AVIATION DEMAND FORECASTS

Facility planning requires a definition of demand that may be expected to occur during the useful life of the facility's crucial components. For HDE, this involves projecting aviation demand for a 20-year timeframe. In this report, forecasts of county registered aircraft, based aircraft, based aircraft fleet mix, and annual airport operations are forecast to establish the existing and ultimate critical aircraft.

The forecasts generated may be used for a multitude of purposes, including facility needs assessments and environmental evaluations. The forecasts will be submitted to the FAA for review and approval to ensure accuracy and reasonable projections of aviation activity. The intent of the projections is to enable the airport to make facility improvements to meet demand in the most efficient and cost-effective manner possible.

It should be noted that aviation activity can be affected by numerous outside influences on a local, regional, and national level. As a result, forecasts of aviation demand should be used only for advisory purposes. It is recommended that planning strategies remain flexible enough to accommodate any unforeseen facility needs.

FORECASTING APPROACH

Typically, the most accurate and reliable forecasting approach is derived from multiple analytical forecasting techniques. Analytical forecasting methodologies typically consist of regression analysis, trend analysis and extrapolation, market share or ratio analysis, and smoothing. Through the use of multiple forecasting techniques based upon each aviation demand indicator, an envelope of aviation demand projections can be generated.

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

Regression analysis measures the statistical relationship between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures associations between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

Trend analysis and extrapolation is a forecasting technique that records historical activity (such as airport operations) and projects this pattern into the future. Oftentimes, this technique can be beneficial when local conditions of the study area are differentiated from the region or other airports.

Market share or ratio analysis can be described as a forecasting technique that assumes the existence of a top-down relationship between national, regional, and local forecasts. The local forecasts are presented as a market share of regional forecasts, and regional forecasts are presented as a market share of national forecasts. Typically, historical market shares are calculated and used as a base to project future market shares.

Smoothing is a statistical forecasting technique that can be applied to historical data, giving greater weight to the most recent trends and conditions. Generally, this technique is most effective when generating short-term forecasts.

NATIONAL GENERAL 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 air carriers/air taxi, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units 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 forecast update was prepared was FAA *Aerospace Forecasts – Fiscal Years 2022-2042*, released in June 2022. The FAA primarily uses the economic performance of the United States (U.S.) 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 document.

The COVID-19 pandemic has been the biggest factor affecting aviation since March 2020. The effect of the pandemic on the aviation industry has been most devastating to the commercial airline operators, who are still working to recover from staggering losses and add capacity back into networks. However, other segments of the aviation industry, including general aviation such as charters, air taxi, and fractionals, were not impacted quite so much as the airlines. In fact, they appear to have maintained pre-pandemic levels and, in many cases, showed increases in activity. 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.

The long-term outlook for general aviation (GA) is promising, as growth at the high-end offsets continuing retirements at the traditional low end of the segment. The active general aviation fleet is forecast to remain relatively stable between 2022 and 2042, increasing by just 0.1 percent. While steady growth in both GDP and corporate profits in continued growth of the turbine and rotorcraft fleets, the largest of the fleet – fixed-wing piston aircraft – continues to shrink over the forecast period.

The FAA forecasts the fleet mix and hours flown for single engine piston aircraft, multi-engine piston aircraft, turboprops, business jets, piston and turbine helicopters, light sport, experimental, and others (gliders and balloons). The FAA forecasts “active aircraft,” not total aircraft. An active aircraft is one that is flown at least one hour during the year. From 2010 through 2013, the FAA undertook an effort to have all aircraft owners re-register their aircraft. This effort resulted in a 10.5 percent decrease in the number of active general aviation aircraft, mostly in the piston category. **Table 6** shows the primary general aviation demand indicators as forecast by the FAA.

TABLE 6 | FAA General Aviation Forecast

Demand Indicator	FY 2022	FY 2042	CAGR
General Aviation (GA) Fleet			
Total Fixed Wing Piston	133,815	112,915	-0.8%
Total Fixed Wing Turbine	26,480	38,455	1.9%
Total Helicopters	9,955	13,530	1.5%
Total Other (experimental, light sport, etc.)	34,340	44,005	1.2%
Total GA Fleet	**204,590**	**208,905**	**0.1%**
General Aviation Operations			
Local	13,731,399	15,767,539	0.7%
Itinerant	14,569,014	16,259,605	0.6%
Total GA Operations	**28,300,413**	**32,027,144**	**0.6%**
CAGR: compound annual growth rate (2022-2042)			

Source: FAA Aerospace Forecast – Fiscal Years 2022-2042

GENERAL AVIATION AIRCRAFT FLEET MIX

For 2022, the FAA estimates there are 133,815 piston-powered, fixed-wing aircraft in the national fleet. That number is forecast to decline by 0.8 percent by 2042, resulting in 112,915 aircraft. This includes a decline of 0.9 percent in single engine piston aircraft and a decline of 0.3 percent in multi-engine piston aircraft. Total turbine aircraft are forecast to grow at an annual rate of 1.9 percent through 2042. The FAA estimates there are 26,480 fixed-wing turbine-powered aircraft in the national fleet in 2022, and there will be 38,455 by 2042. Turboprops are forecast to grow by 0.6 percent annually, while business jets are projected to grow by 2.6 percent annually through 2042.

Total helicopters are projected to grow by 1.5 percent annually over the forecast period. There were an estimated 9,955 total helicopters in the national fleet in 2022, and that number is expected to grow to a total of 13,530 by 2042. This includes a CAGR of 0.6 percent for piston helicopters and 1.9 percent for turbine helicopters.

The FAA also forecasts experimental aircraft, light sport aircraft, and others. Combined, there are an estimated 34,340 other aircraft in 2022 that are forecast to grow to 44,005 by 2042, for an annual growth rate of 1.2 percent.

GENERAL AVIATION OPERATIONS

The FAA also forecasts total operations based upon activity at air traffic control towers (ATCT) across the United States. Operations are categorized as air carrier, air taxi/commuter, general aviation, and military. While the fleet size remains relatively level, the number of general aviation operations at towered airports is projected to increase from 28.3 million in 2022 to 32.0 million in 2042, for a CAGR of 0.6 percent per year as growth in turbine, rotorcraft, and experimental hours offset a decline in fixed-wing piston hours. This includes annual growth rates of 0.7 percent for local general aviation operations and 0.6 percent for itinerant general aviation operations.

Exhibit 11 presents the historical and forecast U.S. active general aviation aircraft and operations.

GENERAL AVIATION SHIPMENTS AND REVENUE

On an annual basis the General Aviation Manufacturers Association (GAMA) publishes an aviation industry outlook that documents past and current trends and provides an assessment of the future condition of the general aviation industry. **Table 7** presents historical data related to general aviation aircraft shipments.

Worldwide shipments of general aviation airplanes increased in the year 2021 with a total of 2,646 units delivered around the globe, compared to 2,408 units in 2020, but not quite reaching the 2,658 units delivered in 2019. Worldwide general aviation billings were the highest in 2008. In 2021, there was an increase of new aircraft shipments with more than $21 billion compared to the previous year's $20 billion. North America continues to be the largest market for general aviation aircraft and leads the way in the manufacturing of piston, turboprop, and jet aircraft. The Asia-Pacific region is the second largest market for piston-powered, while Latin America is the second leading in the turboprop market, and Europe leads in business jet deliveries.

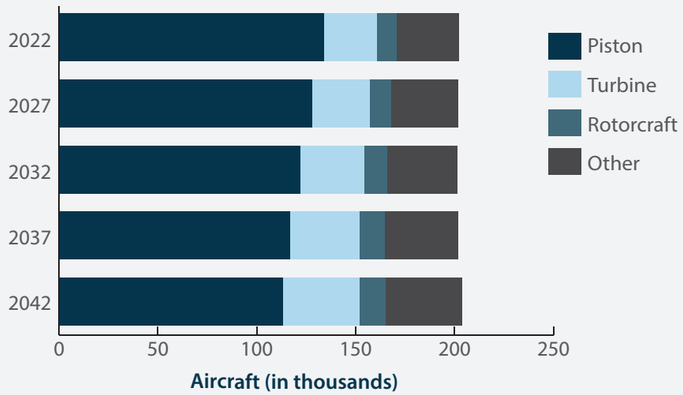
TABLE 7 | Annual General Aviation Airplane Shipments Manufactured Worldwide and Factory Net Billings

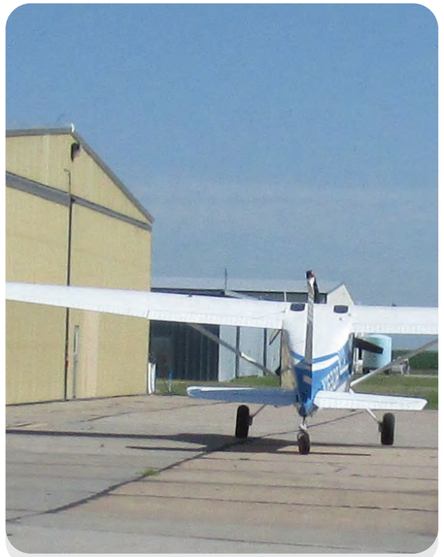
Year	Total	SEP	MEP	TP	J	Net Billings ($millions)
1994	1,132	544	77	233	278	3,749
1995	1,251	605	61	285	300	4,294
1996	1,437	731	70	320	316	4,936
1997	1,840	1043	80	279	438	7,170
1998	2,457	1508	98	336	515	8,604
1999	2,808	1689	112	340	667	11,560
2000	3,147	1,877	103	415	752	13,496
2001	2,998	1,645	147	422	784	13,868
2002	2,677	1,591	130	280	676	11,778
2003	2,686	1,825	71	272	518	9,998
2004	2,962	1,999	52	319	592	12,093
2005	3,590	2,326	139	375	750	15,156
2006	4,054	2,513	242	412	887	18,815
2007	4,277	2,417	258	465	1,137	21,837
2008	3,974	1,943	176	538	1,317	24,846
2009	2,283	893	70	446	874	19,474
2010	2,024	781	108	368	767	19,715
2011	2,120	761	137	526	696	19,042
2012	2,164	817	91	584	672	18,895
2013	2,353	908	122	645	678	23,450
2014	2,454	986	143	603	722	24,499
2015	2,331	946	110	557	718	24,129
2016	2,268	890	129	582	667	21,092
2017	2,324	936	149	563	676	20,197
2018	2,441	952	185	601	703	20,515
2019	2,658	1,111	213	525	809	23,515
2020	2,408	1,164	157	443	644	20,048
2021	2,646	1,261	148	527	710	21,603

SEP - Single-Engine Piston; MEP - Multi-Engine Piston; TP - Turboprop; J - Turbofan/Turbojet

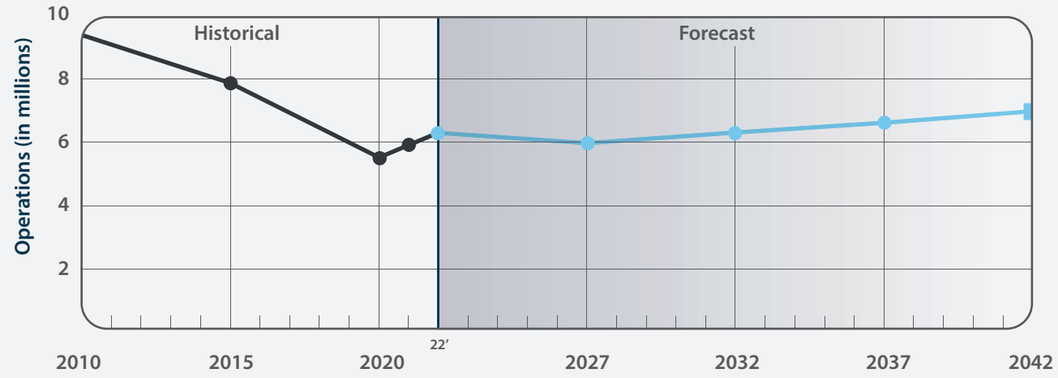
Source: General Aviation Manufacturers Association, 2021 Annual Report

U.S. Active General Aviation Aircraft

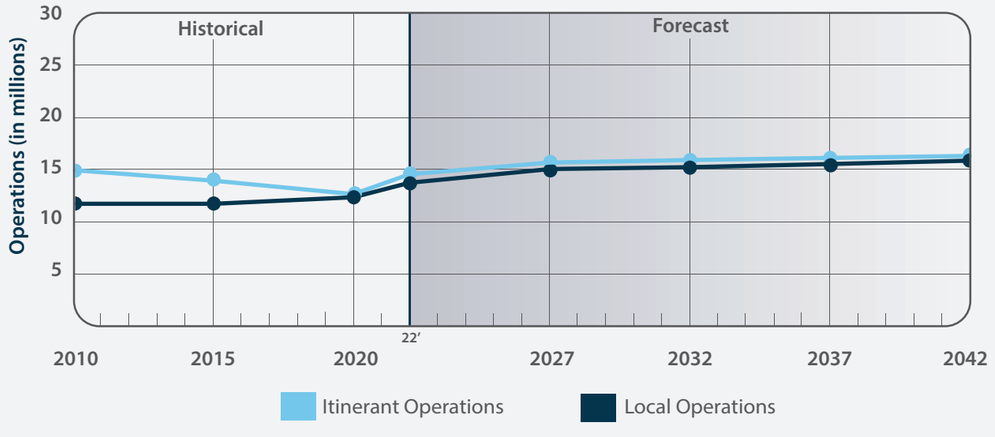




U.S. Air Taxi Operations



U.S. General Aviation Operations



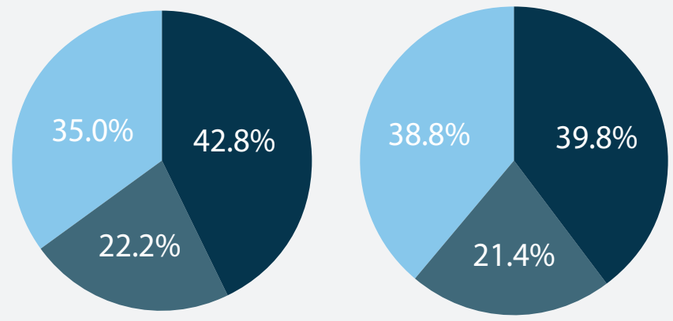
Active Pilots By Certificate

2022

Total Active Pilots: **474,450***

2042

Total Active Pilots: **500,720**



**Excludes Student Pilot Certificates*

Source: FAA Aerospace Forecasts FY2022-2042

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Business Jets: Business jet deliveries increased from 644 units in 2020 to 710 units in 2021, rebounding from the previous year's drop from 809. The North American market accounted for 66 percent of business jet deliveries, which was 0.1 percent decrease in market share compared to 2020.

Turboprops: Turboprop shipments were up from 443 in 2020 to 527 in 2021. North America's market share of turboprop aircraft, however, decreased by 2.3 percent in the last year. The European and Asia-Pacific markets also decreased, while Latin American and Middle East & African markets increased their market share.

Pistons: In 2021, piston airplane shipments increased to 1,409 units compared to 1,321 units prior year. North America's market share of piston aircraft deliveries rose 0.8 percent from the year 2020. The European, Latin American, and Middle East & African markets experienced a positive rate in market share during the past year, while Asia-Pacific saw a decline.

U.S. PILOT POPULATION

There were 470,408 active pilots certified by the FAA at the end of 2021, with 474,450 active pilots projected in 2022

There were 470,408 active pilots certified by the FAA at the end of 2021, with 474,450 active pilots projected in 2022. All pilot categories, except for private and recreational-only certificates, are expected to continue to increase. Excluding student pilots, the number of active general aviation pilots is projected to increase by about 26,270 (up 0.3 percent annually) between 2022 and 2042. The ATP category is forecast to increase by 28,300 (up 0.8 percent annually). Sport pilots and commercial pilots are predicted to increase by 2.7 percent and 0.1 percent annually, respectively, over the forecast period, while private pilot certificates are projected to decrease at an average annual rate of 0.5 percent through 2042. The FAA has currently suspended the student pilot forecast.

RISKS TO THE FORECAST

While the FAA is confident that its forecasts for aviation demand and activity can be reached, this is dependent on several factors, including the strength of the global economy, security (including the threat of international terrorism), and oil prices. Higher oil prices could lead to further shifts in consumer spending away from aviation, dampening a recovery in air transport demand. The COVID-19 pandemic introduced a new risk, and though the industry has rebounded, the threat of future global health pandemics and potential economic fallout remain.

AIRPORT SERVICE AREA

The first step in determining the aviation demand for an airport is to define its generalized service area for various segments of aviation the airport can accommodate. The service area is determined primarily by evaluating the location of competing airports, their capabilities, their services, and their relative attraction and convenience. In determining the aviation demand for an airport, it is necessary to identify

the role of the airport as well as the specific areas of aviation demand the airport is intended to serve. HDE is classified in the NIPIAS as a Local GA airport, meaning its primary role is to serve general aviation providing communities with access to local and regional markets. These airports account for 36 percent of all NPIAS airports and have moderate levels of activity with some multi-engine propeller aircraft, which typically accommodate flight training, emergency service, and charter passenger service.

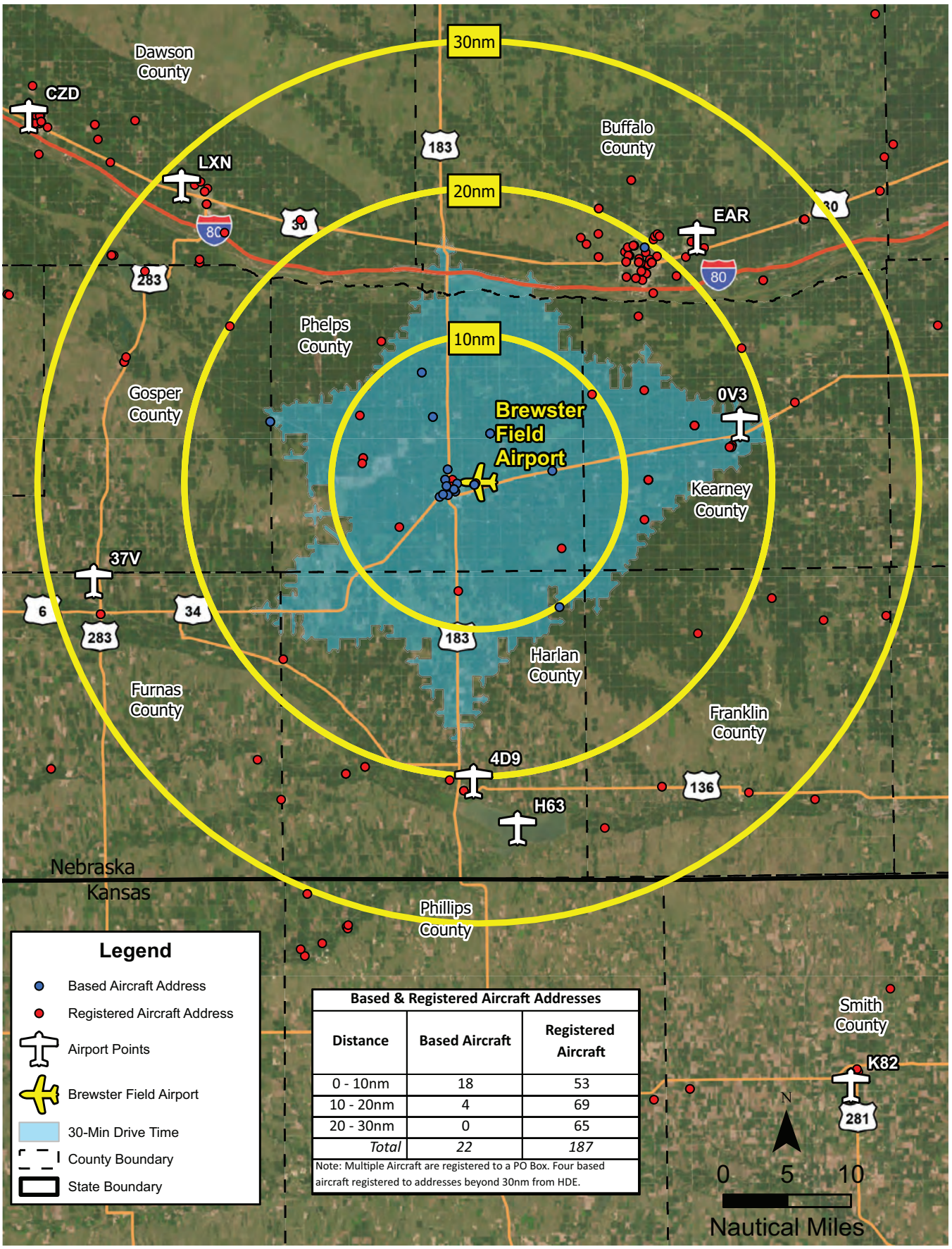
The service area for an airport is a geographic region from which an airport can be expected to attract the largest share of its activity.

The service area for an airport is a geographic region from which an airport can be expected to attract the largest share of its activity. The definition of the service area can then be used to identify other factors, such as socioeconomic and demographic trends, which influence aviation demand at the airport. Moreover, aviation demand will be impacted by the proximity of competing airports, the surface transportation network, and the strength of general aviation services provided by the airport and competing airports.

As in any business enterprise, the more attractive the facility is in terms of service and capabilities, the more competitive it will be in the market. If an airport's attractiveness increases in relation to nearby airports, so will the size of its service area. If facilities and services are adequate and/or competitive, some level of aviation activity might be attracted to the airport from more distant locales.

The service area for a local GA airport like HDE typically extends up to a 30-nm radius around the airport but can stretch beyond this. The proximity and level of GA services are largely the defining factors when describing the GA service area. Within 30 nm of HDE, there are four other NPIAS airports offering varying levels of service including Pioneer Village Field Airport (0V3) located 18.2 nm east-northeast, Alma Municipal Airport (4D9) located 20.4 nm south, Kearney Regional Airport (EAR) located 22.3 nm northeast, and Jim Kelly Field Airport (LXN) located 28.5 nm northwest. Even though there are several competing airports nearby, HDE is the only NPIAS airport in Phelps County. Harlan County Lake Seaplane Base (H63) and Arapahoe Municipal Airport (37V), which are not part of the NPIAS, are located 23.7 nm south and 27 nm west-southwest, respectively. There are two additional NPIAS airports within a 50-nautical mile (nm) radius: Cozad Municipal Airport (CZD) located 39.4 nm to the northwest and Smith Center Municipal Airport (K82) located 48.2 nm south-southeast. These airports are somewhat distant but can still have an influence on HDE.

There are two primary demand components that must be addressed in order to define the HDE GA service area. The first is the airport's ability to attract based aircraft. Convenience is generally the determining factor in an aircraft owner's decision to base at an airport, with proximity to their residence or business being a key incentive. **Exhibit 12** depicts a 30-minute drive time isochrone from HDE, which encompasses a significant portion of Phelps County and extends east into Kearney County and south into Harlan County. Portions of southern Buffalo County are also within a 30-minute drive time from HDE. The exhibit also illustrates the location of based and registered aircraft in the region. There are 26 based aircraft at HDE, with 18 registered to addresses within 10 nm of the airport and highly concentrated in and around the City of Holdrege. Four based aircraft are registered at addresses between 10nm and 20 nm, and the remaining four based aircraft are registered to addresses beyond a 30 nm radius, which is common for business aircraft registered to corporations or for aircraft owners that reside out-of-state



Legend

- Based Aircraft Address
- Registered Aircraft Address
- Airport Points
- Brewster Field Airport
- 30-Min Drive Time
- County Boundary
- State Boundary

Based & Registered Aircraft Addresses

Distance	Based Aircraft	Registered Aircraft
0 - 10nm	18	53
10 - 20nm	4	69
20 - 30nm	0	65
Total	*22*	*187*

Note: Multiple Aircraft are registered to a PO Box. Four based aircraft registered to addresses beyond 30nm from HDE.

for a portion of the year. The map shows clusters of registered aircraft with the most significant concentrations in the Kearney area, approximately 20+ nm northeast of HDE. Registrations within Phelps County are also focused near Holdrege with a few more scattered in the surrounding areas. In total, there are 187 registered aircraft within 30 nm of HDE.

The second demand segment to consider is itinerant aircraft operations. In most instances, pilots will choose to utilize airports nearer their intended destination; however, this is also contingent on the airport's capabilities to accommodate the aircraft operator. As a result, airports offering quality services and facilities are more likely to attract itinerant operators in the region.

The primary service area for HDE is defined as Phelps County.

With several competing airports in the region, HDE's primary service area is defined by its convenience to its users (access to Highway 6/34) and its ability to compete for based aircraft. Of the four other public use airports within the 30 nm radius that are included in the NPIAS, only two (Kearny Regional Airport and Jim Kelly Field Airport) offer competitive aviation services. However, one is in Dawson County northwest of HDE and the other in Buffalo County northeast of HDE. Both are outside of the 20 nm radius and well outside of the 30-minute drive time isochrone. The airport and its 30-minute drive time isochrone are largely contained within Phelps County. HDE also offers competitive facilities including a 4,701-foot runway that can accommodate small and some mid-sized business jets and have instrument approach capabilities, availability of Jet A fuel, and aircraft maintenance services. The area is well known for its aerial application and travel by medical professionals proving essential services to the City of Holdrege and Phelps County. Therefore, HDE's primary service area is defined as Phelps County with secondary areas extending to those areas beyond that are within the 30-minute drive time isochrone.

EXISTING FORCASTS

2022 TERMINAL AREA FORECAST (TAF)

The TAF is the official FAA forecast of aviation activity for U.S. airports. It contains active airports in the NPIAS including FAA-towered airports, federal contract towered airports, non-federal towered airports, and non-towered airports. The TAF includes forecasts for air carrier, air-taxi/commuter, general aviation, and military categories. While the TAF can and does provide a point of reference for comparison, its purpose is much broader in defining FAA national workload measures. The current TAF was published in March 2022 and is based on the federal fiscal year (October-September).

As presented in **Table 8,** the TAF projects general aviation activity at HDE to remain static over the forecast period. A static projection is not an indicator of FAA's true value of future activity at HDE; instead, it is the common practice by the FAA forecasters for airports without an airport traffic control tower (ATCT). Given that there is currently no commercial service activity at HDE, the TAF does not reflect any existing and/or forecast air carrier operations or air taxi operations, nor does it reflect any military operations over the forecast period. The TAF estimates that local and itinerant GA operations comprise all the operational activity at the airport and are estimated to account for approximately 62.50 percent and 37.50 percent of operations, respectively, over the planning period. Based aircraft are also projected to remain flat over the next 20 years.

TABLE 8 | Total Operations forecast

Year	Air Carrier	Itinerant GA	Itinerant Military	Itinerant Air Taxi	Local GA	Local Military	Total	Based Aircraft
2022	0	6,000	0	0	10,000	0	16,000	25
2027	0	6,000	0	0	10,000	0	16,000	25
2032	0	6,000	0	0	10,000	0	16,000	25
2042	0	6,000	0	0	10,000	0	16,000	25

Source: 2022 Terminal Area Forecast (TAF)

REGISTERED AIRCRAFT FORECAST

Historical registered aircraft counts for Phelps County from 1993 to 2022 are presented in **Table 9**. Aircraft registrations have grown from a low of 24 in 2001-2002 to 52 registrations reported in 2022. The historic peak over this period was reached in 2021, when there were 53 aircraft registered in the county.

TABLE 9 | Phelps County, NE Registered Aircraft

Year	Single Engine Piston	Multi Engine Piston	Turboprop	Jet	Helicopter	UAV	Other	Total
1993	34	1	0	0	0	0	0	35
1994	33	0	1	0	0	0	0	34
1995	33	0	1	0	0	0	0	34
1996	31	0	1	0	0	0	0	32
1997	31	0	1	0	0	0	0	32
1998	28	0	1	0	0	0	0	29
1999	24	0	1	0	0	0	0	25
2000	24	0	1	0	0	0	0	25
2001	23	0	1	0	0	0	0	24
2002	23	0	1	0	0	0	0	24
2003	23	2	3	0	0	0	0	28
2004	26	1	3	0	0	0	0	30
2005	22	1	3	0	0	0	0	26
2006	25	2	0	0	0	0	0	27
2007	23	2	0	0	0	0	0	25
2008	21	2	3	1	1	0	0	28
2009	22	2	4	0	0	0	0	28
2010	22	3	6	0	0	0	0	31
2011	22	3	6	0	1	0	0	32
2012	23	3	7	1	1	0	0	35
2013	22	2	10	1	2	0	0	37
2014	24	3	8	1	1	0	0	37
2015	24	3	8	2	1	0	0	38
2016	27	3	8	2	1	0	0	41
2017	31	3	9	2	3	0	0	48
2018	31	2	10	2	3	0	0	48
2019	32	1	9	3	4	0	0	49
2020	33	1	12	3	3	0	0	52
2021	33	1	15	3	1	0	0	53
2022*	29	1	17	3	1	1	0	52

UAV – Unmanned Aerial Vehicle
*Fleet mix reported through 9/13/22

Source: FAA Registered Aircraft

As detailed in the table, the single engine piston aircraft category represents the most registered aircraft in the county in 2022, with 29 of the 52 registered aircraft, accounting for 56 percent of aircraft. Turboprops made up the next largest segment with 17 registrations, or 33 percent of the fleet mix. Turboprops have been on an incline since 2002 and nearly doubled in 2022 catching up to the single engine piston aircraft within Phelps County. There were also three jets, one multi-engine aircraft, one helicopter, and one unmanned aerial vehicle (UAV).

New registered aircraft forecasts have been prepared for Phelps County, which will ultimately be used to determine projections for based aircraft at HDE over the next 20 years. The first forecast considers the relationship between Phelps County's market share of registered aircraft to that of total U.S. active GA aircraft. Essentially, this involves a comparison of the service area aircraft ownership trend against the nation's ownership trends. This analysis is detailed in **Table 10** and on **Figure 4**. The county's market share of aircraft ownership was 0.0254 percent in 2022. The constant market share forecast maintains the current market share over the forecast period resulting in a near stagnant growth in registrations, with just one additional aircraft registration in the county by 2042, reflective of a CAGR of 0.10 percent.

Two increasing market share forecasts were also prepared. The first considered a low-range scenario based upon the county's historic high market share, which was 0.0259 percent in 2021. This forecast resulted in 54 registered aircraft in the county by 2042 and a CAGR of 0.59 percent. The high-range market share forecast considered a slightly more aggressive approach based on the 5-year growth rate of the market share of U.S. aircraft (2.32 percent CAGR), which produced 82 registered aircraft in the county by 2042.

A different set of forecasts were also considered, based on population trends. For these projections, service area registrations were compared to the population in Phelps County, resulting in a ratio of registered aircraft per 1,000 residents. Population has been steadily decreasing over time and is projected to continue. In 2022, there were 5.82 aircraft per 1,000 residents. When this ratio is carried through the plan years as a constant, the result is a declined growth scenario, with one less registered aircraft by 2042. An increasing ratio projection was also developed. The high-range option based on a 0.79 percent CAGR. This produced a forecast of 62 county-registered aircraft by the end of the planning period.

Several regression forecasts were prepared, including single-variable regressions examining registered aircraft's correlation with the Phelps County population, employment, per capita personal income (PCPI), and gross regional product (GRP) growth trends and its correlation with U.S. active general aviation aircraft. Multiple variable regressions were also prepared combining the various variables. An r^2 value of over 0.9 is the general threshold to determine dependability. Only one of the regressions produced a strong correlation (r^2 value over 0.9); therefore, the remaining regression forecasts were not considered further.

The highest r^2 value by a single variable was the time-series regression, which had an r^2 value of 0.89 indicating a relatively strong correlation. This regression resulted in 80 registered aircraft in the county by 2042 and a CAGR of 2.08 percent.

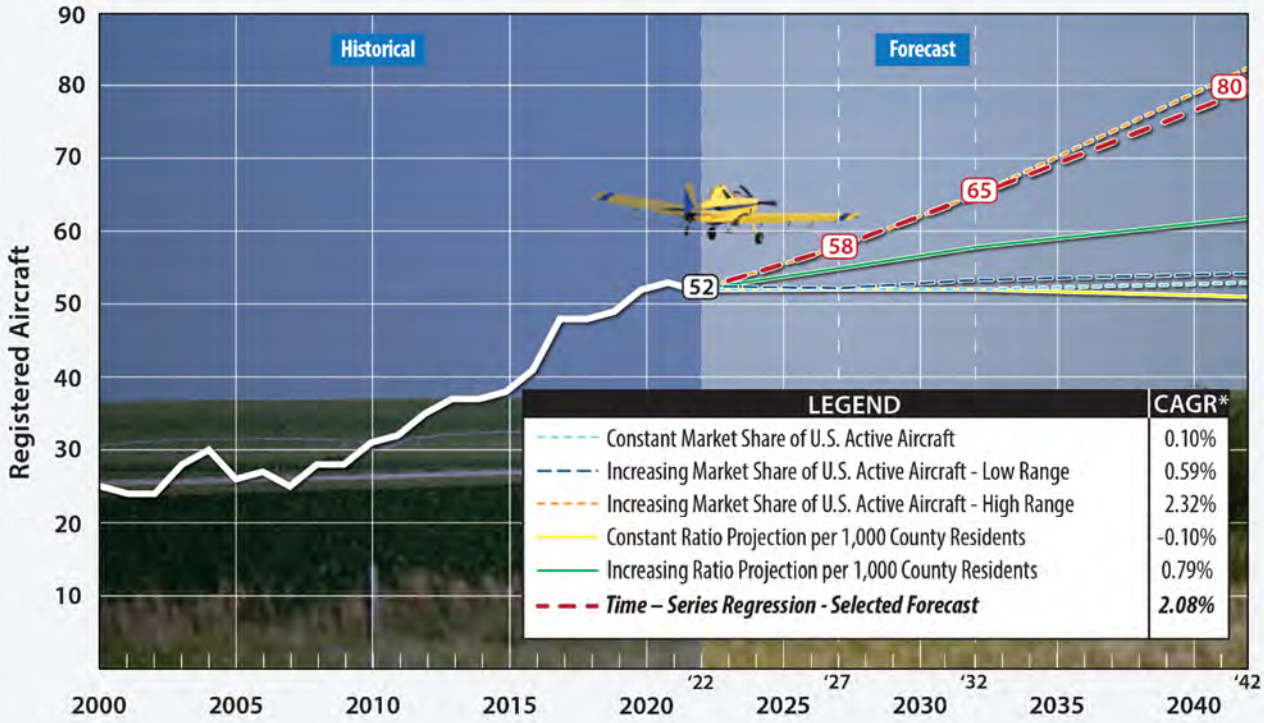
TABLE 10 | Registered Aircraft Forecast - Phelps County, NE

Year	Service Area Registrations	U.S. Active GA Aircraft	Percent of U.S. Active GA Aircraft	Service Area Population	Aircraft Per 1,000 Population
2000	25	217,533	0.0115%	9,733	2.57
2001	24	211,446	0.0114%	9,704	2.47
2002	24	211,244	0.0114%	9,684	2.48
2003	28	209,606	0.0134%	9,576	2.92
2004	30	219,319	0.0137%	9,535	3.15
2005	26	224,257	0.0116%	9,402	2.77
2006	27	221,942	0.0122%	9,405	2.87
2007	25	231,606	0.0108%	9,222	2.71
2008	28	228,664	0.0122%	9,195	3.05
2009	28	223,876	0.0125%	9,148	3.06
2010	31	223,370	0.0139%	9,183	3.38
2011	32	220,453	0.0145%	9,137	3.50
2012	35	209,034	0.0167%	9,200	3.80
2013	37	199,927	0.0185%	9,168	4.04
2014	37	204,408	0.0181%	9,147	4.05
2015	38	210,031	0.0181%	9,199	4.13
2016	41	211,794	0.0194%	9,176	4.47
2017	48	211,757	0.0227%	9,025	5.32
2018	48	211,749	0.0227%	8,973	5.35
2019	49	210,981	0.0232%	8,957	5.47
2020	52	204,140	0.0255%	8,968	5.80
2021	53	204,405	0.0259%	8,937	5.93
2022	52	204,590	0.0254%	8,941	5.82
Constant Market Share of U.S. Active Aircraft (CAGR 0.10%)					
2027	52	204,925	0.0254%	8,940	5.82
2032	52	205,195	0.0254%	8,912	5.83
2042	53	208,905	0.0254%	8,768	6.04
Increasing Market Share of U.S. Active Aircraft Low-Range (CAGR 0.59%)					
2027	52	204,925	0.0255%	8,940	5.82
2032	53	205,195	0.0257%	8,912	5.95
2042	54	208,905	0.0259%	8,768	6.16
Increasing Market Share of U.S. Active Aircraft High-Range (CAGR 2.32%)					
2027	58	204,925	0.0289%	8,940	6.52
2032	65	205,195	0.0323%	8,912	7.34
2042	82	208,905	0.0392%	8,768	9.38
Constant Ratio Projection per 1,000 County Residents (CAGR -0.10%)					
2027	52	204,925	0.0254%	8,940	5.82
2032	52	205,195	0.0253%	8,912	5.82
2042	51	208,905	0.0244%	8,768	5.82
Increasing Ratio Projection per 1,000 County Residents (CAGR 0.79%)					
2027	55	204,925	0.0268%	8,940	6.14
2032	58	205,195	0.0283%	8,912	6.46
2042	62	208,905	0.0297%	8,768	7.10
Time–Series Regression (CAGR 2.08%) – Selected Forecast					
2027	58	204,925	0.0283%	8,940	6.49
2032	65	205,195	0.0317%	8,912	7.29
2042	80	208,905	0.0383%	8,768	9.12

CAGR: Compound Annual Growth Rate

Source: FAA Aircraft Registration Database; FAA Aerospace Forecasts- Fiscal Years 2022-2042; Woods and Poole (2022).

Figure 4: Phelps County Registered Aircraft



* **CAGR** - Compound Annual Growth Rate

Sources: FAA Aircraft Registration Database; FAA Aerospace Forecasts- Fiscal Years 2022-2042; Woods and Poole (2022).

The registered aircraft projections resulted in a range between 51 and 80 registered aircraft in Phelps County by 2042. The constant market share shows virtually no growth in the county registered aircraft, while the low-range market share resulted in a slow growth rate, both likely underestimate the growth of Phelps County registered aircraft. Similarly, the constant ratio projection shows a declined growth rate, and the increasing ratio projects another slow growth, which also appear to misconstrue the county's long-term potential to capture more of the market share, with just nine aircraft projected over the next 20 years. Examining the past 20-year period, the county has experienced modest growth in registered aircraft, and it is anticipated that this trend will continue into the next 20-year period as the national fleet and economic growth is expected to continue. Ultimately, the selected forecast for registered aircraft for Phelps County is the time-series regression projection, with a CAGR of 2.08 percent. This projection shows an increase from 52 registered aircraft in 2022 to 58 in 2027, 65 in 2032, and 80 in 2042.

BASED AIRCRAFT FORECAST

There are currently 26 based aircraft at Brewster Field Airport

Nationally, based aircraft records have been historically inconsistent. Airports were not required to report their based aircraft totals to the FAA until recently, and any data that was provided was not validated. Now, however, based aircraft counts are included on a registry that the FAA updates and maintains with validated information. The most recent FAA-validated based aircraft count for HDE was 26 aircraft, which was reported in July 2022.

Based aircraft forecasts build upon the registered aircraft projections developed in the previous section. Like those forecasts, market share and ratio analyses were performed to produce a range of projections for based aircraft at HDE. These forecasts are detailed in **Table 11** and **Figure 5**.

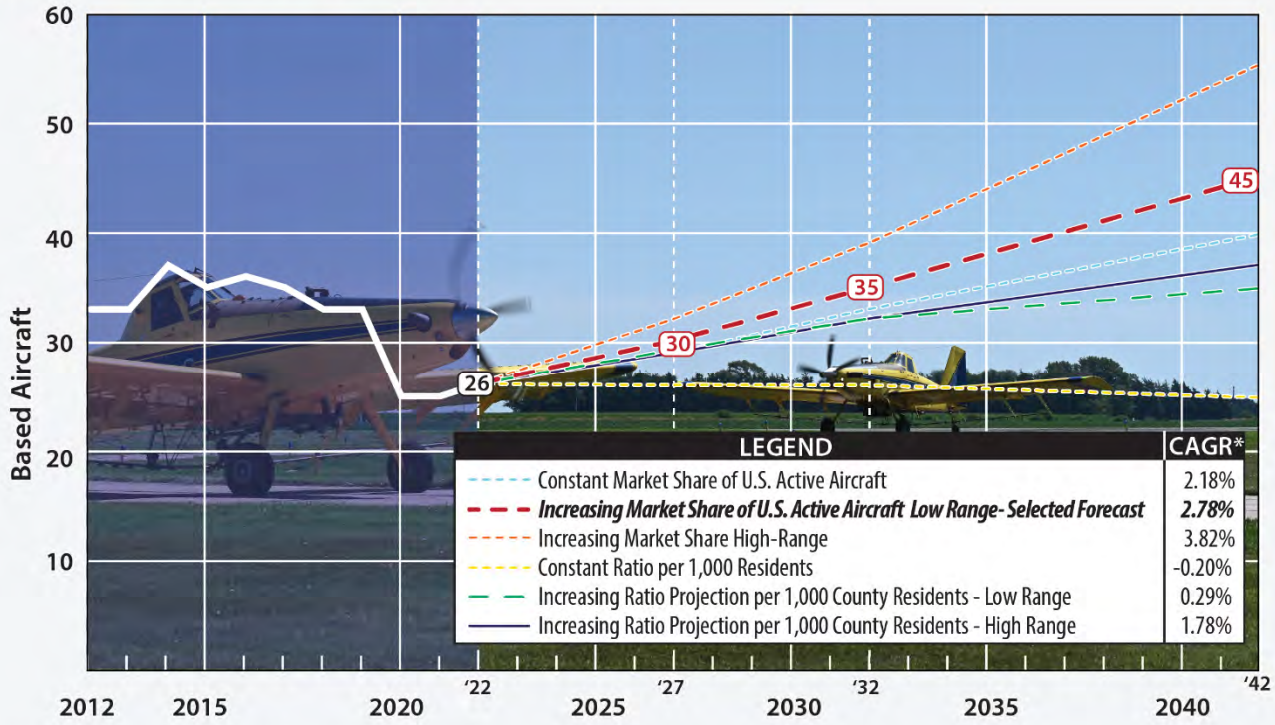
TABLE 11 | Based Aircraft Forecasts

Year	HDE Based Aircraft	Phelps County Registrations	Market Share %	Population	Aircraft Per 1,000 Residents
2012	33	35	94.29%	9,200	3.59
2013	33	37	89.19%	9,168	3.60
2014	37	37	100.00%	9,147	4.05
2015	35	38	92.11%	9,199	3.80
2016	36	41	87.80%	9,176	3.92
2017	35	48	72.92%	9,025	3.88
2018	33	48	68.75%	8,973	3.68
2019	33	49	67.35%	8,957	3.68
2020	25	52	48.08%	8,968	2.79
2021	25	53	47.17%	8,937	2.80
2022	26	52	50.00%	8,941	2.91
Constant Market Share (CAGR 2.18%)					
2027	29	58	50.00%	8,940	3.24
2032	33	65	50.00%	8,912	3.65
2042	40	80	50.00%	8,768	4.56
Increasing Market Share Low-Range (CAGR 2.78%) – Selected Forecast					
2027	30	58	51.57%	8,968	3.34
2032	35	65	53.14%	8,937	3.86
2042	45	80	56.27%	8,941	5.03
Increasing Market Share High-Range (CAGR 3.82%)					
2027	32	58	54.69%	8,940	3.55
2032	39	65	59.38%	8,912	4.33
2042	55	80	68.75%	8,768	6.27
Constant Ratio per 1,000 Residents (CAGR -0.20%)					
2027	26	58	44.83%	8,940	2.91
2032	26	65	40.00%	8,912	2.91
2042	25	80	31.25%	8,768	2.91
Increasing Ratio per 1,000 Residents Low-Range (CAGR 0.29%)					
2027	29	58	50.00%	8,940	3.19
2032	31	65	47.69%	8,912	3.48
2042	35	80	43.75%	8,768	4.05
Increasing Ratio per 1,000 Residents High-Range (CAGR 1.78%)					
2027	29	58	50.00%	8,940	3.22
2032	32	65	49.23%	8,912	3.54
2042	37	80	46.25%	8,768	4.17

Sources: Airport records; FAA TAF; Woods & Poole CEDDS 2022

The first forecast considered a constant market share. In 2022, the airport held 50.00 percent of the market share, with 26 of the 52 registered aircraft in Phelps County basing at HDE. Carrying this market share percentage forward through the plan years results in 40 based aircraft by 2042.

Figure 5: Based Aircraft Forecasts



* **CAGR** - Compound Annual Growth Rate

Sources: Airport records; FAA TAF; Woods & Poole CEDDS 2022

Based on the historic based aircraft count at HDE two increasing market share were also evaluated. The low-range increasing market share establishes an average 5-year market share of 56.27 percent. This results in four additional based aircraft by 2027, growing to 19 aircraft basing at HDE by 2042, reflective of a 2.78 percent CAGR. The high-range increasing market share considered a return to the 5-year peak market share of 68.75 percent that was reached in 2018. This forecast resulted in 55 registered aircraft in the county by 2042 and a CAGR of 3.82 percent.

The ratio of based aircraft to county population was also examined in both constant and increasing scenarios. There were 2.91 based aircraft per 1,000 residents in 2022. This ratio when carried through as a constant resulted in one less based aircraft by 2042 due to the projected decline in county population.

Two increasing ratio projections for based aircraft have been developed. The first considered a return to the historic high ratio of registered aircraft per 1,000 county residents, which was 4.05 in 2014. Applying this ratio to the end of the planning period results in nine new based aircraft at HDE by 2042, for a total of 35. The second increasing ratio projection considered a scenario of 4.17 ratio of based aircraft per 1,000 residents being reached by the end of the planning period. This results in the addition of 11 new based aircraft by 2042, reflective of a 1.78 percent CAGR.

The projections produced a range between 25 and 55 aircraft potentially basing at HDE by the end of the planning period. With no current hangar vacancies, plans are in place for additional hangar developments in the near term with interest from several individuals to lease those hangars, which indicates demand for increased based aircraft at the airport. Based on this potential for increased demand at HDE, the increasing market share low-range projection will be carried forward as the selected forecast.

BASED AIRCRAFT FLEET MIX

The type of aircraft based at an airport is another important consideration when planning for the future. Currently, the fleet mix at HDE consists of 19 single engine piston aircraft, two multi-engine, three turboprops, and two jets. Given that the total number of based aircraft at the airport is projected to increase over the planning period, it is necessary to project how the fleet mix will change over this time. A forecast of the evolving fleet mix will ensure that adequate facilities are planned to accommodate these aircraft in the future.

The fleet mix projection for HDE was determined by comparing the airport's existing fleet mix to national general aviation fleet mix trends. The forecast for the active U.S. GA fleet shows increasing trends in turbine and jet aircraft, with piston aircraft declining over the next 20 years. Multi-engine piston aircraft are anticipated to ultimately be phased out altogether. Growth is expected in experimental and light sport aircraft as well. The GAMA has high optimism that innovations in electric propulsion and supersonic technologies will increase in the sector's global reach, which will result in the growth of experimental and light sport aircraft.

Table 12 details the fleet mix projection prepared for HDE. While these forecasts take into account national trends, the fleet mix at HDE is anticipated to continue to consist primarily of piston aircraft over the planning period, with the addition of one turboprop, three jets, three helicopters, and one multi-engine phasing out by the end of the planning period.

TABLE 12 | Based Aircraft Fleet Mix

	EXISTING		FORECAST					
Aircraft Type	**2022**	**%**	**2027**	**%**	**2032**	**%**	**2042**	**%**
Single Engine Piston	19	73.08%	21	70.00%	25	71.43%	32	71.11%
Multi-Engine Piston	2	7.69%	2	6.67%	1	2.86%	1	2.22%
Turboprop	3	11.54%	3	10.00%	3	8.57%	4	8.89%
Jet	2	7.69%	3	10.00%	4	11.43%	5	11.11%
Helicopter	0	0.00%	1	3.33%	2	5.71%	3	6.67%
Totals	**26**	**100.00%**	**30**	**100.00%**	**35**	**100.00%**	**45**	**100.00%**

Source: Airport records; Coffman Associates analysis

GENERAL AVIATION OPERATIONS

General aviation operations are classified as either local or itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Generally, local operations are characterized by

training operations or operations that remain in local airspace that originate and conclude at the same airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Typically, itinerant operations increase with business and commercial use, since business aircraft are not generally used for large scale training activities.

As a non-towered airport, operational estimates for HDE are derived from several sources, including the FAA TAF and the FAA Form 5010, *Airport Master Record*. Both the TAF and the current version of HDE's *Airport Master Record* reflect a total of 16,000 operations in 2022. The TAF and *Airport Master Record* did not record any air taxi operations; therefore, a further evaluation was made. Annual air taxi operations for 2022 were estimated to be 112 based on data obtained from AirportIQ, which is a data collection service that contains archived aviation data on U.S. airports. A total of 16,112 operations has been selected for use as the base year total operations count from which new operational forecasts will be developed.

Itinerant GA Operations Forecast

Itinerant operations occurring at HDE account for approximately 38 percent of total operations. Several forecasts for itinerant GA operations have been prepared, as presented in **Table 13** and on **Figure 6**. In 2022, HDE was estimated to have experienced 6,000 itinerant GA operations. Like the previous projections, market share and ratio comparisons have been made. For the market share evaluations, HDE's annual itinerant operations have been compared to total U.S. itinerant general aviation operations. The first projection evaluates a constant market share scenario, where the airport's 2022 market share of 0.0412 percent is maintained through the planning period. Keeping this figure at a constant resulted in an increase of itinerant operations over the next 20 years, with 6,700 operations projected by 2042, reflective of a 0.55 percent CAGR.

Three increasing market share forecasts were also prepared based on low-, mid-, and high-range scenarios. The low-range growth scenario, which resulted in slow growth in annual itinerant operations, forecasts 7,390 operations by 2042. The mid-range scenario, which produced a marginal increase in annual itinerant operations, forecasts the airport's market share will grow to 0.0502 percent by 2042, or 8,160 operations. The high-range scenario achieves a market share of 0.0611 percent by the end of the planning period. This resulted in a strong growth with the addition of 3,930 operations at HDE by 2042, for a total of 9,930 itinerant GA operations.

Another forecasting methodology utilized considers the number of itinerant operations occurring at HDE compared to the number of based aircraft at the airport in both constant and increasing scenarios. In 2022, with 6,000 itinerant operations and 26 based aircraft, there were 231 itinerant operations per based aircraft. When this figure is carried through the planning period, the result is a significant increase in itinerant GA operations. The constant ratio projection results in a CAGR of 2.79 percent, or 10,400 annual itinerant operations by 2042. An increasing ratio projection was also analyzed, resulting in more aggressive growth in this operational category, with 12,630 annual itinerant operations projected by 2042, for a CAGR of 3.79 percent.

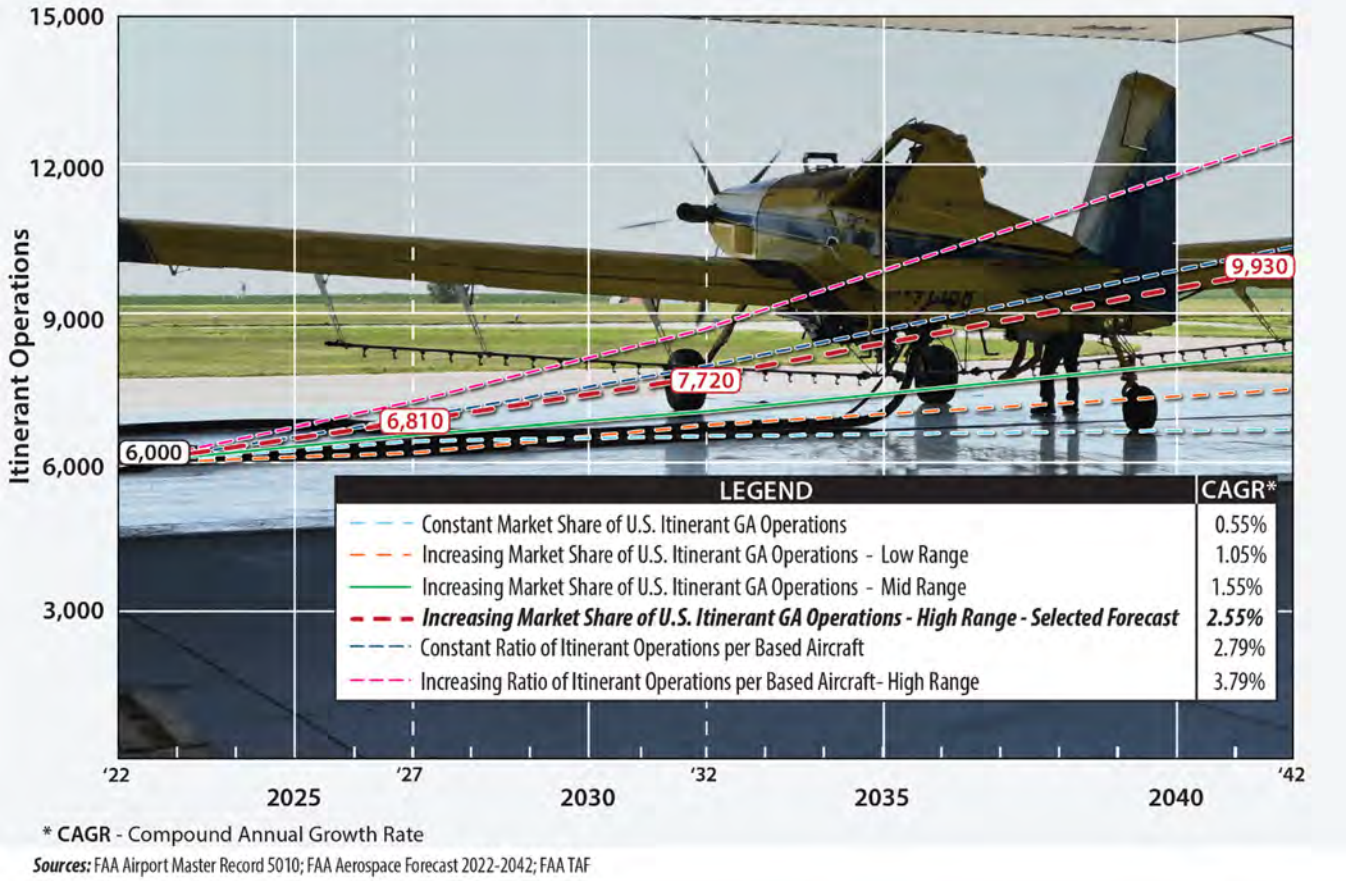
TABLE 13 | General Aviation Itinerant Operations

Year	HDE Itinerant Operations	U.S. ATCT GA Itinerant Operations	HDE Share %	HDE Based Aircraft	Itinerant Ops per Based Aircraft
2022	6,000	14,569,014	0.0412%	26	231
Constant Market Share of U.S. Itinerant GA Operations (CAGR 0.55%)					
2027	6,440	15,636,300	0.0412%	30	215
2032	6,520	15,838,715	0.0412%	35	189
2042	6,700	16,259,605	0.0412%	45	149
Increasing Market Share of U.S. Itinerant GA Operations Low-Range (CAGR 1.05%)					
2027	6,320	15,636,300	0.0404%	30	211
2032	6,660	15,838,715	0.0420%	35	193
2042	7,390	16,259,605	0.0455%	45	164
Increasing Market Share of U.S. Itinerant GA Operations Mid-Range (CAGR 1.55%)					
2027	6,480	15,636,300	0.0414%	30	217
2032	7,000	15,838,715	0.0442%	35	203
2042	8,160	16,259,605	0.0502%	45	181
Increasing Market Share of U.S. Itinerant GA Operations High-Range (CAGR 2.55%) – Selected Forecast					
2027	6,810	15,636,300	0.0436%	30	228
2032	7,720	15,838,715	0.0487%	35	224
2042	9,930	16,259,605	0.0611%	45	221
Constant Ratio of Itinerant Operations per Based Aircraft (CAGR 2.79%)					
2027	6,910	15,636,300	0.0442%	30	231
2032	7,980	15,838,715	0.0504%	35	231
2042	10,400	16,259,605	0.0640%	45	231
Increasing Ratio of Itinerant Operations per Based Aircraft High-Range (CAGR 3.79%)					
2027	7,230	15,636,300	0.0462%	30	242
2032	8,700	15,838,715	0.0549%	35	252
2042	12,630	16,259,605	0.0777%	45	281

Sources: FAA Airport Master Record 5010; FAA Aerospace Forecast 2022-2042; FAA TAF

The forecasts prepared resulted in a range between 6,700 and 12,630 annual itinerant GA operations at HDE. For HDE, growth in itinerant operations is anticipated, driven primarily by the potential for more based aircraft. The airport is also the only facility in Phelps County offering a 4,701-foot runway, making it attractive to itinerant operations who require longer runway lengths. Aerial application operations are also a driving factor at HDE and are anticipated to grow throughout the planning period. Additionally, HDE is a known as a critical medical site and maintains steady traffic, which contributes to the itinerant operations. As such, the high-range increasing market share forecast, reflective of a 2.55 percent CAGR, has been selected as the most reasonable projection.

Figure 6: General Aviation Itinerant Operations Forecast



* **CAGR** - Compound Annual Growth Rate

Sources: FAA Airport Master Record 5010; FAA Aerospace Forecast 2022-2042; FAA TAF

Local GA Operations Forecast

Local operations, or those that stay within the traffic pattern or are executing touch-and-go operations have also been forecast. This type of operation is most commonly conducted by GA operators and comprises the majority of the total operations, accounting for approximately 63 percent, occurring at HDE. In 2022, there were an estimated 10,000 local GA operations at the airport, which translated to a market share of 0.0728 percent and 385 operations per based aircraft. Like the itinerant forecasts, several market share projections were made. These forecasts are detailed in **Table 14** and on **Figure 7**.

The first forecast considers a constant market share with the airport's 2022 market share of 0.0728 percent maintained through 2042. This produced 11,480 local GA operations by the end of the planning period, for a CAGR of 0.69 percent.

Low-range, mid-range, and high-range increasing market share forecasts were also prepared. The low-range projection considered a growth scenario based on a CAGR of 1.19 percent and resulted in 12,670 operations by 2042, or an increase of about 1,500 local operations by the end of the planning period. The second increasing market share assessed a middle range between the low and high range, which produced 13,980 local operations, for a CAGR 1.69 percent. The high-range scenario produced a more aggressive growth rate of 2.69 percent, which, when compared with national projections for local GA activity, grew the airport's market share to 0.1078 percent by 2042, or 17,000 operations.

TABLE 14 | General Aviation Local Operations

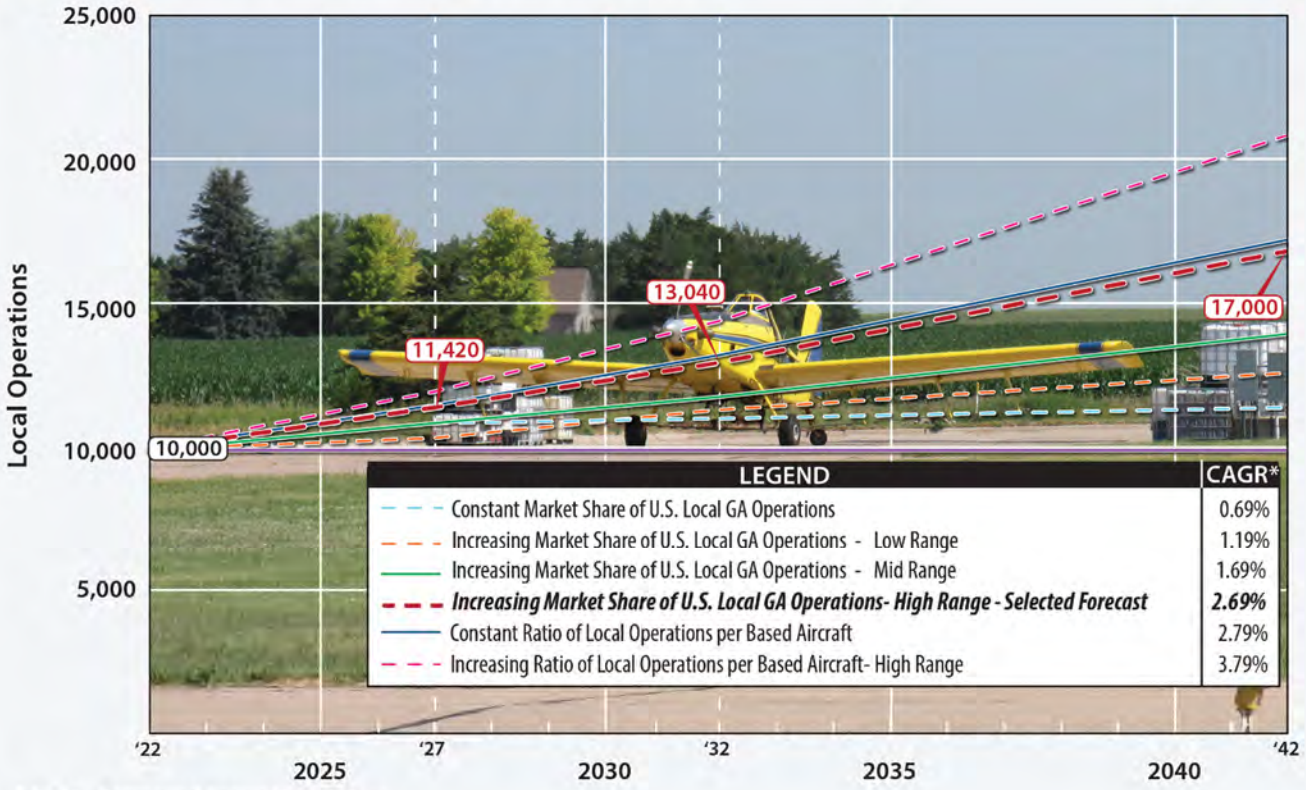
Year	HDE Local Operations	U.S. ATCT GA Local Operations	HDE Share %	HDE Based Aircraft	Local Ops per Based Aircraft
2022	10,000	13,731,399	0.0728%	26	385
Constant Market Share of U.S. Local GA Operations (CAGR 0.69%)					
2027	10,890	14,950,786	0.0728%	30	364
2032	11,080	15,214,104	0.0728%	35	321
2042	11,480	15,767,539	0.0728%	45	255
Increasing Market Share of U.S. Local GA Operations Low-Range (CAGR 1.19%)					
2027	10,610	14,950,786	0.0710%	30	355
2032	11,260	15,214,104	0.0740%	35	326
2042	12,670	15,767,539	0.0804%	45	281
Increasing Market Share of U.S. Local GA Operations Mid -Range (CAGR 1.69%)					
2027	10,870	14,950,786	0.0727%	30	363
2032	11,820	15,214,104	0.0777%	35	342
2042	13,980	15,767,539	0.0887%	45	311
Increasing Market Share of U.S. Local GA Operations High-Range (CAGR 2.69%) – Selected Forecast					
2027	11,420	14,950,786	0.0764%	30	382
2032	13,040	15,214,104	0.0857%	35	378
2042	17,000	15,767,539	0.1078%	45	378
Constant Ratio of Local Operations per Based Aircraft (CAGR 2.79%)					
2027	11,520	14,950,786	0.0771%	30	385
2032	13,300	15,214,104	0.0874%	35	385
2042	17,330	15,767,539	0.1099%	45	385
Increasing Ratio of Local Operations per Based Aircraft High-Range (CAGR 3.79%)					
2027	12,040	14,950,786	0.0805%	30	403
2032	14,510	15,214,104	0.0954%	35	420
2042	21,040	15,767,539	0.1334%	45	467

Sources: FAA Airport Master Record 5010; FAA Aerospace Forecast 2022-2042; FAA TAF

The next forecast considered a constant ratio of 385 local operations per based aircraft. When this figure is maintained through the plan years, local operations increase to 17,330 by 2042, reflective of a 2.79 percent CAGR. An increasing ratio projection was also developed, resulting in 21,040 local operations by the end of 2042.

The forecasts prepared resulted in a range between 11,480 and 21,040 local GA operations. Local operations at HDE will likely continue to dominate in terms of the airport's total activity, with steady growth anticipated to occur over the next 20 years as other aviation demand indicators increase alongside local and regional economic and industrial growth. Therefore, the preferred forecast is the high-range increasing market share, which reflects 11,420 in 2027, 13,040 in 2032, and 17,000 in 2042, for a CAGR of 2.69 percent.

Figure 7: General Aviation Local Operations Forecast



* **CAGR** - Compound Annual Growth Rate

Sources: FAA Airport Master Record 5010; FAA Aerospace Forecast 2022-2042; FAA TAF

AIR TAXI OPERATIONS FORECAST

The air taxi category can be classified as a subset of the itinerant operations category and includes aircraft involved in on-demand passenger charter, fractional ownership aircraft operations, small parcel transport, and air ambulance activity. While not typically a large percentage of total airport operations, air taxi operations can be conducted via more sophisticated aircraft, ranging from multi-engine piston aircraft up to large business jet aircraft. As a result, it is important to factor these types of operations at airports that experience substantial amounts of air taxi operations.

The air taxi category, which is subset of the itinerant operations category, is comprised of operations that are conducted by aircraft operating under the 14 CFR Part 135. Part 135 operations are “for hire” or “on-demand” and include charter and commuter flights, air ambulance, or fractional ownership aircraft operations. The FAA Form 5010 and the FAA TAF do not account for any air taxi operations at HDE. However, information obtained from Airport IQ, a data collection service that contains archived aviation data on U.S. airports, indicates otherwise. For a 12-month period ending in October 2022, Airport IQ recorded 112 air taxi operations at the airport. This figure will thus be carried forward as a more accurate reflection of air taxi activity occurring at HDE.

Like the previous operations forecasts, several market share projections were developed that considered different growth scenarios. Nationally, the airport holds 0.0018 percent of the market share of air taxi operations. Carrying this percentage forward throughout the planning period resulted in a CAGR of 0.52 percent, or 124 air taxi operations by 2042. Next, three increasing market share forecasts were calculated based on low, mid, and high range scenarios. The low range scenario produced a forecast of 142 air taxi operations by 2042, equating to a CAGR of 1.19 percent. The midrange took an average of the low and high range, which produced 223 air taxi operations by 2042, at a CAGR of 3.50 percent. The high-range scenario projects 308 air taxi operations for a CAGR of 5.19 percent. **Table 15** and **Figure 8** details each of the forecasts completed for air taxi operations throughout the long-term planning horizon.

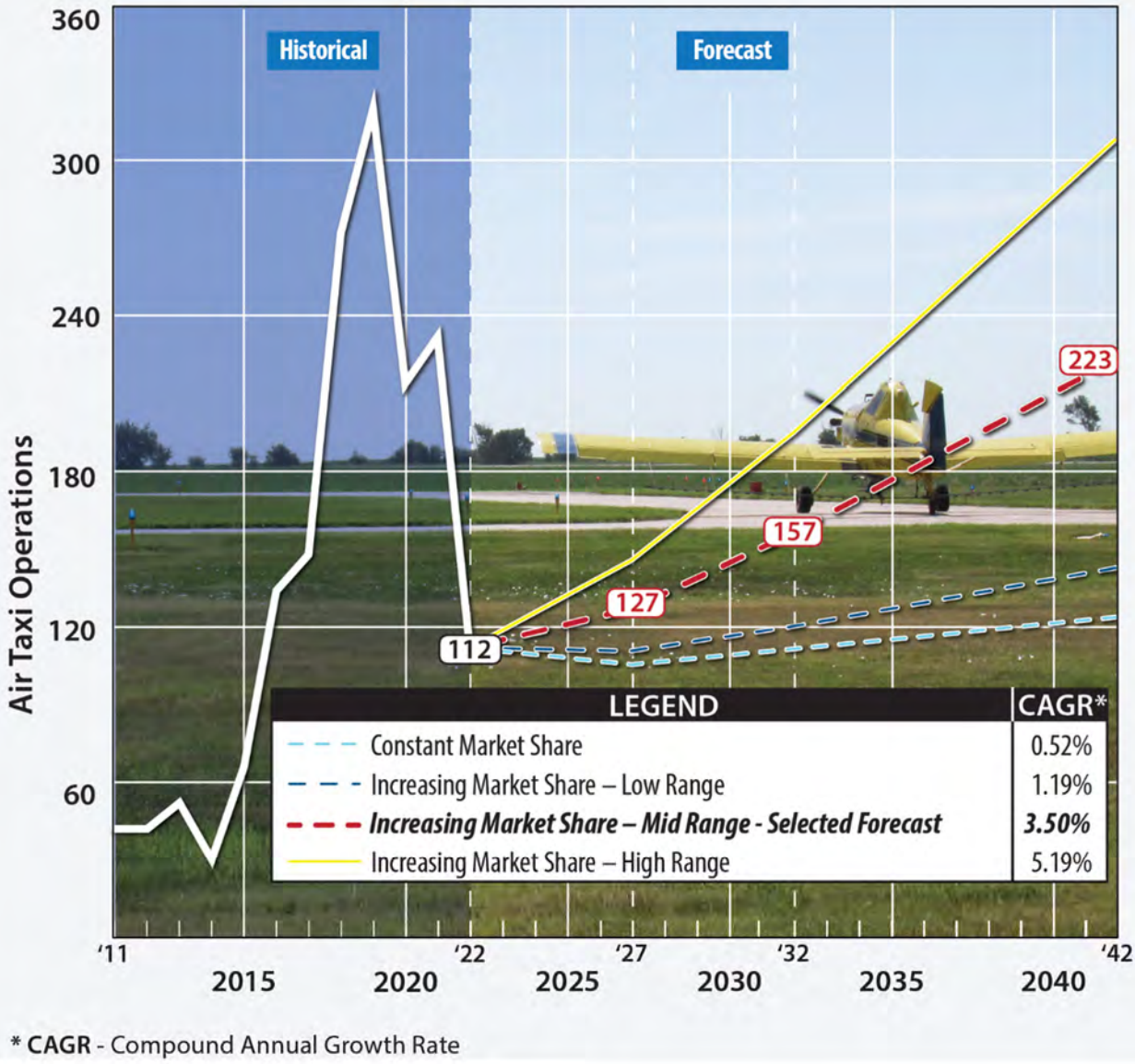
Table 15 | Other Air Taxi Operations - Brewster Field Airport

Year	HDE Air Taxi Operations	U.S. Air Taxi Operations	HDE Market Share %
2011	42	9,278,542	0.0005%
2012	42	8,994,371	0.0005%
2013	52	8,803,402	0.0006%
2014	30	8,439,711	0.0004%
2015	66	7,895,478	0.0008%
2016	134	7,580,119	0.0018%
2017	148	7,179,651	0.0021%
2018	272	7,125,556	0.0038%
2019	320	7,234,239	0.0044%
2020	214	5,471,641	0.0039%
2021	232	5,882,460	0.0039%
2022	112	6,285,000	0.0018%
Constant Market Share (CAGR 0.52%)			
2027	106	5,963,000	0.0018%
2032	112	6,286,000	0.0018%
2042	124	6,967,000	0.0018%
Increasing Market Share Low-Range (CAGR 1.19%)			
2027	110	5,963,000	0.0018%
2032	120	6,286,000	0.0019%
2042	142	6,967,000	0.0020%
Increasing Market Share Mid-Range (CAGR 3.50%) – Selected Forecast			
2027	127	5,963,000	0.0021%
2032	157	6,286,000	0.0025%
2042	223	6,967,000	0.0032%
Increasing Market Share High-Range (CAGR 5.19%)			
2027	146	5,963,000	0.0024%
2032	195	6,286,000	0.0031%
2042	308	6,967,000	0.0044%

Sources: FAA Aerospace Forecast 2022-2042, Airport IQ

Some level of growth in annual air taxi operations is anticipated at HDE over the next 20 years. The air taxi range between 124 and a high of 308 operations based on a high-range increasing market share. As mentioned previously, HDE is a critical medical site and has a steady flow of activity by medical professionals, and this combined with local industry growth will likely support increased growth in air taxi operations at the airport. Large-scale manufacturers are already established in the area for medical equipment and suppliers and a worldwide exporter of construction equipment. Both are growing markets with evident growth potential. Therefore, the high-range increasing market share will be carried forward as the selected forecast, with 223 air taxi operations by 2042.

Figure 8: Other Air Taxi Operations Forecasts



* **CAGR** - Compound Annual Growth Rate

Sources: FAA Aerospace Forecast 2022-2042

MILITARY OPERATIONS FORECAST

It is not uncommon for military aircraft to utilize civilian airports for training or other purposes. However, forecasting military operations is challenging due to their national security nature and the fact that missions can change daily, making it difficult to project future operations based on historical data. Thus, it is not unusual for the FAA to flatline military operations projections. The TAF currently does not reflect any military operations in 2022, and there are no indicators of activity in the future; therefore, this study will not forecast any military operations.

ANNUAL INSTRUMENT APPROACHES

An annual instrument approach (AIA) is defined by the FAA as "an approach to an airport with intent to land by an aircraft in accordance with IFR flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum approach altitude." An aircraft must follow one of the published instrument approach procedures at an airport in order to qualify as an instrument approach. Practice or training approaches do not count as AIAs, nor do instrument approaches that occur in visual conditions.

TABLE 16 | Annual Instrument Approaches

Year	Annual Instrument Approaches	Itinerant Operations	Ratio
2022	153	6,112	2.5%
2027	173	6,937	2.5%
2032	197	7,877	2.5%
2042	254	10,153	2.5%

Source: Coffman Associates analysis

In low visibility conditions or poor weather conditions, pilots can only complete flight training operations under instrument flight rules (IFR). Local operations are not typically performed during IFR conditions. As a result, an estimate of the total number AIAs can be made based on a percentage of itinerant operations regardless of poor weather conditions. An estimate of 2.5 percent of total itinerant (general aviation and air taxi) operations is utilized to forecast AIAs at HDE, as presented in **Table 16.**

PEAK PERIOD FORECASTS

Forecasts of peak activity at an airport are important in determining facility requirements for the future. The peaking periods used to develop the capacity analysis and facility requirements are as follows: peak month, design day, busy day, and design hour. **Peak month** refers to the calendar month in which traffic activity is highest. The **design day** is the average day in the peak month, while the **busy day** is reflective of the busiest day of a typical week during the peak month. Finally, **design hour** refers to the peak hour within the design day.

TABLE 17 | Peak Period Forecasts

	Year			
	2022	2027	2032	2042
Annual	16,112	18,400	20,900	27,200
Peak Month	1,611	1,840	2,090	2,720
Design Day	65	74	84	110
Busy Day	52	59	67	88
Design Hour	8	9	10	13

Sources: FAA TAF, Coffman Associates analysis

Because HDE is not equipped with an airport traffic control tower, precise operational data is not available for establishing true peaking characteristics. For this reason, estimated peaking characteristics have been developed based on knowledge of other general aviation airports with control towers. For this study, the peak month was estimated at 10 percent of the annual operations, which resulted in 1,611 operations during the peak month of the base year. By the end of the planning period, 2,720 operations are projected to occur during the peak month. The design day is estimated by dividing the peak month by the average number of days in a month, and the busy day is calculated at 1.25 times the design day. The design hour is estimated at 15 percent of the design day. Peak period forecasts are presented in **Table 17**.

FORECAST COMPARISON TO THE TERMINAL AREA FORECAST

A summary of the selected forecasts is presented on **Exhibit 13**. The FAA reviews the forecasts presented in this aviation 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 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems*.

If the forecasts exceed these parameters, they may be sent to FAA headquarters in Washington, D.C. for further review. **Table 18** presents the direct comparison of the planning forecasts prepared in this study with the TAF published in March 2022. The operations forecast is slightly outside the TAF tolerance for 5-year at 13.95 percent, and nearly 12 percent outside the tolerance for the 10-year period. This is due to operations being flatlined over the planning period in the TAF, whereas the selected forecast shows projected growth. In addition, the base year also depicts a discrepancy as the TAF does not show any air taxis in the base year or through the planning period. In terms of based aircraft, both the 5-year and 10-year forecasts are slightly beyond the TAF tolerance. Again, these discrepancies are a result of the TAF projections being flatlined throughout the plan years. It should also be noted that a contribution to the outside tolerance level is the discrepancy in the 2022 count of based aircraft between the official FAA based aircraft inventory from www.basedaircraft.com and the TAF.

TABLE 18 | Forecast Comparison to the *Terminal Area Forecast*

	Base Year	FORECAST			CAGR
	2022	2027	2032	2042	2022-2042
Total Operations					
Selected Forecast	16,112	18,400	20,900	27,200	2.66%
FAA TAF	16,000	16,000	16,000	16,000	0.00%
% Difference	0.70%	13.95%	26.56%	51.85%	
Based Aircraft					
Selected Forecast	26	30	35	45	3.11%
FAA TAF	25	25	25	25	0.00%
% Difference	3.92%	18.18%	33.33%	57.14%	
CAGR - Compound annual growth rate					

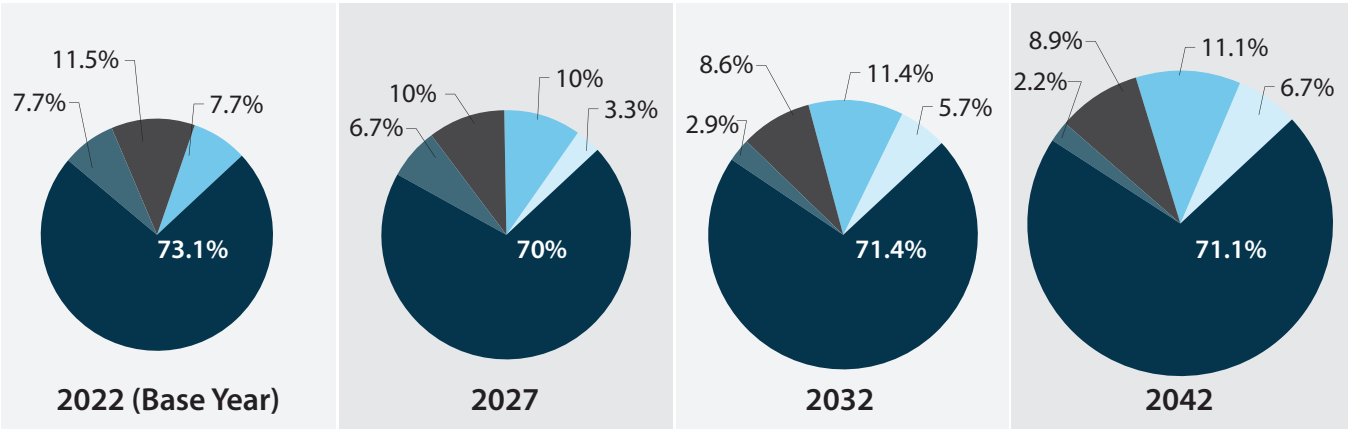
Source: Coffman Associates analysis

CRITICAL AIRCRAFT

The critical aircraft is defined as an aircraft conducting at least 500 itinerant operations at an airport or the most regularly scheduled aircraft in commercial service. When planning for future airport facilities, it is important to consider the demands of aircraft operating at the airport currently or anticipated to operate in the future. Caution must be exercised to ensure that short-term development does not preclude the long-term needs of the airport. Thus, a balance must be struck between the facility needs of aircraft currently operating at an airport versus those projected to operate.

	BASE YEAR	2027	2032	2042
ANNUAL OPERATIONS				
Itinerant				
Air Carrier	0	0	0	0
Other Air Taxi	112	127	157	223
General Aviation	6,000	6,810	7,720	9,930
Military	0	0	0	0
Total Itinerant Operations	***6,112***	***6,937***	***7,877***	***10,153***
Local				
General Aviation	10,000	11,420	13,040	17,000
Military	0	0	0	0
Total Local Operations	***10,000***	***11,420***	***13,040***	***17,000***
Total Annual Operations	***16,112***	***18,400***	***20,900***	***27,200***
PEAKING				
Total Annual Operations	16,112	18,400	20,900	27,200
Peak Month	1,611	1,840	2,090	2,720
Design Day	65	74	84	110
Design Hour	52	59	67	88
Busy Day	8	9	10	13
BASED AIRCRAFT				
Single Engine	19	21	25	32
Multi-Engine	2	2	1	1
Turboprop	3	3	3	4
Jet	2	3	4	5
Helicopter	0	1	2	3
Total Based Aircraft	***26***	***30***	***35***	***45***

Based Aircraft Fleet Mix



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 aircraft is used to define the design parameters for an airport. The design aircraft may be a single aircraft type or, more commonly, is a composite aircraft representing a collection of aircraft with similar characteristics. The critical aircraft is defined by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). FAA AC 150/5300-13B, *Airport Design*, describes the following airplane classification systems, the parameters of which are presented on **Exhibit 14**.

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. In addition, the Operational Specifications under Part 121, Part 129, or Part 135 for a specific operator and aircraft type may specify a minimum approach speed that is the AAC, rather than V_{REF}.

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.

Aircraft in AAC A and B are further distinguished between those weighing more or less than 12,500 pounds. Those under 12,500 pounds are classified as “small” or (s). The applicable design standards for the airport are different based on the “small” classification.

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 area (TOFA), 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 critical aircraft. The TDG is classified by an alphanumeric system: 1A, 1B, 2A, 2B, 3, 4, 5, and 6. 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 TSA, 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.

Exhibit 15 presents the aircraft classification of the most common aircraft in operation today.

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)

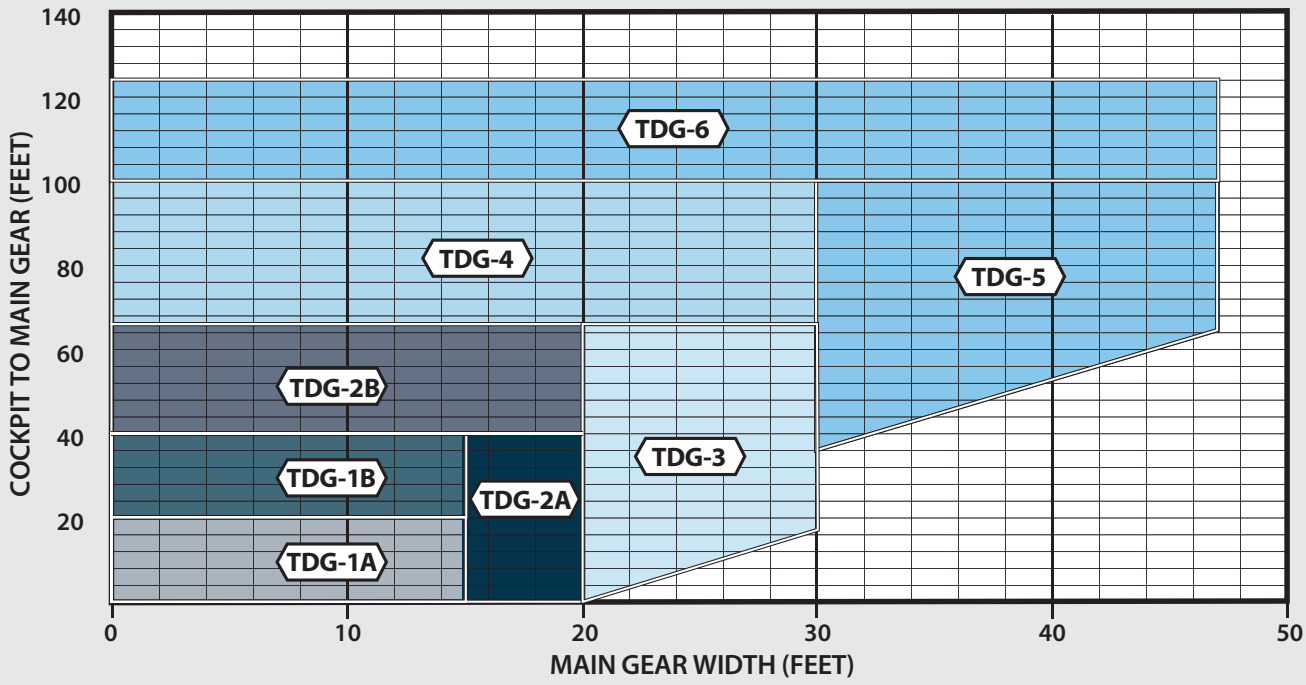
Group #	Tail Height (ft)	Wingspan (ft)
I	<20	<49
II	20-<30	49-<79
III	30-<45	79-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262

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 150/5300-13B, Airport Design

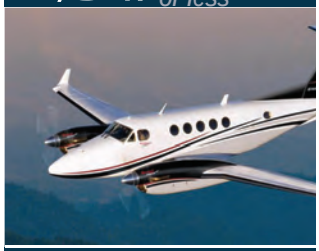
A-I

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)	2A
• Embraer Phenom 100	1B

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

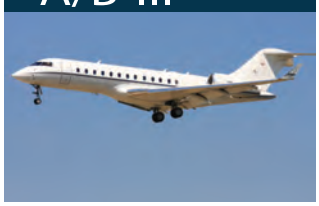


Aircraft	TDG
• **Beech Super King Air 200**	**2A**
• Cessna 441 Conquest	1A
• Cessna Citation CJ2 (525A)	2A
• Pilatus PC-12	1A

B-II *over 12,500 lbs.*

Aircraft	TDG
• Beech Super King Air 350	2A
• Cessna Citation CJ3(525B), V (560)	2A
• Cessna Citation Bravo (550)	1A
• **Cessna Citation CJ4 (525C)**	**1B**
• Cessna Citation Latitude/Longitude	1B
• Embraer Phenom 300	1B
• Falcon 10, 20, 50	1B
• Falcon 900, 2000	2A
• Hawker 800, 800XP, 850XP, 4000	1B
• Pilatus PC-24	1B

A/B-III

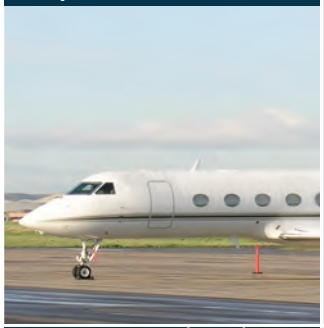


Aircraft	TDG
• Bombardier Dash 8	3
• **Bombardier Global 5000**, 6000, 7000, 8000	**2B**
• Falcon 6X, 7X, 8X	2B

C/D-I

Aircraft	TDG
• **Lear** 25, 31, 45, 55, **60**	**1B**
• Learjet 35, 36 (D-I)	1B

C/D-II

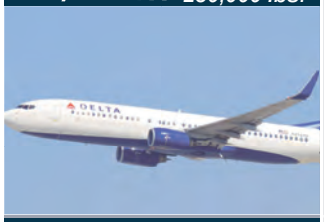


Aircraft	TDG
• Challenger 600/604/ 800/850	1B
• Cessna Citation VII, X+	1B
• Embraer Legacy 450/500	1B
• **Gulfstream IV**, 350, 450 (D-II)	2A
• Gulfstream G200/G280	1B
• Lear 70, 75	1B

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

Aircraft	TDG
• Gulfstream V	2A
• **Gulfstream** G500, 550, 600, **650 (D-III)**	**2B**

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

TDG - Taxiway Design Group

Note: Aircraft pictured is identified in bold type.

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.

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 on the airport.

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 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 should read "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. The runway-to-taxiway centerline separation for Runway 18-36 is 300 feet. Given that Runway 18 and Runway 36 are served by a GPS LPV approach with visibility minimums down to one mile, this runway is within APRC B/III/5000. Runway 11-29 is not equipped with a parallel taxiway, therefore it is not applied an APRC or DPRC.

Departure Reference Code (DPRC) | A code signifying the current operational capabilities of a runway and associated parallel taxiway with regard to take-off operations. The DPRC represents those aircraft that can take off 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: AAC and ADG. A runway may have more than one DPRC depending on the parallel taxiway separation distance.

The current runway/taxiway centerline separation of 300 feet results in a DPRC of B/III for Runway 18-36.

AIRPORT DESIGN AIRCRAFT

As stated previously, it is critical to have an accurate understanding of the types of aircraft that operate at the airport currently and are expected to use the airport in the future. Aircraft type can have a significant impact on airport design criteria and the type of facilities necessary to accommodate the aircraft that are utilizing the airport most frequently.

The most recent annual data was obtained from the FAA's Traffic Flow Management System Counts (TFMSC), a database maintained by the FAA to monitor the type of aircraft and frequency of usage at airports. Typically, information is added to the database when pilots file flight plans and/or when flights are detected by the National Airspace System (NAS) on radar. The TFMSC includes data for general aviation, commercial service (air carrier and air taxi), and military aircraft. Although the program can identify the aircraft operating under IFR-filed flight plans and on radar, it does not account for all aircraft operating without a flight plan due to limited radar coverage. Thus, it is likely the airport experiences additional operations that are not recorded in the TFMSC. Despite this likelihood for incomplete operational data, the TFMSC is a valuable resource for identifying the primary aircraft users and type of aircraft operating at the airport on a regular basis. Additionally, the TFMSC does provide an accurate reflection of IFR activity. Operators of high-performance aircraft, such as turboprops and jets, tend to file flight plans at a high rate. **Exhibit 16** details the TFMSC operational mix at HDE since 2013. In addition to the TFMSC, the airport has maintained records of turbine traffic between August 2021 and August 2022. A summary of this data is provided in **Table 19**.

TABLE 19 | Airport Turbine Operations Records

Year	Month	Aircraft	Operations
2021	August	King Air 90	5
2021	September	Citation 560 King Air 90 King Air 300	1 2 1
2021	October	King Air 90 Citation 560	3 1
2021	November	King Air 90 Citation 560/XL	1 2
2021	December	King Air 90 Citation 560/XL	3 2
2022	January	King Air 90 King Air 200 Citation 560	7 1 1
2022	February	King Air 90 King Air 200	3 2
2022	March	King Air 90	6
2022	April	Cessna Conquest King Air 90 Pilatus Beechjet 400	1 6 1 1
2022	May	Citation 560 King Air 90	2 1

ARC	Aircraft	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
A-I	Cirrus Vision Jet	0	0	0	0	0	0	0	2	0	2
	Epic Dynasty	0	0	0	0	0	2	0	0	0	0
	Piper Malibu/Meridian	24	6	10	82	26	112	96	4	2	2
	Socata TBM 7/850/900	34	2	4	6	2	6	116	156	242	388
	Total	58	8	14	88	28	120	212	162	244	392
A-II	Cessna Caravan	0	0	0	2	0	0	2	0	2	2
	Pilatus PC-12	10	2	4	4	12	2	8	10	20	28
	Total	10	2	4	6	12	2	10	10	22	30
B-I	Aero Commander 680	0	0	0	0	0	0	0	2	0	0
	Beech 99 Airliner	2	0	2	0	0	0	0	0	0	0
	Beechjet 400	0	0	4	4	0	2	0	0	0	2
	Cessna 425 Corsair	0	8	0	0	0	0	4	0	6	2
	Citation CJ1	0	2	8	32	4	2	2	0	4	4
	Citation I/SP	72	64	48	42	42	32	24	24	26	30
	Citation M2	0	0	0	0	0	2	30	190	326	396
	Citation Mustang	14	12	18	16	0	0	0	2	2	0
	Honda Jet	0	0	0	0	0	6	0	4	2	0
	King Air 90/100	150	122	234	218	230	220	172	120	190	148
	Mitsubishi MU-2	0	0	0	6	0	0	0	0	0	0
	Phenom 100	2	0	0	0	2	0	0	0	4	0
	Piaggio Avanti	0	0	0	0	0	4	0	2	0	0
	Piper Cheyenne	6	0	4	4	4	2	0	0	22	68
	Total	246	208	318	322	282	270	232	344	582	650
B-II	Aero Commander 690	10	0	14	2	0	0	24	8	0	0
	Cessna Conquest	0	44	14	0	4	4	2	6	8	16
	Challenger 300	0	2	0	0	0	0	0	0	0	0
	Citation CJ2/CJ3/CJ4	0	6	0	2	0	2	0	2	0	2
	Citation II/SP/Latitude	4	10	2	4	6	8	4	6	2	0
	Citation V/Sovereign	0	48	98	110	116	28	12	8	12	22
	Citation X	4	0	0	0	0	0	0	0	0	0
	Citation XLS	8	0	4	2	6	12	6	0	10	16
	King Air 200/300/350	84	66	24	18	42	104	186	164	170	94
	King Air F90	12	0	0	0	0	0	0	0	2	0
	Phenom 300	0	0	0	0	0	0	0	2	0	2
	Swearingen Merlin	4	4	10	10	10	4	2	6	4	2
	Total	126	180	166	148	184	162	236	202	208	154
C-II	Challenger 600/604	0	0	0	2	0	0	0	0	0	0
	Embraer ERJ-135/140/145	0	0	0	2	0	0	2	0	0	0
	Total	0	0	0	4	0	0	2	0	0	0

Aircraft Reference Code (ARC) Summary

ARC CODE	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
A-I	58	8	14	88	28	120	212	162	244	392
A-II	10	2	4	6	12	2	10	10	22	30
B-I	246	208	318	322	282	270	232	344	582	650
B-II	126	180	166	148	184	162	236	202	208	154
C-II	0	0	0	4	0	0	2	0	0	0
Total	440	398	502	568	506	554	692	718	1,056	1,226

APPROACH CATEGORY (AC)

AC	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
A	68	10	18	94	40	122	222	172	266	422
B	372	388	484	470	466	432	468	546	790	804
C	0	0	0	4	0	0	2	0	0	0
Total	440	398	502	568	506	554	692	718	1,056	1,226

DESIGN GROUP (DG)

DG	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
I	304	216	332	410	310	390	444	506	826	1042
II	136	182	170	158	196	164	248	212	230	184
Total	440	398	502	568	506	554	692	718	1,056	1,226

Source: TFMSC January 2013 Through September 2022
*2022 Data from October 2021 through September 2022

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TABLE 19 | Airport Turbine Operations Records (continued)

Year	Month	Aircraft	Operations
2022	June	King Air 90	3
		Citation 560/XL	5
		Cessna Caravan	1
2022	July	King Air 90	1
		King Air 200	1
		Citation XL	1
2022	August	King Air 90	3
		Citation 560/XL	3
		Cessna Caravan	1
		Total	**71**

Source: HDE Airport Records (August 2021-August 2022)

Existing, Future, and Ultimate Critical Aircraft

Each runway at HDE is assigned an existing, future, and ultimate critical aircraft from which airfield design standards are applied. As the primary runway, Runway 18-36 should be capable of accommodating the largest and fastest aircraft using the airport now (existing) and forecast to use the airport over the next 20 years (future), as well as beyond the 20 years (ultimate). Since Runway 18-36 does not provide for 95 percent of crosswind coverage during 10.5 knot conditions (see **Exhibit 2**), Runway 11-29 serves as the airport's crosswind runway for small aircraft within ARC A/B-I. The following sections will discuss the specific aircraft and/or grouping of aircraft that qualify to be the critical aircraft for both runways.

The current critical aircraft for Runway 18-36 is Citation M2 (B-I).

Runway 18-36: A TFMSC report was prepared to identify the primary aircraft types operating at HDE. The data is limited as the TFMSC reports just 1,226 operations in 2022, which is approximately 8 percent of the total operations estimated for 2022. As can be seen on the exhibit, the airport experiences activity by a range of business jets, but only aircraft in the B-I category conduct more than 500 annual operations. In 2022, the greatest number of operations in any single design family was 650 in B-I, which accounted for 53 percent of logged turbine aircraft activity. Representative aircraft in this category include the Citation I, Citation M2, and King Air 90/100 series. Additionally, all four of the based jet aircraft fall into the B-I category and include a Cessna Citation I, Cessna Mustang, and two Cessna M2s. Aerial applicators are also an integral part of HDE's activity that should be considered for facility planning purposes. The aerial applicators based at HDE have among them five based AT-502 (A-II), Piper PA-18 (A-I), Citabria (A-I), Cessna 182Q (A-I), and a Piper PA-36 (A-I).

In addition to the operations recorded in the TFSMC, airport/FBO's records detailing operations by larger aircraft types and frequency are also available. Like the TFMSC, this data is somewhat limited because it does not account for operations that occurred outside of the FBO's operating hours. However, it does mirror the TFSMC data, with most operations over the last five years conducted by aircraft within the B-I category. Therefore, it is reasonable to identify B-I as the airport's existing critical aircraft, with the Citation M2 serving as the representative aircraft.

The future critical aircraft for Runway 18-36 is King Air 200/300/400 series and the Citation 560 (B-II).

For future critical aircraft, it is important to consider the growth potential that exists at HDE now and over the next 20 years, as well as local and regional economic and industrial growth. Nationally, the aircraft fleet is shifting to include more larger and more sophisticated jets and fewer piston-powered aircraft. As new hangar developments are planned in the near future, it is important to plan for increased operations from larger jet aircraft and consider the potential impact of additional based jets. According to the TFMSC data and airport records, ARC B-II aircraft operate regularly at the airport including the King Air 200/300/350 series and the Citation 560, with many of those operations associated with a critical medical site. In addition, as new hangar development for the aerial applicators is planned in the near future, it is not unreasonable to consider larger aircraft such as an AT-802s (B-II) aircraft to base at the airport. For these reasons, the future critical aircraft is ARC B-II aircraft, with the King Air 200/300/400 series and the Citation 560 serving as the representative aircraft.

The ultimate critical aircraft for Runway 18-36 is the Gulfstream G280 and Challenger 600/604 (C-II).

Beyond the planning period of this study, it is important to plan for increased operations from larger jet aircraft in the ultimate condition. The forecast includes the potential for three turbine aircraft, which can potentially include a larger business jet aircraft within approach category C, which includes the Learjet family of jets, smaller Gulfstreams (GII/G280), and the Challenger 600/604/800 series. As was presented previously, the service area for HDE has been steadily increasing in the jet category and are expected to continue to grow over time as indicated by national trends. As more sophisticated aircraft enter the service area, it is reasonable to consider some will choose to operate at HDE on a frequent basis. While data from recent years shows limited activity in approach category C, HDE has historically been planned to meet ARC C-II standards, and the airport's role in the state system plan includes accommodating mid-sized business jets within the B-II or greater categories. For these reasons, this study will consider ARC C-II as the ultimate critical design utilizing the Gulfstream G280 and Challenger 600/604 as critical aircraft.

The existing, future, and ultimate critical aircraft for Runway 11-29 is Piper Super Cub (A-1(small)).

Runway 11-29: As stated previously, crosswind coverage of the primary Runway 18-36 is 91.96 percent in the 10.5 knot condition and exceeds 95 percent in the 13-knot condition. Therefore, a crosswind runway is only justified to the 10.5 knot condition, which limits accessibility in all weather conditions to aircraft within ARC A/B-I. Within this grouping of aircraft, one of the most active aircraft, is the Piper PA-18-150 Super Cub, which is also based at HDE. Based on historic wind data, it is not anticipated that crosswind Runway 11-29 will qualify for a higher design standard in the future or ultimate condition; therefore, the existing, future, and ultimate critical aircraft for Runway 11-29 is identified as the Piper Super Cub.

Existing, Future, and Ultimate Airfield Design

The RDC relates to specific design criteria set forth by the FAA that an airport should meet. The RDC is determined by the aircraft or category of aircraft expected to use each runway. Runway 18-36, the airport's primary runway, measures 4,701 feet long by 75 feet wide with an APRC and DPRC capable of accommodating up to ARC B-III aircraft. Runway 18-36 is equipped with a GPS LPV approach with visibility minimums down to one mile. The existing ARC for HDE is B-I, the resulting RDC for Runway 18-36 is B-I-5000, and the existing TDG is 1A.

Based on the future critical aircraft (B-II), planning should reflect RDC B-II-4000 design standards, which accounts for the potential for the airport to pursue visibility minimums down to lower than one mile but not lower than ¾-mile. The ultimate critical aircraft will reflect RDC C-II-4000 design standards. Taxiway A, which is 35 feet wide, currently falls into TDG 2A. The taxiway should continue to be designed to TDG 2A standards. **Table 20** summarizes the airport and runway classification currently and in the future. The next section, Facility Requirements, will outline the airside and landside elements necessary to meeting the aviation needs that have been determined in this forecasting effort.

TABLE 20 | Airport and Runway Classifications

	RUNWAY 18-36			RUNWAY 11-29
	Existing	Future	Ultimate	Existing/Future/Ultimate
Critical Aircraft	Citation M2	King Air 200/300/400 Citation 560	Challenger 600/604 Gulfstream G280	Piper Super Cub
Runway Design Code (RDC)	B-I-5000	B-II-4000	C-II-4000	A-I(small)-VIS
Approach Reference Code (APRC)	B/III/5000	B/III/4000	B/III/4000	N/A
Departure Reference Code (DPRC)	B/III	B/III	B/III	N/A
Taxiway Design Group (TDG)	1A	2A*		N/A

*Based on the Beechcraft King Air 200/300/350
N/A – Not applicable

Source: FAA AC 150/5300-13B; Coffman Associates analysis