4. Aviation Activity and Forecasting

Aviation demand forecasts help to determine the size and timing of needed airport improvements. This chapter discusses the types and levels of aviation activity historically and projects future activity expected at Logan-Cache Airport during the forecast period of 2009 through 2029. The methodology followed is from "Forecasting Aviation Activity by Airport," GRA, Incorporated, July 2001.

The forecasting methodology covers the following key steps:

Step 1: Identify aviation activity parameters and measures to forecast.

Since the Logan-Cache Airport is currently a general aviation airport, without commercial passenger service, the following activity categories are projected:

- Based Aircraft, including fleet mix.
- Annual Aircraft Operations, including air taxi, general aviation (GA), military, local vs. itinerant and annual instrument approaches.
- Airport Reference Code, which defines the appropriate FAA criteria for airport design and is determined by the most demanding aircraft that regularly uses the airport.

Step 2: Collect and review previous airport forecasts.

Step 3: Gather Data.

Step 4: Select forecast methods.

Step 5: Apply forecast methods and evaluate results.

Step 6. Summarize and document results.

Step 7: Compare airport planning forecast results with TAF (Terminal Area Forecasts).

The guidance given in the document recognizes that the results of various projections of aviation activity need to be evaluated by the forecaster before they are finalized and that professional judgment should be used to determine what is reasonable.

Before proceeding with the steps 2 through 7 of the forecast procedure of based aircraft and annual aircraft operations, nationwide aviation trends will be discussed.

4.1 Trends in General Aviation

General aviation (GA) is defined by the FAA as all aviation other than scheduled commercial aviation and military aviation. GA provides a wide range of essential services such as personal and business transportation, medical evacuation and agricultural support to communities across the state. Over 2,300 GA aircraft including single-engine piston-powered airplanes, multi-engine turboprops, intercontinental business jets, helicopters, and experimental and light sport aircraft are currently based in the State of Utah. While GA activity sits often in the shadow of commercial activity, it plays an integral role in fostering the state economy. The large majority of airports in Utah are used for general aviation, and GA aircraft perform the majority of aircraft takeoffs and landings in the state. In addition, GA airports provide the closest access to the national air transportation system in most of the state.

Consequently, it is important to identify GA trends that could affect future demand on Utah's aviation system. As stated as a guiding principle for the FAA's National Plan of Integrated Airport Systems (NPIAS), "Airports should be flexible and expandable, able to meet increased demand and to accommodate new aircraft types."

The Utah Continuous Airport Systems Plan (2007) discusses national trends impacting Utah aviation and indicates that certain national shifts within the airline industry and business aviation will also impact aviation in Utah over the forecast period. The most significant include:

- The ability of the legacy carriers to effectively compete with the low cost carriers through further reductions in non-fuel operating costs, achievement of a fuel efficient fleet, and a route system that emphasizes the highest yield in profitable markets.
- Continued retirement of the existing turboprop fleet used to serve smaller markets and the extent to which the airlines embrace newer technology turboprop aircraft, such as Bombardier Aerospace's Q400. These aircraft could operate well at Utah's high elevation airports, but may be too large to be profitable on routes serving Utah's smaller communities.
- A shift in the U.S. away from larger jets to regional jets (RJ) and greater use of RJs with 70 or more seats.
- The extent to which corporate aviation embraces micro jets or very light jets (VLJs) and develops point-to-point air service using these aircraft.
- The degree to which higher aircraft operating costs and potential user fees and taxes reduce general aviation recreational and business flying.

Two other national trends that could influence aviation activity in Utah include the following:

- Sport Aviation -- In 2004, the FAA created a new rule for the manufacture, certification, operation, and maintenance of light-sport aircraft and a new sport pilot certificate. Light-sport aircraft are low-performance aircraft weighing less than 660 pounds (if lighter-than-air), 1,320 pounds (if not intended for use on water), or 1,430 pounds (if intended for water use). They are heavier than ultralight vehicles and include airplanes, gliders, balloons, powered parachutes, weight-shift-control aircraft, and gyroplanes. A person with a valid driver's license can operate a light-sport aircraft. Sport aviation is likely to boost general aviation by providing a safe, relatively inexpensive way to introduce people to flying. Many light-sport aircraft are not appreciably different from other piston-powered aircraft that are now using GA airports. While conflicts between lower-performance and higher-performance aircraft can arise at busier airports, as they have in the past, most can be mitigated with voluntary procedures.
- Next Generation Air Transportation System (NGATS) -- The FAA is part of an interagency and private industry effort to develop a concept for 2025 that transitions the current national airspace system into the Next Generation Airport Transportation System (NGATS or NexGen). NexGen encompasses advances in automation information systems, communications, navigation, surveillance, and weather. NexGen is dependent on global positioning system (GPS) satellites.

Since 2003, the Wide Area Augmentation System (WAAS) has been available to provide more exacting navigational guidance than GPS alone. WAAS helps GPS provide vertical guidance to the runway surface and eliminates the need for costly instrument landing systems (ILS). Potentially, thousands of small airports that lack ILS now will be useable during bad weather with WAAS-aided approaches, increasing safety and reducing air traffic delays. As of September, 2008 the FAA has produced over 1,300 WAAS-based Localizer Performance with Vertical guidance (LPV) approach procedures at over 830 airports. Their goal is to continue producing LPVs at a rate of 500 per year until every qualified runway in the national system of airports has at least one.

While instrument approaches can be developed inexpensively using GPS, weather reporting equipment, runway lights, approach lights, parallel taxiways, compliance with more demanding design standards, and other improvements are needed for instrument runways that are not needed for visual runways.

4.2 Airport Classification and Current Aircraft Data

Airport classification systems are used to identify the role of each airport in the state system and to understand the types of facilities and services necessary at each. The FAA has a classification system for the 35 Utah airports included in the National Plan of Integrated Airport Systems (NPIAS) consisting of commercial airports and general aviation airports. Logan-Cache Airport is categorized in the NPIAS as a general aviation airport.

The State has developed a complementary classification system as part of their Utah Continuous Airport System Plan (UCASP). State airport classifications do not supersede FAA classifications but supplement them by providing a more detailed division of airport types based on activities served, economic factors, facilities, accessibility to the public, and demographics.

The UCASP includes two classifications of commercial airports:

International Airport – This type of airport provides essential domestic and international commercial airline access. Salt Lake City International Airport is the only Utah airport in this classification.

National Airports – These airports accommodate a high level of commercial service and general aviation activity and serve major population centers or tourism destinations in the state.

The UCASP includes three classifications of general aviation airports:

- General Aviation Regional Airports – These airports serve primarily general aviation activity, including jet and multi-engine aircraft and provide access to major population centers.
- General Aviation Community Airports – These airports provide aviation access to smaller population centers and are used for emergency air medical operations, business, recreational, and personal flying activities.
- General Aviation Local Airports – These airports have local importance, primarily serving recreational and personal flying activities.

Logan-Cache Airport has been classified by the State as a General Aviation Regional Airport.

The UCASP classifies General Aviation Regional airports as those connecting local economies to the wider state and national economies. They serve primarily general aviation activity with a focus and capability to serve business jet and multi-engine aircraft. The minimum objectives for General Aviation Regional Airports under UCASP are presented in Table 9.

Table 9. Minimum Objectives

Criteria	Minimum Objectives
ARC	C-II or greater
Runway Length	Accommodate 75% of large aircraft at 60% useful load
Runway Width	To meet ARC
Runway Strength	Single-wheel gear – 30,000 lbs., equivalent for dual wheel
Taxiway	Partial parallel
Navigational Aids	Non-Precision Straight-In Approach
Visual Aids	GVGIs, REILs

Criteria	Minimum Objectives
Lighting	MIRL, Beacon, Windsock
Weather	Automated Weather
Services	Phone Restrooms FBO – limited service Maintenance facilities – limited service On-site courtesy car Perimeter fencing
Facilities	Terminal with appropriate facilities Hangars – 60% of based fleet and 25% of overnight aircraft Apron – 40% of based fleet and 50% for transient Auto parking – equal to 33% of based aircraft Food – limited service restaurant or vending service

4.3 Historical and Current Aviation Data

Historical aviation data for based aircraft and aircraft operations for the Logan-Cache Airport were obtained from the FAA TAF (Terminal Area Forecast), and are summarized in Figure 9 and Table 10.

Figure 9. FAA TAF Historical Based Aircraft Data

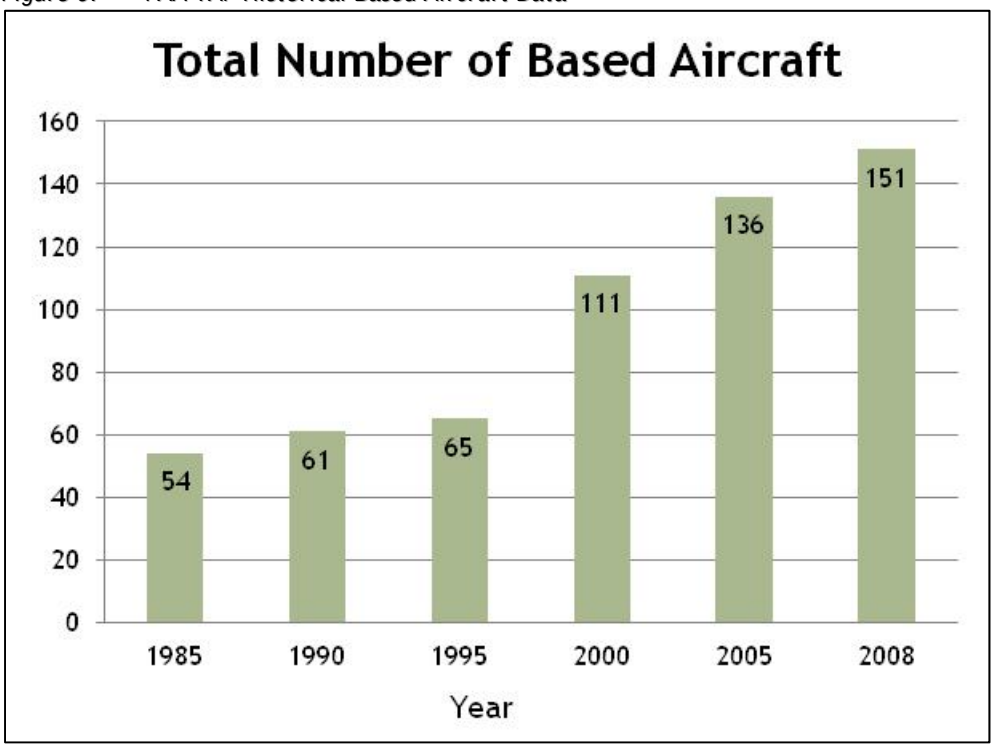

Table 10. FAA TAF Historical Aircraft Operations Data

Annual Operations	1985	1990	1995	2000	2005	2008
Itinerant Air Taxi & Commuter	1,500	1,500	1,500	1,500	500	500
Itinerant GA	5,000	6,000	5,000	11,600	48,287	50,469
Itinerant Military	300	300	500	100	100	100
Itinerant Total	6,800	7,800	7,000	13,200	48,887	51,069

Annual Operations	1985	1990	1995	2000	2005	2008
Local GA	11,000	22,000	15,000	27,300	123,287	124,207
Local Military	0	0	0	0	0	0
Local Total	11,000	22,000	15,000	27,300	123,287	124,207
Instrument Operations	0	0	0	0	0	2,500
Total Operations	17,800	29,800	22,000	40,500	172,174	175,276

Current aviation record data for based aircraft and aircraft operations was obtained from the following sources:

Federal Aviation Administration, Terminal Area Forecast

FAA Airport Master Record, Form 5010, GCR & Associates

Utah Continuous Aviation System Plan (UCASP), 2007

The based aircraft numbers from these sources were compared and a summary of current data is shown in Table 11. The year of the study data is shown in each column heading. The Utah Department of Aeronautics used automated acoustical counters at many airports in the State to establish a more consistent baseline for the development of forecasts. In 2005 data was collected at the Logan-Cache airport.

Two types of aircraft activity data discussed are Based Aircraft and Annual Operations. Based Aircraft consists of the number of aircraft that are stored at an airport, either in hangars or on tie-downs. Annual Operations are the number of aircraft takeoffs or landings that occur annually at an airport. An up-to-date aircraft count maintained by the airport manager includes a total of 125 aircraft based at the Logan-Cache Airport. Of these, 105 are single engine, 10 are multi-engine non-jet, 4 are jet engine, 4 are helicopter, and 2 are gliders. The airport's FAA Form 5010 Airport Master Record indicates a total of 63,800 annual operations. This total includes 60,00 local general aviation operations, 2,500 itinerant general aviation operations, 1,200 air taxi operations, and 100 military operations. The airport also began experiencing Part 139 charter operations in 2008, mainly providing transportation for local and visiting college athletic teams.

Table 11. Current Aviation Demand

	FAA TAF (2008)	FAA Master Record (2008)	Utah Continuous Airport System Plan (2005)
Based Aircraft			
Single Engine	-----	95	110
Multi Engine	-----	12	5
Other	------	14	21
Total	151	121	136
Itinerant Annual Operations			
Air Taxi	500	1200	500
GA	50,469	2,500	1,645
Military	100	100	50
Total Itinerant	51,069	3,800	2,195
Local Annual Operations			
GA	124,207	60,000	43,076
Military	0	0	0
Total Local	124,207	60,000	43,076

	FAA TAF (2008)	FAA Master Record (2008)	Utah Continuous Airport System Plan (2005)
TOTAL	175,276	63,800	45,271
Operations per Based Aircraft	1,161	527	333
Instrument Operations	0	2,500 (estimated)	0

4.4 Future Aviation Activity Forecasts

Three methodologies were used to create the based aircraft and aircraft operations forecasts for the Airport: FAA TAF growth rates and UCASP growth rates extrapolated to 2029, and Bear River Multi-County District population and employment growth rates.

Forecast 1: FAA Terminal Area Forecast Growth Rate

The FAA annually prepares aviation demand forecasts called the Terminal Area Forecasts (TAF) for all airports included in the National Plan of Integrated Airport Systems (NPIAS). The FAA TAF provides forecast data for based aircraft, annual operations, and annual growth rates for each. It was noted in the historical TAF data that a significant jump occurred in both based aircraft (40%) and annual operations (340%) between 2000 and 2001. A 20% drop in based aircraft was reported in 2004, but no corresponding reduction in airport operations is evident in the data. Growth is relatively steady beyond that point typically between 1% and 2% per year. Forecast #1 is based on this growth rate and is presented in Table 12.

Forecast 2: UCASP Forecast Growth Rate/Methodology

The UCASP contains forecasts for all airports in the state including the Logan-Cache Airport. The methodology used to forecast future based aircraft and aviation activity was prepared using the population growth rate projected for the county in which the airport is located. Forecast 2 is also presented in Table 12 below. Forecast years 2006, 2011, 2016 and 2026 were interpolated to correspond with forecast years used in this master plan.

Forecast 3: Socioeconomic Data Forecast Growth Rate

Both population and employment growth within an airport's service area can be a significant factor in the growth of aviation activity at an airport. Since the UCASP forecast was prepared based on the population projections of Cache County, an analysis of regional socioeconomic data was incorporated into this airport planning forecast to provide an additional perspective on potential aviation activity. Since there are only two airports within the Bear River Multi County District (Cache, Box Elder and Rich counties) this area was considered an appropriate service area to evaluate. Projections of the total resident population and employment of the Bear River MCD were obtained. A combined average growth rate of population and employment was prepared in five-year increments from 2005 – 2030 and is shown in Table 12. The combined population and employment growth rates were applied to the existing known based aircraft and aircraft operations to create Forecast #3 shown in Table 13.

Table 12. Bear River MCD Population and Employment Forecasts

Year	Population	Employment	Five Year Growth Rates			
				Pop	Emp	Avg
2000	136,712	77,341				
2005	150,930	87,878	2000-2005	10.40%	13.62%	12.01%

	Forecasts					
2010	169,946	105,718	2005-2010	12.60%	20.30%	16.45%
2015	189,999	120,580	2010-2015	11.80%	14.06%	12.93%
2020	211,143	132,075	2015-2020	11.13%	9.53%	10.33%
2025	232,484	143,773	2020-2025	10.11%	8.86%	9.48%
2030	255,156	157,130	2025-2030	9.75%	9.29%	9.52%

Source: Utah Governor's Office of Planning and Budget, 2008 Baseline Projections

Table 13. Comparison of Based Aircraft Forecasts

Year	Forecast #1 FAA TAF	Forecast #2 Utah Continuous Aviation System Plan	Forecast #3 Socioeconomic Growth Rate
2009	153	146*	129
2014	166	162*	146
2019	181	181*	161
2024	196	202*	176
2029	201*	222*	193

** Interpolated or Extrapolated value*

Because the historical data provided in the TAF has shown significant fluctuations in the number of based aircraft at the airport and the UCASP forecast is most specific to Cache County, the UCASP growth rate forecast was selected for the Logan-Cache Airport forecast. The base year 2008 numbers were adjusted, based on a current count of aircraft at the airport provided by the airport manager. Table 14 shows the based aircraft fleet mix forecast.

Table 14. Forecast Based Aircraft Fleet Mix

Year	Single Engine	Multi Engine	Jet	Helicopter	Other	Total
2008	105	10	4	4	2	125
2009	108	11	4	4	2	129
2014	119	11	5	5	2	142
2019	133	13	5	5	3	159
2024	148	14	6	6	3	177
2029	164	16	6	6	3	195

The three forecast methodologies used above for based aircraft were also relied upon to prepare aircraft operations forecasts and are shown in Table 15.

Forecast #1- The FAA TAF forecasts of total airport operations.

Forecast #2- The Utah Continuous Aviation System Plan growth rates were used, starting with the actual acoustical counts taken by the Utah Department of Aeronautics in 2005. These forecasts were interpolated to match the five-year forecast periods of this study.

Forecast #3- This was prepared using the five-year average population and employment forecast growth rates shown in Table 15, beginning with the UDOA 2005 baseline counts.

Table 15. Comparison of Aircraft Operations Forecasts

Year	Forecast #1 FAA TAF	Forecast #2 Utah Continuous Aviation System Plan	Forecast #3 Population Growth Rate
2009	176,334	85,090*	64,476
2014	181,803	94,871*	75,082

Year	Forecast #1 FAA TAF	Forecast #2 Utah Continuous Aviation System Plan	Forecast #3 Population Growth Rate
2019	187,592	106,169*	84,790
2024	193,723	118,196*	93,550
2029	200,157*	130,224*	102,422

** Interpolated or Extrapolated Value*

The adjusted UCASP forecast #2 above was selected as the 2009-2029 aircraft operations forecast, rounded to the nearest 100. The selected forecast annual operations per based aircraft are projected to be 668 through the study period. Using the selected based aircraft forecast, the detailed Aircraft Operations Forecast was prepared and is presented in Table 16 for based aircraft and aircraft operations.

Table 16. Logan-Cache Airport Aviation Demand Forecasts

Year	Based Aircraft				Aircraft Operations			Instrument Approaches
	Single Engine	Multi Engine	Other	Total Aircraft	Local GA	Itinerant GA	Total Operations	
2009	108	11	10	129	81,000	4,100	85,100	5,000
2014	119	11	12	142	90,300	4,600	94,900	5,600
2019	133	13	13	159	101,000	5,200	106,200	6,300
2024	148	14	15	177	112,500	5,700	118,200	7,050
2029	164	16	15	195	123,900	6,300	130,200	7,900

Population for Cache County is forecast to grow from 112,141 today (2008 estimate) to 178,379 by year 2029. By the year 2059 it is forecast to grow to 325,582 or an increase of 183%. If comparable growth occurs with respect to based aircraft and aircraft operations, between 2029 and 2059, total based aircraft for a 50-year forecast would be 356 and aircraft operations could rise to 237,600. This estimate does not consider the possibility of future commercial service.

4.5 Recommended Operations Forecast Versus TAF

Table 17 compares the selected forecasts for the Logan-Cache Airport with the FAA TAF numbers. The selected based aircraft forecast differs from the FAA TAF forecast up to negative 16% primarily because the existing number of based aircraft in the TAF records is overestimated when compared with the documentation provided by the airport manager of existing aircraft at the airport. The selected operations forecast is more than double the TAF forecast in year 2009, but the difference narrows to one-third after 20-years. This is attributable to the fact that the TAF forecasts had a significant increase, historically, that were perpetuated into the future. The selected forecast starts much lower after having been based on the UCASP that was founded on acoustical data collection for airport operations in 2005.

Table 17. Comparison of Selected Forecasts with Terminal Area Forecasts

Year	Based Aircraft Forecast			Operations Forecast		
	FAA TAF	Selected	Difference	FAA TAF	Selected	Difference
2009	153	129	-16%	176,334	85,100	-52%
2014	166	142	-14%	181,803	94,900	-48%

Year	Based Aircraft Forecast			Operations Forecast		
	FAA TAF	Selected	Difference	FAA TAF	Selected	Difference
2019	181	159	-12%	187,592	106,200	-43%
2024	196	177	-10%	193,723	118,200	-39%
2029	201*	195	-3%	200,157	130,200	-35%

** Interpolated or Extrapolated value*