FAA Regional Air Service Demand Study

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3-42-0125-003-03
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Task B — Forecast of Passengers, Operations and Other Activities

May 2007

Delaware Valley Regional Planning Commission

ABE –
Lehigh Valley
International Airport

ACY –
Atlantic City
International Airport

TTN –
Trenton Mercer
Airport

Port Authority of New York & New Jersey

JFK –
John F. Kennedy
International Airport

LGA –
LaGuardia Airport

EWR –
Newark Liberty
International Airport

New York State Department of Transportation

SWF –
Stewart International
Airport

HPN –
Westchester County
Airport

ISP –
Long Island
MacArthur Airport

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FAA Regional Air Service Demand Study

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I. INTRODUCTION AND TASK B PURPOSE

The purpose of this report is to provide a passenger forecast for three airports. These airports are the Lehigh Valley International Airport (ABE), Atlantic City International Airport (ACY), and Trenton-Mercer Airport (TTN), which are located in or near Allentown, PA; Atlantic City, NJ; and Trenton, NJ, respectively. For purposes of this report, the airports are referred to as Lehigh Valley, Atlantic City, and Trenton.

The forecasts of this study are part of an integrated projection of aviation demand covering portions of eastern Pennsylvania, south eastern New York, and New Jersey. The need for the study is created by the existing and expected congestion at the three commercial passenger airports operated by the Port Authority of New York and New Jersey (PANYNJ): John F. Kennedy International Airport, Newark Liberty International Airport, and LaGuardia Airport. The forecasts for the three airports of this analysis will be used as input into the overall study to develop a rational basis for meeting aviation demand, and to improve overall regional economic conditions.

While a principal focus of this study is the interaction of the three study airports with the PANYNJ airports, there are similar interactions among other regional airports, such as Philadelphia International Airport and Harrisburg International Airport. The same factors that influence the overlap of aviation demand will be considered regardless of the airport location.

In fact, large portions of nine or more states stretching from Washington, D.C./Northern Virginia through Boston are highly urbanized and highly dependent upon air travel. As will be discussed in this report, the three airports in this study are in the middle of this Northeast Corridor region, and their current and future aviation activity is highly dependent upon regional issues and the actions or inaction at dozens of airports, including some that may not now have scheduled commercial air service. These regional issues include, but are not limited to: developments at other airports, airline market decisions, highway congestion/construction, passenger rail operation, consumer travel trends, and national/statewide policies with respect to the supporting aviation versus other modes of travel.

This report will provide background on the Delaware Valley Regional Planning Commission (DVRPC) and national trends in air passengers. The three study airports and their respective air trade areas (called *catchment* areas in this analysis) will be identified. Existing commercial air service will be reviewed and the forecast assumptions stated. Finally, the forecasts themselves will be presented.

These forecasts are intended for long-term facility planning purposes as part of this specific FAA-supported regional study. They are not intended to replace the forecasts developed for the study airports individually, nor are they designed for short-term planning. Rather, they have been developed to stimulate discussion of

the long-term demand for aviation in the region and the many ways that demand might be accommodated. Note that these forecasts are *unconstrained*, meaning that it is assumed that facilities will be constructed, or other changes made, so that all passengers, cargo, and aircraft operations can be accommodated at the three study airports and all other airports in the region.

II. DVRPC BACKGROUND

The sponsoring agency for this study is the Delaware Valley Regional Planning Commission or DVRPC. This agency provides coordinated planning for nine counties in southeastern Pennsylvania and west central New Jersey. These counties are identified and their 2000 Census and projected 2025 populations are provided in **Table II-1**.

Table II-1
Counties of the DVRPC and Their Population

Area	2000	2025	Average Annual Growth	Percentage Increase
Pennsylvania				
Bucks	597,635	748,120	0.9%	25.2%
Chester	433,501	550,160	1.0%	26.9%
Delaware	550,864	547,784	0.0%	-0.6%
Montgomery	750,097	857,030	0.5%	14.3%
Philadelphia	1,517,550	1,500,000	0.0%	-1.2%
New Jersey				
Burlington	423,394	513,450	0.8%	21.3%
Camden	508,932	513,530	0.0%	0.9%
Gloucester	254,673	322,520	0.9%	26.6%
Mercer	350,761	404,850	0.6%	15.4%
TOTAL	5,387,407	5,957,444	0.4%	10.6%

Source: DVRPC, March, 2002

The nine counties had a 2000 population of nearly 5.4 million and the agency predicts that by 2025 it will be nearly six million. The total growth in the 25-year period is 10.6 percent, which calculates at an average annual growth rate of 0.4 percent.

The DVRPC counties are relatively large in population and highly urbanized. None of the nine counties is expected to grow dramatically in population over the 25 year period shown and two counties (Philadelphia and Delaware) are even expected to decrease slightly in population.

Of the three airports in this forecast, only Trenton is actually located in the DVRPC area; Lehigh Valley is just north of the region and Atlantic City is southeast of the region. The only other scheduled commercial passenger service airport within the nine DVRPC counties is the Philadelphia International Airport; however, a number of general aviation airports are also located in the area.

III. NATIONAL PASSENGER ACTIVITY TRENDS

The number of scheduled commercial air passengers in the United States has been increasing steadily over time. Over the last 50 years the number of passengers on U.S. airlines has increased from approximately 35 million in 1954 to just fewer than 700 million in 2004 – a twenty-fold increase in 50 years. The historical record of U.S. airline passenger growth by decade is shown on **Table III-1**.

Table III-1
Total U.S. Enplaned Passengers by Decade

Year	U.S. Enplanements
1954	35,448,000
1964	88,520,000
1974	207,458,000
1984	344,683,000
1994	528,848,000
2004	697,792,000
Average Annual Growth	
1954-1964	9.6%
1964-1974	8.9%
1974-1984	5.2%
1984-1994	4.4%
1994-2004	2.8%
1954-2004	6.1%

Source: U.S. Department of Transportation

The average annual growth rate over the entire 50-year period is 6.1 percent. By decade, the rate of grow appears to be slowing from 9.6 percent from 1954 to 1964 to 2.8 percent from 1994 to 2004. However, this relatively slow growth rate in the last decade was partially caused by the unusual suspension of traffic following the events of September 11, 2001. In fact, in the entire 50-year period, there were only eight years of annual declines, two of which were 2001 and 2002. In recent years, the typical annual increase of passenger traffic has averaged three to five percent. While tentative FAA information indicates 2005 will have a well above average 7.1 percent year-over-year increase in U.S. passengers, the FAA projects a possible decline of total passengers in 2006 due to cut-backs in available airline seat availability.

Forecasts of continued growth of passengers of U.S. airlines or within the U.S. average between three and five percent annually, depending on the source. The FAA's latest national forecast for the 2006 to 2017 period indicates 3.1 percent average annual growth. Boeing and Airbus predict traffic for the entire North American market rather than just the U.S., but the U.S. represents most of this traffic. Boeing projecting a 3.5 percent average annual growth over the next 20 years for North America and Airbus seeing a 4.2 percent increase. For the same region, Rolls Royce estimates long term growth will average 3.7 percent, while

Avitas (an independent forecasting company) projects a 4.2 percent increase. Note that all of these national forecasts may be for slightly different time periods, types of traffic, and market areas; yet all see continued growth of passengers in the overall U.S. market.

On a worldwide basis, the expected rate of growth of scheduled commercial passenger traffic is expected to be much higher. For example, Boeing's worldwide forecast is for 4.8 percent average annual growth, but most other independent forecasts are between the five and six percent average annual increase range. The reason for this difference is that the U.S. (and the remainder of North America) is seen as a 'mature' market, while Asia, particularly China, is seen as faster growing or less mature market. However, the size of North American market is far larger than anywhere else in the world and roughly half of worldwide air passengers are traveling within or to/from North America. For example, the amount of travel within North America is currently nearly ten times the size of China and twice the level of that within Europe.

IV. CATCHMENT AREA IDENTIFICATION

As part of this study, catchment areas were identified surrounding each airport. These catchment areas are comprised of counties that are adjacent or near each airport and extend in a rough circle with a radius of 50 to 75 miles from each airport. While the catchment areas indicate areas geographically near each airport, these catchment areas overlap both among the three airports in this study, and with the adjacent airports in the New York and Philadelphia areas. This overlap occurs because the region's airports are relatively close together, good highways connect most major cities, air service levels vary so much between airports, and competition for travel options is intense. Therefore, air passengers can chose among the region's airports, and the catchment areas provide what might be defined as a maximum geographic representation of what the extended service area for each airport may be. In reality, passengers may drive past one airport to another seeking a specific airline, lower fares, non-stop flights, or for other reasons. (The Task A survey findings, presented under separate cover, present summaries of airport choice factors).

The catchment areas of each airport are presented in **Table IV-1**. Counties that overlap between these three airports are marked with an asterisk; additional overlap for all these counties occurs with airports such as Philadelphia International and Newark Liberty International.

Table IV-1
Catchment Areas Identification

Lehigh Valley	Atlantic City	Trenton
Berks, PA	Atlantic, NJ	Bucks, PA*
Bucks, PA*	Burlington, NJ*	Burlington, NJ*
Carbon, PA	Camden, NJ	Hunterdon, NJ*
Columbia, PA	Cape May, NJ	Mercer, NJ*
Hunterdon, NJ*	Cumberland, NJ	Middlesex, NJ
Lackawanna, PA	Gloucester, NJ	Monmouth, NJ*
Lehigh, PA	Mercer, NJ*	Montgomery, PA*
Luzerne, PA	Monmouth, NJ*	Ocean, NJ*
Monroe, PA	Ocean, NJ*	Somerset, NJ
Montgomery, PA*	Salem, NJ	
Northampton, PA		
Northumberland, PA		
Pike, PA		
Schuylkill, PA		
Susquehanna, PA		
Warren, PA		
Wyoming, PA		

"*" indicates county shared with another market of this study.
Source: PB Aviation

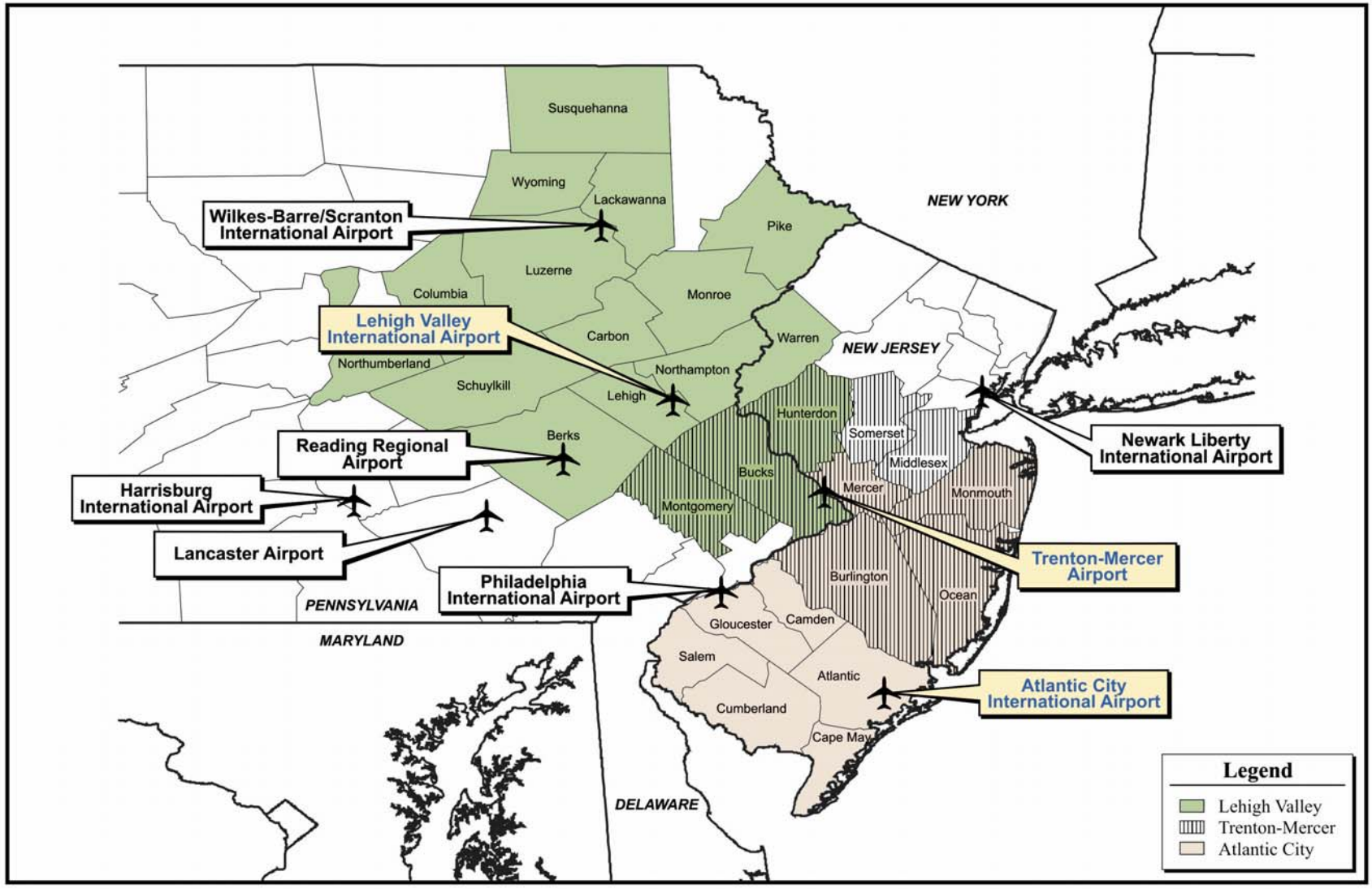
Based on this analysis, the catchment areas of Lehigh Valley and Atlantic City do not overlap. Trenton, in the middle, shares four counties with Atlantic City and three with Lehigh Valley; Trenton has two counties (Somerset and Middlesex) not shared with another airport in this study, but these two counties are relatively close to New York City and various airports operated by the PANYNJ. While not

presented in this report, the catchment areas of airports such as Newark Liberty, Philadelphia International, and Harrisburg are also likely to include all of counties identified in this analysis. Wilkes-Barre/Scranton International Airport is also located in Luzerne County within the Lehigh Valley catchment area. Reading Regional Airport, which in the past has had scheduled commercial passenger service, is located in Berks County, also within the Lehigh Valley catchment area.

Details of a market survey that identified catchment area counties and the choices of air passengers for airports are contained in another volume of this study. Other analysis of the behavior patters of regional air passengers are also identified in that report; however, highlights of the survey factors influencing each airport in this study are included in the forecast section of this report.

The catchment area counties are shown graphically on **Exhibit IV-1**. Details on the demographics of each airport catchment area are presented in the next section.

Exhibit IV-1
Airport Catchment Area Identification



V. CATCHMENT AREA DEMOGRAPHICS

Demographic factors typically provide the foundation for passenger air service demand at an airport. This section provides historical and forecast data on the catchment areas for each airport.

V.1 Lehigh Valley

The 17 counties that are defined as the catchment area for Lehigh Valley currently have a total population of 3.7 million. By 2025, this region's population is expected to grow to 4.5 million as projected by Regional Economic Models, Inc. (REMI). Historically, the average annual population growth rate has been 0.8 percent annually, and is expected to remain stable at 0.8 percent annually over 20-year projection period.

Employment within the Lehigh Valley region is 2.2 million persons; by 2025, employment is expected to reach 2.6 million persons. This is an average annual growth of employment of 0.8 percent - matching population growth.

The income of all persons residing in the region was $141 billion in 2002. This personal income is anticipated to increase to $239 billion by 2025 an average annual increase of 2.4 percent. Gross regional product is expected to rise by an average of 3.3 percent in the same period.

The historical and projected demographic indicators for the Lehigh Valley catchment area are presented on **Table V.1-1**.

In comparison to the entire United States, the population of the Lehigh Valley catchment area is expected to grow at approximately a similar annual rate (1.0 percent) as the nation; however, employment growth is projected to be lower (0.8 percent versus 1.5 percent).

V.2 Atlantic City

Population of the 10 county Atlantic City catchment area is estimated at 3.3 million in 2002. By 2025, this population is expected to increase to 4.1 million or a 1.0 percent average annual growth rate.

Employment growth is expected to be similar to population over the next 20 years with a 0.9 percent average annual growth rate. Total personal income and gross regional product are expected to grow at average annual rates of 2.5 percent and 3.2 percent, respectively during the same time period.

These Atlantic City catchment area statistics are shown on **Table V.2-1**.

Table V.1-1
Lehigh Valley Demographic Data

Year	Population	Employment	Personal Income (000,000s) (2005 dollars)	GRP (000,000s) (2005 dollars)
Actual				
1985	3,252,389	1,684,679	$90,156	$92,314
1986	3,276,846	1,722,252	$93,214	$96,045
1987	3,310,391	1,781,920	$97,186	$101,807
1988	3,350,115	1,839,412	$103,048	$108,956
1989	3,382,353	1,875,546	$109,670	$113,210
1990	3,413,008	1,894,612	$112,690	$114,986
1991	3,450,106	1,854,835	$113,191	$115,908
1992	3,483,886	1,858,822	$116,640	$119,926
1993	3,516,346	1,879,509	$117,452	$122,262
1994	3,545,951	1,896,213	$119,295	$125,554
1995	3,571,984	1,940,061	$121,913	$129,781
1996	3,597,637	1,964,611	$124,883	$131,314
1997	3,615,252	2,009,025	$127,949	$135,513
1998	3,638,423	2,048,969	$133,214	$140,337
1999	3,662,064	2,089,061	$135,058	$142,472
2000	3,683,174	2,144,425	$141,733	$145,600
2001	3,712,376	2,153,799	$140,340	$142,016
2002	3,741,123	2,158,597	$141,496	$145,645
Projected				
2003	3,766,918	2,159,062	$142,841	$151,868
2004	3,791,770	2,177,092	$147,025	$160,793
2005	3,816,211	2,201,062	$152,185	$169,111
2006	3,840,359	2,227,786	$159,247	$178,082
2007	3,864,545	2,255,417	$165,878	$187,831
2008	3,889,741	2,280,611	$170,017	$196,075
2009	3,915,648	2,303,057	$174,035	$204,487
2010	3,941,995	2,324,060	$178,033	$213,163
2011	3,968,749	2,343,589	$182,090	$221,735
2012	3,996,482	2,361,831	$186,230	$230,705
2013	4,026,141	2,382,467	$189,559	$236,161
2014	4,057,544	2,402,325	$193,011	$241,817
2015	4,089,969	2,421,796	$196,550	$247,721
2016	4,124,888	2,436,544	$200,115	$253,289
2017	4,161,112	2,451,674	$203,892	$258,965
2018	4,198,534	2,465,915	$207,759	$264,644
2019	4,236,880	2,479,754	$211,724	$270,359
2020	4,275,563	2,493,721	$215,753	$276,188
2021	4,314,604	2,507,882	$220,111	$282,979
2022	4,353,894	2,521,610	$224,576	$289,862
2023	4,393,667	2,536,677	$229,202	$297,025
2024	4,433,437	2,551,154	$233,861	$304,247
2025	4,472,663	2,566,437	$238,563	$311,737
Average Annual Growth				
1985-2002	0.8%	1.5%	2.7%	2.7%
2003-2025	0.8%	0.8%	2.4%	3.3%

Source: REMI, 2005

Table V.2-1
Atlantic City Demographic Data

Year	Population	Employment	Personal Income (000,000s) (2005 dollars)	GRP (000,000s) (2005 dollars)
Actual				
1985	2,797,672	1,351,419	$79,295	$81,434
1986	2,840,170	1,392,292	$82,793	$86,598
1987	2,883,097	1,434,893	$87,046	$92,324
1988	2,924,121	1,482,804	$92,916	$100,388
1989	2,948,288	1,506,872	$97,121	$103,119
1990	2,970,696	1,506,060	$98,728	$103,782
1991	2,998,216	1,462,001	$98,180	$104,600
1992	3,022,268	1,470,804	$102,313	$107,082
1993	3,048,114	1,484,919	$102,363	$109,073
1994	3,076,535	1,507,265	$103,014	$110,798
1995	3,107,383	1,528,627	$105,185	$111,918
1996	3,132,822	1,545,970	$108,411	$114,795
1997	3,157,117	1,574,757	$112,349	$119,642
1998	3,182,724	1,600,917	$116,791	$120,775
1999	3,209,084	1,624,297	$118,119	$121,918
2000	3,236,912	1,675,548	$124,730	$123,572
2001	3,266,995	1,697,821	$124,428	$113,674
2002	3,307,713	1,725,918	$126,065	$119,108
Projected				
2003	3,346,406	1,737,325	$127,860	$124,086
2004	3,382,833	1,756,313	$131,850	$130,782
2005	3,417,297	1,780,505	$136,800	$137,202
2006	3,450,015	1,805,830	$143,365	$144,131
2007	3,481,521	1,832,063	$149,585	$151,630
2008	3,513,496	1,858,698	$153,714	$158,185
2009	3,545,889	1,883,823	$157,801	$164,941
2010	3,578,725	1,908,558	$161,956	$171,979
2011	3,611,909	1,932,578	$166,191	$178,999
2012	3,645,936	1,955,664	$170,465	$186,374
2013	3,680,581	1,975,053	$173,698	$190,791
2014	3,715,874	1,993,229	$177,029	$195,308
2015	3,751,246	2,010,181	$180,443	$199,927
2016	3,788,118	2,022,581	$183,810	$204,236
2017	3,825,458	2,034,832	$187,295	$208,588
2018	3,863,181	2,046,389	$190,877	$212,936
2019	3,901,017	2,057,577	$194,560	$217,293
2020	3,938,832	2,068,833	$198,324	$221,728
2021	3,976,847	2,080,280	$202,414	$226,880
2022	4,014,940	2,091,349	$206,618	$232,092
2023	4,053,322	2,103,588	$210,986	$237,511
2024	4,091,522	2,115,248	$215,398	$242,957
2025	4,129,117	2,127,559	$219,875	$248,584
Average Annual Growth				
1985-2002	1.0%	1.4%	2.8%	2.3%
2003-2025	1.0%	0.9%	2.5%	3.2%

Source: REMI, 2005

In comparison to the entire nation, personal income growth in the Atlantic City catchment area is expected to be higher than the U.S., while employment growth is less.

V.3 Trenton

Based on REMI survey data, the catchment area of Trenton is larger than Lehigh Valley or Atlantic City with 4.5 million residents. Over the next 20 years, the average annual growth rate is estimated to be 0.9 percent resulting in 5.6 million people in 2025.

Anticipated rates of growth of employment and total personal income are similar to Atlantic City – partly because the catchment areas include many of the same counties. The average annual growth rates for employment and total personal income are 0.9 percent and 2.5 percent respectively; the demographic data is shown on **Table V.3-1**.

In comparison to the U.S., the Trenton catchment area is ahead in the rate of population and total personal income growth, but behind in employment growth.

* * * * * *

This demographic analysis indicates that each airport's theoretical maximum catchment area has a large population and relatively strong economy. The three catchment areas vary in population from 3.3 to 4.5 million, which, on a stand-alone basis as discussed below, may provide a substantial base for scheduled commercial passenger service. Further, the growth rates of population, employment, total personal income, and gross regional product appear similar to national averages.

The three study airport's passengers are today virtually all ultimately destined to or from the region; that is, there are essentially no connecting passengers at these airports. Typically, such a purely origin and destination airport's passenger volumes are related to population and other characteristics of its catchment area. That is, as its catchment area grows in population and/or affluence and/or other characteristics of its service region change, an airport's passenger levels are directly affected. However, the air passengers who live in or visit the 29 counties included in the catchment area of the three airports of this forecast generally use airports located in Philadelphia, Harrisburg, Newark, or some other city rather than the "local" airport. Therefore, no reliable mathematical relationships were found between historical air passenger activity to catchment area population, employment, personal income, gross regional product, or other factors. However, the demographic data shown in this section is valuable to indicate the potential size and economic vitality of the counties surrounding each study airport.

Table V.3-1
Trenton Demographic Data

Year	Population	Employment	Personal Income (000,000s) (2005 dollars)	GRP (000,000s) (2005 dollars)
Actual				
1985	3,711,309	2,009,990	$117,529	$124,707
1986	3,772,337	2,086,481	$123,234	$132,600
1987	3,839,415	2,166,037	$130,362	$142,358
1988	3,895,552	2,240,440	$140,126	$155,346
1989	3,925,607	2,273,377	$147,946	$160,750
1990	3,957,708	2,283,152	$152,336	$163,751
1991	3,997,459	2,229,347	$152,114	$165,198
1992	4,038,980	2,246,108	$158,399	$170,181
1993	4,084,981	2,285,411	$159,190	$173,796
1994	4,134,393	2,308,125	$161,522	$178,094
1995	4,185,623	2,362,117	$166,271	$182,778
1996	4,234,670	2,406,330	$172,219	$187,939
1997	4,278,798	2,470,995	$178,186	$195,820
1998	4,329,114	2,529,408	$188,046	$202,343
1999	4,379,097	2,577,782	$191,582	$206,042
2000	4,431,882	2,672,042	$204,628	$212,275
2001	4,485,681	2,707,958	$202,903	$216,040
2002	4,541,291	2,724,971	$203,305	$223,305
Projected				
2003	4,596,706	2,730,982	$205,750	$232,576
2004	4,648,575	2,759,663	$212,115	$246,202
2005	4,697,732	2,795,685	$220,047	$258,940
2006	4,744,447	2,833,269	$230,594	$272,488
2007	4,789,458	2,873,231	$240,714	$287,216
2008	4,834,630	2,912,224	$247,250	$299,811
2009	4,879,587	2,947,683	$253,629	$312,599
2010	4,924,305	2,981,955	$260,084	$325,764
2011	4,968,547	3,014,527	$266,644	$338,708
2012	5,012,827	3,044,703	$273,198	$352,113
2013	5,057,257	3,072,851	$278,069	$360,327
2014	5,102,293	3,100,844	$283,175	$368,902
2015	5,147,272	3,127,258	$288,383	$377,763
2016	5,194,278	3,147,138	$293,553	$386,082
2017	5,241,955	3,167,102	$298,926	$394,521
2018	5,290,369	3,185,956	$304,458	$402,972
2019	5,339,380	3,204,429	$310,151	$411,472
2020	5,388,776	3,223,068	$315,970	$420,146
2021	5,438,879	3,241,850	$322,263	$430,233
2022	5,489,607	3,260,092	$328,729	$440,453
2023	5,541,435	3,280,158	$335,461	$451,084
2024	5,593,750	3,299,444	$342,273	$461,787
2025	5,645,969	3,319,743	$349,194	$472,876
Average Annual Growth				
1985-2002	1.2%	1.8%	3.3%	3.5%
2003-2025	0.9%	0.9%	2.4%	3.3%

Source: REMI, 2005

VI. FORECAST METHODOLOGY

This section will identify various *traditional* approaches used to forecast passenger activity at any individual airport, so as to provide background on potential methods for the three study airports. The sub-sections below will identify various forecast methods, provide an estimate of potential "maximum" regional passengers based on catchment area population, and list unique characteristics of the study area airports which tend to favor use of larger, big-city, or airline hub airports rather than relatively smaller airports. In addition, a "non-traditional" section will present the assumptions for an "optimistic" scenario to be applied to each of the three study airports. This optimistic passenger scenario assumes a major low-fare airline begins operating in the near term at each airport. The parameters of this optimistic scenario are stated, but they represent perhaps a more dramatic change in the regional air service market where the total number of air passengers grows much more then originally assumed or certain passengers shift from their traditional airport to one of the three study area airports.

The focus of this section is on scheduled commercial air passengers because they are the most critical element of this study, and several other elements of the forecast are dependent upon the passenger activity. However, the general forecasting principals discussed are also applicable and utilized for the other elements of this study, including air cargo.

VI.1 Identification of Possible Forecast Methods

In a July 2001 report titled *Forecasting Aviation Activity by Airport*, the FAA identified several of the most common methods to forecast air passenger volumes. Several of these FAA-identified forecasting methods (as well as others) are addressed below with comments made on *applicability* to the forecasts for the three study area airports.

- **Regression Analysis** – One of the most common forecasting techniques is to use proven statistical methods to project a dependent variable (such as passengers) on the basis of independent variables (such as income, population, and employment). Based on the REMI population, employment, and other data of the catchment areas identified previously, this method was tried, but the correlations (called coefficient of determination) proved very low making the relationship(s) unreliable.
- **Trend Analysis** – Another very popular and logical approach is to project future trends based on the historical record. That is, in simplified form, if air traffic has grown at a 3 percent average rate in the past, it will likely grow at a 3 percent rate in the future. The fact that this method is simple, usually reliable, and easy to apply makes it applicable to many situations. However, the historical passenger records for the three study airports provide a somewhat erratic trend. Therefore, this method was found not well suited to developing these projections.

- **Share Analysis** – The share analysis method of forecasting can be used if there is a reliable higher level forecast and the relationship of activity between the higher source and the airport is expected to remain constant. That is, if a national forecast of air passengers is available and if the airport has an historical, for example, 1 percent share, then an airport will likely retain its 1 percent share into the future. However, the erratic historical trend in passengers at the airports discourages this method for the three study area airports.
- **Parallel Projection** – Similar to the share analysis above, if the national trend is, for example, an increase of 3 percent annually and if the local area and conditions are similar to the national, then a local increase of 3 percent annually can also be expected. This simple, but logical, method is one of the projection techniques used in this analysis because local and national trends in certain scenarios are believed to be similar.
- **Exponential Smoothing** – Another statistical method is to project activity based on historical trends with an increased weight based on recent events and a lesser weight for more distant observations. While mathematically logical, the reason for the historical trends must be addressed to eliminate short-term or one-time events. Again, the somewhat erratic nature of historical traffic, coupled with the distortions caused by the events of September 11, 2001, makes this technique questionable for the three study airports.
- **Choice and Distribution Models** – This method assumes a level of regional demand and then allocates activity among alternate aviation facilities. This method appears ideal for an area that is densely populated and has numerous airports (such as these study area airports); however, it is difficult to project the total regional demand with accuracy and to decide on a reasonable allocation method to numerous airports, each with its own unique situations. Therefore, this method was eliminated for this study.
- **Comparisons and Surveys** – These two forecast methods project air traffic based upon a comparison with similarly situated airports or upon a survey of passengers and/or airlines that identify what might happen. Determination of similar airports and reliable survey techniques are key to the success of this method. However, the instability of the airlines and the fickle nature of customers may make identification of reliable trends difficult – particularly since the growth of low cost airlines has distorted traditional airline service patterns.
- **Range Projections** – When one single "best" forecast cannot be developed, sometimes a range of expected activity is made. In a simple form, a high and low estimate is made and traffic is assumed to fall somewhere in this range. For each airport in this study, three forecasts (pessimistic, base, and optimistic) will be made to cover a range of future possibilities.
- **Logical Assumptions/Expert Analysis** – When certain mathematical methods fail, scenarios can be developed and explained to make projections. This method is particularly appropriate when the historical activity record is erratic or if conditions in the future are expected to be significantly different than the past. Because of the sometimes erratic nature of historical traffic and the expectations of improved passenger traffic at the study airports, this method will be the principal basis for these forecasts.

Note that while each of the forecasting methods is described separately above, in reality, a combination of techniques and methods will be used. A discussion of each projection and its basis will be made in the by airport forecast section.

VI.2 Total Passengers Based Solely on Catchment Area Population

This sub-section will make a one-year projection of total air passengers, within each catchment area, based on national enplaned passenger averages. The purpose of this exercise is to show what the potential number of passengers might be if all the residents/visitors of the catchment areas used only the airport in question, and if national averages were applicable. Of course, this number of potential passengers is just a planning number because the catchment areas overlap between the study airports, as well as with the catchment area(s) of other regional airports. More specifically, the metropolitan areas of New York and Philadelphia share these catchment areas, so the potential number of air passengers is very large versus the reality of current study area airport passenger levels. This calculated number will be used as an *indicator* of an absolute peak annual enplanement that would be difficult to reach because so many other airports (i.e. Newark and Philadelphia) are located nearby.

An estimated 650 million domestic air passenger enplanements occurred in the U.S. in 2005. The population of the United States in 2005 was approximately 296 million. Therefore, there were, on average, approximately 2.2 domestic enplanements per U.S. resident. However, approximately one half of all U.S. enplanements involved a connecting flight; therefore, the total passenger ration is divided to half to identify only the true originating passengers. Thus the average nationwide ratio of originating passengers to population is approximately 1.1 to 1. Using this ratio, the number of domestic enplanements in each catchment area is shown on **Table VI.2-1**.

Table VI.2-1
Enplaned Passenger Ratio Projection

CATCHMENT AREA	2005 CATCHMENT AREA POPULATION	TOTAL ENPLANED PASSENGER RATIO	ELIMINATION OF CONNECTING PASSENGER FACTOR	2005 POTENTIAL DOMESTIC ENPLANED PASSENGERS
Lehigh Valley	3,816,211	2.2	0.5	4,200,000
Atlantic City	3,417,297	2.2	0.5	3,800,000
Trenton	4,697,732	2.2	0.5	5,200,000

Source: PB Aviation

Under these assumptions, the catchment area around Lehigh Valley generates over 4 million annual enplanements. In other words, if there were no other airports in the region and people of the region traveled at average proportions, this airport might see a maximum of this level of enplanements. Similarly the Atlantic City

catchment area generates an estimated 3.8 million air passengers, and Trenton 5.2 million.

Note again, these estimates are not forecasts of air passengers, but rather *indicators* of the maximum potential of an assumed catchment area without regard to the large number of regional airports (particularly those in Newark, New York, and Philadelphia) available. Finally, the three catchment areas of this study also overlap, so there is even more competition for air passengers.

VI.3 Unique Issues of the Study Areas Affecting Air Passengers

The preceding section indicated there appears to be an enormous number of potential air passengers in the region surrounding the three study area airports. However, for the most part, these passengers currently utilize Philadelphia International, Newark Liberty International, or some other airport. Therefore, this sub-section will address why air passengers typically choose to utilize a larger airport versus a smaller one. Again, as noted previously, the Task A survey findings, presented under separate cover, present summaries of specific airport choice factors identified by passengers traveling through Atlantic City, Lehigh Valley, and Trenton. In general, key factors may include:

- **Adjacent Major Airports** – The major reason that air passengers from a wide geographic area typically drive to a major city is that it usually has a world-class international airport with a wide variety of airlines, flight times, and other services. For example, the flight schedule as of March, 1, 2006 indicates that the Philadelphia International Airport has an average of 616 daily non-stops flights to 119 destinations. As another indicator of the variety of non-stop service at local airports, there are three non-stop daily flights a day from Philadelphia International to Roanoke, Virginia and three non-stop daily flights from Newark Liberty International to San Diego, California - - a level of non-stop, large aircraft service likely not available at other area airports.
- **Adjacent Major Cities** – Consumers near major cities are often in the habit of driving to that major city for various reasons for business or pleasure, so a drive to the major city to catch a flight may not be viewed as potentially difficult. In a similar manner, the air passenger's office or place of business may be in that city, so that they can combine trips. Certainly the road network to and from that major city, as indicated below may influence the drive decision.
- **Excellent Inter-Regional Highway Connections** – The interstate and other highway systems, as well as the mass transit systems, are usually designed to aid access to and from major cities, rather then suburban or rural locations. Therefore, ground travel to and from a major regional airport from its surrounding area may be easier then to a more remote airport. While admittedly the major highways to and from New York and Philadelphia from these catchment areas may often be crowded, they represent the typical condition of highways surrounding metropolitan areas and are usually expected by residents and visitors.

- **Potential for Public Airport Ground Transit** – A large, regional airport may have a variety of public transportation options not available at other airports. For example, both Philadelphia International and Newark Liberty International have rail connections, as well as numerous private bus, limo, other types of shuttles.
- **Established Airline Service** – A number of airlines provide service and a wide variety of routes are currently available at the major city airports. Therefore, it is doubtful that an airline will relocate these flights to a regional airport. While it is possible the more remote airport will acquire service to some of the cities served from the large city airport, the choices of carrier, flight times, etc. will likely be less.
- **Existing Airline Hubs** – A major airport is often the location of an airline hub. These hubs provide even more reasons (choice of non-stop destinations, number of daily flights, etc.) to fly to or from the large city airport. Airline hubs in the vicinity of the study area airports include: Southwest at Baltimore Washington – Thurgood Marshall International; US Airways at Philadelphia International; Continental at Newark Liberty International; both Delta and US Airways at LaGuardia; and JetBlue at John F. Kennedy International. Even the "minor" hub of say American at John F. Kennedy or Southwest at Philadelphia are likely larger, by themselves, than the traffic at a typical U.S. medium-sized airport.
- **Existing Airport Infrastructure** – The large airports in the vicinity also have the airport infrastructure to support current levels or increased levels of flights including runways, gates, public parking, ground access, etc. These airports also usually have multiple instrument landing approach systems and extensive levels of support equipment and facilities to keep the airport open and in operation 24/7. Another key parameter is that competitive airports such as those in Newark and Philadelphia each have over 100 airline gates available with terminal facilities to support these gates versus the relatively few gates at other airports.
- **Additional Fringe Area Airports/Potential for New Airport Locations** – As air traffic at a major city airport increases, additional airports often grow or are established in adjacent areas. While these additional airport market forces typically only apply at the very largest cities, locations like Chicago, Los Angeles, and Miami have all seen additional commercial airports developed in or near their vicinity. As will be noted in this report, the study airports all have the potential to become "second" airports for Philadelphia and New York, in the same manner, other airports (such as those located in Harrisburg, Wilkes-Barre/Scranton, Newburgh {Stewart}, and Wilmington) have the potential to offer new service and also compete with all the regional airports.
- **Competition from Highways and Rail** – In addition to competition from other airports, travelers can also choose to take a train or drive to their destination. Since September 11, 2001, most trips within approximately three to four hours of home or office have become driving trips rather then flying trips because of the perceived hassle of air travel - particularly the potential delays in security lines. In the northeast corridor, rail travel to/from Boston to Washington, D.C. is often an option, rather than flying.

There are additional reasons why a larger airport with better air service may have more appeal to passengers versus a smaller one. It is clear that there is a certain economy of scale in marketing that results in larger airports attracting even more passengers, rather than passengers avoiding large airports. That is, the larger an airport becomes, the more it seems to attract passengers from a wider and wider area. The following issues provide potential airline travel advantages for a larger airport versus a smaller one.

- **Lower (and/or more choice of) Fares** – A larger airport with more carriers, flight times, etc. as discussed in this section, also has the likelihood of having lower available fares (ticket price) than a smaller airport. The increased competition of that airport means that, assuming one has no interest in flight times or carrier, the opportunity for a lower fare exists. All things considered, the airport that has airlines offering lower fares often provides an incentive for its use. In a similar manner, the choices of first class, business class, or excursion fares might also be greater at a larger airport.
- **Additional Airline Choices** – It stands to reason that a larger airport would typically have more choices of airlines. Because many persons have a preference, the additional airlines at one airport may attract certain passengers.
- **Additional Flight Times** – Almost certainly a larger airport would have additional flight time choices. Studies of air passengers typically rank available schedule as the second most important factor (after cost) in selection of a flight.
- **Additional Choice of Aircraft** (Avoidance of Turbo-Props and Regional Jets) – A larger airport also likely has more variety on choice of aircraft. This issue is most important if the large airport has mainline jet aircraft versus airports that offer turbo-prop or regional jet service. In addition, the larger airport may also have widebody or multi-class aircraft that a smaller airport may not have. An issue is that smaller airports often have smaller sized aircraft and many travelers avoid smaller aircraft in preference to larger ones.
- **Available Direct (non-stop) Service/No Connections** – For many travelers, a non-stop flight versus a connecting flight is important. This factor ties to the additional flight times issue because the total travel time is usually much shorter with a non-stop flight. Many classes of travelers (such as senior citizens, persons traveling with pets, children traveling alone, etc.) also insist on non-stop flights. Finally, many travelers avoid connecting flights because hub airports such as Chicago, Atlanta, and Dallas have the potential for serious delays.
- **Available International Flights** – In order to catch an international flight, most persons drive to a larger airport in order to assure they can arrive and depart the airport on their own schedule.
- **Available Airport Amenities** – Perhaps least important as an airport choice factor, a larger airport often has additional services and conveniences that attract users. This includes restaurants and stores, as well as airline clubs, exclusive frequent traveler lines, and other perks.

Negating the value of a larger airport are the factors that might attract persons to a smaller airport. The advantages of use of a smaller airport might include the following:

- Easier parking and ground access
- Shorter security lines
- Less chance of massive delays
- Increased feeling of security
- Friendlier personnel
- Less walking distance

In conclusion, it is often difficult for a relatively small airport to compete with an established major city airport. It may be even more difficult to compete with an airline hub airport such as those operated by US Airways at Philadelphia International and Continental at Newark Liberty International.

VI.4 Optimistic Scenario Assumptions

Each of the three airports in this study will have an optimistic passenger activity projection that assumes a relatively dramatic increase in volume from current levels. This optimistic scenario is provided to indicate the potential for passenger volumes to expand well beyond current levels or for certain passengers to shift between regional airports. While the traditional type of forecast assumptions and the unconstrained nature of this forecast suggest that passenger traffic will likely grow more moderately at each airport, the regional air service market is subject to airline and other competitive factors that could result in substantial passenger volume change. This section will present the assumptions for the optimistic scenario for each airport.

Low cost carriers have increased their share of the U.S. market from 16 percent in 2000 to 26 percent in 2006. This increase in market share has resulted from increased capacity from existing airports and introduction of service to 'new' cities. For example, Southwest typically adds a city (airport) or two each year to their route system. AirTran has been on a more rapid growth pattern with several new cities added in each of the past few years as the carrier expanded to the West Coast. JetBlue is still in a start-up phase adding several new cities each year. As each airline gets larger, the opportunities for expansion are reduced and typically the pace of introduction of new cities slows. For example, Southwest has said it will add no new cities next year and AirTran said probably no new cities will be added. However, AirTran is current conducting a public contest to identify their next 'new' city. Frontier is adding service to Mexico rather then U.S. cities. JetBlue has slowed its aircraft delivery schedule, but sees several potential new cities in the coming year, while American Trans Air has been cutting back service due to its reorganization.

For the optimistic passenger forecast scenario, it is assumed that one or more low fare airlines initiate service to each of the study airports. For analysis purposes, it is assumed that this service will be introduced immediately (2006) and that passenger levels will continue to grow after the new airline(s) introduces service.

Further, all existing airline service or similar levels of passengers continue. That is, the new low cost airline service is additive to the airport's total passenger level.

To develop the optimistic scenario of how many passengers this potential new service would represent, the introduction of Southwest Airlines service is modeled. This is not to say that Southwest service is possible or expected at any study area airports, rather to obtain a service level or mathematical model for a substantial increase in passengers, one has to replicate a successful example. In reality, the introduction of service to the study area airports in the 20-year timeframe of this study is more likely by other low fare carriers such as AirTran, JetBlue, or Frontier, as well as various proposed start-ups such as Virgin American from San Francisco and AirBus from Columbus, Ohio. Thus it is more likely that several airlines might increase service over time just like Delta Air Lines has added new service to Wilmington, Delaware and Trenton in 2006. Further, any growth of passengers is likely to be steady increase rather then a one-time event.

Southwest Airlines is a fully unionized airline with almost all of its employee groups represented. As part of its agreement with its airport station personnel, Southwest has to employ its ticket counter and baggage personnel on a full-time basis and cannot subcontract this function to another airline or hire part-time employees. Because of this rule, Southwest has to enter a new airport market with a substantial presence and must offer flights throughout the day to keep its staff occupied and maximize the use of its airport ticket counter, holdroom, and gate assets. For example, when Southwest started service at the Philadelphia International Airport they had 14 daily departures; in Denver they started with 13 daily departures. Of course, these are major city markets; however, Southwest indicates that a minimum of 8 to 12 daily flights is sought for a new market. For existing markets, the smallest market is likely Corpus Christi, Texas that has six scheduled Southwest departures per day; Jackson, Mississippi has nine daily Southwest departures and Harlingen, Texas twelve.

For purposes of this analysis, 11 daily departures at start-up are assumed. Note that this could also represent, for example, five flights by one airline and six by another, but a total of 11 new daily departures are assumed in the optimistic scenario for each airport in this study.

Southwest's aircraft fleet is comprised solely of Boeing 737 aircraft, but of three types as shown on Table VI.4.1.

Table VI. 4-1
Current Aircraft in Southwest's Fleet

TYPE	NUMBER IN FLEET	AVAILABLE SEATS
Boeing 737-500	25	122
Boeing 737-300	194	137
Boeing 737-700	258	137

Source: Southwest

Note that in addition Southwest has 118 Boeing 737-700 aircraft on order.

For purposes of this analysis, new service in the optimistic scenario to Atlantic City, Lehigh Valley, and Trenton is assumed to be provided by Boeing 737-300 or -700 aircraft with 137 available passenger seats. In addition, the most common kinds of Airbus and McDonald-Douglas aircraft have similar seat capacities indicating this is a reasonable passenger capacity range for new mainline jet service.

Assuming 11 Boeing 737-300/700 flights per day and an 80 percent load factor, the total additional enplaned passengers per year with the low cost carrier service are 442,000. This calculation is presented in Table VI.4.2.

Table VI. 4-2
Additional Enplaned Passenger Calculation

FACTORS	AMOUNTS
Aircraft Passenger Seat Capacity (B737-300/700)	137
Load Factor	80 Percent
Days per Year	365
Total Annual Enplanements	442,000

Source: PB

An annual new passenger level of 442,000 would make each airport have the same number of Southwest passengers as cities such as Columbus, Ohio; Indianapolis, Indiana; Tucson, Arizona; Detroit, Michigan; Omaha, Nebraska; or Little Rock, Arkansas. Alternatively, this level of passengers is similar to the number that AirTran has at its secondary hub at the Akron-Canton International Airport and JetBlue has at Orlando.

Note that this optimistic scenario is a planning exercise to provide an example of the up-side potential of the markets; either more or less passengers are equally possible. The runway facilities are probably in place at each regional airport in this study to handle 11 or more large jet aircraft departure per day; however, in all cases substantial terminal, roadway, parking, and other facilities would need improvement – therefore, they are assumed. Airspace congestion issues also need to be resolved because the northeast has some of the densest airspace in the world and another flight at one regional airport sometimes takes-away a flight from another. Such an increase in passenger activity often requires certain political and environmental approvals that are sometimes difficult or time-consuming to obtain. Finally, there are a number of airports in the region (including Stewart, Wilkes-

Barre, and Wilmington) in addition to the three in this study that are vying for increased air service and one or more of the airports, but not likely all of them, would likely see such a strong increase in passenger traffic in a 20-year time frame. The result is that it is possible that one or more regional airports will see this "optimistic" level of traffic at some time during the 20-year planning period and that this type of passenger traffic increase should be considered in this planning document.

VII. AIRPORT FACILITIES

This section will briefly describe the existing airport facilities at each study airport. While not a factor in this *unconstrained* activity forecast, in reality, the limits of existing facilities could represent a serious constraint to unrestricted growth at the study airports.

VII.1 Lehigh Valley

The Lehigh Valley International Airport has two intersecting runways. One is 7,600 feet long and 150 feet wide and the other is 5,797 feet by 150 feet. Full parallel taxiways serve both runways.

The airport has Instrument Landing System (ILS) approaches and the field is open 24 hours with a tower and Aircraft Rescue and Fire Fighting (ARFF) index of C. Ground access to the airport is relatively easy via State Route 22.

VII.2 Atlantic City

The Atlantic City International Airport has two intersecting runways with the longer being 10,000 feet by 150 feet. The other is 6,144 feet by 150 feet and both have parallel taxiways.

The airport has ILS approaches and the field is open 24 hours with a tower and ARFF index of C. The airport is used by the FAA as its test facility and approximately 40 percent of existing aircraft operations are by military aircraft. The airport is located about 10 miles from Atlantic City on Route 30. Limited access highways serving the airport include the Garden State Parkway and the Atlantic City Expressway.

VII.3 Trenton

The Trenton-Mercer Airport also has two intersecting runways. One is 6,006 feet long and the other is 4,800 feet long. Each runway is 150 feet wide and the airport has full parallel taxiways, but their use involves crossing runways, which lowers potential airfield capacity.

The airport has an ILS approach and the field is open 24 hours with a control tower and ARFF index of B. Interstate 95 is adjacent to the airport with ease access.

The airport has an existing passenger terminal of approximately 23,000 square feet with one and a half passenger gates. Environmental approval has just been received to construct a 44,000 square foot, two gate passenger terminal costing an estimated $25 million.

* * * * *

Based on current activity levels, none of these study airports currently have a significant airfield capacity issue; however, because runways intersect, each is essentially a single runway operation during Instrument Flight Rule (IFR) conditions. Very roughly, the theoretical capacity of an airfield with intersecting runways and fully parallel taxiways is 200,000 operations per year – a level not currently approached at any of these airports.

Each of the airports has a passenger terminal, cargo ramp, FBO(s), and other facilities. While each airport can, in general, meet current aviation demands, none has substantial extra capacity; therefore, certain facility improvements may be necessary, over time, if demand significantly increases. In particular, the airport terminals and ground access facilities at each study area airport would require substantial enlargement if their air traffic increased dramatically – such an increase in size may or may not be practical.

VIII. PASSENGER ACTIVITY FORECASTS

This section provides the passenger activity forecast for each of the three study area airports. Each airport is addressed separately below with information regarding its historical passenger volume and current air service. Discussion is included regarding what factors will influence the airport's passenger traffic in the future and three scenarios of future passenger levels for each airport are presented.

The forecasts for all three airports share the following base assumptions:

- Essentially all of the scheduled commercial passengers in this analysis are flying domestically; that is, no non-stop international passengers are projected. Each airport in this study is so close to major airports located in Philadelphia, Newark, and New York (John F. Kennedy International and LaGuardia), international passengers will migrate to these mega-hub airports and none of these airports can reasonably expect to attract substantial, non-stop international service in the study timeframe. International passengers can, of course, connect to and from international destinations from the study area airports.
- Essentially all of the passengers projected in this analysis are origin and destination passengers and the amount of connecting passengers at each airport is minimal. For almost all of what the FAA defines as Medium, Small, and Non-Hub airports, there are no or very few connecting passengers. Rather these airports are each classified as "spokes" meaning they "feed" passengers to the FAA classed Large Hub airports such as Atlanta and Chicago-O'Hare.
- All of the passengers are counted as "scheduled" for purposes of this analysis. While each of these airports, particularly Atlantic City, have had charter flights in the past, most airlines are switching to scheduled service. The total amount of charter flights in the United States is declining rapidly and further, the differentiation between scheduled and charter is rapidly disappearing as low fares are offered on scheduled airlines particularly to beach, casino, and other vacation destinations that previously were served with charter flights. While charter flights will continue at each airport, for purposes of this analysis, the total passenger projections will include charter flights.
- The basis of the "optimistic" scenario for each of the three airports is presented in the previous section. In brief, this scenario assumes a major low fare airline or equivalent amount of service starts in the near term in addition to current service.

In addition, each airport's specific forecast characteristics and assumptions are identified below.

VIII.1 Lehigh Valley

This section will provide the forecast of enplaned passengers for Lehigh Valley. The historical record of passengers will be presented, assumptions identified, and the forecasts developed.

VIII.1.1 Historical Passenger Traffic

Based on FAA Terminal Area Forecast (TAF) data, enplaned passengers at the airport have grown from 238,798 in 1976 to 509,793 in 2004. This is an average annual growth rate in the 28 year period of 2.7 percent or an average of approximately 10,000 enplanements annually. **Table VIII.1-1** provides this historical record.

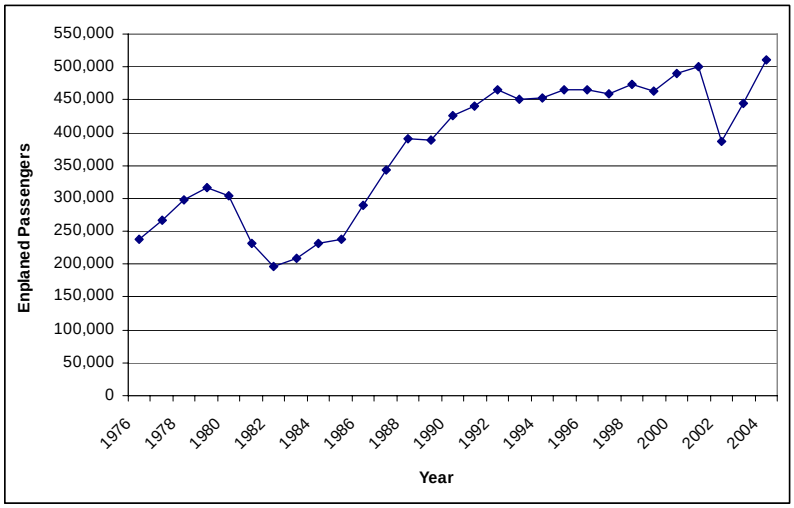
Table VIII.1-1
Historical Enplanements
Lehigh Valley International Airport

Year	Enplaned Passengers
1976	238,798
1977	266,590
1978	297,590
1979	315,821
1980	304,784
1981	232,052
1982	195,594
1983	207,830
1984	231,573
1985	238,463
1986	290,003
1987	342,724
1988	391,581
1989	388,538
1990	426,174
1991	440,755
1992	465,616
1993	451,149
1994	453,567
1995	466,075
1996	465,873
1997	458,879
1998	474,477
1999	463,461
2000	490,111
2001	499,754
2002	387,123
2003	445,473
2004	509,793
Average Annual Growth	
1976-2004	2.7%

Source: FAA TAF, Feb. 2006

Passenger levels in the period from 1976 to 1988 varied greatly; however, since 1990, the passenger levels have been over 400,000 annually except for the 2002, which shows the impact of the events of September 11, 2001. Based on airport records, 2005 enplaned passengers were 417,301 a decline of approximately 90,000 from 2004. These historical trends (excluding 2005) are more apparent on the graph shown in **Exhibit VII.1-1**.

Exhibit VIII.1-1
Historical Enplanements
Lehigh Valley International Airport



VIII.1.2 Current Airline Schedule

The airport will be served by seven airlines after Hooters Air discontinues service on April 19, 2006. These airlines and their number of daily departures, destinations, and equipment type are shown on **Table VIII.1-2**.

Table VIII.1-2
Scheduled Passenger Departures
Lehigh Valley International Airport

Airline	Daily Flights	Destinations	Aircraft
Air Canada	3	Toronto	Beechcraft 1900
Allegiant Air	1	Orlando/Sanford	MD-80
Continental	6	Cleveland, Boston	Beechcraft 1900, Embraer RJs
Delta	8	Atlanta, Cincinnati	Canadair RJs
Northwest	3	Detroit	Canadair RJs
United	8	Chicago, Washington, D.C.	Saab 340, Canadair RJs
US Airways	14	Charlotte, Philadelphia, Pittsburgh	Dash 8, Jetstream 41, Embraer RJs, Airbus A-319
Total Flights	43	Total Cities 12	

Source: Airport, April 2006

VIII.1.3 Passenger Survey Information

In-terminal passenger surveys were conducted in 2005 to identify factors influencing airport choice in the eastern Pennsylvania, south eastern New York, and New Jersey. Complete details of survey information for Lehigh Valley and other airports are contained in separate documents, but several significant issues are addressed below.

- More than half of Lehigh Valley's passengers (57 percent) were traveling for leisure rather than business purposes. This suggests they may be more ticket price-sensitive.
- The vast majority (94 percent) of passengers were on a domestic trip.
- Most travelers (71 percent) started their air travel journey from home.
- Some 40 percent of travelers considered another airport and most of those (58 percent) considered Philadelphia International. Most of the remainder of those who considered another airport (28 percent) identified Newark Liberty International.
- For travelers using Lehigh Valley, travel time to/from airport and convenient flight schedules were the most important factors influencing airport choice.
- The businesses or residences of persons using the airport were very concentrated in the immediate area of the airport. Lehigh and Northampton counties were, by far, the source/destination of most passengers.

Of course, the characteristics of air passengers could change over time as airlines shift service; however, it is significant that fewer than 50 percent of the persons in the counties closest to Lehigh Valley actually use the airport for air travel.

VIII.1.4 Passenger Forecast

This section will present three passenger forecast scenarios for Lehigh Valley. Included below will be a discussion of the airport's specific demand factors and then, each forecast is presented.

General Forecast Issues

As previously noted, passenger volume at Lehigh Valley has been roughly in the 400,000 to 500,000 range for the past 15 years, but the trend (excluding the impact of September 11, 2001) appears to be one of gradual increase. The airport has a wide variety of airlines and destinations, suggesting a solid base of traffic upon which traffic can grow.

Competition for passenger traffic is intense within the airport's catchment area with airline hubs located in Philadelphia and Newark, as well as other, smaller airports located in the vicinity. The driving distance from Allentown to Philadelphia (city to city) is approximately 63 miles and from Allentown to Newark is approximately 80 miles. Thus driving times between airports is likely under two hours which is typically an indicator that the markets overlap.

However, Lehigh Valley offers a relatively uncongested airport facility, shorter driving times for immediate area residents/visitors, and competitive fares on selected routes. The key issue is that several low fare airlines have initiated service at Newark and Philadelphia creating a ticket price war attracting price-sensitive travels to these other airports.

The underlying logic of this analysis is that Lehigh Valley remains a "spoke" airport where air passengers generally fly to a major hub for transfer. For example, United will take passengers to Chicago-O'Hare and Washington Dulles, while US Airways will focus service to its Charlotte and Philadelphia hubs. It is also possible in the 20 years of this forecast that various low fare airlines will initiate service to their hubs from Lehigh Valley. This scenario is specifically addressed in the optimistic passenger scenario where 11 daily low fare airline departures per day are initially assumed in addition to all other service. For example, Southwest may initiate service to Chicago, Nashville, and Orlando or AirTran may provide service to Atlanta and points in Florida; also possible is that JetBlue provides service to John F. Kennedy Airport in New York and cities in Florida such as Orlando, Tampa, and Ft. Lauderdale. However, it is assumed that most catchment area passengers will continue to use alternative airports located in places such as Newark and Philadelphia because they are relatively close geographically and offer so many flight and airline options. Additionally, other regional airports such as Wilkes-Barre/Scranton, Trenton, Newburgh (Stewart), Lancaster, and Harrisburg will also attract catchment area passengers, further splintering the market. Under all the scenarios of this forecast, including the optimistic scenario, the major hub airports located in Philadelphia and Newark retain the majority of Philadelphia and New York/Newark area passengers.

Passenger Forecast Scenarios

The FAA's 2006 TAF (published February 2006) for Lehigh Valley indicates an average annual growth rate of 2.5 percent over their 20 year forecast period. This growth rate is fairly close to the FAA's anticipated national average domestic revenue passenger enplanement growth rate of 2.9 percent. Both enplanement forecast growth rates are ahead of the 1.2 percent average annual growth in catchment area population and employment as projected by REMI.

For this analysis, three different scenarios have been developed as follows.

- **Pessimistic** – The actual average growth rate of passengers in the 1990 – 2004 period was 1.3 percent annually. This same level of growth is projected for the next 20 years to indicate no change in the long-term growth trend of air passengers.
- **Base** – The FAA's TAF indicates that Lehigh Valley passenger levels will grow at a level slightly less than the national average growth rate. This 2.5 percent TAF average annual rate is projected in this analysis as the base rate of increase.
- **Optimistic** – Under the optimistic scenario, it is assumed a major low cost carrier introduces service and all its passengers are additive to the total passenger volume. It is projected this new carrier has Boeing 737-700 aircraft

with 137 seats, an 80 percent load factor, and initial service of 11 flights per day. Therefore, in the first year (assumed for planning purposes to be 2006) approximately 442,000 additional enplaned passengers will use the airport. For each year past 2006, a much higher then national average annual growth rate of 3.7 percent is assumed to indicate a very competitive and stimulated market. This basis optimistic scenario was completely described in the previous section.

All these growth rates are applied to the airport's actual 2005 passenger traffic level (as reported by the airport) which was 417,301 – a sharp drop from the over 500,000 of the previous year. The result is that the Pessimistic projection indicates that almost 542,000 passenger enplanements will occur at the airport in 2025 or approximately 120,000 more than currently. Under the Base forecast, the year 2025 will see about 685,000 enplanements or almost 300,000 more than today. Finally, the Optimistic forecast is for 1,741,000 passengers by 2025 or over four times today's level. These projections and the FAA 2006 TAF forecast are presented on **Table VIII.1-3**.

Table VIII.1-3
Enplaned Passenger Forecast
Lehigh Valley International Airport

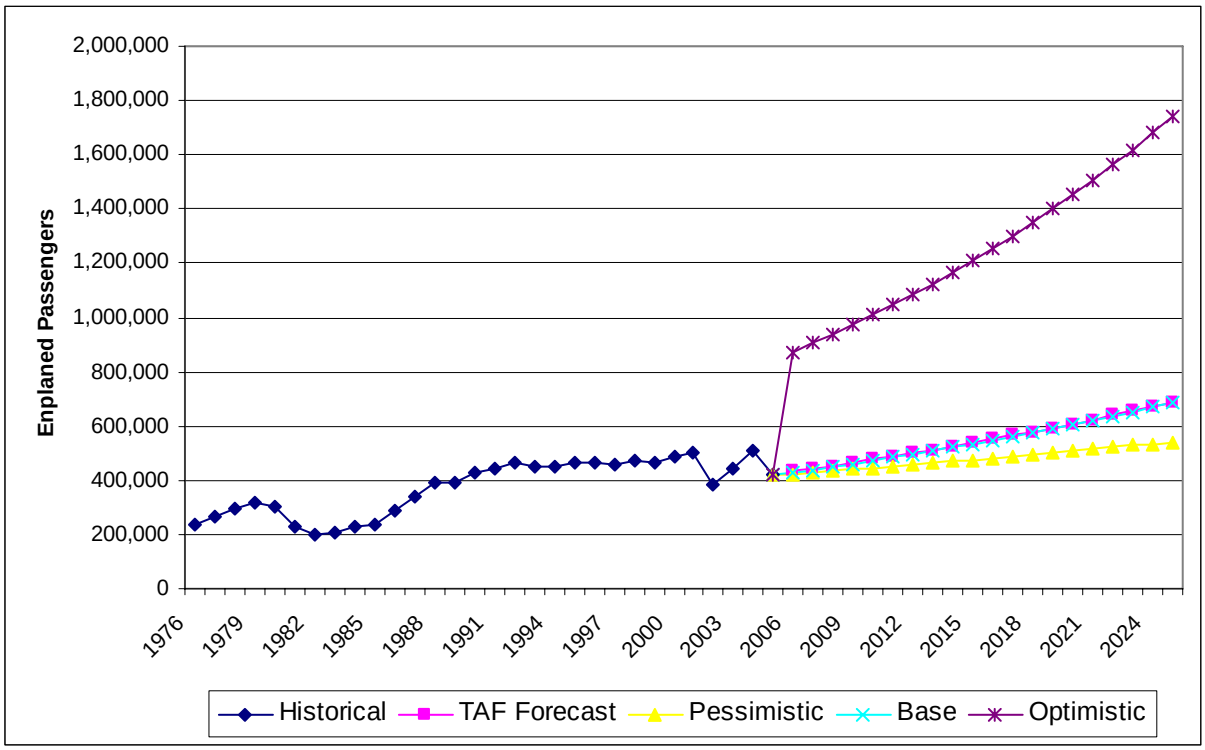
	TAF		2006 Forecast		
Year	Actual	Projected	Pessimistic	Base	Optimistic
1976	238,798				
1977	266,590				
1978	297,590				
1979	315,821				
1980	304,784				
1981	232,052				
1982	195,594				
1983	207,830				
1984	231,573				
1985	238,463				
1986	290,003				
1987	342,724				
1988	391,581				
1989	388,538				
1990	426,174				
1991	440,755				
1992	465,616				
1993	451,149				
1994	453,567				
1995	466,075				
1996	465,873				
1997	458,879				
1998	474,477				
1999	463,461				
2000	490,111				
2001	499,754				
2002	387,123				
2003	445,473				
2004	509,793				
2005	417,301		417,301	417,301	417,301
2006		432,126	423,000	428,000	873,000
2007		442,752	428,000	439,000	905,000
2008		453,649	434,000	450,000	938,000
2009		464,725	440,000	461,000	973,000
2010		476,285	446,000	473,000	1,009,000
2011		488,038	452,000	485,000	1,046,000
2012		500,092	458,000	497,000	1,085,000
2013		512,453	464,000	509,000	1,125,000
2014		525,131	470,000	522,000	1,167,000
2015		538,133	476,000	535,000	1,210,000
2016		551,469	482,000	548,000	1,255,000
2017		565,147	488,000	562,000	1,301,000
2018		579,175	494,000	576,000	1,349,000
2019		593,563	500,000	590,000	1,399,000
2020		608,322	507,000	605,000	1,451,000
2021		623,459	514,000	620,000	1,505,000
2022		638,985	521,000	636,000	1,561,000
2023		654,911	528,000	652,000	1,619,000
2024		671,247	535,000	668,000	1,679,000
2025		688,004	542,000	685,000	1,741,000
Average Annual Growth Rate					
1976-2004	2.7%				
1990-2004	1.3%				
2005-2025			1.3%	2.5%	7.4%
2006-2025		2.5%	1.3%	2.5%	3.7%

Source: FAA TAF, Feb. 2006; PB Aviation

Note: 2005 number is the actual enplanement number per airport records

These forecasts are graphically shown on **Exhibit VIII.1-2**.

Exhibit VIII.1-2
Forecasts
Lehigh Valley International Airport



VIII.2 Atlantic City

This section will provide the forecast of enplaned passengers for Atlantic City. The historical record of passengers will be presented, assumptions identified, and the forecasts developed.

VIII.2.1 Historical Passenger Traffic

Based on airport records from 1985 to 2005, Atlantic City has varied from a minimum of 138,450 enplaned passengers in 1985 to a maximum of 523,344 in 2004. The most recent year (2005) saw 488,579 passengers and since 1997 the airport has seen at least 400,000 passengers annually.

Airport passenger records are recorded a number of different ways depending on the source data. The airport itself records passengers on a calendar year basis by accumulating the activity reported to it each month by each airline using the airport. This airport data includes charter and commuter airline passengers that are often not in the FAA's database. The FAA records passengers two ways.

- **O & D** – Origin and destination (O & D) passenger information is collected by the FAA based on analysis of every tenth ticket sold by the major airlines. Information from these tickets is recorded on the basis of true originating airport, all connections (or transfers), and the passenger's ultimate airport destination.
- **TAF** – The FAA collects information from each major airline on the number of enplaned passengers at each of its stations. This information is compiled into the FAA's "official" record of airline and airport activity and published annually in a number of reports including an annual by airport record and forecast called the Terminal Area Forecast (TAF). The most current TAF was published in February 2006.

The FAA's records are collected on a Federal fiscal year basis, which begins October 1 each year, so they are slightly different from the airport's records that are presented on a calendar year basis. No passengers are missed by shift of fiscal and calendar years; rather, the annual totals reported by various entities will never exactly match. Much more importantly, the FAA's passenger totals do not include some small airlines and charter carriers not obligated to report, as well as a small percentage of the O & D traffic that is missed in the complicated collection and analysis process. For most airports, there is usually little difference between the passenger records of the airport and FAA; however, Atlantic City has had a number of charter and commuter carriers that were not obligated to report and there are differences in the historical records. The airport's records are believed most representative of the airport's actual activity; therefore, they are used in this report.

In recent years the annual record of passengers collected by the airport and the FAA's TAF are reasonably close. A comparison of FAA and airport records of enplaned passengers is presented in **Table VIII.2-1**.

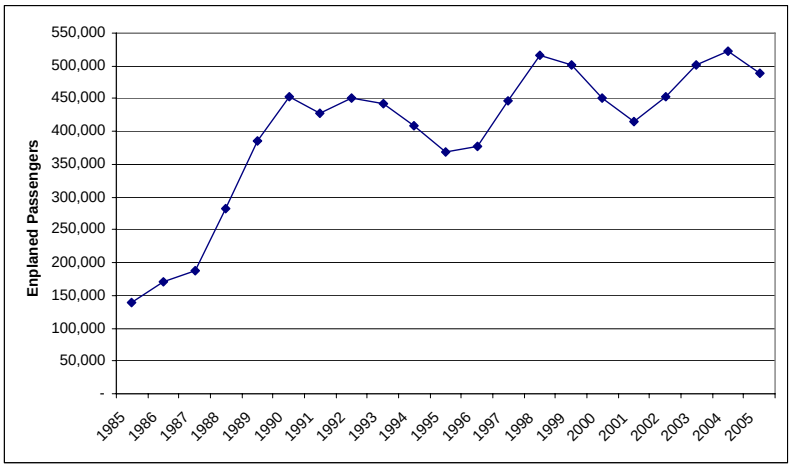
Table VIII.2-1
Historical Enplaned Passengers
Atlantic City International Airport

Year	Airport Records	F A A	
		O & D	TAF
1985	138,450	3,510	118,155
1986	171,052	1,030	163,195
1987	188,512	820	160,740
1988	281,739	38,300	249,177
1989	385,832	79,160	322,222
1990	452,039	147,570	376,486
1991	427,623	238,980	357,042
1992	451,234	252,300	424,161
1993	442,602	230,960	392,763
1994	408,827	198,480	371,652
1995	367,892	174,530	269,166
1996	376,529	175,630	378,260
1997	446,627	254,010	424,110
1998	516,050	319,950	393,940
1999	501,907	334,350	461,036
2000	451,178	305,610	415,514
2001	415,555	293,910	406,381
2002	452,293	339,010	385,966
2003	500,920	401,240	462,279
2004	523,344	425,860	511,245
2005	488,579	-	-

Sources: Airport; O&D Survey of Airline Traffic, U.S. DOT, Table VII.1-1; FAA TAF, February 2006; Compiled by PB

Using the airport's record of enplaned passengers, the annual number of enplanements has been in the 400,000 to 500,000 range between 1990 and 2005. The highest annual total in this 16-year period was 523,344 in 2004 and the lowest 367,892 in 1995. The average of the 16 year period is almost exactly 450,000 – which is the approximate enplanement level of 2005. Graphically the historical Atlantic City enplaned passengers are presented in **Exhibit VIII.2-1**.

Exhibit VIII.2-1
Historical Enplaned Passengers
Atlantic City International Airport



Source: Airport, 2006

For the past two years approximately 20 percent of the passengers have been on charter flights and 80 percent scheduled. Within the scheduled category, most passengers are on Spirit Airlines as presented in **Table VIII.2-2** which shows the source of passengers for the past two years.

Table VIII.2-2
2004 and 2005 Enplanements by Airline
Atlantic City International Airport

	2004	2005	2005 Share
Scheduled Passengers			
Spirit	396,895	354,155	72.5%
Delta/Comair	30,832	33,584	6.9%
Total Scheduled	427,727	387,739	79.4%
Charter Passengers			
Domestic	95,590	100,812	20.6%
International	27	28	0.0%
Total Charter	95,617	100,840	20.6%
Total	523,344	488,579	100.0%

Source: Airport

VIII.2-2 Current Airline Schedule

As of April 2006, the airport is currently served on a scheduled basis by two airlines. Comair, a Delta connection carrier, flies two daily regional jet flights to Cincinnati. Spirit Airlines has two daily flights to Fort Lauderdale, one to Fort Meyers, one to Myrtle Beach, two to Orlando, one to Tampa, and one to West Palm

Beach. This April schedule by airline, destination, number of departure, and aircraft type is shown on **Table VIII.2-3**.

Table VIII.2-3
Scheduled Passenger Departures
Atlantic City International Airport

Airline	Daily Flights	Destination	Aircraft
Delta/Comair	2	Cincinnati	Canadair RJ
Spirit	2	Ft. Lauderdale	MD-80
Spirit	1	Ft. Myers	MD-80
Spirit	1	Myrtle Beach	MD-80
Spirit	2	Orlando	MD-80
Spirit	1	Tampa/St. Pete.	MD-80
Spirit	1	West Palm Beach	MD-80
Total	10		

Source: Official Airline Guide, April 2006

In addition to the passenger departures presented in the table above, Delta Air Lines has announced that starting June 8, 2006, new non-stop service will start between Atlantic City and Atlanta.

As of the April schedule shown above, the airport had an average of 10 daily scheduled passenger flights. These flights represent approximately 1,220 available daily seats. Based solely on this one-month schedule, if every flight were full, the airport would have approximately 450,000 scheduled enplaned passengers per year; if every flight were 80 percent full, there would be approximately 350,000 scheduled enplaned passengers.

VIII.2.3 Background on Spirit Airlines

Atlantic City's current passenger levels are currently largely dependent upon the continued operation of Spirit Airlines as approximately 91 percent of scheduled passengers and 72 percent of the total passengers were on this airline in 2005. Spirit was recently purchased and recapitalized; orders for an all-new Airbus fleet were made by the new owners. The current Spirit fleet consists of 16 MD-80 aircraft and 10 A-319 and 6 A-321 aircraft. By the end of 2006, Spirit expects to be flying an all-new, all-Airbus fleet.

Spirit was founded in Michigan in 1980 and their route structure was traditionally based at the Detroit Metropolitan Wayne County Airport; however, in recent years the airline has shifted service trying to find more profitable routes. The airline retains their hub in Detroit; however, Fort Lauderdale has now become their largest hub with flights to many domestic points, as well as many destinations in the Caribbean. In total, the airline serves 27 destinations with 125 daily flights. Spirit routes are mainly on the East Coast and Caribbean, but there are a few West Coast routes from Detroit.

Spirit serves a niche role as one of the U.S.'s smaller airlines. Its advantages for continued operation include:

- New aircraft fleet.
- Adequate capitalization and aggressive owners.
- Low fare and good service orientation that appeals to meet today's passenger demands.
- Successful existing route structure.

Potential issues for Spirit are that, as it grows, it could increase competition with the legacy airlines such as Northwest, United, and Delta and/or the low fare airlines such as AirTran, JetBlue, and Southwest. More specifically, the growth of another low fare airline at Atlantic City could seriously harm the airline's routes from this station.

VIII.2.4 Background on Casino Gaming and Air Service

Casino gaming is one of the largest industries in Atlantic City and a potential source of air passengers. However, most current casino patrons drive or take busses to Atlantic City and relatively few arrive by scheduled aircraft.

Several issues influence the future activity or growth of casino gaming in Atlantic City, including:

- The growth of gaming in the United States and specifically in Atlantic City.
- The type of gaming and casino-related activities in Atlantic City versus competitive locations.
- The propensity of casino patrons and other Atlantic City area visitors to travel by air.

Indicators are clear that gaming is growing on a nationwide basis; however, most of this growth is in Indian and "riverboat" casinos, as well as other non-traditional locations such as Connecticut and Detroit and less in established gaming centers such as Las Vegas, Reno, and Atlantic City. In fact, Atlantic City went for 13 years between opening of its last new casino and the $1.1 billion Borgata which opened in 2003. However, the growth in casinos, based on the Las Vegas model, is currently high end dining, spa activities, shows, shopping, condo living, and other non-gaming related activities. That is, while the number of visitors and gaming revenues may be stable, the visitor expenditures can be up sharply.

Therefore, the future of casino gaming in Atlantic City is not certain, but the expectation of this analysis is for continued growth because some of the most business-savvy gaming firms in the nation own and/or operate the major Atlantic City casinos.

The principal issue for this analysis is how many of these casino visitors will arrive by air. It is assumed, based on past activity that most visitors to Atlantic City will continue to drive cars or arrive on busses because Atlantic City is in the center of

population of the Eastern United States and a relatively easy drive for many Americans. If a person wants to gamble and flies to their destination, that destination will likely be Las Vegas because of the scale and perceived glamour of that location, as well as the extensive air service to and from Las Vegas including the airline hubs of Southwest and U S Airways (formerly America West).

VIII.2.5 Passenger Survey Information

In-terminal passenger surveys were conducted in July and August 2005 to identify factors influencing airport choice in the eastern Pennsylvania, south eastern New York, and New Jersey. Complete details of survey information for Atlantic City and other airports are contained in separate documents, but several significant issues are addressed below.

- Passengers in the Atlantic City survey reported that leisure travel was overwhelmingly (89 percent) their trip purpose. This level is much higher than the 50 to 60 percent leisure traveler ratio seen at the average airport.
- Travel trip to the airport varied greatly, but most trips were an hour on more. This appears to be sufficient time to drive to other area airports.
- Virtually all Atlantic City travelers (99 percent) were on domestic journeys.
- Some 34 percent of travelers said they considered another airport; the business travelers were more interested in considering other airports versus the leisure travelers. Philadelphia was picked two to one (63 percent to 31 percent) over Newark as the other airport considered. Train travel was used in lieu of air travel by 14 percent of the survey responders within the last year.
- For travelers using Atlantic City, 1) direct flights, 2) convenient schedules, 3) ease airport access, and 4) ticket price were seen as the most important airport choice factors.
- The greatest density of airport users was from the coastal area of New Jersey stretching from Long Branch to Cape May. Because the Garden State Parkway connects these shore communities, this highway appears to be the principal means of access to the airport. The two counties with the highest proportion of residents using the airport were Atlantic and Cape May.

In summary, the Atlantic City airport appears to have a more leisure travel and price-sensitive focus than Lehigh Valley or Trenton.

VIII.2.6 Passenger Forecast

This section will present three passenger forecast scenarios for Atlantic City. Included below is a discussion of the airport's specific demand factors and each forecast is presented.

General Forecast Issues

As previously noted, passenger volume at Atlantic City has been roughly in the 400,000 to 500,000 range for the past 15 years, so it is unknown when the airport can break-out of this pattern. More importantly, 72 percent of 2005 total

enplanements were on one airline (Spirit), making the airport potentially vulnerable to this particular airline and its decisions regarding level of service.

Competition for passenger traffic is intense within the airport's catchment area with airline hubs in Philadelphia and Newark, as well as low fare airline competition from a number of airports. The driving distance to Philadelphia from Atlantic City (city to city) is 62 miles and from Atlantic City to Newark is 114 miles.

Atlantic City offers a relatively uncongested airport facility, shorter driving times for area residents/visitors, and competitive fares on selected routes. However, the future level of traffic is unknown because while the residents of the greater Atlantic City area are likely to use the airport as long as good air service is available, persons in many surrounding counties can almost as easily reach Philadelphia, Newark, or other airports by driving a few more miles.

Base Passenger Forecast

The FAA annually prepares the TAF forecast mentioned above and because it appears to represent a logical trend of passengers, it will be used as the base passenger forecast for this analysis. The TAF forecast is calculated on a share of national market calculation, as well as other inputs in the FAA's model. The latest TAF forecast for Atlantic City assumes that 2005 fiscal year traffic totals 494,543, which was very close to the airport's calendar year 2005 total of 488,579.

The TAF has an average annual growth rate of 1.4 percent over the 20 year forecast period. This growth rate is fairly close to the anticipated 1.2 percent average annual growth in catchment area population and 1.2 percent average annual growth in employment as projected by REMI. This TAF average annual growth rate is less than the anticipated 3.2 percent growth in total personal income and 4.2 percent growth in gross regional product.

The TAF projects that by 2025 there will be 658,312 enplaned passengers at Atlantic City; this is an increase of approximately 165,000 from today or a 33 percent increase. As noted, the average annual increase from 2005 through 2025 is 1.4 percent. This TAF (to be the Base) passenger forecast is presented in **Table VIII.2-4**.

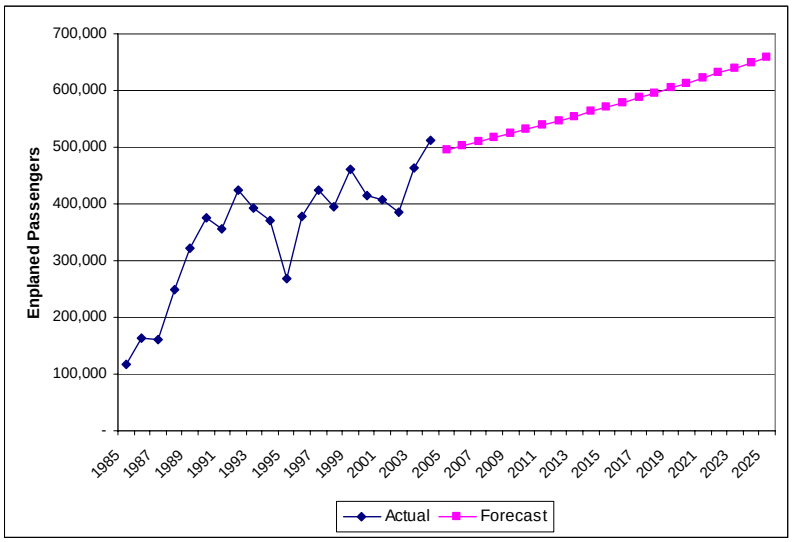
Table VIII.2-4
TAF - Base Passenger Forecast
Atlantic City International Airport

	TAF*	
Year	Actual	Projected
1985	118,155	
1986	163,195	
1987	160,740	
1988	249,177	
1989	322,222	
1990	376,486	
1991	357,042	
1992	424,161	
1993	392,763	
1994	371,652	
1995	269,166	
1996	378,260	
1997	424,110	
1998	393,940	
1999	461,036	
2000	415,514	
2001	406,381	
2002	385,966	
2003	462,279	
2004	511,245	
2005		494,543
2006		502,321
2007		509,505
2008		516,795
2009		524,189
2010		531,692
2011		539,305
2012		547,028
2013		554,863
2014		562,813
2015		570,880
2016		579,063
2017		587,367
2018		595,791
2019		604,338
2020		613,011
2021		621,809
2022		630,737
2023		639,796
2024		648,987
2025		658,312
Average Annual Growth		
2005-2025		1.4%

Source: FAA TAF, Feb. 2006;
Compiled by PB

In graphical form, the Base Atlantic City forecast is present on **Exhibit VIII.2-2** indicating continued growth of enplaned passengers from today's level.

Exhibit VIII.2-2
Base Enplaned Passenger Forecast
Atlantic City International Airport



This Base forecast assumes that Spirit, Delta Connection, and/or other airlines will continue to serve the airport and add routes or flights as appropriate. However, growth of regional air service will also continue in Philadelphia, Newark, or other airports where new routes and flights are added due to competition among airlines and sufficient volumes of incremental passengers that can be induced to fly. That is, Atlantic City continues to serve its an increasing level of passengers with a "low-fare" type airline that stimulates air travel.

Under this scenario, Atlantic City is assumed to retain its 'low fare' airline orientation, which stimulates passenger demand versus the typical smaller airport that does not have a low fare airline. Ground access issues are assumed to remain similar to today where passengers can easily get to and from the airport, as well as airports in larger cities. Finally, no environmental or community concerns are assumed to limit growth of the airport. In fact, it is assumed the community will be active in support of airport expansion to attract tourists to southern New Jersey and encourage low fare airline service so that local residents can transact business or go on their own vacation.

Optimistic and Pessimistic Passenger Forecasts

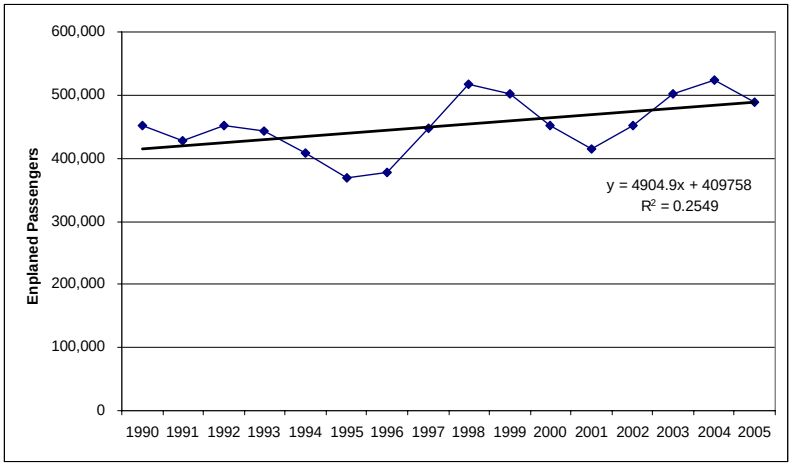
This section presents the Optimistic and Pessimistic forecast scenarios. A summary table of all three (base, optimistic, and pessimistic) forecasts is also included.

The Optimistic forecast is based upon a second major low cost airline entering the market in 2006. This airline is assumed to be flying a 137-seat aircraft such as the Boeing 737-700. An initial average of 11 flights per day is projected with an 80

percent load factor. This "second" low cost carrier airline at Atlantic City could be continued expansion of service by Spirit or introduction of a second airline such as Southwest. Alternatively, several low fare carriers could introduce service at the same time such as AirTran or Frontier. Of course, other legacy airlines such as Northwest or United might also introduce service with similar results, as could a start-up airline not currently in operation such as Virgin America. In the first full year of operation of this second low cost carrier, approximately 442,000 additional enplaned passengers would be projected. Past 2006, the average growth of passengers is assumed at 3.1 percent annually. This rate of growth is the FAA's national average increase (for all passengers including domestic and foreign) as presented in the *FAA Aerospace Forecasts Fiscal Years 2006 – 2017,* published in March 2006 indicating the system enplanements of U.S. mainline and regional air carriers. The FAA forecast is for a 12-year period, but for this analysis, the same average rate of growth is continued to the end of the 20-year planning period. Utilizing this rate of growth, the airport's passengers will more than triple in 20 years increasing from under 500,000 in 2005 to 1,664,000 in 2025, an increase of over one million passengers.

The Pessimistic forecast assumes air passenger traffic grows at the same rate it has grown over the past 15 years from 1990 to 2005 – this is the period the airport reached a period of stability with annual passengers ranging between approximately 400,000 and 500,000 annually. A regression analysis trend line was developed to project the recent year's traffic as shown on **Exhibit VIII.2-3**.

Exhibit VIII.2-3
Linear Regression Last 15 Years
Atlantic City International Airport



This Pessimistic projection assumes Atlantic City retains its base level of passengers, but does not grow as fast as competing airports. Under the Pessimistic scenario, only an average annual growth rate of 0.9 percent occurs, but the airport does not lose its existing base of passengers, so by 2025 there are approximately 586,000 enplanements at the airport.

As an absolute worst case, it is possible during the 20-year forecast period that some or all its airlines will desert the airport. This is possible because the airport only has a few carriers and one or more might declare bankruptcy or cease service. In recent years such major changes at an airport are unusual, but not uncommon. In all cases, it is assumed that, in time, another low fare airline will see opportunity at the airport and initiate service. Therefore, the forecast for Atlantic City suggest that one or more airlines will utilize the airport; however, the projections for any specific year are subject to possible extreme variations as airlines increase and reduce service.

The air service assumptions of Optimistic scenario are that Spirit and/or other low fare airlines both continue and expand service at Atlantic City. The Pessimistic scenario sees low fare service continuing, but either lack of new markets or greater expansion at competing airports somewhat limits growth at Atlantic City.

The summary table of Atlantic City passenger forecasts is presented in **Table VIII.2-5**.

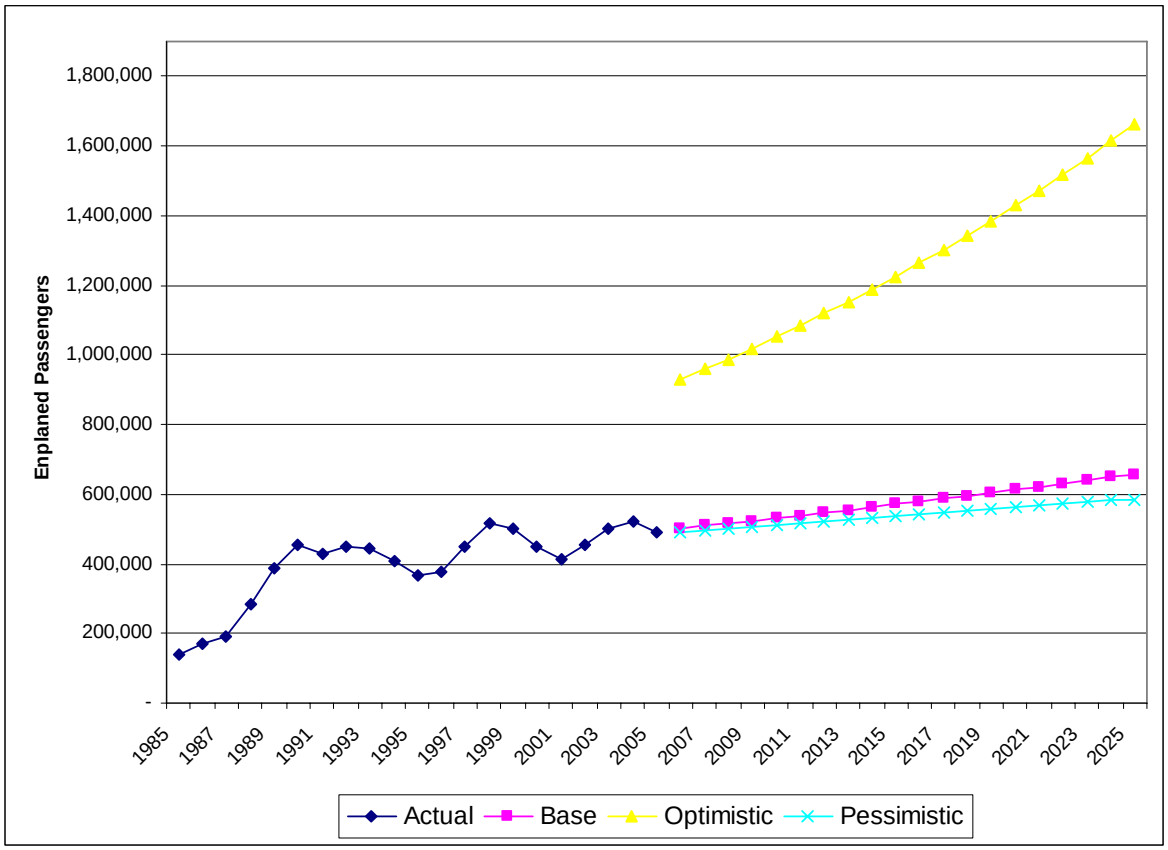
Table VIII.2-5
Enplaned Passenger Forecast
Atlantic City International Airport

		Forecast		
Year	**Actual**	**Pessimistic**	**Base**	**Optimistic**
1985	138,450			
1986	171,052			
1987	188,512			
1988	281,739			
1989	385,832			
1990	452,039			
1991	427,623			
1992	451,234			
1993	442,602			
1994	408,827			
1995	367,892			
1996	376,529			
1997	446,627			
1998	516,050			
1999	501,907			
2000	451,178			
2001	415,555			
2002	452,293			
2003	500,920			
2004	523,344			
2005	488,579			
2006		493,000	502,000	929,000
2007		498,000	510,000	958,000
2008		503,000	517,000	988,000
2009		508,000	524,000	1,019,000
2010		**513,000**	**532,000**	1,051,000
2011		518,000	539,000	1,084,000
2012		523,000	547,000	1,118,000
2013		527,000	555,000	1,153,000
2014		532,000	563,000	1,189,000
2015		**537,000**	**571,000**	1,226,000
2016		542,000	579,000	1,264,000
2017		547,000	587,000	1,303,000
2018		552,000	596,000	1,343,000
2019		557,000	604,000	1,385,000
2020		**562,000**	**613,000**	1,428,000
2021		567,000	622,000	1,472,000
2022		572,000	631,000	1,518,000
2023		577,000	640,000	1,565,000
2024		581,000	649,000	1,614,000
2025		**586,000**	**658,000**	1,664,000
Average Annual Growth Rate				
2006-2025		0.9%	1.4%	3.1%

Source: PB Aviation

The three Atlantic City passenger forecasts are shown graphically **Exhibit VIII.2-4**.

Exhibit VIII.2-4
Enplaned Passenger Forecasts
Atlantic City International Airport



Source: Airport and PB, 2006

VIII.3 Trenton

This section will provide the forecast of enplaned passengers for Trenton. The historical record of passengers will be presented, assumptions identified, and then the forecasts developed.

VIII.3.1 Historical Passenger Traffic

Based upon airport records, the number of enplaned passengers in 1998 was over 90,000, but levels have decrease since that time to today's level of less than 10,000 per year. The 1985 through 2004 historical record of FAA Origin and Destination (O&D) and Terminal Area Forecast (TAF) enplaned passengers indicate a similar trend of sharp increase and decrease. The FAA's record of O&D passengers closely matches airport records (shown for 1995 through 2005), but the FAA has a longer record of historical O&D traffic available, so it is used for further analysis. The 20 years of O&D traffic shows a peak of approximately 90,000

enplaned passengers in 1998 and a low of less then 1,000 in 1994. These FAA and airport historical records of enplaned passengers are shown in **Table VIII.3-1.**

Table VIII.3-1
Historical Enplaned Passengers
Trenton Mercer Airport

Year	FAA		Airport Records
	Origin & Destination	Terminal Area	
1985	14,170	27,037	-
1986	8,650	24,686	-
1987	3,940	14,589	-
1988	2,320	11,953	-
1989	1,660	7,666	-
1990	9,300	9,653	-
1991	14,230	10,346	-
1992	24,710	29,845	-
1993	4,590	6,782	-
1994	580	1,864	-
1995	17,970	4,569	18,187
1996	68,000	64,265	70,074
1997	77,240	79,783	76,609
1998	90,270	86,389	90,397
1999	29,330	70,139	49,274
2000	77,130	66,164	79,102
2001	58,330	71,497	57,946
2002	25,310	24,940	23,770
2003	23,620	25,479	23,441
2004	12,510	15,512	12,610
2005	-	-	8,706

Sources: DOT, *Air Passenger Origin-Destination Survey, 2005.*
FAA *Terminal Area Forecast*, February 2006
Airport Records, 2006

Passenger levels in the most recent years represent the passenger service of Boston-Maine Airways as described in the following section.

VIII.3.2 Current Airline Schedule

As of April 2006, the airport is served by Boston-Maine Airways operating as Pan Am Clipper Connection. This carrier started operating at the airport on March 29, 2004 and provides weekday service to and from New Bedford, Massachusetts.

The April 2006 schedule indicates 72 scheduled monthly flights on 19-seat Jetstream 31 aircraft. This represents 1,368 available departing seats per month or 16,416 seats per year. Assuming this schedule remains the same and the aircraft depart on-average half full, the airport might expect 8,000 enplanements per year from this airline – approximately the same amount as in 2005.

VIII.3.3 Background on Pan Am Clipper Connection

Scheduled passenger service is provided to Trenton by Boston-Maine Airways operating as Pan Am Clipper Connection. Flights operate from Trenton to New Bedford, Massachusetts, connecting onward to Portsmouth, New Hampshire. These flights are operated with Jetstream 31 aircraft, a modern turbo-prop aircraft seating a maximum of 19 passengers. Pan Am provides addition Boeing 727-200 service from Atlanta and Orlando/Sanford to San Juan and Aguadilla, Puerto Rico.

VIII.3.4 Background on Passenger Activity

In recent years, Trenton has attracted various commuter and other airlines providing shuttle or "feed" service to select East Coast cities. In general, passengers used the airport to avoid congested airports such as Philadelphia and Newark or to save time by having direct access to major cities.

However, since September 11, 2001, air travelers on shorter routes have switched to driving rather then flying. The most dramatic *decrease* in flying has been in routes less than 250 miles despite the fact that many of these very short routes were served by low fare airlines. The decrease in short distance routes has probably impacted the volume of traffic at Trenton.

Another factor that is harming all airports that depend on smaller aircraft is that new FAA rules are making it much more costly to operate aircraft under 50 seats. These rules require all aircraft to have new types of electronic safety equipment that was not original equipment when the aircraft were built. Further, few manufactures are building new 19 or 30/35 seat aircraft (the standard size of feeder-route aircraft) and the current fleets of such aircraft are often more then 20 years old, so some of these aircraft are being retired. Therefore, aircraft of less then 50 seats are fast disappearing from the U.S. domestic fleet other then in Alaska, in FAA Essential Air Service, or on other specialized routes.

This nationwide decrease in 50 seat or less aircraft is likely to influence the future air service at Trenton because some historical service has been on this type of aircraft. On the other hand, approximately 2,000 regional jets of 50 seat capacity have been recently built on a world-wide basis and have taken most of the market formerly flown by smaller, under-50 seat turbo-prop aircraft. While the market for newly built 50-seat regional jets has dried-up and one of the top two manufactures has creased production, there are numerous nearly new models of 50-seat regional jets available for purchase that might be used at Trenton or other points.

VIII.3.5 Passenger Survey Information

In-terminal passenger surveys were conducted in 2005 to identify factors influencing airport choice in the eastern Pennsylvania, south eastern New York, and New Jersey. Complete details of survey information for Trenton and other airports are contained in separate documents, but several significant issues are addressed below.

- Business travel was more prevalent (79 percent) versus leisure travel.
- Travel times to and from the airport and dwell times at the airport were very short compared to Lehigh Valley and Atlantic City.
- All travelers surveyed were on a domestic trip.
- Twenty nine percent of the travelers reported considering another airport and Philadelphia represent roughly two thirds of those (64 percent) versus Newark (36 percent).
- Almost half of respondents (47 percent) have taken a train in lieu of an air trip in the last year.
- Mercer and Bucks counties were the source of most survey respondents.

While the sample size at Trenton for this survey was relatively small, the persons currently using the airport are (for the most part) largely time sensitive, business persons.

VIII.3.6 Base, Optimistic, and Pessimistic Passenger Forecasts

Trenton currently has a limited level of passenger service with approximately five weekday flights on 19-seat turboprop aircraft to New Bedford, Massachusetts and Baltimore. New commuter service on Delta to Atlanta and Boston starts in December. The latest FAA TAF indicates a level of passengers commensurate with continuation of the 19-seat turboprop aircraft service. Because the turbo-prop flights are the historical level of air service, continuation of such 19-seat turbo-prop service is assumed for the Pessimistic forecast. Typical 19-seat turbo-prop aircraft types include the Jetsteam 31 and Beechcraft 1900.

For the Base forecast, the three daily flights are assumed, but on a larger, 50-seat regional jet aircraft to represent either expansion of the 19-seat turbo-prop service or their replace for fewer flight, but on larger aircraft. Typical 50-seat regional jets include the Bombardier Canadair CRJ-200 and Embraer RJ – 145. These 50-seat regional jets are often used to provide connecting service to a major airline hub such as Washington Dulles, Charlotte, Cleveland, or Detroit, so this type of hub-connection service is envisioned.

Finally, for the Optimistic forecast, it is projected that a major low cost carrier will initiate service as describe in the previous section presenting the optimistic scenario for each study area airport. This new airline could be AirTran, Frontier, JetBlue, Southwest, Spirit, or a start up such as Virgin America. Alternatively, one or more legacy carrier such as Northwest, Delta, or United might introduce service to one of their hubs. For this type of hub-feed service, three or four daily flights are typically initiated and the number of flights and passengers increase over time if the service is successful. For this optimistic analysis, 11 initial flights are projected on a 137-seat capacity Boeing 737; note that an Airbus A-319 mainline jet has a similar seat capacity. An 80 percent load factor is assumed. The result is the airport would have approximately 442,000 additional enplaned passengers in the first full year of operation – assumed to be 2006. By 2025, at the end of the forecast period approximately 644,100 enplaned passengers would be served.

The typical aircraft type, seat capacity, frequency, load factor and other assumptions of the three Trenton forecast scenarios are shown in **Table VIII.3-2**. Based on the aircraft assumptions, an annual initial year enplaned passenger projection is derived. Finally, a long term average annual growth rate of 2 percent is projected to indicate that passenger volumes of each scenario will likely increase over time.

Table VIII.3-2
Activity Forecast Assumptions
Trenton Mercer Airport

	Scenarios		
Factors	**Pessimistic**	**Base**	**Optimistic**
Typical Aircraft Type	Jetsteam 31	CRJ-100	Boeing 737-300/700
Available Seats	19	50	137
Load Factor	50%	50%	80%
Departures per day	3	3	11
Departures per year	1,095	1,095	4,015
Annual Passengers	10,000	27,000	442,000
Annual Growth Rate	2%	2%	2%

Source: PB Aviation

Using the above airline activity assumptions, a 20-year forecast of enplaned passengers at the Pessimistic, Base, and Optimistic levels has been developed and is shown on **Table VIII.3-3**. The FAA's TAF forecast (both historical and projected) is also shown in the Table. This forecast reflects the three different airline service assumptions with a change from the current three flights per day on 19-seat aircraft to the service shown in Table VIII.3-2 occurring in 2005. An annual growth of 2 percent is shown throughout the 20-year forecast period. Obviously, these assumed airline service levels may not exactly match reality, but they represent a range of future activity possible at the airport. Under the FAA's TAF, approximately 18,000 annual passengers are projected for 2025. Under the Pessimistic scenario, approximately 15,000 enplaned passengers are predicted in 2025, with the Base forecast approximately 40,000 enplanements are projected in 2025, and with the Optimistic forecast approximately 644,100 enplanements are projected for 2025.

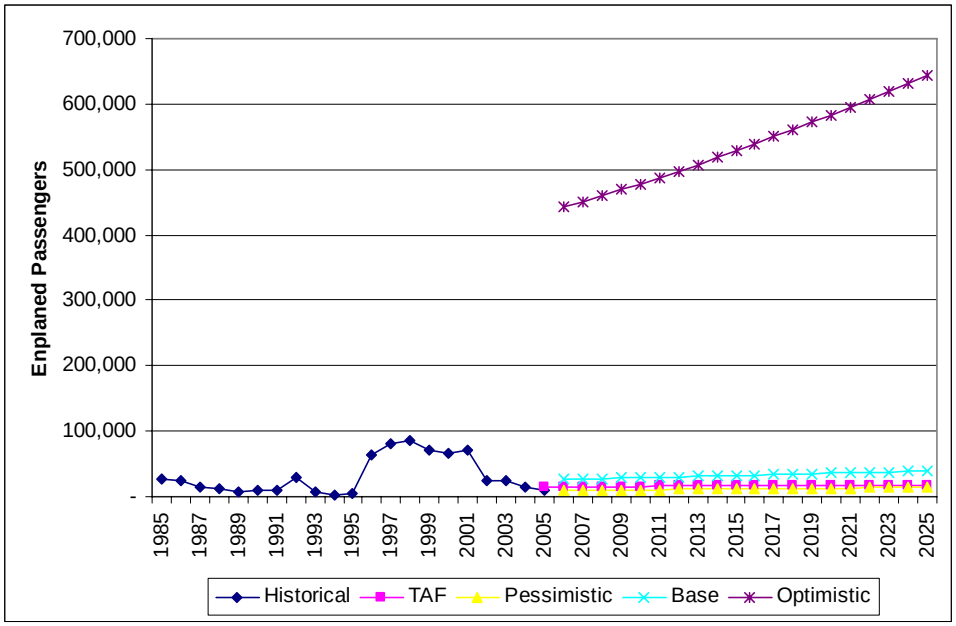
Table VIII.3-3
Enplaned Passenger Forecasts
Trenton Mercer Airport

	TAF	2006 Forecast			
Year	Historical	TAF	Pessimistic	Base	Optimistic
1985	27,037				
1986	24,686				
1987	14,589				
1988	11,953				
1989	7,666				
1990	9,653				
1991	10,346				
1992	29,845				
1993	6,782				
1994	1,864				
1995	4,569				
1996	64,265				
1997	79,783				
1998	86,389				
1999	70,139				
2000	66,164				
2001	71,497				
2002	24,940				
2003	25,479				
2004	15,512				
2005	8,706	15,271			
2006		15,385	10,000	27,000	442,000
2007		15,499	10,200	27,500	450,800
2008		15,614	10,400	28,100	459,800
2009		15,731	10,600	28,700	469,000
2010		15,848	10,800	29,300	478,400
2011		15,966	11,000	29,900	488,000
2012		16,084	11,200	30,500	497,800
2013		16,204	11,400	31,100	507,800
2014		16,325	11,600	31,700	518,000
2015		16,446	11,800	32,300	528,400
2016		16,569	12,000	32,900	539,000
2017		16,692	12,200	33,600	549,800
2018		16,816	12,400	34,300	560,800
2019		16,941	12,600	35,000	572,000
2020		17,068	12,900	35,700	583,400
2021		17,195	13,200	36,400	595,100
2022		17,323	13,500	37,100	607,000
2023		17,452	13,800	37,800	619,100
2024		17,582	14,100	38,600	631,500
2025		17,713	14,400	39,400	644,100
Average Annual Growth Rate					
2006-2025		0.7%	1.9%	2.0%	2.0%

Sources: FAA *Terminal Area Forecast*, February 2006
PB Aviation

This Trenton enplaned passenger forecast is shown graphically on **Exhibit VIII.3-1**.

Exhibit VIII.3-1
Enplaned Passenger Forecasts
Trenton Mercer Airport



IX. AIR CARGO ACTIVITY FORECASTS

This section provides the air cargo forecasts for the three study area airports. Both the amount of air cargo and all-cargo aircraft operations will be projected. General factors affecting air cargo in the DVRPC area are discussed first and then forecasts for each airport are presented.

Basic assumptions underlying the air cargo forecasts, and certain facts regarding air cargo in the eastern Pennsylvania, New Jersey, and southeast New York area are presented below.

- **The number of major domestic air cargo firms is limited** – Air cargo growth has occurred in the United States largely as a result of the actions of the 'integrated' air cargo companies. The firms are called integrated because the same firm is responsible for the pick-up, carriage, and delivery of packages; the business started in 1971 with the founding of Federal Express – now FedEx. The two largest firms in the domestic integrated air cargo business are FedEx and United Parcel Service (UPS); a third firm, DHL, is big internationally, but is struggling to gain market share domestically after having absorbed Airborne. From a market share perspective, almost all domestic air cargo is carried by one of these three airlines with the exceptions of a limited amount of "belly" cargo carried by the passenger airlines and extremely small volumes of express shipment carried by non-scheduled, charter carriers. (As an indicator of the size of the three domestic package carriers, FedEx utilizes 677 aircraft and over 70,000 trucks.) Therefore, the actions of FedEx, UPS, and DHL are likely to drive the forecasts of air cargo at Lehigh Valley, Trenton, and Atlantic City, so the focus of analysis is on their expected activity.

- **The majority of air cargo has switched to all-cargo aircraft** – After September 11, 2001, the FAA restricted the carriage of air cargo on passenger aircraft. The result is that most air cargo now moves by the integrated cargo companies or on other all-cargo aircraft and the volume of air cargo carried on passenger aircraft is severely diminished. Further, the passenger airlines have switched a larger proportion of their service at Lehigh Valley, Trenton, and Atlantic City to regional jet aircraft that have little extra space for air cargo. Finally, the integrated all-cargo companies (FedEx, UPS, and DHL) have become much more aggressive in seeking all types of cargo shipments, including those that traditionally moved by truck, and have taken business that formerly was carried by the passenger airlines. Again, this means that the focus of this air cargo forecast is on the three integrated all-cargo firms.

- **Most air mail is now carried by the integrated cargo companies; volumes have diminished** – In the past, air mail was a major contributor to the volume of air cargo at airports. However, the U.S. Post Office has switched most of its volume to the all-cargo operations of FedEx and UPS who do not provide a separate record of 'mail' volume carried on their aircraft. Further, the

U.S. Post Office has increased its reliance upon an expanded truck network to carry both first class and bulk mail. Finally, the total amount (in weight) of U.S. mail has been static or shrinking over the years. The result is that the volume of domestic air mail recorded at most U.S. airports has diminished to almost negligible amounts. For this reason, no separate projection of air mail is provided in this analysis; rather, all air cargo volumes (freight and mail) are combined in the air cargo total.

- **In recent years, trucks have taken some of the cargo formerly carried by air, but growth, over time, in air cargo is expected** – Because of the limitations placed on movement of cargo by air after September 11, 2001 and the higher cost of fuel, many shipments that formerly went by air now travel by truck. In fact, FedEx and UPS, as well as other firms, have been greatly expanding their truck fleets to accommodate express parcels. For example, FedEx has bought several trucking firms and established an entirely new FedEx "green" channel to move ground parcels. Further, the integrated air cargo companies have aggressively priced their second and third day (that is, truck) products to reduce their air shipments. The result is that domestic air cargo volumes have been reduced in the past few years; however, return to growth in the domestic air cargo sector is expected by the FAA and most other forecasters.

- **The study region is the existing location of hubs for two integrated all-cargo airlines** – UPS has a domestic and international air cargo hub at Philadelphia International Airport and FedEx has a domestic and international air cargo hub at Newark Liberty International Airport. In both cases, the domestic hub is a smaller satellite of their main operation, but each location is the principal gateway for their European routes. The size of each of these regional hub operations means that air cargo from a wide geographic area is trucked into and out of the facilities which diminishes the opportunities for other regional airports to expect aircraft of FedEx and UPS to operate. Note that these all-cargo airlines usually operate at times of the day different from the passenger airlines so that airport congestion or capacity issues at Philadelphia and Newark may not impact their operations.

- **Much of the region's remaining international air cargo is trucked to J. F. Kennedy International Airport because it is also a major air cargo hub** – In addition to the hubs of UPS and FedEx at Philadelphia and Newark airports respectively, a large international air cargo hub exists at J. F. Kennedy International Airport. Kennedy is served by most of the world's airlines with wide body passenger aircraft capable of carrying air cargo in addition to passengers, as well as a number of airlines providing all-cargo flights. The result is that Kennedy was the sixth largest U.S. airport in 2005 in air cargo volume. The 2005 air cargo volume at the region's largest airports is presented in **Table IX-1** in total metric tons.

Table IX-1
Rank and Volume of Air Cargo at Regional Hubs in 2005

U.S. Rank	Airport	Air Cargo
6	Kennedy	1,649,055
9	Newark	957,374
14	Philadelphia	558,071
Source: ACI-NA, 2006		

- **Strong long term growth of domestic air cargo is expected, but international markets are expanding even more** – The FAA predicts domestic air cargo will grow at an average annual rate of 3.1 percent between 2007 and 2017. Near term growth may be higher. On a long-term international basis, the FAA predicts average annual growth rates at 5.1 percent. Other forecasters predict international air cargo will grow even faster, with six to seven percent annual increases predicted by Airbus, Boeing, Merge Global, and the Air Cargo Management Group. What is hidden in these statistics is that domestic air cargo growth appears to be slowing while Asian traffic is dramatically increasing. The result is that U.S. gateways to China and other Asian points are likely to see strong growth while other airports may see less of an increase.

The above factors combine to provide the following general basis for the forecast of air cargo for Lehigh Valley, Trenton, and Atlantic City, as follows.

- Future air cargo volume projections are based largely on the expected activity of FedEx, UPS, and DHL.

- The DVRPC market is extremely competitive for air cargo service and most air cargo will continue to transit Philadelphia, Newark, and Kennedy, as well as being trucked to save cost.

- All the air cargo projected for Lehigh Valley, Trenton, and Atlantic City in this analysis will be classified as domestic freight because the air mail is typically shipped separately, and any international air cargo will likely be sent directly to a gateway airport such as Newark or carried to a domestic hub for re-shipment.

The detailed projection of activity for each airport is provided below.

IX.1 Lehigh Valley

Lehigh Valley has current all-cargo aircraft flights by FedEx and DHL. FedEx currently serves the airport with two B-727-200F aircraft per weekday and DHL utilizes either a DC-9 or DC-8 aircraft depending on the load. DHL also has a ground shipment warehouse in the Allentown area with approximately one half million square feet of floor space, but their on-airport facility is approximately 70,000 square feet.

Records of the past 14 years of total air cargo at the airport indicate growth since 1994, but relatively stable activity after 1999. In fact, the last four years have each been in the 23,000 to 24,000 annual ton range. Air cargo tonnage volumes at the airport are presented in **Table IX.1-1**.

Table IX.1-1
Historical Air Cargo
Lehigh Valley International Airport

Year	Total Tons
1992	6,231
1993	12,622
1994	15,966
1995	18,839
1996	13,053
1997	13,502
1998	16,835
1999	20,475
2000	23,891
2001	20,468
2002	23,764
2003	24,149
2004	23,408
2005	23,391
Average Annual Growth Rate	
1992-2005	11%
1999-2005	2%

Source: Airport, 2006
Note: Total On and Off in tons.

While volume appears to have stabilized in recent years, for the future, growth in air cargo at the FAA's national average domestic rate of 3.1 percent is projected. This means that air cargo shipments will increase from approximately 23,000 tons in 2005 to 43,000 tons in 2025 or an almost doubling of volume. This forecast includes the volumes of the all-cargo airlines and the relatively small amounts of air cargo carried in the bellies of passenger aircraft. This projection is shown on **Table IX.1-2**.

Table IX.1-2
Forecast Air Cargo
Lehigh Valley International Airport

Actual	
2005	23,391
Projected	
2006	24,000
2007	25,000
2008	26,000
2009	27,000
2010	28,000
2011	29,000
2012	30,000
2013	31,000
2014	32,000
2015	33,000
2016	34,000
2017	35,000
2018	36,000
2019	37,000
2020	38,000
2021	39,000
2022	40,000
2023	41,000
2024	42,000
2025	43,000
Average Annual Growth Rate	
2006-2025	3.1%

Source: Airport and PB Aviation, 2006
Note: Total On and Off in tons.

In order to accommodate this volume of air cargo, the number of aircraft operations is expected to increase, as will the size of the aircraft. Generally, air cargo operators increased the size of the aircraft rather then add more flights. Further, in addition to increasing in average size, the type of all-cargo aircraft is expected to evolve with older models being replaced with newer models. More specifically, DC-9s, DC-8s, and B 727s will be replaced with B 757 and B 737 equipment and larger A300 aircraft will be utilized. Each of these newer aircraft is more fuel efficient and generally larger then the one it replaces. The all-cargo fleet mix and operations projections for Lehigh Valley are presented in **Table IX.1-3**.

Table IX.1-3
Forecast All-Cargo Operations
Lehigh Valley International Airport

Year	Airline	Aircraft	Landing Per Week Day	Operations Per Year
2006	DHL	DC-9/DC-8	1	500
	FedEx	727-200F	2	1,000
	Total		3	1,500
2010	DHL	757-200F	1	500
	FedEx	757-200F	1	500
	Total		2	1,000
2015	DHL	757-200F	1	500
	FedEx	757-200F	2	1,000
	Total		3	1,500
2020	DHL	B737-700F	2	1,000
	FedEx	757-200F	2	1,000
	Total		4	2,000
2025	DHL	B737-700F	2	1,000
	FedEx	A300F	2	1,000
	Total		4	2,000

Source: PB Aviation

All or almost all of the tonnage of air cargo projected at the airport is expected to be carried on all-cargo aircraft and all is expected to be domestic or destined to/from a domestic hub for re-shipment. Only one forecast of air cargo shipments and all-cargo aircraft operations is provided because the market appears fairly stable without expectation of dramatic increases or decreases.

IX.2 Atlantic City

Atlantic City has no current scheduled all-cargo aircraft activity. The airport does not have current scheduled all-cargo aircraft service because its air cargo is handled through airports in Philadelphia and/or other airport cities. However, for the future, scheduled all-cargo service is predicted, as will be discussed.

The airport's two current scheduled passenger airlines (Comair and Spirit) carry little or no air cargo. The reason Comair does not carry much cargo is that it flies regional jets that are not well suited for large volumes of air cargo. Spirit does not carry significant cargo because it has traditional served vacation (not business) destinations and it flew many routes on a less than daily schedule with MD-80 jets – an aircraft suited for small packages, but not heavy cargo. Further, Spirit has historically been focused on its passenger rather then air cargo service. However, growth of air cargo volume by the scheduled passenger airlines is possible.

As previously noted, the driving distance from Atlantic City to Philadelphia is 62 miles and to Newark is 114 miles. Therefore, the existing air cargo to and from southern New Jersey can be carried to/from other airports on trucks to meet most

of the integrated airlines' delivery deadlines. For example, FedEx Priority Packages that require a 10:30 AM delivery can be delivered in throughout New Jersey; however, FedEx First Overnight Packages that require a customer delivery by 8:30 are not available in certain of the southernmost counties of New Jersey.

This Atlantic City air cargo forecast is based upon several assumptions, as follows:

- National air cargo volumes will continue to increase which forces the air cargo airlines to add service to additional airports to handle the volume of traffic and to meet their service objectives.

- Atlantic City is selected by the integrated cargo airlines as the best airport to serve the southern New Jersey market.

- Once all-cargo service is initiated to Atlantic City, capacity is likely to be increased comparatively rapidly to serve a larger geographic area of the state that is closest to Atlantic City.

- The availability of scheduled all-cargo service to Atlantic City, as well as other factors, greatly limits or eliminates the amount of air cargo carried by the passenger airlines.

The forecast of air cargo flights and volume to Atlantic City indicates that by 2010 one airline will initiate service. By 2015 another carrier will also initiate service to remain competitive and traffic continues to grow. Of course, actual airlines and aircraft type are decided by competitive decisions, but the expectation of airline behavior is presented in **Table IX.2-1**.

Table IX.2-1
Forecast Scheduled All-Cargo Aircraft Departures and Annual Volumes
Atlantic City International Airport

Year	Potential Airline	Type Aircraft	Weekday Departures	Annual Aircraft Operations	Aircraft Cargo Capacity (pounds)	Load Factor	Annual Load (pounds)
2006	-	-	0	0			0
Total 2006			0	0			0
2010	FedEx	B 757-200	1	500	70,000	50%	18,250,000
Total 2010			1	500			18,250,000
2015	FedEx	B 757-200	1	500	70,000	50%	18,250,000
	UPS	B 757-200	1	500	70,000	50%	18,250,000
Total 2015			2	1,000			36,500,000
2020	FedEx	B 757-200	2	1,000	70,000	50%	36,500,000
	UPS	B 757-200	1	500	70,000	50%	18,250,000
Total 2020			3	1,500			54,750,000
2025	FedEx	B 757-200	2	1,000	70,000	50%	36,500,000
	UPS	B 757-200	2	1,000	70,000	50%	36,500,000
Total 2025			4	2,000			73,000,000

Source: PB, 2006

As noted, all air cargo activity at Atlantic City is assumed to be transported in all-cargo aircraft and all is domestic or carried to/from a domestic hub for transshipment. In a worst-case or pessimistic scenario, the airport might see little or no air cargo activity continuing the present situation. However, in what is believed a more realistic or base case scenario, at some point all cargo flights are expected at the airport. The base case also reflects an optimistic view that all cargo flights will be initiated and that traffic will grow.

IX.3 Trenton

Trenton has no current scheduled all-cargo aircraft activity. The airport does not have current scheduled all-cargo aircraft service because its community's air cargo is handled through airports in Philadelphia and/or other airport cities. For the future, no all cargo air service is predicted because the airport is close to several major all-cargo airline hubs. Further, the airport does not have any existing air cargo ramp space to accommodate all cargo aircraft. Finally, any requests to add facilities to handle all-cargo aircraft might meet community opposition.

Passenger or charter airlines currently or expected to serve the airport in the pessimistic, base, or optimistic passenger forecasts are not expected to have a capacity or desire to have a significant air cargo operation at the airport – because their focus is on passengers or their aircraft are not well suited to air cargo. While certain small amounts of very high priority express shipments are expected to transit the airport in the future, the total number and weight of such shipments is expected to remain negligible. Therefore, under all scenarios, the expected volume of air cargo to/from Trenton is relatively small and no all-cargo aircraft operations are predicted.

X. FORECAST AIRCRAFT OPERATIONS AND FLEET MIX

Based on the scheduled commercial passenger and air cargo activity forecasts previously presented in this report, an aircraft operations forecast will be developed in this section. The fleet-mix of these commercial operations will also be provided. In addition to scheduled commercial passenger and all-cargo flights (called air carrier in this analysis), this operations projection will also include three other categories: air taxi/commuter, general aviation, and military aircraft activity.

The passenger forecasts were developed with pessimistic, base, and optimistic scenarios; therefore, three scenarios of scheduled commercial aircraft operations will be presented. This category of air carrier aircraft operations will include the projected all-cargo aircraft operations. The other types of activity (air taxi/commuter, general aviation, and military) are presented with one future scenario because their levels of both historical and future activity have been and are projected to be relatively stable.

The aircraft operations forecasts for each study area airport are presented below.

X.1 Lehigh Valley

Lehigh Valley currently has an extensive schedule of commercial passenger and all-cargo flights; therefore, in order to predict the future fleet mix and operations, expansion and extension of the current schedule was made to reflect the increase in activity and the passage of time.

In general, the future passenger aircraft operations schedule was developed by utilizing the same airline companies and markets as currently served. For projection purposes, the existing schedule was expanded to reflect the expected increase in activity over the 20-year planning period – assuming that the future schedule will reflect growth from the current activity. Of course, it is realized that airlines and destinations will change over 20 years and new airlines and destinations will be added. The other assumptions of the operations/fleet mix forecast include:

- Increasing the number of flights serving each market.
- Increasing the size (seat or cargo capacity) of certain aircraft – particularly in the all-cargo schedule, where as the market grows a larger aircraft is normally substituted.
- Replacing “old” generation aircraft types with newer replacements.

For example, the 19 seat Beechcraft 1900 evolves, over time, into the 37 seat Dash 8-200, and then the 50 seat Dash 8-300 – each a newer, more fuel efficient, and more passenger-friendly aircraft. However, other routes see frequency increases and replacement of 'old' 150-seat MD-80 aircraft with 'new' 150-seat A-319 aircraft. Perhaps most importantly for the airport, most of today's passenger air service is on 37 to 50 seat regional jet aircraft. These types of aircraft are fairly new and by 2025 a few will likely still be in service; however, the expected trend will be to replace those aircraft, over time, with new, advanced technology 70 and 90 seat regional jets.

The expected fleet mix and operations estimates for all-cargo aircraft were presented previously in the air cargo section. The future passenger fleet mix for scheduled commercial passenger activity in the Pessimistic, Base, and Optimistic scenarios is presented in **Tables X.1-1, X.1-2, and X.1-3** respectively.

Due to the anticipated continuation of the trend for aircraft to rise slightly in seat capacity over time, the number of passenger aircraft operations does not increase significantly in this projection. Also the mix of aircraft is constantly changing including a resurgence of new technology turbo-prop aircraft which are very fuel efficient. These new technology turbo-prop aircraft appear to be ideal for service on relatively short, high passenger volume routes because of their fuel efficiency and design for large numbers of flights (cycles, in aviation terms) per day. A summary of the forecast of types of scheduled commercial passenger operations by time period, scenario, and general type of aircraft for Lehigh Valley is presented in **Table X.1-4**.

The FAA annually publishes a Terminal Area Forecast (TAF) that presents a historical review and projection of operations at most U.S. airports. The projection is done on a share of U.S. and trend basis. The latest TAF was published in February 2006 and projects an annual average rate of growth of operations at Lehigh Valley of 1.6 percent between 2005 and 2025.

The TAF separates operations by air carrier, air taxi/commuter, general aviation, and military. Each category of operations is projected to increase by the FAA, with the exception of military – which is expected to remain stable. The TAF for Lehigh Valley is presented on **Table X.1-5**.

For this forecast, each of the categories of aircraft operations was examined and new projections made for the 20-year analysis period. Three different scenarios of scheduled commercial air passenger aircraft operations were projected – baseline, optimistic, and pessimistic - but only a baseline projection for the other categories because dramatic variations are not expected. Discussion of the historical activity and rational behind the projections are provided below.

- **Air Carrier** – The scheduled commercial passenger and all-cargo aircraft operations are combined for the analysis in this category. Detailed by airline

Table X.1-1
Pessimistic Passenger Forecast
Scheduled Passenger Aircraft Departures
Lehigh Valley International Airport

Weekday				Available Seats	
Airline	**Flights**	**Destinations**	**Aircraft**	**By Aircraft**	**Daily Total**
Scheduled Passenger Departures - 2006					
Air Canada	3	Toronto	Beechcraft 1900	19	57
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	4	Cleveland	Embraer 135	37	148
Continental	3	Boston	Beechcraft 1900	19	57
Delta	4	Atlanta	Canadair RJs	50	200
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	3	Detroit	Canadair RJs	50	150
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Saab 340	34	136
US Airways	1	Charlotte	Airbus A-319	124	124
US Airways	2	Charlotte	Canadair RJ	50	100
US Airways	2	Philadelphia	Canadair RJ	50	100
US Airways	3	Philadelphia	Dash 8 - 200	37	111
US Airways	4	Pittsburgh	Saab 340	34	136
Total	**42**				**1,869**
Scheduled Passenger Departures - 2010					
Air Canada	4	Toronto	Beechcraft 1900	19	76
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	3	Boston	Beechcraft 1900	19	57
Delta	5	Atlanta	Canadair RJs	50	250
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	3	Detroit	Canadair RJs	50	150
United	5	Chicago	Canadair RJs	50	250
United	3	Washington, D.C.	Canadair RJs	50	150
US Airways	4	Charlotte	Canadair RJs	50	200
US Airways	4	Philadelphia	Dash 8 - 200	37	148
US Airways	4	Pittsburgh	Dash 8 - 200	37	148
Total	**42**				**1,939**
Scheduled Passenger Departures - 2015					
Air Canada	3	Toronto	Dash 8 - 200	37	111
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	4	Boston	Beechcraft 1900	19	76
Delta	5	Atlanta	Canadair RJs	50	250
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	4	Detroit	Canadair RJs	50	200
United	5	Chicago	Canadair RJs	50	250
United	3	Washington, D.C.	Canadair RJs	50	150
US Airways	4	Charlotte	Canadair RJs	50	200
US Airways	4	Philadelphia	Dash 8-300	50	200
US Airways	3	Pittsburgh	Dash 8-300	50	150
Total	**42**				**2,097**
Scheduled Passenger Departures - 2020					
Air Canada	2	Toronto	Dash 8-300	50	100
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	4	Boston	Beechcraft 1900	19	76
Delta	5	Atlanta	Embraer 170	70	350
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	4	Detroit	Canadair RJs	50	200
United	5	Chicago	Canadair RJs	50	250
United	3	Washington, D.C.	Canadair RJs	50	150
US Airways	5	Charlotte	Canadair RJs	50	250
US Airways	4	Philadelphia	Dash 8-300	50	200
US Airways	3	Pittsburgh	Dash 8-300	50	150
Total	**42**				**2,236**
Scheduled Passenger Departures - 2025					
Air Canada	2	Toronto	Dash 8-300	50	100
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	1	Boston	Canadair RJs	50	50
Delta	6	Atlanta	Embraer 170	70	420
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	5	Detroit	Canadair RJs	50	250
United	5	Chicago	Embraer 170	70	350
United	5	Washington, D.C.	Canadair RJs	50	250
US Airways	2	Charlotte	Airbus A-319	124	248
US Airways	5	Philadelphia	Dash 8-300	50	250
US Airways	4	Pittsburgh	Dash 8-300	50	200
Total	**42**				**2,628**

Source: PB Aviation, Official Airline Guide, July 2006

Table X.1-2
Base Passenger Forecast
Scheduled Passenger Aircraft Departures
Lehigh Valley International Airport

Weekday				Available Seats	
Airline	**Flights**	**Destinations**	**Aircraft**	**By Aircraft**	**Daily Total**
Scheduled Passenger Departures - 2006					
Air Canada	3	Toronto	Beechcraft 1900	19	57
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	4	Cleveland	Embraer 135	37	148
Continental	3	Boston	Beechcraft 1900	19	57
Delta	4	Atlanta	Canadair RJs	50	200
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	3	Detroit	Canadair RJs	50	150
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Saab 340	34	136
US Airways	1	Charlotte	Airbus A-319	124	124
US Airways	2	Charlotte	Canadair RJ	50	100
US Airways	2	Philadelphia	Canadair RJ	50	100
US Airways	3	Philadelphia	Dash 8 - 200	37	111
US Airways	4	Pittsburgh	Saab 340	34	136
Total	**42**				**1,869**
Scheduled Passenger Departures - 2010					
Air Canada	4	Toronto	Beechcraft 1900	19	76
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	3	Boston	Beechcraft 1900	19	57
Delta	5	Atlanta	Canadair RJs	50	250
Delta	4	Cincinnati	Canadair RJs	50	200
Northwest	4	Detroit	Canadair RJs	50	200
United	4	Chicago	Canadair RJs	50	200
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	2	Charlotte	Airbus A-319	124	248
US Airways	5	Philadelphia	Dash 8 - 200	37	185
US Airways	3	Pittsburgh	Dash 8 - 200	37	111
Total	**42**				**2,087**
Scheduled Passenger Departures - 2015					
Air Canada	3	Toronto	Dash 8 - 200	37	111
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	3	Boston	Beechcraft 1900	19	57
Delta	6	Atlanta	Canadair RJs	50	300
Delta	4	Cincinnati	Canadair RJs	50	200
Northwest	4	Detroit	Canadair RJs	50	200
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	3	Charlotte	Airbus A-319	124	372
US Airways	5	Philadelphia	Dash 8-300	50	250
US Airways	3	Pittsburgh	Dash 8-300	50	150
Total	**44**				**2,450**
Scheduled Passenger Departures - 2020					
Air Canada	3	Toronto	Dash 8-300	50	150
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	2	Boston	ATR-72	70	140
Delta	6	Atlanta	Embraer 170	70	420
Delta	4	Cincinnati	Canadair RJs	50	200
Northwest	4	Detroit	Canadair RJs	50	200
United	6	Chicago	Canadair RJs	50	300
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	3	Charlotte	Airbus A-319	124	372
US Airways	6	Philadelphia	Dash 8-300	50	300
US Airways	3	Pittsburgh	Dash 8-300	50	150
Total	**45**				**2,792**
Scheduled Passenger Departures - 2025					
Air Canada	3	Toronto	Dash 8-300	50	150
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	4	Cleveland	ATR-72	70	280
Continental	3	Boston	ATR-72	70	210
Delta	6	Atlanta	Embraer 170	70	420
Delta	3	Cincinnati	Embraer 170	70	210
Northwest	3	Detroit	Embraer 170	70	210
United	6	Chicago	Embraer 170	70	420
United	5	Washington, D.C.	Canadair RJs	50	250
US Airways	3	Charlotte	Airbus A-319	124	372
US Airways	6	Philadelphia	Dash 8-300	50	300
US Airways	4	Pittsburgh	Dash 8-300	50	200
Total	**47**				**3,172**

Source: PB Aviation, Official Airline Guide, July 2006

Table X.1-3
Optimistic Passenger Forecast
Scheduled Passenger Aircraft Departures
Lehigh Valley International Airport

Weekday				Available Seats	
Airline	Flights	Destinations	Aircraft	By Aircraft	Daily Total
Scheduled Passenger Departures - 2006					
Air Canada	3	Toronto	Beechcraft 1900	19	57
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	4	Cleveland	Embraer 135	37	148
Continental	3	Boston	Beechcraft 1900	19	57
Delta	4	Atlanta	Canadair RJs	50	200
Delta	3	Cincinnati	Canadair RJs	50	150
Northwest	3	Detroit	Canadair RJs	50	150
Southwest	11	Various	Boeing 737-700	137	1,507
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Saab 340	34	136
US Airways	1	Charlotte	Airbus A-319	124	124
US Airways	2	Charlotte	Canadair RJ	50	100
US Airways	2	Philadelphia	Canadair RJ	50	100
US Airways	3	Philadelphia	Dash 8 - 200	37	111
US Airways	4	Pittsburgh	Saab 340	34	136
Total	**53**				**3,376**
Scheduled Passenger Departures - 2010					
Air Canada	4	Toronto	Beechcraft 1900	19	76
Allegiant Air	1	Orlando/Sanford	MD-80	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	3	Boston	Beechcraft 1900	19	57
Delta	4	Atlanta	Embraer 170	70	280
Delta	4	Cincinnati	Canadair RJs	50	200
Northwest	4	Detroit	Canadair RJs	50	200
Southwest	14	Various	Boeing 737-700	137	1,918
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	2	Charlotte	Airbus A-319	124	248
US Airways	6	Philadelphia	Dash 8 - 200	37	222
US Airways	4	Pittsburgh	Dash 8 - 200	37	148
Total	**58**				**4,159**
Scheduled Passenger Departures - 2015					
Air Canada	3	Toronto	Dash 8 - 200	37	111
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	3	Cleveland	ATR-72	70	210
Continental	3	Boston	Beechcraft 1900	19	57
Delta	6	Atlanta	Embraer 170	70	420
Delta	4	Cincinnati	Canadair RJs	50	200
Northwest	4	Detroit	Canadair RJs	50	200
Southwest	18	Various	Boeing 737-700	137	2,466
United	5	Chicago	Canadair RJs	50	250
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	3	Charlotte	Airbus A-319	124	372
US Airways	6	Philadelphia	Dash 8-300	50	300
US Airways	3	Pittsburgh	Dash 8-300	50	150
Total	**63**				**5,086**
Scheduled Passenger Departures - 2020					
Air Canada	3	Toronto	Dash 8-300	50	150
Allegiant Air	1	Orlando/Sanford	Airbus A-319	150	150
Continental	4	Cleveland	ATR-72	70	280
Continental	2	Boston	ATR-72	70	140
Delta	6	Atlanta	Embraer 170	70	420
Delta	5	Cincinnati	Canadair RJs	50	250
Northwest	5	Detroit	Canadair RJs	50	250
Southwest	23	Various	Boeing 737-700	137	3,151
United	5	Chicago	Embraer 170	70	350
United	4	Washington, D.C.	Canadair RJs	50	200
US Airways	4	Charlotte	Airbus A-319	124	496
US Airways	7	Philadelphia	Dash 8-300	50	350
US Airways	4	Pittsburgh	Dash 8-300	50	200
Total	**73**				**6,387**
Scheduled Passenger Departures - 2025					
Air Canada	3	Toronto	Dash 8-300	50	150
Allegiant Air	2	Orlando/Sanford	Airbus A-319	150	300
Continental	4	Cleveland	Embraer 170	70	280
Continental	3	Boston	ATR-72	70	210
Delta	6	Atlanta	Embraer 170	70	420
Delta	5	Cincinnati	Embraer 170	70	350
Northwest	5	Detroit	Embraer 170	70	350
Southwest	30	Various	Boeing 737-700	137	4,110
United	6	Chicago	Embraer 170	70	420
United	6	Washington, D.C.	Canadair RJs	50	300
US Airways	4	Charlotte	Airbus A-319	124	496
US Airways	7	Philadelphia	Dash 8-300	50	350
US Airways	4	Pittsburgh	Dash 8-300	50	200
Total	**85**				**7,936**

Source: PB Aviation, Official Airline Guide, July 2006

Table X.1-4
Passenger Fleet Mix Forecast
Lehigh Valley International Airport

Scenario / Aircraft Type	Average Daily Passenger Aircraft Departures				
	2006	2010	2015	2020	2025
Pessimistic					
Turbo-Prop	17	18	17	16	14
Regional Jets	23	23	24	25	25
Mainline Jets	2	1	1	1	3
Total	**42**	**42**	**42**	**42**	**42**
Base					
Turbo-Prop	17	18	17	17	20
Regional Jets	23	21	23	24	23
Mainline Jets	2	3	4	4	4
Total	**42**	**42**	**44**	**45**	**47**
Optimistic					
Turbo-Prop	17	20	18	20	17
Regional Jets	23	21	23	25	32
Mainline Jets	13	17	22	28	36
Total	**53**	**58**	**63**	**73**	**85**

Source: PB Aviation

and aircraft projections were made and presented above to develop the forecast commercial activity and each is presented in a Pessimistic, Base, and Optimistic format. Historically the air carrier operations at Lehigh Valley have ranged from approximately 10,000 to 20,000; however, the future projections indicate a higher level going forward based upon the airline's 2006 schedule.

- **Air Taxi/Commuter** – The FAA's historical record of operations runs from 1976 to 2004 and indicates annual air taxi/commuter operations have varied from a low of under 10,000 to over 24,000. The FAA's future projection increases from 17,478 in 2005 to 24,246 in 2025, an average annual growth rate of 1.7 percent. This forecast projects a similar trend of 1.7 percent average annual growth, but from a higher base of 20,000 annual operations because each of the last ten years has seen approximately 20,000 operations which appears to be a better baseline to begin the projection.

- **General Aviation** – A wide rage of activity has been recorded in this category ranging from approximately 60,000 operations in 1982 to 117,552 in 1976. The FAA TAF projects an average annual increase of 1.7 percent in this category, as does this analysis. However, both 2003 and 2004 recorded approximately 90,000 general aviation operations; therefore, this projection starts at 90,000 - the trend of the most recent years.

- **Military** – Military operations represent only about 3 percent of the airport's total and historically they have remained under 10,000 per year. The TAF indicates that military operations will remain stable at 3,069 between 2005 and

Table X.1-5
Historical and Projected Aircraft Operations
From FAA TAF
Lehigh Valley International Airport

Year	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total
Actual					
1976	9,469	12,367	117,552	2,706	142,094
1977	9,896	13,619	115,097	1,982	140,594
1978	10,691	10,686	104,764	1,321	127,462
1979	10,018	9,744	97,501	1,267	118,530
1980	9,730	10,149	86,571	1,631	108,081
1981	8,996	17,130	74,723	1,909	102,758
1982	8,051	21,994	60,046	2,335	92,426
1983	7,033	19,817	69,565	3,702	100,117
1984	8,287	18,537	67,749	5,417	99,990
1985	8,728	16,446	74,982	5,257	105,413
1986	11,644	19,387	79,582	6,695	117,308
1987	13,560	19,081	84,193	6,470	123,304
1988	10,797	24,360	90,791	6,932	132,880
1989	10,226	23,538	97,837	8,149	139,750
1990	13,839	21,835	92,139	9,394	137,207
1991	12,616	22,912	95,877	6,386	137,791
1992	16,119	24,220	93,502	7,843	141,684
1993	14,776	23,673	95,489	7,258	141,196
1994	16,675	22,366	90,420	5,542	135,003
1995	19,446	14,905	111,046	7,162	152,559
1996	17,579	17,201	95,411	6,578	136,769
1997	17,421	19,832	94,853	7,598	139,704
1998	17,859	20,465	97,527	7,023	142,874
1999	18,030	20,532	108,386	6,702	153,650
2000	20,441	19,141	93,250	4,197	137,029
2001	19,349	18,063	94,371	4,043	135,826
2002	17,594	20,555	103,320	4,518	145,987
2003	18,154	21,590	89,948	3,676	133,368
2004	20,298	20,405	89,526	3,601	133,830
Projected					
2005	20,511	17,478	87,233	3,069	128,291
2006	20,819	17,766	88,922	3,069	130,576
2007	21,131	18,060	90,645	3,069	132,905
2008	21,448	18,358	92,401	3,069	135,276
2009	21,770	18,660	94,190	3,069	137,689
2010	22,096	18,968	96,015	3,069	140,148
2011	22,428	19,281	97,876	3,069	142,654
2012	22,764	19,599	99,771	3,069	145,203
2013	23,105	19,923	101,705	3,069	147,802
2014	23,452	20,252	103,675	3,069	150,448
2015	23,804	20,586	105,168	3,069	152,627
2016	24,161	20,925	106,683	3,069	154,838
2017	24,523	21,271	108,220	3,069	157,083
2018	24,891	21,622	109,781	3,069	159,363
2019	25,265	21,978	111,366	3,069	161,678
2020	25,644	22,341	112,973	3,069	164,027
2021	26,028	22,710	114,605	3,069	166,412
2022	26,419	23,084	116,262	3,069	168,834
2023	26,815	23,465	117,943	3,069	171,292
2024	27,217	23,852	119,650	3,069	173,788
2025	27,625	24,246	121,382	3,069	176,322
Average Annual Growth Rate					
2004-2025	1.5%	0.8%	1.5%	-0.8%	1.3%
2005-2025	1.5%	1.7%	1.7%	0.0%	1.6%

Source: FAA TAF, 2006

2025. Because 2003 and 2004 each saw approximately 3,600 military operations per year, this analysis assumes that the future years will also see 3,600 military operations.

In total, the TAF's 29 year historical record indicates that airport operations have ranged from approximately 92,000 to 153,000; for the future, the TAF sees the number of operations increasing from 128,291 in 2005 to 176,322 in 2025, a 1.6 percent average annual growth rate. This forecast has three scenarios of future aircraft operations, but they are generally similar in total ranging by 2025 from 183,200 to 210,200. This aircraft operations projection is shown in **Table X.1-6**.

Table X.1-6
Forecast Aircraft Operations
Lehigh Valley International Airport

	Commercial Air Carrier			Air Taxi &	General		Total Operations		
Year	Pessimistic	Base	Optimistic	Commuter	Aviation	Military	Pessimistic	Base	Optimistic
2006	27,500	27,500	34,500	20,000	90,000	3,600	141,100	141,100	148,100
2010	27,000	27,000	37,000	21,400	96,300	3,600	148,300	148,300	158,300
2015	27,000	29,000	40,000	23,400	104,800	3,600	158,800	160,800	171,800
2020	28,000	30,000	48,000	25,400	114,000	3,600	171,000	173,000	191,000
2025	28,000	31,000	55,000	27,600	124,000	3,600	183,200	186,200	210,200
Average Annual Growth Rate									
2006-2025	0.1%	0.6%	2.5%	1.7%	1.7%	0.0%	1.4%	1.5%	1.9%

Source: PB Aviation

This forecast of total operations projects an average annual increase of 1.4, 1.5, or 1.9 percent depending on scenario. This is slightly lower then the 2.0 percent average annual growth rate of operations projected by the FAA for the nation as a whole.

X.2 Atlantic City

Atlantic City has scheduled commercial passenger air service currently and this analysis predicts the introduction of all-cargo service during the 20-year planning period. The fleet mix of all-cargo service was previously presented and this section will detail the expected scheduled commercial passenger flights and other categories of aircraft operations.

The passenger flights were developed based upon growth and expansion of the existing schedule in the same manner as the Lehigh Valley schedule presented above. **Table X.2-1** presents the three scenarios of scheduled passenger activity over the 20-year forecast period.

As previously discussed, the FAA TAF provides the basis record of historical and projected operations at airports. In the last ten years, the airport has averaged approximately 120,000 annual operations and the FAA predicts relatively slow growth (an average annual rate of 0.8 percent) going forward. This FAA TAF is shown on **Table X.2-2**.

Table X.2-1
Scheduled Passenger Aircraft Departures
Atlantic City International Airport

Year	Type Aircraft	Aircraft Capacity	Daily Departures	Load Factor	Annual Enplaned Passengers
Pessimistic Forecast					
2006	CRJ-200	50	2	60%	
	MD-80	175	10	75%	
	Total 2006		**12**		**493,000**
2010	CRJ-200	50	4	60%	
	Airbus A-319	134	12	80%	
	Total 2010		**16**		**513,000**
2015	CRJ-200	50	4	60%	
	Airbus A-319	134	13	80%	
	Total 2015		**17**		**537,000**
2020	CRJ-200	50	5	60%	
	Airbus A-319	134	13	80%	
	Total 2020		**18**		**562,000**
2025	CRJ-200	50	5	60%	
	Airbus A-319	134	14	80%	
	Total 2025		**19**		**586,000**
Base Forecast					
2006	CRJ-200	50	2	60%	
	MD-80	175	10	75%	
	Total 2006		**12**		**502,000**
2010	CRJ-200	50	3	60%	
	Airbus A-319	134	13	80%	
	Total 2010		**16**		**532,000**
2015	CRJ-200	50	3	60%	
	Airbus A-319	134	14	80%	
	Total 2015		**17**		**571,000**
2020	CRJ-200	50	3	60%	
	Airbus A-319	134	15	80%	
	Total 2020		**18**		**613,000**
2025	CRJ-200	50	3	60%	
	Airbus A-319	134	16	80%	
	Total 2025		**19**		**658,000**
Optimistic Forecast					
2006	CRJ-200	50	2	55%	
	B 737-700	137	11	80%	
	MD-80	175	13	60%	
	Total 2006		**26**		**929,000**
2010	CRJ-200	50	3	55%	
	B 737-700	137	13	80%	
	Airbus A-319	134	17	60%	
	Total 2010		**33**		**1,051,000**
2015	CRJ-200	50	3	55%	
	B 737-700	137	16	75%	
	Airbus A-319	134	20	60%	
	Total 2015		**39**		**1,226,000**
2020	CRJ-200	50	3	55%	
	B 737-700	137	20	75%	
	Airbus A-319	134	24	60%	
	Total 2020		**47**		**1,428,000**
2025	CRJ-200	50	3	55%	
	B 737-700	137	25	75%	
	Airbus A-319	134	29	60%	
	Total 2025		**57**		**1,664,000**

Source: PB Aviation

Table X.2-2
Historical and Projected Aircraft Operations from FAA TAF
Atlantic City International Airport

Year	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total
Actual					
1976	892	7,664	56,346	38,391	103,293
1977	2,000	8,215	79,475	43,981	133,671
1978	1,431	8,285	83,520	40,024	133,260
1979	1,888	11,780	80,540	33,614	127,822
1980	2,018	15,581	89,884	33,004	140,487
1981	2,736	8,029	70,770	27,678	109,213
1982	5,157	6,998	38,484	22,253	72,892
1983	624	18,162	48,971	26,992	94,749
1984	460	23,161	48,386	25,824	97,831
1985	449	10,736	50,613	26,079	87,877
1986	561	10,748	48,296	27,425	87,030
1987	615	13,476	50,044	27,617	91,752
1988	5,861	13,615	56,321	24,935	100,732
1989	8,210	15,567	50,566	24,823	99,166
1990	8,761	18,899	51,504	26,175	105,339
1991	8,498	17,322	48,653	21,051	95,524
1992	9,018	24,900	51,481	29,786	115,185
1993	11,470	18,779	49,093	26,278	105,620
1994	11,698	16,002	63,427	33,805	124,932
1995	9,261	16,252	59,654	29,963	115,130
1996	10,048	14,923	57,665	28,491	111,127
1997	12,260	14,540	62,764	36,776	126,340
1998	16,463	15,437	64,885	40,809	137,594
1999	14,034	14,400	58,900	43,180	130,514
2000	14,862	12,501	62,655	44,451	134,469
2001	12,616	12,558	57,799	41,281	124,254
2002	11,350	12,110	55,471	45,368	124,299
2003	13,261	11,094	51,690	47,527	123,572
2004	14,063	9,331	50,999	44,127	118,520
Projected					
2005	13,746	8,612	53,128	49,252	124,738
2006	13,860	8,650	54,029	49,252	125,791
2007	13,968	8,689	54,899	49,252	126,808
2008	14,076	8,728	55,781	49,252	127,837
2009	14,186	8,767	56,679	49,252	128,884
2010	14,296	8,806	57,590	49,252	129,944
2011	14,407	8,846	58,515	49,252	131,020
2012	14,519	8,885	59,457	49,252	132,113
2013	14,631	8,925	60,414	49,252	133,222
2014	14,746	8,965	61,385	49,252	134,348
2015	14,861	9,005	62,155	49,252	135,273
2016	14,978	9,045	62,933	49,252	136,208
2017	15,095	9,085	63,721	49,252	137,153
2018	15,213	9,126	64,520	49,252	138,111
2019	15,332	9,167	65,330	49,252	139,081
2020	15,451	9,208	66,150	49,252	140,061
2021	15,572	9,249	66,981	49,252	141,054
2022	15,694	9,290	67,823	49,252	142,059
2023	15,816	9,332	68,676	49,252	143,076
2024	15,940	9,374	69,540	49,252	144,106
2025	16,064	9,416	70,417	49,252	145,149
Average Annual Growth Rate					
2004-2025	0.6%	0.0%	1.5%	0.5%	1.0%
2005-2025	0.8%	0.4%	1.4%	0.0%	0.8%

Source: FAA TAF, 2006

To forecast the future number of aircraft operations at Atlantic City, the scheduled commercial passenger and all-cargo flights were combined in the commercial air carrier category on the basis of Pessimistic, Base, and Optimistic scenarios. The air taxi/commuter, general aviation, and military categories were also projected based upon the most recent year (2004) actual activity and the trend apparent from the historical activity and FAA's national projections. This analysis projects an increase of over one percent annually in operations resulting in over 140,000 operations in 2025 in each of the three scenarios as shown on **Table X.2-3**.

The operations projection of this analysis estimates aircraft activity breaking the static pattern of recent years and growing through the planning period. This new operations forecast projection is generally similar to that shown in the TAF.

Table X.2-3
Forecast Aircraft Operations
Atlantic City International Airport

Year	Commercial Air Carrier			Air Taxi & Commuter	General Aviation	Military	Total Operations		
	Pessimistic	Base	Optimistic				Pessimistic	Base	Optimistic
2006	7,500	7,500	16,300	9,300	51,000	44,100	111,900	111,900	120,700
2010	10,500	10,500	21,100	10,100	54,600	44,100	119,300	119,300	129,900
2015	11,600	11,600	25,400	11,100	59,400	44,100	126,200	126,200	140,000
2020	12,800	12,800	30,900	12,100	64,600	44,100	133,600	133,600	151,700
2025	13,900	13,900	37,700	13,100	70,300	44,100	141,400	141,400	165,200
Average Annual Growth Rate									
2006-2025	3.3%	3.3%	4.5%	1.8%	1.7%	0.0%	1.2%	1.2%	1.7%

Source: PB Aviation

X.3 Trenton

This section will present the aircraft operations and fleet mix forecast for Trenton. As previously presented, the Trenton passenger forecast has three scenarios of activity. These passenger totals translate into aircraft activity as presented in **Table X.3-1**.

The FAA TAF for Trenton appears to indicate a decreasing trend of total aircraft operations from 182,250 in 1976 to 115,850 in 2004. The majority of operations (historically over 90 percent) and the apparent reason for the decline are in the general aviation category. However, for the future the FAA TAF projects an increase in general aviation activity and therefore an increase in total operations as shown on **Table X.3-2**.

No scheduled all-cargo flights are predicted in this analysis; therefore, all the air carrier activity is represent by passenger flights. The future air carrier flights are predicted in Pessimistic, Base, and Optimistic scenarios and the air taxi/commuter, general aviation, and military are projected in one scenario based upon the trend of historical activity and national trends. The aircraft operations forecast for Trenton is presented in **Table X.3-3**.

Table X.3-1
Scheduled Passenger Aircraft Departures
Trenton Mercer Airport

Year	Type Aircraft	Aircraft Capacity	Daily Flights	Load Factor	Annual Passengers
Pessimistic Forecast					
2006	Jetstream 31	19	3	50%	10,000
2010	Jetstream 31	19	3	52%	10,800
2015	Jetstream 31	19	3	57%	11,800
2020	Jetstream 31	19	3	62%	12,900
2025	Jetstream 31	19	4	52%	14,400
Base Forecast					
2006	CRJ-100/200	50	3	50%	27,000
2010	CRJ-100/200	50	3	53%	29,300
2015	CRJ-100/200	50	3	59%	32,300
2020	CRJ-100/200	50	3	65%	35,700
2025	CRJ-100/200	50	4	54%	39,400
Optimistic Forecast					
2006	Boeing 737-700	137	11	80%	442,000
2010	Boeing 737-700	137	12	80%	478,400
2015	Boeing 737-700	137	13	80%	528,400
2020	Boeing 737-700	137	15	80%	583,400
2025	Boeing 737-700	137	16	80%	644,100

Source: PB Aviation

This analysis predicts a growth of operations in all categories for Trenton except military with total operations (in all three scenarios) reaching in the optimistic case, approximately 168,000 in 2025. The key variable for Trenton remains general aviation traffic which continues to represent approximately 90 percent of aircraft operations activity.

Table X.3-2
Historical and Projected Aircraft Operations from FAA TAF
Trenton Mercer Airport

Year	Air Carrier	Air Taxi & Commuter	General Aviation	Military	Total
Actual					
1976	7,372	1,429	160,192	13,257	182,250
1977	1,000	4,494	160,457	9,425	175,376
1978	611	7,990	147,550	8,996	165,147
1979	600	9,284	159,109	8,692	177,685
1980	10	8,872	149,505	8,566	166,953
1981	4	10,225	137,535	10,735	158,499
1982	2	7,492	137,697	9,439	154,630
1983	0	8,105	147,298	9,427	164,830
1984	1,177	8,798	132,081	9,132	151,188
1985	1,361	6,274	160,551	9,604	177,790
1986	961	5,979	165,551	8,949	181,440
1987	18	5,652	147,863	7,329	160,862
1988	4	5,692	160,383	10,793	176,872
1989	6	2,436	144,371	10,578	157,391
1990	227	3,477	139,785	10,499	153,988
1991	87	3,785	121,703	8,978	134,553
1992	1,814	4,646	156,600	10,793	173,853
1993	141	2,712	145,999	9,778	158,630
1994	7	2,225	137,438	6,934	146,604
1995	271	892	138,700	5,846	145,709
1996	3,146	720	113,814	5,009	122,689
1997	3,194	803	102,749	4,336	111,082
1998	3,656	959	102,377	3,988	110,980
1999	3,873	1,134	139,959	4,829	149,795
2000	609	7,571	137,862	5,111	151,153
2001	1	7,900	119,935	4,318	132,154
2002	5	6,916	107,485	3,682	118,088
2003	7	7,589	101,690	3,260	112,546
2004	13	7,550	105,215	3,072	115,850
Projected					
2005	10	7,015	90,945	3,486	101,456
2006	10	7,041	91,752	3,486	102,289
2007	10	7,068	92,569	3,486	103,133
2008	10	7,094	93,396	3,486	103,986
2009	10	7,121	94,235	3,486	104,852
2010	10	7,148	95,085	3,486	105,729
2011	10	7,174	95,945	3,486	106,615
2012	10	7,201	96,817	3,486	107,514
2013	10	7,228	97,700	3,486	108,424
2014	10	7,255	98,595	3,486	109,346
2015	10	7,283	99,166	3,486	109,945
2016	10	7,310	99,742	3,486	110,548
2017	10	7,337	100,323	3,486	111,156
2018	10	7,365	100,908	3,486	111,769
2019	10	7,392	101,499	3,486	112,387
2020	10	7,420	102,094	3,486	113,010
2021	10	7,448	102,694	3,486	113,638
2022	10	7,476	103,299	3,486	114,271
2023	10	7,504	103,909	3,486	114,909
2024	10	7,532	104,524	3,486	115,552
2025	10	7,560	105,144	3,486	116,200
Average Annual Growth Rate					
2004-2025	-1.2%	0.0%	0.0%	0.6%	0.0%
2005-2025	0.0%	0.4%	0.7%	0.0%	0.7%

Source: FAA TAF, 2006

Table X.3-3
Forecast Aircraft Operations
Trenton Mercer Airport

	Commercial Air Carrier			Air Taxi &	General		Total Operations		
Year	Pessimistic	Base	Optimistic	Commuter	Aviation	Military	Pessimistic	Base	Optimistic
2006	1,900	1,900	6,900	7,500	105,000	3,500	117,900	117,900	122,900
2010	1,900	1,900	7,500	7,900	112,300	3,500	125,600	125,600	131,200
2015	1,900	1,900	8,100	8,400	122,100	3,500	135,900	135,900	142,100
2020	1,900	1,900	9,400	8,900	132,800	3,500	147,100	147,100	154,600
2025	2,500	2,500	10,000	9,900	144,500	3,500	160,400	160,400	167,900
Average Annual Growth Rate									
2006-2025	1.5%	1.5%	2.0%	1.5%	1.7%	0.0%	1.6%	1.6%	1.7%

Source: PB Aviation

XI. IMPACT FACTORS

By nature, forecasting aviation activity is not an exact science. Many factors impact future trends in aviation activity. Several critical "impact factors" or issues relating to future air travel behavior are summarized below; and each is addressed in more detail in the sections that follow:

- **Low Cost Carriers** – When low cost carriers (LCCs) enter air markets, passenger ticket prices tend to decline and travel (especially leisure travel) increases. LCCs have significant market share at many airports in the region and influence the ticket prices and air service at all the regional airports. These forecasts assume, in general, that market share for LCCs will increase.
- **Changes to Flight Access Regulations at LGA, JFK, and EWR** – Currently, hourly operations by commercial aircraft at LGA are limited to 75 per hour. While the current rule under FAR Part 93 is expected to expire at the end of 2006, the FAA is expected to make a similar replacement rule. Thus, the 75 operations per hour cap on commercial operations is expected to continue throughout the forecast period. Similarly, operational limits imposed by FAR Part 93 at JFK will expire at the end of 2006. This forecast assumes that the FAA lets the current rule expire and will not impose new limits at JFK. While FAR Part 93 was originally designed to regulate demand at EWR, these provisions were only implemented for a short time. They have not been in effect for over 30 years. This forecast assumes that no new air capacity rule would be in effect at EWR. However, based upon current technology, all three airports appear near the limits of their airside capacity during certain periods of the day. Therefore, the FAA has introduced proposed new rules to increase the average size of aircraft at LGA and create a free market for slots to maximize their utilization.
- **Changes to Flight Access Regulations at HPN** – Currently, half-hourly operations at HPN are limited to four operations by commercial passenger carriers. This previously voluntary limit was converted to legislation in September 2004. This forecast assumes that past levels of compliance with the caps on operations and passengers will continue into the future. HPN serves as an example that other airports in the region may introduce their own restrictions during the forecast period.
- **Fuel Prices –** The price of aviation fuel has risen dramatically over the past two years. Peak prices for crude oil in 2005 and 2006 were above $70 per barrel. Higher fuel prices should result in higher fares and subsequently lower passenger demand. This forecast assumes that relatively high fuel prices (perhaps, greater than $60 per barrel) are now a permanent part of the aviation market. However, in the short term fuel prices have again started dropping, but the key assumption of the forecasts is that fuel remains available to commercial airlines during the period.
- **Airline Bankruptcies –** The past five years have witnessed dramatic changes to the overall financial health of the airline industry, with four "legacy" airlines entering bankruptcy at least once. Continued operation of an airline during bankruptcy tends to depress ticket pricing and stimulate

demand. After bankruptcy, pricing tends to stabilize (often at a higher level), which would reduce passenger travel. This forecast assumes that the "legacy" airlines will weather current financial problems that thrust them into bankruptcy and will emerge as lower cost competitors. This forecast also assumes that JetBlue will successfully make the transition from being a small regional airline to a large national carrier and, as noted above, that other LCCs will continue to stimulate demand in the region.

- **The Effect of Economic Upturns and Downturns –** Air travel varies, with among other factors, the health of the economy. With the advent of low-cost carriers, more travel has become discretionary (leisure) and therefore more likely to vary with levels of disposable income. This forecast describes long-term trends and does not forecast variations due to short-term economic spurts and recessions. These short-term events produce variability around the long-term trends identified in the forecast. History has shown that air travel tends to recover after short-term economic and political events.
- **Effects of the Attacks of September 11, 2001 -- Real Decline in Short-Haul Travel** – The net effect of the attacks of September 11, 2001 was to increase real air travel times for air transportation by some amount to permit increased security screening. For this analysis, we have estimated that time as approximately 30 minutes. This increased time to travel has had the net effect of reducing demand for short-haul flights (less than 500 miles) because it sometimes takes more time to fly than to drive. This forecast assumes that the travel time increase is permanent and that the current demand profile (decreasing demand) for short-haul travel will continue. Note that this security delay does not apply to rail travel which makes northeast corridor trains more attractive on some routes versus air travel.
- **Effects of the Attacks of September 11, 2001 – Declining Yields for Long-Haul Travel** – With the decline in short-haul travel, airlines, especially low cost carriers have shifted some of their capacity into long-haul flights. As a result of this and other reasons, fares and yields for long-haul travel have declined. This forecast assumes that this lower fare environment is largely permanent and thus a stimulus for air travel, although some small market corrections will occur.
- **Effects of the Attacks of September 11, 2001 – Air Cargo Industry** – The volume of air cargo carried on passenger airlines has declined in response to reductions in cargo capacity available on certain routes and new air cargo security rules which restrict or prohibit certain kinds of air cargo on passenger flights. This forecast assumes that the shift to most air cargo being carried on all cargo aircraft continues.
- **Airline Industry Outlook –** The ability to pass on higher fuel prices as fare increases to the traveler and the improvement of "legacy" carrier cost structures during bankruptcy protection will improve airline economics on a going forward. For this forecast, it is assumed that the fleet mix of these commercial passenger service airlines is expected to change as follows:

  - The industry will continue to replace smaller regional jet aircraft with larger regional jet aircraft that have lower average operating costs per passenger mile.
  - Small 19-passenger turboprops will likely disappear; however, larger 50 to 70 passenger turboprops will see resurgence because of their operating economies.
  - More narrow-body aircraft will continue to enter the domestic fleet.
  - Narrow-body aircraft will be similar in size to the existing fleet.
  - Fewer wide body aircraft will be used on domestic routes.

- **Effect of Airside Congestion –** Airside congestion reduces the service reliability of air transportation, making it a less attractive choice particularly for short-haul travel. This forecast assumes that airside congestion will have no effect on air travel demand as this forecast is unconstrained.
- **Effect of Regional Ground Transportation Congestion –** The passenger surveys demonstrated that travel time to the airport, especially from home, is an important factor for airport choice. Therefore, passengers usually choose the closest airport, but only if there is equal air service quality and similar airline ticket pricing. This forecast assumes an unconstrained case where levels of ground transportation congestion remain at current levels for all airports which does not change current airport choice patterns.

Each of these impact factors is further detailed in the following sections. A summary of other significant factors affecting the forecast is included in the last section.

XI.1 LOW COST CARRIERS

Since deregulation of the airlines in 1978, LCCs have continuously increased their presence in the national market. In 2005, the LCCs (American Trans Air, America West, AirTran, Frontier, JetBlue, Sun Country, Southwest, and Spirit) enplaned approximately 161 million passengers. This compares to the 2000 total for these airlines of approximately 110 million passengers. From 2000 to 2006 the share of LCC passengers increased from approximately 16 percent to 26 percent of the national total. Note that Southwest Airlines represented 66 percent of the 2000 total of LCC passengers, but by 2005 Southwest's share was 55 percent.

The legacy airlines, as defined by the FAA, are Alaska, American, Continental, Delta, Northwest, United, and US Airways. Their share of the U.S. domestic market continues to decrease as both the LCCs expand and many of the legacy carriers shed aircraft and employees in order to reduce costs. However, the legacy airlines have been growing in the much smaller international marketplace where, so far, the LCCs have not ventured.

Note that this analysis recognizes that America West has now merged with US Airways and is no longer a LCC. Further, despite its stock ticker symbol of "LCC," US Airways is still classified as a legacy carrier. Therefore, the distinction among passenger airlines (including legacy, LCCs, regionals, and other) is blurring.

Regardless of which airlines grow or decline and/or which go bankrupt, it appears the U.S. passenger airline market will remain very competitive. However, the exact airlines, airports, or markets that will benefit from this competitive situation are difficult to predict because the market continuously changes.

XI.2 CHANGES IN FLIGHT ACCESS REGULATIONS AT LGA, JFK, AND EWR

FAR Part 93 was originally imposed in 1968 by the FAA to control airline access to LGA, JFK, and EWR, as well as Washington National (DCA) and Chicago O'Hare (ORD). This rule subsequently has been modified several times, changing operational levels, the regulated hours, or types of commercial and general aviation operations effected. Shortly after its imposition, the rule was eliminated entirely at EWR and was not replaced. In 2000, Congress passed the AIR-21 legislation which called for easing of restrictions and for the elimination of the rule entirely by the end of 2006.

In addition, AIR-21 authorized an unlimited number of new slots at LGA for operation of air service to small and non-hub communities with aircraft that have less than 70 seats. In response, airlines scheduled 300 new operations per day to LGA and indicated intent to introduce even more new service. Flight delays dramatically increased to the point where LGA was responsible for a significant portion of delays in the entire national airspace system. The Port Authority requested that the FAA impose a limit on the number of new operations, and in response the FAA held a lottery that determined which airlines would receive 159 AIR-21 slots (chosen among the existing AIR-21 slot holders) and established a limit of 75 commercial operations per hour plus 6 slots per hour for non-scheduled and general aviation aircraft operations.

Future access regulations at LGA that replace current FAR Part 93 and AIR-21 slots are not anticipated to include limits on aircraft size beyond the physical capacity of the airport to handle larger aircraft. Thus, this forecast anticipates that airlines will have an increased ability to grow the size of aircraft used to serve a market in response to demand and serve all the demand it can while maintaining flight profitably. Thus, the continuation of a Federal constraint on aircraft flight volume at LGA would not change the passenger demand at other regional airports.

Future growth in aircraft operations demand might trigger imposition of Federal demand management at JFK and EWR airports. Peak period aircraft delay levels at both airports are already at high levels. Additional increases in demand will likely increase these delay levels further; therefore, such capacity controls or other flight demand mitigation levels are possible.

Current demand at EWR is over 40 percent regional jet (RJ) aircraft, predominantly operated by one carrier. Over time and with growth of domestic air markets, this carrier has the diversity of domestic aircraft to replace these RJ aircraft with larger narrow-body aircraft. Thus, it is reasonable to assume that the long-range forecast of passenger demand at EWR could be served within existing levels of annual operations, but with larger aircraft. Thus, a Federal constraint on aircraft traffic volume at EWR would not materially change the passenger demand at other regional airports. Further, a rather substantial amount of the passenger traffic at EWR is connecting, if in the future origin and destination passengers increase, the percentage of connecting passengers could decrease providing additional capacity.

Current demand at JFK is over 20 percent regional jet aircraft. In addition, virtually all domestic service is by narrow-body aircraft. International service is a mix of narrow-body, small wide-body (B-767), and larger wide-body aircraft. Similar to EWR it is reasonable to assume that the long-range forecast of passenger demand could be served within existing levels of annual operations, but with larger aircraft. Thus, a Federal constraint on aircraft traffic volume at JFK would not materially change the passenger demand at other regional airports.

The changes to Federal access rules do not affect the Port Authority perimeter rule for LGA, which limits service from LGA to destinations within 1,500 miles (the exception being Denver, which had service when the rule was initially imposed). With the advent of B-757 and B-767 aircraft, the relatively short length of LGA runways no longer limits the markets that could be served from LGA using jet aircraft. The Port Authority imposed the perimeter rule to maintain the diversity of short-haul markets from LGA. Long-haul markets have equivalent access to the New York market through JFK. The 2005 passenger surveys for LGA and JFK confirm that the entirety of the LGA service area lies within the JFK service area. The Port Authority does not anticipate changing the perimeter rule and this forecast assumes that the perimeter rule will stay in place. Any potential changes to the perimeter rule largely affect the distribution of activity between JFK and LGA and do not materially affect demand levels at other regional airports.

XI.3 CHANGES IN FLIGHT ACCESS REGULATIONS AT HPN

Westchester County imposed restrictions on the number of commercial flights at Westchester County Airport (HPN) in September 2004 that formalized voluntary restrictions in place since 1984. County Executive Andy Spano said “It means these traditional protections for the communities around the airport will now be part of the laws of Westchester County. They will now have permanence.” He added, “This is an important element of the ‘Good Neighbor Policy’ for the airport, which balances the needs of the flying public with the rights of people who live near the airport.”

The new legislation provides the following:

- A maximum of four scheduled commercial aircraft may enplane or deplane per half hour,
- On average, there may not be more than 240 scheduled passengers per half hour (either arriving or departing),
- Continuation of the lottery allocation system for flights, to determine what airline can use the airport at what time, and
- County control of ramp operations.

These restrictions are similar to what has been in effect by contract at the airport since 1984. Over the years, the airlines agreed to periodic extensions of the restrictions. With the most recent extension expiring December 31, 2004, Spano initiated the effort to codify the restrictions, to make it less likely the restrictions can ever be successfully challenged. However, the long-term imposition and effectiveness of specific airport restrictions is unknown.

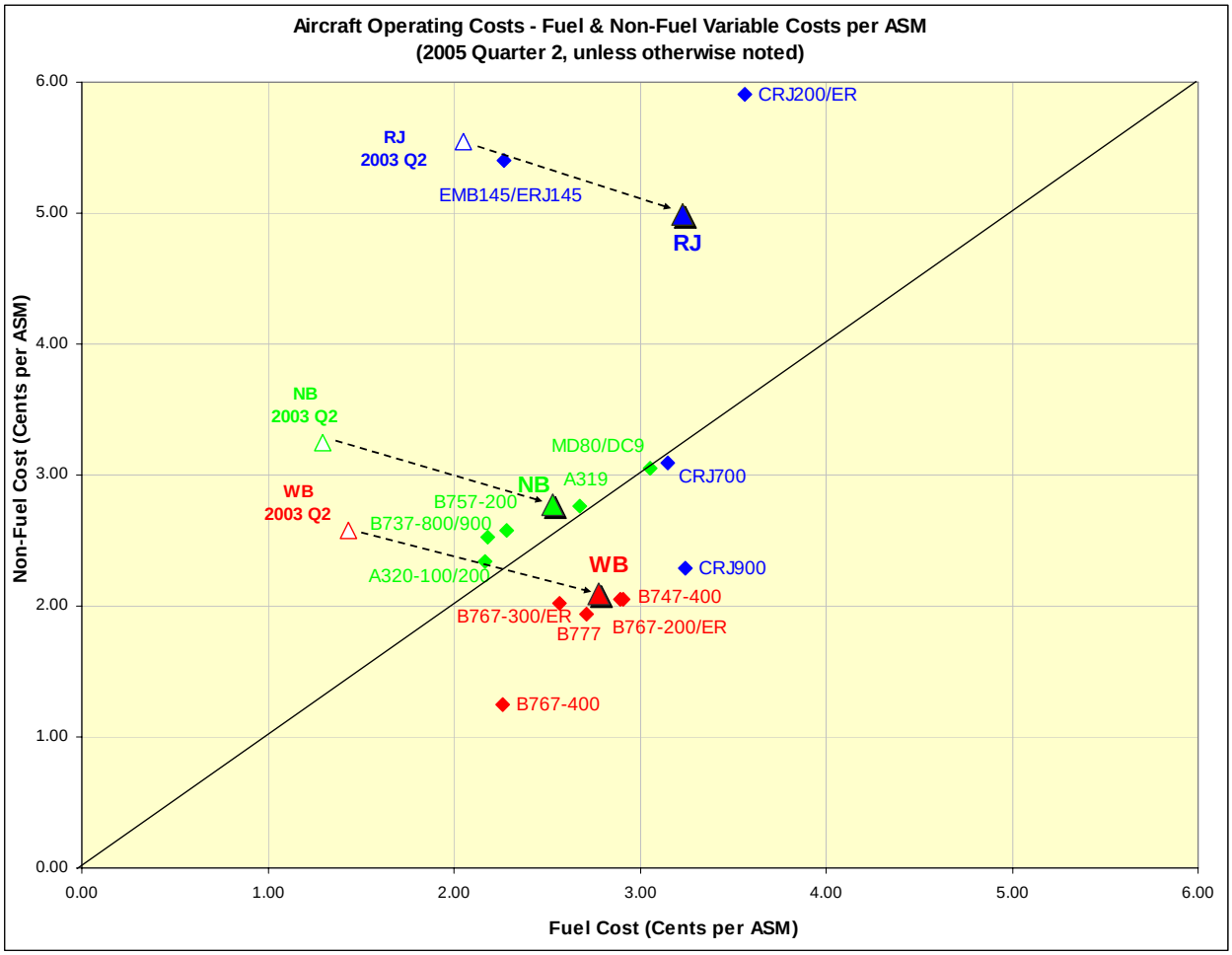
XI.4 FUEL PRICES

The dramatic rise of fuel prices in 2005 has changed the economics of the aviation industry. Two carriers (Delta Air Lines and Northwest Airlines) declared bankruptcy as a direct result of initial weak financial positions and subsequent increases in fuel prices. Other established airlines increased their losses. Certain previously profitable LCCs began posting losses as well.

Higher fuel prices increase the average cost per passenger mile of providing air service. Over the past four years, airlines have faced declining revenue per passenger mile (yield), primarily as a result of increased competition from new LCCs. They had responded by cutting labor and other non-fuel costs. However, recent fuel cost increases more than offset these other cost savings.

Exhibit XI-1 compares the fleet average non-fuel (y-axis) and fuel (x-axis) costs per passenger mile for regional jet, narrow-body, and wide-body aircraft types. Values for 2003 and 2005 are shown. Overall, fuel cost per passenger mile doubled from 2003 to 2005. Regional jet aircraft have fuel costs that are approximately 10 to 20 percent more per passenger mile than narrow-body aircraft. In addition, regional jet aircraft have labor costs per passenger mile that are more than 60 percent greater than those for narrow-body aircraft.

Exhibit XI-1
Comparison of Fuel and Non-Fuel Aircraft Operating Costs



Sources: US DOT Form 41 and Landrum & Brown analysis

The industry has responded relatively quickly. Northwest Airlines took advantage of bankruptcy and cancelled various flying contracts with Mesaba Airlines for use of smaller aircraft. Comair (Delta owned commuter carrier) has parked 30 regional jet aircraft. The Independence Air bankruptcy idled a large regional jet fleet. Further cuts in regional jet operations are likely if high fuel prices continue. Simply put, yields on regional jet markets are too low to support their operation in certain markets. The industry is likely to respond with less frequent service with larger, more efficient aircraft.

This forecast assumes that relatively high fuel prices are now a permanent part of the aviation market. This will result in airlines choosing larger, more efficient aircraft and attempting to increase load factors. In addition, with some recently announced domestic capacity cuts, airlines should be able to more easily raise prices to cover increased fuel costs.

XI.5 AIRLINE BANKRUPTCIES

While fuel costs have largely driven the latest round of airline bankruptcies, other, earlier airline bankruptcies had a variety of causes. Major airlines have had to use bankruptcy protection to overhaul what the airlines saw as archaic labor contracts, decreased fleet size, rationalize route structures, reduce debt, and restructure defined benefit retirement programs. This process is not yet complete, although many legacy carriers now have cost structures that are far more similar to newer LCCs.

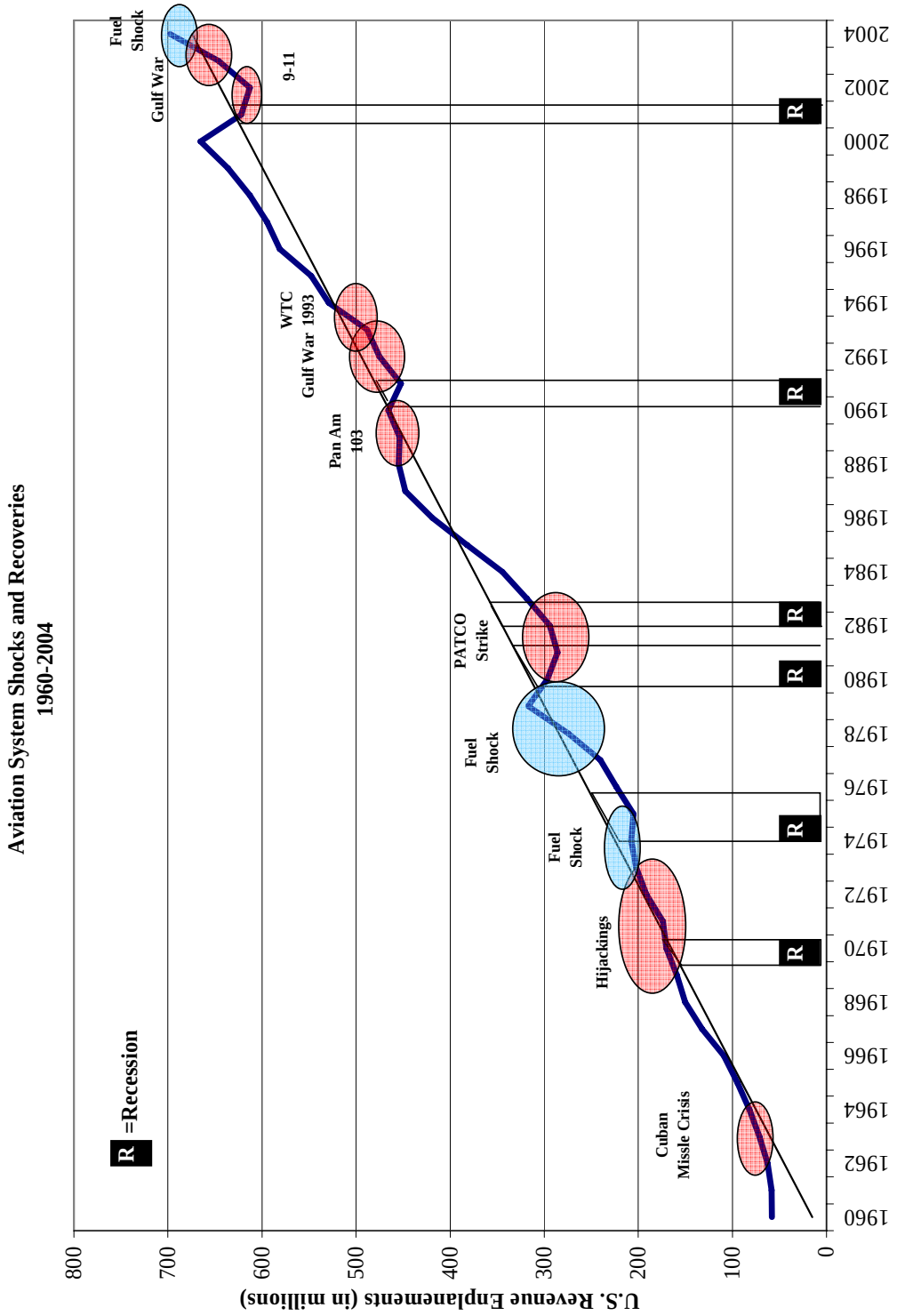
Far more new carriers fail than succeed. Many fail because of a faulty business concept or intense competition; others have a sound business concept, but fail because of bad timing. Independence Air is the most recent example of bad timing, starting with a regional jet based business plan, just prior to the price of fuel increasing to the point where regional jet aircraft became less profitable. After their start-up cash was depleted, they then entered the already highly competitive long-haul market when yields had already declined 40 percent.

Other start-up low cost carriers fail when they make the transition from being a small airline with a single mission or focus city, to being a large airline with multiple missions and focus cities. People Express is perhaps the most noteworthy past example of such a failure. Midway Airlines also failed in a similar manner. A small and inexperienced management staff cannot manage a large complex airline. JetBlue is currently making the transition from being a small start-up airline to a large network carrier. It is currently in the highest risk part of its growth, where new management systems are being implemented at a far higher cost and level of complexity than the systems they replaced. The key to its success will be keeping unit costs low enough to sustain their price advantage over other airlines.

XI.6 EFFECTS OF ECONOMIC UPTURNS AND DOWNTURNS

Use of aviation for travel varies with the economy, population, and a multitude of other factors. Focusing solely upon the economy, aviation travel has declined during most recessions and bounced back during subsequent economic expansions. The overall 45-year trend of U.S. passenger enplanements has been relatively constant as shown on Exhibit IX-2. As more and more air travel is for discretionary (leisure) purposes, the variability of air travel with economic cycles should increase. This is because historically the level of business travel (measured by passenger counts) has been more stable from year to year versus leisure travel. **Exhibit XI-2** also shows that air travel has been relatively resilient in weathering fuel-price shocks and terrorist attacks. This forecast focuses on long-term trends. Short-term perturbations should be expected around the underlying trend.

Exhibit XI-2
Aviation Industry Shocks and Recoveries



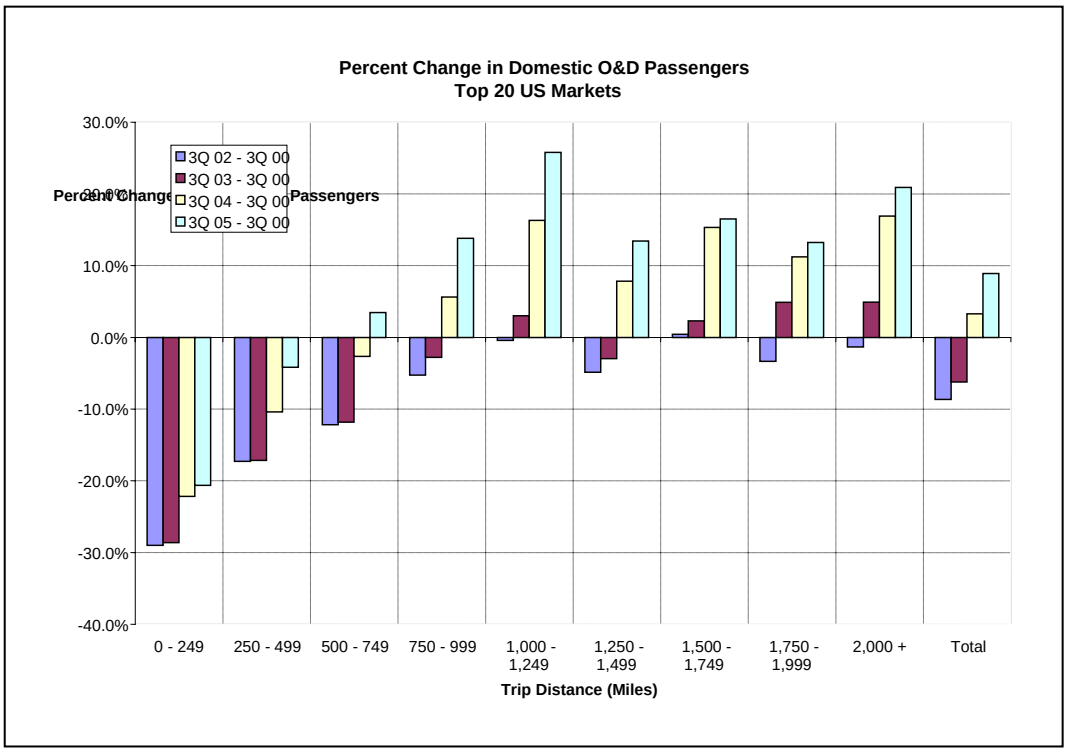
Source: Landrum & Brown analysis

XI.7 EFFECTS OF THE ATTACKS OF SEPTEMBER 11, 2001 – REAL DECLINE IN SHORT-HAUL TRAVEL

The initial thought that fear of air travel after September 11, 2001 would drive passengers away from air travel have proven to be largely unfounded. However, changes to security procedures have changed travel habits since they have increased the time required to travel through the airport. Post September 11, 2001 security has added a considerable hassle factor to air travel which has caused an increasing number of potential air travelers to seek alternatives. The decision to drive rather than fly has disproportionately affected travel in short-haul markets, as driving or other modes becomes an increasingly viable alternative the shorter the trip length. On longer trips, the air travel time increase is far less noticeable since other modes do not provide the speed of aircraft over long distances. Non-Hub airports (as defined by the FAA) have been particularly affected by the increase in security check related delays as the majority of flights from these airports historically have been 500 miles or less, connecting the airports to a legacy carriers' hub airport. A total of 41 Non-Hub airports in the continental U.S. lost all scheduled passenger service between April 2000 and April 2006.

Exhibit XI-3 shows the change in demand by travel distance from the top 20 U.S. markets compared to the third quarter 2000. Initially (fourth quarter 2001), all markets declined. However by 2004, only the decline in short-haul travel, especially travel of less than 500 miles remained. By third quarter 2005, travel longer than 500 rebounded to levels above those shown in 2000.

Exhibit XI-3
Annual Change in Travel By Length Of Trip – Top 20 U.S. Markets

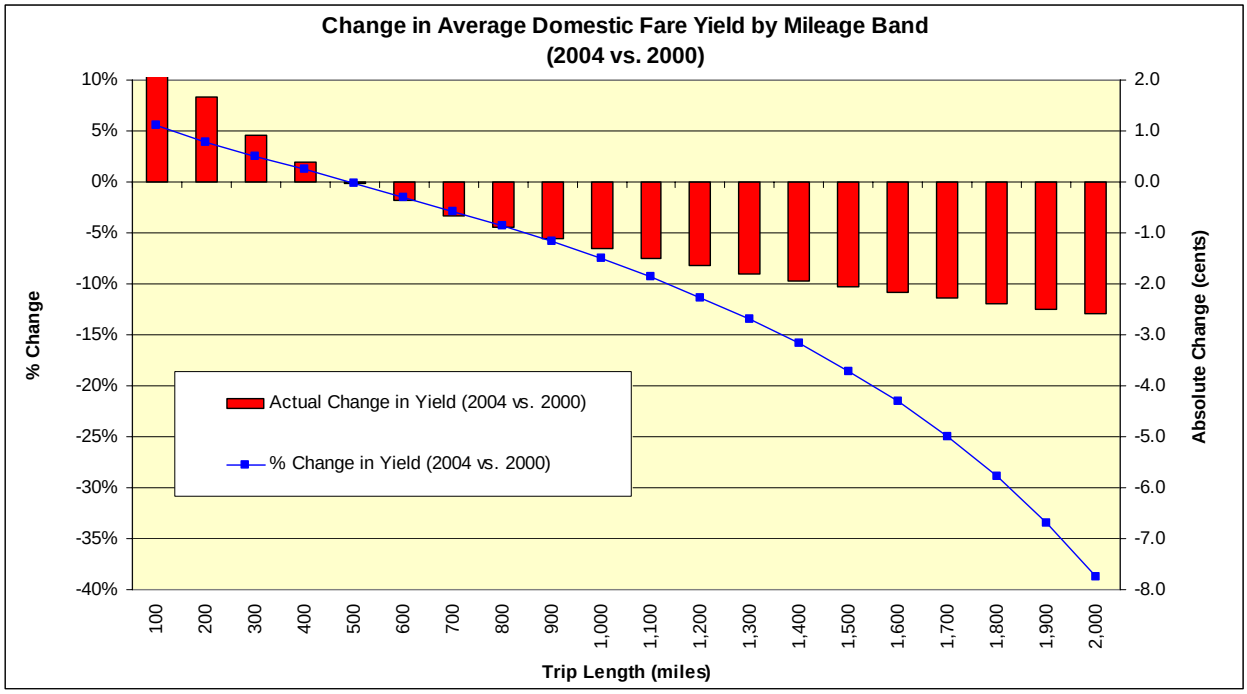


Sources: US DOT T-100 Data and Landrum & Brown analysis

XI.8 EFFECT OF THE ATTACKS OF SEPTEMBER 11, 2001 – DECLINING YIELDS FOR LONG-HAUL TRAVEL

With the decline in short-haul travel, airlines, especially low cost carriers, have shifted their capacity into longer-haul flights. For example, the start-up of JetBlue at New York's JFK airport originally focused on long-haul flights. Among others, these two factors have caused airline yields to decline on long-haul flights. As shown in **Exhibit XI-4**, yields for long-haul flights have declined by as much as 40 percent in the past five years while yields on short-haul flights (under 500 miles) have increased.

Exhibit XI-4
Yield Trends by Length of Haul



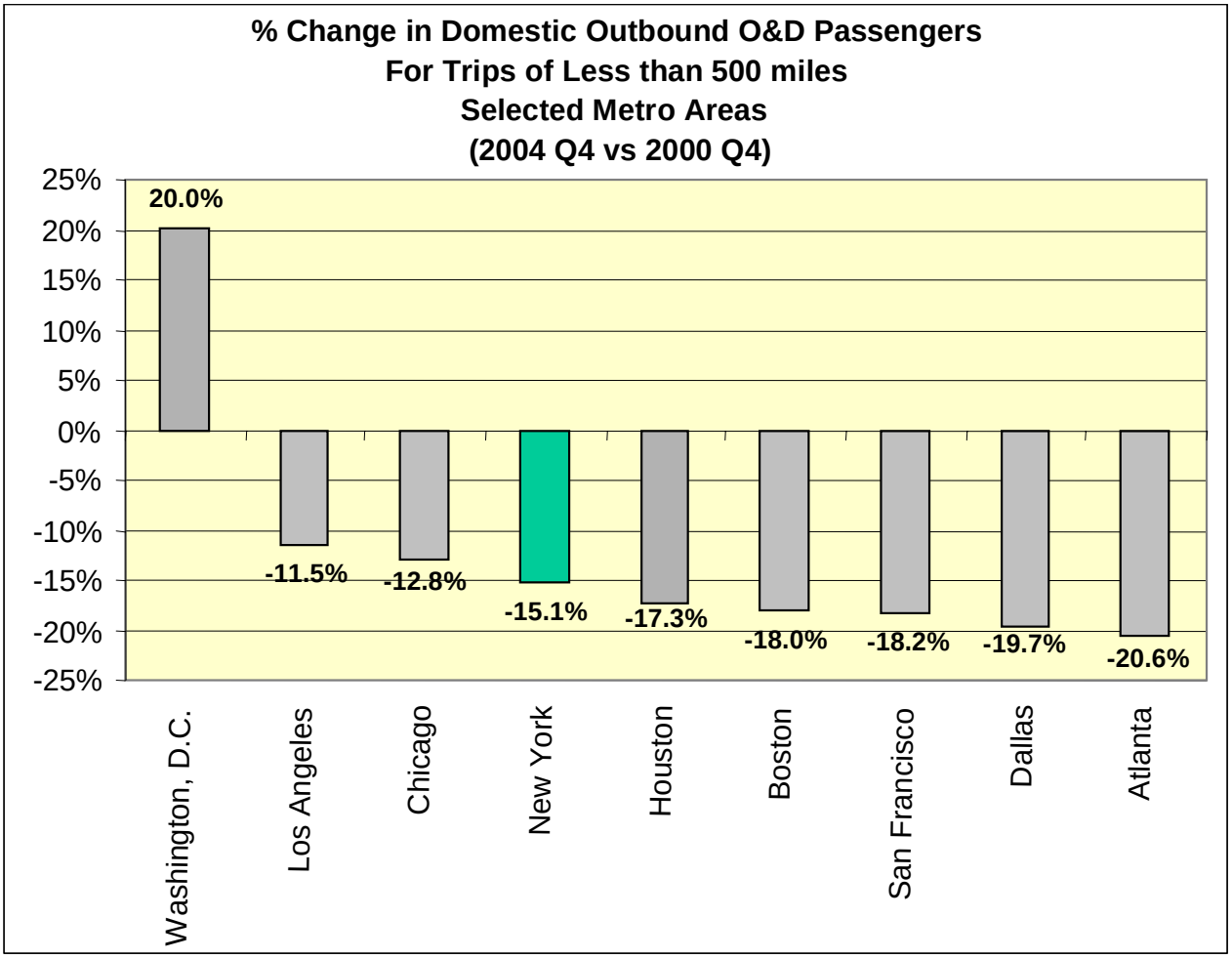
Sources: US DOT T-100 and Landrum & Brown analysis

Given the prior focus of major airlines on long-haul flights, this decline in yields has been a major factor in defining the airlines' current financial condition. While travel has increased in markets of greater than 1,000 miles, revenue per passenger mile has declined.

The current conditions indicate that the industry has significant over-capacity for long-haul service. JetBlue has indicated that future expansion from the New York region with their EMB-190 aircraft will be in short- and medium-haul point-to-point markets. This will increase competitive pressure on shorter-haul market fares. The major portion of JetBlue's expansion plans will focus on areas outside of New York.

Exhibit XI-5 confirms that the decline in short-haul travel was fairly uniform, except where demand was stimulated by very low air fares and large increases in service to/from Washington D.C. caused by the start-up of Independence Air. Thus, the long-term decline in air travel has occurred because of economic factors, rather than because of fear of flying. On short-haul travel, the time savings is less; therefore, a lower price is needed to produce a similar amount of travel. The economics of air travel are still about paying more to travel faster and save time. The more time saved, the more the trip is worth to the passenger.

Exhibit XI-5
Annual Change inTravel by Major Markets



Sources: US DOT T-100 Data and Landrum & Brown analysis

XI.9 EFFECTS OF THE ATTACKS OF SEPTEMBER 11, 2001 – AIR CARGO INDUSTRY

A general economic downturn that began in 2000 adversely affected air cargo in terms of growth rates, and in some markets, total volumes. This economic downturn and increased competition was more important than the events of September 11, 2001 on air cargo activity. Critical issues and impacts that have changed the air cargo industry in the last five years include:

- Dramatically increased use of trucks for both short- and medium-hauls.
- Escalation of operating costs, especially insurance.
- Consolidation among smaller firms.
- Failure of many small cargo airlines and smaller support firms, as well as many consolidators and freight forwarders.

- Higher security costs and increased time to implement security procedures.
- Continued downward trend of customer rates, particularly as new second and third day shipping options divert packages from the most expensive next day services.

Since 2001, the air cargo industry has generally demonstrated very modest growth if not actual declines in domestic volume. Traffic patterns, however, have been difficult to establish given a shift of the main U.S. mail contract to FedEx. After the events of September 11, 2001, passenger aircraft were no longer permitted to carry many kinds of air cargo (including bulk U.S. mail) and FedEx was awarded a contract to carry most U.S. mail. This U.S. mail contract award to FedEx has altered reporting of air cargo and mail volumes and changed the industry's understanding of how much cargo is actually moved. For purposes of this forecast, the definition of air cargo includes mail.

In many cases, the passenger airlines have decreased the number of flights they operate and have reduced the size of aircraft on many remaining flights. This has reduced the aircraft belly capacity available for cargo on many routes. Coupled with the application of the more stringent "known shipper rule"[1], passenger carriers are either reluctant to or are constrained from accepting some freight. As a result more freight flows through freight forwarders or the integrated airlines (FedEx, UPS, and DHL) that make use of multiple modes for cargo shipments.

This forecast assumes that the structural change of a shift from air cargo on passenger aircraft to all cargo aircraft is permanent and that that continued heightened air cargo security will continue. However, the trend of growth of air cargo shipments will reemerge as just-in-time delivery of all types of products remains the norm.

[1] The "known shipper rule" allows shippers that have an established business history with air carriers or freight forwarders to ship cargo on planes.

XI.10 AIRLINE INDUSTRY OUTLOOK

Two major airlines (United and US Airways) emerged from bankruptcy protection in 2006. The remaining two carriers currently in bankruptcy (Delta and Northwest) are unlikely to emerge until at least 2007. However, it is expected that they will continue to fly as long as they do not sustain any labor actions. If either carrier has a significant labor action, it may cease flying and it is unlikely that it would resume. One or more airline mergers might be an outcome, similar to the merger between US Airways and America West.

High fuel costs and lower average fares are likely to continue driving smaller regional jet aircraft out of competitive markets where the cost of providing service exceeds revenue. New, larger regional jet aircraft have higher labor productivity and will continue to enter the market. However, major airlines are likely to use independent providers to fly most regional aircraft. Small regional jet and turboprop aircraft will likely continue in markets (especially short-haul) where yields are sufficiently high to cover the high costs of providing service and traffic volumes are relatively small.

For this forecast, it is assumed that airline fleet changes will include:

- The industry will continue to replace smaller regional jet aircraft with larger regional jet aircraft that have lower operating costs per passenger mile.
- Modern turboprop aircraft will remain or enter the fleet on short-haul routes; however, the smallest 19 and 34 seat aircraft will gradually disappear from main routes.
- More narrow-body aircraft will continue to enter the fleet replacing the smallest regional jets, previous generation narrow-body aircraft, and older wide-body aircraft.
- These new narrow-body aircraft will be similar in size to the existing fleet.

The overall financial health of the airline industry will improve with increasing revenues and lower costs. However, fare levels to passengers are not likely to increase; rather, in real terms, they are likely to continue to decline.

XI.11 EFFECT OF AIRSIDE CONGESTION

Increasing airside congestion at many large hub airports will likely only have a limited effect on demand as airlines substitute larger aircraft and selectively raise fares on capacity-restricted routes. Further, as congestion increases, airlines have responded by increasing the travel time in the schedule. While this increase in travel time may result in higher airline costs, it tends to hide the extent of the congestion problem since airlines strive to maintain an 85 percent or better on-time performance. In addition, airlines will also increase time between flights so that delays on one flight have only a limited effect on the next flight.

By increasing the amount of time the flight takes, the airline tends to make the short-haul flight (less than 500 miles) less attractive when compared to the travel time of alternative travel modes, such as rail or driving. This has already been demonstrated by the approximately half hour increase in passenger travel time that resulted from changed security procedures after September 11, 2001. As described previously, the market response to this half-hour increase in total travel time was a decline in short-haul flights and virtually no change in demand for long-haul flights.

The major difference between travel time increases that result from airside congestion and from security delays are that the time increases are unequal between airports. Small regional airports are not likely to see significant airside congestion, while many large hub airports such as EWR, LGA, and JFK have airside congestion today and could have increased airside congestion in the future. The increases in travel time due to security requirements are similar for all airports.

Thus, increases in airside congestion could change passenger demand at the smaller regional airports if congestion becomes severe enough. As previously noted, the DVRPC "optimistic" passenger forecast assumes that the three DVRPC study airports are able to capture a significantly higher percentage of the air travelers that originate from the counties that make up their existing catchment areas.

During the course of the study period (through 2025), should JFK, EWR, and LGA (as well as PHL) experience much higher levels of congestion, it is not inconceivable that passenger volumes at ABE, ACY, and TTN could increase by significantly more than even the optimistic forecasts, resulting in projected demand levels as much as 30 to 50 percent higher.

XI.12 EFFECT OF REGIONAL GROUND TRANSPORTATION CONGESTION

The passenger surveys have demonstrated that travel time to the airport, especially from home, is an important factor for airport choice. Given equal air service quality and similar pricing, passengers will choose the closer airport. Some passengers will choose the closer airport, even when the air trip is longer or costs more.

As ground transportation congestion increases, it has the net effect of increasing the length of the entire journey, thereby reducing the net travel time savings gained by using air transportation. In short-haul travel, where alternative modes of transportation exist (such as car or rail), air travel may lose some demand to other modes of transportation. In long-haul travel, where air travel is frequently the only realistic mode of choice, air travel will still be used. Thus, increased levels of ground transportation congestion will reduce demand for short-haul travel, but will likely not change demand for long-haul travel.

The net effect of increased ground transportation congestion will be to increase the travel time to the airport. From more distant locations, the increased congestion

will become a factor in airport choice. To the extent that ground transportation congestion increases unequally among the airports, airport choice decisions will change. However, airport choice will only change if comparable air service (destination and price) is available at the closer airport.

Thus, increases in ground transportation congestion could change passenger demand at the smaller regional airports in a manner similar to the changes that would result from air side congestion:

1. In trips less than 500 miles to an un-congested airport, where comparable (competing) air service already exists at the smaller airport.

2. In trips where the origin of the passenger trip was substantially closer to the smaller airport and the where competing connecting service already exists through an un-congested hub airport.

In the past, airlines tended to specialize at one or more of a region's airports rather than providing service to all of them. The domestic legacy airlines are now serving all three of the Port Authority airports and some of the other regional airports as well. It is not clear whether the airlines are changing service patterns within the system of airports in response to ground transportation issues or primarily for competitive reasons. Often it takes a new entrant airline to establish service within a regional airport system to prompt incumbent carriers to expand their service.

Improving the regional ground transportation system serving an airport has the effect of extending the service area for the airport. Improvements to the roadway network provide the largest increase in service area since virtually all passengers using the regional airports arrive by some type of private car (including taxi, limo, or rental car). Point-to-point rail service only increases access to areas that are easily accessible to rail stations. Further, rail service must be conveniently timed with flight arrivals (including delayed arrivals) and departures and have airport station facilities that promote an easy transfer between rail and air. If park-and-ride concepts are used at out-lying stations, security must be provided for over night parking and rates must be comparable or less than airport rates.

Generally, the survey has found that the great majority of passengers use airports that are within 60 minutes of their local trip origins. Thus, rail access must provide a maximum of an approximately 60 minute travel time to the airport from the furthest station (allowing for some travel time to/from the station).

XI.13 SUMMARY OF FACTORS AFFECTING THE FORECASTS

The purpose of this impact analysis section has been to identify and evaluate factors that could affect the forecasts. In fact, there are an infinite number of issues that could influence the attached forecasts from the most mundane, short term road closure that blocks entry to an airport to a worldwide depression that reduces air travel for decades.

It is probably necessary at this point to again identify the most significant national issues most likely to influence air travel activity over the long term. These issues were previous identified, but they include:

GDP – The health of the U. S. economy is probably the single most important factor in influencing the level of air travel. This economic health is normally measured by Gross Domestic Product (GDP). This factor influences air cargo and general aviation, as well as commercial air passengers. In simplest form, a strong and growing economy means increasing air traffic and the basis of this forecast is a continued, long term expansion of the U.S. economy. The strength of the local economy is also a factor in the demand for air transportation; however, to a smaller degree then the national trends.

Population Characteristics – The size of the local population is critical to provide a base for air transportation demand. However, the changes in air travel are based upon the level of growth (if any) in that population and the economic characteristics of those residents.

Existing Air Service Patterns – Current airport locations and air service patterns form the basis of this analysis. While the existing situation may result in less than ideal service at higher costs and potential environmental impact, the existing conditions are likely to be slow to change.

Domestic Passenger Airline Deregulation – Prior to 1978, domestic passenger airline routes, fares, and other conditions of service were strictly regulated by the Civil Aeronautics Board. With airline deregulation, dramatic changes in airline behavior and the air passenger market have occurred. For example, new airlines have been established and previous ones have gone out of business; however, the most dramatic change is that fares have been reduced and competition increased. This free market has served as dramatic stimulus to air travel and this analysis assumes that the market will remain deregulated and, perhaps, if foreign airlines are permitted to operate domestic routes, even more stimulation will occur.

International Passenger Airline Deregulation – While domestic passenger travel is largely deregulated, many international routes remain regulated. The U.S. Government is pursuing what they call an “open skies” program to increase competition on international routes, but many routes remain closed and fares remain relatively high. Further, few “low fare” airlines have introduced service on international routes and many international gateways remain congested. While international routes remain a relatively small portion (less than approximately 5 percent) of U.S. air travel, further stimulation of passenger air travel could occur if international routes were fully deregulated.

Air Cargo Market Deregulation – In a similar manner to the domestic passenger market, air cargo service has been partially deregulated stimulating service. However, the more dramatic market change has been the introduction of a new express delivery air cargo business model started by Federal Express (now FedEx) in 1971. This new model eliminates the freight forwarder and complicated multi-

company system formerly used and introduced an "integrated" system for small packages where the airline picks up, carries, and delivers the package all with minimum hassle and at a relatively low cost. Today FedEx, UPS, DHL, and other firms provide a complete, low cost, and very efficient system to move small packages that has revolutionized the supply chain system for both consumers and companies.

Noise and Other Environmental Regulation – Perhaps one of the most under-recognized factors affecting air transportation is the issue of environmental regulation and impact. The airlines have been forced to spend large sums to purchase new aircraft and change their operating practices due to noise and pollution regulations, while airports have often been limited in their operation and expansion by regulations and community concerns over noise, neighborhood relocation, traffic congestion, and other issues. Large sums that could have been spent on developing airport capacity have been spent on necessary environmental issues. For the future, environmental regulation and costs are expected to continue changing, perhaps dramatically, the rate of aviation growth and the location of that activity. While in the past aircraft noise issues have dominated the limits on growth of aviation, in the future, air and water quality issues are playing an increasing role.

Citizen and Political Response – Perhaps related to the environmental issues are the concerns of citizens regarding the costs, congestion, and propriety of growth of aviation. A number of environmental justice issues are also raised on the basis that costs and impacts of aviation activity may not be distributed fairly. Financial issues may play a key role in the question of who pays for airport improvements and who benefits from airport development. Certainly taxpayers have a right to ask if, for example, a proposed new airport terminal is more important than a proposed new highway or hospital. A further issue of airport development and activity is the issue that many communities do not want an airport located in their area, but they do want the benefits of an airport for travel. This is the 'not in my back yard' concern that airports provide multiple benefits, just as long as it is located some distance from my house. The answer to these issues may be the continued trade-off and balance between the costs and benefits of aviation that make forecasting specific aviation activity difficult.

Leakage of Air Travel Demand to Other Airports – The air passenger surveys have demonstrated that passengers consider and use alternate airports for various trips. This forecast assumes that the current propensity to use alternative airports will continue over time. The independent socio-economic variables analyzed in the study reflect current forecasts for unequal population, income, and employment growth among the various counties and catchment areas. The dependent variables of forecast passenger travel at each airport will naturally reflect the unique demographic characteristics of each airport's service area.

Impacts on Regional Airports of Increased Congestion at JFK, EWR, and LGA - The underlying principle for the "baseline" forecast is that there will be an *unconstrained* growth of airspace, airport, and other capacity to meet demand. The previously presented DVRPC "optimistic" passenger forecast assumes that the non-

PANYNJ/Philadelphia airports are able to capture a significantly higher percentage of the air travelers that originate from their catchment areas. In addition, during the course of the study period (through 2025), should JFK, EWR, and LGA (as well as PHL) experience much higher levels of congestion than is the case today, it is not inconceivable that passenger volumes at ABE, ACY, and TTN could increase by significantly more than even the "optimistic" forecasts.

Finally two factors have been much discussed for their potential significant impact on air passenger levels – these are continuing terrorism and pandemic diseases. The impact of terrorism comes after the events of September 11, 2001 with the various subsequent 'shoe-bomber,' liquid explosives, and other incidents. The pandemic disease issue is generated by the SARS, bird flu, and other infectious disease issues that have recently reduced air traffic to certain countries. Both of these issues are assumed to have no long term impact on domestic air travel, although short-term impacts are possible.

All of these factors have been recognized (to varying degree) in the forecasts. However, they represent issues that may need to be re-evaluated in the future as conditions continue to change.