



# **Nantucket Memorial Airport Master Plan Update**

## **Chapter 4— Aviation Activity Trends**



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Prepared for:  
**Nantucket Memorial Airport Commission**

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## Chapter 4- Aviation Activity Trends

### 4.1 Aviation Activity – Overview

Aviation activity is tracked and measured in a variety of ways, primarily in terms of **passenger enplanements** and **aircraft operations**. Enplanements and operations are recorded by a variety of agencies and companies including the FAA, airport administration and operations, airlines, U.S. DOT, U.S. DHS, and various private firms such as Passur, FlightAware, etc. that track flights throughout the U.S. The extensive amount of data collection presents both advantages and challenges:

- **Advantages:** extensive amount of data; different data points and level of detail compiled; different sources can verify overall trends.
- **Challenges:** data is measured using different definitions; different time periods (e.g. fiscal year vs. calendar year); is collected and used for different purposes; difficult to ascertain accuracy of individual sources; not all data is in the public domain; and it is difficult to reconcile apparent differences/discrepancies between data sources.

Most measures of aviation activity at Nantucket Airport showed declines between 2000 and 2012. Aircraft operations and passenger enplanements experienced upward and downward cycles over that 13 year period, however the overall trend was downward. Significantly, Air Carrier enplanements to large hub destinations (New York and beyond) and Business Jet activity both experienced strong growth.

The implications of this growth will be examined, below.

Table 4-1

Aviation Activity - Nantucket Airport  
Percent Change 2000 - 2012

<b>Passenger Enplanements</b>	-41.9%
<b>Aircraft Operations:</b>	
• Air Carrier	+720%
• Air Taxi	-20.6%
• General Aviation	-27.7%
• Business Jets	+24.9%
<b>Based Aircraft</b>	-31.6%

Sources: FAA and Nantucket Airport

Air carrier aircraft operations are primarily Jet Blue's ERJ-190. Other (smaller) regional jets and turboprops, as well as activity by Cape Air, Nantucket and Island Airlines, are counted by the FAA as air taxi.



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A variety of factors account for the change in aviation activity:

- a. The rapidly rising cost of General Aviation aircraft ownership and operation.
- b. The economic recession of 2008-2010, which impacted visitor travel throughout Massachusetts and New England, exacerbated the downward trends. The decline in aviation activity, however, pre-dated the start of the recession.
- c. Competition from scheduled ferry service between Hyannis and Nantucket, particularly the high-speed ferry. Factors such as cost and frequency of service have contributed to the shift in ridership and impact on Passenger Enplanements.

Activity trends experienced at Nantucket were not unique. Airports throughout the Commonwealth, New England, and the U.S. experienced similar, and in some cases steeper declines in aviation activity over the same 13 year period, due to many of the same factors.

Positive trends included continued summer hub service by four major airlines and their regional partners. Cape Air has continued to expand its overall network, and Island Airlines has added several Cessna Caravans to their fleet. Corporate aircraft activity rebounded after the decline in 2008 – 2010.

*As discussed in more detail in Chapter 5, Forecasts, the current trends and economic factors that would stimulate future growth in aviation activity at Nantucket Airport would include: additional Air Carrier regional jet service, particularly to hub airports; continued steady growth in the Commonwealth and national economy; aircraft operating costs rise no faster than the overall rate of inflation; no new security restrictions or procedures are imposed on airport or airspace access. These affect both aircraft operations and passenger enplanements, as further discussed below.*

## 4.2 Passenger Enplanements

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### 4.2.1 Aircraft Passengers

Government and airport statistics count **Passenger Enplanements**, which is defined as one revenue-generating passenger that boards an aircraft at the airport for departure. In addition, the types of passengers are classified as:

- **Origin and Destination (O&D)** – a passenger trip that begins and ends at a particular airport. Nantucket Airport is primarily an Origin and Destination point – i.e. the large majority of arriving passengers do not connect with another flight.
- **Connecting** – passengers that connect with another flight to continue their trip. At airports such as Boston Logan, JFK, Philadelphia, Newark, Dallas-Fort Worth, Atlanta, etc., a large percentage of their passengers connect with other flights as opposed to ending or beginning their trip there.



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Aircraft passenger and users at Nantucket Airport (FAA identifier = ACK) encompass five separate and very distinct markets. Each market segment has different travel needs, price sensitivity, schedule flexibility, and each responds to different market/economic factors. The first two markets, i.e. Island visitors, represent the largest segment of aviation users.

**Table 4-2**

Nantucket Travel Market	Primary Travel Modes To-From Island
1. Year-round Island residents	Primarily ferry passengers, as well as scheduled airline passengers, some owner-flown GA aircraft
2. Seasonal workers - primarily employed in the service/ hospitality industry	Primarily ferry passengers as well as scheduled airline passengers
3. Second home owners	Corporate aircraft, owner-flown GA traffic, private boat, scheduled airline, on-demand air taxi service, ferry.
4. Non-resident (short-term) Island visitors	Primarily ferry passengers, some owner-flown GA traffic, as well as some scheduled airline passengers
5. Daily workers ('commuters') primarily in construction and goods delivery	Primarily ferry passengers, as well as scheduled airline passengers

### 4.2.2 Additional Trends and Factors

- There are two modes of travel between Nantucket and the mainland; by water and air. In C.Y. 2011 and 2012, approximately 78% of all passengers used ferry service and 22% used air service.
- Nantucket's economy is heavily dependent on tourism and the hospitality industry. In turn, the tourist and hospitality industry is dependent on reliable ferry and air service.
- Both ferry and air service passenger traffic exhibit very strong summer season peaks.
- Nantucket is an origin and destination (O&D) passenger market. The majority of ferry and air passengers are visitors, and the majority of passengers are also discretionary vs. business travelers.
- Nantucket's year-round population is just under 11,000. In the summer season the Island's population can reach almost 60,000.
- There are five distinct travel markets on Nantucket, and each market has different travel requirements as well as different price and trip time sensitivity:
  - a. year-round Island residents
  - b. seasonal residents (primarily employed in the hospitality/retail industry)
  - c. second home owners
  - d. non-resident tourists (typically short-term visitors – two weeks or less)
  - e. short-term workers (daily/weekly commuters – e.g. construction, etc.)
- The majority of visitors to Nantucket originate from the Northeast, particularly from the greater New York metro region. Most visitors drive to Hyannis to connect with ferry service to Nantucket.
- Future residential and commercial development, as well as population and employment growth on the Island, is constrained by the limited amount of land area available, due in part to protected sensitive environmental resources, open space, and historic districts; the high cost of land and housing, and the lack of affordable housing; and the Island's remote location.
- No significant changes are anticipated to the Island's economy or demographic characteristics.



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### 4.2.3 Passenger Airline Service

- Scheduled airline service at Nantucket is provided to two separate and distinct markets: the first is year-round, very short-haul, high frequency ('shuttle-like') service provided by Cape Air/Nantucket Airlines, and Island Air. The 9-passenger piston-engine Cessna 402 is the primary aircraft used, with several turboprop Cessna Caravans (also 9-passengers) now in service with Island Air.

<i>Airline</i>	<i>Airport</i>
<b>Cape Air &amp; Nantucket Airlines</b>	Boston, Hyannis, Martha's Vineyard, Providence, New Bedford
<b>Island Airlines</b>	Hyannis

- Cape Air has interline agreements with a number of major airlines, including Jet Blue and United. Cape Air operates from Jet Blue gates in Terminal C at Logan Airport. In the peak summer season, Jet Blue flies between Nantucket and JFK International Airport, and Cape Air flies between Nantucket and Boston Logan Airport year-round providing connecting service with Jet Blue. Jet Blue has greatly increased service at Boston Logan Airport since 2010.
- The short-haul air service competes directly with ferry service between Hyannis and Nantucket. Passenger traffic on the short-haul airlines (Nantucket and Island Airlines), as well as the regular ferry service, has declined since 2008 while passenger traffic on high-speed ferries has increased.
- Ferry service attracts price sensitive passengers, as well as those who prefer not to fly in relatively small aircraft such as the Cessna 402. High-speed ferry service has been particularly competitive with air service on the Hyannis-Nantucket route, which is the largest single route in terms of passenger volume for both the short-haul airlines and ferry companies.
- Both Cape and Island Air have indicated that they will continue to operate the C-402 for the foreseeable future on the existing short-haul route network.
- The second air service market at Nantucket is the summer season, hub-oriented service provided by four major airlines<sup>2</sup>.

<i>Airline</i>	<i>Hub Airport</i>	<i>Aircraft (pax seats)</i>
<b>Jet Blue</b>	Boston Logan and JFK New York	ERJ-190 (100)
<b>United (Commutair)</b>	Newark	Dash 8-Q300 (50)
<b>Delta (Chautauqua)</b>	JFK New York	CRJ-200 (50)
<b>US Airways (Air Wisconsin)</b>	Reagan National, Washington DC.	CRJ-200 (50)
US Air previously served ACK - LaGuardia and Philadelphia. United, Delta, and US Airways use regional partners for service to ACK.		

Three of the four carriers use their regional partners to serve ACK. In addition, Tradewinds offers year-round small turboprop service between ACK and Teterboro, NJ and White Plains, NY, operating Cessna Caravans. Access to airline hubs provides connecting service to a large number of domestic and international destinations. Newark was a major hub for Continental, acquired by United, and offers connections via one airline to a large number of domestic and international destinations. Service to some hub airports such as JFK and Boston Logan, for example, requires changing airlines and terminals if passengers transfer to another airline for their connecting service.

<sup>2</sup> Major airline – a certificated air carrier that generates more than \$1 billion in revenue annually. In 2013 there were 17 major airlines in the U.S.



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- The summer season hub airline service will be impacted by on-going changes in the airline industry, including consolidation and mergers (such as the recent American-US Airways merger), the replacement of 50-seat regional aircraft with 70-100 seat aircraft, limited capacity growth, as well as rising costs and ancillary fees. Even with those changes mainline service will continue to be seasonal, hub-oriented, and focused on the New York City metro region.

There are a number of sources of passenger data, and they each use different definitions of passengers (e.g. air carrier, air taxi, regional, major, revenue vs. non-revenue, etc.):

- The U.S. DOT compiles passenger data from airlines, which is imported into the Air Carrier Activity Information System (ACAIS);
- The FAA uses the ACAIS database to report passenger boarding and all-cargo data;
- Airlines report passenger data to individual airports, as well as to U.S. DOT;
- Airports track passenger traffic, as reported by the individual airlines.

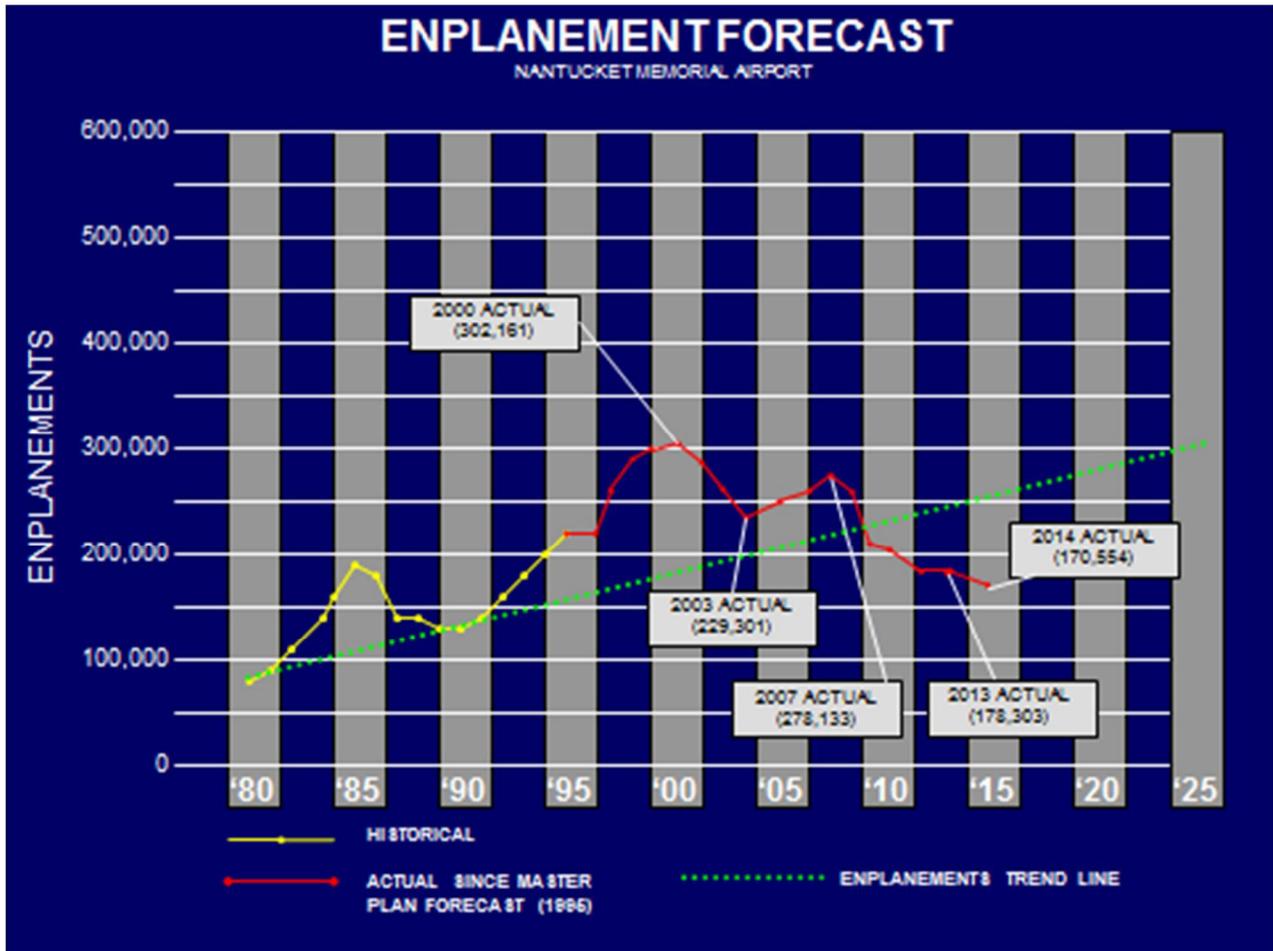
As a result of these differing sources, the passenger data does not exactly correspond with each other. Based on the FAA's ACAIS database, passenger enplanements at Nantucket Airport have fluctuated in cycles since 1980.

**Chart 4-1** on the following page, illustrates the cyclical nature of Nantucket's enplanements, albeit with a decline driven by the national recession between 2007 and 2012 when enplanements fell by 37%. However, the general Enplanements Trend Line (green dashed line) shows a consistent overall average increase.



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Chart 4-1



Declines in passenger traffic have been due in large part to the national economic recession, rising cost of aircraft operations, as well as increased competition from ferry service. Most of the decline was experienced by year-round passengers on Cape Air/Nantucket Airlines and Island Airlines. During the 2000-2012 period, enplanements declined by nearly 42%. However, during the most recent two-year period 2012-2014, the rate of decline fell to just 2.8% (see Table 4.3, below). Significantly, during the period 2009 through 2014, summer season Air Carrier passengers on JetBlue, Delta, US Airways, and United had increased by 66% which is further discussed below.



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Table 4-3

<i>Passenger Enplanements Nantucket Airport</i>	
<b>1986</b>	170,524
<b>1987</b>	140,388
<b>1988</b>	134,537
<b>1989</b>	125,169
<b>1990</b>	128,343
<b>1991</b>	134,482
<b>1992</b>	155,222
<b>1993</b>	179,451
<b>1994</b>	200,474
<b>1995</b>	219,563
<b>1996</b>	217,170
<b>1997</b>	253,985
<b>1998</b>	277,030
<b>1999</b>	299,490
<b>2000</b>	302,161
<b>2001</b>	276,924
<b>2002</b>	257,997
<b>2003</b>	229,301
<b>2004</b>	242,975
<b>2005</b>	249,002
<b>2006</b>	269,433
<b>2007</b>	278,133
<b>2008</b>	257,755
<b>2009</b>	203,786
<b>2010</b>	201,638
<b>2011</b>	179,410
<b>2012</b>	175,420
<b>2013</b>	178,303
<b>2014</b>	170,554
<u>Percent Change</u>	
<b>1986-1990</b>	-24.7%
<b>1990-2000</b>	135.4%
<b>2000-2012</b>	-41.9%
<b>2012-2014</b>	-2.8%

*Source: Nantucket Airport*



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The addition of E-190 air carrier service by Jet Blue, as well as the introduction of Cessna Caravan service by Island Air, has stimulated summer passenger enplanements at Nantucket Airport. Summer service by JetBlue, US Airways, Delta Express, and United Airlines has increased the enplaned passengers at Nantucket from 29,916 in 2009 to 49,826 in 2014, a 66% increase (see Table 4-4).

**Table 4-4**

<b>Passenger Enplanements – Nantucket Airport</b>			
<b>C.Y.</b>	<b>Year-Round Air Shuttles</b>	<b>Summer Season Air Carriers</b>	<b>Total Enplanements</b>
2009	173,870 (85.3%)	29,916 (14.7%)	203,786 (100%)
2010	168,470 (83.5%)	33,168 (16.5%)	201,638 (100%)
2011	143,988 (80.3%)	35,422 (19.7%)	179,410 (100%)
2012	137,185 (78.2%)	38,235 (21.8%)	175,420 (100%)
2013	129,338 (72.5%)	48,965 (27.5%)	178,303 (100%)
2014	120,728 (70.8%)	49,826 (29.2%)	170,554 (100%)
<b>Percent Change</b>			
<b>2009-2014</b>	<b>-31%</b>	<b>+66%</b>	<b>-16%</b>

**Notes:** Data source: Nantucket Airport. Summer season typically provided between June-September. Year-round service provided by Cape Air, Nantucket Airlines, and Island Airlines. Summer season service provided by a number of regional airlines operating under contract to major airlines (US Airways, United, Delta). JetBlue operates own regional service. Different hub destinations were served between 2009-2012

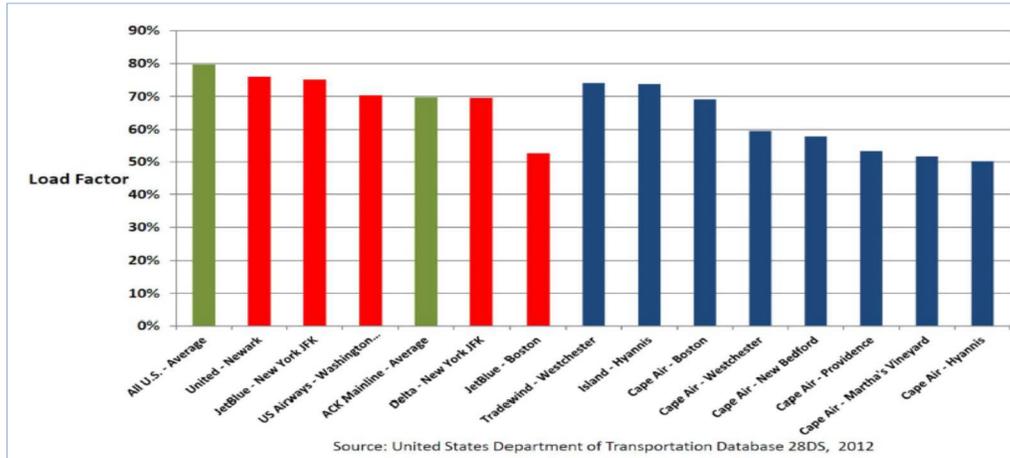
Cape Air, Nantucket, and Island Airlines generated an average load factor (percent of seats occupied by revenue passengers) of less than 70% - on some routes it was close to 60%. On a 9-seat aircraft that is an average of 5.5 to 6 passenger enplanements per departure. By comparison the major airlines had an average load factor of almost 84% in 2013. The relatively low load factors generated by Cape Air, Nantucket and Island Airlines are due to the high-frequency service pattern they offer.

If they reduced frequency but still generated the same number of passenger enplanements, their average load factors would increase. However, reducing frequency would likely impact enplanements, due to passenger reactions to reduced service. Other regional carriers, particularly those connected to major airlines, operate larger aircraft and generate higher load factors, and would not offer the high-frequency service that Cape Air, Nantucket and Island Airlines offer.



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Chart 4-2-Cape Air/Nantucket/Island Airlines Load Factors Lower than Major Airlines



### 4.2.4 Year-Round Air Service

Three airlines serve Nantucket Airport year-round: Cape Air and Nantucket Airlines (both are subsidiaries of Hyannis Air Service, Inc.), and Island Airlines. Cape Air has the most extensive route network of the three carriers (Figure 4.1), and also operates the largest number of aircraft. A number of Cape Air's destinations are subsidized under the U.S. DOT's Essential Air Service (EAS) program, although none of the Cape and Island Airports or Boston Logan receives EAS subsidies. Cape Air also serves EAS airports in the central and western U.S., as well as the Caribbean.

The primary market in terms of number of passengers carried and aircraft flights for all three carriers is Hyannis-Nantucket (Table 4.5), followed by ACK-BOS.

The year-round service provided by Cape Air-Nantucket Airlines-Island Airlines can be characterized as a *very short haul, high frequency, shuttle operation*. The three carriers continue a service pattern developed by Provincetown-Boston Airlines (PBA) that served the same destinations with a wide variety of aircraft from the 1950s until 1989. As noted above, all three are certified by FAA as air taxi carriers, operating under FAR Part 135.

Table 4-5

Airline	Non-Stop Markets To/From Nantucket Airport		Aircraft Operated
Cape Air	→ Hyannis – Barnstable Airport → Boston Logan Airport → Providence Airport*	→ Martha's Vineyard Airport* → New Bedford Airport* → Provincetown Airport*	→ Cessna 402 – 70 (includes Nantucket Airlines) → ATR-42 – 2 (Pacific service)
Nantucket Airlines	→ Hyannis – Barnstable Airport		→ see above
Island Airlines	→ Hyannis – Barnstable Airport		→ Cessna 402 – 6 → Cessna Caravan - 3 → Beech King Air - 3
*Seasonal service			



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That particular type of short-haul high frequency service, using relatively small aircraft (i.e. 9 passenger seats) is rare in the U.S., with only a small handful of similar markets (e.g. New England Airlines between Westerly and Block Island, RI). Cape Air also provides a similar type of short-haul, high frequency service in the Caribbean with a hub at San Juan, Puerto Rico.

Figure 4-1 - Cape Air Route Map



Given the strong seasonality of the Cape and Islands and the Caribbean markets, which do not overlap, the airline is able to shift assets between the two markets during their respective peak seasons. Cape Air also provides regional air service between Guam-Saipan-Rota in the Pacific using ATR-42 aircraft (operating under FAR Part 121).

According to the Nantucket Chamber of Commerce, the New York metro region is the primary origin for visitors to Nantucket. Based on a number of surveys conducted by New England states<sup>3</sup>, more than 50% of all visitor trips to New England are made by automobile as opposed to airlines. By comparison, other leisure/resort destinations such as Las Vegas, Hawaii, and the ski resorts in the Rocky Mountains such as Aspen, Lake Tahoe, and Jackson Hole, a large percentage of visitors fly in and out.

<sup>3</sup> Sources include: Massachusetts Office of Travel & Tourism, 2012 Annual Report: "Travel by personal car is the dominant mode of transportation (69.6%)" and Warnick, Rodney, Ph.D., UMass at Amherst, "Travel Trends In New England And The Northeast US: Updating Post 9-11 Trends". The report concluded: "The Northeast United States, and specifically the New England Region, is relatively compact which facilitates domestic and vacation travel, especially by car. Mintel Reports research indicates that, after 9-11, travelers reacting to financial concerns and lingering safety fears were less likely to fly and more likely to drive to their vacation destinations (compared to the 3 years prior to 2001)."



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There are several indicators that those “beyond” markets are too small to attract year-round air service:

- The number of passenger enplanements at New Bedford and Providence are relatively small (Appendix E, as well as airport statistics on Nantucket Airport web site - <http://www.nantucketairport.com/statistics.htm>)
- The carriers that provide either year-round service (Cape Air/Nantucket/Island Airlines) or summer seasonal service (Jet Blue, United, US Airways, Delta) to ACK have not initiated service to beyond markets, with the exception of Tradewinds and Cape Air service to White Plains, NY.
- If carriers were to provide non-stop service to markets beyond Boston, Hyannis, Providence and New Bedford, that service would draw traffic away from those markets, potentially making them unviable.
- Cape Air currently has a hub feed network throughout the Northeast (Figure 4-3) into Logan Airport, with connecting service to Nantucket.

A variety of factors directly affect the type of short-haul, high frequency service provided by Cape Air-Nantucket Airlines-Island Airlines:

- The primary competition on the largest market (Hyannis-Nantucket) is from scheduled ferry service. Two ferry companies (the Steamship Authority and Hy-Line Cruises) serve that market year-round and offer scheduled ‘regular’ ferry runs, as well as high-speed ferry service.
- The regular and high-speed ferry service is less expensive than air service (Table 4-7), and therefore appeals to price sensitive passengers that have schedule flexibility. Two ferry companies offering multiple round trips per day also provide flexibility and back-up for passengers with flexible schedules. Increased high-speed ferry service between Hyannis and Nantucket has drawn passengers from the short-haul, high-frequency air shuttle services (**see Chart 4-3**).



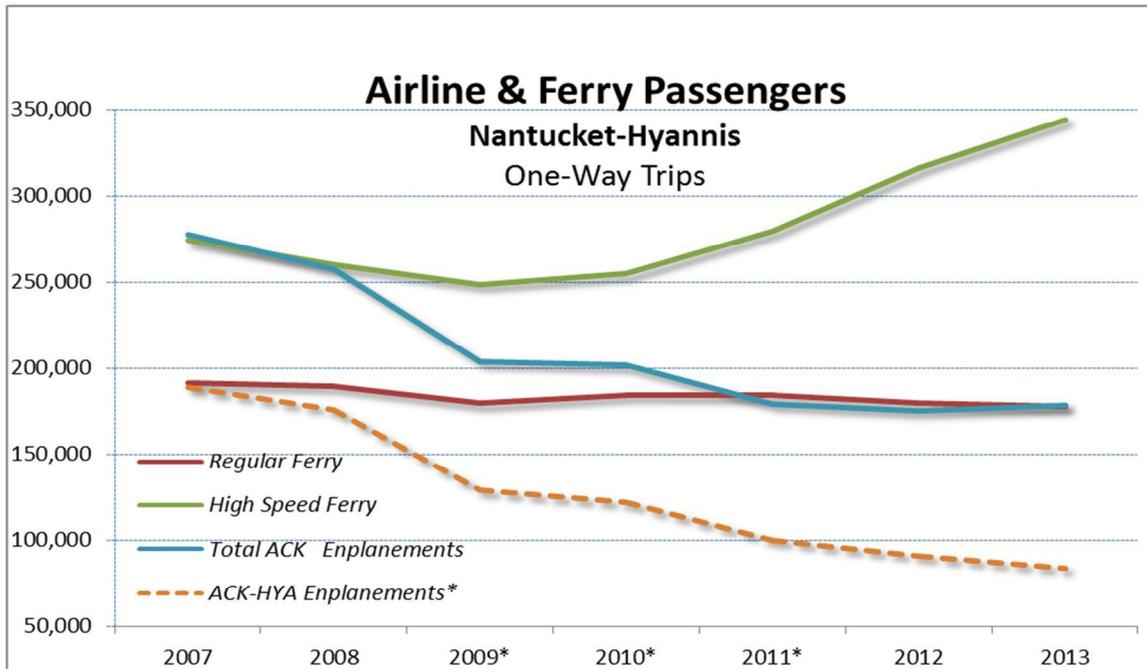
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Table 4-7

<b>Hyannis - Nantucket Round Trip Fare &amp; One-Way Travel Times</b>					
<u>Airline</u>	<u>RT Fare</u>	<u>OW Trip</u>	<u>Ferry Line</u>	<u>RT Fare</u>	<u>OW Trip</u>
<b>Cape Air Discount</b>	\$99.00	20 min	<b>SSA Regular</b>	\$35.00	2:15 min
<b>Cape Air Unrestricted</b>	\$158.00	20 min	<b>SSA High Speed</b>	\$69.00	60 min
<b>Island Airlines</b>	\$147.00	20 min	<b>Hy-Line Regular</b>	\$45.00	2:15 min
			<b>Hy-Line High Speed</b>	\$77.00	60 min

Sources: Company web sites, December 2013. Fares shown per person/adult. Ferry terminal in downtown.

Chart 4-3



\* 2007-2014 from ACK Annual Statistics for Island Air & Nantucket Airlines (+ Nantucket Shuttle 2007-11) and SSA

- If airline ticket prices increase at a higher rate than ferry prices (e.g. due to rising avgas prices, replacement costs of the Cessna 402, new federal regulations, etc.) then it is anticipated that ferry service will capture a growing share of the passenger traffic between Hyannis and Nantucket.
- Cessna 402s are piston-engine aircraft that are 30+ years old. Their primary advantages are that they are relatively inexpensive to acquire and operate compared to turbine-powered aircraft, and, because they have 9 seats, they allow the carriers to operate under FAR Part 135 which is less stringent and less expensive than operating under FAR Part 121.



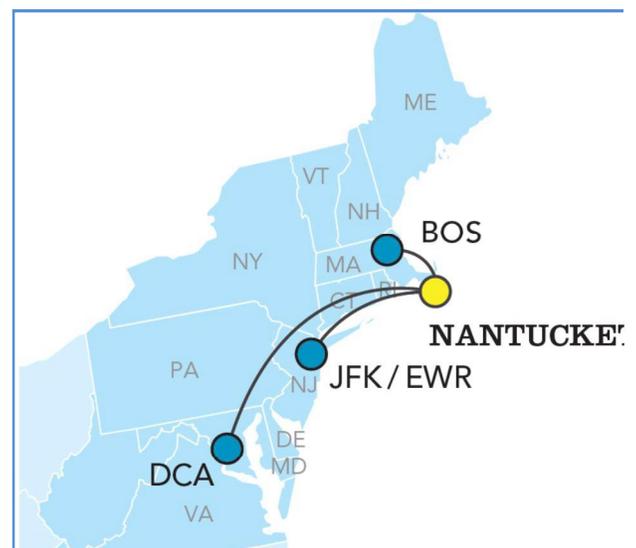
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- Cape Air has indicated it has no immediate plans to replace the C-402, although it has studied alternative aircraft, including a new design from Tecnam Aircraft, the P2012 Traveller that is potentially similar to the C-402, i.e. 9-passenger seats and two piston engines. However it is still in the design phase and has not been certified by FAA. Island Airlines operated both the C-402 as well as new Cessna Caravans, a 9-passenger, single-engine turboprop. While the Caravan uses Jet A fuel (vs. avgas), it is more expensive to acquire and operate than the 402.
- The Cessna 402 piston engines use leaded fuel (avgas, also known as 100LL). The aviation industry anticipates that 100LL avgas will be discontinued by the end of this decade, if not sooner, and currently there is no FAA-certified replacement fuel. Any sudden disruption or discontinuation of avgas would have a significant impact on all piston engine aircraft, including the Cessna 402s.
- Given the location and high frequency of Cape/Island/Nantucket Airline aircraft operations, maintenance costs increase over time and parts become more expensive.
- Some of the traveling public has a negative perception of ‘small aircraft’, including the Cessna 402 as well as turboprops. Awareness of that bias was a factor in many airlines acquiring regional jets, even for relatively short-haul markets. However, jets and most multi-engine turboprops are not a practical or feasible replacement alternative for the Cessna 402, so it is unlikely that Cape/Nantucket/ Island Airlines can capture those travelers with concerns or bias about ‘small aircraft’.

### 4.2.5 Seasonal Scheduled Air Service

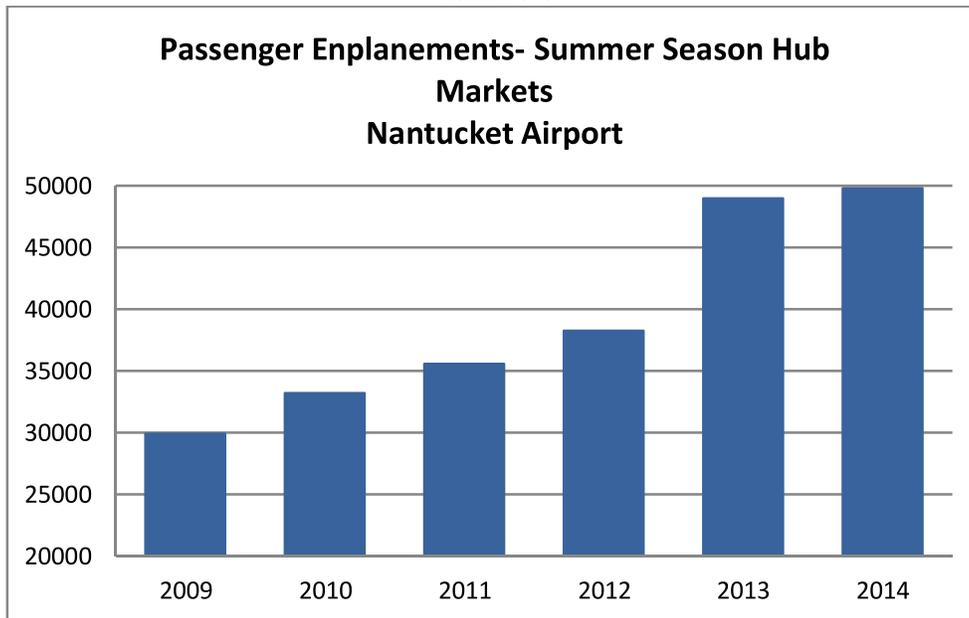
A significant component of scheduled airline service to Nantucket is the summer season, hub-oriented market (Figure 4-2). Summer season service is provided by four major airlines: Jet Blue, Delta, US Airways, and United. Jet Blue operates their own regional jets, while the latter three carriers use their regional partners to serve ACK. The primary passenger market is ACK-JFK, which is served by Jet Blue as well as Delta. JFK is the main hub for Jet Blue, and Boston Logan has become a secondary hub for Jet Blue. The New York metro area is the largest passenger market to Nantucket outside of New England. Between 2003 and 2014, major airlines have served a variety of hubs to/from ACK. This summer season air service has grown steadily over the past five years at ACK.

Figure 4-2 – Summer Season Route Map





**Chart 4-4**



Between 2008 and 2014, seasonal hub service increased from approximately 15% to more than 29% of all passenger enplanements at ACK. Over that same period, the number of seasonal Air Carrier passenger enplanements grew by approximately 66%, as shown on Chart 4-4 above.

A number of factors affect the volume of passengers at a given airport:

- Markets served – both connecting hub and O&D destinations
- Frequency of service – number of daily flights
- Type of equipment – passenger preference for jet service
- Fares charged – unlike the year-round carriers noted above, the seasonal carriers do not compete against ferry service

Jet Blue is a low-fare carrier, which is reflected in the average fare to JFK. However, average fares in other markets to/from ACK do not reflect low fare or discount service. The fact that the summer hub service does not compete against ferry service is a factor in the relative lack of price sensitivity in those markets

**Nantucket-Boston Logan Route**

Boston-Logan Airport is a rapidly growing hub for Jet Blue, and summer season service between BOS-ACK was provided by Jet Blue in 2012 and 2014 with ERJ-190 aircraft. In addition, Cape Air also serves the BOS-ACK route year-round with the C-402. Cape Air has an interline agreement and code shares with Jet Blue. Cape Air and Jet Blue both operate from Terminal C at Logan Airport.

If Jet Blue were to completely replace Cape Air on the ACK-BOS route using the 100-passenger seat ERJ-190 aircraft during four summer months, and if Jet Blue provided an average of 2.5 departures per day - every day June through September, they could generate an approx. 85% load factor, which matches their 2013 system-wide load factor. Depending on the fare charged, it is possible that regional jet service



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between ACK-BOS would stimulate additional traffic on that route, appealing to passengers who are concerned about flying on small aircraft and currently take the ferry instead.

**Table 4-9**

Nantucket-Boston Air Carrier Passengers (Two-Way)					
CY	Winter	Cape Air		Jet Blue (Summer)	Total Passengers
		Summer	Total		
2003	12,264	52,442	64,706		64,706
2004	13,806	49,448	63,254		63,254
2005	14,245	53,855	68,100		68,100
2006	15,479	56,120	71,599		71,599
2007	14,857	54,262	69,119	3,282	72,401
2008	14,093	51,810	65,903		65,903
2009	12,043	44,059	56,102		56,102
2010	12,570	46,648	59,218		59,218
2011	12,040	42,783	54,823		54,823
2012	12,864	41,637	54,501	11,660	66,161
2013	17,804	36,011	53,815	16,480	70,295

- 2013 = January-September 2013 actual + October-December 2012 actual
- Cape Air operated Cessna 402 (9 pass. seats). Jet Blue operated ERJ-190 (100 pass. seats)
- Winter months=November-April. Summer months=May-October
- Source: United States Department of Transportation Database 28DM

Although Cape Air currently serves ACK-BOS year-round it is not anticipated that Jet Blue would serve that route year-round, even if no other air service was available on that route. Cape Air's average load factors are relatively low compared to major airlines such as Jet Blue, United, US Airways, etc., although Cape Air's break-even load factors are lower as well.



## Nantucket Memorial Airport Master Plan Update

Chart 4-4-1

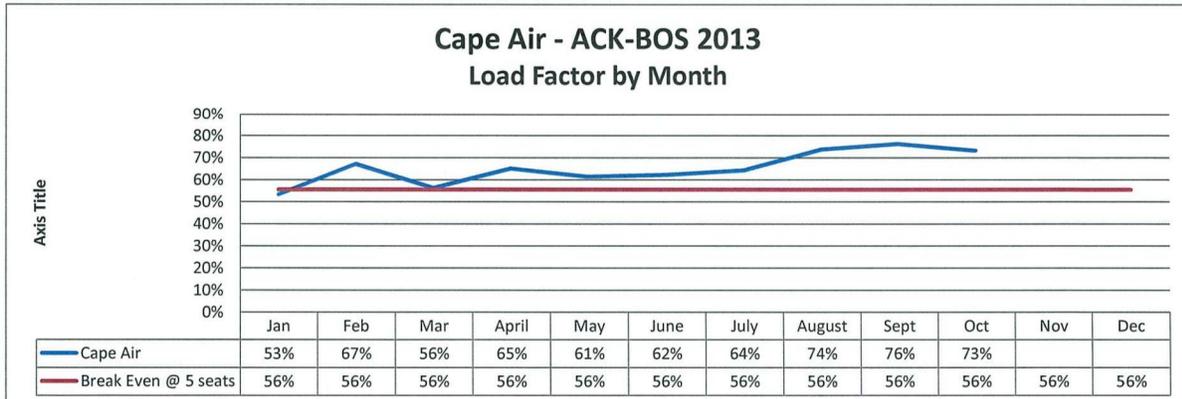
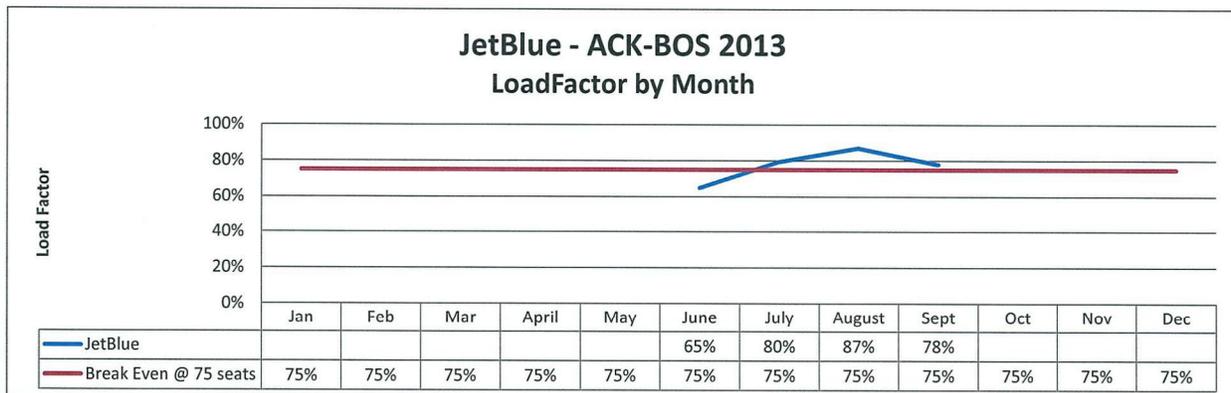


Chart 4-4-2



Source: Nantucket Airport. Break-even load factors (BELF) are estimated.

While the potential load factors on jet service between ACK-BOS by Jet Blue are encouraging, the distance of only 80 miles is a very short leg for an ERJ-190 and may not be economical to operate over the long term. It is assumed that the BOS-ACK leg would be one part of larger network for a particular aircraft (e.g. BOS-ACK-JFK-CLT-MCO). Jet Blue recently announced that it will not increase its current fleet of ERJ-190 aircraft (approx. 60 airplanes) but will instead focus on adding more A-320s and A-321s.

An industry commentator recently noted Jet Blue’s strategy of using the ERJ-190 to develop new markets to the point that they generate enough traffic to support A-320 or A-321 service. Jet Blue would require significant traffic diversion from the ferry service to generate sufficient traffic on the ACK-BOS route that could support regular A-320 service in the near future, and it is not anticipated that they would operate an A-320 on such a short route due to lack of efficiencies as well as life-cycle costs of time-limited parts such as engines and tires.

“Jet Blue’s new plan entails deferring 24 E-190 deliveries scheduled for the next five years until 2020 and thereafter, while ordering 35 more Airbus jets. The reason for JetBlue’s change of heart is quite simple: the E-190 has a much higher unit cost than the Airbus jets, primarily due to its lower fuel efficiency. This has been exacerbated by the very high cost of maintaining the E-190’s engines. The engine maintenance problems only cropped up within the past year. The primary offsetting advantage of the E-190 is its smaller size. This allows it to



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profitably fly routes that may not have enough demand for a 150-seat A320 (let alone an even larger A321). However, most of JetBlue's routes have plenty of passenger traffic, so the company is better off using larger jets with lower unit costs. The E-190's real mission for JetBlue today is for short-haul flying -- particularly in Boston and San Juan -- and opening new routes. New routes tend to mature over a two- to three-year period, during which time demand builds up. As a result, it's useful to have a smaller plane like the E-190 when starting service. However, within a few years, it's usually sensible to "upgauge" to the larger A320, with its lower unit costs. Many current E-190 routes could eventually support A320s, which will free up E-190s for new routes, without requiring any expansion of that fleet." (Source: JetBlue's New Fleet Plan Is a Game-Changer, Nov. 2, 2013, [Adam Levine-Weinberg, http://www.fool.com/investing/general/2013/11/02/jetblue-new-fleet-plan-is-a-game-changer.aspx](http://www.fool.com/investing/general/2013/11/02/jetblue-new-fleet-plan-is-a-game-changer.aspx))

As noted above, part of Jet Blue's strategy is to free up some ERJ-190 routes when they grow large enough to support A-320 service, which may provide opportunities for additional ACK-BOS jet service by the ERJ-190 in the future. As long as Cape Air continues to provide ACK-BOS service as a code share with Jet Blue, it is not likely that Jet Blue will completely replace their C-402 service.

It has been noted that Jet Blue offered lower ticket prices on the BOS-ACK route than did Cape Air, which raises two important questions: what is Jet Blue's long term strategy with that type of fare structure, and is that fare structure viable for Jet Blue over the long term. If Cape Air were to discontinue BOS-ACK service, then Jet Blue may expand their service in that market in the summer months. As noted above, it is not anticipated that Jet Blue would provide winter service with ERJ-190s, even if Cape Air were not serving that market.

**Table 4-10**  
**Nantucket Airport**  
**Passengers (Inbound and Outbound)**  
**Summer Season - Hub Service 2003-2013**

	Continental/United	JetBlue			Delta			Tradewinds			USAirways			Combined Total
	Newark (EWR)	New York JFK	Boston BOS	New York JFK	Teterboro TEB	Westchester HPN	Philadelphia PHL	New York LGA	Boston BOS	Washington DCA				
2003	10,891	-	-	-	-	-	4,758	19,965	2,311	3,747	41,672			
2004	12,559	-	-	-	-	-	3,240	23,498	5,189	1,426	45,912			
2005	11,394	-	-	-	-	-	2,489	19,218	2,566	33	35,700			
2006	10,837	-	-	-	1,525	1,237	3,377	17,914	-	4,053	38,943			
2007	8,828	13,663	3,282	11,083	2,709	2,679	-	21,528	-	3,881	67,653			
2008	12,696	13,306	-	11,553	2,291	2,596	-	14,050	-	4,664	61,156			
2009	9,182	18,361	-	11,612	1,955	2,422	-	9,278	-	6,557	59,367			
2010	9,667	25,403	-	10,402	1,644	2,137	-	6,460	-	10,088	65,801			
2011	10,908	31,196	-	9,502	1,772	2,164	-	8,032	-	8,163	71,737			
2012	14,503	35,734	11,660	10,262	1,230	1,715	-	-	-	8,922	84,026			
2013	15,472	38,590	16,480	12,991	2,026	3,146	-	2,749	-	9,244	100,698			

Summer months = May-October

2013 YTD: Based on January-September 2013 actuals, plus October-December 2012 actuals.

Source: United States Department of Transportation Database 28DM

Other non-stop hub service from Nantucket includes Delta to JFK, US Airways to Reagan National (DCA), and United serves Newark (EWR). US Airways had previously provided service between ACK and Philadelphia, a major domestic and international hub, as well as LaGuardia Airport, however it did not offer non-stop service to those airports in 2012 or 2013. Boston Logan, JFK, and Newark offer connections to multiple domestic and international destinations. Since EWR is a major hub for United (previously Continental), it offers the advantage of accessing their network via a single carrier. Delta

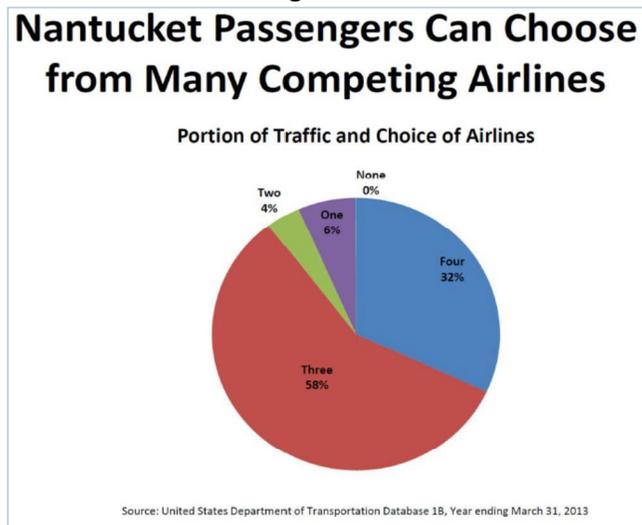


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offers a number of domestic and international connections at JFK, but both JFK and BOS are served by a number of other carriers, and accessing their networks require airline transfers and changing terminals. If US Airways were to resume ACK-PHL service, that would provide access to one of their largest domestic and international hubs.

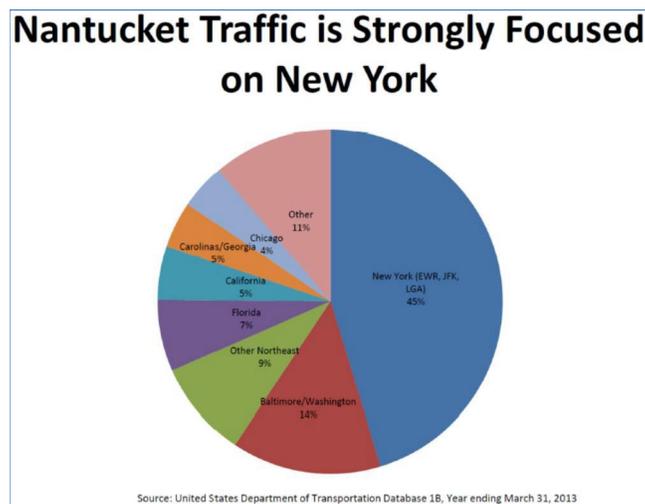
The recent merger between US Airways and American resulted in US Airways giving up some slots at DCA to other airlines, which may impact service to some airports like ACK. DCA is not a major connecting hub for US Airways, and shifting ACK service from DCA back to PHL would provide better access to both domestic and international connecting service with the newly merged US Airways and American. It will likely take several years for the new US-AA company to integrate their networks, computer reservation systems, marketing programs, etc. One conclusion is that, given the relatively small size of the overall air service market at ACK combined with its strong summer season characteristic, Nantucket passengers have multiple choices available.

Figure 4-3



The summer season air service network reflects the key characteristic of Nantucket passengers – Nantucket’s largest single passenger market is the New York metro region, as shown in Figure 4.4, below.

Figure 4-4





## ***Nantucket Memorial Airport Master Plan Update***

The seasonal hub service to/from ACK accommodates origin and destination (O&D) passengers as well as connecting traffic. The airlines typically provide 2 to 3 flights per day during the summer season, which runs between June-September. The aircraft used range from the 100-passenger seat Embraer ERJ-190 operated by Jet Blue, to the 50-seat Canadair CRJ-200, and the D-H Dash 8 turboprop.

Due to the concentration in hub markets and the relatively short-haul legs, the carriers have flexibility in terms of the specific aircraft they can use to serve ACK, as well as their specific schedules depending on daily utilization. For example, airlines can provide round-trip flights between DCA-ACK, JFK-ACK, EWR-ACK, etc. during off-peak periods to increase aircraft utilization and revenue potential.

Major carriers and their regional partners are replacing their 50-seat aircraft with larger 70 – 100 seat airplanes such as the ERJ-190, CRJ-900, B-717, etc., which may impact service patterns at airports like ACK in the future. In addition, major airlines have been limiting capacity growth, so they are fewer larger aircraft are being used to maintain the same approximate number of seats.

The primary role of the regional airlines such as Delta Connection, US Airways Express, United Express, etc. is hub-feed for their mainline partners. Because ACK traffic represents a relatively small and seasonal market for mainline carriers, and combines both O&D and connecting passengers, the service patterns provided to ACK vary each year depending on each airline's schedule, equipment availability, and marketing goals. For example, US Airways previously provided service to LaGuardia (LGA) and Philadelphia (PHL), but has not served those airports from ACK since 2011.

The possible introduction of future service from ACK to new hub markets such as Charlotte, NC (CLT), US Airways hub; Atlanta (ATL), Delta hub; Dulles (IAD), Cleveland (CLE), or Chicago O'Hare (ORD), United hubs; Dallas-Fort Worth (DFW), American Airlines hub; or potentially service to Toronto, Canada, could generate more passenger enplanements during the summer season. While new service to one of those hubs is possible, it is not considered to be likely for a number of reasons:

- New service would draw traffic away from existing hub markets
- The longer distances increase trip times, scheduling challenges, and less flexibility for carriers
- As discussed below airline consolidation/mergers, maintaining strong limits on capacity expansion, and the shift from 50-seat regional aircraft to larger equipment, all create uncertainty about the role that ACK will play as networks evolve. In general however, it is anticipated that seasonal service to existing hub markets will continue, with some fluctuations (for example, possible shift of US Airways service from DCA to PHL or LGA). The introduction of larger aircraft such as the ERJ-190, CRJ-900, ATR-72, etc., may result in lower frequencies.

Two significant on-going trends in the airline industry could impact future seasonal service to Nantucket: a) major airline consolidation/mergers, and b) the retirement of the 50-seat regional jet. US Airways and American are completing their planned merger while both Delta and United, which provide seasonal service to Nantucket, transitioned through large mergers and continue to provide hub service.

US Airways and American agreed to give up slots at Washington Reagan Airport, which is currently served from ACK by US Airways. How that divestiture of slots at DCA will impact seasonal service to ACK



## ***Nantucket Memorial Airport Master Plan Update***

in 2015 and beyond is unknown, but it is anticipated that the new American (merged with US Air) will continue to provide seasonal service to ACK, potentially to PHL or LGA, which as noted above US Air served previously.

Almost all mainline and regional carriers are rapidly grounding their 50-seat regional jets and turboprops and replacing them with larger 70 – 100 seat jets. Delta recently acquired the B-717 from Air Tran/Southwest, and has large orders for the CRJ-900, as does United. US Airways regional partners have been acquiring ERJ-170 and 190 aircraft. Jet Blue operates the CRJ-190 in the ACK-JFK market, and also operates the Airbus A-320 and A-321. The logical impact of replacing existing 50-seat aircraft with larger regional jets, assuming the same type of seasonal hub service is continues at ACK, would be a reduction in frequency (i.e. number of flights per day).

Such a reduction in frequency would be consistent with the mainline carriers' policy of limiting capacity growth throughout their system in order to reduce their operating costs and increase load factors. That strategy has been credited in part with the mainline carriers' relatively strong financial performance since 2010, along with the adoption of so-called ancillary fees for services such as baggage check, on-board meals, seat assignments, preferred boarding, etc. United released a statement in late 2013 that the company plans to generate \$700 million in additional ancillary fees by 2017 "by giving customers new options, optimizing pricing on existing products and expanding availability of ancillary products through additional distribution channels."

The U.S. DOT requires major airlines to report passenger origin and destination data based on a 10% sample of all tickets issued, and that O&D data is published by the DOT. Of the top 10 origin and destination markets from ACK the top four markets (JFK, DCA, BOS, and ORD) generated 86% of the passengers.

Tradewind serves Teterboro, NJ and White Plains, NY with Cessna Caravans. However, those particular NY airports are not airline hubs, they have generated a relatively small share of total ACK passengers, they do not provide any connecting service and they do not generate sufficient traffic to be in the top 10 markets. Between 2006-2012, Tradewind averaged approximately 1,800 passengers per season.

The concentration of passengers to/from New York is consistent with the Nantucket Chamber of Commerce information that the primary market for Island visitors is from the greater NY Metropolitan region. The O&D data also indicates that the level of demand to other hub airports would likely not support new scheduled service to Nantucket.



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Table 4-11

### Origin and Destination (O&D) Air Markets from Nantucket 2012

Rank	Destination	Passengers *	Average Fare
1	New York - JFK	37,230	\$171
2	Washington DC Reagan - DCA	9,830	\$257
3	Boston Logan - BOS	6,990	\$108
4	Chicago O'Hare - ORD	3,630	\$233
5	San Francisco - SFO	2,020	\$391
6	Newark, NJ - EWR	1,540	\$222
7	Charlotte, NC -CLT	1,530	\$224
8	Los Angeles, CA - LAX	1,440	\$392
9	Baltimore, MD - BWI	1,380	\$194
10	Fort Lauderdale, FL - FLL	1,290	\$303

Source: U.S. DOT \*Note: Both inbound and outbound passengers.

### 4.3 Aircraft Operations

Each aircraft landing and takeoff is counted as one operation. Each aircraft that arrives and departs Nantucket Airport is counted as 2 operations. In addition, aircraft operations are classified as transient and local, as well as air carrier, air taxi, general aviation, and military.

- **Itinerant (or transient)** – an aircraft that arrives from another airport or departs to another airport, or outside of the local airport area.
- **Local** – aircraft operations that occurs directly at the airport, primarily training activity in the form of practice takeoffs and landings (also known as touch-and-goes) and practice instrument approaches.
- **Air Carrier and Air Taxi** – commercial air service provided for compensation and hire under specific federal aviation regulations.
- **General Aviation** – all civilian aircraft operations *other than* air carriers and air taxi.
- **Military** – all branches of the Service within the Department of Defense.

Aircraft operations at Nantucket Airport were recorded by the FAA Air traffic control tower personnel<sup>4</sup>. Between 1980 and 2012, aircraft operations have fluctuated in cycles. Between 2000 and 2012, total aircraft operations (takeoffs and landings) at Nantucket Airport declined by more than 22%, and general aviation (GA) aircraft operations declined by 27%.

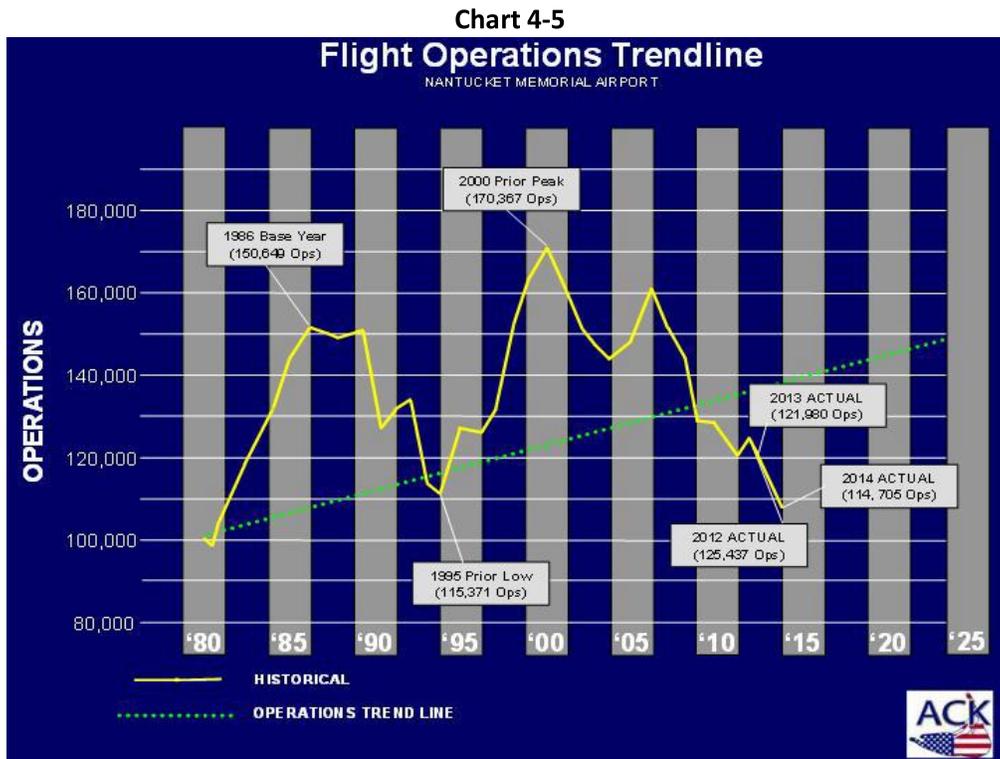
<sup>4</sup> Aircraft operations data are uploaded to FAA's *Air Traffic Activity Data System (ATADS)* web site - <https://aspm.faa.gov/opsnet/sys/Main.asp?force=atads>



## Nantucket Memorial Airport Master Plan Update

### Aviation Operations

- Aviation activity closely mirrors the Island's seasonal economy, i.e. very strong peak season (June-September). Between 2001 and 2012, 48% of total annual aircraft operations (takeoffs and landings) occurred in those four summer months, one of the strongest seasonal peaks among U.S. airports.
- Total aircraft operations (takeoffs and landings) at Nantucket Airport declined by 22.1% between 2000 and 2012. Airline operations declined by 20% over the same period, and general aviation aircraft operations declined by almost 28%.
- A number of factors relate to the decline, including rising aircraft costs (aviation fuel, new aircraft, parts, maintenance, etc.), the 2008 - 2010 economic recession, airport and airspace security procedures, and increased competition from high-speed ferry service between Hyannis and Nantucket.
- Two key points concerning the decline in aircraft operations; a) the decline was not unique to Nantucket Airport - aircraft operations have dropped at airports throughout the six New England states and the U.S. as a whole over the same period; and b) the decline occurred over a 13 year period, predating the economic recession of 2008-2010.





# Nantucket Memorial Airport Master Plan Update

Table 4-12

## Nantucket Airport – Aircraft Operations

Calendar Year	Facility	IFR Itinerant					VFR Itinerant					Itinerant					Local			Total Operations
		Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Air Carrier	Air Taxi	General Aviation	Military	Total	Civil	Military	Total	
2000	ACK	0	39,112	15,244	121	54,477	5	80,747	30,798	598	112,148	5	119,859	46,042	719	166,625	3,321	421	3,742	170,367
2001	ACK	12	43,231	15,058	288	58,589	14	72,403	27,734	491	100,642	26	115,634	42,792	779	159,231	1,386	423	1,809	161,040
2002	ACK	5	40,525	14,232	259	55,021	0	67,841	28,216	316	96,373	5	108,366	42,448	575	151,394	1,175	392	1,567	152,961
2003	ACK	9	39,331	15,100	233	54,673	2	64,956	26,388	242	91,588	11	104,287	41,488	475	146,261	1,341	306	1,647	147,908
2004	ACK	1	35,716	14,034	149	49,900	9	67,929	25,202	286	93,426	10	103,645	39,236	435	143,326	837	213	1,050	144,376
2005	ACK	8	38,822	14,205	157	52,992	0	68,966	23,957	205	93,128	8	107,588	38,182	362	146,120	1,210	191	1,401	147,521
2006	ACK	0	36,991	12,005	220	49,216	0	85,291	26,090	256	111,637	0	122,282	38,095	476	160,853	586	179	765	161,618
2007	ACK	356	35,928	11,393	83	47,760	985	81,376	19,840	140	102,351	1,351	117,304	31,233	223	150,111	345	89	434	150,545
2008	ACK	188	31,320	9,999	180	41,887	530	84,907	23,309	277	109,023	718	116,227	33,308	457	150,710	385	204	589	151,299
2009	ACK	295	30,150	10,226	255	40,926	4	68,177	18,478	283	86,942	299	98,327	28,704	538	127,868	276	44	320	128,188
2010	ACK	391	27,948	9,272	159	37,770	0	69,737	19,387	374	89,498	391	97,685	28,659	533	127,268	213	142	355	127,623
2011	ACK	526	26,857	10,572	236	38,191	326	62,190	19,170	337	82,023	852	89,047	29,742	573	120,214	156	52	208	120,422
2012	ACK	726	22,944	9,391	481	33,542	26	72,181	25,981	504	98,682	752	95,125	35,372	985	132,234	339	148	487	132,721
2013	ACK	784	25,460	10,046	447	36,737	9	61,856	21,700	419	83,984	793	87,316	31,746	866	120,721	170	56	226	120,947
2014	ACK	823	21,038	9,321	366	31,548	1	58,987	23,259	269	82,516	824	80,025	32,580	635	114,064	150	44	194	114,258
<b>Total:</b>		<b>4,124</b>	<b>495,173</b>	<b>180,098</b>	<b>3,634</b>	<b>683,029</b>	<b>1,921</b>	<b>1,067,544</b>	<b>359,509</b>	<b>4,997</b>	<b>1,433,971</b>	<b>6,045</b>	<b>1,562,717</b>	<b>539,607</b>	<b>8,631</b>	<b>2,117,000</b>	<b>11,890</b>	<b>2,904</b>	<b>14,794</b>	<b>2,131,794</b>
<b>% Change 2000-2014</b>		<b>823%</b>	<b>-46.2%</b>	<b>-38.9%</b>	<b>202.5%</b>	<b>-42.1%</b>	<b>-80%</b>	<b>-26.9%</b>	<b>-24.5%</b>	<b>-55%</b>	<b>-26.4%</b>	<b>16380%</b>	<b>-33.2%</b>	<b>-24%</b>	<b>-11.7%</b>	<b>-31.5%</b>	<b>95.5%</b>	<b>-89.5%</b>	<b>-94.8%</b>	<b>-32.9%</b>

Source: FAA Air Traffic Activity Data System (ATADS)

IFR Itinerant -	Operation to/from another airport under instrument weather conditions
VFR Itinerant -	Operation to/from another airport under visual weather conditions
Total Itinerant -	All operations to/from another airport
Local -	Operation on or in close proximity to ACK. Primarily training activity
Air Carrier -	Aircraft with more than 60 passenger seats or more than 60,000 lbs. cargo capacity
Air Taxi -	Aircraft used for scheduled and on-demand service with less than 60 passengers seats
GA -	General Aviation



## *Nantucket Memorial Airport Master Plan Update*

The decline in aviation activity was not unique to ACK. Aircraft operations declined by 30.3% over the same period at airports throughout the six New England states, and general aviation aircraft operations declined by 32% over the same period<sup>1</sup>. As discussed in more detail below, a number of factors account for the overall decline in operations:

- Rising cost of aircraft ownership and operations
- Competition from other modes of transportation (e.g. scheduled ferry service to Nantucket)
- Economic recession of 2008-2010
- Increased airport and airspace security

Similar external factors that impacted aircraft operations also affected the number of passenger enplanements at ACK. As with aircraft operations, passengers at Nantucket Airport are actually different types of users and respond to different market forces, which are identified and analyzed below.

Aviation activity at Nantucket Memorial Airport<sup>5</sup> directly impacts a number of key elements of the airport and its surroundings, including both on-airport and off-airport facility requirements, airport financial performance, as well as environmental impacts and sustainability, which are analyzed in other sections of this Airport Master Plan. In terms of existing and future airport facilities, aviation activity data is used to determine:

- **Critical design aircraft.** The FAA defines a number of aircraft characteristics that determine the appropriate airport design standards including wingspan, approach speed, landing gear dimensions, aircraft weight and gear type, tail height, etc. Critical design aircraft must generate enough activity at ACK to meet FAA's threshold for substantial use.<sup>6</sup> At Nantucket, the existing critical design aircraft are JetBlue's E-190 and the Gulfstream G-V corporate jet, both Design Group C-III.
- **Airport capacity.** Activity data is a key component of determining the demand-capacity of various airport facilities including the runway and taxiway system, aircraft parking - ramps and hangars, terminal building functions, auto parking and access roads, aviation fuel storage and dispensing, etc. As discussed below Nantucket Airport is unique in terms of its very strong summer season, which requires a unique balance between meeting FAA design criteria, passenger and aircraft demand, protecting environmental resources, enhancing the airport's financial performance, and being a good neighbor on the Island.

Aviation activity at Nantucket Airport directly impacts a number of both airport-related and Island-wide issues/factors.

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<sup>5</sup> FAA three-letter identifier = ACK

<sup>6</sup> Source: FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Runway Design, Chapter 1, para. 102 (8). "Substantial Use Threshold. Federally funded projects require that critical design airplanes have at least 500 or more annual itinerant operations at the airport (landings and takeoffs are considered as separate operations) for an individual airplane or a family grouping of airplanes. Under unusual circumstances, adjustments may be made to the 500 total annual itinerant operations threshold after considering the circumstances of a particular airport."



## Nantucket Memorial Airport Master Plan Update

**Table 4-13 – Airport Facility Requirements**

<b>Airside</b>	→ Runways → Navigation Aids	→ Taxiways → Fuel Storage	→ Aircraft Parking Aprons	→ Aircraft Hangars → ARFF Building
<b>Landside</b>	→ Terminal Building → FAA Control Tower	→ FBO & Airport Administration Bldg.	→ Auto Parking → Access Road	→ Commercial Tenants
<b>Off-Airport</b>	→ Access roads & intersections	→ Hotels & Retail Businesses	→ Airspace/Height Limitation	→ Land Use & Zoning

**Table 4-14 - Airport Financial Performance**

<b>Revenue Sources</b>	→ Aeronautical → Non-Aeronautical Parcels → Other
<b>Expenses</b>	→ Operating & Maintenance (O&M) → Capital Improvements → Other
<b>FAA &amp; State Grants</b>	→ Assurances & Requirements
<b>Passenger Facility Charge (PFC)</b>	→ FAA Review & Approval
<b>Customer Facility Charge (CFC)</b>	→ Airport-Tenant Coordination

**Table 4-15 - Environmental**

→ Aircraft Noise → Water Quality → Wetlands	→ Rare & Endangered Species Protection → Habitat Enhancement + Management → Emissions & Air Quality
→ Reduce, Reuse, Retrofit, Recycle → Energy Conservation → Coastal Zone Management	→ Renewable Energy Sources → Sustainability Best Practices → Green Buildings/LEED Certification
→ Hazardous Materials Management	→ Construction

**Table 4-16 – Nantucket Economy**

<b>Airport Employment</b>	→ Airlines → Concessions → Other Businesses → Airport staff
<b>Off-Airport Employment</b>	→ Hospitality & Retail → Ground transportation → Other
<b>Direct &amp; Indirect Multiplier Effect</b>	→ Expenditures in the Island economy



## Nantucket Memorial Airport Master Plan Update

In relation to Table 4-16, Nantucket Economy, the Massachusetts Aeronautics Commission (MAC) sponsored a statewide airport economic impact study in 2001 that was prepared by SH&E. The study analyzed the economic impact of each public-use airport in the Commonwealth, as well as the statewide collective impact of all of the airports in the state. According to the study, Nantucket Airport generated the following county-wide economic impacts:

### Countywide Impacts

Estimates suggest that approximately 205,443 visitors arrived in Massachusetts through Nantucket Memorial Airport. Direct impacts were obtained from survey data gathered from airport management and tenants. Direct impacts associated with on-airport tenants and general aviation visitors also cause multiplier impacts throughout Nantucket County. Those impacts were calculated using RIMS II multipliers for Nantucket County.

### Nantucket County Impacts

	Direct Impacts	Total Impacts
<b>Output (Sales):</b>		
On-Airport	\$23,426,512	\$34,024,751
Off-Airport	64,143,058	94,264,652
<b>Total Effect</b>	<b>\$87,569,570</b>	<b>\$128,289,404</b>
<b>Payroll (Wages):</b>		
On-Airport	\$4,760,037	\$8,547,409
Off-Airport	19,228,186	28,616,217
<b>Total Effect</b>	<b>\$23,988,224</b>	<b>\$37,163,626</b>
<b>Employment (Jobs):</b>		
On-Airport	203	313
Off-Airport	1,183	1,466
<b>Total Effect</b>	<b>1,386</b>	<b>1,779</b>

Table 4-17

### Economic Impact of General and Commercial Aviation in Massachusetts Annual Visitor Expenditures

Airport	Estimated Annual Visitors	Annual # of Days Stayed	Annual Visitor Expenditure
<b>Cape &amp; Island</b>			
Barnstable Municipal (Hyannis)	255,543	1,228,312	100,290,801
Cape Cod (Marstons Mills)	1,838	5,345	312,570
Chatham Municipal	1,995	5,804	339,362
Falmouth Airpark	1,129	3,284	192,007
Katama Airpark (Edgartown)	6,300	18,327	1,071,668
Martha's Vineyard	86,372	538,307	48,327,621
Nantucket Memorial	205,443	1,394,208	128,286,116
Provincetown Municipal	198,824	647,472	41,915,293
<b>Subtotal</b>	<b>757,444</b>	<b>3,841,059</b>	<b>320,735,438</b>

Source: SH&E, The Economic Impact of Public Use Airports, MAC



## ***Nantucket Memorial Airport Master Plan Update***

Aviation activity at Nantucket Airport falls into the three broad categories listed below. Within each of those three categories are distinct sub-sets of aviation users that are defined and analyzed.

- 1. Airline Service**
  - Scheduled
  - Scheduled Air Taxi
- 2. General Aviation**
  - Corporate
  - Owner-Flown
  - On-Demand Air Taxi
- 3. Public Service**
  - Government Agency (Federal - State)
  - Private (Boston MedFlight, Compassion Flights, etc.)
  - Military

The level of activity generated by each category of aviation user at Nantucket is determined by different factors; each has different airport facility and service requirements; they have different financial impacts on the airport; and each user has different environmental impacts.

It is important to note that while these three aviation categories are distinct, and a number of activity records are based on those categories, the services that they provide and the aircraft operated frequently overlap. One example within public service, all three sub-sets (government agency, private company and military) provide emergency medical transport, and all three operate fixed-wing aircraft and helicopters. Similar overlaps exist in the other categories as well, that are discussed below.

The specific factors and trends that directly impact aviation activity at ACK that are analyzed below include:

- Historic Aviation Trends and Current Activity Levels
- Socio-Economic and Demographic Factors
- Aviation Industry Trends
- Nantucket Airport Facilities, Services, and Costs
- External Factors:
  - Cost of aircraft and services: fuel, aircraft, parts, etc.
  - Airport & airspace security
  - New technologies
- Competitive Modes of Travel
  - Ferry service
  - Other



## Nantucket Memorial Airport Master Plan Update

### 4.3.1 Airline Operations

#### Definition of Terms

A number of federal agencies, as well as Nantucket Airport, compile data on airline activity. The U.S. DOT and the FAA issue operating certificates to companies that provide scheduled air carrier, scheduled air taxi, and on-demand (non-scheduled) air taxi services. The DOT and FAA also define each type of user (see definitions below and Appendix D). The FAA also issues and enforces regulations that govern all commercial operations. The regulations affect the type of aircraft that operators fly as well as the cost to provide air service. As noted below, that has a direct bearing on the carriers that provide year-round scheduled air service at Nantucket.

- **Air Carrier (AC):** A company or legal entity with an operating certificate issued by a government agency that provides air service for compensation or hire (under Federal Aviation Regulation Part 121). The FAA defines an *air carrier aircraft* as having seating capacity of more than 60 seats or a maximum payload capacity of more than 18,000 pounds carrying passengers or cargo for hire or compensation (see examples below). All major airlines in the U.S. have large hub airports (such as JFK International, Newark, Charlotte, Philadelphia, Chicago O’Hare, Atlanta, etc.)

Major airlines also have operating agreements with a number of different regional airlines to provide feeder service to their hubs using turboprops and regional jets. Jet Blue is almost unique in operating their own regional jets. The largest aircraft used in scheduled service at ACK is Jet Blue’s 100 passenger seat ERJ-190, shown below. Major and regional airlines are currently in the process of replacing their 50-seat aircraft (such as the CRJ-200 and DH-8-200) with larger 70 – 100 seat aircraft.

As noted above, FAA air traffic controllers distinguish between air carrier and air taxi aircraft operations. Air carrier aircraft are defined by FAA as more than 60 seats and can carry more than 18,000 lbs. of payload. That includes regional jets such as the CRJ-700, ERJ-190 (flown by JetBlue), larger turboprops such as ATR-72, as well as Boeing B-737 and Airbus A-319 and A-320 aircraft.



## Nantucket Memorial Airport Master Plan Update

Figure 4-5- Air Carrier Aircraft

Jet Blue Embraer ERJ-190



United Boeing 737-700



US Air Express - Canadair CRJ-200



United Express - DHC-8-202



- **Air Taxi (AT):** The FAA defines air taxi aircraft as designed to have a maximum seating capacity of 60 seats or less or a maximum payload capacity of 18,000 pounds or less carrying passengers or cargo for hire or compensation (see examples below). An air taxi operator is a company with an operating certificate issued by the US DOT and FAA to provide either scheduled or on-demand service under FAR Part 135. Cape Air, Nantucket, and Island Air are designated as air taxi companies.

Nine-seat aircraft such as the Cessna 402 and Cessna Caravan (shown below) can provide scheduled air taxi service under FAR Part 135, while larger aircraft (such as the CRJ-200 and DHC-8, shown below) must operate under FAR Part 121. FAR Part 121 is more stringent and more costly for air carriers than operating under FAR Part 135.

In addition to scheduled air taxi service, a number of different aircraft are used to provide on-demand (non-scheduled) air taxi service. Among the larger on-demand air taxi companies are NetJets, FlexJets, Citation Shares, etc., as well as a number of smaller air taxi companies. They also operate under FAR Part 135, and fly primarily corporate jets such as the Gulfstream G-450 and G-550, Citation Excel and CJ models, Hawker 800, Falcon 2000, Canadair Challengers, etc. Turboprop aircraft such as the Cessna Caravan, Beech King Air, Pilatus PC-12, and Piaggio Avanti, among others, are also used in on-demand air taxi service.



## Nantucket Memorial Airport Master Plan Update

Figure 4-6- Scheduled Air Taxi ('Regional') Aircraft

Cape Air - Cessna 402

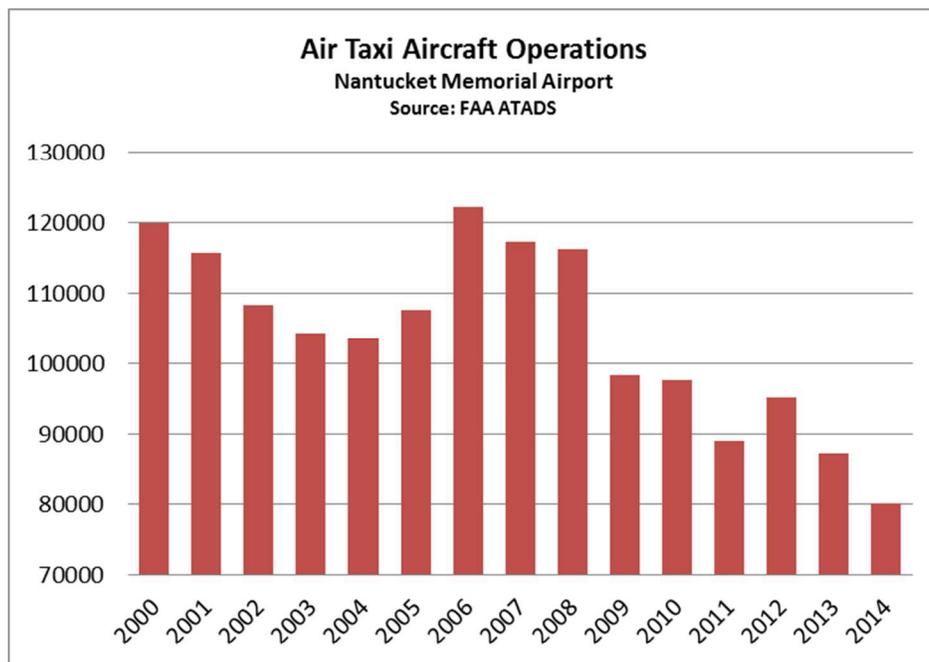


Island Airlines - Cessna Caravan



The FAA permits carriers such as Cape Air and Island Air to provide scheduled service with aircraft that have a maximum of 9 passenger seats (the Cessna 402 and Caravan) under FAR Part 135, as a scheduled air taxi. Aircraft used in scheduled service with more than 9 passenger seats, such as the ERJ-190, B-737, CRJ-200, and turboprops such as the DHC-8, for example, must operate under the more stringent FAR Part 121, which is more expensive for an air carrier to comply with compared to FAR Part 135. The difference between federal regulations impact the replacement options for the Cessna 402 aircraft.

Chart 4-6



- Air taxi operations declined by 33% between 2000-2014
- Still represent the majority of commercial operations at ACK
- The decline is due to various factors:
  - The recession of 2008-2010
  - Shift of passengers to high-speed ferry service



## Nantucket Memorial Airport Master Plan Update

### 4.3.2 On-Demand Air Taxi Service

The FAA issues operating certificates to companies to provide scheduled air taxi services (e.g. Cape Air, Nantucket Airlines, and Island Airlines – discussed above), as well as on-demand (i.e. non-scheduled) air taxi services.

A wide variety of companies provide on-demand air taxi services, from scheduled airlines including Delta, United, US Airways, Cape Air, Island, etc., to general aviation aircraft operators flying large corporate jets (Boeing BBJ, Bombardier Global 7000, Gulfstream G-550, etc.) to turboprops (Raytheon King Air 200 & 350, Cessna Caravan, Pilatus PC-12, etc.), to piston-engine aircraft (Piper Malibu & Matrix, Aztec & Navajo, Cessna 206, Beech Baron, etc.)

Some major airlines operate separate charter companies with corporate jets to provide air taxi services to their first class (premium) passengers. There are also large air taxi companies that specialize in providing on-demand service with corporate aircraft, such as NetJets, FlexJets, Citation Shares, etc. In addition to large air taxi companies, there are a large number of FAA certified air taxi companies that are relatively small and operate one or two aircraft.

Because on-demand air taxi operators fly the same equipment as general aviation pilots as well as mainline carriers, it is more challenging to track and count the level of on-demand air taxi activity. Typically the only distinguishing feature between corporate aircraft on the ramp at ACK in terms of which one is an air taxi operator and the other is privately owned and operated (i.e. under FAR Part 91) is the specific call sign used by the pilots when they are flying.

The majority of the users of corporate and air taxi aircraft at Nantucket are second home owners, followed by seasonal visitors. Relatively few year-round or seasonal Island residents use corporate aircraft, and few commuters (i.e. daily workers) do as well. A major factor in utilization of corporate aircraft is their high cost. A single engine turboprop can cost \$2.5 - \$4 million, and corporate jets (G-650 and Boeing BBJ, e.g.) can cost as much as \$65 million.

**Figure 4-7- Non-Scheduled Air Taxi and Corporate Aircraft**

**Boeing BBJ**



**G650**

**Gulfstream**



**Cessna Caravan**



**Raytheon-Beech King Air**





## ***Nantucket Memorial Airport Master Plan Update***

In addition to providing on-demand service, corporate and air taxi operators can serve any airport their customer needs access to. Operators fly non-stop to/from Nantucket throughout North America, the Caribbean, and Europe. The main runway 6-24 is 6,303 feet long, which is sufficient for many corporate jets to fly non-stop from Nantucket to California, the Caribbean, and Europe. Because there are no federal customs or immigration services at Nantucket, in-bound flights from abroad must stop at designated landing rights airports and be cleared before proceeding to ACK. Outbound flights from ACK to Europe, etc. can depart and fly non-stop from the Island.

Corporate and air taxi aircraft activity data is compiled by a number of private companies (FlightAware, Passur, etc.) that provide flight tracking services for fixed base operators, corporate operators, airports, airlines, etc. The flight tracking companies record data from individual flight plans filed with FAA that identify each flight's date, time, origin and destination, aircraft type, and registration number. Appendix J contains a sample of the data for Nantucket Airport for July 7, 2013. The spreadsheet documents the variety of destinations served from ACK, including Europe, the Caribbean, California, Colorado, etc. The data was arranged in terms of metro areas, and it highlights that the New York Metro region is the largest origin and destination market for corporate and air taxi aircraft, which is consistent with the Chamber of Commerce visitor data.

The on-demand air taxi industry experienced a significant decline in activity during the recession of 2008-2010 (see Appendix I for a detailed discussion about the state of the on-demand and fractional ownership industry). One segment of that market, the fractional ownership program, saw a large decrease in activity. While air taxi traffic has rebounded since 2010, it has not reached the levels of activity experienced in 2004-2007.

The FAA projects that corporate and on-demand air taxi activity will increase nationally. In their latest *Aerospace Forecasts, 2013-2033*, FAA noted:

“Hours flown by turbine aircraft (including rotorcraft) are forecast to increase 3.3 percent yearly over the forecast period, compared with a slight decline of 0.2 percent for piston-powered aircraft. Jet aircraft are forecast to account for most of the increase, with hours flown increasing at an average annual rate of 4.3 percent over the forecast period. The large increases in jet hours result mainly from the increasing size of the business jet fleet, along with a measured recovery in utilization rates from recession induced record lows. Turboprop hours are also expected to increase significantly from what forecast last year, due to the recent trend of significant increase in agricultural use turboprop aircraft, with an average of 2.1 percent per year. Rotorcraft hours, which were less impacted by the economic downturn when compared to other categories and rebounded earlier, are projected to grow by 2.7 percent yearly.”



## Nantucket Memorial Airport Master Plan Update

### 4.3.3 Cargo/Freight/Mail

A number of carriers provide air freight service to/from Nantucket (Appendix H). However, the majority of freight is transported by ferry between the Island and the mainland, particularly construction equipment, building materials, vehicles, heavy supplies, etc. Wiggins Airways flies Cessna Caravans for FedEx between Nantucket, Martha's Vineyard, and Providence. At Providence the flights connect with mainline FedEx aircraft that fly to Memphis, FedEx main hub.

FedEx traffic shows a strong summer peak to ACK, consistent with activity levels in general. Cape and Island Air also fly freight from Hyannis to ACK, and in 2012 Island Air was the largest of the freight carriers by weight. Current freight volumes are lower than before the 2007-2010 recession. The growing use of email and the high speed ferry services are drawing traffic from the courier flights.

**Table 4-18**  
**Federal Express Courier Traffic (Pounds)**  
**Nantucket Airport**

	Summer	Winter	Total
2002	49,520	120,760	170,280
2003	434,840	235,020	669,860
2004	463,340	270,460	733,800
2005	445,000	279,320	724,320
2006	453,520	247,640	701,160
2007	437,100	259,700	696,800
2008	386,843	198,561	585,404
2009	310,954	169,502	480,456
2010	367,243	281,320	648,563
2011	937,631	439,413	1,377,044
2012	1,176,448	418,671	1,595,119
2013	1,053,433	394,504	1,447,937

Winter months=November-April. Summer months=May-October  
 2013 are estimates: January-September 2013 actuals plus October-December 2012 actuals.  
 Source: United States Department of Transportation Database 28DM



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**Table 4-19**  
**Cape Air Mail (Pounds)**  
**Nantucket and Hyannis**

	Winter	Summer	Total
2003	503,925	599,443	1,103,368
2004	547,172	496,200	1,043,372
2005	418,838	608,378	1,027,216
2006	541,681	625,763	1,167,444
2007	514,245	604,834	1,119,079
2008	442,053	537,023	979,076
2009	407,997	540,993	948,990
2010	436,413	425,324	861,737
2011	451,986	374,605	826,591
2012	301,947	446,257	748,204
2013	439,974	477,569	917,543

Winter months=November-April. Summer months=May-October  
 2013 are estimates: January-September 2013 actuals plus October-December 2012 actuals.  
 Source: United States Department of Transportation Database 28DM

**Table 4-20**  
**Island Airlines - Air Freight (In Pounds)**  
**Nantucket and Hyannis**

	Summer	Winter	Total
2010	Unkn.	91,270	91,270
2011	605,371	310,554	915,925
2012	816,542	287,126	1,103,668
2013	623,498	216,022	839,520

Winter months=November-April. Summer months=May-October  
 2013 are estimates: January-September 2013 actuals plus October-December 2012 actuals.  
 Source: United States Department of Transportation Database 28DM



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### 4.3.4 General Aviation Activity

GA encompasses a large segment of users, from privately owned and flown piston-engine aircraft to large corporate jets. Between 2000 and 2012, GA aircraft operations at ACK declined by almost 28%. Training (i.e. local) operations declined by almost 90% over the same period, although there are plans to offer flight training at ACK in 2014. Challenges facing the GA industry include the rising cost and potential limited availability of 100LL avgas, rising aircraft acquisition and operating costs, declining pilot population, as well as airspace and airport security regulations. Corporate aircraft operations declined between 2008 and 2010 at Nantucket, as well as nationally, as a result of the economic recession, and that market has not yet rebounded to the 2004-2007 levels.

#### Definition of Terms

General aviation encompasses a very broad spectrum of civil aircraft activity. GA is defined as all civil aircraft activity except those classified as air carriers or air taxi. As a result, GA activity encompasses many missions, including:

General Aviation Aircraft Missions	
Personal/Discretionary/Recreational	Construction support
Corporate/Business	Agricultural application
Electronic news gathering (ENG)	Flight training
Aerial surveillance, pipeline and powerline patrol	Firefighting
Law enforcement	Ranching-herding
Aerial Filming-Photography-Marketing	Environmental surveillance
Medical evacuation	Air shows/demonstrations

In addition, a wide variety of aircraft are used in those various missions. Not all of those missions occur at Nantucket Airport and neither the FAA nor the airport tracks GA activity at Nantucket Airport by each mission flown. As a result there is no data to quantify the level of GA activity at ACK by each mission or aircraft type.



## Nantucket Memorial Airport Master Plan Update

### GA Activity Trends

GA activity is counted by the FAA air traffic controllers as either ‘local’ or ‘itinerant’. Local operations occur within the vicinity of the airport, and are primarily training in the form of repeated takeoffs and landings (touch and goes) on a given runway, as well as practice instrument approaches.

Between 2000 and 2014, local operations declined by almost 96% and represented less than 1% of total operations at ACK in 2014. There is no flight school based at ACK, and its distance from the mainland decreases its utility for flight training given the availability of other airports. There are discussions about starting a flight school at ACK which could stimulate flight training activity in the future.

Itinerant GA operations declined by 29% between 2000 and 2014. Those operations were conducted by aircraft flying to or from other airports. They are comprised primarily of piston and turbine-engine aircraft. There are relatively few helicopter operations at ACK, and almost no light sport aircraft, ultralights, or gliders.

Piston-engine aircraft are primarily owner flown, and the majority of flights are personal/discretionary missions. They are owned and operated by second home owners, seasonal visitors, and some Island residents. Few seasonal workers or commuters own and operate their own aircraft.

Owners and operators of piston engine aircraft are relatively price sensitive compared to operators of corporate aircraft, and therefore piston activity levels are more affected by fuel prices and airport charges. Most piston aircraft trips to Nantucket start or end in the Northeast.

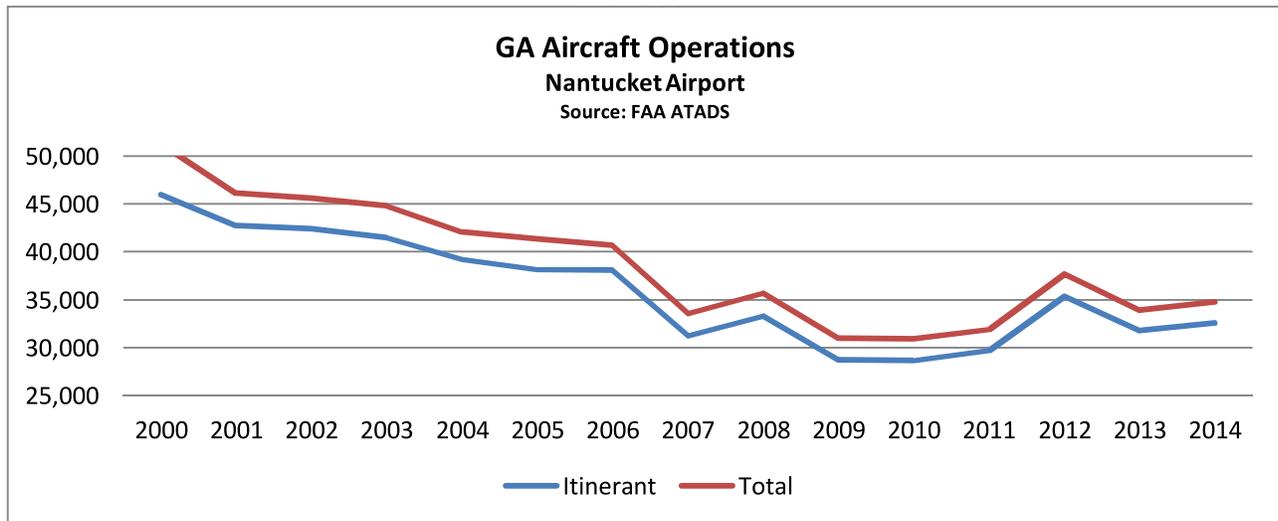
**Table 4-21**  
**General Aviation Aircraft Operations**  
**Nantucket Airport**  
**Source: FAA ATADS**

<u>CY</u>	<u>GA Itinerant</u>	<u>GA Local</u>	<u>Itinerant % Total</u>
2000	46,042	3,321	93.3%
2001	42,792	1,386	96.9%
2002	42,448	1,175	97.3%
2003	41,488	1,341	96.9%
2004	39,236	837	97.9%
2005	38,162	1,210	96.9%
2006	38,095	586	98.5%
2007	31,233	345	98.9%
2008	33,308	385	98.9%
2009	28,704	276	99.0%
2010	28,659	213	99.3%
2011	29,742	156	99.5%
2012	35,372	339	99.1%
2013	31,746	170	99.4%
2014	<u>32,580</u>	<u>150</u>	99.5%
<b>2000-2014</b>	<b>-29.2%</b>	<b>-95.5%</b>	



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Chart 4-7



### Factors Impacting GA Activity

A variety of factors have and likely will continue to impact GA activity, both at Nantucket Airport as well as regionally and nationally. Of the various factors discussed below, only airport rates and charges and the availability of hangars and tiedowns are directly controlled by the airport itself – the other factors are typically outside of any particular airport’s control.

- **Rising aircraft ownership and operating costs**, including new and used aircraft prices, parts, fuel prices, insurance, fuel, maintenance, etc. For more than 20 years aircraft ownership and operating costs have increased faster than the overall rate of inflation, particularly the price of new aircraft and fuel. For example, a popular personal and training airplane - a new Cessna 172 (single piston engine, four seats, fixed landing gear) – costs \$400,000 (or \$100,000 per seat). Those increased costs have directly impacted the number of new aircraft sales nationally. As a result airplane owners have kept existing airplanes vs. trading in for new, and the average age of a general aviation airplane is almost 40 years old, which results in higher maintenance and operating costs.
- **Availability of fuel** – avgas, or 100LL, is used in piston engine aircraft (including the Cessna 402 flown by Cape Air), and it is the only fuel sold in the U.S. with lead additive. The U.S. EPA and various environmental groups have been studying avgas, and some groups have called for its discontinuation. In addition, compared to jet and auto fuel, only a very small quantity of avgas is sold, and it is one of the most expensive processed fuels produced by oil companies. A variety of industry groups, aviation companies, and the FAA have been studying alternatives to avgas, but have not found any that are ‘drop-in’ ready. A discontinuation of avgas, or even a decline in its availability before a ‘drop-in ready’ fuel is found, would potentially ground a large part of the GA piston engine fleet.
- **State sales and use taxes** – until 2001 the state of Massachusetts imposed sales tax on aircraft and parts sold and/or based in the state. Other New England states, such as NH, did not charge sales or use tax on aircraft, and a number of owners and operators in the Bay State moved their aircraft to adjoining states to avoid Massachusetts state taxes. The Massachusetts *Sales Tax Exemption on Aircraft Parts and Maintenance* was passed in 2001 and has been renewed by the state legislature, but only for a limited period. The repeal of the aircraft sales tax directly benefitted in-state aircraft service



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companies and fixed base operators. If the repeal were allowed to lapse in the future, the reinstatement of a sales tax would decrease GA activity throughout the Commonwealth. The economic recession of 2008-2010 put severe pressure on state budgets across the country resulting in significant budget and staffing cuts, and as result states have been looking for new revenues including eliminating tax exemptions.

- **Airport rates and charges** – piston aircraft owners are relatively price sensitive, and will base their aircraft at airports with competitive (i.e. lower) prices for tiedowns, hangars, and fuel, if the airports are located within a convenient driving distance (typically less than 1 hour drive time) from home or office. However, ACK is the only airport on the Island, so it does not have competition for based aircraft as do airports on the mainland.
- **Availability of hangars and tiedowns** – both the availability and the cost of hangars and aircraft tiedowns will affect the number of based aircraft, and also operations. Historically, most of the hangars at ACK have been occupied and based aircraft tiedowns were mostly occupied, although the availability of hangars and tiedowns has increased recently. The number of based aircraft at Nantucket Airport typically increases in the summer months. Given its location and market base, GA aircraft owners/users at ACK are somewhat less price sensitive than other GA aircraft operators. FAA's Terminal Area Forecast (TAF) predicts that based aircraft at ACK will increase by 11 airplanes by 2040, an increase of 42%, to a total of 37 based aircraft.
- **Local and regional economy** – although factors such as rates of employment, per capita income, and disposable personal income typically have a bearing on aviation activity at a given airport, the majority of ACK airport users are visitors, not Island residents. As a consequence, the New England regional economy has more of an impact on overall aviation activity at ACK than changes in employment or per capita income of Island residents. For example, the recent recession (2008-2010) greatly impacted corporate aviation activity regionally, nationally, and world-wide, which also had an impact on corporate traffic at ACK. But the Island's economy did not directly impact corporate aviation activity. The economic recession also prompted travelers to visit locations closer to home, which benefitted summer destinations such as ACK, however, many travelers were also more price sensitive and used lower cost transportation modes (such as the ferry vs. air service), and also visited for shorter periods. As noted above, factors such as the performance of the stock market and corporate profits have a more direct impact on corporate aircraft and air taxi activity (often used by second home owners) at ACK.
- **Pilot career opportunities** – one factor in stimulating GA flying, and training in particular (discussed below) are career opportunities for professional pilots. Due to the recent recession, airlines and corporations had significantly reduced their fleets and furloughed flight crews, some of which have since been hired back. However, pilot hiring by regional and mainline carriers has not rebounded significantly, and the public perception of airline careers has become more negative due to numerous bankruptcies, mergers, and downsizing. In addition, Congress recently passed legislation requiring the FAA to substantially increase the minimum time and experience requirements for new copilots to be hired by air carriers. At the same time the military has been reducing the number of slots for new pilots, in part because fewer graded military pilots are leaving the service (in part because of fewer airline jobs), but also because all of the branches of the military are focused on increasing their fleets of unmanned aerial vehicles (UAV). As a result, the number of personnel being trained as UAV pilots is greater than for manned aircraft, and that trend is anticipated to continue. The combination of



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reduced airline, corporate, and military pilot opportunities decreases the level of interest in GA as a career path.

- **Local/flight training activity** – although there is currently no flight school based at ACK, the airport is used occasionally by student pilots based at other airports on the mainland. In addition, a new program to offer flight training and aircraft rental on the Island is actively being planned for start-up in 2014, which would generate more local/training GA activity at ACK. A number of factors have combined to significantly decrease the overall level of flight training statewide and regionally: the cost of flight training has risen faster than the rate of inflation; airlines and military are recruiting fewer pilots (discussed above); government subsidies for flight training in the form of the GI Bill and student loans have decreased; and security procedures (including the use of Temporary Flight Restrictions – TFR), makes operation of GA aircraft less attractive. Also, GA flight schools are making much greater use of computer and simulator based training in an effort to reduce costs and increase safety. FAA recently adopted new regulations and procedures for light sport pilots and light sport aircraft (LSA), which has stimulated training activity at certain airports. However, the cost of LSAs were not as low as anticipated/hoped, and combined with restrictions on their use have limited demand for that type of GA activity. Finally, civilian interest in piloting Unmanned Aerial Vehicles (UAV) is growing rapidly, and colleges are offering more programs for UAV operators.
- As noted in the Washington Times, Jan. 30, 2103: “Flight training schools have taken a tip from the [FAA](#)’s estimates that 10,000-plus commercial drones will be operational in the United States in the next few years, and bolstered their course selection. Even community colleges now offer training on remote
- **Airport and Airspace Security** – Nantucket Airport operates with an FAR Part 139 Operating Certificate, which requires the airport to comply with all appropriate FAA and TSA security requirements. While general aviation aircraft and GA airports have not been subject to similar security requirements as the airlines and their passengers, secured access onto airport movement areas and temporary flight restriction (TFR) have impacted GA activity. In November 2014, for example, Vice President Joseph Biden visited Nantucket and a TFR was imposed that restricted access to ACK. TFR’s are imposed for a variety reasons including VIP visits, as well as emergency response, etc. When the president visits Martha’s Vineyard, for example, a large TFR is imposed. TFRs can be imposed very quickly, and penalties to pilots for violating TFRs can be severe. As a result, many pilots are very cautious in the vicinity of TFRs. See Appendix L for a copy of the published TFR over ACK in November 2013.

As noted above with future air carrier activity, a number of external events could significantly impact GA activity at ACK, including a sharp rise in avgas and/or Jet A fuel prices, a shortage of avgas, rapidly increasing cost of new aircraft and parts, or new security regulations or restrictions aimed at GA. However, none of those events are currently anticipated to occur in the foreseeable future, and based on historical trends the FAA’s Terminal Area Forecast of GA activity is reasonable.

### 4.3.5 Corporate Aircraft Activity

Corporate aircraft are also referred to as business jets or business aircraft. They are predominantly turbine powered, including both turboprops and jets. The majority of turbine powered GA aircraft at ACK are flown by professional pilots, although some turbine aircraft are owner-flown, particularly single-engine turboprops such as the TBM-700/850 and Piper Meridian. Some smaller jets such as the Cessna



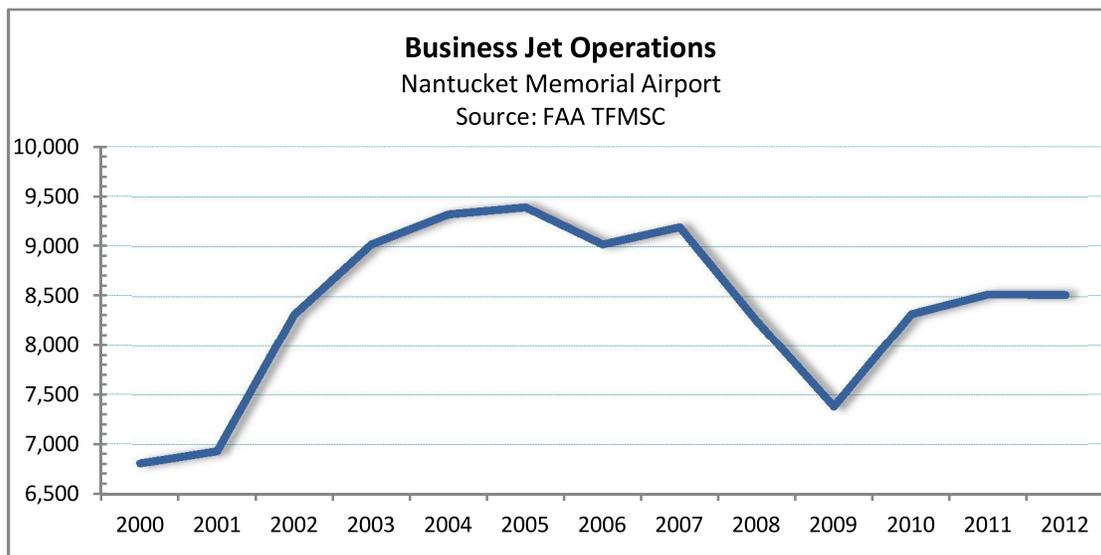
## Nantucket Memorial Airport Master Plan Update

Citation CJ-1 and CJ-2, Mustang, and Embraer Phenom are also owner flown, but the majority of jets are flown by professional pilots.

Most turbine aircraft are owned and/or operated by second home owners on the Island, followed by seasonal visitors. Table 4-13 documents the very high percentage of business jet operations during the peak summer season, which is consistent with second home owner patterns. In many respects, the second home owner market and corporate jet activity are relatively mature – i.e. they've already experienced strong growth, and have been relatively stable for a period of time.

As noted with air taxi aircraft, above, relatively few year-round Island residents or seasonal workers / daily commuters own or operate corporate aircraft, particularly jets, in large part because of their high acquisition and operating costs. While FAA and trade association surveys indicate that the majority of corporate aircraft missions are conducted for business, at Nantucket they are primarily used by second home owners who are on vacation.

Chart 4-8



The FAA tracks business jet operations, and their data indicate a fluctuation in activity at ACK between 2000 and 2012. The decline in operations between 2008-2010 coincided with the recession, and also with the steep decline in corporate jet activity nationally. Corporate aircraft activity has rebounded between 2010 and 2012, but not returned to the levels experienced between 2004-2007.

While second home owners who also own corporate aircraft are less price sensitive than other aviation users, the level of corporate aircraft activity is related to broad economic indicators such as the performance of the stock market (Dow Jones and Nasdaq indexes), and corporate profits.

The cash flow generated by investments in a rising market and corporate profits covers the cost of operating business aircraft. As noted previously, the limited land area on the Island and the restrictions on future development help to maintain the highest property values in the country, but also limit future



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growth in new housing, both affordable and high-end. As a result, no significant increase is predicted in the number of second home owners.

In addition to a rebound in operations since 2010, the size of corporate jets have increased at ACK, in part due to the introduction of new large jets such as the Gulfstream G-650, new models of the Boeing BBJ (a derivative of the Boeing 737-800), Canadair Global 7000 and 6000, and the use of B-757 and B-767 as corporate aircraft.

**Table 4-22**

Business Jet Ops	
Year	Peak Season % of Total
2000	75.5
2001	75.4
2002	76.0
2003	77.0
2004	77.5
2005	78.8
2006	78.6
2007	79.3
2008	76.5
2009	76.2
2010	76.9
2011	78.2
2012	77.6

Source: FAA TFMSC

Note: Peak season includes June, July, August, & September

### 4.3.6 Public Service/Government/Military Aviation Activity

A variety of agencies provide public service missions to and from Nantucket Airport including the U.S. Coast Guard, Massachusetts State Police, Boston MedFlight, the Massachusetts Air National Guard, as well as private medical evacuation companies. In addition, transient military units occasionally use Nantucket Airport, as well as government aircraft such as VIP flights. There are no based military or government aircraft at Nantucket.



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The missions served are also extremely varied, and include public service, law enforcement, VIP transportation, disaster relief, national security, etc. In addition, private companies such as Boston MedFlight, and private individuals (aircraft owners) operating as “Compassion Flights”, and also as part of the ‘Corporate Angel Network’ (CAN), provide a variety of public service-medical related missions. While Nantucket Airport does not have any based government or military aircraft, it is utilized by a variety of agencies and private companies that provide a variety of public service missions to the Island.

### State Police, U.S. Coast Guard, MedFlight

The Massachusetts State Police, Boston MedFlight, the U.S. Coast Guard, as well as various Army National Guard units all operate helicopters in the Bay State and throughout the Cape and Islands, for search and rescue, medical evacuation, disaster relief, and law enforcement. Each of those agencies uses Nantucket Airport on an as-needed basis.

For Island residents, those agencies provide critical air transportation to trauma centers in Boston and elsewhere. In addition, there are fixed-wing medevac aircraft, as well as ‘compassion flights’ which are private GA aircraft that transport ill patients to hospitals. It is not anticipated that any of the public service providers will base their helicopters at Nantucket Airport, but they use the instrument approaches, ATC services, the parking aprons, terminal facilities, and FBO services.

**Figure 4-8- Public Service Aircraft**

**Coast Guard HC-144 Sentry**



**Coast Guard MH-60**



**US Army National Guard – UH-60**



**Boston MedFlight**



### Military Activity

There are no military aviation units based at Nantucket Airport, and none are anticipated to locate to ACK in the foreseeable future. Otis AFB on Cape Cod formerly housed the Mass. ANG 104<sup>th</sup> Fighter Wing, which moved to Barnes Westfield Airport in 2007 as part of the Base Realignment and Closure (BRAC) program. Joint Base Cape Cod is currently home to Air Station Cape Cod (ASCC) with three helicopters



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and four jets, which is the only Coast Guard Aviation facility in the northeast. Transient military aircraft use Nantucket Airport on an as-needed basis, and military conduct training activity at civilian airports throughout the Commonwealth.

In 2012 there were fewer than 1,200 total military aircraft operations at ACK, which represented less than 1% of total activity at the airport. The FAA predicts that military aircraft operations will remain flat throughout the forecast period, and given possible upcoming Defense Department budget cuts, along with the military's increased focus on the use of unmanned aerial vehicles (UAV), the FAA's forecast appears to be reasonable.

### **Irregular Operations (IROPs)**

By their very nature and definition, IROPs are irregular and unpredictable. ACK has served as a staging area for search and rescue operations, as well as aircraft diversions due to mechanical problems, ill passengers and crew, and deteriorating weather. Those types of diversions will continue to occur, and the frequency of such occurrences will be tied to factors such as overall aviation activity in the region, etc.

Many aircraft flying the North Atlantic Track System (NATS) between the U.S. East Coast and Europe overfly Nantucket. Aircraft overflying the Cape and Islands have a variety of airports to divert to based on the type and extent of their emergency, and airport facilities and services needed. VIP visits, such as those by the current (2015) U.S. Vice President Joe Biden and Secretary of State John Kerry, are anticipated to continue, although they are not possible to predict with any accuracy. The Airport has operating and contingency plans in place to accommodate IROPs, including VIP visits.



**4.4 Peak Season and Peak Month Operations**

Nantucket Airport experiences a very strong peak season, which typically lasts for four months from June to September coinciding with peak summer tourist season. Between 2001 and 2014 peak season operations consistently generated between 46% - 51% of total annual activity, which is one of the strongest seasonal peaks of any airport in the U.S. (Table 4-23).

**Table 4-23  
Peak Season Aircraft Operations  
June-September 2001-2014  
Nantucket Memorial Airport**

<b>Year</b>	<b>Seasonal Operations</b>	<b>% Total Annual Ops</b>
2001	74,253	46.1
2002	73,165	47.8
2003	73,362	49.6
2004	68,709	47.6
2005	71,956	48.8
2006	74,719	46.2
2007	69,821	46.4
2008	73,529	48.6
2009	58,639	45.7
2010	60,706	47.6
2011	57,723	47.9
2012	65,781	49.6
2013	55,953	48.9
2014	58,165	50.9
<b>2001-2014</b>	<b>-21.7%</b>	

<b>Annual Average</b>		
<b>2001-2014</b>	<b>66,892</b>	<b>47.9%</b>

Source: FAA ATADS



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Peak month is typically July/August, and peak month activity shows similar trends – it has consistently represented 14.2% of total annual operations (Table 4-24).

**Table 4-24**  
**Peak Month Operations**  
**2001-2014**  
**Nantucket Memorial Airport**

Year	Peak Month	% Total Ops
2001	22,958	14.3
2002	20,939	13.7
2003	22,029	14.9
2004	19,644	13.6
2005	21,091	14.3
2006	22,151	13.7
2007	20,042	13.3
2008	23,116	15.3
2009	17,200	13.4
2010	17,937	14.1
2011	17,077	14.2
2012	19,026	14.3
2013	17,720	14.6
2014	17,394	15.2
<hr/>		
2001-2014	-24.2%	

<u>Annual Average</u>		
<b>2001-2014</b>	<b>19,880</b>	<b>14.2%</b>

Source: FAA ATADS



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