



AIRPORT CAPITAL DEVELOPMENT COSTS  
2009 - 2013

**February 2009**

## TABLE OF CONTENTS

<b>BACKGROUND</b> .....	<b>1</b>
<b>RESULTS IN BRIEF</b> .....	<b>2</b>
<b>ACI-NA ESTIMATE OF CAPITAL DEVELOPMENT COSTS</b> .....	<b>3</b>
<b>PROJECT DEVELOPMENT COSTS BY LOCATION AND TYPE</b> .....	<b>7</b>
<b>COMPARISON OF ACI-NA AND FAA ESTIMATES</b> .....	<b>10</b>
<b>CONCLUSION</b> .....	<b>12</b>
<b>APPENDIX 1: SCOPE AND METHODOLOGY</b> .....	<b>13</b>
<b>APPENDIX 2: ACI-NA CAPITAL DEVELOPMENT NEEDS SURVEY INSTRUMENT</b> .....	<b>15</b>
<b>APPENDIX 3: HOW ACI-NA CALCULATED CAPITAL DEVELOPMENT COSTS</b> .....	<b>18</b>
<b>APPENDIX 4: FAA DEFINITIONS OF AIRPORT CATEGORIES</b> .....	<b>21</b>
<b>APPENDIX 5: RESPONDENTS 2007 PASSENGER TRAFFIC STATISTICS</b> .....	<b>23</b>
<b>APPENDIX 6: ABOUT THIS REPORT</b> .....	<b>26</b>

**TABLES**

TABLE 1: AIRPORT CAPITAL DEVELOPMENT COST ESTIMATES BY YEAR AND AIRPORT CATEGORY .....3  
TABLE 2: RATE OF ANNUAL CAPITAL COST INCREASES.....5  
TABLE 3: DEVELOPMENT COSTS BY PROJECT LOCATION .....7  
TABLE 4: DEVELOPMENT COSTS FOR UNCOMMITTED PROJECTS BY PROJECT LOCATION.....8  
TABLE 5: DEVELOPMENT COSTS BY PROJECT TYPE .....9  
TABLE 6: COMMITTED VS. UNCOMMITTED PROJECTS BY HUB SIZE .....9  
TABLE 7: FUNDING SOURCES FOR COMMITTED PROJECTS.....10  
TABLE 8: ACI-NA SAMPLE COMPARED TO INDUSTRY TOTAL .....18  
TABLE 9: ACI-NA SAMPLE CAPITAL DEVELOPMENT COSTS PER ENPLANEMENT.....18  
TABLE 10: TOTAL CAPITAL DEVELOPMENT COSTS ESTIMATE FOR LARGE, MEDIUM, AND SMALL HUB AIRPORTS ....19  
TABLE 11: TOTAL CAPITAL DEVELOPMENT COSTS ESTIMATE .....19  
TABLE 12: PROJECTS WITH COST ESCALATION INFLATION .....19  
TABLE 13: TOTAL INDUSTRY ESTIMATE.....20  
TABLE 14: ACI-NA TOTAL COSTS BY PROJECT TYPE .....20

**FIGURES**

FIGURE 1: 5-YEAR DEVELOPMENT ESTIMATES FROM PUBLISHED ACI-NA CAPITAL NEEDS REPORT.....4  
FIGURE 2: CONSUMER PRICE INDEX INDICATES CONTINUED INFLATION.....4  
FIGURE 3: CONSTRUCTION COST ESCALATION HAS BEEN SIGNIFICANT .....5  
FIGURE 4: FAA PROJECTS CONTINUED GROWTH IN PASSENGERS .....6  
FIGURE 5: FAA PROJECTS CONTINUED GROWTH IN AIR CARGO.....6  
FIGURE 6: AIRPORT CAPITAL DEVELOPMENT COST ESTIMATES BY AIRPORT CATEGORY .....8  
FIGURE 7: CHANGE IN DEVELOPMENT COST FROM LAST ACI-NA REPORT .....9  
FIGURE 8: FUNDING SOURCES FOR COMMITTED PROJECTS .....10

## **BACKGROUND**

The Airports Council International-North America (ACI-NA) periodically updates its estimate of capital development costs for the airports that comprise the national airport system of the United States, as defined by the Federal Aviation Administration (FAA).

About 3,400 airports, ranging from the largest commercial service airports to general aviation airports, comprise the national airport system. Development projects at these airports generally fall within five categories: (1) expanding an airport's capacity beyond its current design to meet growth in demand for aviation services, (2) bringing an airport up to FAA-recommended design standards to achieve full productivity of aircraft using the airport, (3) reconstructing aging airport infrastructure, (4) upgrading infrastructure to accommodate the introduction of different aircraft types, and (5) addressing safety, security, and environmental concerns.

ACI-NA conducts its assessment using the FAA's airport classifications. The reason for reporting results in this way is that sources of capital to address needs differ in capability and capacity within airport groups. This is reflected in the structure of the federal Airport Improvement Program (AIP), use and role of Passenger Facility Charges (PFCs), access to private capital markets that provide bond financing, and underlying degree that airports of different classes can internally generate net income for reinvestment. Definitions of the FAA's airport classifications used in this report are included in Appendix 4.

## RESULTS IN BRIEF

The ACI-NA total estimate of airports' capital development costs for 2009 through 2013, adjusted for inflation,<sup>1</sup> is \$94.3 billion or \$18.9 billion annualized.<sup>2</sup> This is an 8.0 percent increase over the 2007 estimate of \$87.4 billion or \$17.5 billion annualized for 2007 through 2011, and 32.0% increase over the 2005 estimate of \$71.5 billion or 14.3 billion annualized for 2005 through 2009.<sup>3</sup> The estimate for large, medium and small hubs only<sup>4</sup> is a 6.3% increase over the last estimate done in 2007. ACI-NA attributes this increase to several factors, including projects to accommodate ongoing forecast long-term air traffic growth, inflation, and construction costs that are increasing faster than inflation.

Commercial airports account for \$80.7 billion (86 percent) of the total \$94.3 billion for planned investments. This includes:

- large hubs that account for \$55.3 billion (59 percent),
- medium hubs that account for \$13.3 billion (14 percent),
- small hubs that account for \$5.8 billion (6 percent),
- non-hubs that account for \$5.3 billion (6 percent), and
- other commercial service airports that account for \$1.0 billion (1 percent).

Non-commercial airports account for \$13.6 billion (14 percent) of the total \$94.4 billion. This includes:

- reliever airports that account for \$3.6 billion (3.9 percent), and
- other general aviation airports that account for \$10.0 billion (10.6 percent).

The largest increase by airport category from the previous estimate is for non-primary commercial service airports with 25.6% increase. FAA attributes the increase in part to the non-primary entitlement funding which began in FY 2001, and partly to the expanded eligibility for AIP funding at these facilities for hangars, fuel facilities, and other items contained in Vision 100-Century of Aviation Reauthorization Act.<sup>5</sup>

Large hubs recorded an increase of 19.0 percent from \$46.5 billion to \$55.3 billion. Their share of the total development increased from the 2007 estimate by 5.4%. Significant development was identified by Chicago O'Hare International, New York JFK and Newark International, Boston Logan International and Miami International Airports.

Medium and small hubs saw the largest decreases of capital investment by more than 22 percent and 8 percent respectively among all the airport hub categories, leading to the decrease of their share of total development by 6.6% from the 2007 estimate. Medium hubs such as General

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<sup>1</sup> ACI-NA used a 1.5 percent inflation adjustment.

<sup>2</sup> The ACI-NA total estimate of airports' capital development costs for the period 2009 through 2013, in 2008 constant dollars, not adjusted for inflation, is \$90.3 billion or \$18.1 billion annualized.

<sup>3</sup> Estimates reflect the dollars at the time the report was prepared. 2009 report reflects 2008 dollars, 2007 report reflects 2006 dollars, and 2005 report reflects 2004 dollars.

<sup>4</sup> Development costs for large, medium and small hubs are based on ACI-NA Survey data. Development costs for non-hub, commercial service, reliever and general aviation airports are based on FAA 2008 NPIAS report.

<sup>5</sup> FAA 2008 NPIAS report

Mitchell, Tucson, Manchester, Oakland, and Indianapolis saw a 60+% decrease from their previous estimate, while small hubs such as Albany and Gerald R. Ford reported a 50+% decrease from their previous estimate.

This shows that as a result of recent cuts in airline service, airports are taking steps to control costs and have had to defer some of capital projects previously planned. Medium and small hub airports are particularly affected by the current downturn in the economy and aviation industry. However, as pointed out in the FAA’s NPIAS report, the large scale, long-term programs (e.g., a new runway or significant runway extension) involving a sequence of planning, environmental analysis, approval, financing, and construction, typically over a 10- to 15-year period, are not particularly sensitive to short-term fluctuations in traffic.

### ACI-NA ESTIMATE OF CAPITAL DEVELOPMENT COSTS

As shown in Table 1, the total for each year 2009 through 2013 ranges from \$20.3 billion in 2010 to \$17.0 billion in 2012<sup>6</sup>. Large hub airports account for the majority of these costs with 58.6 percent of the total followed by medium hub airports that account for 14.1 percent of the total.<sup>7</sup>

**Table 1: Airport Capital Development Cost Estimates by Year and Airport Category**

Millions of Current Year Dollars

Airport Category	2009	2010	2011	2012	2013	2009-2013	Percent
Large hub	\$ 11,099	\$ 11,951	\$ 11,052	\$10,193	\$ 10,977	\$ 55,273	58.6%
Medium hub	3,523	2,869	2,859	1,821	2,201	13,273	14.1%
Small hub	1,384	1,509	1,233	918	754	5,800	6.1%
Nonhub	1,036	1,051	1,067	1,083	1,099	5,335	5.6%
Commercial service	201	204	207	210	213	1,035	1.1%
Reliever	706	716	727	738	749	3,636	3.9%
General aviation	1,932	1,961	1,990	2,020	2,050	9,953	10.6%
Total	19,880	20,262	19,136	16,983	18,045	94,305	100%
Annual Capital Needs 2009-13	-	-	-	-	-	18,861	-
Annual Capital Needs 2007-11	-	-	-	-	-	17,472	-
Annual Capital Needs 2005-09	-	-	-	-	-	14,296	-

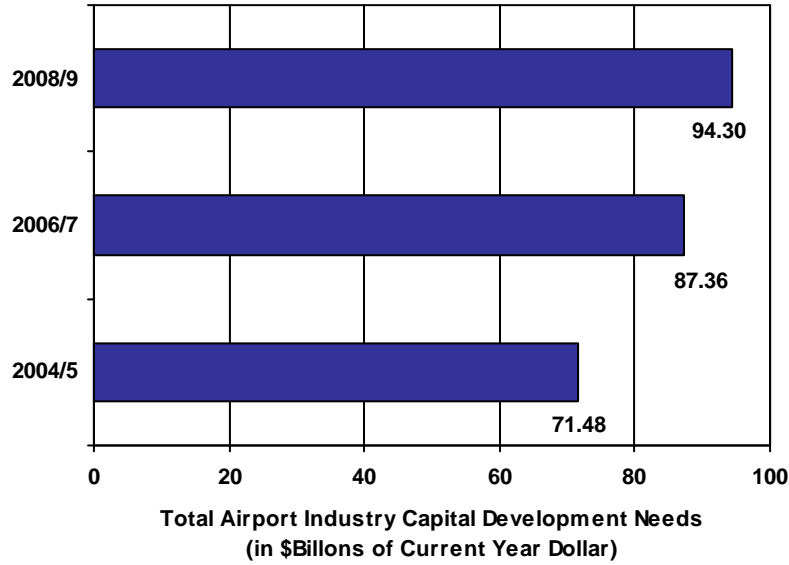
Sources: ACI-NA survey and FAA NPIAS.

Figure 1 below shows that the increase of capital development needs has slowed down recently. Our 2006/7 survey estimated an increase of more than 22% over the estimate from the 2004/5 survey whereas this year’s estimate only shows an 8% increase over the last estimate done, in 2007.

<sup>6</sup> See appendix 3 for an explanation of how ACI-NA calculated airports’ capital development costs.

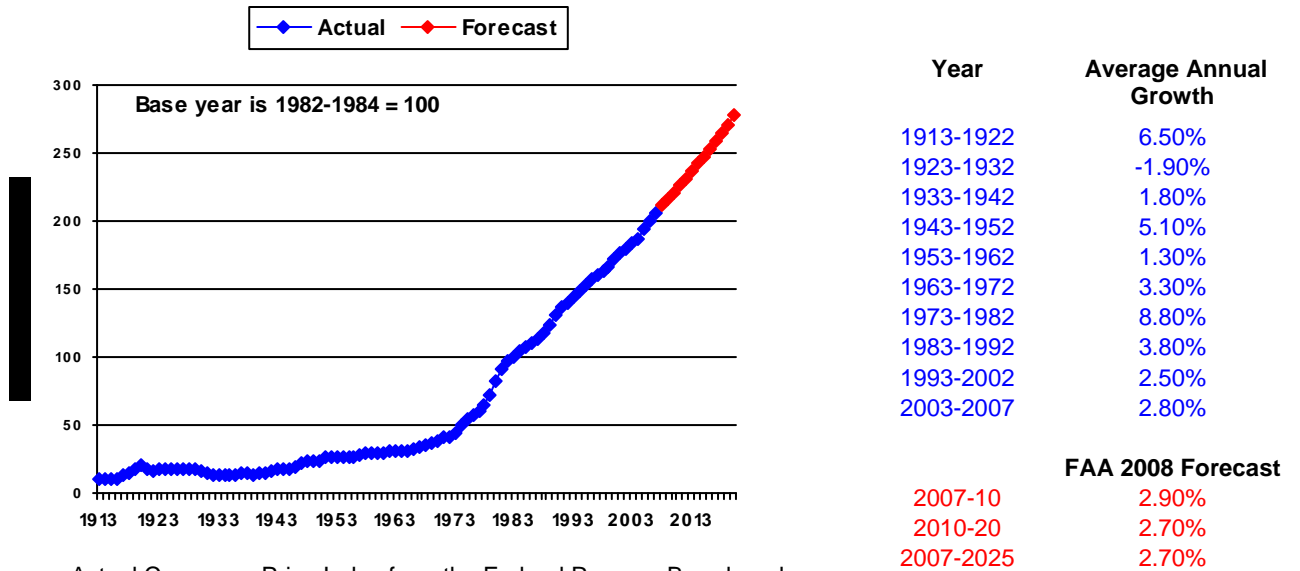
<sup>7</sup> ACI-NA used the FAA definitions for categories of airports. See appendix 4.

**Figure 1: 5-Year Development Estimates from Published ACI-NA Capital Needs Report**



ACI-NA adjusted its capital development costs estimate to account for inflation because inflation decreases buying power. As shown in Figure 2, inflation is projected to continue in the 2009 through 2013 development costs estimate period, albeit at a much slower pace.

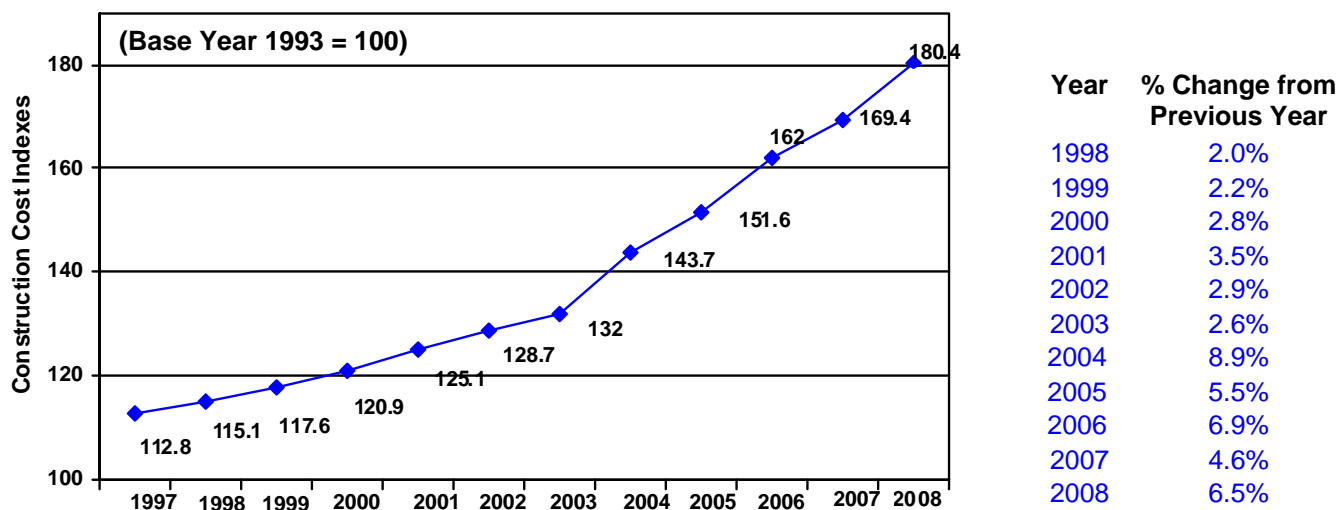
**Figure 2: Consumer Price Index Indicates Continued Inflation**



Sources: Actual Consumer Price Index from the Federal Reserve Board, and forecast from the FAA 2008 Forecast Report.

Compounding the general inflationary trend is the much higher inflation rate for construction material and components. As shown in Figure 3, the “RSMeans Construction Cost Indexes” data shows significant building cost escalation in recent years, a trend that is expected to continue but at a slower pace for the immediate future.<sup>8</sup>

**Figure 3: Construction Cost Escalation Has Been Significant**



Source: Engineering News-Record, “RSMeans Construction Cost Index”

Recent construction cost escalation has clearly impacted airport development costs. ACI-NA surveyed respondents about their experiences with increasing construction costs. As shown in Table 2, nearly 60 percent of all respondents to this question reported an increase of greater than five percent for development projects recently bid or re-estimated, with an average of 7% increases for the 45 reporting airports; over one-fifth reported an above 10 percent increase. These increases are well above the general inflation rate of 2.8 percent. FAA also reported in its latest NPIAS report that “construction costs have increased approximately 11 percent” for the past two years, “due in large part to increases in materials and labor.”<sup>9</sup>

**Table 2: Rate of Annual Capital Cost Increases**

Rate of annual cost increase for projects recently bid or re-estimated	Number of respondents	Percentage of respondents
Less than five percent	19	42%
Five to ten percent	17	38%
Ten to twenty percent	8	18%
Over twenty percent	1	2%
Total	45	100%

Source: ACI-NA survey.

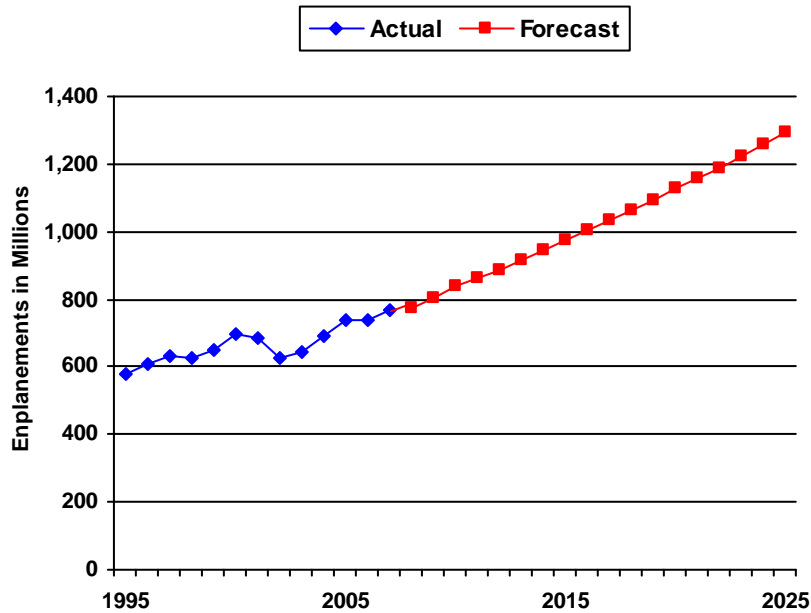
<sup>8</sup> Engineering News Record.

<sup>9</sup> Civil Works Construction Cost Index System (CWCCIS), cited in FAA NPIAS report, calculated by the U.S. Army Corp of Engineers, March 2008. Comparing construction costs for fiscal year 2007 to fiscal year 2005.



Additionally, the demand for passenger and cargo service will continue to grow resulting in a corresponding increase in airports' capital development costs. The FAA's most recent forecast indicates that aviation demand will grow steadily during fiscal years 2008 through 2025 as shown in Figure 4 for passengers and Figure 5 for cargo.

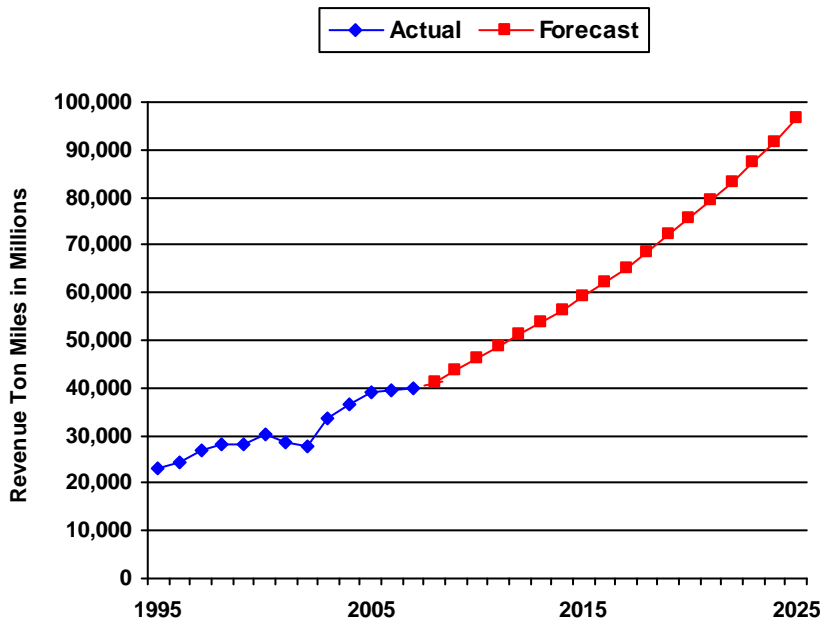
**Figure 4: FAA Projects Continued Growth in Passengers**



Source: FAA.

Year	Enplanements (in Millions)
1975	201.9
1980	312.0
1985	394.7
1990	497.9
1995	579.7
2000	697.6
2001	683.4
2002	625.8
2003	642.0
2004	689.9
2005	736.6
2006	740.4
2007	764.7
<b>FAA 2008 Forecast</b>	
2008	776.5
2009	805.7
2010	836.0
2015	973.1
2016	1,001.8
2020	1,126.5
2025	1,292.9

**Figure 5: FAA Projects Continued Growth in Air Cargo**



Source: FAA.

Year	Revenue Ton Miles (in Millions)
1995	23,228
1996	24,217
1997	26,952
1998	28,350
1999	28,102
2000	30,057
2001	28,485
2002	27,763
2003	33,514
2004	36,463
2005	39,219
2006	39,669
2007	40,072
<b>FAA 2008 Forecast</b>	
2008	41,177
2009	43,708
2010	46,210
2015	59,092
2020	75,677
2025	96,459

## PROJECT DEVELOPMENT COSTS BY LOCATION AND TYPE

To help provide a broad perspective on the various capital development projects and associated financing that airports are considering for 2009 through 2013, ACI-NA asked respondents to provide information on project costs by location and type. Project location indicates whether projects are for the airside, terminal, or landside. Project type indicates whether projects are for access, airfield capacity, airfield standards, environment, new airport, airfield reconstruction, safety, terminal, or security. For project financing, respondents were first asked to divide all projects into two broad categories: committed projects for which financing is secured or expected, and uncommitted projects which are essential to meet current and future traffic growth and facility demand but with inadequate funding. Respondents were further requested to specify the breakdown of funding sources from bond, Passenger Facility Charge (PFC), AIP entitlement and discretionary, state, local, cash/retained earnings, TSA, and Customer Facility Charge (CFC).

### Development Costs by Location

As shown in Table 3, for 2009 through 2013, terminal projects represent 46.6 percent of the total capital development costs for large, medium and small hub airports, followed by airside projects that represent 32.0 percent of total costs and landside projects that represent 21.3 percent of total costs. This information is based on the ACI-NA survey sample.

**Table 3: Development Costs by Project Location**

Project location	Percentage for all respondents	Percentage for large hub respondents	Percentage for medium hub respondents	Percentage for small hub respondents
Airside	32.0%	29.0%	39.1%	47.6%
Terminal	46.6%	50.7%	36.3%	22.8%
Landside	21.3%	20.3%	24.6%	29.5%
Total <sup>1</sup>	100.0%	77.8%	17.3%	3.3%

Source: ACI-NA survey.

Note: Total excludes projects without specified location code or projects located in multiple locations without breakdown.

Uncommitted projects are projects that cannot proceed due to inadequate funding. These projects have been included in the master plan, airport layout plan, or capital plan that are essential to meet current or future air traffic growth and facility demand. Airports generally believe that airlines will support these projects or will not block through MII disapproval, and for which airports expect to obtain all environmental and other approvals. However, large, medium and small airports differ completely for development costs by location for projects without adequate funding. Table 4 below shows that projects located in terminal represents the largest percentage for large hubs, projects located for airside the largest for medium hubs, and landside projects for small hubs.

**Table 4: Development Costs for Uncommitted Projects by Project Location**

Uncommitted project location	Percentage for all respondents	Percentage for large hub respondents	Percentage for medium hub respondents	Percentage for small hub respondents
Airside	36.6%	33.8%	52.5%	39.0%
Terminal	50.0%	54.0%	33.4%	21.0%
Landside	13.3%	12.2%	14.0%	40.0%
Total <sup>1</sup>	100.0%	82.8%	13.0%	2.5%

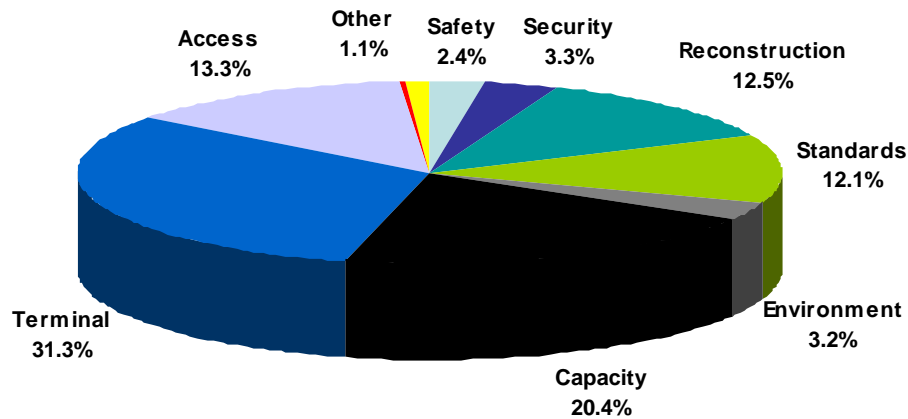
Source: ACI-NA survey.

Note: Total excludes projects without specified location code or projects located in multiple locations without breakdown.

### Development Costs by Project Type

Figure 6 below shows that terminal projects account for 31.3% of the total development needs of all airports for the estimate period of 2009 through 2013, followed by capacity projects of 20.4% and access projects of 13.3%.

**Figure 6: Airport Capital Development Cost Estimates by Airport Category**



As shown in Table 5, for 2009 through 2013, large hub airport terminal projects are the dominant project type representing 41.6 percent of all projects, followed by capacity projects at 24.9 percent and access projects at 16.3 percent. About 50 to 60 percent of the terminal projects are eligible for Federal aid. Revenue-generating areas used exclusively by a single tenant or by concessions, such as gift shops and restaurants, are excluded. Projects such as gates and related areas are eligible for the PFC Program but are ineligible under the Federal grant program.

For medium hub airport respondents, terminal projects are also the dominant project type representing 35.3 percent of all projects, followed by capacity projects at 22.2 percent and access projects at 15.6 percent. In contrast to large and medium hub airports, small hub airport respondents reported that their dominant project type is capacity projects at 24.0 percent of all projects, followed by reconstruction projects at 21.2% and access projects at 16.1 percent. This information is based on the ACI-NA survey sample.

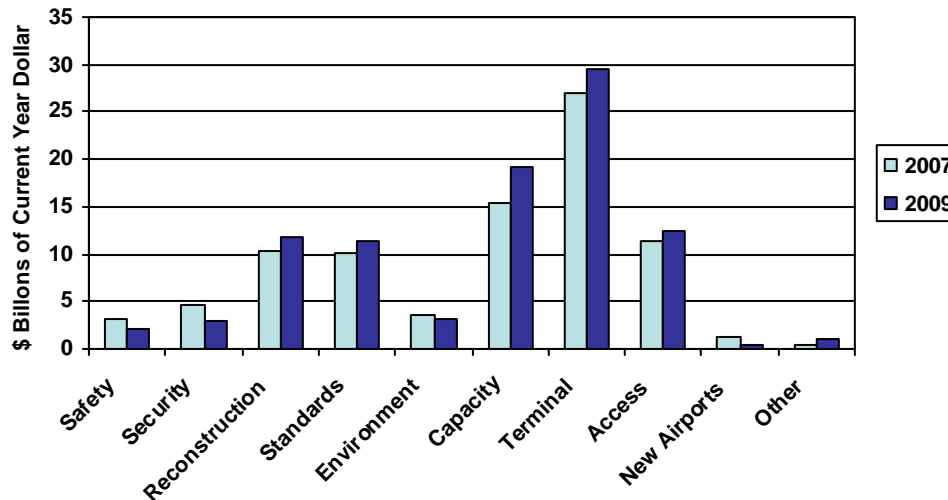
**Table 5: Development Costs by Project Type**

Airport Category	Safety	Sec.	Recon.	Stnds.	Env.	Cap.	Term.	Access	New Airports	Other	Percent
Large Hub	1.2%	3.8%	6.9%	0.5%	3.4%	24.9%	41.6%	16.3%	0.1%	1.2%	58.6%
Medium Hub	2.5%	3.3%	11.3%	5.1%	4.9%	22.2%	35.3%	15.6%	0.0%	0.0%	14.1%
Small Hub	4.4%	3.9%	21.2%	4.1%	3.1%	24.0%	14.5%	16.1%	5.2%	3.6%	6.1%
Nonhub	13.6%	1.3%	26.7%	34.5%	3.9%	3.7%	13.2%	2.4%	0.0%	0.6%	5.6%
Comm service	4.6%	2.2%	37.1%	45.4%	0.1%	1.6%	5.1%	2.7%	0.0%	1.1%	1.1%
Reliever	1.9%	1.2%	24.8%	53.0%	0.2%	11.9%	0.8%	3.2%	0.0%	0.7%	3.9%
General aviation	1.7%	2.4%	25.7%	60.1%	1.2%	4.8%	1.5%	1.9%	0.0%	0.6%	10.6%
Percent	2.4%	3.3%	12.5%	12.1%	3.2%	20.4%	31.3%	13.3%	0.4%	1.1%	100%

Sources: ACI-NA survey and FAA NPIAS.

Figure 7 below shows that increases in development costs mainly come from terminal, capacity, access, reconstruction and standard projects, whereas safety, security, environment and new airport projects all saw decreases from the 2007 estimate.

**Figure 7: Change in Development Cost from Last ACI-NA Report**



**Project Funding**

Table 6 below shows that medium and small hub airports have over 65% of the projects (in terms of project cost) for which financing is secured or expected. Committed projects represented a lower percentage of about 58% for large hub airports.

**Table 6: Committed vs. Uncommitted Projects by Hub Size**

Airport Category	Committed Projects	Uncommitted Projects	Total
Large Hub	57.6%	42.4%	100.0%
Medium Hub	67.7%	32.3%	100.0%
Small Hub	65.0%	35.0%	100.0%

Table 7 shows that bonds, AIP (entitlement and discretionary combined), and PFC are the three major funding sources for committed projects. Together, they comprised of close to 74% of all the committed projects for large, medium and small hub airports, as shown in Figure 8.

**Table 7: Funding Sources for Committed Projects**

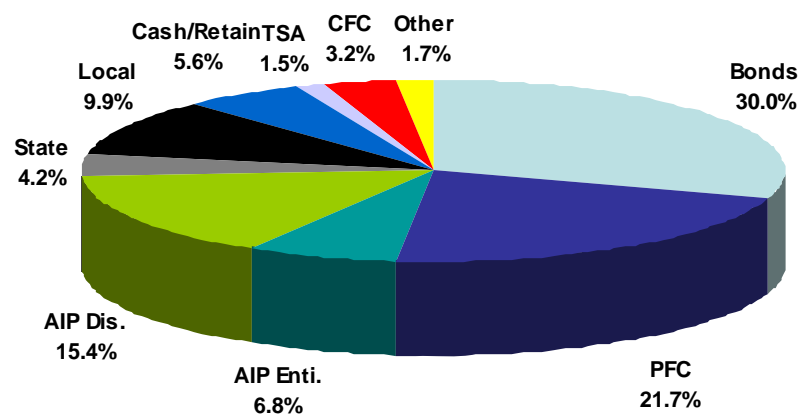
Airport Category	Bonds	PFC	AIP Enti.	AIP Dis.	State	Local	Cash/Retain	TSA	CFC	Other	Total <sup>1</sup>
Large Hub	32.5%	22.8%	4.2%	13.7%	5.1%	12.0%	4.8%	1.3%	3.5%	0.2%	100.0%
Medium Hub	31.5%	23.8%	12.3%	14.6%	1.1%	3.6%	8.3%	2.6%	2.1%	0.2%	100.0%
Small Hub	3.5%	11.7%	26.4%	33.1%	8.1%	7.4%	7.6%	1.4%	0.4%	0.4%	100.0%
Summary	30.0%	21.7%	6.8%	15.4%	4.2%	9.9%	5.6%	1.5%	3.2%	1.7%	100.0%

Sources: ACI-NA survey.

Note 1: Total excludes projects without specified funding sources.

Glossary: AIP Enti. – AIP Entitlement, AIP Dis. – AIP Discretionary, Cash/Retain. – Cash/Retained Earnings, CFC – Customer Facility Charge.

**Figure 8: Funding Sources for Committed Projects**



## COMPARISON OF ACI-NA AND FAA ESTIMATES

The FAA also develops an estimate that is a subset of the ACI-NA estimate. The FAA reports the results of its work in the National Plan of Integrated Airport Systems (NPIAS) every two years. Currently, as well as historically, the ACI-NA and FAA have differed in what projects they count to estimate capital development costs resulting in different figures.

It is critical to understand the differences in the ACI-NA and FAA estimates because of their role in considering federal policy and funding levels for the AIP and federally approved local PFCs. It is also important to understand the estimates in weighing AIP funding levels in concert with other funding sources for airport development.

The ACI-NA and FAA estimates are the two main sources for Congress and other stakeholders to review in considering the funding regime for airport capital development going forward as part of the FAA reauthorization process. As in the past, decisions on funding reach well beyond the actual authorization period and impact what capital development can be achieved to address

aviation demand. Additionally, these decisions have a direct and long-term bearing on our nation's competitive position in the global economy.

The ACI-NA estimate of \$94.3 billion is greater than the FAA estimate of \$49.7 billion for several reasons.<sup>10</sup> First, the ACI-NA estimate includes all future projects while the FAA estimate includes only future AIP-eligible projects. Second, the ACI-NA estimate includes both projects that have identified and non-identified funding sources, while the FAA estimate only includes projects that do not have identified funding sources. Third, the ACI-NA estimate uses more recent data than that used by the FAA. Fourth, the ACI-NA estimate is adjusted for inflation, while the FAA estimate is not.<sup>11</sup>

ACI-NA captures important information that the FAA estimate fails to capture, including:

- PFC-funded projects and projects with other identified funding, including bonds and local funding;
- Airport funded air traffic control facilities and airport or TSA-funded security projects;
- AIP-eligible projects that airports did not report to the FAA because there is a low probability of getting additional AIP funding;
- AIP-ineligible projects, including parking facilities, hangars, cargo buildings, and the revenue producing portion of passenger terminals.

For example, the cost for projects at large hub airports in the NPIAS totals \$18.0 billion while the ACI-NA estimate totals \$55.3 billion. Within this category, the NPIAS totals \$5.4 billion for terminal projects while the ACI-NA estimate totals \$23.0 billion. The difference in this case is because the NPIAS does not include the revenue generating portion of terminals such as development of facilities for non-aeronautical revenue.

Another example is the cost for airport-implemented security projects. Within this category, the NPIAS totals \$970 million while the ACI-NA estimate totals \$3.1 billion. The difference in this case is because the NPIAS only captures security projects funded with AIP grants while the ACI-NA estimate captures security projects funded by airports and the TSA, including in-line checked baggage screening systems.

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<sup>10</sup> Both the ACI-NA and the FAA estimates are for 2009 through 2013. The ACI-NA survey was completed in early 2009 and the FAA estimate is based on airport master and state system planning documents available through 2007.

<sup>11</sup> The Government Accountability Office testimony *Airport Finance: Preliminary Analysis of Proposed Changes in the Airport Improvement Program May Not Resolve Funding Needs for Smaller Airports*, GAO-07-617T (Washington, D.C.; March 28, 2007) also explains the differences between the ACI-NA and FAA estimates, including variances related to estimating approach, definition, measurement, and timing.

## CONCLUSION

The current economic and airline industry downturn clearly has had an impact on airport capital improvement program. The development cost estimate for 2009-2013 for large, medium and small hub airports shows an increase at a much slower pace of 8% over the estimate for 2007-2011, which was more than 22% increase over the estimate for 2005-2009. The current environment has forced airports to postpone some of the capital project previously planned. Medium and small hub airports has seen a decrease in capital projects for the first time since ACI-NA started researching capital development needs. However, large scale long-term programs involving multi-year planning are not particularly sensitive to short-term fluctuations in traffic.

Airport operators have a responsibility to make needed investments in their facilities so that they can ensure efficient and safe operations for the traveling public and other aeronautical users. Without adequate investment, the ability of airports to fully serve the public is diminished.

ACI-NA's survey of planned capital development and inventory of airport projects shows that additional investment is required across all categories of airports in America's national airport system. This investment requirement covers the full range of development necessary, from airfield improvements to terminal expansion to in-line checked baggage screening equipment.

Driving these investment requirements is a steady increase in demand over the long term as well as inflation. As the FAA forecast shows, passenger and cargo traffic will continue to grow steadily.

## **APPENDIX 1: SCOPE AND METHODOLOGY**

The ACI-NA survey instrument was developed with input from the FAA and the GAO. This included the various definitions in the survey, such as project type codes.

ACI-NA surveyed all of its airport members in the United States. Ninety-five (95) airports responded. ACI-NA staff followed-up with respondents as necessary to answer questions about the survey and ensure accuracy of respondents answers.

Respondents were asked to identify all capital development projects and associated costs for calendar years 2009 through 2013, and to report these costs in 2008 constant year dollars. Costs included interest, construction and management costs, architectural and engineering costs, and contingency costs. Costs for multi-year projects were listed in the year when the money was expected to be spent.

Information on costs for capital development projects were divided into two sections: committed and uncommitted. For each section, airports were requested to list the ten largest projects in terms of costs and list the rest of the project costs as “all other projects.”

Committed projects included those projects for which financing was secured or was expected to be secured, and environmental and other required approvals had been obtained or were expected to be obtained. These are projects that airlines supported or did not block through such actions as Majority in Interest (MII) disapproval.

Uncommitted projects included projects in airport master, layout, or capital plans that were essential to meet current or future air traffic growth and facility demand, but that could not proceed due to inadequate funding. Respondents were to include only projects they expected the airlines would support or would not block through such actions as MII disapproval, and for which they expected to obtain all environmental and other approvals. Survey respondents were not to include any “wish list” projects.

For both committed and uncommitted projects, respondents were asked to identify projects by location and type. Location codes included whether a project was airside, terminal, or landside. Type codes included whether a project was access, airfield capacity, airfield standards, environment, new airport, airfield reconstruction, safety, terminal, or security. To ensure the ACI-NA data was fully comparable with the FAA, ACI-NA used the same definitions for project type as the FAA uses in its NPIAS. In cases where multiple codes applied for either project location or type, respondents were asked to provide the cost percentage for each code.

For both committed and uncommitted projects, respondents were also asked to identify the funding sources for projects by calendar year 2009 through 2013, and by the percentage each applicable funding source was to provide. Funding sources included bonds, PFCs, AIP entitlements, AIP discretionary, state, local, cash/retained earnings, TSA, customer facility charges, and other funding. Respondents were asked to report the funding sources by the percentage each source would provide for projects.



This ACI-NA survey also added a question regarding the rate of annual cost increases airports have been experiencing for projects recently bid or re-estimated by the respondent.

# APPENDIX 2: ACI-NA CAPITAL DEVELOPMENT NEEDS SURVEY INSTRUMENT



## 2008 ACI-NA Airport Capital Development Needs Survey (2009-2013)

General Information

Please complete as best as you can for each commercial airport in your jurisdiction. It is very important to provide the respondents' names and addresses. The names of the airports and the survey results will be reported to this journal.

Country	
State/Province	
City	
Postal Code	
Phone	
Fax	
E-mail	

Guidelines for Completing the Survey

Please identify all capital development projects and costs between calendar years 2009-2013. All costs should be expressed in 2008 constant year millions of U.S. dollars (i.e. \$800,000-US or \$1,000,000-US). Total costs should include indirect, construction and management costs, soft costs and engineering costs, and contingency costs.

Project Level or Code

Use the project level codes to indicate whether the project is an airport, terminal, or building project. If an airport, terminal, or building project, include the project cost percentage by each code. (i.e. A-50%, L-50%, S-50%)

Code	Project Level or Code
A	Airport
L	Terminal
S	Building

Project Type Codes

Use the project type codes to indicate whether the project is an access, airfield expansion, utility terminal, or security project. If multiple codes apply, include the project cost percentage by each code. (i.e. C-50%, D-50%, E-50%)

Code	Project Type Codes
A	Access
C	Airfield Capacity
D	Airfield Development
E	Environment
N	New Airport
R	Reliability
S	Security
T	Terminal
U	Utility





### APPENDIX 3: HOW ACI-NA CALCULATED CAPITAL DEVELOPMENT COSTS

ACI-NA calculated airports' capital development costs using the ACI-NA survey and the FAA NPIAS. Specifically, ACI-NA used its survey data to calculate costs for large, medium, and small hub airports and used the FAA NPIAS data to calculate costs for nonhub, commercial service, reliever, and general aviation airports. ACI-NA also used FAA 2007 enplanement data, which is the latest available information, to make calculations.

The total capital development costs for large, medium, and small hub airports was based on responses from 26 large hub, 26 medium hub, and 21 small hub airports. As shown in Table 8, this represents 87 percent of all passengers enplaned at large hubs, 74 percent of all passengers enplaned at medium hubs, and 29 percent of all passengers enplaned at small hubs in 2007.

**Table 8: ACI-NA Sample Compared to Industry Total**

Airport Category	Number of respondents	Total number of airports in the category	Respondents percentage of all airports in the category	Respondents percentage of total 2007 enplanements in the category	Respondents percentage of total 2007 enplanements
Large Hub	26	30	87%	87.4%	60.4%
Medium Hub	26	37	70%	73.5%	14.6%
Small Hub	21	73	29%	28.7%	2.3%
All other	22	3,221	<1%	8.2%	0.2%
Total	95	3,361	-	77.5%	77.5%

As shown in Table 9, ACI-NA then calculated the total capital development costs per 2007 enplanement for the respondent large, medium, and small hub airports.

**Table 9: ACI-NA Sample Capital Development Costs Per Enplanement**

Airport Category	Total costs for 2009-2013 in millions of 2008 constant dollars	Total 2007 enplanements by category	Cost per enplanement in 2008 constant dollars
Large Hub <sup>12</sup>	40,813	423,566,579	96.36
Medium Hub	9,376	110,911,761	84.54
Small Hub	1,598	17,833,465	89.59

As shown in Table 10, this cost per enplanement in 2008 constant dollars was then used as the unit cost to estimate the capital development costs for all large, medium, and small hub airports.

<sup>12</sup> When estimating the cost for the four large hub airports that did not participate in the survey, the total development cost for Chicago's O'Hare Airport was excluded.

**Table 10: Total Capital Development Costs Estimate for Large, Medium, and Small Hub Airports**

2008 Constant Dollars

<b>Airport Category</b>	<b>Total 2007 enplanements</b>	<b>Cost per enplanement in 2008 constant dollars</b>	<b>Total 2009-2013 capital development costs in millions of 2008 constant dollars</b>
Large Hub <sup>13</sup>	489,792,109	96.36	52,899
Medium Hub	150,809,801	84.54	12,749
Small Hub	62,218,458	89.59	5,557

Table 11 shows the total capital development costs for all airports in the national airport system in 2008 constant dollars using the ACI-NA estimate for large, medium, and small hub airports and the FAA NPIAS data for nonhub, commercial service, reliever, and general aviation airports. ACI-NA used the NPIAS data due to the small number of nonhub, commercial service, reliever, and general aviation airports in the ACI-NA survey sample.

**Table 11: Total Capital Development Costs Estimate**

2008 Constant Dollars

<b>Airport Category</b>	<b>Total number of airports by category in national airport system</b>	<b>Total 2009- 2013 capital development costs in millions of 2008 constant dollars</b>	<b>Percentage of Total</b>
Large Hub	30	\$ 52,899	58.6%
Medium Hub	37	12,749	14.1%
Small Hub	73	5,557	6.2%
Nonhub	248	5,101	5.6%
Commercial service	139	990	1.1%
Reliever	270	3,476	3.8%
General aviation	2,564	9,516	10.5%
Total	3,361	90,305	100% <sup>1</sup>

Note 1 - Figures do not sum to 100 percent due to rounding

Respondents provided information regarding cost escalation inflation for 1,066 projects. As shown in Table 12, close to 47 percent of these projects included an escalation for construction cost inflation while 53 percent did not.

**Table 12: Projects with Cost Escalation Inflation**

<b>Airport Category</b>	<b>Number of Projects</b>	<b>Percentage</b>
Projects with cost escalation Inflation	498	46.7%
Projects without cost escalation Inflation	568	53.3%
Total	1,066	100.0%

Taking the escalating construction cost into consideration, ACI-NA made a 1.5 percent inflation adjustment to the total estimate in 2008 constant dollars to reflect total capital needs in current year dollars. As shown in Table 13, total industry capital needs are estimated to be \$94.3 billion in current year dollars. Average annual capital needs for the years 2009 through 2013 are 8% higher than for the years 2007-2011 estimated in the ACI-NA survey done almost two years ago.

<sup>13</sup> Include development cost for ORD.

**Table 13: Total Industry Estimate**

Millions of Current Year Dollars

<b>Airport Category</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2009-2013</b>	<b>Percent</b>
Large hub	\$ 11,099	\$ 11,951	\$ 11,052	\$10,193	\$ 10,977	\$ 55,273	58.6%
Medium hub	3,523	2,869	2,859	1,821	2,201	13,273	14.1%
Small hub	1,384	1,509	1,233	918	754	5,800	6.1%
Nonhub	1,036	1,051	1,067	1,083	1,099	5,335	5.6%
Commercial service	201	204	207	210	213	1,035	1.1%
Reliever	706	716	727	738	749	3,636	3.9%
General aviation	1,932	1,961	1,990	2,020	2,050	9,953	10.6%
Total	19,880	20,262	19,136	16,983	18,045	94,305	100%
Annual Capital Needs 2009-13	-	-	-	-	-	18,861	-
Annual Capital Needs 2007-11	-	-	-	-	-	17,472	-
Annual Capital Needs 2005-09	-	-	-	-	-	14,296	-

Besides calculating the total developments costs, ACI-NA also calculated development costs by project type. To do this ACI-NA first determined the percentage distribution by project type using ACI-NA survey results for large, medium, and small hub airports and using the NPIAS data for non-hub, commercial service, reliever, and general aviation airports. As shown in Table 13, the project type percentage distribution was then multiplied by the total industry estimate for each category of airport to determine the total costs by project type as shown in Table 14.

**Table 14: ACI-NA Total Costs by Project Type**

Millions of Current Year Dollars

<b>Airport Type</b>	<b>Safety</b>	<b>Sec.</b>	<b>Recon</b>	<b>Stnds.</b>	<b>Env.</b>	<b>Cap.</b>	<b>Term.</b>	<b>Access</b>	<b>New Airports</b>	<b>Other</b>	<b>Total</b>	<b>Percent</b>
Large Hub	\$651	\$2,102	\$3,830	\$268	\$1,892	\$13,778	\$23,019	\$ 9,034	\$ 34	\$664	\$55,273	58.6%
Medium Hub	327	438	1,498	671	646	2,948	4,680	2,066	0	0	13,273	14.1%
Small Hub	253	227	1,229	235	178	1,395	840	931	303	209	5,800	6.2%
Nonhub	724	69	1,422	1,843	208	198	706	130	0	35	5,335	5.6%
Commercial Service	48	23	384	470	1	17	52	28	0	12	1,035	1.1%
Reliever	68	45	902	1,929	7	433	30	115	0	24	3,636	3.9%
GA	168	234	2,553	5,981	129	479	152	191	0	64	9,953	10.5%
Total	2,239	3,138	11,820	11,396	3,060	19,247	29,479	12,496	337	1,007	94,305	100%
Percent	2.4%	3.3%	12.5%	12.1%	3.2%	20.4%	31.3%	13.3%	0.4%	1.1%	100.0%	-

## **APPENDIX 4: FAA DEFINITIONS OF AIRPORT CATEGORIES**

FAA defines airports by categories of airport activities, including commercial service, primary, cargo service, reliever, and general aviation airports.

**Commercial Service Airports** are publicly owned airports that have at least 2,500 passenger boardings each calendar year and receive scheduled passenger service. Passenger boardings refer to revenue passenger boardings on an aircraft in service in air commerce whether or not in scheduled service. The definition also includes passengers who continue on an aircraft in international flight that stops at an airport in any of the 50 States for a non-traffic purpose, such as refueling or aircraft maintenance rather than passenger activity. Passenger boardings at airports that receive scheduled passenger service are also referred to as Enplanements.

**Nonprimary Commercial Service Airports** are Commercial Service Airports that have at least 2,500 and no more than 10,000 passenger boardings each year.

**Primary Airports** are Commercial Service Airports that have more than 10,000 passenger boardings each year. Hub categories for Primary Airports are defined as a percentage of total passenger boardings within the United States in the most current calendar year ending before the start of the current fiscal year. For example, calendar year 2001 data are used for fiscal year 2003 since the fiscal year began 9 months after the end of that calendar year. The table below depicts the formulae used for the definition of airport categories based on statutory provisions cited within the table, including Hub Type described in 49 USC 47102.

**Reliever Airports** are airports designated by the FAA to relieve congestion at Commercial Service Airports and to provide improved general aviation access to the overall community. These may be publicly or privately-owned.

**General Aviation Airports** is the largest single group of airports in the U.S. system. The category also includes privately owned, public use airports that enplane 2500 or more passengers annually and receive scheduled airline service.



## Definition of Airport Categories

Airport Classifications		Hub Type: Percentage of Annual Passenger Boardings	Common Name
<b>Commercial Service:</b> Publicly owned airports that have <u>at least 2,500</u> passenger boardings each calendar year and receive scheduled passenger service §47102(7)	<b>Primary:</b> Have <u>more than 10,000</u> passenger boardings each year §47102(11)	<b>Large Hub:</b> 1% or more	<b>Large Hub</b>
		<b>Medium Hub:</b> At least 0.25%, but less than 1%	<b>Medium Hub</b>
		<b>Small Hub:</b> At least 0.05%, but less than 0.25%	<b>Small Hub</b>
		<b>Non hub:</b> More than 10,000, but less than 0.05%*	<b>Nonhub Primary</b>
	<b>Nonprimary</b>	<b>Non hub:</b> At least 2,500 and no more than 10,000*	<b>Nonprimary Commercial Service</b>
<b>Nonprimary</b> (Except Commercial Service)		Not Applicable	<b>Reliever</b> §47102(18)

**APPENDIX 5: RESPONDENTS 2007 PASSENGER TRAFFIC STATISTICS**

<b>Airport</b>	<b>Code</b>	<b>Category</b>	<b>Calendar Year 2007 Enplanements</b>
Hartsfield - Jackson Atlanta International Airport	<b>ATL</b>	L	43,236,665
Chicago O'Hare International Airport	<b>ORD</b>	L	36,521,585
Dallas Fort Worth International Airport	<b>DFW</b>	L	28,482,417
Denver International Airport	<b>DEN</b>	L	24,117,623
John F Kennedy International Airport	<b>JFK</b>	L	23,401,351
McCarran International Airport	<b>LAS</b>	L	22,537,950
Sky Harbor International Airport	<b>PHX</b>	L	20,796,173
George Bush Intercontinental Airport	<b>IAH</b>	L	20,767,144
Newark Liberty International Airport	<b>EWR</b>	L	18,163,652
Orlando International Airport	<b>MCO</b>	L	17,614,679
Detroit Metropolitan Wayne County Airport	<b>DTW</b>	L	17,495,135
San Francisco International Airport	<b>SFO</b>	L	17,280,328
Minneapolis/St. Paul International Airport	<b>MSP</b>	L	16,962,563
Miami International Airport	<b>MIA</b>	L	16,194,162
Philadelphia International Airport	<b>PHL</b>	L	15,656,653
Seattle-Tacoma International Airport	<b>SEA</b>	L	15,419,116
Logan International Airport	<b>BOS</b>	L	13,783,297
La Guardia Airport	<b>LGA</b>	L	12,529,890
Dulles International Airport	<b>IAD</b>	L	11,789,441
Fort Lauderdale/Hollywood International Airport	<b>FLL</b>	L	11,079,250
Salt Lake City International Airport	<b>SLC</b>	L	10,560,906
Baltimore International Airport	<b>BWI</b>	L	10,487,789
Tampa International Airport	<b>TPA</b>	L	9,306,036
San Diego International Airport	<b>SAN</b>	L	9,138,116
Ronald Reagan Washington National Airport	<b>DCA</b>	L	9,038,174
Cincinnati/Northern Kentucky Int'l Airport	<b>CVG</b>	L	7,728,069
Portland International Airport	<b>PDX</b>	M	7,281,057
Oakland International Airport	<b>OAK</b>	M	7,144,127
Lambert-St Louis International Airport	<b>STL</b>	M	7,130,801
Kansas City International Airport	<b>MCI</b>	M	5,833,064
Cleveland-Hopkins International Airport	<b>CLE</b>	M	5,571,219
Memphis International Airport	<b>MEM</b>	M	5,546,321
Sacramento International Airport	<b>SMF</b>	M	5,382,463
Norman Y. Mineta San Jose International Airport	<b>SJC</b>	M	5,255,257
John Wayne Airport	<b>SNA</b>	M	4,948,846
Nashville International Airport	<b>BNA</b>	M	4,887,925
Pittsburgh International Airport	<b>PIT</b>	M	4,875,883
W. P. Hobby Airport	<b>HOU</b>	M	4,239,375
Austin-Bergstrom International Airport	<b>AUS</b>	M	4,181,956
Indianapolis International Airport	<b>IND</b>	M	4,097,398
Southwest Florida International Airport	<b>RSW</b>	M	3,986,928

San Antonio International Airport	<b>SAT</b>	M	3,911,726
Port Columbus International Airport	<b>CMH</b>	M	3,827,349
General Mitchell International Airport	<b>MKE</b>	M	3,751,345
Jacksonville International Airport	<b>JAX</b>	M	3,138,015
Buffalo Niagara International Airport	<b>BUF</b>	M	2,677,183
Anchorage International Airport	<b>ANC</b>	M	2,617,964
Reno-Tahoe International Airport	<b>RNO</b>	M	2,450,451
Tucson International Airport	<b>TUS</b>	M	2,178,748
Eppley Airfield	<b>OMA</b>	M	2,162,954
Manchester Airport	<b>MHT</b>	M	1,920,911
Louisville International Airport	<b>SDF</b>	M	1,912,495
Boise Air Terminal/Gowen Field	<b>BOI</b>	S	1,689,046
Albany International Airport	<b>ALB</b>	S	1,423,754
Dayton International Airport	<b>DAY</b>	S	1,412,758
Charleston AFB/International	<b>CHS</b>	S	1,145,129
Colorado Springs Airport	<b>COS</b>	S	1,040,879
Savannah/Hilton Head International Airport	<b>SAV</b>	S	992,625
Gerald R. Ford International Airport	<b>GRR</b>	S	992,539
Des Moines International Airport	<b>DSM</b>	S	963,231
McGhee Tyson Airport	<b>TYS</b>	S	888,995
Dane County Regional Airport	<b>MSN</b>	S	783,937
Sarasota/Bradenton International Airport	<b>SRQ</b>	S	782,497
Springfield-Branson National Airport	<b>GSP</b>	S	774,450
Jackson-Evers International Airport	<b>JAN</b>	S	717,576
Burlington International Airport	<b>BTV</b>	S	703,186
Fresno Yosemite International Airport	<b>FAT</b>	S	636,032
Huntsville International Airport	<b>HSV</b>	S	607,205
Baton Rouge Metropolitan	<b>BTR</b>	S	482,253
Quad City International Airport	<b>MLI</b>	S	481,595
Tallahassee Regional Airport	<b>TLH</b>	S	462,233
Stewart International Airport	<b>SWF</b>	S	455,045
South Bend Regional Airport	<b>SBN</b>	S	398,500
Chattanooga Metropolitan Airport	<b>CHA</b>	N	301,803
Asheville Regional Airport	<b>AVL</b>	N	292,053
Fort Wayne International Airport	<b>FWA</b>	N	289,210
Capital City Airport	<b>LAN</b>	N	256,563
Lafayette Regional Airport	<b>LFT</b>	N	219,442
Lincoln Airport	<b>LNK</b>	N	170,105
Melbourne International Airport	<b>MLB</b>	N	137,102
Teterboro Airport	<b>TEB</b>	N	16,243
Naples Municipal Airport	<b>APF</b>	N	13,984
Rickenbacker International Airport	<b>LCK</b>	None	3,833
Portland-Mulino Airport	<b>4S9</b>	GA	Not Available
Allegheny County Airport	<b>AGC</b>	R	Not Available
Page Field Airport	<b>FMY</b>	R	Not Available

Portland-Hillsboro Airport	<b>HIO</b>	R	Not Available
Niagara Fall International Airport	<b>IAG</b>	R	Not Available
Bowman Field Airport	<b>LOU</b>	R	Not Available
Charles B. Wheeler Downtown Airport	<b>MKC</b>	R	Not Available
Martin State Airport	<b>MTN</b>	R	Not Available
Opa Locka Airport	<b>OPF</b>	R	Not Available
Tamiami Airport	<b>TMB</b>	R	Not Available
Portland Troutdale Airport	<b>TTD</b>	R	Not Available
Willow Run Airport	<b>YIP</b>	R	Not Available

Source: FAA

Please note that in this report, ACI-NA defines airport category based on FAA calendar year 2007 enplanements, while the latest FAA NPIAS report for 2007-2011 categorized airports based on FAA Calendar Year 2006 enplanements.

Number of Airports for Each Airport Category for CY 2006 and 2007

<b>Airport Category</b>	<b>2006</b>	<b>2007</b>
Large Hub	30	30
Medium Hub	37	37
Small Hub	72	73
Nonhub	244	248
Commercial service	139	139
Reliever	270	270
General aviation	2,564	2,564
Subtotal	3,356	3,361

## **APPENDIX 6: ABOUT THIS REPORT**

The ACI-NA thanks its member airports for their contribution and input to this report. Without their participation, ACI-NA would not have been able to create this report and the important information on the airport development costs required for the national airport system of the United States.

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