

Chapter 3 – Aviation Activity Forecast

Introduction

Forecasting aviation activity helps the local airport sponsor determine future airport infrastructure and equipment needs. The preferred demand forecasts, when compared to existing airport facilities, are used to identify the type, extent, and timing of aviation development at an airport.

Aviation activity at an airport is influenced by numerous factors including socioeconomic trends related to the region's population, tourism demand, local business composition and travel needs, the local, regional, and national economy, aviation/airline industry trends, the aviation services provided at the airport, and number of other factors. The aviation activity forecasts developed for ABI take these factors into consideration.

This chapter provides forecasted aviation activity levels for ABI for the next twenty years for passenger enplanements, airline, air taxi, general aviation, military, and cargo tonnage levels. Additionally, derivative forecasts have been developed for instrument approach activity, itinerant vs. local operations, peak period activity, and aircraft fleet mix.

Historical Aviation Activity

Overview

ABI has an air traffic control tower that operates 24 hours per day, 7 days per week, 365 days per year. Consequently, the historic air traffic activity levels at ABI are well documented. **Table 3-1, *Historic Aviation Activity***, shows the annual aircraft operations data at ABI since 1990. An aircraft operation is defined as an aircraft takeoff or landing.

**Table 3-1
Historic Aviation Activity**

Calendar Year	Itinerant					Local			Total Operations
	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	
1990	46	16,078	35,718	3,781	55,623	28,366	11,105	39,471	95,094
1991	75	12,364	35,493	6,330	54,262	26,202	16,119	42,321	96,583
1992	112	15,724	32,393	8,107	56,336	25,478	22,693	48,171	104,507
1993	119	16,554	30,887	9,007	56,567	23,560	21,968	45,528	102,095
1994	345	19,255	30,844	9,237	59,681	19,320	19,416	38,736	98,417
1995	287	18,025	30,237	9,645	58,194	17,286	19,718	37,004	95,198
1996	279	16,327	28,325	10,027	54,958	17,060	17,103	34,163	89,121
1997	290	14,096	26,578	9,340	50,304	12,760	13,719	26,479	76,783
1998	225	14,099	26,709	10,260	51,293	13,911	16,832	30,743	82,036
1999	254	11,905	26,850	10,786	49,795	18,597	20,060	38,657	88,452
2000	277	13,489	23,622	10,680	48,068	13,403	19,080	32,483	80,551
2001	243	12,817	24,376	11,164	48,600	15,047	19,356	34,403	83,003
2002	171	10,992	24,265	10,585	46,013	14,880	19,269	34,149	80,162
2003	136	11,140	22,447	10,958	44,681	18,863	20,439	39,302	83,983
2004	260	11,854	18,634	8,727	39,475	15,773	18,359	34,132	73,607
2005	152	13,226	20,181	8,417	41,976	17,121	16,970	34,091	76,067
2006	353	14,293	22,480	8,662	45,788	16,408	16,448	32,856	78,644
2007	354	14,130	22,682	8,762	45,928	19,253	15,302	34,555	80,483
2008	305	12,872	26,842	14,015	54,034	13,772	17,309	31,081	85,115
2009	363	11,020	20,167	11,256	42,806	9,047	11,622	20,669	63,475
2010	397	10,187	21,055	7,853	39,492	10,398	10,048	20,446	59,938
2011	330	10,456	22,339	8,645	41,770	7,959	10,191	18,150	59,920
2012	225	10,075	22,933	5,913	39,146	10,571	10,738	21,309	60,455
2013	217	10,903	21,426	7,718	40,264	12,649	12,496	25,145	65,409
2014	226	10,317	18,205	8,443	37,191	7,631	10,778	18,409	55,600
2015	289	9,275	17,182	7,344	34,090	10,378	10,170	20,548	54,638
2016	295	8,633	16,211	6,379	31,518	6,286	8,163	14,449	45,967

Source: FAA OPSNET DATABASE, pulled 9/7/17.

ABI has seen a 51.6% decline in total operation since 1990. The majority of the decline has come from reductions in general aviation itinerant operations (a total decrease of 19,507 from 1990 to 2016) and general aviation local (“civil”) operations (a total decrease of 22,080 from 1990 to 2016). There has also been a consistent decline in air taxi operations since 1990 but this has been slightly offset by an increase in air carrier traffic over the same period. The number of annual military operations has also slightly

declined since 1990. However, there have been some intermittent periods of growth and retraction during that time.

Air Carrier, Commuter, and Non-Commuter Air Taxi Operations

It should be noted that the “air taxi” category in the FAA OPSNET Database includes airline operations that are classified as “commuter” airline operations. A commuter airline operation is defined as a scheduled air carrier operation with no more than 60 passenger seats. Sometimes commuter airline operations are referred to as “regional” airline operations. The FAA OPSNET Database classifies “air carrier” operations as only those air carrier operations with more than 60 passenger seats. Consequently, what would commonly be referred to as “airline operations” at ABI includes a combination of the air carrier and air taxi figures shown in the FAA OPSNET Database.

To identify the total number of airline operations that have historically occurred at ABI (air carrier and commuter), T-100 data for ABI was pulled from the Bureau of Transportation Statistics (BTS) website. **Table 3-2, Airline Operations and Non-Commuter Air Taxi Activity**, provides the total airline operations figures (air carrier and commuter) for ABI and shows the amount of Air Taxi Operations that do not fall into the commuter category.

**Table 3-2
Airline Operations and Non-Commuter Air Taxi Activity**

Year	T-100 Data - Airline Operations (Air Carrier and Commuter)	Air Carrier Data from FAA OPSNET Database	Commuter Airline Operations	Total Air Taxi Operations from OPSNET Database	Commuter Airline Operations	Total Air Taxi Operations Excluding Commuter Airline Operations	% of Air Taxi Operations Classified as Commuter Airline OPS
2006	8792	353	8439	14,293	5,854	5,536	59.04%
2007	8772	354	8418	14,130	5,712	5,899	59.58%
2008	7872	305	7567	12,872	5,305	6,259	58.79%
2009	6224	363	5861	11,020	5,159	4,967	53.19%
2010	6066	397	5669	10,187	4,518	4,758	55.65%
2011	6004	330	5674	10,456	4,782	4,759	54.27%
2012	6012	225	5787	10,075	4,288	4,313	57.44%
2013	6572	217	6355	10,903	4,548	4,415	58.29%
2014	6680	226	6454	10,317	3,863	4,078	62.56%
2015	6082	289	5793	9,275	3,482	3,627	62.46%
2016	5872	295	5577	8,633	3,056	3,243	64.60%

Source: FAA OPSNET DATABASE, pulled 9/7/17. BTS T-100 data, pulled 10/5/17.

Historic Passenger Enplanements and Load Factor

Table 3-3, *Historic Passenger Enplanements & Load Factor*, provides an overview of the passenger enplanement and outbound load factor history at ABI since 1990. Passenger enplanements have been cyclical at ABI since 1990. Enplanements saw a general decline from 1990 to 1999. However, since 1999 enplanements have increased by 75.2% at ABI reaching a peak in 2014 of almost 94,000 enplanements. Load factor was very low during the mid to late 1990's and early 2000's but has increased since that time.

Table 3-3
Historic Passenger Enplanements & Load Factor

Calendar Year	Enplanements	Average Load Factor
1990	74,063	72.60%
1991	58,141	74.25%
1992	62,370	72.19%
1993	66,287	59.14%
1994	73,328	44.60%
1995	67,631	43.10%
1996	66,775	37.91%
1997	53,826	76.84%
1998	52,418	59.45%
1999	47,984	53.16%
2000	58,447	50.22%
2001	58,206	50.70%
2002	46,176	57.16%
2003	52,021	56.61%
2004	67,773	58.74%
2005	78,269	56.83%
2006	90,918	59.58%
2007	90,369	62.83%
2008	87,682	66.36%
2009	81,172	67.72%
2010	73,605	63.28%
2011	80,434	70.07%
2012	74,523	70.14%
2013	82,758	68.10%
2014	93,656	71.67%
2015	86,000	73.92%
2016	84,073	73.16%

Source: Enplanement data from 2016 to 1999 was FAA Website, pulled 9/7/17. Enplanement data from 1990 to 1998 pulled from TAF. Load factor data from BTS T-100 Domestic Segment Database, pulled 9/8/17

Top ABI Destinations

A True Market Estimate project was conducted for ABI in 2011 by Mead and Hunt. As part of the study the Top 50 destination markets from ABI were identified based on 2010 data. **Table 3-4, Top ABI Destinations,** shows the top 10 destinations that were identified.

**Table 3-4
Top ABI Destinations**

Destination Rank	Destination Name	True Market Estimate	Passengers Daily Each Way (PDEWs)
1	Dallas, TX (DFW)	11,276	15.4
2	Las Vegas, NV	8,756	12.0
3	Orange County, CA	7,439	10.2
4	Phoenix, AZ	6,389	8.8
5	Seattle, WA	5,992	8.2
6	Orlando, FL	5,881	8.1
7	Atlanta, GA	5,665	7.8
8	Chicago, IL (ORD)	5,629	7.7
9	Los Angeles, CA	5,505	7.5
10	Denver, CO	5,453	7.5

Source: Mead and Hunt – True Market Estimate Study for ABI, 2011. True market estimate numbers and PDEWs are based on the number of individuals in the ABI catchment traveling to these destinations. Some of these passengers are leaked to other airports as discussed in the Catchment Area discussion in the Inventory Chapter.

Historic Based Aircraft

Table 3-5, Historic Based Aircraft, provides an overview of the based aircraft history at ABI since 1990. The based aircraft data is erratic with some steep year-to-year increases/decreases and up to 5 year periods with no change. It is assumed that these steep increases and decreases did not occur as suddenly as the data shows but rather the figures were not updated annually. Consequently, when the figures were updated the increases/decreases were very steep.

Table 3-5
Historic Based Aircraft

Calendar Year	Based Aircraft
1990	175
1991	170
1992	174
1993	174
1994	160
1995	159
1996	159
1997	159
1998	159
1999	159
2000	159
2001	75
2002	84
2003	85
2004	145
2005	145
2006	145
2007	98
2008	98
2009	104
2010	105
2011	125
2012	125
2013	125
2014	125
2015	125
2016	117
2017	105

Source: Based aircraft data from 1990 to 2015 pulled from FAA TAF on 9-7-17. 2016 data was pulled from ABI's 2016 5010 dated 7/28/16. 2017 data was pulled from ABI's 2017 5010 dated 8/8/17.

Historic IFR Operations

Table 3-6, Historic IFR Operations, provides an overview of the IFR aircraft operations history at ABI since 1990. In total, from 1990 to 2016, approximately 39.42% of all

aircraft operations have been conducted under Instrument Flight Rules (IFR). However, the annual IFR percentage of total operations has increased from less than 30% in 1999 and 2002, to over 40% for every year since 2008. This trend is attributable to the reduced number of VFR operations occurring at ABI rather than an increase in the total number of IFR operations.

Table 3-6
Historic IFR Operations

Calendar Year	Air Carrier	Air Taxi	General Aviation	Military	Total IFR	Total Operations	IFR % of Total Operations
1990	11	15,070	32,492	3,781	51,354	95,094	54.00%
1991	5	8,950	30,894	5,849	45,698	96,583	47.31%
1992	14	13,433	28,220	7,374	49,041	104,507	46.93%
1993	18	14,159	27,094	7,374	48,645	102,095	47.65%
1994	55	15,393	23,034	6,745	45,227	98,417	45.95%
1995	61	13,559	9,887	6,732	30,239	95,198	31.76%
1996	58	12,699	8,408	7,554	28,719	89,121	32.22%
1997	32	9,770	9,307	6,939	26,048	76,783	33.92%
1998	38	9,222	9,627	7,774	26,661	82,036	32.50%
1999	70	8,540	8,763	8,549	25,922	88,452	29.31%
2000	148	11,084	7,790	8,478	27,500	80,551	34.14%
2001	86	9,243	8,140	8,932	26,401	83,003	31.81%
2002	77	7,703	7,983	8,083	23,846	80,162	29.75%
2003	112	8,183	7,639	9,392	25,326	83,983	30.16%
2004	91	9,976	7,907	7,458	25,432	73,607	34.55%
2005	152	11,990	7,445	7,633	27,220	76,067	35.78%
2006	344	12,817	8,450	8,010	29,621	78,644	37.66%
2007	354	12,473	10,195	8,105	31,127	80,483	38.68%
2008	281	10,572	11,103	12,505	34,461	85,115	40.49%
2009	361	9,068	8,744	10,521	28,694	63,475	45.21%
2010	394	8,708	10,615	7,308	27,025	59,938	45.09%
2011	315	8,373	11,188	6,364	26,240	59,920	43.79%
2012	223	8,477	11,936	5,496	26,132	60,455	43.23%
2013	214	9,151	10,391	7,244	27,000	65,409	41.28%
2014	224	9,109	8,059	7,952	25,344	55,600	45.58%
2015	274	8,419	7,841	6,659	23,193	54,638	42.45%
2016	295	8,004	7,543	5,937	21,779	45,967	47.38%
Total:	4,307	284,145	340,695	204,748	833,895	2,115,303	39.42%

Source: FAA OPSNET DATABASE, pulled 9/7/17.

Historic Itinerant/Local Operations

Table 3-7, *Historic Itinerant/Local Operations*, provides an overview of the ratio of itinerant aircraft operations to total aircraft operations since 1990. From 1990 to 2007, the percentage of itinerant operations to total operations stayed relatively consistent. However, since 2007 the percentage of itinerant operations to total operations has generally increased when compared to the pre-2007 data and has not dropped below 60% since that time. In total, since 1990, itinerant aircraft operations have made up 59.94% of total operations at ABI.

Table 3-7
Historic Itinerant/Local Operations

Calendar Year	Total Itinerant OPS	Total Local OPS	Total Operations	Itinerant OPS % of Total OPS
1990	55,623	39,471	95,094	58.49%
1991	54,262	42,321	96,583	56.18%
1992	56,336	48,171	104,507	53.91%
1993	56,567	45,528	102,095	55.41%
1994	59,681	38,736	98,417	60.64%
1995	58,194	37,004	95,198	61.13%
1996	54,958	34,163	89,121	61.67%
1997	50,304	26,479	76,783	65.51%
1998	51,293	30,743	82,036	62.52%
1999	49,795	38,657	88,452	56.30%
2000	48,068	32,483	80,551	59.67%
2001	48,600	34,403	83,003	58.55%
2002	46,013	34,149	80,162	57.40%
2003	44,681	39,302	83,983	53.20%
2004	39,475	34,132	73,607	53.63%
2005	41,976	34,091	76,067	55.18%
2006	45,788	32,856	78,644	58.22%
2007	45,928	34,555	80,483	57.07%
2008	54,034	31,081	85,115	63.48%
2009	42,806	20,669	63,475	67.44%
2010	39,492	20,446	59,938	65.89%
2011	41,770	18,150	59,920	69.71%
2012	39,146	21,309	60,455	64.75%
2013	40,264	25,145	65,409	61.56%
2014	37,191	18,409	55,600	66.89%
2015	34,090	20,548	54,638	62.39%
2016	31,518	14,449	45,967	68.57%
Total:	1,267,853	847,450	2,115,303	59.94%

Source: FAA OPSNET DATABASE, pulled 9/7/17.

Historic Air Cargo Tonnage

Table 3-8, *Air Cargo Data*, provides an overview of the air cargo tonnage at ABI since 2002. Currently, overall freight tonnage is down from its peak in 2010 and 2013. However, the 2016 freight figures are still 30% higher than they were in 2004 – 2006, the lowest years on record. It should also be noted that the deplaned freight tonnage percentage of total freight tonnage has increased to over 70% in three of the past 4 years.

Table 3-8
Air Cargo Data

Year	Enplaned Cargo Tonnage	Deplaned Cargo Tonnage	Total Air Cargo Tonnage	Deplaned Cargo % of Total Cargo
2002	477.94	831.79	1,309.73	63.51%
2003	369.79	703.51	1,073.30	65.55%
2004	356.15	580.14	936.29	61.96%
2005	322.28	492.83	815.12	60.46%
2006	364.11	588.89	953.00	61.79%
2007	443.68	741.66	1,185.34	62.57%
2008	396.40	698.41	1,094.80	63.79%
2009	514.15	936.06	1,450.21	64.55%
2010	500.57	1,012.59	1,513.15	66.92%
2011	476.74	981.85	1,458.59	67.31%
2012	431.67	984.22	1,415.89	69.51%
2013	419.67	1,045.57	1,466.25	71.31%
2014	435.53	1,011.18	1,446.71	69.90%
2015	363.77	861.69	1,225.45	70.32%
2016	308.74	893.09	1,201.83	74.31%

Source: ABI Cargo/Freight Data

Aircraft Diversions

Due to its close proximity to DFW, ABI receives aircraft diversions on a regular basis when the weather is poor at DFW. These diversions are typically American Eagle or American Airlines mainline flights but other air carriers use ABI as a diversion destination as well. Based on a review of ABI’s diversion records from 2015 and 2016, the majority of the diverted aircraft are regional jets, B-737s, MD-80s, A320s, and A321s. However, larger aircraft are sometimes diverted to the airport. In 2015, an all-cargo Boeing 747 diverted into ABI. **Table 3-9**, *Aircraft Diversions*, shows the diversions by month at ABI in

2015 and 2016. The majority of the diversions occur in the late spring and summer months.

**Table 3-9
Aircraft Diversions**

Year	Destination Rank	# of Diversions
2015	January	2
	February	2
	March	4
	April	33
	May	35
	June	18
	July	2
	August	8
	September	4
	October	11
	November	24
	December	4
	Total	147
2016	January	6
	February	2
	March	7
	April	13
	May	6
	June	23
	July	29
	August	11
	September	6
	October	5
	November	4
	December	4
	Total	116

Source: ABI Diversion Records

FAA Terminal Area Forecast

Table 3-10, TAF Forecast, provides an overview of forecasted growth at ABI from 2017 through 2045 according to the FAA's TAF. According to the TAF, ABI should expect a 0.94% annual increase in enplanements that will primarily be met by increases in commuter airline activity. Aircraft operations numbers are expected to grow slowly (0.23% annually) with most of the growth coming from itinerant commuter/air taxi operations and itinerant general aviation operations. Based aircraft are expected to increase approximately 1.74% annually.

**Table 3-10
TAF Forecast**

Fiscal Year	Enplanements			Itinerant Operations					Local Operations			Total Ops	Based Aircraft
	Air Carrier	Commuter	Total	Air Carrier	Air Taxi & Commuter	GA	Military	Total	Civil	Military	Total		
2017	1,886	81,329	83,215	338	8,864	15,977	6,553	31,732	6,468	8,277	14,745	46,477	131
2018	1,886	82,125	84,011	338	8,908	16,005	6,553	31,804	6,505	8,277	14,782	46,586	133
2019	1,886	82,944	84,830	338	8,953	16,033	6,553	31,877	6,542	8,277	14,819	46,696	135
2020	1,886	83,763	85,649	338	8,998	16,061	6,553	31,950	6,580	8,277	14,857	46,807	137
2021	1,886	84,594	86,480	338	9,043	16,089	6,553	32,023	6,618	8,277	14,895	46,918	139
2022	1,886	85,436	87,322	338	9,088	16,117	6,553	32,096	6,656	8,277	14,933	47,029	142
2023	1,886	86,278	88,164	338	9,133	16,145	6,553	32,169	6,694	8,277	14,971	47,140	144
2024	1,886	87,132	89,018	338	9,178	16,173	6,553	32,242	6,732	8,277	15,009	47,251	146
2025	1,886	88,003	89,889	338	9,223	16,201	6,553	32,315	6,770	8,277	15,047	47,362	148
2026	1,886	88,884	90,770	338	9,268	16,229	6,553	32,388	6,808	8,277	15,085	47,473	150
2027	1,886	89,773	91,659	338	9,313	16,257	6,553	32,461	6,846	8,277	15,123	47,584	152
2028	1,886	90,673	92,559	338	9,358	16,285	6,553	32,534	6,884	8,277	15,161	47,695	155
2029	1,886	91,578	93,464	338	9,404	16,313	6,553	32,608	6,923	8,277	15,200	47,808	158
2030	1,886	92,494	94,380	338	9,450	16,341	6,553	32,682	6,962	8,277	15,239	47,921	161
2031	1,886	93,418	95,304	338	9,496	16,369	6,553	32,756	7,001	8,277	15,278	48,034	164
2032	1,886	94,353	96,239	338	9,544	16,397	6,553	32,832	7,041	8,277	15,318	48,150	167
2033	1,886	95,296	97,182	338	9,592	16,425	6,553	32,908	7,081	8,277	15,358	48,266	170
2034	1,886	96,248	98,134	338	9,640	16,453	6,553	32,984	7,121	8,277	15,398	48,382	173
2035	1,886	97,208	99,094	338	9,688	16,481	6,553	33,060	7,161	8,277	15,438	48,498	176
2036	1,886	98,179	100,065	338	9,736	16,510	6,553	33,137	7,201	8,277	15,478	48,615	179
2037	1,886	99,161	101,047	338	9,784	16,539	6,553	33,214	7,242	8,277	15,519	48,733	183
2038	1,886	100,152	102,038	338	9,832	16,568	6,553	33,291	7,283	8,277	15,560	48,851	187
2039	1,886	101,151	103,037	338	9,881	16,597	6,553	33,369	7,324	8,277	15,601	48,970	191
2040	1,886	102,162	104,048	338	9,930	16,626	6,553	33,447	7,366	8,277	15,643	49,090	195
2041	1,886	103,183	105,069	338	9,979	16,655	6,553	33,525	7,408	8,277	15,685	49,210	199
2042	1,886	104,215	106,101	338	10,029	16,684	6,553	33,604	7,450	8,277	15,727	49,331	203
2043	1,886	105,257	107,143	338	10,079	16,713	6,553	33,683	7,492	8,277	15,769	49,452	207
2044	1,886	106,309	108,195	338	10,129	16,742	6,553	33,762	7,534	8,277	15,811	49,573	211
2045	1,886	107,372	109,258	338	10,179	16,771	6,553	33,841	7,577	8,277	15,854	49,695	216
Annual Growth Rate	0.00%	0.96%	0.94%	0.00%	0.48%	0.17%	0.00%	0.22%	0.55%	0.00%	0.25%	0.23%	1.74%

Source: FAA TAF DATABASE, pulled 9/7/17.

Airline Operations and Passenger Activity Forecast

Airline and passenger activity forecasts are closely linked and both are influenced by numerous factors including airline industry trends, socioeconomic changes, the local business climate, tourism, and many other factors. When forecasting future airline operations and passenger activity levels it is important that the forecasts are properly linked to ensure they are consistent with each other. The enplanement forecast is generally viewed as the forecast that drives the airline activity forecast as airline activity is generally based on passenger travel demands. However, other factors, like airline fleet mix and airline consolidations/mergers, can affect an airline's operational tempo at an airport irrespective of passenger travel demands. Consequently, an airport could have a passenger enplanement forecast that shows increasing enplanements while forecasted airline operations figures decrease because larger aircraft are being used to service the market. These factors and others are discussed in the sections below regarding the passenger enplanement forecast and the airline operations forecast for ABI.

Passenger Activity Forecast

Passenger activity at an airport is primarily measured by enplanements, which is the number of individuals boarding an airline aircraft at an airport to fly to another destination. This includes passengers using an airport as their point of origin for a trip and passengers using the airport as a connection point to transfer to another airline flight. Currently, ABI is only used as an Origin and Designation (O&D) airport. No connecting passenger traffic exist.

To forecast future passenger activity, a number of different forecasting techniques were reviewed and considered including:

- Regression Analysis – A regression analysis is a statistical forecasting methodology that projects the growth or decline of a dependent variable (i.e. Enplanements) based on one or more independent variables (i.e. population, income, employment growth, GDP, etc.). Historic values for both the dependent and independent variables are analyzed to determine whether a sufficient correlation exists between the two for the independent variables to be used to predict future dependent variable values.
- Trend Analysis – A trend analysis is the simplest and most familiar form of forecasting and is also one of the most widely used. Historic data is collected and used to develop a forecast for an aviation activity element (e.g. enplanements, operations, etc.). An assumption of this forecasting methodology is that future

aviation activity trends will be similar to those seen in the past. Though this assumption seems broad in its application, it can serve as a reliable forecasting method.

- Share/Market Analysis – Share/Market Analysis forecasts utilize a high-level aggregate forecast (e.g. a national, regional, or state forecast) and utilize the growth rates provided in that forecast as the basis for developing a local forecast for an airport. The FAA’s annual Aerospace Forecast is commonly used in these forecast models.

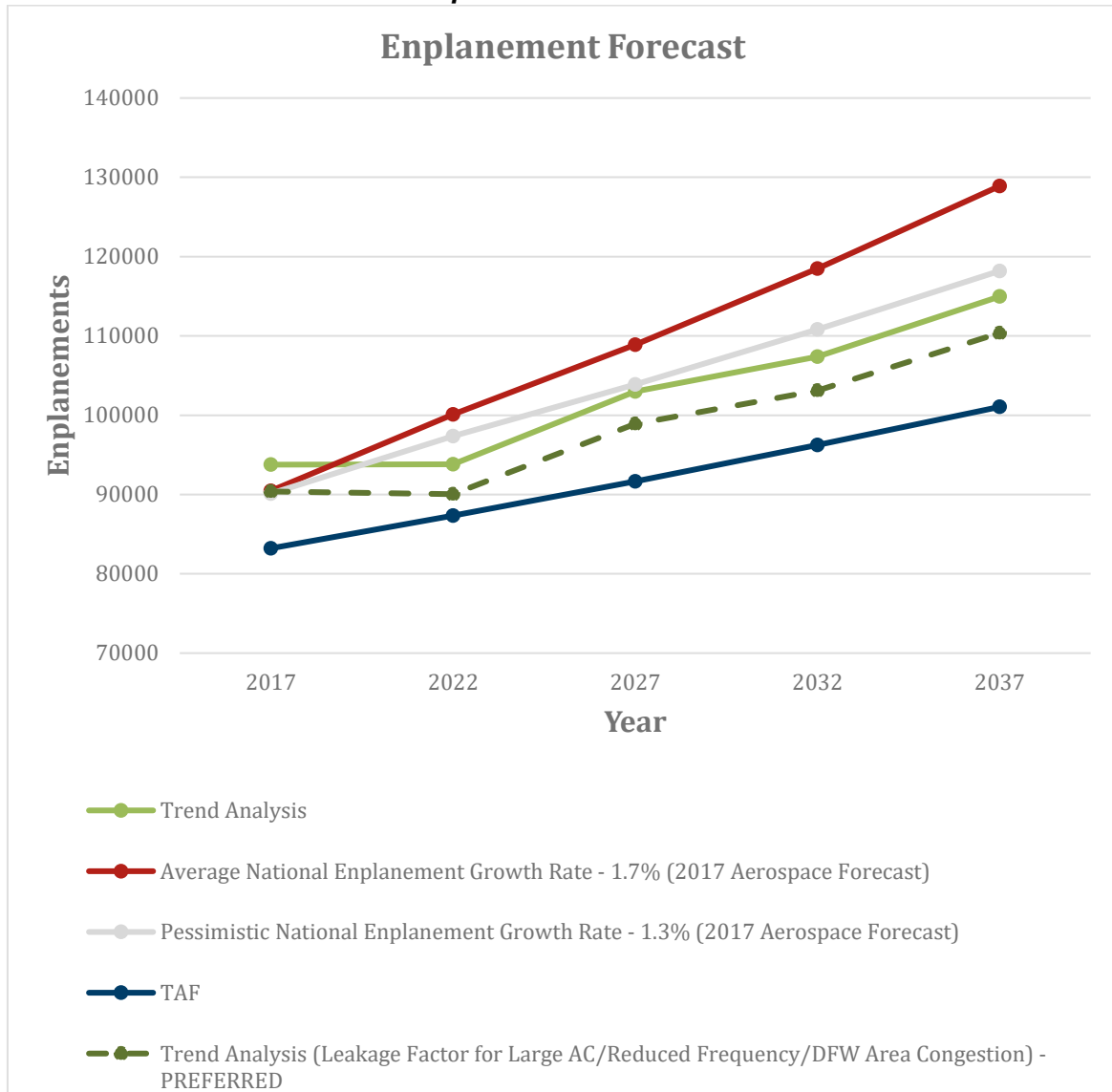
Table 3-11 and **Figure 3-1** show the various enplanement forecasts alternatives that were developed for ABI. Additionally, the FAA’s Terminal Area Forecast (TAF) is shown. Multiple draft forecasts were run using both linear and multiple regression forecasting methodologies with various combinations of independent variables. However, none of the draft regression based forecasts were considered statistically reliable and consequently they are excluded from the table and graph below.

Table 3-11
Enplanement Forecast

Year	Trend Analysis	Average National Enplanement Growth Rate - 1.7% (2017 Aerospace Forecast)	Pessimistic National Enplanement Growth Rate - 1.3% (2017 Aerospace Forecast)	TAF (Current)	Trend Analysis (Leakage Factor for Large AC/Reduced Frequency/DFW Area Congestion) - PREFERRED
2017	93,766	90,471	90,115	83,215	90,399
2022	93,797	100,101	97,377	87,322	90,045
2027	103,005	108,903	103,873	91,659	98,885
2032	107,405	118,480	110,803	96,239	103,108
2037	114,966	128,899	118,195	101,047	110,367

Source: Garver, 2017

**Figure 3-1
Enplanement Forecast**



Source: Garver, 2017

The result of each of these forecast alternatives were reviewed with respect to their alignment with the projected economic and population growth in the region, national trends/forecasts regarding enplanement growth, projected airline industry changes, local considerations, and other sociodemographic factors. Based on the review, the trend analysis forecast that includes an increased leakage factor due to reduced flight frequency because of larger aircraft was selected as the preferred passenger enplanement forecast. Envoy Air (dba American Eagle) is purchasing more ERJ-175

aircraft (76 seats per aircraft) and it is expected that Eagle Aviation Services, Inc. (EASI) will be responsible for the maintenance of those aircraft at some point during the forecast period. As a result, it is expected that the EASI maintenance facility will play a major role in determining the airline fleet mix that will serve ABI in the future. When EASI begins handling the maintenance of the larger ERJ-175 aircraft it is expected that Envoy Air will begin utilizing ERJ-175's to serve ABI. Due to the larger size of these aircraft, Envoy could potentially reduce its flight frequency at ABI which could lead to increased passenger leakage to other airports. In surveys, passengers frequently rate flight frequency/times as a key factor in making their travel plans. Consequently, if flight frequency is reduced at ABI, some existing passengers may be inclined to drive to other area airports where more frequent flights or non-stop service exists to their destination. There is no timeline on when the migration to ERJ-175 aircraft will occur. It should also be noted that Envoy Air has started reinstating some ERJ-140 aircraft (44 seats per aircraft) that were previously out of service to accommodate existing demand. EASI is expected to be responsible for the maintenance of these aircraft in the near term.

A factor that that could potentially reduce leakage to the Dallas-Fort Worth area airports is the continued growth and congestion in the Dallas-Fort Worth metropolitan area. As the Dallas-Fort Worth area continues to grow, traffic congestion is likely to worsen which will increase the amount of time it will take individuals from the Abilene area to drive to the Dallas-Fort Worth area airports. As it gets more difficult for people to drive to the Dallas-Fort Worth area airports, it is likely that more passengers will chose to fly out of ABI rather than drive to the airports in the Dallas-Fort Worth area.

Based on the preferred enplanement forecast, ABI is expected to see an approximately 30% increase (above their 2016 actual enplanement numbers) in passenger traffic during the 20 year forecast period.

Airline Operations Forecast

The airline operations forecast provides a picture of how air carrier and commuter airline traffic is expected to change at ABI in the future. As previously mentioned the enplanement forecast is a key consideration in the development of this forecast but a number of other factors must be considered including local trends/considerations and airline industry changes. Each of these considerations are discussed below.

Local Trends/Considerations

Envoy Air (dba American Eagle) is the only airline currently operating at ABI. Envoy Air currently offers 5 to 6 daily departures to Dallas-Fort Worth International Airport (DFW) on 50-seat Embraer ERJ-145 aircraft. Envoy Air has a major maintenance facility at ABI –

EASI – that handles the maintenance of Envoy Air’s Embraer ERJ-145 fleet. The ERJ-145 fleet is older and is expected to be retired at some point in the future. However, there is not a defined timeline for this. As previously discussed, Envoy Air has been purchasing new ERJ-175 aircraft and has been re-activating some of their inactive ERJ-140 aircraft to keep up with increasing air travel demand across their network. If EASI begins handling the maintenance of Envoy Air’s growing ERJ-175 fleet, it is expected that those aircraft will begin serving ABI and the number of ERJ-145 operations will decrease as well as the number of airline operations in total.

Additionally, ABI is making a concerted effort to attract additional airlines to the airport. The addition of other airlines and/or new non-stop destinations will increase ABI’s airline operations and could potentially increase their enplanement numbers by reducing their leakage to other commercial service airports located within a reasonable driving distance.

Airline Industry Trends

The airline industry has seen a consistent trend of consolidations in the past 10 to 15 years. This has resulted in the development of a number of very large airlines that dominate the domestic air carrier market. In 2000, twelve airlines transported approximately 93.4% of all domestic passengers. Those twelve airlines included TWA, U.S. Airways, America West, Northwest Airlines, Continental Airlines, and AirTran which have all been overtaken in mergers since that time. In 2016, the five major domestic airlines (e.g. Delta, United, Southwest, American, Alaska) carried 87.1% of all domestic passengers. This consolidation has reduced competition on many routes throughout the US resulting in higher fares, reduced capacity, and higher load factors on many routes. This is an important consideration when developing airline activity forecasts as airlines now have more pricing power and are focused on flying routes that will produce higher profits which can result in some less lucrative markets being under served.

Airline Activity Forecast

A number of different airline activity forecast alternatives were developed based on the considerations previously mentioned. The forecast alternatives included:

- Trend Analysis – A trend analysis was completed using historic air carrier and commuter aircraft operations data to establish a picture of how airline traffic will change in the future.
- Enplanement Ratio Forecast – Since 2010, ABI has had an average load factor of approximately 71% and it was assumed this would stay relatively consistent during the forecast period. Based on average load factor, the enplanement forecast, and the average size of aircraft serving ABI, the number of forecasted airline operations can be calculated for this planning exercise. However, it should be noted that the airline industry is volatile and is regularly impacted by

numerous factors that can effect airline traffic forecasts for a particular airport. These factors include air carrier planning considerations, regional and national economic conditions, fleet size, air crew availability, aircraft availability and size, and numerous other factors. Two different enplanement ratio forecasts were developed for consideration. The first forecast assumes that ABI will primarily be served by 50 seat aircraft during the forecast period similar to the aircraft that currently serve the airport. The second forecast assumes that ABI will incrementally see increases to the average size of airline aircraft during forecast period (e.g. migration from ERJ-145 to ERJ-175 aircraft).

- Share/Market Analysis – The 2017-2037 FAA Aerospace forecast indicates that the average growth rate nationwide for commercial operations (e.g. air carrier, commuter, and air taxi) will be approximately 1.5% annually. This same growth factor was applied to ABI’s existing airline traffic data to develop a forecast for future activity.

In addition to the forecasts mentioned above, a number of forecasts were run using linear and multiple regression techniques. However, none of the regressions were found to be sufficiently reliable so they were excluded.

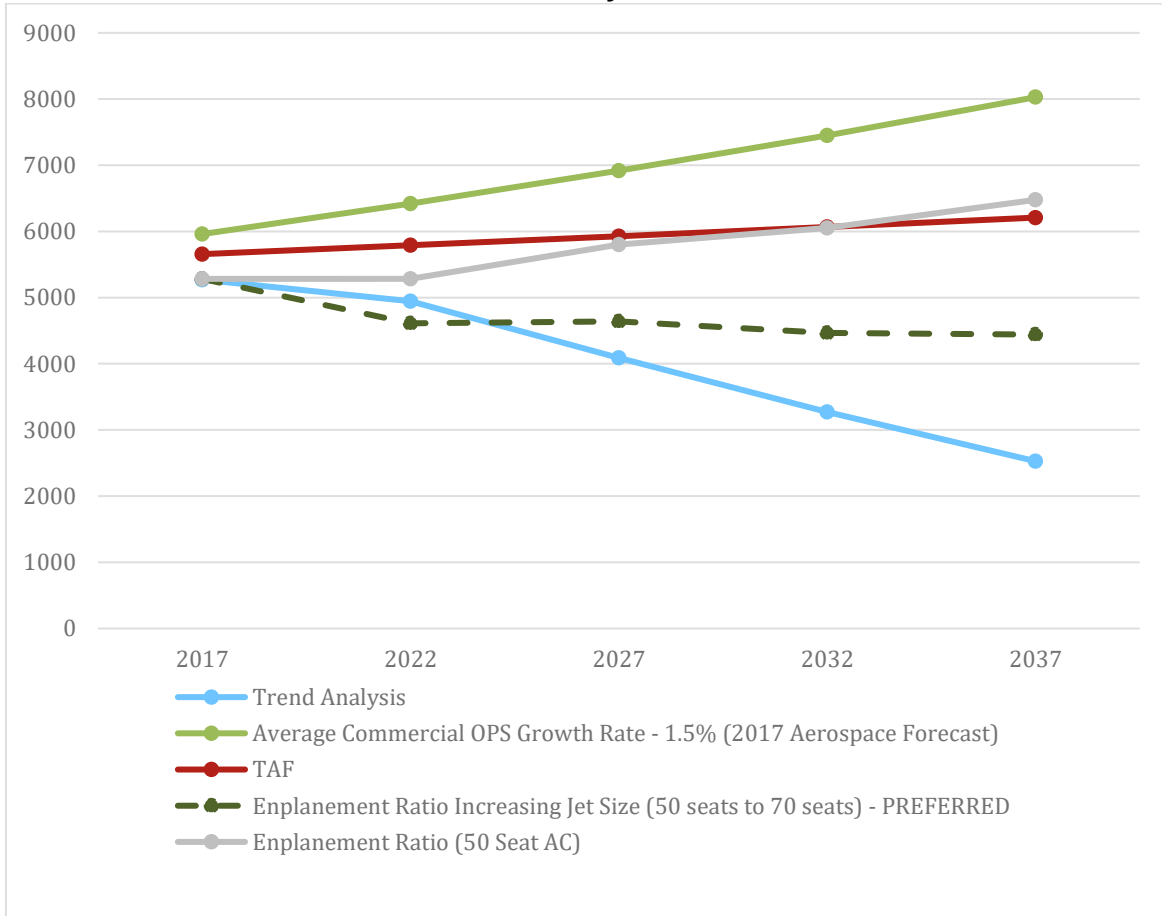
The results of the forecasts described above are shown in **Table 3-12** and **Figure 3-2**.

Table 3-12
Airline Activity Forecast

Year	Trend Analysis	Average Commercial OPS Growth Rate - 1.5% (2017 Aerospace Forecast)	Enplanement Ratio Increasing Jet Size (50 seats to 70 seats) - PREFERRED	Enplanement Ratio (50 Seat AC)	TAF
2017	5,270	5,960	5,283	5,283	5,656
2022	4,943	6,421	4,612	5,020	5,791
2027	4,091	6,917	4,643	5,513	5,926
2032	3,270	7,451	4,468	5,748	6,064
2037	2,528	8,027	4,441	6,153	6,208

Source: Garver, 2017

**Figure 3-2
Airline Activity Forecast**



Source: Garver, 2017

Based on the enplanement forecast and the local and national considerations previously discussed, the Enplanement Ratio Increasing Jet Size (50 seats to 70 seats) has been selected as the preferred forecast. However, it is not expected that the migration to larger aircraft will be as gradual as depicted in the forecast graphic. It is expected that this shift will occur in a “stair-step” fashion as EASI takes on the maintenance of the ERJ-175 fleet.

Air Taxi, General Aviation, and Military Activity Forecast

This section provides the forecasts that were developed for air taxi, general aviation, and military activity at ABI.

Air Taxi Activity Forecast

The FAA defines Air Taxi operators as companies that operate aircraft originally designed to have no more than 60 passenger seats or a cargo payload of 18,000 lbs. and that carry cargo or mail on either a scheduled or charter basis, and/or carry passengers on an on-demand basis or limited schedule basis (i.e. four or fewer round trips a week on at least one route according to published flight schedules) only. At ABI, non-commuter air taxi operations include the Cessna Caravans that FedEx operates, on demand charter services provided by Abilene Aero, the operation of fractional aircraft ownership companies, the operation of small aircraft air taxi services (e.g. PlaneSmart, Linear Air, etc.), and other for-hire aircraft operations. This forecast excludes airline commuter aircraft operations.

Air taxi operations at ABI have declined consistently since 2008 with a 48% decrease since that time. The FAA Aerospace Forecast estimates that air taxi operations will decrease nationwide by approximately 0.9% annually between 2017 and 2037.

A number of different forecasting techniques were used to estimate future air taxi operations at ABI including:

- TAF (Interpolated) – The FAA’s TAF provides a forecast of future air taxi/commuter airline activity at an airport. Historically, approximately 60% of the total air taxi operations recorded in the FAA OPSNET database at ABI have been considered commuter airline operations. That ratio is expected to remain relatively consistent during the forecast period. Consequently, this forecast assumes that approximately 40% of the forecasted TAF air taxi numbers will be for non-commuter air taxi operations.
- Share/Market Analysis – The FAA’s Aerospace Forecast predicts that air taxi operations will decrease by an average of 0.9% annually through 2037. This growth rate was applied to ABI’s current air taxi operations figures to develop a forecast for the future.

A regression analysis forecast and trend analysis forecast were conducted however both of those statistical models were deemed unreliable because they showed declines beyond what could be considered realistic.

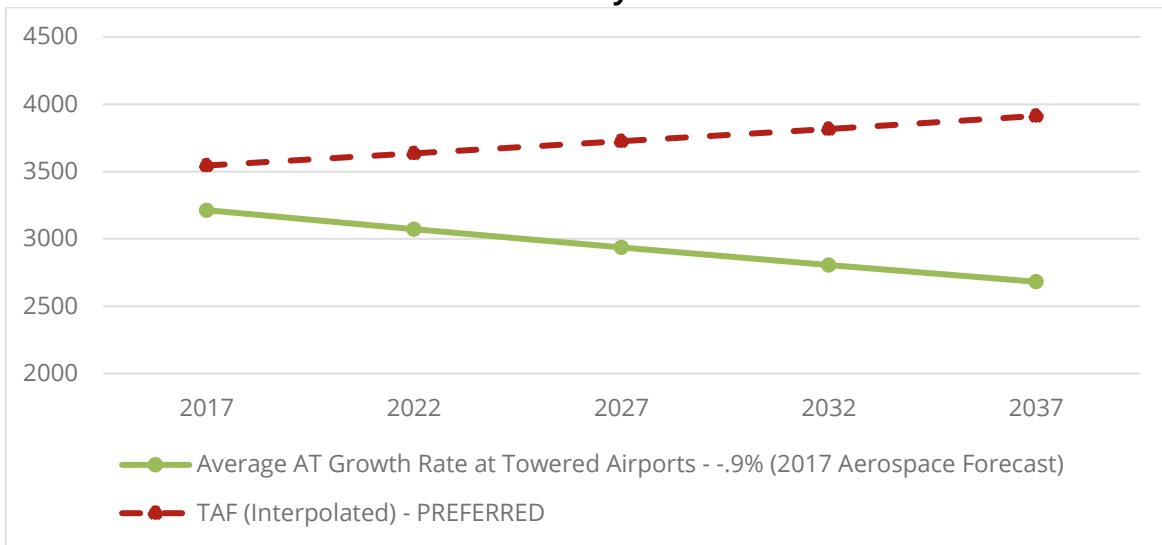
The results of the forecasts described above are shown in **Table 3-13** and **Figure 3-3**.

Table 3-13
Air Taxi Activity Forecast

Year	Average AT Growth Rate at Towered Airports - -.9% (2017 Aerospace Forecast)	TAF (Interpolated) - PREFERRED
2017	3,214	3,546
2022	3,072	3,635
2027	2,936	3,725
2032	2,806	3,818
2037	2,682	3,914

Source: Garver, 2017

Figure 3-3
Air Taxi Activity Forecast



Source: Garver, 2017

The air taxi activity forecast using the interpolated TAF data was selected as the preferred forecast as it shows slow growth which is reasonable for ABI to expect.

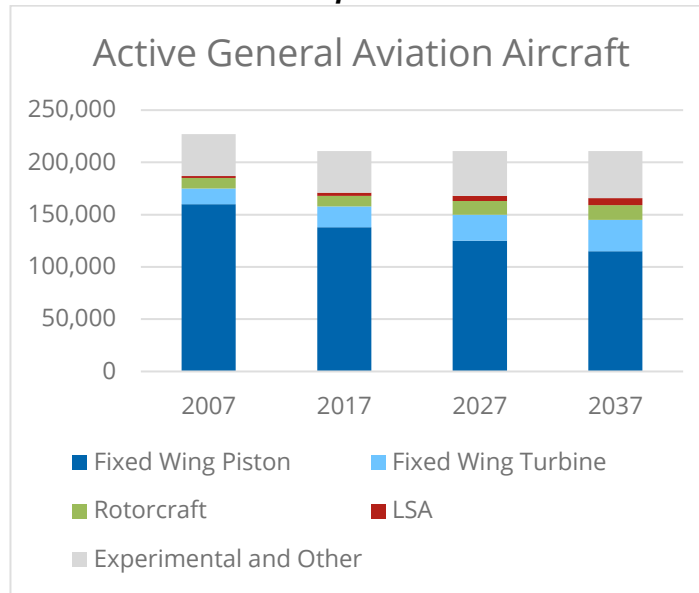
General Aviation Forecasts

General aviation operations are considered to be all aircraft operations other than those classified as air carrier, commuter, air taxi, or military operations. This section will discuss the factors impacting the growth of general aviation and provide a forecast for future GA growth at ABI.

General Aviation Trends

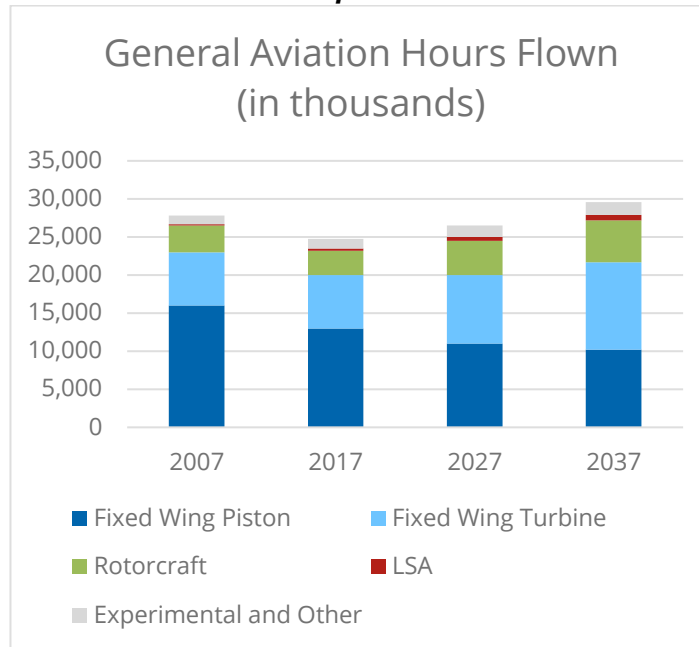
According to the FAA's *2017 - 2037 Aerospace Forecast*, the number of active GA aircraft is forecasted to grow at a rate of 0.1 percent annually between 2017 and 2037 and the number of hours flown is forecasted to grow at a rate of 0.9 percent annually during that same period. This slight growth is expected to primarily come from the growth in the production and utilization of Light Sport Aircraft (LSA), rotocraft, fixed wing turbine aircraft (turbo-prop and jet), and experimental aircraft. The largest segment of the existing general aviation aircraft fleet, fixed wing piston aircraft, is expected to decline over the forecast period. **Figure 3-4** and **Figure 3-5** depict these forecasted trends. Additionally, the number of pilots (including Airline Transport Pilots - ATPs) is expected to decrease over the forecast period by approximately 0.1% annually.

Figure 3-4
FAA Aerospace Forecast



Source: FAA Aerospace Forecast, 2017 - 2037

**Figure 3-5
FAA Aerospace Forecast**



Source: FAA Aerospace Forecast, 2017 - 2037

General Aviation Based Aircraft Forecast

The number of GA aircraft that can be expected to base at an airport facility is dependent on several factors, such as available facilities (e.g. hangars), services provided at the airport, airport proximity and access, etc. GA operators are particularly sensitive to both the quality and location of their basing facilities, with proximity to home and work often identified as the primary considerations in choosing where to base an aircraft. Hangars at ABI are close to capacity. A few T-hangars are currently available and no waiting list currently exists. There are no vacant box hangars. Determining the number and type of general aviation aircraft anticipated to be based at an airport is a vital component in establishing a development plan for an airport.

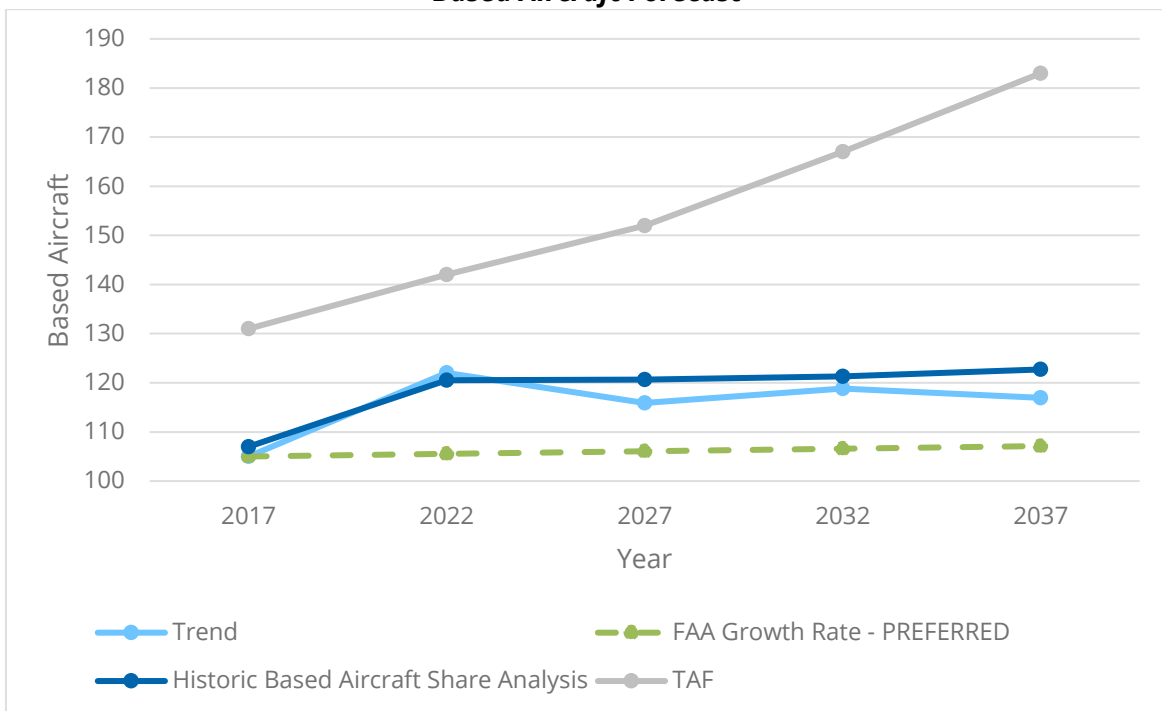
A number of different forecasting techniques were used to forecast future based aircraft activity at ABI. However, after reviewing the potential forecasting options it was determined that the forecast based on the FAA's Aerospace Forecast growth rate for active GA aircraft provided the most realistic and feasible projected growth for based aircraft at ABI. **Table 3-14** and **Figure 3-6** show the various based aircraft forecasts that were considered.

Table 3-14
Based Aircraft Forecast

Year	Trend	FAA Growth Rate - PREFERRED	Historic Based Aircraft Share Analysis	TAF
2017	105	105	105	131
2022	122	106	121	142
2027	116	106	121	152
2032	119	107	121	167
2037	117	107	123	183

Source: Garver, 2017

Figure 3-6
Based Aircraft Forecast



Source: Garver, 2017

Forecast of Aircraft Fleet Mix for Based Aircraft

The mix of based aircraft for incremental periods throughout the planning period is illustrated in **Table 3-15** and **Figure 3-7, Based Aircraft Fleet Mix, 2017-2037**. Consistent

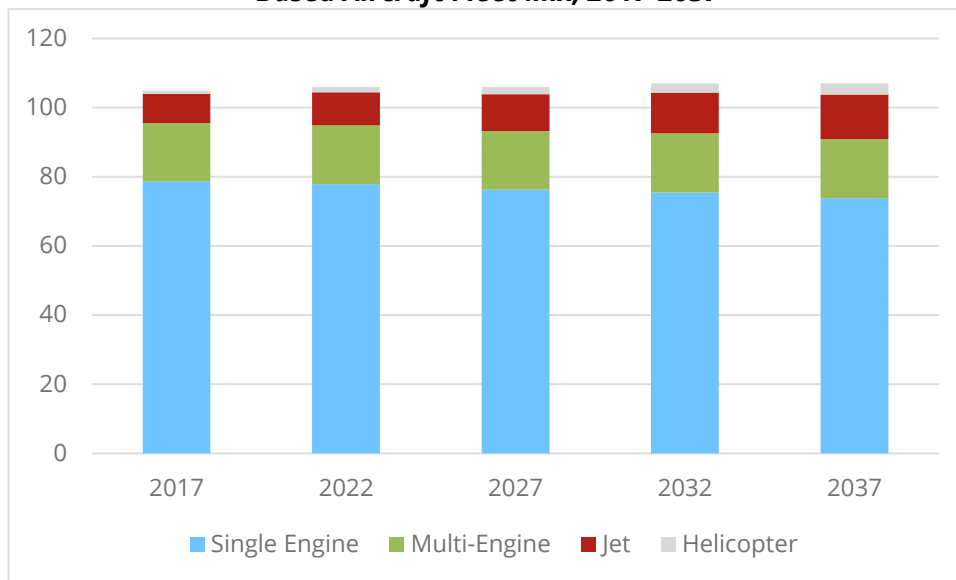
with the FAA's current Aerospace's Forecast, it is assumed that the fleet mix percentage of single engine piston aircraft will decrease during the forecast period but this decrease will be somewhat offset by the expected nationwide increase in light sport aircraft. Both single engine piston aircraft and light sport aircraft are included in the single engine aircraft category in the table below. Additionally, the fleet mix percentage of jet and helicopter aircraft are expected to increase during the forecast period.

Table 3-15
Based Aircraft Fleet Mix, 2017-2037

Aircraft Type	2017	2022	2027	2032	2037
Single Engine	79	78	76	75	74
Multi-Engine	17	17	17	17	17
Jet	8	10	11	12	13
Helicopter	1	2	2	3	3
Total	105	106	106	107	107

Source: Garver Forecast Data for ABI, 2017

Figure 3-7
Based Aircraft Fleet Mix, 2017-2037



Source: Garver Forecast Data for ABI, 2017

General Aviation Activity Forecast

General Aviation activity has decreased nationwide over the past 20 years and this trend is no different at ABI. ABI has seen relatively consistent declines in GA activity (both itinerant and local) since 1990 according to the FAA OPSNET database. However, as previously discussed, the FAA Aerospace Forecast predicts slow growth in general aviation activity across the United States over the next 20 years.

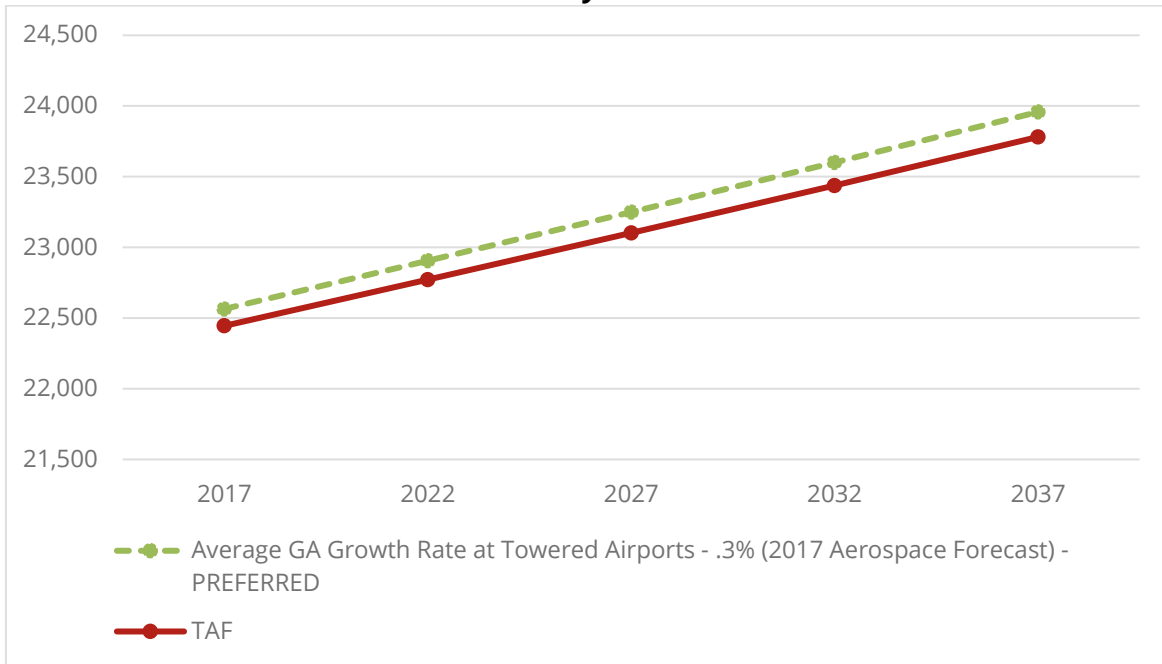
To forecast future GA activity at ABI, a number of forecast alternatives were developed for further evaluation. The regression and trend analysis alternatives that were developed showed declining growth that went beyond a reasonable level. Additionally, the regression forecast showed an R² value that was too low for the model to be considered statistically reliable. These factors led to the regression and trend analysis forecasts being excluded. A market/share analysis forecast was conducted using the average growth rate for GA operations at towered airports contained in the FAA Aerospace Forecast (0.3%). **Table 3-16** and **Figure 3-8** shows this forecast in comparison to the TAF.

Table 3-16
GA Activity Forecast

Year	Average GA Growth Rate at Towered Airports - .3% (2017 Aerospace Forecast) - PREFERRED	TAF
2017	22,564	22,445
2022	22,905	22,773
2027	23,251	23,103
2032	23,601	23,438
2037	23,958	23,781

Source: Garver, 2017

**Figure 3-8
GA Activity Forecast**



Source: Garver, 2017

Based on the forecasted economic and population growth in the region, the Average GA Growth Rate at Towered Airports forecast was selected as the preferred alternative.

Military Activity Forecast

Military activity at ABI is common due to its proximity to Dyess Air Force base. Consequently, ABI is commonly used by military aircraft for practice instrument approaches for refueling stops. In 2016, military operations accounted for over 14,500 total aircraft operations at ABI. Military operations are expected to follow the TAF projections during the forecast period. The TAF projects an average of 14,830 military operations per year.

Total Aircraft Operations Forecast

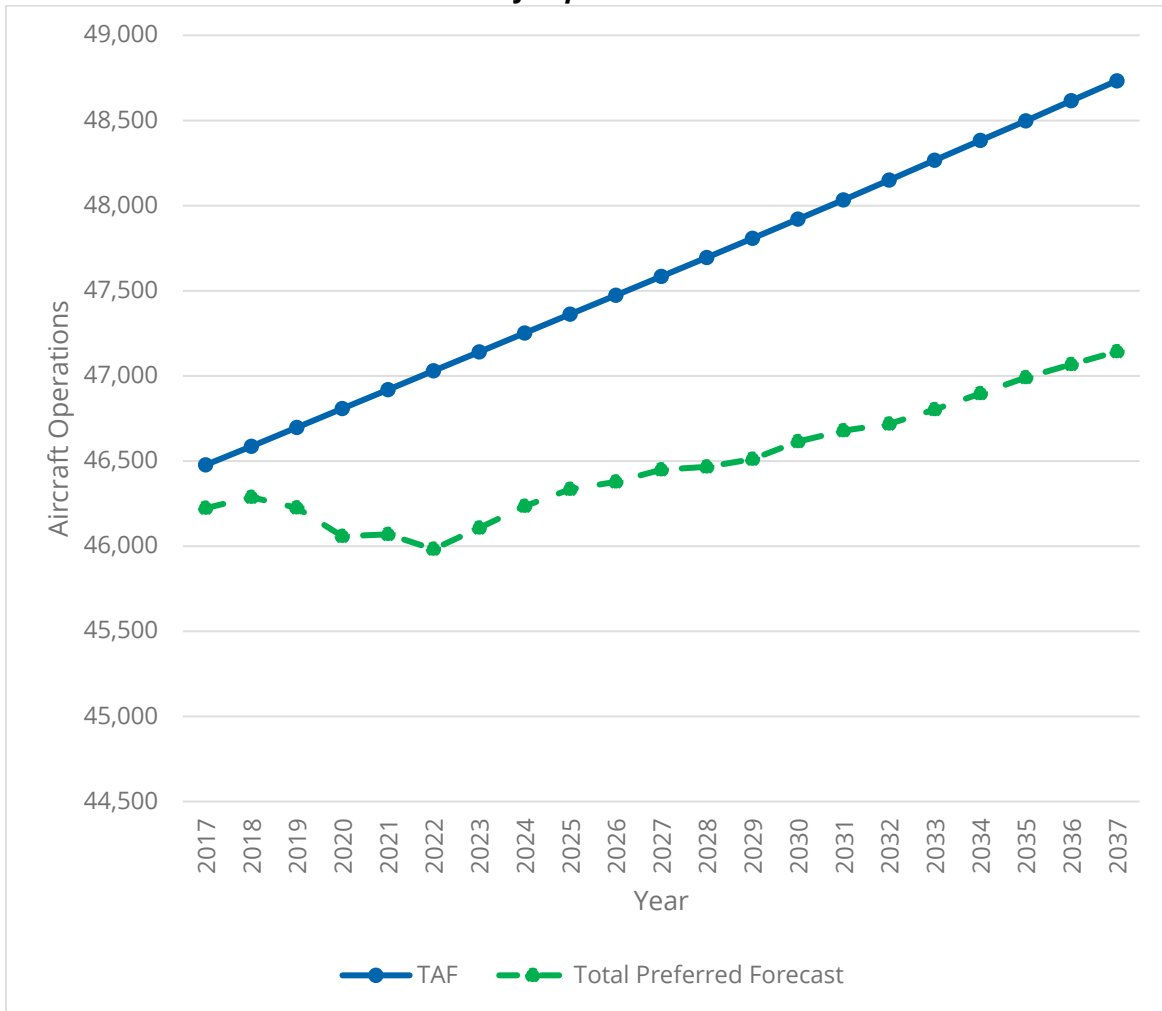
Combining the airline, air taxi, general aviation, and military activity forecasts that were previously discussed, provides a holistic aircraft operations forecast for ABI. Based on the preferred forecasts that were selected, the total aircraft operations forecast for ABI is summarized in **Figure 3-9** and **Table 3-17**.

Table 3-17
Total Aircraft Operations Forecast

Year	AC/ Commuter	AT (non- commuter)	GA OPS	Military	Total Preferred Forecast	TAF	Difference
2017	5,283	3,546	22,564	14,830	46,223	46,477	-254
2018	5,261	3,563	22,632	14,830	46,286	46,586	-300
2019	5,114	3,581	22,700	14,830	46,225	46,696	-471
2020	4,861	3,599	22,768	14,830	46,058	46,807	-749
2021	4,786	3,617	22,836	14,830	46,070	46,918	-848
2022	4,612	3,635	22,905	14,830	45,982	47,029	-1,047
2023	4,649	3,653	22,974	14,830	46,106	47,140	-1,034
2024	4,691	3,671	23,043	14,830	46,235	47,251	-1,016
2025	4,703	3,689	23,112	14,830	46,334	47,362	-1,028
2026	4,660	3,707	23,181	14,830	46,378	47,473	-1,095
2027	4,643	3,725	23,251	14,830	46,448	47,584	-1,136
2028	4,572	3,743	23,320	14,830	46,466	47,695	-1,229
2029	4,528	3,762	23,390	14,830	46,510	47,808	-1,298
2030	4,544	3,780	23,461	14,830	46,615	47,921	-1,306
2031	4,518	3,798	23,531	14,830	46,678	48,034	-1,356
2032	4,468	3,818	23,601	14,830	46,717	48,150	-1,433
2033	4,463	3,837	23,672	14,830	46,802	48,266	-1,464
2034	4,467	3,856	23,743	14,830	46,897	48,382	-1,485
2035	4,470	3,875	23,815	14,830	46,989	48,498	-1,509
2036	4,457	3,894	23,886	14,830	47,068	48,615	-1,547
2037	4,441	3,914	23,958	14,830	47,143	48,733	-1,590

Source: Garver, 2017

**Figure 3-9
Total Aircraft Operations Forecast**



Source: FAA TAF, Garver, 2017

Air Cargo Tonnage Forecast

FedEx has a cargo operation at ABI that includes a small distribution center. The operation is based on the Northwest GA ramp. Currently, FedEx only operates Cessna Caravan aircraft out of ABI. No other cargo operators currently utilize the airport on a regular basis.

From a national perspective, the growth of air cargo is closely tied to overall economic growth. Consequently, in its annual Aerospace Forecast, the FAA uses forecasted

changes in national Gross Domestic Product (GDP) to predict changes in the cargo industry. According to the 2017 – 2037 FAA Aerospace Forecast, domestic cargo Revenue Ton Miles (RTM) are forecasted to increase by 1.3% annually across the United States. Abilene's economy is expected to grow during the forecast period which should provide a basis for potential growth in air cargo traffic at the airport.

Additionally, it is expected that the growth of air cargo at ABI will be closely tied to the future growth of direct-to-consumer shipping related to the e-commerce industry (e.g. Amazon, etc.) that has grown in recent years with the growth of Amazon and the popularity their Amazon Prime membership. Amazon Prime membership has grown rapidly in the US in the past 2 years. In the 1st quarter of 2016, Amazon reportedly had approximately 58 million Amazon Prime subscribers. At the end of the 1st quarter of 2017, Amazon reported that there were now over 80 million Amazon Prime subscribers which is a 38% increase in a single year. Amazon Prime adoption rates are the highest among households earning more than \$112,000 annually. It is estimated that currently 70% of households that earn more than \$112,000 annually are Amazon Prime subscribers. According the Woods and Poole's Socio-Economic forecasts for the Abilene MSA, it is expected that the number of households in the MSA with higher incomes (\$100,000 or more) will increase. This growth will also provide a foundation for potential air cargo growth at ABI.

The utilization of drones to transport and deliver cargo is also a factor that could have an effect on cargo tonnage at ABI. The drone industry is growing rapidly and the associated technology is evolving quickly. Consequently, it is difficult to know with any certainty how drones could affect air cargo operations at ABI and nationwide.

A number of air cargo forecast alternatives were developed for consideration. The following forecasting techniques were utilized:

- Trend Analysis – A trend analysis was conducted with ABI's historic air cargo data to determine how it could potentially change in the future.
- Market/Share Forecast – A forecast was developed using the FAA's projected growth rate for RTMs over the forecast period.
- Historic Growth Rate Forecast – ABI's historic annualized air cargo growth rate has been approximately 0.8% annually since 2003. This growth rates was utilized to project future growth.

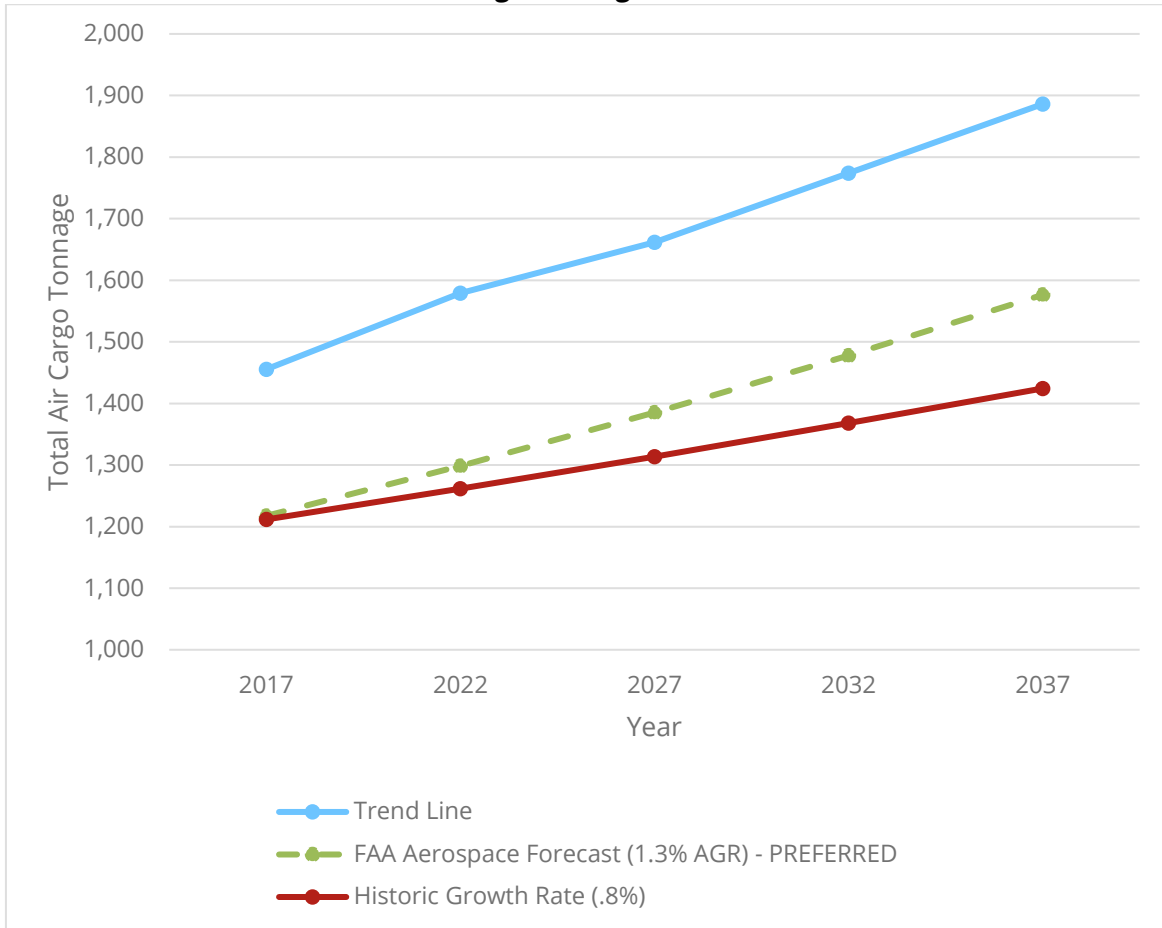
A regression analysis was run using population and a variety of socioeconomic factors as potential independent variables but none of the variations produced a reliable forecast. Consequently, all regression models have been excluded. The air cargo forecast alternatives are shown in **Table 3-18** and **Figure 3-10**.

Table 3-18
Air Cargo Tonnage Forecast

Year	Trend Line	FAA Aerospace Forecast (1.3% AGR) - PREFERRED	Historic Growth Rate (.8%)
2017	1,455	1,217	1,212
2022	1,579	1,299	1,262
2027	1,662	1,385	1,314
2032	1,774	1,478	1,368
2037	1,886	1,576	1,424

Source: Garver, 2017

Figure 3-10
Air Cargo Tonnage Forecast



Source: Garver, 2017

Based on the expected nationwide growth in air cargo, the incremental growth in the Abilene economy, and the increasing number of households with higher incomes, the FAA Aerospace Forecast alternative was selected as the preferred forecast.

Instrument Approach Activity Forecast

Table 3-19, *Instrument Approach Forecasts, 2017-2037*, summarizes the forecast of annual instrument approaches at ABI throughout the planning period. The forecast of annual instrument approaches (AIAs) provides further guidance in determining requirements for the type, extent, and timing of future navigational aid (NAVAID) equipment.

The forecast for instrument approach procedures is based on the IFR flight plan filings for the last nine-year period. During the last nine year period, an average of 44% of total operations have been conducted under an instrument flight plan. It is assumed that this percentage will grow slightly during the forecast period as it has increased incrementally since 1995 due to the decline in VFR operations which is expected to continue. The predicted decrease in air carrier operations will also be a factor that contributes to the slight growth in IFR operations. Dividing the annual number of forecasted instrument operations in half provides an estimate of the number of instrument approaches conducted at ABI.

Table 3-19
Instrument Approach Forecasts, 2017-2037

Category	2017	2022	2027	2032	2037
Annual Operations	46,223	45,982	46,448	46,717	47,143
Percentage of Annual OPS that are IFR	44%	45%	46%	47%	48%
Forecasted Number of Instrument Approaches	10,169	10,346	10,683	10,979	11,314

Source: Garver, 2017

Itinerant vs Local Operations Forecast

The FAA defines an aircraft operation as an aircraft takeoff or landing at an airport. Aircraft operations can further be divided into local and itinerant operations. According to FAA Order 7210.3AA, *Facility Operation and Administration, October 12, 2017*, a local operation is any operation performed by an aircraft that “remains in the local traffic pattern, performs a simulated instrument approach, or operates to or from the Airport and a practice area within a 20-mile radius of the field or tower.” An itinerant operation is

any operation that is not considered local. Based on the FAA OPSNET database, since 2008 approximately 34% of the operations conducted at ABI have been considered local operation and 66% considered itinerant operations. This percentage has stayed relatively consistent since 2008 and is expected to remain consistent throughout the forecast period. **Table 3-20, *Itinerant vs. Local Activity Forecast***, provides a summary of this information. All types of aircraft operations (e.g. GA, air taxiway, air carrier, and military) are included in these figures.

Table 3-20
Itinerant vs. Local Activity Forecast

Year	2017	2022	2027	2032	2037
Local Operations	15,716	15,634	15,792	15,883	16,029
Itinerant Operations	30,507	30,348	30,656	30,834	31,114
Total	46,223	45,982	46,448	46,717	47,143

Source: Garver, 2017

Peak Period Forecasts

Peak period forecasts are essential for ensuring that an airport is prepared for and capable of handling the peaking characteristics of the aeronautical activity that will take place at the airport. Peak period forecasts were performed in three areas: enplanements, aircraft operations, and cargo tonnage. In each of these areas the average amount of activity for the peak month is defined, the average day for the peak month, and the peak hour of the average peak month day. **Table 3-21, *Peak Activity Forecast***, shows the results of the peak forecast analysis. The methodology used to establish values for each of these categories is described below.

Historically, ABI’s peak month for passenger enplanements accounts for approximately 9.4% of the total of enplanements occurring at the airport in a year. This is not forecasted to change significantly during the forecast period. Consequently, the Peak Month passenger enplanement calculations assume that approximately 9.4% of the forecasted annual enplanements will be handled in the peak month. The Peak Month Average Day (PMAD) calculations are developed by taking the Peak Month values and dividing them by 30 to reach an average day value. The Peak Hour values were developed by taking the PMAD figures, evaluating the current flight schedule, and calculating the estimated number of enplanements being processed at the airport during the peak hour. Based on ABI’s current flight schedule it was determined that the peak hour typically occurs in the morning when two Envoy Air flights depart approximately 1 hour and 15 minutes apart from each other (one at 7 AM and the other at 8:15 AM).

Because these flights are less than 1.5 hours apart there is a stronger potential for passengers taking either flight to arrive at the airport around the same time resulting in a peak of activity. Additionally, the expected migration toward larger airline aircraft was taken into consideration for the future peak hour calculations which is why higher peak hour numbers are shown in 2022 even though total annual enplanements are forecasted to be less than in 2017.

Based on ABI’s historic aircraft operations data, the peak month of operations usually accounts for approximately 10.3% of the total annual number of aircraft operations at the ABI. This percentage is expected to stay consistent during the forecast period. The PMAD values were developed by taking the peak month activity levels and dividing those figures by 30. It was assumed that approximately 10% of ABI’s total daily traffic would occur during the peak hour.

Historically, the peak month for cargo tonnage at ABI accounts for approximately 9.4% of the total annual amount of cargo tonnage passing through the airport. This percentage is expected to remain relatively consistent during the forecast period. PMAD values were developed by dividing the peak month values by 30.

**Figure 3-21
Peak Activity Forecast**

Category	Forecast	Year				
		2017	2022	2027	2032	2037
Enplanements	Annual	90,399	90,045	98,885	103,108	110,367
	Peak Month	8,498	8,464	9,295	9,692	10,374
	PMAD	283	282	310	323	346
	Peak Hour	57	71	77	81	86
Aircraft Operations	Annual	46,223	45,982	46,448	46,717	47,143
	Peak Month	4,761	4,736	4,784	4,812	4,856
	PMAD	159	158	159	160	162
	Peak Hour	16	16	16	16	16
Cargo Tonnage	Annual	1,217	1,299	1,385	1,478	1,576
	Peak Month	114	122	130	139	148
	PMAD	4	4	4	5	5

Source: Garver, 2017

In general, the peaking characteristics most likely to affect the long-term development of ABI facilities are the peak day and hour passenger enplanement figures that could be affected by larger aircraft and reduced flight frequency.

Aircraft Mix Forecast

Table 3-22, Aircraft Operations – Fleet Mix Forecast, displays the aircraft fleet mix operations forecast for ABI for each phase throughout the 20-year planning period. An examination of IFR operations data at ABI through the FAA’s Traffic Flow Management System Counts (TFMSC) database provides some guidance towards developing an accurate fleet mix forecast. The FAA’s TFMSC records account for approximately 33% of the total operations that occur at ABI, and the recorded data allows aircraft operations to be segmented by aircraft type. Consequently, the TFMSC counts can provide a good indicator of the type of aircraft that use ABI and the frequency of those aircraft. FAA TFMSC data from 2016 was used for this analysis. It is also assumed that the aircraft not included in the TFMSC data are primarily small aircraft in Aircraft Design Groups (ADG) I and II and Aircraft Approach Categories (AAC) A and B as most aircraft larger than this are rarely flown on VFR flight plans.

Total operations can be broken down into AACs and ADGs. This helps to better define the types of aircraft that will operate at the airport in the future. It also allows for better planning of future facilities and airside needs for the airport and the ability to justify such facilities when the market demands their construction. Based on the 2016 TFMSC information, the following ratios were utilized for the forecast based on historic data:

- Approach Category:
 - A – 55%
 - B – 31.5%
 - C – 13%
 - D – .2%
 - Helicopter – .3%
- Aircraft Design Group:
 - Group 1 – 53.5%
 - Group 2 – 45%
 - Group 3 – 1%
 - Group 4 – .2%
 - Helicopter – .3%

These ratios are expected to remain fairly consistent with the exception of the number of Group II and III aircraft operations. As previously discussed, Envoy Air is purchasing additional ERJ-175 aircraft (a ADG III aircraft) and that will replace the existing ERJ-145 aircraft (a ADG II aircraft). As this change occurs, the total percentage of ADG II aircraft operations will fall and the percentage of ADG III aircraft operations will increase. This change was considered as part of the calculations. Both the ERJ-175 and ERJ-145 are AAC C aircraft so no amendments were made to those ratios for the forecast period.

**Table 3-22
Aircraft Operations – Fleet Mix Forecast**

Aircraft Approach Category	2017	2022	2027	2032	2037
Category A (Less Than 91 Knots)	25,423	25,290	25,546	25,694	25,929
Category B (92 – 120 Knots)	14,560	14,484	14,631	14,716	14,850
Category C (121 – 140 Knots)	6,009	5,978	6,038	6,073	6,129
Category D (141 – 160 Knots)	92	92	93	93	94
Helicopter	139	138	139	140	141
Airplane Design Group					
Group I (Less Than 49 Feet)	24,729	24,600	24,850	24,994	25,222
Group II (49 Feet To 78 Feet)	20,800	19,692	18,902	18,023	17,214
Group III (79 Feet To 118 Feet) or Larger	462	1,460	2,464	3,467	4,471
Group IV (119 Feet To 171 Feet) or Larger	92	92	93	93	94
Helicopter	139	138	139	140	141
Total	46,223	45,982	46,448	46,717	47,143

Source: Garver, 2017

Critical Aircraft Determination

The “critical” aircraft at an airport is the largest and most demanding aircraft or category of aircraft conducting at least 500 operations per year. Determining the critical aircraft is important for assessing airport design and layout and the structural and equipment needs for both the airfield and terminal area. It is evaluated with respect to aircraft size

and speed. The aircraft operating at ABI vary from small piston aircraft to air carrier aircraft. Based on the types of aircraft utilizing the airport, the existing “critical” aircraft at ABI would fall into the C-III-2,400 category. **Table 3-23, Critical Aircraft Operations**, shows the most common aircraft operating at ABI that define its current critical aircraft category. The preferred forecasts confirm this aircraft category to be the critical aircraft during the short-term and maintain it as such throughout the 20-year planning period.

Table 3-23
Critical Aircraft Operations

Aircraft Type and ARC	Aircraft Reference Code (ARC)	# of Operations in 2016
C-130	C-IV	92
Embraer 170	C-III	142
B-737-800	D-III	50
B-737-700	C-III	36
MD-83	C-III	17
MD-82	C-III	12
EMB 135/140	C-II	2,059
EMB 145	C-II	2,939
Gulfstream IV	C-II	67
Gulfstream V	C-III	14
Bombardier Global 5000	C-III	10

Source: FAA TFMSC database, Aircraft Characteristics Diagrams

Forecast Summary

In general, ABI is expected to have slow to flat growth in passenger enplanements, based aircraft, aircraft operations, and cargo tonnage throughout the forecast period. **Table 3-24, Forecast Summary**, summarizes the forecasts for these areas. The most significant

outcome of this forecast analysis is the understanding that the probable migration from ERJ-145 to ERJ-175 aircraft by Envoy Air will have a significant impact ABI and the peaking characteristics of this forecast. This topic will be further evaluated in the Facility Requirements Chapter.

**Table 3-24
Forecast Summary**

Year	Airline OPS	Air Taxi (non-commuter) OPS	GA OPS	Military OPS	Total OPS	Enplanements	Cargo Tonnage	Based Aircraft
2017	5,283	3,546	22,564	14,830	46,223	90,399	1,217	105
2018	5,261	3,563	22,632	14,830	46,286	93,254	1,233	105
2019	5,114	3,581	22,700	14,830	46,225	94,406	1,249	105
2020	4,861	3,599	22,768	14,830	46,058	91,461	1,266	105
2021	4,786	3,617	22,836	14,830	46,070	91,754	1,282	105
2022	4,612	3,635	22,905	14,830	45,982	90,045	1,299	106
2023	4,649	3,653	22,974	14,830	46,106	92,421	1,316	106
2024	4,691	3,671	23,043	14,830	46,235	94,919	1,333	106
2025	4,703	3,689	23,112	14,830	46,334	96,836	1,350	106
2026	4,660	3,707	23,181	14,830	46,378	97,602	1,368	106
2027	4,643	3,725	23,251	14,830	46,448	98,885	1,385	106
2028	4,572	3,743	23,320	14,830	46,466	99,010	1,403	106
2029	4,528	3,762	23,390	14,830	46,510	99,667	1,422	106
2030	4,544	3,780	23,461	14,830	46,615	101,634	1,440	106
2031	4,518	3,798	23,531	14,830	46,678	102,657	1,459	106
2032	4,468	3,818	23,601	14,830	46,717	103,108	1,478	107
2033	4,463	3,837	23,672	14,830	46,802	104,559	1,497	107
2034	4,467	3,856	23,743	14,830	46,897	106,254	1,516	107
2035	4,470	3,875	23,815	14,830	46,989	107,894	1,536	107
2036	4,457	3,894	23,886	14,830	47,068	109,185	1,556	107
2037	4,441	3,914	23,958	14,830	47,143	110,367	1,576	107

TAF Comparison

In general, the forecasts provided in this chapter meet the requirements stated in AC 150/5070-6 (current series) for generally being in compliance with the existing TAF for ABI (e.g. 10% or less difference in the 5 year forecast and 15% of less difference in the 10 year forecast).

The enplanement forecast is 3.1% and 7.9% higher than the TAF in the 5 and 10 year forecast intervals (2022 and 2027). The total aircraft operations forecast is approximately 2.3% and 2.4% lower than the TAF for 2022 and 2027 respectively.

The only exception is the selected based aircraft forecast for ABI. The TAF provides an aggressive based aircraft forecast that is not realistic for ABI based on recent declines in ABI's based aircraft count and the nationwide declines in the manufacturing of smaller aircraft.