

# Chapter 4

## *Air Traffic Forecasts*

### 4.1 EXECUTIVE SUMMARY

Forecasts of aviation demand are a key element of an airport's future planning, as they are used as the basis for the demand/capacity and facility requirements analyses which identify airport development needs. Such forecasts include consideration of key factors and trends, including historical traffic development, demographic and economic context of the market, and aviation and airline industry trends and events that may impact traffic demand and the ability to service that demand. These factors, among others, provide the basis for baseline and alternative scenario forecasts around which the master planning effort is focused.

The limited air traffic activity at Niagara Falls International Airport ("NFIA") in recent history, and the very recent air service and physical development, require a forecast approach that focuses less of the historic levels of activity at NFIA, and more on the growth outlook for and competitive position of NFIA in the context of the large air travel market that is within a 65 mile radius. The analysis of NFIA's position in this regional market, which generated 34.7 million origination/destination ("O/D") passengers in 2012 at the region's seven airports, indicates a strong potential for traffic growth. The forecast defines this potential in the context of a Baseline Case and several potential scenarios.

The Baseline Case forecast, combined with the "Introduction of Transatlantic Service Scenario", is considered the most likely forecast for NFIA. This forecasts NFIA annual passenger levels to increase 4.0% in fiscal year 2013 to 180,137 annual passengers, and then increase to 685,707 annual passengers in 2040. Over the forecast period from 2012 through 2040, passenger traffic is forecast to grow by a compound annual growth rate ("CAGR") of 4.9%.

The forecast also addresses aircraft movements (takeoffs and landings) at NFIA. The Baseline Case forecasts total aircraft movements at NFIA are forecast to reach 30,081 in 2040, representing a CAGR of 0.4% over the forecast period. This growth by type of activity is:

- Commercial aircraft movements are forecast to grow by CAGR of 3.6% over the forecast period, reaching 3,751 movements in 2040, compared to 1,328 in 2012.
- Military operations are expected to grow 5% between 2012 and the end of the forecast period in 2040, and reach 8,238 movements in 2040, compared to 7,846 in 2012, equivalent to 0.2% CAGR over the forecast period.
- General Aviation operations are expected to grow 1.0% over the forecast period, and reach 18,090 movements in 2040, compared to 17,911 in 2012, equivalent to 0.04% CAGR over the forecast period.

## 4.2 BACKGROUND

InterVISTAS Consulting LLC (“InterVISTAS”) has developed air traffic forecasts for Niagara Falls International Airport in support of the Master Plan Update being performed by McFarland Johnson.

The following core outputs result from this traffic forecast:

- Forecasts of annual (calendar year) passenger volumes for the period 2013 to 2040
- Forecasts of annual (calendar year) aircraft movements for the period 2013 to 2040.

**Note: Much of the discussion contained in this Chapter pertains to Total Passengers – which includes both Enplaned and Deplaned Passengers. It is understood that Facility Requirements and other airport development needs are driven by the Enplaned Passenger component. As such, the latter part of this Chapter focuses more specific attention on the Enplaned Passenger estimates at NFIA.**

### 4.2.1 Report Structure

This report presents the air traffic forecasts produced by InterVISTAS and McFarland Johnson, as well as documentation of the methodology and assumptions underlying the forecasts.

The report is structured as follows:

- Section 4.3 describes the current and historical aviation activity in the Buffalo Niagara Region and at NFIA;
- Section 4.4 provides background on the market’s economy and demography;
- Section 4.5 describes the air traffic forecast methodology and assumptions;
- Section 4.6 presents the forecasts of total passengers and aircraft movements;
- Section 4.7 outlines the fleet mix projections;
- Section 4.8 presents the General Aviation projections; and
- Section 4.9 provides the peak analysis.

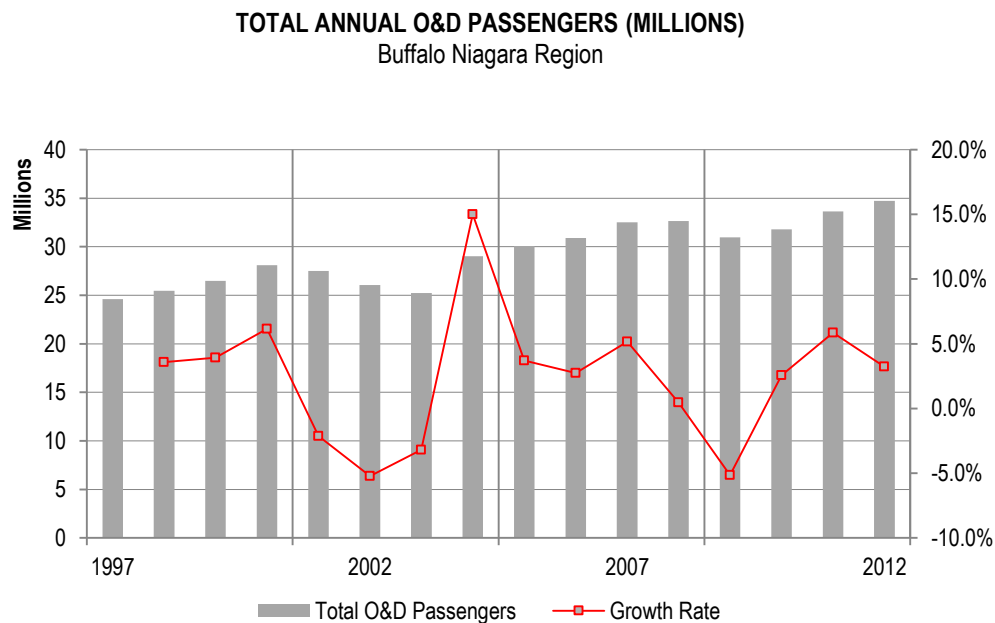
### 4.3 HISTORICAL TRAFFIC DEVELOPMENT

#### 4.3.1 Regional O&D Traffic Development

Due to the limited air traffic activity at the Niagara Falls International Airport (“IAG”) in recent history, and it’s very recent development and service with scheduled airline operations, the analysis of the historical traffic trend focuses not only on NFIA’s current market but also on the total potential passenger pool available to the airport. For the purpose of this analysis, the defined potential region includes an area with an approximate radius of 65 miles and contains seven airports: Niagara Falls International Airport (“IAG”), Buffalo Niagara International Airport (“BUF”), Rochester International Airport (“ROC”), Toronto Pearson International Airport (“YYZ”), London Metropolitan Airport (“YXU”), Hamilton International Airport (“YHM”), and Toronto City International Airport (“YTZ”). This region is referred to as the Buffalo Niagara Region (“the Region”).

Analysis of the regional origin and destination (“O&D”) passenger traffic in the region shows an increase at a compounded annual growth rate of 2.3%, from approximately 24.6 million total annual passengers in 1997 to 34.7 million total annual passengers in 2012, as depicted graphically on Figure 4-1. During the period 1997-2012 the passenger traffic generation has been impacted by global and regional economic activity trends, airline industry development and competition in the United States and Canada, and government policy regarding air travel and aviation infrastructure development.

**Figure 4-1 Total Annual O&D Passengers**

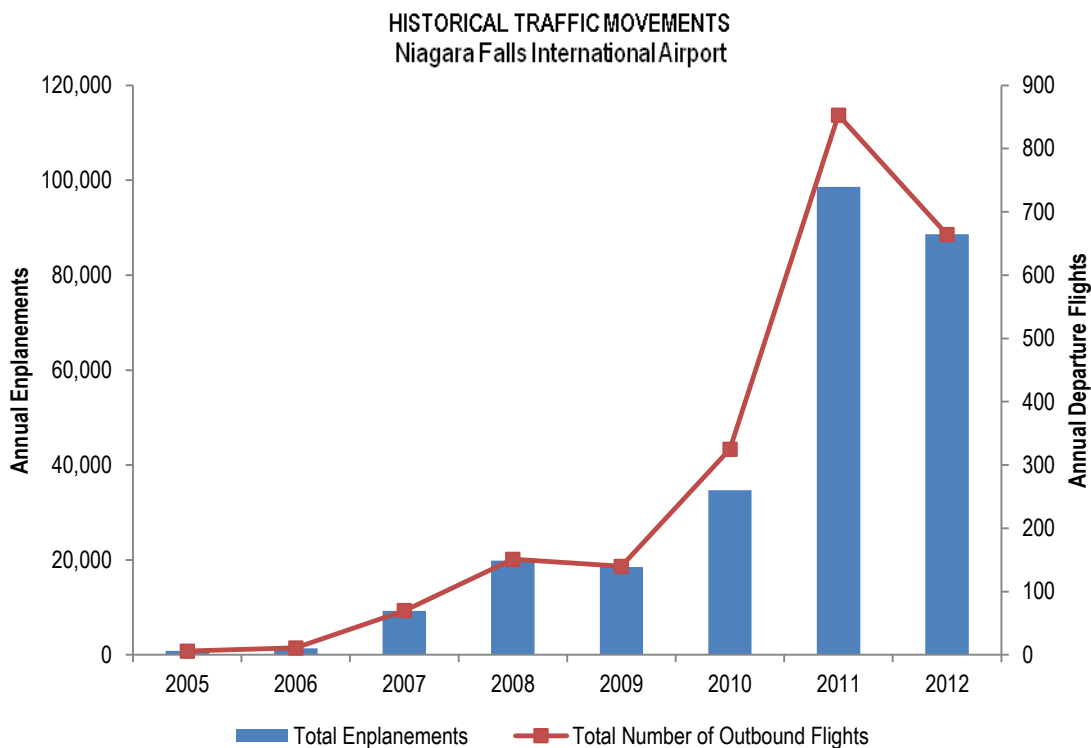


Source: Diio & U.S. Department of Transportation.

Historically, Niagara Falls International Airport has experienced limited service by commercial passenger airlines. For various periods in the 1980s, the airport was served by now defunct carriers such as Air Niagara, Empire Airlines and Kiwi International. More recently, Direct Air operated flights between NFIA and Myrtle Beach, South Carolina. Direct Air initiated service at NFIA in March 2007 and ceased operations in March 2012, when it filed for bankruptcy. Additionally, Vision Airlines began flights to Fort Walton Beach, Florida in 2010, but eventually discontinued service at NFIA and exited the market in 2012. Currently, NFIA is served by Spirit Airlines and Allegiant Air.

In 2011, the airport handled 98,604 enplanements. In 2012, traffic declined by 10.1% to 88,628 enplanements, following the exit of Direct Air (see Figure 4-2).

**Figure 4-2 Historical Traffic Movements**

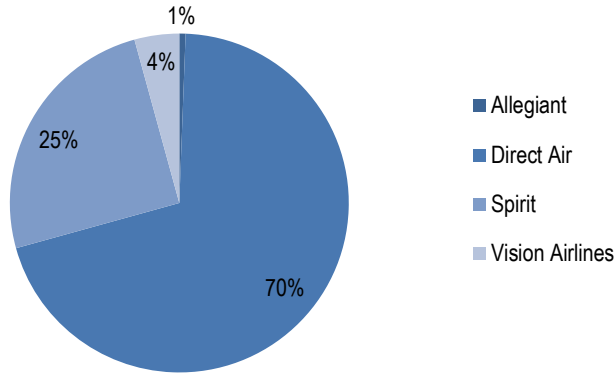


Source: Niagara Falls International Airport.

In terms of operations, Direct Air had 591 departures at NFIA in 2011, accounting for 70% of total operations (see Figure 4-3). In that year, Spirit Airlines' new services to Myrtle Beach and Fort Lauderdale accounted for 25% of the total operations.

### Figure 4-3 Historical Traffic Movements by Airlines - 2011

HISTORICAL TRAFFIC MOVEMENTS BY AIRLINES- 2011  
Niagara Falls International Airport

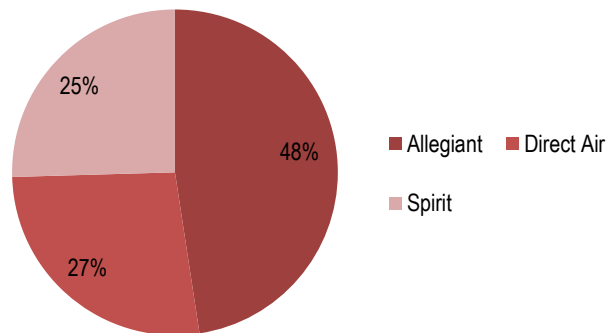


Source: Niagara Falls International Airport.

By 2012, Allegiant operated 48% of the total flights at NFIA, followed by Direct Air which operated 27% of flights at the airport (see Figure 4-4).

### Figure 4-4 Historical Traffic Movements by Airlines - 2012

HISTORICAL TRAFFIC MOVEMENTS BY AIRLINES - 2012  
Niagara Falls International Airport



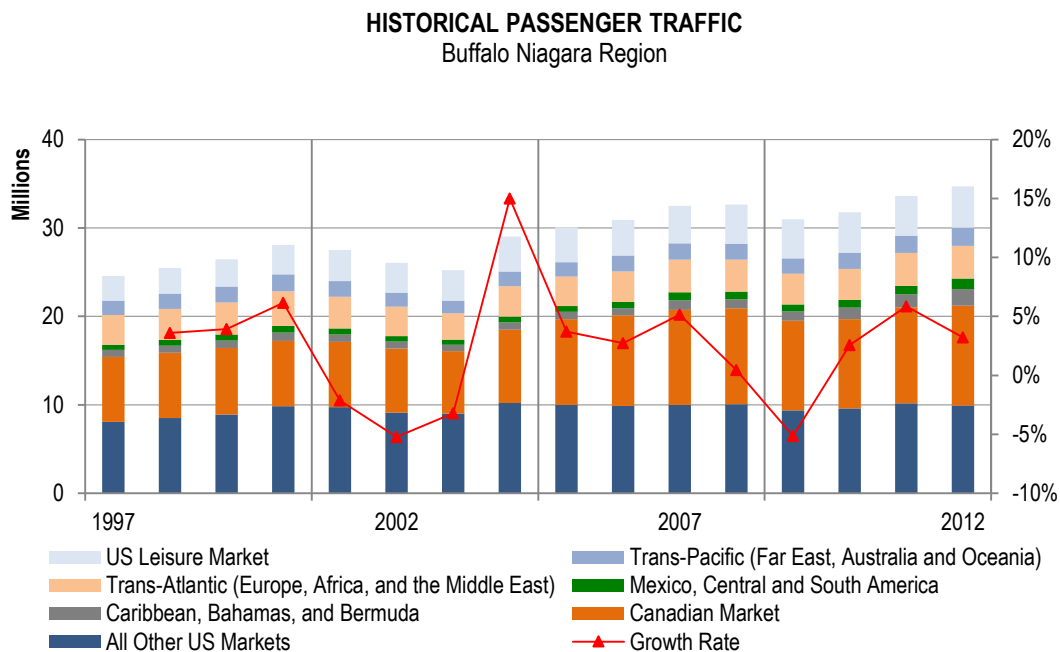
Source: Niagara Falls International Airport.

## O&D Traffic, Geographical Classification 1997-2012

Analysis of O&D traffic in the Buffalo Niagara Region required the segmentation of traffic into seven market classifications, as shown on Figure 4-5 and Table 4-1. These market classifications are:

1. All Other U.S. Markets: Includes all O&D traffic to and from U.S. markets excluding U.S. Leisure Market (see item 7 below).
2. Canadian Market: All O&D traffic to and from Canadian markets.
3. Caribbean, Bahamas, and Bermuda: All O&D traffic to and from these markets.
4. Mexico, Central and South America: All O&D traffic to and from these markets.
5. Trans-Atlantic: All O&D traffic to and from Europe, Africa and Middle East.
6. Trans-Pacific: All O&D traffic to and from the Far East, Australia, and Oceania.
7. U.S. Leisure Market: All O&D traffic to and from the states of Arizona, Florida, Hawaii, and Nevada, as well as Puerto Rico, the U.S. Virgin Islands, Pacific Islands/Trusts and, for the purpose of this analysis, Myrtle Beach (SC).

**Figure 4-5 Historical Passenger Traffic**



Source: Diio & U.S. Department of Transportation.

The analysis discloses solid growth in all seven market classifications, with the leisure markets demonstrating the most growth, and the Trans-Atlantic demonstrating the least. The Caribbean, Bahamas, and Bermuda increased at a compound annual growth rate of 6.0%, reaching 1.2 million in 2012. Mexico, Central and South America and the U.S. Leisure Market, respectively, increased at a compounded annual growth rates of 4.7% and 3.5%, respectively.

**Table 4-1 Estimated International O&D Passenger Traffic by Market Region**

ESTIMATED INTERNATIONAL O&D PASSENGER BY MARKET REGION						Avg. Annual Growth Rate 1997-2012
	1997	2001	2005	2008	2012	
All Other US Markets	8,071,526	9,738,575	9,999,663	10,080,778	9,915,099	1.40%
Canadian Market	7,348,720	7,381,931	9,694,471	10,843,127	11,304,147	2.90%
Caribbean, Bahamas, and Bermuda	778,828	849,188	816,991	1,006,885	1,862,587	6.00%
Mexico, Central and South America	598,697	657,653	647,800	857,252	1,199,010	4.70%
Trans-Atlantic (Europe, Africa, and the Middle East)	3,349,281	3,607,062	3,340,196	3,633,770	3,705,118	0.70%
Trans-Pacific (Far East, Australia and Oceania)	1,647,553	1,760,843	1,639,902	1,823,953	2,039,561	1.40%
US Leisure Market	2,793,105	3,502,326	3,950,495	4,409,852	4,697,060	3.50%
<b>Total</b>	<b>24,587,710</b>	<b>27,497,578</b>	<b>30,089,518</b>	<b>32,655,617</b>	<b>34,722,583</b>	<b>2.30%</b>

Sources: United States Department of Transportation Origin & Destination Survey and T-100 Database; Dii; GTAA Master Plan Chapter 3; InterVISTAS Consulting.

### Airport Choice Factors

With multiple airports available within the Buffalo Niagara Region, there are several factors that have been identified that will impact a passenger's choice when choosing an airport to utilize. These factors are discussed below.

- Airport Costs:** One of the fundamental drivers of Canadian demand discussed throughout these forecasts is the cost difference between Toronto Pearson and the U.S. counterparts, particularly NFIA. The air fare differences will be discussed as part of the forecast methodology in Section 4.5, however one of the key underlying factors in the air fare differences is the cost of doing business at the respective airports. Unlike the \$4.50 USD Passenger Facility Charge (PFC) cap in the U.S., Canada does not have a cap on their equivalent Airport Improvement Fee which is currently \$25 CAD at Toronto Pearson and Hamilton, and \$20 CAD at Toronto City and London, all before applicable taxes. The fee at Toronto Pearson is up from its previous level of \$20 CAD in 2012. As of July 2015, NFIA does not charge a PFC to passengers. According to a report from the Conference Board of Canada, the Airport Improvement Fee combined with other taxes and fees amount of over \$80 CAD compared to only \$32 USD in taxes on a similar base fare from a U.S. airport.<sup>1</sup>

The combination of lower fares and lower taxes and fees often yield savings of over \$100 per person to leisure destinations. When considering family or group travel, which is consistent with that of a family-friendly leisure destination, the savings of using a lower cost U.S. airport becomes substantial.

- Low Cost Carrier (LCC) Market Share:** The Toronto Pearson airport operates as a hub for Air Canada, which operates an extensive network of domestic and international flights from the airport. The combination of extensive flight offerings brought on by a hub airline along with higher airport costs, create a difficult opportunity for low cost airlines to effectively compete. Westjet, the largest LCC in Canada, operates between 80 and 100

<sup>1</sup> Gill, Vijay, "Driven Away: Why More Canadians are Choosing Cross Border Airports", The *Conference Board of Canada*, October 2012, 35.

flights from Toronto Pearson depending on the day and season. While this may appear significant, for a large market and large airport, LCC are estimated to represent less than 10% of the market share at Toronto Pearson. Toronto City Airport has low fares offered by Porter Airlines, however due to limited infrastructure; flights are operated on turboprop aircraft and limited primarily to destinations within the region. The remaining airports within the Region, London and Hamilton, offer weekly flights on a seasonal basis to leisure destinations on airlines including Air Transat, Sunwing, and WestJet, as well as daily service to regional destinations on WestJet and United Airlines. Celebrity Cruises also offers frequent charter flights from these airports to Miami for passengers preparing to board cruises. With the exception of seasonal service to Orlando, much of the seasonal service provided at London and Hamilton are to destinations within the Caribbean and not presently served by airlines at Niagara Falls or Buffalo.

The concentration of LCC flights, all to leisure destinations, is one of the key drivers for NFIA’s share in the greater regions leisure traffic. The greater regional passenger dynamics are discussed in detail in Section 4.5.2. Details of the average fares are also covered throughout Section 4.5.

**Parking/Ground Transportation:** One often overlooked cost comparison is airport parking. Parking within the most deeply discounted lot at Toronto-Pearson, the Value Park Lot, the difference in cost is approximately \$22 USD per week when compared to the fees charged for parking at NFIA. When comparing to a parking lot with similar proximity to the terminal as those provided at NFIA, the difference when parking into the Daily Park Lot increases to approximately \$58 per week. Aside from airport parking, even ground transportations options for Toronto-Pearson may result in a higher user costs. On average, round trip transit fares on the Union Pearson Express train are priced at approximately \$53 CAD round trip per person between the airport and downtown (\$38 CAD round trip per person for transit card holders). A family of up to 5 will pay a reduced with, with a total round trip priced at approximately \$110 CAD.

These airport choice factors provide a number of considerations for passengers within the Toronto region. As noted in Table 4-2 below, a review of considerations for flights in late November, 2015, a peak travel period within the United States, flights for a family of four to the Orlando, Florida region from Niagara Falls would save the family over \$400 when compared to flights from Toronto Pearson.

**Table 4-2 Example of Trip Costs from Toronto, ON Region to Orlando, FL Region (November 2015)**

From Downtown Toronto	To YYZ	To YHM	To YXU	To BUF	To NFIA
Fare (USD)	\$376	\$369	\$356	\$351	\$244
Distance (km)	26	99	191	174	139
Train (USD)	\$42	\$0	\$0	\$0	\$0
Gas (USD)	\$0	\$86	\$165	\$150	\$120
Toll (USD)	\$0	\$0	\$0	\$6	\$4
Parking (USD/week)	\$0	\$46	\$39	\$45	\$60
Total (USD)	\$418	\$501	\$560	\$552	\$428
<b>Total (family of four) (USD)</b>	<b>\$1,590</b>	<b>\$1,608</b>	<b>\$1,628</b>	<b>\$1,605</b>	<b>\$1,160</b>

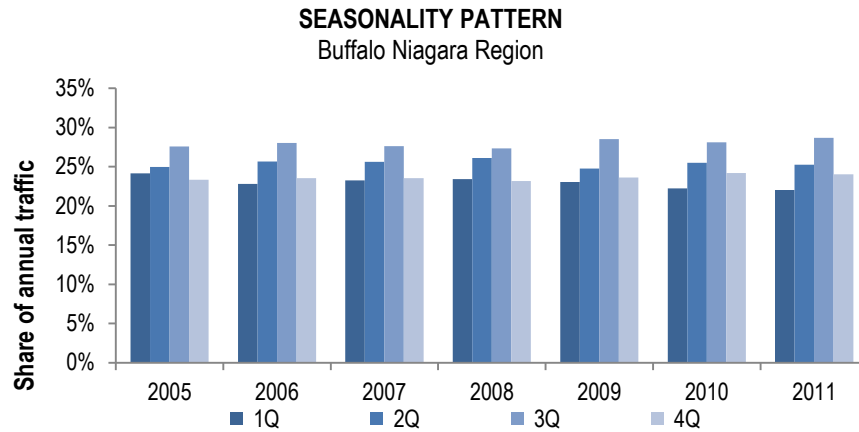
Source: Westjet.com, Allegiantair.com, Kayak.com as of July 8, 2015 for travel to occur November 22 – November 29, or date of closest available flight. Gas costs determined based on Canada Revenue Agency rate of 55 cents/km. All values provided in Canadian Dollars converted to U.S. Dollars at a rate of \$1.27 CAD to \$1.00 USD.



### 4.3.2 Seasonality

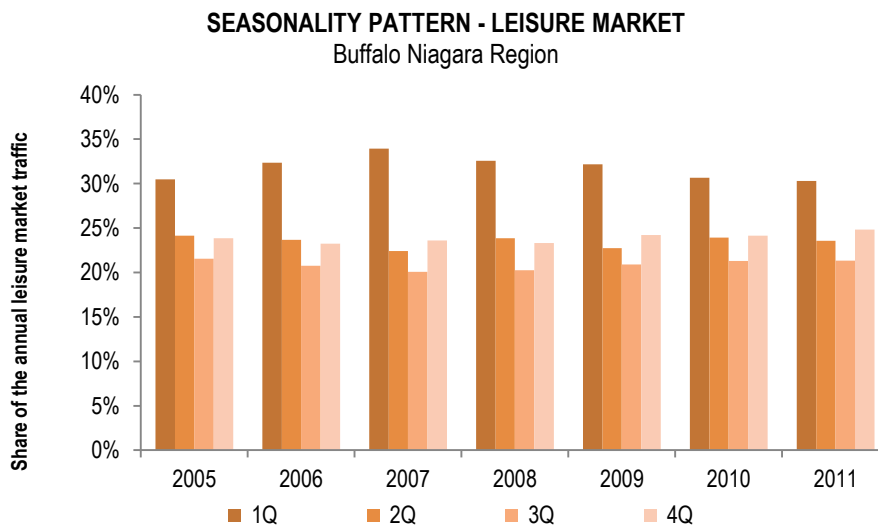
The analysis revealed distinct seasonality trends for the Buffalo Niagara Region's O&D traffic. During the historic period reviewed, the third quarter was on average the busiest quarter, as shown in Figure 6. However, analysis of seasonality patterns in the leisure markets (U.S. Leisure Market, and the Mexico and Caribbean Market) indicates a marked activity peak in the first quarter, as shown in Figure 4-7.

**Figure 4-6 Seasonality Pattern**



Source: Diiio & U.S. Department of Transportation.

**Figure 4-7 Seasonality Pattern – Leisure Market**



Source: Diiio & U.S. Department of Transportation.

### 4.3.3 Air Cargo, Military & General Aviation Operations

Unlike passenger traffic operations, cargo, military and general aviation operations are typically airport specific, and based on each airport's strategic planning and operational focus. These three types of operations at NFIA are discussed below.

#### Air Cargo Operations

In order to provide guidance for the NFIA cargo forecast, InterVISTAS reviewed the airport's historic air cargo data and reviewed past air cargo studies related to NFIA, including an Air Cargo Assessment report completed in May 2012. This Assessment concluded that NFIA faced many challenges in developing air cargo business and that demand in the region was a potential issue. The challenges confronting NFIA were categorized in four major areas:

- 1) A small and slow growing local market for air cargo shipments;
- 2) Stiff competition from established cargo gateways;
- 3) Restrictive air cargo industry dynamics; and
- 4) Operations-oriented issues at Niagara Falls International Airport.

Further, due to the relatively low commercial air services levels at NFIA historically, there is very little air cargo experience from which to draw reliable conclusions. For a brief period, between 2003 and 2007, Kitty Hawk Airlines operated all-cargo flights at NFIA. At its peak in 2004 and 2005, it averaged close to 500 annual departures and carried approximately 13,000 metric tons of air cargo per year. By 2007, Kitty Hawk was experiencing financial difficulties brought on by a changing business environment for air cargo and a weakening economy. The airline discontinued service at NFIA and, eventually, went out of business completely. Since Kitty Hawk's exit from NFIA, air volumes dropped significantly and, in 2010, only 21 metric tons of air cargo was handled at NFIA.

While NFIA may be capable of handling air cargo operations in terms of a long runway to accommodate large cargo aircraft, a precision instrument approach, and developable land for cargo facilities, the airport is largely limited with respect to air cargo growth by the types of air services available at the airport and competition from nearby airports. Currently, the infrequent weekly services of low-fare carriers like Allegiant Air and Spirit Airlines do not meet the needs of air cargo shippers. In fact, Allegiant has a corporate policy to not carry air cargo on its flights and Spirit traditionally carries very little cargo. Other types of operations that may operate at NFIA such as charter flights and turboprop aircraft typically do not carry much cargo as their aircraft and/or frequencies are not suited for the air cargo market.

Given the current situation at NFIA, it was concluded that the air cargo potential of the airport, for forecast purposes, is driven less by market demand and much more influenced by the air services expected at NFIA over time. In such an environment, cargo forecasts are best developed based on possible air service scenarios. These scenarios for air cargo at NFIA will be discussed further in the methodology section of this report.

## **Military Operations**

In addition to the commercial aviation activities at NFIA, the airport is occupied by the Niagara Falls Air Reserve Station. The station is home to the U.S. Air Force Reserve Command's 914th Airlift Wing and the New York Air National Guard's 107th Airlift Wing. These units operate Lockheed C-130 Hercules aircraft at NFIA. During the forecast effort, InterVISTAS reviewed historical military operations data and spoke with representatives familiar with military operations at NFIA. The secondary research allowed for analysis of recent operational trends while the primary research sought to gain insights on the future levels of military operations at NFIA for forecast purposes.

Between 1997 and 2012, military aircraft operations declined by 36% at NFIA. In 1997, military flights totaled 12,328 and by 2012, the flights totaled 7,846. However, since 2010, military operations have been relatively stable, suggesting that the major fluctuations have ceased. In terms of forward-looking guidance for military operations at NFIA, InterVISTAS obtained qualitative comments on the station's future activities. It was understood that quantifying the activities was extremely difficult due to the ever-changing environment related to Federal budgets and military operations. Based on analysis of the information gathered and InterVISTAS' own assumptions, for forecasts purposes, it was determined that the outlook for U.S. military operations in the NFIA forecast would show overall flat growth.

## **General Aviation and Charter Operations**

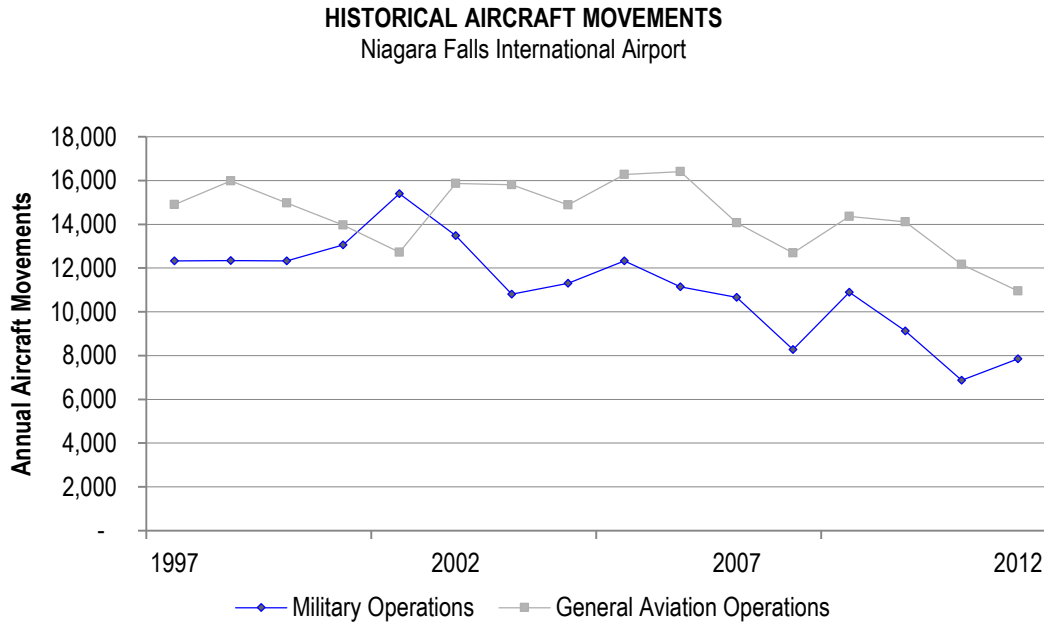
General aviation activity tends to follow trends in underlying economic conditions and growth in the region served by the airport. This is especially the case where there are multiple airports that can serve general aviation activity conveniently and efficiently. In the absence of the expansion of (or major concentration of) corporate general aviation based aircraft at an airport, the historical trends can be expected to continue, subject to variation resulting from underlying economic trends. Interviews with NFIA operational management indicated the likelihood of continuation of general aviation demand at levels consistent with historical activity, adjusted to reflect underlying economic demand. As a result, General Aviation operations are expected to grow 1% by the end of the forecast period, and reach 18,092 movements (two-way) in 2040 compare to 17,911 in 2012. This corresponds to a Compound Annual Growth Rate (CAGR) of 0.04% between 2012 and 2040. CAGR relates to the average annual growth rate over a period of several years.

Charter activity, like general aviation, is on-demand, and does not follow a set schedule. However, by reviewing the number of historic charter flights for passengers and cargo at NFIA and elsewhere in the Buffalo Niagara Region, the forecast can be informed of the trends, and estimate the demand for charter activity. Historic levels and trends have been incorporated into the aircraft operations and passenger traffic forecast through the overall operational and traffic level base.

While the General Aviation forecasts are centered on aircraft movements, it is sometimes necessary for the airport to consider the number of total passengers that will be associated with those movements. Unfortunately, no historical record of total General Aviation passengers at NFIA was located during the forecast process.

Figure 4-8 illustrates the historical development of both military and general aviation in Niagara Falls International Airport.

**Figure 4-8 Historical Aircraft Movements**



Source: Niagara Falls International Airport.

Between 1997 and 2012, both military and general aviation operations declined at NFIA by, an annual average of, -2.0% and -3.0%, respectively.

#### 4.4 DEMOGRAPHIC AND ECONOMIC BACKGROUND

Among the main drivers of air traffic demand, the socio-economic characteristics of the markets involved are the most dominant factors. Accordingly, social and economic development in the Buffalo Niagara Region was analyzed to understand the basis for air travel demand.

The primary service area of NFIA is composed of the Province of Ontario (Canada) and Western New York State (United States). Consequently, the population trends and economic activity of this service area were analyzed. Population growth provides an increasing source of demand for air travel, and rising economic activity, as measured by Gross Domestic Product (“GDP”) also drives increased air travel in the Buffalo Niagara Region.

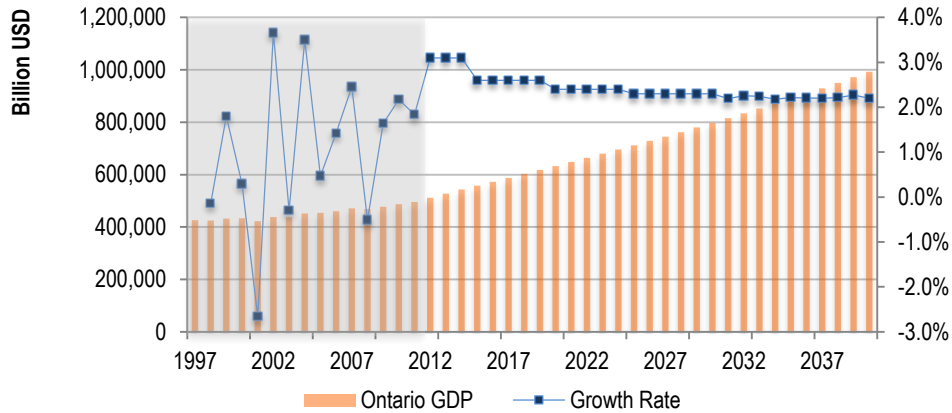
##### 4.4.1 Gross Domestic Product

As will be discussed in further detail as part of the development of air traffic forecasts within this chapter, GDP of both the Province of Ontario and Western New York State correlates positively to the growth in passenger and cargo traffic at NFIA over the same period. Ontario experienced real GDP annual growth of 1.8% in 2011, 3.1% in 2012, and is forecasted to experience 3.1%

growth in 2013.<sup>2</sup> According to the Ontario Ministry of Finance, GDP in the province is forecast to grow by an average of 2.8% per year over the next five years (2013-2017). Further, the Ontario Ministry of Finance forecasts the provincial GDP growth rate over the longer term to be slightly lower, with a compound annual growth rate of 2.4% from 2013 to 2040, as shown in Figure 4-9.

**Figure 4-9 Ontario Historical GDP Developments & Future Outlook**

**ONTARIO HISTORICAL GDP DEVELOPMENTS & FUTURE OUTLOOK**



Sources: Woods & Poole Economics, Ontario Ministry of Finance.

For the U.S. side of the Buffalo Niagara Region, the Buffalo-Niagara Falls (Western New York State) metropolitan area is the second-largest metropolitan area in New York, centered on the urbanized area of Buffalo. In 2013, this area is estimated to have a GDP of USD42.3 billion, which is 4.1% of the New York State GDP.<sup>3</sup>

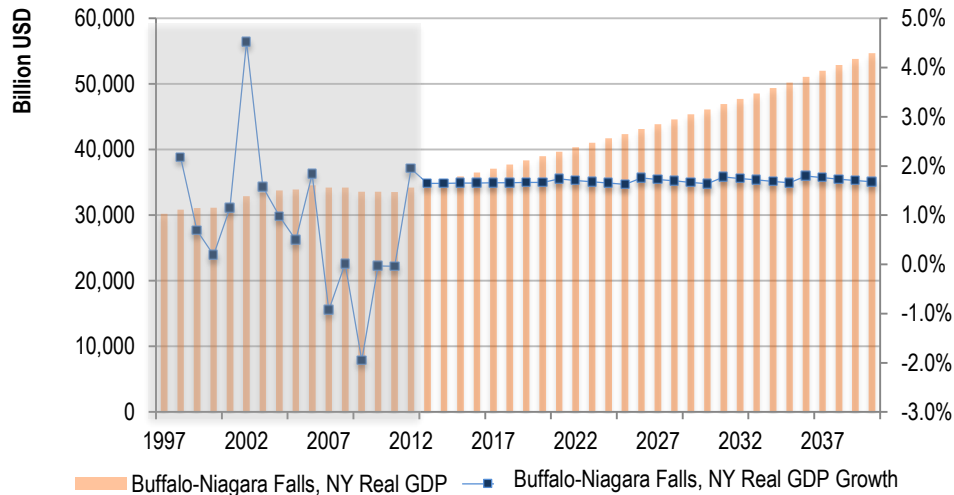
The GDP for the Western New York Region is projected to grow by an average 1.6% per year over the next 5 years (2013-2017), as shown in Figure 4-10. This is in line with the growth in the O&D traffic over the period. Further Woods & Poole Economics forecasts the area’s GDP to continue at the same rate for the next 27 years (2013-2040).

<sup>2</sup> Ontario Ministry of Finance.

<sup>3</sup> InterVISTAS Consulting Group Analysis, Woods & Poole Economics.

**Figure 4-10 Buffalo-Niagara Falls, NY Historical GDP Developments & Future Outlook**

**BUFFALO-NIAGARA FALLS, NY HISTORICAL GDP DEVELOPMENTS & FUTURE OUTLOOK**



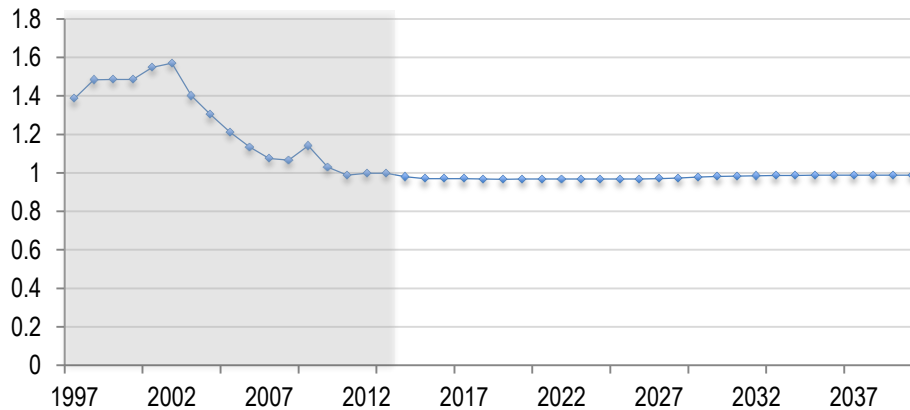
Source: Woods & Poole Economics.

Overall growth in GDP has been consistent over a lengthy period, which indicates that continued growth in the economy is likely to be sustainable over the forecast period. The consistent historic growth has occurred during a period of numerous exogenous shocks that have affected regional and global economies.

In recent years, the strong Canadian dollar has placed Canadian travelers in a favorable position to purchase goods and services in the United States, including air travel. Other factors have also proved effective in attracting additional Canadian travelers, including the availability of multiple low cost carriers, lower airport fees (including parking fees), reduced border crossing wait times, non-stop service to multiple leisure destinations. As Figure 4-11 illustrates both the Economist Intelligence Unit and Global Insight forecasts project a stable Canadian dollar at or close to par versus the U.S. dollar.

**Figure 4-11 CAD USD Exchange Rate**

**CAD USD EXCHANGE RATE**



Source: Economist Intelligence Unit & Global Insight Forecast.

#### 4.4.2 Population

Population trends in both Southern Ontario and Western New York are key drivers of demand of originating passenger traffic. With a population of more than 13 million, 85% of which live in the urban centers, Ontario is home to about 2 out of 5 Canadians. From 1997 to 2012, the population grew at an average annual rate of 1.3%. A high immigration rate is a primary driver of population growth in Canada, and 60% of all immigrant relocations to Canada settle in Ontario.<sup>4</sup> The high immigration rates to Canada drive population growth, which has been identified as a primary driver of air travel demand. As immigration continues as a prime factor towards population growth in Ontario, demand for air services in the region, including from NFIA, will also similarly continue to increase.

The Ontario Ministry of Finance has projected a healthy population growth for the next 25 years, an increase of 32.7% is expected which will bring the total population to 17.7 million by 2036 compare to 13.4 million in 2011. However, the annual rate of growth is projected to slow gradually over the projection period, starting at 1.2% in 2011-12 and moderating to 1.0% by 2035-36. The main driver of growth is the net migration, which is predicted to account for 68% of all population growth in the province over the 2011–2036 period.

On the other hand, the population of Western New York has been declining at an average annual rate of -0.3%. From 1997 through 2012, the population has decreased from 1.19 million to 1.13 million inhabitants.

Woods & Poole Economics does not expect the population to decline as it has in the past; however, the projected growth is not significant either, the estimated annual growth rate starts from 0.1% in 2012 and gradually increases to 0.6% in 2040. Woods & Poole estimated that the population of Western New York Region will reach 1.2 million in 2040, a growth rate of 3.1%.

<sup>4</sup> Ontario Ministry of Finance.

**Table 4-3 Population Development & Outlook in the Buffalo Niagara Region**

Year	Ontario Population	Ontario Population Growth Rate	Buffalo-Niagara Falls, NY Population	Buffalo-Niagara Falls, NY Population Growth Rate
1997	11,227,651		1,186,355	
2000	11,683,290	4.1%	1,169,060	-1.5%
2010	13,227,791	13.2%	1,135,198	-2.9%
2011	13,372,996	1.1%	1,135,351	0.0%
2012	13,532,720	1.2%	1,135,961	0.1%
2013	13,692,035	1.2%	1,136,759	0.1%
2014	13,850,837	1.2%	1,137,667	0.1%
2015	14,012,595	1.2%	1,138,648	0.1%
2016	14,177,430	1.2%	1,139,693	0.1%
2017	14,345,396	1.2%	1,140,894	0.1%
2018	14,516,522	1.2%	1,142,151	0.1%
2019	14,690,763	1.2%	1,143,449	0.1%
2020	14,868,106	1.2%	1,144,811	0.1%
2025	15,781,892	6.1%	1,151,845	0.6%
2030	16,705,682	5.9%	1,158,542	0.6%
2035	17,624,406	5.5%	1,164,687	0.5%
2040	18,564,933	5.3%	1,171,194	0.6%

Source: Woods & Poole Economics, Ontario Ministry of Finance.

## 4.5 FORECAST METHODOLOGY

### 4.5.1 Introduction

Air travel is a derived demand. In general, the potential traffic demand pool is quantified by the economic and demographic profile of the airport’s catchment area (described by e.g. GDP, personal income, private consumption levels, tourism, and population). The traditional traffic forecast approach, therefore, focuses on the recognized relationship that exists between air traffic development and the development of socio-economic variables that are known to drive air traffic. For instance, history has shown that there is a close relationship between global economic growth (expressed in real Gross Domestic Product) and annual air traffic growth.

Through statistical tools, such as regression analysis, the relationship between air traffic and the relevant socio-economic factors can be found and expressed in various econometric models. Using long-term projections of the independent variables (like GDP, income etc.), future traffic levels can now be predicted.

The project team analyzed the various factors that have historically driven air traffic activity in the Buffalo Niagara Region. Simply put, it is reasonable to assume that the factors that have historically driven air travel demand will continue to drive air travel demand in the future and in the same proportions. For instance, all things being equal, if a 1% increase in regional GDP is found to be highly correlated to a 1% increase in air travel historically, an analytical model can be developed to then estimate future air travel levels based on forecasts of GDP. Econometric models enable this forecasting technique and allow for testing to ensure that the forecast results are reasonable and acceptable.



As with any forecast methodology, there are uncertainties regarding these factors, such as the outlook for regional and world economies, and the structure and growth of the airline industry. Dependable forecasting requires awareness of the uncertainties surrounding each forecast. A pragmatic, yet systematic, approach has been used to produce a set of unbiased aviation activity forecasts for the Buffalo Niagara Region.

As described in the rest of this chapter, forecasts have been produced for the following:

- Passenger traffic;
- Aircraft movements;
- Cargo volume.

The following sections describe the methodology used to forecast each separate segment; the results are presented in the next section.

#### 4.5.2 Total Air Passengers

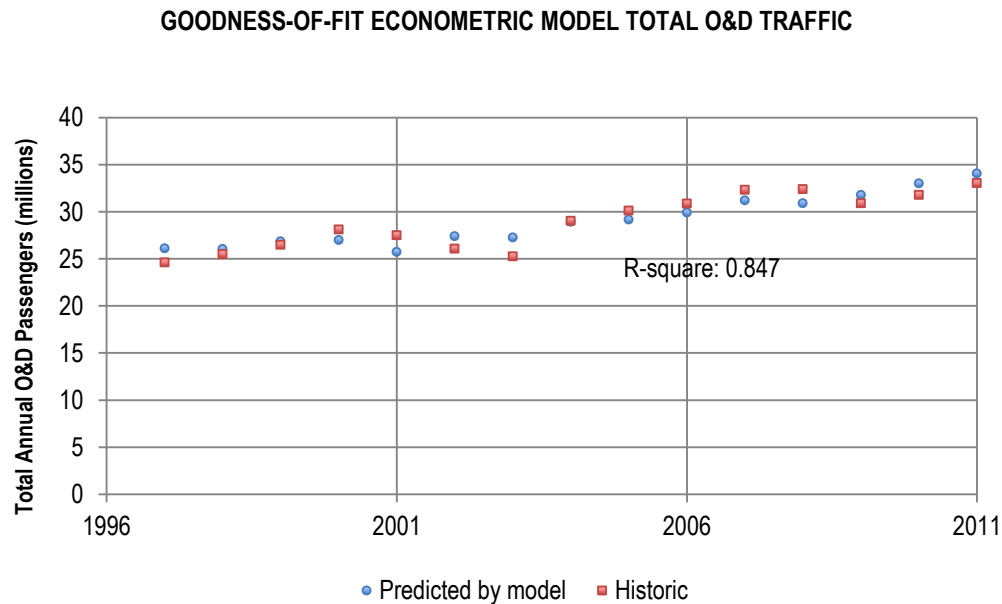
##### **Total O&D Traffic**

The total air transport market in the Buffalo Niagara Region, involving both the Canadian domestic market and the U.S.-Canada market, is mainly served by airline services at Toronto Pearson International Airport (YYZ), with the remainder of the market served by other airports within the United States and Canada.

InterVISTAS used the following approach to prepare the Passenger Forecast:

1. Through an econometric model developed by InterVISTAS, historic annual O&D passenger traffic development between 1997 and 2012 in Niagara Falls region has been related to the historic development of various socio-economic variables, such as the economic growth in Ontario and Western New York, population growth in both of these areas, U.S. - Canada currency exchange rate developments, airline fare levels, and other relevant factors. Using a regression analysis, the Gross Domestic Product of Ontario (expressed in real terms) was identified as the variable with the strongest correlations with historic O&D traffic development. The regression analysis produced a high adjusted  $R^2$  value of 0.847, indicating that this variable is expected to serve as a reliable predictor for future total O&D traffic development. See Figure 4-12 for the Goodness-of-Fit Econometric Model output, where Goodness-of-Fit refers to how well a set of variables explains another set of variables.

**Figure 4-12 Goodness-of-Fit Econometric Model - Total O&D Traffic**



Source: InterVISTAS Consulting Group.

The model for determining total O&D traffic can be described by the following equation:

$$\begin{aligned} &Ln(\text{Total O\&D Traffic}) \\ &= c_1 + c_2 * Ln(\text{Real Ontario GDP}) \end{aligned}$$

where:

- *Ln* is the natural log of the variable
- *Total O&D traffic* is total annual O&D traffic
- *Real Ontario GDP* is the Ontario Gross Domestic Product adjusted for inflation
- $c_1$ , and  $c_2$ , are the estimated model parameters capturing the impact of various factors on the Buffalo Niagara Region's total O&D traffic growth

The econometric model describing total O&D traffic resulted in the following values for the dominant parameters, or elasticities:

- GDP elasticity of 1.74

Considerable research has established a positive relationship between economic growth (or income growth) and air travel (For example, see: *Air Travel Demand Elasticities: Concepts, Issues and Measurement*, D. Gillen, W.G. Morrison and C. Stewart, 2002). In many cases, demand for air travel grows at a rate higher than that of the economy, so that each 1% increase in GDP results in air traffic growth of 1.0% to 2.0%. However, as markets mature, the GDP elasticity tends to decline – further GDP growth has a smaller impact on air travel growth. The

regression results indicate a very high GDP parameter: each 1% increase in GDP results in a 1.74% increase in total O&D traffic.

While there is potential for air traffic development in the Buffalo Niagara Region, the market will ultimately reach maturity and consequently, the elasticity value requires adjustment in order to reflect the most probable trend. Consequently, the elasticity for this forecast is modeled to decrease to 1.2 by the end of the forecast period.

Research on income elasticity for U.S. air travel has produced values of between 1.6 and 2.2<sup>5</sup>

2. Using forecasts of the Ontario Gross Domestic Product (expressed in real terms)<sup>6</sup>, future total O&D forecast levels were generated.

### **Total U.S. Market O&D Traffic- Including U.S. Leisure Market**

Traditionally, New York, followed by California, have been the main O&D markets for air travel from the Buffalo Niagara Region to the United States, representing respectively, 17.9% and 14.2% of total, respectively. Other important markets are Illinois, Texas, New Jersey and Massachusetts.

During the historic period between 1997 and 2012, total U.S. Market traffic in the Buffalo Niagara Region has grown by a CAGR 1.9%, with two major declines in 2002 and 2009, reflecting events on September 11, 2001 and the and then the global financial crisis of 2008.

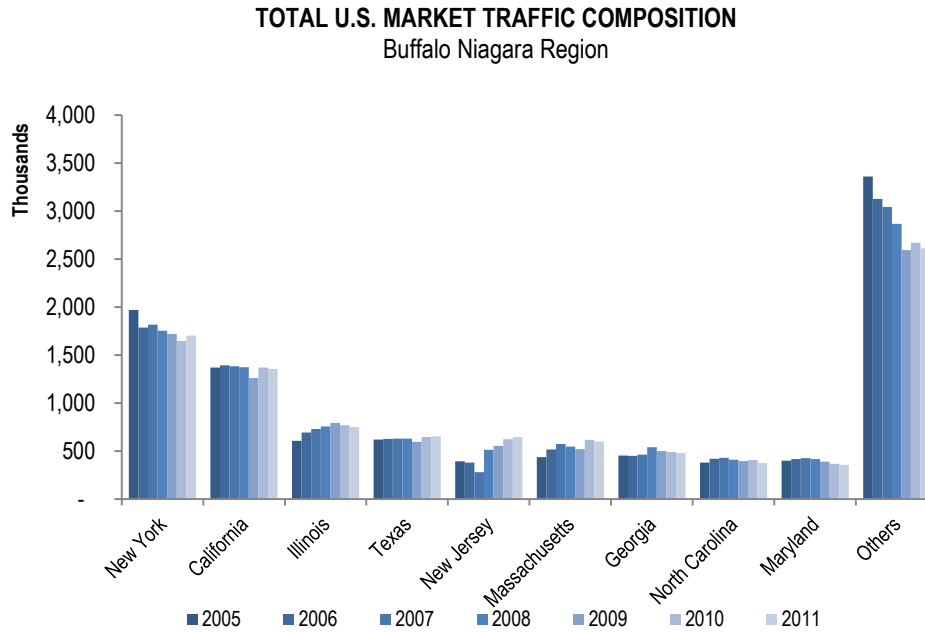
Similar to the approach used to forecast total O&D traffic for the Buffalo Niagara Region, an econometric approach was used to correlate the historic traffic development of identified market categories with the historic development of various socio-economic variables. Based on recent traffic developments at NFIA, three markets were identified as NFIA's main markets of opportunity for the baseline analysis: All Other U.S., U.S. Leisure, and Mexico & Caribbean. Using a regression analysis, Ontario GDP and average real air-fares in NFIA main markets of opportunity were identified as the explanatory variables (adjusted R<sup>2</sup> of 0.871). As part of this analysis, other variables such as Western New York Real GDP, population and U.S. – Canada currency exchange rate were also tested, and no significant correlations were found.

Figure 4-14 is the result of the analysis for the U.S. Market.

<sup>5</sup> An example is located at [http://www.mcrit.com/transvisions/documents/new/air\\_transport\\_demand\\_drivers.pdf](http://www.mcrit.com/transvisions/documents/new/air_transport_demand_drivers.pdf).

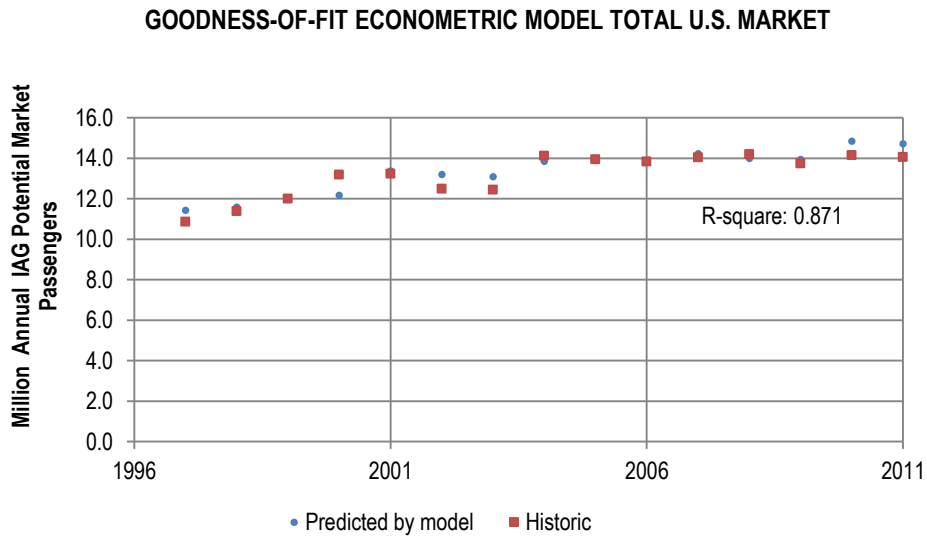
<sup>6</sup> Source: Ontario Ministry of Finance.

**Figure 4-13 Total U.S. Market Traffic Composition**



Source: Diio & U.S Department of Transportation.

**Figure 4-14 Goodness-of-Fit Econometric Model Total U.S. Market**



Source: InterVISTAS Consulting Group.

The corresponding model can be described by the following equation:

$$\begin{aligned} & \text{Ln}(\text{Total U.S. Traffic})_{2003-2010} \\ &= c_1 + c_2 * \text{Ln}(\text{Real Ontario GDP}) + c_3 * \text{Ln}(\text{Real Average Airfare}) + c_4 * \text{dummy}_{9/11} + \\ & c_5 * \text{Dummy}_{\text{economic crisis}} \end{aligned}$$

where:

- *Ln* is the natural log of the variable
- *Total U.S. traffic* is Total U.S. Market O&D traffic including the U.S. Leisure Market
- *Real Ontario GDP* is the Ontario Gross Domestic Product adjusted for inflation
- *Real Average Airfare* is the air fare on NFIA markets of opportunity, adjusted for inflation
- *Dummy<sub>9/11</sub>* is a 0,1 dummy, picking up the value 1 in 2001 to reflect the impact of the September 11<sup>th</sup> events on traffic;
- *Dummy<sub>economic crisis</sub>* is a 0,1 dummy, picking up the value 1 in 2009 to reflect the impact of the financial crisis on traffic;
- *c<sub>1</sub>, c<sub>2</sub>, c<sub>3</sub>, c<sub>4</sub> and c<sub>5</sub>* are the estimated model parameters capturing the impact of various factors on traffic growth

The regression analysis produced the following values for the model parameters:

- GDP elasticity of 1.2
- Air fare coefficient of -0.32

In comparison to the GDP elasticity for the total O&D market, the results from the total U.S. market traffic suggest a more mature market where GDP growth will stimulate traffic growth at a slower pace. The fare elasticity falls within a range that can be expected for this market.

As mentioned previously, research on income elasticity for U.S. air travel has produced values of between 1.6 and 2.2. For the fare elasticities, research has estimated values of between -0.2 and -2.0.<sup>7</sup> The fare elasticity estimates produced by the model fall within that range.

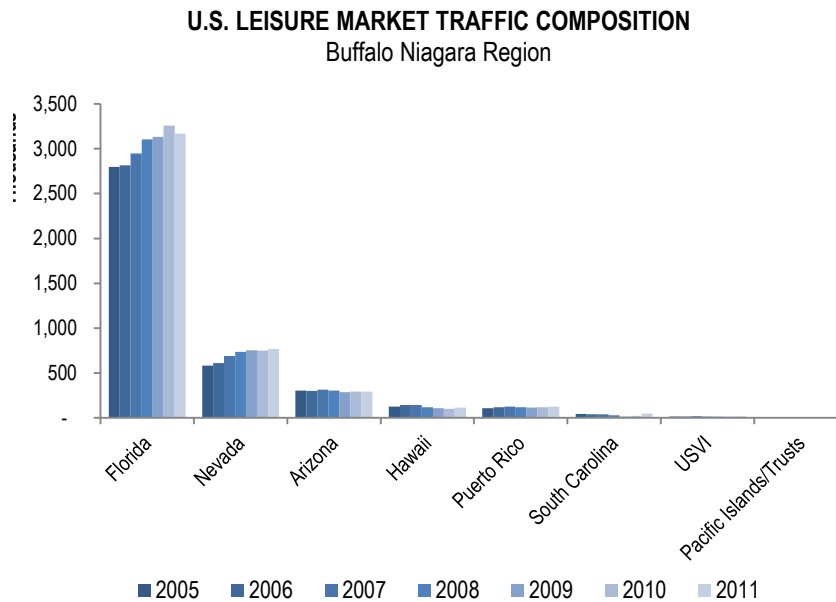
Using forecasts of the respective model variables and the relationship derived from the regression analysis, future Total U.S. traffic levels were forecast. Ontario Ministry of Finance's forecast of the Ontario GDP was used, while the fares are projected to remain constant over the forecast period.

### **U.S. Leisure Market O&D Traffic**

As presented in Figure 4-15, Florida has been the main O&D market for leisure travel for the Buffalo Niagara Region, representing 70% of the U.S. Leisure Market and growing by a CAGR

<sup>7</sup> [http://www.iata.org/whatwedo/Documents/economics/InterVISTAS\\_Elasticity\\_Study\\_2007.pdf](http://www.iata.org/whatwedo/Documents/economics/InterVISTAS_Elasticity_Study_2007.pdf)

**Figure 4-15 U.S. Leisure Market Traffic Composition**



Source: Diio & U.S. Department of Transportation.

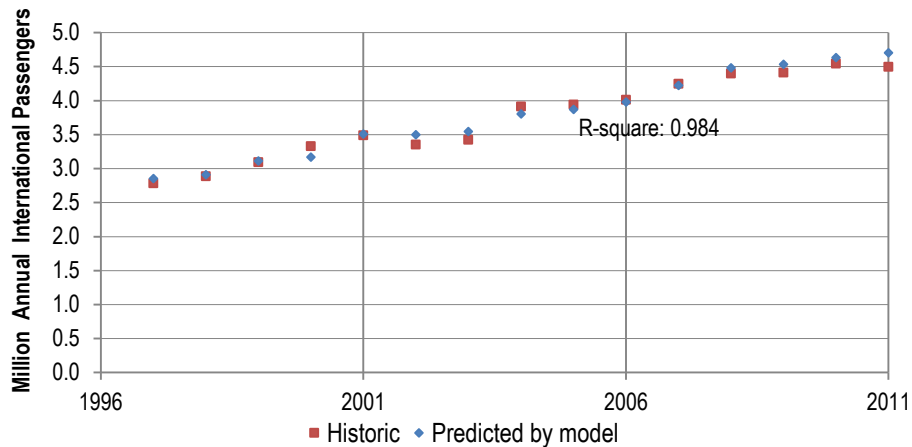
of 2.1%. Nevada is the second biggest market, with 17% market share and increasing by a CAGR of 4.7%.

During the historic period between 1997 and 2012, U.S. Leisure Market traffic in the Buffalo Niagara Region grew by a CAGR 3.5%.

Similar to the approach to forecast total O&D traffic and Total U.S. Market traffic, an econometric approach was used to correlate the historic traffic development with the historic development of various socio-economic variables. Using a regression analysis, Ontario GDP and average real air fares on NFIA’s markets of opportunity, defined as All Other U.S., U.S. Leisure, Mexico, and Caribbean markets were identified as the explanatory variables (adjusted R<sup>2</sup> of 0.984). As part of this analysis other variables such as Western New York Real GDP, population and exchange rate were also tested, and no significant correlations were found.

Figure 4-16 compares historical trend with the results of the econometric model.

**Figure 4-16 Goodness-of-Fit Econometric Model U.S. Leisure Market**  
**GOODNESS-OF-FIT ECONOMETRIC MODEL U.S. LEISURE MARKET**



Source: InterVISTAS Consulting Group.

The corresponding model can be described by the following equation:

$$\ln(U.S. \text{ Leisure Traffic})_{2003-2010}$$

$$= c_1 + c_2 * \ln(\text{Real Ontario GDP}) + c_3 * \ln(\text{Real Average Airfare}) + c_4 * \text{dummy}_{9/11} + c_5 * \text{Dummy}_{\text{economic crisis}}$$

where:

- *Ln* is the natural log of the variable
- *U.S. Leisure traffic* is U.S. Leisure<sup>8</sup> Market O&D traffic
- *Real Ontario GDP* is the Ontario Gross Domestic Product adjusted for inflation
- *Real Average Airfare* is the air fare for NFIA markets of opportunity, adjusted for inflation
- *Dummy<sub>9/11</sub>* is a 0,1 dummy, picking up the value 1 in 2001 to reflect the impact of the September 11<sup>th</sup> events on traffic;
- *Dummy<sub>economic crisis</sub>* is a 0,1 dummy, picking up the value 1 in 2008 to reflect the impact of the economic crisis on traffic;
- *c<sub>1</sub>, c<sub>2</sub>, c<sub>3</sub>, c<sub>4</sub> and c<sub>5</sub>* are the estimated model parameters capturing the impact of various factors on traffic growth

The regression analysis produced the following values for the model parameters:

<sup>8</sup> U.S. Leisure Market is defined as all O&D traffic to and from the states of Arizona, Florida, Hawaii, and Nevada, as well as Puerto Rico, U.S. Virgin Islands, Pacific Islands/Trusts and for the purpose of this forecast, all O&D traffic to and from Myrtle Beach (SC).

- GDP elasticity of 2.7
- Air fare coefficient of -0.35

In comparison to the GDP elasticity on the total O&D market and the Total U.S. Market, the results from the Total U.S. Leisure market traffic suggest a less mature market where GDP growth will stimulate significant traffic growth. The fare elasticity falls within a range that can be expected for leisure markets.

While there is opportunity for air traffic development in the region, the market will ultimately reach maturity and consequently, the elasticity was adjusted to reflect the most probable trend. Consequently, the elasticity is modeled to decrease to 1.5 by the end of the forecast period, which is a common multiplier for leisure markets.

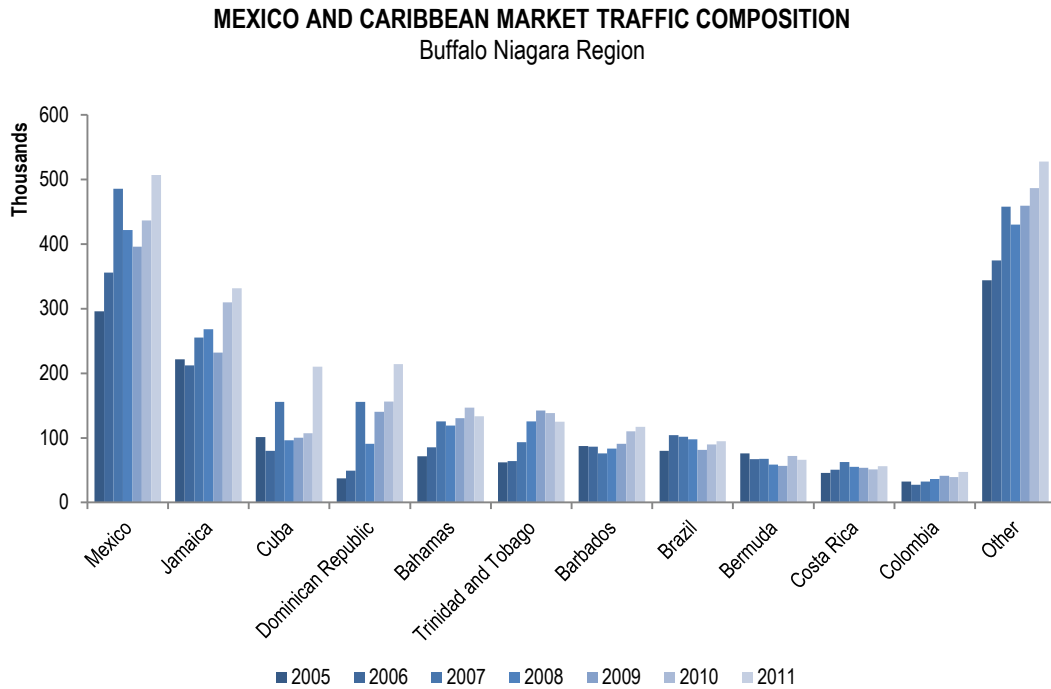
Using forecasts of the respective model variables and the relationship derived from the regression analysis, future Total U.S. Leisure traffic levels could be forecast. Ontario Ministry of Finance's forecast of the Ontario GDP was used, while fare levels are projected to remain constant over the forecast period.

### **Mexico and Caribbean Market O&D Traffic**

As presented in Figure 4-17, Mexico is the largest O&D market for Buffalo Niagara Region air travel to and from Latin America and the Caribbean. Mexico represents 20.9% of the total traffic and a CAGR of 9.4%. Jamaica and Cuba are the other two significant markets, with respectively 13.6% and 8.7% market share and CAGR of 6.9% and 13.0%. The Dominican Republic is the fastest growing market with CAGR of 33.8% its market share has increased from 2.6% in 2005 to 8.8% in 2011.



**Figure 4-17 Mexico and Caribbean Market Traffic Composition**

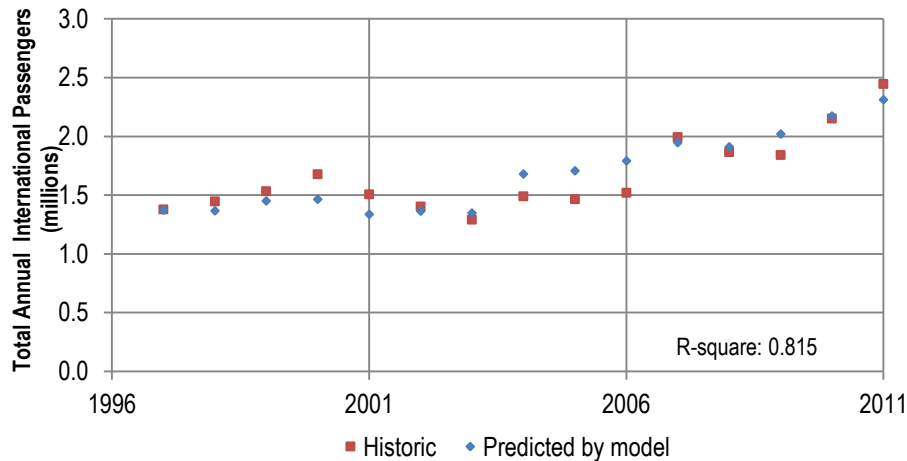


Source: Diio & U.S. Department of Transportation.

During the historic period between 1997 and 2012, traffic to and from Mexico & Caribbean Market in the Buffalo Niagara Region grew by a CAGR 5.5%.

Similar to the approach used to forecast the other three market categories, an econometric approach was used to correlate the historic traffic development with the historic development of various socio-economic variables. Using a regression analysis, Ontario GDP was identified as the explanatory variable (adjusted  $R^2$  of 0.815). As part of this analysis other variables such as Western New York Real GDP, population and exchange rate were also tested, and no significant correlations were found.

**Figure 4-18 Goodness-of-Fit Econometric Model Mexico & Caribbean Market**  
**GOODNESS-OF-FIT ECONOMETRIC MODEL MEXICO & CARIBBEAN MARKET**



Source: InterVISTAS Consulting Group.

The corresponding model can be described by the following equation:

$$\begin{aligned} & \text{Ln}(\text{Mexico and Caribbean Traffic})_{2003-2010} \\ & = c_1 + c_2 * \text{Ln}(\text{Real Ontario GDP}) + c_3 * \text{Dummy}_{9/11} \end{aligned}$$

where:

- *Ln* is the natural log of the variable
- *Mexico and Caribbean traffic* is total O&D traffic to and from Central, South and Latin American Market
- *Real Ontario GDP* is the Ontario Gross Domestic Product adjusted for inflation
- *Dummy<sub>9/11</sub>* is a 0,1 dummy, picking up the value 1 in 2002 and 2003 to reflect the impact of the September 11<sup>th</sup> events on traffic;
- *c<sub>1</sub>*, *c<sub>2</sub>*, and *c<sub>3</sub>*, are the estimated model parameters capturing the impact of various factors on traffic growth

The regression analysis produced the following values for the model parameters:

- GDP elasticity of 3.4

In comparison to the GDP elasticity on the other three markets, the results from the Mexico & Caribbean Market traffic suggest a developing market where GDP growth will stimulate extremely high traffic growth.

While there is substantial scope for air traffic development in the Buffalo Niagara Region, the market will ultimately reach maturity and consequently, the elasticity was adjusted in order to reflect the most probable trend. Consequently, the elasticity is modeled to decrease to 1.5 by the end of the planning period, which is a common multiplier for leisure markets such as those found in the Mexico and Caribbean regions.

Using forecasts of the respective model variables and the relationship derived from the regression analysis, future Total Mexico and Caribbean traffic levels could be forecast. Ontario Ministry of Finance's forecast of the Ontario GDP has been used.

### **Seat Capacity Analysis**

The forecast resulting from the top-down econometric approach has been blended with a bottom-up analysis of the available airline seat capacity. Short-term capacity levels in the region, as well as the available year-to-date data, were examined in order to calibrate the traffic forecast for the initial years. By analyzing current capacity as published in the Official Airline Guide, and Diiio, (Data In, Intelligence Out, an Amadeus Database), forecast periods were adjusted to reflect what capacity level is expected to enter the market.

InterVISTAS has also interviewed representatives of NFIA to inform forecast results. Based on these conversations, as well as observation of airline industry trends, InterVISTAS has used an assumption of 4% annual growth rate between years 2013-2015. Beginning in 2016, the projected growth rate estimated through the econometric-models for each market is applied.

### **Introduction of Trans-Atlantic Services**

In addition to the projected O&D traffic through the analysis of the historical trend and the developed econometric model as mentioned above, a Trans-Atlantic service at NFIA with Boeing 757 or similar type aircraft, is also introduced. It is expected that these services would be for Western Europe markets – such as the United Kingdom and Ireland.

The incorporation of Trans-Atlantic services to the forecast is based on detailed information obtained regarding NFIA's marketing efforts to attract airlines serving European markets and the potential of those airlines initiating operations at NFIA in the future. It is anticipated that this service could begin as early as 2020 with up to two (2) weekly departures in the first year.

Key assumptions developing this scenario are:

- Average load factor of approx. 85%
- Flights will be seasonal in nature and, throughout the forecast period, the season is assumed to be 13 weeks long.
- The first 9-10 years the equipment on this route is assumed to be Boeing 757 or a similar type aircraft, gradually replaced with Boeing 767 or similar type aircraft,
- Weekly round-trips will increase over time during the forecast period as follows:
  - Year 1: 2 weekly departure
  - Years 2-3: 4 weekly departures

- Years 4-5: 6 weekly departures
- Years 6-8: 10 weekly departures
- Years 9-10: 14 weekly departures
- Years 11-13: 16 weekly departures
- Years 14-17: 18 weekly departures
- Years 18-21: 20 weekly departures

### 4.5.3 Aircraft Movements

Commercial airline aircraft movements are generally a function of passenger traffic demand and air service development, shaped by carrier networks and average aircraft size. Forecasts of future aircraft movements are derived taking into consideration passenger traffic demand, potential service improvement/expansion, change of average aircraft size, and load factor.

Passenger aircraft movements depend on the average aircraft size and average load factor (i.e. average passengers per flight), as represented by the formula below:

$$\text{Aircraft movements} = \frac{\text{Passenger movements}}{\text{Average aircraft size} \times \text{average load factor}}$$

## 4.6 AIR TRAFFIC FORECAST

### 4.6.1 Total O&D Passenger Forecast

The Baseline Case, or most likely forecast, of passenger traffic at NFIA combined with the introduction of a Trans-Atlantic service is provided in Table 4-4.

Total O&D passenger traffic is expected to increase 4.0% in fiscal year 2013 to 180,137 total annual passengers. Under the influence of the strong and continuing growth of the Ontario economy, total traffic at NFIA is predicted to increase to 710,789 total annual passengers in 2040. Over the forecast period from 2012 through 2040, traffic is forecast to grow by a CAGR of 5.0%.

Table 4-4 also shows breakdowns into All Other U.S. Market, U.S. Leisure Market, Mexico & Caribbean, and Transatlantic (Europe) traffic. U.S. Leisure Market continues to be the largest traffic segment over the planning period. Although this segment is projected to increase by 260% over the period between 2012 and 2040, its share of total traffic is projected to decline slightly from approximately 97.1% in 2012 to 89.0% in 2040 as the growth in other markets outpaces US Leisure traffic growth.

**Table 4-4 Forecast Total Passengers (000)**

Year	IAG Baseline Case and A New Trans-Atlantic Service					Total O&D Passenger
	Total O&D Passenger Buffalo Niagara Region	All Other US Markets	US Leisure Market	Mexico & Caribbean	Trans-Atlantic (Europe)	
1997	24,588	0.00	0.0	0.0	0.0	0.0
2000	28,096	0.00	0.0	0.0	0.0	0.0
2010	31,773	0.00	0.0	0.0	0.0	0.0
2011	33,637	0.33	188.8	4.8	0.0	193.9
2012	34,723	0.29	169.7	3.3	0.0	173.3
2013	35,590	0.30	176.4	3.4	0.0	180.1
2014	37,869	0.32	183.1	3.9	0.0	187.3
2015	39,934	0.33	190.0	4.5	0.0	194.8
2016	41,757	0.34	202.6	4.9	0.0	207.8
2017	43,663	0.35	215.9	5.3	0.0	221.6
2018	45,656	0.36	229.8	5.7	0.0	235.9
2019	47,740	0.37	244.3	6.2	0.0	250.9
2020	49,919	0.38	258.4	6.6	3.9	269.3
2021	52,205	0.39	272.9	7.1	7.8	288.2
2025	61,351	0.44	335.5	9	19.5	364.4
2026	64,038	0.45	351.9	9.5	19.5	381.4
2030	74,764	0.50	421.6	11.7	33.6	467.4
2035	90,601	0.57	513.3	14.6	44.7	573.2
2040	109,655	0.65	610.3	17.4	57.4	685.8
Annual Growth Rates						
2012	3.2%	-12.1%	-10.1%	-31.3%	0.0%	-10.6%
2013	2.5%	3.4%	3.9%	3.0%	0.0%	3.9%
2014	6.4%	6.7%	3.8%	14.7%	0.0%	4.0%
2015	5.5%	3.1%	3.8%	15.4%	0.0%	4.0%
2016	4.6%	3.0%	6.6%	8.9%	0.0%	6.7%
2017	4.6%	2.9%	6.6%	8.2%	0.0%	6.6%
2018	4.6%	2.9%	6.4%	7.5%	0.0%	6.5%
2019	4.6%	2.8%	6.3%	8.8%	0.0%	6.4%
2020	4.6%	2.7%	5.8%	6.5%	0.0%	7.3%
2020-2025	22.9%	15.8%	29.8%	36.4%	400.0%	35.3%
2025-2030	21.9%	13.6%	25.7%	30.0%	72.3%	28.3%
2030-2035	21.2%	14.0%	21.8%	24.8%	33.0%	22.6%
2035-2040	21.0%	14.0%	18.9%	19.2%	28.4%	19.6%
Compound Annual Growth Rates						
2012-2016	3.8%	3.2%	3.6%	8.2%	0.0%	3.7%
2015-2025	4.0%	2.6%	5.3%	6.5%	0.0%	5.9%
2012-2040	4.0%	2.8%	4.5%	5.9%	0.0%	4.9%

Source: InterVISTAS Consulting.

The forecast anticipates the addition of new routes to Europe, as well as additional frequencies on existing international routes. As a result, Trans-Atlantic traffic is forecast to grow by a compound annual growth rate of 13.7% from 2020-2040. By 2040, the Trans-Atlantic segment accounts for 8.4% of total passenger traffic, compared to no traffic until 2020. The fluctuating growths throughout the planning period are derived by the anticipated increases in the weekly scheduled frequencies.

#### 4.6.2 Aircraft Movements Forecast

The Baseline Case, or most likely forecast of aircraft movements (two-way), is provided in Table 4-5. In the Baseline Case forecast, total commercial aircraft movements (two-way) are projected to grow by CAGR of 3.6% over the forecast period, reaching 3,751 movements (two-way) in 2040 compare to 1,328 in 2012.

Military operations are expected to grow 5% by the end of the forecast period, and reach 8,238 movements in 2040 compared to 7,846 in 2012, equivalent to 0.2% CAGR over the forecast period. Additionally, the General Aviation operations are expected to remain flat through the forecast period, reaching 18,090 movements (two-way) in 2040 compare to 17,911 in 2012. Over the forecast period this corresponds to a 0.04% CAGR.

In line with the historical trend, no increase in air cargo operations is forecasted in the Baseline Case. Total aircraft movements at NFIA reach 30,081 (two-way) in 2040, representing a CAGR of 0.4% over the forecast period. The fluctuating growths throughout the planning period are derived by the anticipated increases in the weekly scheduled frequencies.

### 4.7 FLEET MIX

#### 4.7.1 Commercial Aviation

During the forecast period, it is expected that the commercial fleet mix at NFIA will remain fairly consistent and maintain similarities to present day operations. Currently, both Spirit and Allegiant operate aircraft in FAA Airplane Design Group III at NFIA. Spirit utilizes A320s and Allegiant utilizes MD80s.

For the Baseline Case traffic categories - All Other US, US Leisure, and Mexico & Caribbean – InterVISTAS expects that Design Group III airplanes will remain the aircraft of choice for airlines carrying passengers in these NFIA markets. Given the geographic locations of the expected NFIA markets, the predicted sizes of those markets and the vast number of airlines operating these aircraft, InterVISTAS is confident in this assumption. Aircraft such as the B737, A320 and MD80 have been the workhorses of many US airlines for decades and it is highly likely that their positive attributes and their continued refinement will make them ubiquitous at airports like NFIA for several more decades.

Accordingly, InterVISTAS' forecast model for NFIA incorporated aircraft of a size (in number of seats) that is consistent with Design Group III aircraft. The number of seats onboard these aircraft are expected to range from 130-180 over the forecast period. As discussed previously,

**Table 4-5 Forecast Total Aircraft Movements (Operations)**

Year	Commercial	Cargo	Military	GA Itinerant	GA Local	Total
1997	0	-	12,328	14,906	19,883	47,117
2000	0	-	13,052	13,365	14,697	41,114
2010	0	-	9,130	14,112	11,150	34,392
2011	1,706	-	6,873	12,170	7,724	28,473
2012	1,328	-	7,846	10,957	6,954	27,085
2013	1,380	-	7,860	10,961	6,957	27,158
2014	1,415	-	7,874	10,965	6,959	27,213
2015	1,452	-	7,888	10,969	6,961	27,270
2016	1,528	-	7,902	10,973	6,964	27,367
2017	1,607	-	7,916	10,977	6,966	27,466
2018	1,689	-	7,930	10,980	6,969	27,568
2019	1,773	-	7,944	10,984	6,972	27,673
2020	1,877	-	7,958	10,988	6,974	27,797
2021	1,953	-	7,972	10,992	6,976	27,893
2025	2,392	-	8,028	11,008	6,986	28,414
2026	2,475	-	8,042	11,012	6,989	28,518
2030	2,891	-	8,098	11,027	7,000	29,016
2035	3,327	-	8,168	11,047	7,012	29,554
2040	3,751	-	8,238	11,067	7,025	30,081
Annual Growth Rates						
2012	-22.2%	-	14.2%	-10.0%	-10.0%	-4.9%
2013	3.9%	-	0.2%	0.0%	0.0%	0.3%
2014	2.5%	-	0.2%	0.0%	0.0%	0.2%
2015	2.6%	-	0.2%	0.0%	0.0%	0.2%
2016	5.2%	-	0.2%	0.0%	0.0%	0.4%
2017	5.2%	-	0.2%	0.0%	0.0%	0.4%
2018	5.1%	-	0.2%	0.0%	0.0%	0.4%
2019	5.0%	-	0.2%	0.0%	0.0%	0.4%
2020	5.9%	-	0.2%	0.0%	0.0%	0.4%
2020-2025	27.4%	-	0.9%	0.2%	0.2%	2.2%
2025-2030	20.9%	-	0.9%	0.2%	0.2%	2.1%
2030-2035	15.1%	-	0.9%	0.2%	0.2%	1.9%
2035-2040	12.7%	-	0.9%	0.2%	0.2%	1.8%
Compound Annual Growth Rates						
2012-2016	2.8%	-	0.1%	0.0%	0.0%	0.2%
2015-2025	4.6%	-	0.2%	0.0%	0.0%	0.4%
2012-2040	3.6%	-	0.2%	0.0%	0.0%	0.4%

Source: InterVISTAS Consulting, McFarland Johnson, Inc.

average load factor assumptions are applied to aircraft with these seat counts to determine the estimated aircraft operations at NFIA. The projection of the fleet mix is also greatly influenced by Spirit and Allegiant fleet plan. Table 4-6 below illustrates the expected mix at NFIA. Based on the Allegiant's projected fleet plan, by 2015 the airline will be utilizing 19 A319 compare to 0 in 2012. The published fleet plan of Spirit also reports an increase of 30%, growing from 54 to 71 Airbus narrow-bodies. This graduate shift towards the next generation narrow-body aircraft has been assumed in the NFIA fleet mix projection.



For the Baseline Case traffic category - Trans-Atlantic Europe Service Introduction – InterVISTAS expects that Design Group IV airplanes will be the most likely types of aircraft flying between NFIA and European destinations. The aircraft in Design Group IV such as the B757 and the B767 are very commonly used by airlines operating between points in the eastern US and Europe. The aircraft size (in seats), range capabilities and economics are well-suited for many US-Europe markets, including NFIA.

During the forecast period in the Trans-Atlantic Europe Service Introduction category, InterVISTAS expects the aircraft size (in seats) to increase as passenger demand levels increase. For approximately the first 15 years of service, InterVISTAS assumes B757 will carry this traffic. After Year 15, the aircraft utilized will begin migrating to the B767. As a result, InterVISTAS sees average seats per operation increasing from about 180 to almost 300 seats during the forecast period.

In addition to the commercial fleet mix projections, InterVISTAS has also analyzed the historical weekly General Aviation movements in NFIA. Single-Engine Piston has been determined as the main aircraft with almost 40% share. The General Aviation operation in NFIA is expected to remain quite stable and a limited growth is assumed throughout the planning period, which is also reflected in the expected fleet mix, maintaining the same distribution.

With respect to the Military operations, currently C-130 Hercules is the dominant aircraft at NFIA, and is expected to remain the main aircraft to be operated in the Niagara Falls Air Reserve Station. The expected fleet mix distribution at NFIA is illustrated in Table 4-6 below.

**Table 4-6 Niagara Falls International Airport Fleet Mix Forecast**

Aircraft	Seats	FAA Design Code	2012		2018		2023		2033	
			Departures	Share	Departures	Share	Departures	Share	Departures	Share
<b>COMMERCIAL</b>										
A 320	175	III	208	31.3%	268	31.7%	333	30.6%	467	29.5%
MD - 80	160	III	456	68.7%	548	64.9%	286	26.3%	150	9.5%
B - 757	200	IV	-	0.0%	-	0.0%	39	3.6%	117	7.4%
B - 767	250	IV	-	0.0%	-	0.0%	-	0.0%	-	0.0%
A-319	150	III	-	0.0%	29	3.4%	429	39.5%	849	53.6%
<b>GENERAL AVIATION</b>										
Single-Engine Piston			3,565	39.8%	3,572	39.8%	3,578	39.8%	3,591	39.8%
Single-Engine Turboprop			1,541	17.2%	1,543	17.2%	1,546	17.2%	1,552	17.2%
Twin-Engine Jet			1,442	16.1%	1,445	16.1%	1,448	16.1%	1,453	16.1%
Twin-Engine Piston			1,156	12.9%	1,158	12.9%	1,160	12.9%	1,164	12.9%
Twin-Engine Turboprop			1,253	14.0%	1,256	14.0%	1,259	14.0%	1,263	14.0%
<b>MILITARY</b>										
C-130 Hercules			3,923	100.0%	3,965	100.0%	4,000	100.0%	4,070	100.0%

Source: InterVISTAS Consulting.

## 4.8 GENERAL AVIATION FORECASTS

General aviation activity at NFIA is estimated to involve approximately 80% locally based aircraft, comprised of primarily single-engine aircraft. The limited itinerant aircraft that utilize NFIA are primarily single-engine or (in the case of business aircraft) twin-engine non-jet aircraft. The cost of aircraft fuel and general economic conditions has impacted general aviation activity in most regions of the U.S., including the Buffalo Niagara Region. It is anticipated that this trend will largely continue over the forecast period, dampening demand and resulting in overall flat growth of GA operations at NFIA, as described above.

The total annual number of passengers onboard GA flights at NFIA is difficult to estimate, but, for forecast purposes, InterVISTAS believes it is reasonable to assume an average of two passengers per GA operation during the forecast period. Table 4-7 below shows the resulting forecast GA passenger counts at NFIA between 2012 and 2040.

**Table 4-7 Forecast General Aviation Traffic Movements**

Year	General Aviation Operations	General Aviation Passengers
2012	17,912	35,824
2013	17,918	35,836
2014	17,924	35,848
2015	17,930	35,860
2016	17,936	35,872
2020	17,962	35,924
2021	17,968	35,936
2025	17,994	35,988
2026	18,000	36,000
2030	18,026	36,052
2035	18,058	36,116
2040	18,090	36,180
Annual Growth Rates		
2013	0.0%	0.0%
2014	0.0%	0.0%
2015	0.0%	0.0%
2015-2025	0.2%	0.2%
2020-2025	0.2%	0.2%
2025-2030	0.2%	0.2%
2030-2035	0.2%	0.2%
2035-2040	0.2%	0.2%

Source: InterVISTAS Consulting Group.

#### 4.8.1 Air Cargo Forecasts

Based on the findings of past cargo studies reviewed by InterVISTAS, it is apparent that air cargo levels at Niagara Falls International Airport are highly influenced by competition from other airports in the region, appropriate airline services to transport cargo, and cargo-related infrastructure at NFIA. From a regional perspective, it is anticipated that the vast majority of commercial air services in the Buffalo Niagara Region will remain located at Buffalo Niagara International Airport - including both passenger services and air express cargo services. In addition to BNIA's air express carriers (FedEx and UPS), the airport's passenger airlines will likely remain traditional network and low-cost carriers that are known to carry belly cargo. Due to the presence of these air services, BNIA will continue to attract the majority of air cargo moving in the region.

Meanwhile, the passenger airlines expected to operate at NFIA are ultra low cost carriers (such as Allegiant and Spirit) that are known to forgo carrying belly cargo. The operational profiles of these types of carriers - where destinations are served on an infrequent, less-than-daily basis - makes them less attractive options to the air cargo community. Further, carriers offering international services between Europe and NFIA will also operate relatively infrequently where destinations may not be served on a daily basis from NFIA and only on a seasonal basis. Therefore, it is unlikely that the airlines at NFIA will carry meaningful amounts of cargo during the forecast period. Due to the small amounts of cargo that may be carried over the course of each year, Baseline Case forecasts show annual cargo volumes at a level equal to the average tonnage reported at NFIA between the years 2010 and 2012. The annual 31 metric tons of air cargo estimated represents the amount of cargo that will be carried by the types of airlines expected to operate at NFIA during the forecast period.

#### 4.8.2 Based Aircraft Forecasts

The forecasts of based aircraft serve a prime role in the future planning of facilities at Niagara Falls International Airport. While many of the airside facilities will be planned based on the larger air carrier and military aircraft utilizing NFIA, the number of based general aviation aircraft is pivotal when planning for the development of future facilities such as aircraft hangars and apron space to accommodate based aircraft. The Federal Aviation Administration publishes an annual forecast that identifies national trends and growth/decline of general aviation aircraft by type, including single engine, multi-engine (piston), multi-engine (turbofan), jet, and rotorcraft. The FAA Aerospace Forecasts for Fiscal Years 2012-2032 indicate relatively flat conditions for all aircraft types, particularly for single engine and multi-engine aircraft, with a slightly higher rate of growth for jets and rotorcraft. However, as local socioeconomic conditions have been relatively flat in recent history, the growth rate for based single and multi-engine aircraft has been reduced by 50%, while the growth rate for jets and rotorcraft follow the rates identified in FAA's Aerospace Forecasts for Fiscal Years 2012-2032. The number of based military aircraft is anticipated to remain unchanged throughout the forecast period. Table 4-8 indicates the forecast of based aircraft at NFIA compared with the projected numbers indicated in the FAA's Terminal Area forecasts.

**Table 4-8 Based Aircraft Forecasts**

Year	Single	Multi	Jet	Rotor	Military	Total	TAF
2012	53	4	3	1	12	<b>73</b>	47
2013	53	4	3	1	12	<b>73</b>	48
2014	53	4	3	1	12	<b>73</b>	48
2015	53	4	3	1	12	<b>73</b>	48
2016	53	4	3	1	12	<b>73</b>	49
2020	52	4	4	1	12	<b>73</b>	50
2021	52	4	4	1	12	<b>73</b>	51
2025	52	4	5	1	12	<b>74</b>	52
2026	52	4	5	1	12	<b>74</b>	52
2030	53	4	6	2	12	<b>77</b>	52
2035	53	4	7	2	12	<b>78</b>	52
2040	53	5	9	2	12	<b>81</b>	52

Source: McFarland-Johnson, Inc.

## 4.9 PEAK PERIOD FORECASTS

To support the airport facilities planning process, peak period forecasts were derived from the annual forecast numbers. Peak period forecasts present the air traffic activity levels that can be expected during peak hours, and typically drive airport facility requirements. Key indicators are the number of aircraft operations in the peak, driving the layout of the airfield, and peak hour passenger enplanements, driving the requirements for filters such as check-in, security and immigration.

### 4.9.1 Peak Hour Forecast of Aircraft Operations

Table 4-9 presents the historical peak period activity levels for Commercial, Military and General Aviation operations. The peak month and peak day activity levels for Commercial, Military and General Aviation operations are determined using the available data from the FAA Air Traffic Activity Systems Database. With historic peak hour data unavailable, commercial activity level in the peak hour has been estimated using commercial air carrier schedule data for 2011 and 2012. The historic schedule data indicates NFIA handled two aircraft operations in the peak hour. In addition, it is estimated the airport handled one additional charter aircraft in the peak hour. The number of Military and General Aviation operations in the peak hour is estimated assuming a certain distribution of traffic throughout the day. Traffic is not evenly distributed over the day, but typically has a distinct profile with peaks (where traffic activity is concentrated) and troughs (with no or limited activity). It is assumed activity in the peak hour is 150% times the theoretical average hourly activity if traffic were to be distributed evenly throughout the day.

**Table 4-9 Peak Profile at Niagara Falls International Airport**

		2008	2009	2010	2011	2012
<b>Commercial Operations</b>	Peak Month				143	166
	Peak Day				14	20
	Peak Hour				4	4
<b>Military Operations</b>	Peak Month	902	1,043	1,045	809	877
	Peak Day	115	118	117	102	126
	Peak Hour	7	7	7	6	8
<b>General Aviation Operations</b>	Peak Month	1,656	1,709	1,849	1,636	1,395
	Peak Day	114	109	167	125	178
	Peak Hour	7	7	10	8	11

Source: FAA ATAD; McFarland Johnson.

To forecast future peak month, peak day and peak hour operations for the Commercial, Military and General Aviation segments, the following ratio approach is used (a standard approach used in airport forecasting):

**Peak Month / Annual Aircraft Movements**

The ratio of peak month aircraft operations to annual aircraft movements. During the historic period reviewed, the average ratio was 14.97% for Commercial operations, 10.97% for Military operations and 12.85% for General Aviation operations. The ratio of peak month aircraft movements to annual aircraft movements is expected to remain constant during the forecast period for all segments.

**Peak Day / Annual Aircraft Movements**

The ratio of peak day aircraft movements to annual aircraft movements. During the historic period reviewed, the average ratio was for 1.88% for Commercial operations, 1.37% for Military operations and 1.10% for General Aviation operations. The ratio of peak month aircraft movements to annual aircraft movements is expected to remain constant during the forecast period for all segments.

As mentioned, the activity in the peak hour is determined by assuming a certain distribution of traffic throughout the day. By applying these average ratios to the projected Commercial, Military and General Aviation annual movements, the future peak profile can be forecasted and is presented in Table 4-10.

**Table 4-10 Forecasted Peak Operations Profile at Niagara Falls International Airport**

		2012	2015	2016	2020	2021	2025	2026	2030	2035
<b>Commercial Operations</b>	Peak Month	166	221	236	281	292	358	371	433	498
	Peak Day	20	28	29	35	37	45	47	54	63
	Peak Hour	4	3	3	5	5	7	7	7	7
<b>Military Operations</b>	Peak Month	877	866	867	873	875	881	882	889	896
	Peak Day	126	108	108	109	109	110	110	111	112
	Peak Hour	8	9	9	9	9	9	9	9	9
<b>General Aviation Operations</b>	Peak Month	1,395	2,304	2,304	2,308	2,309	2,312	2,313	2,316	2,320
	Peak Day	178	197	197	198	198	198	198	198	199
	Peak Hour	11	12	12	12	12	12	12	12	12

Source: InterVISTAS Consulting Group; McFarland Johnson.

#### 4.9.2 Peak Hour Forecast of Passenger Enplanements

Future passenger enplanements in the peak hour are forecasted by multiplying the expected number of commercial departures by the estimated number of passenger enplanements per departure. To forecast the future of aircraft departures, a bottom-up approach of the expected air service development at the airport in the coming years is used, in conjunction with an analysis of the air service pattern of similar airports.

Historic analysis of airline schedule data revealed that NFIA handled two departures in the peak hour; in addition it is estimated the airport handled one additional charter aircraft. These departures take place in the morning between 10 and 11am, and in the evening between 6 and 7pm. Rather than adding additional services at these hours, it is more likely that new services will be introduced around noon and later in the afternoon, i.e. outside the current peak hour.

Around 2020, it is anticipated NFIA will also see the introduction of charter services from Europe. Based on airline operations across time zone differences, these international services are likely to arrive around noon and depart in the late afternoon, and are expected to coincide with one of the newly formed peaks at NFIA from 2025 onwards.

Table 4-11 presents the resulting peak forecast for commercial aircraft at NFIA, and the corresponding enplanements. The number of passenger enplanements per departure has received a small premium to reflect expected higher load factors in the peak hour.

**Table 4-11 Forecast Peak Enplanement Profile at Niagara Falls International Airport**

Year	Peak Hour Departures		Enplanements per Departure		Peak Hour Enplanements	
	Baseline	European Service	Baseline	European Service	Baseline	European Service
2013	3	0	134	-	403	-
2014	3	0	134	-	403	-
2015	3	0	134	-	403	-
2020	4	0	143	-	573	-
2025	4	1	153	178	610	178
2030	4	1	162	210	647	210
2035	4	1	171	243	683	243
2040	4	1	180	275	720	275

Source: InterVISTAS Consulting.

The forecast projects that the peak hour enplanements will grow to 573 enplanements by 2020, 857 by 2030, and ultimately 995 by 2040, out of which 0, 210, and 275 enplanements respectively are associated with the introduction of the European Services. The key driver is the expected European services; these international services are likely to arrive around noon and depart in the late afternoon and coincide with one of the peaks at NFIA.

#### 4.10 COMPARISON WITH FAA TERMINAL AREA FORECASTS

In comparing the NFIA forecasts with the FAA’s most recent Terminal Area Forecasts (“TAF”), it can be shown that the Master Plan Update is reasonably close in terms of Aircraft Operations levels (especially in the earlier years of the forecasts), but there are substantial differences in the Passenger Enplanements estimates (see Table 4-12). Additionally, Tables 4-13 and 4-14 below show alternative formats of the TAF comparisons to the Master Plan Update forecast results.

One reason for the variances in Passenger Enplanements relates to the large discrepancy between the figures reported for 2012. The FAA reports 94,912 enplanements, while InterVISTAS relied upon enplanements data reported by the U.S. Department of Transportation that shows 86,605 enplanements at NFIA. With the historic NFIA data varying between sources by 8.8%, the respective Enplanement forecasts are clearly starting at vastly different traffic levels which carry through to the out-years.

**Table 4-12 NFIA Forecast Summary and Comparison to FAA Terminal Area Forecast**

Forecast/Component	2012	2013	2016	2017	2022	2023	2027	2032	CAGR <sup>4</sup> (2012-2032)
<b>FAA Terminal Area Forecasts (2012)</b>									
Passenger Enplanements	94,912	96,430	101,136	102,767	111,332	113,140	120,658	130,780	1.54%
Aircraft Operations	25,296	25,132	25,318	25,384	25,724	25,794	26,091	26,483	0.22%
Based Aircraft	47	48	49	49	51	52	52	52	0.48%
<b>NFIA Master Plan Update (2013)</b>									
Passenger Enplanements <sup>1</sup>	86,605	90,069	107,846	114,690	151,831	161,819	199,366	253,523	5.25%
Aircraft Operations <sup>2</sup>	27,085	27,158	27,419	27,518	28,026	28,155	28,621	29,222	0.36%
Based Aircraft	73	73	73	73	73	73	74	77	0.25%
<b>Percent Difference from TAF</b>									
Enplanements	-8.8%	-6.6%	6.6%	11.6%	36.4%	43.0%	65.2%	93.9%	N/A
Aircraft Operations	7.1%	8.1%	8.3%	8.4%	8.9%	9.2%	9.7%	10.3%	N/A
Based Aircraft <sup>3</sup>	55.3%	52.1%	49.0%	49.0%	43.1%	40.4%	42.3%	48.1%	N/A

**Notes:**

1 – InterVISTAS’ NFIA passenger forecasts were developed on an Origin & Destination (2-way) basis. The Passenger Enplanements figures shown in this table were derived by taking 50% of the Origin & Destination forecasts. Actual 2012 Enplanements at NFIA are as reported by the U.S. Department of Transportation.

2 – InterVISTAS’ Aircraft Operations forecasts include categories equivalent to those identified from the FAA Terminal Area Forecasts listed in this table.

3 – The NFIA Master Plan Update forecasts incorporate 12 based military aircraft at NFIA. The FAA’s 2012 TAF does not incorporate the presence of the based military aircraft, which accounts for a substantial portion of the differential.

4- CAGR – Compound Annual Growth Rate

Source: FAA Terminal Area Forecasts, 2012; FAA Air Traffic Activity Data System (ATADS); U.S. Department of Transportation T-100 Air Carrier Reports; InterVISTAS Consulting; and McFarland Johnson, Inc.

Additionally, the Enplanements variations in the forecast years relate to the differences in methodologies employed by the FAA and InterVISTAS. The FAA methodology is largely based on econometric modeling and historic NFIA traffic levels, while InterVISTAS’ methodology is based on a regional analysis of passenger demand and explicit assumptions of new international and domestic low cost carrier services at the NFIA. In this manner, the InterVISTAS methodology incorporates substantial “net new” passenger demand (driven by the new air services) - which is absent from the FAA forecasts. In 2032, the FAA forecast shows approximately 131,000 Enplanements, while the Master Plan Update expects over 253,000 Enplanements.

On the other hand, the Aircraft Operations forecasts for NFIA are very similar in the early years, but vary through the planning period. While both forecasts incorporate a decrease in general aviation operations between 2012 and 2016, the TAF forecasts incorporate a much more substantial decrease as opposed to the Master Plan forecasts. The FAA TAF shows flat overall growth of Aircraft Operations, whereas the Master Plan Update shows slow net growth of approximately 2,100 Operations (or an average increase of 0.4% per year) through 2032.



**Table 4-13 NFIA Forecast Summary and Comparison to FAA Terminal Area Forecast for Aircraft Operations (Using TAF Formatting)**

Year	Itinerant Air Carrier	Itinerant Air Taxi	Itinerant GA	Itinerant Military	Local Civil	Local Military	Total Airport Ops
<i>Source: FAA TAF (2012)</i>							
2012	1,242	1,194	9,976	4,611	5,262	3,011	25,296
2013	1,260	1,194	10,259	4,611	4,797	3,011	25,132
2016	1,314	1,194	10,238	4,611	4,950	3,011	25,318
2017	1,336	1,194	10,231	4,611	5,001	3,011	25,384
2022	1,444	1,194	10,196	4,611	5,268	3,011	25,724
2023	1,466	1,194	10,189	4,611	5,323	3,011	25,794
2027	1,562	1,194	10,161	4,611	5,552	3,011	26,091
2032	1,692	1,194	10,126	4,611	5,849	3,011	26,483
<i>Source: NFIA Master Plan Update Forecasts (2013)<sup>1</sup></i>							
2012	1,328	N/A	10,957	N/A	6,954	7,846	27,085
2013	1,380	N/A	10,961	N/A	6,957	7,860	27,158
2016	1,548	N/A	10,973	N/A	6,964	7,902	27,387
2017	1,627	N/A	10,977	N/A	6,967	7,916	27,487
2022	2,064	N/A	10,996	N/A	6,979	7,986	28,025
2023	2,174	N/A	11,000	N/A	6,981	8,000	28,155
2027	2,558	N/A	11,016	N/A	6,991	8,056	28,621
2032	3,056	N/A	11,035	N/A	7,004	8,126	29,221

**Notes:**

*1 – Due to lack of available information, the NFIA Master Plan forecasts do not distinguish between Itinerant Military and Local Military operations. With the presence of the U.S. Air Force Reserve Command's 914th Airlift Wing and the New York Air National Guard's 107th Airlift Wing at NFIA, the forecasts assume that the majority of the military operations will be Local operations. Therefore, for purposes of this table, all military operations listed under the NFIA Master Plan Update are designated as Local Military.*

**Table 4-14 NFIA Forecast Summary and Comparison to FAA Terminal Area Forecast for Passenger Enplanements (Using TAF Formatting)**

Year	Air Carrier	Air Taxi	Commuter	US Flag	Foreign Flag	Total International Enplanements	Total Enplanements
<i>Source: FAA TAF - 2012</i>							
2012	89,443	N/A	5,459	N/A	N/A	N/A	94,912
2013	90,961	N/A	5,459	N/A	N/A	N/A	96,430
2016	95,667	N/A	5,459	N/A	N/A	N/A	101,136
2017	97,298	N/A	5,459	N/A	N/A	N/A	102,767
2022	105,863	N/A	5,459	N/A	N/A	N/A	111,332
2023	107,671	N/A	5,459	N/A	N/A	N/A	113,140
2027	115,189	N/A	5,459	N/A	N/A	N/A	120,658
2032	125,311	N/A	5,459	N/A	N/A	N/A	130,780
<i>Source: NFIA Master Plan Update Forecasts (2013)<sup>12</sup></i>							
2012	86,605	N/A	N/A	86,605	N/A	1,631	86,605
2013	90,069	N/A	N/A	90,069	N/A	1,696	90,069
2016	103,946	N/A	N/A	103,946	N/A	2,458	107,846
2017	110,790	N/A	N/A	110,790	N/A	2,657	114,960
2022	151,831	N/A	N/A	147,931	3,900	7,663	151,831
2023	161,819	N/A	N/A	155,969	5,850	9,857	161,819
2027	199,365	N/A	N/A	189,615	9,750	14,781	199,365
2032	253,523	N/A	N/A	235,476	18,047	24,469	253,523

**Notes:**

1 – The Air Carrier category under the NFIA Master Plan Update Forecasts is assumed to be comprised of commercial operations by US Flag and Foreign Flag airlines.

2 – The Total International Enplanements category under the NFIA Master Plan Update Forecasts is assumed to be comprised of passengers traveling on: 1) US Flag airlines - serving Mexico and the Caribbean markets and 2) Foreign Flag airlines.