BNA MASTER PLAN
NASHVILLE INTERNATIONAL AIRPORT

Metropolitan Nashville Airport Authority

# Aviation Demand Forecasts

## Nashville International Airport (BNA)

**Master Plan Update**

**November 9, 2018**

**DRAFT**

AECOM

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All forecasts are subject to levels of uncertainty. The forecasts provided in this Technical Report are based on the information available at the time of their creation. Various factors, other than those included in the forecast models, can influence future aviation demand. Unexpected events may occur and some underlying forecast assumptions and/or expectations may not materialize. Therefore, actual performance may differ from the forecasts presented in this report and could be significant.

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# Executive Summary

AECOM has been engaged by the Metropolitan Nashville Airport Authority (MNAA) to provide airport planning services associated with an Airport Master Plan update for the Nashville International Airport (BNA, the Airport). This technical report presents a summary of historical aviation demand at BNA and a forecast of unconstrained aviation demand from 2018 through 2037 (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 in the report and include an explanation of the forecast approach and methodology; the forecast results; and a comparison with other forecasts prepared for BNA, including the Federal Aviation Administration (FAA) Terminal Area Forecast (TAF), the Enplanements Forecast prepared by Mary A. Lynch/TransSolutions for the Vision Plan (Vision Plan Forecast), and the 2013 BNA Master Plan Forecast.

The recommended forecasts as summarized in the table below provide the basis for determining the planning activity levels, and future facility requirements in the BNA Master Plan Update.

### Summary of Aviation Demand Forecasts

| Year | Total Enplanements | Total Operations | Total Based Aircraft |
|---|---|---|---|
| | | **Actual** | |
| 2017 | 7,076,371 | 205,802 | 107 |
| | | **Forecast** | |
| 2022 | 9,047,142 | 256,599 | 122 |
| 2027 | 9,938,318 | 273,924 | 140 |
| 2032 | 10,886,036 | 291,664 | 160 |
| 2037 | 11,935,070 | 311,114 | 184 |

The scope of work for the BNA Master Plan update includes the Noise Exposure Map (NEM) update for 2019 and 2024. The NEM forecast for 2019 and 2024 is attached in Appendix A.

# 1. Introduction

Forecasts of future aviation activity levels are the basis for effective decisions in airport master planning. The recommended forecasts provide the basis for determining the planning activity levels, and future facility requirements in the BNA Master Plan Update. It also provides a basis for the development of alternatives to meet the projected demand, and as a basis for environmental analyses and economic and financial plans.

The forecast elements for this master plan include:

- Enplaned passengers
  - Domestic and international enplaned passengers
- Air Cargo
  - Freight by integrated and all-cargo carriers
  - Freight by combination carriers
  - Air Mail
- Aircraft operations
  - Air carrier (commercial passenger air carrier)
  - Air carrier (integrated and all-cargo carriers)
  - Air taxi and general aviation
  - Military aircraft operations
  - Breakdowns between itinerant and local operations
- Based Aircraft

Each forecast includes unconstrained demand for the 20-year planning horizon (2037) grouped into five-year periods and utilizing actual 2017 statistics as the baseline.

This report includes the following sections:

- Section 2, Airport Service Region, defines the catchment area around BNA. It establishes the framework for analyzing the aviation demand.
- Section 3, Economic Basis for Aviation Demand, identifies the economic drivers for aviation demand and trends of aviation fuel prices. It provides the economic parameters for the forecast models.
- Section 4, Historical Aviation Demand, describes the historical air service development and industry trends at BNA. It provides the historical background and baseline conditions for the forecast development and analysis.
- Section 5, Aviation Demand Forecasts, provides the aviation demand forecasts for annual enplaned passengers, annual operation, based aircraft, daily and peak hour enplanements and operations. It also identifies the critical aircraft.
- Section 6, Summary, summaries the aviation demand forecasts for 2022, 2027, 2032 and 2037.

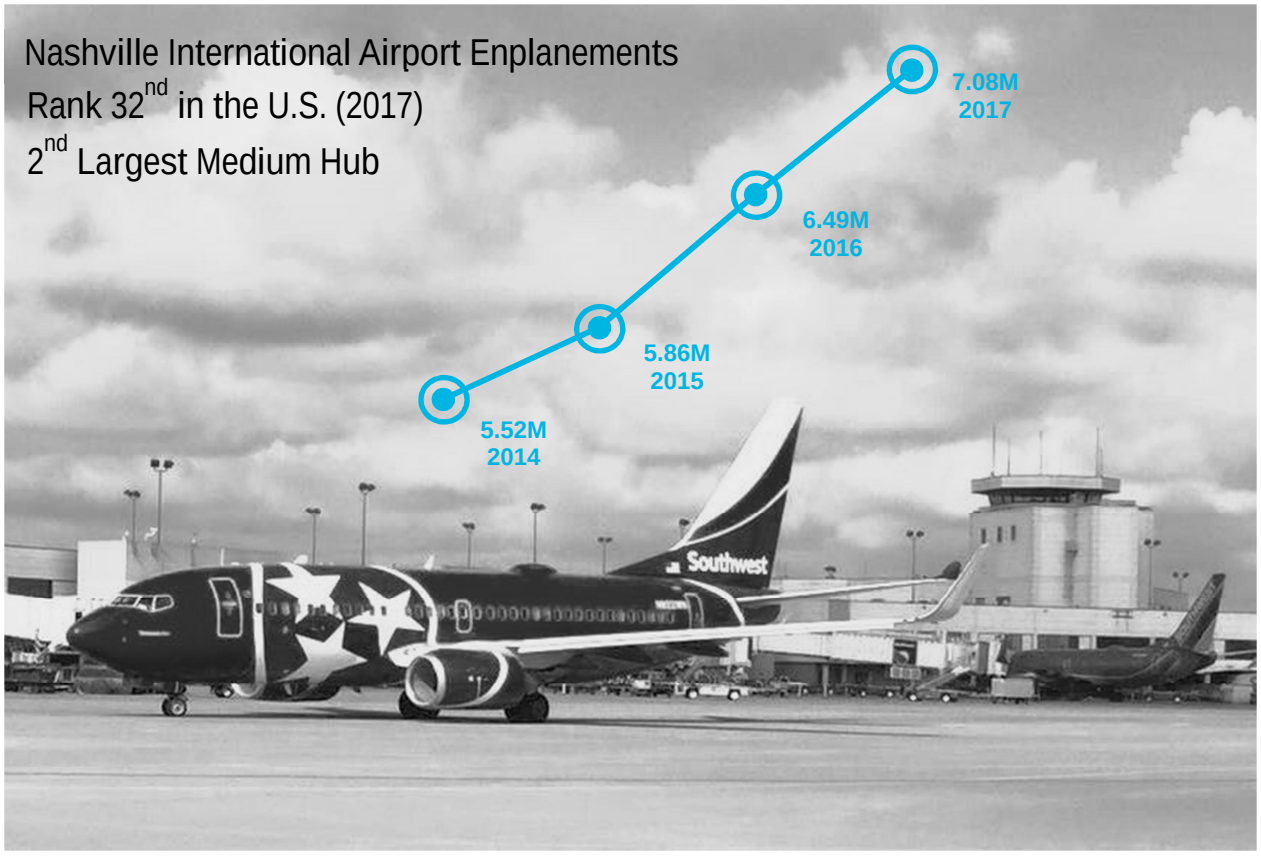
The scope of work for the BNA Master Plan update includes the NEM update for 2019 and 2024. The NEM forecast for 2019 and 2024 is attached in **Appendix A**.

# 2. Airport Service Region

BNA is the primary commercial service airport serving the Nashville metropolitan and the surrounding area. The airport enplaned over 7 million passengers in 2017 to become the 32nd busiest airport in the U.S. based on enplanements. The FAA classifies BNA as a medium hub airport since it serves between 0.25% and 1% of the total enplanements at airports in the FAA's National Plan of Integrated Airport Systems. BNA ranked as the second largest medium hub airports in 2017.

As shown on **Figure 1**, BNA is at least 120 driving-miles away from other competitor airports and is the only medium hub airport in the region. For the purposes of the aviation demand forecast analysis, the primary catchment area served by BNA (i.e. the Airport service region) is defined as the Nashville-Davidson Murfreesboro-Franklin Metropolitan Statistical Area (Nashville MSA). The fourteen counties in the Nashville MSA include, Cannon, Cheatham, Davidson, Dickson, Hickman, Macon, Maury, Robertson, Rutherford, Smith, Sumner, Trousdale, Williamson, and Wilson Counties. The secondary catchment area served by BNA may extend beyond the primary MSA depending on population density and availability of other commercial service airports; however, it is the economic basis of the Nashville MSA that drives the principal demand for supporting the aviation activities at BNA.

According to the U.S. Department of Commerce, the Census Bureau, and the 2017 Tennessee State Profile from Woods & Poole Economics (W&P), the population of this 14-county airport service region was nearly 1.86 million in 2016 (see **Table 1** and **Figure 2**), representing approximately 28% of the total Tennessee population of 6.7 million. BNA is located in Davidson County, which accounts for about 37% of the population of the service region as reflected by the population distributions shown in **Figure 2**. Over 80% of the population in the service region is from five counties surrounding the Airport, including Davidson, Rutherford, Williamson, Sumer, and Wilson Counties. Most of these areas are located within 60-minute drive time to BNA. The economic growth and activities within Nashville MSA stimulate a significant portion of passenger demand at BNA. The socioeconomic characteristics for this service region were used to evaluate the long-term aviation activity trends at BNA.



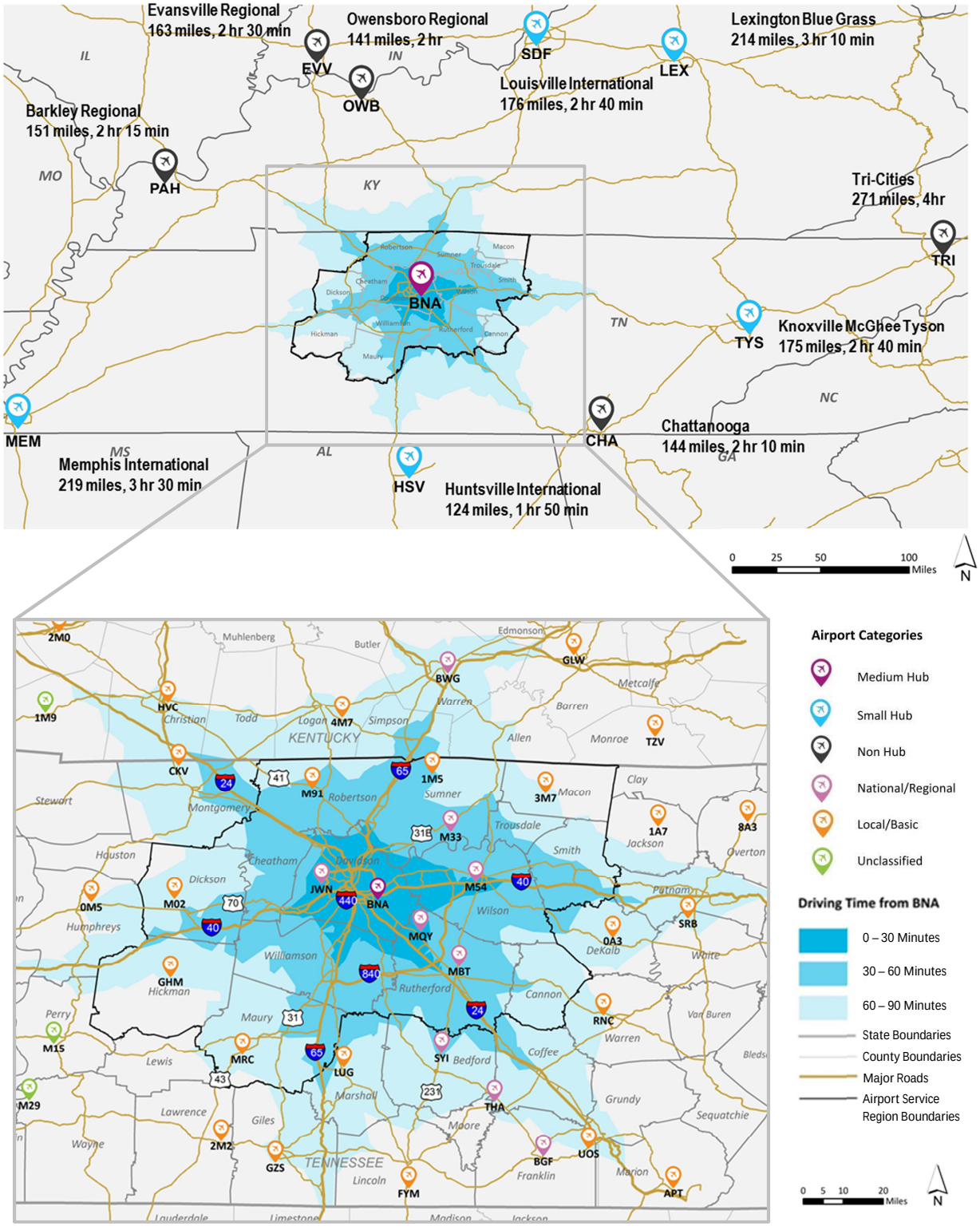


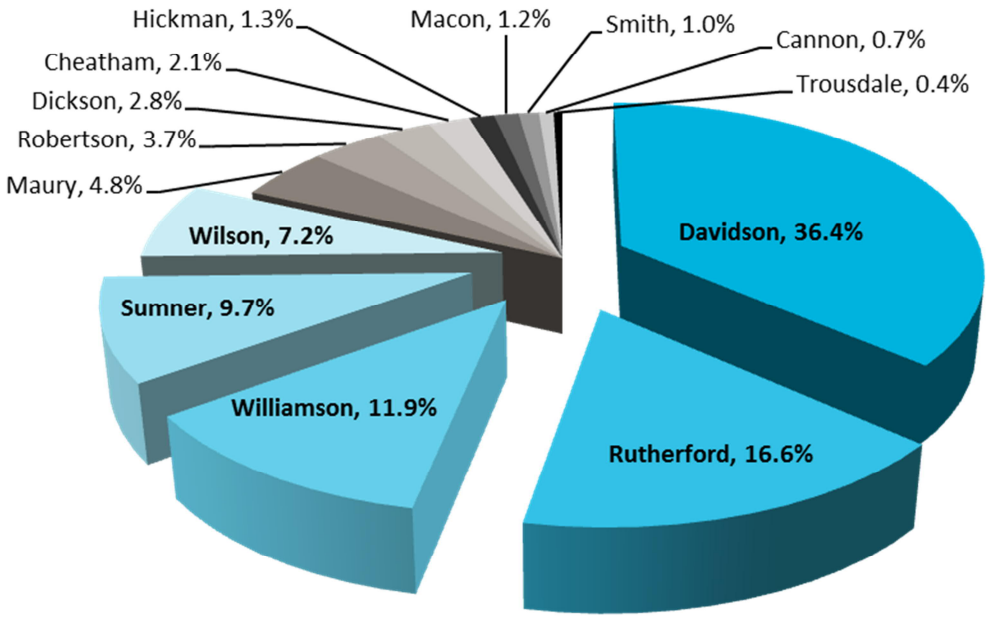

**Figure 1. Airport Service Region**

*Abbreviation: NPIAS – National Plan of Integrated Airport Systems identified by FAA*

## Table 1. Population Distribution in the Airport Service Region and Tennessee

| Area | 2017 Population (thousands) | Percentage |
|---|---|---|
| **Tennessee (TN)** | **6,715** | |
| **Nashville MSA / Airport Service Region** | **1,895** | **28% of TN** |
| Davidson County | 690 | 36.4% |
| Rutherford County | 315 | 16.6% |
| Williamson County | 226 | 11.9% |
| Sumner County | 183 | 9.7% |
| Wilson County | 136 | 7.2% |
| Maury County | 91 | 4.8% |
| Robertson County | 70 | 3.7% |
| Dickson County | 53 | 2.8% |
| Cheatham County | 40 | 2.1% |
| Hickman County | 25 | 1.3% |
| Macon County | 24 | 1.2% |
| Smith County | 20 | 1.0% |
| Cannon County | 14 | 0.7% |
| Trousdale County | 8 | 0.4% |

*Source: W&P.*




## Figure 2. Population Distribution in the Airport Service Region

*Source: W&P.*

# 3. Economic Basis for Aviation Demand

## 3.1 Socioeconomics

The economy of the region served by the Airport is an important determinant of long-term passenger demand at BNA. The development and diversity of the economic base of the Airport service region is important to future passenger traffic growth. The Nashville MSA has a diverse population and economic base and is one of the most actively growing regions in the nation. The Nashville MSA's relatively strong and diverse service economy, coupled with a steady inflow of in-migration from other states, has historically provided a stable basis for economic growth. The tourism industry has expanded in Nashville in recent years and makes significant economic contributions to the region's economic growth.

The following sections discuss the economic basis for aviation demand at BNA, including a summary of the economic outlook for the United States, Tennessee, and Nashville MSA.

The primary sources of economic outlook for Nashville MSA and Tennessee are based on the 2017 State Profile for Tennessee from W&P; the Economic Study & Forecast: Metropolitan Nashville Airport Authority, February 2017; and the Economic Report to the Governor of the State of Tennessee, January 2018, prepared by Boyd Center for Business & Economic Research (Boyd). Supplemental sources of socioeconomic indicators are collected and compiled from different government and local agencies, such as Nashville Convention & Visitors Corp (NCVC), Nashville Area Chamber of Commerce, Bureau of Labor Statistics (BLS), Bureau of Transportation Statistics (BTS), Energy Information Administration (EIA), Congressional Budget Office (CBO), FAA, etc.

### 3.1.1 Population

The population of Nashville MSA increased from 1.68 million in 2010 to 1.86 million in 2016 at a compound annual growth rate (CAGR) of 1.75%, which was higher than the growth experienced by the state (0.79%) and the nation (0.78%) between 2010 and 2016.

Population in Nashville MSA is projected to follow the historical trend and continue to outpace Tennessee and the nation as a whole. **Figure 3** shows the projected annual growth rates Nashville MSA to be between 1.7% and 1.5% over the 20-year planning horizon. W&P projected the total population in Nashville MSA will reach 2.6 M by 2037.

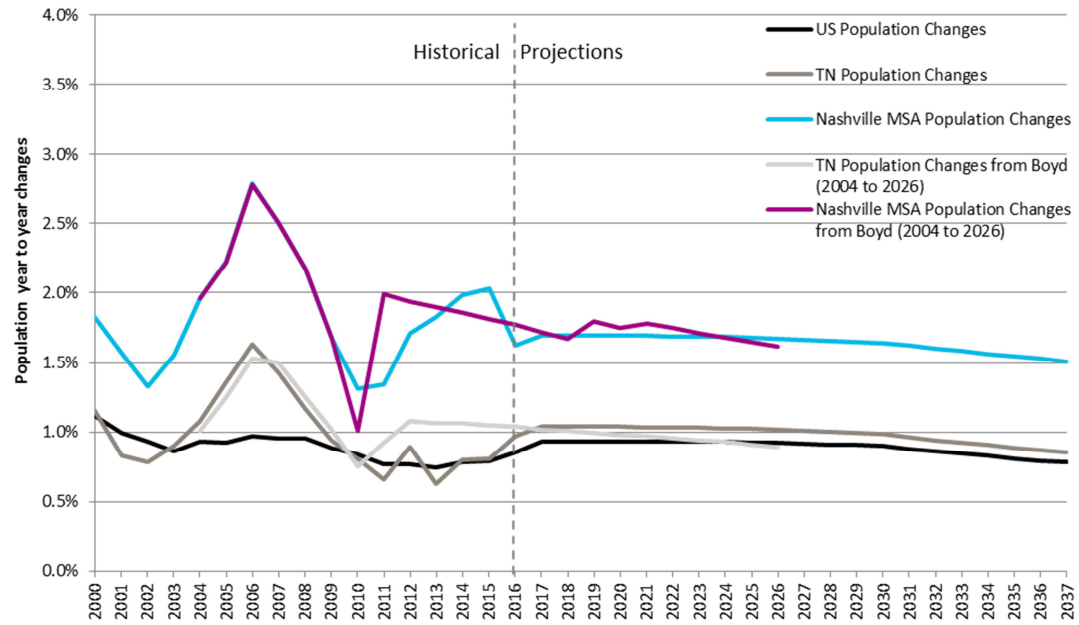
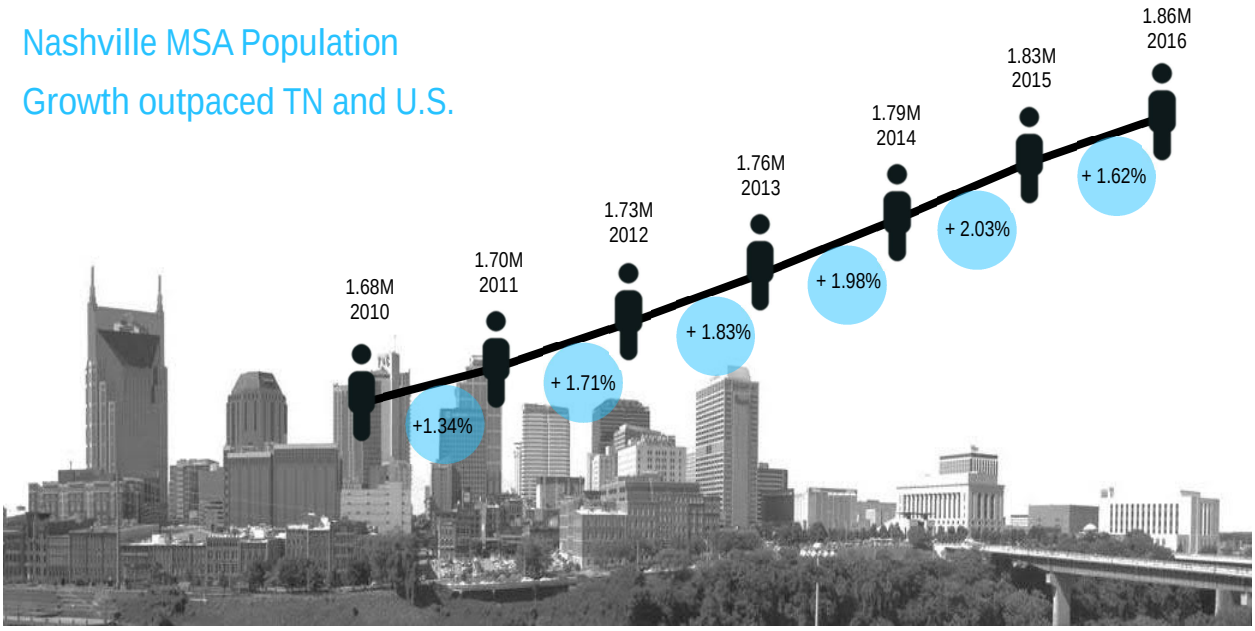



**Figure 3. Historical and Projected Population Changes**

*Source: W&P. Boyd's Economic Study & Forecast: Metropolitan Nashville Airport Authority, issue February 2017. AECOM analysis.*



### 3.1.2 Businesses and Employment

The Nashville MSA is a magnet for business and educated work force. The positive business atmosphere is supported by low taxes, minimal regulations, and progressive law reforms[1]. The overall quality of life and relatively lower cost of living than the U.S. average attract individuals, families, and entrepreneurs to live, work, and invest in the region. The nonfarm employment of the Nashville MSA increased at a CAGR of 3.16% from 2010 to 2016 and outpaced the growth of nonfarm employment in Tennessee (1.87%) and the U.S. (1.86%).

The major private sector employers in the Nashville MSA are shown in **Table 2**. The health care industry plays an important role in the region. The health care and social assistance employment contributed to nearly 11% of the total employment in the Nashville MSA and is continuously growing. Five out of the top ten employers are from the healthcare sector, including the Vanderbilt University Medical Center, HCA Healthcare, Saint Thomas Health, Community Health Systems, and National Healthcare. Other top industries include automobile manufacturing (Nissan North America), education and research (Vanderbilt University), retail (the Kroger, Lowe's, Amazon, Dollar General, Genesco, Gap), consumer and food products (Electrolux Home Products, Tyson Foods), logistics (Geodis), technology (Dell), and other industries. These companies not only drive the economic growth in the Airport service region, but also rely on the passenger and freight services provided by BNA to grow their business.

**Table 2. Major Employers in Nashville MSA**

| Company | No. of Local Employees | Industry |
|---|---|---|
| Vanderbilt University Medical Center | 20,428 | Education/Health Care/Research |
| Nissan North America | 10,750 | Auto Manufacturing |
| HCA Healthcare Inc. | 10,613 | Health Care |
| Vanderbilt University | 6,912 | Education/Research |
| Saint Thomas Health | 6,243 | Health Care |
| Community Health Systems | 4,700 | Health Care |
| Randstad | 4,557 | Employment Placement |
| Asurion | 3,600 | Specialty Insurance Services |
| The Kroger Co. | 3,523 | Retail |
| National HealthCare Corp. | 3,250 | Health Care |
| Shoney's | 3,000 | Restaurant |
| Electrolux Home Products | 2,900 | Consumer Products |
| Bridgestone Americas | 2,897 | Tire Manufacturing |
| Lowe's Cos. | 2,890 | Retail |
| Cracker Barrel Old Country Store | 2,600 | Restaurant |
| Amazon.com | 2,500 | Internet Retail |
| Gaylord Opryland Resort | 2,500 | Tourism |
| AT&T Inc. | 2,250 | Telecommunications |
| Dollar General Corp. | 2,219 | Retail |
| Middle Tennessee State University | 2,174 | Education |
| United Healthcare | 2,052 | Health Care |
| Goodwill Industries of Middle TN | 2,029 | Non-Profit Retail |
| Verizon Wireless | 2,025 | Telecommunications |

[1] Nashville in Motion, Nashville Area Chamber of Commerce, 2017 edition.

| Company | No. of Local Employees | Industry |
|---|---|---|
| A.O. Smith Corp. | 1,922 | Manufacturing |
| Ingram Content Group Inc. | 1,859 | Digital Publishing |
| Tyson Foods | 1,792 | Food Products |
| State Farm Insurance Cos. | 1,650 | Insurance |
| Schneider Electric | 1,600 | Industrial Equipment |
| Walgreens Co. | 1,592 | Health Care |
| Dell | 1,500 | Technology |
| Geodis | 1,376 | Logistics/Supply Chain |
| Deloitte | 1,371 | Professional Services |
| Genesco Inc. | 1,355 | Retail |
| Gap Inc. | 1,306 | Retail |
| Regions Bank | 1,250 | Financial Services |
| Lifeway Christian Resources | 1,229 | Non-Profit Bookstore/Publisher |

*Source: Nashville Area Chamber of Commerce, February 2018. AECOM added the industry.*

Nashville MSA is expected to continue to generate jobs at a steady pace over the next 20-year planning horizon. As shown in **Figure 4**, the nonfarm employment in the MSA is projected to grow at an annual rate between 1.5% and 1.9%, which is higher than the growth rate projected for Tennessee and the national average (1.1% to 1.5%).

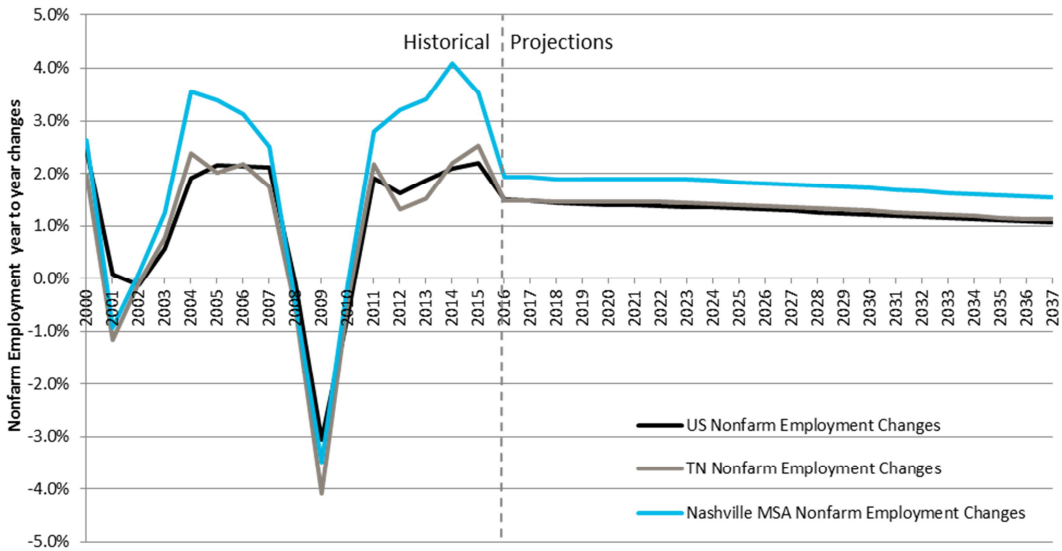



**Figure 4. Historical and Projected Nonfarm Employment Changes**

*Source: W&P. Boyd's Economic Study & Forecast: Metropolitan Nashville Airport Authority, issue February 2017. AECOM analysis.*

### 3.1.3 Unemployment

Just as employment trends can provide an indication of economic conditions and its relation to aviation demand, unemployment rates can correlate to a reduction in aviation demand. **Figure 5** depicts historical and projected unemployment rates. Historical data from 2004 to 2015 was obtained from the BLS and W&P for the Nashville MSA, Tennessee, and the U.S.

Unemployment rates were steadily decreasing and dropped to below 5% in 2007. However, the 2007-2009 recession caused rates to soar to highs of 10.5% in Tennessee, 9.5% in the Nashville MSA, and 9.3% in the U.S. in 2009. Unemployment rates started to decrease after 2010 and have returned to pre-recession levels. Overall U.S. unemployment rates are expected to level out during the planning horizon to approximately 4.9% in 2027 based on the outlook from CBO. It is anticipated that the unemployment rate for the service region will remain in-line with the historic trend and stay below the unemployment rate for Tennessee and the U.S. Boyd's Economic Study & Forecast projects the unemployment rate for the Nashville MSA will stay between 3.6% and 3.8% during the 2017 to 2026 time period as shown in **Figure 5**.

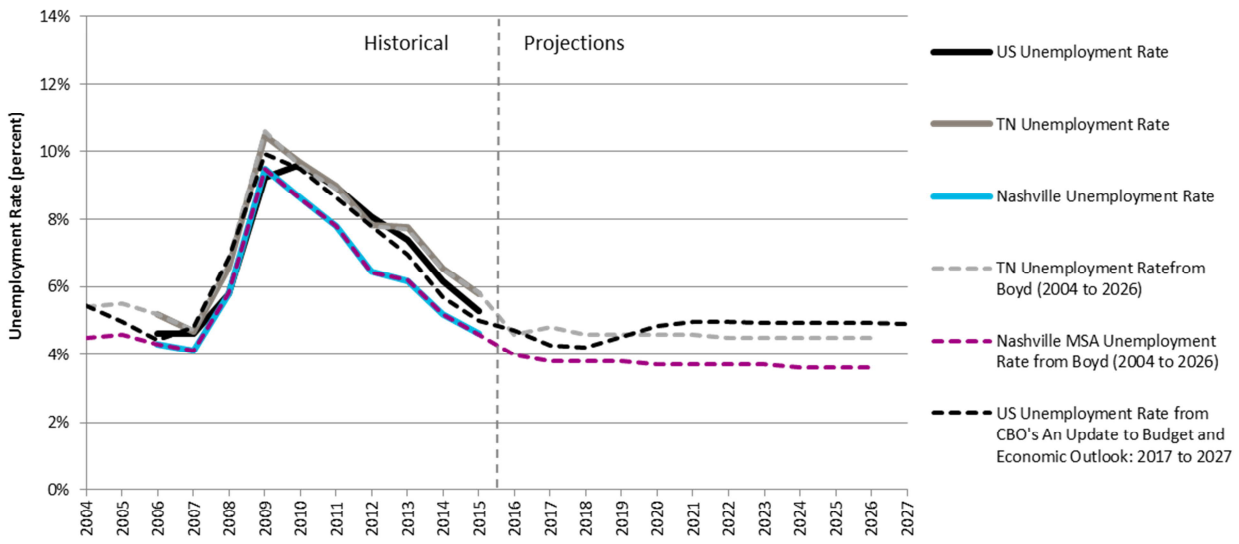



**Figure 5. Historical and Projected Unemployment Rates**

*Source: W&P's unemployment rates for the US, TN, and MSA from 2006 to 2015 are from Bureau of Labor Statistics. US unemployment rates with projections to 2027 are from Congressional Budget Office's (CBO's) An Update to the Budget and Economic Outlook 2017 to 2027, issue June2017. Boyd's Economic Study & Forecast: Metropolitan Nashville Airport Authority, issue February 2017. AECOM analysis.*

### 3.1.4 Tourism

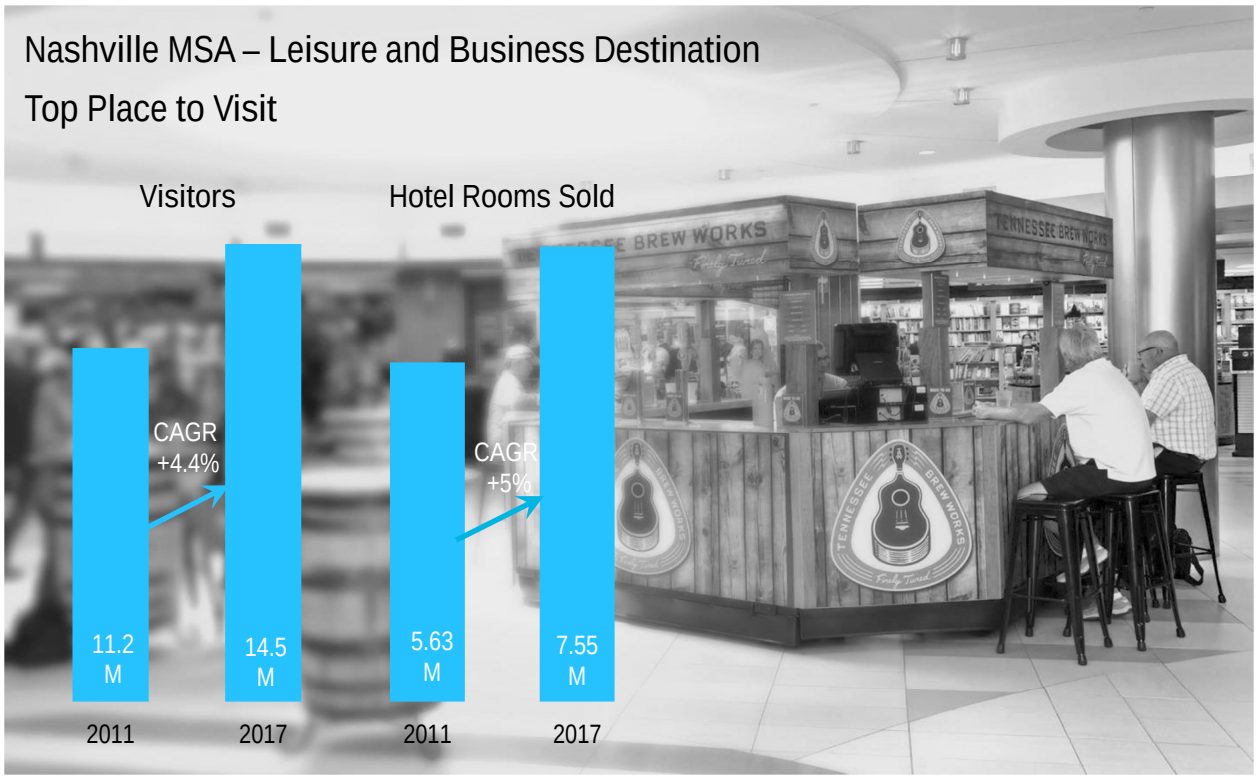
Nashville attracted 14.5 million visitors in 2017, representing a CAGR of 4.45% from 2011 to 2017. Nashville has become a global leisure and business travel destination. Through September 2016, Nashville experienced a streak of 70 consecutive months of year-over-year growth in hotel rooms sold. [2] **Table 3** summarizes the continuous increase in number of visitors, hotel occupancy rate, hotel rooms sold, and conventions held, which demonstrate a strong performance in the tourism industry in the Airport service region.

**Table 3. Nashville Hotel and Convention Performance**

| Descriptions | 2010* | 2011 | 2012 | 2013** | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| Hotel Occupancy Tax (thousand) | $25,165 | $31,555 | $34,971 | $40,204 | $49,883 | $57,028 | $64,709 | $72,551 |
| No. of Visitors # (million) | 10 | 11.2 | 11.5 | 12.2 | 13.1 | 13.5 | 13.9 | 14.5 |
| Hotel Occupancy Rate | 59% | 63% | 66% | 69% | 73% | 74% | 75% | 75% |
| Conventions Held | 288 | 406 | 419 | 537 | 610 | 638 | 687 | 891 |
| Hotel Rooms Sold | 4,985,412 | 5,626,326 | 6,023,309 | 6,354,899 | 6,824,306 | 7,067,951 | 7,307,989 | 7,545,872 |

*Source: NCVC.*

*Note: * Flood in May 2010. Gaylord Opryland Resort & Convention Center closed May-November.*
*** Music City Center opened in May 2013.*
*# The visitor count number includes both overnight and day visitors who have traveled more than 50 miles. The number covers the Nashville MSA.*

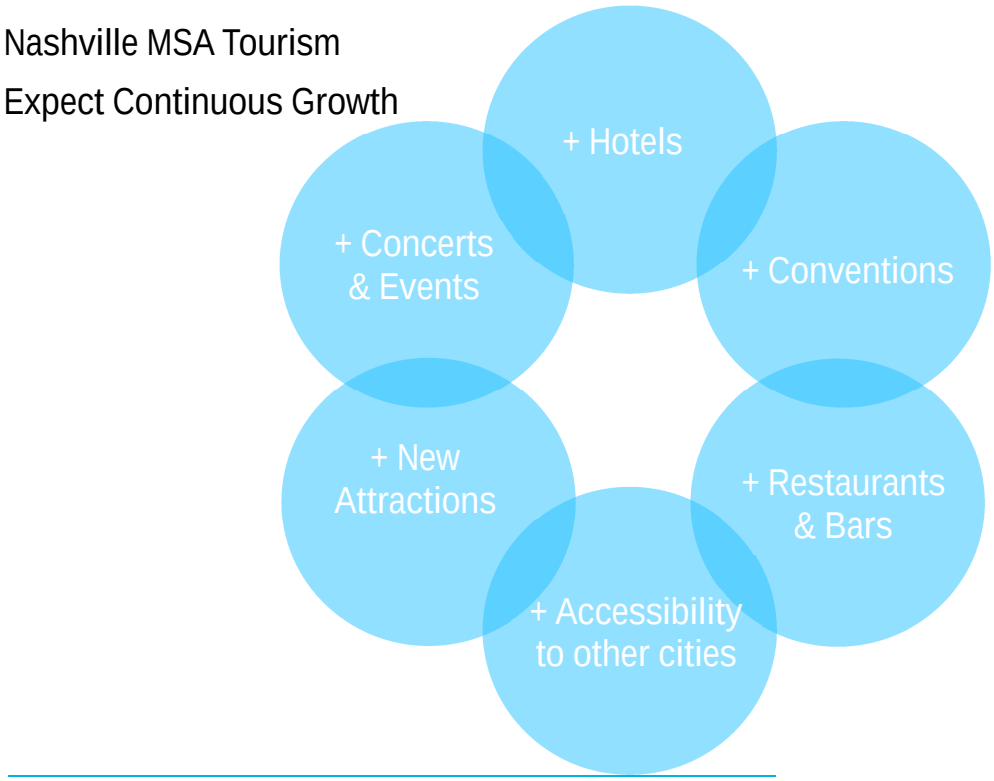



[2] Nashville Convention & Visitors Crop. (NCVC).

Multiple media and travel agencies such as TripAdvisor, National Geographic Traveler U.K., and Conde Nast Traveler have named Nashville as a top place to visit in 2018. The number of visitors is expected to grow in coming years in view of the following factors[3]:

- **Opening of more hotels** – Nashville has 28,300 hotel rooms in the city and 41,500 in the Nashville MSA.[4] 27 hotel properties are under construction with 5,360 rooms (+12.9%) to be opened in the coming three years. 23 hotel properties are in their final planning phase with the potential addition of 3,800 rooms (+22.2%) between 2019 and 2020. [5]
- **New international nonstop flights** – British Airways began their nonstop flight from London to Nashville on May 4, 2018. Since London is the gateway to and from Europe, the direct flights between Heathrow (LHR) and BNA will open up more economic and tourism opportunities.
- **More citywide conventions** – 17 large conventions which typically use three or more hotels and include more than 1,500 rooms booking on their biggest nights. It is a significant increase from 10 citywide conventions held in 2017.
- **Opening of new attractions** – recently opened and to-be-opened attractions include Whiskey Row, Ole Red, Merle Haggard Museum, SoundWaves at Gaylord Opryland, Nashville Shores' Aqua Park, Pins Mechanical Co., a new Tennessee State Museum, and National Museum of African American Music.
- **Strong concert schedule** already in the calendar.
- **Opening of more restaurants and bars** – 113 new restaurants/bars/cafes were opened in 2018, and 149 (+31.9%) new ones have opened/announced to be opened in 2018.[6]

Nashville's strength as a destination for both leisure and business travelers is continuously reflected in the outstanding records year over year. It is anticipated that the growth momentum will continue and have a positive economic impact to the Airport service region.




[3] Ibid.
[4] Ibid.
[5] MNAA, Davidson County Hotel Development Pipeline provided March 2018.
[6] Ibid. 2.

## 3.2 Per Capita Personal Income

Per capita personal income is the sum of all salaries, wages, dividends, and other types of incomes and profits received by individuals in the area divided by total population. Typically, there is a correlation between high per capita personal income and increased air travel by a Service Area population. Per capita personal income in the Nashville MSA has historically been higher than that in the state and the nation. The year over year increase in per capita personal income in the Nashville MSA has increased remarkably by 4.4% from 2013 to 2014, and 6% from 2015 to 2016, which are both higher than the growth in Tennessee and in the U.S. as shown in **Figure 6** .

Projections for the 20-year planning horizon given in **Figure 6** show that per capita personal income in the Nashville MSA will grow at an annual growth rate between 1.12% and 1.52%, which will outpace the growth rates for the U.S. between 1.0% and 1.5%. The projected growth rates for Tennessee are very close to the Nashville MSA and slightly higher than the U.S.

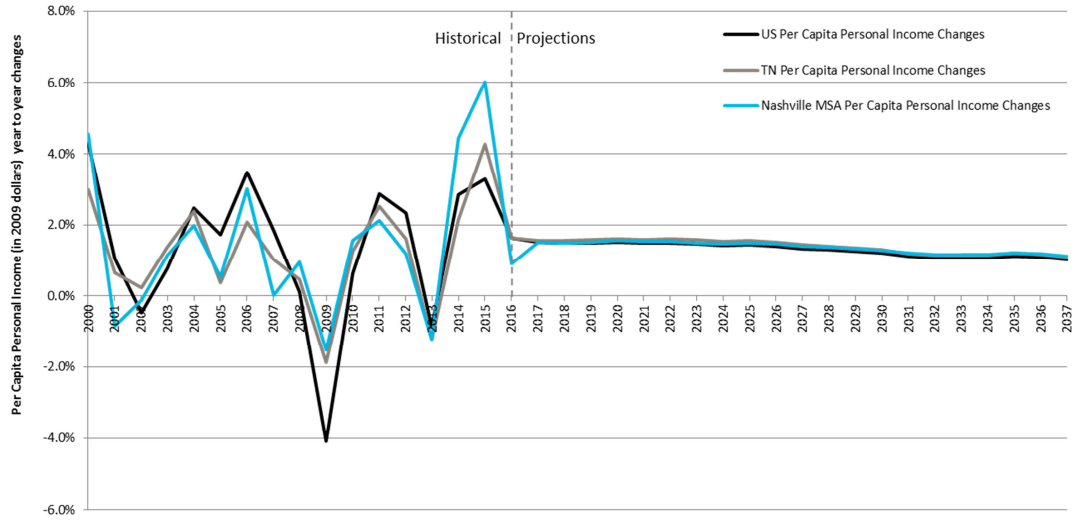




**Figure 6. Historical and Projected Per Capita Personal Income Changes**

*Source: W&P. AECOM analysis.*

## 3.3 Economic Outlook

Economic activity in the Airport service region is directly linked to the production of goods and services in the rest of the state and the nation. Both airline travel and the movement of cargo through BNA depend on the economic linkages between the Nashville MSA, Tennessee, and U.S.

### 3.3.1 U.S. Economy

A summary of the U.S. economic outlook was conducted using publications by the CBO's *The 2017 Long-Term Budget Outlook, March 2017*, and *An Update to the Budget and Economic Outlook: 2017 to 2017, June 2017*. In addition, the economic forecasts contained in the *FAA Aerospace Forecast FY2018- 2038*[7], and socioeconomic forecasts from W&P were referenced in this analysis.

The pace of growth in the nation's output after the 2007-2009 recession[8] has been slow compared with that in most other recession recoveries since World War II. The slow pace is broadly consistent with international experiences following a financial crisis. It requires time for households to settle their debts and build up wealth, for companies to regain their confidence in investing in their businesses, and for financial institutions to recover their capital bases and credit levels.

As the recovery is approaching its ninth year, the U.S. economy is expected to grow at a steady and modest pace for the next few years. Taking several factors into account, the CBO projects that economy will expand through 2018 and grow moderately afterwards. CBO forecasts the annual real GDP growth over the 10-year projection period to be an average of 1.9%. The projections by W&P are slightly higher than the CBO in the medium term (10-year) at CAGR of 2.1% and remain steady in the long term (20-year) at CAGR of 2.0%. The economic forecasts in the *FAA Aerospace Forecast FY2018-2038* include a range of projections for U.S. economic growth, including a baseline, pessimistic, and optimistic scenarios. The CBO and W&P projections are also close to FAA's baseline scenario at CAGR of 2.0% in the medium term and in the long term.

**Figure 7** illustrates the year-over-year changes on historic and projected GDP from CBO, FAA Aerospace Forecast FY2018-2038, and W&P.

### 3.3.2 Statewide and Regional Economy

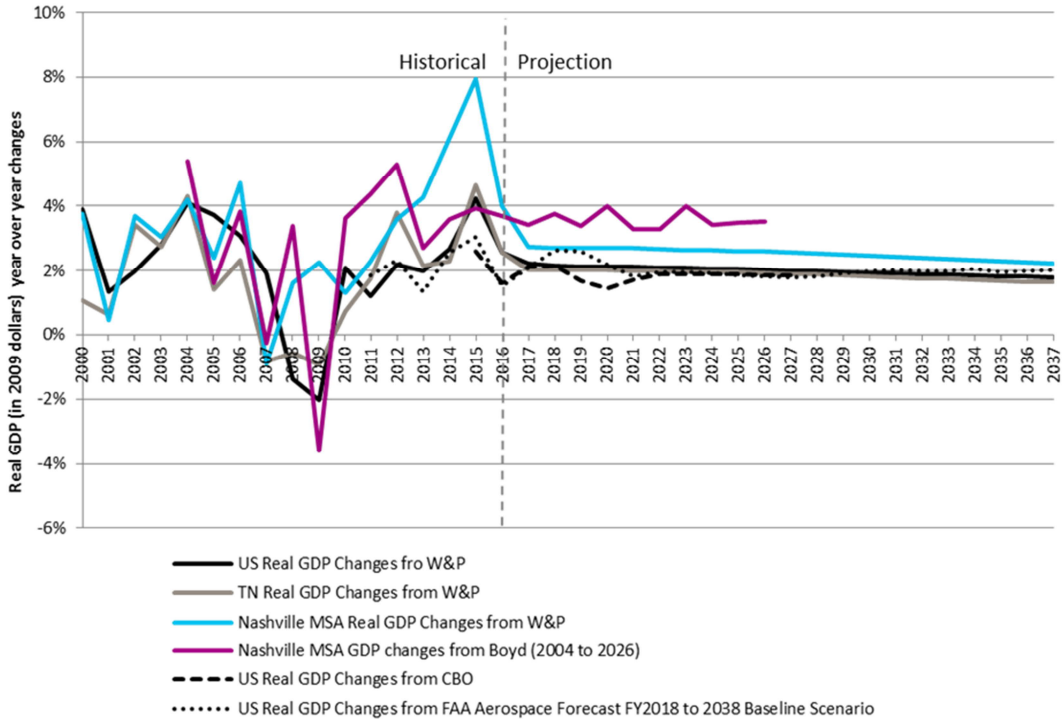
The economic outlook for Tennessee and Nashville MSA reference the *2017 State Profile for Tennessee* from W&P, the *Economic Study & Forecast: Metropolitan Nashville Airport Authority, February 2017*, and the *Economic Report to the Governor of the State of Tennessee, January 2018*, prepared by Boyd.

Economic conditions in Tennessee are expected to continue its improvement, building on expectations of healthy national growth described above. Most measures of economic activity, such as employment and unemployment rate, show full recovery since the 2007-2009 recession. Over the next decade, the real GDP of Tennessee is projected to advance by 2.0% per year by both W&P and Boyd.

The Nashville MSA, as an economic engine for the region, accounts for 28% of the population, and 38% of the GDP in Tennessee. Both W&P and Boyd forecasted the Nashville MSA to continue rising faster than the nation as a whole or Tennessee in next decade. By 2027, W&P projected that nearly 30% of the population and 41% of the GDP in Tennessee will come from Nashville MSA. By 2037, the portion contributed by Nashville MSA is projected to reach 32% in population, and over 43% in GDP. The CAGR for Nashville MSA GDP is projected to be at 2.7% in the medium term (2017 to 2027) and 2.5% in the long term (2017 to 2037). The forecast from Boyd's Economic Study & Forecast: MNAA is more aggressive than W&P. Boyd projected the Nashville MSA GDP to grow at a CAGR of 3.6% from 2017 to 2026.

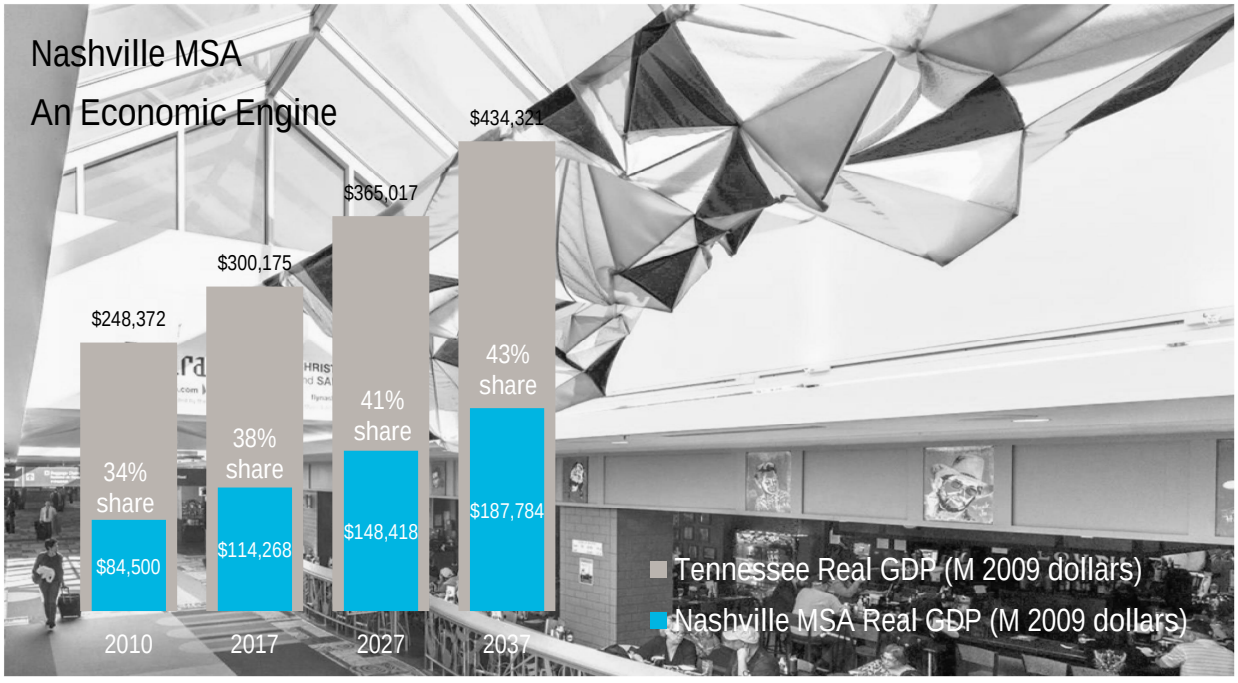
[7] The FAA used the economic forecasts developed by IHS Global Insight, Inc. to project aviation demands for the Aerospace Forecast FY2018-2038.
[8] According to the National Bureau of Economic Research, the recession began in December 2007 and ended in June 2009.

**Figure 7** illustrates the year-over-year changes on historical and projected Nashville MSA and Tennessee GDP from W&P and Boyd.




## Figure 7. Historical and Projected GDP Changes

*Source: W&P. Boyd's Economic Study & Forecast: Metropolitan Nashville Airport Authority, issue February 2017. FAA Aerospace Forecast FY2018-2038. AECOM analysis.*



## 3.4 Aviation Fuel Prices

Fluctuations and overall trends in the cost of aviation fuel is an important factor affecting the aviation industry since it directly impacts an airline's operating expenses and thus airfares and passenger demand. 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. By mid-2008, average fuel prices were three times higher than they were in 2003. In the second half of 2008 when the recession was approaching its peak fuel demand decreased worldwide and prices followed. However, with the initial recovery stage in 2009 prices began to back to a relatively steady cost between $3 and $3.5 per gallon unit mid-2014. With surging oil production and declining demand, fuel costs dropped and stayed between $1.2 and $2 per gallon in the recent two years as depicted in **Figure 8**.

Analysts hold different views regarding how oil and aviation fuel prices may change in the future. Reference case forecasts project fuel prices out into the future based on current market conditions, exchange rates, technology advancement in oil extraction, and other possible factors which may affect the supply and demand of crude oil. In order to consider future uncertainties, organizations such as the U.S. Energy Information Administration (USEIA) develop both high and low oil price forecasts in addition to a reference case. The long-term annual projections of jet fuel by the USEIA, including the reference case, and the high and low oil price cases are illustrated in **Figure 9**. The projected average annual growth rates of jet fuel price by the USEIA from 2018 to 2050 are 1.77%, 2.18%, and 3.14% for the low, reference, and high oil price cases, respectively. The *FAA Aerospace Forecast FY2018-2038* projects U.S. mainline air carrier jet fuel prices to increase 2.07% per annum from 2017 to 2037 which is on the low side but falls within the projections by the USEIA's reference and high oil price cases. The regression analysis for the enplanement forecast is based on the reference oil price projected by USEIA.

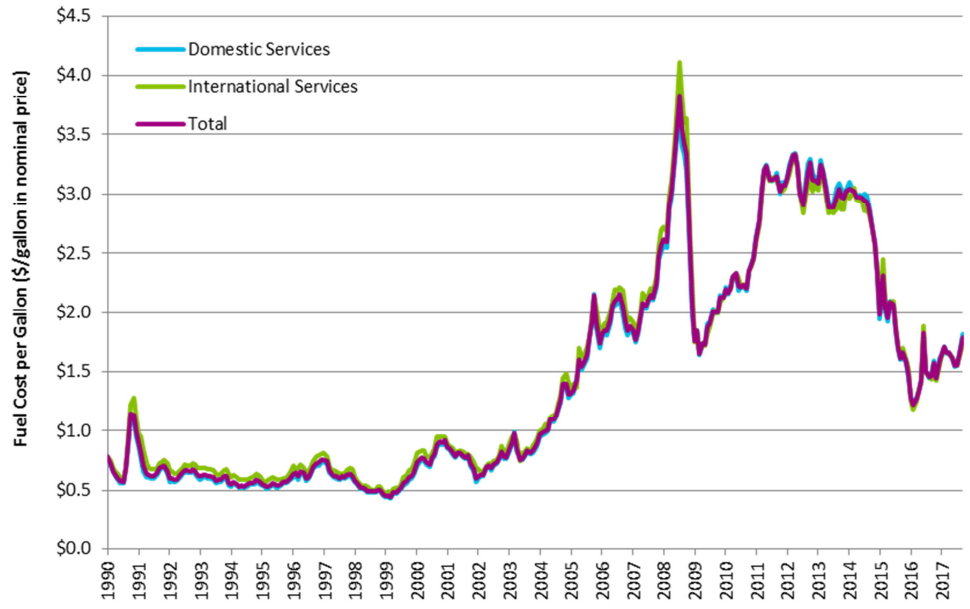



**Figure 8. Historical Monthly Airline Fuel Costs per Gallon (nominal dollars)**

*Source: Bureau of Transportation Statistics F41 Schedule P12A as of February 2018. AECOM analysis.*

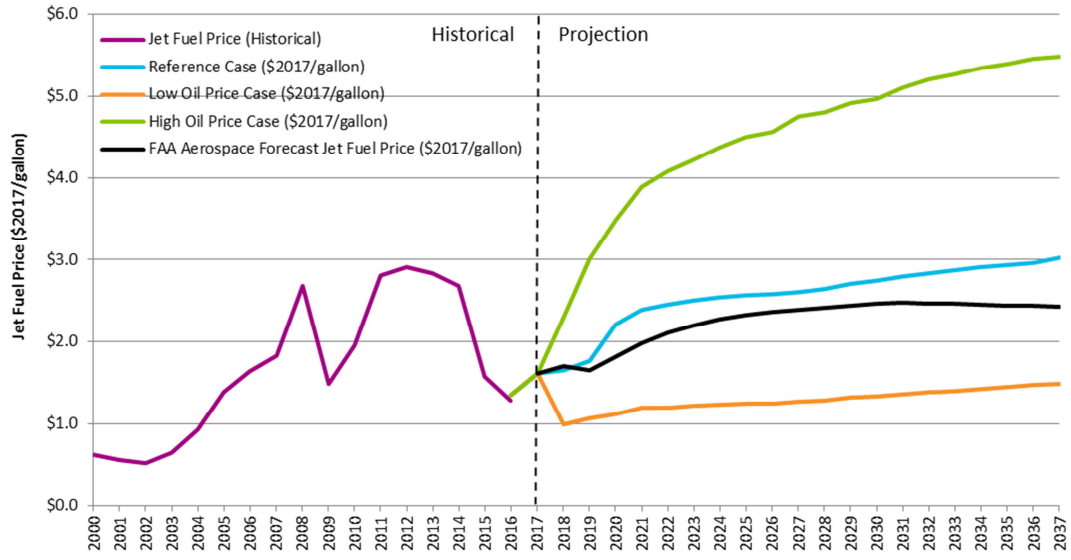



**Figure 9. Historical and Projections of Jet Fuel Price (2017 dollars per gallon)**

*Source: U.S. Energy Information Administration, Annual Energy Outlook 2018 with Projections to 2050, issue February 2018. FAA Aerospace Forecasts FY2018-2038. Historical fuel price is converted to 2017 dollars based on CPI for all urban consumers from the U.S. Bureau of Labor Statistics. AECOM analysis.*

## 3.5 Summary of Economic Basis for Aviation Demand

The various economic and demographic indicators discussed above collectively portray the Nashville MSA as a mature and expanding economic area capable of producing continuous demand for air transportation services. The MSA economy indicates full recovery after the last recession. Similar to the historical trend, both the W&P and Boyd forecasts project that GDP growth within the Airport service region will outpace the growth in Tennessee and in the U.S. The historical trends and projections for key economic variables summarized in this section were used in the development of the aviation demand forecasts. However, the results of these analyses do not necessarily provide a direct correlation 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 uncover 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 can affect the ultimate reality of forecasting. Events such as economic recessions, financial crisis, new technology, widespread health issues, terrorist attacks, and so forth cannot be predicted with any certainty or likelihood and therefore, the results of the economic analyses serve as a guideline and indicator for projecting future aviation demand rather than a precise predictor.

# 4. Historical Aviation Demand

This section describes historical aviation demand at BNA, including an analysis of commercial air carrier service providers; enplaned passengers, load factors, and seats per departure; airline shares of passengers; airline service; airline yields; air cargo tonnage; and aircraft operations.

## 4.1 Air Service Development

### 4.1.1 Airlines Serving the Airport

In 2017, 14 operating air carriers[9] for scheduled passenger services provided service at BNA. In summer 2018, British Airways (BA) and Allegiant Air (G4) joined the Nashville market and added eight new destinations to the Airport. In addition, vacation packages are provided by Vacation Express in conjunction with charter services operated by a series of air carriers. **Table 4** below lists the passenger airlines that serve the Airport in 2017 and 2018.

**Table 4. Air Carriers at BNA**

| Carriers[1, 4] | Type[3] |
|---|---|
| **Scheduled Passenger Services** | |
| Southwest Airlines (WN) | U.S. Air Carrier (Low-cost Carrier) |
| American Airlines (AA) | U.S. Air Carrier (Network Carrier) |
| Delta Air Lines (DL) | U.S. Air Carrier (Network Carrier) |
| United Airlines (UA) | U.S. Air Carrier (Network Carrier) |
| JetBlue Airways (B6) | U.S. Air Carrier (Low-cost Carrier) |
| Frontier Airlines (F9) | U.S. Air Carrier (Low-cost Carrier) |
| Alaska Airlines (AS)[2] | U.S. Air Carrier (Network Carrier) |
| Air Canada (AC) | Foreign Air Carrier (Network Carrier) |
| WestJet (WS) | Foreign Air Carrier (Low-cost Carrier) |
| Corporate Flight Management / Contour Airlines (LF) | Commuter Air Carrier |
| Virgin America (VX)[2] | U.S. Air Carrier (Network Carrier) |
| Boutique Air Inc. (4B) | Commuter Air Carrier |
| One Jet (J1) | Charter Operator |
| British Airways (BA) | Foreign Air Carrier (Network Carrier) |
| Allegiant Air (G4) | U.S. Air Carrier (Low-cost Carrier) |
| **Vacation Packages/Charter Non-Schedule Services** | |
| Vacation Express (Sunwing Airlines/Swift Air/Miami Air/ World Atlantic Airlines/Viva AeroBus/Aeromexico, etc.) | Charter Operator |

*Source: MNAA, Diio Data provided in February 2018. AECOM added the new airlines in 2018.*

*Note: 1. Carriers are arranged in descending order based on the number of scheduled seats in 2017.*

*2. Alaska acquired Virgin America in late 2016. They are still in the process of integration. Their data has not been combined in this analysis yet.*

*3. U.S. and foreign air carriers are grouped into two broad groups: network carriers and low-cost carriers, based on their differences in operation and business models. In recent years, the differences between these carriers narrowed. Low-cost carriers in the U.S. are expanding into international markets such as Latin America and the Caribbean and compete against network carriers. U.S. carriers may be grouped into three groups as the industry evolves: traditional network legacy carriers (American, United, Delta), ultra-low-cost carriers (Frontier, Allegiant), and something in between (Southwest, JetBlue, Alaska/ Virgin America). For master planning purposes, the traditional grouping into two broad groups is still applicable in this analysis.*

*4. Southern Airways Express provides scheduled flights to MEM using their single turboprop engine 11-seat aircraft. They operate from the FBO terminal.*

[9] Regional affiliates and code-share carriers are included. E.g. Envoy (American Eagle) are included under American Airlines.

**Figure 10** and **Figure 11** present the historical market share and the total enplanements of the top passenger airlines serving BNA, respectively. These airlines comprised over 95% of the market share based on enplanements. Historical data for airlines that have merged within the past several years are combined. For example, data for Delta Air Lines and Northwest Airlines, American Airlines and US Airways, are combined for comparison. The top five passenger airlines at BNA are Southwest Airlines (Southwest, WN), American Airlines (American, AA), United Airlines (United, UA), Delta Air Lines (Delta, DL), and Frontier Airlines (Frontier, F9). JetBlue Airways (JetBlue, B6) began their service at BNA to Boston (BOS) and Fort Lauderdale (FLL) in May 2016 and became the sixth top passenger airline at BNA.

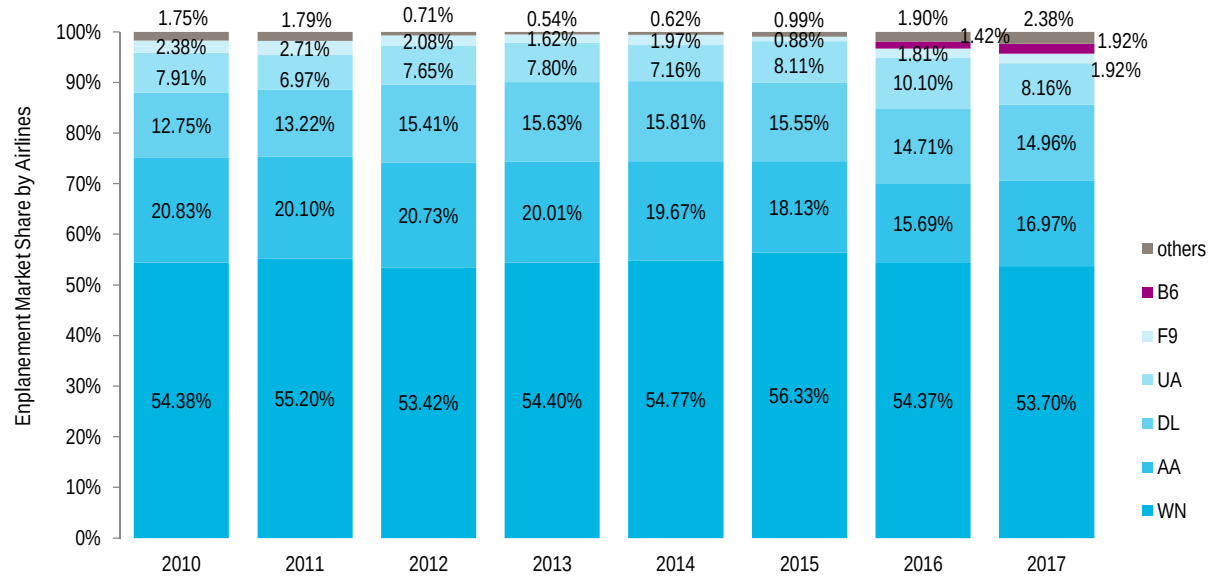



**Figure 10. Enplanement Market Share by Airlines**

*Source: MNAA. AECOM analysis.*

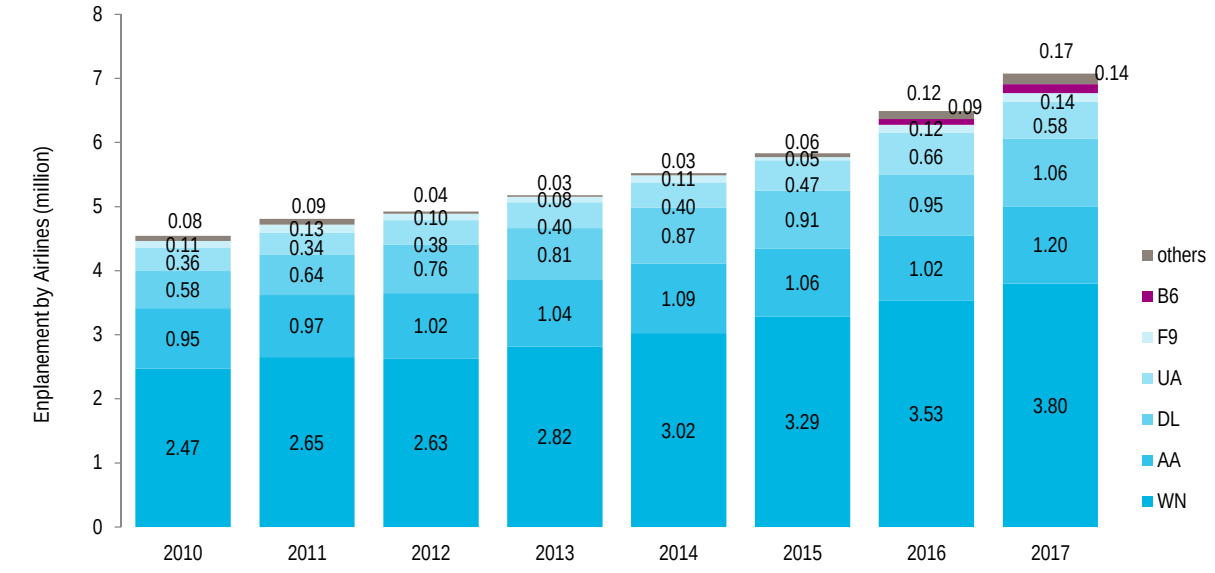



**Figure 11. Enplanement by Airlines**

*Source: MNAA. AECOM analysis.*

Southwest provides the most air service at BNA and contributes to over 50% of market share by enplanements. BNA serves as a focus city for Southwest. With new flights to/from Atlanta (ATL) starting in August 2018, Southwest provides nonstop services to 38 destinations at BNA.

American, including their regional carriers, has the second largest enplaned passenger market share at BNA. American provides nonstop services to 10 destinations at BNA. Except for one international flight to Cancun (CUN), all of American's other flights are connected to their hubs at Dallas/Fort Worth (DFW), Charlotte (CLT), Chicago (ORD), Philadelphia (PHL), LaGuardia (LGA), Miami (MIA), Los Angeles (LAX), Reagan National (DCA), and Kennedy (JFK).

Delta has the third largest share of enplanements at BNA. Most of Delta's flights are connected to their hubs at Atlanta (ATL), Detroit (DTW), Minneapolis (MSP), LaGuardia (LGA), and Los Angeles (LAX). With the addition of Las Vegas (LAS) in 2018, Delta provides 14 nonstop destinations, including one international destination to Cancun (CUN).

As the fourth top airlines, United connects their BNA passengers through their hubs at Chicago (ORD), Bush (IAH), Newark (EWR), Dulles (IAD), Denver (DEN), and San Francisco (SFO).

Frontier connects most of their flights to its hub at Denver (DEN) and its focus cities at Orlando (MCO), Las Vegas (LAS), and Philadelphia (PHL). Frontier will add a new destination, Trenton (TTN), to BNA in 2018.

JetBlue returned to BNA in 2016 after their last flight to JFK terminated in 2008. JetBlue serves the Nashville market with daily nonstop flights to Boston (BOS), and Fort Lauderdale (FLL).

Allegiant Air (Allegiant, G4) begin operating out of BNA in June 2018. They add service to seven new destinations: Punta Gorda/Fort Myers (PGD), Destin-Fort Walton Beach (VPS), Myrtle Beach (MYR), Savannah (SAV), Richmond (RIC), St. Petersburg (PIE), and Syracuse (SYR).

Although Alaska Airlines (Alaska, AS) and WestJet (WS) are not currently comprising a significant market share at BNA, they are increasing their market share significantly by adding 78% and 19% more scheduled seats in 2018, respectively. Their percentage increase in scheduled seat capacity outpaced the other airlines at BNA in 2018. Alaska will add service to San Francisco (SFO) and WestJet will nearly double their flights to Calgary (YYC).

### 4.1.2 Nonstop Services from the Airport

**Figure 12** shows 66 nonstop destinations served by BNA in 2018, including 58 domestic destinations and eight international destinations. Three out of eight international destinations provide preclearance[10] at their airports, including Toronto (YYZ), Calgary (YYC), and Grand Bahamas (FPO). The remaining five international markets include London (LHR) in Europe, and Cancun (CUN), Cozumel (CZM), Punta Cana (PUJ), and Montego Bay (MBJ) in the Caribbean.

BNA will add 10 new markets in 2018. Most of these new destinations are mentioned in prior paragraphs and they are summarized below for easy reference:

- Frontier: Trenton (TTN)
- Southwest: Oklahoma (OKC)
- British Airways: London (LHR)
- Allegiant: Punta Gorda (PGD), Destin (VPS), Myrtle Beach (MYR), Richmond (RIC), Savanna (SAV), St. Petersburg (PIE), and Syracuse (SYR).

**Table 5** summarizes the total seat capacity for the top 20 markets in 2017 and 2018. Most of these top destinations are hub airports for the major carriers as discussed in the previous section. The highest growth markets include ATL, PHL, and BOS based on seat capacity. In summary, the total seat capacity at BNA is increased by 9.4% from 2017 to 2018.

[10] Foreign airports with preclearance have U.S. Customs and Border Protection (CBP) law enforcement personnel to inspect travelers prior to boarding U.S-bound flights. Through preclearance, CBP Officers conduct the same immigration, customs, and agriculture inspections of international air travelers typically performed upon arrival in the U.S. before departure from foreign airports.

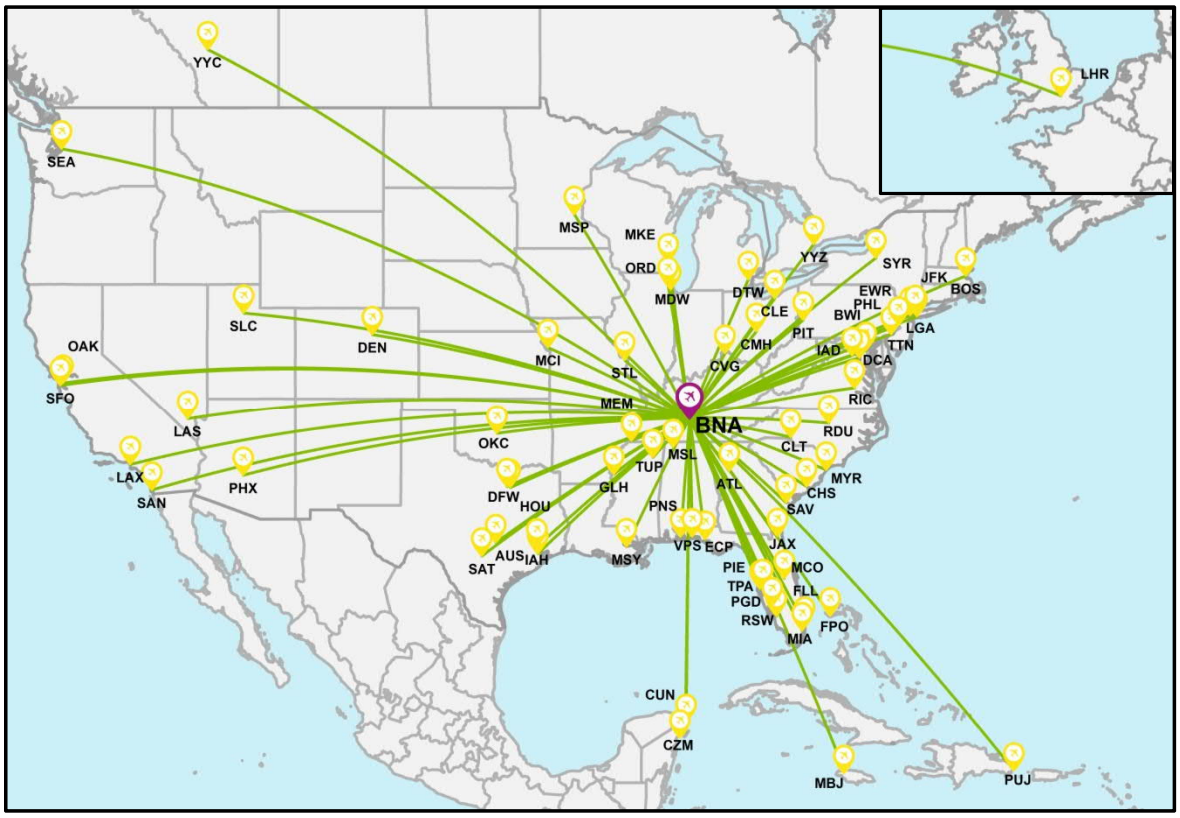



**Figure 12. Nonstop Destinations in 2018**

## Table 5. Top 20 Nonstop Destinations and Scheduled Seats

| Destination Airports | Airlines | Scheduled Seats in 2017 | Scheduled Seats in 2018 | % Change |
|---|---|---|---|---|
| ATL | DL, WN | 508,062 | 644,292 | 26.8% |
| DFW | AA | 390,989 | 409,795 | 4.8% |
| DEN | F9, UA, WN | 355,446 | 385,650 | 8.5% |
| ORD | AA, UA | 353,745 | 378,857 | 7.1% |
| LGA | AA, DL, WN | 395,161 | 378,291 | -4.3% |
| CLT | AA, WN | 348,870 | 357,147 | 2.4% |
| LAX | AA, DL, WN | 314,510 | 341,001 | 8.4% |
| BOS | B6, DL, WN | 271,186 | 335,433 | 23.7% |
| MDW | WN | 345,285 | 327,572 | -5.1% |
| DTW | DL, WN | 305,959 | 326,731 | 6.8% |
| PHL | AA, F9, WN | 238,138 | 321,246 | 34.9% |
| BWI | WN | 305,795 | 303,707 | -0.7% |
| MCO | DL, F9, WN | 268,056 | 279,264 | 4.2% |
| DCA | AA, WN | 258,080 | 251,611 | -2.5% |
| FLL | B6, WN | 234,133 | 242,965 | 3.8% |
| LAS | DL, F9, WN | 202,743 | 215,979 | 6.5% |
| DAL | WN | 209,551 | 211,930 | 1.1% |
| HOU | WN | 209,312 | 202,797 | -3.1% |
| TPA | F9, WN | 191,992 | 202,707 | 5.6% |
| RDU | DL, WN | 178,384 | 202,426 | 13.5% |
| **All Destinations** | **All** | **8,688,839** | **9,506,832** | **9.4%** |

*Source: Flight schedules from Innovata via Aviation Dataminer, accessed March 2018. AECOM analysis.*

## 4.2 Enplaned Passengers

Enplaned passengers represent one of the single largest drivers in the master planning process for any commercial service airport. **Table 6** and **Figure 13** present enplaned passengers at BNA for the period from 1992 through 2017. During this period, enplaned passenger levels varied with peaks of 4.5 million in 2000 before the 2001 recession, 4.9 million in 2007 before the 2007 recession, and reached a historical peak at 7.1 million in 2017.

As is typical for most commercial service airports, the trend of historical enplaned passengers generally follows the timeline for periods of economic recession. The financial crisis in early 1990s; Iraq's invasion of Kuwait in the summer of 1990 which drove up the world price of oil; the burst of the Dot-Com bubble in 2000; the attack on September 11th, 2001; and the financial turmoil in late 2007 all correlate to a reduction in enplaned passengers at BNA. Enplanements rebounded after each financial downturn, and the effects of the Gulf War and September 11th. BNA took approximately six years to return to positive growth in enplanements after the economic downturn in 1990s. The recovery period was reduced to three years after the early 2000s recession, and further reduced to only two years after the economic downturn in late 2007. The recoveries experienced at BNA in the recent recessions are much faster and stronger than many airports in the U.S.

**Table 6. Historical Enplaned Passengers**

| Year | Enplaned Passengers | YOY % Change | Year | Enplaned Passengers | YOY % Change |
|---|---|---|---|---|---|
| 1992 | 5,084,560 | N/A | 2005 | 4,611,326 | 6.4% |
| 1993 | 4,547,347 | -10.6% | 2006 | 4,830,523 | 4.8% |
| 1994 | 4,332,593 | -4.7% | 2007 | 4,931,903 | 2.1% |
| 1995 | 3,777,880 | -12.8% | 2008 | 4,692,566 | -4.9% |
| 1996 | 3,559,674 | -5.8% | 2009 | 4,482,571 | -4.5% |
| 1997 | 3,816,316 | 7.2% | 2010 | 4,542,041 | 1.3% |
| 1998 | 4,014,613 | 5.2% | 2011 | 4,806,092 | 5.8% |
| 1999 | 4,278,374 | 6.6% | 2012 | 4,923,323 | 2.4% |
| 2000 | 4,516,970 | 5.6% | 2013 | 5,178,915 | 5.2% |
| 2001 | 4,236,811 | -6.2% | 2014 | 5,521,701 | 6.6% |
| 2002 | 4,020,460 | -5.1% | 2015 | 5,831,513 | 5.6% |
| 2003 | 3,991,831 | -0.7% | 2016 | 6,490,039 | 11.3% |
| 2004 | 4,335,205 | 8.6% | 2017 | 7,076,371 | 9.0% |

| Historical Growth Periods | CAGR |
|---|---|
| 1996 to 2000 | 6.1% |
| 2003 to 2007 | 5.4% |
| 2010 to 2017 | 6.5% |

*Source: MNAA. AECOM analysis.*

*Abbreviations: N/A- not available. CAGR – Compound annual growth rate. YOY – Year-over-year.*

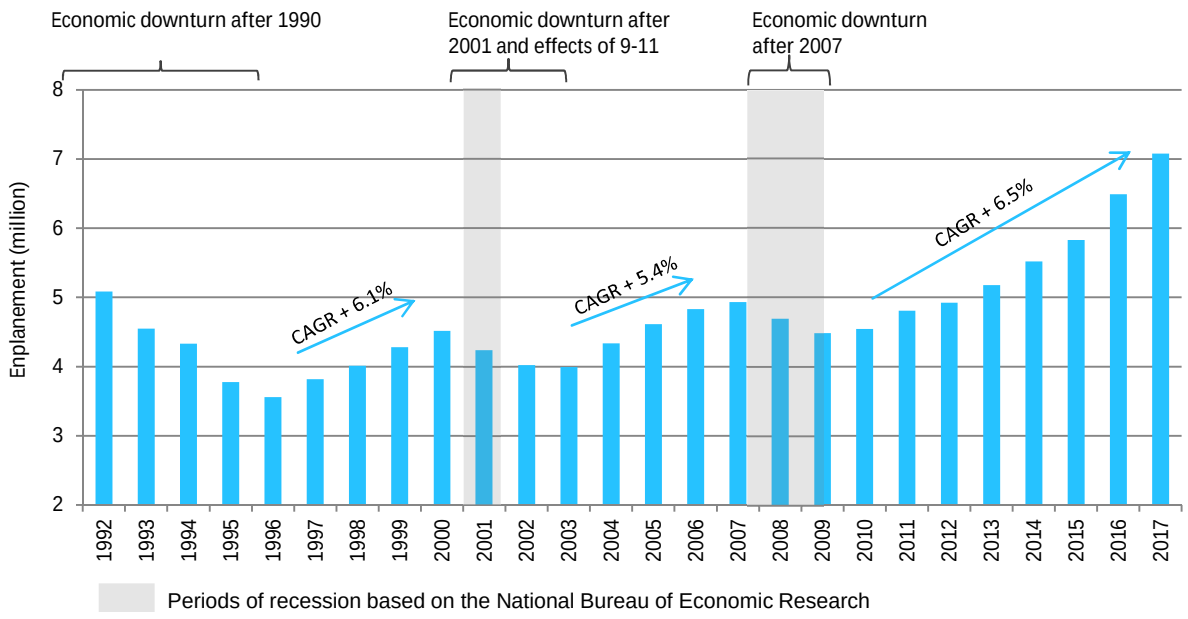



**Figure 13. Historical Enplaned Passengers**

*Source: MNAA. AECOM analysis.*
*Abbreviations: CAGR – Compound annual growth rate*

### 4.2.1 Domestic vs. International Passengers

Approximately 99% of the passengers at BNA are domestic passengers. **Table 7** presents the split between total international and domestic passengers between 2000 and 2017, including both outbound and inbound passengers.

**Table 7. Historical Domestic and International Passengers**

| Year | Domestic Passengers | International Passengers* | % Domestic | % International | International Passengers YOY % Change |
|---|---|---|---|---|---|
| 2000 | 8,988,124 | 55,941 | 99.38% | 0.62% | -2.5% |
| 2001 | 8,424,351 | 49,266 | 99.42% | 0.58% | -11.9% |
| 2002 | 8,000,736 | 40,284 | 99.50% | 0.50% | -18.2% |
| 2003 | 7,943,107 | 38,071 | 99.52% | 0.48% | -5.5% |
| 2004 | 8,638,746 | 27,978 | 99.68% | 0.32% | -26.5% |
| 2005 | 9,189,565 | 42,976 | 99.53% | 0.47% | 53.6% |
| 2006 | 9,612,247 | 51,139 | 99.47% | 0.53% | 19.0% |
| 2007 | 9,819,129 | 57,395 | 99.42% | 0.58% | 12.2% |
| 2008 | 9,342,484 | 53,559 | 99.43% | 0.57% | -6.7% |
| 2009 | 8,897,839 | 39,021 | 99.56% | 0.44% | -27.1% |
| 2010 | 9,037,456 | 39,047 | 99.57% | 0.43% | 0.1% |
| 2011 | 9,559,545 | 42,624 | 99.56% | 0.44% | 9.2% |
| 2012 | 9,792,270 | 42,220 | 99.57% | 0.43% | -0.9% |

| Year | Domestic Passengers | International Passengers* | % Domestic | % International | International Passengers YOY % Change |
|---|---|---|---|---|---|
| 2013 | 10,299,679 | 52,030 | 99.50% | 0.50% | 23.2% |
| 2014 | 10,973,388 | 66,246 | 99.40% | 0.60% | 27.3% |
| 2015 | 11,589,392 | 84,241 | 99.28% | 0.72% | 27.2% |
| 2016 | 12,860,592 | 119,511 | 99.08% | 0.92% | 41.9% |
| 2017 | 13,962,223 | 172,225 | 98.78% | 1.22% | 44.1% |

*Source: MNAA. AECOM analysis.*

*Abbreviations: YOY – Year-over-year.*

*Note: * Include passengers to/from international airports with preclearance e.g. YYC and YYZ.*

The year-over-year growth rates for international passengers are summarized in **Table 7**. The historical trends of international passenger demand are similar to the trends on total enplanements, which follow the pattern of declines during the financial downturns with strong rebounds soon after the recessions. Since 2013, the annual growth rates of international passengers increased in double digits continuously for five years. As shown in **Table 8**, airlines are adding scheduled flights and seats to the international markets. American started their services to CUN in 2016, and Southwest started the same route in 2017. West Jet commenced services at BNA in 2016 by providing flights to YYZ, and added a new destination to YYC in 2017. British Airways initiated new service to LHR in 2018.

### Table 8. Scheduled International Departure Seats

| Year | CUN | | | YYZ | | YYC | LHR | Total Scheduled Seats | YOY % Change |
|---|---|---|---|---|---|---|---|---|---|
| | DL | AA | WN | AC | WS | WS | BA | | |
| 2013 | 2,556 | | | 32,250 | | | | 34,806 | |
| 2014 | 3,266 | | | 32,950 | | | | 36,216 | 4.1% |
| 2015 | 5,316 | | | 33,775 | | | | 39,091 | 7.9% |
| 2016 | 5,364 | 4,528 | | 46,187 | 13,950 | | | 70,029 | 79.1% |
| 2017 | 5,364 | 5,180 | 1,144 | 51,900 | 26,892 | 7,100 | | 97,580 | 39.3% |
| 2018 | 5,350 | 5,376 | 4,433 | 51,550 | 29,871 | 10,692 | 34,882 | 142,154 | 45.7% |

*Source: Flight schedules from Innovata via Aviation Dataminer, accessed March 2018. AECOM analysis.*

*Abbreviations: YOY – Year-over-year.*

Other than scheduled air carriers, there are international flights provided by charter carriers. Charter international flights are typically provided with vacation packages to winter sun destinations in Mexico and the Caribbean. **Table 9** summarizes the percentages of international passengers on scheduled or charter flights.

### Table 9. Historical International Passengers on Scheduled and Charter Carriers

| Year | International Passengers on Scheduled Carriers* | International Passengers on Charter Carriers | % Scheduled Carriers | % Charter Carriers |
|---|---|---|---|---|
| 2013 | 46,579 | 5,451 | 89.5% | 10.5% |
| 2014 | 55,262 | 10,984 | 83.4% | 16.6% |
| 2015 | 63,301 | 20,940 | 75.1% | 24.9% |
| 2016 | 107,304 | 12,207 | 89.8% | 10.2% |
| 2017 | 159,945 | 12,280 | 92.9% | 7.1% |

*Source: MNAA. AECOM analysis.*

*Note: * Include DL, AA, WN, AC, WS, and Air Georgian (Air Canada Express).*

### 4.2.2 Originating vs. Connecting Passengers

BNA is primarily an origin and destination (O&D) airport with approximately 88% of the Airport's enplaned passengers being local and 12% of passengers connecting through BNA to their final destinations. **Table 10** summarizes the approximate number of originating and connecting passengers at BNA. WN serves BNA as a focus city and provides nonstop services to 38 destinations. Other network airlines provide most of their flights from BNA to their hubs for connection to other destinations. Most of the connecting passengers at BNA are WN passengers.

**Table 10. Historical Originating and Connecting Passengers**

| Year | Originating Passengers | Connecting Passengers | % Originating | % Connecting |
|---|---|---|---|---|
| 2013 | 4,502,382 | 676,533 | 86.9% | 13.1% |
| 2014 | 4,833,636 | 688,065 | 87.5% | 12.5% |
| 2015 | 5,112,009 | 719,504 | 87.7% | 12.3% |
| 2016 | 5,807,169 | 682,870 | 89.5% | 10.5% |
| 2017 | 6,265,179 | 811,192 | 88.5% | 11.5% |

*Source: MNAA. AECOM analysis.*

## 4.3 Load Factors

Enplaned passenger trends at any commercial service airport typically do not tell the complete story regarding airline service. It is also important to understand the historical trend of average load factors and seat capacity to better understand airport utilization dynamics. The number of aircraft operations and the average size of aircraft serving the airport do not necessarily increase or decrease with the numbers of enplaned passengers. Thus, this section describes the BNA load factors; the subsequent section discusses BNA seat capacity and fleet mix.

**Table 11** presents historical data on load factors[11] for 2000 through 2017. Graphic presentations of monthly and annual trends are shown in **Figure 14** and **Figure 15**. **Figure 15** includes the national trend on load factors for domestic, international, and the combined total for all U.S. air carriers per the FAA Aerospace Forecast.

The load factors for both domestic and international departures from BNA vary seasonally with peaks in summers and troughs in winters as illustrated in **Figure 14**. Regardless of monthly variations, the overall annual load factor increased gradually for domestic, international, and total departures throughout the past decade. The average load factor for domestic departures at BNA increased from 66.4% in 2002 to 82.6% in 2017 (i.e. a 16.2% increase) as summarized in **Table 11**.

**Table 11. Historical Load Factors**

| Year | Domestic Load Factor | International Load Factor | Airport Total Load Factor |
|---|---|---|---|
| 2002 | 66.4% | 52.9% | 66.3% |
| 2003 | 65.2% | 50.9% | 65.2% |
| 2004 | 67.1% | 59.8% | 67.1% |
| 2005 | 69.6% | 60.5% | 69.6% |
| 2006 | 73.7% | 60.3% | 73.6% |
| 2007 | 73.5% | 64.4% | 73.4% |
| 2008 | 73.5% | 64.4% | 73.4% |
| 2009 | 76.3% | 55.0% | 76.2% |
| 2010 | 78.0% | 60.2% | 77.9% |
| 2011 | 80.6% | 65.1% | 80.5% |
| 2012 | 79.4% | 63.0% | 79.3% |
| 2013 | 78.7% | 70.1% | 78.7% |
| 2014 | 81.7% | 76.9% | 81.6% |
| 2015 | 82.7% | 81.5% | 82.6% |
| 2016 | 83.1% | 79.4% | 83.1% |
| 2017 | 82.6% | 82.9% | 82.6% |
| **Period** | | **Percentage Change*** | |
| 2002 to 2017 | 16.2% | 30.0% | 16.3% |

*Source: U.S. DOT T-100 Segment database. AECOM analysis.*

*Note: * Percentage change in load factor is given in absolute difference.*

As shown in **Figure 15**, the load factors of domestic departures and total departures at BNA were gradually increasing to approximately 83% and catching up with the national average. FAA Aerospace Forecast projects the domestic load factors over the 20-year forecast period will raise to 86% in 2037. The domestic load factors for BNA are expected to increase to similar level as the national trend projected by FAA Aerospace Forecast and reach 86%.

[11] Load factors are calculated as total revenue passenger miles over available seat miles.

The average load factor for international departures at BNA increased from 52.9% in 2002 to 82.9% in 2017 (i.e. a 30% increase). The average load factor for total departures is similar to domestic departures as most of the flights at BNA are domestic, increasing from 66.3% in 2002 to 82.6% in 2017 (i.e. a 16.3% increase).

The increase in load factors for international departures at BNA outpaced the national trend. Load factors for international departures of all commercial air carriers in the U.S. increased from 74.5% in 2002 to 81% in 2017 (i.e. a 6.5% increase). The international load factors for BNA are expected to stay above the national trend projected by FAA Aerospace Forecast and reach approximately 83%.

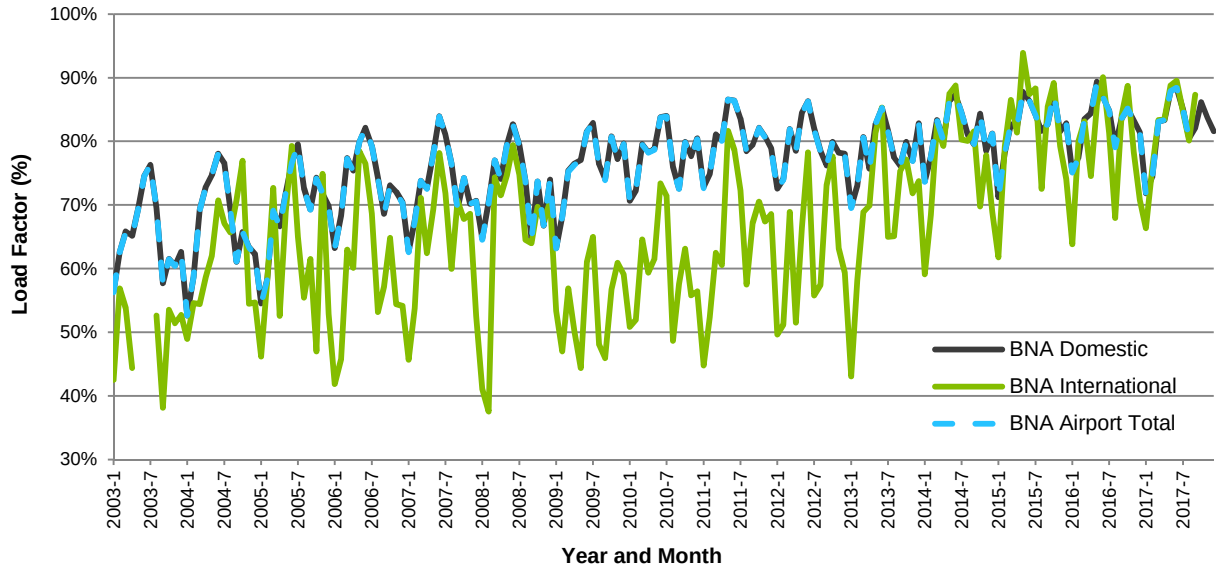



**Figure 14. Historical Load Factors (Monthly)**

*Source: U.S. DOT T-100 Segment database. AECOM analysis.*

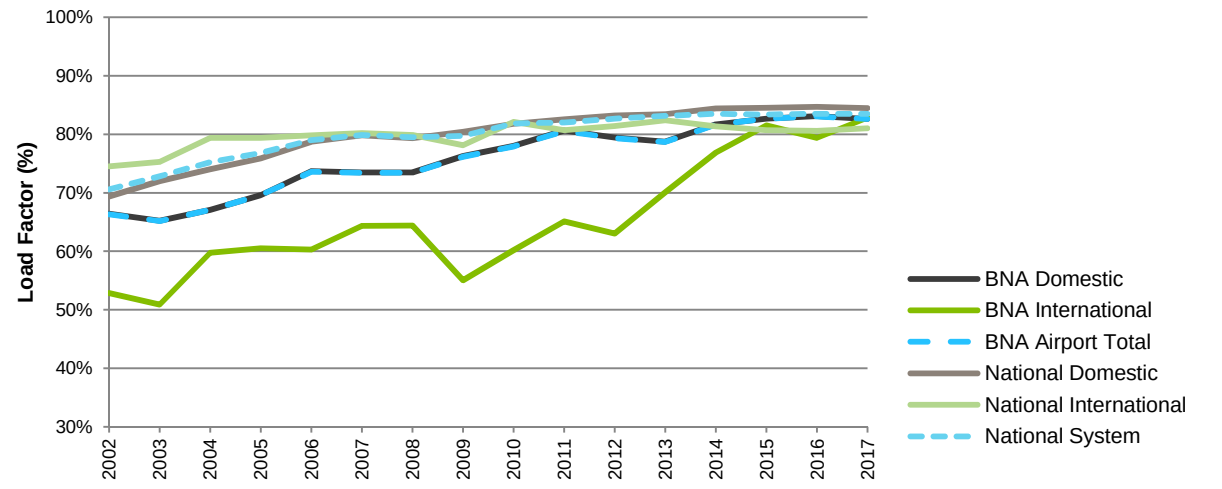



**Figure 15. Historical Load Factors (Annually)**

*Source: U.S. DOT T-100 Segment database. FAA Aerospace Forecast FY2018-2038. AECOM analysis.*

## 4.4 Aircraft Fleet Mix and Average Seats per Departure

**Figure 16** summarizes the major changes in fleet mix based on the number of scheduled annual departures at BNA since 2010. During this time frame, Southwest retired their B737-300 (126-seat 733) and retrofitted their B737-700 by adding one row of seats (increased from 134-seat 73G to 143-seat 73W), and added more B737-800 (175-seat 73H) at BNA. The historical average seats per departure for Southwest increased from 136 seats in 2010 to 148 seats to 2017. Southwest new orders for B737 MAX 8 (175-seat) were delivered in 2017 and B737 MAX 7 (150-seat) will probably be delivered in around 2023. It is anticipated that the average seats per departure for Southwest at BNA will increase to between 150 and 175 seats.

American is gradually replacing their narrowbody MD-80 (including M80, M83) with A319, A320, and B737-800. They also added more seats to their B737-800 (148-seat 738 to 160-seat 73H). American's regional jets[12] such as Embraer ERJ-135 (37-seat ER3), ERJ-140 (44-seat ERD), ERJ-170 (72-seat E70), and Bombardier CRJ-100 (50-seat CRJ) are gradually being replaced by mostly ERJ-175 (76-seat E75), CRJ-700 (65/70-seat CR7), and some CRJ-900 (76-seat CR9), and CRJ-200s (50-seat CR2). American operates mostly regional jets at BNA, and the average seats per departure increased from 83 seats in 2010 to 89 seats in 2017.

Delta's regional 50-seaters like ERJ-140/145 and CRJ-100 are being replaced by 69- to 76-seat ERJ-170 and CRJ-900. Delta has operated more mainline fleet at BNA in recent years and they are now mostly served by the 149-seat MD-88, 110-seat B717-200, 132-seat A319, 158-seat MD-90, and 148-seat A320. The average seats per departure for Delta increased significantly from 77 seats to 109 seats, which reflected an increasing mix of their mainline fleet against the regional jets. The percentage of operations by Delta regional jets decreased from 73% in 2010 to 46% in 2017.

United used to operate only regional jets, including CRJ-100/700 and ERJ-145, at BNA in 2010. By 2017, United operated 27% of their flights at BNA using their mainline fleet with over 100 seats, including A319, A320, and B737-700/800/900. The remaining 73% of United's operations are provided by regional jets, mostly ERJ-175 (76-seat E7W), and some 70-seat CRJ-700, and 50-seat ERJ-145.

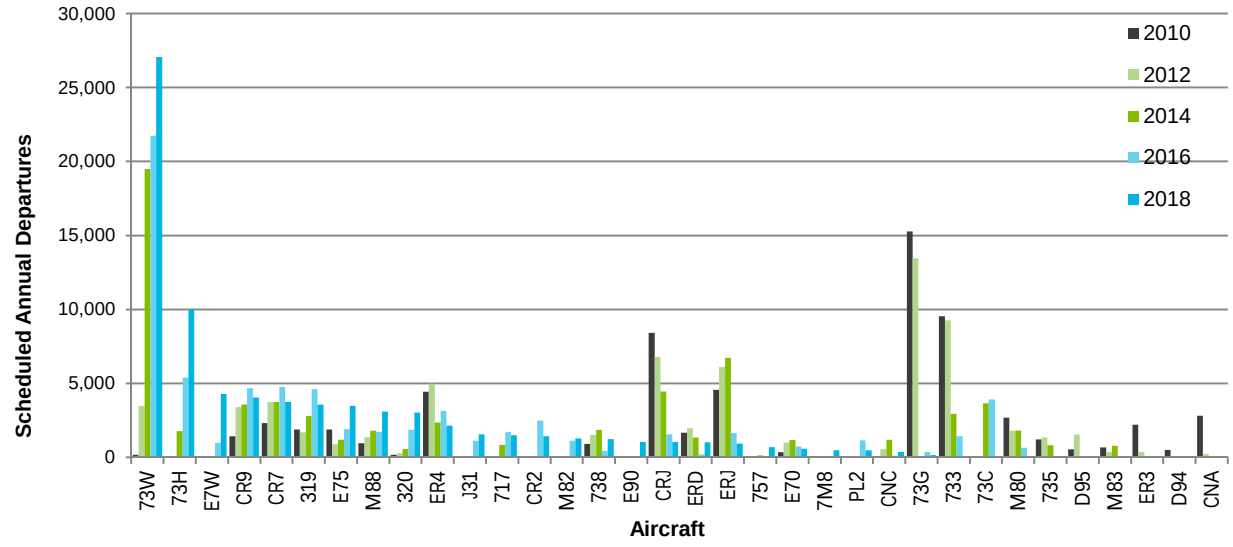



**Figure 16. Aircraft Fleet Mix**

*Source: Flight schedules from Innovata via Aviation Dataminer, accessed March 2018. AECOM analysis.*
*Note: For clarity, only alternate years from 2010 through 2018, and aircraft models with over 365 departures a year are shown.*

[12] Regional jets refer to short to medium-range turbofan-engine aircraft with less than 90 seats, including 50-seaters like ERJ-135/140/145, and CRJ-100/200; and larger jets with 70 to 90 seats like ERJ-170/175, and CRJ-700/900.

In summary, the average seat capacity for all the scheduled operations at BNA increased from 96 seats per departure in 2010 to 115 seats per departure in 2017 as shown in **Figure 17**. Based on the available flight schedules, the seat capacity will further increase to 120 seats per departure in 2018.

The trend for the airlines at BNA is an increase in the number of seats offered per departure. A portion of this increase is due to the airlines adding seats by reconfiguring existing aircraft models and replacing older aircraft with larger seat capacity aircraft. Examples of this trend at BNA include airlines operating more mainline aircraft (aircraft with over 90 seats, e.g. B737, A319, A320, and MD-88, etc.) than regional jets (aircraft with less than 90 seats, e.g. ERJ-145/175, and CRJ-700/900, etc.). The percentages of departures provided by mainline aircraft increased from 54% in 2010 to 64.5% in 2017 as depicted in **Figure 18**. Based on the available flight schedules, the percentage of operations by mainline aircraft will increase to 68% in 2018.

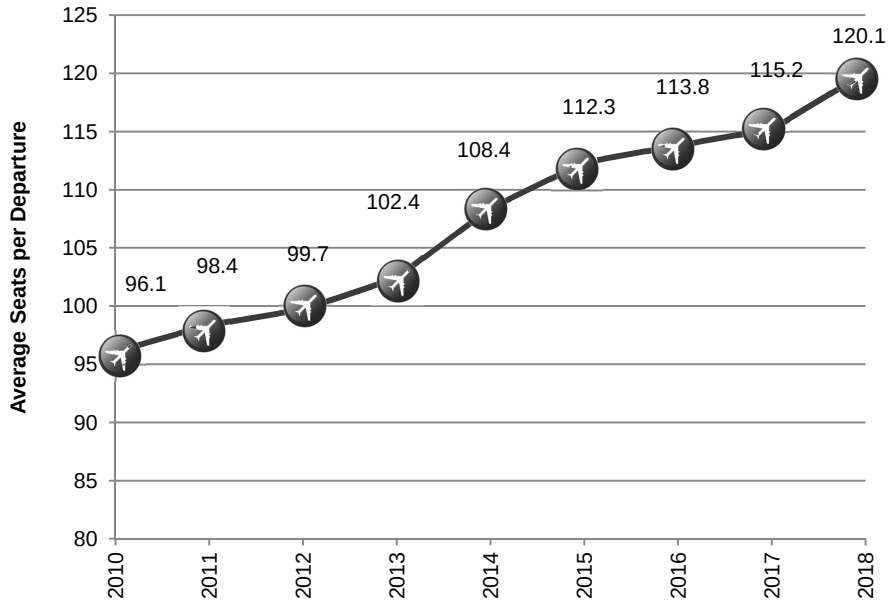



**Figure 17. Average Seats Per Departure**

*Source: Flight schedules from Innovata via Aviation Dataminer, accessed March 2018. AECOM analysis.*

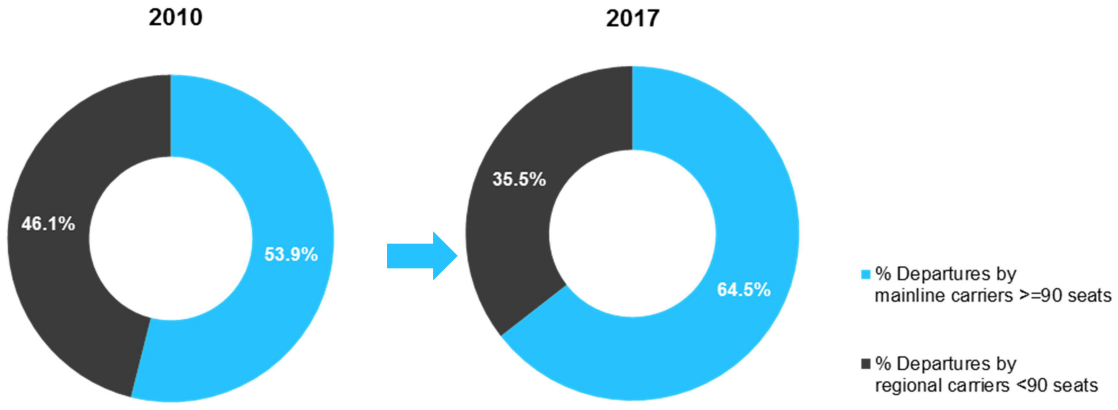



**Figure 18. Percentage of Mainline and Regional Carriers by Scheduled Departures**

*Source: Flight schedules from Innovata via Aviation Dataminer, accessed March 2018. AECOM analysis.*

## 4.5 Airline Yields

**Figure 19** summarizes airline yields for BNA and the U.S from 2000 through 2017. Yield is a measure of airline revenue, normalized for distance. It is measured in cents per revenue-passenger-mile, and is calculated by dividing fare revenue by trip length. **Figure 19** also graphically presents the year over year changes on yields for both BNA and the U.S. Since the majority of passengers at BNA (over 98%) are domestic, domestic passenger yields for air carriers in the U.S. are included for comparison. Historical variations in yields for BNA and domestic yields for the U.S. increase and decrease at a similar pattern. The drops in 2009 and 2016 airline yield are consistent with the drop in oil prices.

**Figure 20** presents the changes in yields for the top four airlines at BNA. The historical trends indicate that these airlines have improved their revenue performance through years, especially Southwest.

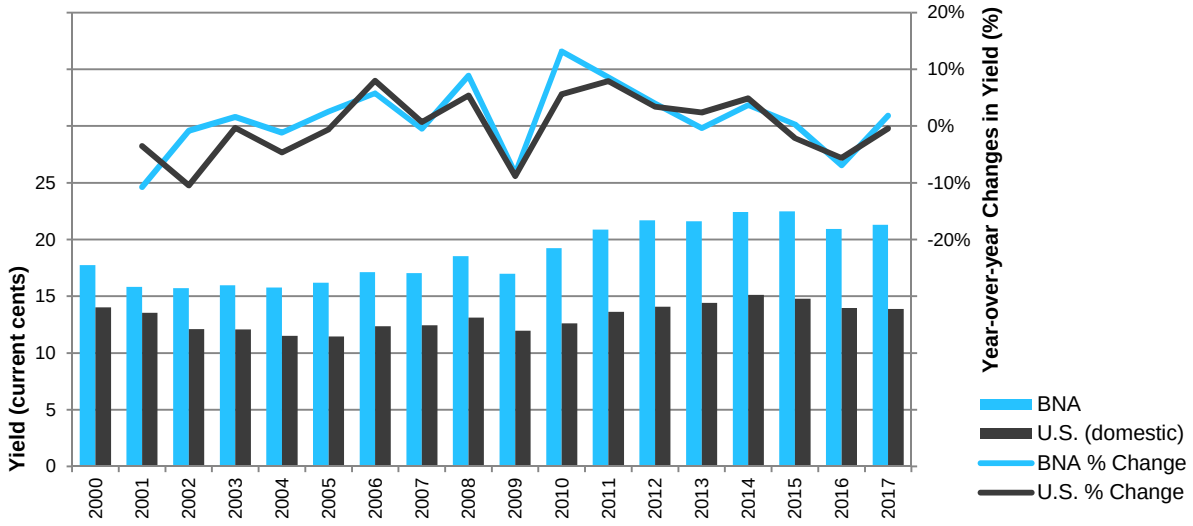



**Figure 19. Historical Yield and Year-over-Year Changes**

*Source: U.S. DOT DB1B Market data, accessed April 2018. FAA Aerospace Forecast FY2018-2038. AECOM analysis.*

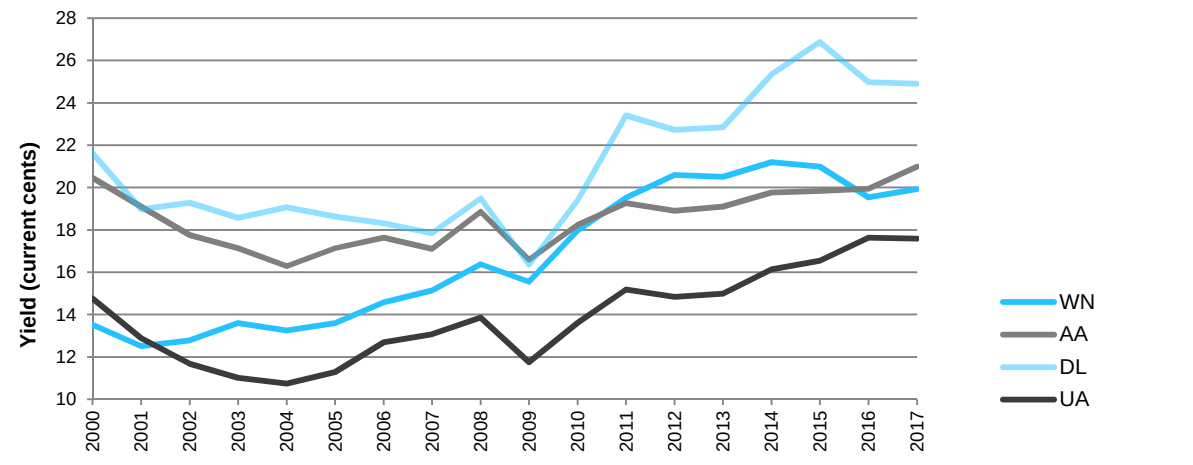



**Figure 20. Historical Yield for Top Four Airlines at BNA**

*Source: U.S. DOT DB1B Market data, accessed April 2018. AECOM analysis.*

## 4.6 Air Cargo

Historical air cargo (air freight and mail) tonnage throughout at BNA from 2000 to 2017 is summarized in **Figure 21**. Domestic freight throughputs maintained between 20,000 and 28,000 tons for outbound, and between 17,000 and 24,000 tons for inbound freight throughout the last two decades. The most significant change was with international cargo as described in later paragraphs. International freight nearly disappeared in BNA after the 2007-2009 recession. In 2017, only 0.02% of the air cargo volume consisted of international freight. The air mail volume at BNA is only limited to 1.7% of total cargo volume. The majority of the air cargo at BNA consists of domestic freight.

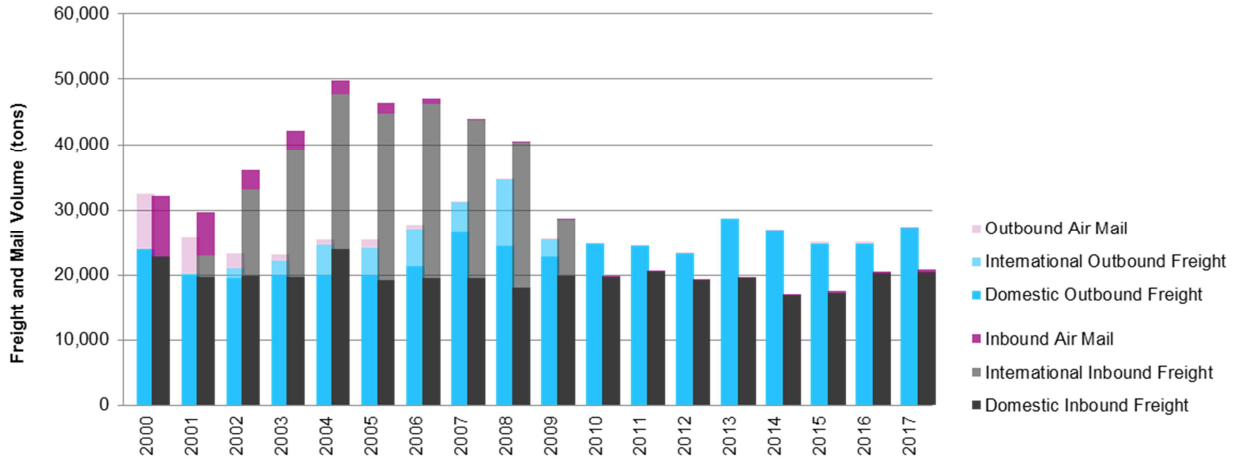



**Figure 21. Historical Air Cargo Tonnage**

*Source: MNAA. AECOM analysis.*

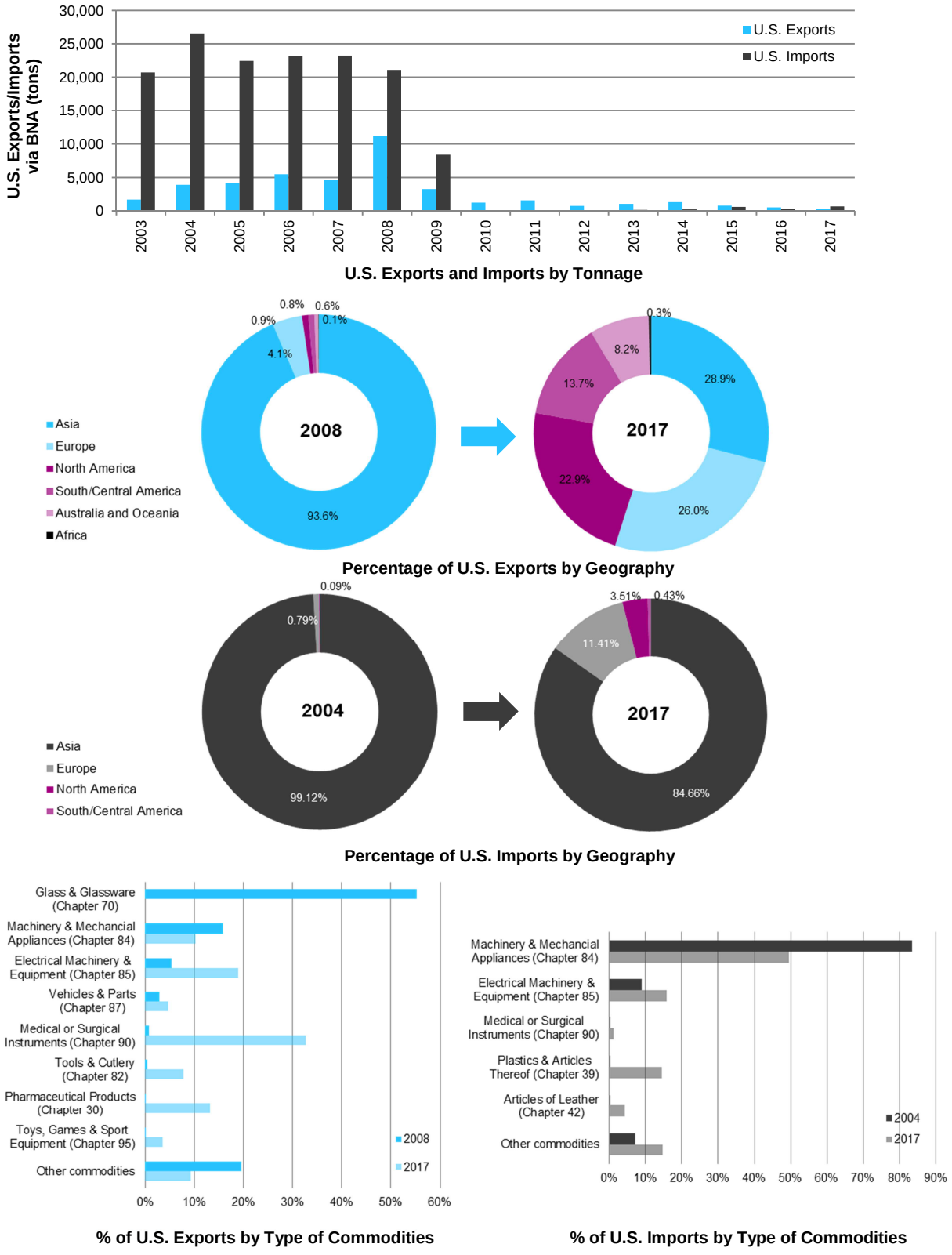
**Figure 22** illustrates the changes in U.S. exports and imports via BNA from the historical highest volume to 2017 in terms of tonnage, geography, and type of commodities. It shows that the majority of the exports/imports were to/from Asia, but the mix has been diversified in recent years. China Airlines used to operate air freighters in BNA from 2001 to 2009. The decline in international cargo, especially imports from Asia, is consistent with the operations ceased by China Airlines.

The type of goods being exported and imported[13] also varied through the years. As shown in **Figure 22**, there are more medical or surgical instruments and pharmaceutical products being exported in 2017 than ten years ago. Machinery and mechanical appliances, and electrical equipment are still the main type of imports, but the varieties of imported commodities have been more diversified. The increase in exports of medical and pharmaceutical products is consistent with the high presence of healthcare industry in the MSA. Exports of vehicle parts and accessories will likely stay on the upward curve as Japan-based auto-parts company Denso will expand their manufacturing facility in Maryville.

While there will be growth in imports and exports with the blooming economy of the MSA, the total international air cargo throughput is anticipated to remain as a minor portion of the total air cargo tonnage at BNA following the historical trend in the recent years.

As the majority of the air cargo (over 98%) is domestic in recent years, further analysis on the composition of freight delivered by different carriers is focused on the historical trend in the last five years from 2012 through 2017 as summarized in **Table 12**.

[13] The commodity classifications follow the chapters in Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States (2017).




## Figure 22. Historical U.S. Exports and Imports via BNA

*Source: U.S. Department of Commerce. AECOM analysis.*

*Note: Please refer to Schedule B: Statistical Classification of Domestic and Foreign Commodities Exported from the United States (2017) for the detailed description for the commodify classifications given in different chapters.*

## Table 12. Historical Air Cargo Tonnage by Types

| Year | Integrated or All-Cargo Carriers (tons) | Combination Carriers (tons)[1] | Total Throughput (tons) | % Integrated or All-Cargo Carriers | % Combination Carriers |
|---|---|---|---|---|---|
| 2012 | 35,878 | 6,584 | 42,463 | 84.5% | 15.5% |
| 2013 | 40,927 | 7,335 | 48,262 | 84.8% | 15.2% |
| 2014 | 37,014 | 7,019 | 44,033 | 84.1% | 15.9% |
| 2015 | 35,095 | 7,450 | 42,546 | 82.5% | 17.5% |
| 2016 | 37,538 | 8,044 | 45,582 | 82.4% | 17.6% |
| 2017 | 39,720 | 8,633 | 48,353 | 82.1% | 17.9% |
| **Period** | | | **CAGR** | | |
| **2012 to 2017** | **2.4%** | **3.7%** | **2.6%** | N/A | N/A |

| Year | Domestic Freight (tons) | International Freight (tons) | Air Mail (tons) | Total Throughput (tons) | % Domestic Freight | % International Freight | % Air Mail |
|---|---|---|---|---|---|---|---|
| 2012 | 42,462 | 0 | 1 | 42,463 | 100.0% | 0.00% | 0.001% |
| 2013 | 48,262 | 0 | 0 | 48,262 | 100.0% | 0.00% | 0.00% |
| 2014 | 43,888 | 0 | 144 | 44,033 | 99.7% | 0.00% | 0.33% |
| 2015 | 41,942 | 0 | 604 | 42,546 | 98.6% | 0.00% | 1.42% |
| 2016 | 44,943 | 3 | 636 | 45,582 | 98.6% | 0.01% | 1.40% |
| 2017 | 47,535 | 11 | 808 | 48,353 | 98.3% | 0.02% | 1.67% |
| **Period** | | | | **CAGR** | | | |
| **2012 to 2017** | **2.3%** | N/A | N/A | **2.6%** | N/A | N/A | N/A |

*Source: MNAA. AECOM analysis.*

*Note: 1. Air mails are carried by passenger aircraft at BNA and their tonnages are grouped under combination carriers in this table.*
*2. Total may not add up due to rounding.*

*Abbreviations: N/A – Not available. CAGR – Compound annual growth rate.*

Air cargo services are provided by four basic types of carriers:

- Combination carriers – passenger airlines offering cargo services. They use either passenger aircraft designed with additional freight capacity, or in some cases air freighters. They may limit their services to express packages, mail, and palletized freight on scheduled passenger services or may operate their own cargo service with dedicated air freighter. Examples at BNA include Southwest, Delta, American, United, and Alaska. These passenger airlines only provide belly cargo capacity at BNA. They do not provide dedicated freighters at BNA like some other large combination carriers (e.g. Korean Airlines, Lufthansa, and Cathay Pacific). China Airlines used to be the largest combination carrier which provided major cargo services at BNA but their service ended in 2009.
- Integrated carriers offering door-to-door services by combining air and land transport (also known as integrated express operators or integrators). The largest air freight carriers are the integrated carriers FedEx, and UPS. Other major integrators include DHL, BAX Global (before 2011), and TNT. Integrated carriers operate extensive hub-and-spoke networks providing expansive geographic coverage with their fleet of scheduled aircraft, trucks, and couriers. FedEx became the dominant air cargo carrier at BNA after China Airlines left in 2009, and BAX Global gave up their domestic air freight service in 2011 after being acquired by Deutsche Bahn in 2006. Airborne Express (ABX) was acquired by DHL and they started operating at BNA in 2012. Before Airborne Express, Astar Air provided the service on behalf on DHL.

- All-cargo airlines offering chartered and/or scheduled services. They operate scheduled services for contract shipper and also provide charter operations for other airlines. They typically utilize freight forwarders to arrange most of their shipments. The largest scheduled all-cargo carrier with presence in the U.S. is Cargolux based in Luxembourg. Air Transport International (ATI or ATN) and its sister company Capital Cargo International (before 2013) are the all-cargo airlines at BNA. Air Transport International also leases their aircraft (B757-200PCF) to DHL.
- Leasing companies providing air freighters on dry or wet lease.

Table 12 summarizes the historical air cargo volume carried by integrated or all-cargo carriers (82% to 85%), and combination carriers (15% to 18%). The air cargo tonnages for integrated and all-cargo carriers are grouped together because they both utilize air freighters. Combination carriers at BNA only provide belly cargo capacity on their passenger aircraft. Hence, only the air cargo on air freighters (excluding belly cargo) will be used to estimate the number of cargo aircraft operations.

**Figure 23** depicts the air cargo throughput by carriers. FedEx has the largest market share by tonnage at BNA and is followed by DHL (Airborne Express). Southwest provides cargo service using their passenger aircraft and is the third largest air cargo carrier at BNA. British Airways began their service from LHR in May 2018 using their B787-8 aircraft. IAG Cargo handles the freight services of British Airways and they offer a belly payload capacity of 15 tonnes per flight on the B787-8 between LHR and BNA. IAG/British Airways cargo bookings have started strong. It is anticipated that the growth in international freight will increase accordingly.

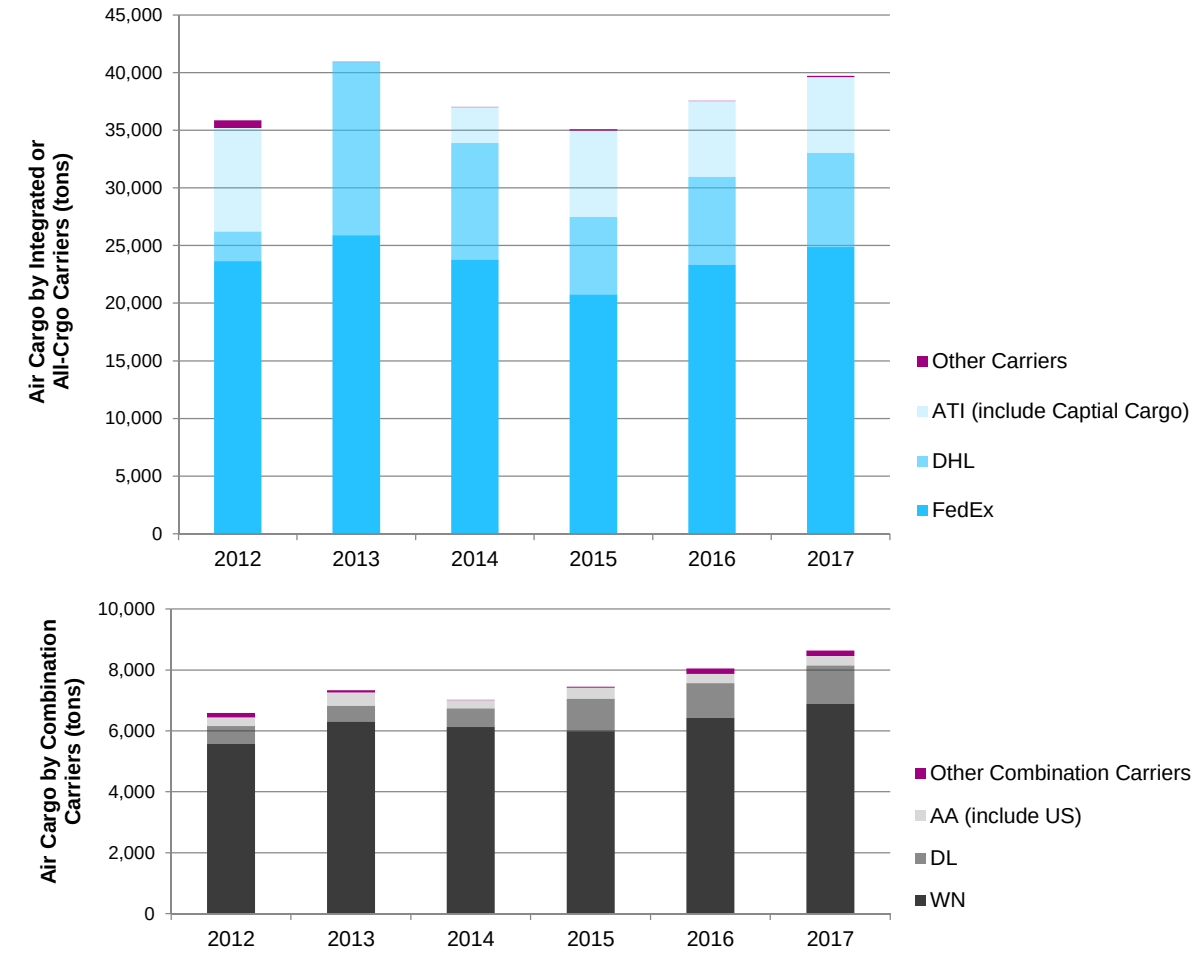



**Figure 23. Historical Air Cargo Throughput by Carriers**

*Source: MNAA. AECOM analysis.*

**Table 13** and **Figure 24** summarize the fleet mix of air freighters operated at BNA in 2017. FedEx mainly operates their B757-200 with some A300-600, and occasionally uses B767-300, MD-10, and MD-11 freighters for their operations from BNA to multiple destinations, including Memphis (MEM), Minneapolis (MSP), Indianapolis (IND), and Pittsburgh (PIT), etc. DHL (Airborne Express) operates mostly B767-300 freighters for destinations including Miami (MIA) and Cincinnati (CVG). ATI operates mostly B767-200 freighters for their flights between CVG and BNA.

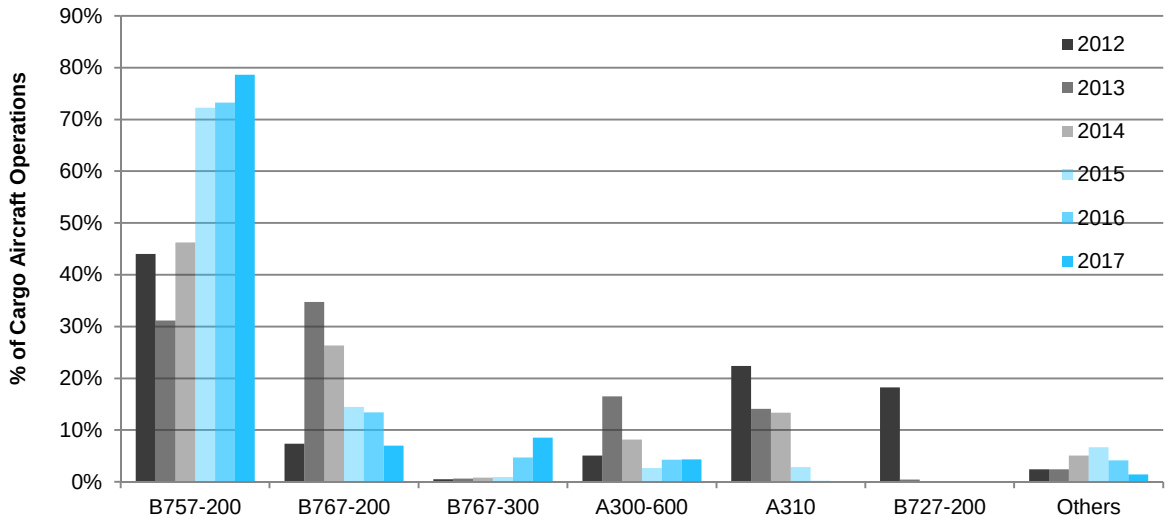
In 2017, over 78% of the freighter operations at BNA were flown by B757-200 aircraft and their operations are increasing with the growth of FedEx. B767-300 freighter operations are also increasing, which is primarily driven by the fleet of Airborne Express (DHL). B727-200 models were either flown by previous cargo carriers who no longer operate at BNA (e.g. Astar Air, BAX Global, Capital Cargo), or they were retired (e.g. by FedEx).

### Table 13. All-Cargo or Integrated Carriers Fleet Mix at BNA

| Carrier | Fleet | Maximum Payload[1] |
|---|---|---|
| FedEx | B757-200 Freighter | 60,000 lbs |
| | A300-600 Freighter | 105,000 lbs |
| | B767-300 Freighter | 120,000 lbs |
| | MD-10 Freighter | 170,000 lbs |
| | MD-11 Freighter | 180,000 lbs |
| Airborne Express (DHL) | B767-300 Freighter | 119,000 to 121,000 lbs |
| | B767-200 Freighter | 54,000 to 98,000 lbs |
| Air Transport International | B767-200 Freighter | 54,000 to 98,000 lbs |

*Source: Carriers' websites. AECOM analysis.*

*Note: 1. Maximum payloads for FedEx's and Air Transport International's fleet are based on their corresponding websites. Maximum payload for Airborne Express's B767-300 Freighter is based on Boeing's Specifications for different engines.*




### Figure 24. Historical Cargo Aircraft Fleet Mix

*Source: FAA Traffic Flow Management System Counts (TFMSC). AECOM analysis.*

## 4.7 Aircraft Operations

Historical total aircraft operations data provided in **Table 14** and **Figure 25** is based on the FAA Air Traffic Activity Data System (ATADS). A reconciliation and comparison of the operations recorded by the data from MNAA and the FAA ATADS was conducted to estimate the breakdown of cargo aircraft. The total aircraft operations from both data sets are very similar (less than 1% difference). In the recent decade, the differences in operations by type are also very similar (less than 0.6% difference). **Table 15** summarizes the historical aircraft operations by type of operations based on both MNAA and FAA ATADS. The operations from air carrier (passenger and cargo), air taxi, general aviation, and military aircraft follow the FAA ATADS. The split between passenger air carrier and cargo carrier operations is based on MNAA records.

Annual operations at BNA decreased from over 300,000 operations in the early 1990s to just over 200,000 operations in 2017. Even after the economic downturns when total enplanements increased at over 6% per annum from 1996 to 2000 and from 2010 to 2017, total operations only increased at 2.7% and 2.4% during the same period, respectively. Between 2003 and 2007, aircraft operations decreased while enplanements increased at over 5% per annum.

This is consistent with an industry-wide trend, with airlines generally increasing aircraft size, but providing less frequency resulting in fuller flights (higher load factors). Total cargo volume increased in the recent three years; however, cargo aircraft operations decreased. The trend is probably influenced by the increase in cargo aircraft size and lifting capacity (payload) per flight (e.g. increasing B767-300 freighter operations), the optimization of freight volume per flight, and the balance between enplaned and deplaned cargo demand.

Total general aviation activities (air taxi and general aviation operations) at BNA decreased from over 110,000 operations in early 2000s to 67,000 operations in 2017. Further discussion on the historical trend of general aviation activities is included in the subsequent section.

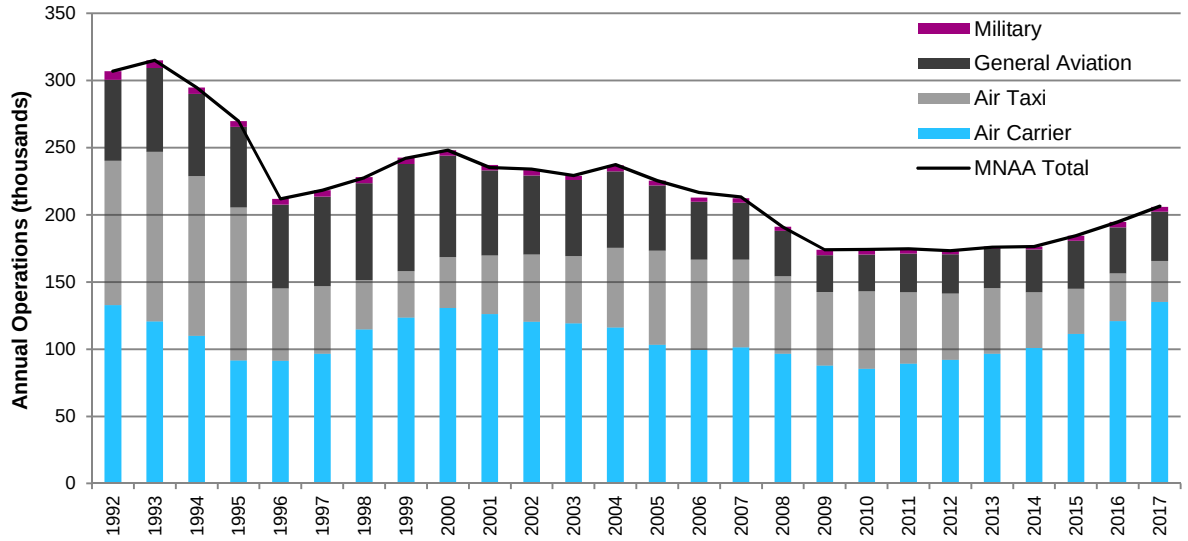



**Figure 25. Historical Aircraft Operations by Type**

*Source: MNAA. FAA ATADS. AECOM analysis.*
*Note: Total operations from MNAA are very similar to FAA ATADS. <1% difference.*

## Table 14. Historical Aircraft Operations

| Year[1] | Aircraft Operations | YOY % Change | Year | Aircraft Operations | YOY % Change |
|---|---|---|---|---|---|
| 1992 | 306,746 | N/A | 2005 | 225,309 | -4.9% |
| 1993 | 315,049 | 2.7% | 2006 | 212,828 | -5.5% |
| 1994 | 294,617 | -6.5% | 2007 | 212,204 | -0.3% |
| 1995 | 269,774 | -8.4% | 2008 | 191,125 | -9.9% |
| 1996 | 211,821 | -21.5% | 2009 | 174,058 | -8.9% |
| 1997 | 218,185 | 3.0% | 2010 | 174,235 | 0.1% |
| 1998 | 227,959 | 4.5% | 2011 | 174,750 | 0.3% |
| 1999 | 242,433 | 6.3% | 2012 | 173,222 | -0.9% |
| 2000 | 248,135 | 2.4% | 2013 | 176,426 | 1.8% |
| 2001 | 237,139 | -4.4% | 2014 | 176,284 | -0.1% |
| 2002 | 233,163 | -1.7% | 2015 | 184,421 | 4.6% |
| 2003 | 228,977 | -1.8% | 2016 | 194,758 | 5.6% |
| 2004 | 236,794 | 3.4% | 2017 | 205,802 | 5.7% |

| Historical Growth Periods[2] | CAGR |
|---|---|
| 1996 to 2000 | 2.7% |
| 2003 to 2007 | -1.9% |
| 2010 to 2017 | 2.4% |

*Source: FAA ATADS. AECOM analysis.*

*Note: 1. FAA ATADS data grouped in calendar year is used instead of FAA TAF which is based on federal fiscal year.*

*2. Historical growth periods refer to the growth of enplanements given in **Table 6**.*

*Abbreviations: N/A- not available. CAGR – Compound annual growth rate. YOY – Year-over-year.*

## Table 15. Historical Aircraft Operations by Type

| Year | Air Carrier | | Total Air Carrier | Air Taxi | General Aviation | Military | Total Operations |
|---|---|---|---|---|---|---|---|
| | Passenger Aircraft | Cargo Aircraft | | | | | |
| 2012 | 89,699 | 2,230 | 91,929 | 49,293 | 29,418 | 2,582 | 173,222 |
| 2013 | 94,426 | 2,136 | 96,562 | 48,707 | 29,501 | 1,656 | 176,426 |
| 2014 | 98,262 | 2,488 | 100,750 | 41,523 | 31,813 | 2,198 | 176,284 |
| 2015 | 108,494 | 2,910 | 111,404 | 33,509 | 35,656 | 3,852 | 184,421 |
| 2016 | 118,399 | 2,556 | 120,955 | 35,423 | 34,152 | 4,228 | 194,758 |
| 2017 | 132,473 | 2,662 | 135,135 | 30,540 | 36,577 | 3,550 | 205,802 |

*Source: MNAA. FAA ATADS. AECOM analysis.*

## 4.8 Based Aircraft

Historical based aircraft records were obtained from the FAA TAF, MNAA, and the two full service Fixed Base Operators (FBOs): Atlantic Aviation, and Signature Flight Support. **Table 16** and **Figure 26** provide information on aircraft based at BNA since 2000, including the number of single-engine, multi-engine, jet, and helicopter aircraft.

While the total number of based aircraft at BNA decreased from 172 in 2000 to 87 in 2017, the number of jets increased significantly from 31 in 2000 to 57 in 2017 or from 18% to 65.5% of the total based aircraft. The increase in jet aircraft and associated decrease in single-engine and multi-engine aircraft is indicative of increased business aviation and FBO activity at BNA.

**Table 16. Historical Based Aircraft by Type**

| | Number of Based Aircraft | | | | | | Percentage of Total Based Aircraft | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Single | Multi | Jet | Helios | Other | Total | Single | Multi | Jet | Helios | Other |
| 2000 | 51 | 77 | 31 | 1 | 12 | 172 | 29.7% | 44.8% | 18.0% | 0.6% | 7.0% |
| 2001 | 44 | 85 | 42 | 2 | 12 | 185 | 23.8% | 45.9% | 22.7% | 1.1% | 6.5% |
| 2002 | 64 | 75 | 38 | 2 | 12 | 191 | 33.5% | 39.3% | 19.9% | 1.0% | 6.3% |
| 2003 | 67 | 74 | 38 | 2 | 12 | 193 | 34.7% | 38.3% | 19.7% | 1.0% | 6.2% |
| 2004 | 45 | 60 | 34 | 2 | 12 | 153 | 29.4% | 39.2% | 22.2% | 1.3% | 7.8% |
| 2005 | 40 | 50 | 42 | 2 | 12 | 146 | 27.4% | 34.2% | 28.8% | 1.4% | 8.2% |
| 2006 | 30 | 57 | 46 | 2 | 8 | 143 | 21.0% | 39.9% | 32.2% | 1.4% | 5.6% |
| 2007 | 30 | 57 | 46 | 2 | 8 | 143 | 21.0% | 39.9% | 32.2% | 1.4% | 5.6% |
| 2008 | 26 | 37 | 43 | 2 | 11 | 119 | 21.8% | 31.1% | 36.1% | 1.7% | 9.2% |
| 2009 | 20 | 35 | 45 | 2 | 10 | 112 | 17.9% | 31.3% | 40.2% | 1.8% | 8.9% |
| 2010 | 18 | 32 | 48 | 2 | 0 | 100 | 18.0% | 32.0% | 48.0% | 2.0% | 0.0% |
| 2011 | 22 | 34 | 42 | 2 | 0 | 100 | 22.0% | 34.0% | 42.0% | 2.0% | 0.0% |
| 2012 | 16 | 24 | 44 | 2 | 0 | 86 | 18.6% | 27.9% | 51.2% | 2.3% | 0.0% |
| 2013 | 19 | 25 | 47 | 1 | 0 | 92 | 20.7% | 27.2% | 51.1% | 1.1% | 0.0% |
| 2014 | 20 | 23 | 49 | 1 | 0 | 93 | 21.5% | 24.7% | 52.7% | 1.1% | 0.0% |
| 2015 | 20 | 23 | 49 | 1 | 0 | 93 | 21.5% | 24.7% | 52.7% | 1.1% | 0.0% |
| 2016 | 20 | 23 | 49 | 1 | 0 | 93 | 21.5% | 24.7% | 52.7% | 1.1% | 0.0% |
| 2017 | 17 | 12 | 57 | 1 | 0 | 87 | 19.5% | 13.8% | 65.5% | 1.1% | 0.0% |
| **Period** | | | **CAGR** | | | | | | | | |
| 2000 to 2017 | -6.3% | -10.4% | 3.6% | 0.0% | -100% | -3.9% | N/A | N/A | N/A | N/A | N/A |

*Source: 2000 to 2016 from FAA TAF 2017 Model, issue Jan 2018. 2017 from MNAA and FBOs, collected in April 2018. AECOM analysis.*

*Note: There are 20 based helicopters for the Army National Guard which is not recorded in FAA TAF. Table 16 excluded these 20 based military aircraft.*

*Abbreviations: N/A- not applicable. CAGR – Compound annual growth rate.*

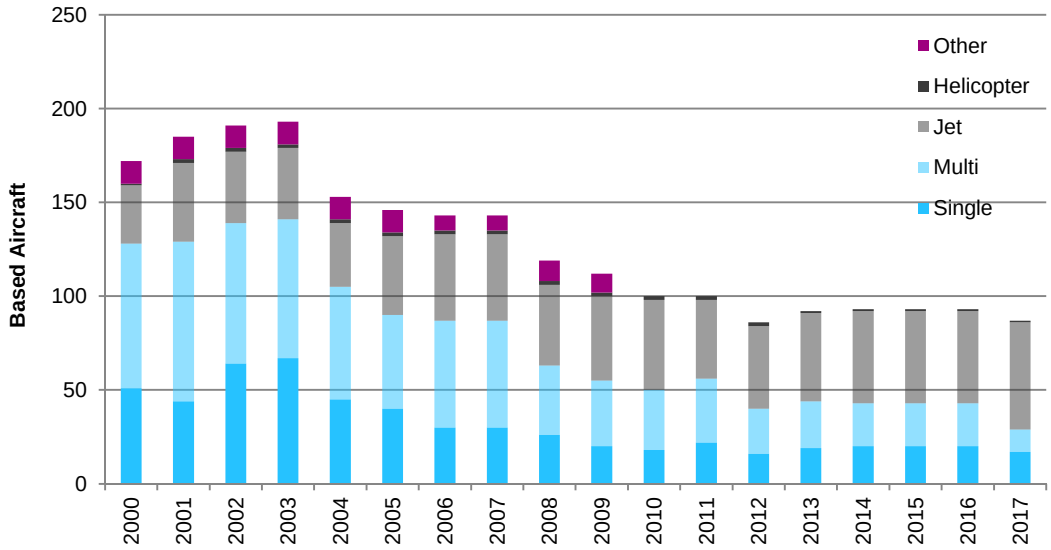



**Figure 26. Historical Based Aircraft by Type**

*Source: FAA TAF, issue January 2018. AECOM analysis.*

# 5. Aviation Demand Forecasts

Forecasts of aviation demand were developed for the following main categories, including:

- Enplaned passengers
  - Domestic and international enplaned passengers
- Air Cargo
  - Freight by integrated and all-cargo carriers
  - Freight by combination carriers
  - Air Mail
- Aircraft operations
  - Air carrier (commercial passenger air carrier)
  - Air carrier (integrated and all-cargo carriers)
  - Air taxi and general aviation
  - Military aircraft operations
  - Breakdowns between itinerant and local operations
- Based Aircraft

Each forecast includes expected demand for the 20-year planning horizon (2037) grouped into five-year periods and utilizing actual 2017 statistics as the baseline.

## 5.1 Enplaned Passengers Forecast

The forecast analysis consisted of two main elements: a short-term forecast, and a long-term forecast. The short-term forecast focuses on the coming four to six years and references some of the recent known factors such as planned events, hotel developments, and announcements of new airline services, etc. The long-term forecast projects the enplanement demands in the 20-year planning horizon based on macroscopic socioeconomic conditions, and historical trends at the airport. A range of scenarios from a high (optimistic) scenario, baseline, to a low (pessimistic) scenario were considered.

### 5.1.1 Short-Term Enplanement Forecast

The short-term forecast developed estimates for 2018 and then extended them over four to six years to match the growth projected in the long-term forecast models described in the next section. Enplanements in 2018 are expected to increase by approximately 9% to 7.7 million. The following factors were considered in developing the short-term enplanement forecast:

- Enplanements for the first three months in 2018 were 7.7% to 11.7% higher than the same months in 2017. Enplanements in the recent 12-month period (April 2017 to March 2018) were 8.8% higher than the preceding 12-month period (April 2016 to March 2017).
- The scheduled departures seats in 2018 were 9.4% higher than 2017 (**Table 5**). The flight schedules were accessed in March 2018, and typically represent the scheduled operations of most airlines in the subsequent 9 to 12-month period.
- At least ten new markets (LHR, TTN, OKC, PGD, VPS, MYR, RIC, SAV, PIE, and SYR) and two new airlines (British Airways and Allegiant) were added in 2018.
- Enplanements increased at a compound annual growth rate of 6.5% between 2010 and 2017. The growth momentum in the recent two years was very strong at 11.3% and 9% in 2016 and 2017, respectively (**Table 6**).
- 27 hotel properties are under construction and will add over 12% of rooms in the coming three years. More large conventions and concerts have already scheduled in 2018. More new attractions, restaurants, and bars are in the pipeline. Nashville's strength as a destination for both leisure and business travelers will continue.

### 5.1.2 Long-Term Enplanement Forecast

The long-term forecast projects the enplanement demands in the 20-year planning horizon based on key socioeconomic forecasts, and historical trends at the airport. The projections are focused on the ability of the primary Airport Service Region's economic base to generate increasing passenger demands in the long-term. As discussed in **Section 3**, the Nashville MSA is a mature and expanding economic area that outpaces the average growth in Tennessee and in the U.S. It is identified as a strong and healthy economy capable of supporting further growth in aviation demand.

#### 5.1.2.1 Econometric Models

Econometric models using regression analysis were developed to project passenger demands in relation to socioeconomic factors, including GDP, nonfarm employment, per capita personal income, population, unemployment rate, and jet fuel price. The correlation may be single (pair-wise) or multiple correlations. Correlation analysis was first conducted to identify relevant independent variables for the regression models. Then the significance of the variables was tested to avoid multicollinearity. The following independent variables were used to develop the econometric models after testing for significance. The corresponding coefficients of determination ($R^2$) for the models are given in brackets.

- Nashville MSA real GDP ($R^2 = 0.87$)
- Nashville MSA nonfarm employment ($R^2 = 0.92$)
- Nashville MSA real per capital personal income ($R^2 = 0.90$)
- Fuel Price and Nashville MSA real GDP ($R^2 = 0.93$)
- Fuel Price and Nashville MSA nonfarm employment ($R^2 = 0.95$)
- Unemployment and Nashville MSA capital personal income ($R^2 = 0.94$)

The high coefficients of determination (over 0.85) signify a high percent of variation in the dependent variables (i.e. enplanements) that are explained by the independent variables (i.e. the socioeconomic parameters). **Table 17** summarizes the forecast enplanements for the econometric models.

Both Boyd and W&P developed GDP forecasts, and both of them were used to project long-term enplanements in the econometric models. Boyd has a more aggressive GDP forecast with annual growth rates of 3.27% to 3.99% between 2018 and 2026. The GDP forecast is extrapolated to 2037 assuming a growth rate of 3.5% per annum for the optimistic scenarios. W&P's GDP forecast represents the moderate scenarios with annual growth rates of 2.71% in 2018 and gradually decreased to 2.23% in 2037.

#### 5.1.2.2 Time-Series Trend Models

Time-series models were also developed to analyze the historical trends at BNA and to project the future based on current or past trends. Aviation demand is typically cyclical in response to changing economic conditions as discussed in an earlier **Section 4.2** (see **Figure 13**), thus, the historical period analyzed considered the historical peaks and troughs. The following time-series models were adopted:

- Time-series model from 2000 to 2017
- Time-series model from 2010 to 2017

The time-series model from 2000 to 2017 represents the trend from the historical peak in 2000 to the recent peak in 2017. It projects a lower, more pessimistic enplanement demand scenario assuming the historical cyclical characteristic continues into the future.

The time-series model from 2010 to 2017 represents a continuation of the recent prosperous trend. It projects an optimistic scenario if the high growth of the recent years continues in the long-term. The outcomes of the time-series models are summarized in **Table 17**.

### 5.1.3 Recommended Baseline Enplanement Forecast

To account for the inherent uncertainty of aviation demand forecasting, a range of enplaned passenger forecasts were developed considering various socioeconomic and historical conditions. Together these forecast scenarios represent a reasonable range of potential demand. The outcomes of the econometric models and time-series models are summarized below as the baseline, high (optimistic), and low (pessimistic) scenarios, each representing varying levels of enplaned passenger activity that may occur based on economic conditions in the service region, as well as fuel price fluctuations that could impact the aviation industry. The consolidated scenarios are presented in **Table 18** and **Figure 27**.

Considering the robust economy of the Nashville MSA, the likelihood of achieving the upper demand estimate is anticipated to be higher than the lower demand estimate. Hence the baseline forecast is closer to the high scenario. Comparisons of the recommended baseline enplanement forecast with the FAA TAF, the BNA Vision forecast, and the 2013 BNA Master Plan Forecast are included in **Table 18** and **Figure 27**.

The FAA's TAF is prepared annually for each commercial service airport in the U.S. Variations from the FAA TAF, while expected due to local growth in demand, need to be reviewed and approved by the FAA. Forecasts are considered consistent with the FAA TAF if the variations are less than 10% within the five-year forecast period, and less than 15% in the 10-year forecast period. The baseline enplanement forecast for this Master Plan Update differs from the FAA TAF by less than 10% in the 5 year planning horizon (9.7%), and less than 15% in the 10 year planning horizon (7.6%).

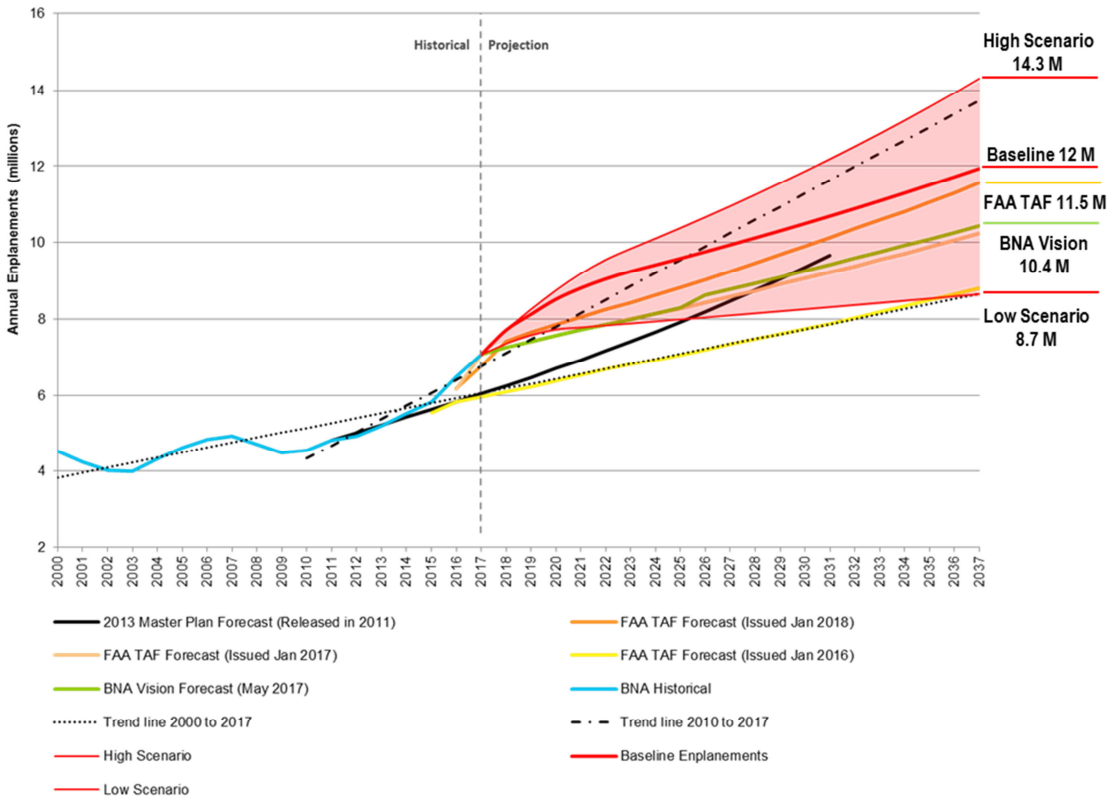



**Figure 27. Enplanement Forecasts**

*Source: FAA TAF (issued 2018, 2017, 2016). BNA Vision Forecast. 2013 Master Plan Forecast. AECOM analysis.*

## Table 17. Econometric and Time-Series Models

| | Econometric Models | | | | | | | | Time-Series Models | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | MSA Real GDP (Boyd) | MSA Real GDP (W&P) | MSA Nonfarm Employment | MSA Real PCPI | Fuel Price & MSA Real GDP (Boyd) | Fuel Price & MSA Real GDP (W&P) | Fuel Price & MSA Nonfarm Employment | MSA Unemployment & Real PCPI | Time-series from 2000 to 2017 | Time-series from 2010 to 2017 |
| | | | | | Actual | | | | | |
| 2017 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 | 7,076,371 |
| | | | | | Forecast | | | | | |
| 2022 | 9,553,211 | 9,553,211 | 8,730,991 | 8,714,122 | 9,553,211 | 9,553,211 | 8,723,418 | 8,702,248 | 7,834,581 | 9,553,211 |
| 2027 | 10,950,798 | 10,557,367 | 9,451,759 | 9,342,720 | 10,949,811 | 10,543,088 | 9,402,678 | 9,266,593 | 8,097,516 | 10,820,847 |
| 2032 | 12,517,561 | 11,528,343 | 10,232,027 | 10,016,661 | 12,515,022 | 11,493,291 | 10,134,830 | 9,867,536 | 8,369,276 | 12,185,815 |
| 2037 | 14,308,485 | 12,588,621 | 11,076,710 | 10,739,218 | 14,303,971 | 12,529,131 | 10,923,991 | 10,507,451 | 8,650,157 | 13,722,963 |
| Period | | | | | CAGR | | | | | |
| 2017 to 2022 (5-year) | 6.19% | 6.19% | 4.29% | 4.25% | 6.19% | 6.19% | 4.27% | 4.22% | 2.06% | 6.19% |
| 2017 to 2027 (10-year) | 4.46% | 4.08% | 2.94% | 2.82% | 4.46% | 4.07% | 2.88% | 2.73% | 1.36% | 4.34% |
| 2017 to 2037 (20-year) | 3.58% | 2.92% | 2.27% | 2.11% | 3.58% | 2.90% | 2.19% | 2.00% | 1.01% | 3.37% |

*Source: AECOM analysis.*

*Abbreviations: PCPI – Per capita personal income. CAGR – Compound annual growth rate.*

## Table 18. Enplanement Forecasts and Comparison with other Forecasts

| Year | High Scenario | Baseline Scenario | Low Scenario | FAA TAF (2017 Model, issued Jan 2018) | % Difference between Baseline and FAA TAF | BNA Vision Forecast (May 2017) | % Difference between baseline and BNA Vision Forecast | 2013 Master Plan Forecast | % Difference between Baseline and 2013 Master Plan Forecast |
|---|---|---|---|---|---|---|---|---|---|
| | | Actual | | Forecast | | Forecast | | Forecast | |
| 2017 | 7,076,371 | **7,076,371** | 7,076,371 | 6,765,647 | 4.6% | 7,091,433 | -0.2% | 6,041,800 | 17.1% |
| | | Forecast | | Forecast | | Forecast | | Forecast | |
| 2022 | 9,553,211 | **9,047,142** | 7,834,581 | 8,247,112 | 9.7% | 7,888,956 | 14.7% | 7,166,800 | 26.2% |
| 2027 | 10,950,798 | **9,938,318** | 8,097,516 | 9,237,934 | 7.6% | 8,773,944 | 13.3% | 8,465,700 | 17.4% |
| 2032 | 12,517,561 | **10,886,036** | 8,369,276 | 10,360,652 | 5.1% | 9,586,955 | 13.6% | N/A | N/A |
| 2037 | 14,308,485 | **11,935,070** | 8,650,157 | 11,548,320 | 3.4% | 10,440,067 | 14.3% | N/A | N/A |
| Period | | CAGR | | CAGR | | CAGR | | CAGR | |
| 2017 to 2022 (5-year) | 6.2% | **5.0%** | 2.1% | 4.0% | N/A | 2.2% | N/A | 3.5% | N/A |
| 2017 to 2027 (10-year) | 4.5% | **3.5%** | 1.4% | 3.2% | N/A | 2.2% | N/A | 3.4% | N/A |
| 2017 to 2037 (20-year) | 3.6% | **2.7%** | 1.0% | 2.7% | N/A | 2.0% | N/A | N/A | N/A |

*Source: FAA TAF 2017 Model (issued Jan 2018). BNA Vision Forecast (May 2017). 2013 Master Plan Forecast (Released in 2011). AECOM analysis.*
*Abbreviations: CAGR – Compound annual growth rate. N/A- not applicable.*

### 5.1.4 Domestic and International Passenger Forecasts

As discussed in **Section 4.2.1**, international passenger growth rates have been increasing at BNA in double digits continuously since 2013. Airlines added scheduled flights and seats to the international markets as shown in the published 2018 schedules. British Airways began their service from LHR to BNA in May 2018. The international growth momentum is expected to continue at BNA for all the forecast scenarios. The following factors are considered in developing the international passenger forecasts:

- British Airways' scheduled operations in 2018 to 2019 as given in **Table 19** are included in the forecast for international demand at BNA.

**Table 19. Additional International Flights to LHR by British Airways**

| Period | Scheduled Departures | Scheduled Departure Seats |
|---|---|---|
| May to Dec 2018 | 164 | 35,097 |
| 2019 | 239 | 51,146 |

*Source: Flight schedules from Innovata via Aviation Dataminer.*

- Nashville has become a global leisure and business travel destination. The growth in conventions is solid as described in **Section 3.1.4**. Multiple media and travel agencies such as TripAdvisor, National Geographic Traveler U.K., and Conde Nest Traveler have named Nashville as the top place to visit in 2018. The number of visitors (including international visitors) is expected to grow.
- The most lucrative passengers are the business travelers who fill up the premium cabins (first/business class). These tickets represent 75% of the airline's revenue on some flights, especially on international long-haul routes. As mentioned in **Section 3.2**, the per capital personal income in the Nashville MSA is higher than the state and national average. In addition, the percentage of households with annual income over $200,000 is increasing in Nashville MSA and will outpace the U.S. as shown in **Figure 28**. The high income group households represent the high-end customers who are more likely to purchase premium tickets. The increasing high income households will support the international demand at Nashville.

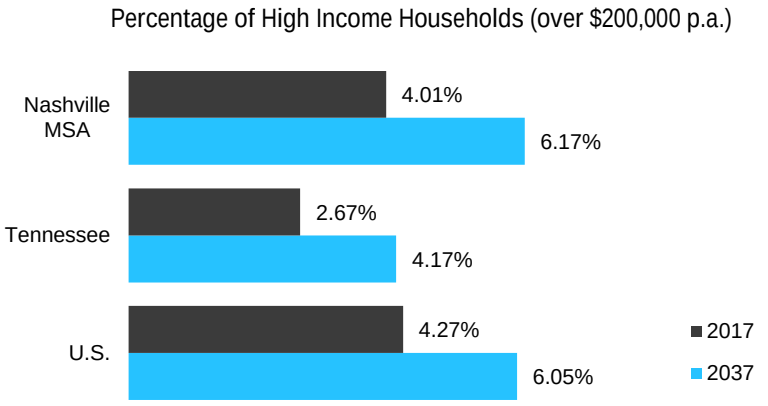



**Figure 28. Percentage of High Income Households**

*Source: W&P. AECOM analysis.*

- There are potential new destinations as gateways to Europe other than LHR, just to name a few: e.g. Gatwick (LGW), Keflavik (KEF), and Dublin (DUB), by foreign low cost carriers with new business models such as Norwegian, WOW air, and Aer Lingus, etc.

- For U.S. air carriers (e.g. DL, AA, WN at BNA), Latin America/Caribbean/Mexico will remain the largest international destinations despite the recent economic and political crises in Venezuela and Brazil. With the Latin America region, Mexico and Dominican Republic are the two largest economies and are expected to have strong growth.
- For foreign flag carriers (e.g. AC, WS, BA at BNA), the Europe and Canada regions are more mature markets and are projected with moderate economic growth and slightly slower than the Latin America region. The GDP growth forecast for Canada, Atlantic, and Latin America regions are given in **Table 20**. The enplanement growth rates projected by *FAA Aerospace Forecast FY2018-2038* for these three regions are summarized in **Table 21**.
- The economic and air travel growth in the Asia Pacific region is strong. The GDP growth forecast and international enplanement growth rates projected by *FAA Aerospace Forecast FY2018-2038* for the Asia Pacific region are included in **Table 20** and **Table 21.** Considering the high performance of modern aircraft with ultra-long range, there is potential for air service to markets in countries with liberal aviation agreements with the U.S. in the long-term.
- Aircraft manufactures like Boeing and Airbus prepare detailed forecasts regularly and provide an insight on the global and regional industry trends. Their inter-regional forecasts for North America are summarized in **Table 22** for reference.

### Table 20. International GDP Growth Forecast by Travel Region

| Period | Canada | Atlantic | Latin America/ Caribbean/Mexico | Asia Pacific |
|---|---|---|---|---|
| 2010 to 2017 | 2.2% | 1.9% | 1.5% | 4.6% |
| 2017 to 2018 | 2.4% | 2.5% | 1.9% | 4.6% |
| 2018 to 2028 | 2.0% | 2.2% | 3.0% | 4.3% |
| 2018 to 2038 | 2.0% | 2.1% | 3.0% | 3.8% |

*Source: Global Insight website. FAA Aerospace Forecast FY2018-2038.*

### Table 21. U.S. Scheduled International Passenger Enplanement Growth Forecast by Travel Region

| Period | U.S./Canada Transborder | Atlantic | Latin America/ Caribbean/Mexico | Asia Pacific |
|---|---|---|---|---|
| **U.S. Mainline Carriers** | | | | |
| 2010 to 2017 | N/A | 0.2% | 5.5% | 1.1% |
| 2017 to 2018 | N/A | 3.0% | 6.9% | 0.8% |
| 2018 to 2028 | N/A | 2.9% | 3.6% | 2.5% |
| 2018 to 2038 | N/A | 2.6% | 3.7% | 2.5% |
| **U.S. and Foreign Flag Carriers** | | | | |
| 2010 to 2017 | 4.2% | 5.1% | 6.4% | 6.2% |
| 2017 to 2018 | 4.3% | 5.9% | 5.1% | 4.7% |
| 2018 to 2028 | 3.5% | 3.4% | 3.2% | 4.1% |
| 2018 to 2038 | 3.4% | 3.3% | 3.7% | 3.7% |

*Source: FAA Aerospace Forecast FY2018- 2038.*

### Table 22. Inter-Regional Passenger Traffic Forecast by Aircraft Manufactures

| Period | North America-Europe | North America-Latin America | North America-Asia Pacific |
|---|---|---|---|
| **Airbus Global Market Forecast 2017-2036** | | | |
| 2017 to 2036 | 2.9% | 3.9% | 4.5% |
| **Boeing Current Market Outlook 2017-2036** | | | |
| 2017 to 2036 | 1.8% | 3.0% | 2.0% |

*Source: Airbus Global Market Forecast 2017-2036. Boeing Current Market Outlook 2017-2036.*
*Note: Traffic flows are in RPK – revenue passenger kilometers.*

Three scenarios were developed based on the international growth potential at Nashville:

The high scenario assumes the percentage of international passengers at BNA will increase from 1.22% in 2017 to approximately 3.35% and the growth rates will be 9% per annum over the 20-year planning horizon. The high scenario includes potential new foreign flag carrier launching a new market in the near-term.

The baseline scenario assumes the percentage of international passengers will increase from 1.22% to 2.4% and the growth rates will be 6.2% per annum from 2017 to 2037. It considers potential new foreign flag carrier launching a new market in the intermediate-term.

The low scenario assumes the percentage of international passengers will increase from 1.22% to 1.9% and the growth rates will be 3.3% per annum from 2017 through 2037. It represents an average growth similar to the other airports in the nation.

The domestic and international passenger forecast for the three scenarios are summarized in **Table 23**.

### Table 23. Domestic and International Enplanement Forecasts

| Year | High Scenario | | Baseline Scenario | | Low Scenario | |
|---|---|---|---|---|---|---|
| | Domestic Enplanements | International Enplanements | Domestic Enplanements | International Enplanements | Domestic Enplanements | International Enplanements |
| | | | **Actual** | | | |
| 2017 | 6,990,259 | 86,113 | **6,990,259** | **86,113** | 6,990,259 | 86,113 |
| | | | **Forecast** | | | |
| 2022 | 9,376,804 | 176,407 | **8,897,084** | **150,058** | 7,709,531 | 125,049 |
| 2027 | 10,693,829 | 256,969 | **9,748,633** | **189,685** | 7,960,173 | 137,344 |
| 2032 | 12,161,239 | 356,322 | **10,651,048** | **234,988** | 8,218,954 | 150,322 |
| 2037 | 13,829,641 | 478,844 | **11,647,600** | **287,470** | 8,486,139 | 164,017 |
| **Period** | | | **CAGR** | | | |
| 2017 to 2022 (5-year) | 6.1% | 15.4% | **4.9%** | **11.6%** | 2.0% | 7.7% |
| 2017 to 2027 (10-year) | 4.3% | 11.6% | **3.4%** | **8.1%** | 1.3% | 4.8% |
| 2017 to 2037 (20-year) | 3.5% | 9.0% | **2.6%** | **6.2%** | 1.0% | 3.3% |

Abbreviations: CAGR – Compound annual growth rate.

## 5.2 Air Cargo Forecast

The primary objective of the air cargo forecast is to provide a reasonable order of magnitude projection of cargo activity that can be expected over the 20 year planning horizon. Due to the cyclical nature of the economy, the focus of the forecasts is not to predict year-to-year fluctuations, but to establish a trend that represents long-term growth potential. The air cargo industry is undergoing some transformations, as carriers adjust operations, and new carriers expand their distribution networks in the growing e-commerce marketplace. BNA experienced similar fluctuations in air cargo demand in the past as discussed in **Section 4.6**. Nevertheless, the air cargo throughput is expected to grow with the economy of the Nashville MSA in the long-term.

Various air cargo growth forecasts were analyzed to identify a reasonable expectation for air cargo volume at BNA in the future:

- *Boeing's World Air Cargo Forecast 2016-2017*: Boeing biannually develops a detailed analysis and forecast on the air cargo industry for worldwide regions and markets. The latest forecast includes high, base, and low cases from 2015 to 2035. The high, base, and low cases forecast the U.S. domestic revenue tonne-kilometer (RTKs) to grow at an average annual rate of 2.7%, 2.2%, and 1.7% over the 20-year period from 2015 to 2035, respectively. Three growth models are developed referencing Boeing's World Air Cargo Forecast 20-year growth rates with an extrapolation to 2037 for the high, base, and low cases.
- *The FAA Aerospace Forecast FY 2018-2038*: The FAA projects the U.S. total domestic air cargo revenue ton miles (RTMs) to increase at an average annual rate of 2.0% for the 20-year period from 2018 to 2038. This model references the projected long-term growth rate from the FAA Aerospace Forecast.
- Time-Series Model: After China Airlines ceased their air cargo operations at BNA in 2009, and the global financial crisis lasted from late 2007 to 2009, the air cargo volume has returned to the upward curve in recent years. This model is based on the historical trend in the recent five years from 2012 to 2017.

For each of these five models, the cargo demands for 2018 and 2019 are increased by the additional belly cargo capacity provided by British Airways/IAG Cargo to/from LHR starting in May 2018.

**Table 24** summarizes the air cargo forecasts for these five models, which are then consolidated to the baseline, high (optimistic), and low (pessimistic) scenarios representing varying levels of air cargo throughput estimates for the 20-year planning horizon. The consolidated scenarios are presented in **Table 25** and **Figure 29**.

A comparison between the air cargo forecast and the projections from the 2013 Master Plan, as well as the forecast from the Regional Freight and Goods Movement Study for the Nashville Area Metropolitan Planning Organization (MPO), December 2014, are given in **Table 25** and **Figure 29**. Both of the air cargo forecasts are within the range of our projections in the long-term. The 2013 Master Plan forecast annual growth rate of 2.1% between 2011 and 2031. The Regional Freight and Goods Movement Study forecast air cargo at the Nashville region to grow by 2.5% annually between 2012 and 2040. Both growth rates are very close to our baseline scenario at 2.9% per annum in 10-year and 2.4% per annum in 20-year period.

For each of the baseline, high, and low scenarios, the corresponding estimates for freight and air mail are provided in **Table 26**.

For the purpose of estimating cargo aircraft operations in the next section, the air cargo volumes carried by integrated or all-cargo carriers are estimated in **Table 27**.

## Table 24. Air Cargo Forecast Models

| | Industry Reference | | | | Time-Series Model |
|---|---|---|---|---|---|
| Year | Boeing's High Case (tons) | Boeing's Base Case (tons) | Boeing's Low Case (tons) | FAA Aerospace Forecast (tons) | Time-series from 2012 to 2017 (tons) |
| | | | Actual | | |
| 2017 | 48,353 | 48,353 | 48,353 | 48,353 | 48,353 |
| | | | Forecast | | |
| 2022 | 61,525 | 59,529 | 56,894 | 58,139 | 55,033 |
| 2027 | 70,292 | 66,567 | 61,715 | 64,295 | 58,199 |
| 2032 | 80,308 | 74,218 | 66,943 | 71,102 | 61,365 |
| 2037 | 91,751 | 82,748 | 72,616 | 78,630 | 64,530 |
| Period | | | CAGR | | |
| 2017 to 2022 (5-year) | 4.9% | 4.3% | 3.3% | 3.8% | 2.6% |
| 2017 to 2027 (10-year) | 3.8% | 3.3% | 2.5% | 2.9% | 1.9% |
| 2017 to 2037 (20-year) | 3.3% | 2.7% | 2.1% | 2.5% | 1.5% |
| Immediate Growth | | | | | |
| 2017 to 2018 | 11.0% | 9.5% | 6.9% | 9.0% | 6.4% |
| Long Term Growth | | | | | |
| 2020 to 2037 | 2.7% | 2.2% | 1.7% | 2.0% | 1.1% |

*Abbreviations: CAGR – Compound annual growth rate.*

*Note: Air cargo volumes are given in tons.*

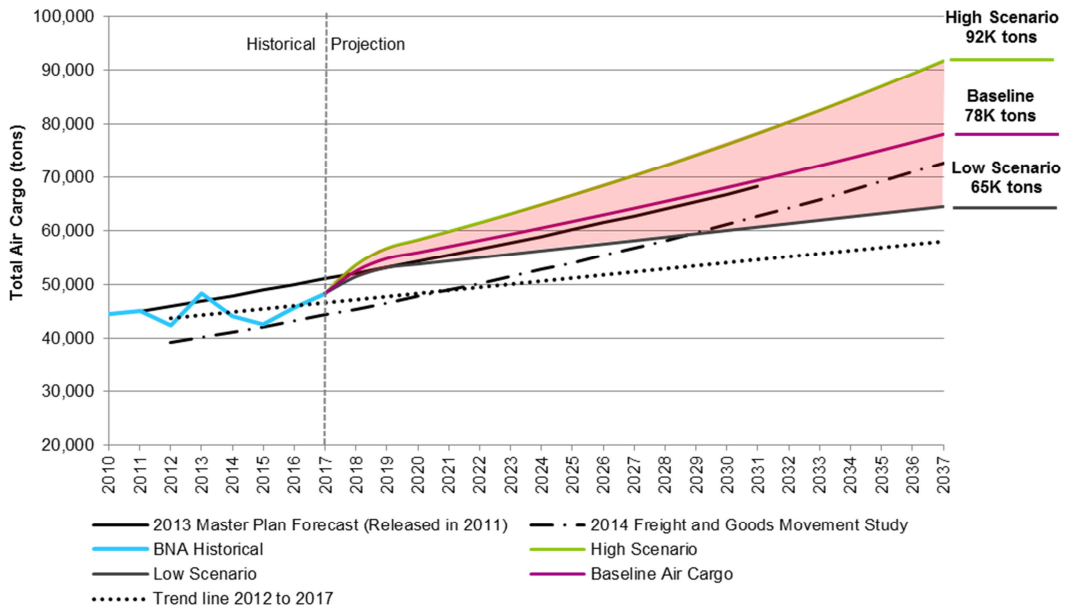



**Figure 29. Air Cargo Forecasts**

*Source: 2013 Master Plan Forecast. 2014 Nashville Area MPO Freight and Goods Movement Study. AECOM analysis.*

## Table 25. Air Cargo Forecasts and Comparison with Previous Master Plan Forecasts

| Year | High Scenario | Baseline Scenario | Low Scenario | 2013 Master Plan Forecast | % Difference between Baseline and 2013 Master Plan Forecast | 2014 Freight and Goods Movement Study Forecast | % Difference between Baseline and 2014 Freight and Goods Movement Study Forecast |
|---|---|---|---|---|---|---|---|
| | | Actual | | Forecast | | Forecast | |
| 2017 | 48,353 | **48,353** | 48,353 | 51,000 | -5.19% | 44,334 | 9.06% |
| | | Forecast | | Forecast | | Forecast | |
| 2022 | 61,525 | **58,224** | 55,033 | 56,590 | 2.9% | 50,173 | 16.1% |
| 2027 | 70,292 | **64,213** | 58,199 | 62,760 | 2.3% | 56,780 | 13.1% |
| 2032 | 80,308 | **70,787** | 61,365 | N/A | N/A | 64,258 | 10.2% |
| 2037 | 91,751 | **78,055** | 64,530 | N/A | N/A | 72,721 | 7.3% |
| Period | | CAGR | | CAGR | | CAGR | |
| 2017 to 2022 (5-year) | 4.9% | **3.8%** | 2.6% | 2.1% | N/A | 2.5% | N/A |
| 2017 to 2027 (10-year) | 3.8% | **2.9%** | 1.9% | 2.1% | N/A | 2.5% | N/A |
| 2017 to 2037 (20-year) | 3.3% | **2.4%** | 1.5% | N/A | N/A | 2.5% | N/A |

*Source: 2013 Master Plan Forecast. 2014 Nashville Area MPO Freight and Goods Movement Study. AECOM analysis.*
*Abbreviations: CAGR – Compound annual growth rate. N/A- not available.*
*Note: Air cargo volumes are given in tons.*

## Table 26. Freight and Air Mail Forecasts

| Year | High Scenario | | Baseline Scenario | | Low Scenario | |
|---|---|---|---|---|---|---|
| | Freight (tons) | Air Mail (tons) | Freight (tons) | Air Mail (tons) | Freight (tons) | Air Mail (tons) |
| | | | Actual | | | |
| 2017 | 47,545 | 808 | **47,545** | **808** | 47,545 | 808 |
| | | | Forecast | | | |
| 2022 | 60,542 | 983 | **57,266** | **959** | 54,125 | 908 |
| 2027 | 69,186 | 1,106 | **63,179** | **1,034** | 57,266 | 933 |
| 2032 | 79,063 | 1,244 | **69,671** | **1,117** | 60,405 | 959 |
| 2037 | 90,351 | 1,400 | **76,848** | **1,207** | 63,544 | 986 |

*Note: Air cargo volumes are given in tons. Numbers may not add up due to rounding.*

## Table 27. Air Cargo Forecasts by Type of Carrier

| Year | High Scenario | | Baseline Scenario | | Low Scenario | |
|---|---|---|---|---|---|---|
| | Integrated or All-Cargo Carriers (tons) | Combination Carriers (tons) | Integrated or All-Cargo Carriers (tons) | Combination Carriers (tons) | Integrated or All-Cargo Carriers (tons) | Combination Carriers (tons) |
| | | | Actual | | | |
| 2017 | 39,720 | 8,633 | **39,720** | **8,633** | 39,720 | 8,633 |
| | | | Forecast | | | |
| 2022 | 47,394 | 13,148 | **46,234** | **11,031** | 43,786 | 10,339 |
| 2027 | 53,337 | 15,849 | **49,878** | **13,301** | 45,013 | 12,252 |
| 2032 | 60,026 | 19,037 | **53,858** | **15,812** | 46,275 | 14,131 |
| 2037 | 67,553 | 22,797 | **58,210** | **18,638** | 47,572 | 15,973 |

*Note: Air cargo volumes are given in tons. Numbers may not add up due to rounding.*

## 5.3 Aircraft Operations Forecast

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

Commercial air carrier operations include those certified under FAR Part 121 or 129 to conduct scheduled services on specific routes. For the purposes of master planning, commercial airline operations include the activities by commercial air carriers, including commuter air carriers with FAR Part 121 or 135 certification, which provide scheduled services on specific routes. 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 may hold only FAR Part 135 certification if their fleet typically consists of small aircraft below 30 seats.

At BNA, charter operators like One Jet (under Part 135), and air carriers for Vacation Express (e.g. Sunway Airlines, and Viva AeroBus/Aeromexico operate under Part 129, and Swift Air, Miami Air, and World Atlantic Airlines operate under Part 121) as shown in **Table 4** in **Section 4.1**, and are included as commercial air carriers.

Air taxi operators typically hold FAR Part 135 certification and provide on-demand services for compensation or hire. The air taxi operations are analyzed together with the general aviation activities. The approach and methodologies are detailed in the following sections.

### 5.3.1 Commercial Airline Operations

Commercial airline operations were estimated utilizing the enplaned passenger forecasts for this Master Plan Update, the projected number of commercial operations at BNA was determined by evaluating 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.

Passenger aircraft operations were further divided into mainline air carrier and regional air carrier operations based on the forecast enplanements for each group as well as differences in average aircraft size (seat capacity) and average load factor.

The aircraft sizes (seat capacity) for the mainline and regional fleet mix at BNA are grouped in categories as given in **Table 28**. The future trends for each category of aircraft are described in **Table 28**. The future trends reference industry trends, the age of the existing fleet for the major airlines, and their outstanding orders for new aircraft. The average retirement age for commercial passenger aircraft assumed approximately 25 years[14].

The existing average seat capacity for each aircraft size category and the corresponding proportion of operations in base year 2017 were first estimated, and then they were projected to the future for the high, baseline, and low scenarios. The high scenario assumes airlines will have a higher proportion of larger aircraft operating at BNA and with higher load factor. **Table 29** summarizes the assumed seat capacity and proportion of operations for each aircraft category over the planning horizon.

The estimates for the small widebody (WB) aircraft considered the additional 162 departures (i.e. 326 operations) to LHR by B787-8 in 2018, and projects that British Airways will gradually increase the frequency to daily operations after 2018. In the high scenario, a new foreign flag carrier from Europe is assumed to join the market within five years and the next one will join in ten years (potential carriers include Norwegian with B787-8, WOW or Aer Lingus with A330). In the baseline scenario, a new foreign flag carrier from Europe is assumed to join the market within ten years and the next one will join in fifteen years. The low scenario assumes growth with existing foreign flag carrier flying B787-8. MNAA advised that the addition of a new foreign flag carrier from Europe is very likely to happen in the near future.

[14] IATA Maintenance Cost Conference 2016.

## Table 28. Aircraft Size Categories and Future Trends

| Aircraft Size Categories | Seat Capacity | Typical Aircraft Models at BNA (operating Airlines) | Future Trends |
|---|---|---|---|
| **Mainline** | **Over 90 seats** | | |
| **Small WB (twin-aisle)** | Less than 300 seats | B787-8 (BA) | • Driven by international demand.<br>• Future models in this group may include B787-8/9, A330, and A330NEO. |
| **Large NB** | Over 175 seats | B757 (DL)<br>A320-100/200 (DL)<br>B737-900 winglets (AS)<br>B737-900 (AS, DL, US) | • Retiring B757.<br>• DL may replace their B757 by A321NEO, which has increased seat capacity to 197 seats.<br>• Future models in this group include: B737-900, B737 MAX 9, B737 MAX 200, B737 MAX 10, A321, and A321NEO. |
| **Intermediate NB** | 150 to 175 seats | B737 MAX8 (WN)<br>B737-800 winglets (WN)<br>B737-800 (DL, UA)<br>MD-90 (DL)<br>A320-100/200 (B6, F9, UA, AA, G4, AS, DL)<br>A320 sharklets (AS) | • Retiring MD-90<br>• DL's MD-90 age 22.4 years, and will likely be replace by A321Neo.<br>• WN, AA, UA, WS, and AC have ordered B737 MAX 8.<br>• Future models in this group include: B737-800, B737 MAX 8, A320, A320NEO |
| **Small NB** | Less than 150 seats | B737-700 winglets (WN, AS, AS, WS)<br>B737-700 (UA)<br>B737-300 (WN)<br>B737-300 winglets (WN)<br>MD-88 (DL)<br>MD-82 (DL)<br>B717 (DL)<br>A319 (AA, UA, DL, F9, G4)<br>E190 (AA, B6) | • Retiring 737 Classics, MD-80s.<br>• WN has retired their B737-300s in 2018, and has ordered some B737 MAX 7.<br>• DL's MD-82 age 27.6 years, and MD-82 age 31 years. They will be retired.<br>• DL's B717 age 16 years. Based on an average retirement age of 25 years, these B717 will be retired in 10 years, and replaced by CS1000 or A321NEO.<br>• AA's E190 are from US Airways at age 11 years. B6's E190 age 10 years. They will probably be in service for another 15 to 20 years.<br>• Future models in this group include: B737-700, B737 MAX 7, A319, A319NEO |
| **Regional** | **Less than 90 seats** | | |
| **75-seaters/ Large Regional Aircraft** | 65 to 80 seats | Bombardier Q400 (WS)<br>CRJ-900 (DL, AA)<br>ERJ-175 (AA, DL)<br>ERJ-175 (UA, DL)<br>CRJ-700 (AA, UA, DL)<br>ERJ-170 (AA, DL) | • The Embraer E-jet and E2 families are likely to dominant the future delivery of new regional jets over the next decade. CRJ NextGen orders have fallen behind. The Chinese ARJ-21 is unlikely to have orders outside China. Mitsubishi's MRJ has yet to be certified.<br>• As the existing ERJ and CRJ are gradually being replaced by new ones in the long-term, the new models typically has more seats e.g. the E175-E2 add one more row of seats to a total of 90 seats. |
| **50-seaters/ Intermediate Regional Aircraft** | 40 to 50 seats | ERJ-135/140/145 (UA)<br>ERJ-145 (AA)<br>CRJ (AC)<br>CRJ-200 (UA, AA)<br>ERJ-140 (AA) | |
| **Small Regional Aircraft (mostly Turboprops)** | Less than 20 seats | BAe Jetstream 31 (LF)<br>Cessna single turboprop engine aircraft CNC (9X)<br>Pilatus PC-12 (4B)<br>Hawker Beechjet 400A (J1) | • Turboprops will likely remain a niche player at BNA for commuter carriers and charter operators. |

*Abbreviations: WB – Widebody aircraft. NB-Narrowbody aircraft.*

## Table 29. Average Seats and Percentage of Fleet Mix by Aircraft Size Category Assumptions

### High Scenario

| Aircraft Size Categories | Average Seats | | | | | Percentage of Fleet Mix | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mainline** | **2017** | **2022** | **2027** | **2032** | **2037** | **2017** | **2022** | **2027** | **2032** | **2037** |
| **Small WB** | N/A | 222 | 231 | 236 | 241 | 0.0% | 0.4% | 0.6% | 0.8% | 1.1% |
| **Large NB** | 176 | 185 | 190 | 195 | 200 | 0.8% | 2.0% | 2.3% | 2.5% | 2.8% |
| **Intermediate NB** | 166 | 168 | 170 | 173 | 175 | 23.7% | 32.6% | 39.6% | 48.2% | 58.7% |
| **Small NB** | 140 | 141 | 144 | 147 | 150 | 75.4% | 65.0% | 57.6% | 48.5% | 37.5% |
| **Regional** | | | | | | | | | | |
| **75-seaters** | 73 | 75 | 77 | 80 | 82 | 65.8% | 64.2% | 66.1% | 68.1% | 70.2% |
| **50-seaters** | 50 | 50 | 50 | 50 | 50 | 21.1% | 23.5% | 21.6% | 19.6% | 17.5% |
| **Small Regional** | 13 | 13 | 13 | 13 | 13 | 13.2% | 12.3% | 12.3% | 12.3% | 12.3% |

### Baseline Scenario

| Aircraft Size Categories | Average Seats | | | | | Percentage of Fleet Mix | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mainline** | **2017** | **2022** | **2027** | **2032** | **2037** | **2017** | **2022** | **2027** | **2032** | **2037** |
| **Small WB** | N/A | 214 | 222 | 231 | 236 | 0.0% | 0.4% | 0.5% | 0.7% | 0.9% |
| **Large NB** | 176 | 184 | 188 | 191 | 195 | 0.8% | 2.0% | 2.1% | 2.2% | 2.3% |
| **Intermediate NB** | 166 | 168 | 170 | 173 | 175 | 23.7% | 31.3% | 36.3% | 42.1% | 48.8% |
| **Small NB** | 140 | 140 | 142 | 143 | 145 | 75.4% | 66.3% | 61.1% | 55.0% | 48.0% |
| **Regional** | | | | | | | | | | |
| **75-seaters** | 73 | 75 | 77 | 78 | 80 | 65.8% | 63.9% | 65.5% | 67.2% | 68.9% |
| **50-seaters** | 50 | 50 | 50 | 50 | 50 | 21.1% | 23.8% | 22.1% | 20.5% | 18.8% |
| **Small Regional** | 13 | 13 | 13 | 13 | 13 | 13.2% | 12.3% | 12.3% | 12.3% | 12.3% |

### Low Scenario

| Aircraft Size Categories | Average Seats | | | | | Percentage of Fleet Mix | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Mainline** | **2017** | **2022** | **2027** | **2032** | **2037** | **2017** | **2022** | **2027** | **2032** | **2037** |
| **Small WB** | N/A | 214 | 214 | 214 | 214 | 0.0% | 0.4% | 0.5% | 0.5% | 0.6% |
| **Large NB** | 176 | 182 | 183 | 184 | 185 | 0.8% | 2.0% | 2.0% | 2.1% | 2.2% |
| **Intermediate NB** | 166 | 166 | 167 | 167 | 168 | 23.7% | 30.1% | 33.3% | 36.7% | 40.6% |
| **Small NB** | 140 | 139 | 140 | 140 | 140 | 75.4% | 67.5% | 64.2% | 60.6% | 56.6% |
| **Regional** | | | | | | | | | | |
| **75-seaters** | 73 | 74 | 75 | 75 | 76 | 65.8% | 63.4% | 64.4% | 65.3% | 66.3% |
| **50-seaters** | 50 | 50 | 50 | 50 | 50 | 21.1% | 24.3% | 23.3% | 22.3% | 21.4% |
| **Small Regional** | 13 | 13 | 13 | 13 | 13 | 13.2% | 12.3% | 12.3% | 12.3% | 12.3% |

*Source: Base year estimates based on flight schedules from Innovata via Aviation Data Miner. AECOM analysis.*

The projected passenger aircraft operations for the three scenarios are summarized in **Table 30**.

### Table 30. Passenger Aircraft Operation Forecasts

| Year | High Scenario | | | Baseline Scenario | | | Low Scenario | | |
|---|---|---|---|---|---|---|---|---|---|
| | Mainline | Regional | Total Passenger Aircraft Operations | Mainline | Regional | Total Passenger Aircraft Operations | Mainline | Regional | Total Passenger Aircraft Operations |
| | | | | | Actual | | | | |
| 2017 | 85,852 | 46,621 | 132,473 | **85,852** | **46,621** | **132,473** | 85,852 | 46,621 | 132,473 |
| | | | | | Forecast | | | | |
| 2022 | 128,612 | 57,341 | 185,953 | **123,575** | **56,689** | **180,263** | 108,739 | 52,460 | 161,199 |
| 2027 | 143,113 | 58,263 | 201,375 | **130,549** | **57,639** | **188,187** | 111,436 | 53,652 | 165,088 |
| 2032 | 158,551 | 58,507 | 217,058 | **138,932** | **58,273** | **197,205** | 112,730 | 54,191 | 166,921 |
| 2037 | 175,301 | 58,813 | 234,114 | **147,695** | **58,791** | **206,486** | 115,361 | 55,399 | 170,760 |

*Source: Existing proportion of total passenger aircraft operations between mainline and regional aircraft operations reference MNAA data.*

The annual operations for the largest aircraft size category (i.e. small WB aircraft) for determination of the future design aircraft are summarized in **Table 31**. Operations in 2018 are shown as the near-term estimates based on the published schedule of British Airways' B787-8 operations to LHR that began May 2018.

### Table 31. Annual Operations for Small Widebody Aircraft

| Year | Small Widebody Aircraft (e.g. B787-8, B787-9, A330, A330NEO) | | |
|---|---|---|---|
| | High Scenario | Baseline Scenario | Low Scenario |
| | | Estimate | |
| 2018 | 326 | **326** | 326 |
| | | Forecast | |
| 2022 | 511 | **481** | 481 |
| 2027 | 797 | **672** | 544 |
| 2032 | 1,238 | **947** | 607 |
| 2037 | 1,920 | **1,333** | 686 |

*Source: 2018 estimates are based on flight schedules from Innovata via Aviation DataMiner. AECOM analysis.*

### 5.3.2 All-Cargo Aircraft Operations

As previously described in **Section 4.6**, FedEx has the largest market share at BNA and they mainly operate B757-200 with some A300-600, and occasional B767-300, MD-10, and MD-11 freighters. The second largest integrated carrier is DHL (Airborne Express), and they operate mostly B767-300 freighters. In 2017, over 78% of the freighter operations at BNA were flown by B757-200 aircraft and their operations are increasing with the growth of FedEx.

Freighters tend to be retired much later than passenger aircraft. While the average retirement age for passenger aircraft is approximately 25 years, the average for freight aircraft is approximately 33 years. In other words, 50% of freighters are still in service at the age of 33 years but less than 15% of passenger aircraft survived at the same age. Some of the passenger aircraft with low utilization are converted to freighter to extend their service life by 10 to 20 years. It is anticipated that over half of the cargo aircraft introduced over the planning horizon will be passenger to freighter conversions.

The future fleet mix for freighter at BNA will still be dominated by B757-200 with potential increase in B767-300 operations. Over the past few years, the ratio of cargo volume to cargo aircraft operations is steady between 12 and 19, and with an average at 15. Similar ratios are used to forecast all-cargo aircraft operations to reflect the characteristics of BNA:

- High scenario – A gradual increase in the proportion of larger freighters is assumed (i.e. cargo volume to aircraft operation ratio will decrease gradually to 12).
- Baseline scenario – The proportion of the freighter fleet mix assumes similar to 2017 (i.e. cargo volume to aircraft operation ratio is at approximately 15).
- Low scenario – The increase in the proportion of larger freighters assumes less than the high and base scenarios (i.e. cargo volume to aircraft operation ratio will increase gradually to 16).

The forecast all-cargo aircraft operations are summarized in **Table 32**.

**Table 32. All-Cargo Aircraft Operation Forecasts**

| | All-Cargo Aircraft Operations | | |
|---|---|---|---|
| Year | High Scenario | Baseline Scenario | Low Scenario |
| | | Estimate | |
| 2017 | 2,662 | **2,662** | 2,662 |
| | | Forecast | |
| 2022 | 3,354 | **3,099** | 2,884 |
| 2027 | 3,986 | **3,343** | 2,913 |
| 2032 | 4,737 | **3,610** | 2,943 |
| 2037 | 5,629 | **3,901** | 2,973 |

### 5.3.3 General Aviation and Air Taxi Operations

The forecast for general aviation (GA) and air taxi[15] operations at BNA is based on the estimated number of operations per based aircraft by type of aircraft, ownership, and usage. The based aircraft forecast is given in the subsequent **Section 5.4**, which is used in this section to estimate the general aviation and air taxi operations forecast. The methodology is illustrated in **Figure 30** and the assumptions in the model are listed below.

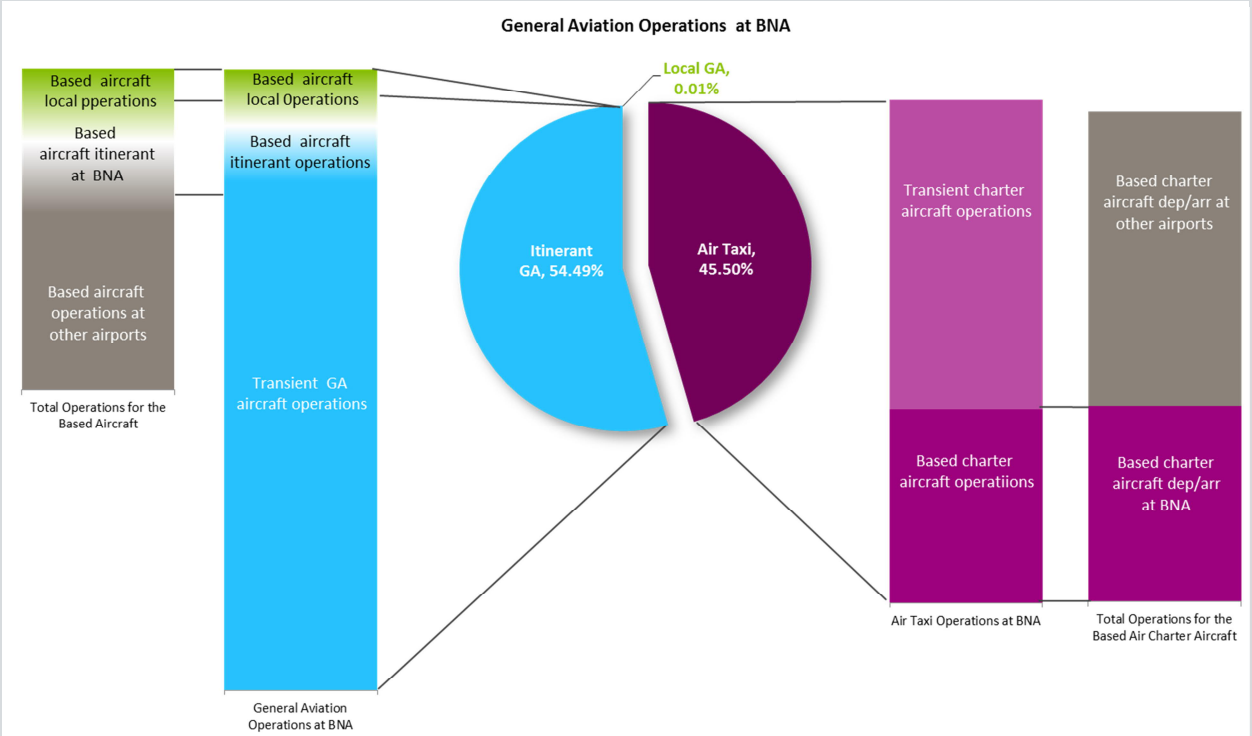



**Figure 30. General Aviation Operations Model Illustration**

*Source: AECOM.*

- The average number of hours flown and number of landings by different type of active aircraft for different usage reference the FAA General Aviation and Part 135 Activity Survey 2016 and are adjusted to the characteristics of BNA. It is generally assumed that based aircraft owned by individuals tend to fly mostly for personal use, while corporation-owned aircraft are used mostly for business. Based aircraft operated by the flight school are used for instructional purposes. The average number of hours flown and number of landings per based air charter aircraft operated by charter services at BNA, such as Nashville Jet, Secure Air Charter, Jet Linx Aviation, and Jet Right Nashville (Averitt Air), reference the Part 135 air taxi operations from the 2016 FAA Survey. Based air charter aircraft are identified by their transport airworthiness certifications. It is estimated that there are 48 based air charters in 2017. All of the based aircraft at BNA are assumed active with valid FAA registration. **Table 33** summarizes the number of based aircraft by type, ownership, and average aircraft age, and **Table 34** provides the estimated average number of landings per based aircraft assumed in the model.

[15] Air taxi operations are air carriers that transport persons, property, and mail using small aircraft under 30 seats or a maximum payload capacity of 7,500 lbs. Air taxi operators typically hold FAR Part 135 certification and provide on-demand services (for compensation or hire). Operations in which persons or cargo are transported without compensation or hire are conducted under FAR Part 91. There are many business aircraft that are not used for compensation or hire and are thus only governed by FAR Part 91. These business aircraft are typically owned by individuals or businesses.

- The model assumes 45% of the total operations flown by a based general aviation aircraft in each year are either departures or arrivals at BNA; 55% are operations at other airports. Since there is minimal local general aviation operations recorded at BNA, only 0.1% of the 45% of the operations generated by the based general aviation aircraft at BNA are local operations. The remaining 99.9% are itinerant operations.
- Amongst the total number of operations flown by a based air charter aircraft in each year, the model assumes approximately 35% are departures or arrivals at BNA. The remaining 65% are flights to other airports. Air charters are more likely to fly multiple destinations.
- The proportion of transient aircraft operations is estimated to be approximately 80% for general aviation operations; and 60% for air taxi operations in 2017. The estimated percentage of transient operations amongst air taxi operations considered the presence of 48 based air charters at BNA. The model assumed similar percentage of transient aircraft operations for general aviation and air taxi operations over the planning horizon.

### Table 33. Type of Based Aircraft Ownership and Average Age

**Total Based Aircraft at BNA**

| Type of Aircraft / Ownership | No. of Based Aircraft in 2017 | Average Age of Based Aircraft |
|---|---|---|
| **Single Engine Piston** | | |
| Corporation | 10 | 33 |
| Individual | 5 | 38 |
| **Single Engine Turboprop** | | |
| Corporation | 2 | 15 |
| **Multi Engine Piston** | | |
| Corporation | 4 | 36 |
| Co-owned | 1 | 55 |
| Individual | 2 | 40 |
| **Multi Engine Turboprop** | | |
| Corporation | 4 | 24 |
| Individual | 1 | 34 |
| **Jet Aircraft** | | |
| Corporation | 54 | 16 |
| Co-owned | 1 | N/A |
| Unknown | 2 | N/A |
| **Rotorcraft Turboshaft** | | |
| Corporation | 1 | 22 |
| **Total Based Aircraft at BNA** | **87** | **22** |

**Based Aircraft for Nashville Flight Training**

| Type of Aircraft | No. of Based Aircraft in 2017 | Average Age of Based Aircraft |
|---|---|---|
| **Single Engine Piston** | 8 | 38 |
| **Multi Engine Piston** | 2 | 57 |
| **Total Based Aircraft for Flight Training** | **10** | **42** |

*Source: FAA Aircraft Registry, accessed May 2018. AECOM Analysis.*
*Abbreviations: N/A – Not available.*

## Table 34. Estimated Average Landings per Based Aircraft in Base Year 2017

| Type of Aircraft / Ownership | Average Landings per Based Aircraft |
|---|---|
| **General Aviation Use** | |
| **Single Engine Piston** | |
| Corporation | 100 |
| Individual | 35 |
| **Single Engine Turboprop** | |
| Corporation | 130 |
| **Multi Engine Piston** | |
| Corporation | 80 |
| Individual | 45 |
| **Multi Engine Turboprop** | |
| Corporation | 170 |
| Individual | 130 |
| **Jet Aircraft** | |
| Corporation | 350 |
| Co-owned | 260 |
| **Rotorcraft Turboshaft** | |
| Corporation | 100 |
| **Flight Training Use** | |
| **Single Engine Piston** | 200 |
| **Multi Engine Piston** | 250 |
| **On Demand Part 135 Use** | |
| **Jet Aircraft** | 350 |

*Source: FAA General Aviation and Part 135 Activity Survey 2016. AECOM Analysis.*
*Note: The two jet aircraft with unknown classification on ownership are assumed for on demand Part 135 use based on the type of aircraft.*

The forecast annual total general aviation and air taxi operations based on the based aircraft forecast for the baseline, low, and high scenarios are given in **Table 35**.

**Table 35. General Aviation and Air Taxi Operation Forecasts**

| Year | High Scenario | | | | Baseline Scenario | | | | Low Scenario | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Air Taxi | General Aviation | | Total | Air Taxi | General Aviation | | Total | Air Taxi | General Aviation | | Total |
| | | Itinerant | Local | | | Itinerant | Local | | | Itinerant | Local | |
| | | | | | | Actual | | | | | | |
| 2017 | 30,540 | 36,570 | 7 | 67,117 | **30,540** | **36,570** | **7** | **67,117** | 30,540 | 36,570 | 7 | 67,117 |
| | | | | | | Forecast | | | | | | |
| 2022 | 34,677 | 41,535 | 9 | 76,221 | **32,029** | **37,649** | **8** | **69,687** | 30,154 | 33,094 | 7 | 63,255 |
| 2027 | 40,582 | 49,084 | 10 | 89,676 | **36,595** | **42,240** | **9** | **78,844** | 30,078 | 31,528 | 7 | 61,613 |
| 2032 | 46,717 | 58,509 | 12 | 105,239 | **40,926** | **46,363** | **10** | **87,299** | 29,935 | 29,455 | 6 | 59,397 |
| 2037 | 53,861 | 70,142 | 15 | 124,017 | **45,569** | **51,596** | **11** | **97,177** | 29,731 | 28,062 | 6 | 57,800 |

*Note: Numbers may not add up due to rounding.*

### 5.3.4 Military Operations

In addition to the Tennessee Air National Guard, BNA military facilities (Berry Field National Guard Base) began supporting Tennessee Army National Guard operations in 2012. The Tennessee Army National Guard has 20 rotorcrafts based at BNA. The annual military operations recorded in 2017 were 3,550 operations. The military activities at BNA over the planning horizon assume maintaining annual aircraft operations at the 2017 level.

### 5.3.5 Total Aircraft Operations

The total aircraft operations forecast, including commercial passenger air carrier, all-cargo carrier, air taxi, general aviation, and military aircraft operations, for the 20-year planning period are summarized in **Table 36**.

A comparison of the projected total operations with the FAA TAF and the 2013 Master Plan Forecast is also included in **Table 36**. The forecast total operations for the baseline scenario differ from the FAA TAF by 10.8% in the 5-year forecast period, and 8.3% in the 10-year forecast period.

**Table 36. Total Aircraft Operation Forecasts and Comparison with other Forecasts**

| Year | High Scenario | Baseline Scenario | Low Scenario | FAA TAF (2017 Model, issued Jan 2018) | % Difference between Baseline and FAA TAF | 2013 Master Plan Forecast | % Difference between Baseline and 2013 Master Plan Forecast |
|---|---|---|---|---|---|---|---|
| | | Actual | | Forecast | | Forecast | |
| 2017 | 205,802 | **205,802** | 205,802 | 204,731 | 0.5% | 208,960 | -1.5% |
| | | Forecast | | Forecast | | Forecast | |
| 2022 | 269,078 | **256,599** | 230,888 | 231,516 | 10.8% | 232,170 | 10.5% |
| 2027 | 298,588 | **273,924** | 233,164 | 252,921 | 8.3% | 258,040 | 6.2% |
| 2032 | 330,584 | **291,664** | 232,810 | 277,300 | 5.2% | N/A | N/A |
| 2037 | 367,311 | **311,114** | 235,083 | 303,038 | 2.7% | N/A | N/A |
| Period | | CAGR | | CAGR | | CAGR | |
| 2017 to 2022 (5-year) | 5.5% | **4.5%** | 2.3% | 2.5% | N/A | 2.1% | N/A |
| 2017 to 2027 (10-year) | 3.8% | **2.9%** | 1.3% | 2.1% | N/A | 2.1% | N/A |
| 2017 to 2037 (20-year) | 2.9% | **2.1%** | 0.7% | 2.0% | N/A | N/A | N/A |

*Source: FAA TAF 2017 Model (issued Jan 2018). 2013 Master Plan Forecast (Released in 2011). AECOM analysis.*
*Abbreviations: CAGR – Compound annual growth rate. N/A- not applicable.*

## 5.4 Based Aircraft Forecast

### 5.4.1 Forecasting Methodology

The forecast for based aircraft at BNA include both top-down and bottom-up approaches:

- The top-down approach estimates the total regional demand for based aircraft in the Nashville MSA based on historic activities and socio-economic factors. The future based aircraft fleet is then allocated to each airport in the area to derive future based aircraft at BNA.
- The bottom-up approach projects the based aircraft at BNA by type based on growth rates predicted nationally by the FAA, General Aviation Manufacturer's Association (GAMA), and aircraft manufacturers; and is then adjusted based on recent local trends observed at BNA.

The results of both approaches are compared and consolidated to a recommended baseline scenario, a high scenario, and a low scenario. Findings are then compared with the FAA TAF and 2013 Master Plan based aircraft forecasts for BNA.

### 5.4.2 Based Aircraft in the Nashville MSA

The future regional demand for based aircraft in the Nashville MSA is estimated by econometric model and time-series trend model. The airports included in the regional demand analysis are summarized in **Table 37**.

**Table 37. Airports included in the MSA Regional Based Aircraft Demand Analysis**

| Airport ID | Airport | No. of Based Aircraft in 2017 |
|---|---|---|
| BNA | Nashville International | 87 |
| JWN | John C Tune | 135 |
| MQY | Smyrna | 286 |
| M33 | Sumner County Regional | 54 |
| M54 | Lebanon Municipal | 92 |
| MBT | Murfreesboro Municipal | 122 |
| SYI | Shelbyville | 61 |
| M91 | Springfield Robertson County | 56 |
| 1M5 | Portland Municipal | 10 |
| 3M7 | Lafayette Municipal | 24 |
| MRC | Maury County | 22 |
| GHM | Centerville Municipal | 20 |
| M02 | Dickson Municipal | 35 |
| LUG | Ellington | 50 |
| | **Total** | **1,054** |

*Note: SYI and LUG are included because they are located just outside the MSA boundary and are in close proximity (60-min drive time) to BNA.*

The econometric model adopted regression analysis that relates aviation demand (dependent variables), such as based aircraft numbers, to key parameters (independent variables) such as income, population, and employment. Correlations between historic based aircraft and socioeconomic data were analyzed to find the highest relationship between the dependent and independent variables. The forecast of future based aircraft in the MSA was then derived from the regression model incorporating forecast socioeconomic data to 2037.

Analyses on historic data demonstrated a strong correlation of regional based aircraft numbers to the total nonfarm employment in the MSA. The coefficient of determination ($R^2$) is 0.91 which signifies a high percent of variation in the dependent variables that are explained by the independent variables.

The future based aircraft in the MSA was estimated based on the forecast economic growth represented by the increase in total nonfarm employment prepared by W&P. **Figure 31** presents the outcome of the regression model, and correlation with historical records.

Two time-series models were developed:

- Time-series model from 2000 to 2017
- Time-series model from 2010 to 2017

The time-series model from 2000 to 2017 represents a long-term historic trend and projects a lower, more pessimistic based aircraft demand scenario assuming the historical cyclical characteristic continues into the future.

The time-series model from 2010 to 2017 represents a continuation of the recent prosperous trend. It projects an optimistic scenario if the high growth of the recent years continues in the long-term. The outcomes of the time-series models are given in **Figure 31**.

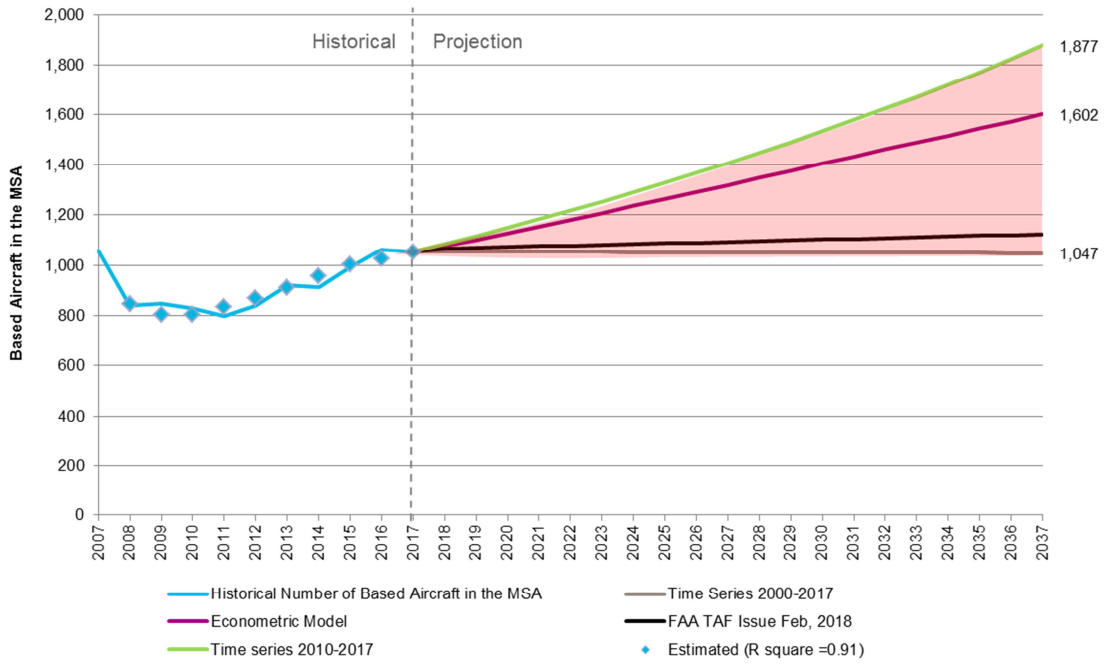



**Figure 31. Based Aircraft Projections in the Nashville MSA**

### 5.4.3 Based Aircraft Projections for BNA

**Top Down Approach**

The forecast based aircraft at BNA is then obtained by distributing the total demand of the Nashville MSA based on three cases:

- The low case (existing share) assumes the total based aircraft in the Nashville MSA will reach the lower bound projection with 1,047 aircraft by 2037, and the relative attractiveness of BNA to other airports in the region stay constant throughout the planning horizon. The share of based aircraft at BNA stays at the existing share between 8.25% and 9%.
- The base case (modest increasing share) assumes the total based aircraft in the Nashville MSA will reach the moderate projection with 1,602 aircraft by 2037, and there will be improvements in the facilities, support business, and services at BNA as compared to other airports in the region. The share of based aircraft at BNA will gradually increase to 10%, which was the historical share 3 to 4 years ago.
- The high case (increasing share) assumes the total based aircraft in the Nashville MSA will reach the upper bound projection with 1,877 aircraft by 2037, and there will be additional facilities at BNA that will attract more based aircraft to BNA than other airports in the region. The share of based aircraft at BNA will gradually increase to 11%, which is the historical share 5 to 6 years ago.

**Table 38** summarizes the distribution to BNA for these three cases.

**Bottom Up Approach**

**Table 39** summarizes the projected CAGR for different type of aircraft by *FAA Aerospace Forecast FY2018-2038*, *GAMA 2017 Industry Outlook*, FAA TAF for BNA, and *Bombardier Market Forecast 2016-2025*.

Two cases were developed for the bottom up approach:

- The low growth case assumes fixed wing piston aircraft will shrink over the forecast period following the national trend predicted by the FAA Aerospace Forecast. Considering the strong historic growth in fixed wing turbine aircraft at BNA, this case assumes their growth will at least meet the higher of the two projected national growth rates from the FAA Aerospace Forecast and GAMA. The proposed annual growth rates are given in **Table 39**.
- The high growth case assumes fixed wing piston aircraft and rotorcraft will reach the growth rates estimated by FAA TAF for BNA. The growth rates projected for fixed wing turbo jet aircraft will at least reach the growth rates of piston aircraft projected by FAA TAF based on strong historic growth for high value aircraft at BNA. The growth for turboprop aircraft will be lower than the turbo jet aircraft and is assumed 25 percent higher than the low growth case. The proposed annual growth rates are given in **Table 39**.

**Table 38** summarizes the forecast based aircraft numbers for BNA using the bottom up approach.

## Table 38. Summary of the Top Down and Bottom Up Based Aircraft Projections

| Year | Top Down Approach | | | Bottom Up Approach | |
|---|---|---|---|---|---|
| | Low Case (Existing share 8.25% to 9%) | Base Case (Increasing share to 10%) | High Case (Increasing share to 11%) | Low Growth Case | High Growth Case |
| | | | Actual | | |
| 2017 | 87 | 87 | 87 | 87 | 87 |
| | | | Forecast | | |
| 2022 | 89 | 102 | 108 | 93 | 102 |
| 2027 | 91 | 120 | 134 | 101 | 120 |
| 2032 | 92 | 139 | 166 | 109 | 142 |
| 2037 | 94 | 160 | 207 | 118 | 167 |

## Table 39. Projected Based Aircraft Growth Rate by Type

| Source | Fixed Wing Piston | | | Fixed Wing Turbine | | | Helicopter | Total Based Aircraft |
|---|---|---|---|---|---|---|---|---|
| | Single Engine | Multi-Engine | Total | Turbo prop | Turbo Jet | Total | Turbine | |
| **Historical CAGR (2010 to 2017)** | | | | | | | | |
| FAA Aerospace Forecast 2018-2038 | -0.97% | -2.91% | -1.16% | 0.09% | 2.95% | 1.72% | 1.84% | -0.67% |
| **Historical CAGR (2010 to 2016)** | | | | | | | | |
| GAMA 2017 Industry Outlook | N/A | N/A | -2.07% | 0.09% | 1.06% | N/A | 1.68% | -1.55% |
| **Forecast CAGR (2017 to 2037)** | | | | | | | | |
| FAA Aerospace Forecast 2018-2038 | -0.95% | -0.42% | -0.90% | 1.69% | 2.19% | 2.00% | 1.94% | 0.00% |
| FAA TAF for BNA | 3.40% | N/A* | N/A | N/A* | 2.71% | N/A | 3.53% | 2.46% |
| **Forecast CAGR (2016 to 2025)** | | | | | | | | |
| GAMA 2017 Industry Outlook | N/A | N/A | -0.72% | 0.21% | 2.18% | N/A | 2.50% | 0.02% |
| Bombardier Market Forecast 2016-2025 | N/A | N/A | N/A | N/A | 2% | N/A | N/A | N/A |
| **Bottom Up Approach Assumed CAGR (2017 to 2037)** | | | | | | | | |
| Low Growth Case | -0.95% | -0.42% | -0.78% | 1.69% | 2.19% | 2.13% | 2.50% | 1.53% |
| High Growth Case | 3.40% | 3.40% | 3.40% | 2.11% | 3.40% | 3.28% | 3.53% | 3.31% |

*Note: * FAA TAF report multi-engine aircraft only, which include multi-engine propeller-driven aircraft either reciprocal engine or turboprop.*

*Abbreviations: CAGR – Compound annual growth rate. N/A- not available.*

By comparing the outcome of both approaches, it is anticipated that the number of based aircraft at BNA will be between the optimistic estimate of 207 and the conservative estimate of 94 aircraft. The baseline scenario is projected to reach 164 based aircraft over the 20-year planning horizon.

**Table 40** summarizes the baseline, low, and high scenarios for forecast based aircraft by engine type. The baseline based aircraft forecast by categories; the comparison with FAA TAF and 2013 Master Plan are given in **Figure 32** and **Table 41**.

### Table 40. Projected Based Aircraft by Type

| Year | Fixed Wing Piston | | | Fixed Wing Turbine | | | Helicopter | Total Based Aircraft* |
|---|---|---|---|---|---|---|---|---|
| | Single Engine | Multi-Engine | Total | Turbo prop | Turbo Jet | Total | Turbine | |
| 2017 | 15 | 7 | 22 | 7 | 57 | 64 | 1 | **87** |
| **Baseline Scenario** | | | | | | | | |
| 2022 | 18 | 8 | 26 | 8 | 67 | 75 | 1 | **102** |
| 2027 | 21 | 10 | 31 | 9 | 79 | 88 | 1 | **120** |
| 2032 | 24 | 11 | 35 | 10 | 93 | 103 | 2 | **140** |
| 2037 | 29 | 13 | 42 | 11 | 109 | 120 | 2 | **164** |
| **High Scenario** | | | | | | | | |
| 2022 | 19 | 9 | 28 | 9 | 69 | 78 | 2 | **108** |
| 2027 | 24 | 11 | 35 | 11 | 85 | 96 | 3 | **134** |
| 2032 | 31 | 15 | 46 | 13 | 103 | 116 | 4 | **166** |
| 2037 | 40 | 19 | 59 | 16 | 125 | 141 | 7 | **207** |
| **Low Scenario** | | | | | | | | |
| 2022 | 14 | 7 | 21 | 7 | 60 | 67 | 1 | **89** |
| 2027 | 13 | 7 | 20 | 7 | 63 | 70 | 1 | **91** |
| 2032 | 12 | 6 | 18 | 7 | 66 | 73 | 1 | **92** |
| 2037 | 11 | 6 | 17 | 7 | 69 | 76 | 1 | **94** |

*Note: * Total number of based aircraft excluded 20 based military helicopters for the Army National Guard.*

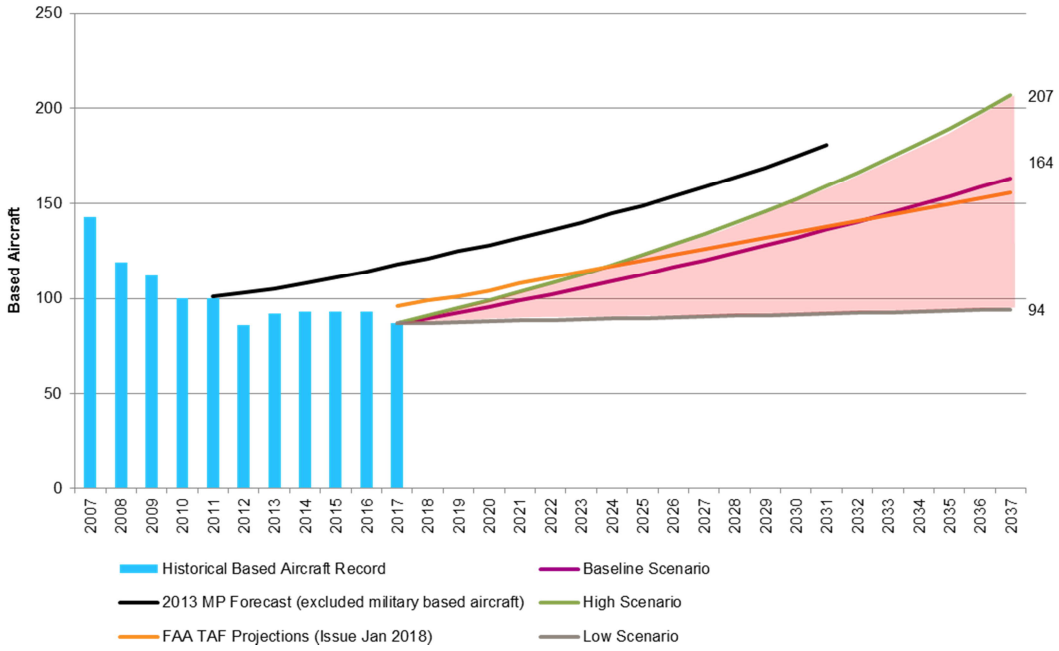



**Figure 32. Based Aircraft Projections for BNA**

## Table 41. Based Aircraft Forecast and Comparison with other Forecasts

| Year | Baseline Based Aircraft Forecast | | | | | FAA TAF (2017 Model, issued Jan 2018) | % Difference with FAA TAF | 2013 Master Plan Forecast | % Difference with 2013 Master Plan Forecast |
|---|---|---|---|---|---|---|---|---|---|
| | Single | Multi | Jet | Helios Other | Total* | | | | |
| | Actual | | | | | Forecast | | Forecast | |
| 2017 | 17 | 12 | 57 | 1 | **87** | 96 | -9.4% | 118 | -26.3% |
| | Forecast | | | | | Forecast | | Forecast | |
| 2022 | 20 | 14 | 67 | 1 | **102** | 111 | -8.1% | 136 | -25.0% |
| 2027 | 24 | 16 | 79 | 1 | **120** | 120 | 0.0% | 159 | -24.5% |
| 2032 | 27 | 18 | 93 | 2 | **140** | 141 | -0.7% | N/A | N/A |
| 2037 | 32 | 21 | 109 | 2 | **164** | 156 | 5.1% | N/A | N/A |
| Period | CAGR | | | | | CAGR | | CAGR | |
| 2017 to 2022 (5-year) | 3.3% | 3.1% | 3.3% | 0.0% | 3.2% | 2.9% | N/A | 2.9% | N/A |
| 2017 to 2027 (10-year) | 3.4% | 2.9% | 3.3% | 0.0% | 3.3% | 2.3% | N/A | 3.0% | N/A |
| 2017 to 2037 (20-year) | 3.2% | 2.8% | 3.3% | 3.5% | 3.2% | 2.5% | N/A | N/A | N/A |

*Note: * The based aircraft records and projections from FAA TAF do not include the 20 based military helicopters for the Army National Guard. The baseline based aircraft forecasts and the 2013 Master Plan Forecast shown in this table also excluded these 20 based military helicopters.*

*Abbreviations: CAGR – Compound annual growth rate. N/A- not available.*

## 5.5 Critical Aircraft

FAA Advisory Circular (AC) No. 150/5000-17, *Critical Aircraft and Regular Use Determination,* provides guidance on the determination of critical aircraft (also known as design aircraft) in the conduct of facility planning studies. It defines design aircraft as the most demanding aircraft type, or group of aircraft with similar characteristics that make regular use of the airport. Regular use is 500 annual operations, excluding touch-and-go operations. The operations count by aircraft make and model is required for the most recent 12-month period of activity that is available.

FAA AC 150/5300-13A Change 1, *Airport Design*, recommends that the design aircraft for the purposes of airport geometric design to be a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). **Table 42** provides a list of aircraft with AAC C, and D; ADG III, IV, and V; and TDG 4, 5, and 6; and has operations at BNA from January to December 2017 based on FAA Traffic Flow Management System Counts (TFMSC).

The most demanding aircraft with at least 500 operations in the 12-month period from January to December 2017 was the B757-200 aircraft. This aircraft model accounted for over 2,200 operations per year at BNA. Based on the dimensions and approach speed of the B757-200 aircraft, it is classified as an AAC-C, ADG-IV, and TDG-5 aircraft. However, out of the 11,456 operations shown in **Table 42**, over 7,100 operations are flown by aircraft with AAC-D. The existing design aircraft for the airport is identified to be the group of aircraft with the most demanding characteristics as listed below:

- AAC – D (Approach speed 141 knots or more but less than 166 knots)
- ADG – IV (Wingspan 118 feet or more but less than 171 feet)
- TDG – 5 (Cockpit to main gear 40 feet or more but less than 100 feet, and main gear width 30 feet or more but less than 45 feet. Refer to Figure 1-1 of AC 150/5300-13A Change 1 for details)

For the future design aircraft, **Section 5.3** and **Table 31** provide the annual operations forecast for the largest aircraft size category (i.e. small widebody aircraft). Operations in 2018 are based on the published schedule of British Airways' B787-8 operations to LHR commencing May 2018. B787-8 aircraft and other small widebody aircraft (e.g. B787-9, and A330) are classified as AAC-C, ADG-V, and TDG-5 aircraft. There will be approximately 328 operations by B787-8 aircraft at BNA in 2018. Forecasts for the baseline and low scenarios project this group of small widebody aircraft will increase to over 500 annual operations between five to ten years as shown in **Table 31**. The high scenario projects the small widebody aircraft will have over 500 annual operations in five years.

Hence, the future design aircraft is proposed to be the group of aircraft with the following characteristics:

- AAC – D (same as existing design aircraft)
- ADG – V (Wingspan 171 feet or more but less than 214 feet)
- TDG – 5 (same as existing design aircraft)

## Table 42. Operations by Selected Aircraft Model at BNA (January to December 2017)

| Aircraft Model* | Operations in 12-month from January to December 2017 | Aircraft Approach Category (AAC) | Airplane Design Group (ADG) | Taxiway Design Group (TDG) |
|---|---|---|---|---|
| B744 - Boeing 747-400 | 12 | D | V | 5 |
| B742 - Boeing 747-200 | 2 | D | V | 5 |
| A359 - Airbus 350-900 | 2 | C | V | 5 |
| A333 - Airbus A330-300 | 4 | C | V | 5 |
| A332 - Airbus A330-200 | 2 | C | V | 5 |
| B77L - Boeing 777-200LRF/LR | 4 | C | V | 5 |
| B772 - Boeing 777-200 | 16 | C | V | 5 |
| B764 - Boeing 767-400 | 24 | D | IV | 5 |
| B763 - Boeing 767-300 | 216 | C | IV | 5 |
| B762 - Boeing 767-200 | 250 | C | IV | 5 |
| B753 - Boeing 757-300 | 26 | D | IV | 4 |
| **B752 - Boeing 757-200** | **2,229** | **C** | **IV** | **4** |
| A306 - Airbus A300 B4-600 | 95 | C | IV | 5 |
| A30B - Airbus A300-B2 | 2 | C | IV | 5 |
| A310 - Airbus A310 All Series | 4 | C | IV | 5 |
| K35R - Boeing KC-135 Stratotanker | 23 | C | IV | 4 |
| MD11 - Boeing (Douglas) MD 11 | 2 | D | IV | 6 |
| MD81 - Boeing (Douglas) MD 81 | 2 | C | III | 4 |
| MD82 - Boeing (Douglas) MD 82 | 540 | C | III | 4 |
| MD83 - Boeing (Douglas) MD 83 | 1,544 | D | III | 4 |
| MD87 - Boeing (Douglas) MD 87 | 2 | C | III | 4 |
| MD88 - Boeing (Douglas) MD 88 | 5,531 | D | III | 4 |
| MD90 - Boeing (Douglas) MD 90 | 924 | C | III | 4 |

| | No. of Operations | | |
|---|---|---|---|
| **Total operations by the above-listed aircraft models** | **11,456** | | |
| Total operations by aircraft with AAC-C | | 4,315 | |
| **Total operations by aircraft with AAC-D** | | **7,141** | |
| Total operations by aircraft with ADG-III | | | 8,543 |
| **Total operations by aircraft with ADG-IV** | | | **2,871** |
| Total operations by aircraft with ADG-V | | | 42 |
| Total operations by aircraft with TDG-4 | | | 10,821 |
| **Total operations by aircraft with TDG-5** | | | **633** |
| Total operations by aircraft with TDG-6 | | | 2 |

*Source: FAA TMFSC. AECOM analysis.*

*Note: * Aircraft models summarized in this able include aircraft with AAC C, and D; ADG III, IV, and V; and TDG 4, 5, and 6.*

## 5.6 Peak Activity Forecasts

The passenger and aircraft traffic demand patterns at an airport are subject to seasonal, monthly, daily, and even hourly variations. These variations result in peak periods when the greatest amount of demand is placed upon the facilities. Peaking characteristics identify the expected peak periods throughout the planning horizon for facility planning purposes. The objective of developing peak activity forecasts is to provide a design level that sizes facilities so they are neither underutilized nor overcrowded too often.

The peak activity forecasts in this section include:

- enplanements;
- commercial carrier operations; and
- total aircraft operations.

### 5.6.1 "Average Day of the Peak Month" and "Peak Hour"

FAA guidance recommends using the peak hour of the average day in the peak month (ADPM) for the purposes of physical facility planning. The peak hour determination for enplanements and aircraft operations are based on monthly and hourly historic data from the Airport statistics reports, FAA ATADS, and Nashville InFLIGHT Flight Tracking System (FTS).

#### 5.6.1.1 Enplanements

**Figure 33** depicts the historical monthly enplanements at BNA between 2012 and 2017. The peaks occurred during May to August in the summer, and October in the fall. Approximately 9.4% of the annual enplanements were recorded in the peak month. In 2017, the peak month was June. The ADPM peak hour analysis is based on the commercial airline flight schedules in June, 2017.

**Figure 34** presents the daily scheduled departure and arrivals seats in the peak month June, 2017. Saturdays and Sundays are typically not as busy as weekdays as shown in **Figure 34**. There are occasionally spikes at the end of mega events to meet the high demands for attendees leaving the city within a short period of time. For planning purposes, we recommend selecting a weekday in the peak month representing the average activities that is not the highest day after special events. Hence, Monday June 19, 2017 is selected as the design day (i.e. ADPM) for the peak hour demand analysis.

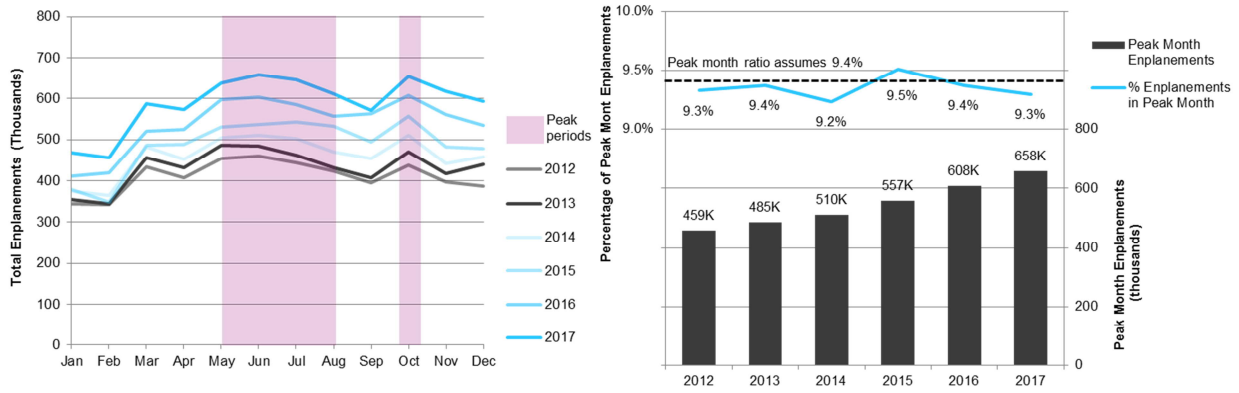



**Figure 33. Monthly Enplanements and Percentage of Enplanements in the Peak Month**

*Source: MNAA. AECOM analysis.*

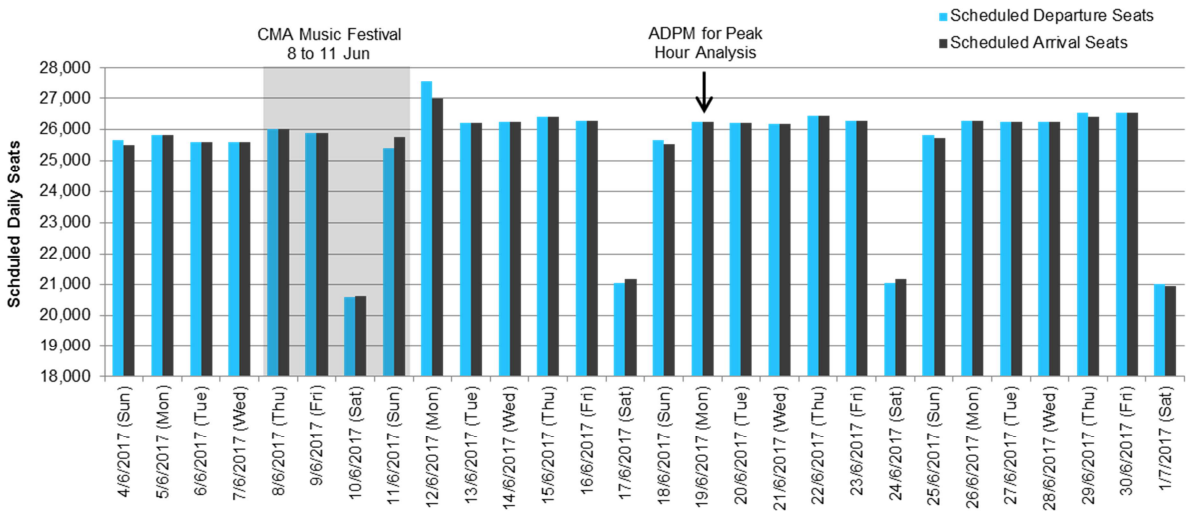



**Figure 34. Scheduled Daily Departure and Arrival Seats in Peak Month 2017**

*Source: Flight schedules from Innovata via Aviation Dataminer. AECOM analysis.*

The peak hour demand analysis is based on the flight schedule for the design day in the base year 2017. **Figure 35** and **Figure 36** show the daily distribution of enplaned and deplaned passengers, respectively. **Table 43** summarizes the peak hour demands in the base year and the projected peak hour demand based on the forecast annual enplanements, peak month ratio (9.4%), and the peak hour ratio (11.2% for enplanements, and 12.2% for deplanements). Based on the historical trends, it is anticipated that the peak hour enplanements will increase from 2,439 to 4,114; and the peak hour deplanements will increase from 2,652 to 4,473 during the 20-year planning horizon.

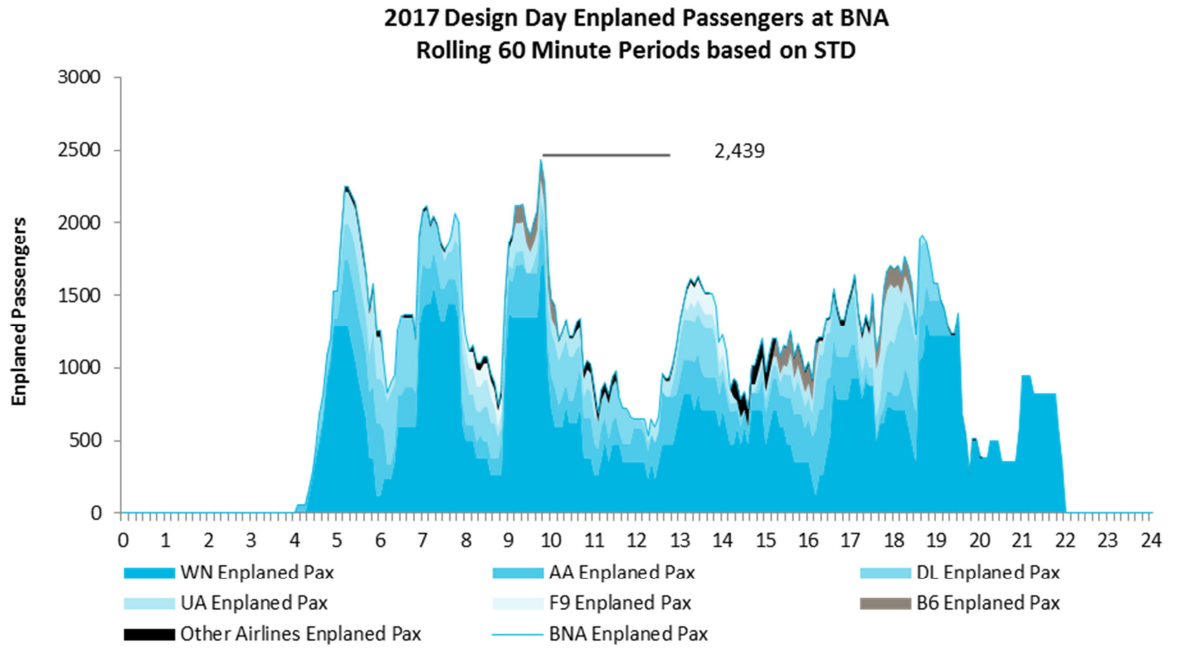



**Figure 35. 2017 Design Day Enplaned Passengers**

*Source: Flight schedule on Jun 19, 2017 from Innovata via Aviation Dataminer. AECOM analysis.*
*Abbreviations: STD – Scheduled time of departure; Pax – Passengers.*

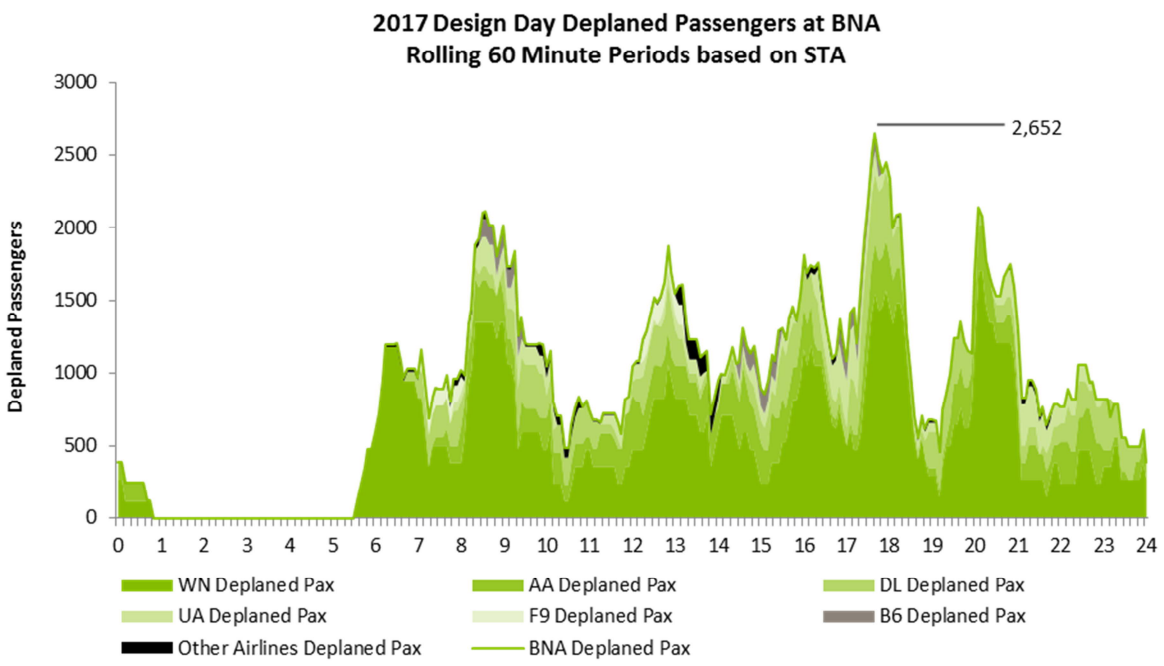



**Figure 36. 2017 Design Day Deplaned Passengers**

*Source: Flight schedule on Jun 19, 2017 from Innovata via Aviation Dataminer. AECOM analysis.*
*Abbreviations: STA – Scheduled time of arrival; Pax – Passengers.*

**Table 43. Peak Hour Enplanement and Deplanement Forecasts**

| Year | Annual Enplanements | Peak Month Enplanements | Design Day Enplanements | Peak Hour Enplanements | Peak Hour Deplanements |
|---|---|---|---|---|---|
| | | | Actual | | |
| 2017 | 7,076,371 | 657,960 | 21,686 | 2,439 | 2,652 |
| | | | Forecast | | |
| 2022 | 9,047,142 | 850,431 | 27,725 | 3,118 | 3,391 |
| 2027 | 9,938,318 | 934,202 | 30,456 | 3,425 | 3,725 |
| 2032 | 10,886,036 | 1,023,287 | 33,360 | 3,752 | 4,080 |
| 2037 | 11,935,070 | 1,121,897 | 36,575 | 4,114 | 4,473 |

### 5.6.1.2 Commercial Air Carrier Operations

**Figure 37** summaries the historical monthly commercial air carrier operations. Peak operations also occurred during May to August in the summer, and October in the fall. The peak month accounted for approximately 9% of the annual air carrier operations. In 2017, the peak month for commercial air carrier operations was October.

The peak hour operations for the week from October 8, 2017 (Sunday) to October 14, 2017 (Saturday) were analyzed and most of the days had 24 departures, 24 arrivals, and 40 operations during the corresponding peak hours. Saturdays typically experienced the lowest activities and had 18 departures, 18 arrivals, and 32 operations during the corresponding peak hours.

Since the design day selected for peak hour passenger enplanements was in June 2017, the peak hour operations for the week from June 18, 2017 (Sunday) to June 24, 2017 (Saturday) were also analyzed for comparison. The peak hour departures and arrivals during the weekdays were the same as October 2017 (i.e. 24 departures and 24 arrivals), but the total operations was higher at 42 operations. Saturdays had the lowest activity and have 20 departures, 20 arrivals, and 33 operations during the corresponding peak hours. **Figure 38** shows the daily distribution of scheduled departure and arrival operations throughout the same design day as passenger enplanements (i.e. June 19, 2017).

**Table 44** summarizes the peak hour demands in the base year and the projected peak hour demand based on the forecast annual passenger aircraft operations, peak month ratio (9.0%), and the peak hour ratio (10.6% for departures and arrivals, 9.3% for combined operations).

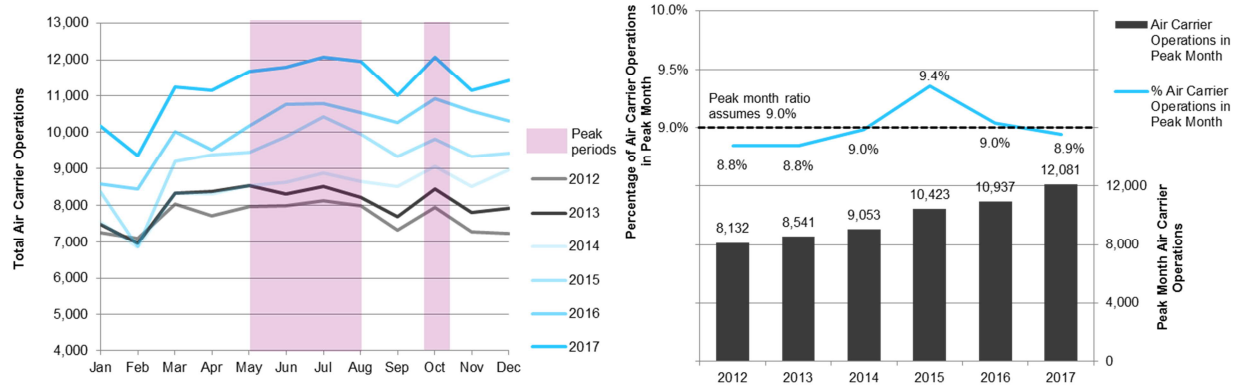



**Figure 37. Monthly Air Carrier Operations and Percentage of Air Carrier Operations in the Peak Month**

*Source: MNAA. FAA ATADS. AECOM analysis.*

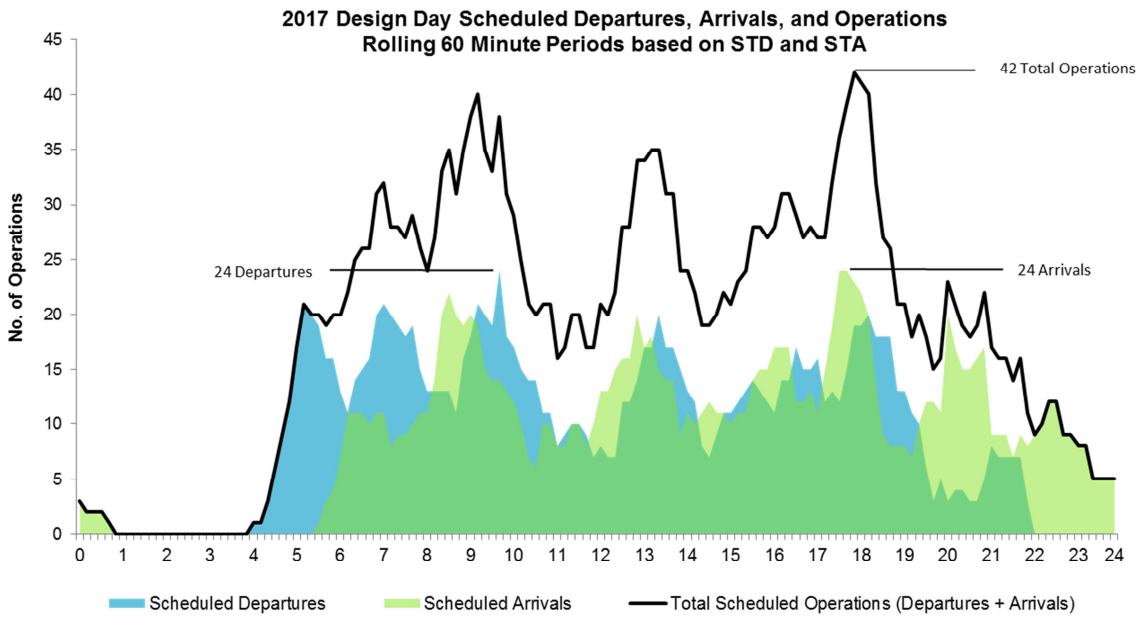



**Figure 38. 2017 Design Day Commercial Passenger Aircraft Operations**

*Source: Flight schedules on Jun 19, 2017 from Innovata via Aviation Dataminer. AECOM analysis.*
*Abbreviations: STD – Scheduled time of departure; STA- Scheduled time of arrival; Pax – Passengers.*

## Table 44. Peak Hour Commercial Air Carrier Operation Forecasts

| Year | Annual Operations | Peak Month Operations | Design Day Departures | Design Day Arrivals | Peak Hour Departures | Peak Hour Arrivals | Peak Hour Operations |
|---|---|---|---|---|---|---|---|
| | | | | Actual | | | |
| 2017 | 132,473 | 11,869 | 227 | 227 | 24 | 24 | 42 |
| | | | | Forecast | | | |
| 2022 | 180,263 | 16,151 | 309 | 309 | 33 | 33 | 57 |
| 2027 | 188,187 | 16,861 | 322 | 322 | 34 | 34 | 60 |
| 2032 | 197,205 | 17,669 | 338 | 338 | 36 | 36 | 63 |
| 2037 | 206,486 | 18,500 | 354 | 354 | 38 | 38 | 66 |

### 5.6.1.3 Total Aircraft Operations

**Figure 39** summaries the historical monthly total aircraft operations. Peak operations also occurred during May to August in the summer, and October in the fall. The peak month accounts for approximately 9% of the annual total aircraft operations. In 2017, the peak month for total aircraft operation was October. In order to determine the peak hour operations for non-scheduled operations (e.g. general aviation and cargo aircraft operations), flight data from the FTS are collected for analysis.

The monthly total aircraft operations from the 2017 FTS data are included in **Figure 39**. FTS was able to track approximately 96% of the total operations in 2017. Most of the missing data are in the non-peak months from January to April. The number of operations tracked during the peak month in October is generally consistent with the FAA ATADS data.

**Figure 40** presents the daily total aircraft operations in October 2017. Weekends had less total operations than weekdays. An average day on Friday October 13, 2017 was selected for peak hour analysis.

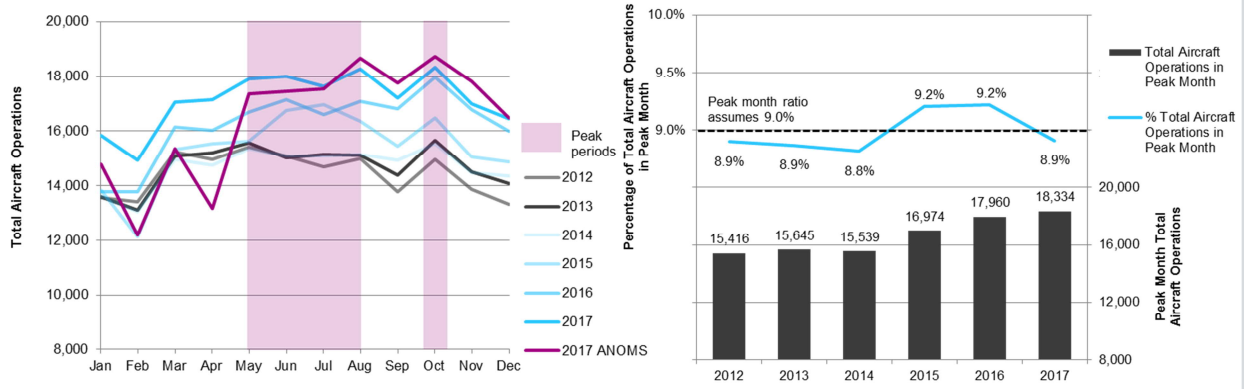



**Figure 39. Monthly Total Operations and Percentage of Total Operations in the Peak Month**

*Source: MNAA FTS Data. FAA ATADS. AECOM analysis.*

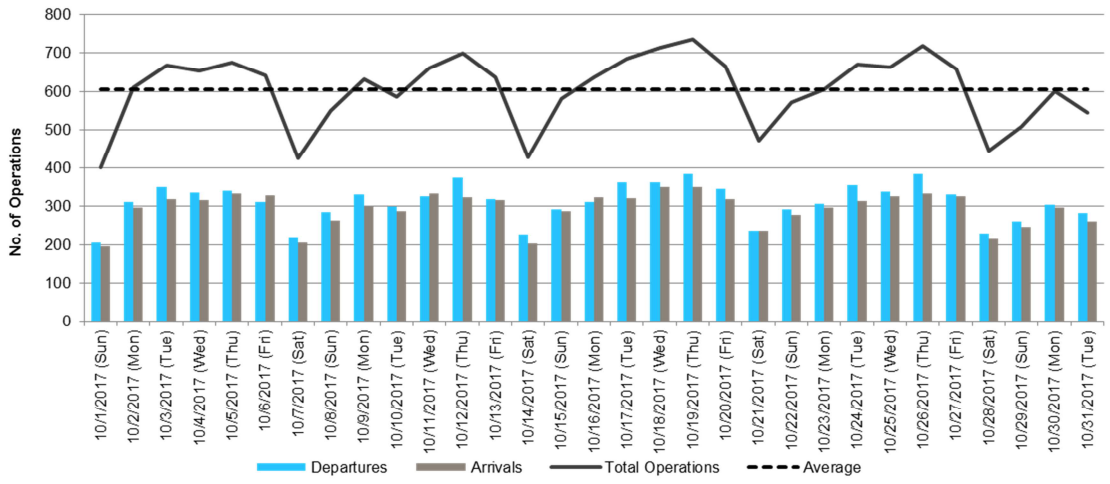



**Figure 40. Daily Total Departures, Arrivals, and Total Operations in the Peak Month**

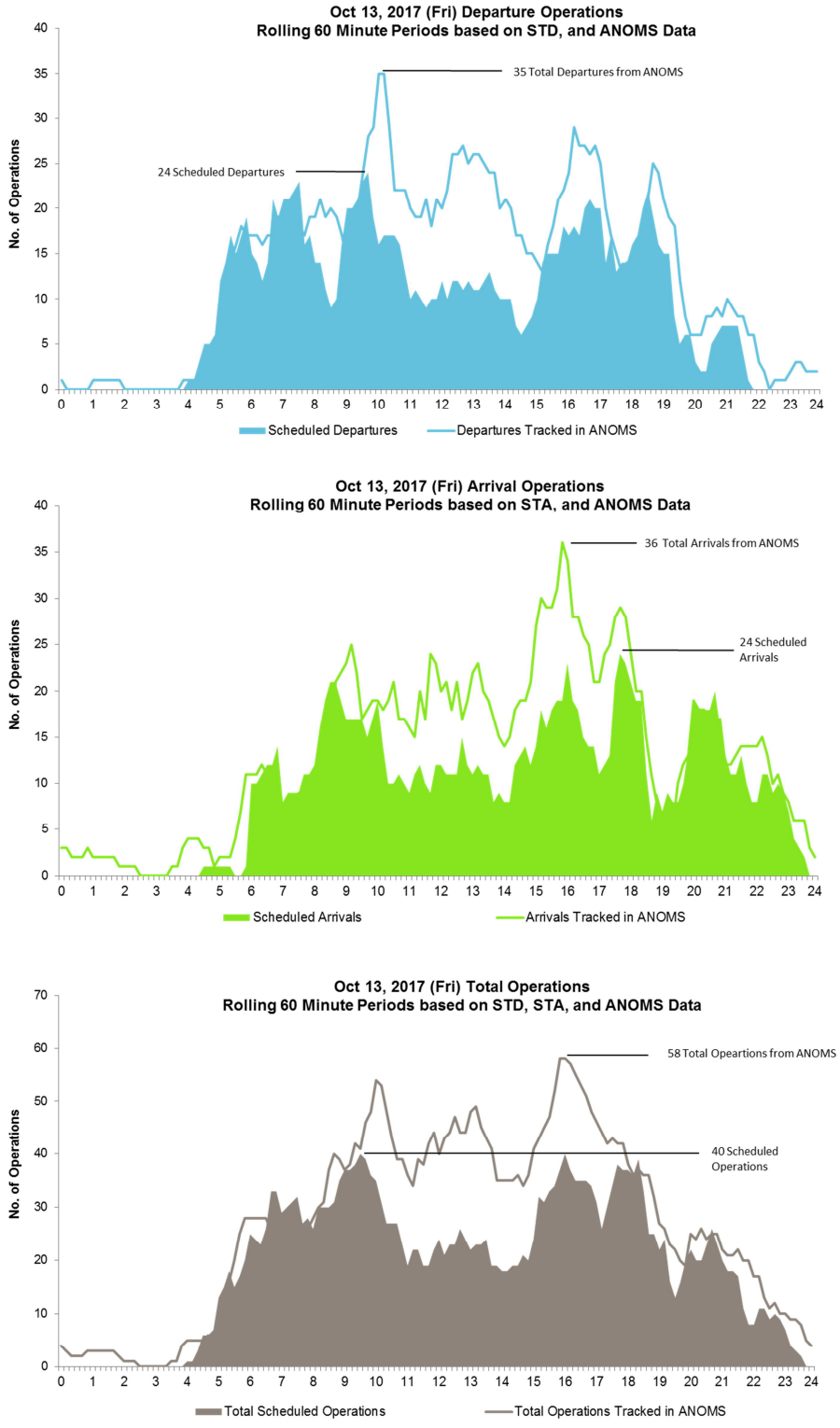
*Source: MNAA FTS Data. AECOM analysis.*

The findings of the peak hour total operations analysis are given in **Figure 41**. The number of departures, arrivals, and total operations throughout the day are shown in separate graphs. The aircraft operations obtained from the FTS data and the flight schedules are both included in each graph. The white space between the operations from the FTS data and the scheduled operations represent the estimated non-scheduled operations.

Peak hour total departures were estimated to be 35 operations in the morning; peak hour total arrivals were 36 operations in the afternoon; and peak hour total aircraft operations were 58 operations based on the FTS data collected on October 13, 2017. **Table 45** summarizes the peak hour demands in the base year and the projected peak hour demand based on the forecast annual total aircraft operations.

### Table 45. Peak Hour Total Aircraft Operation Forecasts

| Year | Annual Operations | Peak Month Operations | Design Day Daily Operations | Peak Hour Departures | Peak Hour Arrivals | Peak Hour Operations |
|---|---|---|---|---|---|---|
| | | | Actual | | | |
| 2017 | 205,802 | 18,334 | 637 | 35 | 36 | 58 |
| | | | Forecast | | | |
| 2022 | 256,599 | 22,859 | 794 | 44 | 45 | 72 |
| 2027 | 273,924 | 24,403 | 848 | 47 | 48 | 77 |
| 2032 | 291,664 | 25,983 | 903 | 50 | 51 | 82 |
| 2037 | 311,114 | 27,716 | 963 | 53 | 55 | 88 |




## Figure 41. 2017 Design Day Total Aircraft Operations

*Source: MNAA FTS data. Flight schedules on Oct 13, 2017 from Innovata via Aviation Dataminer. AECOM analysis.*
*Abbreviations: STD – Scheduled time of departure; STA- Scheduled time of arrivals.*

# 6. Summary of Aviation Demand Forecasts

**Table 46** summarizes the recommended baseline unconstrained forecasts for enplanements, aircraft operations, and based aircraft for BNA over the 20-year planning horizon.

**Table 46. Summary of Aviation Demand Forecasts for the 20-Year Planning Horizon**

| Year | Total Enplanements | Operations | | | | | Based Aircraft | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air Carrier | Air Taxi | General Aviation | Military | Total Operations | Single-Engine | Multi-Engine | Jet | Helicopter | Military | Total Based Aircraft |
| | | | | | | Actual | | | | | | |
| 2017 | **7,076,371** | 135,135 | 30,540 | 36,577 | 3,550 | **205,802** | 17 | 12 | 57 | 1 | 20 | **107** |
| | | | | | | Forecast | | | | | | |
| 2022 | **9,047,142** | 183,362 | 32,029 | 37,658 | 3,550 | **256,599** | 20 | 14 | 67 | 1 | 20 | **122** |
| 2027 | **9,938,318** | 191,530 | 36,595 | 42,249 | 3,550 | **273,924** | 24 | 16 | 79 | 1 | 20 | **140** |
| 2032 | **10,886,036** | 200,815 | 40,926 | 46,373 | 3,550 | **291,664** | 27 | 18 | 93 | 2 | 20 | **160** |
| 2037 | **11,935,070** | 210,387 | 45,569 | 51,608 | 3,550 | **311,114** | 32 | 21 | 109 | 2 | 20 | **184** |
| Period | | | | | | CAGR | | | | | | |
| 2017 to 2022 (5-year) | **5.0%** | 6.3% | 1.0% | 0.6% | 0.0% | **4.5%** | 3.3% | 3.1% | 3.3% | 0.0% | 0.0% | **2.7%** |
| 2017 to 2027 (10-year) | **3.5%** | 3.5% | 1.8% | 1.5% | 0.0% | **2.9%** | 3.4% | 2.9% | 3.3% | 0.0% | 0.0% | **2.7%** |
| 2017 to 2037 (20-year) | **2.7%** | 2.2% | 2.0% | 1.7% | 0.0% | **2.1%** | 3.2% | 2.8% | 3.3% | 3.5% | 0.0% | **2.7%** |

*Abbreviations: CAGR – Compound annual growth rate.*

**Table 47** summarizes the forecast levels and growth rates, and **Table 48** summarizes the comparison with the FAA TAF.

## Table 47. Summary of Forecast Levels and Growth Rates

### A. Forecast Levels and Growth Rates

**Specify base year: 2017**

| | | | | | | Average Annual Compound Growth Rates | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Base Yr. Level | Base Yr. +1yr. | Base Yr. +5yrs. | Base Yr. +10yrs. | Base Yr. +15yrs. | Base Yr. to +1 | Base Yr. to +5 | Base Yr. to +10 | Base Yr. to +15 |
| | 2017 | 2018 | 2022 | 2027 | 2032 | 2017 to 2018 | 2017 to 2022 | 2017 to 2027 | 2017 to 2032 |
| **Passenger Enplanements** | | | | | | | | | |
| Air Carrier (mainline)[1] | 5,857,592 | 6,390,631 | 7,604,481 | 8,417,526 | 9,290,836 | 9.1% | 5.4% | 3.7% | 3.1% |
| Commuter (regional)[1] | 1,218,779 | 1,258,926 | 1,442,661 | 1,520,791 | 1,595,200 | 3.3% | 3.4% | 2.2% | 1.8% |
| TOTAL | 7,076,371 | 7,713,244 | 9,047,142 | 9,938,318 | 10,886,036 | 9.0% | 5.0% | 3.5% | 2.9% |
| **Operations** | | | | | | | | | |
| Itinerant | | | | | | | | | |
| Air Carrier (mainline)[2] | 85,852 | 107,618 | 123,575 | 130,549 | 138,932 | 25.4% | 7.6% | 4.3% | 3.3% |
| Commuter (regional)[2] | 46,621 | 52,416 | 56,689 | 57,639 | 58,273 | 12.4% | 4.0% | 2.1% | 1.5% |
| Cargo Carrier | 2,662 | 2,785 | 3,099 | 3,343 | 3,610 | 4.6% | 3.1% | 2.3% | 2.1% |
| Total Commercial Operations | 135,135 | 162,819 | 183,362 | 191,530 | 200,815 | 20.5% | 6.3% | 3.5% | 2.7% |
| Air taxi | 30,540 | 30,832 | 32,029 | 36,595 | 40,926 | 1.0% | 1.0% | 1.8% | 2.0% |
| General aviation | 36,569 | 36,783 | 37,650 | 42,240 | 46,363 | 0.6% | 0.6% | 1.5% | 1.6% |
| Military | 3,550 | 3,550 | 3,550 | 3,550 | 3,550 | 0.0% | 0.0% | 0.0% | 0.0% |
| Local | | | | | | | | | |
| General aviation | 8 | 8 | 8 | 9 | 10 | 0.0% | 0.0% | 1.2% | 1.5% |
| Military | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0.0% | 0.0% |
| TOTAL OPERATIONS | 205,802 | 233,992 | 256,599 | 273,924 | 291,664 | 13.7% | 4.5% | 2.9% | 2.4% |
| **Instrument Operations** | 217,587 | 247,391 | 280,993 | 299,965 | 319,392 | 13.7% | 5.2% | 3.3% | 2.6% |
| **Peak Hour Operations** | 58 | 61 | 72 | 77 | 82 | 4.4% | 4.4% | 2.9% | 2.3% |
| **Cargo/mail (enplaned + deplaned tons)** | 48,353 | 52,493 | 58,224 | 64,213 | 70,787 | 8.6% | 3.8% | 2.9% | 2.6% |

| | Base Yr. Level | Base Yr. +1yr. | Base Yr. +5yrs. | Base Yr. +10yrs. | Base Yr. +15yrs. | Average Annual Compound Growth Rates: Base Yr. to +1 | Base Yr. to +5 | Base Yr. to +10 | Base Yr. to +15 |
|---|---|---|---|---|---|---|---|---|---|
| | 2017 | 2018 | 2022 | 2027 | 2032 | 2017 to 2018 | 2017 to 2022 | 2017 to 2027 | 2017 to 2032 |
| **Based Aircraft** | | | | | | | | | |
| Single Engine (Nonjet) | 17 | 17 | 20 | 24 | 27 | 0.0% | 3.3% | 3.5% | 3.1% |
| Multi Engine (Nonjet) | 12 | 12 | 14 | 16 | 18 | 0.0% | 3.1% | 2.9% | 2.7% |
| Jet Engine | 57 | 59 | 67 | 79 | 93 | 3.5% | 3.3% | 3.3% | 3.3% |
| Helicopter | 1 | 1 | 1 | 1 | 2 | 0.0% | 0.0% | 0.0% | 4.7% |
| Other | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% | 0.0% | 0.0% |
| TOTAL | 87 | 89 | 102 | 120 | 140 | 2.3% | 3.2% | 3.3% | 3.2% |

*Note: 1. Mainline aircraft refers to aircraft with over 90 seats, including small narrowbody (B737 classics, MD-80s, A319, E190), medium narrowbody (B737 MAX8, MD-90, A320), large narrowbody (B757, B737 MAX9, A321 neo), and small widebody (B787-8, A330). Regional aircraft refer to aircraft with less than 90 seats, e.g. ERJ135/140/145/175, Q400, CRJ-200/700/900, and turboprops.*

*2. The number of mainline and regional commercial passenger aircraft operations in 2018 is estimated from the flight schedules. A summary of the scheduled departures and seats for 2018 is attached in Appendix B.*

## B. Operational Factors

| | Base Yr. Level | Base Yr. +1yr. | Base Yr. +5yrs. | Base Yr. +10yrs. | Base Yr. +15yrs. |
|---|---|---|---|---|---|
| | 2017 | 2018 | 2022 | 2027 | 2032 |
| **Average aircraft size (seats)** | | | | | |
| Air Carrier (mainline)[3] | 146 | 148 | 150 | 154 | 157 |
| Commuter (regional)[3] | 60 | 60 | 61 | 63 | 64 |
| **Average enplaning load factor** | | | | | |
| Air Carrier (mainline)[4] | 82.6% | 80% | 82% | 84% | 85% |
| Commuter (regional)[4] | 82.6% | 80% | 83% | 84% | 85% |
| **GA operations per based aircraft** | 420 | 413 | 369 | 352 | 331 |

*Note: 3. The average aircraft size (seats per departure) for 2017 and 2018 are estimated from the flight schedules. A summary of the scheduled departures and seats for 2017 and 2018 is attached in Appendix B. The average aircraft fleet mix of 2017 and 2018 from the flight schedules are adopted as basis for the forecast.*

*4. The load factor in 2017 is based on U.S. DOT T-100 Segment database.*

## Table 48. Comparison between Airport Planning and FAA TAF Forecasts

| | Year | Airport Forecast | FAA TAF | % Difference |
|---|---|---|---|---|
| **Passenger Enplanements** | | | | |
| Base yr. | 2017 | 7,076,371 | 6,765,647 | 4.6% |
| Base yr. + 5yrs. | 2022 | 9,047,142 | 8,247,112 | 9.7% |
| Base yr. + 10yrs. | 2027 | 9,938,318 | 9,237,934 | 7.6% |
| Base yr. + 15yrs. | 2032 | 10,886,036 | 10,360,652 | 5.1% |
| **Commercial Operations** | | | | |
| Base yr. | 2017 | 135,135 | 132,308 | 2.1% |
| Base yr. + 5yrs. | 2022 | 183,362 | 170,925 | 7.3% |
| Base yr. + 10yrs. | 2027 | 191,530 | 192,729 | -0.6% |
| Base yr. + 15yrs. | 2032 | 200,815 | 215,784 | -6.9% |
| **Total Operations** | | | | |
| Base yr. | 2017 | 205,802 | 204,731 | 0.5% |
| Base yr. + 5yrs. | 2022 | 256,599 | 231,516 | 10.8% |
| Base yr. + 10yrs. | 2027 | 273,924 | 252,921 | 8.3% |
| Base yr. + 15yrs. | 2032 | 291,664 | 277,300 | 5.2% |

*Note: TAF data is on a U.S. government fiscal year basis (October through September).*

BNA
MASTER PLAN
NASHVILLE INTERNATIONAL AIRPORT

Metropolitan Nashville Airport Authority

# Appendix A

## Noise Exposure Map (NEM) Update Forecast 2019 and 2024

## Nashville International Airport (BNA)

**Master Plan Update**

**August 21, 2018**

**DRAFT**

AECOM

# Appendix A NEM Update Forecast 2019 and 2024

For the purpose of developing the Noise Exposure Map (NEM) update for MNAA, the annual aircraft operations forecast for 2019 and 2024 are given in **Table A-1** below. The annual aircraft operations forecast follows the approach and methodology given in the Aviation Demand Forecasts Report for the BNA Master Plan Update.

**Table A-1. Annual Aircraft Operations Forecast for 2019 and 2024**

| Year | Baseline Scenario | | | | | | |
|---|---|---|---|---|---|---|---|
| | Passenger Aircraft | All-Cargo Aircraft | Air Carrier | Air Taxi | General Aviation | Military | Total Operations |
| | | | | Actual | | | |
| 2017 | 132,473 | 2,662 | 135,135 | 30,540 | 36,577 | 3,550 | **205,802** |
| | | | | Forecast | | | |
| 2019 | 169,137 | 2,896 | 172,033 | 31,127 | 37,006 | 3,550 | **243,716** |
| 2024 | 183,385 | 3,194 | 186,579 | 33,783 | 39,431 | 3,550 | **263,343** |

*Source: AECOM analysis.*

In accordance with Federal Aviation Regulations (FAR) Part 150 guidance, operations are shown by arrivals and departures, time-of-day, and stage length. Time-of-day indicates, as the name implies, whether the operation takes place in the day or night, while stage length is used to assess typical aircraft takeoff weights and resulting takeoff performance. Standard noise modeling methodology assumes that aircraft takeoff weights and resulting aircraft performance can be approximated based upon stage (or trip) length, a factor much more readily obtainable from airline schedules. Longer distance (high stage length) flights are assumed to require more fuel and thus to have higher takeoff weights. This increases takeoff distance and lowers the aircraft's climb rate, as compared to lighter (short trip) flights. Accordingly, information on aircraft stage lengths is incorporated into the Part 150 forecast. The following presents the parameters that define the time-of-day and stage length metrics:

| Day/Night Operations | Time-of-Day |
|---|---|
| Day Operations | 7:00 am to 10:00 pm |
| Night Operations | 10:00 pm to 7:00 am |

| Abbreviations for Stage Lengths (SL) | Trip Length (Nautical Miles) |
|---|---|
| SL1 | 0 – 500 |
| SL2 | 500 – 1,000 |
| SL3 | 1,000 – 1,500 |
| SL4 | 1,500 – 2,500 |
| SL5 | 2,500 – 3,500 |
| SL6 | 3,500 – 4,500 |

Operations forecasts for all activity types (Passenger, Cargo, GA, and Military) are presented with this level of detail to facilitate the NEM modeling process.

Passenger carrier operations are presented in Tables TS-1 for the 2017 baseline operations data, while Tables TS-2 and TS-3 present the 2019 and 2024 operations forecast, respectively.

In line with announced fleet changes, the American and Delta MD80 series fleets have been eliminated from the fleet after 2020. These operations have been replaced by B737 operations by both carriers consistent with their announced fleet replacement strategies.

## Table TS-1. 2017 Passenger Carrier Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| A319 | Airbus A319 | 2,349 | 740 | 3,089 | 916 | 623 | 374 | 714 | 0 | 2,627 | 239 | 156 | 30 | 37 | 0 | 462 | 3,089 | 6,178 |
| A320 | Airbus A320 | 2,307 | 207 | 2,514 | 484 | 1,381 | 164 | 313 | 0 | 2,342 | 43 | 116 | 6 | 7 | 0 | 172 | 2,514 | 5,028 |
| A321 | Airbus A321 | 108 | 11 | 119 | 55 | 31 | 8 | 16 | 0 | 110 | 3 | 4 | 1 | 1 | 0 | 9 | 119 | 238 |
| B38M | Boeing 737 MAX 8 | 230 | 37 | 267 | 51 | 111 | 18 | 35 | 0 | 215 | 15 | 21 | 7 | 9 | 0 | 52 | 267 | 534 |
| B712 | Boeing 717 | 990 | 12 | 1,002 | 661 | 316 | 2 | 4 | 0 | 983 | 13 | 5 | 0 | 1 | 0 | 19 | 1,002 | 2,004 |
| B733 | Boeing 737-300 | 900 | 127 | 1,027 | 513 | 410 | 2 | 4 | 0 | 929 | 8 | 86 | 2 | 2 | 0 | 98 | 1,027 | 2,054 |
| B737 | Boeing 737-700 | 19,128 | 3,025 | 22,153 | 9,337 | 8,280 | 598 | 1,144 | 0 | 19,359 | 968 | 1,526 | 134 | 166 | 0 | 2,794 | 22,153 | 44,306 |
| B738 | Boeing 737-800 | 8,163 | 1,784 | 9,947 | 1,653 | 4,125 | 711 | 1,359 | 0 | 7,848 | 259 | 1,232 | 272 | 336 | 0 | 2,099 | 9,947 | 19,894 |
| B739 | Boeing 737-900 | 337 | 38 | 375 | 66 | 45 | 82 | 157 | 0 | 350 | 2 | 16 | 3 | 4 | 0 | 25 | 375 | 750 |
| B752 | Boeing 757-200 | 74 | 8 | 82 | 25 | 25 | 7 | 12 | 0 | 69 | 6 | 5 | 1 | 1 | 0 | 13 | 82 | 164 |
| B753 | Boeing 757-300 | 26 | 1 | 27 | 15 | 8 | 1 | 1 | 0 | 25 | 1 | 0 | 0 | 1 | 0 | 2 | 27 | 54 |
| CRJ1 | Canadair Regional Jet 100 | 246 | 53 | 299 | 0 | 204 | 0 | 0 | 0 | 204 | 0 | 95 | 0 | 0 | 0 | 95 | 299 | 598 |
| CRJ2 | Canadair Regional Jet 200 | 2,103 | 205 | 2,308 | 871 | 932 | 0 | 0 | 0 | 1,803 | 207 | 298 | 0 | 0 | 0 | 505 | 2,308 | 4,616 |
| CRJ7 | Canadair Regional Jet 700 | 3,264 | 798 | 4,062 | 2,875 | 838 | 3 | 7 | 0 | 3,723 | 330 | 7 | 1 | 1 | 0 | 339 | 4,062 | 8,124 |
| CRJ9 | Canadair Regional Jet 900 | 3,608 | 471 | 4,079 | 984 | 2,135 | 8 | 16 | 0 | 3,143 | 557 | 375 | 2 | 2 | 0 | 936 | 4,079 | 8,158 |
| DH8D | DHC-8-400 Dash 8Q | 270 | 0 | 270 | 1 | 269 | 0 | 0 | 0 | 270 | 0 | 0 | 0 | 0 | 0 | 0 | 270 | 540 |
| E135 | Embraer RJ135 | 220 | 62 | 282 | 15 | 218 | 1 | 2 | 0 | 236 | 1 | 45 | 0 | 0 | 0 | 46 | 282 | 564 |
| E145 | Embraer RJ145 | 1,879 | 58 | 1,937 | 896 | 915 | 2 | 5 | 0 | 1,818 | 13 | 105 | 0 | 1 | 0 | 119 | 1,937 | 3,874 |
| E170 | Embraer 170 | 860 | 7 | 867 | 91 | 754 | 2 | 3 | 0 | 850 | 9 | 8 | 0 | 0 | 0 | 17 | 867 | 1,734 |
| E190 | Embraer 190 | 512 | 29 | 541 | 102 | 388 | 1 | 1 | 0 | 492 | 1 | 48 | 0 | 0 | 0 | 49 | 541 | 1,082 |
| E45X | Embraer 145XR | 188 | 6 | 194 | 79 | 110 | 0 | 0 | 0 | 189 | 0 | 5 | 0 | 0 | 0 | 5 | 194 | 388 |
| E75L | Embraer 175 (long wing) | 3,819 | 496 | 4,315 | 1,335 | 2,503 | 15 | 28 | 0 | 3,881 | 312 | 117 | 2 | 3 | 0 | 434 | 4,315 | 8,630 |
| E75S | Embraer 175 (short wing) | 1,923 | 128 | 2,051 | 632 | 1,327 | 9 | 17 | 0 | 1,985 | 31 | 31 | 2 | 2 | 0 | 66 | 2,051 | 4,102 |
| MD82 | McDonnell Douglas MD-82 | 187 | 3 | 190 | 2 | 187 | 0 | 1 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | 380 |
| MD83 | McDonnell Douglas MD-83 | 678 | 3 | 681 | 26 | 649 | 0 | 0 | 0 | 675 | 1 | 5 | 0 | 0 | 0 | 6 | 681 | 1,362 |
| MD88 | McDonnell Douglas MD-88 | 2,767 | 306 | 3,073 | 2,645 | 80 | 4 | 7 | 0 | 2,736 | 327 | 8 | 1 | 1 | 0 | 337 | 3,073 | 6,146 |
| MD90 | McDonnell Douglas MD-90 | 418 | 67 | 485 | 378 | 41 | 2 | 3 | 0 | 424 | 58 | 3 | 0 | 1 | 0 | 62 | 486 | 971 |
| Total | | 57,554 | 8,682 | 66,236 | 24,708 | 26,905 | 2,014 | 3,849 | 0 | 57,476 | 3,404 | 4,317 | 464 | 576 | 0 | 8,761 | 66,237 | 132,473 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 21, 2018.*

## Table TS-2. 2019 Passenger Carrier Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| A319 | Airbus A319 | 2,999 | 945 | 3,944 | 1,170 | 795 | 477 | 912 | 0 | 3,354 | 305 | 199 | 39 | 47 | 0 | 590 | 3,944 | 7,888 |
| A320 | Airbus A320 | 2,946 | 264 | 3,210 | 618 | 1,763 | 209 | 400 | 0 | 2,990 | 55 | 148 | 8 | 9 | 0 | 220 | 3,210 | 6,420 |
| A321 | Airbus A321 | 1,139 | 14 | 1,153 | 1,070 | 40 | 11 | 20 | 0 | 1,141 | 4 | 5 | 1 | 2 | 0 | 12 | 1,153 | 2,306 |
| B38M | Boeing 737 MAX 8 | 533 | 51 | 584 | 68 | 381 | 24 | 45 | 0 | 518 | 19 | 27 | 9 | 11 | 0 | 66 | 584 | 1,168 |
| B712 | Boeing 717 | 1,264 | 15 | 1,279 | 844 | 403 | 3 | 5 | 0 | 1,255 | 17 | 6 | 0 | 1 | 0 | 24 | 1,279 | 2,558 |
| B733 | Boeing 737-300 | 1,149 | 162 | 1,311 | 655 | 523 | 3 | 5 | 0 | 1,186 | 10 | 110 | 2 | 3 | 0 | 125 | 1,311 | 2,622 |
| B737 | Boeing 737-700 | 24,217 | 3,842 | 28,059 | 11,862 | 10,505 | 729 | 1,417 | 0 | 24,513 | 1,230 | 1,938 | 169 | 208 | 0 | 3,545 | 28,058 | 56,117 |
| B738 | Boeing 737-800 | 10,422 | 2,278 | 12,700 | 2,110 | 5,267 | 907 | 1,736 | 0 | 10,020 | 331 | 1,573 | 348 | 428 | 0 | 2,680 | 12,700 | 25,400 |
| B739 | Boeing 737-900 | 426 | 71 | 497 | 84 | 57 | 111 | 212 | 0 | 464 | 4 | 20 | 4 | 5 | 0 | 33 | 497 | 994 |
| B752 | Boeing 757-200 | 74 | 8 | 82 | 25 | 25 | 7 | 12 | 0 | 69 | 6 | 5 | 1 | 1 | 0 | 13 | 82 | 164 |
| B753 | Boeing 757-300 | 26 | 1 | 27 | 15 | 8 | 1 | 1 | 0 | 25 | 1 | 0 | 0 | 1 | 0 | 2 | 27 | 54 |
| B788 | Boeing 787-8 | 238 | 0 | 238 | 0 | 0 | 0 | 0 | 238 | 238 | 0 | 0 | 0 | 0 | 0 | 0 | 238 | 476 |
| CRJ1 | Canadair Regional Jet 100 | 313 | 68 | 381 | 0 | 260 | 0 | 0 | 0 | 260 | 0 | 121 | 0 | 0 | 0 | 121 | 381 | 762 |
| CRJ2 | Canadair Regional Jet 200 | 2,684 | 262 | 2,946 | 1,112 | 1,190 | 0 | 0 | 0 | 2,302 | 264 | 380 | 0 | 0 | 0 | 644 | 2,946 | 5,892 |
| CRJ7 | Canadair Regional Jet 700 | 4,168 | 1,019 | 5,187 | 3,671 | 1,070 | 4 | 9 | 0 | 4,754 | 421 | 9 | 1 | 2 | 0 | 433 | 5,187 | 10,374 |
| CRJ9 | Canadair Regional Jet 900 | 4,607 | 601 | 5,208 | 1,256 | 2,726 | 11 | 20 | 0 | 4,013 | 711 | 479 | 2 | 3 | 0 | 1,195 | 5,208 | 10,416 |
| DH8D | DHC-8-400 Dash 8Q | 344 | 0 | 344 | 1 | 343 | 0 | 0 | 0 | 344 | 0 | 0 | 0 | 0 | 0 | 0 | 344 | 688 |
| E135 | Embraer RJ135 | 281 | 79 | 360 | 20 | 278 | 1 | 3 | 0 | 302 | 1 | 57 | 0 | 0 | 0 | 58 | 360 | 720 |
| E145 | Embraer RJ145 | 2,399 | 74 | 2,473 | 1,144 | 1,168 | 3 | 6 | 0 | 2,321 | 17 | 134 | 0 | 1 | 0 | 152 | 2,473 | 4,946 |
| E170 | Embraer 170 | 1,097 | 9 | 1,106 | 116 | 963 | 2 | 4 | 0 | 1,085 | 11 | 10 | 0 | 0 | 0 | 21 | 1,106 | 2,212 |
| E190 | Embraer 190 | 654 | 37 | 691 | 131 | 495 | 1 | 2 | 0 | 629 | 1 | 61 | 0 | 0 | 0 | 62 | 691 | 1,382 |
| E45X | Embraer 145XR | 240 | 8 | 248 | 102 | 140 | 0 | 0 | 0 | 242 | 0 | 6 | 0 | 0 | 0 | 6 | 248 | 496 |
| E75L | Embraer 175 (long wing) | 4,876 | 633 | 5,509 | 1,705 | 3,196 | 19 | 36 | 0 | 4,956 | 398 | 149 | 3 | 3 | 0 | 553 | 5,509 | 11,018 |
| E75S | Embraer 175 (short wing) | 2,455 | 163 | 2,618 | 806 | 1,694 | 11 | 22 | 0 | 2,533 | 40 | 40 | 2 | 3 | 0 | 85 | 2,618 | 5,236 |
| MD83 | McDonnell Douglas MD-83 | 866 | 4 | 870 | 34 | 829 | 0 | 0 | 0 | 863 | 1 | 6 | 0 | 0 | 0 | 7 | 870 | 1,740 |
| MD88 | McDonnell Douglas MD-88 | 2,533 | 391 | 2,924 | 2,377 | 102 | 5 | 9 | 0 | 2,493 | 418 | 10 | 1 | 2 | 0 | 431 | 2,924 | 5,848 |
| MD90 | McDonnell Douglas MD-90 | 534 | 86 | 620 | 483 | 52 | 2 | 4 | 0 | 541 | 74 | 4 | 0 | 1 | 0 | 79 | 620 | 1,240 |
| Total | | 73,484 | 11,085 | 84,569 | 31,479 | 34,273 | 2,541 | 4,880 | 238 | 73,411 | 4,339 | 5,497 | 590 | 731 | 0 | 11,157 | 84,568 | 169,137 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 21, 2018.*

## Table TS-3. 2024 Passenger Carrier Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | Total Operations |
| A319 | Airbus A319 | 3,252 | 1,024 | 4,276 | 1,268 | 862 | 517 | 989 | 0 | 3,636 | 331 | 216 | 42 | 51 | 0 | 640 | 4,276 | 8,552 |
| A320 | Airbus A320 | 3,194 | 287 | 3,481 | 670 | 1,912 | 227 | 433 | 0 | 3,242 | 60 | 161 | 8 | 10 | 0 | 239 | 3,481 | 6,962 |
| A321 | Airbus A321 | 1,926 | 116 | 2,042 | 1,070 | 825 | 14 | 27 | 0 | 1,936 | 85 | 17 | 2 | 2 | 0 | 106 | 2,042 | 4,084 |
| B38M | Boeing 737 MAX 8 | 576 | 55 | 631 | 73 | 411 | 26 | 49 | 0 | 559 | 21 | 29 | 10 | 12 | 0 | 72 | 631 | 1,262 |
| B712 | Boeing 717 | 1,368 | 17 | 1,385 | 914 | 437 | 3 | 5 | 0 | 1,359 | 18 | 7 | 0 | 1 | 0 | 26 | 1,385 | 2,770 |
| B737 | Boeing 737-700 | 29,832 | 4,610 | 34,442 | 16,524 | 11,247 | 810 | 1,550 | 0 | 30,131 | 1,786 | 2,113 | 185 | 228 | 0 | 4,312 | 34,443 | 68,885 |
| B738 | Boeing 737-800 | 12,546 | 2,646 | 15,192 | 2,998 | 6,278 | 987 | 1,887 | 0 | 12,150 | 370 | 1,824 | 380 | 468 | 0 | 3,042 | 15,192 | 30,384 |
| B739 | Boeing 737-900 | 467 | 53 | 520 | 92 | 62 | 114 | 217 | 0 | 485 | 3 | 22 | 4 | 6 | 0 | 35 | 520 | 1,040 |
| B752 | Boeing 757-200 | 74 | 8 | 82 | 25 | 25 | 7 | 12 | 0 | 69 | 6 | 5 | 1 | 1 | 0 | 13 | 82 | 164 |
| B753 | Boeing 757-300 | 26 | 1 | 27 | 15 | 8 | 1 | 1 | 0 | 25 | 1 | 0 | 0 | 1 | 0 | 2 | 27 | 54 |
| B788 | Boeing 787-8 | 260 | 0 | 260 | 0 | 0 | 0 | 0 | 260 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 260 | 520 |
| CRJ1 | Canadair Regional Jet 100 | 341 | 73 | 414 | 0 | 282 | 0 | 0 | 0 | 282 | 0 | 132 | 0 | 0 | 0 | 132 | 414 | 828 |
| CRJ2 | Canadair Regional Jet 200 | 2,911 | 284 | 3,195 | 1,205 | 1,290 | 0 | 0 | 0 | 2,495 | 287 | 413 | 0 | 0 | 0 | 700 | 3,195 | 6,390 |
| CRJ7 | Canadair Regional Jet 700 | 4,518 | 1,105 | 5,623 | 3,979 | 1,160 | 5 | 9 | 0 | 5,153 | 457 | 10 | 1 | 2 | 0 | 470 | 5,623 | 11,246 |
| CRJ9 | Canadair Regional Jet 900 | 4,995 | 652 | 5,647 | 1,362 | 2,956 | 11 | 22 | 0 | 4,351 | 771 | 519 | 3 | 3 | 0 | 1,296 | 5,647 | 11,294 |
| DH8D | DHC-8-400 Dash 8Q | 374 | 0 | 374 | 1 | 373 | 0 | 0 | 0 | 374 | 0 | 0 | 0 | 0 | 0 | 0 | 374 | 748 |
| E135 | Embraer RJ135 | 304 | 86 | 390 | 21 | 302 | 1 | 3 | 0 | 327 | 1 | 62 | 0 | 0 | 0 | 63 | 390 | 780 |
| E145 | Embraer RJ145 | 2,601 | 80 | 2,681 | 1,240 | 1,267 | 3 | 7 | 0 | 2,517 | 18 | 145 | 0 | 1 | 0 | 164 | 2,681 | 5,362 |
| E170 | Embraer 170 | 1,190 | 10 | 1,200 | 126 | 1,044 | 2 | 5 | 0 | 1,177 | 12 | 11 | 0 | 0 | 0 | 23 | 1,200 | 2,400 |
| E190 | Embraer 190 | 708 | 40 | 748 | 141 | 537 | 1 | 2 | 0 | 681 | 1 | 66 | 0 | 0 | 0 | 67 | 748 | 1,496 |
| E45X | Embraer 145XR | 260 | 8 | 268 | 109 | 152 | 0 | 0 | 0 | 261 | 0 | 7 | 0 | 0 | 0 | 7 | 268 | 536 |
| E75L | Embraer 175 (long wing) | 5,287 | 687 | 5,974 | 1,848 | 3,465 | 21 | 39 | 0 | 5,373 | 432 | 162 | 3 | 4 | 0 | 601 | 5,974 | 11,948 |
| E75S | Embraer 175 (short wing) | 2,663 | 177 | 2,840 | 875 | 1,837 | 12 | 24 | 0 | 2,748 | 43 | 43 | 3 | 3 | 0 | 92 | 2,840 | 5,680 |
| Total | | 79,673 | 12,019 | 91,692 | 34,556 | 36,732 | 2,762 | 5,281 | 260 | 79,591 | 4,703 | 5,964 | 642 | 793 | 0 | 12,102 | 91,693 | 183,385 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 21, 2018.*

Table TS-4 presents the 2017 baseline cargo operations data, while Table TS-5 and Table TS-6 present the 2019 and 2024 forecasted operations respectively.

## Table TS-4. 2017 All-Cargo Aircraft Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| A306 | Airbus A300-600 | 30 | 77 | 107 | 23 | 2 | 0 | 0 | 0 | 25 | 81 | 1 | 0 | 0 | 0 | 82 | 107 | 214 |
| B190 | Beechcraft 1900 | 3 | 3 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 0 | 0 | 0 | 5 | 6 | 12 |
| B744 | Boeing 747-400 | 4 | 3 | 7 | 2 | 2 | 0 | 0 | 0 | 4 | 1 | 1 | 1 | 0 | 0 | 3 | 7 | 14 |
| B752 | Boeing 757-200 | 161 | 767 | 928 | 229 | 12 | 1 | 0 | 0 | 242 | 523 | 163 | 0 | 0 | 0 | 686 | 928 | 1,856 |
| B762 | Boeing 767-200 | 45 | 35 | 80 | 4 | 1 | 2 | 0 | 0 | 7 | 71 | 2 | 0 | 0 | 0 | 73 | 80 | 160 |
| B763 | Boeing 767-300 | 31 | 128 | 159 | 14 | 4 | 1 | 0 | 0 | 19 | 137 | 3 | 0 | 0 | 0 | 140 | 159 | 318 |
| B77L | Boeing 777-200LR / 777F | 2 | 3 | 5 | 1 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 0 | 2 | 5 | 10 |
| C208 | Cessna 208 Caravan | 8 | 1 | 9 | 4 | 0 | 0 | 0 | 0 | 4 | 4 | 1 | 0 | 0 | 0 | 5 | 9 | 18 |
| DC10 | Douglas DC-10 | 5 | 4 | 9 | 4 | 3 | 0 | 0 | 0 | 7 | 2 | 0 | 0 | 0 | 0 | 2 | 9 | 18 |
| MD11 | McDonnell Douglas MD-11 | 10 | 4 | 14 | 7 | 3 | 2 | 0 | 0 | 12 | 1 | 0 | 1 | 0 | 0 | 2 | 14 | 28 |
| SW4 | SWEARINGEN Merlin 4 | 4 | 3 | 7 | 2 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 5 | 7 | 14 |
| Total | | 303 | 1,028 | 1,331 | 291 | 27 | 8 | 0 | 0 | 326 | 828 | 173 | 4 | 0 | 0 | 1,005 | 1,331 | 2,662 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

## Table TS-5. 2019 All-Cargo Aircraft Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| A306 | Airbus A300-600 | 33 | 83 | 116 | 25 | 2 | 0 | 0 | 0 | 27 | 88 | 1 | 0 | 0 | 0 | 89 | 116 | 232 |
| B190 | Beechcraft 1900 | 3 | 3 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 0 | 0 | 0 | 5 | 6 | 12 |
| B752 | Boeing 757-200 | 182 | 842 | 1,024 | 253 | 15 | 3 | 0 | 0 | 271 | 571 | 179 | 3 | 0 | 0 | 753 | 1,024 | 2,048 |
| B762 | Boeing 767-200 | 49 | 38 | 87 | 4 | 1 | 2 | 0 | 0 | 7 | 78 | 2 | 0 | 0 | 0 | 80 | 87 | 174 |
| B763 | Boeing 767-300 | 39 | 144 | 183 | 19 | 7 | 1 | 0 | 0 | 27 | 153 | 3 | 0 | 0 | 0 | 156 | 183 | 366 |
| C208 | Cessna 208 Caravan | 9 | 1 | 10 | 5 | 0 | 0 | 0 | 0 | 5 | 4 | 1 | 0 | 0 | 0 | 5 | 10 | 20 |
| MD11 | McDonnell Douglas MD-11 | 11 | 4 | 15 | 8 | 3 | 2 | 0 | 0 | 13 | 1 | 0 | 1 | 0 | 0 | 2 | 15 | 30 |
| SW4 | SWEARINGEN Merlin 4 | 4 | 3 | 7 | 2 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 0 | 0 | 0 | 5 | 7 | 14 |
| Total | | 330 | 1,118 | 1,448 | 317 | 28 | 8 | 0 | 0 | 353 | 903 | 188 | 4 | 0 | 0 | 1,095 | 1,448 | 2,896 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

## Table TS-6. 2024 All-Cargo Aircraft Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | | Night | | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| A306 | Airbus A300-600 | 36 | 92 | 128 | 28 | 2 | 0 | 0 | 0 | 30 | 97 | 1 | 0 | 0 | 0 | 98 | 128 | 256 |
| B190 | Beechcraft 1900 | 4 | 4 | 8 | 2 | 0 | 0 | 0 | 0 | 2 | 5 | 1 | 0 | 0 | 0 | 6 | 8 | 16 |
| B752 | Boeing 757-200 | 199 | 927 | 1,126 | 280 | 16 | 3 | 0 | 0 | 299 | 627 | 197 | 3 | 0 | 0 | 827 | 1,126 | 2,252 |
| B762 | Boeing 767-200 | 60 | 47 | 107 | 11 | 5 | 2 | 0 | 0 | 18 | 87 | 2 | 0 | 0 | 0 | 89 | 107 | 214 |
| B763 | Boeing 767-300 | 43 | 159 | 202 | 20 | 9 | 3 | 0 | 0 | 32 | 165 | 4 | 1 | 0 | 0 | 170 | 202 | 404 |
| C208 | Cessna 208 Caravan | 10 | 1 | 11 | 5 | 0 | 0 | 0 | 0 | 5 | 5 | 1 | 0 | 0 | 0 | 6 | 11 | 22 |
| MD11 | McDonnell Douglas MD-11 | 6 | 0 | 6 | 6 | 0 | 0 | 0 | | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 12 |
| SW4 | SWEARINGEN Merlin 4 | 5 | 4 | 9 | 3 | 0 | 0 | 0 | 0 | 3 | 5 | 1 | 0 | 0 | 0 | 6 | 9 | 18 |
| Total | | 363 | 1,234 | 1,597 | 355 | 32 | 8 | 0 | 0 | 395 | 991 | 207 | 4 | 0 | 0 | 1,202 | 1,597 | 3,194 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

Table TS-7 presents the 2017 general aviation operations data, while Table TS-8 and Table TS-9 present the 2019 and 2024 forecasted operations respectively.

## Table TS-7. 2017 General Aviation Operations

| Aircraft Type | Arrivals | | | Departures | | | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Day | | | | | | Night | | | | | | | |
| | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | Total Departures | |
| Business Jet | 17,459 | 1,670 | 19,129 | 9,828 | 5,763 | 545 | 563 | 30 | 16,729 | 1,694 | 615 | 47 | 44 | 0 | 2,400 | 19,129 | 38,258 |
| Turbo Prop | 7,614 | 460 | 8,074 | 6,691 | 606 | 6 | 6 | 0 | 7,309 | 670 | 94 | 1 | 0 | 0 | 765 | 8,074 | 16,148 |
| Multi Piston | 1,128 | 373 | 1,501 | 805 | 95 | 2 | 2 | 0 | 904 | 558 | 38 | 1 | 0 | 0 | 597 | 1,501 | 3,002 |
| Single Piston | 4,725 | 129 | 4,854 | 1,936 | 186 | 13 | 14 | 1 | 2,150 | 2,238 | 456 | 6 | 5 | 0 | 2,705 | 4,855 | 9,709 |
| Total | 30,926 | 2,632 | 33,558 | 19,260 | 6,650 | 566 | 585 | 31 | 27,092 | 5,160 | 1,203 | 55 | 49 | 0 | 6,467 | 33,559 | 67,117 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

## Table TS-8. 2019 General Aviation Operations

| Aircraft Type | Arrivals | | | Departures | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | Night | Total Arrivals | Day | | | | | | Night | | | | | | Total Departures | Total Operations |
| | | | | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | | |
| Business Jet | 17,724 | 1,695 | 19,419 | 9,977 | 5,850 | 553 | 571 | 31 | 16,982 | 1,721 | 624 | 47 | 45 | 0 | 2,437 | 19,419 | 38,838 |
| Turbo Prop | 7,729 | 467 | 8,196 | 6,793 | 615 | 6 | 6 | 0 | 7,420 | 680 | 95 | 1 | 0 | 0 | 776 | 8,196 | 16,392 |
| Multi Piston | 1,145 | 379 | 1,524 | 818 | 96 | 2 | 2 | 0 | 918 | 565 | 39 | 1 | 0 | 0 | 605 | 1,523 | 3,047 |
| Single Piston | 4,797 | 131 | 4,928 | 1,965 | 189 | 13 | 14 | 1 | 2,182 | 2,272 | 463 | 6 | 5 | 0 | 2,746 | 4,928 | 9,856 |
| Total | 31,395 | 2,672 | 34,067 | 19,553 | 6,750 | 574 | 593 | 32 | 27,502 | 5,238 | 1,221 | 55 | 50 | 0 | 6,564 | 34,066 | 68,133 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

## Table TS-9. 2024 General Aviation Operations

| Aircraft Type | Arrivals | | | Departures | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Day | Night | Total Arrivals | Day | | | | | | Night | | | | | | Total Departures | Total Operations |
| | | | | SL1 | SL2 | SL3 | SL4 | SL6 | Total | SL1 | SL2 | SL3 | SL4 | SL6 | Total | | |
| Business Jet | 19,045 | 1,822 | 20,867 | 10,721 | 6,287 | 593 | 614 | 33 | 18,248 | 1,849 | 671 | 51 | 48 | 0 | 2,619 | 20,867 | 41,734 |
| Turbo Prop | 8,306 | 502 | 8,808 | 7,299 | 661 | 7 | 7 | 0 | 7,974 | 730 | 103 | 1 | 0 | 0 | 834 | 8,808 | 17,616 |
| Multi Piston | 1,230 | 407 | 1,637 | 878 | 104 | 2 | 2 | 0 | 986 | 609 | 41 | 1 | 0 | 0 | 651 | 1,637 | 3,274 |
| Single Piston | 5,154 | 141 | 5,295 | 2,111 | 203 | 15 | 15 | 1 | 2,345 | 2,441 | 497 | 6 | 6 | 0 | 2,950 | 5,295 | 10,590 |
| Total | 33,735 | 2,872 | 36,607 | 21,009 | 7,255 | 617 | 638 | 34 | 29,553 | 5,629 | 1,312 | 59 | 54 | 0 | 7,054 | 36,607 | 73,214 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

To address the military flights, the 3,550 annual operations from OPSNET were distributed among military aircraft types known to be operating at BNA. Approximately half of the operations were assigned to the TAANG Blackhawk helicopters based at BNA and the remainder assigned to the military fleet aircraft types available for BNA from July 2017 to June 2018 through the FAA Traffic Flow Management System Counts (TFMSC). Tables TS-10 presents the Military operations that will be used for the NEM update.

### Table TS-10. 2017, 2019, and 2024 Military Operations

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Day | | | | | Night | | | | | | |
| | | Day | Night | Total Arrivals | SL1 | SL2 | SL3 | SL4 | Total | SL1 | SL2 | SL3 | SL4 | Total | Total Departures | |
| A10 | Fairchild A10 | 3 | 0 | 3 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| B350 | Beech Super King Air 350 | 14 | 1 | 15 | 8 | 5 | 1 | 1 | 15 | 0 | 0 | 0 | 0 | 0 | 15 | 30 |
| B737 | Boeing 737-700 | 10 | 0 | 10 | 9 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 20 |
| B747 | Boeing 747 All Series | 5 | 0 | 5 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 10 |
| BE20 | Beech 200 Super King | 16 | 0 | 16 | 10 | 6 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 16 | 32 |
| BE40 | Raytheon/Beech Beechjet 400/T-1 | 47 | 0 | 47 | 40 | 7 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 47 | 94 |
| BE9L | Beech King Air 90 | 8 | 0 | 8 | 5 | 3 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 8 | 16 |
| C130 | Lockheed 130 Hercules | 50 | 3 | 53 | 32 | 16 | 1 | 2 | 51 | 2 | 0 | 0 | 0 | 2 | 53 | 106 |
| C17 | Boeing Globemaster 3 | 30 | 2 | 32 | 19 | 1 | 2 | 7 | 29 | 2 | 0 | 0 | 1 | 3 | 32 | 64 |
| C30J | C-130J Hercules ; Lockheed | 27 | 1 | 28 | 18 | 7 | 1 | 2 | 28 | 0 | 0 | 0 | 0 | 0 | 28 | 56 |
| C560 | Cessna Citation V/Ultra/Encore | 21 | 1 | 22 | 17 | 4 | 0 | 0 | 21 | 1 | 0 | 0 | 0 | 1 | 22 | 44 |
| C750 | Cessna Citation X | 15 | 0 | 15 | 12 | 1 | 1 | 0 | 14 | 0 | 1 | 0 | 0 | 1 | 15 | 30 |
| CN35 | CASA CN-235 | 7 | 0 | 7 | 7 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 14 |
| D328 | Dornier 328 Series | 41 | 0 | 41 | 39 | 2 | 0 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 41 | 82 |
| DA42 | Diamond Twin Star | 3 | 0 | 3 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |
| DHC6 | DeHavilland Twin Otter | 3 | 1 | 4 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 8 |
| EC45 | Eurocopter EC-145 | 30 | 0 | 30 | 30 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 60 |
| F15 | Boeing F-15 Eagle | 6 | 0 | 6 | 6 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 12 |
| F16 | Lockheed F-16 Fighting Falcon | 9 | 0 | 9 | 7 | 2 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 18 |
| F18 | Boeing FA-18 Hornet | 11 | 0 | 11 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 11 | 22 |
| F18H | F/A 18 Hornet | 36 | 0 | 36 | 14 | 22 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 36 | 72 |
| F18S | F18 Hornet | 33 | 1 | 34 | 6 | 28 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 34 | 68 |
| F22 | Boeing Raptor F22 | 10 | 0 | 10 | 9 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 20 |
| F5 | Northrop F-5 Freedom Fighter | 3 | 0 | 3 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 6 |

| Aircraft Code | Model | Arrivals | | | Departures | | | | | | | | | | | Total Operations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Day | Night | Total Arrivals | Day | | | | | Night | | | | | Total Departures | |
| | | | | | SL1 | SL2 | SL3 | SL4 | Total | SL1 | SL2 | SL3 | SL4 | Total | | |
| FA18 | F18 Hornet | 16 | 0 | 16 | 16 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 16 | 32 |
| GLF5 | Gulfstream V/G500 | 8 | 0 | 8 | 7 | 1 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 8 | 16 |
| H60 | Sikorsky SH-60 Seahawk | 46 | 0 | 46 | 46 | 0 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 46 | 92 |
| HAR | Boeing AV-8 Harrier | 7 | 0 | 7 | 6 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 7 | 14 |
| HAWK | BAe Systems Hawk | 15 | 0 | 15 | 15 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 15 | 30 |
| K35R | Boeing KC-135 Stratotanker | 10 | 0 | 10 | 5 | 4 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 20 |
| LJ35 | Bombardier Learjet 35/36 | 9 | 0 | 9 | 5 | 4 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 18 |
| M28 | PZL M-28 Skytruck | 4 | 0 | 4 | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 8 |
| P28A | Piper Cherokee | 11 | 0 | 11 | 11 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 11 | 22 |
| P8 | Boeing P-8 Poseidon | 4 | 0 | 4 | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 8 |
| PC12 | Pilatus PC-12 | 13 | 0 | 13 | 13 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 13 | 26 |
| SW4 | Swearingen Merlin 4/4A Metro2 | 13 | 0 | 13 | 11 | 2 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 13 | 26 |
| T38 | Northrop T-38 Talon | 16 | 0 | 16 | 9 | 7 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 16 | 32 |
| TEX2 | Raytheon Texan 2 | 103 | 0 | 103 | 98 | 5 | 0 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 103 | 206 |
| UH60 | Blackhawk Helicopter | 1,052 | 0 | 1,052 | 1,052 | 0 | 0 | 0 | 1,052 | 0 | 0 | 0 | 0 | 0 | 1,052 | 2,104 |
| Total | | 1,765 | 10 | 1,775 | 1,613 | 136 | 7 | 12 | 1,768 | 5 | 1 | 0 | 1 | 7 | 1,775 | 3,550 |

*Source: Nashville InFLIGHT Flight Tracking System (FTS), FAA OPSNET, TransSolutions, August 17, 2018.*

# Appendix B Summary of Scheduled Departures in 2017 and 2018

The average seats per departure and fleet mix for 2017 and 2018 are based on the flight schedules as summarized in **Table B-1** below.

### Table B-1. Summary of Scheduled Departures and Departure Seats in 2017 and 2018

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| **4B** | | | **1,052** | **7,454** |
| | GLH | | 626 | 4,442 |
| | | PL2 | 626 | 4,442 |
| | MSL | | 426 | 3,012 |
| | | PL2 | 426 | 3,012 |
| **9X** | | | **401** | **4,317** |
| | MEM | | 401 | 4,317 |
| | | CNC | 401 | 4,317 |
| **AA** | | | **16,038** | **1,535,710** |
| | CLT | | 2,673 | 315,171 |
| | | 319 | 988 | 126,464 |
| | | 320 | 426 | 63,900 |
| | | 321 | 80 | 14,960 |
| | | 738 | 79 | 11,692 |
| | | 73H | 155 | 24,800 |
| | | CR2 | 31 | 1,550 |
| | | | | |
| | | CR9 | 310 | 23,422 |
| | | E75 | 468 | 34,919 |
| | | E90 | 136 | 13,464 |
| | CUN | | 41 | 5,376 |
| | | 319 | 37 | 4,736 |
| | | 73H | 4 | 640 |
| | DCA | | 1,667 | 101,593 |
| | | 319 | 2 | 256 |
| | | CR2 | 407 | 20,350 |
| | | CR7 | 374 | 24,117 |
| | | | | |
| | | CRJ | 140 | 7,000 |
| | | E75 | 542 | 39,770 |
| | | ER4 | 202 | 10,100 |
| | DFW | | 2,774 | 404,097 |
| | | 319 | 1 | 128 |
| | | 738 | 917 | 135,716 |
| | | 73H | 859 | 138,613 |
| | | | | |
| | | E75 | 131 | 9,956 |
| | | ER4 | 2 | 100 |
| | | M80 | 176 | 24,640 |
| | | M82 | 688 | 94,944 |
| | JFK | | 716 | 36,256 |
| | | E75 | 80 | 6,094 |
| | | ER4 | 363 | 18,150 |
| | | ERD | 273 | 12,012 |
| | LAX | | 757 | 115,950 |
| | | 319 | 47 | 6,016 |
| | | 32B | 27 | 4,293 |

| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|
| **4B** | | | **952** | **6,664** |
| | GLH | | 625 | 4,375 |
| | | PL2 | 625 | 4,375 |
| | MSL | | 327 | 2,289 |
| | | PL2 | 327 | 2,289 |
| **9X** | | | **724** | **7,878** |
| | MEM | | 724 | 7,878 |
| | | CNC | 724 | 7,878 |
| **AA** | | | **16,064** | **1,436,057** |
| | CLT | | 2,789 | 296,514 |
| | | 319 | 1,401 | 177,156 |
| | | 320 | 193 | 28,950 |
| | | | | |
| | | | | |
| | | | | |
| | | CR2 | 9 | 450 |
| | | CR7 | 1 | 65 |
| | | CR9 | 403 | 30,628 |
| | | E75 | 753 | 56,394 |
| | | E90 | 29 | 2,871 |
| | CUN | | 41 | 5,180 |
| | | 319 | 41 | 5,180 |
| | | | | |
| | DCA | | 1,728 | 103,179 |
| | | | | |
| | | CR2 | 723 | 36,144 |
| | | CR7 | 548 | 35,620 |
| | | CR9 | 63 | 4,788 |
| | | | | |
| | | E75 | 277 | 20,777 |
| | | ER4 | 117 | 5,850 |
| | DFW | | 2,706 | 390,989 |
| | | 319 | 82 | 10,268 |
| | | | | |
| | | 73H | 1,557 | 235,795 |
| | | CR9 | 16 | 1,216 |
| | | E75 | 20 | 1,520 |
| | | ER4 | 1 | 50 |
| | | | | |
| | | M82 | 1,030 | 142,140 |
| | JFK | | 724 | 44,081 |
| | | E75 | 319 | 23,831 |
| | | ER4 | 405 | 20,250 |
| | | ERD | | |
| | LAX | | 671 | 94,592 |
| | | 319 | 278 | 34,756 |
| | | | | |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| | | 738 | 330 | 48,840 |
| | | 73H | 353 | 56,801 |
| | LGA | | 1,642 | 99,842 |
| | | 321 | 1 | 187 |
| | | CR2 | 79 | 3,950 |
| | | E75 | 874 | 64,899 |
| | | ER4 | 89 | 4,450 |
| | | ERD | 599 | 26,356 |
| | MIA | | 1,084 | 97,311 |
| | | 319 | 84 | 10,752 |
| | | 73H | 144 | 23,340 |
| | | E75 | 856 | 63,219 |
| | | | | |
| | ORD | | 2,928 | 201,901 |
| | | 738 | 131 | 19,388 |
| | | 73H | 51 | 8,160 |
| | | | | |
| | | CR7 | 2,050 | 137,577 |
| | | E75 | 76 | 5,776 |
| | | ER4 | 620 | 31,000 |
| | PHL | | 1,756 | 158,213 |
| | | 319 | 386 | 49,408 |
| | | | | |
| | | | | |
| | | 320 | 19 | 2,850 |
| | | 321 | 1 | 187 |
| | | E75 | 504 | 37,400 |
| | | E90 | 532 | 52,668 |
| | | ER4 | 314 | 15,700 |
| **AC** | | | **1,031** | **51,550** |
| | YYZ | | 1,031 | 51,550 |
| | | CRJ | 1,031 | 51,550 |
| **AS** | | | **681** | **111,908** |
| | SEA | | 434 | 75,236 |
| | | 320 | 1 | 148 |
| | | 739 | 147 | 25,284 |
| | | 73H | 80 | 12,560 |
| | | 73J | 206 | 37,244 |
| | SFO | | 247 | 36,672 |
| | | 319 | 3 | 357 |
| | | 320 | 209 | 30,932 |
| | | 32A | 28 | 4,088 |
| | | 32B | 7 | 1,295 |
| **B6** | | | **1,067** | **158,800** |
| | BOS | | 703 | 104,200 |
| | | 320 | 678 | 101,700 |
| | | E90 | 25 | 2,500 |
| | FLL | | 364 | 54,600 |
| | | 320 | 364 | 54,600 |
| **BA** | | | **164** | **35,097** |
| | LHR | | 164 | 35,097 |
| | | 788 | 163 | 34,882 |
| | | 789 | 1 | 215 |
| **DL** | | | **12,436** | **1,412,598** |
| | ATL | | 3,538 | 554,480 |
| | | 319 | 9 | 1,188 |

| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|
| | | | | |
| | | 73H | 393 | 59,836 |
| | LGA | | 1,644 | 104,187 |
| | | | | |
| | | CR2 | 246 | 12,300 |
| | | E75 | 884 | 66,187 |
| | | ER4 | 514 | 25,700 |
| | | ERD | | |
| | MIA | | 1,092 | 91,190 |
| | | 319 | | |
| | | 73H | 131 | 20,139 |
| | | E75 | 923 | 69,151 |
| | | ER4 | 38 | 1,900 |
| | ORD | | 2,967 | 184,740 |
| | | | | |
| | | 73H | | |
| | | CR2 | 182 | 9,100 |
| | | CR7 | 2,250 | 148,890 |
| | | E75 | | |
| | | ER4 | 535 | 26,750 |
| | PHL | | 1,702 | 121,405 |
| | | 319 | | |
| | | CR2 | 235 | 11,750 |
| | | CR9 | 5 | 380 |
| | | | | |
| | | | | |
| | | E75 | 1,343 | 100,336 |
| | | E90 | 61 | 6,039 |
| | | ER4 | 58 | 2,900 |
| **AC** | | | **1,038** | **51,900** |
| | YYZ | | 1,038 | 51,900 |
| | | CRJ | 1,038 | 51,900 |
| **AS** | | | **366** | **62,205** |
| | SEA | | 366 | 62,205 |
| | | | | |
| | | 739 | 65 | 11,180 |
| | | 73H | 144 | 22,608 |
| | | 73J | 157 | 28,417 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **B6** | | | **1,086** | **162,150** |
| | BOS | | 721 | 107,400 |
| | | 320 | 706 | 105,900 |
| | | E90 | 15 | 1,500 |
| | FLL | | 365 | 54,750 |
| | | 320 | 365 | 54,750 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **DL** | | | **11,345** | **1,235,456** |
| | ATL | | 3,508 | 508,062 |
| | | 319 | 124 | 15,828 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 | Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|---|---|---|---|---|
| | | 320 | 2 | 296 | | | 320 | 117 | 17,316 |
| | | 321 | 1 | 170 | | | | | |
| | | 717 | 58 | 6,380 | | | 717 | 381 | 41,910 |
| | | 738 | 4 | 600 | | | 738 | 11 | 1,650 |
| | | 739 | 61 | 10,980 | | | 739 | 1 | 180 |
| | | | | | | | 73H | 1 | 150 |
| | | 73W | 1 | 124 | | | 73W | 35 | 4,340 |
| | | 757 | 556 | 110,644 | | | 757 | 1 | 184 |
| | | | | | | | CR7 | 1 | 70 |
| | | | | | | | CR9 | 5 | 380 |
| | | M88 | 2,842 | 423,458 | | | M88 | 2,446 | 364,454 |
| | | M90 | 4 | 640 | | | M90 | 385 | 61,600 |
| | BOS | | 765 | 58,274 | | BOS | | 365 | 27,011 |
| | | 321 | 1 | 170 | | | | | |
| | | 757 | 5 | 995 | | | | | |
| | | CR7 | 1 | 69 | | | | | |
| | | CR9 | 467 | 35,492 | | | CR9 | 266 | 20,216 |
| | | E70 | 16 | 1,088 | | | E70 | 89 | 6,045 |
| | | E75 | 46 | 3,514 | | | E75 | 10 | 750 |
| | | E7W | 229 | 16,946 | | | E7W | | |
| | CUN | | 34 | 5,438 | | CUN | | 36 | 5,364 |
| | | 739 | 12 | 2,160 | | | 320 | | |
| | | M88 | 22 | 3,278 | | | M88 | 36 | 5,364 |
| | CVG | | 229 | 17,404 | | CVG | | 376 | 25,456 |
| | | CR9 | 229 | 17,404 | | | CR9 | 256 | 19,456 |
| | | | | | | | CRJ | 120 | 6,000 |
| | DTW | | 1,867 | 225,167 | | DTW | | 1,849 | 205,156 |
| | | 319 | 66 | 8,712 | | | 319 | 144 | 18,366 |
| | | 320 | 64 | 9,472 | | | 320 | 185 | 27,380 |
| | | 321 | 17 | 2,890 | | | | | |
| | | 717 | 844 | 92,840 | | | 717 | 537 | 59,070 |
| | | 739 | 27 | 4,860 | | | 739 | 4 | 720 |
| | | | | | | | 73H | 1 | 150 |
| | | | | | | | 757 | 1 | 184 |
| | | CR7 | 5 | 346 | | | CR7 | 67 | 4,620 |
| | | CR9 | 305 | 23,180 | | | CR9 | 490 | 37,240 |
| | | | | | | | CRJ | 53 | 2,650 |
| | | | | | | | E70 | 1 | 68 |
| | | E75 | 2 | 146 | | | E75 | 6 | 452 |
| | | E7W | 1 | 74 | | | | | |
| | | M88 | 283 | 42,167 | | | M88 | 304 | 45,296 |
| | | M90 | 253 | 40,480 | | | M90 | 56 | 8,960 |
| | JFK | | 786 | 59,160 | | JFK | | 487 | 37,012 |
| | | CR9 | 498 | 37,848 | | | CR9 | 487 | 37,012 |
| | | E7W | 288 | 21,312 | | | | | |
| | LAS | | 2 | 300 | | LAS | | | |
| | | 738 | 2 | 300 | | | 738 | | |
| | LAX | | 546 | 77,724 | | LAX | | 524 | 70,854 |
| | | 319 | 232 | 30,624 | | | 319 | 356 | 45,654 |
| | | 738 | 314 | 47,100 | | | 738 | 168 | 25,200 |
| | LGA | | 1,817 | 134,314 | | LGA | | 1,759 | 130,129 |
| | | CR7 | 99 | 6,902 | | | CR7 | 162 | 11,322 |
| | | CR9 | 505 | 38,380 | | | CR9 | 1,197 | 90,972 |
| | | E70 | 145 | 9,906 | | | E70 | 311 | 21,213 |
| | | E75 | 81 | 6,088 | | | E75 | 89 | 6,622 |
| | | E7W | 987 | 73,038 | | | E7W | | |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| | MCO | | 24 | 1,800 |
| | | | | |
| | | CR9 | 12 | 912 |
| | | E7W | 12 | 888 |
| | MSN | | 2 | 220 |
| | | 717 | 2 | 220 |
| | MSP | | 1,558 | 134,802 |
| | | 319 | 13 | 1,716 |
| | | 717 | 418 | 45,980 |
| | | CR7 | 166 | 11,545 |
| | | CR9 | 853 | 64,828 |
| | | | | |
| | | E7W | 76 | 5,624 |
| | | M88 | 1 | 149 |
| | | M90 | 31 | 4,960 |
| | RDU | | 581 | 43,705 |
| | | CR7 | 46 | 3,175 |
| | | CR9 | 530 | 40,280 |
| | | CRJ | 5 | 250 |
| | SEA | | 328 | 46,068 |
| | | 319 | 174 | 22,968 |
| | | 738 | 154 | 23,100 |
| | SLC | | 359 | 53,742 |
| | | 319 | 6 | 792 |
| | | | | |
| | | 738 | 353 | 52,950 |
| | | | | |
| **F9** | | | **1,097** | **177,501** |
| | DEN | | 305 | 45,900 |
| | | 319 | 178 | 24,564 |
| | | 320 | 127 | 21,336 |
| | | | | |
| | LAS | | 191 | 32,088 |
| | | 320 | 191 | 32,088 |
| | MCO | | 232 | 39,201 |
| | | | | |
| | | 320 | 217 | 36,456 |
| | | 321 | 15 | 2,745 |
| | PHL | | 152 | 25,536 |
| | | | | |
| | | 320 | 152 | 25,536 |
| | | | | |
| | | | | |
| | RSW | | 83 | 12,264 |
| | | 319 | 56 | 7,728 |
| | | 320 | 27 | 4,536 |
| | TPA | | 20 | 3,360 |
| | | 320 | 20 | 3,360 |
| | TTN | | 114 | 19,152 |
| | | 320 | 114 | 19,152 |
| **G4** | | | **343** | **59,388** |
| | MYR | | 42 | 7,434 |
| | | 320 | 42 | 7,434 |
| | PGD | | 68 | 12,036 |
| | | 320 | 68 | 12,036 |

| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|
| | MCO | | 39 | 2,998 |
| | | 717 | 1 | 110 |
| | | CR9 | 38 | 2,888 |
| | | E7W | | |
| | | | | |
| | | | | |
| | MSP | | 1,535 | 126,853 |
| | | 319 | 18 | 2,328 |
| | | 717 | 230 | 25,300 |
| | | CR7 | 46 | 3,192 |
| | | CR9 | 1,214 | 92,264 |
| | | E70 | 6 | 420 |
| | | | | |
| | | M88 | 1 | 149 |
| | | M90 | 20 | 3,200 |
| | RDU | | 306 | 23,243 |
| | | CR7 | 2 | 139 |
| | | CR9 | 304 | 23,104 |
| | | | | |
| | SEA | | 198 | 25,728 |
| | | 319 | 198 | 25,728 |
| | | 738 | | |
| | SLC | | 363 | 47,590 |
| | | 319 | 281 | 35,844 |
| | | 320 | 43 | 6,364 |
| | | 738 | 33 | 4,950 |
| | | CR7 | 4 | 280 |
| | | CR9 | 2 | 152 |
| **F9** | | | **914** | **140,610** |
| | DEN | | 332 | 50,739 |
| | | 319 | 194 | 26,772 |
| | | 320 | 85 | 14,280 |
| | | 321 | 53 | 9,687 |
| | LAS | | 169 | 28,392 |
| | | 320 | 169 | 28,392 |
| | MCO | | 237 | 36,951 |
| | | 319 | 96 | 13,248 |
| | | 320 | 140 | 23,520 |
| | | 321 | 1 | 183 |
| | PHL | | 71 | 9,798 |
| | | 319 | 71 | 9,798 |
| | | 320 | | |
| | PHX | | 48 | 6,624 |
| | | 319 | 48 | 6,624 |
| | RSW | | 50 | 6,930 |
| | | 319 | 49 | 6,762 |
| | | 320 | 1 | 168 |
| | TPA | | 7 | 1,176 |
| | | 320 | 7 | 1,176 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| | PIE | | 48 | 8,055 |
| | | 319 | 21 | 3,276 |
| | | 320 | 27 | 4,779 |
| | RIC | | 48 | 8,496 |
| | | 320 | 48 | 8,496 |
| | SAV | | 50 | 8,787 |
| | | 319 | 3 | 468 |
| | | 320 | 47 | 8,319 |
| | SYR | | 26 | 4,224 |
| | | 319 | 18 | 2,808 |
| | | 320 | 8 | 1,416 |
| | VPS | | 61 | 10,356 |
| | | 319 | 21 | 3,276 |
| | | 320 | 40 | 7,080 |
| | | | | |
| | | | | |
| | | | | |
| **LF** | | | **1,547** | **28,187** |
| | TUP | | 1,547 | 28,187 |
| | | J31 | 1,511 | 27,503 |
| | | J32 | 36 | 684 |
| **SY** | | | **104** | **16,848** |
| | MCO | | 17 | 2,754 |
| | | 738 | 17 | 2,754 |
| | MIA | | 17 | 2,754 |
| | | 738 | 17 | 2,754 |
| | MSP | | 17 | 2,754 |
| | | 738 | 17 | 2,754 |
| | MSY | | 18 | 2,916 |
| | | 738 | 18 | 2,916 |
| | RSW | | 18 | 2,916 |
| | | 738 | 18 | 2,916 |
| | TPA | | 17 | 2,754 |
| | | 738 | 17 | 2,754 |
| **UA** | | | **8,748** | **774,151** |
| | DEN | | 1,072 | 83,536 |
| | | 319 | 59 | 7,080 |
| | | 320 | 1 | 138 |
| | | 738 | 21 | 3,192 |
| | | | | |
| | | CR7 | 93 | 6,510 |
| | | E70 | 1 | 70 |
| | | E7W | 894 | 66,396 |
| | | ER4 | 3 | 150 |
| | EWR | | 1,685 | 165,441 |
| | | 319 | 164 | 19,680 |
| | | 320 | 104 | 14,352 |
| | | 738 | 387 | 58,824 |
| | | 739 | 6 | 1,002 |
| | | 73G | 145 | 17,110 |
| | | E70 | 171 | 11,682 |
| | | E7W | 289 | 21,841 |
| | | ERJ | 419 | 20,950 |
| | IAD | | 1,089 | 82,057 |
| | | 319 | 112 | 13,440 |
| | | 320 | 3 | 414 |

| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
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| **J1** | | | **246** | **1,682** |
| | PIT | | 246 | 1,682 |
| | | BE4 | 246 | 1,682 |
| **LF** | | | **1,551** | **28,162** |
| | TUP | | 1,551 | 28,162 |
| | | J31 | 1,551 | 28,162 |
| | | | | |
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| **UA** | | | **7,442** | **634,876** |
| | DEN | | 706 | 57,412 |
| | | 319 | 39 | 4,680 |
| | | 320 | 23 | 3,174 |
| | | 738 | 39 | 5,928 |
| | | 739 | 1 | 167 |
| | | CR7 | 269 | 18,830 |
| | | E70 | 62 | 4,184 |
| | | E7W | 271 | 20,349 |
| | | ER4 | 2 | 100 |
| | EWR | | 1,396 | 137,683 |
| | | 319 | 21 | 2,520 |
| | | 320 | 169 | 23,322 |
| | | 738 | 263 | 39,976 |
| | | 739 | 27 | 4,509 |
| | | 73G | 213 | 25,134 |
| | | E70 | 189 | 12,910 |
| | | E7W | 142 | 10,712 |
| | | ERJ | 372 | 18,600 |
| | IAD | | 1,064 | 74,766 |
| | | 319 | | |
| | | 320 | 2 | 276 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| | | 73G | 1 | 118 |
| | | CR2 | 58 | 2,900 |
| | | CR7 | 413 | 28,910 |
| | | CRJ | 22 | 1,100 |
| | | E7W | 444 | 33,375 |
| | | ER4 | 12 | 600 |
| | | ERJ | 24 | 1,200 |
| | IAH | | 1,862 | 167,255 |
| | | 319 | 179 | 21,480 |
| | | 320 | 231 | 31,878 |
| | | 738 | 29 | 4,408 |
| | | 739 | 92 | 15,364 |
| | | 73G | 91 | 10,738 |
| | | CR7 | 547 | 38,290 |
| | | E70 | 120 | 8,216 |
| | | E7W | 325 | 24,481 |
| | | ERJ | 248 | 12,400 |
| | ORD | | 2,396 | 194,600 |
| | | 319 | 313 | 37,560 |
| | | 320 | 174 | 24,012 |
| | | 738 | 13 | 1,976 |
| | | 739 | 11 | 1,837 |
| | | 73G | 146 | 17,228 |
| | | CR2 | 365 | 18,250 |
| | | CR7 | 75 | 5,250 |
| | | CRJ | 200 | 10,000 |
| | | E70 | 18 | 1,230 |
| | | E7W | 946 | 70,507 |
| | | ER4 | 50 | 2,500 |
| | | ERJ | 85 | 4,250 |
| | SFO | | 644 | 81,262 |
| | | 319 | 528 | 63,360 |
| | | 320 | 30 | 4,140 |
| | | 738 | 40 | 6,080 |
| | | 739 | 46 | 7,682 |
| **VX** | | | **114** | **16,224** |
| | SFO | | 114 | 16,224 |
| | | 319 | 15 | 1,770 |
| | | 320 | 99 | 14,454 |
| **WN** | | | **35,649** | **5,355,302** |
| | ATL | | 613 | 89,515 |
| | | 73H | 58 | 10,150 |
| | | 73W | 555 | 79,365 |
| | AUS | | 858 | 130,822 |
| | | | | |
| | | 73H | 254 | 44,450 |
| | | 73W | 604 | 86,372 |
| | BOS | | 959 | 149,457 |
| | | | | |
| | | 73H | 376 | 65,800 |
| | | 73W | 574 | 82,082 |
| | | 7M8 | 9 | 1,575 |
| | BWI | | 2,091 | 311,813 |
| | | | | |
| | | | | |
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| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|
| | | 73G | 3 | 354 |
| | | CR2 | | |
| | | CR7 | 630 | 44,100 |
| | | | | |
| | | E7W | 333 | 25,236 |
| | | ER4 | 96 | 4,800 |
| | | | | |
| | IAH | | 1,717 | 133,233 |
| | | 319 | 150 | 18,000 |
| | | 320 | 48 | 6,624 |
| | | 738 | 30 | 4,560 |
| | | 739 | 4 | 668 |
| | | 73G | 118 | 13,924 |
| | | CR7 | 529 | 37,030 |
| | | E70 | 17 | 1,160 |
| | | E7W | 395 | 29,967 |
| | | ERJ | 426 | 21,300 |
| | ORD | | 2,088 | 169,005 |
| | | 319 | 73 | 8,760 |
| | | 320 | 156 | 21,528 |
| | | 738 | 34 | 5,168 |
| | | 739 | 43 | 7,181 |
| | | 73G | 87 | 10,266 |
| | | 753 | 1 | 213 |
| | | CR2 | 30 | 1,500 |
| | | CR7 | 156 | 10,920 |
| | | E70 | 99 | 6,752 |
| | | E7W | 1,051 | 78,817 |
| | | ER4 | 182 | 9,100 |
| | | ERJ | 176 | 8,800 |
| | SFO | | 471 | 62,777 |
| | | 319 | 275 | 33,000 |
| | | 320 | 60 | 8,280 |
| | | 738 | 81 | 12,312 |
| | | 739 | 55 | 9,185 |
| **VX** | | | **118** | **15,184** |
| | SFO | | 118 | 15,184 |
| | | 319 | 73 | 8,614 |
| | | 320 | 45 | 6,570 |
| **WN** | | | **32,796** | **4,872,023** |
| | ATL | | | |
| | | 73H | | |
| | | 73W | | |
| | AUS | | 850 | 125,940 |
| | | 73C | 180 | 25,740 |
| | | 73H | 136 | 23,838 |
| | | 73W | 534 | 76,362 |
| | BOS | | 930 | 136,775 |
| | | 73C | 291 | 41,613 |
| | | 73H | 117 | 20,516 |
| | | 73W | 522 | 74,646 |
| | | | | |
| | BWI | | 2,061 | 305,795 |
| | | 738 | 6 | 1,050 |
| | | 733 | 51 | 7,293 |
| | | 73C | 478 | 68,354 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 | Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|---|---|---|---|---|
| | | 73H | 364 | 63,700 | | | 73H | 338 | 59,214 |
| | | 73W | 1,691 | 241,813 | | | 73W | 1,188 | 169,884 |
| | | 7M8 | 36 | 6,300 | | | | | |
| | CHS | | 449 | 65,551 | | CHS | | 403 | 60,194 |
| | | | | | | | 733 | 11 | 1,573 |
| | | | | | | | 73C | 88 | 12,584 |
| | | 73H | 42 | 7,350 | | | 73H | 79 | 13,862 |
| | | 73W | 407 | 58,201 | | | 73W | 225 | 32,175 |
| | CLE | | 906 | 135,734 | | CLE | | 886 | 128,524 |
| | | | | | | | 73C | 49 | 7,007 |
| | | 73H | 192 | 33,600 | | | 73H | 57 | 9,977 |
| | | 73W | 713 | 101,959 | | | 73W | 780 | 111,540 |
| | | 7M8 | 1 | 175 | | | | | |
| | CLT | | 496 | 72,176 | | CLT | | 365 | 52,356 |
| | | | | | | | 73C | 80 | 11,440 |
| | | 73H | 39 | 6,825 | | | 73H | 5 | 876 |
| | | 73W | 457 | 65,351 | | | 73W | 280 | 40,040 |
| | CMH | | 701 | 103,251 | | CMH | | 692 | 101,102 |
| | | | | | | | 73C | 216 | 30,888 |
| | | 73H | 82 | 14,350 | | | 73H | 67 | 11,727 |
| | | 73W | 607 | 86,801 | | | 73W | 409 | 58,487 |
| | | 7M8 | 12 | 2,100 | | | | | |
| | CUN | | 39 | 5,577 | | CUN | | 8 | 1,144 |
| | | 73W | 39 | 5,577 | | | 73W | 8 | 1,144 |
| | DAL | | 1,467 | 219,833 | | DAL | | 1,369 | 209,551 |
| | | 738 | 4 | 640 | | | 738 | 9 | 1,575 |
| | | | | | | | 733 | 15 | 2,145 |
| | | | | | | | 73C | 239 | 34,177 |
| | | 73H | 305 | 53,375 | | | 73H | 418 | 73,270 |
| | | 73W | 1,151 | 164,593 | | | 73W | 688 | 98,384 |
| | | 7M8 | 7 | 1,225 | | | | | |
| | DCA | | 1,124 | 160,764 | | DCA | | 1,083 | 154,901 |
| | | 73H | 1 | 175 | | | 73H | 1 | 175 |
| | | 73W | 1,123 | 160,589 | | | 73W | 1,082 | 154,726 |
| | DEN | | 1,646 | 255,902 | | DEN | | 1,596 | 247,295 |
| | | 738 | 12 | 1,920 | | | | | |
| | | | | | | | 733 | 29 | 4,147 |
| | | | | | | | 73C | 184 | 26,312 |
| | | 73H | 626 | 109,550 | | | 73H | 592 | 103,723 |
| | | 73W | 999 | 142,857 | | | 73W | 791 | 113,113 |
| | | 7M8 | 9 | 1,575 | | | | | |
| | DTW | | 681 | 101,543 | | DTW | | 675 | 100,803 |
| | | | | | | | 73C | 91 | 13,013 |
| | | 73H | 130 | 22,750 | | | 73H | 133 | 23,297 |
| | | 73W | 551 | 78,793 | | | 73W | 451 | 64,493 |
| | ECP | | 805 | 116,011 | | ECP | | 720 | 106,402 |
| | | | | | | | 73C | 51 | 7,293 |
| | | 73H | 20 | 3,500 | | | 73H | 107 | 18,743 |
| | | 73W | 777 | 111,111 | | | 73W | 562 | 80,366 |
| | | 7M8 | 8 | 1,400 | | | | | |
| | FLL | | 1,243 | 190,713 | | FLL | | 1,219 | 179,383 |
| | | 738 | 36 | 5,760 | | | | | |
| | | | | | | | 733 | 11 | 1,573 |
| | | | | | | | 73C | 204 | 29,172 |
| | | 73H | 347 | 60,725 | | | 73H | 158 | 27,660 |
| | | 73W | 821 | 117,403 | | | 73W | 846 | 120,978 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 |
|---|---|---|---|---|
| | | 7M8 | 39 | 6,825 |
| | HOU | | 1,385 | 209,287 |
| | | | | |
| | | | | |
| | | | | |
| | | 73H | 314 | 54,950 |
| | | 73W | 1,034 | 147,862 |
| | | 7M8 | 37 | 6,475 |
| | JAX | | 980 | 142,636 |
| | | | | |
| | | | | |
| | | 73H | 74 | 12,950 |
| | | 73W | 902 | 128,986 |
| | | 7M8 | 4 | 700 |
| | LAS | | 1,143 | 189,721 |
| | | 73H | 734 | 128,450 |
| | | 73W | 322 | 46,046 |
| | | 7M8 | 87 | 15,225 |
| | LAX | | 1,016 | 155,336 |
| | | | | |
| | | 73H | 281 | 49,175 |
| | | 73W | 702 | 100,386 |
| | | 7M8 | 33 | 5,775 |
| | LGA | | 1,070 | 157,266 |
| | | 73H | 133 | 23,275 |
| | | 73W | 937 | 133,991 |
| | MCI | | 1,245 | 181,715 |
| | | | | |
| | | 73H | 115 | 20,125 |
| | | 73W | 1,130 | 161,590 |
| | | | | |
| | MCO | | 1,638 | 246,520 |
| | | | | |
| | | 738 | 30 | 4,800 |
| | | | | |
| | | 73H | 317 | 55,475 |
| | | 73W | 1,240 | 177,320 |
| | | 7M8 | 51 | 8,925 |
| | MDW | | 2,311 | 340,894 |
| | | 738 | 5 | 800 |
| | | 73H | 306 | 53,550 |
| | | 73W | 1,983 | 283,569 |
| | | 7M8 | 17 | 2,975 |
| | MKE | | 699 | 106,293 |
| | | 73H | 198 | 34,650 |
| | | 73W | 501 | 71,643 |
| | MSP | | 365 | 52,739 |
| | | | | |
| | | 73H | 17 | 2,975 |
| | | 73W | 348 | 49,764 |
| | MSY | | 1,222 | 178,010 |
| | | | | |
| | | | | |
| | | 73H | 102 | 17,850 |
| | | 73W | 1,120 | 160,160 |
| | OAK | | 365 | 56,707 |

| Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|
| | | | | |
| | HOU | | 1,377 | 209,312 |
| | | 738 | 10 | 1,750 |
| | | 733 | 40 | 5,720 |
| | | 73C | 253 | 36,179 |
| | | 73H | 377 | 65,992 |
| | | 73W | 697 | 99,671 |
| | | | | |
| | JAX | | 957 | 140,960 |
| | | 738 | 28 | 4,900 |
| | | 73C | 388 | 55,484 |
| | | 73H | 100 | 17,513 |
| | | 73W | 441 | 63,063 |
| | | | | |
| | LAS | | 1,116 | 174,351 |
| | | 73H | 458 | 80,257 |
| | | 73W | 658 | 94,094 |
| | | | | |
| | LAX | | 1,007 | 149,064 |
| | | 738 | 9 | 1,575 |
| | | 73H | 149 | 26,082 |
| | | 73W | 849 | 121,407 |
| | | | | |
| | LGA | | 1,123 | 160,845 |
| | | 73H | 8 | 1,400 |
| | | 73W | 1,115 | 159,445 |
| | MCI | | 1,213 | 176,480 |
| | | 733 | 9 | 1,287 |
| | | 73C | 401 | 57,343 |
| | | 73H | 94 | 16,463 |
| | | 73W | 709 | 101,387 |
| | MCO | | 1,533 | 228,107 |
| | | 733 | 14 | 2,002 |
| | | | | |
| | | 73C | 325 | 46,475 |
| | | 73H | 276 | 48,356 |
| | | 73W | 918 | 131,274 |
| | | | | |
| | MDW | | 2,309 | 345,285 |
| | | 738 | 36 | 6,300 |
| | | 73H | 433 | 75,865 |
| | | 73W | 1,840 | 263,120 |
| | | | | |
| | MKE | | 113 | 17,055 |
| | | 73H | 28 | 4,900 |
| | | 73W | 85 | 12,155 |
| | MSP | | 211 | 32,268 |
| | | 73C | 11 | 1,573 |
| | | 73H | 65 | 11,390 |
| | | 73W | 135 | 19,305 |
| | MSY | | 1,168 | 168,697 |
| | | 733 | 5 | 715 |
| | | 73C | 175 | 25,025 |
| | | 73H | 52 | 9,109 |
| | | 73W | 936 | 133,848 |
| | OAK | | 365 | 56,526 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 | Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|---|---|---|---|---|
| | | 73H | 139 | 24,325 | | | 73H | 135 | 23,636 |
| | | 73W | 224 | 32,032 | | | 73W | 230 | 32,890 |
| | | 7M8 | 2 | 350 | | | | | |
| | OKC | | 22 | 3,146 | | | | | |
| | | 73W | 22 | 3,146 | | | | | |
| | PHL | | 854 | 129,002 | | PHL | | 711 | 106,935 |
| | | | | | | | 733 | 9 | 1,287 |
| | | | | | | | 73C | 133 | 19,019 |
| | | 73H | 214 | 37,450 | | | 73H | 164 | 28,714 |
| | | 73W | 639 | 91,377 | | | 73W | 405 | 57,915 |
| | | 7M8 | 1 | 175 | | | | | |
| | PHX | | 1,041 | 165,711 | | PHX | | 962 | 148,583 |
| | | 738 | 16 | 2,560 | | | | | |
| | | 73H | 430 | 75,250 | | | 73H | 343 | 60,066 |
| | | 73W | 507 | 72,501 | | | 73W | 619 | 88,517 |
| | | 7M8 | 88 | 15,400 | | | | | |
| | PIT | | 529 | 79,839 | | PIT | | 390 | 59,232 |
| | | | | | | | 733 | 10 | 1,430 |
| | | | | | | | 73C | 137 | 19,591 |
| | | 73H | 131 | 22,925 | | | 73H | 108 | 18,906 |
| | | 73W | 398 | 56,914 | | | 73W | 135 | 19,305 |
| | PNS | | 725 | 103,675 | | PNS | | 717 | 106,595 |
| | | | | | | | 73C | 118 | 16,874 |
| | | | | | | | 73H | 125 | 21,939 |
| | | 73W | 725 | 103,675 | | | 73W | 474 | 67,782 |
| | RDU | | 1,120 | 162,592 | | RDU | | 1,071 | 155,141 |
| | | | | | | | 733 | 10 | 1,430 |
| | | | | | | | 73C | 436 | 62,348 |
| | | 73H | 76 | 13,300 | | | 73H | 62 | 10,854 |
| | | 73W | 1,044 | 149,292 | | | 73W | 563 | 80,509 |
| | RSW | | 84 | 12,652 | | RSW | | 133 | 19,019 |
| | | | | | | | 73C | 41 | 5,863 |
| | | 73H | 20 | 3,500 | | | | | |
| | | 73W | 64 | 9,152 | | | 73W | 92 | 13,156 |
| | SAN | | 607 | 97,041 | | SAN | | 462 | 69,853 |
| | | 73H | 316 | 55,300 | | | 73H | 118 | 20,661 |
| | | 73W | 287 | 41,041 | | | 73W | 344 | 49,192 |
| | | 7M8 | 4 | 700 | | | | | |
| | SAT | | 692 | 106,700 | | SAT | | 740 | 106,972 |
| | | | | | | | 73C | 151 | 21,593 |
| | | 73H | 242 | 42,350 | | | 73H | 36 | 6,300 |
| | | 73W | 450 | 64,350 | | | 73W | 553 | 79,079 |
| | SEA | | 118 | 19,242 | | SEA | | 113 | 19,308 |
| | | 73H | 65 | 11,375 | | | 73H | 97 | 17,020 |
| | | 73W | 44 | 6,292 | | | 73W | 16 | 2,288 |
| | | 7M8 | 9 | 1,575 | | | | | |
| | STL | | 964 | 141,660 | | STL | | 828 | 120,454 |
| | | | | | | | 738 | 5 | 875 |
| | | | | | | | 733 | 3 | 429 |
| | | | | | | | 73C | 283 | 40,469 |
| | | 73H | 119 | 20,825 | | | 73H | 59 | 10,327 |
| | | 73W | 845 | 120,835 | | | 73W | 478 | 68,354 |
| | TPA | | 1,376 | 208,256 | | TPA | | 1,320 | 190,816 |
| | | | | | | | 73C | 387 | 55,341 |
| | | 73H | 358 | 62,650 | | | 73H | 64 | 11,208 |
| | | 73W | 1,017 | 145,431 | | | 73W | 869 | 124,267 |

| Carrier | Destination | Aircraft | Departures 1/1/2018 - 12/31/2018 | Departure Seats 1/1/2018 - 12/31/2018 | Carrier | Destination | Aircraft | Departures 1/1/2017 - 12/31/2017 | Departure Seats 1/1/2017 - 12/31/2017 |
|---|---|---|---|---|---|---|---|---|---|
| | | 7M8 | 1 | 175 | | | | | |
| **WS** | | | **471** | **48,510** | **WS** | | | **396** | **33,992** |
| | YYC | | 131 | 18,270 | | YYC | | 50 | 7,100 |
| | | 736 | 4 | 452 | | | | | |
| | | 73H | 62 | 9,368 | | | 73H | 40 | 5,800 |
| | | 73W | 65 | 8,450 | | | 73W | 10 | 1,300 |
| | YYZ | | 340 | 30,240 | | YYZ | | 346 | 26,892 |
| | | 736 | 1 | 113 | | | | | |
| | | 73H | 24 | 3,624 | | | | | |
| | | 73W | 32 | 4,160 | | | | | |
| | | DH4 | 283 | 22,343 | | | DH4 | 346 | 26,892 |
| **Total** | | | **80,943** | **9,793,545** | **Total** | | | **75,038** | **8,688,839** |
| **Sub-Total** | | | | | **Sub-Total** | | | | |
| **Mainline** | | | **25,124** | **1,522,011** | **Mainline** | | | **26,379** | **1,589,012** |
| **Regional** | | | **55,819** | **8,271,534** | **Regional** | | | **48,659** | **7,099,827** |

*Source: Flight schedule from Innovata via Aviation Dataminer. AECOM analysis.*

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