taxi (21.5%)	General Aviation (40.8%)	Military (6.0%)	***Total Itinerant (77.6%)***	Civil (18.6%)	Military (3.8%)	***Total Local (22.4%)***	***Total Operations***
2022 Baseline	5,234	12,014	22,845	3,340	43,432	10,433	2,109	12,542	55,974
2027 (+5 years)	5,906	13,557	25,780	3,769	49,012	11,773	2,380	14,153	63,165
2032 (+10 years)	6,077	13,950	26,526	3,878	50,430	12,114	2,449	14,563	64,993
2037 (+15 years)	6,248	14,342	27,272	3,987	51,848	12,454	2,518	14,972	66,821
2042 (+20 years)	6,419	14,734	28,018	4,096	53,267	12,795	2,586	15,382	68,648

Source: Jviation, a Woolpert Company

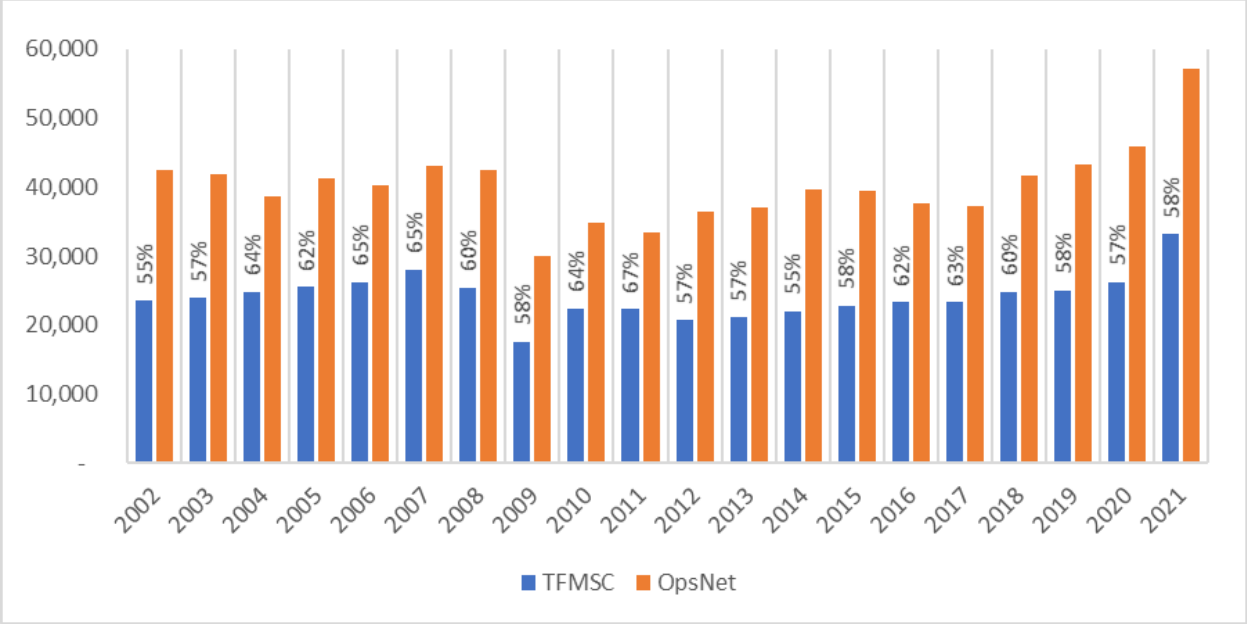
3.9.6 Instrument Operations

The FAA TFMSC provides data for flights with flight plans and/or tracked within the National Airspace System (NAS); thus, most Visual Flight Rules (VFR) traffic is excluded.

The TFMSC operations are often used to broadly estimate Instrument Flight Rules (IFR) operations at an airport. Annual operation counts for an airport from the TFMSC database are not comprehensive, especially at airports with a large amount of general aviation activity such as EGE. Nevertheless, it still provides value since the data includes details about each operation that is often not available through other data sources (e.g., type and category for each aircraft flight). This data also provides useful information about more demanding operations such as complex aircraft that file flight plans.

Presented in **Figure 3-21** is a comparison between the annual operations captured in the TFMSC to those in OpsNet. TFMSC captured from 55% to 67% of the total annual operations at the Airport with a recent five-year average accounting for 59%. This data suggests that a majority of flights at EGE file flight plans or are otherwise captured by the TFMSC.

Figure 3-21: EGE Operations TFMSC and OpsNet Comparison



Source: FAA

3.9.7 Critical Aircraft Determination

The determination of a Critical Aircraft is important since that aircraft will help establish facility requirements for the airport.

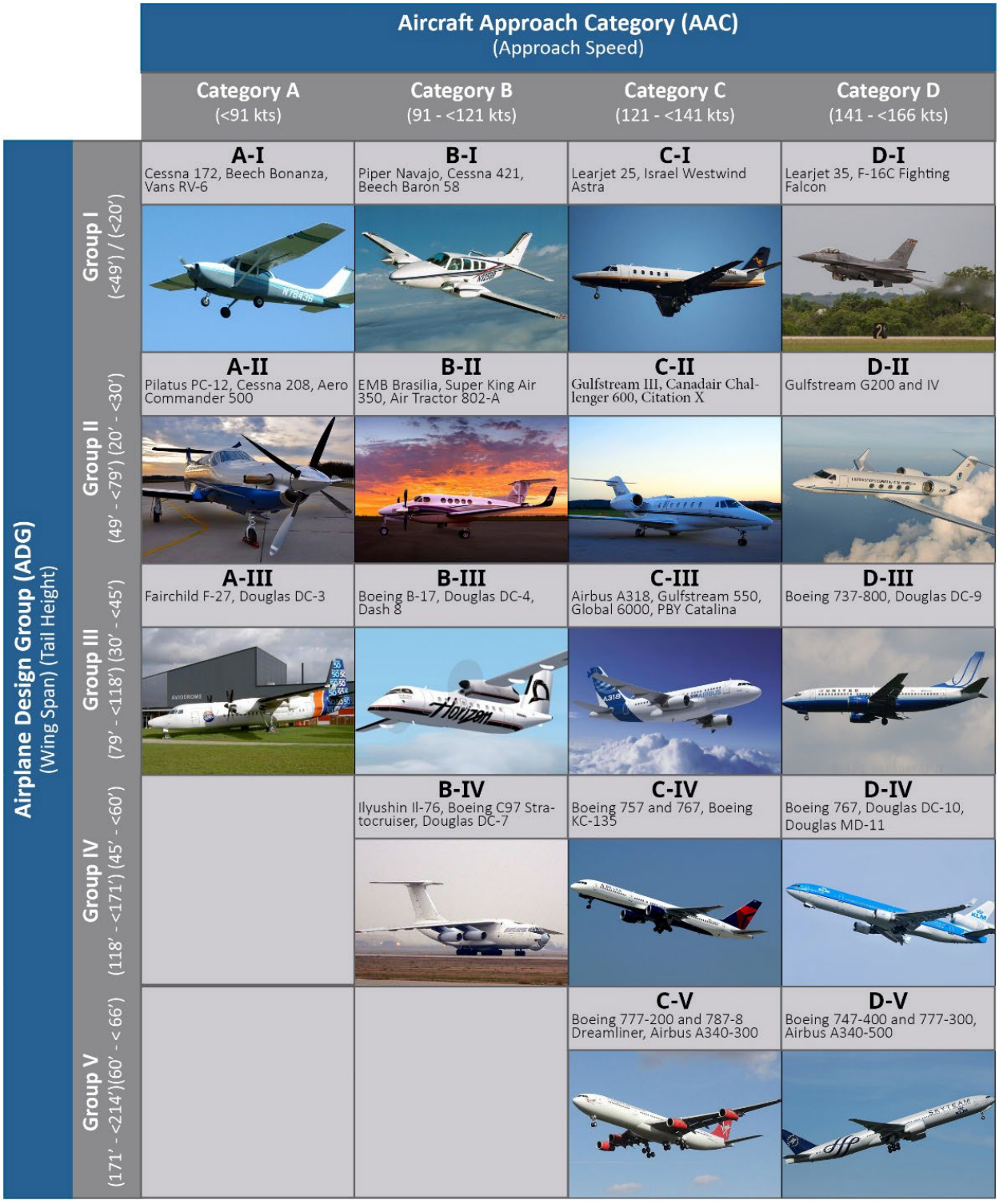
The ultimate design and development of airport facilities are directly impacted by the demand for those facilities. Aircraft-related activities, in the form of based aircraft, operational levels, and types of operations, serve as the basis for that demand. In general, airport infrastructure components are designed to accommodate the most demanding aircraft type that will utilize the infrastructure on a regular basis. The FAA refers to this aircraft as the Critical Aircraft, which it defines 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,[7] including both itinerant and local operations but excluding touch-and-go operations." The primary purpose of identifying the Critical Aircraft is to ultimately translate the operational requirements of that aircraft to airport facilities.

The FAA has developed a system to connect the physical characteristics of the Critical Aircraft to airport planning and design standards. This system is known as the **Airport Reference Code (ARC)**, and is detailed in FAA AC 150/5300-13B, *Airport Design.* A combination of two codes is used to develop the ARC. The first code is the **Aircraft Approach Category (AAC)** based on the approach speed (landing speed) of an aircraft, is designated with a letter. The second code, **Airplane Design Group (ADG)**, is determined by the wingspan and tail height of an aircraft and is presented as a Roman numeral.

Each individual aircraft is assigned a reference code as well as each runway and the entire airport. The ARC of a runway and airport is based upon the aircraft or combination of aircraft with the highest approach speed and greatest wingspan that either use or are expected to make regular use of it. The figure on the following page lists the approach categories and design groups and provides example aircraft in each ARC.

[7] FAA. Advisory Circular 150/5000-17 Critical Aircraft and Regular Use Determination.

Figure 3-22: FAA Airport Design Codes



Source: FAA, Jviation, a Woolpert Company, Public Domain Images

The FAA further explains that similar characteristics "are the practice of grouping aircraft by comparable operational performance and/or physical dimensions. This is to recognize that it is sometimes necessary for airfield planning and development to group aircraft with similar characteristics together instead of requiring a single aircraft type to exceed the regular use threshold alone." This is pertinent to EGE as the Airport serves a wide variety of aircraft.

The tables below categorize each operation in the TFMSC dataset by the ADG and AAC. A small number of operations without an ADG and/or AAC were excluded. Activity by category has been fairly stable over the years, with notable changes during the peak pandemic years of increased ADG B and C and decreased AAC IV operations. This is consistent with increases in business aviation activity and downturn by the airlines over this period; a return to previous levels for AAC IV is expected as airline activity recovers to pre-pandemic levels. Recall these TFMSC operations only account for about 59% of the total traffic at EGE.

Table 3-5: EGE Operations by ADG

	Airport Design Group (ADG)			
	A	B	C	D
2002	621	11,168	8,234	1,569
2003	747	11,278	8,188	1,753
2004	785	11,400	9,180	1,900
2005	955	12,202	9,775	1,845
2006	1,090	13,177	9,903	1,729
2007	1,101	14,195	10,658	1,858
2008	1,062	12,752	9,803	1,671
2009	967	9,060	6,376	958
2010	1,362	9,861	9,700	1,339
2011	1,210	9,655	9,947	1,385
2012	1,276	9,441	8,579	1,271
2013	1,367	10,751	7,464	1,436
2014	1,481	11,329	7,563	1,528
2015	1,585	11,716	7,890	1,440
2016	1,486	11,100	9,059	1,564
2017	1,693	10,320	9,582	1,608
2018	1,705	10,803	10,601	1,652
2019	1,792	10,970	10,615	1,486
2020	1,838	12,144	10,273	1,489
2021	1,815	14,895	13,896	1,768
5 Year Average (2017-21)	1,769	11,826	10,993	1,601

Table 3-6: EGE Operations by AAC

	Aircraft Approach Category (AAC)			
	I	II	III	IV
2002	8,456	10,666	282	2,189
2003	8,623	10,180	955	2,208
2004	8,891	9,974	1,851	2,550
2005	8,632	10,472	3,061	2,612
2006	8,194	11,387	4,068	2,250
2007	8,402	12,335	4,581	2,494
2008	7,488	11,231	4,093	2,476
2009	5,031	7,794	2,343	2,193
2010	6,408	12,144	1,440	2,270
2011	6,357	12,491	1,240	2,109
2012	6,016	10,947	1,603	2,001
2013	5,818	10,845	2,586	1,770
2014	5,930	11,302	3,316	1,353
2015	5,756	12,090	3,709	1,076
2016	5,525	13,669	2,875	1,140
2017	5,143	14,284	2,713	1,063
2018	5,150	14,641	4,034	936
2019	5,099	14,118	4,612	1,034
2020	5,014	15,955	3,924	851
2021	6,288	19,078	6,402	606
5 Year Average (2017-21)	5,339	15,615	4,337	898

Source: FAA

Based on the TFMSC data, the Airport easily surpasses 500 annual operations for ADG D and AAC IV aircraft. Notable aircraft in these categories operating at EGE include Boeing 757-200 (C-IV), Boeing Globemaster (B-IV), C-130 Hercules (C-IV), Gulfstream G500 (D-III), and Gulfstream G400 (D-II). *Based on recorded regular usage and projected future activity, the existing and future Critical Aircraft designation is D-IV grouping of aircraft with similar characteristics*.

Figure 3-23: Boeing 757 Parked at EGE

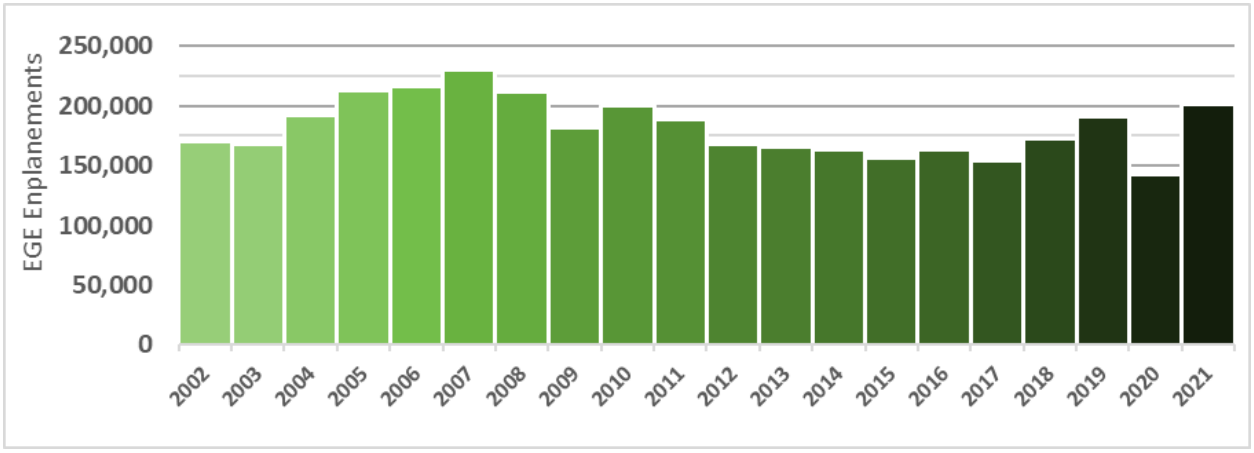
Source: EGE

3.10 Enplanements

3.10.1 Historical Enplanements

Historical passenger enplanements at EGE from 2002 through 2021 are presented in **Figure 3-24**. Over that period, annual enplanements have varied from a low of roughly 140,000 in 2020 to a high of 230,000 in 2007. As evidenced by data from 2005 through 2008, the Airport and community have demonstrated an ability to consistently serve well over 200,000 passengers.

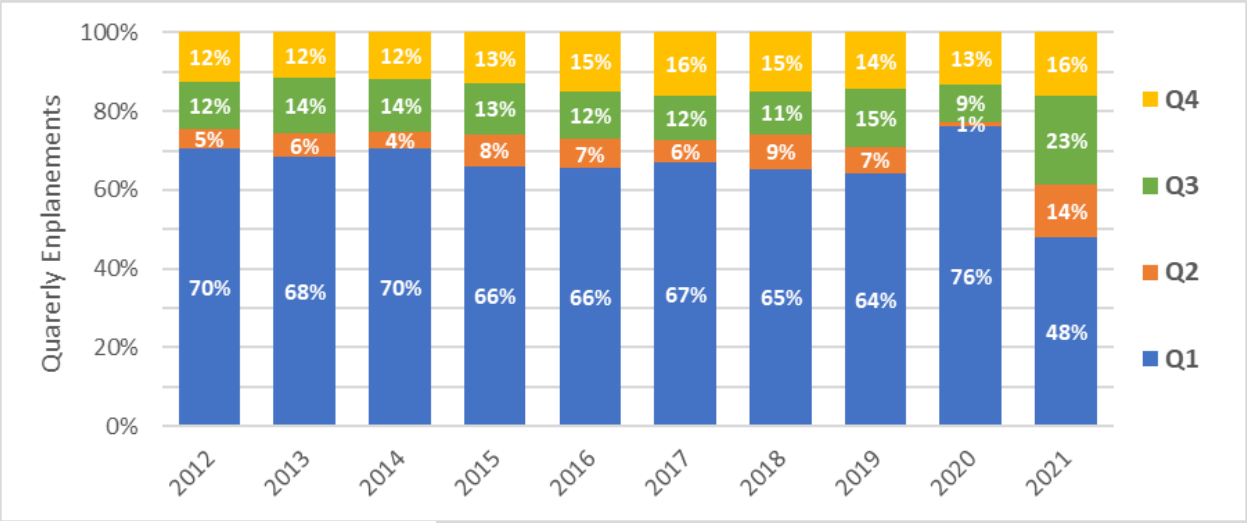
Figure 3-24: EGE Enplanements



Source: FAA, BTS

Charted below (**Figure 3-25**) are EGE enplanements divided by annual quarters. The first quarter of the year (January, February, and March) has always been the busiest quarter for the Airport as it coincides with the snow-based tourism season. During the years leading up to the pandemic, the first quarter accounted for approximately 65% of annual enplanements. In 2020, this jumped to 76% but then dropped to 48% in 2021. The percentage of enplanements occurring in the second and third quarters in 2021 increased substantially, evening out the dispersion of passengers throughout the entire calendar year. However, it is likely that much of the 2020 and 2021 numbers are pandemic-driven anomalies. Until such changes are validated as actual trends in future years, it is likely that the percentages generally reflected from 2012 to 2019 will prevail for EGE.

Figure 3-25: EGE Enplanements by Quarter



Source: FAA, BTS

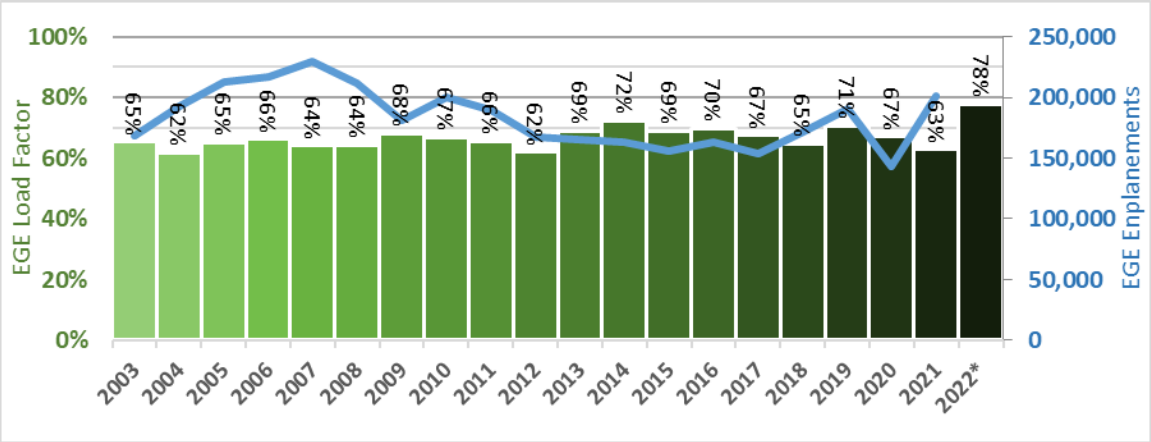
3.10.2 Load Factor

Load factor is a metric of how much commercial passenger aircraft capacity is being utilized. If flights are full of passengers, load factors are high and, conversely, when flights are empty, load factors are low. This is an important consideration for airlines in that it directly relates to profitability of specific routes and times of year when those routes are active. Thus, airlines closely examine load factors when evaluating the value of the routes themselves as well as deciding if and when to add (or reduce) capacity through new routes or additional aircraft. Because of its importance to airlines, load factor is a similarly important metric to an airport since it provides a gauge as to the health of its routes and a mechanism to predict future airline service activities.

Historical annual load factors for EGE (**Figure 3-26**) have typically ranged from 62% to 72%. Half way through 2022, the Airport is on pace to have its best load factor rate by a notable margin (in 2019, the average load factor for all U.S. commercial air carriers serving domestic routes was 85.2%). While EGE's load factors are lower than national averages, the Airport's unique seasonal peaking market accounts for most of this difference. Nevertheless, these historic load factors indicate there is room for

additional passengers based on existing standard service to the Airport. It should also be noted that historical fluctuations in total annual enplanements did not have a significant inverse relationship with load factors. So, in years where enplanements increased, load factors did not marketedly decrease as one may expect if the increase in enplanements were simply due to additional airline capacity. This effectively means that airlines at EGE have been largely effetive in matching EGE market demands with aircraft frequency and capacity .

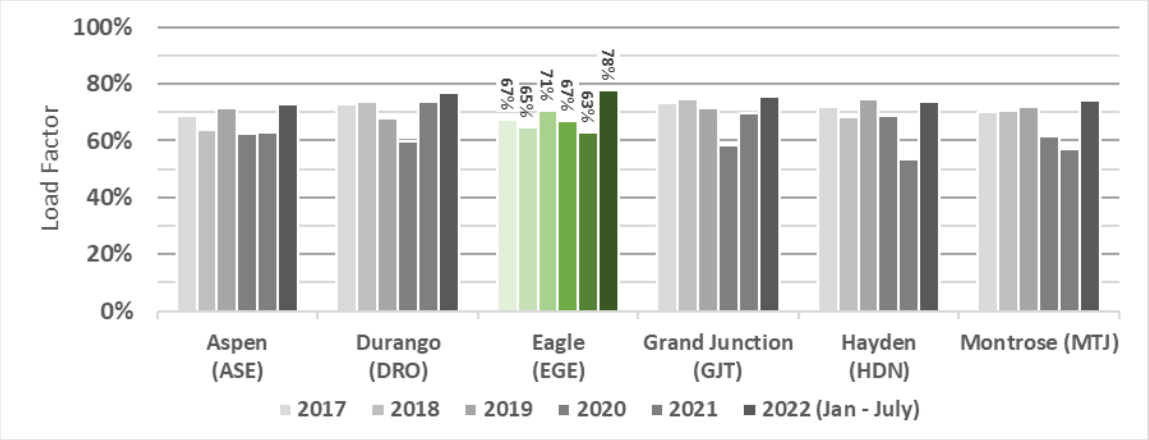
Figure 3-26: EGE Load Factor



*2022 only includes data for January through July
Source: FAA, BTS

Historical annual load factors for EGE and other comparable commercial airports in Colorado are graphed in **Figure 3-27**. Across the state, load factors declined substantially in 2020 due to the pandemic. Load factors for some of the airports rebounded in 2021, while others, including EGE, stayed flat or even declined further. Through the first half of 2022, load factors were up across the board, and reaching levels comparable to the highest seen. Generally, EGE load factors appear within the range of comparable Colorado commercial service airports serving seasonal mountain markets.

Figure 3-27: Colorado Load Factor

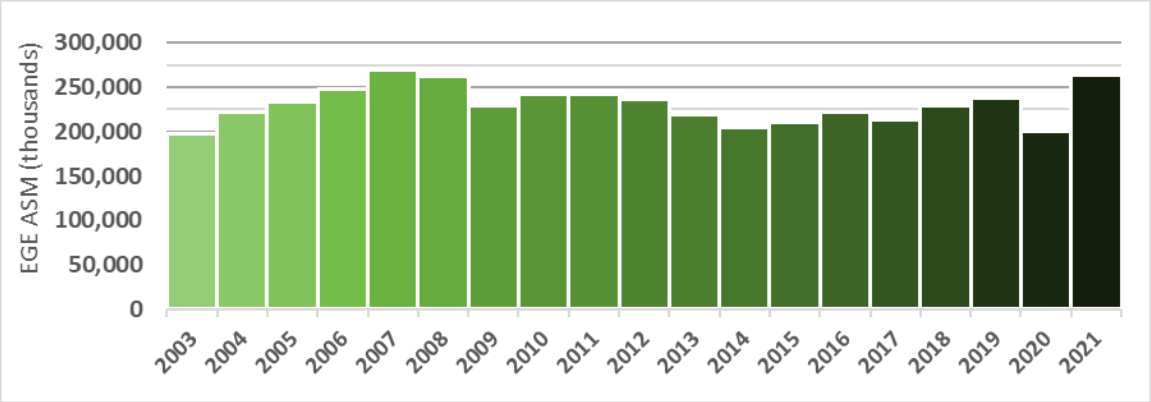


Source: FAA, BTS

3.10.3 Available Seat Miles

Available seat miles (ASM) is another commercial air service capacity metric based on the number of airline seats available multiplied by the number of miles flown. Connected to this are **revenue passenger miles (RPM)**, calculated by multiplying the number of revenue passengers by aircraft miles flown. Taking the ratio of ASM and RPM results in one way to measure **load factor**, a metric of utilized capacity. To evaluate how commercial passenger capacity has changed, the historical ASM for EGE are charted in **Figure 3-28**. Since 2003, the ASM capacity peaks at EGE occurred in 2007 and 2008, as well as the post-pandemic recovery in 2021. The general distribution of this data matches that of the historical enplanements, which is to be expected - as capacity has increased so have the number of enplaned passengers.

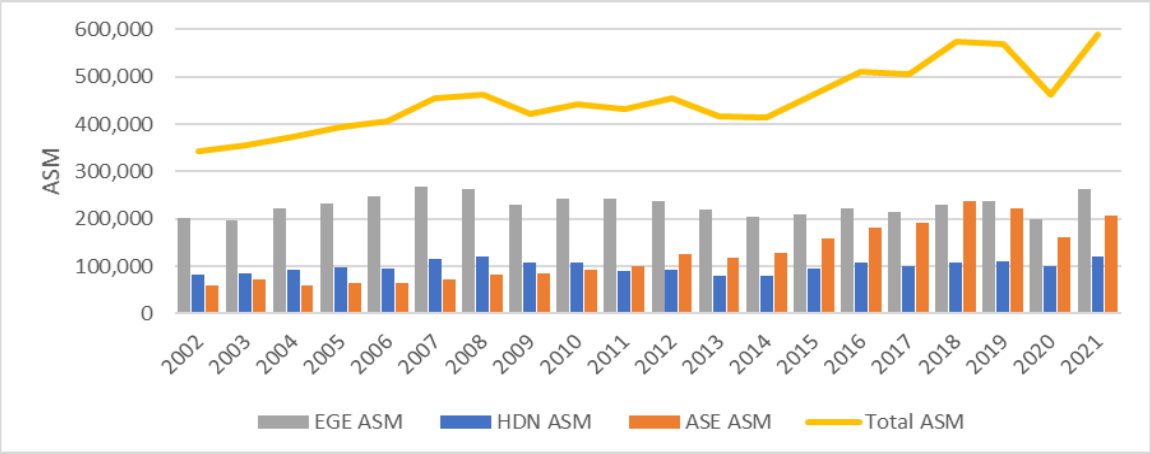
Figure 3-28: EGE Available Seat Miles (ASM)



Source: FAA, BTS

Charted below are the ASM for the three Colorado area seasonal mountain market airports: EGE, ASE, and HDN. The overall pattern of capacity for EGE and HDN are similar, hitting highs around 2007 and then decreasing through 2014. Historically, EGE has largely commanded the majority of ASMs amongst this group until ASE's capacity growth from 2015 to 2018. While EGE still has the most capacity on an annual basis, ASE is much closer than was seen in previous years.

Figure 3-29: EGE, ASE, HDN Available Seat Miles (ASM)



Source: FAA, BTS

3.10.4 Enplanements Forecast

In reviewing the various enplanement metrics listed above, there are multiple scenarios in which EGE could experience an expansion of its commercial air service levels in response to local market demands. For example, airlines at EGE historically have operated at load factors lower than national averages; simply experiencing a sustained increase in load factors could increase overall enplanements without the need for additional airlines, routes, or aircraft (partial data from 2022 indicates that EGE is trending towards such higher load factors). Additionally, 2021 ASMs demonstrate that EGE is capable of not just servicing its previous high-capacity levels, but that more growth could be accommodated within the market. Improvement in technologies, especially instrument approach capability, will likely improve air carrier reliability and service. Additional daily air carrier flights can be accommodated within the current airfield and terminal, resulting in increased capacity and likely enplanements. Bolstering travel during the EGE market area's nonpeak or shoulder seasons would have a net gain in overall enplanements without stressing the peak busy season for the terminal. Currently, local residents are estimated to account for only 19% of EGE enplanements; the increasing population and wealth of the counties within the market area indicate that EGE may experience an expansion in the number of local fliers that will raise load factors and increase enplanements. Though these increases in demand can be considered collectively or individually, EGE must be prepared to meet the demands experienced through increasing enplanements.

When these areas of potential growth meet the ongoing changes in national passenger travel, reinvigorated local air service development, and future terminal enhancements, the potential for a significant increase in enplanements exists that exceeds historical highs. However, it is understood that while these potentials are reasonable, they nonetheless remain speculative, and it is important that any forecasts that could result in direct airport facility improvements be based in real world certainties to the extent possible. Thus, this forecasting effort has established a scenario-based methodology to consider these potentials and their implications for EGE that will provide the Airport with a projection of what could be experienced in the future. Specifically, four enplanement scenarios were developed that examine these various potentials and how they could interplay at EGE, driving future enplanement levels.

The *pessimistic scenario* (AAGR 0.4%) assumes a return to pre-pandemic enplanement trends and is based on the FAA TAF for EGE enplanements (AAGR 1.18%). Note that this scenario differs from others in that it is also based on an FAA projection of 190,000 enplanements in 2023, which is lower than current levels. Starting from this point, annual enplanements grow at the FAA TAF rate. Due to the FAA's projected initial lower enplanement levels, this would be an immediate change in direction for the TAF's enplanement trend of the past two years. This shift would be based on a "return to normalcy" or those prevailing conditions and trends that existed prior to the pandemic. This scenario should be considered a minimum scenario for the Airport.

The *optimistic load factor scenario* (AAGR 0.9%) is built around reasonable incremental increases in load factor such that airlines operating at EGE will better approximate national trends. This scenario is based on progressively increasing load

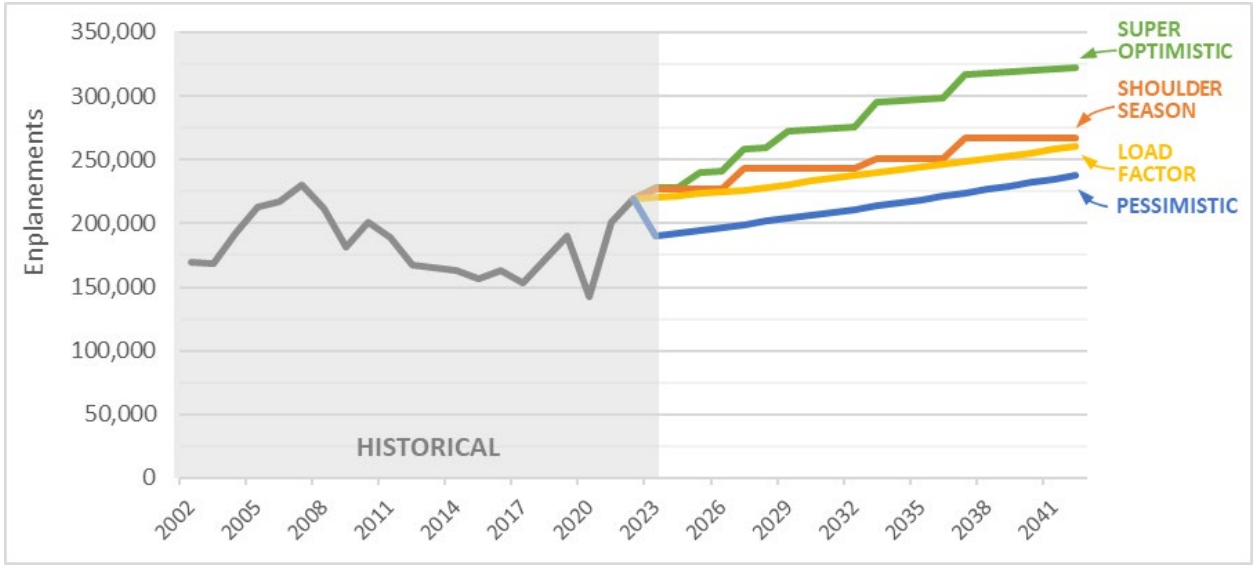
factors for both American Airlines and Delta Airlines such that they equal 80% by the end of the planning period, while United Airlines, which has historically experienced lower load factor rates, increases to equal 75% within the 20-year planning window. It should also be noted that this scenario is based on a projected enplanement total of 219,009 in 2022.

The *optimistic shoulder season scenario* (AAGR 1.0%) is based on increased seat capacity during EGE's market area shoulder seasons in the Spring (i.e., April, May, and June) and the Fall (i.e., September, October, and November). This scenario uses flat (not increasing) historic load factors for each airline. Based on aircraft currently operating at EGE, capacity was added incrementally over time since significant capacity increase over a short period would be unlikely. Specifically, an additional regional jet daily flight was added after forecast year one and after year 11, while additional daily national/international flights were added after forecast year six and year 16. This scenario is also based on a projected enplanement total of 219,009 in 2022.

The *super optimistic scenario* (AAGR 2.0%) combines the projected enplanement increases represented in the previous two optimistic scenarios. In essence, this scenario assumes that airline load factors will increase at EGE, that enplanement levels will grow during the off-peak seasons, and that additional capacity/flights will be added to EGE. Note that the capacity increase could come from existing markets or entirely new markets, including international. This scenario is also based on a projected enplanement total of 219,009 in 2022.

The four enplanement forecast scenarios are graphically presented below in **Figure 3-30** and numerically presented for key years in **Table 3-7.**

Figure 3-30: EGE Enplanements Forecast



Source: Jviation, a Woolpert Company

Table 3-7: EGE Enplanements Forecast

Year	Pessimistic Scenario	Optimistic Load Factor Scenario	Optimistic Shoulder Season Scenario	Super Optimistic Scenario
2022 Baseline	219,009*	219,009	219,009	219,009
2027 (+5 years)	199,128	226,133	242,777	258,269
2032 (+10 years)	211,157	237,474	242,777	275,418
2037 (+15 years)	223,913	248,815	266,545	316,855
2042 (+20 years)	237,439	260,156	266,545	322,554
2022 -2042 AAGR	*0.4%*	*0.9%*	*1.0%*	*2.0%*

* Not shown in the table is that the FAA projects that this total to be 190,000 in 2023.
Source: Jviation, a Woolpert Company

Forecasting is generally understood to be an inexact science due the number, range, and unpredictability of the variables that could dramatically impact a forecast. As demonstrated above, a few, minor improvements in load factor and capacity could drastically increase annual enplanements at EGE, while another "black swan event," an unexpected or unknowable negative event like a pandemic, could result in a dramatic decrease. Regardless of uncertainty, it is still important to establish reasonable and defensible projections for the purposes of developing plans for terminal and airfield improvements to accommodate the likely increasing number of travelers at EGE. The *optimistic load factor scenario* has been identified as the preferred forecast. However, the *super optimistic scenario* will be utilized for peaking to establish maximum potential levels, and all enplanement forecast scenarios will be carried forward into subsequent chapters to establish reasonable development plans for how EGE should respond if any of the higher growth rate scenarios are realized.

*The **Optimistic Load Factor Scenario** was identified as the preferred forecast for EGE enplanements.*

The next chapter, *Facility Requirements*, will compare the enplanement forecast against items such as TSA throughput, baggage claim capacity, concessionaires, airline gates, passenger parking, and peak hour. Against these metrics, Planning Activity Levels (PALs) will be determined to establish trigger points for when future commercial terminal area capacity projects should be planned and implemented to meet future requirements if and when they are needed.

3.11 Peaking Characteristics

Peak period activity helps determine the optimum sizing of terminal facilities, landside facilities, and airfield capacities. In this analysis, three specific peak periods were used to determine what size facilities may be needed to meet forecasted demand: peak month, average day of the peak month, and peak hour. Peaking was calculated for operations and enplanements.

- **Peak Month:** The month during which the most aircraft operations/ enplanements occur.
- **Peak Month Average Day (PMAD):** Aircraft and passenger activity that can be expected on a typical day during the peak month.

- **Peak Hour:** The hour during which most activity occurs within the average day of the peak month.

These peaking characteristics are estimated for aircraft operations (*optimistic scenario*) and passenger activity (*super optimistic scenario*) based on five-year averages for 2022, 2027, 2032, 2037, and 2042 (see **Table 3-8**). Determining the peaking of activity at EGE is especially crucial given the high-level of seasonality experienced by the Airport. Hourly air carrier calculations were based on arriving and departing flight schedules and monthly capacity. Other operation categories were calculated using hourly ADS-B data (peak hour 12%). Note that different categories have different peak months, so the columns do not sum to equal the overall operation totals. For example, while air carrier operations peak in January, general aviation operations peak in July while military peaks in August.

Table 3-8: EGE Peak Period Operations

Category / Year	Annual	Peak Month	Average Day	Peak Hour
Air Carrier				
2022	5,234	1,047	35	10
2027	5,906	1,181	39	12
2032	6,077	1,215	41	12
2037	6,248	1,250	42	13
2042	6,419	1,284	43	14
Air Taxi				
2022	12,014	1,562	52	6
2027	13,557	1,762	59	7
2032	13,950	1,814	60	7
2037	14,342	1,864	62	7
2042	14,734	1,915	64	8
General Aviation				
2022	33,278	3,661	122	15
2027	37,553	4,131	138	17
2032	38,640	4,250	142	17
2037	39,726	4,370	146	17
2042	40,813	4,489	150	18
Military				
2022	5,449	654	22	3
2027	6,149	738	25	3
2032	6,327	759	25	3
2037	6,505	781	26	3
2042	6,682	802	27	3
Total Operations				
2022	55,974	6,213	207	25
2027	63,165	7,011	234	29
2032	64,993	7,214	240	29
2037	66,821	7,417	247	30
2042	68,648	7,620	254	31

Source: Jviation, a Woolpert Company

The air carrier peaking hour is especially high as the airlines arrive during a small window during the shortened daylight hours of the winter. Air carrier peak estimates

are 10 hourly operations, increasing to 14 in the future, which is considered to be significant for an airport that operates with seven or fewer gates. The peak hourly operations for the Airport are estimated at 25 in the baseline year of 2022. This is projected to increase to 31 peak hour operations by 2042, which again is considered to be significant for a single runway airport with challenging surrounding terrain.

Peak hour enplanements were determined based on an understanding and application of airline schedules and estimated load factors. Hourly flight data was collected from airline schedules for winter 2022 departures and an estimated seat load factor of 70% was applied. Airline enplanement data show January (followed by February and March) as being the busiest passenger travel months of the year. Each of those three months encompass approximately 20% of EGE's total annual passenger enplanements, resulting in roughly 60% of all Airport enplanements occuring during those three winter months. Note air taxi enplanement and non-revenue air carrier enplanements are not included in these calculations. While the non-rev passengers make use of some terminal facilities, their overall percentage of enplanements was determined to be inconsequential.

As shown in **Table 3-9**, the calculated peak hour for enplanements in the baseline year of 2022 is 554, when six or more air carrier flights depart EGE within the same hour during the winter. This peak hour total is projected to increase to 731 by 2042.

Table 3-9: EGE Peak Period Enplanements

Category / Year	Annual Enplanements	Peak Month	Peak Month Average Day	Peak Hour
Air Carrier				
2022	219,009	48,182	1,606	554
2027	258,269	55,528	1,851	629
2032	275,418	57,838	1,928	655
2037	316,855	64,955	2,165	736
2042	322,554	64,511	2,150	731

Source: Jviation, a Woolpert Company

Figure 3-31: EGE Passengers Waiting for Baggage

Source: EGE

3.12 Forecast Summary

The results of the forecast are tabularized below in **Table 3-10**. FAA reviews if the passenger enplanements, based aircraft, and operations forecasts are within 10% of the five-year TAF and 15% of the 10-year TAF. The EGE preferred forecasts are within these tolerances, as shown by the comparison in the table below. Annual instrument operations were estimated by applying the 59% TFMSC average to the preferred operations forecast scenario.

In summary, EGE is anticipated to grow in all facets of aviation activity over the next two decades. This growth reflects the aviation industry recovering from the pandemic as well as strong socioeconomic growth in Eagle County and the surrounding area.

Table 3-10: EGE Forecast Summary and TAF Comparison

	2022 Baseline	2027 +5 Years	2032 +10 Years	2037 +15 Years	2042 +20 Years
Based Aircraft	**96**	**113**	**129**	**146**	**162**
Single Engine	54	64	73	82	91
Multi Engine	2	3	3	3	4
Jet	25	29	33	38	42
Rotorcraft	15	17	20	22	25
Total AAGR	-	*3.3%*	*3.0%*	*2.8%*	*2.7%*
Operations	**55,974**	**63,165**	**64,993**	**66,821**	**68,648**
Itinerant	43,432	49,012	50,430	51,848	53,267
Air Carrier	*5,234*	*5,906*	*6,077*	*6,248*	*6,419*
Commuter/Air Taxi	*12,014*	*13,557*	*13,950*	*14,342*	*14,734*
General aviation	*22,845*	*25,780*	*26,526*	*27,272*	*28,018*
Military	*3,340*	*3,769*	*3,878*	*3,987*	*4,096*
Local	12,542	14,153	14,563	14,972	15,382
General aviation	*10,433*	*11,773*	*12,114*	*12,454*	*12,795*
Military	*2,109*	*2,380*	*2,449*	*2,518*	*2,586*
Total AAGR	-	*2.4%*	*1.5%*	*1.2%*	*1.0%*
Peak Hour	25	29	29	30	31
Instrument Operations	**33,025**	**37,267**	**38,346**	**39,424**	**40,502**
Enplanements	**219,009**	**226,133**	**237,474**	**248,815**	**260,156**
Total AAGR	-	*0.9%*	*0.9%*	*0.9%*	*0.9%*
Peak Hour	554	629	655	736	731

TAF Comparison (Baseline, 5 and 10 Years)	2022 Baseline	2027 +5 Years	2032 +10 Years
TAF Based Aircraft	96	113	129
Percent Difference	-	*0.0%*	*0.0%*
TAF Operations	57,833	59,380	60,906
Percent Difference	-	*6.4%*	*6.7%*
TAF Enplanements	189,940	205,647	219,152
Percent Difference	-	*9.9%*	*8.4%*

Source: Jviation, a Woolpert Company