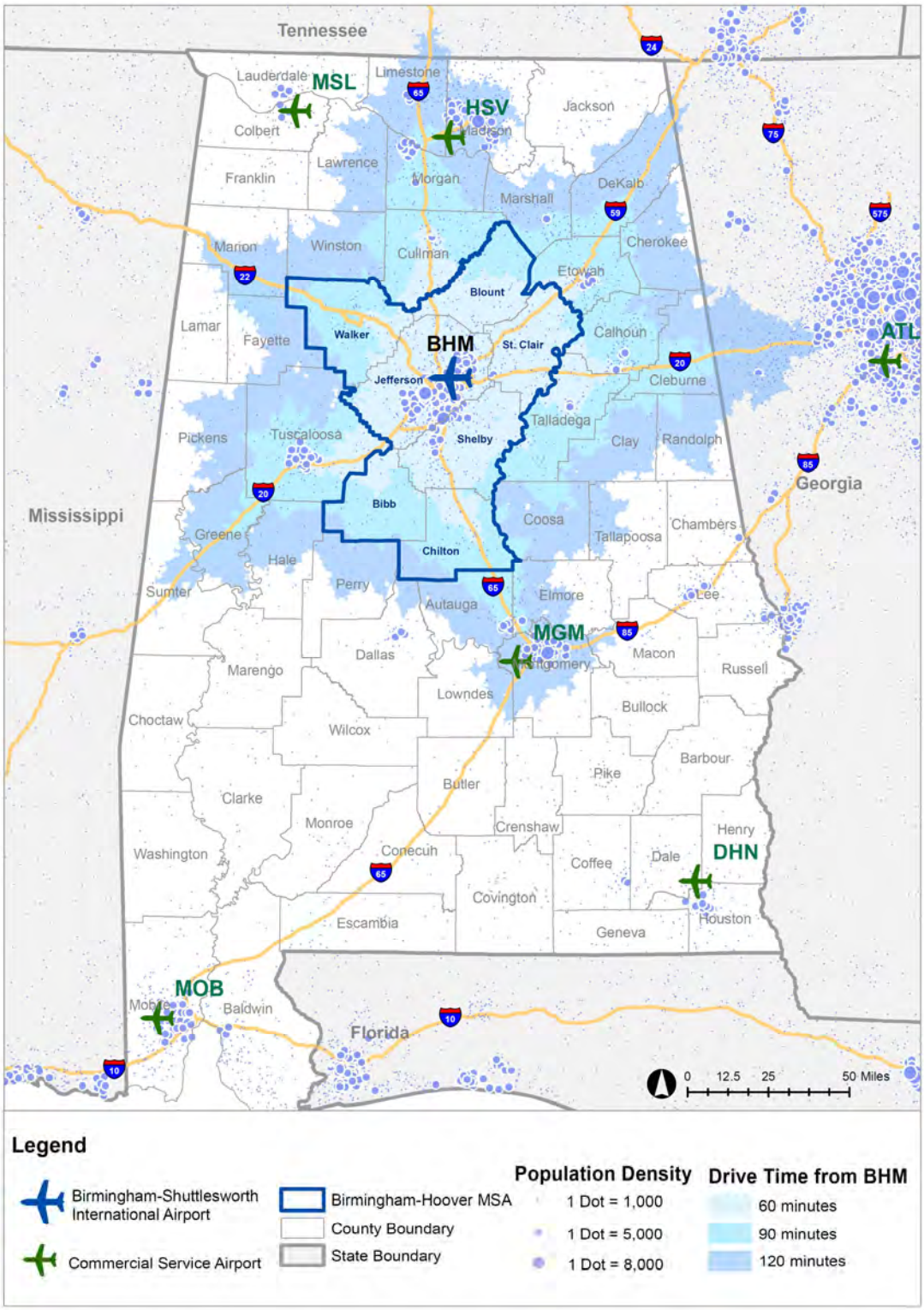
2 AVIATION DEMAND FORECASTS

This chapter presents a summary of historical aviation demand at Birmingham-Shuttlesworth International Airport (BHM / the Airport) and a forecast of unconstrained aviation demand for 2014 through 2035 (the forecast period). Forecast scenarios were developed for enplaned passengers, air cargo tonnage, aircraft operations, and based aircraft. The supporting analyses required in developing the forecasts are presented below followed by an explanation of the forecast approach and methodology, the forecast results and a comparison of the Master Plan forecast results to the 2014 FAA Terminal Area Forecast (TAF) for BHM.

Disclaimer *— All forecasts are subject to uncertainty. The forecast presented in this report is based on information that is available as of the date of publication. Various factors, other than those included in the forecast models, can influence future aviation demand. Unexpected events may occur and some underlying forecast assumptions may not materialize. Therefore actual performance may differ from the forecasts presented in this chapter and these differences could be significant.*

2.1 Airport Service Region

As shown on **Figure 2-1**, the primary geographical area served by BHM consists of Bibb, Blount, Chilton, Jefferson, St. Clair, Shelby, and Walker counties, which are defined as the Birmingham-Hoover Metropolitan Statistical Area (MSA) centered on Birmingham. According to the U.S. Department of Commerce, Bureau of the Census, the population of the Birmingham-Hoover MSA was 1,140,300 in 2013 (see **Table 2-1**), representing approximately 24 percent of the total Alabama population of 4.8 million. The City of Birmingham is mostly located within Jefferson County and covers part of Shelby County. Jefferson and Shelby counties account for about 76 percent of the population of the Birmingham-Hoover MSA, as reflected by the population densities shown in **Figure 2-1**. The economic growth and activity within this area stimulate a significant portion of passenger demand at BHM. The Birmingham-Hoover MSA was defined as the Airport service region, and statistics for the Birmingham-Hoover MSA were used to evaluate certain long-term and future aviation activity trends at BHM.



Source: U.S. Census Bureau

FIGURE 2-1
AIRPORT SERVICE REGION

TABLE 2-1
POPULATION DISTRIBUTION IN THE BIRMINGHAM-HOOVER MSA AND ALABAMA

Area	2013 Population	Percentage
Alabama (AL)[1]	**4,833,722**	
Birmingham-Hoover MSA[2]	**1,140,300**	**23.6% of AL**
Jefferson County	659,479	57.8%
Shelby County	204,180	17.9%
St. Clair County	86,308	7.6%
Walker County	65,998	5.8%
Blount County	57,872	5.1%
Chilton County	43,951	3.9%
Bibb County	22,512	2.0%
MSA Total	**1,140,300**	**100%**

Note: Percentages may not add to totals because of rounding.
Source:
1. U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties, and Puerto Rico Commonwealth and Municipios: April 1, 2010 to July 1, 2013
2. U.S. Census Bureau, Population Division, Metropolitan and Micropolitan Statistical Area Totals Dataset: Population and Estimated Components of Change: April 1, 2010 to July 1, 2013

2.2 Commercial Service Airports in Alabama

The extent of BHM's service region is also related to the proximity of other airports within reasonable driving distances and the destinations (market) these airports connect. There are six commercial service airports in Alabama including BHM, Dothan Regional Airport (DHN), Huntsville International Airport (Carl T. Jones Field) (HSV), Mobile Regional Airport (MOB), Montgomery Regional Airport (Dannelly Field) (MGM), and Northwest Alabama Regional Airport (MSL). **Table 2-2** presents the driving distance between these airports and BHM, and the comparison of their destinations of scheduled services in 2013. This comparison of scheduled services provides an indication of the existing and potential air service competition. Previous **Figure 2-1** presents the driving distance from BHM to these airports graphically.

As shown in **Table 2-2**, all the scheduled services at the two international airports in Alabama, BHM and HSV, are for domestic passengers only. There are very limited non-scheduled passenger flights at these two airports in recent years. Only one chartered passenger flight was recorded in 2013 from BHM to Punta Cana, Dominican Republic by Miami Air. In the recent ten years, scheduled international revenue passenger-miles were only recorded in 2003, 2005, 2007, and 2010 for BHM and only in 2005 for HSV. Passengers to/from international destinations may travel to/from Hartsfield–Jackson Atlanta International Airport (ATL) or connect at airports which these six Alabama commercial service airports provide frequent scheduled connections.

TABLE 2-2
SCHEDULED AIRLINE SERVICE AT COMMERCIAL SERVICE AIRPORTS IN ALABAMA
(2013)

Driving Distance from BHM (in miles)	Approximate driving time without traffic (Note 1)	Revenue Passenger-Miles (in thousands)	Destinations		
			Airport	City, State	Number of scheduled departures (Note 2)
Birmingham-Shuttlesworth International Airport (BHM)					
		698,775	ATL	Atlanta, GA	3,463
			CLT	Charlotte, NC	2,521
			IAH	Houston, TX	1,727
			DTW	Detroit, MI	1,232
			DFW	Dallas/Fort Worth, TX	1,063
			DAL	Dallas, TX	1,026
			BWI	Baltimore, MD	963
			ORD	Chicago, IL	912
			DCA	Washington, DC	884
			MCO	Orlando, FL	724
			MIA	Miami, FL	708
			MDW	Chicago, IL	699
			TPA	Tampa, FL	679
			HOU	Houston, TX	673
			LAS	Las Vegas, NV	364
			STL	St. Louis, MO	359
			DEN	Denver, CO	339
			LGA	New York, NY	311
			PHL	Philadelphia, PA	310
			MSP	Minneapolis, MN	306
			MSY	New Orleans, LA	268
			JAX	Jacksonville, FL	145
Huntsville International Airport (HSV)					
95 miles	1 hr 30 mins	201,487	ATL	Atlanta, GA	2,910
			CLT	Charlotte, NC	1,810
			DCA	Washington, DC	1,151
			ORD	Chicago, IL	1,037
			DFW	Dallas/Fort Worth, TX	1,031
			IAH	Houston, TX	946
			DTW	Detroit, MI	645
			IAD	Washington, DC	601
			DEN	Denver, CO	465

Driving Distance from BHM (in miles)	Approximate driving time without traffic (Note 1)	Revenue Passenger-Miles (in thousands)	Destinations		
			Airport	City, State	Number of scheduled departures (Note 2)
Montgomery Regional Airport (MGM)					
103 miles	1 hr 30 mins	45,200	ATL	Atlanta, GA	2,828
			DFW	Dallas/Fort Worth, TX	1,051
			CLT	Charlotte, NC	927
Mobile Regional Airport (MOB)					
249 miles	4 hrs	117,632	ATL	Atlanta, GA	2,758
			IAH	Houston, TX	1,665
			CLT	Charlotte, NC	1,328
			DFW	Dallas/Fort Worth, TX	1,061
			ORD	Chicago, IL	268
Dothan Regional Airport (DHN)					
197 miles	3 hr	8,151	ATL	Atlanta, GA	1,382
Northwest Alabama Regional (MSL)					
118 miles	2 hr	399	ATL	Atlanta, GA	421

Notes:
1. Rounded to the nearest half hour.
2. Less than 9 scheduled departures in 2013 are not shown.

Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

2.3 Economic Basis for Aviation Demand

The economy of the Birmingham-Hoover MSA is an important determinant of long-term passenger demand at BHM. The development and diversity of the economic base of an airport service region are important to future passenger traffic growth. The Birmingham-Hoover MSA has a diverse population and economic base and is the most active economic engine for Alabama. The Birmingham-Hoover MSA is composed of seven counties, including Jefferson County – the largest county in Alabama, and several of the fastest-growing suburban areas such as Blount, Chilton, St. Clair, and Shelby counties. Shelby County has the highest annual population, employment and Gross Domestic Product (GDP) growth in Alabama at 2.8 percent, 3.9 percent and 5.4 percent respectively for the period between 2000 and 2013. St. Clair County has the highest annual personal income growth at 3.8 percent and Shelby County is the second highest at 3.6 percent for 13 years since 2000.[1]

The following sections present a discussion of the economic basis for aviation demand at BHM. Also provided is a summary of the economic outlook for the United States, Alabama, and the Birmingham-Hoover MSA.

2.3.1 Historical Population, Employment, and Per Capita Income

Tables 2-3 to 2-5 present comparative trends in population, nonfarm employment, and per capita personal income in the Birmingham-Hoover MSA, Alabama, and the United States from 2000 through 2013. The demand for aviation is largely a function of demographic and economic activity. The analysis of local and regional socioeconomic data assists the aviation demand analysis.

2.3.1.1 Population

As shown in **Table 2-3**, the population of the Birmingham-Hoover MSA increased at higher annual growth rates than the population of Alabama during the historical period between 2000 and 2004, and then fell behind the growth in the state during the period between 2004 and 2011. In the recent three years, the population of the Birmingham-Hoover MSA grew at a higher rate than the state. Area population growth is supported by the fast-growing suburban areas, in particular, the Shelby and St. Clair counties.

Populations in the Birmingham-Hoover MSA and the State of Alabama have historically grown at lower rates than in the nation as a whole (except from year 2005 to 2006). Population in the Birmingham-Hoover MSA increased an average of 0.61 percent per year between 2000 and 2013. The MSA population growth rate between 2000 and 2013 is slightly lower than 0.64 percent growth in Alabama and the 0.88 percent growth in the United States.

[1] AECOM analysis on Woods & Poole Economics' 2014 State Profile for Alabama.

TABLE 2-3
HISTORICAL POPULATION

Year	Population (thousands)		
	Birmingham-Hoover MSA	Alabama	United States
2000	1,053	4,452	282,162
2001	1,060	4,468	284,969
2002	1,065	4,480	287,625
2003	1,073	4,503	290,108
2004	1,082	4,531	292,805
2005	1,090	4,570	295,517
2006	1,104	4,629	298,380
2007	1,113	4,673	301,231
2008	1,123	4,718	304,094
2009	1,131	4,758	306,772
2010	1,129	4,786	309,326
2011	1,131	4,802	311,583
2012	1,135	4,818	313,874
2013	1,140	4,834	316,129
Period	**Year-over-Year Percentage Changes**		
2000-2001	0.66%	0.36%	0.99%
2001-2002	0.47%	0.27%	0.93%
2002-2003	0.75%	0.51%	0.86%
2003-2004	0.84%	0.62%	0.93%
2004-2005	0.74%	0.86%	0.93%
2005-2006	1.28%	1.29%	0.97%
2006-2007	0.82%	0.95%	0.96%
2007-2008	0.90%	0.96%	0.95%
2008-2009	0.71%	0.85%	0.88%
2009-2010	-0.18%	0.59%	0.83%
2010-2011	0.18%	0.33%	0.73%
2011-2012	0.35%	0.33%	0.74%
2012-2013	0.44%	0.33%	0.72%
Period	**Average Annual Compound Growth Rate (AAGR)**		
2000-2005	0.69%	0.52%	0.93%
2005-2010	0.71%	0.93%	0.92%
2010-2013	0.32%	0.33%	0.73%
2000-2013	0.61%	0.64%	0.88%

Source:
1. U.S. Census Bureau, Population Division, Intercensal Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2000 to July 1, 2010
2. U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties, and Puerto Rico Commonwealth and Municipios: April 1, 2010 to July 1, 2013
3. U.S. Census Bureau, Population Division, Annual Estimates of the Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2000 to July 1, 2009
4. U.S. Census Bureau, Population Division, Metropolitan and Micropolitan Statistical Area Totals Dataset: Population and Estimated Components of Change: April 1, 2010 to July 1, 2013

2.3.1.2 Employment

Since 2000, nonfarm employment in the Birmingham-Hoover MSA varies up and down at similar annual growth rates as in the State and grows slower than the nation, as shown in **Table 2-4**.

Between 2000 and 2013, nonfarm employment in the Birmingham-Hoover MSA decreased an average of -0.15 percent per year, which is very close to the annual averages of -0.11 percent in Alabama. During the same period, nonfarm employment increased at 0.25 percent in the nation as a whole. Although nonfarm employment in the MSA has decreased over the past 13 years on average, nonfarm employment in the recent three years indicates a continue recovery with an average annual growth rate of 1.04 percent in the MSA, which nearly doubles the growth in Alabama at 0.58 percent between 2010 and 2013.

An indicator of a region's economic strength is its performance during recessions or periods of weak economic conditions. Since 2000, the fluctuations in economic activity in the Birmingham-Hoover MSA during economic recessions, as measured by nonfarm employment, have often fluctuated more than national trends. In the first recession of the 21st century, nonfarm employment in the Birmingham-Hoover MSA decreased at a higher contraction rate of -0.17 percent to -1.3 percent as compared to the national trend at 0.04 percent to -1.1 percent between 2000 and 2003. During the years leading into the recent recession beginning December 2007, nonfarm employment in the Birmingham-Hoover MSA also decreased at a higher rate at -0.77 percent to -5.57 percent as compared to the national trend at a contraction rate of -0.55 percent to -4.34 percent during 2007 through 2010. The Birmingham-Hoover MSA employment also recovered at a slower rate at 0.37 percent to 1.68 percent from 2010 to 2013 as compared to the growth of 1.21 percent to 1.71 percent for the nonfarm employment in the entire U.S.

2.3.1.3 Per Capita Personal Income

Average per capita personal income in the Birmingham-Hoover MSA has historically been higher than that in the state, but lower than in the nation as shown in **Table 2-5**. In 2012, the most recent year for which per capita income data were available from the U.S. Bureau of Economic Analysis at the time this report was prepared, the average per capita income in the Birmingham-Hoover MSA was $41,850, compared with $35,942 for Alabama and $44,200 for the United States.

Average annual growth in per capita income in the Birmingham-Hoover MSA has, at times, exceeded that of the state and the nation, as was the case between 2000 and 2005, when the average annual growth in the Birmingham-Hoover MSA was 4.22 percent, compared with 4.16 percent for Alabama and 3.25 percent for the United States. The growth in per capita income in the Birmingham-Hoover MSA slows down in the subsequent years and the overall average annual growth rate over the past 13 years are very similar to the national trend, both at 2.97 percent per year.

TABLE 2-4
HISTORICAL NONFARM EMPLOYMENT

Year	Nonfarm Employment (thousands)		
	Birmingham-Hoover MSA	Alabama	United States
2000	517	1,931	132,030
2001	516	1,909	132,080
2002	509	1,884	130,628
2003	506	1,876	130,315
2004	512	1,902	131,732
2005	519	1,945	133,997
2006	529	1,980	136,403
2007	533	2,006	137,935
2008	529	1,992	137,170
2009	500	1,886	131,220
2010	492	1,871	130,272
2011	494	1,870	131,849
2012	502	1,885	134,098
2013	507	1,904	136,363
Period	**Year-over-Year Percentage Changes**		
2000-2001	-0.17%	-1.16%	0.04%
2001-2002	-1.30%	-1.32%	-1.10%
2002-2003	-0.63%	-0.42%	-0.24%
2003-2004	1.07%	1.39%	1.09%
2004-2005	1.51%	2.26%	1.72%
2005-2006	1.83%	1.80%	1.80%
2006-2007	0.87%	1.32%	1.12%
2007-2008	-0.77%	-0.67%	-0.55%
2008-2009	-5.57%	-5.32%	-4.34%
2009-2010	-1.60%	-0.82%	-0.72%
2010-2011	0.37%	-0.03%	1.21%
2011-2012	1.68%	0.78%	1.71%
2012-2013	1.08%	0.99%	1.69%
Period	**Average Annual Compound Growth Rate (AAGR)**		
2000-2005	0.09%	0.14%	0.30%
2005-2010	-1.08%	-0.77%	-0.56%
2010-2013	1.04%	0.58%	1.53%
2000-2013	-0.15%	-0.11%	0.25%

Source: U.S. Department of Labor, Bureau of Labor Statistics. Accessed November 2014.

TABLE 2-5
HISTORICAL PER CAPITA PERSONAL INCOME

Year	Per capita Personal Income (dollars)		
	Birmingham-Hoover MSA	Alabama	United States
2000	29,455	24,628	30,587
2001	30,436	25,547	31,524
2002	31,374	26,153	31,800
2003	32,268	27,121	32,677
2004	34,621	28,864	34,300
2005	36,222	30,194	35,888
2006	38,037	31,616	38,127
2007	39,071	32,777	39,804
2008	39,841	33,715	40,873
2009	37,773	32,961	39,379
2010	38,705	33,894	40,144
2011	40,289	35,010	42,332
2012	41,850	35,942	44,200
2013	n.a.	36,481	44,765
Period	**Year-over-Year Percentage Changes**		
2000-2001	3.33%	3.73%	3.06%
2001-2002	3.08%	2.37%	0.88%
2002-2003	2.85%	3.70%	2.76%
2003-2004	7.29%	6.43%	4.97%
2004-2005	4.62%	4.61%	4.63%
2005-2006	5.01%	4.71%	6.24%
2006-2007	2.72%	3.67%	4.40%
2007-2008	1.97%	2.86%	2.69%
2008-2009	-5.19%	-2.24%	-3.66%
2009-2010	2.47%	2.83%	1.94%
2010-2011	4.09%	3.29%	5.45%
2011-2012	3.87%	2.66%	4.41%
2012-2013	n.a.	1.50%	1.28%
Period	**Average Annual Compound Growth Rate (AAGR)**		
2000-2005	4.22%	4.16%	3.25%
2005-2010	1.33%	2.34%	2.27%
2010-2013	n.a.	2.48%	3.70%
2000-2013	2.97%[1]	3.07%	2.97%

Notes:
1. The AAGR for MSA was based on the period from 2000 to 2012.
2. n.a. denotes not available.

Source: U.S. Department of Commerce, Bureau of Economic Analysis. MSA data dated May 30, 2014. Alabama and U.S. data dated September 30, 2014.

2.3.2 Economic Outlook

Economic activity in the Birmingham-Hoover MSA and in Alabama is directly linked to the production of goods and services in the rest of the United States. Both airline travel and the movement of cargo through BHM depend on the economic linkages between the regional, State, and national economies.

2.3.2.1 U.S. Economy

The U.S. economic outlook is summarized below with reference to the Budget and Economic Outlook: Fiscal Years 2014 to 2024, dated February 2014, An Update to the Budget and Economic Outlook: Fiscal Years 2014 to 2024, dated August 2014, prepared by the Congress of the U.S. Congressional Budget Office (CBO), and the economic forecasts in the FAA Aerospace Forecast FY2013-2034[2], and the socioeconomic forecasts from Woods & Poole Economics.

The U.S. economy has struggled to recover from the recent recession that, according to the National Bureau of Economic Research, began in December 2007 and ended in June 2009. The pace of growth in the nation's output has been slow compared with that in most other recoveries since World War II.

The slow pace of the recovery is broadly consistent with international experience of recoveries following financial crisis. It normally takes time for households to settle their debts and build up their wealth again, for companies to regain their confidence in putting investment in their business, and for financial institutions to recover their capital bases and credit levels after the financial crisis.

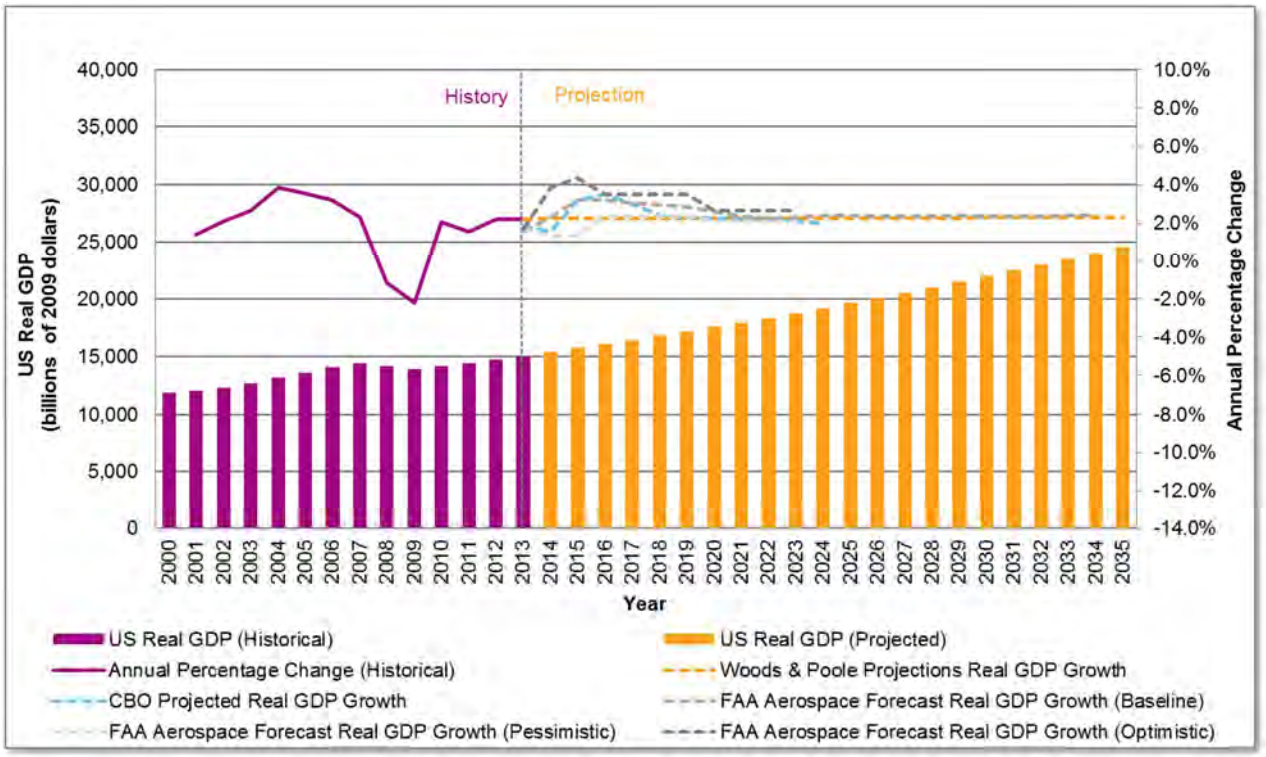
As the recovery is approaching its fifth year, the U.S. economy is expected to grow at a solid pace for the next few years. A recent report indicates that private sector debt levels have been decreasing and public sector debt levels have stabilized, and recent data suggest a firming of the employment market. On the other hand, the boost to the economy from fiscal stimulus is diminishing, leaving the economy to rely on the underlying strength in private demand. [3]

Taking different factors into account, CBO projects that economic growth will pick up in the next few years and will grow moderately in later years. The projections by Woods & Poole Economics are close to the CBO in the medium-term and remain a steady growth rate in long term. The economic forecasts in the FAA Aerospace Forecast FY2014-2034 include a range of projections for U.S. economic growth, the baseline, pessimistic and optimistic scenarios. The CBO and Woods & Poole projections are within the range predicted by these three scenarios. The long-term projections of GDP growth rates in the FAA's baseline scenario and Woods & Poole are very close with each other, at approximately 2.3 to 2.5 percent per year over the 20-year planning period. **Figure 2-2** presents the GDP projections by CBO, FAA Aerospace Forecast FY2014-2034 and Woods & Poole Economics. Year-over-year changes are included to demonstrate the historic and forecast trend.

The unemployment rate and oil prices are two key parameters relevant to the U.S. economy and are discussed in later sections.

[2] The FAA used the economic forecasts developed by IHS Global Insight, Inc. to project domestic aviation demand for the Aerospace Forecast FY2014-2034.
[3] FAA Aerospace Forecast FY2014-2034.

FIGURE 2-2
HISTORICAL AND PROJECTED REAL GDP IN THE U.S.



Source: U.S. Congressional Budget Office (CBO), An Update to the Budget and Economic Outlook: FY 2014 to 2024. The FAA Aerospace Forecast FY2014-2034. Woods & Poole Economics.

2.3.2.2 Alabama and Birmingham-Hoover MSA Economy

Alabama is located at the heart of the Southeastern U.S, and is one of the driving forces behind the nation's growing economy. The industries in Alabama range from automotive and aerospace to metals and medical. The state has also invested in education, health care, and banking.

Since Mercedes-Benz's first automobile plant was decided to be located at Vance in Tuscaloosa in 1993 and the first production was commenced in 1997, Alabama has rapidly emerged as one of the nation's major automotive manufacturing centers. Honda chose Lincoln in Talladega as their automobile factory in 1999. Toyota has an engine plant in Huntsville and Hyundai has an assembly facility in Montgomery. The aerospace industry in Alabama is growing in recent years, especially when Airbus chose Brookley in Mobile as the site to build its first aircraft assembly plant in the U.S. The Airbus facility is scheduled to begin their first aircraft assembly in 2015 and the first delivery targeted for 2016. [4]

The largest employers in Alabama include the University of Alabama, Regions Financial Corp., AT&T, St. Vincent's Health System, and Honda Manufacturing[5]. Four of these employers are located in Birmingham and only Honda Manufacturing is located in Lincoln.

[4] Alabama Department of Commerce.
[5] Birmingham Business Journal

The Birmingham-Hoover MSA is centrally located in Alabama and has a quality labor pool. The regional leadership puts efforts in providing more industrial sites along the I-20 corridor with adequate infrastructure for development. They also play an active role in the recruitment of bio-technical, medical, banking, distribution, and wholesale industries. While growth is expected to continue in the region's service economy, the region continues to recruit manufacturing firms and technology-based service industries. Economic growth in the Birmingham-Hoover MSA has remained stable and healthy during the past several years. Looking forward, the GDP is forecast to grow moderately for the next few years.

Table 2-6 summarizes the historical and projected real GDP of Alabama, Birmingham-Hoover MSA, and the United States from Woods & Poole Economics.

TABLE 2-6
HISTORICAL AND PROJECTED REAL GDP FOR BIRMINGHAM-HOOVER MSA, ALABAMA, AND UNITED STATES

Year	Real GDP (in millions of 2009 dollars)		
	Birmingham-Hoover MSA	Alabama	United States
2000	42,500	139,555	11,890,302
2010	49,693	170,030	14,154,695
2011	50,480	171,525	14,372,520
2012	51,151	174,437	14,692,775
2013	51,835	177,408	15,020,627
2014	52,532	180,438	15,356,265
2015	53,241	183,530	15,699,883
2020	56,999	199,952	17,544,865
2025	61,143	218,125	19,621,692
2030	65,728	238,267	21,961,223
2035	70,819	260,625	24,598,661
Period	**Historic Average Annual Compound Growth Rate (AAGR)**		
2000-2005	3.23%	3.23%	2.71%
2005-2010	-0.05%	0.77%	0.82%
2010-2013	1.42%	1.43%	2.00%
2000-2013	1.54%	1.86%	1.81%
Period	**Forecast Average Annual Compound Growth Rate (AAGR)**		
2015-2020	1.4%	1.7%	2.2%
2015-2025	1.4%	1.7%	2.3%
2015-2035	1.4%	1.8%	2.3%

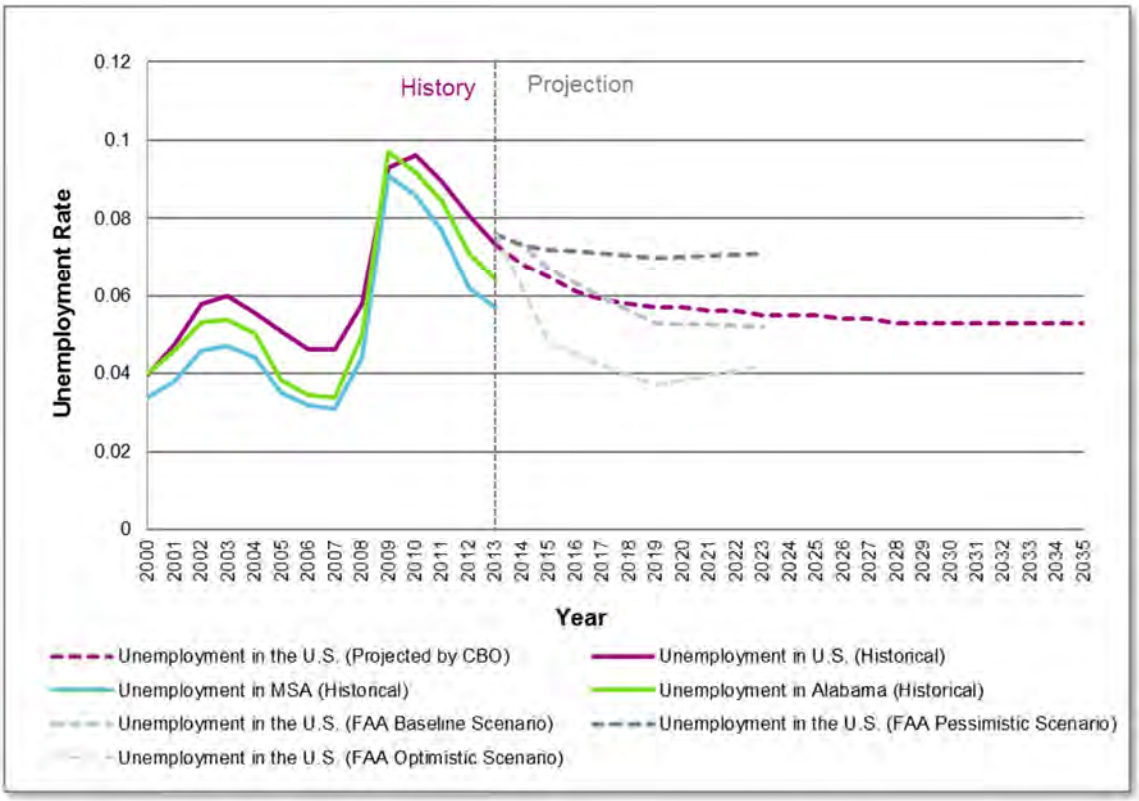
Source: Woods & Poole Economics.

2.3.2.3 Unemployment Rates

In addition to the employment trends cited above, the unemployment rate is also indicative of general economic conditions. **Figure 2-3** presents annual unemployment rates in the Birmingham-Hoover MSA, Alabama, and the nation as a whole for 2000 through 2013 based on the historical record from the Bureau of Labor Statistics. Since the beginning of the recent recession beginning December 2007, unemployment rates in the Birmingham-Hoover MSA, Alabama, and the United States increased to over 9 percent as shown on **Figure 2-3** and started to decrease since 2009/2010. The unemployment rate in the Birmingham-Hoover MSA was generally lower than the rates in the state and in the nation over the same period. The average unemployment rate in the Birmingham-Hoover MSA for the period from January to September 2014 was 6.0 percent as compared to 6.7 percent in Alabama and 6.3 percent in the United States.

Figure 2-3 also presents the forecast unemployment projected by the U.S. Congressional Budget Office and FAA Aerospace Forecast FY2014-2034 for the entire nation. The projections by the U.S. Congressional Budget Office lie within the optimistic and pessimistic scenarios by the FAA and they are close to the FAA baseline scenario. It is anticipated that the unemployment rate for the Birmingham-Hoover MSA will continue to be lower than the national unemployment following the historical trend.

FIGURE 2-3
HISTORICAL AND PROJECTED UNEMPLOYMENT RATE

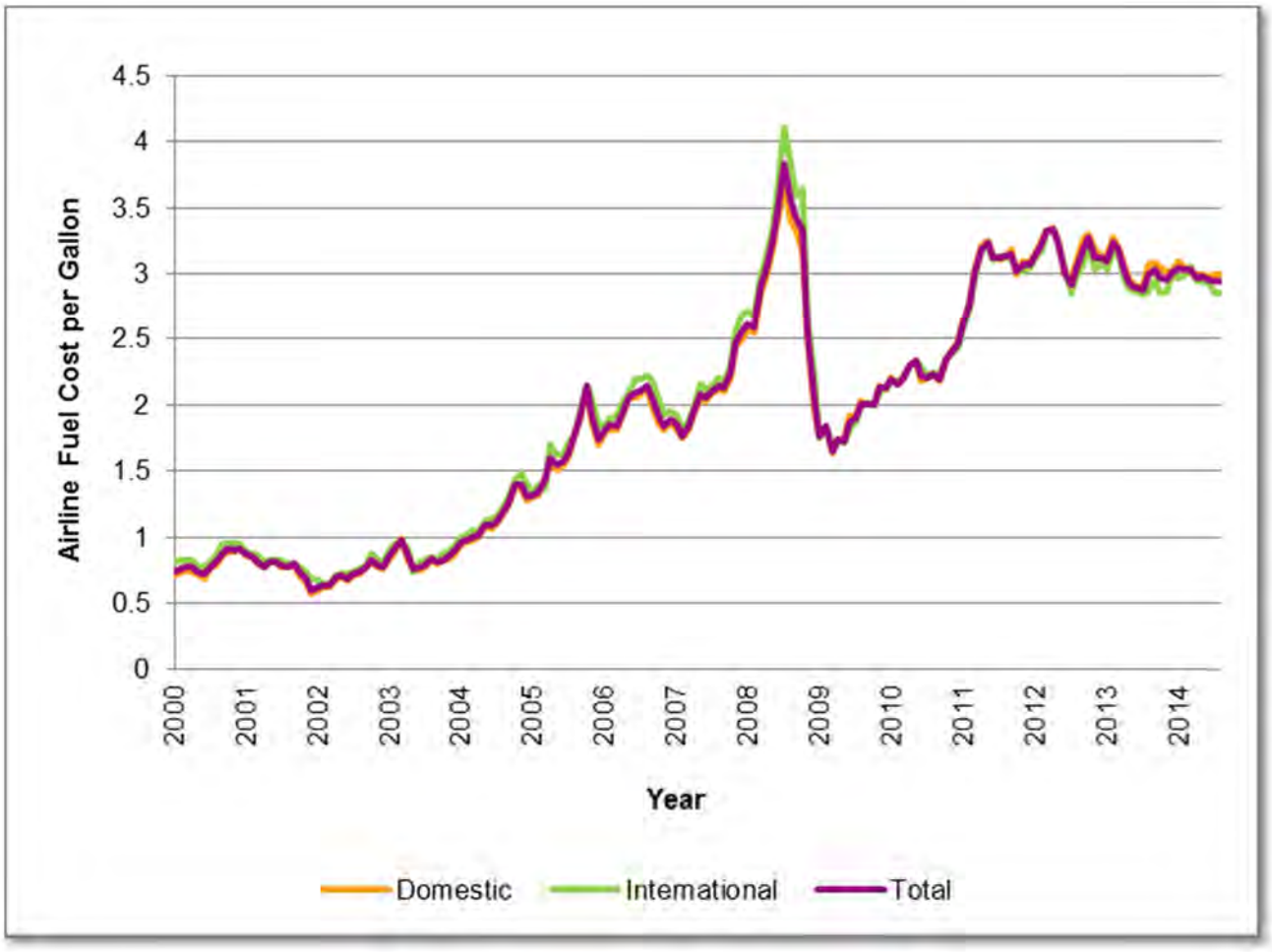


Source: U.S. Bureau of Labor Statistics for the historical unemployment rate for the U.S., Alabama, and Birmingham-Hoover MSA. U.S. Congressional Budget Office (CBO): 2014 Long-Term Budget Outlook, issue July 2014, for the projected data from 2014 to 2035. FAA Aerospace Forecast FY2014-2034 for the projected civilian unemployment rate from 2014 to 2023.

2.3.2.4 Aviation Fuel Prices

The price of aviation fuel is an important factor affecting the aviation industry. Fuel prices are particularly sensitive to worldwide economic uncertainty and political instability. Beginning in 2003, fuel prices increased as a result of the Iraq War, political instability in some oil-producing countries, the rapidly growing economies of China, India, and other developing countries, and other factors influencing the demand for and supply of oil. By mid-2008, the average fuel prices were three times higher than they were in 2003. In the second half of 2008, fuel prices fell sharply as demand was reduced worldwide, although prices began to pick up again from 2009 to 2011 and remained relatively steady from 2011 to present. The historical trend of monthly aviation fuel costs is shown in **Figure 2-4**. In the very recent history (mid to late 2014), fuel prices are at record lows.

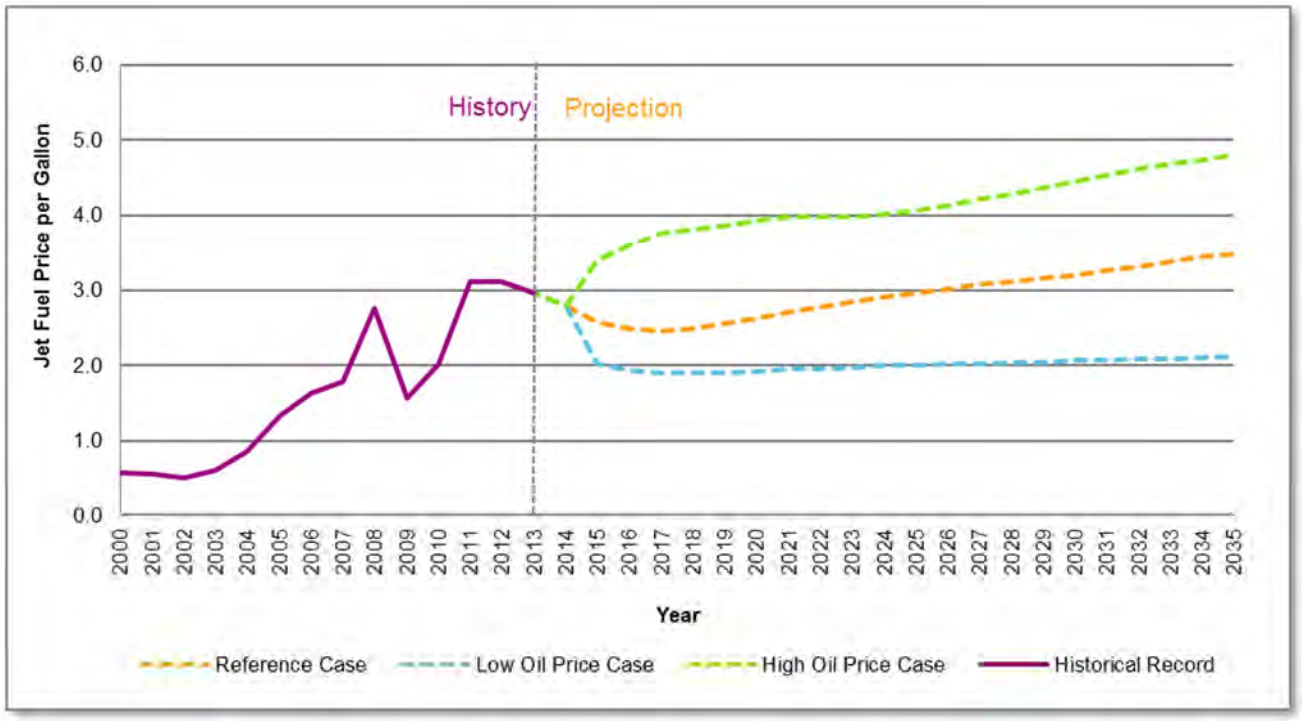
FIGURE 2-4
HISTORICAL MONTHLY AIRLINE FUEL COST PER GALLON FOR ALL U.S. CARRIERS (NOMINAL DOLLARS)



Source: Bureau of Transportation Statistics F41 Schedule P12A as of November 2014

Analysts hold different views regarding how oil and aviation fuel prices may change in the future. Reference forecasts projected fuel prices out into the future based on current market conditions, other possible factors which may affect the supply and demand of crude oil, exchange rates, and technology advancement in oil extraction, etc. To consider the uncertainties in the future market, organizations such as the U.S. Energy Information Administration have high and low oil price forecasts, in addition to their reference case. The long-term annual projections of jet fuel by the U.S. Energy Information Administration, including their reference, high and low oil price cases, are given in **Figure 2-5**. The projected average annual growth rate on the jet fuel price by the U.S. Energy Information Administration for the period between 2013 and 2034 are -1.61 percent, 0.71 percent and 2.27 percent for the low oil price, reference and high oil price cases respectively. The FAA Aerospace Forecast FY2014-2034 projections for U.S. mainline air carrier jet fuel prices at -0.4 percent from 2013 to 2034 is on the low side and falls within the projections by the US. Energy Information Administration's reference and low oil price cases.

FIGURE 2-5
PROJECTIONS OF JET FUEL PRICE (2012 DOLLARS PER GALLON)



Source: U.S. Energy Information Administration, Annual Energy Outlook 2014 with Projections to 2040, issue April 2014. Historical fuel price is converted to 2012 dollars based on CPI for all urban consumers from the U.S. Bureau of Labor Statistics.

2.3.3 Summary

The descriptions of the various economic and demographic indicators discussed above collectively describe the Birmingham-Hoover MSA as a mature economic region capable of producing significant demand for air transportation services. In terms of population, nonfarm employment, and per capita income growth in Birmingham-Hoover MSA is similar to the historical growth in Alabama and slightly behind the United States. In the recent three years, the growth in nonfarm employment and per capita income in Birmingham-Hoover MSA outpaced the growth in Alabama and shows solid recovery after the last recession.

The Birmingham-Hoover MSA includes a large and diversified commercial and industrial base with a significant presence of growing industry sectors. The GDP for the Birmingham-Hoover MSA is projected to increase modestly and similar to the average annual growth over the past decade.

Recent trends of these key economic and demographic variables indicate a promising recovery from the national economic recession. Over the longer term, growth in these key economic and demographic variables is expected to be recovered and produce average growth at or slightly below their long-term historical averages.

The historical trends and projections for the key economic variables discussed above were used in the general development of the aviation demand forecasts. The results of these analyses do not necessarily provide a direct one-for-one link between growth of an individual economic variable and the forecast elements. Instead, the trends in economic variables are compared with the trends in aviation demand in an attempt to discover general relationships between the two and identify reasonable indicators of growth in future aviation activity. The primary reason for this comparison is that innumerable outside influences affect the results of the forecasts. Events such as economic recessions, financial crisis, use of new technology, widespread health issues, terrorist attacks, etc., cannot be predicted with certainty and, therefore, the results of the economic analyses are used as a guideline and indicator to project future aviation demand rather than a precise predictor.

2.4 Historical Aviation Demand

This section describes historical aviation demand, and includes an analysis of airlines serving BHM; enplaned passengers; trends in enplaned passengers, load factors, and seats per departure; market shares of passengers; airline service; airline yields; air cargo tonnage; and aircraft operations.

2.4.1 Airlines Serving the Airport

In 2013, BHM was served by six mainline airlines and ten regional affiliates for scheduled passenger services. All top four major U.S. airlines serve BHM, including American Airlines/US Airways, Delta Air Lines, United Airlines, and Southwest Airlines. Mainline airlines publish their own schedules and usually operate larger narrowbody aircraft, while their regional affiliates or subsidiaries operate smaller aircraft typically on behalf of mainline airlines. Subsidiaries of mainline airlines and regional affiliates are often contracted by mainline airlines to fly a limited flight schedule to smaller cities that cannot support service by larger narrowbody aircraft, supplement narrowbody aircraft service on routes that require higher scheduled flight frequencies, and provide point-to-point service to larger cities. FAA defined mainline air carriers as airlines that use large passenger jets (over 90 seats) and regional carriers as airlines that used smaller piston, turboprop, and regional jet aircraft (up to 90 seats) to provide connecting passengers to the larger carriers[6]. A detailed listing of passenger airlines serving BHM and their average seat capacity in 2013 is provided in **Table 2-7**. The airlines are grouped into mainline or regional air carrier based on their average seat capacity.

[6] FAA Aerospace Forecast FY2014-2034.

TABLE 2-7
PASSENGER AIRLINES SERVING BHM (2013)

Mainline Air Carrier		Regional Air Carrier	
Airline	**Average Seat Capacity**	**Airline**	**Average Seat Capacity**
Scheduled		**Scheduled**	
Southwest Airlines (Note 1)	142	ExpressJet Airlines (Note 3)	54
AirTran Airways (Note 1)	127	PSA Airlines (Note 4)	52
Delta Air Lines	142	Mesa Airlines (Note 5)	80
American Airlines (Note 2)	137	Endeavor Air (Note 6)	53
US Airways (Note 2)	146	Envoy Air (Note 7)	50
United Air Lines	160	Compass Airlines (Note 8)	73
		SkyWest Airlines (Note 9)	50
		Air Wisconsin Airlines (Note 10)	50
		Chautauqua Airlines (Note 11)	50
		Shuttle America (Note 12)	71
Non-scheduled/Charter		**Non-scheduled/Charter**	
Miami Air International	172	Republic Airlines (Note 13)	99
Allegiant Air	160	Tradewind Aviation	7
Sun Country Airlines	162	TAG Aviation S.A.	15
JetBlue Airways	150		

Notes:
1. Southwest Airlines and AirTran Airways are in the process of integration after the merger.
2. American Airlines and US Airways are in the process of integration after the merger to be the new American Airlines.
3. Affiliated with American Airlines, Delta Air Lines and United Air Lines (operates as American Eagle, Delta Connection, and United Express).
4. Wholly owned subsidiary of US Airways (the new American Airlines after the merger).
5. Affiliated with US Airways, and United Air Lines. Operates as US Airways Express for flights to/from Charlotte BHM-CLT.
6. Wholly owned subsidiary of Delta Air Lines and is flying as Delta Connection.
7. Wholly owned subsidiary of American Airlines and is flying as American Eagle.
8. Affiliated with Delta Air Lines and is flying as Delta Connection.
9. Affiliated with United Airlines, Delta Air Lines, US Airways, American Airlines and Alaska Airlines. Operates as United Airlines for flights to/from Chicago, BHM-ORD, and Houston, BHM-IAH.
10. Affiliated with US Airways, and United Air Lines. Operates as US Airways Express for flights to/from Charlotte, BHM-CLT, and Washington D.C., BHM-DCA.
11. A subsidiary of Republic Airways and operates as United Express.
12. A subsidiary of Republic Airways and affiliated with United Airlines and Delta Air Lines. Operates as Delta Connection for flights to/from New York, BHM-LGA.
13. Although the average seat capacity for Republic Airlines' aircraft operating at BHM was over 90 (99 seats provided by an Embraer 190 aircraft to/from ACY), it was considered as a regional air carrier in view of the nature of their overall airline services.

Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

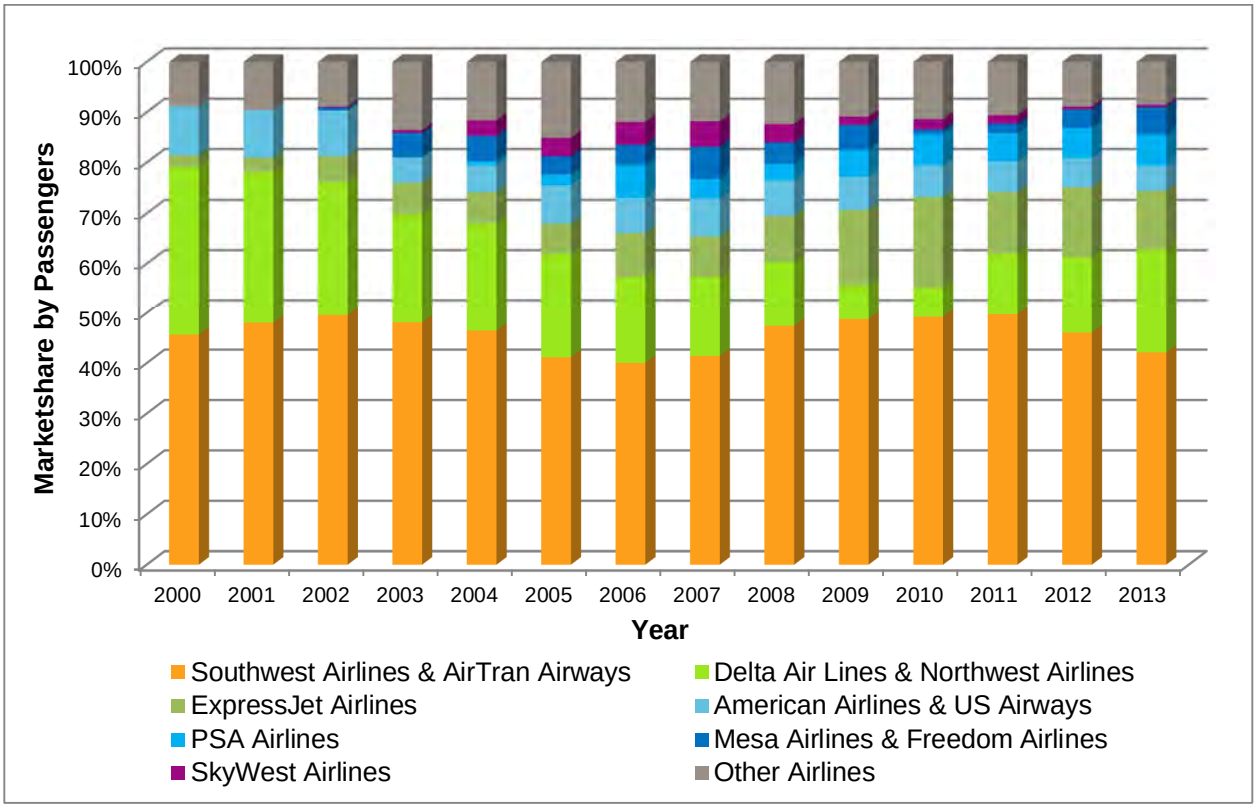
Table 2-8 and **Figure 2-6** present the historical market share of the top passenger airlines serving BHM. These airlines compose 85 percent to over 90 percent of the market share at BHM from 2000 to 2013. Historical data for airlines merged over the years or in the process of integration after merger are combined in **Table 2-8** and **Figure 2-6**. For example, data for Southwest Airlines and AirTran Airways, Delta Air Lines and Northwest Airlines, American Airlines and US Airways, ExpressJet Airlines and Atlantic Southeast Airlines, Mesa Airlines and Freedom Airlines, are combined for comparison. Historical data for Continental Air Lines are combined with United Air Lines for analysis, but their combined market share is less than two percent in the past ten years and is included in the other airlines category as shown in **Table 2-8** and **Figure 2-6**. United Air Lines' affiliate regional airlines and subsidiary, such as ExpressJet Airlines and SkyWest Airlines are shown in **Table 2-8** and **Figure 2-6**.

TABLE 2-8
HISTORICAL MARKET SHARES OF PASSENGER AIRLINES SERVING BHM (2000-2013)

Year	Mainline Air Carrier			Regional Air Carrier				Sub-total of Top 7 Airlines	Other Airlines
	Southwest & AirTran	Delta & Northwest	American & US Airways	ExpressJet	PSA	Mesa & Freedom	SkyWest		
2000	45.7%	33.5%	9.7%	2.3%	0.0%	0.0%	0.0%	91.1%	8.9%
2001	48.0%	30.0%	9.5%	2.9%	0.0%	0.0%	0.0%	90.4%	9.6%
2002	49.6%	26.6%	9.1%	5.1%	0.0%	0.5%	0.2%	91.1%	8.9%
2003	48.1%	21.7%	4.9%	6.2%	0.0%	4.9%	0.6%	86.5%	13.5%
2004	46.5%	21.5%	5.2%	6.2%	0.9%	5.0%	3.1%	88.4%	11.6%
2005	41.2%	20.7%	7.6%	6.1%	2.0%	3.6%	3.7%	84.9%	15.1%
2006	40.0%	17.3%	7.0%	8.7%	6.5%	3.9%	4.6%	88.1%	11.9%
2007	41.4%	16.0%	7.6%	8.0%	3.9%	6.3%	5.1%	88.2%	11.8%
2008	47.4%	12.8%	7.0%	9.3%	3.1%	4.3%	3.7%	87.7%	12.3%
2009	48.8%	6.8%	6.5%	15.1%	5.3%	5.0%	1.7%	89.1%	10.9%
2010	49.2%	5.9%	6.2%	18.1%	6.3%	0.8%	2.1%	88.6%	11.4%
2011	49.7%	12.2%	5.9%	12.3%	5.7%	1.9%	1.7%	89.4%	10.6%
2012	46.1%	15.3%	5.7%	13.9%	6.0%	3.7%	0.6%	91.1%	8.9%
2013	42.1%	20.6%	4.8%	11.8%	6.3%	5.4%	0.5%	91.5%	8.5%

Note: Data included enplaned passengers for non-scheduled/charter flights.
Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

FIGURE 2-6
MARKET SHARES OF PASSENGER AIRLINES SERVING BHM (2000-2013)



Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

As shown in **Table 2-8** and **Figure 2-6**, Southwest Airlines has strong presence in BHM and serves from 40 percent to nearly 50 percent of the total passengers in BHM since 2000. In the recent three years, the market share of Southwest Airlines declined gradually to approximately 42 percent in 2013. Delta Air Lines is the second largest passenger airline serving BHM after Southwest Airlines. Delta Air Line's market share in BHM has gradually increased in the recent years to approximately 21 percent. The market share of combined American Airlines and US Airways varies from approximately five to ten percent in the period between 2000 and 2013. The market shares of American Airlines and US Airways seems to have declined in the recent four years. However, if the combined market shares with their subsidiary PS Airlines and affiliate regional Mesa Airlines are considered, their shares in BHM have in fact increased from 13 to 16 percent. It demonstrates a shift of American Airlines and US Airways from operating their larger narrowbody aircraft (having approximately 135 to 188 seats) to their regional affiliate or subsidiary operating smaller aircraft (with less than 90 seat capacity) at BHM in recent years.

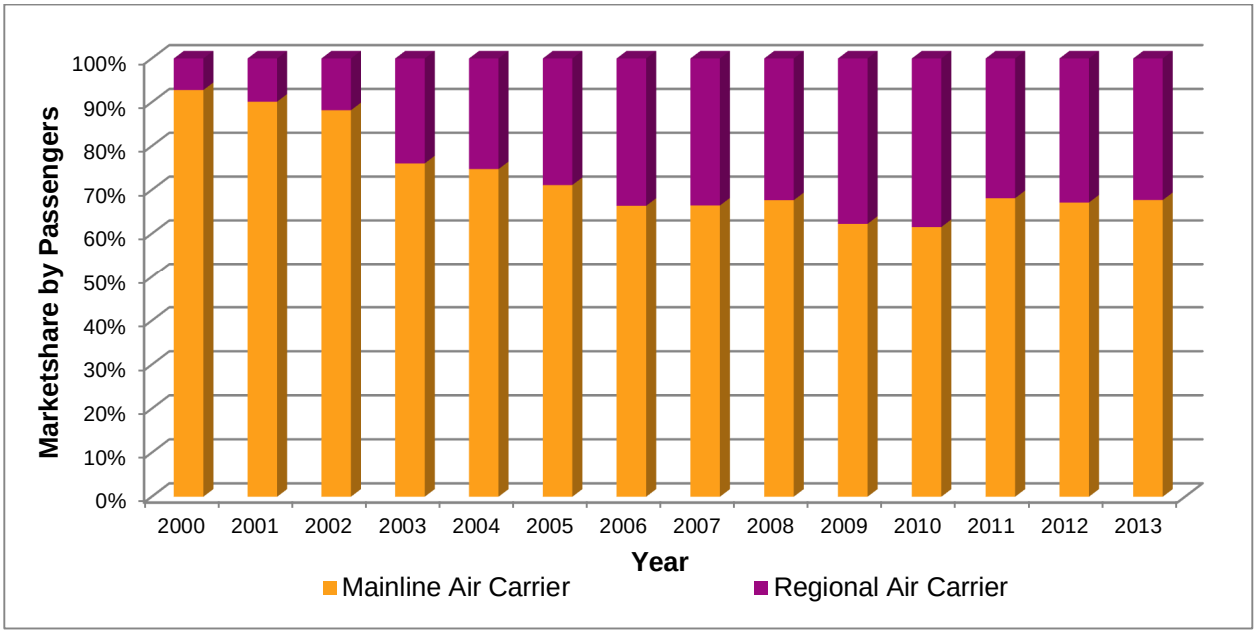
The percentage of market shares between mainline and regional air carriers are given in **Table 2-9** and **Figure 2-7**. The market shares at BHM have been shifted to regional air carriers. In the recent three years, the split of enplaned passengers between mainline and regional air carrier is approximately 67.7 percent to 32.3 percent on average.

TABLE 2-9
HISTORICAL MARKET SHARES FOR MAINLINE AND REGIONAL AIR CARRIERS
(2000-2013)

Year	Mainline Air Carrier	Regional Air Carrier
2000	92.79%	7.21%
2001	90.15%	9.85%
2002	88.19%	11.81%
2003	76.06%	23.94%
2004	74.75%	25.25%
2005	71.13%	28.87%
2006	66.38%	33.62%
2007	66.46%	33.54%
2008	67.66%	32.34%
2009	62.27%	37.73%
2010	61.55%	38.45%
2011	68.13%	31.87%
2012	67.13%	32.87%
2013	67.70%	32.30%

Note: Mainline air carriers and regional air carriers follow the list in **Table 2-7** above.
Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

FIGURE 2-7
HISTORICAL MARKET SHARES FOR MAINLINE AND REGIONAL AIR CARRIERS
(2000-2013)



Note: Mainline air carriers and regional air carriers follow the list in **Table 2-7** above.
Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

2.4.2 Enplaned Passengers

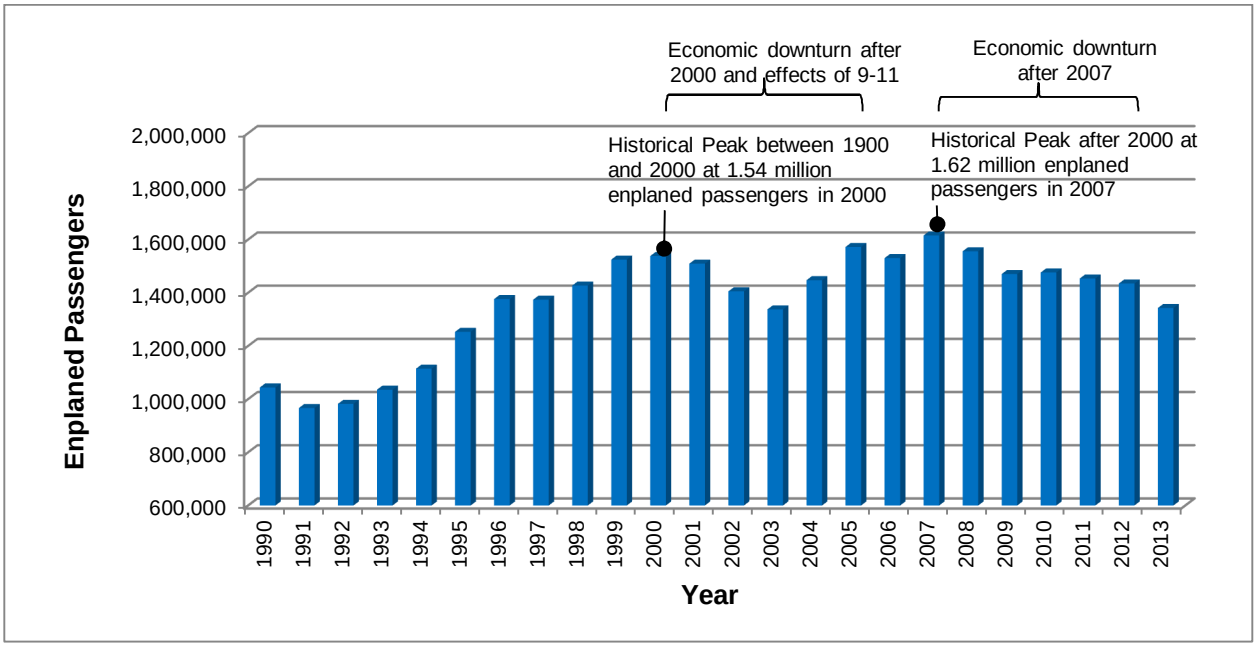
Enplaned passengers represent one of the single largest drivers in the master planning process for any airport. **Table 2-10** and **Figure 2-8** present numbers of enplaned passengers at BHM in 1990 through 2013. The historical enplaned passengers vary with peaks between 1990 and 2000 at 1,538,165 in 2000 and between 2001 and 2013 at 1,615,386 in 2007. The peaks were followed by troughs in 2003 at 1,377,636 and the recent lowest in 2013 at 1,342,611 enplaned passengers. The trend for historical enplaned passengers follows the timeline for the burst of the Dot-Com bubble in 2000, the attack on September 11, 2001 and the financial turmoil in 2007. The enplanements at BHM rebounded since the aftermaths of the first financial downturn in the century and the effect of September 11, and surpassed the 2000 number in 2005 and reached the next peak in 2007. The growth in enplanements was strong and continuous from 2003 to 2007. However, the recovery after the second financial downturn in the century has been slow for BHM since 2007. The enplaned passengers decreased from 2007 to 2009, followed by a slight rebound in 2010, and continued to decline from 2011 to 2013.

TABLE 2-10
HISTORICAL ENPLANED PASSENGERS

Year	Enplaned Passengers	Year-over-Year Percentage Change
1990	1,043,830	
1991	966,451	-7.41%
1992	982,081	1.62%
1993	1,035,341	5.42%
1994	1,114,377	7.63%
1995	1,253,024	12.44%
1996	1,376,247	9.83%
1997	1,373,865	-0.17%
1998	1,427,055	3.87%
1999	1,524,580	6.83%
2000	1,538,165	0.89%
2001	1,509,341	-1.87%
2002	1,405,123	-6.90%
2003	1,337,300	-4.83%
2004	1,447,014	8.20%
2005	1,572,145	8.65%
2006	1,530,280	-2.66%
2007	1,615,386	5.56%
2008	1,555,884	-3.68%
2009	1,470,263	-5.50%
2010	1,476,078	0.40%
2011	1,453,529	-1.53%
2012	1,434,622	-1.30%
2013	1,342,611	-6.41%
Period	**Average Annual Compound Growth Rate (AAGR)**	
2000-2005	0.44%	
2005-2010	-1.25%	
2010-2013	-3.11%	
2000-2013	-1.04%	
1990-2013	1.10%	

Source: Actual enplanements from 1990 to 1999: Birmingham-Shuttlesworth International Airport Master Plan Update, August 2002. Actual enplanements from 2000 to 2013: Birmingham-Shuttlesworth International Airport Statistical Data Reports. AECOM Analysis.

FIGURE 2-8
HISTORICAL ENPLANED PASSENGERS



Source: Actual enplanements from 1990 to 1999: Birmingham-Shuttlesworth International Airport Master Plan Update, August 2002. Actual enplanements from 2000 to 2013: Birmingham-Shuttlesworth International Airport Statistical Data Reports. AECOM Analysis.

Table 2-11 shows average annual compound growth rates (AAGR) in numbers of enplaned passengers at BHM, in Alabama, and in the nation as a whole between different periods. Between 2000 and 2005, the number of enplaned passengers at BHM grew at the same rate (0.4 percent) as the number of enplaned passengers in Alabama, but slower than the rate in the nation as a whole (0.8 percent). Between 2005 and 2010, the number of enplaned passengers at BHM declined at a faster rate (-1.3 percent) than the national average (-0.8 percent), but not as fast as the average of Alabama (-2.1 percent). In the recent three years, the number of enplaned passengers at BHM declined at a faster rate (-3.1 percent) than the average of Alabama (-2.4 percent) while the overall national average is rebounding (1.4 percent). Over the past 13 years, the number of enplaned passengers at BHM declined at an annual average rate of one percent which is less than the decline in Alabama (-1.2 percent) but trailing the average annual growth rate of the nation (0.3 percent).

TABLE 2-11
COMPARISON OF HISTORICAL AVERAGE ANNUAL GROWTH RATES IN ENPLANED PASSENGERS IN BHM, ALABAMA, AND THE UNITED STATES

Period	BHM	Alabama	United States
2000-2005	0.4%	0.4%	0.8%
2005-2010	-1.3%	-2.1%	-0.8%
2010-2013	-3.1%	-2.4%	1.4%
2000-2013	-1.0%	-1.2%	0.3%

Source:
1. BHM Enplanements - Birmingham-Shuttlesworth International Airport Statistical Data Reports.
2. Alabama and the United States Enplanements - FAA Terminal Area Forecast (TAF), February 2014.

The historical share of BHM over the total enplanements in Alabama and the United States are summarized in **Table 2-12**. The annual share of BHM enplanements is gradually declining from 0.22 percent to 0.18 percent of total United States enplanements from 2000 through 2013. However, the share of BHM enplanements increases slightly from 55.7 percent to 56.8 percent of total Alabama enplanements since 2000.

TABLE 2-12
HISTORICAL SHARE OF ENPLANEMENTS IN BHM OVER ALABAMA AND THE UNITED STATES

Year	Alabama	United States
2000	55.71%	0.22%
2001	55.27%	0.22%
2002	57.73%	0.22%
2003	54.37%	0.21%
2004	55.40%	0.21%
2005	55.71%	0.21%
2006	56.76%	0.21%
2007	58.85%	0.21%
2008	55.52%	0.21%
2009	58.22%	0.21%
2010	58.12%	0.21%
2011	56.30%	0.20%
2012	56.30%	0.20%
2013	56.84%	0.18%
	Average Annual Compound Growth Rate (AAGR)	
2000-2013	0.15%	-1.33%

Source:
1. BHM Enplanements - Birmingham-Shuttlesworth International Airport Statistical Data Reports.
2. Alabama and the United States Enplanements - FAA Terminal Area Forecast (TAF), February 2014.

2.4.3 Load Factors and Average Seats per Departure

Enplaned passenger trends may not tell the complete story regarding service by tenant airlines; numbers of aircraft operations and the average size of aircraft serving the airport have not necessarily increased or decreased with the numbers of enplaned passengers. It is important to understand the historical trend of the average load factors and seat capacity for the commercial airline services specific to BHM. **Tables 2-13** and **2-14** present historical data on load factors and average seats per departure for 2000 through 2013 respectively. Graphic presentations of their trends are shown in **Figures 2-9** and **2-10**.

Historic load factors at BHM have trended similar to most other major airports in the U.S. During the early 90s, the airlines faced a period of substantial financial losses, which resulted in several airline failures and bankruptcies, which subsequently decreased the number of seats available (i.e., capacity) and produced full flights (i.e., high load factors). Capacity was reduced again following the September 11, 2001 attacks. Since 2008, the major network carriers have consolidated and continue to restructure their operations. All recent trends have enhanced airline financial performance and efficiencies, largely eliminating capacity excesses as indicated by the increase load factors.

As shown in **Table 2-13** and **Figure 2-9**, the average load factors for mainline and regional air carriers, as well as the airport total have increased in the past 13 years. The largest mainline air carrier at BHM, Southwest Airlines and AirTran Airways, which represents over 45 percent of the enplanements in BHM, increased their load factors from approximately 68.2 percent in 2000 to 72.4 percent in 2013 on average. The second largest mainline air carrier, Delta Air Lines and Northwest Airlines, which represents over 18 percent of the enplanements in BHM, increased their load factors significantly from approximately 57.5 percent in 2000 to 77.3 percent. The overall average load factors for all the airlines with services in BHM increased from approximately 63.5 percent in 2000 to 75.7 percent in 2013 (i.e. increased by 12.2 percent). The increase in load factors at BHM follows the national trend where domestic load factors increased from 71.2 percent in 2000 to 84.2 percent in 2013 (i.e. increased by 13 percent).

The changes in average seats per departure for the mainline, regional air carriers, and the airport total from 2000 through 2013 are shown in **Table 2-14** and **Figure 2-10**. The average seats per departure for Southwest Airlines increased from 134 in 2000 to 142 in 2013 as they introduced more services by their B737-700 (143-seat) and some B737-800 (175-seat), and replace their B737-300 (137-seat) and B737-100/200/500 (122-seat).

The average seat capacity for Delta Air Lines remains at a similar level since 2000 and is mainly provided by their McDonnell Douglas DC9 aircraft (142 to 149-seat). The original fleet of Northwest Airlines mainly consisted of McDonnell Douglas DC-9-30 aircraft (100-seat), but DC-9-30s no longer serve at BHM after Northwest Airlines was acquired by Delta Air Lines.

American Airlines used to service BHM mostly with their Fokker 100 (87 to 97-seat) and they are replaced by the larger McDonnell Douglas DC9 (135 to 140-seat) in recent years. US Airways also used to service BHM with their Fokker 100 (97-seat) but their service at BHM is diminishing as they are integrating with American Airlines and shifting their operations to their regional affiliate or subsidiary operating smaller aircraft.

ExpressJet used to operate only Embraer-145 (50-seat) at BHM. In recent years, ExpressJet expanded their service in BHM with the addition of slightly larger aircraft, Canadair CRJ-700 (65-seat) and some Canadair CRJ 900 (76-seat) and Canadair CRJ-200ER/RJ-440 (50-seat). The Embraer-145 (50-seat) is still the dominant airframe for ExpressJet at BHM so the overall increase in average seat capacity is minor over the years from 50 in 2000 to 54 seats per departure in 2013.

PSA Airlines' fleet remains the same Canadair RJ-200ER /RJ-440 (50-seat) and Canadair RJ-700 (70-seat) over the years. The decrease in PSA Airlines' average load factor from 60 in 2004 to 52 seats per departure in 2013 is mainly the result of their expansion of service by their Canadair RJ-200ER /RJ-440 (50-seat) while the service by Canadair RJ-700 (70-seat) between BHM and Charlotte CLT remains at similar level.

Mesa Airlines operates only the Embraer-145 (50-seat) at BHM in 2002 and changed to mainly Canadair CRJ-900 (79 to 86-seat) and some Canadair CRJ-700 (70-seat) in recent years.

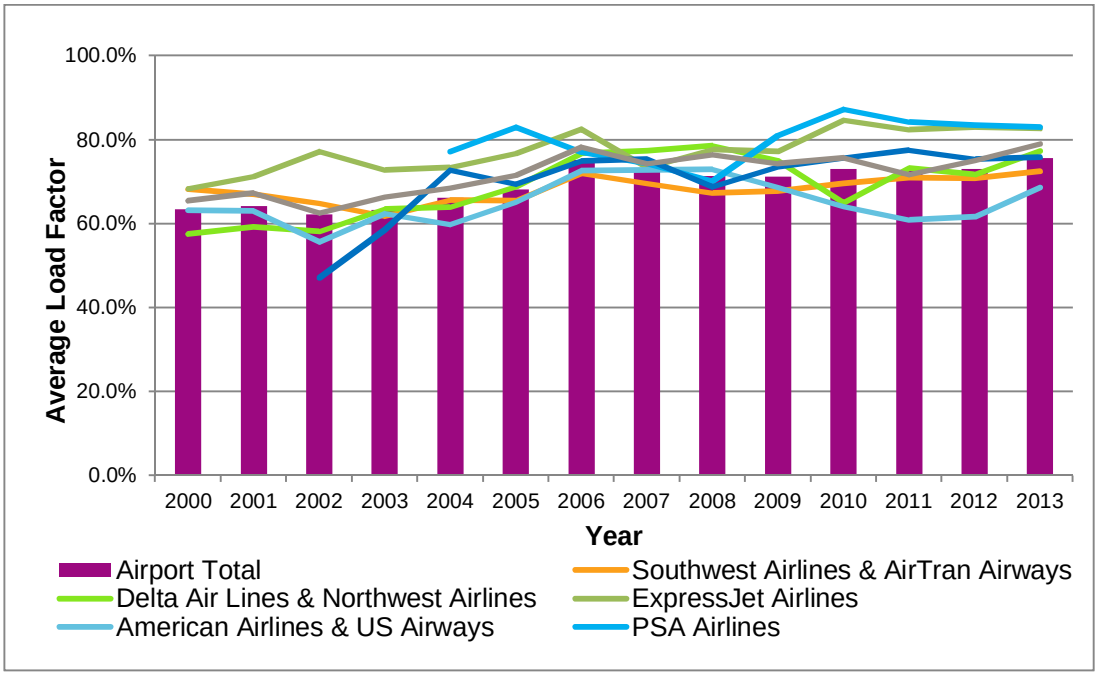
The average seat capacity for the airport as a whole decreased from 118 in 2000 to 97 seats per departure in 2013. The decrease in seat capacity is consistent with the shift of market share from mainline air carriers (with 90 seats or more) to regional air carriers (up to 90 seats) in BHM as discussed in **Section 2.4.1**.

TABLE 2-13
AVERAGE LOAD FACTORS (2000-2013)

Year	Mainline Air Carrier			Regional Air Carrier			Other Airlines	Airport Total
	Southwest & AirTran	Delta & Northwest	American & US Airways	ExpressJet	PSA	Mesa & Freedom		
2000	68.2%	57.5%	63.1%	68.3%	no record	no record	65.5%	63.5%
2001	67.0%	59.2%	63.0%	71.2%	no record	no record	67.2%	64.2%
2002	64.8%	58.1%	55.7%	77.1%	no record	47.0%	62.6%	62.2%
2003	61.8%	63.5%	62.3%	72.7%	no record	58.5%	66.3%	63.2%
2004	65.6%	63.9%	59.7%	73.4%	77.1%	72.7%	68.5%	66.2%
2005	65.4%	68.8%	65.1%	76.8%	83.0%	69.3%	71.5%	68.2%
2006	72.1%	76.7%	72.6%	82.5%	77.0%	74.8%	78.3%	75.1%
2007	69.6%	77.4%	72.8%	73.4%	74.2%	75.3%	74.2%	72.6%
2008	67.2%	78.6%	72.9%	77.6%	70.2%	68.7%	76.5%	71.4%
2009	67.7%	75.0%	68.7%	77.1%	81.0%	73.5%	74.3%	71.3%
2010	69.5%	65.0%	64.0%	84.7%	87.2%	75.6%	75.7%	73.1%
2011	71.0%	73.3%	60.9%	82.4%	84.3%	77.4%	71.7%	72.7%
2012	70.7%	71.7%	61.7%	83.0%	83.4%	75.4%	75.1%	73.0%
2013	72.4%	77.3%	68.7%	82.7%	83.0%	75.9%	79.0%	75.7%

Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

FIGURE 2-9
AVERAGE LOAD FACTORS (2000-2013)



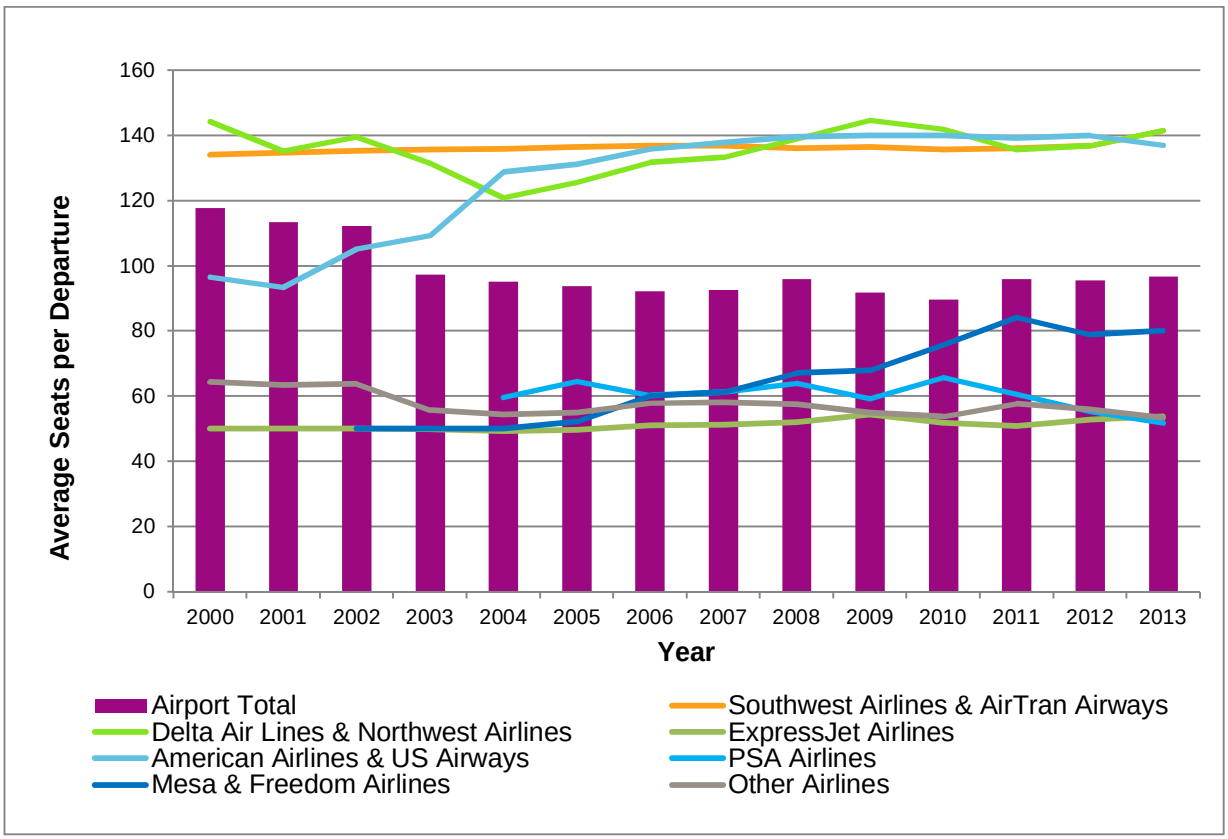
Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

TABLE 2-14
AVERAGE SEATS PER DEPARTURE (2000-2013)

Year	Mainline Air Carrier			Regional Air Carrier			Other Airlines	Airport Total
	Southwest & AirTran	Delta & Northwest	American & US Airways	ExpressJet	PSA	Mesa & Freedom		
2000	134	144	97	50	no record	no record	64	118
2001	135	135	93	50	no record	no record	63	113
2002	135	140	105	50	no record	50	64	112
2003	136	132	109	50	no record	50	56	97
2004	136	121	129	49	60	50	54	95
2005	136	126	131	50	65	52	55	94
2006	137	132	136	51	60	60	58	92
2007	137	133	138	51	61	61	58	93
2008	136	139	140	52	64	67	58	96
2009	136	145	140	54	59	68	55	92
2010	136	142	140	52	66	76	54	90
2011	136	136	139	51	61	84	58	96
2012	137	137	140	53	55	79	56	96
2013	142	142	137	54	52	80	53	97

Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

FIGURE 2-10
AVERAGE SEATS PER DEPARTURE (2000-2013)



Source: U.S. Department of Transportation, T-100 Segment database. AECOM analysis.

2.4.4 Airline Yields

Table 2-15 presents information on yields for BHM and in the United States as a whole in 2000 through 2013. Yield is a measure of airline revenue, normalized for distance. Yield is measured in cents per revenue-passenger-mile, and is calculated by dividing fare revenue by trip length. **Figure 2-11** graphically presents the year over year changes on the yields for both the BHM and the United States.

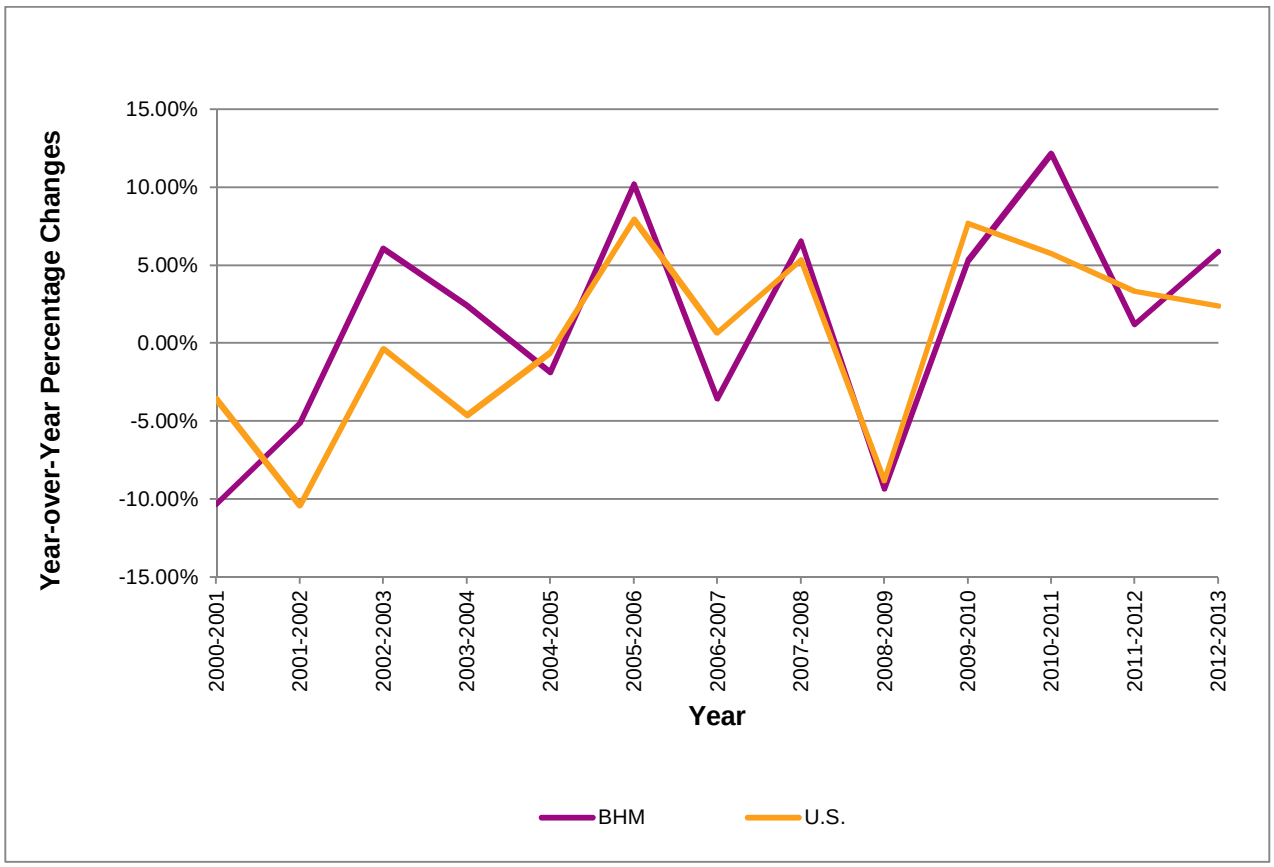
As shown in **Figure 2-11**, historical variations in the changes in yields for BHM and domestic yields for the United States go up and down in a similar pattern. BHM yields decreased by an annual average contraction rate of -1.93 percent and the domestic yields for the United States as a whole decreased at -3.98 percent during the period from 2000 to 2005. From 2005 to 2010, the BHM yields and the domestic yields of the nation increased at an AAGR of 1.57 percent and 2.37 percent respectively. In the recent three years, the increase in BHM yields increase at 6.34 percent per year, which is much higher than the growth of the domestic yields of the nation at 3.84 percent per year. Over the past 13 years, the BHM yields increased at 1.28 percent per year, while the growth of the domestic yields for the nation increased at 0.21 percent per year.

TABLE 2-15
HISTORICAL YIELDS

Year	BHM (Note 1) (Cents)	United States (Domestic) (Note 2) (Cents)
2000	25.33	14.03
2001	22.71	13.53
2002	21.55	12.12
2003	22.86	12.08
2004	23.42	11.52
2005	22.99	11.45
2006	25.33	12.36
2007	24.43	12.45
2008	26.03	13.11
2009	23.60	11.95
2010	24.85	12.87
2011	27.88	13.62
2012	28.22	14.08
2013	29.88	14.42
Period	**Year-over-Year Percentage Changes**	
2000-2001	-10.34%	-3.55%
2001-2002	-5.13%	-10.42%
2002-2003	6.10%	-0.33%
2003-2004	2.44%	-4.64%
2004-2005	-1.86%	-0.61%
2005-2006	10.21%	7.95%
2006-2007	-3.57%	0.69%
2007-2008	6.57%	5.35%
2008-2009	-9.35%	-8.83%
2009-2010	5.32%	7.71%
2010-2011	12.19%	5.78%
2011-2012	1.23%	3.36%
2012-2013	5.88%	2.41%
Period	**Average Annual Compound Growth Rate (AAGR)**	
2000-2005	-1.93%	-3.98%
2005-2010	1.57%	2.37%
2010-2013	6.34%	3.84%
2000-2013	1.28%	0.21%

Source:
1. U.S. Department of Transportation, Origin-Destination Survey DB1B database. AECOM analysis.
2. FAA Aerospace Forecast Fiscal Years 2014-2034.

FIGURE 2-11
HISTORICAL CHANGES IN YIELDS



Source:
1. U.S. Department of Transportation, Origin-Destination Survey DB1B database. AECOM analysis.
2. FAA Aerospace Forecast Fiscal Years 2014-2034.

2.4.5 Air Cargo

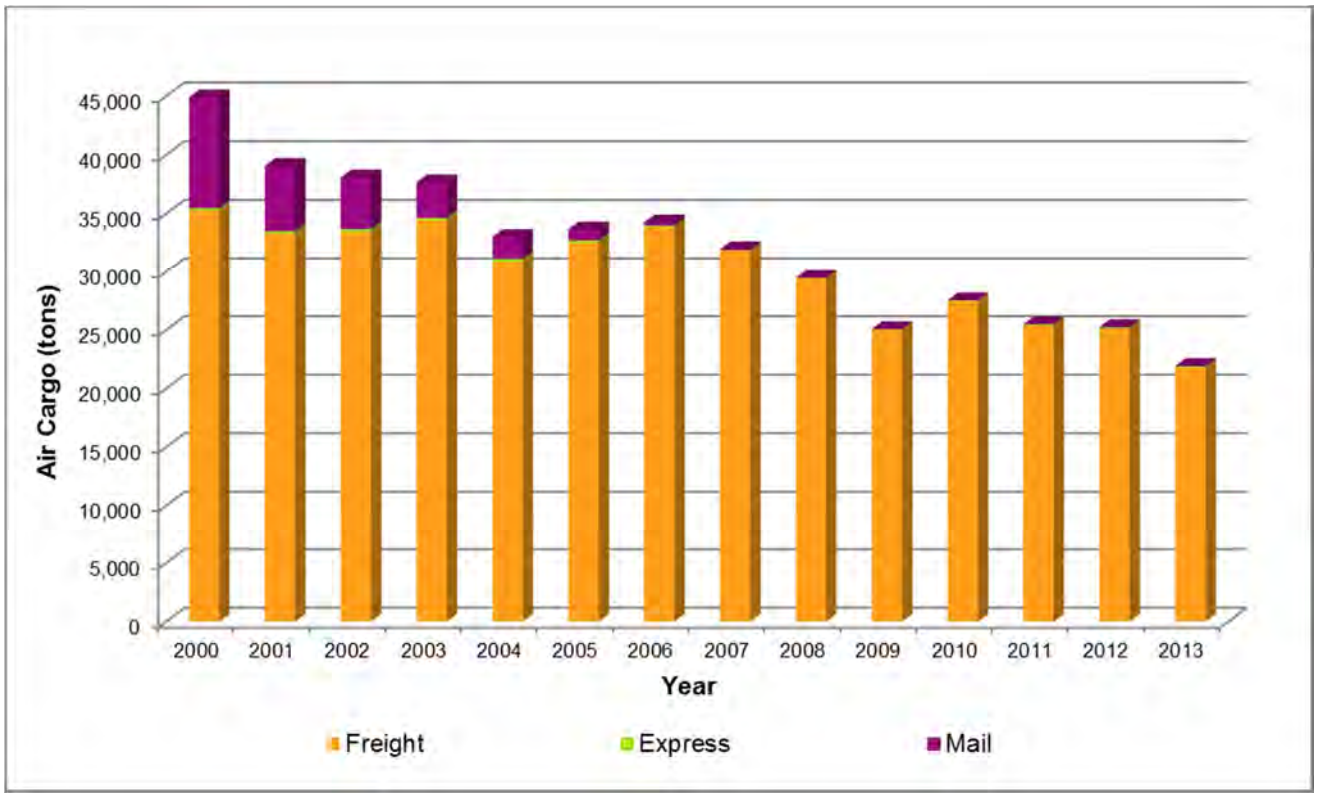
Historical air cargo (air freight, express, and mail) tonnage throughput at BHM is presented in **Table 2-16** and **Figure 2-12**. From 2000 through 2013, total air cargo in BHM decreased in an average of -5.37 percent per year. The decrease in air mail is more severe at -36.58 percent per year than the decrease in express or freight at -4.48 percent and -3.64 percent per year respectively over the 13-year period. The percentage share of air mail in total air cargo also decreased from nearly 21 percent in 2000 to less than 1 percent in 2013. Since 2007, over 99 percent of the total air cargo at BHM is freight.

TABLE 2-16
HISTORICAL AIR CARGO TONNAGE THROUGHPUT

Year	Freight	Express	Mail	Total	% of Freight	% of Express	% of Mail
2000	35,272.3	201.5	9,423.3	44,897.1	78.56%	0.45%	20.99%
2001	33,301.8	207.5	5,556.8	39,066.1	85.24%	0.53%	14.22%
2002	33,447.0	245.5	4,384.2	38,076.7	87.84%	0.64%	11.51%
2003	34,437.9	213.5	3,013.6	37,665.0	91.43%	0.57%	8.00%
2004	30,934.5	214.2	1,869.2	33,017.9	93.69%	0.65%	5.66%
2005	32,503.1	215.3	937.4	33,655.8	96.58%	0.64%	2.79%
2006	33,863.2	123.9	274.3	34,261.4	98.84%	0.36%	0.80%
2007	31,902.6	15.1	39.2	31,956.9	99.83%	0.05%	0.12%
2008	29,451.6	17.9	5.8	29,475.3	99.92%	0.06%	0.02%
2009	25,030.3	41.0	0.7	25,072.0	99.83%	0.16%	0.003%
2010	27,495.2	50.7	0.5	27,546.4	99.81%	0.18%	0.002%
2011	25,390.0	92.7	13.5	25,496.2	99.58%	0.36%	0.05%
2012	25,121.5	101.7	20.1	25,243.3	99.52%	0.40%	0.08%
2013	21,776.6	111.0	25.3	21,912.9	99.38%	0.51%	0.12%
Period	**Average Annual Compound Growth Rate (AAGR)**						
2000-2005	-1.62%	1.33%	-36.97%	-5.60%			
2005-2010	-3.29%	-25.12%	-77.85%	-3.93%			
2010-2013	-7.48%	29.85%	269.87%	-7.34%			
2000-2013	-3.64%	-4.48%	-36.58%	-5.37%			

Source: BHM Enplanements - Birmingham-Shuttlesworth International Airport Statistical Data Reports.

FIGURE 2-12
HISTORICAL AIR CARGO TONNAGE



Source: BHM Enplanements - Birmingham-Shuttlesworth International Airport Statistical Data Reports.

2.4.5.1 All-Cargo Carrier Landed Weight

Air cargo typically moves in the bellies of passenger aircraft or in dedicated all-cargo aircraft on both scheduled and non-scheduled service. Both belly cargo delivered by passenger aircraft and dedicated all-cargo aircraft operate at BHM.

Each year, the FAA asks airports to report aircraft operations exclusively dedicated to the transport of cargo and use this all-cargo data to help allocate AIP cargo entitlement funds. The all-cargo data collected by the FAA for BHM in terms of gross landed weight[7] and the relative ranking among all the qualified airports in the Unites States are presented in **Table 2-17**. Qualified airports include those airports with all-cargo throughput over one hundred million pounds per year. There are a total of 112 qualified airports nationwide in 2013, including two Alabama airports – BHM and Huntsville International Airport (HVS). The demand for air cargo is a derived demand resulting from economic activity. Cargo carriers face price competition from alternative shipping methods such as trucks, container ships, and rail. Cargo carriers also have the choice of their hub locations together with their ground connection network for distribution of their air cargo by truck. Nearby airports are often competitive with each other in the air cargo market. All-cargo demand in Alabama is primarily served by cargo carrier in BHM and HVS. In order to analyze the historical air cargo trend of the region, the all-cargo data for HVS and Alabama (total of BHM and HVS) are also included in **Table 2-17**.

A graphic representation of the historical all-cargo aircraft gross landed weight for BHM, HSV and combined Alabama is given in **Figure 2-13**.

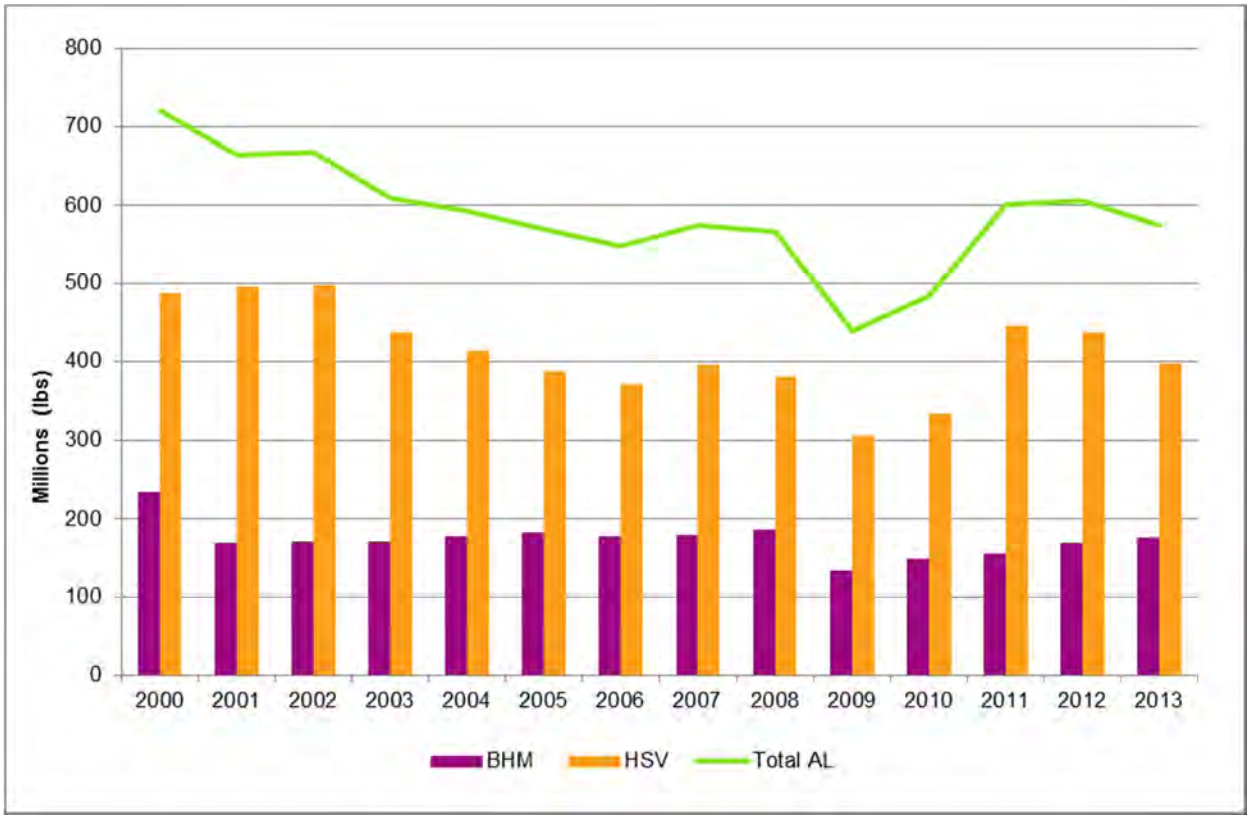
[7] The all-cargo aircraft gross landed weight is the certificated maximum gross landed weight of the aircraft type as specified by the aircraft manufacturer.

TABLE 2-17
HISTORICAL ALL-CARGO AIRCRAFT GROSS LANDED WEIGHT FOR BHM, HSV, AND ALABAMA

Year	BHM		HSV		Total AL Gross Landed Weight (lbs)	BHM share in AL	HSV share in AL
	Gross Landed Weight (lbs)	Ranking in U.S.	Gross Landed Weight (lbs)	Ranking in U.S.			
2000	233,896,700	93	486,510,020	62	720,406,720	32.47%	67.53%
2001	169,361,400	103	495,054,754	60	664,416,154	25.49%	74.51%
2002	171,401,550	100	496,612,012	57	668,013,562	25.66%	74.34%
2003	171,957,550	98	436,937,165	63	608,894,715	28.24%	71.76%
2004	179,051,250	104	413,791,286	67	592,842,536	30.20%	69.80%
2005	182,797,590	105	386,621,292	70	569,418,882	32.10%	67.90%
2006	177,470,701	106	370,128,741	69	547,599,442	32.41%	67.59%
2007	179,558,350	105	394,884,639	64	574,442,989	31.26%	68.74%
2008	186,962,977	99	380,384,289	64	567,347,266	32.95%	67.05%
2009	133,824,660	104	305,771,057	72	439,595,717	30.44%	69.56%
2010	148,596,240	105	334,431,032	65	483,027,272	30.76%	69.24%
2011	155,487,030	97	445,198,179	46	600,685,209	25.88%	74.12%
2012	169,788,685	92	437,129,815	48	606,918,500	27.98%	72.02%
2013	176,960,365	93	397,102,094	54	574,062,459	30.83%	69.17%
Period	**Year-over-Year Percentage Changes**						
2000-2001	-27.59%		1.76%		-7.77%	-21.49%	10.33%
2001-2002	1.20%		0.31%		0.54%	0.66%	-0.23%
2002-2003	0.32%		-12.02%		-8.85%	10.07%	-3.47%
2003-2004	4.13%		-5.30%		-2.64%	6.94%	-2.73%
2004-2005	2.09%		-6.57%		-3.95%	6.29%	-2.72%
2005-2006	-2.91%		-4.27%		-3.83%	0.95%	-0.45%
2006-2007	1.18%		6.69%		4.90%	-3.55%	1.70%
2007-2008	4.12%		-3.67%		-1.24%	5.43%	-2.47%
2008-2009	-28.42%		-19.62%		-22.52%	-7.62%	3.75%
2009-2010	11.04%		9.37%		9.88%	1.05%	-0.46%
2010-2011	4.64%		33.12%		24.36%	-15.86%	7.05%
2011-2012	9.20%		-1.81%		1.04%	8.08%	-2.82%
2012-2013	4.22%		-9.16%		-5.41%	10.19%	-3.96%
Period	**Average Annual Compound Growth Rate (AAGR)**						
2000-2005	-4.81%		-4.49%		-4.60%	-0.23%	0.11%
2005-2010	-4.06%		-2.86%		-3.24%	-0.85%	0.39%
2010-2013	6.00%		5.89%		5.92%	0.07%	-0.03%
2001-2013	0.37%		-1.82%		-1.21%	1.60%	-0.62%

Source: FAA All-Cargo Data for U.S. Airports, accessed November 2014.

FIGURE 2-13
HISTORICAL ALL-CARGO AIRCRAFT GROSS LANDED WEIGHT FOR BHM, HSV, AND ALABAMA



Source: FAA All-Cargo Data for U.S. Airports, accessed November 2014.

As shown in **Table 2-17** and **Figure 2-13**, the all-cargo aircraft landed weight at BHM has been increasing steadily at an annual average rate of 0.37 percent since 2001, except a significant decline in the year 2008 at -28.4 percent after the financial turmoil in late 2007, and a small decline in the year 2006 at -2.9 percent, but the all-cargo landed weight quickly rebounded in the subsequent years. The increase in all-cargo aircraft landed weight at BHM is significant in the recent three years from 2010 to 2013, at 6.0 percent per year. The all-cargo operators at BHM are predominantly United Parcel Service (UPS) and Federal Express Corporation (FedEx), who mainly provide domestic scheduled all-cargo services with occasional non-scheduled all-cargo operations. In 2013, USA Jet Airlines, Ameristar Air Cargo and Gulf & Caribbean Cargo have a few non-scheduled all-cargo flights from BHM and they are all domestic flights except one flight to Mexico by Ameristar Air Cargo. Only minimal volume of international air cargo was recorded at BHM in 2012 based on the non-scheduled all-cargo flight to Tegucigalpa in Honduras. Ameristar Air Cargo, and Gulf and Caribbean Cargo sometimes operate all-cargo aircraft at BHM to/from Mexico but the volume is considered minimal. Northern Air Cargo, Prescott Support, Kalitta Charters II, Atlas Air and Volga-Dnepr Airlines also conducted a few non-scheduled all-cargo flights at BHM in recent years.

HSV is an important air cargo hub for the cargo carrier Panalpina in the United States. HSV also acts as a major collection and distribution center for Panalpina's vast road feeder services network throughout the North America. HSV handles over 200 million pounds of cargo a year, including international air cargo. As shown in **Table 2-17** and **Figure 2-13**, the all-cargo gross landed weight for HSV varies between 67.5 percent and 74.5 percent of the total gross landed weight in Alabama throughout the past 13 years, which is more than double of BHM.

In 2011, there was a significant increase in air cargo at HSV with the expansion of service by Panalpina. However, in the recent three years, the percentage share of all-cargo landed weight for HSV in Alabama decreased from 74.1 percent to 69.2 percent and the gross landed weight decreased -1.8 percent from 2011 to 2012 and decreased an additional -9.2 percent from 2012 to 2013. This recent trend indicates a possible shift of all-cargo activities from HSV to BHM.

2.4.5.2 All-Cargo Carrier Cargo Revenue Ton Miles

At the national level, the FAA Aerospace Forecast FY2014-2034 analyzed the commercial air cargo activities in terms of cargo revenue ton miles (RTMs). Air cargo RTMs flown by all-cargo carriers comprised 79.7 percent of total RTMs in the United States in 2013, with passenger carriers flying the remainder as belly cargo[8]. **Table 2-18** summarized the historical all-cargo carriers RTMs in the United States. **Figure 2-14** graphically presents the year-over-year changes for the all-cargo carrier RTMs in parallel with the historical trends for the all-cargo landed weight at BHM, HSV, and Alabama.

As shown in **Figure 2-14**, the historical year-over-year changes in all-cargo landed weight in BHM, HSV and combined Alabama are consistent with the national trend and vary in a similar pattern as the changes in all-cargo carrier RTMs except in two short periods. After the 9-11 event, the all-cargo activities at BHM, HSV and Alabama took a longer time to recover than other airports in the nation in 2002 to 2004. In 2011, there was a significant increase in air cargo tonnages at HSV which was dominated by the expansion of services of Panalpina in HSV, which did not follow the national trend. Overall, the FAA's domestic all-cargo carrier RTMs estimate for the nation is a reliable reference for the all-cargo activities in Alabama airports.

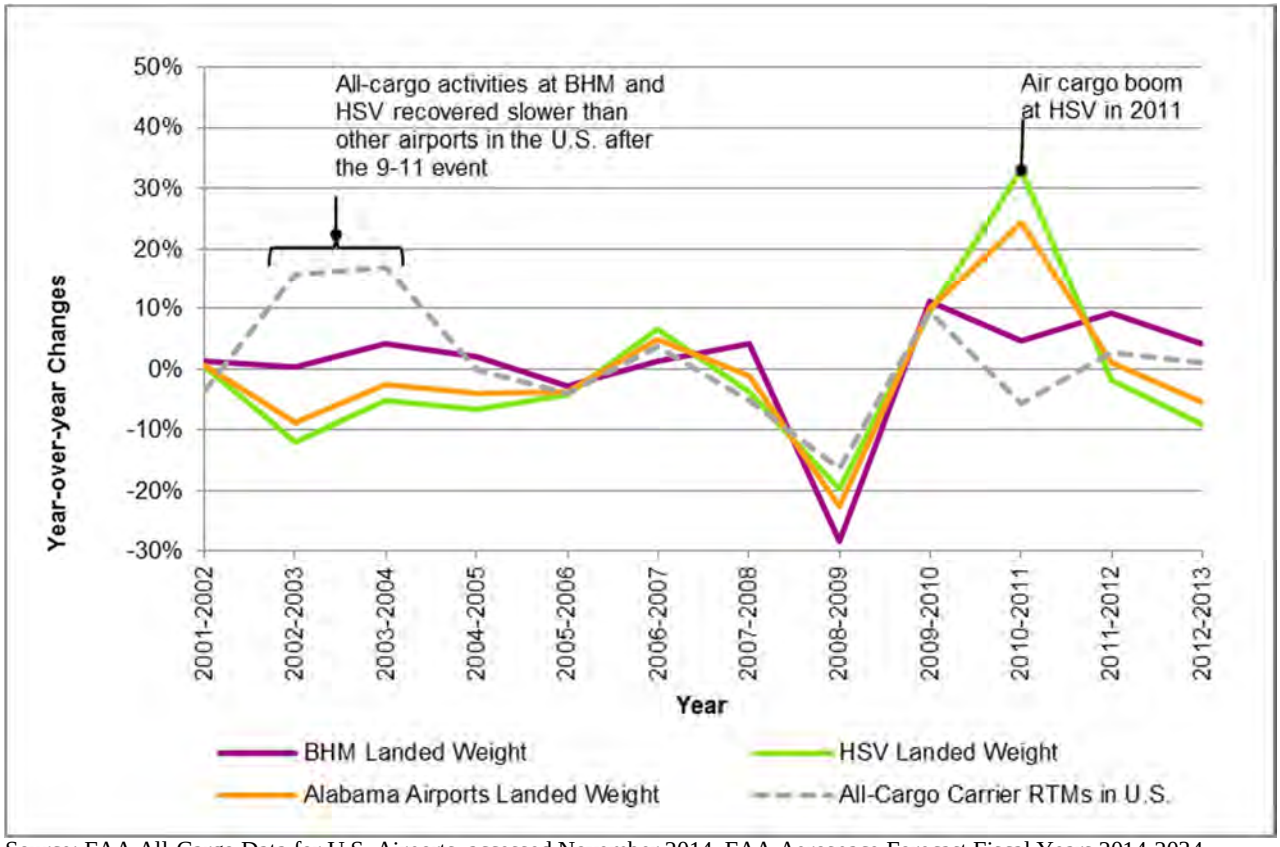
[8] The FAA Aerospace Forecast FY2014-2034.

TABLE 2-18
HISTORICAL ALL-CARGO CARRIER REVENUE TON MILES (RTM)

Year	Domestic All-Cargo Carrier RTMs	Year-over-Year Changes
2000	10,423.698	-
2001	9,992.329	-4.14%
2002	9,629.935	-3.63%
2003	11,153.381	15.82%
2004	13,040.819	16.92%
2005	13,007.856	-0.25%
2006	12,481.161	-4.05%
2007	12,940.495	3.68%
2008	12,260.656	-5.25%
2009	10,275.344	-16.19%
2010	11,243.239	9.42%
2011	10,601.159	-5.71%
2012	10,880.250	2.63%
2013	10,991.528	1.02%
Period	**Average Annual Compound Growth Rate (AAGR)**	
2000-2005	4.53%	
2005-2010	-2.87%	
2010-2013	-0.75%	
2001-2013	0.80%	

Source: FAA Aerospace Forecast Fiscal Years 2014-2034.

FIGURE 2-14
HISTORICAL TRENDS FOR ALL-CARGO LANDED WEIGHT IN BHM, HSV, ALABAMA AND ALL-CARGO CARRIER RTM IN THE U.S.



Source: FAA All-Cargo Data for U.S. Airports, accessed November 2014. FAA Aerospace Forecast Fiscal Years 2014-2034.

2.4.6 Aircraft Operations

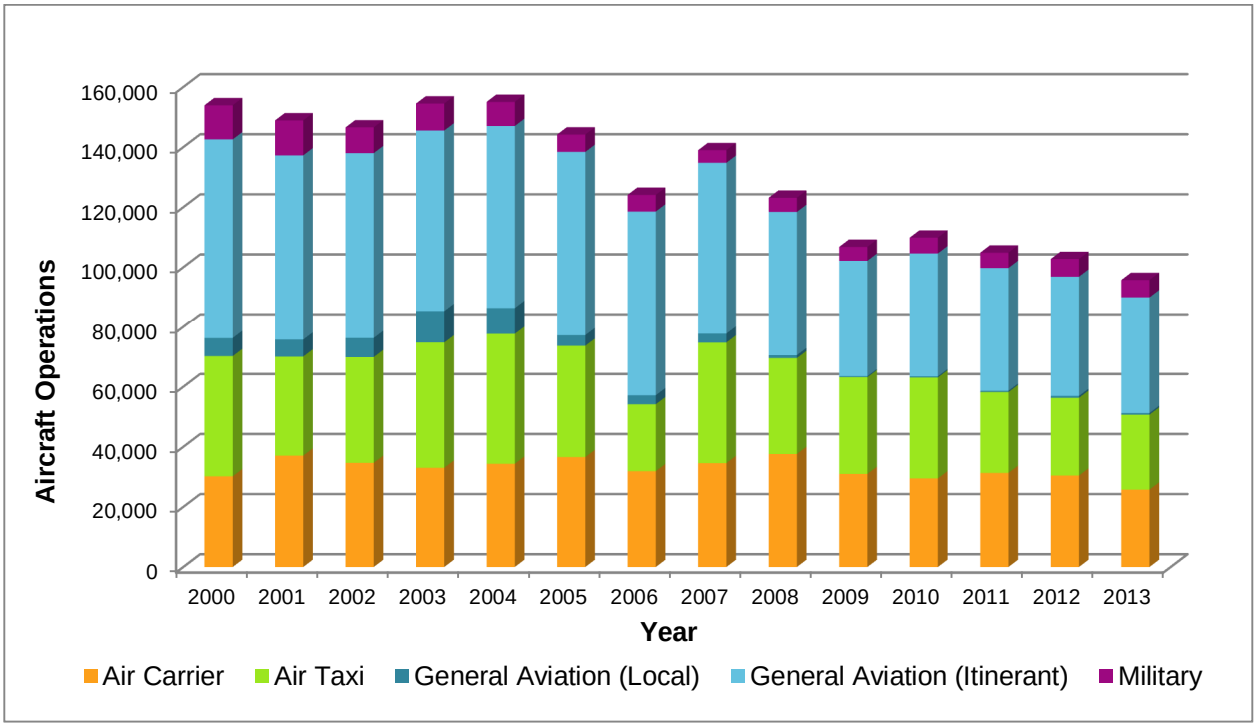
Annual aircraft operations at BHM decreased from approximately 154,000 in 2000 to 96,000 in 2013 at an annual average contraction rate of -3.59 percent. As shown in **Table 2-19** and **Figure 2-15**, all categories of aviation activities decreased over the period from 2000 to 2013. The decrease in general aviation operations is the highest at -17.12 percent for local and -4.06 percent for itinerant general aviation operations. Air taxi, air carrier, and military operations decreased at an average of -3.57 percent, -1.21 percent and -5.03 percent per year respectively over the past 13-year period.

TABLE 2-19
HISTORICAL AIRCRAFT OPERATIONS

Year	Air Carrier	Air Taxi	General Aviation (Local)	General Aviation (Itinerant)	Military	Total Operations
2000	30,165	40,026	6,050	66,318	11,358	153,917
2001	37,049	32,997	5,667	61,534	11,622	148,869
2002	34,658	35,226	6,374	61,731	8,566	146,555
2003	33,019	41,741	10,595	60,162	8,976	154,493
2004	34,335	43,320	8,714	60,649	8,028	155,046
2005	36,573	37,093	3,536	61,186	5,790	144,178
2006	31,887	22,281	2,997	61,386	5,552	124,103
2007	34,544	40,192	2,979	57,049	4,211	138,975
2008	37,600	31,937	974	47,897	4,725	123,133
2009	30,969	32,192	333	38,638	4,648	106,780
2010	29,460	33,629	363	41,146	5,269	109,867
2011	31,288	26,916	430	41,099	5,131	104,864
2012	30,424	25,873	618	39,927	5,902	102,744
2013	25,742	24,954	527	38,707	5,804	95,734
Period	**Average Annual Compound Growth Rate (AAGR)**					
2000-2005	3.93%	-1.51%	-10.18%	-1.60%	-12.61%	-1.30%
2005-2010	-4.23%	-1.94%	-36.57%	-7.63%	-1.87%	-5.29%
2010-2013	-4.40%	-9.47%	13.23%	-2.02%	3.28%	-4.49%
2000-2013	-1.21%	-3.57%	-17.12%	-4.06%	-5.03%	-3.59%

Source: Birmingham-Shuttlesworth International Airport Statistical Data Reports (Aircraft operations reported by the FAA Air Traffic Control Tower).

FIGURE 2-15
HISTORICAL AIRCRAFT OPERATIONS



Source: Birmingham-Shuttlesworth International Airport Statistical Data Reports (Aircraft operations reported by the FAA Air Traffic Control Tower).

2.4.7 Based Aircraft

Historical based aircraft is identified on the FAA TAF released in January 2015 with the actual record updated to 2013. The difference in dates between the 2015 TAF and the 2014 TAF for previous analyses is due to the fact that the based aircraft information was obtained after the 2015 TAF was released. Also, the 2015 TAF was compared with the numbers received directly from the airport and were more in unison than the 2014 TAF. 2013 numbers were obtained from BHM. The number of single-engine, multi-engine, jet aircraft, and helicopter based in BHM from 2000 to 2013 is summarized in **Table 2-20** and **Figure 2-16**.

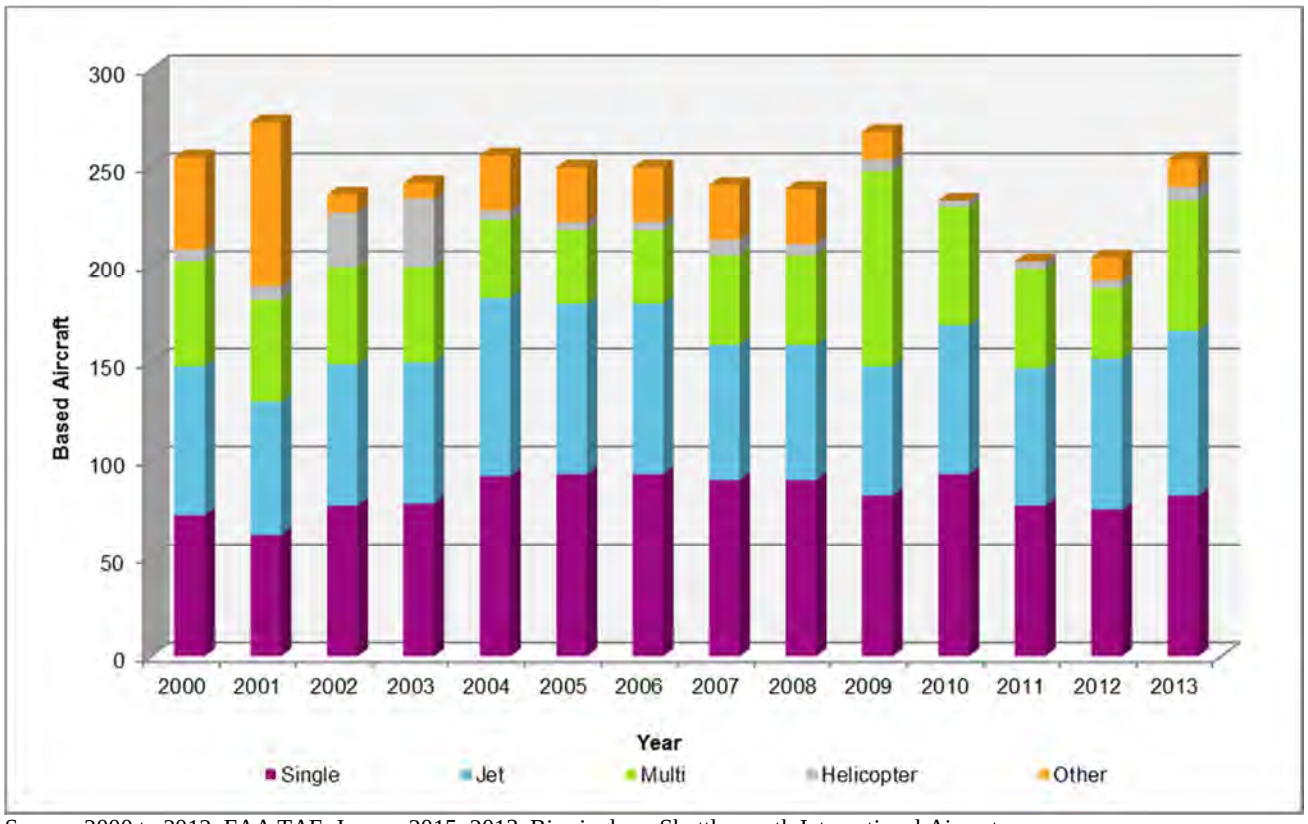
The total based aircraft in BHM has decreased from 255 in 2000 to 202 in 2011, and increased back to 254 in 2013. The number of single-engine aircraft increased from 72 in 2000 to 82 in 2013. The based multi-engine aircraft increased from 54 in 2000 to 67 in 2013. The based jet aircraft increased slightly from 76 in 2000 to 84 in 2013. The number of helicopters based in BHM is maintained at approximately four to seven since 2004.

TABLE 2-20
HISTORICAL BASED AIRCRAFT

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
2000	72	54	76	6	47	255
2001	62	52	68	7	84	273
2002	77	50	72	28	9	236
2003	78	49	72	35	8	242
2004	92	40	91	5	28	256
2005	93	38	87	4	28	250
2006	93	38	87	4	28	250
2007	90	46	69	8	28	241
2008	90	46	69	6	28	239
2009	82	100	66	6	14	268
2010	93	61	76	3	0	233
2011	77	51	70	4	0	202
2012	75	36	77	4	12	204
2013	82	67	84	7	14	254
Period	**Average Annual Compound Growth Rate (AAGR)**					
2000-2005	5.25%	-6.79%	2.74%	-7.79%	-9.84%	-0.40%
2005-2010	0.00%	9.93%	-2.67%	-5.59%		-1.40%
2010-2013	-4.11%	3.18%	3.39%	32.64%		2.92%
2000-2013	1.01%	1.67%	0.77%	1.19%	-8.90%	-0.03%

Source: 2000 to 2012: FAA TAF, January2015. 2013: Birmingham-Shuttlesworth International Airport.

FIGURE 2-16
HISTORICAL BASED AIRCRAFT



Source: 2000 to 2012: FAA TAF, January2015. 2013: Birmingham-Shuttlesworth International Airport.

2.5 Forecast Aviation Demand

Forecasts of aviation demand were developed for the two major categories of commercial passenger airline activity: total enplaned passengers and total aircraft operations. Derivative forecasts were also developed for the significant components of activity within these major categories. For example, within the enplaned passenger category, forecasts were developed for mainline and regional enplaned passengers. Within the aircraft operations category, forecasts were developed for mainline and regional passenger aircraft operations and all-cargo, general aviation, and military aircraft operations. The approach, methodology, and key assumptions used in developing the commercial passenger airline activity forecasts are described in the following subsections.

2.5.1 Enplaned Passengers Forecast

Different approaches were adopted to forecast the enplaned passengers for BHM and they are described in this section.

2.5.1.1 Regression Model

Regression analysis is a statistical technique that ties aviation demand (dependent variables), such as enplaned passengers, to socioeconomic indicators (independent variables) such as airline yields, fuel prices, population, employment, income and GDP. Airline yields are the aviation industry's measure of average ticket prices. Declining yield (or less increase in ticket prices) incentivizes passenger traffic. Correlations between historical aviation demands and socioeconomic data are analyzed to find the highest relationship between the dependent and independent variables. The forecast enplaned passengers are then derived from the regression model based on the forecast socioeconomic data up to 2035.

A regression model includes dummy variables to consider unusual events that do not correlate to underlying socioeconomic trends and airline yields. The unusual events that had a noticeable impact on BHM passenger traffic was the attacks of September 11, 2001 (the 9-11event) and the relatively slower and longer impacts on BHM as compared to other airports in the nation. The 9-11 event had the effect of depressing traffic at BHM from late 2001 to around early 2004. The effect in 2001 and 2004 is less than 2002 and 2003 and the dummy variable for 2001 and 2004 are discounted to a quarter (-0.25) and half (-0.5) of 2002 and 2003 (-1) respectively. The regression model also includes a first-order autoregressive factor to account for serial correlation that is inherent in the time series data. It is a variable that accounts for the interrelationship between prior and current year levels of enplanements.

Multiple regression analyses on historical data from 2000 to 2013 demonstrated that there is a strong correlation of the enplaned passengers for BHM with respect to the airline yields, the Birmingham-Hoover MSA nonfarm employment and the MSA real GDP. The coefficient of determination (R^2) for the regression analyses on enplaned passengers for BHM is 0.92, which represents a very high percent of variation in the dependent variables that are explained by the regression equation.

Forecast socioeconomic data, including the Birmingham-Hoover MSA nonfarm employment and the MSA real GDP, were based on the projections from Woods & Poole Economics[9] and their historical growth trends. The forecast annual growth rates for the airline passenger yields were based on the forecast of domestic passenger yields from the FAA Aerospace forecast FY2014-2034 and extrapolated to 2035. Three scenarios were developed with the regression model based on moderate, optimistic, and aggressive economic growth. The forecast of the enplaned passengers for BHM based on the regression model with three scenarios are given in **Table 2-21** and **Figure 2-17**. The regression models are described as follows:

[9] Woods & Poole Economics' 2014 State Profile for Alabama.

- Moderate economic growth scenario: The Birmingham-Hoover MSA nonfarm employment will grow at similar average annual growth rates as 2012 to 2013 at approximately 1.24 percent to 1.25 percent per year as projected by Woods & Poole Economics. The Birmingham-Hoover MSA GDP will increase at similar average annual growth rates as 2011 to 2013 at approximately at 1.34 percent in 2014 and increase to 1.52 percent in 2035 as projected by Woods & Poole Economics. The airline yields will increase at 3.0 percent from 2013 to 2014 and then increase at 1.30 percent to 1.52 percent per year between 2015 and 2035 as projected by the FAA Aerospace Forecast FY2014-2034 and extrapolated to 2035. This scenario assumes that airline yield (i.e., ticket prices) will outpace the area's socioeconomic growth. As a result, airline financial performance is enhanced despite a slight reduction in passenger demand resulting from higher ticket prices.

- Optimistic economic growth scenario: The Birmingham-Hoover MSA nonfarm employment will grow at an annual growth rate 50 percent higher than the moderate growth scenario, at approximately 1.86 percent to 1.87 percent per year. The Birmingham-Hoover MSA GDP will increase at an annual growth rate 50 percent higher than the moderate growth scenario, at approximately 2.02 percent to 2.36 percent. The optimistic scenario assumes the airline yields will increase at a slower rate than the national trend assumed in the moderate growth scenario at approximately 0.97 percent to 1.14 percent per year.

- Aggressive economic growth scenario: The Birmingham-Hoover MSA nonfarm employment will grow at an annual growth rate of 2.48 percent to 2.5 percent between 2014 and 2035, which is similar to the historical high average growth between 2004 and 2007 at the MSA. The Birmingham-Hoover MSA GDP will increase at annual growth rate of 2.69 percent to 3.15 percent, which is close to the historical high average growth between 2000 and 2005 at the MSA. The airline yields will increase at a slower rate than the assumption in the optimistic scenario at approximately 0.65 percent to 0.76 percent per year.

2.5.1.2 Market Share Model

The market share approach is a top-down model based on the allocation of total enplanements of the United States and Alabama as projected by FAA. The national and statewide forecasts are based on the FAA Terminal Area Forecast (TAF) data and make reference to the projected national trend in FAA Aerospace Forecast FY2014-2034. The historical share of BHM enplanements of the total enplanement in the United States has been declining slightly (AAGR at -1.33 percent) but the share in Alabama is increasing since 2000 (AAGR at 0.15 percent) as show in **Table 2-12** previously. The following scenarios were considered in the market share model:

- Market share of BHM enplanements of the United States continue to decline at similar historical average annual rate from 0.18 percent in 2014 and to 0.14 percent in 2035.

- Market share of BHM enplanements of Alabama continues to increase at similar historical average annual growth rate from 56.9 percent in 2014 to 58.8 percent in 2035.

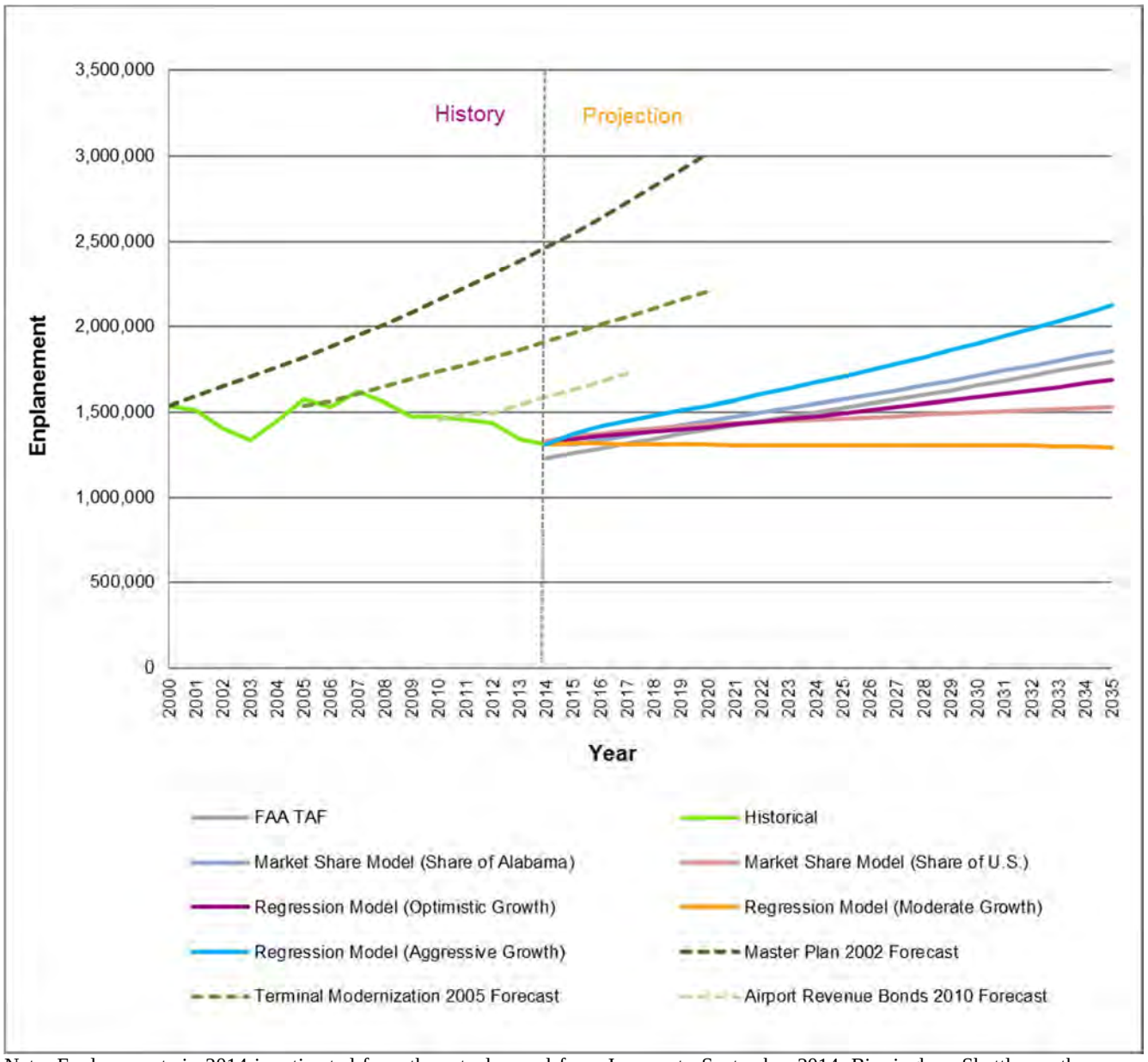
The forecast of the enplaned passengers for BHM based on the two market share models are given in **Table 2-21** and **Figure 2-17**.

TABLE 2-21
ENPLANED PASSENGERS FORECAST BY REGRESSION AND MARKET SHARE MODELS

Year	Actual[1]	Regression Model			Market Share Model	
		Moderate Economic Growth	Optimistic Economic Growth	Aggressive Economic Growth	Share of Alabama	Share of the U.S.
	Actual					
2000	1,538,165					
2005	1,572,145					
2010	1,476,078					
2011	1,453,529					
2012	1,434,622					
2013	1,342,611					
2014	1,312,191					
	Forecast[2]					
2015		1,317,572	1,340,740	1,375,401	1,309,732	1,362,123
2020		1,307,552	1,412,328	1,538,427	1,448,371	1,430,282
2025		1,306,428	1,493,362	1,706,567	1,572,142	1,463,519
2030		1,305,259	1,585,854	1,901,186	1,710,212	1,497,132
2035		1,293,873	1,684,074	2,121,868	1,855,105	1,529,014
Period	Average Annual Compound Growth Rate (AAGR)					
2015-2020		-0.15%	1.05%	2.27%	2.03%	0.98%
2015-2025		-0.08%	1.18%	2.18%	1.84%	0.72%
2015-2035		-0.09%	1.15%	2.19%	1.76%	0.58%

Note: Enplanements in 2014 is estimated from the actual record from January to September 2014, Birmingham-Shuttlesworth International Airport Statistical Data.
Source:
1. Birmingham-Shuttlesworth International Airport Statistical Data Reports.
2. AECOM analysis.

FIGURE 2-17
ENPLANED PASSENGERS FORECAST



Note: Enplanements in 2014 is estimated from the actual record from January to September 2014, Birmingham-Shuttlesworth International Airport Statistical Data.
Source:

1. Birmingham-Shuttlesworth International Airport Statistical Data Reports.
2. Birmingham-Shuttlesworth International Airport Master Plan Update; *URS*; August 2002.
3. Birmingham-Shuttlesworth International Airport Terminal Modernization Project - Forecast of Commercial Passenger Activity; *KPS Group, Sypher:Mueller International, Jacobsen/Daniels Associates*; September 2005.
4. Financial Feasibility Report – Airport Revenue Bonds, Series 2010; *Unison Consulting*; December 2010.
5. FAA TAF, issue February 2014.
6. AECOM analysis.

2.5.1.3 Forecasts by Other Recent Studies and FAA TAF

The forecast of enplaned passengers from the following recent studies and FAA TAF are summarized in **Table 2-22** and graphically presented in **Figure 2-17**.

- Birmingham-Shuttlesworth International Airport Master Plan Update; *URS*; August 2002 (the Master Plan 2002 Forecast)
- Birmingham-Shuttlesworth International Airport Terminal Modernization Project - Forecast of Commercial Passenger Activity; *KPS Group, Sypher:Mueller International, Jacobsen/Daniels Associates*; September 2005 (the Terminal Modernization 2005 Forecast)
- Financial Feasibility Report – Airport Revenue Bonds, Series 2010; *Unison Consulting*; December 2010 (the Airport Revenue Bonds 2010 Forecast)
- FAA TAF, February 2014

As shown in **Table 2-22**, the forecasts by other recent studies are very optimistic and projected the enplaned passenger to rise at an average annual growth rate of approximately 2.4 percent to 3.4 percent through 2020. However, it is noted that these forecasts do not reflect the recent decline in enplanements at BHM and the slow recovery after the financial turmoil in late 2007.

TABLE 2-22
FORECAST ENPLANED PASSENGERS BY OTHER RECENT STUDIES AND FAA TAF

Year	Actual [1]	Master Plan 2002 Forecast [2]	Terminal Modernization 2005 Forecast [3]	Airport Revenue Bonds 2010 Forecast [4]	FAA TAF [5]
2005	1,572,145	1,820,000	1,538,000		1,579,974
2010	1,476,078	2,154,289	1,735,000	1,454,650	1,434,026
2011	1,453,529	2,228,181	1,776,000	1,483,000	1,429,972
2012	1,434,622	2,304,608	1,816,000	1,495,000	1,428,109
2013	1,342,611	2,383,656	1,860,000	1,539,000	1,346,106
2014	1,312,191	2,465,415	1,908,000	1,583,000	1,231,812
2015		2,549,979	1,958,000	1,628,000	1,259,901
2016		2,637,443	2,008,000	1,675,000	1,286,169
2017		2,727,908	2,056,000	1,725,000	1,314,328
2018		2,821,475	2,105,000		1,343,923
2019		2,918,252	2,156,000		1,373,885
2020		3,018,348	2,206,000		1,400,870
2025					1,520,554
2030					1,653,020
2035					1,793,874
Period	**Average Annual Compound Growth Rate (AAGR)**				
2005-2020		3.43%	2.43%	.	-0.80%
2010-2017		3.43%	2.45%	2.47%	-1.24%
2010-2020		3.43%	2.43%		-0.23%
2015-2020					2.14%
2015-2025					1.90%
2015-2035					1.78%

Note: Enplanements in 2014 is estimated from the actual record from January to September 2014, Birmingham-Shuttlesworth International Airport Statistical Data.
Source:
1. Birmingham-Shuttlesworth International Airport Statistical Data Reports.
2. Birmingham-Shuttlesworth International Airport Master Plan Update; *URS*; August 2002.
3. Birmingham-Shuttlesworth International Airport Terminal Modernization Project - Forecast of Commercial Passenger Activity; *KPS Group, Sypher:Mueller International, Jacobsen/Daniels Associates*; September 2005.
4. Financial Feasibility Report – Airport Revenue Bonds, Series 2010; *Unison Consulting*; December 2010.
5. FAA TAF, Issue February 2014. TAF base year is Federal Fiscal Year 2012 (1,428,109 enplanements).

2.5.1.4 Recommended Enplaned Passengers Forecast for Master Plan

To account for the inherent uncertainty of aviation demand forecasting, a range of enplaned passenger forecasts were developed to account for potential demand under various economic and airline industry conditions. Together, these forecast scenarios, as presented in **Table 2-21** and **Figure 2-17**, represent a reasonable range of future numbers of enplaned passengers. The moderate economic growth scenario represents a level of enplaned passenger activity that may occur under moderate MSA economic conditions that would have some impacts on the aviation industry, while the aggressive economic growth scenario represents a level of activity that may occur under very strong economic conditions that would have very positive impacts on the commercial airlines at the airport. The enplaned passengers projected by the two market share models and the optimistic growth scenario lie within the range of the enplaned passengers projected by the moderate and aggressive economic growth scenarios.

Both the optimistic economic growth scenario and FAA TAF enplanements are within the range of the two market share models and the between the aggressive and moderate economic growth scenarios for the 20-year planning period. The optimistic economic growth scenario represents an average annual growth rate of 1.15 percent from 2015 to 2035, which is similar to the historical growth rate of 1.14 percent per year for the enplanements in BHM after the 9-11 event in 2001 to the recent historical peak enplanements in 2007. The FAA TAF projects an annual growth rate of 1.78 percent on enplanements from 2015 to 2035, which is slightly higher than the optimistic economic growth scenario in the long term. For master planning purposes, the FAA TAF enplanements are recommended for a more positive outlook over the 20-year planning horizon. The enplanement forecast is presented in **Table 2-23**. Enplanements at BHM are projected to increase from 1,259,901 in 2015 to 1,793,874 in 2035.

TABLE 2-23
FORECAST ENPLANEMENTS

Year	Enplanements
2015	1,259,901
2020	1,400,870
2025	1,520,554
2035	1,793,874

2.5.2 Air Cargo Throughput Forecast

Described in this section are the different approaches used to forecast BHM's air cargo volume.

First, all-cargo carrier demand (in terms of gross landed weight) in Alabama was estimated by regression model which correlated the national growth trend and the statewide socioeconomic trend to the historical growth of all-cargo carrier demand in Alabama. Three scenarios of the all-cargo carrier demand in BHM were developed based on different percentages share of BHM in Alabama with reference to the historical market share.

Second, the historical growth trends for the all-cargo carrier activities in BHM were analyzed and trend models were developed based on the historical growth rates. Another three scenarios of all-cargo carrier demand at BHM were projected based on the trend models.

The recommended forecast all-cargo carrier gross landed weight is the basis for the projection of all-cargo aircraft operations discussed in the next section.

The total air cargo throughput at BHM was then projected based on the historical proportion of the total air cargo tonnage recorded by the airport and the all-cargo gross landed weight recorded by the FAA for BHM.

2.5.2.1 All-Cargo Carrier Demand in Alabama

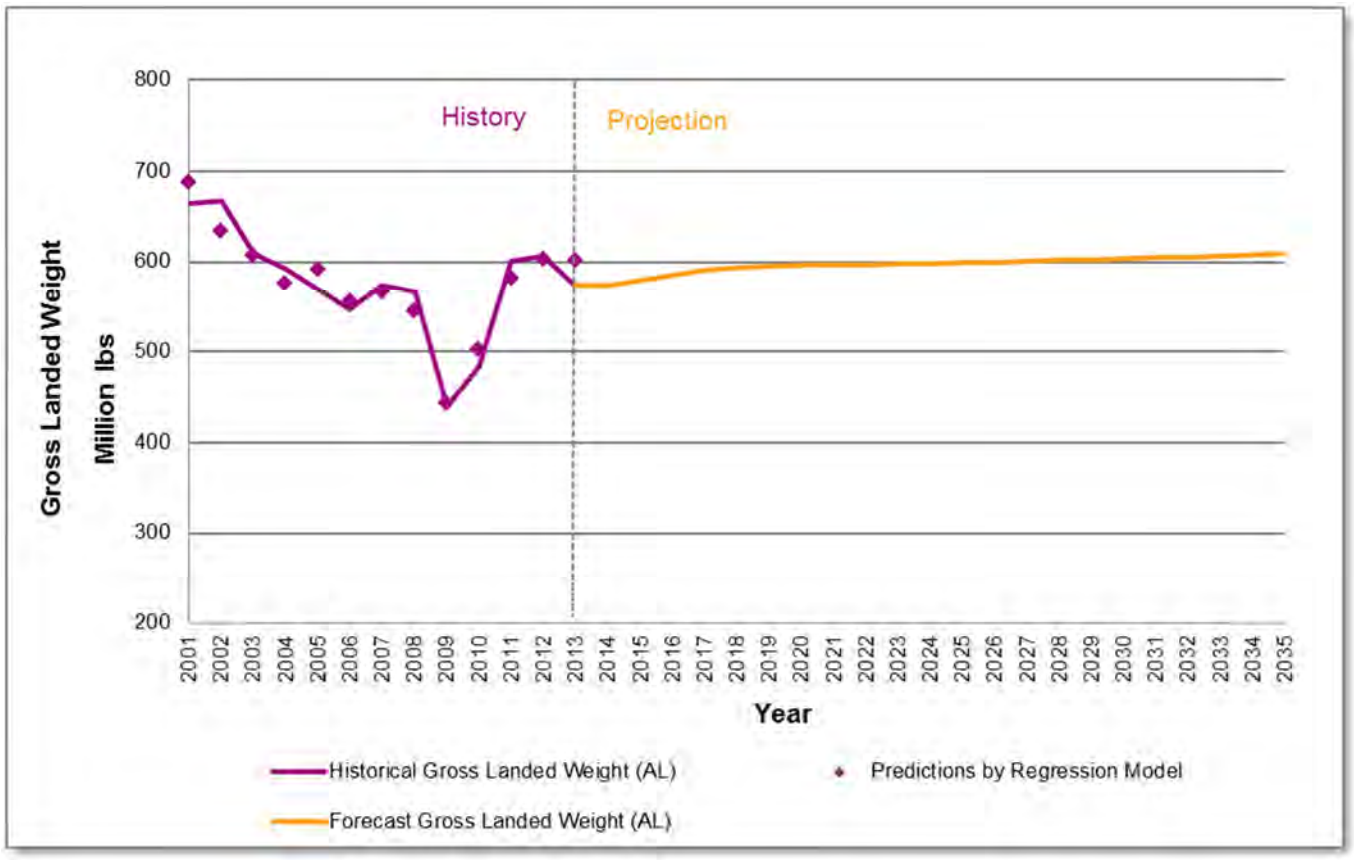
Correlations between historical all-cargo carrier gross landed weights in Alabama airports (combined BHM and HSV), statewide socioeconomic data and all-cargo carrier RTMs for all U.S. commercial air carriers were analyzed to find the highest relationship between the variables. Multiple linear regression analysis of the historical data from 2001 to 2013 demonstrated that there is a strong correlation of the all-cargo carrier gross landed weight in Alabama with respect to the per capita personal income in Alabama and the domestic all-cargo carrier RTMs for all U.S. commercial air carriers.

Dummy variables were included for unusual events that do not correlate to underlying socioeconomic and national trends. Dummy variables for the all-cargo demand regression model for Alabama included the impact of the 9-11 event, and the air cargo boom that occurred at HSV in 2011 for the significant expansion of service by Panalpina. The regression model also included a first-order autoregressive factor to account for serial correlation that is inherent in the time series data. The coefficient of determination (R2) for the regression analyses on all-cargo carrier gross landed weights in Alabama is 0.90, which represents a very high percent of variation in the dependent variables that are explained by the regression equation. The forecast all-cargo carrier demand in Alabama was then derived from the regression model based on the forecast statewide socioeconomic data and national all-cargo carrier RTMs up to 2035.

Forecast statewide per capita personal income was based on the projections from Woods & Poole Economics[10]. The forecast domestic all-cargo carrier RTMs for all U.S. commercial air carriers were based on the forecast from the FAA Aerospace forecast FY2014-2034 and extrapolated to 2035. The forecast of the all-cargo carrier gross landed weight in Alabama based on the regression model is given in **Figure 2-18**.

[10] Woods & Poole Economics' 2014 State Profile for Alabama.

FIGURE 2-18
ALABAMA ALL-CARGO CARRIER GROSS LANDED WEIGHTS



2.5.2.2 All-Cargo Carrier Demand in BHM

Three scenarios for the all-cargo carrier demand in BHM were developed with the regression model based on different percentages share of BHM in Alabama with reference to the historical market share:

- Scenario 1: The historical share of all-cargo carrier gross landed weight of BHM in Alabama increased from 25.49 percent in 2001 to 30.83 percent at an average annual compound growth rate of 1.6 percent. Scenario 1 projects the share of BHM in Alabama to grow at the same historical rate of 1.6 percent per year.

- Scenario 2: The percentage share all-cargo carrier gross landed weight of BHM in Alabama will grow slower than Scenario 1, at 0.8 percent per year.

- Scenario 3: The percentage share of all-cargo carrier gross landed weight of BHM in Alabama will maintain at the same level as 2013, at 30.83 percent of Alabama.

The forecast of the all-cargo carrier demand for BHM based on the regression model and Scenarios 1 to 3 are summarized in **Table 2-24** and **Figure 2-19**.

The historical growth trends for the all-cargo carrier gross landed weight in BHM were analyzed and three trend models were developed based on the historical growth rates.

- Scenario 4: The all-cargo carrier gross landed weight in BHM will grow at a similar rate as the growth occurred from 2001 to 2005, at 1.93 percent per year.

- Scenario 5: The all-cargo carrier gross landed weight in BHM will grow at a similar rate as the growth occurred from 2006 to 2008, at 2.64 percent per year.

- Scenario 6: The all-cargo carrier gross landed weight in BHM will grow at a similar rate as the recent growth occurred in 2012 to 2013, at 4.22 percent per year. The historical growth from 2009 to 2012 was much higher than other historical growth trends, at 8.26 percent per year, which was considered as a short-term rebound.

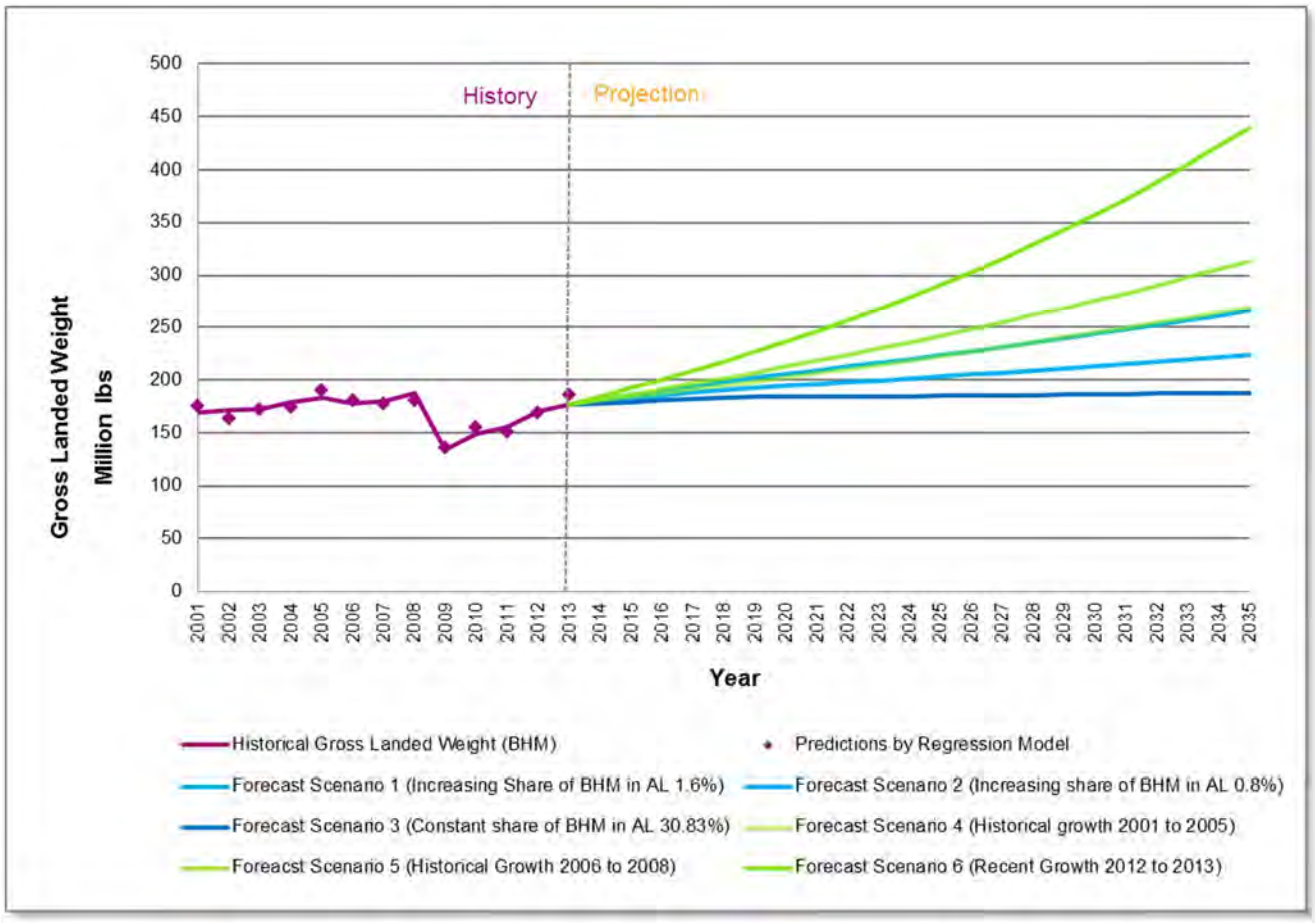
The forecast of the all-cargo carrier demand for BHM based on historical growth trends with three scenarios are presented in **Table 2-24** and **Figure 2-19**.

TABLE 2-24
ALL-CARGO CARRIER GROSS LANDED WEIGHT IN BHM BY REGRESSION AND TREND MODELS (THOUSANDS OF POUNDS)

Year	Actual	Regression Model			Trend Model		
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
	Actual						
2000	233,897						
2005	182,798						
2010	148,596						
2011	155,487						
2012	169,789						
2013	176,960						
	Forecast						
2014		179,924	178,510	177,097	180,370	181,631	184,435
2015		184,493	181,606	178,741	183,846	186,425	192,225
2020		205,470	194,432	183,907	202,255	212,362	236,400
2025		223,303	203,136	184,651	222,507	241,908	290,726
2030		243,677	213,097	186,157	244,787	275,564	357,536
2035		265,957	223,587	187,708	269,299	313,902	439,699
Period	Average Annual Compound Growth Rate (AAGR)						
2015-2020		2.18%	1.37%	0.57%	1.93%	2.64%	4.22%
2015-2025		1.93%	1.13%	0.33%	1.93%	2.64%	4.22%
2015-2035		1.85%	1.05%	0.25%	1.93%	2.64%	4.22%

Source:
1. FAA All-Cargo Data for U.S. Airports, accessed November 2014.
2. AECOM analysis.

FIGURE 2-19
BHM ALL-CARGO CARRIER GROSS LANDED WEIGHTS FORECAST



Source:
1. FAA All-Cargo Data for U.S. Airports, accessed November 2014.
2. AECOM analysis.

2.5.2.3 Recommended All-Cargo Carrier Demand Forecast for Master Plan

The six forecast scenarios, as presented in **Table 2-23** and **Figure 2-19**, represent a reasonable range of future all-cargo carrier demand at BHM, taking into considerations the national trend, regional socioeconomic growth, competitive market share, and historical trends. The projections from Scenarios 1 and 4 come up with very close future all-cargo carrier gross landed weight estimates at 266 million and 269 million pounds in 2035 and the average annual growth rates are 1.85 percent and 1.93 percent for the 20-year design period respectively.

Scenario 1 is within the middle range of the projections from different approaches and is derived from detailed analysis on national and statewide trends. The average annual growth rate in Scenario 1 at 1.85 percent is also very close to the historical growth trend experienced during 2001 and 2005 at 1.93 percent per year. For master planning purposes, Scenario 1 is recommended. The projections of all-cargo aircraft operations and the total air cargo tonnage at BHM are developed based on Scenario 1.

2.5.2.4 Air Cargo Throughput Forecast

Based on the historical proportion of total air cargo tonnage reported in the airport statistical data report and the all-cargo carrier gross landed weight recorded by the FAA, the future total air cargo tonnage at BHM was estimated as shown in **Table 2-24**. Although the total air cargo tonnage at BHM decreased from 44,897 tons in 2000 to 21,913 tons in 2013, the total air cargo tonnage was projected to increase modestly considering the steady growth trend of all-cargo carrier operations at BHM over the same period. The historical decline in air cargo was partly due to the decrease in belly cargo by passenger aircraft instead of dedicated all-cargo aircraft. This observation is consistent with the national trend as reported in the FAA Aerospace Forecast FY2014-2034, which indicated that the ratio of 70:30 between domestic all-cargo carrier RTMs and domestic passenger carrier RTMs in 2000 increased to 88.8:11.2 in 2013 for all U.S. commercial air carriers.

The projections for freight, express and mail to 2035 are summarized in **Table 2-25**. The projections are based on the historical proportion in 2013 and assumed the same for the 20-year planning period at 99.38 percent, 0.51 percent and 0.12 percent for freight, express, and mail respectively.

TABLE 2-25
AIR CARGO THROUGHPUT FORECAST

Year	Actual Total Air Cargo (tons)	Forecast			
		Total Air Cargo (tons)	Freight (tons)	Express (tons)	Mail (tons)
	Actual				
2000	44,897				
2005	33,656				
2010	27,546				
2011	25,496				
2012	25,243				
2013	21,913				
	Forecast				
2014		22,280	22,141	113	26
2015		22,846	22,704	116	26
2020		25,443	25,285	129	29
2025		27,651	27,479	140	32
2030		30,174	29,987	153	35
2035		32,933	32,728	167	38
Period	Average Annual Compound Growth Rate (AAGR)				
2015-2020		2.18%	2.18%	2.18%	2.18%
2015-2025		1.93%	1.93%	1.93%	1.93%
2015-2035		1.85%	1.85%	1.85%	1.85%

Source: Birmingham-Shuttlesworth International Airport Statistical Data Reports.

2.5.3 Aircraft Operations Forecast

Aircraft operations were projected separately for the four major categories of users including, commercial passenger airlines, commercial all-cargo carriers, general aviation, and military.

Commercial airline operations include operations by commercial air carriers certified under FAR Part 121 or 127 to conduct scheduled services on specific routes. These commercial air carriers include major and regional airlines as well as commuter air carrier. Commuter air carriers are those carriers that operate aircraft of 60 or fewer seats, or a maximum payload capacity of 18,000 pounds or less. These commuter air carriers hold a certificate issued under section 298C of the Federal Aviation Act. Some of the commuter air carriers hold certification under both FAR Part 121 and 135, while some of them may hold only FAR Part 135 certification if their fleet typically consist of small aircraft below 30-seat only. Air taxi refers to those air carriers that transport persons, property, and mail using small aircraft which are under 30 seats or a maximum payload capacity of 7,500 lb. Air taxi air carriers typically hold FAR Part 135 certification and provide on-demand services. For the purpose of master planning, commercial airline operations include the activities by commercial air carriers, including commuter air carriers with FAR Part 121 certification, which provide scheduled services on specific routes. These commercial air carriers may also provide non-scheduled or charter services as a secondary operation. Commercial air carriers include passenger airlines and all-cargo carriers, and the forecast of their annual operations are estimated separately. The air taxi operations are analyzed together with the general aviation activities. The approach and methodologies are detailed in the following sections.

2.5.3.1 Passenger Aircraft Operations

Passenger aircraft operations were estimated from the enplaned passenger forecasts. The aggregate number of commercial operations at an airport depends on three main factors: total passengers, average aircraft size (seat capacity), and average load factor. The number of operations was derived by total passengers divided by the multiple of average seat capacity and average load factor. Total passengers include both enplaned and deplaned passengers. BHM focuses on origin-destination (OD) markets and the total passengers forecast are projected to be twice of the enplanements forecast.

Passenger aircraft operations were further divided into mainline air carrier operations and regional air carrier (commuter) operations base on their difference in average aircraft size (seat capacity).

Analysis of historical commercial airline activity at BHM shows that the regional air carriers grow faster than the mainline air carriers. The percentage market share by passengers of regional air carriers increased from 7.2 percent in 2000 to 32.3 percent in 2013. The future market share of passengers by regional air carriers is projected to increase from 32.3 percent to 40 percent in 2035 and the total regional air carrier enplanement average growth rate is 2.12 percent per year at BHM, which is in consistent with the growth rate projected by FAA Aerospace Forecast FY2014-2034 for U.S. regional carriers. The future market share of mainline air carrier passengers was projected to decrease from 67.7 percent in 2013 to 60 percent in 2035.

The regional air carrier passengers were further divided into two groups: one group represents regional air carriers similar to ExpressJet and PSA with average seats per departure of approximately 50 seats, and another group represents those similar to Mesa with average seats per departure close to approximately 80 seats. It was assumed that consolidation among regional carriers and high fuel prices would continue to spur retirements of 50-seat and smaller regional jet. The percentage of larger regional jets with 70 to 90 seats will increase. The forecast enplaned passengers for each group are summarized in **Table 2-26**.

TABLE 2-26
FORECAST ENPLANED PASSENGERS FOR MAINLINE AND REGIONAL AIR CARRIERS

Year	Total Enplanements	Mainline Air Carrier Enplanements	Regional Air Carrier Enplanements		
			Regional Air Carrier with average seat capacity of approximately 50 seats	Regional Air Carrier with average seat capacity of approximate 80 seats	Total Regional Air Carrier
2015	1,259,901	843,843	336,181	79,876	416,058
2020	1,400,870	913,953	384,986	101,931	486,917
2025	1,520,554	966,336	427,237	126,981	554,218
2030	1,653,020	1,023,305	471,283	158,432	629,715
2035	1,793,874	1,076,324	520,223	197,326	717,550
Period	**Average Annual Compound Growth Rate (AAGR)**				
2015-2020	2.14%	1.61%	2.75%	5.00%	3.20%
2015-2025	1.90%	1.36%	2.43%	4.74%	2.91%
2015-2035	1.78%	1.22%	2.21%	4.63%	2.76%

Note: Numbers may not add up due to rounding.

Tables 2-27 and **2-28** summarize the projected load factor and average seat per departure for each group of enplaned passengers. The increase in average load factor for mainline air carriers makes reference to the national trend for domestic U.S. mainline air carriers average load factors[11], which increases by 1.9 percent from 84.2 percent in 2013 to 85.8 percent in 2034. The average load factor for mainline air carriers at BHM was projected to increase similarly from 72.4 percent in 2013 to 73.8 percent. The average load factor for regional air carrier is assumed to increase slightly to 83.1 percent and 76 percent in 2035 for regional jets with average seat capacity of 50s and 80s respectively, which is similar to the increase for domestic U.S. regional air carriers[12].

[11] FAA Aerospace Forecast FY2014-2034.
[12] Ibid.

The FAA projected the average aircraft size for the mainline air carriers will increase by 7.5 seats between 2013 and 2034, going from 153.9 to 164.4. The average seats per departure for mainline air carrier at BHM are projected to increase similar from 142 in 2013 to 149.5 in 2035. The FAA estimated the average seats per aircraft for regional carriers increase an average of 0.5 seats per year to 66.6 seats in 2034[13], which takes into account the retirements of 50-seat jet and small turboprop over the coming years. Since the regional air carrier enplanements at BHM are subdivided into two groups based on seat capacities, the shift from 50-seat regional jets to 70 to 90-seat regional jets have been included in the percentage share of enplanements shown in **Table 2-26**. The average seats per departure for regional air carriers at BHM is projected to increase an average of 0.1 seats per year to 56.2 and 82.3 for the two groups regional air carriers respectively as shown in **Table 2-27**.

TABLE 2-27
AIRCRAFT LOAD FACTOR ASSUMPTIONS

Year	Mainline Air Carrier Average Load Factor	Regional Air Carrier Average Load Factor	
		Regional Air Carrier with average seat capacity of 50s	Regional Air Carrier with average seat capacity of 80s
2015	72.6%	83.0%	75.9%
2020	72.9%	83.0%	75.9%
2025	73.2%	83.1%	76.0%
2030	73.5%	83.1%	76.0%
2035	73.8%	83.1%	76.0%

TABLE 2-28
AIRCRAFT AVERAGE SEATS PER DEPARTURE ASSUMPTIONS

Year	Mainline Air Carrier Average Seats per Departure	Regional Air Carrier Average Seats per Departure	
		Regional Air Carrier with average seat capacity of 50s	Regional Air Carrier with average seat capacity of 80s
2015	143.0	54.2	80.2
2020	144.6	54.7	80.7
2025	146.2	55.2	81.2
2030	147.8	55.7	81.7
2035	149.5	56.2	82.2

[13] Ibid

Table 2-29 presents the passenger aircraft operations forecast for BHM.

TABLE 2-29
PASSENGER AIRCRAFT OPERATIONS FORECAST

Year	Mainline Air Carrier Operations	Regional Air Carrier Operations	
		Regional Air Carrier with average seat capacity of approximately 50 seats	Regional Air Carrier with average seat capacity of approximately 80 seats
2015	16,265	14,944	2,624
2020	17,348	16,952	3,327
2025	18,063	18,637	4,118
2030	18,837	20,369	5,105
2035	19,511	22,278	6,317

2.5.3.2 All-Cargo Aircraft Operations

The forecast of all-cargo carrier gross landed weight was used to derive the operations forecast, based on the all-cargo aircraft fleet mix at BHM and their certificated maximum gross landed weight as specified by the aircraft manufacturer. Historic all-cargo operations by aircraft type were analyzed to understand the fleet mix of the all-cargo operators at BHM.

Table 2-30 summarizes the fleet mix for the two major all-cargo operators with scheduled all-cargo services at BHM in 2013. FedEx flies most of their scheduled all-cargo flights with Boeing 757-200s (over 70 percent) and some with smaller aircraft like Beechcraft Beech 18 C-185s (over 20 percent) in BHM. UPS flies mostly with their Airbus 300-600s (over 90 percent) in BHM. Overall, the approximate percentage of all-cargo operations by B757-200s is 45 percent, by A300-600 is 40 percent, by Beechcraft 18C-185s is 14 percent, and by the largest aircraft B767-300 is 1 percent. It was projected that the proportion of the all-cargo fleet mix will remain the same through 2035. The critical aircraft is at least as large as the B767-300. The overall weighted average of maximum landed weight for all-cargo aircraft is approximately 220,110 pounds.

The all-cargo operation forecast is presented in **Table 2-31**. All-cargo operations in BHM were projected to increase from 1,676 in 2015 to 2,417 in 2035.

TABLE 2-30
ALL-CARGO FLEET MIX

All-Cargo Fleet Mix by Carrier	
Federal Express (FedEx)	**United Parcel Service (UPS)**
Airbus A300-600/R/CF/RCF	Airbus A300-600/R/CF/RCF
Beechcraft Beech 18 C-185	Boeing 757-200
Boeing 727-200/231A	Boeing 767-300/300ER
Boeing 757-200	McDonnell Douglas MD-11
Cessna 208 Caravan	
McDonnell Douglas MD-11	

All-Cargo Fleet Mix by Major Aircraft Model		
Aircraft Model (Note 1)	**Approximate Percentage by Operations**	**Approximate Maximum Landed Weight (lbs)**
Airbus A300-600/R/CF/RCF	40%	315,000
Beechcraft Beech 18 C-185	14%	12,500
Boeing 757-200	45%	198,000
Boeing 767-300/300ER	1%	326,000

Note: The percentages for Boeing 727-200/231A, Cessna 208 Caravan and McDonnell Douglas MD-11 are less than 1 percent each.

TABLE 2-31
FORECAST ALL-CARGO AIRCRAFT OPERATIONS

Year	All-Cargo Operations
2015	1,676
2020	1,867
2025	2,029
2030	2,214
2035	2,417

2.5.3.3 General Aviation, Air Taxi, and Military Operations

This section summarizes the general aviation forecast. General aviation is the operation of civilian aircraft for purposes other than commercial passenger or freight transport, including personal, business and instructional flying[14]. The commercial operations of commuters or regional airlines are excluded from the general aviation category but operations of non-commercial air taxi which typically hold FAR Part 135 certification and provide on-demand services by aircraft with 60 or fewer seats are included in the analysis of this section.

[14] General Aviation Airports: A National Asset, FAA, May 2012.

Historical aircraft operation data is based on the BHM Airport Statistical Data Reports which include data as reported by the FAA Airport Traffic Control Tower. A reconciliation and comparison of the operations recorded by the Airport Statistical Data Reports and the U.S. DOT T-100 database was conducted to estimate the air taxi operations that are non-commercial. The U.S. DOT collects data from commercial airlines including commuters and regional airlines. The estimated non-commercial air taxi operations in 2013 is 11,462 operations and it was projected to increase to 19,313 operations at an annual growth rate of 2.4 percent from 2013 to 2034, which made reference to the FAA projected growth of turbo prop and turbo jet air taxi aircraft in the FAA Aerospace Forecast 2014-2034.

Even though the general aviation activities at BHM declined steadily over the years with the increase in fuel prices, two recessions since 2000 and followed by slow recovery of the U.S. economy, the long term outlook for general aviation is favorable. It is anticipated that the growth in business aviation demand will be driven by a growing U.S. economy, especially in the turbo jet, turboprop, and turbine rotorcraft markets, and will continue to grow over the long term. The projected growth rates from the FAA Aerospace Forecast FY2014-2034 for the general aviation activities in the national system and from the FAA TAF are reviewed. For master planning purposes, the itinerant general aviation operations are projected to grow modestly at 0.91 percent per year and the local general aviation operations will remain at the same level as 2013. The overall general aviation operations will increase from 39,243 operations in 2013 to 47,756 operations in 2035 at an average annual growth rate of 0.9 percent.

Military activity varies with many unpredictable factors such as the political climate and variation in government funding on military activities. Without any specific information from the military, it is recommended to assume the military activity will remain constant throughout the planning period for BHM. The number of annual military operations at BHM is projected to maintain at the same level of 5,804 operations as recorded in 2013.

The general aviation, air taxi, and military operations forecast are shown in **Table 2-31**.

2.5.3.4 Recommended Aircraft Operations Forecast

Table 2-32 summarizes the aircraft operation forecast for BHM. Graphical presentation of the total aircraft operations for BHM is given in **Figure 2-20**.

Air carrier operations include the operations by mainline passenger airlines, all-cargo operators, and a portion of regional passenger airlines (aircraft with more than 60 seats). Air taxi/commuter operations include operations by the remaining portion of regional passenger airlines (aircraft with 60 or fewer seats) and the on-demand air taxi operations discussed above. The proportion of regional air carrier operations to be included under air carrier operations is based on the size of aircraft. It is estimated that an increasing percentage of the fleet mix by ExpressJet and PSA will be over 60 seats as a result of the retirement of their 50-seat Canadair RJ-200ER /RJ-440 and Embraer-145 in the future and replace with 70 to 90-seat models. Mesa Airlines' aircraft are all larger than 60 seats and their operations are under the air carrier category.

A comparison with FAA TAF total operations is included in **Table 2-33** and **Figure 2-20**.

As shown in **Table 2-33**, the forecast total operations for the BHM master plan differ from the FAA TAF by -2.99 percent (i.e. less than 10 percent) in the 5-year forecast period, -1.49 percent (i.e. less than 15 percent) in the 10-year forecast period, and 1.81 percent in the 20-year forecast period.

The total operations forecast from the previous Airport Master Plan 2002 are shown in **Figure 2-20** as reference. **Figure 2-21** presents the total operations for each type of aircraft graphically.

FIGURE 2-20
TOTAL OPERATIONS FORECAST

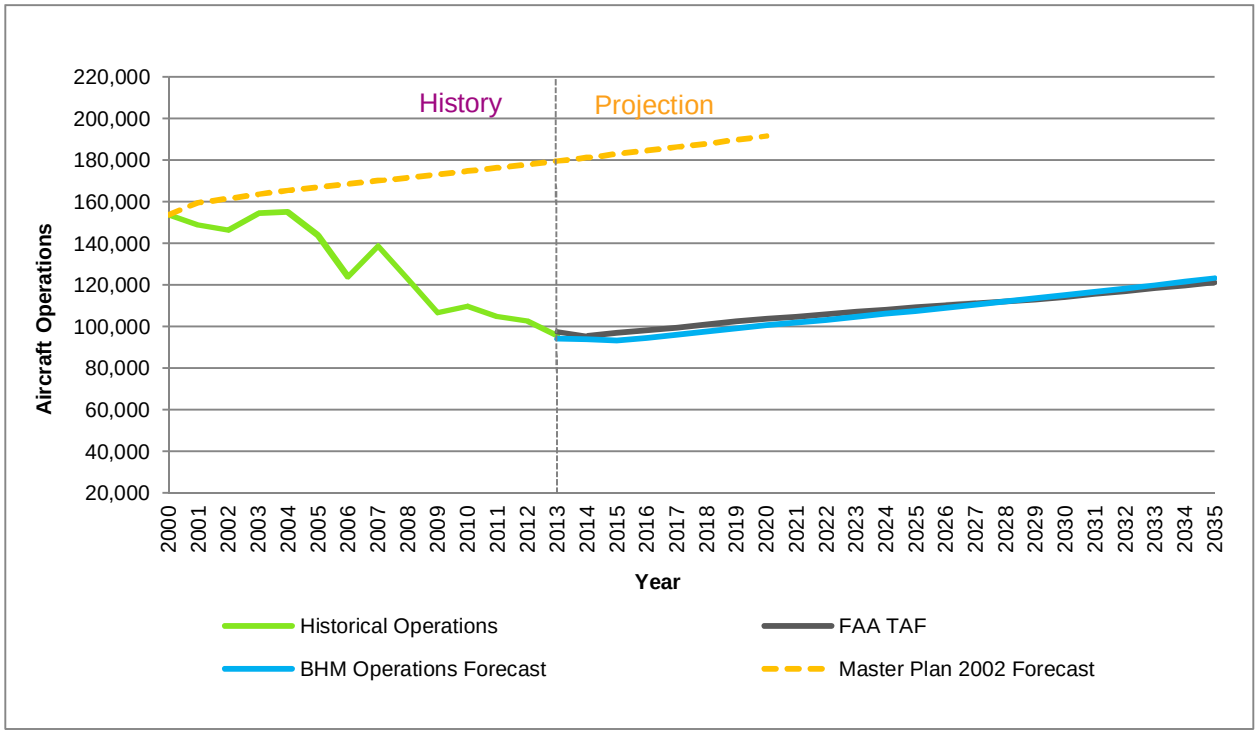


TABLE 2-32
AIRCRAFT OPERATIONS FORECAST

Year	Air Carrier	Air Taxi	General Aviation (Local)	General Aviation (Itinerant)	Military	Total Operations
	Actual					
2000	30,165	40,026	6,050	66,318	11,358	153,917
2005	36,573	37,093	3,536	61,186	5,790	144,178
2010	29,460	33,629	363	41,146	5,269	109,867
2011	31,288	26,916	430	41,099	5,131	104,864
2012	30,424	25,873	618	39,927	5,902	102,744
2013	25,742	24,954	527	38,707	5,804	95,734
	Forecast					
2014	23,071	25,533	527	39,059	5,804	93,994
2015	22,349	25,179	527	39,414	5,804	93,273
2020	25,691	27,336	527	41,237	5,804	100,594
2025	29,597	28,486	527	43,145	5,804	107,559
2030	35,318	28,361	527	45,141	5,804	115,150
2035	43,840	25,997	527	47,229	5,804	123,396
Period	Average Annual Compound Growth Rate (AAGR)					
2015-2020	2.83%	1.66%	0%	0.91%	0%	1.52%
2015-2025	2.85%	1.24%	0%	0.91%	0%	1.44%
2015-2035	3.43%	0.16%	0%	0.91%	0%	1.41%

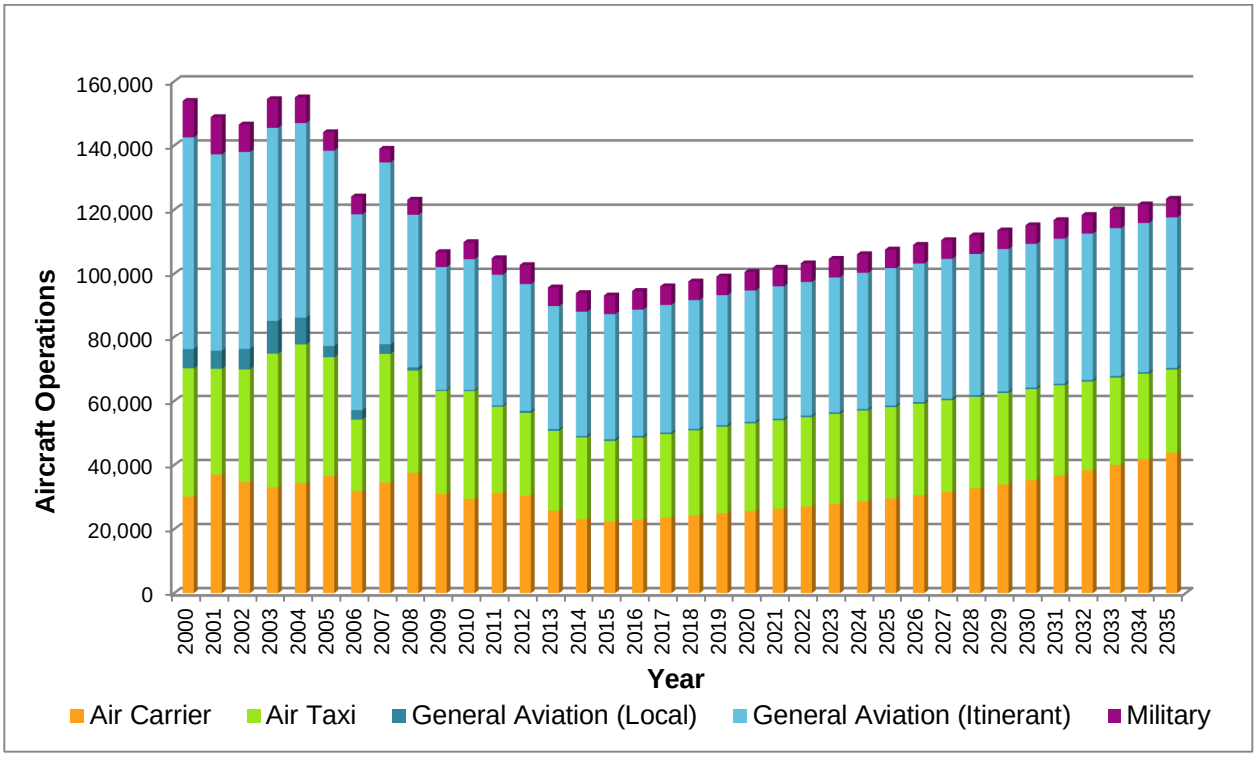
Note: Numbers may not add up due to rounding.

TABLE 2-33
COMPARISON OF TOTAL OPERATIONS FORECAST AND FAA TAF

Year	Forecast Total Operations	FAA TAF Total Operations	Percentage Difference
2015	93,273	96,970	-3.81%
2020	100,594	103,692	-2.99%
2025	107,559	109,184	-1.49%
2030	115,150	114,285	0.76%
2035	123,396	121,205	1.81%
Period	Average Annual Compound Growth Rate (AAGR)		
2015-2020	1.52%	1.35%	
2015-2025	1.44%	1.19%	
2015-2035	1.41%	1.12%	

Source: FAA TAF, issue February 2014. AECOM analysis.

FIGURE 2-21
AIRCRAFT OPERATIONS FORECAST



2.5.4 Based Aircraft Forecast

As noted previously in the general aviation demand forecast for BHM, the long term outlook for general aviation is favorable. It is anticipated that the growth in business aviation demand will be driven by a growing U.S. economy, especially in the turbo jet, turboprop, and turbine rotorcraft markets, and will continue to grow over the long-term. Furthermore, the changes in industrial and commercial characteristics in the airport service region from primarily heavy industries to a combination of health and other service industries are anticipated to generate growth in the based aircraft. The historical trend indicated that the growth in based aircraft in BHM is recovering since 2011.

The based single-engine aircraft is projected to follow the historic trend from 2000 to 2013, and continue to grow at approximately 1.01 percent per year over the 20-year planning period to 102 numbers by 2035. Both the jet and multi-engine aircraft are projected to grow similar to the active turbine fixed wings growth nationwide at approximately 2.4 percent per year based on the FAA Aerospace Forecast FY2014-2034. Based jet and multi-engine aircraft are projected to increase to 142 and 113 by 2035 respectively. Based helicopter is estimated to continue the historic growth at 1.19 percent per year and increases slightly to 9 numbers by 2035. The 14 based aircraft under the other category are military aircraft and they are projected to maintain at the same level as 2013.

Table 2-34, **Figures 2-22,** and **2-23** present the based aircraft forecast. **Table 2-35** summarizes the comparison of the total base aircraft forecast with the FAA TAF. The based aircraft forecast from the previous Airport Master Plan 2002 is included in **Figure 2-22** for reference.

TABLE 2-34
BASED AIRCRAFT FORECAST

Year	Single-Engine	Multi-Engine	Jet	Helicopter	Other	Total
	Actual					
2000	72	54	76	6	47	255
2005	93	38	87	4	28	250
2010	93	61	76	3	0	233
2011	77	51	70	4	0	202
2012	75	36	77	4	12	204
2013	82	67	84	7	14	254
	Forecast					
2014	83	69	86	7	14	259
2015	84	70	88	7	14	263
2020	88	79	99	8	14	288
2025	92	89	112	8	14	315
2030	97	100	126	9	14	346
2035	102	113	142	9	14	380
Period	Average Annual Compound Growth Rate (AAGR)					
2015-2020	1.01%	2.40%	2.40%	1.19%	0.00%	1.81%
2015-2025	1.01%	2.40%	2.40%	1.19%	0.00%	1.82%
2015-2035	1.01%	2.40%	2.40%	1.19%	0.00%	1.85%

Note: Numbers may not add up due to rounding.

TABLE 2-35
COMPARISON OF TOTAL BASED AIRCRAFT FORECAST AND FAA TAF

Year	Forecast Total Based Aircraft	FAA TAF Total Based Aircraft	Percentage Difference
2015	263	252	4.37%
2020	288	284	1.41%
2025	315	314	0.32%
2030	346	347	-0.29%
2035	380	382	-0.52%
Period	Average Annual Compound Growth Rate (AAGR)		
2015-2020	1.81%	2.42%	
2015-2025	1.82%	2.22%	
2015-2035	1.85%	2.10%	

Source: FAA TAF, issue January 2015. AECOM analysis.

FIGURE 2-22
TOTAL BASED AIRCRAFT FORECAST

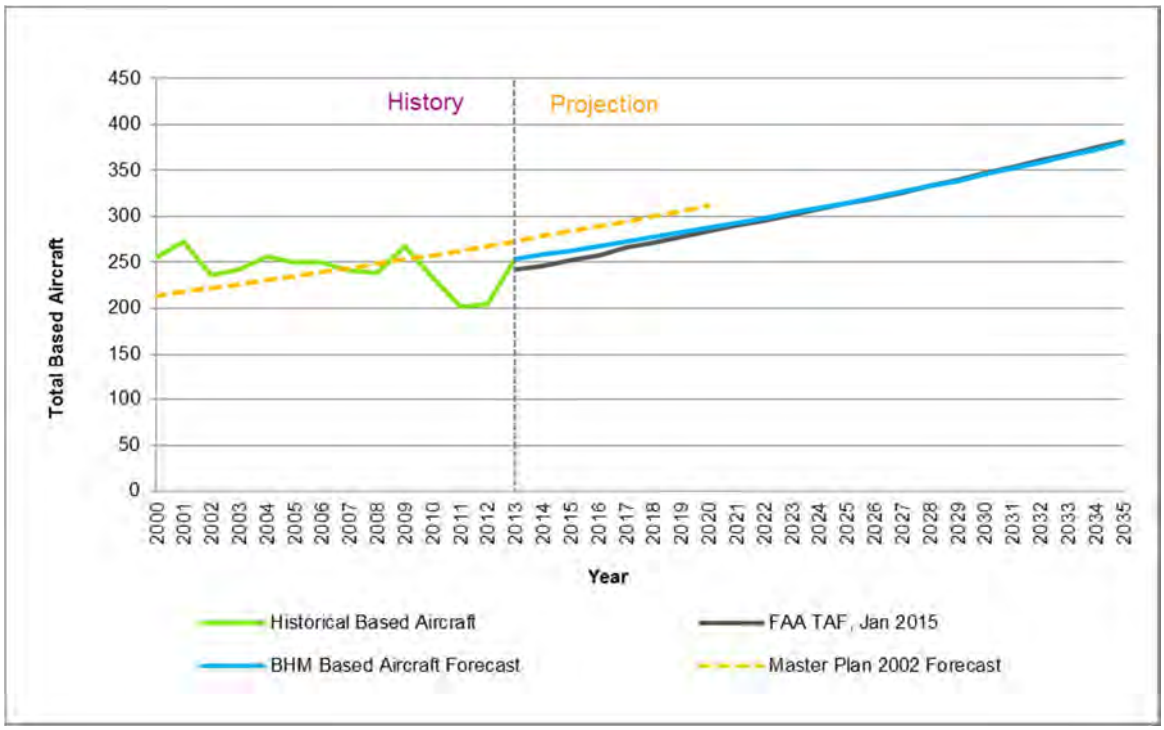
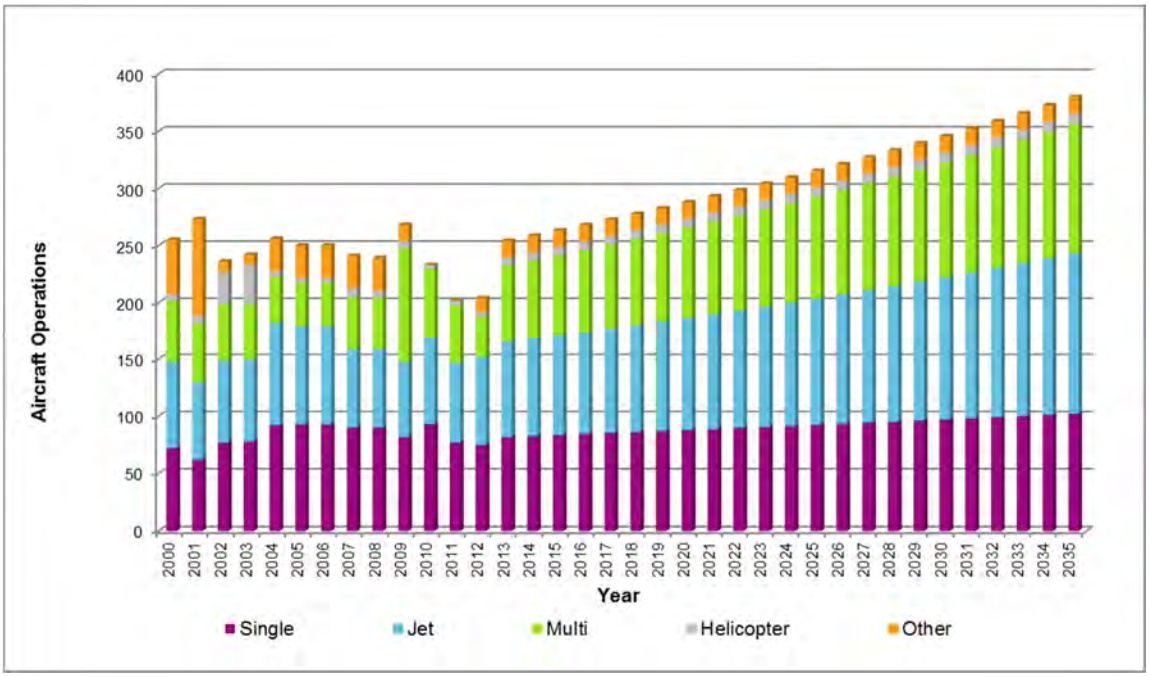


FIGURE 2-23
BASED AIRCRAFT FORECAST



2.5.5 Peak Period Forecasts

While the overall forecasts span the timeframe of a year, peak period forecasts analyze those forecasts in more specific timeframes. Peaking activity can be critical to determining certain facility and equipment requirements at the Airport.

The key elements of peaking forecasts are the peak month, design day, and design hour. The peak month is the month with the most operations or enplanements over the course of the year. The design day is the average day within the peak month. The design hour is the hour with the most operations or enplanements during the design day.

2.5.5.1 Peak Operations Forecasts

Monthly operations data was obtained from the BHM Statistical Data Reports and analyzed for the years 2011 through 2013 as shown below in **Table 2-36.**

TABLE 2-36
HISTORICAL PEAK MONTH AIRCRAFT OPERATIONS

Month	2013 Aircraft Operations	% Annual	2012 Aircraft Operations	% Annual	2011 Aircraft Operations	% Annual
January	7,264	7.59%	7,823	7.65%	8,423	8.10%
February	7,400	7.73%	7,823	7.65%	8,423	8.10%
March	8,333	8.70%	7,982	7.80%	8,423	8.10%
April	8,343	8.71%	8,626	8.43%	8,423	8.10%
May	8,587	8.97%	9,441	9.23%	9,330	8.97%
June	8,035	8.39%	9,016	8.81%	9,342	8.98%
July	7,984	8.34%	8,779	8.58%	8,883	8.54%
August	8,172	8.34%	8,883	8.68%	8,513	8.18%
September	8,032	8.39%	8,883	8.68%	8,468	8.14%
October	8,747	9.14%	9,304	9.09%	9,356	8.99%
November	7,704	8.05%	8,406	8.22%	8,543	8.21%
December	7,133	7.45%	7,359	7.19%	7,897	7.59%
TOTAL	95,734	100.00%	102,325	100.00%	104,024	100.00%

Source: Birmingham-Shuttlesworth International Airport Statistical Data Reports (Aircraft operations reported by the FAA Air Traffic Control Tower)

The peak months were October at 9.14% for 2013, May at 9.23% for 2012, and October at 8.99% for 2011. The average of these three percentages is 9.12%, which is then applied to the forecasted operations to calculate forecasted peak month operations. The resulting number is then divided by the number of days in the peak month (31) to calculate the design day. Additional data from the Airport's Passur system indicated that the average number of operations during the peak hour for the month of October 2013 was 10.85% of the daily operations. This percentage is applied to the design day operations to calculate forecast peak hour operations.

Table 2-37 presents the peak period operations forecasts using the above described method.

TABLE 2-37
PEAK AIRCRAFT OPERATIONS FORECASTS

Year	Total Operations	Peak Month %	Peak Month Operations	Design Day Operations	Peak Hour %	Peak Hour Operations
2014	93,944	9.12%	8,568	276	10.85%	30
2015	93,273	9.12%	8,506	274	10.85%	30
2020	100,594	9.12%	9,174	296	10.85%	32
2025	107,559	9.12%	9,809	316	10.85%	34
2030	115,150	9.12%	10,502	339	10.85%	37
2035	123,396	9.12%	11,254	363	10.85%	39
Period	**Average Annual Compound Growth Rate (AAGR)**					
2015-2020	1.52%		1.52%	1.56%		1.31%
2015-2025	1.44%		1.44%	1.44%		1.26%
2015-2035	1.41%		1.41%	1.42%		1.32%

Note: Rounded up to nearest whole number

2.5.5.2 Peak Enplanements Forecasts

Monthly enplanement data was obtained from the BHM Statistical Data Reports and analyzed for the years 2011 through 2013, as shown in **Table 2-38.**

TABLE 2-38
HISTORICAL PEAK MONTH ENPLANEMENTS

Month	2013 Aircraft Operations	% Annual	2012 Aircraft Operations	% Annual	2011 Aircraft Operations	% Annual
January	99,957	7.44%	102,965	7.18%	105,501	7.26%
February	95,673	7.13%	102,785	7.16%	97,299	6.69%
March	116,155	8.65%	122,145	8.51%	121,684	8.37%
April	113,464	8.45%	115,135	8.03%	116,606	8.02%
May	131,902	9.82%	134,786	9.40%	134,784	9.27%
June	112,987	8.42%	127,583	8.89%	132,668	9.13%
July	116,932	8.71%	129,129	9.00%	132,398	9.11%
August	109,378	8.15%	124,136	8.65%	118,229	8.13%
September	105,961	7.89%	113,098	7.88%	115,849	7.97%
October	121,946	9.08%	128,588	8.96%	131,222	9.03%
November	107,725	8.02%	122,114	8.51%	123,634	8.51%
December	110,531	8.23%	112,158	7.82%	123,655	8.51%
TOTAL	1,342,611	100.00%	1,434,622	100.00%	1,453,529	100.00%

Source: Birmingham-Shuttlesworth International Airport Statistical Data Reports (Aircraft operations reported by the FAA Air Traffic Control Tower)

The peak months were May at 9.82% for 2013, May at 9.40% for 2012, and May at 9.27% for 2011. The average of these three percentages is 9.50%, which is then applied to the forecasted enplanements. The resulting number is then divided by the number of days in the peak month (31) to calculate the design day. An assumption of 15% was used to calculate peak hour enplanements; this percentage is applied to the design day enplanements to calculate the design hour enplanements.

Table 2-39 presents the peak period enplanements forecasts using the above described method.

TABLE 2-39
PEAK ENPLANEMENTS FORECASTS

Year	Total Enplanements	Peak Month %	Peak Month Enplanements	Design Day Enplanements	Peak Hour %	Peak Hour Enplanements
2014	1,231,812	9.50%	117,022	3,775	15%	566
2015	1,259,901	9.50%	119,691	3,861	15%	579
2020	1,400,870	9.50%	133,083	4,293	15%	644
2025	1,520,554	9.50%	144,453	4,660	15%	699
2030	1,653,020	9.50%	157,037	5,066	15%	760
2035	1,793,874	9.50%	170,418	5,497	15%	825
Period	**Average Annual Compound Growth Rate (AAGR)**					
2015-2020	2.14%		2.14%	2.14%		2.15%
2015-2025	1.90%		1.90%	1.90%		1.90%
2015-2035	1.78%		1.78%	1.78%		1.79%

2.5.6 Instrument Operations Forecast

During inclement weather (i.e., instrument meteorological conditions, or IMC), aircraft navigation is accomplished solely by reference to on-board instruments, and separation from other aircraft is mostly provided by Air Traffic Control using radar surveillance. Separation between aircraft is increased during IMC which reduces the volume of aircraft that can be accommodated by the runway and taxiway system. Forecasts of instrument operations factor prominently in the need for and timing of airport capacity improvements, sufficiency of navigational and weather instrumentation, and adequacy of lighting/visual aids.

This section differentiates actual instrument conditions (IMC) from operations that are conducted in accordance with instrument flight rules (IFR) which are often conducted during visual conditions and apply more closely spaced visual separation standards. Weather reports indicate that BHM experiences IMC conditions and traffic flow patterns about five percent of the time. As shown in **Table 2-40** BHM's IFR operations account for approximately 87% of traffic.

TABLE 2-40
HISTORICAL TOWER IFR OPERATIONS

Year	Total Operations	Instrument Operations	Instrument Operations %
2004	150,996	124,244	82.28%
2005	148,862	129,092	86.72%
2006	140,477	120,203	85.57%
2007	138,637	119,786	86.40%
2008	126,258	111,113	88.00%
2009	106,886	102,385	95.79%
2010	109,915	96,097	87.43%
2011	105,624	91,339	86.48%
2012	103,098	88,888	86.22%
2013	96,091	83,532	86.93%

Source: FAA OPSNET Records

Since IFR operations still occur under VFR conditions, IMC operations were calculated by applying the weather-based IMC percentage of 5.66% to total operations. Instrument operations are most indicative of the operating needs required by the carriers while IMC operations relates primarily to the throughput capacity of the airport. A comparison of IFR and IMC operations are included in **Table 2-41**.

TABLE 2-41
INSTRUMENT OPERATIONS FORECAST

Year	Total Operations	IFR Operations %	IFR Operations	IMC %	IMC Operations
2014	93,944	87.18%	81,900	5.66%	5,317
2015	93,273	87.18%	81,315	5.66%	5,279
2020	100,594	87.18%	87,698	5.66%	5,694
2025	107,559	87.18%	93,770	5.66%	6,088
2030	115,150	87.18%	100,388	5.66%	6,517
2035	123,396	87.18%	107,577	5.66%	6,894
Period	**Average Annual Compound Growth Rate (AAGR)**				
2015-2020	1.52%		1.52%		1.53%
2015-2025	1.44%		1.44%		1.44%
2015-2035	1.41%		1.41%		1.34%

2.6 Forecast Aviation Demand Summary

While passenger and aircraft activity has varied in the past, the forecasts for Birmingham-Shuttlesworth International Airport project growth over the next 20 years. A summary of forecasted demand at BHM is shown in **Table 2-42** and comparison to the FAA TAF is shown in **Table 2-43.**

TABLE 2-42
FORECAST SUMMARY TABLE

	Year						Average Compound Annual Growth Rate		
	2014	2015	2020	2025	2030	2035	2015-2020	2015-2025	2015-2035
A. Forecast Levels and Growth Rates									
Passenger Enplanements	1,231,812	1,259,901	1,400,870	1,520,554	1,653,020	1,793,874	2.14%	1.90%	1.78%
Operations									
Itinerant									
Air Carrier	23,071	22,349	25,691	29,597	35,318	43,840	2.83%	2.85%	3.43%
Commuter/Air Taxi	25,533	25,179	27,336	28,486	28,361	25,997	1.66%	1.24%	0.16%
Total Commercial Operations	48,604	47,528	53,027	58,083	63,679	69,837	2.21%	2.03%	1.94%
General Aviation	39,059	39,414	41,237	43,145	45,141	47,229	0.91%	0.91%	0.91%
Military	5,804	5,804	5,804	5,804	5,804	5,804	0.00%	0.00%	0.00%
Local									
General Aviation	527	527	527	527	527	527	0.00%	0.00%	0.00%
Military	0	0	0	0	0	0	0.00%	0.00%	0.00%
TOTAL OPERATIONS	93,944	93,273	100,594	107,559	115,150	123,396	1.52%	1.44%	1.41%
Cargo/mail (enplaned+deplaned tons)	22,280	22,846	25,443	27,651	30,174	32,933	2.18%	1.93%	1.85%
Based Aircraft									
Single Engine	83	84	88	92	97	102	1.01%	1.01%	1.01%
Multi Engine	69	70	79	89	100	113	2.40%	2.40%	2.40%
Jet	86	88	99	112	126	142	2.40%	2.40%	2.40%
Helicopter	7	7	8	8	9	9	1.19%	1.19%	1.19%
Other	14	14	14	14	14	14	0.00%	0.00%	0.00%
TOTAL BASED AIRCRAFT	259	263	288	315	346	380	1.81%	1.82%	1.85%
B. Operational Factors									
Average Aircraft size (seats)									
Mainline Air Carrier		143.0	144.6	146.2	147.8	149.5			
Regional with Capacity in 50s		54.2	54.7	55.2	55.7	56.2			
Regional with Capacity in 80s		80.2	80.7	81.2	81.7	82.2			
Average Enplaning Load Factor									
Mainline Air Carrier		72.6%	72.9%	73.2%	73.5%	73.8%			
Regional with Capacity in 50s		83.0%	83.0%	83.1%	83.1%	83.1%			
Regional with Capacity in 80s		75.9%	75.9%	76.0%	76.0%	76.0%			
GA Operations per Based Aircraft	153	152	145	139	132	126			
C. Peaking Characteristics									
Peak Hour Operations	30	30	32	34	37	39	1.31%	1.26%	1.32%
Peak Hour Enplanements	566	579	644	699	760	825	2.15%	1.90%	1.79%
D. Instrument Operations									
IFR Operations	81,900	81,315	87,698	93,770	100,388	107,577	1.52%	1.44%	1.41%
IMC Operations	5,317	5,279	5,694	6,088	6,517	6,894	1.53%	1.44%	1.34%

Note: Numbers may not add up due to rounding.

TABLE 2-43
FAA TAF COMPARISON

	Year	Airport Forecast	TAF	AF/TAF (% Difference)
Passenger Enplanements	2014	1,231,812	1,231,812	0.00%
	2015	1,259,901	1,259,901	0.00%
	2020	1,400,870	1,400,870	0.00%
	2025	1,520,554	1,520,554	0.00%
	2030	1,653,020	1,653,020	0.00%
	2035	1,793,874	1,793,874	0.00%
Commercial Operations	2014	48,604	50,567	-4.04%
	2015	47,528	51,667	-8.71%
	2020	53,027	56,594	-6.73%
	2025	58,083	60,210	-3.66%
	2030	63,679	63,348	0.52%
	2035	69,837	68,212	2.38%
Total Operations	2014	93,944	95,611	-1.77%
	2015	93,273	96,970	-3.96%
	2020	100,594	103,692	-3.08%
	2025	107,559	109,184	-1.51%
	2030	115,150	114,285	0.76%
	2035	123,396	121,205	1.81%
Total Based Aircraft	2014	259	246	5.28%
	2015	263	252	4.37%
	2020	288	284	1.41%
	2025	315	314	0.32%
	2030	346	347	-0.29%
	2035	380	382	-0.53%

Note: TAF data follows fiscal year of October through September, while Airport Forecast data follows the calendar year