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2022 Airport Master Plan Study Tooele Valley Airport / TVY

AVIATION FORECASTS DRAFT Version 2.0



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CHAPTER 2

AVIATION FORECASTS

2.1 INTRODUCTION

Projected activity levels of aircraft operations and based aircraft for the next 20-year planning horizon are provided in this chapter. The methodology used to estimate projected aviation demand are also described. The chapter concludes with recommended operations and based aircraft forecasts that will be used to plan the requirements for future infrastructure and facilities

2.2 DEMOGRAPHIC, SOCIOECONOMIC, AND OTHER FACTORS

Tooele Valley Airport (TVY) is owned by the Salt Lake City Corporation. The Salt Lake City Department of Airports (SLCDA), a department of the Salt Lake City Corporation, manages and operates TVY. In addition to TVY, the SLCDA manages and operates Salt Lake City International Airport (SLC) and South Valley Regional Airport (U42). Staff members of the SLCDA manage operations across TVY, SLC, and U42.

TVY is in Tooele County, five miles northwest of the city of Tooele, within the municipal boundary of the newly incorporated city of Erda, Utah. According to data from the U.S. Census Bureau, Tooele County grew by 2,857 residents in 2017, making it the 7th fastest growing county in the nation. From 2010-2019, the population increased by 24.1 percent, to nearly 73,000 residents as of 2019. The University of Utah projects the population of Tooele County to grow at 1.5 percent annually through 2065 with population growth from 72,698 to over 100,000 by 2040¹. The growth of Tooele is largely attributed to its proximity to Salt Lake City, the population hub of the region. TVY is a 15-minute drive from the city of Tooele and 35 minutes from downtown Salt Lake City. The median household income of Tooele County residents from 2015-2019 was \$74,562, well above the national average of \$62,843. The population of Salt Lake County in 2020, which includes Salt Lake City, sits at just over 1,185,000 people, growing approximately 15 percent or a compound average growth rate of 1.42 percent since 2010.² It is anticipated Salt Lake County will have a population of approximately 1,400,000 by 2040.

This fast population growth is driving new infrastructure and business development. Infrastructure upgrades include the recent completion of the Midvalley Highway³ which connects UT-138 to I-80 immediately northwest of the Airport. A railway spur that would lead into the Lakeview Business Park is currently in the proposal stages⁴, and Tooele County is providing incentive programs to bring in new businesses⁵. The Lakeview Business Park, located a few miles south of TVY, is a large-scale manufacturing, distribution, and research and development campus in the early stages of buildout. At the time of this writing, multiple distribution, office, and manufacturing facilities have been completed in the business park. Additionally, two new large-scale developments have materialized in Tooele City including Carvana

¹ Utah Long-Term Planning Projections, A Baseline Scenario of Population and Employment Change in Utah and its Counties, The University of Utah Gardner Policy Institute, January 2022

² U.S. Census Bureau QuickFacts: Salt Lake County, Utah. Retrieved January 10, 2022, from <https://www.census.gov/quickfacts/saltlakecountyutah>

³ Midvalley EA. (n.d.). UDOT | Keeping Utah Moving. <https://www.udot.utah.gov/midvalley/>

⁴ Powerful Utah politicians back Tooele rail spur, but see why EPA and others are wary. (2022, February 8). The Salt Lake Tribune. <https://www.sltrib.com/news/environment/2022/02/08/gov-cox-two-utah/>

⁵ Tooele City | The Greatest City in Utah. Retrieved December 16, 2022, from https://tooelecity.org/wp-content/uploads/2021/06/Economic-Development-Strategic-Plan_June-2021_Draft.pdf

with a \$42M investment estimated to provide 173 new jobs, and Plastic Ingenuity which is opening an office with a \$70M investment estimated to provide 96 high paying jobs⁶.

Adjacent to the Lakeview Business Park is the Utah Motorsports Campus (UMC); the largest motorsports complex in Utah. In discussions with UMC management, it was noted the business model for UMC, and complexes like it, is changing to a “club” type of facility catering to drivers instead of being oriented towards spectator events. The model is based on membership and is expected to draw motor racing enthusiasts and sports car owners from the Salt Lake region as well as around the nation. Members from outside the region are expected to use commercial or private air travel to reach UMC. If the concept is successful, it is expected that TVY will begin to experience more frequent use by jet and turboprop operators due to the Airport’s proximity to UMC.

Overall, the business climate and recent developments within Tooele County are indicative of continued large-scale business and job growth. In conversations with SLCD staff and Airport Board members, it was noted that local business leaders view Tooele Valley as the next area in Utah to experience substantial population and economic growth. These factors were considered in the development of this study’s high growth forecast.

2.3 NATIONAL AND REGIONAL AVIATION TRENDS

The FAA Aerospace Forecast (FY 2021 – FY 2041) is a comprehensive 20-year forecast of both commercial and general aviation (GA) activity. For the purposes of this chapter, only GA operational data was analyzed. As detailed in **Table 2-1**, the total number of general aviation aircraft is projected to slightly decrease over the next 20 years, although individual types of aircraft are anticipated to grow significantly in popularity within the same timeframe. Turbojet, light sport, and experimental aircraft are projected to spur growth in the general aviation sector through the next 20 years while single- and multi-engine piston fleets are expected to decrease. Aging aircraft fleets, unfavorable pilot demographics, increasing aircraft ownership costs, and the lack of available lower cost alternatives are accelerating the decline of piston aircraft. The number of turbine-powered GA aircraft is expected to grow by nearly 13,000 between 2020-2040 while the number of light-sport aircraft is forecast to double by 2040. The report also shows that the GA sector, which was not as negatively affected by the pandemic as the airlines, is expected to recover to its pre-pandemic operational numbers much faster than other sectors of aviation.

⁶ *Carvana bringing jobs to Tooele*. (2021, February 11). business.utah.gov. <https://business.utah.gov/news/carvana-bringing-jobs-to-tooele/>

TABLE 2-1
FAA AEROSPACE FORECAST- GENERAL AVIATION FLEET

Year	Single-Engine	Multi-Engine	Turboprop	Turbojet	Rotorcraft	Experimental	Light Sport	Total General Aviation Fleet
2010	139,519	15,900	9,369	11,484	10,102	24,784	6,528	223,370
2011	136,895	15,702	9,523	11,650	10,082	24,275	6,645	220,453
2012	128,847	14,313	10,304	11,793	10,055	26,715	2,001	209,034
2013	124,398	13,257	9,619	11,637	9,765	24,918	2,056	199,927
2014	126,036	13,146	9,777	12,362	9,966	26,191	2,231	204,408
2015	127,887	13,254	9,712	13,440	10,506	27,922	2,369	210,031
2016	129,652	12,986	9,779	13,751	10,577	27,585	2,478	211,794
2017	129,833	13,083	9,949	14,217	10,511	26,921	2,551	211,757
2018	130,179	12,861	9,925	14,596	9,989	27,531	2,554	211,749
2019	128,926	12,470	10,242	14,888	10,198	27,449	2,675	210,981
2020	127,920	12,395	10,205	15,245	10,155	24,455	2,145	204,980
2025	121,765	12,030	10,140	17,315	10,685	27,710	3,385	207,155
2030	116,080	11,765	10,335	19,605	11,420	29,595	4,050	207,040
2040	106,315	11,390	11,215	23,975	13,195	32,765	5,295	208,395
CAGR (2019-2040)	-0.9%	-0.4%	0.4%	2.3%	1.2%	0.8%	3.3%	-0.1%

Source: FAA Aerospace Forecast Fiscal Years 2021-2041

The GA industry remains strong and demand for new pilots and associated training is expected to drive development and increased annual operations at TVY. With COVID-19 related airline pilot retirements and continued “baby-boomer” generation pilots retiring, the increased demand for new pilots is expected to continue for decades. The Bureau of Labor Statistics estimates that, from 2020 to 2030, there will be a demand for 14,500 new pilots each year⁷. Additionally, because TVY is adjacent to a major population base and multiple airports with robust GA communities, it is expected that flight training related use of TVY will continue at current or higher levels through the planning period.

2.4 HISTORICAL AVIATION ACTIVITY

Shown in **Table 2-2** are aircraft operations at TVY between 2005 and 2020 which have been counted through acoustic traffic counters on the airfield. From 2005 to 2020, TVY averaged approximately 44,700 annual operations, with 123 operations per day.

Airport operations are conducted by a variety of users throughout the year. The Bureau of Land Management (BLM) uses TVY during the summer months as a base of operations for their fleet of single engine air tankers (SEATs) to fight forest fires in the region. These aircraft are small but powerful single engine turboprop aircraft. Skydive Utah is also a heavy user of the airport during warmer months and conducts multiple operations a day with their C208 Cessna Caravan, also a single engine turboprop

⁷ *Airline and Commercial Pilots: Occupational Outlook Handbook* (2021, November 1). U.S. Bureau of Labor Statistics. Retrieved January 5, 2022, from <https://www.bls.gov/ooh/transportation-and-material-moving/airline-and-commercial-pilots.htm>

aircraft. While there are other based aircraft tenants who use the airport, most operations accounted for at TVY are related to touch-and-go flight training activity. Students from surrounding airports will fly to TVY to conduct these training operations and to use the instrument landing system (ILS) to practice instrument flying. It is estimated that a quarter to one-half of annual operations at TVY are related to touch-and-go flight training.

TABLE 2-2
ACOUSTIC COUNTER OPERATIONS

Year	Total Operations	Average/Day
2005	57,479	157
2006	49,161	135
2007	56,367	154
2008	47,417	130
2009	41,721	114
2010	40,028	110
2011	42,503	116
2012	44,992	123
2013	38,141	104
2014	37,742	103
2015	36,002	99
2016	41,063	113
2017	44,768	123
2018	50,071	137
2019	45,065	123
2020	43,048	118

Source: SLCDA Acoustic Counter Data, 2021

As part of this study, two other methods of collecting operational traffic data were used as this study required verification of the fleet mix operating at the Airport. One additional method included the use of Envirosuite (EVS) Earth Flight Tracking Data which was available for an 18-month period between April 2020 and September 2021. The EVS data consists of flight track and aircraft identification acquired through the FAA’s System Wide Information Management (SWIM) database and provides operational counts by specific aircraft type.

The other data collection method performed was through the use of three game cameras set on specific locations of the airfield to capture operations. The game camera data was collected between September 16th and October 3rd, 2020. Camera data collection was found to be relatively accurate for recording aircraft that were departing or aircraft that had landed and were taxiing to/from the terminal area. The cameras also recorded aircraft in flight doing touch-and-go operations. However, they were not built to capture that type of activity, which includes fast moving objects at a distance far beyond the camera’s operating parameters. As such, the total number of touch-and-go operations captured by the cameras is less than the actual total number.

The game camera data was examined to compare fleet mix and daily operations with the acoustic traffic counter data and EVS data. This effort helped to validate the EVS data which is incomplete due to the FAA radar system’s lack of coverage within the Tooele Valley. The current radar coverage into Tooele Valley is non-existent at lower elevations down to the surface of the airport, which prevents touch-and-go traffic and other low-level traffic from being captured in the dataset. **Table 2-3** details the annualized EVS data compared to the 2020 acoustic operational count. The 18 months’ worth of EVS data available for TVY was annualized for a total annual estimate of 13,407 operations. This is far lower than what was recorded in 2020 by the acoustic counters.

The game camera data was analyzed for the busiest day’s total operations and the overall average of daily operations. As shown in **Table 2-3**, the busiest day accounted for 113 operations, while the average was 88 operations. These levels of daily operations were near the level of average daily activity recorded by the acoustic counters. Knowing that the game cameras were highly likely to have missed most of the touch-and-go traffic, it is concluded the actual daily activity during which the game cameras were used is higher than recorded. These factors combined serve to validate the acoustic traffic counter data for use as a baseline of annual operational activity.

**TABLE 2-3
OPERATIONS COUNTING METHODOLOGIES COMPARISON**

Operation Counting Method	Annual Operations	Avg. Daily Operations
EVS Data Annualized	13,407	37
Acoustic 2020 Data	43,048	118
Game Camera Busy Day	N/A	113
Game Camera Overall Average	N/A	88

Source: EVS Earth Flight Tracking Data, RS&H Analysis, 2022

The game camera data was also compared to the EVS data of operations by propulsion type. This served to validate the EVS data with the game camera recorded observations. As detailed in **Table 2-4**, the EVS data has roughly 38 percent of total data listed as “unknown”, which is due to the discrepancies in the coding of the data where an actual aircraft type is not identified but can still be counted as an operation. When the unknown category is dispersed into single piston and turboprop categories, the EVS data becomes nearly identical to the fleet mix break out observed with the game cameras. The 21 percent of recorded traffic allocated to turboprop in the game camera break out is almost entirely related to Skydive Utah’s use of their Cessna Caravan for skydiving operations conducted out of TVY.

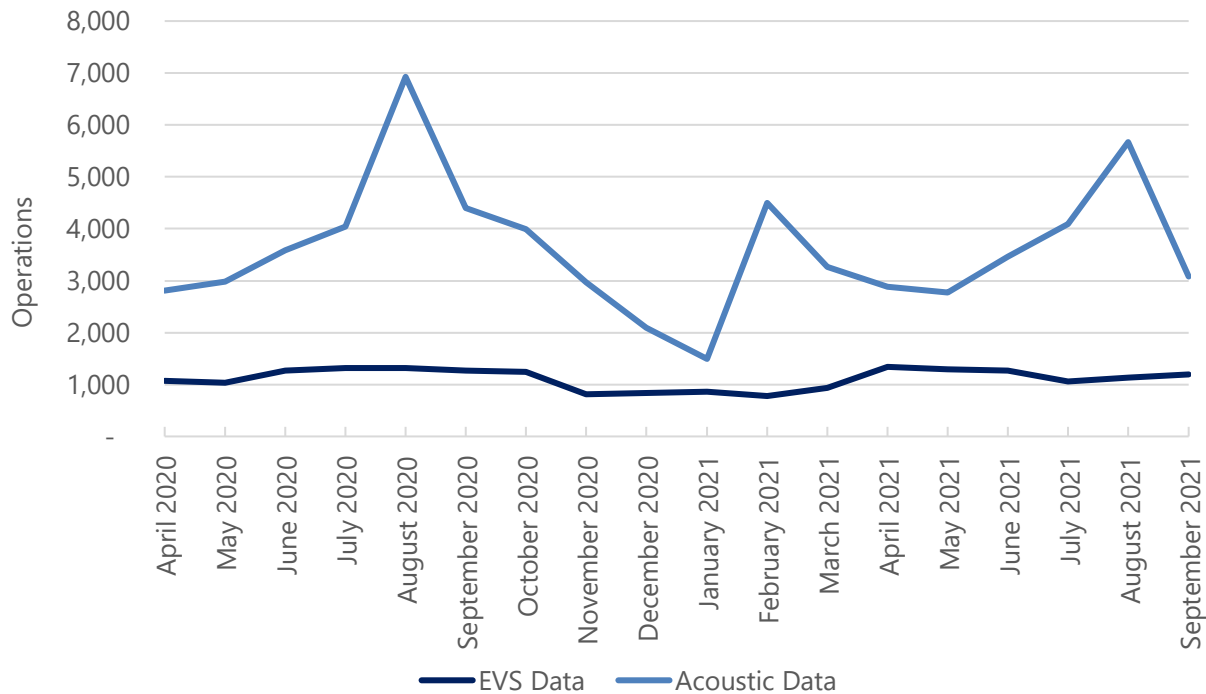
TABLE 2-4
ENVIROSUITE DATA: OPERATIONS BY PROPULSION TYPE

Propulsion Type	EVS - 18 Months Total	EVS - Percentage of Total	Game Camera Percentage of Total
Helicopter	272	1%	1%
Jet	85	0.4%	0%
Single Piston	8,937	44%	73%
Dual Piston	1,565	8%	5%
Turboprop	1,556	8%	21%
Unknown	7,696	38%	

Source: EVS Earth Flight Tracking Data, RS&H Analysis, 2022

The EVS data was also compared to the acoustic traffic counter data on a month-by-month basis, as shown in **Figure 2-1**. Traffic at TVY is seasonally effected and highly weather dependent. This is typical of the flying done by recreational pilots, skydiving operators, and students training. EVS data showed little seasonal adjustment, which further validates that much of the difference in monthly operations counts is related to touch-and-go traffic not captured by the FAA radar system. This further supports seasonal flying as flight training related, with touch-and-go traffic contributing to most operations at the airport.

FIGURE 2-1
ACOUSTIC COUNTER AND EVS DATA – MONTHLY OPERATIONS



Source: EVS Earth Flight Tracking Data, RS&H Analysis, 2022

In summary, the acoustic traffic counter data was validated for accuracy and is used as the baseline for annual operations in this forecast. Furthermore, the EVS data was validated for use when examining fleet mix by propulsion type.

2.4.1 Historical Based Aircraft Counts

Over the last decade, no apron or hangar development has occurred at TVY, and based aircraft numbers have been relatively flat. It is assumed the lack of infrastructure at TVY is partially related to the lack of development. As reported in the TAF, based aircraft have ranged between 14 and 22 aircraft. In 2022, SLCDAs records were analyzed and a total of 20 based aircraft were listed at TVY. This is the maximum level of based aircraft the airport can support while still providing some tie-downs for transient aircraft. Discussions with Airport staff indicated TVY most likely offered fewer transient positions in those years where more than 20 aircraft were reported. Knowing that apron and hangars haven't been recently developed and that TVY is typically at maximum capacity for based tenants, the historical fluctuations of based aircraft are assumed to be related to "snap-shots" in time of reporting when leases were in transition. **Table 2-5** details the historical based aircraft data for TVY.

TABLE 2-5
HISTORICAL BASED AIRCRAFT DATA

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Total
2008	18	1	0	0	19
2009	18	1	0	0	20
2010	18	1	0	0	19
2011	21	1	0	0	19
2012	19	1	0	0	22
2013	19	1	0	0	20
2014	15	1	0	0	20
2015	13	1	0	0	16
2016	13	1	0	0	14
2017	13	0	0	0	16
2018	14	1	0	0	15
2019	-	-	-	-	14
2020	-	-	-	-	14
2021	20	0	0	0	20

Source: FAA 2020 Terminal Area Forecast, SLCDAs Records 2022

Note: 2020 is a forecasted year in the FAA TAF. 2021 is a baseline condition validated via SLCDAs records.

2.5 PRIOR FORECASTS

This section provides a review of current and prior forecasts of operations and based aircraft, including the FAA 2020 Terminal Area Forecast (TAF) and the policy driven forecasts developed as part of the SLCDAs General Aviation Strategy Plan (GASP) completed in 2019. The FAA 2020 TAF details historical data from 2011 through 2019 as well as a 20-year forecast. The GASP forecast included scenarios of growth at TVY and U42 based on the hypothetical relocation of GA aircraft from SLC. The following subsections describes these forecasts and how this Master Plan incorporates them.

2.5.1 Terminal Area Forecast

Table 2-6 details the FAA 2020 TAF. The TAF forecast for TVY shows no growth through the planning period. This is a typical FAA forecast approach in the TAF for small general aviation airports like TVY

because non-towered airports do not have verified operational data provided by an air traffic control tower facility. Historical data is estimated by airport management and reported to the State and FAA. That estimate is typically incorporated into the TAF, and for small airports like TVY, no-growth forecasts are usually assumed unless a planning study is provided to the FAA. The current FAA TAF based aircraft numbers are reasonable, however the total annual operations numbers of 70,424 are higher than historic acoustic traffic counter data counts. Operations numbers shown in the TAF are considered to be inaccurate due to prior reporting errors, and as such, they are not considered as the baseline for this forecast.

TABLE 2-6
FAA TERMINAL AREA FORECAST

Year	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local General Aviation	Local Military	Total Annual Operations	Based Aircraft
2011	250	8774	0	35100	0	44124	19
2012	150	13000	0	7000	0	20150	22
2013	150	13000	0	7000	0	20150	20
2014	150	13000	0	7000	0	20150	20
2015	1003	44774	0	24647	0	70424	16
2016	1003	44774	0	24647	0	70424	14
2017	1003	44774	0	24647	0	70424	16
2018	1003	44774	0	24647	0	70424	15
2019	1003	44774	0	24647	0	70424	14
Forecast							
2020	1003	44774	0	24647	0	70424	14
2025	1003	44774	0	24647	0	70424	14
2030	1003	44774	0	24647	0	70424	14
2040	1003	44774	0	24647	0	70424	14
CAGR (2019-2040)	0%	0%	0%	0%	0%	0%	0%

Source: FAA 2020 Terminal Area Forecast

Source: Source: FAA 2020 Terminal Area Forecast

2.5.2 General Aviation Strategy Plan Forecasts

The General Aviation Strategy Plan (GASP) was completed in 2019 as a component of the Salt Lake City International Airport Master Plan. That study developed a simplistic baseline forecast for U42 and TVY as well as two scenario forecasts based on policy decisions predicated on the relocation of small GA aircraft at SLC to U42 and TVY.

2.5.2.1 GASP Baseline Forecast

The GASP baseline forecast for based aircraft showed no growth through the planning period as it was assumed no new hangars or apron would be constructed. Regarding operations, slight growth was anticipated based on increased flight training activity.

Although acoustic traffic counters are used to estimate the total number of aircraft operations at the airport, they are unable to identify the aircraft source by aircraft type or category of operations performed. Therefore, data from the FAA’s Operations Network (OPSNET) was used for the GASP to segment the historical aircraft operations into categories (air taxi, itinerant GA, and local GA) for

forecasting purposes. The percent mix of operations for each category from the OPSNET data was applied to the total number of aircraft operations from the acoustic counters. This percentage is denoted below, and was carried forward in this study’s forecast:

- » Air Taxi: 1 percent of total operations
- » Itinerant GA: 64 percent of total operations
- » Local GA: 35 percent of total operations

Overall, the GASP baseline forecast aircraft operations to increase from 45,814 in 2018 to 53,718 in 2037 (713 air taxi, 31,834 itinerant GA, and 21,171 local GA).

2.5.2.2 GASP Scenario #1

Scenario #1 was an optimistic, aggressive best-case scenario. The scenario was based on the relocation of based aircraft at SLC to U42 and TVY. Of those estimated to seek relocation it was assumed that 75 percent would relocate to U42, 15 percent would relocate to TVY, and the remaining 10 percent would relocate to an airport outside of the SLC Airport System or no longer lease a hangar. Based on the changes assumed under Scenario #1, an additional 23 based aircraft were forecasted at TVY by 2037. **Table 2-7** and **Table 2-8** show the Scenario #1 based aircraft and aircraft operations forecast developed for TVY.

**TABLE 2-7
GASP SCENARIO #1 BASED AIRCRAFT FORECAST**

	Year	Single-Engine	Multi-Engine	Jet	Helicopter	Total
Historical	2017	13	0	0	0	13
	2018	14	1	0	0	15
Forecast	2022	28	2	0	0	30
	2027	29	3	1	0	33
	2032	31	3	1	0	35
	2037	33	4	1	0	38
CAGR 2018-2037		4.6%	7.6%	n.a.	n.a.	5.0%

Source: SLCDA, RS&H/L&B Analysis, 2019

**TABLE 2-8
GASP SCENARIO #1 AIRCRAFT OPERATIONS FORECAST**

Year	Piston		Turboprop		Jet	Helicopter	Total	
	Single-Engine	Multi-Engine	Single-Engine	Multi-Engine				
Historical	2017	40,962	1,204	248	183	177	1,994	44,768
	2018	45,814	1,347	277	205	198	2,230	50,071
Forecast	2022	70,035	1,416	748	288	202	2,262	74,951
	2027	73,021	1,487	791	384	572	2,302	78,557
	2032	77,882	1,507	869	397	586	2,347	83,588
	2037	82,948	1,573	949	505	600	2,392	88,967
CAGR 2018-2037		3.2%	0.8%	6.7%	4.9%	6.0%	0.4%	3.1%

Source: FAA National Offload Program, RS&H/L&B Analysis, 2019

2.5.2.3 GASP Scenario #2

Scenario #2 shows a more conservative scenario with slower implementation of facility improvements based on the recommendations included in the GASP Report. Based on the changes assumed in Scenario #2, 15 additional based aircraft were forecasted at TVY by 2037. **Table 2-9** and **Table 2-10** show the Scenario #2 based aircraft and aircraft operations forecast developed for TVY.

**TABLE 2-9
GASP SCENARIO #2 BASED AIRCRAFT FORECAST**

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Total	
Historical	2017	13	0	0	13	
	2018	14	1	0	15	
Forecast	2022	20	1	0	21	
	2027	24	2	0	26	
	2032	25	2	1	28	
	2037	26	2	1	29	
CAGR 2018-2037		3.3%	3.7%	n.a.	n.a.	3.5%

Source: SLCD, RS&H/L&B Analysis, 2019

**TABLE 2-10
GASP SCENARIO #2 AIRCRAFT OPERATIONS FORECAST**

Year	Piston		Turboprop		Jet	Helicopter	Total	
	Single-Engine	Multi-Engine	Single-Engine	Multi-Engine				
Historical	2017	40,962	1,204	248	183	177	1,994	44,768
	2018	45,814	1,347	277	205	198	2,230	50,071
Forecast	2022	56,565	1,367	481	209	202	2,262	61,085
	2027	64,452	1,439	623	299	207	2,302	69,322
	2032	67,407	1,462	665	308	586	2,347	72,775
	2037	70,494	1,488	708	318	600	2,392	76,000
CAGR 2018-2037		2.3%	0.5%	5.1%	2.3%	6.0%	0.4%	2.2%

Source: FAA National Offload Program, RS&H/L&B Analysis, 2019

2.5.3 Utah Airports Based Aircraft TAF Comparison

An examination of other airports in Utah was conducted to compare FAA forecasted growth rates of based aircraft. **Table 2-11** details the historical and forecast based aircraft for Heber Valley Airport (HCR), Odgen-Hinkley Airport (OGD), Spanish Fork Airport (SPK), Provo Airport (PVU), and St. George Regional Airport (SGU). HCR, OGD, SPK, and PVU are all airports near the Salt Lake Valley. St. George was included in the comparison because it is similar fast growing Utah city with a population base well suited to support flight schools. In discussions with flight school operators at U42, it was noted that some have operations at SPK and have considered opening another division at SGU. Additionally, the FAA TAF forecast for the State of Utah was included in the comparison analysis.

Most of these airports and the State show growth of based aircraft forecasted through the planning period. Many of these airports have experienced robust based aircraft growth in the past 20 years,

especially SPK. Some airports have lost based aircraft over the last 20 years, such as PVU and OGD, but are forecast to regain some of them in the future. That phenomenon correlates directly to the FAA Aerospace Forecast which has, and continues to, forecast a decline in single engine piston activity. At PVU, many older and rarely used aircraft stored on tie-downs eventually got sold, moved, or scrapped which resulted in a decline in fleet since 2000. Yet, with strong business growth and the national need for flight training, PVU is seeing new hangar development and newer modern small GA aircraft being based at the airport. This is a recognized trend across the country at busy GA airports near metropolitan areas.

The FAA TAF forecasted the total number of based aircraft within the state of Utah to grow at 0.8 percent per year through the planning period. This is less than the more metropolitan and resort-oriented airports in the comparison (except for SPK which like TVY has a no growth forecast typical of small GA airports without a recent planning study forecast). This correlates to what the GA industry has experienced nationwide, which is growth within affluent areas and metropolitan areas while rural area growth remains flat. The 0.8 percent growth rate forecasted for the State overall was determined to be a reasonable estimate for baseline growth at TVY, as it is expected that TVY contribute to a correlated share of the State's growth. As such, the 0.8 percent growth rate as used for the baseline forecast of base aircraft at TVY.

TABLE 2-11
FAA TAF UTAH AIRPORTS BASED AIRCRAFT COMPARISON

Year	HCR Heber Valley	OGD Ogden	SPK Spanish Fork	PVO Provo	SGU St. George	State of Utah
TAF Historical Based Aircraft Data						
2000	76	270	50	153	103	
2001	84	292	50	153	105	
2002	89	292	50	153	118	
2003	90	292	50	154	118	
2004	94	292	108	157	151	
2005	94	292	111	166	177	
2006	100	292	111	166	177	
2007	100	385	111	166	178	
2008	95	277	116	127	178	
2009	113	256	130	114	177	2,050
2010	97	251	125	114	173	1,968
2011	99	247	125	114	177	1,937
2012	87	244	115	111	177	1,843
2013	87	245	114	111	183	2,014
2014	89	243	114	111	185	2,049
2015	98	236	154	111	185	2,035
2016	96	241	155	111	185	2,117
2017	78	236	155	111	195	2,056
2018	78	241	155	111	195	2,063
2019	78	241	141	111	195	1,967
CAGR 2000-2019	0.14%	-0.60%	5.61%	-1.67%	3.42%	
CAGR 2009-2019	-3.64%	-0.60%	0.82%	-0.27%	0.97%	-0.41%
TAF Forecast Based Aircraft Data						
2020	80	241	141	112	197	1,980
2025	90	243	141	122	212	2,058
2030	101	253	141	132	227	2,142
2040	131	273	141	152	257	2,328
CAGR 2019-2020	2.50%	0.60%	0.00%	1.51%	1.32%	0.81%

Source: FAA 2020 Terminal Area Forecast, 2022

Notes: TAF data did not include State of Utah historical numbers between 2000 through 2008.

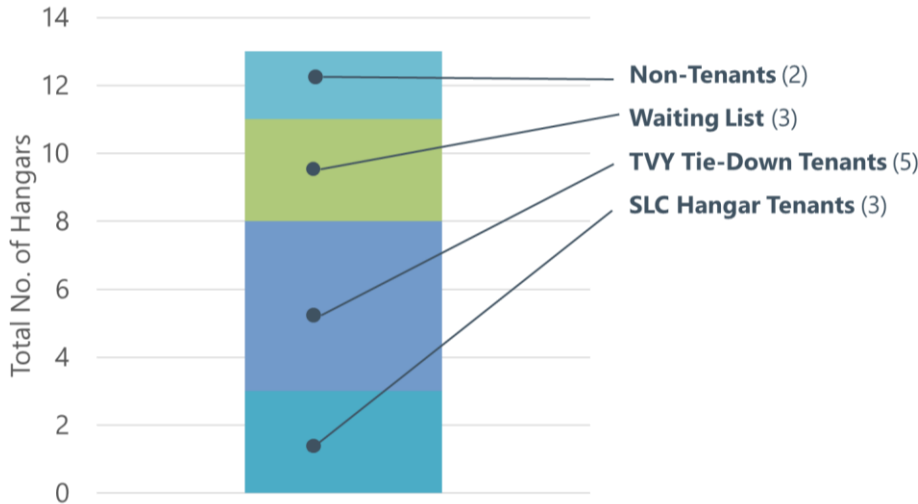
2.6 TENANT SURVEY

This TVY Master Plan is being conducted simultaneously with the U42 Master Plan. As part of these studies, a tenant survey was issued to SLCDA GA tenants at all three of the SLCDA airports. The survey was disseminated to tenants through the SLCDA GA Newsletter which is sent electronically every month. The GA Newsletter is public, and anyone can subscribe to the newsletter via the SLC website. As such, non-tenants also responded to the survey.

The survey was designed to gauge interest in new hangars at U42 and TVY. In addition, tenants at SLC were asked if they would be interested in relocating to U42 or TVY, and if so, how many hangars they would want and at which airport.

In total, the survey garnered 195 responses. Of those responses, 57 were tenants at SLC, 76 were tenants at U42, 9 were tenants at TVY, and 53 were not currently a tenant at any SLCDCA airport. Overall, the survey indicated potential demand for 13 hangars at TVY. **Figure 2-2** displays a breakdown of who taking the survey indicated demand for hangars at TVY.

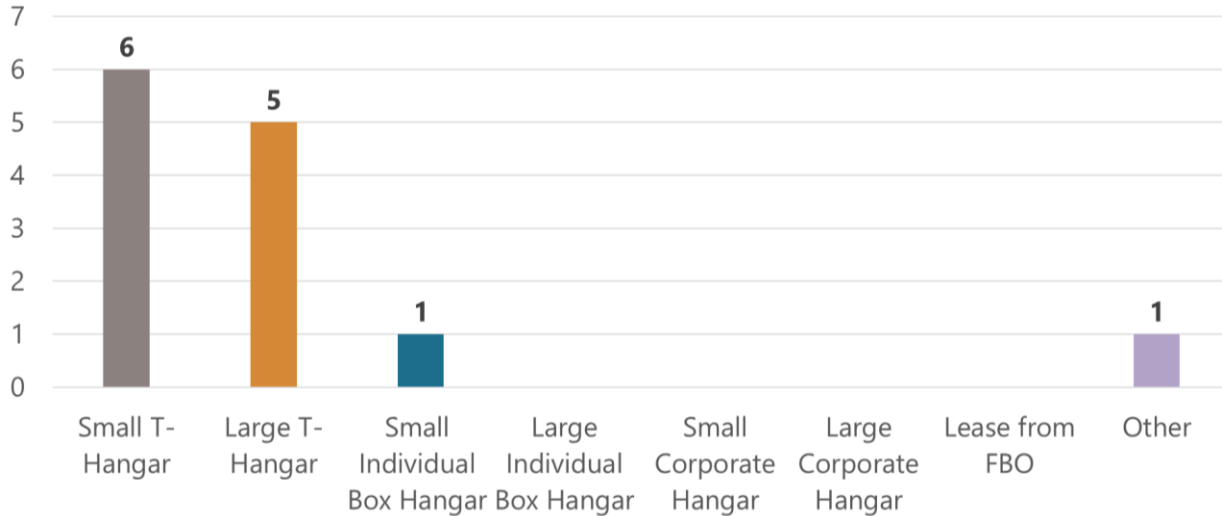
FIGURE 2-2
POTENTIAL HANGAR DEMAND AT TVY BY TENANT



Source: RS&H Analysis, 2022

The survey also asked respondents what type of hangar they would be interested in leasing. **Figure 2-3** denotes the types of hangars the respondents would like at TVY. The majority desired small or larger T-hangars, while one individual had interest in a small box hangar, and another asked for a shade type hangar (which constitutes the "Other").

FIGURE 2-3
POTENTIAL HANGAR DEMAND AT TVY BY HANGAR TYPE



Source: RS&H Analysis, 2022

The tenant survey validated the GASP forecast scenarios. The survey respondent’s indication of demand for hangars at TVY aligns with the GASP near-term forecast for based aircraft in Scenario #1, which is the more aggressive scenario. These factors were taken into consideration in this study’s high-growth forecast.

2.7 AVIATION FORECASTS

The GA Tenant Survey validated demand for hangars within the community of aircraft owners already based within the SLCDA system of airports. That potential demand validated the GASP forecast scenarios, which were based on relocation of smaller GA aircraft from SLC to TVY and U42. Additionally, there is organic growth expected to materialize at TVY based on the magnitude of development within Tooele Valley and the region, which is both currently being realized and forecasted to continue.

Several classical forecasting techniques, such as a socio-economic regression model, were attempted while forecasting based aircraft and aircraft operations at TVY. However, no suitable model was found. Therefore, the local socio-economic trends were not considered as viable indicators for forecasting.

Hangar development at TVY appears highly likely to materialize within the planning period. The socioeconomic dynamics within Tooele Valley and Salt Lake Valley indicate that at the very least, based aircraft growth at TVY will be in line with the FAA’s based aircraft forecast for the State of Utah of 0.8 percent per year. That growth rate was carried forward for this study’s baseline forecast of based aircraft. **Table 2-12** details the baseline forecast for based aircraft at TVY.

TABLE 2-12
TVY BASELINE BASED AIRCRAFT FORECAST

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter	Total
2020	19	0	1	0	0	20
2025	19	0	2	0	0	21
2030	20	0	2	0	0	22
2040	20	0	3	1	0	24
CAGR (2020-2040)	0.3%	-	5.6%	-	-	0.8%

Source: RS&H Analysis, 2022

Note: CAGR percentages not exact due to rounding.

Operations at GA airports normally correlate with the number of based aircraft, and it is typical for forecasts to apply an operations per based aircraft (OPBA) ratio. The OPBA at TVY (estimated at 2,150) is far higher than usual due to the fact the airport has few based aircraft but is used heavily for flight training operations. It is assumed that if the State’s based aircraft fleet increases at 0.8 percent per year, operations at TVY will as well as a direct result of the increases in the fleet within the region. Thus, operations were kept constant with growth forecast for based aircraft. The breakout between itinerant air taxi, itinerant GA, and local GA were carried forward from the OPSNET analysis conducted within the GASP. **Table 2-13** denotes the baseline forecast for operations at TVY.

TABLE 2-13
TVY BASELINE OPERATIONS FORECAST

Year	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local General Aviation	Local Military	Total Annual Operations	Based Aircraft
2020	244	27,738	0	15,066	0	43,048	20
2025	254	28,880	0	15,686	0	44,820	21
2030	264	30,069	0	16,332	0	46,665	22
2040	287	32,595	0	17,704	0	50,585	24
CAGR (2020-2040)	0.8%	0.8%	0.0%	0.8%	0.0%	0.8%	0.8%

Source: RS&H Analysis, 2022

The baseline forecast is conservative and accounts for low levels of organic growth through the next 20 years. The conservative estimate is valid for use as a baseline forecast due to the Airport’s historic trend of having no development in over a decade despite surrounding airports such as Sky Park and Spanish Forks seeing rapid growth. However, the GA Tenant Survey and economic indicators suggest TVY is ripe for increased growth that would match the business, population, and job growth materializing in Salt Lake County and Tooele County. To account for this potential, a high-growth scenario forecast was developed.

This forecast assumes the potential demand of 13 new based aircraft, indicated by the GA tenant survey, would fully materialize by 2025. After that, organic growth of 0.8 percent was applied. The resulting high-growth forecast for based aircraft is detailed in **Table 2-14**. A high-growth operations forecast was not developed, as it is not anticipated that growth in based aircraft at TVY would substantially affect annual operations at TVY since operations are predominantly related to aircraft coming from other airports for flight training purposes.

For purpose of analyzing facility requirements, consideration must be given to the fact that this high-growth forecast could be exceeded in the planning period if a major flight school decided to locate operations at TVY. In that case, operational counts would be expected to increase. The scenario-based facility requirements analysis within this Master Plan will take these factors into consideration to ensure development plans can accommodate the baseline forecast, high growth forecast, and a range of potential growth scenarios possible at TVY in the next 20 years.

TABLE 2-14
TVY HIGH GROWTH BASED AIRCRAFT FORECAST

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter	Total
2020	19	0	1	0	0	20
2025	32	0	1	0	0	33
2030	32	0	2	0	0	34
2040	33	0	3	1	0	37
CAGR (2020-2040)	2.8%	-	5.6%	-	-	3.2%

Source: RS&H Analysis, 2022

Note: CAGR percentages not exact due to rounding.

2.8 CRITICAL AIRCRAFT

The FAA requires the identification of the existing and future critical aircraft for airport planning purposes. The critical aircraft is the most demanding aircraft, or grouping of aircraft, using the airport regularly. Regular use is specifically defined in AC 150/5000-17, *Critical Aircraft and Regular Use Determination*, as 500 total annual operations, not counting touch-and-go operations.

Three parameters are used to classify the critical aircraft: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). The AAC, depicted by a letter, relates to aircraft landing speeds. The ADG, depicted by a Roman numeral, relates to airplane wingspan and height. The TDG, classified by number, relates to the outer-to-outer main gear width and the distance between the cockpit and main gear. These parameters serve as the basis of the design and construction of airport infrastructure.

The 2010 Airport Layout Plan (ALP) lists the Beechcraft Super King Air as the existing critical aircraft for TVY. That aircraft is a B-II-2 aircraft.⁸ The ALP denotes the Cessna Citation X as the future critical aircraft. Per the *FAA Aircraft Characteristics Database (October 2018)*, the Cessna Citation X is a B-II-1B aircraft. However, the Citation X+ is listed as a C-II-1B aircraft.

The approach speed for these aircraft sits on the threshold of AAC A and AAC B. The Citation X+ came to market in 2010 and it is assumed that when the 2010 ALP was developed, manufacturer data at the time indicated the Citation X family was a AAC C aircraft. Thus the 2010 ALP was referring to the Citation X as a C-II aircraft, which would include an upgrade from B approach category to C approach category.

An analysis of the EVS data obtained during this study was used to validate the existing critical aircraft. The annualized number of aircraft operations were sorted by approach and design group category, as detailed in **Table 2-15**. As shown, the EVS data in raw format includes 147 AAC B operations and 1,019 ADG II annual operations. The EVS data contained a significant number of operations that were “unknown,” and not tagged by aircraft type. Those operations were disbursed into AAC and ADG categories by correlating percentages to total. Using this methodology, the EVS raw data implies TVY accommodated approximately 244 AAC B annual operations.

As noted earlier in this chapter, the EVS data provides an incomplete picture of the full breadth of the number of operations at TVY because the data is reliant of FAA radar systems which do not currently have coverage to the ground elevation of TVY. Since operation counts are missing in the EVS data the acoustic traffic counter data was validated and used as a baseline for operational counts. The EVS Extrapolated Data column in **Table 2-17** shows the total number of operations for AAC and ADG aircraft when the EVS data is extrapolated to match the total acoustic traffic counter operation numbers. Likewise, the EVS Extrapolated Data Disbursed column includes the totals when the “unknown” data is dispersed into categories.

⁸ B-II-2 refers to approach category (AAC) B, aircraft design group (ADG) II, and taxiway design group (TDG) 2.

As can be seen in the tables, the EVS raw data and raw disbursed data show that AAC B aircraft are not meeting the substantial use threshold of 500 annual operations. When the EVS data is extrapolated, AAC B aircraft are near the threshold, and when the data is extrapolated and disbursed, AAC B aircraft are above the 500 annual operations threshold.

The 500 annual operations threshold cannot include touch-and-go operations, yet it is estimated that a quarter to half of the operations at TVY are touch-and-go operations. Touch-and-go traffic at TVY is related to training aircraft that are predominantly AAC A aircraft, such as the Cessna 172. Conservatively, if a quarter of the operations from the EVS Extrapolated Data Disbursed AAC B operations were removed, 586 AAC B operations remain. This level of AAC B aircraft operations meets the substantial use threshold, and as such validates the AAC B existing critical aircraft at TVY.

TABLE 2-15
2020 ANNUALIZED AIRCRAFT OPERATIONS BY AAC AND ADG

<u>Annual Mean Operations by AAC</u>				
AAC	EVS Raw Data	EVS Raw Data Disbursed	EVS Extrapolated Data	EVS Extrapolated Data Disbursed
A	7,947	13,135	25,517	42,174
B	147	244	473	782
C	17	28	54	88
D	1	1	2	4
Unknown	5,295		17,002	

<u>Annual Mean Operations by ADG</u>				
ADG	EVS Raw Data	EVS Raw Data Disbursed	EVS Extrapolated Data	EVS Extrapolated Data Disbursed
I	7,093	11,723	22,773	37,639
II	1,019	1,685	3,273	5,409
III	0	0	0	0
Unknown	5,295		17,002	

Source: EVS Earth Flight Tracking Data, RS&H Analysis, 2022

Note: EVS Extrapolated Data refers to the EVS data that was escalated to match total annual acoustic traffic counter data.

The EVS data indicates many different B-II aircraft operate at TVY, and it is the combination of them that meets the substantial use threshold as defined by FAA. The Beechcraft Super King Air, a B-II-2 aircraft, is carried forward in this study as the existing critical aircraft. The characteristics of this aircraft are representative of the other B-II aircraft that the EVS data indicates is being used at TVY.

Considering the developments currently underway and expected in the future within Tooele Valley, and the FAA forecasted increase of the national jet fleet through the planning period, maintaining a future critical aircraft of a C-II jet is prudent. The current future critical aircraft, the Cessna Citation X+, is a C-II-1B aircraft and thus meets this criterion. However, this aircraft has a landing gear configuration that is TDG 1B, whereas the Super King Air is a TDG 2. Many ADG II turboprop and jet aircraft have TDG 2 gear configurations. Thus, the future critical aircraft at TVY is a composite aircraft that includes the Super King Air and the Citation X+. **Table 2-16** details the current and future critical aircraft for TVY.

TABLE 2-16
EXISTING AND FUTURE CRITICAL AIRCRAFT

	Aircraft	AAC	ADG	TDG
Existing Critical Aircraft	Beechcraft Super King Air	B	II	2
Future Critical Aircraft	Beechcraft Super King Air	B	II	2
	Cessna Citation X+	C	II	1B

Source: FAA Aircraft Characteristics Database (October 2018), RS&H Analysis, 2022

2.9 FORECAST SUMMARY

A summary of the baseline aviation forecasts as it relates to aircraft operations and based aircraft is provided below in **Table 2-17**. This table compares the baseline forecast to the current TAF. As noted, the TAF operational numbers weren't aligned with historical acoustic traffic counter data. As such, **Table 2-18** is provided to show a comparison of the baseline condition in 2020 to the baseline forecast proposed in this study.

TABLE 2-17
BASILINE AVIATION FORECAST SUMMARY – 2020 TAF AS BASE YEAR

	Base Yr. Level	Base Yr.+5yrs.	Base Yr.+10yrs.	Base Yr.+20yrs.	Average Annual Compound Growth Rates		
					Base Yr. to +5	Base Yr. to +10	Base Yr. to +20
					2020	2025	2030
Operations							
<u>Itinerant</u>							
Air Taxi	1,003	254	264	287	-24.02%	-12.50%	-6.06%
General aviation	44,774	28,880	30,069	32,595	-8.40%	-3.90%	-1.57%
Military	0	0	0	0	0.00%	0.00%	0.00%
<u>Local</u>							
General aviation	24,647	15,686	16,332	17,704	-8.64%	-4.03%	-1.64%
Military	0	0	0	0	0.00%	0.00%	0.00%
TOTAL OPERATIONS	70,424	44,820	46,665	50,585	-8.64%	-4.03%	-1.64%
Based Aircraft							
Single Engine	14	21	22	23	8.45%	4.62%	2.51%
Multi Engine	0	0	0	0	0.00%	0.00%	0.00%
Jet Engine	0	0	0	1	0.00%	0.00%	-
Helicopter	0	0	0	0	0.00%	0.00%	0.00%
Other	0	0	0	0	0.00%	0.00%	0.00%
TOTAL	14	21	22	24	8.45%	4.62%	2.73%

Source: FAA 2020 TAF, RS&H Analysis, 2022

Note: 2020 was a forecast year in the TAF. However, no change was noted in the TAF between 2019 and 2020 or onward. The FAA 2020 TAF shows incorrect operations and based aircraft data for 2019 and 2020. FAA TAF operations data is far higher than actual. Thus, this table shows a steep decline between 2020 and 2025 operations.

TABLE 2-18
BASILINE AVIATION FORECAST SUMMARY – BASELINE CONDITION AS BASE YEAR

	Base Yr. Level 2020	Base Yr.+5yrs. 2025	Base Yr.+10yrs. 2030	Base Yr.+20yrs. 2040	Average Annual Compound Growth Rates		
					Base Yr. to	Base Yr. to	Base Yr. to
					+5 2025	+10 2030	+20 2040
Operations							
<u>Itinerant</u>							
Air Taxi	244	254	264	287	0.81%	0.79%	0.81%
General aviation	27,738	28,880	30,069	32,595	0.81%	0.81%	0.81%
Military	0	0	0	0	0.00%	0.00%	0.00%
<u>Local</u>							
General aviation	15,066	15,686	16,332	17,704	0.81%	0.81%	0.81%
Military	0	0	0	0	0.00%	0.00%	0.00%
TOTAL OPERATIONS	43,048	44,820	46,665	50,585	0.81%	0.81%	0.81%
Based Aircraft							
Single Engine	20	21	22	23	0.98%	0.96%	0.70%
Multi Engine	0	0	0	0	0.00%	0.00%	0.00%
Jet Engine	0	0	0	1	0.00%	0.00%	-
Helicopter	0	0	0	0	0.00%	0.00%	0.00%
Other	0	0	0	0	0.00%	0.00%	0.00%
TOTAL	20	21	22	24	0.98%	0.96%	0.92%

Source: SLCDA Acoustic Counter Data, SLCDA Records, RS&H Analysis, 2022

As noted in this chapter, the historical FAA data does not align with acoustic traffic counter data or SLCDA records for based aircraft in 2019 or 2020. The variance can be seen in the base year 2020 data shown in **Table 2-19** below. That table shows a comparison between the FAA 2020 TAF and the Master Plan baseline forecast.

TABLE 2-19
BASILINE FORECAST COMPARISON WITH FAA TAF

	Year	Master Plan Forecast	2020 TAF	MP Forecast/ 2020 TAF % Difference
Operations				
Base yr.	2020	43,048	70,424	48.3%
Base yr. + 5yrs.	2025	44,820	70,424	44.4%
Base yr. + 10yrs.	2030	46,665	70,424	40.6%
Base yr. + 20yrs.	2040	50,585	70,424	32.8%
Based Aircraft				
Base yr.	2020	20	14	35.3%
Base yr. + 5yrs.	2025	21	14	40.0%
Base yr. + 10yrs.	2030	22	14	44.4%
Base yr. + 20yrs.	2040	24	14	52.6%

Source: FAA 2020 Terminal Area Forecast

Note: TAF base year 2020 is a forecasted year in the TAF but is the same as 2019.