PASSENGER GROWTH ANALYSIS OF THE 2005-2009 NPIAS

2LT MARK M. HICKIE
JANUARY 4, 2005
1.231-AIRPORT SYSTEMS
# TABLE OF CONTENTS

**TABLE OF FIGURES** ................................................................................................................................................3

**EXECUTIVE SUMMARY** .........................................................................................................................................4

**INTRODUCTION** .......................................................................................................................................................5

  - Airport Breakdown ................................................................................................................................................5
  - Funding Breakdown ..............................................................................................................................................6
  - Capacity Needs at Large Airports ..........................................................................................................................7
  - Areas of Analysis ..................................................................................................................................................7

**NECESSARY FUNDING FOR OVERCAPACITY AIRPORTS** .......................................................................................9

**PASSENGER GROWTH, OVERCAPACITY, AND PHL** ...............................................................................................12

  - 1993-2003 Enplanements Comparison ..................................................................................................................12
  - 2002-2003 Enplanements Comparison ..................................................................................................................13
  - The Airline Industry ..............................................................................................................................................15
  - US Air .................................................................................................................................................................15
  - St. Louis and TWA ..............................................................................................................................................15
  - 2004 Estimation Model .......................................................................................................................................16
  - Recommendation ...............................................................................................................................................18

**FAA FORECASTING CHECKS** ...............................................................................................................................19

  - FAA 2009 Enplanements ...................................................................................................................................19
  - Pittsburgh and St. Louis ....................................................................................................................................20

**CONCLUSION** ..........................................................................................................................................................21
TABLE OF FIGURES

FIGURE 1: NPIAS FUNDING BY AIRPORT TYPE .............................................................. 6
FIGURE 2: NPIAS FUNDING BY DEVELOPMENT TYPE ............................................. 6
FIGURE 3: NPIAS AIRPORTS NEEDING CAPACITY ..................................................... 7
FIGURE 4: NPIAS FUNDING SORTED BY 2003 ENPLANEMENTS .......................... 10
FIGURE 5: RANK COMPARISON OF PASSENGERS VS. NPIAS FUNDING .......... 11
FIGURE 6: PASSENGER GROWTH FROM 1993-2003 ............................................... 13
FIGURE 7: PASSENGER GROWTH FROM 2002-2003 ................................................ 14
FIGURE 8: LARGE, PRIMARY ENPLANEMENTS, 2002-2003 ................................. 16
FIGURE 9: 2004 YEAR END ENPLANEMENT ESTIMATION EQUATION ............. 16
FIGURE 10: 2004 ESTIMATED ENPLANEMENTS .................................................... 17
FIGURE 11: 2004 ESTIMATED PERCENT GROWTH, ENPLANEMENTS ............. 18
FIGURE 12: 2009 FORECASTED ENPLANEMENTS ................................................ 20
Executive Summary

Every two years, the FAA releases a five year plan called the National Plan of Integrated Airport Systems (NPIAS). This comprehensive summary is a federally mandated report that designates one airport in each county of the United States as eligible for federal funding through the Airport Improvement Program (AIP). In addition, the NPIAS allocates an amount to each airports based on six criteria. In combining analysis of passenger statistics and funding allocation at large airports, this report concluded the FAA is taking overcapacity as a serious threat to the national aviation infrastructure. Furthermore, in applying enplanements as a check against FAA designated overcapacity airports, this paper argues that while passenger levels are increasing at these five airports, expansion plans at one airport, Philadelphia, should be placed on hold. The events at St. Louis airport following its merger with American Airlines should prompt Philadelphia to stall plans for construction to allow for its major tenant, US Airways, to either liquidate or emerge from bankruptcy. Finally, in placing growth statistics to bridge the gap between 2003 and forecasted 2004 enplanements, the FAA’s 2009 enplaned passengers at 29 of the 31 large, primary airports are plausible. However, at both St. Louis’ and Pittsburgh’s major airports (STL and PIT), significant anomalies exist that should prompt reevaluation.
Introduction

The National Plan of Integrated Airport Systems (NPIAS) is a federally mandated biannual report the Federal Aviation Administration (FAA) uses to identify airports “significant to national air transportation.” In addition, the NPIAS allocates funds to each of the 3,444 airports it identified in the 2005-2009 report under the Congressional requirement of identifying and funding at least one airport in each county. The subsidies allocated to these airports are granted by the FAA through the Airport Improvement Program (AIP), a program that seeks to improve the safety, capacity, environmental compliance, noise abatement measures and standards compliance at NPIAS airports. This year’s 2005 to 2009 report estimates that $39.5 billion is needed over the next five years to meet the needs of the US with regards to civil aviation. However, before analyzing a few aspects of the NPIAS, it is advantageous to discuss the classification of airports as identified by the FAA.

Airport Breakdown

The 3,444 NPIAS airports are broken down into either primary commercial service airports based on the number of enplanements (large, medium, small, or non-hub) or designated as GA (General Aviation), Reliever or Non-Primary Commercial Service airports. The four groups of commercial airports carry 99.88% of all passengers of which the 31 large airports enplane nearly 70% of passengers. The 278 Reliever airports are distinguished from GA airports due to their proximity to major cities and their importance in diverting corporate traffic. While accounting for only 0.01% of all enplanements, these reliever airports are acknowledged as instrumental to the efficacy of the aviation infrastructure; their importance only grows as large airports creep closer to their stated capacity.

The remaining airports are General Aviation, and the NPIAS recognizes this group to provide the majority of Americans with access to a means of air travel near their home. Without GA airports, only 66% of Americans live within 20 miles of an airport, with GA airports, this number increases to 98%. GA airports account for only 0.06% of all enplanements, yet are earmarked for 17% of AIP funding in 2005. Congressional legislation and a growing need to maintain these airfields account for this disproportional funding, yet for approximately 19% of the US population these airports are their closest means of air transportation. The complete breakdown of percent funding to the various sized airports can be seen below. As expected, the FAA earmarks the largest percentage of AIP funds towards supporting the large, primary airports located in America’s largest cities.
Funding Breakdown

The FAA measures the overall system performance of the aviation infrastructure according to six key performance factors: capacity, noise, pavement condition, surface accessibility, and financial performance. To this end, the funding for airport improvement projects is earmarked for various categories to promote the system-wide development of these areas. The NPIAS states that it does not attempt to allocate funding on a cost-benefit analysis of proposed projects, but instead to support airports according to their local planning process. The breakdown by category of all AIP funding is seen below. Bringing many airports up to standards receives the largest percentage of funding, while the second biggest allocation of funds is allotted towards increasing capacity.
Capacity Needs at Large Airports

Large airports, while only 31 in number, nevertheless account for 69.4% of all enplanements. While some may argue that these airports should therefore receive 69% of all funding, it should be noted many large airports generate their own revenue through landing fees and retail profits, avenues unavailable at smaller airports. Regardless of how much money they should receive in comparison, one aspect unquestionably affecting large airports more is capacity. The NPIAS stated overcapacity is one of its biggest concerns as the industry recovers from September 11th, the SARS epidemic, and passengers’ hesitancies of flying during the initial stages of the Iraq war. The 2005 NPIAS report notes that while delays and cancellations were not catastrophic at the issuance of the report, the emergence of regional jets and low cost carriers will exacerbate the capacity problem as passengers become comfortable again with flying. The MITRE Corporation and the FAA reported several airports in need of capacity and divided them based on forecasts into time windows of needing capacity now, in 2013 and in 2020. The actual models and simulations used to designate these airports as needing capacity are outlined in a separate report but were reported by the NPIAS and shown below:\textsuperscript{10}

<table>
<thead>
<tr>
<th>Airports Today</th>
<th>Airports by 2013</th>
<th>Airports by 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATL Atlanta</td>
<td>ATL Atlanta</td>
<td>EWR Newark</td>
</tr>
<tr>
<td>EWR Newark</td>
<td>LGA New York LaGuardia</td>
<td>LGA New York LaGuardia</td>
</tr>
<tr>
<td>LGA New York LaGuardia</td>
<td>ORD Chicago O'Hare</td>
<td>ORD Chicago O'Hare</td>
</tr>
<tr>
<td>ORD Chicago O'Hare</td>
<td>PHL Philadelphia</td>
<td>JKF New York JFK</td>
</tr>
<tr>
<td>PHL Philadelphia</td>
<td>OAK Oakland</td>
<td>OAK Oakland</td>
</tr>
<tr>
<td>JFK New York JFK</td>
<td>BUR Burbank</td>
<td>BUR Burbank</td>
</tr>
<tr>
<td>OAK Oakland</td>
<td>LGB Long Beach</td>
<td>LGB Long Beach</td>
</tr>
<tr>
<td>BUR Burbank</td>
<td>SNA Orange County</td>
<td>SNA Orange County</td>
</tr>
<tr>
<td>LGB Long Beach</td>
<td>TUS Tucson</td>
<td>TUS Tucson</td>
</tr>
<tr>
<td>SNA Orange County</td>
<td>ABQ Albuquerque</td>
<td>ABQ Albuquerque</td>
</tr>
<tr>
<td>TUS Tucson</td>
<td>SAT San Antonio</td>
<td>SAT San Antonio</td>
</tr>
<tr>
<td>ABQ Albuquerque</td>
<td>HOU Houston Hobby</td>
<td>HOU Houston Hobby</td>
</tr>
<tr>
<td>SAT San Antonio</td>
<td>PBI Palm Beach</td>
<td>FLL Ft. Lauderdale</td>
</tr>
<tr>
<td>HOU Houston Hobby</td>
<td>ONT Ontario</td>
<td>LAS Las Vegas</td>
</tr>
<tr>
<td>PBI Palm Beach</td>
<td>LAS Las Vegas</td>
<td>MDW Chicago Midway</td>
</tr>
<tr>
<td>FLL Ft. Lauderdale</td>
<td>MDW Chicago Midway</td>
<td>BHM Birmingham</td>
</tr>
<tr>
<td></td>
<td>BHM Birmingham</td>
<td>BDL Bradley</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PVD Providence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISP Long Island</td>
</tr>
</tbody>
</table>

Figure 3: NPIAS Airports Needing Capacity\textsuperscript{1}

Areas of Analysis

After reading both the NPIAS and the FAA/MITRE report on capacity, three areas specifically stood out prompting further analysis. In applying classroom knowledge learned to date, it was decided to do a more in-depth study of whether the funding allocation designated for large, primary airports really supported the aim of increasing airport capacity. In addition, this
report sought to determine if enplaned passenger statistics corroborated the earmarking of the five 2003 airports as needing capacity. Furthermore, the report shows analysis of the potential fate of one airport, Philadelphia, should its major airline, US Airways, dissolve. Finally, this report tackles some of the interesting reported aspects of forecasting and corroborates teaching from class about the reliance one should place on forecasted values.
Necessary Funding for Overcapacity Airports

The NPIAS earmarked the majority of funding, as seen in Figure 2: NPIAS Funding by Development Type\textsuperscript{1} for its airports towards meeting standards (36%) with the second greatest allocation towards increasing capacity (19%). Although not a certainty, it can be assumed most large airports meet standards and the majority of this funding went towards smaller, GA airports. Consequently, the greatest congestion at US airports today is faced by those NPIAS airports in the Large Primary Commercial category, this study, therefore, sought to find if proper funding, as earmarked in the NPIAS, is allocated to those airports the FAA indicated were in the most need of capacity.

In order to determine if an airport was receiving adequate funding based on its need for capacity, the 31 Large, Primary airports as indicated in the 2002 NPIAS report were ranked based on the T-100 Market data for 2003 enplaned passengers. Following that, funding amounts for each airport were pulled from the 2005-2009 reports and integrated into this data. To gain a proportional understanding of the relative amount each airport received, the total funding was divided by the number of 2003 enplaned passengers. The subsequent ranks of how each airport compared to the others in the large category were found, in addition, the difference between the airports rank in passengers versus its relative rank in dollars per 2003 passenger was found. Below are the results of the calculations:
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta, GA (Hartsfield Intl.)</td>
<td>ATL</td>
<td>38,852,007</td>
<td>$500,970,892</td>
<td>$12.89</td>
<td>28</td>
<td>27</td>
</tr>
<tr>
<td>Chicago, IL (O'Hare Intl.)</td>
<td>ORD</td>
<td>32,919,804</td>
<td>$2,944,320,261</td>
<td>$89.44</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Los Angeles, CA (Los Angeles Intl.)</td>
<td>LAX</td>
<td>26,204,301</td>
<td>$574,355,674</td>
<td>$21.92</td>
<td>18</td>
<td>15</td>
</tr>
<tr>
<td>Dallas / Ft. Worth, TX (Dallas / Ft. Worth Intl.)</td>
<td>DFW</td>
<td>24,907,575</td>
<td>$1,497,852,713</td>
<td>$59.92</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Phoenix, AZ (Phoenix Sky Harbor Int'l)</td>
<td>PHX</td>
<td>18,253,940</td>
<td>$360,243,477</td>
<td>$19.74</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>Denver, CO (Denver Intl.)</td>
<td>DEN</td>
<td>17,964,574</td>
<td>$488,244,445</td>
<td>$26.02</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Las Vegas, NV (McCarran Int'l)</td>
<td>LAS</td>
<td>17,293,436</td>
<td>$569,234,147</td>
<td>$32.92</td>
<td>10</td>
<td>3</td>
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<tr>
<td>Houston, TX (George Bush Intercontinental)</td>
<td>IAH</td>
<td>16,134,847</td>
<td>$452,477,778</td>
<td>$28.04</td>
<td>12</td>
<td>4</td>
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<tr>
<td>Minneapolis, MN (Minneapolis-St. Paul Intl.)</td>
<td>MSP</td>
<td>16,132,446</td>
<td>$283,763,334</td>
<td>$17.62</td>
<td>23</td>
<td>14</td>
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<tr>
<td>Detroit, MI (Wayne County)</td>
<td>DTW</td>
<td>15,783,660</td>
<td>$395,279,983</td>
<td>$25.04</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>New York, NY (John F. Kennedy Intl.)</td>
<td>JFK</td>
<td>15,681,336</td>
<td>$471,502,304</td>
<td>$30.07</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>Newark, NJ (Newark)</td>
<td>EWR</td>
<td>14,626,728</td>
<td>$536,801,777</td>
<td>$34.54</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Miami, FL (Miami Intl.)</td>
<td>MIA</td>
<td>14,225,683</td>
<td>$2,647,319,091</td>
<td>$186.09</td>
<td>1</td>
<td>12</td>
</tr>
<tr>
<td>San Francisco, CA (San Francisco Intl.)</td>
<td>SFO</td>
<td>14,078,694</td>
<td>$1,338,800,665</td>
<td>$9.51</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>Orlando, FL (Orlando Intl.)</td>
<td>MCO</td>
<td>13,403,770</td>
<td>$565,792,048</td>
<td>$42.21</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Seattle, WA (Seattle-Tacoma Int'l)</td>
<td>SEA</td>
<td>13,068,667</td>
<td>$286,958,750</td>
<td>$21.96</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Philadelphia, PA (Philadelphia Intl.)</td>
<td>PHL</td>
<td>11,870,091</td>
<td>$533,788,499</td>
<td>$55.08</td>
<td>5</td>
<td>12</td>
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<tr>
<td>Charlotte, NC (Douglas Muni.)</td>
<td>CLT</td>
<td>11,464,769</td>
<td>$151,211,610</td>
<td>$13.19</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>New York, NY (La Guarda)</td>
<td>LGA</td>
<td>11,367,126</td>
<td>$578,213,051</td>
<td>$50.87</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td>Boston, MA (Logan Intl.)</td>
<td>BOS</td>
<td>11,087,774</td>
<td>$270,235,269</td>
<td>$24.37</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>Cincinnati, OH (Greater Cincinnati)</td>
<td>CVG</td>
<td>10,442,589</td>
<td>$133,857,693</td>
<td>$12.82</td>
<td>29</td>
<td>8</td>
</tr>
<tr>
<td>St. Louis, MO (Lambert-St. Louis Muni.)</td>
<td>STL</td>
<td>9,943,040</td>
<td>$479,394,685</td>
<td>$48.21</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Baltimore, MD (Baltimore-Washington Intl.)</td>
<td>BWI</td>
<td>9,675,636</td>
<td>$75,845,590</td>
<td>$7.84</td>
<td>31</td>
<td>8</td>
</tr>
<tr>
<td>Salt Lake City, UT (Salt Lake City Intl.)</td>
<td>SLC</td>
<td>8,957,822</td>
<td>$164,999,581</td>
<td>$18.42</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Honolulu, HI (Honolulu Int'l.)</td>
<td>HNL</td>
<td>8,696,302</td>
<td>$145,333,315</td>
<td>$16.34</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>Miami / Ft. Lauderdale, FL (Ft. Lauderdale-Hollywood Intl.)</td>
<td>FLL</td>
<td>8,685,093</td>
<td>$773,616,896</td>
<td>$89.07</td>
<td>3</td>
<td>23</td>
</tr>
<tr>
<td>Chicago, IL (Midway)</td>
<td>MDW</td>
<td>8,684,063</td>
<td>$126,932,900</td>
<td>$14.62</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>Washington, DC (Dulles Intl.)</td>
<td>IAD</td>
<td>8,044,745</td>
<td>$164,323,369</td>
<td>$20.43</td>
<td>19</td>
<td>9</td>
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<tr>
<td>Tampa, FL (Tampa Intl.)</td>
<td>TPA</td>
<td>7,672,690</td>
<td>$173,108,000</td>
<td>$22.56</td>
<td>16</td>
<td>13</td>
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<tr>
<td>San Diego, CA (San Diego Intl.-Lindbergh)</td>
<td>SAN</td>
<td>7,564,150</td>
<td>$154,072,650</td>
<td>$20.37</td>
<td>20</td>
<td>10</td>
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<tr>
<td>Pittsburgh, PA (Greater Pittsburgh)</td>
<td>PIT</td>
<td>7,112,977</td>
<td>$107,000,000</td>
<td>$15.04</td>
<td>25</td>
<td>6</td>
</tr>
</tbody>
</table>

| AVERAGE                      |      | 14,551,327                    | $35.36        |                     |      |            |

Figure 4: NPIAS Funding Sorted by 2003 Enplanements

In answering the question of whether those airports needing capacity are receiving the federal subsidies necessary to expand their operations, the answer for the most part is yes. Three of the five airports (LaGuardia, Philadelphia, and O’Hare) are among the top six in funding rank as each received over $50 per enplaned passenger (orange highlight). Furthermore, Newark, while not in the top bracket of funding allocation, is ranked eighth overall in passenger funding and above the $35.36 average of the 31 airports. The only major anomaly out of the five airports needing capacity is Atlanta; in fact, this airport saw the greatest discrepancy in the difference between the two ranks. Figure 5 depicts these discrepancies between an airport’s passenger rank and its position in terms of NPIAS and AIP funding.
In analyzing the funding per passenger, it is interesting to note that Miami International, an airport not designated as needing capacity today, 2013, or in 2020 received the largest amount of funding per passenger. NPIAS funding, though, is not solely targeted at capacity reduction; Miami was allocated $2.4 billion for construction of the North and South terminals leaving it only $200 million for the rest of its development. If considering only its $200 million for general airport maintenance, this ranks Miami 26th, far below its passenger rank of 13th. While the scope of this research prevented full analysis of the financing of the terminal construction at Miami, it is interesting that the FAA would allocate so much money towards a landside improvement, especially in the face of such growing airside problems across the United States. One hypothesis is the terminal construction may have expanded the airside capacity of the airport by increasing taxiway maneuvering, in which case the funding was well allocated; Miami is quickly developing into a central hub for cargo and passenger service to Central and South America.
Passenger Growth, Overcapacity, and PHL

One of the primary means the MITRE report used to identify airports in need of capacity was by average minutes of delay per operation. In this regard, the five airports identified as needing capacity (ATL, LGA, PHL, ORD, and EWR) were among the highest of the 35 airports shown. Philadelphia and LaGuardia were the highest of any airport at ten minutes of delay per operation and Atlanta and Newark were close behind them at nine minutes of delay per operation. O'Hare had the fewest delay per operation at seven minutes, lower than other airports such as Minneapolis/St. Paul, Detroit, New York JFK, St. Louis, and Memphis. However, an equally important measure of future delays is the relative passenger growth at each airport. In analyzing these values, it can be estimated whether an airport will need additional capacity or see their growth curtailed any.

1993-2003 Enplanements Comparison

At the five airports cited for capacity needs in 2003, all five experienced positive passenger growths. Atlanta and Philadelphia saw the greatest growth at 72.0% and 60.7%, respectively. Newark and LaGuardia saw much growth in comparison but still grew at 25.2% and 18.4%. The only airport that grew significantly less than the average of the 31 airports was O'Hare which saw only 9.7% growth compared to the large, primary airport average of 47.6%. A possible, simple explanation can be seen in the already high number of enplanements in 1993 (6 million more than second ranked Dallas) and the explosive 194% growth over the past 10 years at the auxiliary Midway airport. While three of the five airports needing capacity over the past five years are below the average growth for large airports, no airport is has experienced negative growth or an unexplainable lack of growth. The following shows the development of these airports by rank in 2003 enplanements.
Table 3: 2002 Large, Primary NPIAS Airports
(Ranked By Passenger Enplanments in 2003)

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta, GA (Hartsfield Intl.)</td>
<td>ATL</td>
<td>3</td>
<td>22,584,423</td>
<td>1</td>
<td>38,852,007</td>
<td>2</td>
<td>72.0</td>
</tr>
<tr>
<td>Chicago, IL (O'Hare Intl.)</td>
<td>ORD</td>
<td>1</td>
<td>30,002,879</td>
<td>2</td>
<td>32,919,804</td>
<td>4</td>
<td>9.7</td>
</tr>
<tr>
<td>Los Angeles, CA (Los Angeles Intl.)</td>
<td>LAX</td>
<td>4</td>
<td>22,302,783</td>
<td>3</td>
<td>26,204,301</td>
<td>6</td>
<td>17.5</td>
</tr>
<tr>
<td>Dallas / Ft. Worth, TX (Dallas / Ft. Worth Intl.)</td>
<td>DFW</td>
<td>2</td>
<td>24,521,532</td>
<td>4</td>
<td>32,919,804</td>
<td>6</td>
<td>62.0</td>
</tr>
<tr>
<td>Phoenix, AZ (Phoenix Sky Harbor Intl.)</td>
<td>PHX</td>
<td>10</td>
<td>11,264,493</td>
<td>5</td>
<td>18,253,940</td>
<td>1</td>
<td>27.0</td>
</tr>
<tr>
<td>Denver, CO (Denver Intl.)</td>
<td>DEN</td>
<td>6</td>
<td>14,172,462</td>
<td>6</td>
<td>17,994,574</td>
<td>1</td>
<td>90.7</td>
</tr>
<tr>
<td>Las Vegas, NV (McCarran Intl.)</td>
<td>LAS</td>
<td>18</td>
<td>9,067,952</td>
<td>7</td>
<td>17,293,436</td>
<td>7</td>
<td>59.8</td>
</tr>
<tr>
<td>Houston, TX (George Bush Intercontinental)</td>
<td>IAH</td>
<td>19</td>
<td>9,029,528</td>
<td>8</td>
<td>16,134,647</td>
<td>9</td>
<td>78.7</td>
</tr>
<tr>
<td>Minneapolis, MN (Minneapolis-St. Paul Intl.)</td>
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**SOURCE:** Bureau of Transportation Statistics, Office of Airline Information, Air Carriers: T-100 Market (Washington, DC 2004)

Figure 6: Passenger Growth from 1993-2003

2002-2003 Enplanements Comparison

To gain a more recent measurement of airport growth, the 2002 to 2003 enplaned passenger growth figures were considered. Again, all five airports experienced positive growth as three of the five (LGA, PHL, and ORD) exceeded the average growth of the 31 airports (4.16%). LaGuardia experienced the most growth at 9.4% while Newark only saw 0.9% growth. Nevertheless, as all five saw positive growth the argument that capacity is not needed with
falling passenger numbers at a particular airport can not be made, as might be done at St. Louis or Pittsburgh (-16.8% and -9.5% growth, respectively).

<table>
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<th>(Ranked By Passenger Enplanments in 2003)</th>
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<td>Chicago, IL (O'Hare Intl.)</td>
<td>ORD</td>
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<td>Los Angeles, CA (Los Angeles Intl.)</td>
<td>LAX</td>
</tr>
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<td>Dallas / Ft. Worth, TX (Dallas / Ft. Worth Intl.)</td>
<td>DFW</td>
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<tr>
<td>Phoenix, AZ (Phoenix Sky Harbor Intl.)</td>
<td>PHX</td>
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<td>Denver, CO (Denver Intl.)</td>
<td>DEN</td>
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<tr>
<td>Las Vegas, NV (McCarran Intl.)</td>
<td>LAS</td>
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<td>Houston, TX (George Bush Intercontinental)</td>
<td>IAH</td>
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<tr>
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<td>JFK</td>
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<td>EWR</td>
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<tr>
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<tr>
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<tr>
<td>Philadelphia, PA (Philadelphia Intl.)</td>
<td>PHL</td>
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<tr>
<td>Charlotte, NC (Douglas Muni.)</td>
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<tr>
<td>New York, NY (La Guardia)</td>
<td>LGA</td>
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<td>Cincinnati, OH (Greater Cincinnati)</td>
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<td>St. Louis, MO (Lambert-St. Louis Muni.)</td>
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<td>Baltimore, MD (Baltimore-Washington Intl.)</td>
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<tr>
<td>San Diego, CA (San Diego Intl.-Lindbergh)</td>
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<td>Pittsburgh, PA (Greater Pittsburgh)</td>
<td>PIT</td>
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<tr>
<td>AVERAGE</td>
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</table>

Figure 7: Passenger Growth from 2002-2003²
The Airline Industry

In three of the five airports listed above as needing capacity, one major airline dominates the traffic in and out of those airports. At Atlanta, Delta Airlines accounted for 67% of the traffic in 2003 while AirTran, the second ranked airline by volume only held 11.7%. At Newark, Continental accounts for more than 50% of the passenger traffic while ExpressJet holds an 11% share; at Philadelphia, US Airways accounts for more than 57% of the enplanements. At O'Hare there is some slight parity as United and American account for 40% and 28% of the traffic, respectively, but the only truly balanced airport of the five is LaGuardia as Delta, American, and US Airways shared 22%, 20%, and 11% of the passengers, respectively. Therefore, at O'Hare and especially at Atlanta, Philadelphia and Newark, the capacity problems being experienced today and into the future are likely to be dependent on the success or failure of its major airline. Many major airlines, though, are in perilous positions.

Over the past three years, the airline industry fallen on some of its hardest times. The emergence of Low-Cost Carriers (LCCs) coupled with rising fuel costs has put a strain on several legacy carriers forcing one (US Airways) into bankruptcy, keeping another one in bankruptcy (United) and causing several others to seek major concessions from their labor unions in order to remain competitive (Delta, Continental). The hard times, though, have not fallen only on the legacy carriers. In late October 2004, ATA Airlines filed for Chapter 11 bankruptcy and immediately began selling off some of its gates at Midway airport in Chicago to Air Tran Airways. Furthermore, the recent gem of the low cost carriers, Jet Blue, is forecasted to post its first ever loss for a quarter at the end of 2004, and Independence Air, a recent start-up with a hub at Dulles Airport has indicated its own bankruptcy filing is not far away. The industry is experiencing some of its most tumultuous times and some analysts predict the excess capacity in available seats will not correct itself until the market dissolves one major airline in its entirety.

US Air

US Airways is the 6th largest domestic carrier in terms of enplanements. They operate their primary domestic network throughout the eastern United States with a focus on the mid-Atlantic region. US Air operates hubs at Philadelphia and Charlotte while offering a shuttle service between Boston Logan, LaGuardia, and Reagan National. The airline offers over 3,285 departures a day, although the recent economic difficulties plaguing the industry have hit US Air particularly hard.

On September 12th 2004, US Air filed for Chapter 11 bankruptcy for the second time in three years. Furthermore, on December 6th of this year, the airline released a press report stating that per unit passenger revenue for its mainline operation was down for the month of November by approximately 7% as opposed to a year ago. Finally, a scoring table developed to predict airline bankruptcies shows that US Air failed to reorganize itself to return to a “healthy” flying status after its first bankruptcy and that liquidation may be imminent. All of this does not bode well for the airline; however, the implications to Philadelphia if the airline does liquidate could be catastrophic.

St. Louis and TWA

In 2001, American Airlines purchased Trans World Airlines, or TWA, and the 75 year old icon of American commercial aviation ceased operations as an independent carrier.
Following the merger, American Airlines pulled flight from TWA's hub in St. Louis. While the same scenario is not necessarily imminent should US Airways be liquidated, the subsequent passenger levels at St. Louis airport convey a foreboding story for Philadelphia's airport.

Of the 31 large, primary commercial airports, St. Louis, the former hub of airlines, saw the greatest decline in passenger growth from 2002 to 2003. Well below the industry average of 4.6% growth, St. Louis saw a nearly 17% decline in enplanements.

![% Growth Enplanements, 2002-2003](image)

**Figure 8: Large, Primary Enplanements, 2002-2003.**

### 2004 Estimation Model

In addition to 2003 enplanements, this report forecasted its own 2004 year end data. In an effort to only notice general trends amongst airports, BTS T-100 Market data from January thru August 2004 was extrapolated out to the end of the year. Then, in an effort to be conservative, the last four months of the year were given an extra five percent growth to account for holiday traffic and the gradual increase in passenger levels being experienced by airports. The math for this equation is seen here where X is equal to the # of enplanements reported in the T-100 Market data from January thru August.

\[
2004 \text{ Year End Enplanements} = (X \times 1.5 + ((X \times 1.5) - X) \times 0.5)
\]

**Figure 9: 2004 Year End Enplanement Estimation Equation**
The values calculated with this statistic are shown below. In validation of the conservativeness of the estimates, it should be noted the peak summer travel season was already concluded by August and that the four major hurricanes in the fall of 2004 prevented many enplanments throughout the country. On the other hand, year end values are often adjusted long after the twelve months are over; the values used in this report values could be underestimated if the baseline numbers were later corrected upward. Nevertheless, these values were only calculated to provide a general reference – not to draw hard statistical conclusions.

### Figure 10: 2004 Estimated Enplanements

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<th>Airport</th>
<th>Code</th>
<th>Rank</th>
<th>Total Enplaned Passengers</th>
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Most alarming in this chart is that St. Louis is expected to experience approximately a 35% drop in enplanements. The American Airlines buyout of TWA and subsequent closure of its hub operations there, have crippled the airport.*

Figure 11: 2004 Estimated Percent Growth, Enplanements

**Recommendation**

Philadelphia, while experiencing passenger growth and an average of nine minutes of delay per operation, should delay runway construction to expand the overall capacity of the airport. The withdrawal of flights out of St. Louis following American's acquisition of TWA, and the possible liquidation of US Airways, warrant inaction at least until US Airways either successfully emerges from bankruptcy or liquidates. A recent report that Delta’s withdrawal from Dallas-Fort Worth in January of 2005 will cost that airport $35 million in revenues and 3,6000 jobs substantiates the need to delay construction⁹. This recommendation, in light of growing passenger levels, may only be valid in the short-term.

If the infrastructure is laid and nationwide passenger levels continue to increase, a new airline would likely takeover Philadelphia as a hub in the long term regardless of US Airways liquidation. Already in 2004, Southwest has quickly moved into the airport and started up

*Ironically, this graph also shows decreases in enplanements at both JFK and EWR despite data from those airports showing the contrary. Passenger statistics, as the author learned in his study, can easily be reported in any configuration to paint a rosy picture in press reports. The variations between domestic, international, commuter, air taxi, departing, originating, segment, market, thru, T-3, T-100, total and enplaned passengers are enormous and easily misunderstood to the casual observer. Hence, the decision in this report to stick with one source and one type of data throughout, the Bureau of Transportation Statistics' T-100 Market Data.
operations. However, Southwest already operates a hub at BWI, only about 110 miles away, the likelihood of a second hub there seems remote for them in the short term.

**FAA Forecasting Checks**

Another aspect contained in the 2005 NPIAS report were forecasted values for each primary and commercial airport across the United States in the year 2009. Having studied airport planning forecasts throughout the semester, the results of the joint FAA/MITRE were analyzed for anomalies or interesting revelations.

**FAA 2009 Enplanements**

The FAA’s methodology for predicting 2009 enplanements incorporated many factors to accurately predict “year 5,” or 2009 enplanements. Among these factors were data collected in other reports that had studied airport capacity, nearby airports to include the approximately 300 commercial service airports across the country, and socio-economic demand modeling factors. Critiquing the various factors of the FAA/MITRE methodology would be material enough for an entire different report. This paper, however, focused on the likelihoods of forecasted growth in comparing 2003 and forecasted 2004 data against the 2009 forecasted values.

After incorporating the 2009 enplaned passenger forecasts into the list of the 31 2002 large, primary airports, percent growth forecasts were also calculated, one off 2003 T-100 Market data and the other off the author’s simplistic 2004 forecasted passenger statistics. The results are seen below.
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</tr>
</tbody>
</table>

Figure 12: 2009 Forecasted Enplanements

While the majority of the forecasted values seem plausible, two airports' forecasts do in fact seem extraordinary in their predictions.

**Pittsburgh and St. Louis**

A few general considerations make it seem highly unlikely that the Pittsburgh airport will experience the 55.1% growth from 2003 or the 60.1% growth based off 2004 values. While not privy to all the socio-economic factors considered within predicting forecasting Pittsburgh’s 2009 enplanements, a central industry in Pittsburgh, steel, has recently fallen on hard times as President Bush imposed tariffs on foreign steel imports in March 2002 to allow the domestic industry to restructure.\(^\text{11}\) In addition, recent statistics from the Census Bureau show the population of Allegheny County, where the airport resides, decreased by 4.1% from 1990 to 2000 and another 1.6% drop from 2000 to 2003.\(^\text{12}\) To top it off, Pittsburg serves as a smaller hub for US Air, an airline already noted for its economic problems at the present.
It is therefore peculiar, when considering these facts that the airport will experience the second greatest amount of growth of the large, primary commercial airports. Once previously, the FAA has incorrectly forecasted PIT enplanements by a significant margin. In an October 1991 report entitled "Greater Pittsburgh International Airport: Airport Capacity Enhancement Plan," forecasts called for PIT to rank 13th overall in terms of enplanements by 1998; 2003 enplanement statistics place them 34th. However, if US Air were to vivaciously emerge from bankruptcy and reestablish central operations at PIT, there is a remote chance the airport could reach those values by 2009. For St. Louis, though, meeting the forecasted enplanements might take a miracle.

When forecasting St. Louis enplanements off of 2003 values, it is conceivable that the airport could meet the 43.1% growth needed to coincide with the NPIAS 2009 prediction. However, this seems unlikely as traffic levels continue to decrease and American dropped the departures from the airport in July of 2003 from 417 to 207. What seems more unlikely, though, are the forecasted values for St. Louis if using the author's extrapolated 2004 figures. This scenario calls for approximately 25% growth per year to end at 120.5% growth for the airport to meet its 2009 enplanement forecasts.

Conclusion

In using passenger enplanements statistics as a simple check against the FAA's 2005-2009 NPIAS report, this report reached three general conclusions. With regards to properly addressing overcapacity at its most congested airports, the FAA is seeking to relieve capacity with its funding allocation. Furthermore, Philadelphia's NPIAS designation as "needing capacity" in 2003 may be premature. Any expansion or construction should attempt to wait out US Air's (possible) collapse. Finally, as with any forecasts, there may be extreme deviations that go beyond the limits of feasibility. Out of the 31 airports analyzed, only St. Louis and Pittsburgh were forecasted for growth that exceeds indications recently seen in the enplaned passenger statistics at these airports.
References


2 BTS T-100 Market Data.


8 http://www.nextor.org/Apr04/JP_Clarke.pdf


