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2022 Airport Master Plan Study
South Valley Regional Airport / U42

AVIATION FORECASTS Version 3.0

RS&H

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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 AND SOCIOECONOMIC FACTORS

South Valley Regional Airport is owned by Salt Lake City Corporation. The Salt Lake City Department of Airports (SLCDA), a department of Salt Lake City Corporation, manages and operates U42. U42 sits inside the municipal boundary of West Jordan City which is a municipality within Salt Lake County. According to the West Jordan City's comprehensive general plan, which was completed in 2012, the city has seen a population increase of 141 percent, or an average annual increase of 5.0 percent over the last twenty years. The population growth in the area is largely due to both residential development and land annexation. In 2020, the U.S. Census Bureau reported West Jordan had a population of 116,961[1].

It is estimated that West Jordan's population will increase to over 155,000 by 2031. The population is relatively young, with the average West Jordan resident being 28.2 years old. The median household family income in West Jordan is $80,955, compared to the average of $74,865 of Salt Lake County as a whole. The population of Salt Lake County in 2020 sits at just over 1,185,000 people, growing approximately 15 percent from 2010, or a compound average growth rate of 1.42 percent.[2] It is anticipated that the county will have a population of approximately 1,400,000 by 2040.

Salt Lake County and Utah County are projected to continue to lead job growth and population growth in Utah for the next 40 years.[3] Population is expected to increase through a combination of net migration and births, with the Wasatch Front area remaining the core of the State's overall growth. Over the next 40 years, the employment base is also projected to expand by 63.3 percent with Salt Lake and Utah Counties capturing the majority of the estimated growth in manufacturing, professional, scientific, and technical service areas. The Utah economy is strong and in 2001, Utah led the nation in overall population growth between 2010 through 2020.

Overall, the region surrounding U42 has been growing, and is expected to continue to grow through this study's 20-year planning period and beyond. The area's job growth and consistent population increases are indicative of the strong economy. These factors will influence growth at U42 as more people and businesses locate into the area who may use aviation for business or pleasure. Additionally, the growing population makes it more likely there will be an increased demand for flight training associated with students looking to become career pilots, therefore increasing demand for local flight schools.

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[1] *U.S. Census Bureau QuickFacts: West Jordan city, Utah.* (n.d.). Census Bureau QuickFacts. Retrieved January 11, 2022, from https://www.census.gov/quickfacts/westjordancityutah

[2] U.S. Census Bureau QuickFacts: Salt Lake County, Utah. (n.d.). Census Bureau QuickFacts. Retrieved January 11, 2022 https://www.census.gov/quickfacts/saltlakecountyutah

[3] 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

2.3 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 fleet 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.

TABLE 2-1
FAA AEROSPACE FORECAST

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 has come out of the COVID-19 pandemic strong, and demand for new pilots and associated training, is expected to drive demand for new developments and increasing annual operations at U42. With COVID-19 related airline pilot retirements and continued "baby-boomer" generation pilots retiring, the demand for new pilots is expected to continue for decades. The Bureau of Labor Statistics

estimates from 2020 to 2030 there will be a demand of 14,500 new pilots each year[4]. Because U42 is adjacent to a major population base and multiple airports with thriving GA communities, it is expected that flight training related use of U42 will see higher levels through the planning period.

There are multiple flight schools based at South Valley Regional Airport, including Randon Aviation, Upper Limit Aviation, and Utah Helicopter. During discussions with these operators, they expressed a desire to grow and expect the market for flight training to remain strong through the decade. It is currently estimated that by 2025 there will be a shortage of 34,000 commercial airline pilots worldwide.[5] United Airlines and other carriers are actively addressing this issue by creating their own flight schools. United's new school, United Aviate Academy in Goodyear, Arizona, has been developed to help fill United's need for 10,000 new pilots by 2030. Though, United only expects that 5,000 pilots of their total need will come from United Aviate. Traditionally pilots come into the airline industry from prior military service and numerous smaller flight schools such as those that operate at U42. United and other carriers will continue to rely on these pipelines to meet their demand for new pilots.

Overall, the industry's need for more commercial airline pilots is expected to continue providing demand for flight training. This will result in continued growth of flight training operations at U42.

2.4 HISTORICAL AVIATION ACTIVITY

Shown in **Table 2-2** are aircraft operations at U42 between 2005 and 2020 which have been counted through acoustic traffic counters on the airfield. From 2005 to 2020, U42 has averaged 72,074 annual operations, with an average of 197 operations per day. **Figure 2-1** illustrates the variations year-to-year of operations at U42. A trendline was applied to that data and no trend of growth or decline was found. Overall, operations have been flat with year-to-year variations above and below the 70,000 mark.

[4] Transportation and material moving occupations: Occupational outlook handbook: U.S. Bureau of Labor Statistics. (2021, September 8). Retrieved from https://www.bls.gov/ooh/transportation-and-material-moving/home.htm

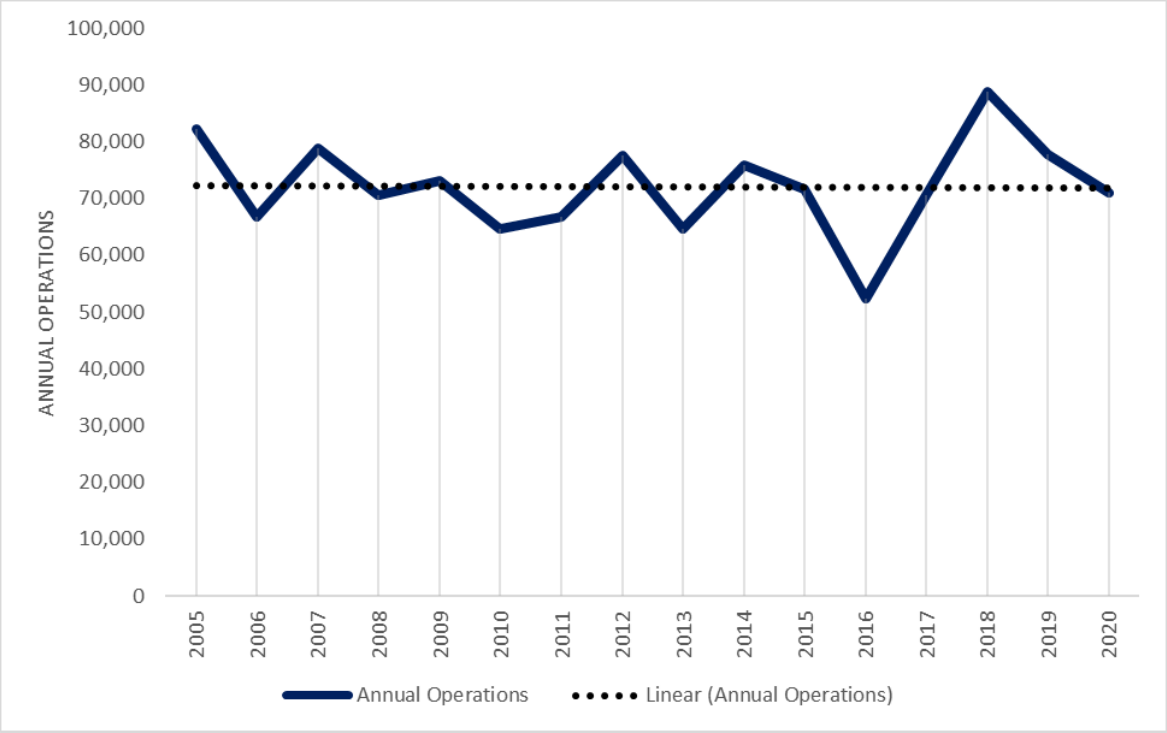
5 The truth about the pilot shortage. (2022, January 27). Retrieved from https://www.linkedin.com/pulse/truth-pilot-shortage-scott-kirby/

TABLE 2-2
ACOUSTIC COUNTER OPERATIONS

Year	Total Operations	Average/Day
2005	82,253	225
2006	66,720	183
2007	78,879	216
2008	70,515	193
2009	73,227	201
2010	64,660	177
2011	66,790	183
2012	77,517	212
2013	64,562	177
2014	75,934	208
2015	71,665	196
2016	52,271	143
2017	70,628	194
2018	88,756	243
2019	77,815	213
2020	70,990	194

Source: SLCDA Acoustic Counter Data, 2021

FIGURE 2-1
ANNUAL OPERATIONS PER ACOUSTIC COUNTER DATA



Source: SLCDA Acoustic Counter Data, 2021. Dotted line shows trendline.

As part of this study, Envirosuite (EVS) Earth Flight Tracking Data was also obtained and used. This data was gathered and used to provide a detailed sample of the exact aircraft types operating at U42. Through analysis of this data, a fleet mix based on propulsion type as well as critical aircraft could be determined.

The EVS data available for this study included 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. The data provides operational counts by specific aircraft type and helped validate the acoustic traffic counter data.

The 18 months of EVS data was totaled and then annualized, as shown in **Table 2-3**, equating to 52,393 annual operations. This is roughly 30 percent lower than the acoustic traffic counter data for 2020, which recorded 70,990 annual operations. The discrepancy required a validation process to determine which data source should be used as a baseline level of operations.

The TVY Master Plan study is being completed simultaneously with this U42 Master Plan study, and EVS data was collected for both airports. For the TVY Master Plan project, game cameras were used to capture 18 days' worth of flight activity between September 16th and October 3rd, 2020. Because the EVS data for TVY was lacking many operations due to lesser radar coverage in the Tooele Valley, the game camera data was used to validate acoustic data. The average daily operational levels of the game camera data closely aligned with and validated the average daily levels of acoustic traffic counter data. Thus, for the TVY Master Plan, the acoustic traffic counter data was used for the baseline of annual operations. The acoustic traffic counters at U42 are similar to those at TVY, and data is collected by the same SLCDA staff. As such, the U42 acoustic traffic counter data was determined acceptable for use as the baseline of annual operations.

TABLE 2-3
EVS DATA OPERATIONS BY PROPULSION TYPE

Propulsion Class	9 Months 2020 Ops	9 Months 2021 Ops	18 Months Total Ops	Annualized
Helicopter	403	1,615	2,018	1,345
Jet	540	369	909	606
Single Piston	33,140	31,446	64,586	43,057
Dual Piston	1,047	953	2,000	1,333
Quad Piston	2	1	3	2
Turboprop	484	496	980	653
Unknown	3,932	4,161	8,093	5,395
Total	**39,548**	**39,041**	**78,589**	**52,393**

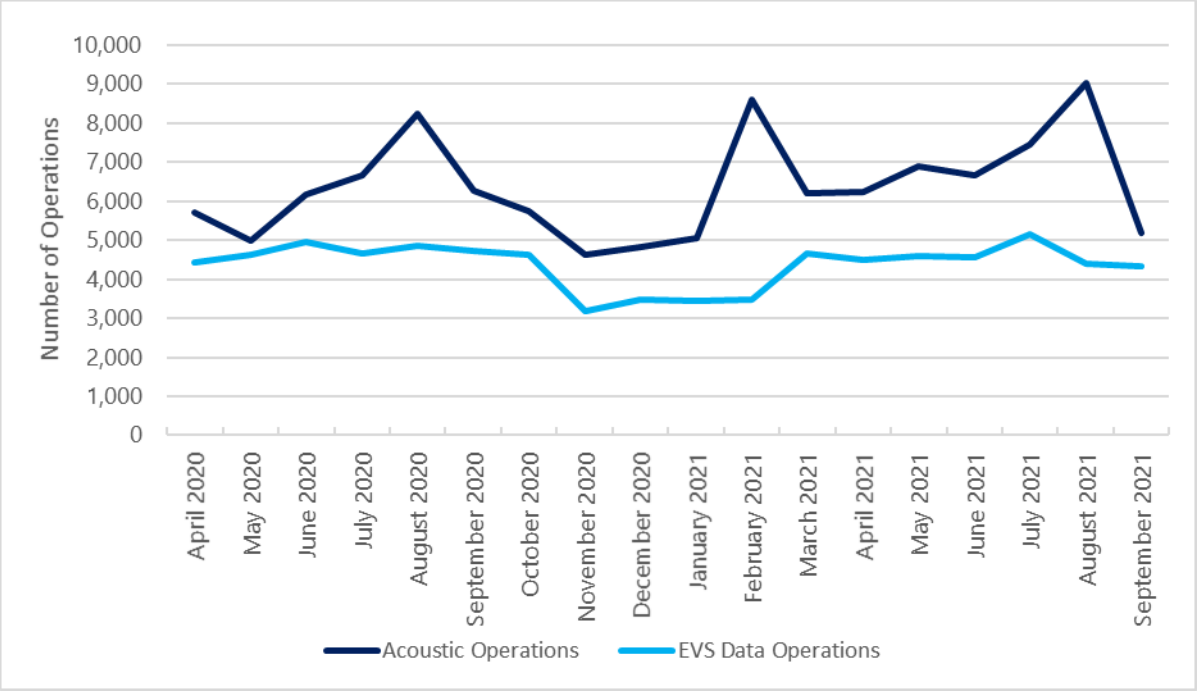
Source: EVS Earth Flight Tracking Data; RS&H Analysis, 2022

The EVS data was also compared to the acoustic traffic counter data on a month-by-month basis, as shown in **Figure 2-2**. Traffic at U42 is seasonally effected and weather dependent, as evidenced by the spike in operations in the summer months of 2020 and 2021. The TVY acoustic data was also compared

with the acoustic data collected for U42, and both showed spikes in operations in August of 2020, February of 2021, and again in August of 2021. The alignment between data sets confirmed accuracy of the acoustic traffic counter data.

Overall, the EVS data provides excellent data pertaining to fleet mix and aircraft types operating at the airport, but does not catch all operations, specifically touch-and-go operations. Thus, acoustical data was used for the annual operations baseline and the EVS data was used for analysis of aircraft specific operations.

FIGURE 2-2
ACOUSTIC COUNTER OPERATIONS CHART



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

2.4.1.1 FAA TFMSC Data Analysis

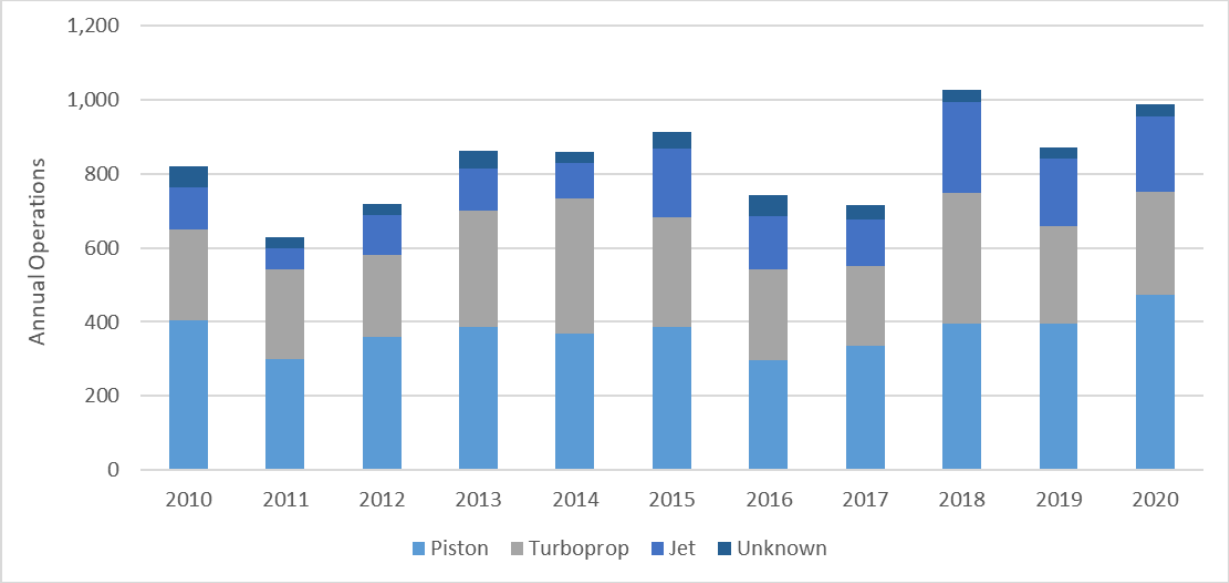
The FAA Traffic Flow Management System Counts (TFMSC) data was also examined for U42. TFMSC data is created when pilots file flight plans, and mostly includes flights conducted under Instrument Flight Rules (IFR). At airports such as U42, the FAA system does not capture all IFR flights conducted at the airport. Nevertheless, the data is useful in examining trends and determining what aircraft fleet mix is using the Airport under an IFR flight plan. These operations are typically business-specific operations and may be related to charter operations. This data assists in pulling out those operations that are mission-oriented from training operations.

Figure 2-3 illustrates the number of annual operations by propulsion type captured in the TFMSC data between 2010 and 2020. On average, 45 percent of IFR operations were conducted by piston aircraft, 33 percent by turboprop aircraft, 17 percent by jet aircraft, and the remining 5 percent is unknown. The piston category includes both single and dual engine aircraft. In examining the dataset of specific aircraft

types making up these operations, it was found the piston category fleet consists mostly of higher performance aircraft not typically used as flight training aircraft.

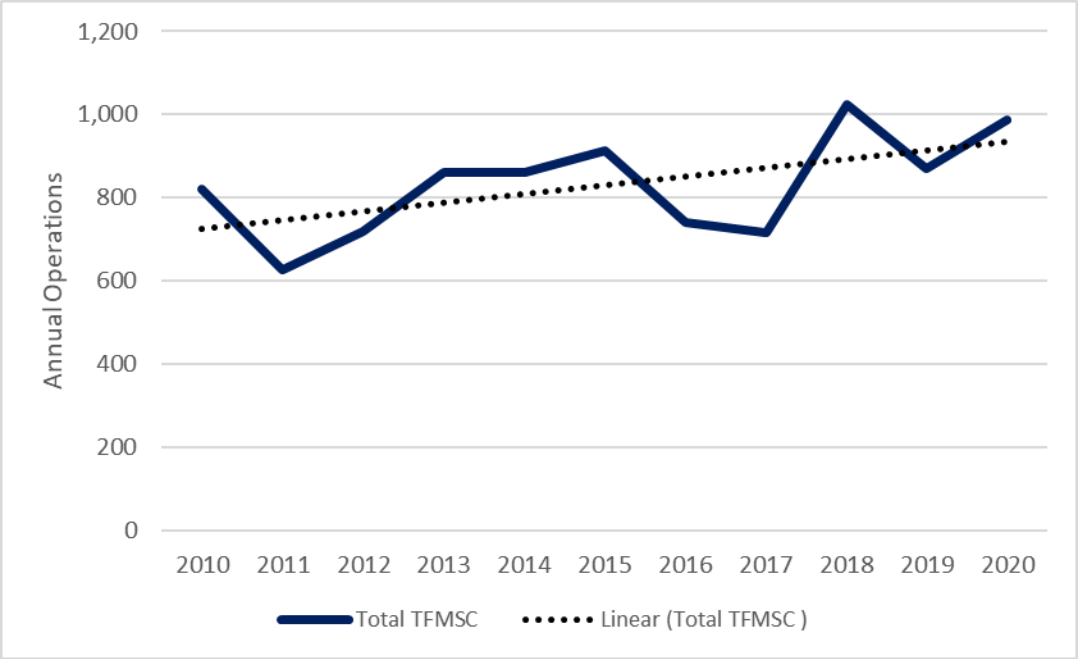
Since 2010, there has been an upward trend in IFR operations at U42, as detailed by the trendline in **Figure 2-4**. These operations are conducted predominantly by high performance aircraft, indicating U42 is being used more consistently by operators with mission-specific operations related to business or other non-training purposes.

FIGURE 2-3
TFMSC ANNUAL OPERATIONS BY PROPULSION TYPE



Source: FAA TFMSC Database; RS&H Analysis, 2022

FIGURE 2-4
TFMSC ANNUAL OPERATIONS TRENDLINE



Source: FAA TFMSC Database; RS&H Analysis, 2022. Dotted line shows trendline.

2.4.1 Historical Based Aircraft Counts

Table 2-4 details historical based aircraft as reported in the FAA 2019 Detailed Terminal Area Forecast (TAF) and the FAA 2020 TAF. The FAA Detailed TAF provided operations by aircraft type and is no longer available at the time of this writing. Those numbers were carried over from the General Aviation Strategy Plan (GASP) that was conducted as a component of the 2020 SLC Airport Master Plan. The FAA 2020 TAF provides only a total number of based aircraft and does not align with the older 2019 Detailed TAF.

Overall, the difference in historical data is negligible. Over the last decade, no hangar or apron development has occurred at U42 and based aircraft numbers have remained relatively consistent. Knowing that facilities haven't been recently developed and that U42 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 and/or reporting errors.

In 2022, SLCDA records were analyzed and a total of 206 aircraft were based at U42. At that time, a corporate hangar and space in the FBO hangars were in transition between leaseholders. On average, U42 is estimated to have between 200 and 225 based aircraft, the difference being related to changes in leases and size of aircraft based in the larger hangars where multiple aircraft are stored.

The FAA uses an online database, BasedAircraft.com, to track based aircraft at all NPIAS airports. That system uses aircraft N- numbers for tracking purposes, and aircraft that lack airworthy certificates are not counted as based aircraft. Additionally, due to aircraft being sold and moved to various airports, it is typical that some aircraft may be counted at other airports, and thus not able to be counted at their new

home airport until further validated. At U42, the database reported 177 based aircraft at the time of this writing. The lower count compared to airport records was determined to be a result of a few un-airworthy aircraft still in hangars and new aircraft to U42 that still required validation in the database. For forecasting purposes, the base number of 177 aircraft was used as the baseline.

TABLE 2-4
HISTORICAL BASED AIRCRAFT DATA

FAA 2019 Detailed Terminal Area Forecast						2020 TAF
Year	Single-Engine	Multi-Engine	Jet	Helicopter	Total	Total
2008	192	19	4	5	220	244
2009	219	20	5	5	249	244
2010	219	20	5	5	249	269
2011	154	10	1	2	167	273
2012	228	15	2	3	248	191
2013	259	17	2	3	281	272
2014	192	11	1	6	210	311
2015	220	16	1	7	244	240
2016	220	16	1	7	244	274
2017	194	9	1	3	207	272
2018	200	13	1	6	220	272
2019	-	-	-	-	-	222
2020	-	-	-	-	-	222
2021	190	12	1	3	206	206

Source: FAA 2019 Detailed Terminal Area Forecast; SLCDA Records 2022
Notes: FAA 2020 Terminal Area Forecast shown for comparison. 2021 data is based on SLCDA records. The BasedAircraft.com database record of 177 based aircraft was used as the starting point for forecasting purposes.

2.5 PRIOR FORECASTS

This section provides a review of prior forecasts of operations and based aircraft, including the FAA 2020 TAF and the policy driven forecasts developed as part of the SLCDA General Aviation Strategy Plan which was completed in 2019. The FAA 2020 TAF provides 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 describe these forecasts and how this master plan forecast is incorporating them.

2.5.1 Terminal Area Forecast

Table 2-5 shows the FAA Terminal Area Forecast (TAF) for U42. The forecast for U42 shows no growth through the planning period. This is typical of small general aviation airports like U42 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 U42, zero growth forecasts are usually assumed unless a planning study is provided to the FAA.

TABLE 2-5
FAA 2020 TERMINAL AREA FORECAST

Year	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local General Aviation	Local Military	Total Annual Operations	Based Aircraft
2011	450	24,210	7,500	48,492	0	80,652	273
2012	650	18,720	7,500	48,130	0	75,000	191
2013	650	18,720	7,500	48,130	0	75,000	272
2014	650	18,720	7,500	48,130	0	75,000	311
2015	658	18,953	7,593	48,730	0	75,934	240
2016	658	18,953	7,593	48,730	0	75,934	274
2017	658	18,953	7,593	48,730	0	75,934	272
2018	658	18,953	7,593	48,730	0	75,934	272
2019	658	18,953	7,593	48,730	0	75,934	222
Forecast							
2020	658	18,953	7,593	48,730	0	75,934	222
2025	658	18,953	7,593	48,730	0	75,934	222
2030	658	18,953	7,593	48,730	0	75,934	222
2040	658	18,953	7,593	48,730	0	75,934	222
CAGR (2019-2040)	0%	0%	0%	0%	0%	0%	0%

Source: FAA 2020 Terminal Area Forecast

2.5.2 General Aviation Strategy Plan

The 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 and 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 study noted that operations and based aircraft at U42 have not followed socio-economic trends in the region. The result is that all socio-economic models tested provided coefficients with inadequate correlation. Therefore, local socio-economic trends were not considered viable indicators for based aircraft or operational forecasts.

The GASP baseline forecast for based aircraft showed immediate growth in the near term related to flight school expansion. At the time of the GASP writing in 2019, conditions were similar to today in 2022 and flight schools were growing fleets to keep up with demand. However, the baseline forecast incorporated an overall decline in single piston aircraft in correlation with the FAA Aerospace Forecasts of the GA fleet. Multi-engine, jet and helicopter fleets were forecasted to continue to grow. The baseline GASP based aircraft forecast is detailed in **Table 2-6**.

TABLE 2-6
GASP BASELINE BASED AIRCRAFT FORECAST

Year		Single Engine Piston	Multi Engine Piston	Jet	Helicopter	Total
Historical	2008	192	19	4	5	220
	2009	219	20	5	5	249
	2010	219	20	5	5	249
	2011	154	10	1	2	167
	2012	228	15	2	3	248
	2013	259	17	2	3	281
	2014	192	11	1	6	210
	2015	220	16	1	7	244
	2016	220	16	1	7	244
	2017	194	9	1	3	207
	2018	200	13	1	6	220
Forecast	2027	209	13	1	7	230
	2032	204	15	1	8	228
	2037	199	17	2	8	226
CAGR 2008-2018		0.4%	-3.7%	-12.9%	1.8%	0.0%
CAGR 2018-2037		0.0%	1.4%	3.7%	1.5%	0.1%

Source: FAA Detailed Terminal Area Forecast; SLCDA; RS&H/L&B Analysis, 2019

Annual operations were forecast to grow from 88,756 in 2018 to 103,980 by 2037. That equates to a compound average annual growth rate of 0.84 percent. The growth in that forecast was attributed to operations per based aircraft (OPBA) increasing at the same level as based aircraft were forecast to grow and increased local GA OPBA assuming continued growth of flight training operations. The increase in flight training activity was estimated to support continued growth in operations despite the forecast for based aircraft to decline.

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. **Table 2-7** and **Table 2-8** show the Scenario #1 based aircraft and aircraft operations forecast for U42.

TABLE 2-7
SCENARIO #1 BASED AIRCRAFT FORECAST

Year		Single-Engine	Multi-Engine	Jet	Helicopter	Total
Historical	2017	194	9	1	3	207
	2018	200	13	1	6	220
Forecast	2022	282	22	1	8	313
	2027	286	27	1	9	323
	2032	290	33	1	10	334
	2037	294	39	2	10	345
CAGR 2018-2037		2.0%	6.0%	3.7%	2.7%	2.4%

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

TABLE 2-8
SCENARIO #1 AIRCRAFT OPERATIONS FORECAST

Year		Piston		Turboprop		Jet	Helicopter	Total
		Single-Engine	Multi-Engine	Single-Engine	Multi-Engine			
Historical	2017	53,475	6,010	2,761	1,559	1,559	9,584	74,948
	2018	57,493	8,383	2,968	2,176	1,847	15,889	88,756
Forecast	2022	73,709	9,437	5,475	3,115	2,214	18,167	112,117
	2027	75,656	10,005	5,812	3,599	2,530	19,205	116,807
	2032	77,678	10,858	6,144	4,204	2,890	20,391	122,165
	2037	79,589	11,816	6,473	4,891	3,280	21,677	127,726
CAGR 2018-2037		1.7%	1.8%	4.2%	4.4%	3.1%	1.6%	1.9%

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. An additional 15,010 aircraft operations are forecasted in Scenario #2 at U42 by 2037. **Table 2-9** and **Table 2-10** show the Scenario #2 based aircraft and aircraft operations forecast for U42.

TABLE 2-9
SCENARIO #2 BASED AIRCRAFT FORECAST

Year		Single-Engine	Multi-Engine	Jet	Helicopter	Total
Historical	2017	194	9	1	3	207
	2018	200	13	1	6	220
Forecast	2022	243	15	1	6	265
	2027	261	19	1	9	290
	2032	261	24	1	10	296
	2037	261	27	2	10	300
CAGR 2018-2037		1.4%	3.9%	3.7%	2.7%	1.6%

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

TABLE 2-10
SCENARIO #2 AIRCRAFT OPERATIONS FORECAST

Year		Piston		Turboprop		Jet	Helicopter	Total
		Single-Engine	Multi-Engine	Single-Engine	Multi-Engine			
Historical	2017	53,475	6,010	2,761	1,559	1,559	9,584	74,948
	2018	57,493	8,383	2,968	2,176	1,847	15,889	88,756
Forecast	2022	67,092	9,093	4,175	2,560	2,214	17,878	103,012
	2027	71,324	9,625	4,970	2,920	2,530	19,205	110,573
	2032	72,540	10,454	5,158	3,402	2,890	20,391	114,835
	2037	73,622	11,305	5,340	3,767	3,280	21,677	118,990
CAGR 2018-2037		1.3%	1.6%	3.1%	2.9%	3.1%	1.6%	1.6%

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 a 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 strong 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 forecasts 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 0.81 percent per year through the planning period. This is less than the more metropolitan and resort-oriented airports in the comparison (expect for SPK which like U42 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 nation-wide, which is growth within affluent areas and metropolitan areas while rural area growth remains flat. The 0.81 percent growth rate forecasted for the State overall was determined to be a reasonable estimate for baseline growth at U42, as it is expected that U42 will contribute to a correlated share of the State's growth. As such, a 0.8 percent growth rate was used for the baseline forecast of base aircraft at U42.

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

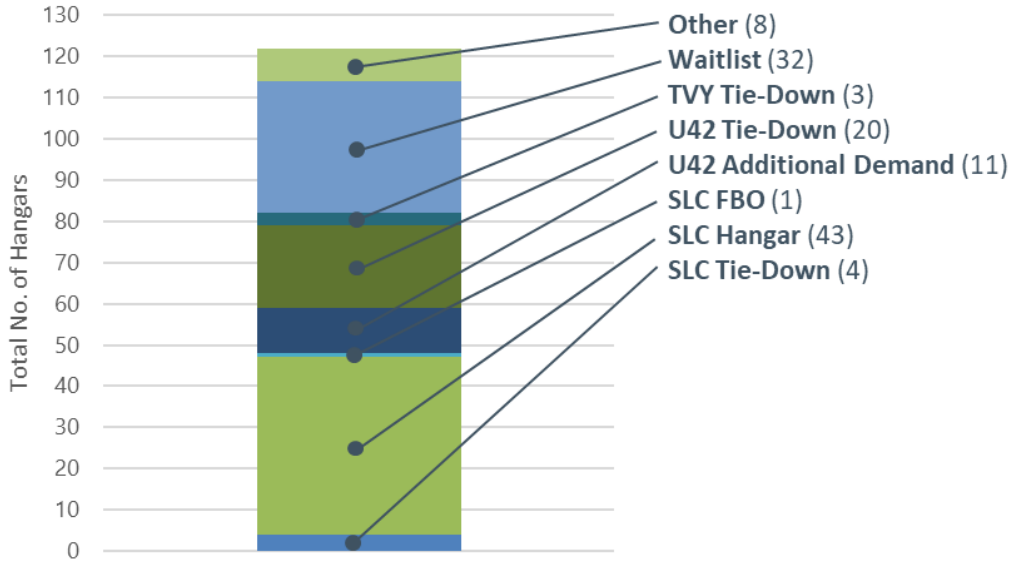
2.6 TENANT SURVEY

This U42 Master Plan is being conducted simultaneously with the TVY 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 publicly available, 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 if there existing aircraft storage accommodations were impacted by proposed development, 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 SLCDA airport. Overall, the survey indicated potential demand for 122 hangars at U42. **Figure 2-5** displays a breakdown of potential U42 hangar/aircraft storage demand as indicated by the survey results.

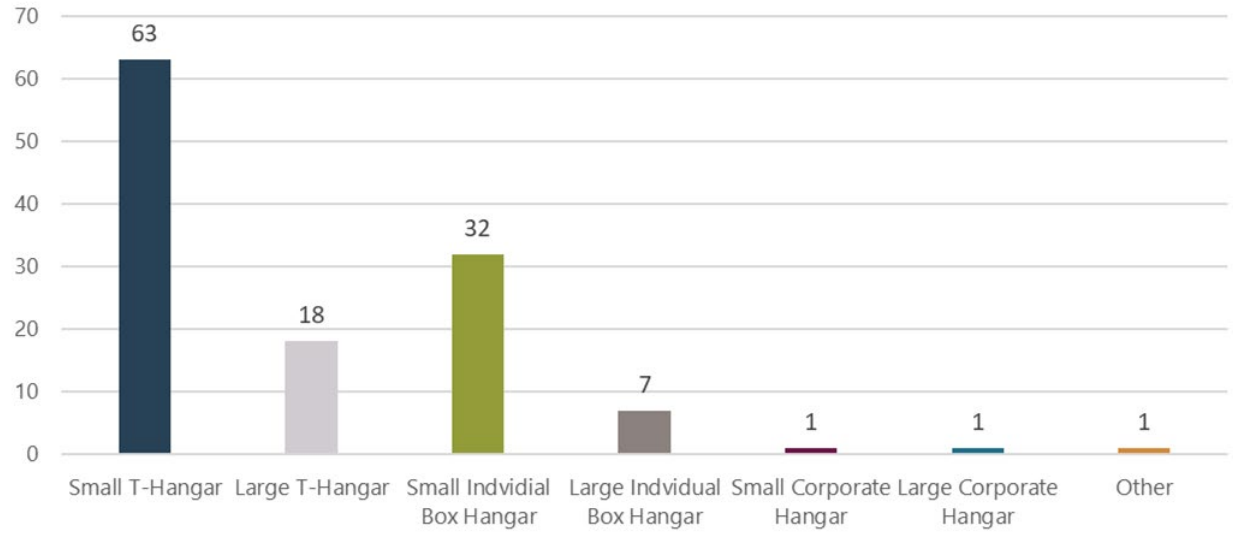
FIGURE 2-5
POTENTIAL HANGAR DEMAND BY ORIGIN



Source: GA Tenant Survey, RS&H Analysis, 2022

The survey also asked respondents what type of hangar they would be interested in leasing. **Figure 2-6** denotes the types of hangars the respondents would like at U42. The majority of respondents desired T-hangars. There was also interest in box hangars and corporate hangars and one individual asked for a shade type hangar (which constitutes the "Other").

FIGURE 2-6
POTENTIAL HANGAR DEMAND BY HANGAR TYPE



Source: GA Tenant Survey, RS&H Analysis, 2022

2.7 AVIATION FORECASTS

The GA Tenant Survey confirmed demand for hangars within the community of aircraft owners already based or on a waitlist within the SLCDA system of airports. The survey also validated the GASP forecast scenarios, which were based on relocation of smaller GA aircraft from SLC to TVY and U42.

Several classical forecasting techniques, such as a socio-economic regression model, were attempted while forecasting based aircraft and aircraft operations at U42. However, no suitable model was found. Therefore, the local socio-economic trends were not considered as viable indicators for forecasting. For U42, the FAA TAF forecast for the state of Utah was determined as the best indicator of future levels for use in the baseline forecast.

Hangar development at U42 is likely to materialize within the planning period. The demand within West Jordan and the Salt Lake Valley for flight training indicate, at the very least, based aircraft growth at U42 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 as detailed in **Table 2-12**.

The growth rate between 2020 and 2025 equated to 1.6 percent year over year. This rate reflects organic growth of 0.8 percent year-over-year as well as the airports efforts to have aircraft validated within the FAA BasedAircraft.com database and ensuring only airworthy aircraft are based on tiedowns and hangars. Beyond 2025, the 0.8 percent growth rate is applied, equating to 241 total based aircraft by 2040.

This baseline forecast of based aircraft is predicated on continued growth of flight training. Flight schools are expected to grow fleets of single engine aircraft, as well as add one additional based multi-engine and helicopter within the planning period. One additional turboprop and jet is also forecast to be based at

U42 by the end of the planning period, which correlates to the FAA's expectation of national turbo and jet fleets to grow through the future.

TABLE 2-12
BASELINE U42 BASED AIRCRAFT FORECAST

Year	Single Engine Piston	Multi-Engine Piston	Turbo Prop	Jet	Helicopter	Total
2020	160	9	4	1	3	177
2025	196	9	4	1	3	213
2030	203	10	4	1	3	221
2040	220	10	5	2	4	241
CAGR (2020-2040)	1.6%	0.5%	0.8%	3.5%	0.8%	1.6%
CAGR (2025-2040)	0.8%	0.4%	0.8%	4.5%	0.8%	0.8%

Source: SLCDA Records; BasedAircraft.com; RS&H Analysis, 2022.
Note 2020 is baseline historical year

Table 2-13 details the baseline operations forecast. The breakout of operational type (i.e., itinerant air taxi, itinerant general aviation, etc.) is based on the breakout percentage of the FAA 2020 TAF. That breakout is valid as the majority of operations at U42 are flight training touch-and-go operations (local general aviation), as well as training operations that leave the airport area (itinerant general aviation). The Army National Guard conducts helicopter flight training operations predominantly Monday through Thursday. Those operations typically leave the airport area as well, which correlates to itinerant military operations.

Itinerant air taxi operations were found to be roughly aligned with TFMSC data which, for 2020, showed a total of 987 operations. It is assumed most air taxi operations are conducted under IFR flight plans. Considering U42 also has based tenants who operate aircraft for business-specific missions and not all TFMSC operations would be related to air taxi operations, 615 itinerant air taxi operations in 2020 is a reasonable estimate. The percentage total of air taxi relative to other categories of operations was held constant though the forecast.

The baseline operations forecast shows growth in all categories, except military, at 0.8 percent per year. This assumes the operations per based aircraft for these categories remains roughly the same though the planning period. The total annual OPBA will decline as itinerant military operations are held constant through the planning period.

The baseline operations forecast is conservative, and accounts for the fact that, between 2005 and 2020, U42 has not seen consistent growth in operations. As shown previously in **Figure 2-1**, the trendline for annual operations is flat at around 70,000 operations. In the future, some years are likely to see operational levels exceed this forecast, while other years may be lower than projected. Overall, it is expected the baseline for average annual operations will increase up to the 80,000 per year mark, with an upward trend from 2020 through the planning period. This will be largely due to increases in flight training activity as well as continued increases in operations by the growing national jet and turboprop aircraft fleet.

TABLE 2-13
BASELINE U42 OPERATIONS FORECAST

Year	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local General Aviation	Local Military	Total Annual Operations	Based Aircraft
2020	615	17,719	7,099	45,557	0	70,990	177
2025	664	19,139	7,099	49,208	0	76,111	213
2030	671	19,319	7,099	49,671	0	76,760	221
2040	741	21,354	7,099	54,904	0	84,098	241
CAGR (2020-2040)	0.9%	0.9%	0.0%	0.9%	0.0%	0.9%	1.6%

Source: SLCDA Records; BasedAircraft.com; RS&H Analysis, 2022.
Note 2020 is baseline historical year

2.7.1.1 High Growth Forecast

Considering the potential demand indicated in the results of the GA Tenant Survey, the increase in flight training forecasted industry-wide, and the robust growth of businesses and population within the Wasatch Front, a high growth forecast was developed. This forecast assumed hangar demand indicated in the GA Tenant Survey would be accommodated by 2025, adding approximately 130 based aircraft. After 2025, the 0.8 percent growth rate was applied, equating to a total of 378 based aircraft by 2040, as detailed in **Table 2-14**.

The results of the GA Tenant Survey suggested aircraft relocated from SLC to U42 would be single piston aircraft along with a few multi-engine piston aircraft. Thus, most of the growth forecasted in the high-growth forecast are single engine piston aircraft. A few additional multi-engine pistons are predicted to be based over time as flight training schools continue to grow fleets. Also, one additional turboprop, jet, and helicopter are forecasted to be based at U42 by the end of the planning period.

The high growth forecast of operations is detailed in **Table 2-15**. This forecast is similar to the baseline forecast in that all operational categories are held constant based on today's OPBA for each[6], expect for military which is not forecasted to grow. The forecast suggests that operations would exceed 100,000 after the hangar demand from the GA Tenant Survey is accommodated. Annual operations would then continue to grow as the based aircraft fleet continues to grow though the rest of the planning period.

TABLE 2-14
HIGH GROWTH BASED AIRCRAFT FORECAST

Year	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter	Total
2020	160	9	4	1	3	177
2025	314	12	4	1	3	335
2030	327	13	4	1	3	348
2040	354	14	5	2	4	378
CAGR (2020-2040)	4.1%	2.2%	0.8%	3.5%	0.8%	3.9%

Source: SLCDA Records; BasedAircraft.com; RS&H Analysis, 2022.
Note 2020 is baseline historical year

[6] OPBA was analyzed based on the total number of based aircraft listed within SLCDA records, which at the time of this writing was 206. Those records included validated and unvalidated aircraft within the FAA BasedAircraft.com system.

TABLE 2-15
HIGH GROWTH OPERATIONS FORECAST

Year	Itinerant Air Taxi	Itinerant General Aviation	Itinerant Military	Local General Aviation	Local Military	Total Annual Operations	Based Aircraft
2020	529	15,225	7,099	39,144	0	61,996	177
2025	1,000	28,815	7,099	74,086	0	111,000	335
2030	1,039	29,933	7,099	76,961	0	115,032	348
2040	1,129	32,513	7,099	83,595	0	124,337	378
CAGR (2020-2040)	3.9%	3.9%	0.0%	3.9%	0.0%	3.5%	3.9%

Source: SLCDA Records; BasedAircraft.com; RS&H Analysis, 2022.
Note 2020 is baseline historical year

Overall, the high-growth forecast accounts for the potential demand indicated in the GA Tenant Survey as well as the organic growth forecasted to materialize at U42.

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 landings.

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 tail 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 U42. That aircraft is a B-II-2 aircraft.[7] 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. This assumption is validated considering the 2010 ALP lists the future Runway Design Code (RDC) would be upgraded to C-II in correlation to the change in critical aircraft to the Cessna Citation X.

[7] B-II-2 refers to approach category (AAC) B, aircraft design group (ADG) II, and taxiway design group (TDG) 2. Since the previous ALP was published, AC 150/5300-13B has been published, which divides TDG 2 into 2A and 2B. The critical aircraft stated in the previous ALP is now categorized with TDG 2A.

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 categories. As shown in **Table 2-16**, the EVS raw data includes 998 AAC B operations and 734 ADG II annual operations. The EVS data contained operations that were "unknown," as they weren't tagged by aircraft type. Those were disbursed into the categories of AAC and ADG by correlating percentage to total. Using this methodology, the EVS raw data disbursed implies U42 accommodated approximately 1,146 AAC B and 923 ADG II annual operations.

As noted earlier in this chapter, the EVS data provides an incomplete picture of the full breadth of operations at U42, assuming the acoustic traffic counters captured a more accurate total number of annual operations. As such, the EVS data was extrapolated to match the acoustic counter totals, as shown in the EVS extrapolated data column of the table. The EVS Extrapolated Data Distributed column includes the totals when the "unknown" data is allocated into categories. TFMSC data is also shown for comparison.

TABLE 2-16
AIRCRAFT OPERATIONS BY AAC AND ADG

Annual Mean Operations by AAC					
AAC	**EVS Raw Data**	**EVS Raw Data Disbursed**	**EVS Extrapolated Data**	**EVS Extrapolated Data Distributed**	**TFMSC**
A	44,556	51,170	60,372	69,333	805
B	998	1,146	1,352	1,553	471
C	54	62	73	84	44
D	13	15	17	20	11
Unknown	6,772		9,176		
Annual Mean Operations by ADG					
ADG	**EVS Raw Data**	**EVS Raw Data Disbursed**	**EVS Extrapolated Data**	**EVS Extrapolated Data Distributed**	**TFMSC**
I	40,928	51,444	55,456	69,705	901
II	734	923	995	1,250	427
Unknown	10,710		14,512		

Source: EVS Earth Flight Tracking Data; FAA TFMSC Data; RS&H Analysis, 2022
Note: EVS Raw Data is not extrapolated. EVS Extrapolated Data refers to the EVS data escalated to match total annual acoustic operations in 2020.

The EVS data validates AAC B and ADG II aircraft are meeting the 500 annual operations threshold required for a critical aircraft. The data also indicated no one specific aircraft is conducting 500 annual operations. Instead, the threshold is met via a variety of AAC B and ADG II aircraft types.

Considering the 500 annual operations threshold cannot include touch-and-go operations, the type of B-II aircraft was further examined. The EVS data showed most B-II aircraft operating at U42 are not the type of aircraft typically used for touch-and-go training operations. The aircraft making up the majority of AAC B and ADG II operations at U42 include the Cessna Citation Jet series aircraft, Beechcraft King Air series aircraft, Cessna Caravan, Pilatus PC-12, Hawker Bae-125 business jet, and other jet and turboprop aircraft.

As such, it is concluded that the B-II aircraft operations in the EVS dataset includes little to no touch-and-go operations, thereby validating the existing critical aircraft as B-II.

The Beechcraft Super King Air was carried forward as the existing critical aircraft for U42. As shown in **Table 2-17,** the Cessna Citation X+ is also carried forward as the future critical aircraft. However, because that aircraft is a TDG 1B aircraft, the Super King Air is also carried forward as a future critical aircraft as it has a more demanding taxiway design group.

Carrying forward a C-II jet aircraft as the future critical aircraft was found prudent, as these faster jet aircraft are operating today at U42, albeit below the threshold of substantial use. As the Salt Lake Valley continues to mature and business jet traffic increases at SLC, U42, and PVU, catering passengers destined to major business hubs in the valley, increased use of C-II aircraft is expected at U42.

TABLE 2-17
EXISTING AND FUTURE CRITICAL AIRCRAFT

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

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

2.9 FORECAST SUMMARY

The summary of aviation forecasts as it relates to aircraft operations and based aircraft is provided below in **Table 2-18**. That table details the baseline forecast and growth rates projected for operations and based aircraft for the 5-, 10-, and 20-year planning period. The base year level in this table does not include what is listed in the FAA 2020 TAF, as that information was found inaccurate. Instead, the base year numbers are set at the 2020 acoustic traffic counter data levels for operations and the based aircraft levels determined in BasedAircraft.com.

TABLE 2-18
AVIATION BASELINE FORECAST SUMMARY

	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	2040	2025	2030	2040
Operations							
Itinerant							
Air Taxi	615	664	671	741	1.55%	0.88%	0.94%
General aviation	17,719	19,139	19,319	21,354	1.55%	0.87%	0.94%
Military	7,099	7,099	7,099	7,099	0.00%	0.00%	0.00%
Local							
General aviation	45,557	49,208	49,671	54,904	1.55%	0.87%	0.94%
Military	0	0	0	0	0.00%	0.00%	0.00%
TOTAL OPERATIONS	70,990	76,110	76,760	84,098	1.40%	0.78%	0.85%
Based Aircraft							
Single Engine Piston	160	196	203	220	4.14%	2.41%	1.61%
Multi Engine Piston	9	9	10	10	0.00%	1.06%	0.53%
Turboprop	4	4	4	5	0.00%	0.00%	1.12%
Jet Engine	1	1	1	2	0.00%	0.00%	3.53%
Helicopter	3	3	3	4	0.00%	0.00%	1.45%
Other	0	0	0	0	0.00%	0.00%	0.00%
TOTAL	177	213	221	241	3.77%	2.24%	1.56%

Source: BasedAircraft.com; RS&H Analysis, 2022

As noted in this chapter, the historical FAA data does not align with acoustic traffic counter data for operations 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 details a comparison between the FAA 2020 TAF and the Master Plan baseline forecast.

TABLE 2-19
FAA TAF TO BASELINE FORECAST COMPARISON

	Year	Master Plan Forecast	2020 TAF	MP Forecast/ 2020 TAF % Difference
Operations				
Base yr.	2020	70,990	75,934	6.7%
Base yr. + 5yrs.	2025	76,111	75,934	0.2%
Base yr. + 10yrs.	2030	76,760	75,934	1.1%
Base yr. + 20yrs.	2040	84,098	75,934	10.2%
Based Aircraft				
Base yr.	2020	177	222	22.6%
Base yr. + 5yrs.	2025	213	222	4.1%
Base yr. + 10yrs.	2030	221	222	0.5%
Base yr. + 20yrs.	2040	241	222	8%

Source: FAA 2020 Terminal Area Forecast; BasedAircraft.com; RS&H Analysis, 2022
Note: TAF base year 2020 is a forecasted year in the TAF but is the same as 2019.