U.S. Department
of Transportation
**Federal Aviation
Administration**

Report to Congress
National Plan of Integrated Airport Systems (NPIAS)

2015 - 2019

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Federal Aviation Administration
U.S. Department of Transportation

Report to Congress

National Plan of Integrated Airport Systems (NPIAS) 2015–2019

Report of the Secretary of Transportation to the United States Congress
Pursuant to Title 49 U.S. Code, Section 47103

The NPIAS 2015–2019 report will be available online at:
http://www.faa.gov/airports/planning_capacity/npias/reports

THE SECRETARY OF TRANSPORTATION
WASHINGTON, DC 20590

September 30, 2014

The Honorable Joseph Biden
President of the Senate
Washington, DC 20510

Dear Mr. President:

I am pleased to transmit to you the National Plan of Integrated Airport Systems (NPIAS) report, 2015-2019.

The NPIAS report estimates the costs associated with establishing a system of airports that adequately meets the needs of civil aviation and supports the U.S. Department of Defense and the U.S. Postal Service. It draws selectively from local, regional, and State planning studies.

I have sent a similar letter to the Speaker of the U.S. House of Representatives.

Sincerely,

Anthony R. Foxx

Enclosure

THE SECRETARY OF TRANSPORTATION
WASHINGTON, DC 20590

September 30, 2014

The Honorable John A. Boehner
Speaker of the House of Representatives
Washington, DC 20515

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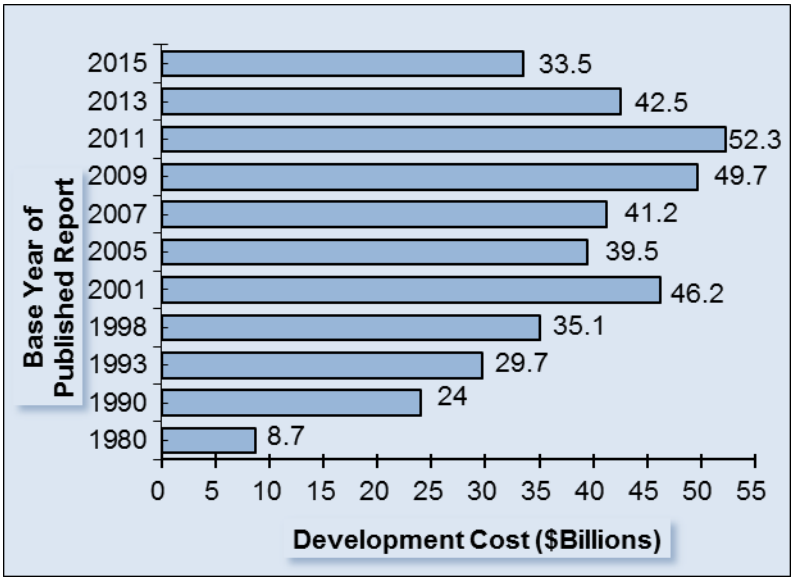
EXECUTIVE SUMMARY

The National Plan of Integrated Airport Systems (NPIAS) for Fiscal Years (FY) 2015 to 2019 is submitted to Congress in accordance with title 49 U.S. Code (U.S.C.), section 47103.

The plan identifies 3,345 public-use airports[1] (3,331 existing and 14 proposed) that are important to national air transportation and therefore eligible to receive grants under the Federal Aviation Administration (FAA) Airport Improvement Program (AIP).



Airport capital development needs are driven by current and forecast traffic; use and age of facilities; and changing aircraft technology, which requires airports to update or replace equipment and infrastructure. The development data contained in this report were largely compiled in FY 2012 and validated during FY 2013 and FY 2014. Since the last report was prepared 2 years ago, construction costs have increased moderately, about 3.9 percent.[2] The FAA estimates that over the next 5 years (2015 to 2019), there will be a need for approximately $33.5 billion of AIP-eligible infrastructure projects. This is a decrease of 21 percent ($9 billion) from the report issued 2 years ago. The change reflects a decrease in estimated needs for all airport categories and all types of airport development except projects to reconstruct or rehabilitate airport facilities, which increased 3.5 percent, mostly at the large hub airports, and an increase of 2.4 percent in security related infrastructure projects which includes perimeter/security fencing and access control systems, mostly at small hub airports. For the first time in five reporting periods, capacity-related development decreased to $4.9 billion, a 50-percent decrease. Terminal-related development had another major drop this reporting period, down by 69 percent from the 2013 report and 79 percent from the 2011 report. Development to improve surface access also decreased for the third consecutive report, with a 34-percent decrease.

The NPIAS identifies AIP-eligible and justified airport improvements that are planned within the next 5 years. The FAA considers improvements included in the NPIAS in the Agency's Airport Capital Improvement Plan process. While all of these 5-year capital estimates are AIP-eligible,

[1] The word "airport," as identified in this report, includes landing areas developed for conventional fixed-wing aircraft, helicopters, and seaplanes.

[2] Source: Civil Works Construction Cost Index System calculated by the U.S. Army Corps of Engineers, September 30, 2013. Comparing construction costs for FY 2011 to 2013.

some may be funded by other sources, including PFCs or other airport revenue or financing. The NPIAS also supports the strategic priorities and key initiatives identified in the FAA Administrator's Strategic Initiatives for safety, access, and global leadership by identifying airport improvements that will best meet those priorities.

Seventy-nine percent of the identified development is intended to rehabilitate existing infrastructure, maintain a state of good repair, and keep airports up to standards for the aircraft that use them. Twenty-one percent of the development in the report is intended to accommodate growth in travel, including more passengers, cargo, and activity and larger aircraft.

Funds for airport development are derived from a variety of sources, including Federal/State/local grants, bond proceeds, passenger facility charges (PFCs), airport-generated funds (landing and terminal fees, parking, aviation fuel, and concessions revenues), and tenant and third-party financing. The availability of funding sources and their adequacy to meet needs varies with type of airport and level of activity.

Chapter 2 of this report addresses the condition and performance of the national airport system, highlighting six topic areas: safety, capacity, environment, pavement condition, surface accessibility, and financial performance. The findings are favorable, indicating the system is safe, convenient, well maintained, and significantly supported by non-Federal revenue paid by users.

DEVELOPMENT ESTIMATES

The 5-year AIP-eligible development needs contained in this report decreased 21 percent from the estimate in the 2013 report.[3] This decrease is due to the current economic situation, reduced aviation activity levels, projects having been completed or having a funding source for the project identified, and a comprehensive review of projects.

Capital development reflects the economic situation of the communities and agencies that own airports. In the last 2 years, many such communities and agencies have opted to defer development projects until aviation activity levels rebound. Several development programs, totaling $2.9 billion, were completed or received PFC approval and are therefore no longer included in the NPIAS (e.g., a terminal project at San Francisco International, an in-line baggage system at Seattle-Tacoma International, and a terminal project at Salt Lake City International). The FAA undertook a comprehensive review of the approximately 18,900 projects at existing and proposed NPIAS airports. This review resulted in approximately 1,598 projects being adjusted, deferred, or removed.

Cost estimates in the NPIAS are obtained primarily from airport master and State system plans prepared by planning and engineering firms for airport sponsors, including local and State agencies. These plans are usually funded in part by FAA, are consistent with FAA forecasts of aeronautical activity, follow FAA guidelines, and have been reviewed and accepted by FAA planners who are familiar with local conditions. Efforts have been made to obtain realistic estimates of development needs that coincide with local and State capital improvement plans. The estimates only include

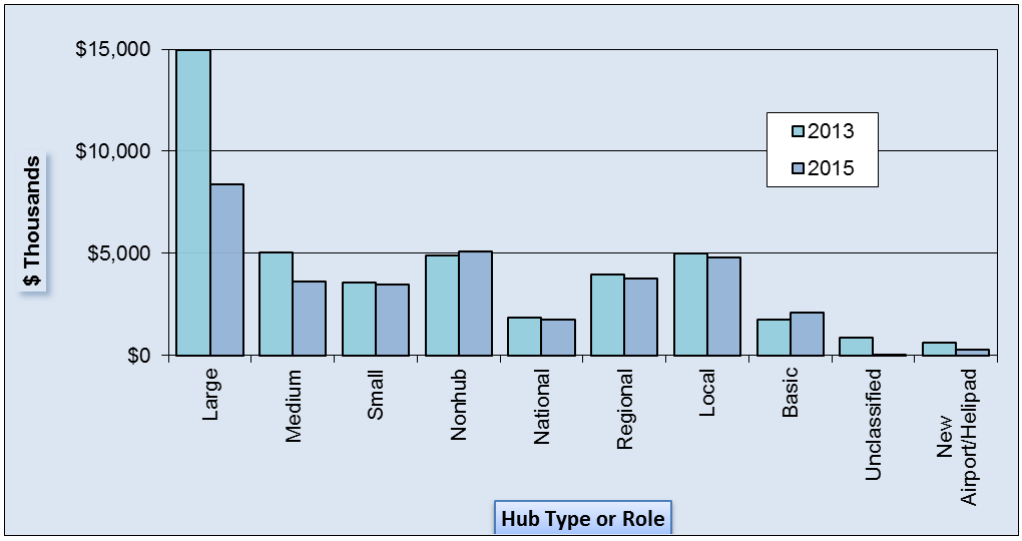
[3] Estimates reflect the dollars at the time the report was prepared (2015 report reflects 2013 dollars; 2013 report reflects 2011 dollars).

development to be undertaken by airport sponsors (as opposed to projects that might be undertaken by airport tenants such as airlines and air cargo operators). The development reflected in the NPIAS is based on planning documents available through 2013.

As a planning document, the NPIAS should not be used in evaluating investment priorities. Generally, development estimates do not include contingency costs (increases in cost based on change in design or construction uncertainty) or normal price escalation due to inflation (annual increase in costs). The NPIAS includes only planned development that is eligible to receive Federal grants under the AIP and is reasonable for the airport.

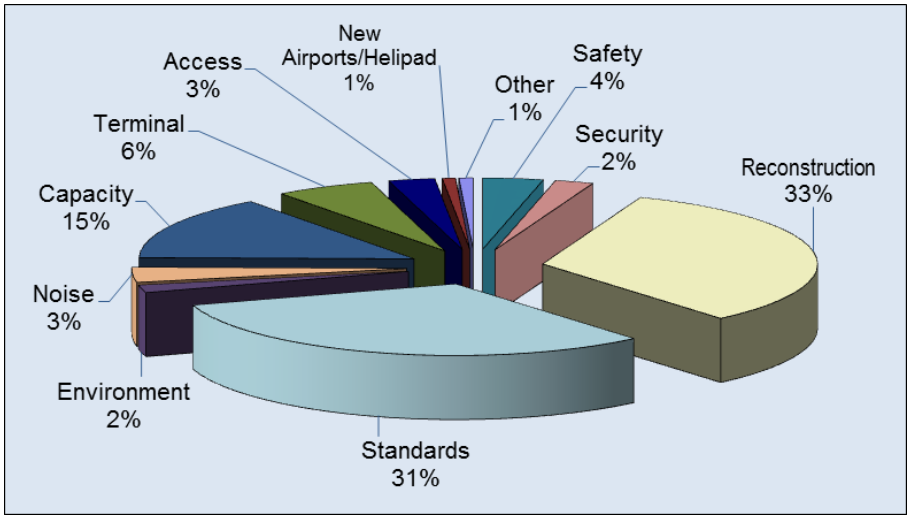
Estimates by Airport Category

The 389 primary airports (large hubs, medium hubs, small hubs, and nonhubs) account for 12 percent of the airports and 62 percent of the total development in this report. Large hubs have the greatest estimated development needs, accounting for $8 billion (25 percent) of the $33.5 billion identified. The 2,939 nonprimary (nonprimary commercial service, general aviation, and reliever airports) make up 88 percent of the airports and account for 38 percent of the total development, respectively, contained in the report. These nonprimary airports are further grouped into five categories: national, regional, local, basic, and unclassified.

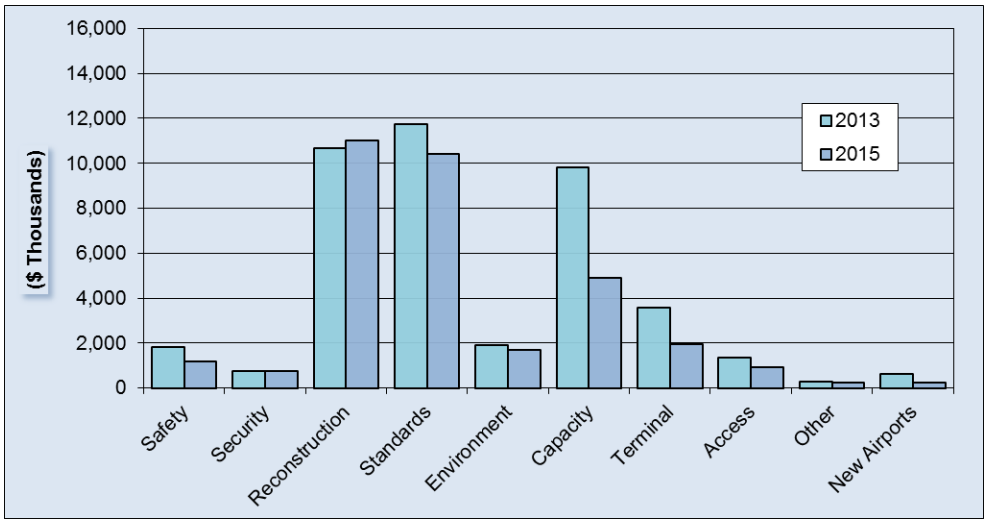


Development estimates for 8 of the 10 airport categories decreased since the last report. The largest decreases in development were for the large hubs ($6.6 billion, a 44-percent decrease), medium hubs ($1.5 billion, a 29-percent decrease), other general aviation airports ($879 million, a 60-percent decrease), and new airports/helipads ($352 million, a 58-percent decrease). Increases are seen at nonhub airports ($198 million, 4-percent increase) and basic airports ($346 million, 20-percent increase). Costs for large hubs reflect continued decreases or deferrals of terminal development projects and decreases in capacity and safety projects. The decrease in terminal development reflects the funding of a few terminal projects through PFCs and a few that were deferred beyond 2019 (i.e., no longer within the 5-year window of this report). When FAA approves collection of PFCs for airport development, the project is considered funded and therefore is no longer included in the NPIAS. Since the last report, FAA has approved PFC collections for significant projects at Hartfield-Jackson Atlanta International, Baltimore/Washington International Thurgood Marshall, John F. Kennedy International, LaGuardia, Salt Lake City International, San Francisco International, and Orlando International.

Estimates by Type of Development



Planned development is divided into categories based on the purpose of the development. Thirty-one percent of the development contained in this report is primarily to bring existing airports up to current design standards and 33 percent is to replace or rehabilitate airport facilities, mostly pavement and lighting systems. Additional significant categories are to increase airfield capacity (15 percent) and to modify, replace, and construct passenger terminal buildings (6 percent) to accommodate more passengers, larger aircraft, new security requirements, and increased competition among airlines. Capacity remains the largest development category for the large hubs. This includes major development programs at Philadelphia International, Chicago O'Hare International, Washington Dulles International, Fort Lauderdale/Hollywood International, and Charlotte/Douglas International.



As airports respond to a changing aviation environment, their development needs also change. Total development needs decreased across most development categories, except security and reconstruction, which both saw slight increases. Costs to increase capacity decreased 50 percent from 2013 to 2015. Development to bring existing airports up to design standards decreased 11 percent, and development to replace or rehabilitate airport pavement and associated equipment increased 3.5 percent from the last report. Development to modify, replace, and construct passenger terminal buildings decreased 45 percent ($1.6 billion), and this was after a 43-percent decrease in 2013. Development to improve surface access also decreased for the third consecutive report, with a 34-percent decrease ($908 million).

STATUS OF AIRLINE AND AIRPORT INDUSTRY

The financial condition of the U.S. airline industry has continued to change, adjusting capacity to seize opportunities, contracting in times of economic distress, creating new revenue sources (e.g., charging fees for baggage check-in and meal services that were previously bundled with the airfare), and introducing services that were not previously available (e.g., premium boarding, premium seating, and fare-lock fees). Starting in 2010, the industry (passenger and cargo carriers combined) has posted net profits every year. At the same time, consolidation among major airlines and investment in newer, more fuel-efficient and larger aircraft has resulted in slower growth in the number of flights, reductions in some flight schedules, and higher load factors, while continuing to accommodate growing numbers of passengers.

Demand for air travel in 2013 grew slowly amid an uncertain economic environment, with system revenue passenger miles increasing 1.4 percent as enplanements increased 0.4 percent. Although total airport operations handled by FAA and contract towers that were hub airports fell in 2013, activity at a number of the large hub airports increased in FY 2013. Activity at nonhub tower airports decreased in FY 2013.

In 2013, the 16 carriers reporting on-time performance recorded an overall on-time arrival rate of 81 percent, a decline from 2012's rate of 83.8 percent.

The majority of airports in the national airport system have adequate airport capacity and few delays. However, there are airports that continue to experience delays. In 2013, there were four airports with average departure delays of more than 12 minutes per operation and two airports with average arrival delays of more than 14 minutes.

Commercial service airports have several sources to fund airport projects, including Federal/ State/local grants, bond proceeds backed by general airport revenues, PFCs, airport-generated funds, and tenant and third-party financing. The majority of the development projects at major U.S. airports are funded through the capital markets, most commonly through airport revenue bonds. The overall creditworthiness of U.S. airports remains strong. Overall, the finances of the primary airports are stable; however, airports are carefully managing operating, financing, and capital expenses and seeking responsible opportunities to increase nonaeronautical revenue.

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CHAPTER 1: AIRPORT SYSTEM COMPOSITION

OVERVIEW

The aviation system plays a key role in the success, strength, and growth of the U.S. economy. Economic activity attributed to civil aviation-related goods and services totaled $1.5 trillion in 2012[4]. Approximately 610,576 active pilots, 209,034 general aviation aircraft, and 6,727 air carrier aircraft utilize 19,360 landing areas consisting of 14,212 private-use (closed to the public) and 5,148 public-use (open to the public) facilities. Between 2009 and 2013, the number of aircraft have declined by approximately 7 percent, the number of public use landing areas have declined 1 percent, and the number of pilots have increased 1 percent. Throughout this report, the term "airport" includes landing areas developed for conventional fixed-wing aircraft, helicopters, and seaplanes. Listed below is a table showing the number of existing private- and public-use landing areas in the U.S. by type of facility, as of September 2014. Ninety-eight percent of the facilities included in the NPIAS are airports.

Type of Facility	Total U.S. Facilities	Private-Use Facilities	Public-Use Facilities	Existing NPIAS Facilities
Airport	13,112	8,266	4,857	3,283
Heliport	5,579	5,513	66	10
Seaplane Base	488	272	216	38
Balloonport	13	12	1	
Gliderport	35	30	5	
Ultralight	122	119	3	
Total	**19,360**	**14,212**	**5,148**	**3,331**[5]

The FAA, in concert with State aviation agencies and local planning organizations, identifies public-use airports that are important to the system for inclusion in the NPIAS. Almost 65 percent (3,331) of the 5,148 public-use airports are included in the NPIAS. There are 1,817 existing public-use airports that generally are not included in the NPIAS because they do not meet the minimum entry criteria,[6] are located at inadequate sites, cannot be expanded and improved to provide a safe and efficient airport, or are located within 20 miles of another NPIAS airport. However, many public-use airports have not sought inclusion in the NPIAS because of their own business, financial, and marketing strategies. All primary and commercial service airports and selected general aviation airports are included in the NPIAS.

The NPIAS report identifies for Congress and the public those airports included in the national airport system, the role they serve, and the amounts and types of airport development eligible for Federal funding under the AIP over the next 5 years. An airport must be included in the NPIAS to

[4] The Economic Impact of Civil Aviation on the U.S. Economy, issued in June 2014.
[5] The 14 Proposed NPIAS airports are not included in this table.
[6] NPIAS entry criteria is contained in FAA Order 5090.3C, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS), available online at: http://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/12754.

be eligible to receive a grant under the AIP. Airport development estimates included in the NPIAS may be funded by other funding sources such as PFCs or other airport revenue or financing.

GUIDING PRINCIPLES FOR THE NATIONAL AIRPORT SYSTEM

The national airport system, envisioned when civil aviation was in its infancy, has been developed and nurtured by close cooperation with airport sponsors and other local agencies, as well as Federal and State agencies. The enduring principles guiding Federal involvement in the airport system were articulated in the 1993 NPIAS Report and were subsequently reviewed in 2011 by FAA and the aviation industry. The core principles were reaffirmed but minor updates were made. The national airport system is critical to the national transportation system and helps air transportation contribute to a productive national economy and international competitiveness. To meet the demand for air transportation, the airports and the airport system should have the following attributes:

- Airports should be safe and efficient, located where people will use them, and developed and maintained to appropriate standards.
- Airports should be affordable to both users and Government, relying primarily on producing self-sustaining revenue, and placing minimal burden on the general revenues of the local, State, and Federal Governments.
- Airports should be flexible and expandable, able to meet increased demand, and to accommodate new aircraft types.
- Airports should be permanent, with assurance that they will remain open for aeronautical use over the long term.
- Airports should be compatible with surrounding communities, maintaining a balance between the needs of aviation, the environment, and the requirements of residents.
- Airports should be developed in concert with improvements to the air traffic control system and technological advancements.
- The airport system should support a variety of critical national objectives, such as defense, emergency readiness, law enforcement, and postal delivery.
- The airport system should be extensive, providing as many people as possible with convenient access to air transportation, typically by having most of the population within 20 miles of a NPIAS airport.

In addition to these principles specific to airport development, a guiding principle for Federal infrastructure investment, as stated in Executive Order 12893,[7] is that such investments must be cost beneficial. The FAA implements these principles by using program guidance to ensure the effective use of Federal aid. A national priority system guides the distribution of funds, supplemented when necessary, by specific requirements for additional analysis or justification. For example, larger airport capacity development projects must be shown to be cost beneficial in order to receive support under the AIP. Moreover, virtually all development projects must be justified based on existing or reasonably anticipated civil aeronautical activity levels.

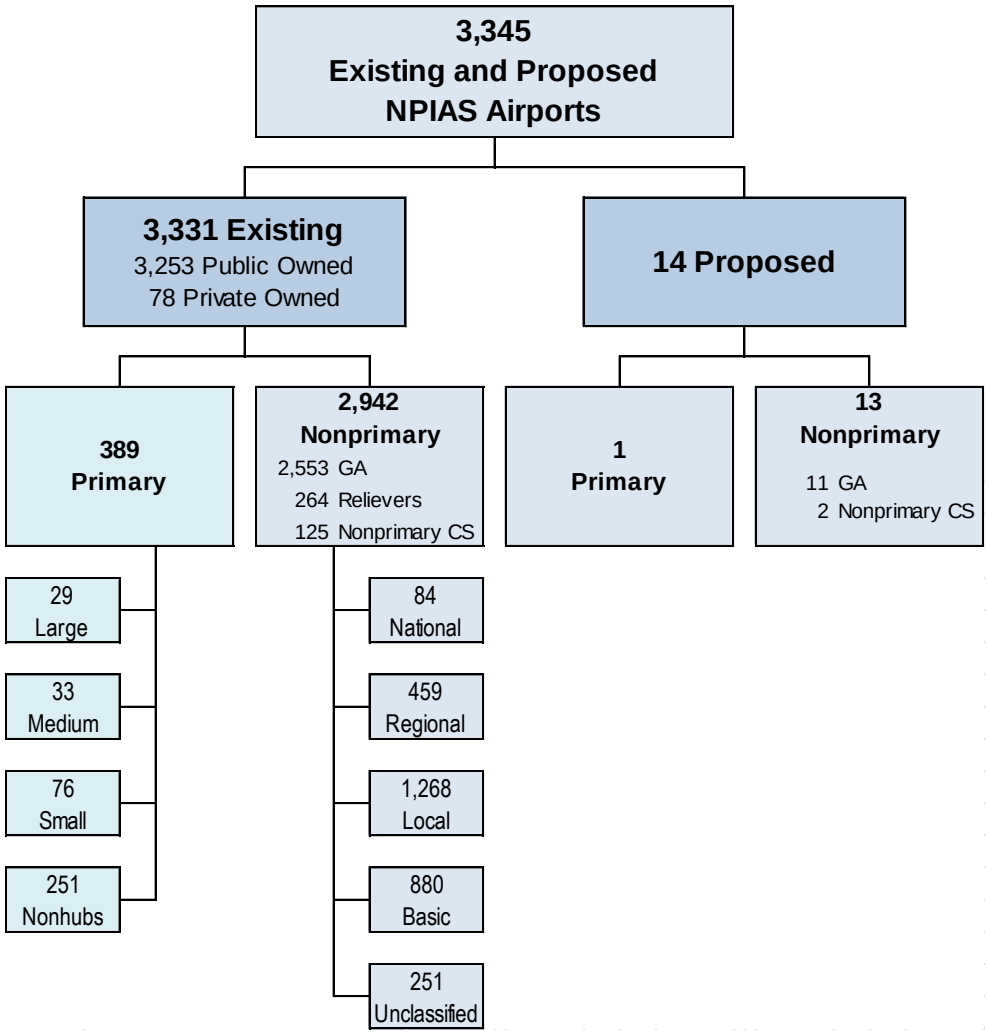
[7] Executive Order 12893, Principles for Federal Infrastructure Investments, was issued in the Federal Register on January 31, 1994, and has not been revoked. See www.archives.gov/federal-register/executive-orders/pdf/12893.pdf.

AIRPORTS IN THE NPIAS

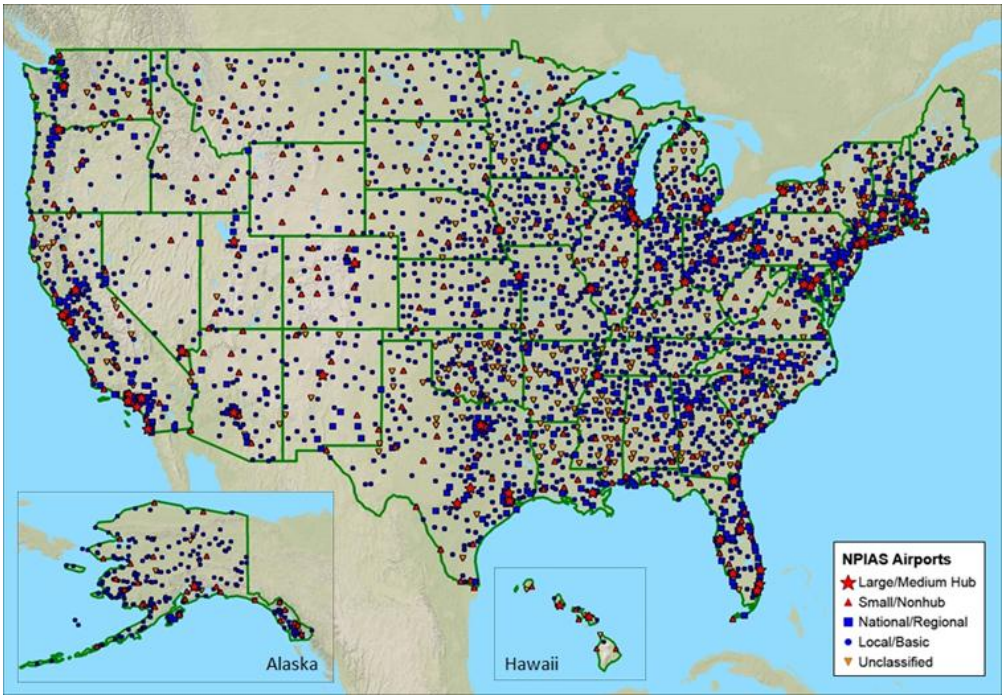
The NPIAS contains 3,345 airports. This includes 3,331 existing and 14 proposed airports that are anticipated to open within the 5-year period covered by this report. The proposed airports are classified in the same categories as existing airports. Almost 98 percent (3,253) of the NPIAS airports are owned by public entities, and 78 are privately owned.

Airports are grouped into two major categories: primary and nonprimary. Primary airports are defined as public airports receiving scheduled air carrier service with 10,000 or more enplaned passengers per year. There are 389 primary airports based on Calendar Year (CY) 2012 data. Primary airports are grouped into four categories defined in statute: large, medium, small, and nonhub.

Nonprimary airports are mainly used by general aviation aircraft. Included in the nonprimary category are nonprimary commercial service airports (public airports receiving scheduled passenger service and between 2,500 and 9,999 enplaned passengers per year); general aviation airports; and reliever airports. There are 2,942 nonprimary airports. These airports are further grouped into five categories: national, regional, local, basic, and unclassified.

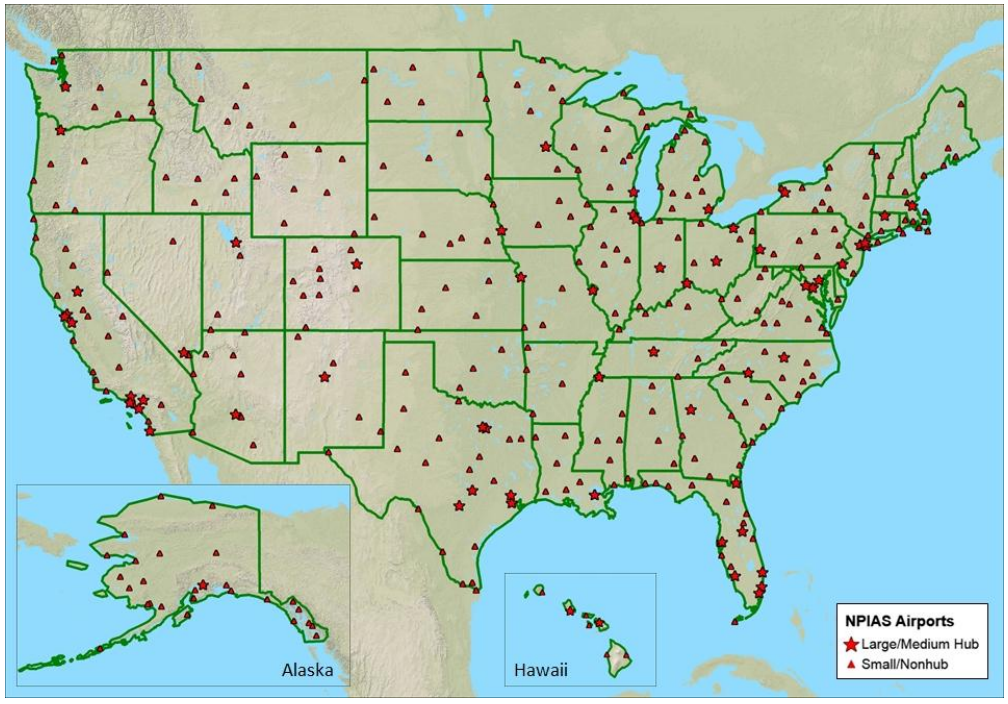


This map shows the distribution of the 3,331 existing NPIAS airports by the airport role. This includes 3,283 airports, 10 heliports, and 38 seaplane bases. Every state has airports in the NPIAS. The complete list of NPIAS airports is contained in Appendix A.



PRIMARY AIRPORTS[8]

The 389 primary airports are grouped into four categories defined in statute: large, medium, and small hubs and nonhub airports. Primary airports receive an annual apportionment with the amount determined by the number of enplaned passengers. CY 2012 enplanements determine FY 2014 service levels and passenger apportionments. The map shows the distribution of the primary airports.



[8] In May 2009, Branson Airport opened in Branson, Missouri. This privately owned airport was built with private funds and has scheduled air carrier service. As an airport that is not open to all aeronautical users, it does not meet the legislative requirement to be classified as a primary airport so it is not included in the NPIAS.

Large Hubs (29)

Large hubs are those airports that each account for 1 percent or more of total U.S. passenger enplanements.[9] Some of these passengers originate in the local community, and some are connecting passengers transferring from one flight to another. Five large hub airports—San Diego International, LaGuardia, General Edward Lawrence Logan International, Fort Lauderdale/Hollywood International, and Orlando International—primarily serve passengers that originate in the community or who are traveling specifically to those destinations. Many other large hub airports support higher percentages of passengers who are traveling through the airport to connect to another flight, rather than starting or ending their travel at these airports. Such connecting traffic can account for more than 65 percent of passenger activity at airports such as Charlotte/Douglas International and Hartsfield-Jackson Atlanta International. The 29 large hub airports account for 71 percent of all passenger enplanements.

Large hub airports tend to concentrate on airline and freight operations and have limited general aviation activity. Four large hub airports (Salt Lake City International, Honolulu International, Las Vegas McCarran International, and Minneapolis-St. Paul International/Wold Chamberlain) have an average of 206 based aircraft, but the other 25 large hubs have an average of 23 based aircraft. Thus, locally based general aviation plays a small role at most large hub airports.

The Nation's air traffic delay problems tend to be concentrated at certain large hub airports. Delays occur primarily during inclement weather conditions (i.e., reduced ceiling and visibility), or when runway capacity is reduced below that needed to accommodate traffic levels. Because of the number of connecting flights supported by these airports, delays among these busy large hub airports can quickly ripple throughout the system, causing delays at smaller airports nationwide.

Medium Hubs (33)

Medium hubs are defined in statute as airports that each account for between 0.25 percent and 1 percent of total U.S. passenger enplanements. The 33 medium hub airports account for 17 percent of all U.S. enplanements. Medium hub airports usually have sufficient capacity to accommodate air carrier operations and a substantial amount of general aviation activity. Two medium hub airports have an average of 628 based aircraft—Dallas Love Field and John Wayne Airport-Orange County—while the other 31 medium hub airports have an average of 80 based aircraft.

Small Hubs (76)

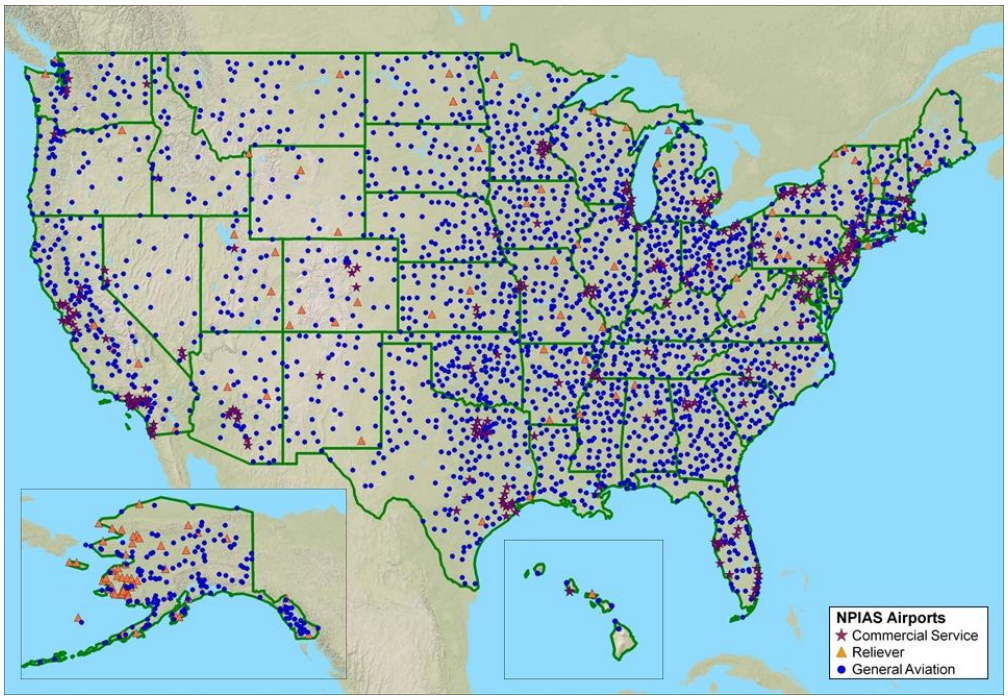
Small hubs are defined in statute as airports that enplane 0.05 percent to 0.25 percent of total U.S. passenger enplanements. There are 76 small hub airports that together account for 9 percent of all enplanements. Less than 25 percent of the runway capacity at small hub airports is used by airline operations, so these airports can accommodate a great deal of general aviation activity, with an average of 122 based aircraft at each airport. These airports are typically uncongested and do not have significant air traffic delays.

[9]The FAA's use of the term hub airport is slightly different than that of airlines, which use it to denote an airport with significant connecting traffic by one or more carriers. The hub categories used by FAA are defined in title 49 U.S.C., section 40102 (2004).

Nonhub Primary (251)

Commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements are categorized as nonhub primary airports. There are 251 nonhub primary airports that together account for 3 percent of all enplanements. These airports are also heavily used by general aviation aircraft, with an average of 88 based aircraft.

NONPRIMARY AIRPORTS



Nonprimary airports are mainly used by general aviation aircraft. Included in the nonprimary category are nonprimary commercial service airports (public airports receiving scheduled passenger service and between 2,500 and 9,999 enplaned passengers per year), general aviation airports, and reliever airports. There are 2,942 nonprimary airports. The FAA has now identified roles for the nonprimary airports (national, local, regional, basic, and unclassified), which are discussed in the section entitled "General Aviation Airports: National Assets."

Nonprimary Commercial Service (125)

Airports that have between 2,500 and 10,000 annual passenger enplanements are categorized as nonprimary commercial service airports. There are 125 of these airports in the NPIAS, and they account for 0.1 percent of all enplanements. These airports have some scheduled air carrier service but are used mainly by general aviation. These airports have an average of 34 based aircraft.

General Aviation Airports (2,553)

Airports that do not receive scheduled commercial service or that do not meet the criteria for classification as a commercial service airport may be included in the NPIAS as general aviation airports if they account for enough activity (having usually at least 10 based aircraft) and are at least 20 miles from the nearest NPIAS airport. These 2,553 airports, with an average of 29 based aircraft, account for 36 percent of the Nation's general aviation fleet. They are the closest source of air transportation for about 19 percent of the population and are particularly important to rural areas.

These airports also support a number of critical functions ranging from flight training, emergency preparedness, and law enforcement. For more information, please see the section entitled "General Aviation Airports: National Assets."

Reliever Airports (264)

Due to different operating requirements between small general aviation aircraft and large commercial aircraft, general aviation pilots often find it difficult to use a congested commercial service airport.[10] In recognition of this, FAA has encouraged the development of high-capacity general aviation airports in major metropolitan areas. These specialized airports, called relievers, provide pilots with attractive alternatives to using congested hub airports. They also provide general aviation access to the surrounding area. To be eligible for reliever designation, these airports must be open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations. The 264 reliever airports have an average of 177 based aircraft, which in total represents 23 percent of the Nation's general aviation fleet.

NEW AIRPORTS

The NPIAS identifies 14 proposed airports that are anticipated to be developed over the 5-year period covered by this report. These new airports are shown separately in Appendix A and are included in the list of airports by State in Appendix A. New airports are identified by a location identifier beginning with a plus symbol (i.e., +07W) and include 11 new or replacement general aviation airports, 2 nonprimary commercial service airports, and 1 new primary airports. Seven of the new airports (six general aviation and one nonprimary commercial service airport) are scheduled to open by 2015. The one proposed new primary airport is proposed to help meet the demand for aviation in the Chicago area and is still in the planning and environmental review stages. Appendix A does not identify new airports expected to be under development after 2019.

AIRPORTS NOT INCLUDED IN THE NPIAS

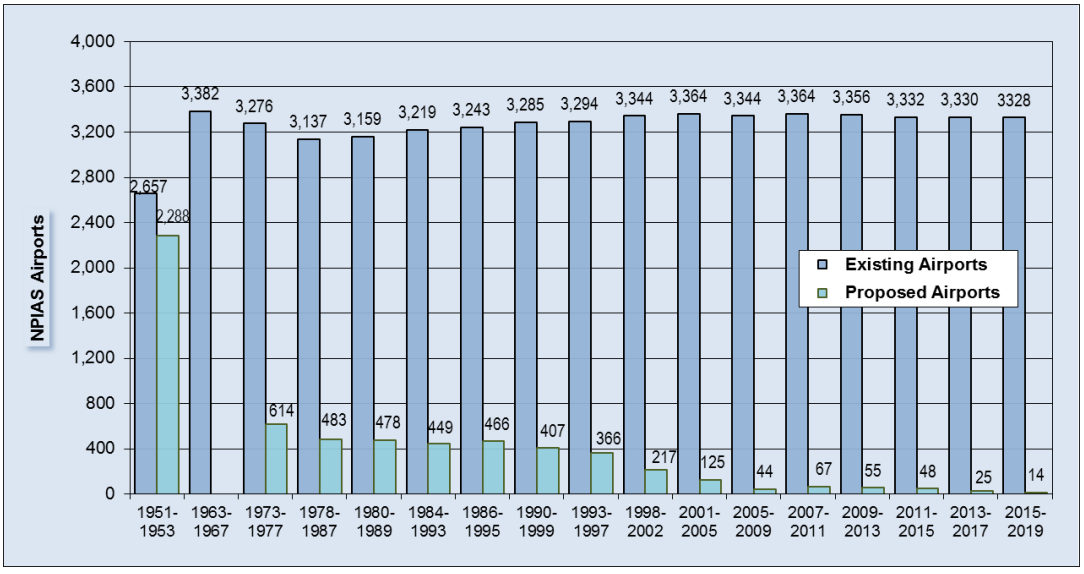
There are 19,360 landing facilities in the United States. Seventy-three percent (14,212) of these facilities are closed to the public and therefore are not eligible for inclusion in the NPIAS. The FAA identifies public-use airports that are important to the national airport system for inclusion in the NPIAS. Of the 5,148 existing public-use airports, 3,331 are included in the NPIAS. The remaining 1,817 public-use airports are not included in the NPIAS either because they do not meet the minimum entry criteria, are located at inadequate sites, cannot be expanded and improved to provide a safe and efficient airport, or are located within 20 miles of another NPIAS airport. In some cases, these airports have their own business, financial, or marketing reasons for not pursuing inclusion in the NPIAS. The public-use facilities not included in the NPIAS have an average of 5 based aircraft compared to 28 based aircraft at the average NPIAS general aviation airport.

[10] Large commercial aircraft typically operate at much higher speeds than small general aviation aircraft. It can be challenging to have both types of aircraft use the same runways during periods of high commercial aircraft activity due to variances in approach airspeed and wake turbulence considerations. Some of the busiest airports are in Class B and C airspace, which have specific requirements for aircraft equipage and pilot qualifications. In addition, general aviation pilots may be less familiar with air traffic control procedures used at airports that primarily serve air carrier operations.

Each State has an aviation system plan that determines the development needed to establish a viable system of airports within that State. Each system plan involves examining the interaction of the airports with the aviation service requirements, economy, population, and surface transportation of a State's geographic area. State plans define an airport system that is consistent with established State goals and objectives for economic development, transportation, land use, and environmental matters. State plans contain about 4,200 public-use airports. Airports included in the State plans but not in the NPIAS are usually smaller airports with State or regional significance. Appendix A contains a summary of airport counts by state.

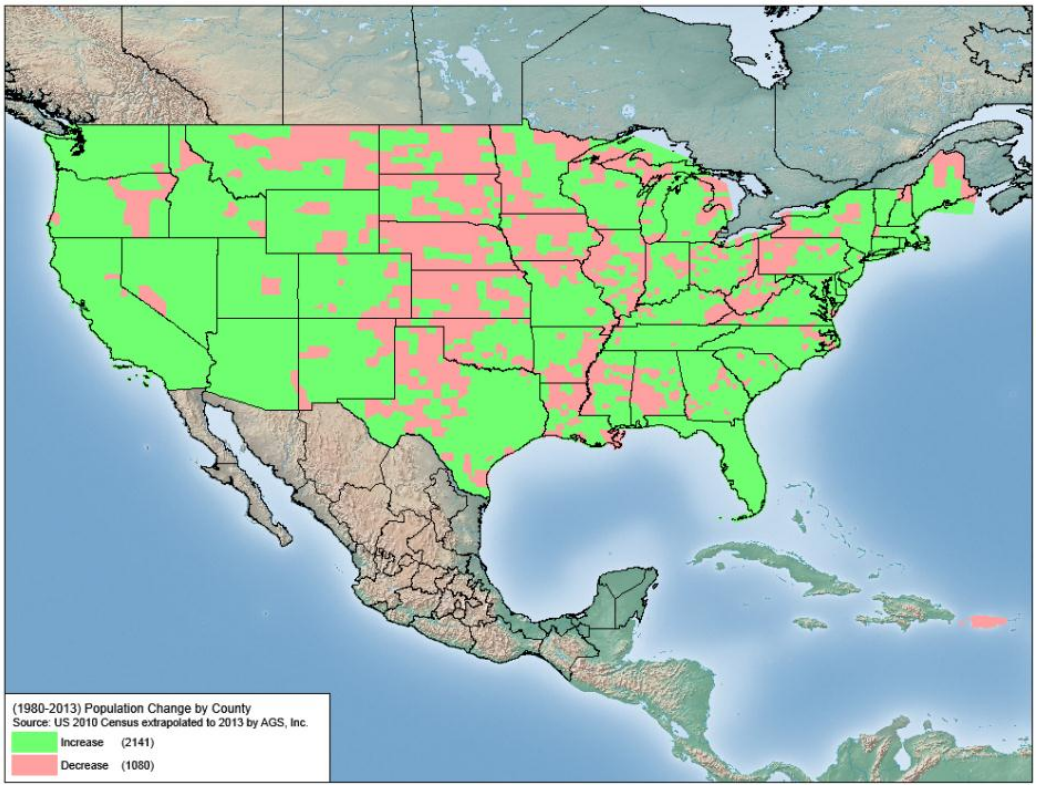
EVOLUTION OF THE NATIONAL AIRPORT SYSTEM

The first airport in the United States opened in 1909 in College Park, Maryland. Today, it is a general aviation airport. Many airports opened as private landing strips or military airfields in the 1920s, 1930s, and 1940s. Some, like Salt Lake City International, evolved into today's commercial service airports. Salt Lake began as a simple landing strip in 1911, became an air mail facility known as Woodward Field in 1920, and ultimately was developed into the large hub airport it is today. Other early landing strips, such as Gauthier's Flying Field just north of Chicago, evolved from a modest grass strip in the 1920s into a thriving general aviation airport with hundreds of based aircraft and about 82,000 takeoffs and landings annually. The airport is currently named Chicago Executive Airport and serves the general and business aviation sectors of the Chicago metropolitan area. Still other airports were established and continue to serve as general aviation facilities providing access to small communities and remote areas. Airports have evolved over the past 90 years to meet the specific needs of the communities they serve and the national aviation system.



The United States turned its attention to the development of civilian aviation after the end of World War II. This included the development of a national network of airports and a national airport plan. The plan identified existing and proposed new airports to serve the commercial and general aviation needs of a growing and dispersed population. Specific criteria were established to ensure the network of airports met national needs at a reasonable cost. Based on the type of airport, these criteria included number of based aircraft, number of annual operations, scheduled air carrier service, and proximity to other airports in the national plan. Criteria also permitted inclusion of airports that met special needs such as access to remote populations.

The national airport plan released in 1951 identified 2,657 existing airports and 2,288 proposed airports. Many of the proposed airports identified in the 1951 plan were constructed in the 1950s. Today, less than 1 percent of the national plan airports are proposed new airports. Aviation in the United States has matured, resulting in a fairly consistent number of airports included in the Nation's airport plan.



Although the number of federally designated NPIAS airports has remained steady, many airports have changed in size and complexity to meet the travel demands of a growing population and expanding economy. There has been dramatic growth in the country's population over the last 30 years. Coupled with substantial migration to the west and south, this growth has resulted in changing aviation needs. Some communities have grown into major business centers requiring sophisticated operations. Other regions have seen population decline as the nature of work has changed over time. With the advent of new technology, airports will continue to evolve.

For instance, the reliever category was established in the1960s. An airport was classified as a reliever if it relieved congestion by drawing slower moving general aviation traffic away from congested airports in large metropolitan areas. In 1968, 147 general aviation airports were designated as relievers for air carrier airports serving the 22 large hub geographic areas.

A review of the 30-year-old reliever program resulted in revisions to the reliever criteria, which FAA implemented in 2001. The national review of general aviation airports, completed in 2012 (see General Aviation Airports: National Assets below), illustrates that many of the airports currently designated as relievers have evolved from relieving congestion at other airports to serving their own economic and operational roles for the communities and regions they serve.

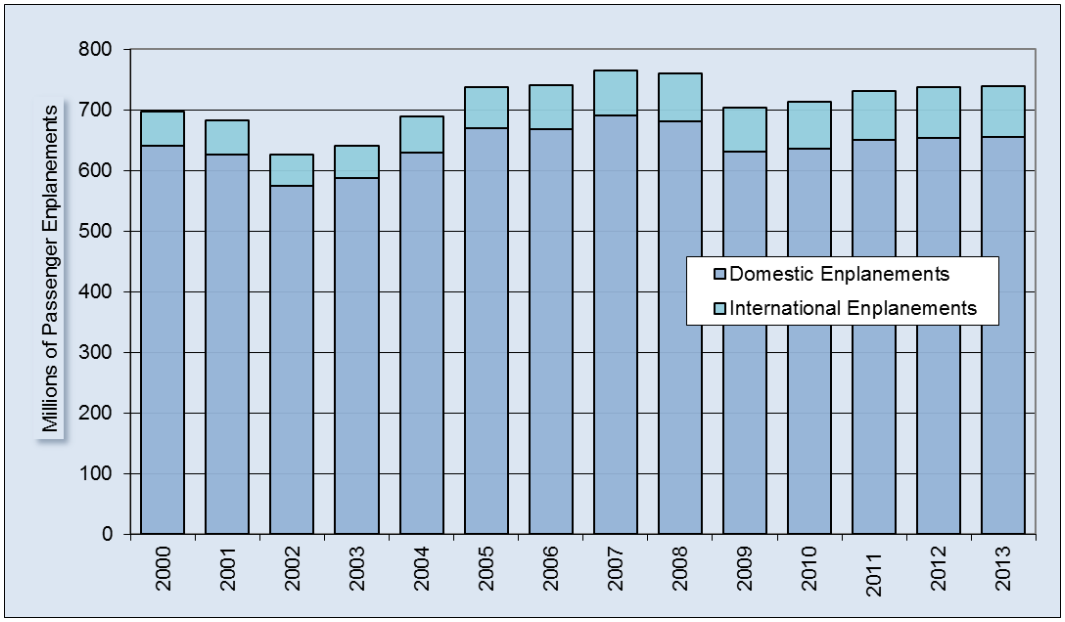
Although the Nation's airports have evolved differently over the past decades, they remain an integral part of U.S. lifestyle and commerce. Some airports are large in size and have multiple runways and facilities. Others are relatively small and may need only a short, single runway to serve a critical purpose. The role of an airport is not necessarily directly related to its size or its facilities. Today, airports fulfill very diverse roles from moving people and cargo and serving agricultural needs, to providing community access and air ambulance services, to supporting private transportation using the smallest piston aircraft to the most sophisticated jets. Because of this, the United States has the largest, most diverse and efficient system of airports in the world.

USE OF THE NATIONAL AIRPORT SYSTEM

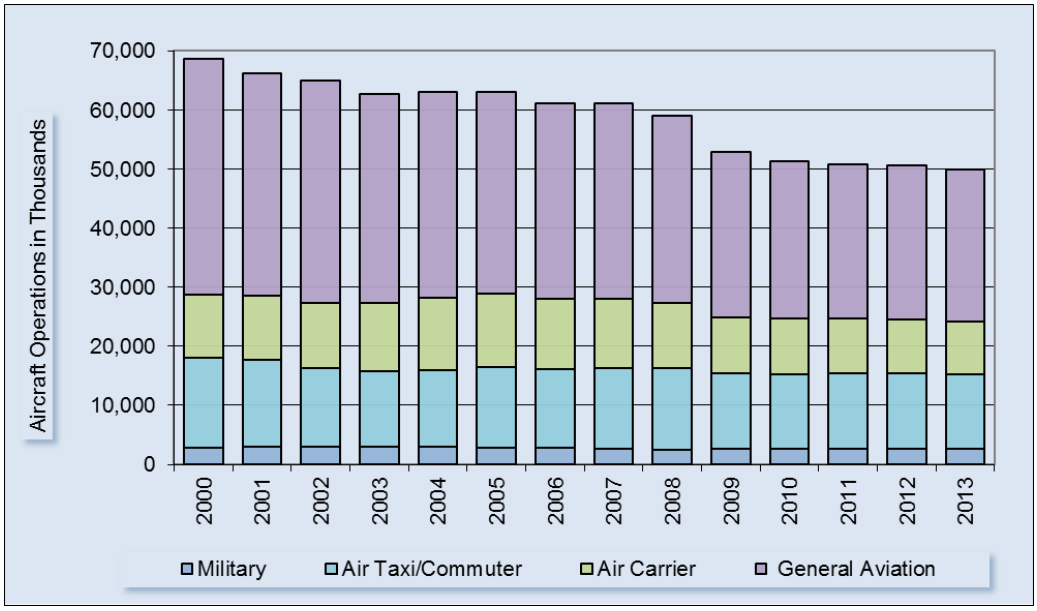
Commercial Airline Operations

The national airport system is a reflection of the types of aircraft using the airports and subsequent economic activity. Of the 3,331 airports contained in the NPIAS, approximately 514 of these airports accommodate commercial airline service. Commercial airline service represents the most widely known aspect of the aviation industry and includes the carriage of passengers on aircraft.

The last decade has been turbulent for commercial air service, resulting in wide variations in annual passenger boardings at NPIAS airports (e.g., declines in 2001 and 2002 after the terrorist attacks of September 2001, and in 2009 and 2010 from the global economic recession). International passenger boardings on U.S. carriers at U.S. airports reached an all-time high in 2013 of 85 million. The 2013 total enplanements were about 41.8 million higher than they were in 2000. Domestic enplanements represent approximately 89 percent of total U.S. passenger traffic at commercial service airports.



Between 2000 and 2013 there have been changes in aircraft operations as measured at the airports with airport traffic control towers. Currently, 516 airport traffic control towers report traffic counts. In 2013, air carrier operations were down more than 15 percent from the peak experienced in 2000. Air taxi/commuter operations as well were down 30 percent in 2013 from their 2005 high. The reductions in aircraft operations reflect air carriers' capacity restraint in better matching available seats with demand, the retirement of older and less efficient aircraft, the shifting of larger aircraft to international services, and the growing use of 70- to 90-seat regional jet aircraft in place of smaller 50-seat regional jets. Air taxi/commuter operations grew annually through 2005, when operations peaked, as the major air carriers shifted flights to their regional partners. Air taxi/commuter operations have decreased 30 percent since the peak in 2005. The combined activities of air carrier and air taxi/commuter operations account for approximately 40 percent of total operations at airports with airport traffic control towers. Total operations by military aircraft have decreased to slightly higher than the 2008 level, which was the lowest annual total in the past 10 years. Similar to general aviation and air carrier/air taxi/commuter activities, overall military aircraft activity was 10 percent lower in 2013 than in 2000. Military operations are a function of defense missions and can fluctuate annually based on national defense needs.



General Aviation

Eighty-five percent of NPIAS airports are classified as general aviation and reliever airports and serve mainly general aviation activity. General aviation activity has seen declining numbers of total operations since 2000, declining at an average annual rate of 3.3 percent. Much of the decline in the later parts of the decade can be attributed to economic conditions, high fuel prices and other factors.

The term "general aviation" encompasses a diverse range of commercial, governmental, and recreational uses. While it is often easier to consider what general aviation does not include—scheduled airline and military activity—this does not sufficiently define general aviation activity. To better understand this segment of the industry and the resulting requirements for the airport and air traffic system, each year FAA surveys the general aviation community through general aviation

and title 14 Code of Federal Regulations (CFR), part 135,[11] activity surveys. These surveys ask respondents to indicate the types of uses of their aircraft and the number of hours flown, as well as the type of aircraft flown, flying conditions, fuel consumption, and aircraft age.

Table 1 summarizes the results of the CY 2012 surveys by types of uses. The percentages are based on the number of actual hours flown. While personal use of general aviation aircraft (33.5 percent) is the single largest use category, the combined nonpersonal uses of general aviation aircraft represent the majority of all general aviation activity.

Table 1: General Aviation and Part 135 Activity Survey
Actual Hours Flown by Use, 2012

Category	Percent of Total
General Aviation Use	
Personal Use[12]	33.5%
Instructional	15.3%
Corporate/Executive	9.7%
Business	8.7%
Aerial Observation	5.4%
Other[13]	5.2%
Aerial Application	3.9%
Other Work Use	1.1%
External Load (Rotorcraft)	0.9%
Aerial Other	0.8%
Sightseeing	0.7%
Air Medical	0.4%
Subtotal	**85.6%**
On-Demand Federal Aviation Regulation Part 135 Use	
Air Taxi and Air Tours	11.4%
Part 135 Air Medical	3.0%
Subtotal Part 135 Use	**14.4%**
Total All Uses	**100.0%**

Source: General Aviation and Part 135 Activity Surveys – CY 2012

It is notable that instructional uses comprise the second largest use category. For 20 years, the majority of commercial airline pilots have been trained through civilian training systems rather than through the military. Instructional training for all pilots, whether pursuing flying recreationally or as a career, is best conducted away from commercial service airports to preserve commercial service airport capacity and enhance reliability for airline schedules. For these reasons, instructional training is currently focused at general aviation airports.

[11] Title 14 CFR, part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons on Board Such Aircraft.
[12] "Personal use" includes recreational flying, family use and tourism, but also includes flying in order to stay current with license requirements.
[13] "Other" is defined as positioning flights, proficiency flights, training, ferrying, sales demos, etc.

The results of the survey demonstrate the role general aviation plays in accommodating commerce throughout the United States. It is estimated that thousands of passengers are carried on business and corporate aircraft each year. Business and corporate aircraft also move air freight,[14] ensuring overnight delivery of high-priority business documents and providing just-in-time delivery of parts to manufacturing plants.

On-demand air taxi services provide air access to communities not served by commercial airlines and additional access to communities with airline service. Air medical services provide rapid access to emergency medical services that cannot be provided on scheduled airline aircraft and in many rural parts of the country, which may not be served by scheduled airline activity. Aerial application includes activities such as fertilizing for agricultural purposes or fighting forest fires. Aerial observations include patrolling pipelines or the electrical grid infrastructure to ensure safety and reliability of these energy systems, identifying forest fires early in their development, or surveying wildlife and natural habitats.

General aviation also encompasses public use activities within these use categories. Examples include the Civil Air Patrol, which provides nearly all of the inland search and rescue missions, or homeland security, law enforcement, and disaster relief activities by other nonmilitary government agencies. These activities are not called out separately, but are included within each use category. In 2012, public use flew 7.6 percent of the total general aviation hours. General aviation also includes the humanitarian services such as transporting patients to medical centers or delivering relief supplies to areas following natural disasters.

As evidenced by the diverse range of activities, general aviation has various land use, airspace, and air traffic requirements that are much different from the requirements for commercial air service. This necessitates a system of airports that is flexible in design and construction to accommodate these uses. General aviation airports are included in the NPIAS because they have the capacity to accommodate these varied uses and roles.

GENERAL AVIATION AIRPORTS: NATIONAL ASSETS

In cooperation with the aviation community, FAA completed two top-down reviews of the existing network of general aviation facilities included in the NPIAS. The results of these efforts are contained in the May 2012 report entitled "General Aviation Airports: A National Asset" and the March 2014 report entitled "ASSET 2: In-Depth Review of 497 Unclassified Airports."[15]

As part of these efforts, the FAA documented the important airport roles and aeronautical functions these facilities provide to their communities and the national airport system. These functions include emergency preparedness and response, direct transportation of people and freight, commercial applications such as agricultural spraying, aerial surveying and oil exploration, and many others. Many of these functions cannot be supported efficiently or economically at primary airports.

[14] Large transport aircraft carrying air cargo are included with the air carrier counts as many of these operators operate under similar regulations to commercial airlines carrying passengers.
[15] Both reports are available online at: http://www.faa.gov/airports/planning_capacity/ga_study/.

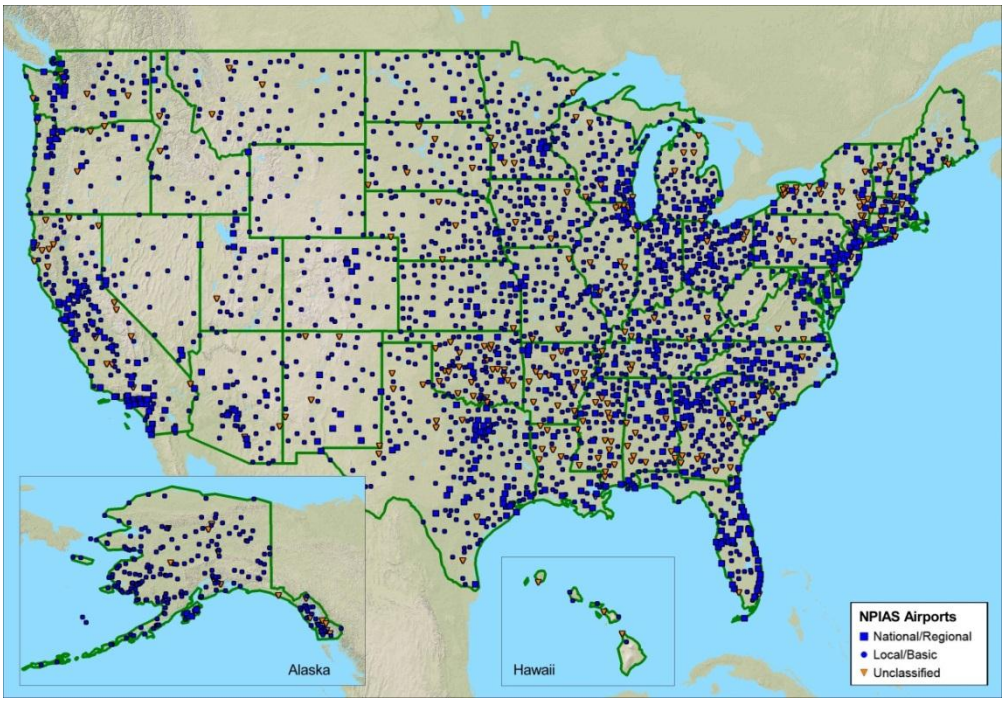
General aviation facilities were divided into categories based on existing activity measures (e.g., the number and types of based aircraft and volume and types of flights). Of the general aviation facilities studied, 2,455 were grouped into four categories using existing activity, geographic factors, and public interest functions. These categories are shown in Table 2.

Table 2: General Aviation Airport Categories

National	Regional	Local	Basic
Supports the national airport system by providing communities with access to national and global markets. These airports have very high levels of activity with many jets and multiengine propeller aircraft. These airports average about 200 total based aircraft, including 30 jets.	Supports regional economies by connecting communities to regional and national markets. These airports have high levels of activity with some jets and multiengine propeller aircraft. These airports average about 90 total based aircraft, including 3 jets.	Supplements local communities by providing access to local and regional markets. These airports have moderate levels of activity with some multiengine propeller aircraft. These airports average about 33-based propeller-driven aircraft and no jets.	Supports general aviation activities, often serving aeronautical functions within the local community such as emergency response and access to remote communities. These airports have moderate levels of activity with an average of 10 propeller-driven aircraft and no jets.

During the initial review, FAA was unable to establish a clearly defined category for the remaining 497 facilities. They have a broad range of different types of activity and characteristics and cannot readily be described as a clear group or category. These 497 facilities were identified as unclassified and were the focus of the subsequent "ASSET 2" study released in March 2014.

After a thorough review of all the information gathered through outreach and coordination with industry stakeholders, including the individual 497 airports, FAA was able to identify a Federal role for 47 percent of the 497 airports. These airports are now categorized as either regional, local, or basic.



The FAA has been unable to categorize 52 percent[16] of the airports. These airports will continue to be listed as unclassified in the NPIAS. While they may not have a clear role today, it is possible that this may change in the future. In addition, 4 of the 497 unclassified airports are closed or no longer serve as active landing facilities, and they have been removed from the NPIAS.

Many of the airports identified as unclassified have received Federal funding in the past and may be considered for future funding if and when activity levels justify AIP-funded capital investments. Future development of nonprimary airports will continue to be based on eligible and justified needs and priorities, consistent with the role of the airport in the national system. Chapter 4 of this report provides development estimates for each of the categories.

The FAA will continue to coordinate with State aviation agencies, airport sponsors, and local planning organizations to identify nonprimary airports that are important to the national transportation system. The FAA will reexamine the nonprimary airports every other year as part of preparing the biennial NPIAS report to Congress. The next review will be in 2015 in preparation for the next NPIAS report. The categories are also included in Appendix A.

[16] The FAA continues to accept additional information from existing NPIAS unclassified airports, allowing airports to be categorized. The numbers in this report reflect information provided through May 22, 2014.

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CHAPTER 2: SYSTEM OBJECTIVES AND PERFORMANCE

OVERVIEW

This chapter describes the U.S. Department of Transportation (DOT) transportation goals and FAA objectives for the national air transportation system. We highlight the performance of the airport system in six key areas: safety, capacity, environmental sustainability, runway pavement condition, surface accessibility, and airport financial performance. This chapter also includes major FAA initiatives that will improve the performance of the national air transportation system in these key areas.

SUPPORTING NATIONAL AIR TRANSPORTATION SYSTEM OBJECTIVES

The NPIAS supports DOT and FAA objectives for the air transportation system, as shown below. DOT objectives are contained in the Strategic Plan for FYs 2014 through 2018.[17]

U.S. Department of Transportation

DOT's Draft Strategic Plan, "Transportation for a New Generation," sets the direction for DOT to provide safe, efficient, convenient, and sustainable transportation choices through five strategic goals that are supported by a wide-ranging management goal to make DOT a high-performance, outcome-driven Agency. Each of the five strategic goals below is reflected in the next section (Factors Indicating System Performance).

1. **Safety:** Improve public health and safety by reducing transportation-related fatalities and injuries;
2. **State of Good Repair:** Ensure the United States proactively maintains its critical transportation infrastructure in a state of good repair;
3. **Economic Competitiveness:** Promote transportation policies and investments that bring lasting equitable and economic benefits to the Nation and its citizens;
4. **Livable Communities:** Foster livable communities by integrating transportation policies, plans, and investments with coordinated housing and economic development policies to increase transportation choices and access to transportation services for all users; and
5. **Environmental Sustainability:** Advance environmentally sustainable policies and investments that reduce carbon and other harmful emissions from transportation sources.

Federal Aviation Administration

The FAA supports DOT strategic goals with four mission-based strategic initiatives listed below. The specific objectives within each goal are available online.[18]

[17] DOT's Draft FY 2014–18 Strategic Plan is available at: http://www.dot.gov/policy-initiatives/draft-dot-strategic-plan-fy-2014-2018.

[18] FAA Strategic Initiatives are available online at: http://www.faa.gov/about/plans_reports/media/FAA_Strategic_Initiatives_Summary.pdf.

1. **Make Aviation Safer and Smarter:** Build on safety management principles to proactively address emerging safety risk by using consistent, data-informed approaches to make smarter, system-level, risk-based decisions.
2. **Deliver Benefits Through Technology/Infrastructure:** Lay the foundation for the National Airspace System (NAS) of the future by achieving prioritized Next Generation Air Transportation System (NextGen) benefits, integrating new user entrants, and delivering more efficient, streamlined services.
3. **Enhance Global Leadership**: Improve safety, air traffic efficiency, and environmental sustainability across the globe through an integrated, data-driven approach that shapes global standards, enhances collaboration and harmonization, and better targets FAA resources and efforts.
4. **Empower and Innovate With the FAA's People:** Prepare FAA's human capital for the future by identifying, recruiting, and training a workforce with the leadership, technical, and functional skills to ensure the United States has the world's safest and most productive aviation sector.

FAA's Office of the Associate Administrator for Airports

Each organization within FAA sets annual performance goals in support of FAA and DOT strategic goals. The Office of Airports is responsible for preparing the NPIAS and administering the AIP as well as other programs that improve the safety, efficiency, and condition of the airport system. In carrying out these functions and implementing the FAA's Office of Airports Business Plan, it contributes substantially to achieving the FAA's strategic goals. Listed below are a few of the major goals the Office of Airports has set for FY 2014[19]:

1. Complete all practicable runway safety area (RSA) improvements by 2015.
2. Maintain the rate of serious runway incursions (Categories A and B) caused by vehicle pedestrian deviations (VPDs) at or below 2 percent of total VPDs.
3. Reduce risk of significant wildlife strikes at certificated airports by implementing wildlife hazard mitigation strategies. Initiate wildlife hazard assessments at general aviation airports with significant activity levels (tier 1).
4. Develop a proactive safety culture at part 139[20] certificated airports through rulemaking, airport design standards, and inspections.
5. Reduce opportunities for improper use of Federal funds by ensuring the proper fulfillment of all regulatory requirements. Prepare and implement updated guidance for the AIP, PFC Program, and State Block Grant Program.
6. Maintain runway pavement in excellent, good, or fair condition for 93 percent of paved runways in the NPIAS.
7. Initiate a formal review of the part 150 Airport Noise Compatibility Planning Program; implement a strategy for updating outdated noise exposure maps (NEM) and Noise Compatibility Programs (NCP), and issue grants for sound insulation programs.
8. Enhance airport sustainability by reducing airport emissions, increasing the energy efficiency of airport power sources, and minimizing airport waste through recycling and reuse programs.

[19] The FAA's Office of Airports FY 2014 Business Plan is available online at: http://www.faa.gov/about/plans_reports/.
[20] For additional information on part 139, visit: http://www.faa.gov/airports/airport_safety/part139_cert/.

9. Improve airport environmental quality through the evaluation of a potential voluntary program for reporting carbon-based emissions at the Nation's airports and establish a methodology and timetable for defining the baseline supporting carbon-neutral growth.
10. Maintain the average age of Office of Airports' advisory circulars (ACs) at 5 years or less.

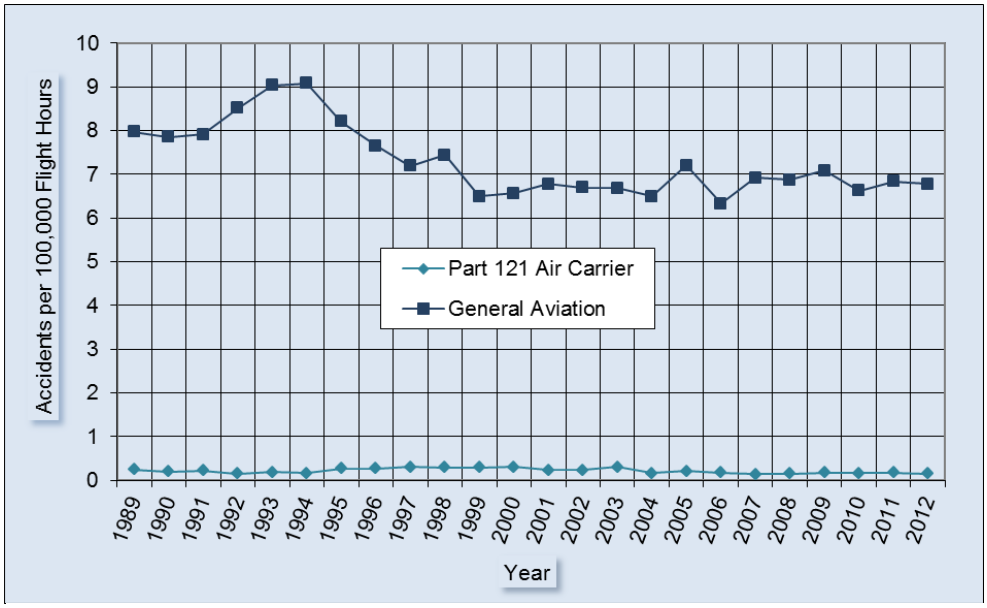
FACTORS INDICATING SYSTEM PERFORMANCE

Since 1993, six key factors have been used in NPIAS Reports to indicate the performance of the airport system: safety, cost-effective capacity, environmental performance, pavement condition, surface transportation accessibility, and financialperformance. These six airport performance factors align with the five strategic goals contained in DOT's Strategic Plan (indicated in parentheses where the alignment is not immediately clear).

However, the six factors are not all related in the same way to capital improvements, and increased investment in airport infrastructure is not the only way to improve performance. For example, Federal aid to airports can be useful when focusing on specific issues, such as the provision of airport rescue and fire fighting equipment, development of safety areas around runways, removal of obstructions in runway approach paths, and planning and implementing noise compatibility measures. By contrast, however, there are also a number of operational and other measures (not involving construction) that airports can take to improve safety, accessibility, efficiency, and financial performance.

SAFETY

The United States has not only the largest and most complex aviation system in the world, but also one of the safest as demonstrated by the low accident rate. Airport facilities and operations are an important contributor to the resulting safety record. Although the airport is rarely determined to be a cause of an aircraft accident, it may be cited as a contributing factor that impacts the severity of an accident, and in many cases, airport facility and operational improvements supported by FAA either mitigate or prevent accidents.



Source: National Transportation Safety Board Aviation Accident Statistics http://www.ntsb.gov/data/aviation_stats.html.

The FAA has made runway safety a focus, and the aviation community has made great progress in improving runway safety. Through a joint effort between FAA and the aviation industry, a Runway Safety Council was formed in 2008 to look into the root causes of runway incursions. The Council comprises representatives from various parts of the aviation industry. A working group integrates investigations of severe runway incursions and conducts a root cause analyses. The working group then presents its root cause analysis to the Council and makes recommendations on ways to improve runway safety. The Council reviews the recommendations. If accepted, the recommendations are assigned to the part of FAA and/or the industry that is best able to implement the recommendations and prevent further runway incursions. The Council tracks recommendations to ensure appropriate action is taken.

Preventing Runway Incursions

To operate safely and efficiently, the aviation system relies on communication and coordination among air traffic controllers, pilots, airports, airport vehicle operators, and pedestrians. Their actions can cause or avert runway incursions.

The International Civil Aviation Organization (ICAO) defines a runway incursion as any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Each incursion is classified based on the severity of the incident into one of four categories. Category A, the most severe, is where a collision was narrowly avoided. Category B is an incident in which separation decreases and there is a significant potential for collision. Category C is an incident characterized by ample time and/or distance to avoid a collision. Category D, the least severe, is where there was no collision hazard. In 2008, the United States implemented ICAO's definition of a runway incursion, and incidents formerly classified as surface incidents[21] are now classified as runway incursions. Table 3 summarizes runway incursion data since 2008, reflecting the previous and current methodologies for incursion classification. The reduction in the number and severity of runway incursions is one of the FAA's top priorities.

Table 3: Historical Runway Incursions

Fiscal Year	Number of Incursions	Annual Operations	Rate of Runway Incursions per Million Operations
2008	1,009	58,562,343	17.2
2009	951	52,928,316	17.9
2010	966	51,249,476	18.9
2011	954	50,739,762	18.8
2012	1,150	50,516,043	22.7
2013	1,241	49,936,655	24.8

Source: FAA Office of Runway Safety

[21] Previously, an incident without an aircraft in potential conflict, such as an unauthorized aircraft crossing an empty runway, was defined as a surface incident and not a runway incursion.

FAA uses AIP funds to enhance airport safety and support the Agency's goal of reducing accidents, fatalities, and runway incursions.[22] With the help of the AIP, airports can reconfigure runways and taxiways to optimize both safety and efficiency. Airport operators can build perimeter roads around the airfield so vehicles do not have to be driven across taxiways and runways. The AIP funds are also used to meet updated standards for runway marking and signs, eliminating confusion on airfields. These updates have included changing the airfield marking standard for taxiway centerlines at certificated airports (based on enplanements) to require special markings that will alert pilots when they are approaching hold short lines and working with airport operators to install stop bars[23] at certain runway/taxiway intersections.

Additional methods of preventing runway incursions include recommending that airports improve how they provide information on rapidly changing runway and taxiway construction and closings. The FAA wants airports to provide airlines and pilots with diagrams giving the latest information on runway construction and closings. They could distribute this information by email, on a Web site, or by hand. It would supplement Notices to Airmen (NOTAMs), which are currently printed as text or delivered verbally and thus do not have diagrams. The FAA is also taking steps to further automate the NOTAM process and is meeting the statutory requirements for NOTNAM modernization in the Pilot Bill of Rights legislation.

Pilot deviations account for the majority of runway incursions. These deviations are caused by pilots in violation of regulations and/or air traffic control instructions. The FAA completed an analysis of taxi clearances and found that more explicit instructions are needed from controllers to pilots. The FAA has issued requirements for controllers to give explicit directions to pilots on precise routes to travel from the gate to the runway. The FAA has also issued requirements to ensure that aircraft crossing intervening runways have proper clearance prior to receiving an actual takeoff clearance.

The FAA aviation safety inspectors now verify that pilots have current surface movement charts (airport diagrams) available and are using them.

Airport managers and fixed-base operators participate in runway safety action teams to address airport-specific factors (e.g., procedures, environment, and infrastructure) that affect runway safety. The FAA requires basic and recurrent driver training programs for all personnel who access the airfield movement areas at commercial airports.[24]

[22] Several FAA F&E programs are also focused on runway safety, including Automatic Surface Detection Equiment, Model X (ASDE-X), Airport Surface Surveillance Capability (ASSC), and Runway Status Lights (RWSL). More information on these programs can be found in the FAA Capital Investment Plan . at: http://www.faa.gov/air_traffic/publications/cip/

[23] A stop bar is a series of in-pavement and elevated red lights that indicate to pilots that they may not cross.

[24] For more information on FAA runway safety initiatives, visit http://www.faa.gov/airports/runway_safety/.

Maintaining Safe Airport Conditions

The FAA helps airports maintain safe conditions by developing airport design standards, based on airport design categories, that apply to facilities throughout the system. Airports agree to meet these FAA standards when they accept AIP funds for capital improvements to their facilities. The FAA standards address physical layout characteristics such as runway length and width, runway/taxiway/taxilane separation, RSAs, lighting, signs, and markings. The standards also address material characteristics (e.g., pavement, wiring, and luminance of lights) and issues such as aircraft rescue and fire fighting equipment, training and operations; snow removal plans and supporting equipment; and wildlife hazard management.

In another effort to promote safety, the Office of Airports has focused contract and staff resources on updating standards contained in ACs. Many AIP-funded projects must comply with the safety standards contained in the ACs. In the last 2 years, FAA updated 22 ACs. Further, the Office of Airports continued to meet its goal of maintaining the average age of ACs at less than 5 years.

The Office of Airports continues efforts on two research programs: Airport Technology Research and the Airport Cooperative Research Program (ACRP). The President's FY 2015 budget submission included a request for $29.5 million in funding for Airport Technology Research. This research is conducted at the FAA's Technical Center in Atlantic City, New Jersey, in the areas of airport planning and design, airport lighting and marking, runway safety, wildlife hazard mitigation near airports, aircraft rescue and fire fighting, and pavement design and construction. The results of the research are used to update ACs and equipment specifications to provide guidance to airport sponsors and consultants.

The ACRP is a national resource for the airport industry, fulfilling the vital needs of airport practitioners by providing industry-driven research at no cost to airports of all sizes across the country and beyond. After 8 years in operation, ACRP has engaged thousands of public- and private-sector airport practitioners, academicians, consultants, advocates, and students to identify the airport industry's most pressing challenges and fund research to document, mitigate, and create tools to help address those challenges.

Since its establishment in 2005, ACRP has authorized more than $86 million for 381 projects to generate nearly 200 research products in the form of reports, digests, syntheses, compact discs, and web documents addressing problems in every area of the airport organization. The ACRP has convened hundreds of panels with thousands of industry experts to obtain research ideas and ensure that each research product is guided by a relevant yet diverse set of perspectives.

In 2013, ACRP produced 39 publications, including 19 reports, 1 research digest, 4 legal digests, and 11 syntheses. A complete listing of all ACRP research projects and research results is available free of charge on the Transportation Research Board ACRP Web site.[25]

[25] The TRB ACRP Web site is located at: http://www.trb.org/acrp/.

An applied way to measure the program's results and effectiveness is an ACRP initiative called "Impacts on Practice." This was developed to provide examples of how airport practitioners are using ACRP results in their work. The results are published and posted on the ACRP website.

The FAA airport design standards have developed over time and provide the necessary dimensions to accommodate aircraft operations, as well as an extra margin of safety such as the standards for RSAs discussed in the next section.

Runway Safety Areas (RSAs)

The standards for RSAs are designed to minimize damage to aircraft and injuries to occupants when an aircraft unintentionally strays from or overruns the runway during an operation. The standards provide for graded areas contiguous to the runway edges that are free of ruts, humps, and other surface irregularities. Only objects required to be there because of their function, such as runway lights or signs, can be in the RSA. These objects must be frangible by being mounted so they break away if struck by an aircraft. Adherence to design standards ensures the consequences of incidents are less likely to be severe.

As aircraft became larger, faster, and more demanding, the required RSA dimensions increased. As a result, many RSAs at commercial service airports (many of which were built decades ago) did not meet current FAA standards, prior to the beginning of the RSA program in 2000. The FAA accelerated the improvement of RSAs that did not meet Agency design standards and is actively working with airport sponsors and local communities to improve the remaining nonstandard RSAs as quickly as possible. At the end of FY 2013, 93 percent of the nonstandard RSAs have been improved to meet dimensional standards or an equivalent level of safety, to the extent practicable, with the help of both AIP and PFC funds as well as local investments. In addition, of the RSAs that also need FAA-owned navigational aid and equipment to be removed or relocated, approximately 74 percent have been improved to the extent practicable, as of September 2014.

For some airports, however, it is not possible to acquire sufficient land to meet RSA standards through full physical compliance. For those cases, FAA, in partnership with industry and airport sponsors, conducted research to develop a soft-ground arrestor system to quickly stop aircraft that overrun the end of a runway. On the basis of that research, FAA issued a specification for Engineered Material Arresting Systems (EMAS). An EMAS is generally a bed of highly crushable material that is installed at either or both ends of a runway. Regardless of the actual material, an EMAS bed provides a safety enhancement on runway ends where there is not sufficient level, cleared land suitable for a standard RSA. An EMAS is designed to stop an overrunning aircraft by exerting predictable deceleration forces on its landing gear as the EMAS material deforms. EMASs have been installed at more than 74 runway ends at 47 airports, and there are plans under contract to install or replace 13 EMAS systems at 7 additional U.S.

airports. The picture on the previous page is an example of an EMAS on the departure end of Runway 5/23 at Yeager Airport in Charleston, West Virginia.

Safety Management System (SMS)

In 2001, ICAO adopted an amendment to Annex 14, Aerodromes, of the Convention on International Civil Aviation requiring all member states to establish SMS initiatives for certificated international airports. The ICAO defines an SMS as a "systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures."[26] An SMS provides an organization's management with a set of decisionmaking tools that can be used to plan, organize, direct, and control its business activities in a manner that enhances safety and ensures compliance with regulatory standards. The FAA supports harmonization of international standards making U.S. aviation safety regulations consistent with ICAO standards and recommended practices.

SMS Pilot Studies

The FAA is developing SMS standards for certificated airports under title 14 Code of Federal Regulations (CFR), part 139. As of May 7, 2014, there are 543 certificated public-use airports and therefore subject to annual part 139 safety inspections to determine continued compliance with regulatory safety standards. Since 2007, FAA has initiated numerous pilot studies to evaluate the development of SMSs at a variety of certificated airports.[27] More than 30 certificated airports of varying sizes and operations have participated in the studies. Participating airports reviewed existing safety standards to determine if they met the intent of typical SMS requirements. They then developed SMS manuals and implementation plans based in part on their findings.

The pilot studies allowed airports and FAA to gain experience establishing airport-specific SMSs that are tailored for the individual airport. Additionally, this experience provided best practices and lessons learned that FAA is using as it considers how to incorporate SMS standards into part 139. A Supplemental Notice of Proposed Rulemaking is being proposed that would require airport operators to institute a safety management system at their airports. This action is necessary to improve safety through conformance with best practices in risk management and promote international harmonization with ICAO standards. The rule is intended to facilitate integration of formal risk management processes within the airport´s day-to-day operations. The SNPRM is anticipated to be published for comment in FY 2015.

To continue the analysis into the next phase of SMS, FAA launched another study in FY 2010 aimed at implementing the SMS at a small number of airports. The study provided funding for participating airports to implement certain processes developed under the original pilot studies. It also required the airports to conduct safety risk analyses to proactively identify hazards and mitigate risks in their operations and development, as well as conduct audits and inspections of their SMS programs to gain lessons learned from implementation and review the effectiveness of their SMS in proactively identifying safety issues on the airport. To participate, the airports had to have participated in the earlier studies. Thirteen airports participated in this study, which ended in

[26] See ICAO Safety Management Manual (SMM), Definitions section, ICAO Doc. 9859-AN/474 (Third Edition-2013).
[27] A list of participating airports is available online at: http://www.faa.gov/airports/airport_safety/safety_management_systems/.

February 2012. The FAA compiled the results of the study and included them in the draft AC 150/5200-37A, Safety Management Systems for Airports, released June 29, 2012.

Safety Risk Management (SRM)

The Office of Airports is also implementing an SMS within its own organization. Beginning in June 2011, certain documentation submitted to FAA for approval must undergo safety risk management assessment. Airport layout plans, modifications of standards, and construction safety phasing plans must incorporate proactive risk assessment aimed at considering safety issues throughout the entire project development cycle from planning to construction.

Wildlife Hazard Mitigation

The FAA has overseen a wildlife management program for more than 50 years in an effort to keep airports safe by making them less attractive to all types of wildlife. The FAA has continued a multifaceted approach for mitigating wildlife strikes. This includes continuing a robust research program, making improvements to the National Wildlife Strike Database and outreach, incorporating new technology to increase and simplify strike reporting, and providing AIP funding to airports to conduct Wildlife Hazard Assessments (WHAs) and develop Wildlife Hazard Management Plans (WHMPs). A number of new wildlife hazard management initiatives were implemented and are underway, including:

- Systematic strike data collection started in 1990 for use by the Office of Airports and the aviation industry as a means of improving airport safety and reducing wildlife hazards. The Web site wildlife.faa.gov has search fields that enable users to find data on specific airports, airlines, and engine types, as well as by date and State without having to download the entire database. The Web site is continuously being updated to add more data and resources. Further, a comprehensive annual report, Wildlife Strikes to Civil Aircraft in the United States, had been made available to the public each year since 1995. From 2009 through 2012, FAA received 40,198 civil aircraft strike reports, including 9,539 in 2009; 9,919 in 2010; 10,090 in 2011; and 10, 650 in 2012.
- The FAA issued a certification alert to airport operators on June 11, 2009, reminding them of their obligation under part 139 to conduct WHAs if they experience a "triggering event" as outlined in section 139.337 (b). As of December 2013, all 544 part 139 certificated airports have either completed a WHA or have initiated a WHA. The FAA has also made AIP funds available for the development of follow-on WHMPs, as needed.
- The FAA has developed a program to conduct wildlife hazard site visits and/or assessments at approximately 2,800 general aviation airports. The program includes a phased approach through the year 2020, due to the large number of assessments and site visits. Approximately half of the 124 largest general aviation airports identified as a candidate for a WHA have already completed or initiated a WHA. The FAA will continue to make AIP funding available for these assessments.

- The FAA identified gaps among certificated airports, air carriers, and general aviation airports in reporting wildlife strikes. Our analysis noted that overall strike reporting has steadily increased while damaging strikes within the airport environment decreased or remained stable. The increased reporting of strikes is due, in part, to the FAA's efforts to improve strike reporting by stakeholders across the country, as well as improving the public's ability to report wildlife strikes through Web sites and smart phone applications. The reduction in damaging strikes is due to professionally run wildlife hazard programs by airports. The FAA is conducting outreach to the aviation community to close the reporting gaps.[28] One of our most successful activities includes printing posters that promote strike reporting. Overall, 24,000 posters have been distributed to more than 4,000 part 139 airports, general aviation airports, aviation flight schools, and the aviation industry over the past 2 years.
- The FAA continued evaluating the performance of low-cost portable bird radars that are capable of detecting and tracking birds on or near airports. Bird radar systems were deployed at Seattle-Tacoma International, Chicago O'Hare International, John F. Kennedy International, and Dallas/Fort Worth International airports. These evaluations are being performed through a multi-year agreement with the United States Department of Agriculture (USDA), the National Wildlife Research Center, the National Center of Atmospheric Research, and Indiana State University.

For the last 15 years, FAA and USDA have conducted a research program to make airports safer by reducing the risks of aircraft-wildlife collisions. The research efforts designed to improve wildlife management techniques and practices on and near airports include:

- Methods for making airport habitats less attractive to species that are the most dangerous in terms of aircraft collisions. This is accomplished by studying which species use the airport property, how they behave in that environment, and why they are attracted.
- Techniques for controlling species by restricting access to attractive features, such as stormwater ponds.
- Technologies for harassing and deterring hazardous species.
- The types of grasses and agricultural crops that will attract the least amount of hazardous wildlife.
- Behavioral reactions of birds and mammals to approaching vehicles and understanding bird movements and flight behaviors to better predict where and when bird strikes are more likely to happen.

Cooperative research efforts between USDA and FAA also include techniques employed on aircraft to deter collisions with wildlife. A new study aims to quantify the sensory capabilities of targeted hazardous avian species and evaluate the effect of modifying on-board aircraft lighting systems. The goal is to develop a novel on-board aircraft lighting system that will enhance detection and avoidance of aircraft by birds and ultimately reduce strikes.

[28] A copy of the report can be found online at: http://www.airporttech.tc.faa.gov/safety/downloads.

CAPACITY (RELATES TO ECONOMIC COMPETITIVENESS)

The capacity of the airport system is affected by many factors, including the layout of individual airports, the manner in which airspace is organized and used, airport operating procedures, weather conditions, the aircraft type using the system, and the application of technology. The majority of airports in our national aviation system have adequate airport capacity and little or no delay. However, at a small number of airports where chronic capacity constraints and delays regularly occur, they frequently impact the entire air transportation system. FAA seeks to enhance capacity where the benefits of additional capacity exceed the costs..

A major concern in airport planning is the adequacy of the runways and taxiways to handle anticipated aircraft operations safely and efficiently. A single runway with a parallel taxiway can normally accommodate approximately 200,000 annual aircraft operations. The FAA provides guidance to help airport sponsors decide when they should consider airfield capacity improvements. Current FAA guidance recommends that capacity planning start when aircraft activity reaches 60 to 75 percent of an airport's airfield capacity. With major airfield improvements often taking 10 or more years from concept to opening, this recommendation allows adequate lead for improvements to be implemented before the problem becomes critical.

Before a new runway or runway extension can be built, FAA must assess potential environmental impacts that may result from airport development projects. The FAA's authorizing statute requires FAA to implement a process for expedited and coordinated environmental reviews of certain airport capacity, safety, and security projects. In addition, FAA is continuing to work closely with the busiest airports to ensure environmental studies for major runway projects or airfield reconfigurations are completed on schedule. The FAA establishes environmental impact analysis teams, maximizes the use of available staff and consultant resources, and utilizes recommended best practices for accomplishing its environmental work in a timely manner. The FAA works with other Federal and State environmental resource agencies to achieve concurrent reviews, analyses, and permit approvals to the greatest extent possible. Schedules are established with key milestones and monitored and a process is created to elevate and resolve disputes or disagreements between parties.

Since 2000, infrastructure projects at 23 busy airports have provided the capability to accommodate more than 2 million additional operations each year. This is a significant accomplishment. Moving forward, new airport infrastructure will continue to play a vital role in increasing capacity. A comprehensive overhaul of the U.S. national airspace system, known as NextGen, will make air travel more convenient and dependable, while ensuring that flights are as safe, secure, and hassle-free as possible. NextGen is better for the environment and the economy. NextGen is not a single system that is "turned on." Through a continuous rollout of improvements, FAA is building the technology and procedural capabilities so that the overall flow of air traffic is more efficient and reliable. Up to date information on NextGen, including Agency plans in the near- and mid-term periods, is available at: www.faa.gov/nextgen.

NextGen benefits airports by providing new tools, such as precision flight procedures and surface management, that can complement traditional airport planning and development initiatives. Airports are active participants in the implementation of NextGen across the national airspace system. While many investments in NextGen are the responsibility of FAA or aircraft operators, airports also have opportunities to advance NextGen (see Alternative Capacity Enhancement Methods on page 31).

Where substantial new capacity is needed, new or expanded airfield infrastructure will generally represent the most viable means of achieving significant capacity increases. NextGen will often be a critical enabler for a new runway, for example, by maximizing the capacity that can be achieved through the use of performance based navigation (PBN) procedures or approaches to closely-spaced parallel runways.

Congestion and Delay

The concentration of aircraft arrivals and departures at an airport can result in congestion and delay. Delay is an indicator that activity levels are approaching or exceeding throughput capacity levels. The impacts of delays can be measured in many ways and include direct costs, such as increased fuel use and crew time, and indirect costs, such as the extra travel time for passengers, missed connections (resulting in delays on other airlines and their passengers), and increased air emissions.

Delay is expressed in different metrics. For example, DOT tracks the on-time performance of airlines and reasons for flights arriving after their scheduled arrival times. Other delay statistics are collected and used for specific purposes. For example, air traffic controllers identify instances where aircraft are delayed 15 minutes or more in a given flight segment. The FAA uses this information to monitor the day-to-day operation of the air traffic control system. Airport planners and designers use the average delay per aircraft operation as a measure of congestion, which is related to the balance of demand versus capacity. This statistic can be forecasted and translated into a dollar cost of delay.

Air Carrier On-Time Performance

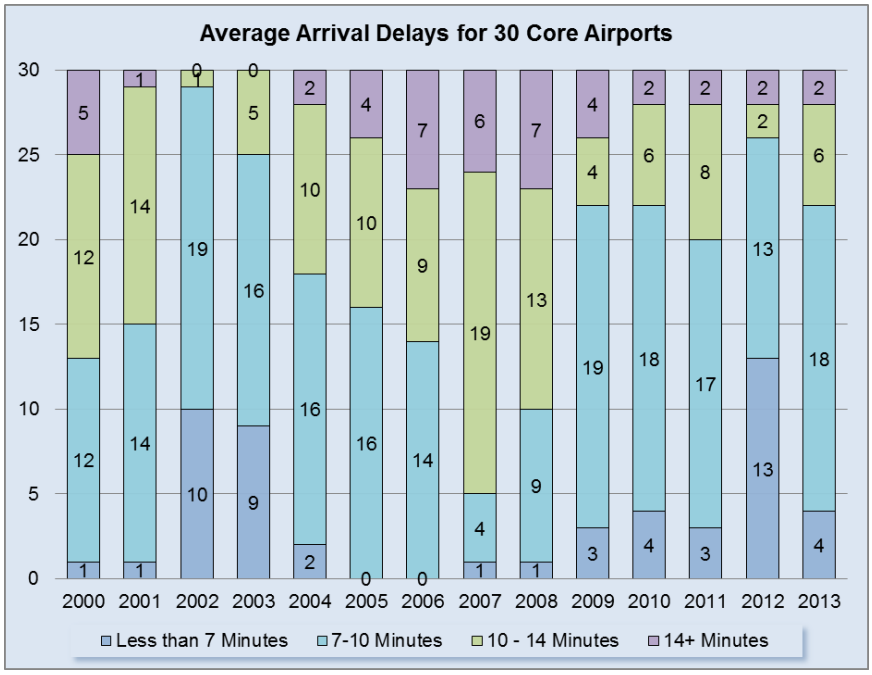
The DOT defines a delayed operation as an aircraft arriving at or departing from a gate 15 minutes or more after its scheduled time. The number of arrivals and departures that are delayed 15 minutes or more is compiled by DOT for busy airports and is reported monthly. In 2013, the 16 carriers reporting on-time performance recorded an overall on-time arrival rate of 81 percent with 1.5 percent of the flights cancelled.[29]

Of the 17.3 percent of flights delayed in 2013,[30] 8 percent were delayed because the aircraft arrived late (previous flight with same aircraft arrived late, causing the present flight to depart late), 6 percent were delayed due to national aviation system delays (such as significant aviation weather constraints, runway closures, heavy traffic volume, and air traffic control), 6 percent were delayed due to air carrier delay (circumstances within the airline's control such as maintenance or crew problems, aircraft cleaning, baggage loading, and fueling), 2 percent of the delays were attributed to cancelled or diverted flights, and less than 1 percent were delayed due to extreme meteorological events that, in the judgment of the carrier, delayed or prevented the operation of a flight, such as tornado, blizzard, or hurricane.

[29]Data available at: http://www.transtats.bts.gov/HomeDrillChart.asp. Beginning in 2014, only 14 air carriers will be required to report airline on-time data to Bureau of Transportation Statistics.
[30]Data available at: http://www.transtats.bts.gov/OT_Delay/OT_DelayCause1.asp?pn=1.

Delay Indicators

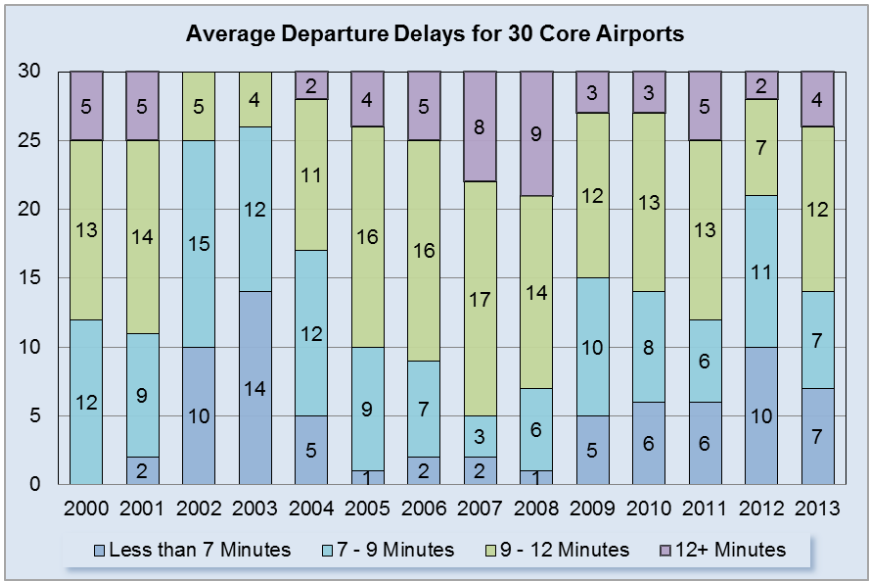
Through the Aviation System Performance Metrics (ASPM) system, FAA tracks delay indicators at the 30 busiest airports, referred to as "core airports,"[31] using reporting from participating airlines. Delays can be measured against the scheduled flight time or against the flight plan. For purposes of this analysis, flight plan data was used.



Source: ASPM. Data available at: https://aspm.faa.gov/aspm/entryASPM.asp

Grouping the core 30 airports according to average arrival delay per operation, there were 17 airports experiencing more than 10 minutes of delay per arrival (e.g., 12 airports with 10 to 14 minutes and 5 with more than 14 minutes) in 2000. In 2007, the number of airports with an average arrival delay of more than 10 minutes had increased to 25. In 2013, the number of airports with more than 10 minutes of delay decreased to 8.

Grouping the core 30 airports according to average departure delay per operation shows that in 2000 there were 18 airports with more than 9 minutes of delay per departure. In 2007, the number of airports with an average departure delay of more than 9 minutes increased to 25. In 2013, the number of airports with more than 9 minutes of delay decreased to 16.



Source: ASPM. Data available at: https://aspm.faa.gov/aspm/entryASPM.asp

[31]The FAA has identified those airports with the greatest impact on system performance as "core airports." These core airports have more than 1 percent of passenger enplanements or 0.75 percent or more of the total nonmilitary itinerant operations.

Airport Capacity–A National Look

In recognition of delays and congestion detailed above, FAA has developed an ongoing series of reports, known as the Future Airport Capacity Task (FACT), to assess the future capacity of the Nation's airports and metropolitan areas. The FACT was published in June 2004, and an update, FACT2, was published in May 2007.[32] The FACT2 analysis identified a significant number of the Nation's airports and metropolitan areas that may need additional capacity in the future if demand reaches forecast levels.

The systemwide analyses conducted in the FACT are intended to determine which airports have the greatest need for additional capacity. This information helps inform FAA strategies about the timing and need for infrastructure improvements at the national level for Agency planning purposes.

Since FACT2 was published, activity levels and forecasts have changed due to economic conditions and airline restructuring. In addition, new runways have opened, and the operational evolution partnership has been completed. NextGen plans and performance capabilities have also matured. As a result, FAA has been working on FACT3 to reexamine the identification of airports and metropolitan areas that are likely to be constrained in the future, based on information available today.

The FACT3 is being developed in conjunction with airport operators, the MITRE Corporation, and multiple FAA offices, including NextGen and Operations Planning and the Air Traffic Organization's Performance Analysis and Strategy. The scope of the analysis will include surface and gate constraints in addition to runway and airspace operations. Updated delay and performance criteria will be used to identify congested airports. The study will identify airports that are expected to be congested by 2020 or 2030 taking into consideration all anticipated airfield capacity improvements and NextGen procedures and technologies. The FAA completed FACT3 in 2014.

Another ongoing series of reports issued by FAA examines the capacity of the major U.S. airports. Formerly known as the Airport Capacity Benchmarks, an updated report will be published in 2014 as the Airport Capacity Profiles. Capacity, for the purposes of this report, is defined as the hourly throughput of arrivals and departures that an airport's runways are able to sustain during periods of high demand. This is represented as the range between the Air Traffic Control Facility Reported Rates and a model-estimated rate. The 2014 version will update previous versions that were published in 2001 and 2004. The 30 core airports are analyzed, as are 3 additional airports that were identified in the FACT2 as capacity-constrained: Long Beach/Daugherty Field, Oakland International, and John Wayne Airport-Orange County. Information is provided on the facility's layout, annual weather conditions, current operations, and recent and future (2020) improvements. Both air traffic control facility "called rates" and model-estimated hourly throughput rates are shown for the highest capacity configuration that is commonly used during visual, marginal, and instrument conditions. The model used for this report is also used for FACT3 as well as for the NextGen systems analysis evaluations.

[32]The FACT 2 report is available online at: http://www.faa.gov/airports/resources/publications/reports/media/fact_2.pdf.

Alternative Capacity Enhancement Methods

While the construction of new runways and runway extensions can provide substantial improvements to capacity, new technology can also benefit some airports by reducing delays and increasing operational efficiency without substantial capital investment.

Delays can be reduced, in part, by modifying air traffic control procedures or introducing new technologies to improve the flow of aircraft en route and in the terminal area. Changes in air traffic and flight procedures also have an impact on capacity. Airspace design changes, for example, can establish more effective airspace structures and provide better access and improved use of available runways.

Navigation and Access

For many decades, the U.S. system of airports depended on ground-based navigational aids. These systems have become increasingly expensive to install, operate and maintain, and are increasingly viewed as being operationally inflexible compared to more modern satellite-based alternatives. Satellite navigation procedures can improve the efficiency of airport arrivals and departures. For general aviation operators and some regional air carriers, WAAS/LPV approach procedures can provide near Category I minimums. Business jet operators and air carriers are more commonly equipped for area navigation (RNAV) and required navigation performance (RNP), which can support Category I minimums.

As of February 2014, there were 3,907 FAA published localizer performance/LPV approaches for use at U.S. airports. In fact, there were about 1,128 airports without instrument landing systems that have an LPV approach. Tens of thousands of general aviation aircraft are already equipped with global positioning systems, and many thousands also have WAAS because it is an attractive upgrade. The FAA is planning for a reduction in conventional navigation aids during the next decade, as RNAV, RNP, and WAAS/LPV operations provide more cost-effective, flexible routes, and instrument approach procedures. In addition, FAA continues to evaluate Ground Based Augmentation System (GBAS) technology to provide Category II/III capabilities. The GBAS for Category I approaches is approved as a non-Federal installation and is in use at Newark Liberty International and George Bush Intercontinental.

Airports have the key role of discussing with their users the need for new or additional PBN procedures. An airport can request that FAA initiate consideration and design of a new approach procedure. Airports can facilitate the aeronautical survey, obstruction mitigation, and runway lighting actions that may be needed to achieve lower minimums.

The FAA also created an initiative called the Optimization of Airspace and Procedures in the Metroplex. A metroplex is a metropolitan area where multiple airports are located. For example, the southern California metroplex contains more than a dozen general aviation airports within its boundary, as well as major commercial airports such as Los Angeles International and Burbank's Bob Hope. The FAA has identified 13 metroplex areas for studies and improvements aimed at deconflicting arrivals and departures through 2017. So far, metroplex projects are in progress in north Texas and Houston; northern and southern California; Atlanta, Georgia; Charlotte, North Carolina; and Washington, DC. While large commercial airports are the primary beneficiaries

of the airspace efficiency improvements, general aviation airports will also see improved efficiency and access.

Surface Surveillance and Collaborative Decisionmaking

Surface surveillance and management is another key area for improving airport efficiency. At 43 civil airports, FAA uses Airport Surface Detection Equipment, Model X (ASDE-X) or Airport Surface Surveillance Capability (ASSC) to track surface movements to enhance safety and traffic flow, and improve collaborative decisionmaking.

At airports with ASDE-X or ASSC, vehicles that regularly operate in the movement area can be equipped with ADS-B squitters. The squitters broadcast vehicle positions to air traffic control, aircraft equipped with ADS-B, and the airport operations center. Situational awareness and safety is improved, particularly during construction projects and winter weather events.

Guiding aircraft in and out of airports more efficiently is essential for smooth operations. To assist with this, FAA and aviation community collaborators have developed the U.S. Airport Surface Collaborative Decision Making (SCDM) concept of operations. The SCDM leverages real-time data sharing among all surface stakeholders, coupled with highly accurate operational data from flight and airport operators, to better understand and manage demand on the surface.

The SCDM focuses on improved predictions of capacity and demand at individual airports, more frequent updates from airlines on the departure schedules for each of their flights, information sharing so all stakeholders are aware of an impending imbalance between capacity and demand, and imposition of queue management when such an imbalance is imminent.

The FAA is continuing to develop and mature SCDM, with the first operational use expected around 2016.

Data Communications

Data Communications (Data Comm) is a component of NextGen that will, in the near-term, improve departure efficiency and reduce departure delays, especially those due to ground delays, airport configuration, and convective weather events. Data Comm will enhance the Tower Data Link Services system to enable the delivery of departure clearances (DCL) and clearance revisions to aircraft.

Currently Pre-departure Clearances (PDC) are issued from controllers to airline Air Operations Centers (AOC) and then sent to the flight deck. Additionally, revisions to PDCs may not be sent within 30 minutes of push-back meaning any revisions within that timeframe have to be communicated via voice.

Data Comm will improve departure operations efficiency by delivering digital clearances directly from the controller to the flight deck, with a copy to the AOCs. The DCLs can be issued anytime up to actual take-off, greatly improving surface efficiency during times when numerous revised clearances need to be issued (i.e., recovery following ground delay programs). The Data Comm DCL capability will be available at 56 of the busiest airports in the contiguous United States starting in 2016.

Improved Closely Spaced Parallel Runway Operations

The FAA is evaluating several approaches to improving arrival and departure procedures at airports with multiple or closely spaced runways, which may give airports greater design flexibility. The goal is to reduce the separation between aircraft as they approach closely spaced parallel runways, which will improve the arrival capacity on those runways especially during poor visibility conditions. To that end, analyses of independent and dependent runway standards are ongoing.

For many years, the lateral separation standard for independent arrivals required that runways be spaced 4,300 feet or more apart. In August 2013, FAA made a determination that lateral runway separation could be safely reduced and made effective a revised separation standard of 3,600 feet for independent arrivals. Additionally, an ongoing analysis of dependent approaches looks to reduce the current 1.5 nautical miles (nm) staggered separation for approaches to parallel runways spaced 2,500 feet or more apart, up to the independent runway separation standard.

Today, there are 16 parallel runway pairs (at eight airports) spaced less than 2,500 feet apart that are authorized for 1.5 nm dependent staggered approaches per FAA Order 7110.308, 1.5-Nautical Mile Dependent Approaches to Parallel Runways Spaced Less Than 2,500 Feet Apart. Work will continue through 2015 to authorize additional runway pairs, at additional airports, for this procedure. The FAA is also planning to reduce dependent staggered separation behind heavy aircraft (capable of takeoff weights greater than 255,000 pounds) and Boeing 757 aircraft operating on closely spaced parallel runways using instrument flight rules.

Congestion Management

Congestion management is a broad term that includes a number of imposed administrative measures (e.g., slots, which limit the number of flights that may be scheduled) to reduce congestion and delay and allocate constrained capacity. Airport operators may seek to reduce congestion through revenue neutral peak hour pricing to encourage airlines to move operations to a less congested time or secondary airport.[33] Another congestion management technique is using the International Air Transport Association (IATA) guidelines for schedule facilitated airports, in accordance with the Worldwide Scheduling Guidelines. An IATA Level 2 designation enables FAA to request all U.S. and foreign air carriers to report to FAA their proposed scheduled operations for the schedule facilitated airport, which allows FAA to closely monitor the traffic levels and prevent excessive scheduling and delays at that facility. This is not a common practice in the United States and has only been utilized at about six U.S. airports. However, FAA has successfully implemented this congestion management technique at selected airports (e.g., San Francisco International and Chicago O'Hare International).

The FAA recognizes the importance of airports specifically and the aviation industry generally as a major economic engine at the local, regional and national level. Airports need to be both environmentally and economically sustainable. However, there are a small number of airports where demand consistently exceeds capacity and causes delays for the entire system, and where it is not immediately clear whether capacity increases are readily achievable. In such locations, other short-

[33] DOT Policy Regarding Airport Rates and Charges, 73 Federal Register 40434 (July 14, 2008); see also, *Air Transport Association of America* v. *U.S. Department of Transportation*, 613 F.3d 206, C.A.D.C (July 13, 2010) (No. 08-1293) denying petition for review of policy.

and long-term solutions may be needed to address congestion by managing and allocating access in a fair and competitive manner.

New York Metro Area

With persistent demand for New York area airspace and the limited ability to expand capacity, FAA is presented with a challenge of how best to allocate scarce runway capacity. For decades, FAA managed congestion at LaGuardia and John F. Kennedy International airports through the High Density Rule (HDR). However, Congress mandated the expiration of the HDR at both airports on January 1, 2007. To minimize congestion at LaGuardia, John F. Kennedy International, and Newark Liberty International after the expiration of the HDR, FAA put temporary orders in place at all three New York metropolitan airports that cap scheduled operations. The orders have been extended until October 29, 2016.

The New York Area Program Integration Office was established to integrate the implementation of delay-reduction initiatives in the New York metropolitan area. It leads a matrix team with representatives from the FAA's Air Traffic, Aviation Safety, Airports, and Aviation Policy, International Affairs and Environment offices. The team has developed an Integrated Master Schedule and Delay Reduction Plan with all delay reduction initiatives and supporting projects.

The Port Authority of New York and New Jersey has a number of ongoing and planned projects to better serve passengers and improve operational efficiency at its system of airports. The Port Authority operates LaGuardia, John F. Kennedy International, Newark Liberty International, Stewart International, Teterboro, and Atlantic City International airports. The Port Authority also continues to evaluate ways to accommodate future demand for air travel in the New York metropolitan area. An ongoing study is analyzing a range of alternatives and will identify a subset of alternatives for further evaluation.

Chicago O'Hare International Airport

The FAA also continues to monitor congestion and delay at Chicago O'Hare International, although the airport is no longer operating under a regulatory limit on scheduled operations. The previous congestion management rule expired on October 31, 2008, in conjunction with the opening of the first new O'Hare Modernization Program runway in November 2008. However, in order to monitor traffic and delay levels, FAA has maintained Chicago O'Hare as an IATA Level 2 schedule facilitated airport. As a Level 2 airport, FAA obtains advance schedule information from U.S. and foreign air carriers, which will enable FAA to identify and work with the carriers to voluntarily mitigate excessive scheduling and delays.

San Francisco International Airport

In 2011, FAA designated San Francisco International Airport as an IATA Level 2 airport in order to mitigate existing congestion and expected increased congestion due to RSA construction work. Under the IATA Level 2 process, beginning with the summer 2012 scheduling season, airlines operating or planning to operate flights submit planned schedules for the upcoming season. The FAA reviews the aggregate of planned schedules and determines whether they may cause significant congestion and delays in light of operational constraints and works with airlines to voluntarily adjust schedules to mitigate congestion and delay impact, as necessary. The FAA will reevaluate the IATA

Level 2 designation for San Francisco International Airport following the completion of the construction at the airport.

Research – Capacity

Through the ACRP, FAA is supporting research to provide better airport planning and design guidance. Two recent studies have been completed related to capacity:

- ACRP 03-17, Evaluating Airfield Capacity, developed a guidebook to assist airport planners with airfield and airspace capacity evaluation. The guidebook presents capacity modeling guidelines that will improve the decisionmaking process for determining the appropriate level of modeling sophistication for a given study or project and improve consistency among airports.
- ACRP 03-20, Defining and Measuring Aircraft Delay and Airport Capacity Thresholds, describes the various types of aircraft/flight delays and how these are calculated through existing major delay metrics.

The FAA is using the results of both projects to update AC 150/5060-5, Airport Capacity and Delay.

ENVIRONMENTAL (RELATES TO LIVABLE COMMUNITIES AND ENVIRONMENTAL SUSTAINABILITY)

Community concern about environmental issues can impact both expansion and operation of existing airports. Environmental constraints also increase the difficulty of developing new airports. The problem is particularly serious in metropolitan areas where there is high aviation demand and also strong pressure to develop residential and other incompatible land uses near airports. In addition, airports in large metropolitan areas are frequently located in air quality nonattainment areas. Historically, communities have been concerned about noise levels, but they are also concerned about air quality, water pollution, and, most recently, climate change.

Airports will be better neighbors as NextGen evolves. New flight procedures such as optimized profile descent arrivals (OPDs) allow aircraft to descend in the shortest route and at a minimum power setting, thereby reducing fuel consumption and emissions. New airframe and engine technologies and the development of renewable sustainable fuels will also improve noise, air quality, and greenhouse gas emissions.

Air Quality

Many of the Nation's airports are located in air quality nonattainment or maintenance areas. Air quality improvements in these areas are accomplished through State Implementation Plans, which provide controls and measures to meet health-based National Ambient Air Quality Standards under the Clean Air Act. The FAA provides financial support for airport air quality mitigation through the AIP and PFC Program.

The FAA encourages early airport actions to reduce local emissions through the Voluntary Airport Low Emissions (VALE) Program. The goal of the VALE Program is to reduce air pollutants at commercial service airports. It is designed to provide airport sponsors with financial and regulatory incentives to stimulate early investment in proven low-emission airport technologies, including alternative fuel vehicles, and low-emission infrastructure, such preconditioned air and electrical

power for aircraft at the gate. The VALE Program was established in FY 2005, and to date, FAA has invested approximately $133 million in AIP funds in 66 VALE projects at 34 commercial service airports.

The FAA Modernization and Reform Act of 2012 (Public Law 112-95) authorized FAA to establish a new emission-reduction pilot program. The Zero-Emission Airport Vehicles and Infrastructure Pilot Program allows FAA to award AIP funds for the acquisition and operation of zero-emission vehicles (ZEVs) and supporting infrastructure at commercial service and general aviation airports.

Sponsors of airports can obtain AIP funding to procure ZEVs. Any public-use airport in the NPIAS is eligible to receive consideration for AIP funding under the ZEV Pilot Program, although (per the Statute) priority will be given to airports located in the U.S. Environmental Protection Agency (EPA) designated air quality nonattainment areas. To meet ZEV standards, the vehicle must produce zero exhaust of any criteria pollutant (or pollutant precursor).

In addition, the FAA has developed enhanced aircraft arrival capabilities that will decrease aircraft fuel consumption, thereby reducing costs and emissions. The FAA has completed 251 Standard Terminal Arrival Routes with OPD capability. Traditional arrival procedures have multiple segments of level flight during descent and each step-down requires a change in power settings. OPD procedures enable arrival aircraft to descend from cruise altitude to final approach at or near idle power with few, if any, level-offs. Because aircraft can use lower and steady power settings, OPD procedures result in reduced fuel burn and lower aircraft exhaust emissions. Another type of efficient arrival procedure is the tailored arrival (TA), which provides fuel, emissions, and noise benefits similar to those of OPDs. TAs are now operational at Miami International, San Francisco International, and Los Angeles International, with additional use being considered at Ted Stevens Anchorage International and two Air Force bases.

Water Quality

Many of the Nation's airports are found near waterways and wetlands because when airports were originally built, the best available land suitable for an airport (flat and inexpensive) was found near water. Today, many airport activities have the potential to cause adverse water quality impacts if they are not properly designed and managed. In particular, airport construction activities and seasonal anti-icing/deicing operations are major concerns. Airport construction activities could cause sediment-laden runoff to enter waterways. Biological and chemical breakdown of deicing chemicals in airport runoff can cause dissolved oxygen demands on receiving waters. Additives in deicing chemicals may be toxic to aquatic life.

For years, FAA has worked with EPA, airport operators, airlines, and industry groups to address various water quality issues. Most recently, FAA consulted with EPA during the rulemaking process to help establish reasonable effluent limit guidelines for airport deicing activities. The final rule was published in the Federal Register on May 16, 2012. Since the publication of the 2012 rule, FAA has continued to work with airport sponsors and airlines in the search for alternatives to glycol-based aircraft deicing chemicals. Currently, industry groups are working on a voluntary pollution reduction program for aircraft deicing fluids that was developed during the rulemaking process.

This is a 5-year effort (2012–2017) with a phase 1 report to be published September 30, 2014. This will address information exchange and outreach, technology development and deployment, pollution reduction goals, and the environmental benefits of pollution reduction.

The FAA is also working with airport sponsors, industry associations, and other Federal agencies to ensure water quality mitigation does not create or improve habitats that attract wildlife and birds that are hazardous to aviation safety. The FAA also continues to participate in ACRP projects administered by the TRB:

- ACRP 02-32, Understanding Microbial Biofilms in Receiving Waters Impacted by Airport Deicing Activities (publication expected in 2014);
- ACRP 09-08, Preparing Guidance on Balancing Airport Stormwater and Wildlife Hazard Management: Analysis Tools and Guidance;
- ACRP 02-39, Preparing a Report on Applying Whole Effluent Toxicity Testing to Airport Deicing Runoff;
- ACRP 02-29, Guidance for Treatment of Deicing-Impacted Airport Stormwater (Report 99, published January 2014);
- ACRP 02-14, Guidebook for Selecting Methods to Monitor Airport and Aircraft Deicing Materials (Report 72, published August 2012); and
- ACRP 02-19, Winter Design Storm Factors for Airport Stormwater Management (Report 81, published December 2012).

Airport Sustainability Efforts

The FAA continues to work closely with aviation stakeholders to promote sustainable airport development. Airport sustainability efforts include:

- Cooperative Research – The FAA has continued work with ACRP on sustainability research. Previous studies included a synthesis report on airport sustainability practices completed in 2008. Ongoing research includes the development of a sustainability decision tool and enhancements to the Sustainable Aviation Guidance Alliance (SAGA) database. The SAGA database was created by industry stakeholders to provide information on airport sustainability practices. Future research projects include a study on the effectiveness and lessons learned from comprehensive airport sustainability plans. This research began in FY 2014.
- Airport Sustainability Planning – The FAA continues to support airports that are preparing comprehensive airport sustainability plans.[34]
- Airport Recycling and Emissions Reductions – In FY 2013, FAA worked with ACRP to complete research on recycling strategies for the airport industry in coordination with industry groups. The FAA is using input from stakeholders to develop additional guidance on developing airport recycling and waste minimization programs.

[34] For further information please visit the Web site: http://www.faa.gov/airports/environmental/sustainability.

Environmental Streamlining

The FAA continues to address airport-related impacts on noise, air quality, and other environmental concerns. In doing so, it complies with many Federal laws, executive orders, and regulations. The FAA's authorizing statute requires FAA to streamline (i.e., improve efficiency and effectiveness) its environmental review of capacity projects at congested airports. The statute also requires FAA to conduct streamlined environmental reviews for Administrator-designated safety or security projects at any airport. Further, FAA streamlines its environmental review of any airport project the U.S. Secretary of Transportation chooses for "expedited processing" under Executive Order 13274, Environmental Stewardship and Transportation Infrastructure Project Reviews.[35]

Environmental Research

The FAA-funded ACRP is examining areas of airport-related environmental concerns and advancing the science and technology necessary for creating an environmentally friendly airport system. The FAA's ACRP efforts are focusing on:

- Airport-related hazardous air pollutants and greenhouse gasses;
- The impact of airports on climate change and community noise;
- Developing alternative aviation fuels;
- Developing advanced noise and air emissions models;
- Promoting airport sustainability;
- Land use compatibility;
- Environmental management systems; and
- Integrating airport development and environmental review processes.

Since 2005, FAA has allocated $86 million toward an array of aviation design, construction, operation, and environmental research projects. In each fiscal year from 2010 through 2013, $15 million was provided for ACRP research, including $5 million specifically for environmental research.

The FAA's Office of Environment and Energy has a Research and Development Program that supports science and technology necessary for creating an environmentally friendly airport system. The program helps to:

- Reduce significant community noise and air quality emissions impacts in absolute terms;
- Limit or reduce the impact of aviation greenhouse gas emissions on global climate (including the rate of fuel burn);
- Improve energy efficiency (including air traffic operations and alternative fuels development); and
- Proactively address other environmental issues.

[35] Executive Order 13274 was issued in the Federal Register on September 18, 2002, and has not been revoked. See http://www.gpo.gov/fdsys/pkg/WCPD-2002-09-23/pdf/WCPD-2002-09-23-Pg1577.pdf.

The program is also designed to better quantify aircraft noise and emissions and their environmental impacts, develop cost-beneficial impact mitigation options, and to develop ways for improving energy efficiency and alternate fuel sources.

Environmental Management Systems at Airports

AC 150/5050-8, Environmental Management Systems for Airport Sponsors, provides guidance to airport sponsors wanting to develop Environmental Management Systems (EMS).[36] It also provides guidance to airport sponsors on the needed parts of an EMS. An EMS is a management framework based on the Plan-Do-Check-Act model. It helps organizations that adopt an EMS to balance environmental performance with business objectives through a process of continual improvement. It has resulted in significant savings and cost avoidance for many organizations, including airport sponsors. Sponsors of large and medium hub airports can obtain AIP funding to assist in developing an EMS.[37]

Livable Communities

The DOT's Livability Initiative is intended to improve the quality of life in communities where coordinated transportation, housing, and commercial development give people access to affordable and environmentally sustainable transportations. This initiative is intended to show how DOT will pursue coordinated, place-based policies and investments that increase transportation choices and access to public transportation services for all Americans. Two strategic objectives for livable communities have been established :

- Expand convenient, safe, and affordable transportation choices for all users by directing federal investments in infrastructure towards projects that more efficiently meet transportation, land use, and economic development goals developed through integrated planning approaches.
- Ensure Federal transportation investments benefit all users by emphasizing greater public engagement, fairness, equity, and accessibility in transportation investment plans, policy guidance, and programs.

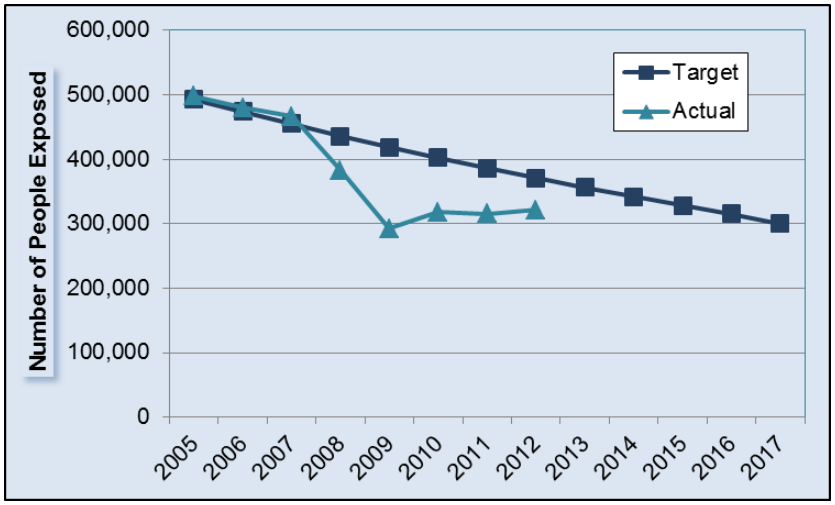
The FAA supports this initiative through the many environmental and sustainability programs described above. The FAA also encourages the review of ground access in master planning and expansion of public transit connections to airports. Public transit connections to airports are discussed later in the Surface Accessibility section.

Noise

The noise situation around airports has improved dramatically since 1976.[38] At that time, an estimated seven million people living near airports in the United States were exposed to significant

[36] AC 150/5050-8 is available online at: http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5050-8.
[37] Program Guidance Letter 07-06 is available online at: http://www.faa.gov/airports/aip/guidance_letters/.
[38] In 1976, DOT published its Aviation Noise Abatement Policy, which provided a course of action for reducing aviation noise impact. The principles contained in that document and subsequent legislative and regulatory action have resulted in a dramatic reduction in the number of Americans adversely exposed to aviation noise. An excerpt of that policy is available online at: http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/planning_toolkit/.

levels of aircraft noise.[39] That number has decreased over time. It is estimated that the number of people in the United States living in areas adjacent to airports with noise levels above the day-night average sound level (DNL) of 65 decibels (dB) has decreased from approximately 498,000 in CY 2005 to 321,000 in CY 2012.



This reduction in the population exposed to significant aircraft noise is primarily due to reductions in aircraft source noise and the phase out of older Stage 1 and 2 aircraft over 75,000 pounds. In February 2013, the ICAO's Committee on Aviation Environmental Protection agreed on a new noise standard for subsonic jet airplanes. This new noise standard ensures the latest available noise reduction technology is incorporated into new aircraft designs after that date. To help ensure continued noise reductions, FAA and stakeholders are developing and implementing operational procedures that could reduce noise from today's fleet as well as to develop quieter aircraft technology through the FAA's Continuous Lower Emissions, Energy, and Noise Program, which could lower the noise from tomorrow's fleet of aircraft.

The FAA established a noise exposure performance target in 1997 to reduce the number of people in the United States exposed to aircraft noise by 1 percent per year. This target was updated in 2007 to reduce the number of people living in areas incompatible with aircraft noise by 4 percent per year. In 2010, FAA established 2005 as the baseline against which to measure the FAA's noise reduction goal. In 2011, FAA set an additional target to reduce the number of people living in areas of significant aircraft noise to 300,000 by 2018. This target is aligned with the 4-percent reduction per year that FAA has been working toward. The FAA is currently exceeding the per annum performance targets and is expected to stay below the 2011 target in the near term, but steps may be needed in the future if FAA is to reach the 2018 target. These steps may include new aircraft and engine technology and operational improvements.

The FAA's part 150 program,[40] established under the Aviation Safety and Noise Abatement Act of 1979 (recodified at title 49 U.S.C., section 47501, *et. seq*.), helps airport operators develop comprehensive noise and land use compatibility programs. Entrance into the part 150 program is voluntary for airport operators and includes development of NEMs, which identify land uses that are incompatible with airport noise, and NCPs, which develop measures to reduce airport-related noise impacts in the community. NEMs are also required for an airport that enters the part 150 program. The airport operator uses NEMs to evaluate current noise impacts and future incompatible

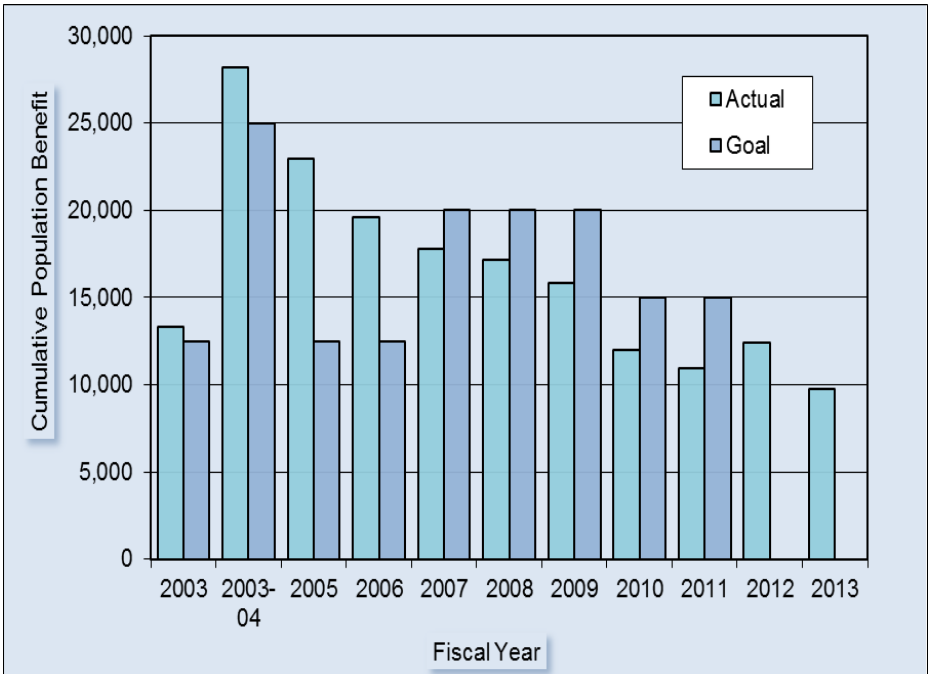
[39] Defined as DNL of 65 dB or higher in title 14 CFR, part 150, section 7, and Appendix A (Table 1) for residential land uses.
[40] Title 14 CFR, part 150, Airport Noise Compatibility Planning.

development. The FAA determines whether the airport operator has prepared NEMs in accordance with part 150. After active and direct participation of affected parties, the airport operator can then submit an NCP outlining mitigation measures to improve noise and land use compatibility. Once an airport has entered the part 150 program, there are requirements to keep the NEMs and NCPs up to date related to the impact of noise on incompatible land uses.

At the end of FY 2013, there were 275 airports participating in the part 150 program, and 256 had NCPs approved by FAA. In addition to first-time NCP approvals, FAA has approved 140 updates to these programs. An FAA-approved NCP allows an airport to seek Federal aid from the AIP noise set-aside for noise mitigation projects.[41] Since 1982, 256 airports have received grants for part 150 studies, and over $5.93 billion have been granted for airport noise compatibility projects. Besides AIP funding, airports have collected and used PFCs for noise mitigation totaling nearly $3.42 billion.

Over the past 35 years, considerable effort has been expended to provide relief to noise-impacted areas by funding noise mitigation projects under the AIP. Noise mitigation projects include residential and public building sound insulation, land acquisition, and relocating residents from noise-impacted areas. Noise compatibility efforts also promote preventive measures such as comprehensive planning, zoning, subdivision ordinances, building codes, and real-estate disclosure. In addition, airports have acquired noise-monitoring equipment and installed noise barriers to reduce ground run-up noise.

The FAA has had an annual performance measure for the AIP noise set-aside program since it was established in FY 2003. The intent of the performance measure is to reduce the population exposed to significant levels (DNL of 65 dB or greater) of aircraft noise. In FYs 2003 and 2004, this measure tracked only resident population benefiting from noise funding. In FY 2005, this was expanded to include student populations. Resident benefits are tracked when the airport provides funding (with



*FY2012: Goal of 50 percent of noise impacted homes located in significantly noise impacted areas in large, medium, and small hub airports.
FY 2013: There was not a business plan goal.

[41] Certain noise projects to benefit schools and medical facilities and mitigations in an approved Final Environmental Impact Statement can be federally funded without an approved NCP.

AIP assistance) for either sound insulation or relocation from the areas of significant airport noise. Student benefits are tracked when the airport provides funding (with AIP assistance) for noise insulation of schools or school relocation. Each year, the Office of Airports' Business Plan establishes a target reduction for resident and student populations. Slightly more than 30,000 residents and students have benefitted from noise funding in FYs 2010 and 2011.

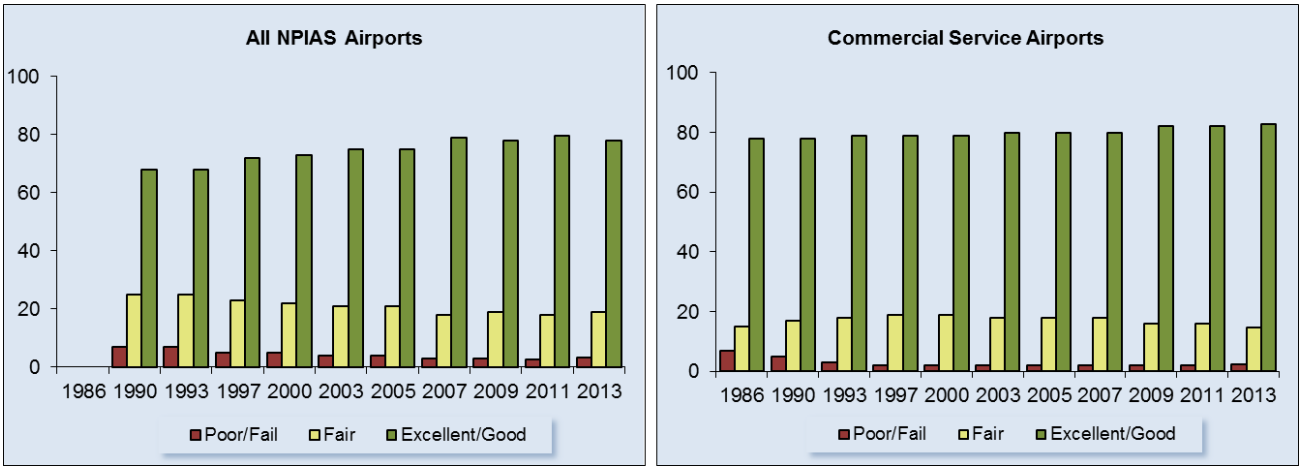
RUNWAY PAVEMENT CONDITION (RELATES TO STATE OF GOOD REPAIR)

Airfield pavement needs regular preventive maintenance to seal cracks and repair damage, increasing the time between major rehabilitation cycles. More significant rehabilitation may be needed on a 15- to 25-year cycle to remedy the effects of age, use, and exposure. Runway pavement in a state of good maintenance minimizes damage to aircraft and avoids unnecessary higher costs for major rehabilitation (e.g., full-depth reconstruction).

As part of airport inspections, FAA updates airport master records for public-use airports and reports the results through the Airport Safety Data Program. Runway pavement conditions are classified as excellent (no visible deterioration), good (all cracks and joints sealed), fair (mild surface cracking, unsealed joints, some slab edge spalling), poor (large open cracks, slab surface and edge spalling, vegetation growing through cracks and joints), or failed (widespread, severe cracking with raveling and deterioration).

The FAA's performance goal is to ensure that not less than 93 percent of runways at airports in the NPIAS are maintained in excellent, good, or fair condition. Data for FY 2013 indicates that 97.5 percent of runways at NPIAS airports are rated excellent, good, or fair, and 2.5 percent are rated poor or failed. Pavements at commercial service airports are better, with 98 percent of the runways rated excellent, good, or fair, and 2 percent rated poor or failed. The figures below show the percentage of runways reported in excellent/good, fair, and poor/failed condition at NPIAS and commercial service airports over the last 25 years.

Figure 1: Runway Pavement Condition (2013)[42]



[42] Runway pavement condition data from 1993, 1997, and 1999 through 2013.

In an effort to ensure that pavement receives the optimum level of maintenance, Congress authorized FAA to permit the use of AIP grants for routine pavement maintenance at nonhub airports. [43] In order for an eligible sponsor to receive an AIP grant for pavement maintenance, the sponsor must be unable to fund maintenance with its own resources and must implement an effective pavement maintenance management program.

Pavement Research

Research has been integral to the FAA's ability to achieve performance goals for runway pavement conditions. Several concentrated pavement-related research programs help address the continued need to improve FAA airport design, construction, and maintenance standards. The majority of pavement research is conducted at the FAA's William J. Hughes Technical Center (Tech Center) in Atlantic City, New Jersey. The Tech Center houses the National Airport Pavement Test Facility (NAPTF), a 1,200-foot building with 900 feet of full-scale airport test pavement. The NAPTF allows FAA and industry to validate new design standards for existing and proposed multiple wheel landing gear configurations.

To augment the research being performed inside the NAPTF, a new facility, the High Temperature Pavement Test Facility, is under construction and scheduled to open in the Summer 2015. The facility will house the newly acquired Heavy Vehicle Simulator–Airport Model to provide increased capacity for performing full-scale accelerated pavement tests.

AC 150/5320-6, Airport Pavement Design and Evaluation, is the FAA standard for airport pavement structural design and has found application worldwide. The AC includes state-of-the-art interactive pavement design software; incorporating results from full-scale tests conducted at the NAPTF as well as other industry research.[44] Enhancements to the design software continue. In FY 2014, FAA will update the AC and accompanying software to include updated design models for asphalt and concrete pavement types based on the most recent series of full-scale test, advances in computational models, and updates to aircraft libraries.

Significant ongoing research based at the Tech Center is aimed at doubling pavement design life for large-hub runways from the current 20-year standard to 40 years. This research and development effort recognizes that extending pavement useful life is a complex problem combining improved, more durable pavement materials, rational pavement maintenance strategies, and better performance prediction models based on collection and analysis of real airport pavement performance data. The goal of this research is to identify strategies to minimize the amount of time that runways are not available for use due to major pavement maintenance and rehabilitation. By extending the time between major rehabilitation of runways, this will reduce the amount of associated aviation system delays and contribute to long-term cost savings.

[43] Congress authorized pavement maintenance at nonhub airports under title 49 U.S.C., sections 47102(3)(H) and 47105(e).
[44] The AC and design programs are available online at: http://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentNumber/150_5320-6.

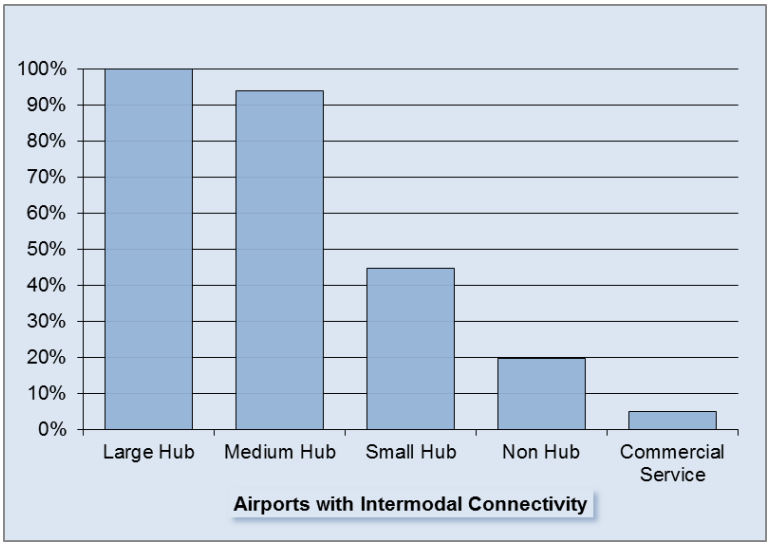
Other research is conducted through FAA-funded Centers of Excellence located throughout the United States.[45]

SURFACE ACCESSIBILITY (RELATES TO LIVABLE COMMUNITIES AND ECONOMIC COMPETITIVENESS)

Airports are generally located to make air transportation as convenient and accessible as possible. The 2010 Census, extrapolated to 2013, reveals that 70 percent of the current U.S. population of 312.8 million people lives within 20 miles of a primary airport. When general aviation airports are also included, 98.5 percent of the population lives within 20 miles of a NPIAS airport.

An important component of the DOT Quality of Life Communities Initiative is to enhance transportation choices for users. Providing public transportation to airports is a means of meeting this goal. Statistics for major airports in the United States indicate an important, but limited, role of public transportation in airport access. The Intermodal Passenger Connectivity database [46] includes information on more than 7,000 passenger transportation terminals and available intermodal connections.

Data collected from 2007 to mid-2012 indicates that on average 29 percent of commercial service airports are served by another scheduled public transportation mode, predominately transit bus (city-wide or metropolitan area buses). However, when looked at by airport hub type, the airports with higher passenger traffic were more likely to have two or more other transport modes. Every large hub airport has at least one transportation mode other than driving a private vehicle. Ninety-four percent of the medium hubs, 45 percent of the small hubs, and 14 percent of the nonhubs and commercial service airports have at least one public transportation mode service the airport.



[45] More information about the Centers of Excellence is available at: http://www.faa.gov/go/coe.
[46] Research and Innovative Technology Administration, Bureau of Transportation Statistics, Intermodal Passenger Connectivity database at: http://www.transtats.bts.gov/DatabaseInfo.asp?DB_ID=640&DB_URL=Subject_ID=3&Subject_Desc=Passenger%20Travel&Mode_ID2=0.

An increasingly popular transportation mode has been the addition of linking commercial service airports with public rail transit services. Table 4 provides a list of these U.S. airports and the type of rail service. Nationwide, air and rail transit are linked at 28 busy airports, including 5 airports served by more than 1 rail mode. Current plans include the extension of rail to Denver International (2016 opening), Bart-Oakland International (2014 opening heavy rail connection), Washington-Dulles International (2018 opening), and Honolulu International (entire 20-mile system to be open in 2019). This will reduce travel time by providing direct links to the airport and reduce traffic delays incurred by automobiles and buses. Airports are eligible to fund the dedicated on-airport (and airport-owned) portions of transit links through PFCs.

Table 4: Airports Served by Rail*

City	Airport	Service
Anchorage	Ted Stevens Anchorage Int'l	Intercity (Amtrak)
Atlanta	Hartsfield-Jackson Atlanta Int'l	Heavy Rail
Boston	General Edward Lawrence Logan Int'l	Heavy Rail
Chicago	Chicago O'Hare Int'l	Commuter and Heavy Rail
Chicago	Chicago Midway Int'l	Heavy Rail
Cleveland	Cleveland-Hopkins Int'l	Heavy Rail
Dallas-Ft. Worth	Dallas-Ft. Worth Int'l	Commuter Rail
Dallas	Dallas Love Field	Commuter Rail
Ft. Lauderdale	Ft. Lauderdale/Hollywood Int'l	Commuter Rail
Los Angeles	Los Angeles Int'l	Light Rail
Burbank-Glendale-Pasadena	Bob Hope Airport	Intercity and Commuter Rail
Miami	Miami Int'l	Commuter and Heavy Rail
Minneapolis-St. Paul	Minneapolis-St. Paul Int'l	Light Rail
Milwaukee	General Mitchell Int'l	Intercity (Amtrak)
New York City	JFK Int'l	Heavy Rail
New York City	Newark Liberty Int'l	Intercity and Commuter
Philadelphia	Philadelphia Int'l	Commuter Rail
Phoenix	Phoenix Sky Harbor Int'l	Light Rail
Portland	Portland Int'l	Light Rail
Providence	Theodore Francis Green State Airport	Commuter Rail
San Francisco	San Francisco Int'l	Heavy Rail
Oakland	Metropolitan Oakland Int'l	Intercity
Salt Lake City	Salt Lake City Int'l	Light Rail
Seattle	Seattle-Tacoma Int'l	Light Rail
South Bend	South Bend Airport	Commuter Rail
St. Louis	St. Louis Lambert Int'l	Light Rail
Baltimore	Baltimore-Washington Int'l	Intercity, Commuter, and Light Rail
Washington	Ronald Reagan Washington National Airport	Heavy Rail

*Some direct rail connections require a bus, people mover, or other connection to the airport.

The link between the airport and surface/ground transportation modes is important. Airports must always be considered critical elements of the total transportation system. The FAA developed the

document Best Practices–Surface Access to Airports to assist airport sponsors in planning and developing effective surface transportation to airports including public transportation.[47] This document links to the following ground transportation planning documents: Intermodal Ground Access to Airports: A Planning Guide, Improving Public Transportation Access to Large Airports, and Strategies for Improving Public Transportation Access to Large Airports. ACRP Report 40, Airport Curbside and Terminal Area Roadway Operations, also provides modeling tools to assist airports in planning for terminal curb and access roadway capacity enhancements based upon a level of service concept.

The ACRP has initiated a related project, ACRP 03-23, Integrating Aviation and Passenger Rail Planning. The objectives of this research are to:

1. provide guidance to airport and rail operators, State and regional transportation planners, elected officials, and interested stakeholders that identifies planning process options, funding challenges, and potential actions; and
2. develop methods and tools necessary to improve integration of rail services with airports, particularly in congested corridors.

A modeling tool for integrating planning for air and rail services is currently under development as a part of this study. The study is expected to be completed in July 2014.

FINANCIAL PERFORMANCE (RELATES TO ECONOMIC COMPETITIVENESS)

The NPIAS airports are owned and operated by thousands of State and local agencies, and a few private owners, making compiling comprehensive data on the financial operations of all 3,328 existing NPIAS airports difficult. However, FAA requires commercial service airports, currently 514 of the NPIAS airports, to report financial data annually, including revenue and expense information. Since the remaining 2,814 NPIAS airports, mostly general aviation, are not required to report financial information, there is limited financial data available for general aviation airports.

The FAA uses data provided by the commercial service airports on FAA Form 5100-127, Operating and Financial Summary, for each fiscal year to evaluate the financial performance of the airports. Data collected in these forms includes the following:

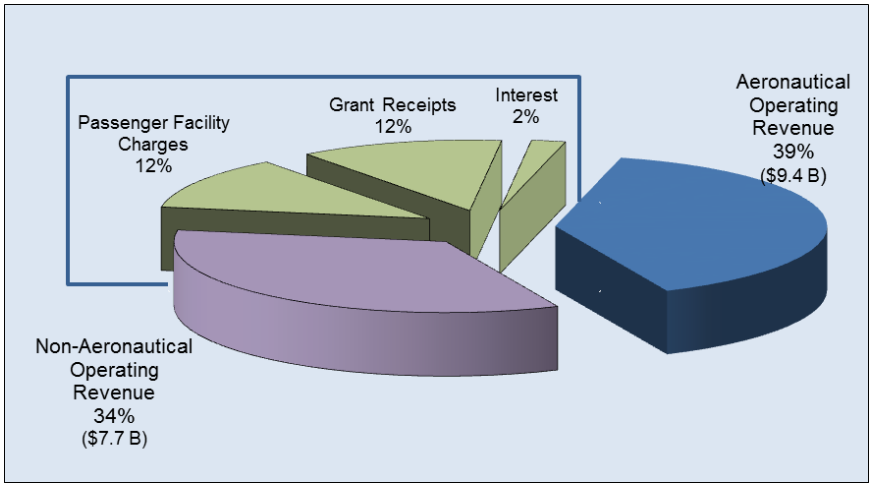
- Aeronautical and nonaeronautical revenues;
- Operating and nonoperating expenses;
- Beginning and ending balances for net assets; and
- Operating statistics.

Total airport revenues for 525 commercial service airports[48] were reported to be nearly $23 billion in 2012. Total airport operating revenue, which includes both aeronautical and nonaeronautical

[47] Best Practices-Surface Access to Airports issued in 2006 is available online at: http://www.faa.gov/airports/resources/publications/reports/media/bulletin_1_surface_access_best_practices.pdf.

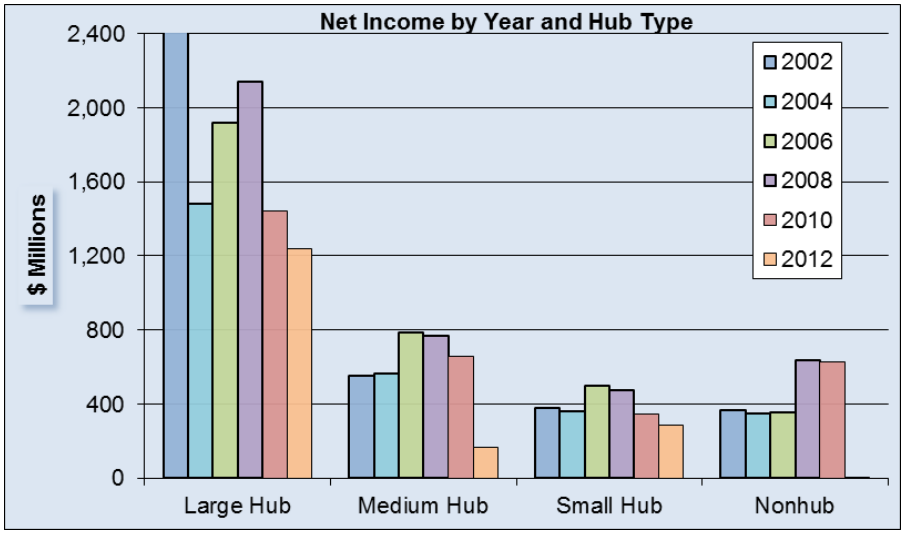
[48] Airport classification for fiscal year financial filing is based on the passenger activity in the preceding calendar year; i.e., an airport classified as commercial service in CY 2012 must file a report for its 2013 fiscal year.

revenue, totaled $17.2 billion (73 percent). Aeronautical operating revenue includes revenue from landing fees; rent from terminals, hangars, and tie downs; fuel sales; and other fees; it accounted for $9.4 billion (39 percent). Nonaeronautical operating revenue includes fees from parking and rental car operations, concessions, and retail operations; it accounted for $7.7 billion (34 percent). Nonoperating revenue from interest, grants, and passenger facility fees totaled $5.4 billion (27 percent), which includes $2.7 billion from PFCs, $2.3 billion from grants, and $311 million in interest income. PFC revenue is approximately 14 percent of large hub airport revenue, 12 percent of medium hub airport revenue, and 10 percent of revenues at small hub airports.

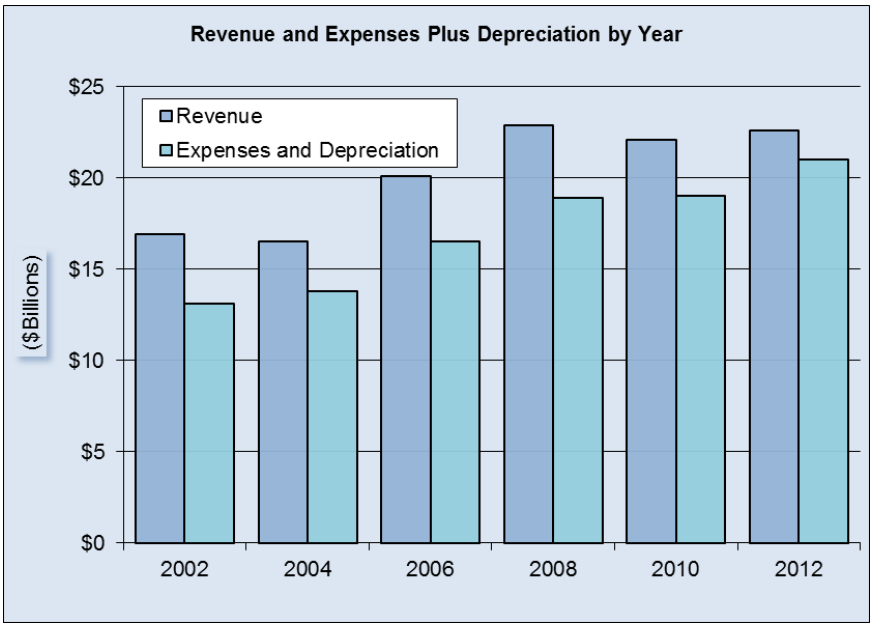


The costs of airport operations and maintenance are a function of the age of the facilities and the nature of airline activity and other operations. Total operating expenses from personnel compensation and benefits, communications and utilities, supplies and materials, contractual services, insurance, and other totaled $11.2 (77 percent) billion. Total nonoperating expenses from interest expense totaled $3.3 billion (24 percent).

There is considerable variation in net income by hub type and year with large hubs accounting for 73 percent of the net income reported in 2012. There is also variation in revenue sources and expenditures among airports. For example, concessions, rental car, and parking revenues are 26 percent of total revenues for large hub airports, 31 percent of revenues for medium hub airports, 30 percent for small hub airports, and 12 percent for nonhub primary and nonprimary commercial service airports. Table 5 on the next page provides a summary of 2012 revenue and expenses by hub type.



The financial status of the Nation's air carrier airports is stable, with airports carefully managing operating, financing, and capital expenses. Airports are moving to shorter-term airline lease agreements in order to more efficiently control their assets and provide opportunities for competitive airline service. Airline lease agreements provide a measure of service and revenue stability. Airports have the ability to diversify and maximize revenue from concessions and other assets allowing greater revenue diversity and growth. Between 2002 and 2012, the total airport revenue and expenses reported for commercial service airports increased. In 2002, the total revenue at commercial service airports was $4.73 billion more than total expenses (including depreciation). In 2012, the total revenue at commercial service airports was $1.69 billion more than total expenses (including depreciation). Over time, expenses are increasing faster than revenues which has led many airports in every category to seek opportunities to increase nonaeronautical revenues.



Commercial service airports have several sources to fund airport development projects, including bond proceeds, PFCs, airport-generated funds (landing and terminal fees and parking, aviation fuel, and concessions revenues), and tenant and third-party financing as well as Federal, State, and local grants. A majority of the development projects at major U.S. airports are funded through the capital markets, most commonly through airport revenue bonds. Bond ratings range from B at the low end to AA at the high end. Airports with more economic and financial strength and diversity tend to achieve higher ratings, while smaller airports tend to be rated lower.

Capital markets evaluate the creditworthiness of an airport based on several factors. These factors include the demand for air service in the region, the type of passenger demand (originating versus transferring), the number of commercial airports in the region, and the quantity and quality of service provided by the airlines. The overall creditworthiness of U.S. airports as a group remains strong. However, continuing fuel price volatility could force airlines to further reduce capacity, which affects airports indirectly.

Large and medium hub airports typically have had strong credit ratings, and this is not expected to change in the study timeframe. Nonhub primary and nonprimary commercial service airports have more limited incomes and generally do not have such robust operating surpluses to repay borrowed funds. As a result, smaller airports tend to rely more heavily on grants than larger airports to finance capital improvements.

Table 5: Airport Operating and Financial Summary 2012 ($ millions)

Category	30 Large Hub	35 Medium Hub	72 Small Hub	329 Nonhub	466 Total
Aeronautical Operating Revenue					
Aeronautical Operating Revenue					
Landing Fees	$2,329	$ 613	$189	$ 83	$3,214
Terminal Rents	3,096	686	234	90	4,106
Cargo and Hangar Rentals	403	103	55	71	632
Fixed-Base Operator Revenue	87	37	35	49	208
Apron Charges/Tie Downs	73	50	23	7	153
Fuel Sales and Taxes	182	43	32	92	349
Other Aeronautical Fees	628	73	41	67	809
Total Aeronautical Operating Revenue	***$6,798***	***$1,605***	***$609***	***$459***	***$9,471***
Nonaeronautical Operating Revenue					
Parking and Rental Car	$2,821	$1,125	$578	$200	$4,724
Concessions	938	117	57	12	1,124
Terminal Rents	314	43	25	9	391
Land Rental and Nonterminal	275	98	88	111	572
Other Nonaeronautical Fees	648	103	75	95	921
Total Nonaeronautical Operating Revenue	***$4,996***	***$1,486***	***$823***	***$427***	***$7,732***
Nonoperating Revenue					
Passenger Facility Charges	$ 1,990	$ 482	$ 211	$ 80	$ 2,763
Grant Receipts	754	358	424	771	2,307
Interest	248	40	14	9	311
Other	107	43	20	96	52
Total Nonoperating Revenue	***$ 2,885***	***$ 923***	***$ 669***	***$ 956***	***$ 5,433***
TOTAL REVENUE	**$14,679**	**$4,014**	**$2,101**	**$1,842**	**$22,636**
Operating Expenses					
Personnel Compensation and Benefits	$2,826	$ 832	$ 470	$370	$ 4,498
Contractual Services	2,502	664	241	189	3,596
Communications and Utilities	670	184	100	74	1,028
Supplies and Materials	288	106	69	69	532
Insurance, Claims, and Settlements	144	38	25	25	232
Other	902	171	111	99	1,283
Total Operating Expenses	***$7,332***	***$1,995***	***$1,016***	***$826***	***$11,169***
Nonoperating Expenses					
Interest Expense	$2,478	$595	$166	$75	$3,314
Other	0	0	0	0	0
Total Nonoperating Expenses	***$2,478***	***$595***	***$166***	***$75***	***$3,314***
TOTAL EXPENSES	**$9,810**	**$2,590**	**$1,182**	**$901**	**$14,483**
Depreciation	$3,631	$1,259	$634	$935	$6,459
NET INCOME	**$1,238**	**$165**	**$285**	**$6**	**$1,694**
Other Information					
Capital Expenditures	$ 5,854	$ 1,251	$ 983	$ 61	$ 9,049
Bond Proceeds	6,182	1,226	295	96	7,799
Sale of Property, Contributed Capital, Other	236	107	85	98	526
Reporting Year Debt Payments	6,818	1,897	550	225	9,490
Indebtedness at End of Year	$64,888	$13,464	$3,603	$2,037	$83,992

Source: Data collected by FAA on FAA Form 5100-127 (Operating and Financial Summary) for fiscal years ending in 2012 (as of February 2014). Compliance Activity Tracking System, http://cats.airports.faa.gov/. Numbers may not add exactly due to rounding.

Note: *Beginning in 2012, approximately 89 State of Alaska airports (mostly nonhubs) were consolidated into one reporting entity and are captured in the Form 5100 data as a "large" hub airport.*

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CHAPTER 3: AVIATION FORECASTS

OVERVIEW

There are several major factors that impact airport development requirements. One of the largest factors affecting airport facility requirements and the future pattern of capital investment is the demand for air transportation.

The FAA uses a comprehensive process to guide future airfield development. It includes airport master planning, FAA airspace studies, environmental analysis and documentation, airfield modeling, and delay analysis, as well as benefit-cost analyses for larger capacity projects. Airfield simulation models are employed to estimate the level of delay associated with current and forecast operations for both the existing airfield and for planned improvements.

Forecasts of future levels of aviation activity, which typically are part of an airport master plan, are the basis for airport planning decisions. These projections are used to determine the need and timing for new or expanded facilities.

The FAA issues an annual forecast that is a top-down forecast for aviation activity in the United States for the next 20 years. The national forecast examines current commercial operations (passenger and cargo) and general aviation as well as emerging aircraft operations (e.g., very light jets, light-sport aircraft, and unmanned aircraft systems) and projects current trends. The information contained in the Activity Forecasts section below is from the national forecast.

The FAA also develops a bottom-up forecast, known as the Terminal Area Forecast (TAF).[49] The TAF is the FAA's forecast of aviation activity for all the existing NPIAS airports. These forecasts are prepared to meet the budget and planning needs of FAA and to provide information that may be useful for State and local authorities, the aviation industry, and other stakeholders.

ACTIVITY FORECASTS[50]

Commercial Aviation

The FAA projects that aviation activity will continue to slowly grow over the long term, despite tough economic times. Since 2000, several major events have led to reduced demand for air travel. These events include the terror attacks of September 2001, skyrocketing prices for fuel, debt restructuring in Europe and the United States, and a global recession.

In response to this period of extreme volatility, air carriers have fine-tuned their business models with the aim of minimizing financial losses by lowering operating costs, eliminating unprofitable routes and grounding older, less fuel-efficient aircraft. To increase operating revenues, carriers have

[49] The TAF is available online at: https://aspm.faa.gov/main/taf.asp.
[50] Source: FAA Aerospace Forecasts, FY 2014–2034, issued in March 2014. See http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2014-2034/.

initiated new services that customers are willing to purchase. Carriers have also started charging separately for services that were historically bundled in the price of a ticket. The capacity discipline exhibited by carriers and their focus on additional revenue streams bolstered the industry to profitability in 2013 for the fourth consecutive year. Going into the next decade, there is cautious optimism that the industry has moved from a boom-to-bust model to one of sustainable profits. The FAA now forecasts one billion passengers will be flown in 2027.

Profitability for U.S. carriers should increase as an improving economy in its fifth year of recovery leads to strengthening demand, which coupled with continuing capacity discipline results in higher fares (and increased ancillary revenues). Over the long term, FAA sees a competitive and profitable aviation industry characterized by increasing demand for air travel and airfares growing more slowly than inflation, reflecting over the long term a growing U.S. economy.

In 2013, system revenue passenger miles increased 1.4 percent as systemwide enplanements increased 0.4 percent. Commercial air carrier domestic enplanements were flat (up 0.1 percent) while international enplanements were up 2.6 percent. The systemwide load factor rose to 83.2 percent (up 0.5 points from 2012). Domestic enplanement market share continued to rise for low-cost carriers, network, and "other" carriers in 2013, while regional carrier share decreased. Domestic low cost carrier enplanement shares increased by 0.1 points to 29.2 percent, while the share of network and "other" carriers rose by 0.5 points to 47.0 percent. The regional carrier share dropped by 0.5 points, to 23.8 percent.

Table 6 summarizes commercial aviation over the 20-year forecast period. International enplanements are forecast to grow at a slightly higher rate than domestic enplanements. Total aircraft operations are expected to grow 1 percent per year, with higher rates of growth among air carriers and lower growth in other categories.

Table 6: U.S. Aviation Activity Forecasts

	FY 2013[1]	FY 2034	Annual Growth
Enplanements (millions)			
Domestic	654.3	961.90	1.90%
International	85.1	187.60	3.80%
Total	**739.3**	**1,149.50**	**2.10%**
Aircraft Operations (thousands) [2]			
Air Carrier	12,776.00	22,110.40	2.60%
Commuter/Air Taxi	8,803.60	8,570.30	-0.10%
General Aviation	25,808.90	28,699.80	0.50%
Military	2,552.20	2,551.90	0.00%
Total	**49,940.70**	**61,932.40**	**1.00%**
Air Cargo Revenue Ton Miles (millions)			
Domestic	12,375.20	16,400.50	1.40%
International	22,437.20	64,591.10	5.20%
Total	**34,812.40**	**80,991.60**	**4.10%**
Active Aircraft			
Piston-Powered	137,965	126,865	-0.40%
Turbine-Powered	22,085	36,420	2.40%
Rotorcraft	10,385	17,895	2.60%
Light-Sport	2,110	4,880	4.10%
Experimental/Other	30,320	39,640	1.28%
Total	**202,865**	**225,700**	**0.50%**

Source: FAA Aerospace Forecasts, FY 2014–2034, issued in March 2014. See http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2014-2034/

[1] Estimated.

[2] At 516 FAA and contract towers.

Cargo

Air cargo (domestic and international freight/express and mail) is moved in the bellies of passenger aircraft and in dedicated all-cargo aircraft. Cargo carriers face price competition from alternative shipping modes such as trucks, container ships, and rail cars.

Air cargo is very important to the U.S. economy, as illustrated by the fact that 27 percent of exports and 22 percent of imports measured by value in 2013 were shipped by air (see Figure 2).[51] In 2010, the President established the National Export Initiative[52] to enhance and coordinate Federal efforts to facilitate the creation of jobs in the United States through the promotion of exports. The goal of this initiative is to improve conditions that directly affect the private sector's ability to export by working

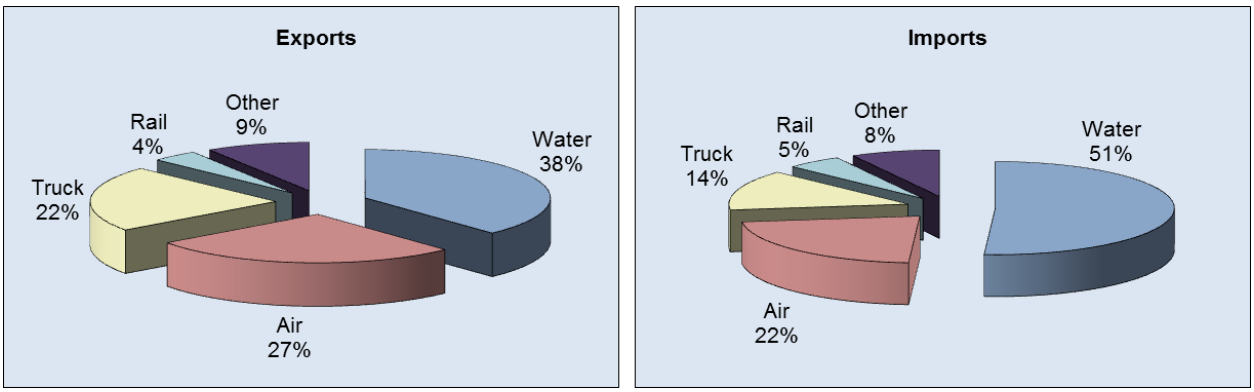
[51] Air, water, and total – U.S. Department of Commerce, U.S. Census Bureau, Foreign Trade Division, FT920 U.S. Merchandise Trade: Selected Highlights, December 2013, available at: http://www.census.gov/foreign-trade/Press-Release/ft920_index.html, as of February 6, 2014. Truck, rail, and pipeline – U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, Transborder Freight data, available at: http://www.bts.gov/programs/international/transborder/, as of December 2013.

[52] Executive Order 13534, National Export Initiative, was issued on March 11, 2010. See http://www.archives.gov/federal-register/executive-orders/2010.html.

to remove trade barriers abroad, by helping firms overcome the hurdles to entering new export markets, by assisting with financing, and by pursuing a Governmentwide approach to export advocacy abroad. Additional information on this important national initiative, which brings together resources from across the U.S. Government to assist American businesses in planning their international sales strategies and succeed in today's global marketplace, can be found at: http://export.gov/.

Air transportation is the preferred mode for the shipment of high-value, lightweight, and perishable goods.[53] In 2012, 7 of the 20 busiest international freight gateways (seaports, land ports, and airports) by value of shipment were airports.[54] Lower shipping costs and more frequent service have made air cargo a major factor in the way global business is conducted.

Figure 2: Value of U.S. International Merchandise Exported and Imported by Mode 2013



Air cargo is generally concentrated at busy commercial service airports. The majority of air cargo flights usually occurs during off-peak periods and do not substantially contribute to airport congestion and delay problems. The principal need for airport development to support cargo operations is related to cargo sorting and transfer facilities developed by the package express carriers. These airports must have high-capacity, all-weather runway systems to support reliable operations.

General Aviation

The FAA forecasts the fleet[55] and hours flown for single-engine piston aircraft, multiengine piston, turboprops, turbojets, piston and turbine-powered rotorcraft, light-sport, experimental, and "other" (which consists of gliders and lighter than air vehicles).

The U.S. general aviation manufacturing sector improved in CY 2013 for every segment, except for business jets. An increase in aircraft deliveries was especially robust for the agricultural airplane portion of turboprops, rotorcraft, and multi-engine piston aircraft. Total piston aircraft shipments by U.S. manufacturers were up by 6.5 percent over CY 2012. This includes a 4.5-percent increase in

[53] Air cargo accounts for less than 1 percent of imports and exports by weight.
[54] Source - U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, National Transportation Statistics, table 1-52, available at: www.bts.gov as of January 2014.
[55] The FAA forecasts active aircraft only. An active aircraft is one that flies at least 1 hour during the year.

single-engine piston shipments and a 27-percent increase in the smaller multi-engine category. Turbine aircraft shipments (turboprop and business jets) by U.S. manufacturers increased by 6.3 percent. This growth is mostly due to a 13.8-percent increase in turboprop shipments, as the decline of business jet shipments continued at a smaller rate of 3.7 percent. General aviation activity at FAA and contract tower airports recorded a 1.2-percent decline in 2013, which was caused by a decrease in itinerant activity; local operations were slightly up (0.7 percent) compared to the previous year.

While the general aviation industry saw moderate to modest growth, the slow economic recovery and economic uncertainties continued to impact the turbojet deliveries. Based on figures released by the General Aviation Manufacturers Association (GAMA),[56] U.S. manufacturers of general aviation aircraft delivered an estimated 1,615 aircraft in CY 2013, 6.4 percent more than in CY 2012. This translates into the third year of increased shipments. Overall piston deliveries increased by 6.5 percent, with single-engine deliveries up 4.5 percent and the much smaller multiengine category up 27 percent. In the turbine categories, turbojet deliveries fell by 3.7 percent. While turboprops were up by 13.8 percent (a substantial portion of these deliveries were for the export market). U.S. billings in CY 2013 totaled $11.1 billion, up 38.1 percent compared with 2012, and were driven by deliveries of more advanced models.

Total piston aircraft deliveries, which were near 2,000 in CY 2000, reached their highest in two decades by 2006 with nearly 2,300 aircraft, and then went down with the recession to stabilize after 2009 at 700 to 800 aircraft a year. Turboprop deliveries, which were around 300 in 2000 fell below 200 by 2003 and then continued to increase, came near 400 by 2011 and exceeded 500 in 2013 with an increase in the agricultural aircraft manufacturing in recent years. Turbojet deliveries were close to 600 in 2000. After a decline below 400 in 2003, they reached their all-time peak in 2008 with 955 aircraft. Then, deliveries declined sharply with the recession and stabilized around mid- to low-300s after 2010.

Fractional Ownership[57]

An important factor in business jet operations is fractionally owned aircraft. The concept of fractional ownership is where corporations or individuals purchase an interest in an aircraft (which can be as little as one sixteenth) and pay a fixed fee for operations and maintenance. Delivery of aircraft for these programs flourished until 2009. The recession has impacted the number of fractional share owners and aircraft. In 2013, the number of share owners and aircraft decreased for the fifth year. Table 7 summarizes fractional shares and number of aircraft between 2001 and 2013.

[56] GAMA data is available online at: https://speednews.com/gama-deliveries.
[57] The Fractional Ownership Final Rule, title 14 CFR, part 91, subpart K, was published in 2003. Prior to that date, fractional ownership operations were conducted under basic part 91 requirements.

Table 7: Fractional Shares and Number of Aircraft in Use

Year	Number of Shares	Number of Aircraft
2001	3,415	696
2002	4,098	776
2003	4,516	826
2004	4,765	865
2005	4,691	949
2006	4,863	984
2007	5,168	1,030
2008	5,179	1,094
2009	4,881	1,037
2010	4,862	1,027
2011	4,677	920
2012	4,350	905
2013	4,365	869

Source: GAMA 2013 General Aviation Statistical Databook and 2014 Industry Outlook
http://www.gama.aero/files/GAMA%202013%20Databook-Updated-LowRes.pdf

Very Light Jets or Microjets

Delivery of smaller affordable business jets (also referred to as very light jets (VLJs) or microjets) began in 2007. The VLJs are able to operate at smaller airports with shorter runways (runway lengths of 3,000 to 3,500 feet), thereby improving access to the national airspace system for rural areas and less-populated urban areas. The lower acquisition and operating costs of VLJs were believed at one time to have the potential to revolutionize the business jet market, particularly by being able to sustain a true on-demand air taxi service. However, VLJs used in air taxi service may require longer runway lengths due to title 14 CFR, part 135.385, requirements.

While initial forecasts called for over 400 aircraft to be delivered a year, events such as the recession along with the bankruptcies of Eclipse Aerospace[58] (a significant manufacturer) and DayJet (the largest on-demand air taxi service) have led FAA to temper more recent forecasts. The worldwide delivery of VLJs was modest in 2013 with 77 VLJs delivered.

Light-Sport Aircraft

The final rule for sport aircraft, which went into effect on September 1, 2004, established a new light-sport aircraft category and allowed aircraft manufacturers to build and sell completed aircraft without obtaining type and production certificates. Instead, aircraft manufacturers will build to industry consensus standards. This reduces development costs and subsequent aircraft acquisition costs. This new category places specific conditions on the design of the aircraft to limit them to "slow (less than 120 knots maximum) and simple" performance aircraft. New pilot training times are reduced and offer more flexibility in the type of aircraft the pilot would be allowed to operate. Viewed by many within the general aviation industry as a revolutionary change in the regulation of recreational aircraft, this rule has increased use of and access to general aviation.

[58] Eclipse Aerospace, Inc., has not delivered an aircraft since 2008.

At the end of 2012, an estimated 2,001 active special light-sport aircraft (beginning in 2012, experimental light-sport aircraft were reclassified within the experimental aircraft category, rather than active special light-sport aircraft). The FAA estimates about a 4.1-percent annual growth of the fleet by 2034 to a total of 4,880 light sport aircraft. Hours flown in light-sport aircraft is expected to see a 5.1-percent annual increase, primarily driven by growth in the fleet. The FAA is also projecting an increase in the number of certified sport pilots from 4,824, as of December 31, 2013, to 15,200 at the end of the forecast period.

Unmanned Aircraft Systems

Unmanned Aircraft Systems (UAS) have historically supported military and security operations. However, interest in civil uses (e.g., aerial mapping, crop monitoring, communications, and commercial photography) is growing. The UAS come in a variety of shapes and sizes and serve diverse purposes. They may have a wingspan as large as a Boeing 737 or smaller than a radio-controlled model airplane. Regardless of size, the responsibility to fly safely applies equally to manned and unmanned aircraft operations.

The FAA first authorized use of unmanned aircraft in the national airspace system in 1990. Since then, the Agency has authorized limited use of UAS for important missions in the public interest, such as firefighting, disaster relief, search and rescue, law enforcement, border patrol, military training, testing, and evaluation. Today, UAS perform border and port surveillance by the U.S. Department of Homeland Security, help with scientific research and environmental monitoring by the National Aeronautics and Space Administration and the National Oceanic and Atmospheric Administration, support public safety by law enforcement agencies, help State universities conduct research, and support various other missions for public (government) entities.

Unmanned aircraft are flying now in the national airspace system under very controlled conditions. Operations potentially range from ground level to above 50,000 feet, depending on the specific type of aircraft. However, UAS operations are currently not authorized in Class B airspace, which exists over major urban areas and contains the highest density of manned aircraft in the national airspace system.

There are currently two ways to get FAA approval to operate a UAS. The first is to obtain a Special Airworthiness Certificate in the experimental category for private sector (civil) aircraft to do research and development, training, and flight demonstrations. The second is to obtain a Certificate of Waiver or Authorization for public aircraft. Routine operation of UAS over densely-populated areas is evaluated on a case-by-case basis.

Unlike the manned aircraft industry, the UAS community does not have a set of standardized design specifications for basic UAS design that ensures safe and reliable operation in typical civilian service applications. Ultimately, the pace of integration will be determined by the ability of industry, the user community, and FAA to overcome technical, regulatory, and operational challenges.

In December 2013, FAA chose six UAS research and test site operators across the country to help meet its UAS research needs. In selecting the six test site operators, FAA considered geography, climate, location of ground infrastructure, research needs, airspace use, safety, aviation experience, and risk. In totality, these six test applications achieve cross-country geographic and climatic

diversity and help FAA meet its UAS research needs. These selected operators are the University of Alaska, State of Nevada, Griffiss International Airport in New York, North Dakota Department of Commerce, Texas A&M University-Corpus Christi, and Virginia Polytechnic Institute and State University.

Once the regulatory structure, operation requirements, and industry standards have been established, the commercial UAS markets will develop. Relatively inexpensive UAS systems under 55 pounds are economically viable for a commercial standpoint, and we expect that market demand for UAS will occur within the constraints of the regulatory and airspace requirements. The FAA expects to publish a Notice of Proposed Rulemaking for small UAS in December 2014.

In June 2014, the FAA published a Federal Register notice on its interpretation of the statutory special rules for model aircraft in the FAA Modernization and Reform Act of 2012. The law is clear that the FAA may take enforcement action against model aircraft operators who operate their aircraft in a manner that endangers the safety of the national airspace system. In the notice, the FAA explains that this enforcement authority is designed to protect users of the airspace as well as people and property on the ground.

Once able to legally operate, FAA estimates roughly 7,500 commercial small UAS will be operating at the end of 5 years. This forecast is highly uncertain and is dependent on the regulatory structure finally adopted and the technology and the cost structure of the industry as it evolves. The safe and efficient integration of UAS into the airspace has the potential for broad benefits for virtually all Americans.

Commercial Space Launch Sites

The FAA's Office of Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launches and reentries and the operation of commercial space launch and reentry sites.[59] The AST's mission is to ensure protection of the public, property, and the national security and foreign policy interests of the United States during commercial launch or reentry activities and to encourage, facilitate, and promote U.S. commercial space transportation.

Commercial space transportation generally consists of the launch of payloads or space flight participants into orbit for either commercial or government customers by private, nongovernment entities called launch services providers. Commercial space transportation also covers suborbital launches, where a vehicle containing a payload or space flight participants is launched on a trajectory that briefly goes into space but returns to Earth without going into orbit. The AST also regulates the planned reentry of reentry vehicles from space to Earth.

Vehicles are launched from licensed launch sites, referred to as commercial spaceports. There were 15 FAA-licensed or permitted launches in 2013 and 9 licensed or permitted launches in 2012. In May 2013, FAA and the AST Advisory Committee published their annual global forecast for

[59] Authorized by Executive Order 12465 and title 51 U.S.C., subtitle V, chapter 509 (the Commercial Space Launch Act of 1984 as amended).

commercial launch demand, the 2013 Commercial Space Transportation Forecasts. An average of 31.2 worldwide commercial space launches is forecast each year through 2022.

Eight commercial space launch sites—located in six states (Alaska, California, New Mexico, Oklahoma, Virginia, and Florida)—have received FAA launch site operator licenses. At this time, three licensed launch sites (Mojave Air and Spaceport, California; Clinton-Sherman Oklahoma Spaceport, Oklahoma; and Cecil Field Spaceport, Florida) are colocated with public-use NPIAS airports. These airports have colocated facilities that accommodate both aviation and space operations.

IMPLICATIONS OF FORECASTED ACTIVITY ON AIRPORTS

The FAA's aviation forecast predicts the industry will grow from 739.3 million passengers in FY 2013 to 1.2 billion in 2034. Cumulatively, air traffic growth for U.S. carriers measured by revenue passenger miles is expected to rise by more than 75 percent in the next 20 years. Airport tower operations are expected to increase by 24 percent. Also, the number of aircraft handled at FAA enroute centers is expected to increase by 41 percent.

The average size of domestic aircraft[60] is expected to increase by 1.3 seats in FY 2014 to 126.3 seats. Average seats per aircraft for mainline carriers are projected to increase by 1.2 seats as network carriers continue to reconfigure their domestic fleets. While demand for 70- to 90-seat aircraft continues to increase, we expect the number of 50-seat regional jets in service to fall, increasing the average regional aircraft size in 2014 by 1.4 seats to 57.5 seats per mile. Passenger trip length in domestic markets will decrease by 2.6 miles during the same period.

The long-term outlook for general aviation is favorable even though near-term growth, particularly for the turbojet sector, is projected to be slow. The growth in business aviation demand over the long term continues, driven by a growing U.S. and world economy, especially in the turbojet, turboprop, and turbine rotorcraft markets. As the fleet grows, the number of general aviation hours flown is projected to increase an average of 1.4 percent a year through 2034.

Airlines select airports as major stations, hubs, and/or international gateways for many reasons, including their potential for expansion as well as underlying demand and many other factors. Airport operators are generally willing to provide adequate runway capacity in order to ensure the airlines continue to operate there, rather than seeing operations shift to a competing airport. Much of the additional capacity at transfer hubs is intended for use by commuter and regional airline aircraft, which transport passengers from smaller cities within several hundred miles of the hub. This traffic is expected to grow as regional carriers continue to acquire jet aircraft. The planning and environmental review processes, which must be completed before a new or extended runway can be built, generally take many years to complete and are often controversial. In addition, new runways are not always feasible and alternative methods to increase capacity and reduce delays are being explored (see the Capacity section in chapter 2).

[60] Defined as seats per mile flown and computed by dividing available seat miles by miles flown.

OTHER FACTORS IMPACTING AIRPORTS

Capacity is affected not only by the volume of air transportation but also by the way in which airlines and other users operate. The FAA anticipates that airlines will continue to concentrate their schedules at their primary hubs, where large numbers of flights converge in short periods of time to maximize the opportunity for passenger transfers. No new airline hubs are expected to arise within the next 5 years. Increased point-to-point service, bypassing hubs, is occurring when warranted by market considerations.

Low-cost carriers frequently serve major metropolitan areas by using less-congested, secondary commercial service airports where existing facilities are underutilized. In the past, this occurred in communities where the major hub airport was served by a legacy carrier. More recently, however, secondary airports are becoming a focus where the major hub airport is nearing capacity and is served by low-cost carriers. As an example, Phoenix-Mesa Gateway has regularly scheduled air service even though the major hub airport (Phoenix Sky Harbor International) is already served by low-cost carriers. In some cases, however, service has been initiated at major airports. For example, low-cost carriers now operate a significant number of flights at the major airports in Las Vegas, Phoenix, Los Angeles, St. Louis, Philadelphia, Boston, and New York. This trend, in part, reflects a shift by airport operators toward practices that facilitate airline competition, such as preferential-use (versus exclusive-use) gate leases, short-term (versus long-term) lease and use agreements, adherence to competitive access assurances that are required when an airport uses PFCs to finance airline gates, and other airport business practices reflected in airport competition plans filed with the Office of the Secretary of Transportation and FAA by medium and large hub airports that are dominated by one or two airlines.

The globalization of the airline industry, the rapid growth of air transportation in other parts of the world, and the increased range and flexibility in the size of international aircraft will combine to bring international passengers to more U.S. airports. For example, British Airways began nonstop Boeing 787 service from London (Heathrow) to Austin, Texas (Austin-Bergstrom International), in March 2014, and All Nippon Airways offers nonstop Boeing 787 service from San Jose, California (Mineta San Jose International), to Tokyo, Japan. The effects will vary but may include requirements for longer runways, terminal building expansion, and provision of Federal inspection facilities for immigration, customs, and agriculture at airports where international traffic was previously limited but is now increasing. The increased number of jet aircraft in the general aviation fleet will result in a demand for longer runways at certain general aviation airports, particularly those with substantial use (500 or more annual operations) by business and corporate aircraft.

New Large Aircraft

Airports in the United States are continuing to plan and develop new facilities for the next generation of large aircraft. The Airbus A380 and the Boeing 747-8 require special consideration due to their fuselage length, wingspan, and weight. For example, the Airbus 380's 262-foot wingspan is 37 feet wider than the next largest aircraft, the 80-foot tail height is 16 feet taller than the next tallest aircraft, and the maximum takeoff weight of approximately 1.3 million pounds is 300,000 pounds heavier than the next heaviest aircraft in the fleet. The Boeing 747-8, at 250 feet in length, is 18 feet longer than the Airbus A380. The current distance between parallel taxiways and their runways, the configuration of taxiway systems, and the layout of terminal buildings are affected by the larger

wingspans (A380) and fuselage length (B-747-8). Underlying structures, such as bridges and culverts, will require either reinforcement to accommodate the aircraft's heavier weight or taxiing routes to avoid these structures.

Currently, the A380 is being operated by foreign air carriers into six U.S. airports: Los Angeles International, John F. Kennedy International, Washington Dulles International, George Bush Houston Intercontinental, Hartsfield-Jackson Atlanta International, and Miami International. Up to a total of 12 airports could receive A380 service in the future. Freighter versions are also planned and could serve Ted Stevens Anchorage International. Orders for the B-747-8s are skewed toward freighter versions and international freight operators. Therefore, the potential locations for this aircraft will mirror those airports currently receiving Boeing 747-400 freighter service. More importantly, because its wingspan is smaller than the A380s, the B-747-8 is projected to operate at nearly 24 U.S. airports. The FAA has been working with Boeing to ensure these airports will be able to accommodate the aircraft.

Several airports are undertaking large modernization projects to improve airfield safety and efficiency and to prepare for projected increases in airplane size and passenger activity. Because airports are continuously upgrading terminals and airfields for a variety of reasons, it is difficult to determine exactly how much of those costs are solely attributable to accommodating the new large aircraft. Airports planning to receive service by new large aircraft started their preparations and financial planning for necessary improvements several years ago. Until all improvements can be made, FAA has and will continue to work on a series of procedures and design processes, already in use by Airbus and Boeing, to safely accommodate these aircraft at existing airports.

Airport Privatization

Public-use airports in the United States that are owned and operated by a public agency or a government entity such as a county, city, or State government are eligible for participation in the Airport Privatization Pilot Program. Congress established the Pilot Program (title 49 U.S.C., section 47134) in 1996 to determine if, once certain economic and legal impediments were removed, privatization could produce alternative sources of capital for airport development and provide benefits, such as improvements in customer service. The FAA Modernization and Reform Act of 2012 expanded the Pilot Program from 5 to 10 airports. However, the requirement that the Pilot Program can include no more than one large hub airport and at least one general aviation airport remained unchanged. Public-owned general aviation airports can be leased or sold; public-owned air carrier airports can only be leased.

In February, 2013, FAA approved a 40-year lease of Luis Muñoz Marin International in San Juan, Puerto Rico, from the Puerto Rico Airports Authority (the public sponsor) to Aerostar (a private operator), under the Pilot Program. Currently, Hendry County's Airglades in Clewiston, Florida, has an application under active FAA consideration. Eight slots (including one for a large hub airport) in the Pilot Program are available.[61]

[61] The application procedures and fact sheet are available online at: http://www.faa.gov/airports/airport_compliance/privatization/.

Conversion of Military Surplus Airfields and Civilian Use of Military Airfields

Since 1989, the Base Realignment and Closure (BRAC) Commission has made many military airfields available for conversion to civil aviation use. About 30 surplus military airfields have been converted to civil use by local communities. Most of these military airfields have long runways and associated facilities that can accommodate large civil aircraft. Twelve of the surplus military airfields have become commercial service airports. Two other surplus airfields (Sacramento Mather, California, and Rickenbacker International, Ohio) have significant cargo service. The remaining surplus airfields are in areas where additional general aviation airports are needed.

Even before the establishment of the BRAC, military officials have cooperated with local communities across the country to provide civilian access to military airport facilities. These local arrangements add capacity to the national airport system and maximize public investment dollars by eliminating the duplication of airport facilities in a community for military and civilian activities. There are approximately 23 military installations that also allow civilian aircraft activity.

The U.S. Department of Defense (DOD) has found it advantageous to operate from civilian airfields. Similar to civilian uses on military airfields, military activity at civilian airfields reduces public investments in airport infrastructure by taking advantage of existing civilian airfield capabilities for military purposes. As specified in National Guard Bureau Air National Guard Pamphlet 32-1001, Airport Joint Use Agreements for Military Use of Civilian Airfields, at airports where military units conduct a significant level of activity, DOD enters into an agreement with the local community to pay for costs related to the military use of the airfield. As of 2013, the military has agreements in place with approximately 65 civilian airports.

Other Innovations Affecting Aviation Demand

Efforts are underway to develop transportation and communication technology that may eventually affect the demand for conventional air transportation. High-speed trains are being demonstrated that could attract more passengers to rail in specific markets, and research is underway into magnetic levitation vehicles. Teleconferencing and other electronic communication techniques could affect the demand for business air travel. These innovations may eventually have a significant effect on airport development needs, but this is not expected to occur during the next 5 years.

CHAPTER 4: DEVELOPMENT REQUIREMENTS

CAPITAL PLANNING OVERVIEW

The development needed to provide an adequate national airport system, as shown in this report, is derived from locally prepared airport master plans, airport system plans,[62] capital improvement plans, and airport inspections. These airport planning documents consider all significant aviation requirements and are also tied to the current use and condition of each airport and the forecast increase in activity. Typically, operators of individual airports prepare airport master plans, usually with the assistance of consultants. The FAA field offices review these plans, which follow a standard outline contained in ACs that link development to current and forecast activity. Plans for major development, such as new runways or runway extensions, tend to be controversial, and the planning process provides interested parties with the opportunity to request a public hearing.

Development that is not eligible for Federal AIP funding, or not justified by the aviation activity forecast over the next 5 years, is screened by FAA planners and is not entered into the NPIAS database. The combination of a planning process that links development to activity, an FAA review that culls out unnecessary and ineligible development, and the discussion of controversial proposals at public hearings results in reasonable and well-documented estimates of future airport project requirements. However, the actual timing and cost of development may vary from the airport master plan. For instance, projects may be deferred or developed in phases in order to reduce immediate costs, or conversely, an unexpected rapid increase in activity may justify accelerating certain development.

State system plans are also used as a data source for the NPIAS. The State system plan includes airport locations considered important to State air transportation objectives, as well as those that are of sufficient national interest to be included in the NPIAS. An important function of the State planning process is to identify airports that meet national interest criteria, but which might not be identified as such by FAA alone. These plans play a part in the development of airport role and conditions and performance information. However, aviation system plan recommendations on capital development at individual airports or at a system of airports are usually secondary to master plan information. In these cases, the State or regional system plan identifies broad needs or priorities within its jurisdiction.

The FAA encourages airports to consult with airlines and other user groups about major airport investment programs. Airlines have questioned the scope and timing of specific development proposals, including major new airports, ground access projects, and certain terminal and airfield improvements. The NPIAS generally reflects the airport operator's viewpoint about the scope and schedule for proposed development. If proposals are downsized, rescheduled, or accomplished in phases, development costs could be lower or more protracted.

[62] An airport master plan is a detailed, long-term development plan for an individual airport. Airport system plans (regional and State) study the performance and interaction of an entire aviation system to understand the interrelationships among and between individual airports.

All development projects identified in the NPIAS are eligible for AIP funding; however, the planned development consistently exceeds the funding available from the AIP each year. While all of these 5-year capital estimates are AIP-eligible, some may be funded by other sources, including PFCs or other airport revenue or financing. In allocating AIP funds, FAA must select projects that advance statutory goals as well as DOT and FAA objectives and enhance the national airport system.

Investment decisions are made using structured selection criteria that help identify critical annual development needs within associated AIP funding levels. This annual internal process, known as the Airports Capital Improvement Plan (ACIP), is used by FAA to select projects for AIP funding. The ACIP allows FAA to determine and fund the most critical airport development needs within AIP funding limits set by Congress through the appropriation process. This is accomplished by establishing a process that, among other things, considers factors such as an airport's service level, national priority rating, activity level, and hub status; type of project; and the Agency's goals for safety, capacity, efficiency, security, and infrastructure preservation.

Using this process, FAA is able to distribute funding made available under the AIP. AIP funding falls into two basic categories: apportioned funds (also known as entitlements) and discretionary funds. Entitlement funds (nearly 70 percent or $2.2 billion of the funding available for grants) are apportioned by formulas contained in statute each year to specific airport sponsors, types of airports, or States. The remaining amount of AIP funding (30 percent) is discretionary funding. Of that amount, approximately two-thirds are designated for specific projects or airport types such as airports in the Military Airport Program, noise mitigation, and environmental projects. The FAA requires benefit-cost analysis (BCA) to demonstrate the merit of capacity projects for which airport sponsors are seeking AIP discretionary funds.

The BCAs are required for capacity projects exceeding $10 million in discretionary funds over the life of the project and for projects requesting a letter of intent (LOI)—a multiyear commitment of Federal AIP support for airfield project. Executive Order 12893, Principles for Federal Infrastructure Investments, dated January 26, 1994, provided the impetus for the Office of Airports to develop its benefit-cost evaluation criteria. The BCA is not applicable to other types of AIP projects that are undertaken for the objective of safety, security, noise mitigation, and conformance with FAA standards. The authorizing statute exempts these projects from the BCA process as the underlying value of the type of project has already been subject to economic evaluations required through regulation and ACs.

The assessment of aviation benefits at airports is challenging due to the variation in operational scope between airport types. Large air carrier airports with substantial activity that frequently experience delays can be evaluated based on the benefits to passengers and aircraft operations of reducing or removing these delays. Standard methodologies and values are readily available for use in these assessments. The FAA has also developed delay propagation multipliers to capture downstream benefits of delay reduction associated with capacity AIP projects at 100 commercial service airports. However, only a small number of airports experience significant levels of congestion and delay.

For the majority of airports, other economic benefits must also be assessed. Typically, this is done by assessing the operations of a new aircraft or aircraft class that would be able to use the airport as a

result of the project. While a project may be justified operationally by relatively few operations of a new aircraft or class of aircraft, quantifying the associated benefit of these operations is a challenge. In addition, BCAs cannot consider the mere shift of passengers or operations from one airport to another as a benefit to the system. Many benefits will not be realized until a project is completed and commissioned, which may be years after the BCA was completed. In addition, the benefits may be realized over a 20-year period and may vary from forecast results in the BCA for reasons having nothing to do with the quality of the BCA itself.

While FAA relies on BCA results, among other considerations, in making discretionary funding decisions for capacity projects, the Agency does not generally use BCA results to determine a project's ranking on the AIP discretionary candidate list. Governing legislation for the AIP identifies a number of other factors, such as safety, congestion relief, intermodal connections, quality of the environment, and capacity, for priority consideration. The FAA is exploring the development of methodologies for quantifying these factors in the future. In addition, other projects included in the candidate list are not subject to the BCA requirement.

When required, the airport sponsor conducts a BCA using requirements developed by FAA. The airport sponsor then submits its BCA and supporting documentation to FAA for review and acceptance. Sometimes it is possible for an airport sponsor to conduct a BCA in conjunction with the development of the airport master plan or environmental study. More typically, the airport sponsor conducts a BCA and submits it to FAA prior to requesting AIP discretionary funds for the project.

In general, a BCA must demonstrate the project's benefits outweigh its costs before FAA will consider the project eligible for discretionary funding. This BCA requirement does not apply to reconstruction projects that do not change the operating characteristics of the airport. In addition to providing a BCA, airport sponsors seeking an LOI must meet additional requirements.

While projects requiring a BCA cannot be funded until FAA accepts the BCA, FAA can still include the project in the ACIP for planning purposes. Since the ACIP is a multiyear planning tool, it is possible for a project needing a BCA to be included in the ACIP for future-year funding consideration.

During FYs 2012 and 2013, the Office of Airports continued efforts to improve the BCA process. The first of these efforts was the completion of the AIP Program Guidance Letter 12-01, Revised BCA Guidance, which raised the point at which a BCA is required from $5 million to $10 million in requested AIP discretionary funds.[63] The $5 million threshold amount had remained unchanged for 14 years while the cost of construction rose significantly over that time. The increased threshold established an equivalent level for requiring the BCA for certain capacity projects from what was originally instituted in 1997.

The Office of Airports also collaborated with the Office of Aviation Policy and Planning for new research through the ACRP; ACRP 03-19, Evaluating the Use of Passenger Air Travel for Capital Investment Planning and Benefit-Cost Analyses, will provide additional information to help airports

[63] The Program Guidance Letter, dated October 28, 2011, is available at: http://www.faa.gov/airports/aip/bc_analysis/.

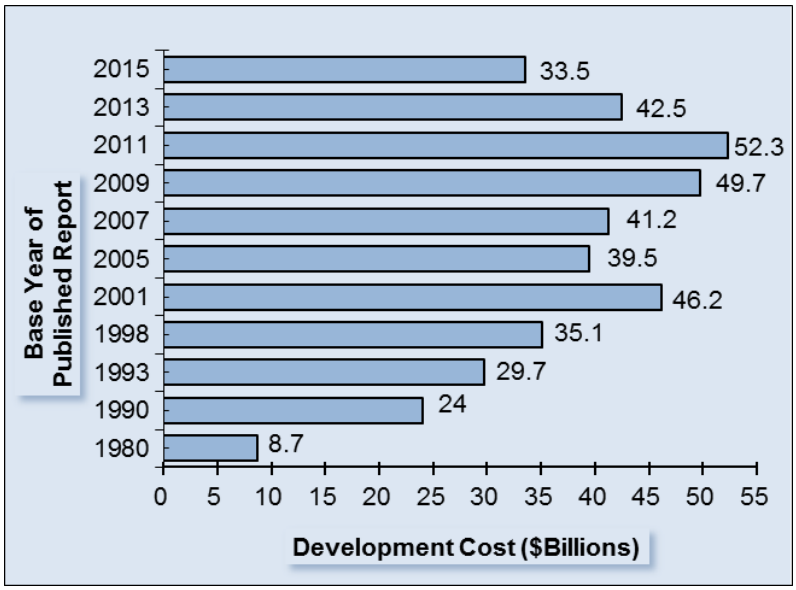
better assess the aviation benefits of capital improvement projects.[64] The research will update the value of time metrics, which are used to help monetize benefits of capacity improvements. In addition, it is intended to improve the application of benefit-cost analysis for airport investment decisionmaking and to do so through a new guidebook for practitioners.

The Office of Airports has also undertaken a comprehensive review of general aviation airports that will include two BCA-related items: guidance for measuring benefits of Federal investment at general aviation and small commercial service airports, and benefit-cost tools for assessing navigation aids, improved approach minima, and weather observing equipment.

In FYs 2012 and 2013, FAA received five new BCAs for proposed capacity improvements at Baltimore/Washington International Thurgood Marshall Airport (BWI); Huntsville International (HSV); Theodore Francis Green International (PVD); Orlando Sanford, Florida; and Grand Marais, Minnesota. In addition, FAA was asked to review the proposed BCA methodologies for proposed capacity improvements at Phoenix Mesa, Arizona, and at three Port Authority of New York and New Jersey airports (LaGuardia, John F. Kennedy International, and Newark International). The FAA completed the reviews for BWI, HSV, and PVD and was satisfied the projects met the benefit-cost criteria and the statutory requirement for discretionary funding.

DEVELOPMENT COSTS

This report reflects the costs associated with capital development projects that are needed from 2015 through 2019 that are AIP eligible and do not have funding sources identified. The 5-year estimates contained in this report ($33.5 billion) are 21 percent lower than those found in the 2013 edition.[65]



This decrease is due to three factors: current economic situation, reduced aviation activity levels, and projects having been completed or funding sources identified. In some cases, a comprehensive review of proposed projects has enabled airport sponsors, State aeronautical agencies, or FAA to conclude that certain AIP-eligible projects will not be needed within the 5-year timeframe of the report.

[64] Information about this research project is available at: http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=2800.
[65] The year shown is the base year for the 5-year calculation (i.e., 2015 identified costs for 2015 to 2019).

In the last 2 years, many airports have deferred planned AIP-eligible projects, either due to slower growth in activity levels that would have warranted the projects or due to financial constraints or other financial priorities (including the need to fund non-AIP eligible projects). Several major development programs were completed or received PFC approval and are therefore no longer included in the NPIAS (e.g., a terminal project at San Francisco International, an in-line baggage system at Seattle-Tacoma International, and a terminal project at Salt Lake City International). Lastly, FAA undertook a comprehensive review of the 19,000 projects at existing and proposed airports in the NPIAS database and adjusted, deferred, or removed approximately 1,600 projects.

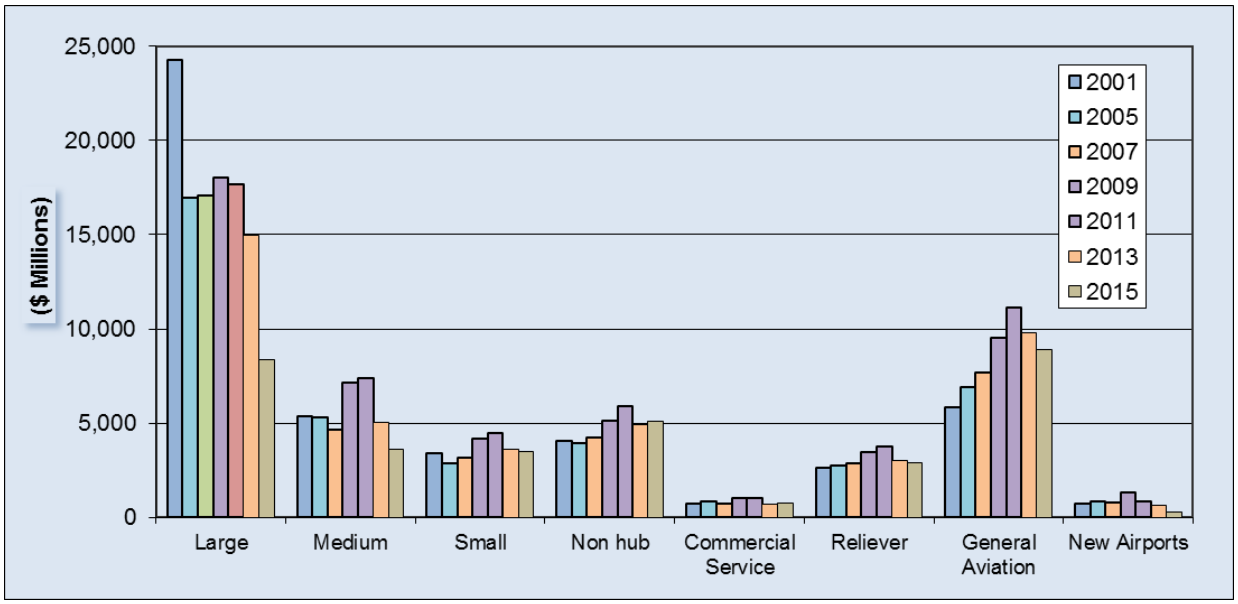
Capital projects are categorized by type of airport and the purpose of the development. There are 10 development purposes and 7 airport types. Development totals by airport type and purpose are shown in Table 8. Costs associated with planning (master plans, regional and State system plans, and environmental studies) are not reflected in Tables 8 through 11 or Appendix A. For the 5-year period covered by this report, planning costs total $363 million with medium hub airports accounting for 61 percent of the total planning cost and general aviation airports accounting for 17 percent.

Table 8: 2015–2019 NPIAS Cost by Airport and Development Category (2013 $millions)

Category	Large	Medium	Small	Nonhub	Nonprimary Commercial Service	Reliever	GA	New Airport/ Helipad	Total	Percent
Safety	$299	$122	$179	$323	$89	$56	$121	$0	$1,189	3.5%
Security	$311	$36	$29	$57	$12	$94	$215	$0	$755	2.3%
Reconstruction	$2,283	$1,573	$1,160	$1,907	$378	$985	$2,771	$0	$11,058	33.0%
Standards	$525	$698	$893	$1,729	$238	$1,369	$5,061	$0	$10,513	31.4%
Environmental	$166	$208	$100	$44	$4	$7	$41	$0	$569	1.7%
Noise	$657	$213	$125	$70	$0	$27	$41	$0	$1,133	3.4%
Capacity	$3,427	$396	$272	$170	$17	$222	$382	$0	$4,886	14.6%
Terminal	$352	$249	$624	$575	$29	$33	$94	$0	$1,954	5.8%
Access	$281	$96	$80	$193	$12	$70	$177	$0	$909	2.7%
Other	$54	$26	$8	$40	$3	$21	$106	$0	$257	0.8%
New Airport	$0	$0	$0	$0	$0	$0	$0	$295	$295	0.9%
Total	**$8,355**	**$3,617**	**$3,471**	**$5,106**	**$782**	**$2,883**	**$9,009**	**$295**	**$33,517**	**100%**
Percentage	**25%**	**11%**	**10%**	**15%**	**2%**	**9%**	**27%**	**1%**	**100%**	**100%**

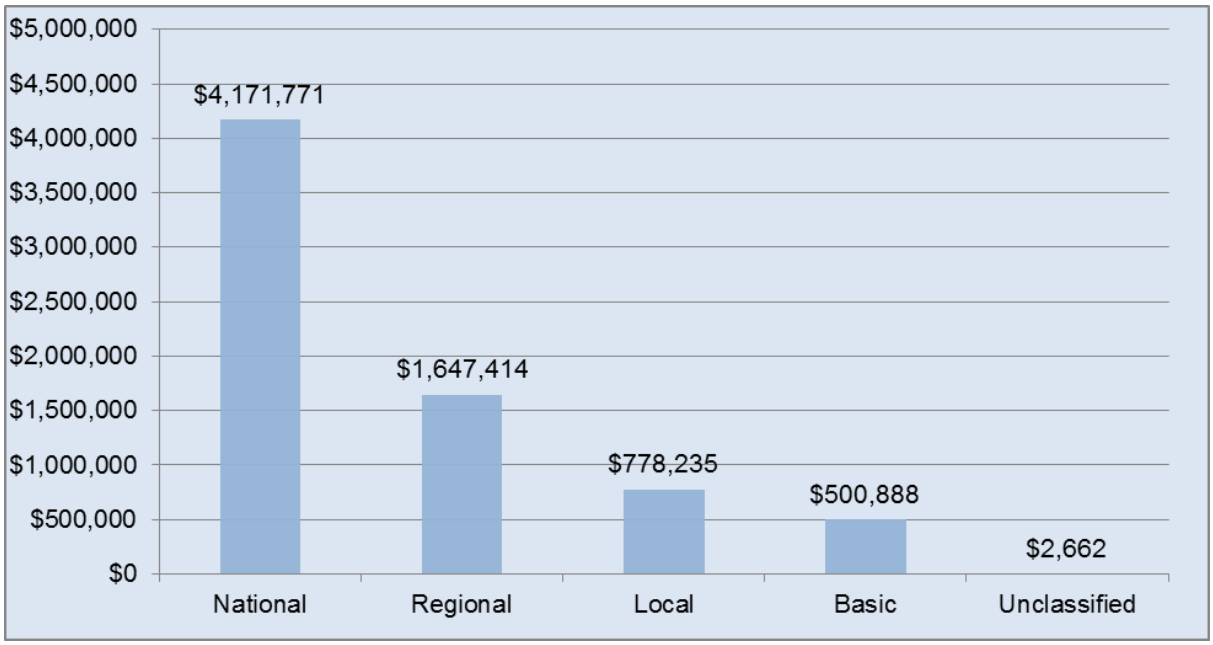
Figure 3 highlights the total AIP-eligible development by airport category since 2001. Every category of airport, except nonhub and nonprimary commercial service, is shown with decreased AIP-eligible development needs over the next 5 years. The most significant decreases were at the large and medium hub airports as well as new airports.

Figure 3: Comparison of 5-Year AIP-Eligible Development Costs by Airport Type Fiscal Years 2001–2015



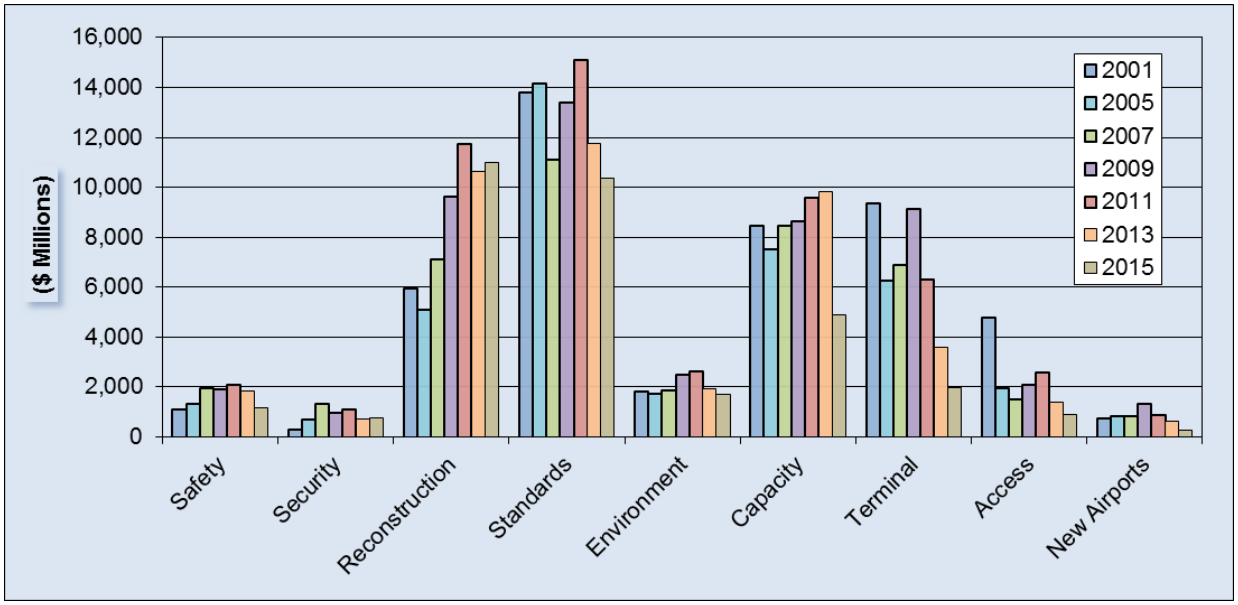
Airports in the new general aviation categories account for $12.7 billion or 38 percent of the total $33.5 billion in AIP-eligible development identified over the next 5 years. Figure 4 compares the average annual development needs for general aviation airports contained in the NPIAS by new category.

Figure 4: Average Annual Development by Nonprimary Airport by Role Fiscal Years 2015–2019



Airport capital development needs are driven by current and forecast traffic, rehabilitation or reconstruction of infrastructure due to use and age of facilities, and changing aircraft technology requiring airports to update or replace equipment and infrastructure. Figure 5 compares the type of needed development identified in the current report to the five previous reports. AIP-eligible development across all categories decreased, except for security and reconstruction, which show 2.4-percent and 3.1-percent increases from the 2013 edition.

Figure 5: Comparison of 5-Year AIP-Eligible Development Costs by Category Fiscal Years 2001–2015



For comparison purposes, the development requirements contained in the previous edition of the NPIAS (2013–2017) are shown below in Table 9.

Table 9: 2013–2017 NPIAS Cost by Airport and Development Category (2011 $millions)

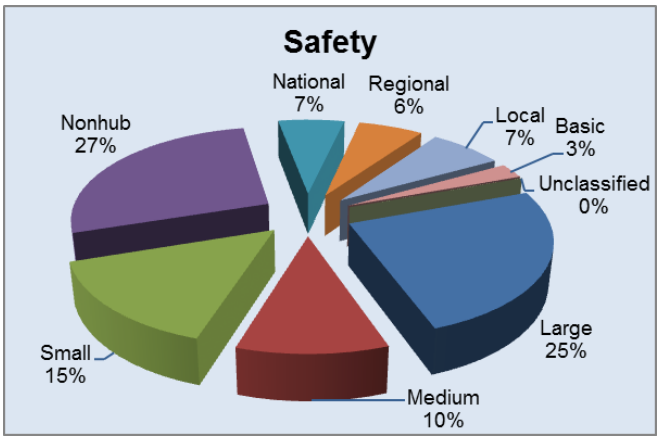
Category	Large	Medium	Small	Nonhub	Nonprimary Commercial Service	Reliever	GA	Total	Percent
Safety	$546	$289	$277	$470	$46	$102	$108	$1,838	4.3%
Security	$287	$29	$48	$57	$14	$54	$247	$736	1.7%
Reconstruction	$2,571	$1,669	$1,124	$1,435	$276	$920	$2,661	$10,656	25.1%
Standards	$622	$792	$1,077	$1,696	$292	$1,499	$5,779	$11,756	27.6%
Environmental	$919	$565	$155	$139	$4	$54	$87	$1,923	4.5%
Capacity	$8,086	$639	$253	$190	$9	$198	$436	$9,811	23.1%
Terminal	$1,583	$536	$522	$718	$17	$63	$132	$3,571	8.4%
Access	$293	$511	$101	$150	$10	$82	$227	$1,374	3.2%
Other	$35	$26	$32	$50	$3	$23	$101	$270	0.6%
New Airport	$0	$0	$0	$0	$0	$0	$0	$610	1.4%
Total	**$14,941**	**$5,055**	**$3,589**	**$4,906**	**$670**	**$2,996**	**$9,777**	**$42,545**	**100%**
Percentage	**35%**	**12%**	**8%**	**12%**	**2%**	**7%**	**23%**	**1%**	**100%**

DEVELOPMENT CATEGORIES

All AIP-eligible projects are categorized based on the principal purpose of the development. Listed below are the 10 development categories, a short description of each, charts illustrating the percentage of development by airport category, and other relevant information.

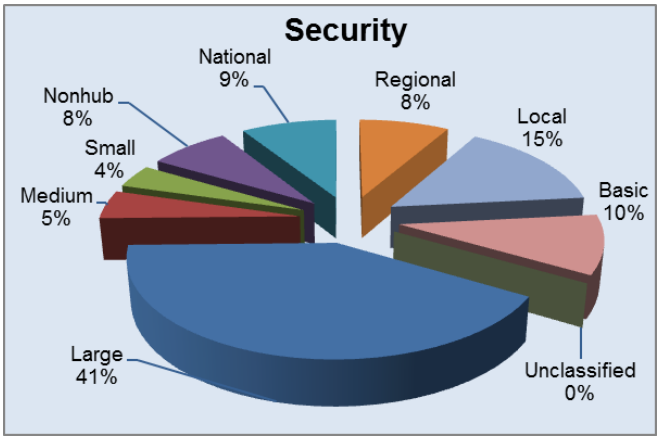
Safety and Security

Safety and security projects include development that is required by Federal regulation, airport certification procedures, or design standards and are intended primarily for the protection of human life. These two categories account for about 6 percent ($1.9 billion) of the funding needs identified in the NPIAS. The FAA gives safety and security development the highest priority to ensure rapid implementation and to achieve the highest possible levels of safety and security.

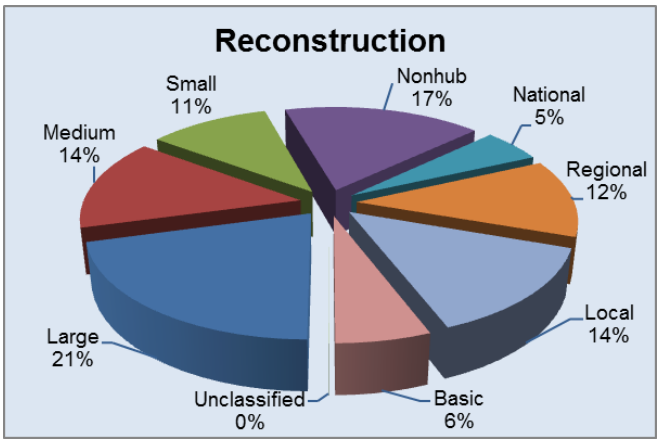


Projects included in the safety category include obstruction lighting and removal, acquisition of aircraft rescue and fire fighting (ARFF) equipment required by part 139, construction or expansion of ARFF buildings, and improvements to RSAs. Safety development totals $1.2 billion, a decrease of $651 million from the last report, largely reflecting the fact that many significant RSA improvements have now been funded and implemented. The 389 primary airports account for 77 percent of the safety projects with large hub airports accounting for 25 percent The 2,942 nonprimary airports account for 23 percent of these projects.

Security projects include security fencing, access control from aircraft movement areas to the terminal, and other security enhancements required by the 14 CFR part 1542 regulation. Security development totals $755 million, an increase of $18 million from the last report. Large hub airports have identified access control systems and other security improvement projects totaling $311 million (41 percent). Nonprimary airports have identified approximately $321 million (42 percent) in perimeter fencing.



Reconstruction

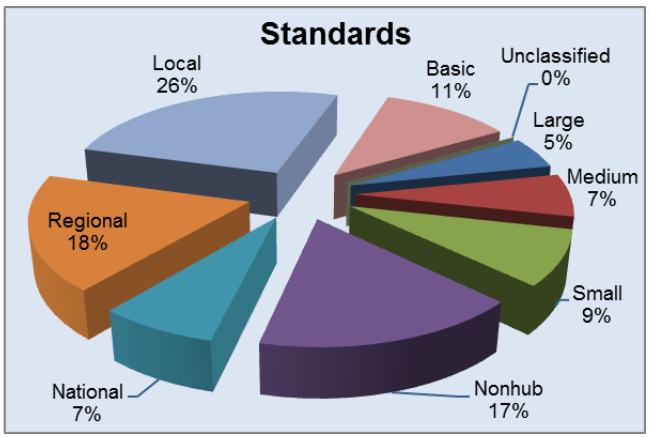


Reconstruction includes development to replace or rehabilitate airport facilities, primarily runway, taxiway, and apron pavement and lighting systems that have deteriorated due to weather or use and that have reached the end of their useful lives. Failure to replace deteriorating pavement increases airport maintenance costs and can result in damage to aircraft propellers and engines, pooling of water and ice deposits that can jeopardize braking and directional control, and eventually potholes that can damage landing gear. Airfield lighting cables and fixtures deteriorate with age, resulting in dim and unreliable lighting if they are not replaced. Reconstruction is included in the NPIAS when normal maintenance procedures are no longer economical and effective.

This category has become the largest development category, accounting for about 33 percent ($11 billion) of NPIAS funding needs, and includes the rehabilitation of pavement on a 15-to 20-year cycle. This category of development increased by 3.1 percent and reflects an increase in reconstruction costs by every type of NPIAS airport. The primary airports account for 63 percent of this development with large hub airports accounting for 21 percent. The nonprimary airports account for 27 percent of this development.

Standards

Many airports were designed and built more than 50 years ago to serve relatively small and slow aircraft. They now serve larger and faster turboprop and jet aircraft. As a result, runways and taxiways must be relocated to provide greater clearance for aircraft with larger wingspans, taxiway geometry should be improved to correct confusing layouts, and aircraft parking areas must be adapted to accommodate larger aircraft.



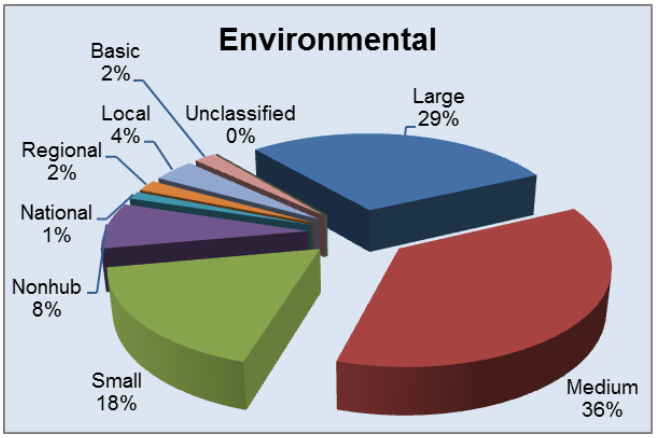
Standards development at general aviation and reliever airports is generally justified to accommodate a substantial number of operations by a "critical" aircraft with sizes and operating characteristics that were not foreseen at the time of original construction. If this work is not undertaken, aircraft may be required to limit fuel or passenger loads because of inadequate runway length. The FAA usually requires proof that an aircraft type will account for at least 500 annual itinerant operations at an airport before the development to accommodate it is included in the NPIAS..

Standards projects include development that is needed to bring an existing airport up to design criteria recommended by FAA. It also includes development that is needed to comply with FAA

technical and operational specifications. Examples of these projects included: strengthening, widening, or relocating runways and taxiways and associated lighting; acquiring equipment (e.g., snow removal; deicing; weather reporting; and approach lighting and guidance systems); and buildings for equipment (snow removal) or aircraft (hangars).

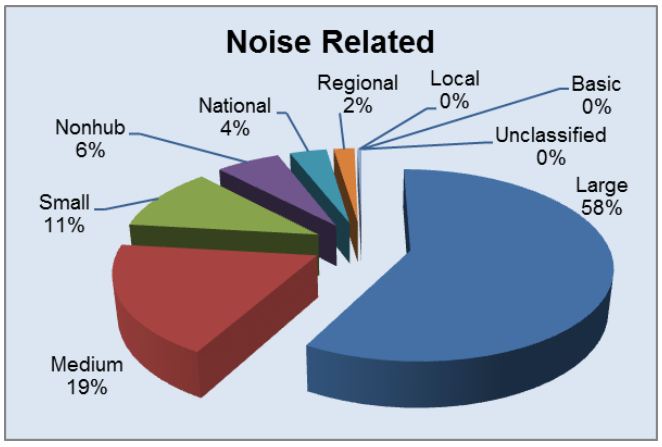
This development category accounts for 31 percent ($10.5 billion) of the NPIAS, a decrease of $1.3 billion from the last report. Nonprimary airports account for 64 percent of this development and primary airports account for 36 percent.

Environment



The environment category includes projects designed to achieve an acceptable balance between airport operational requirements, environmental requirements, and the expectations of residents of the surrounding area for a quiet and clean environment. This development supplements the noise reductions that have been achieved by quieter aircraft and the use of noise abatement flight procedures. This category accounts for 5 percent ($1.7 billion) of NPIAS costs and includes the relocation of households and sound insulation of residences and public buildings in noise impacted areas underlying aircraft approach and departure paths.

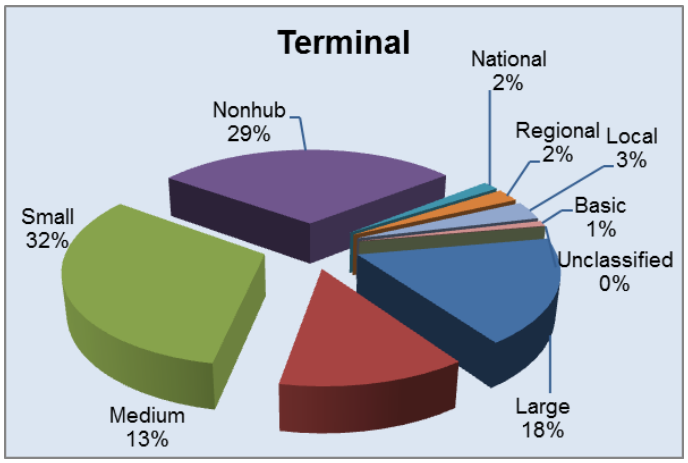
Environmental costs are concentrated at airports with frequent flights by jet aircraft (48 percent large hubs, 25 percent medium hubs, 13 percent small hubs, 7 percent nonhubs, and 7 percent national, regional, local, and basic airports). This development is part of an extensive Federal and industry program—involving land use planning, quieter aircraft, and noise abatement procedures—that has reduced the estimated number of people exposed to significant noise. Sixty-six percent ($1.1 billion) is for noise mitigation for residences or public buildings, noise monitoring systems, and compensation to property owners for overflights.



Thirty-three percent of the cost is for environmental mitigation, which includes deicing containment and treatment facilities, replacement of impacted wetlands, and specialized equipment to support the VALE Program for reducing airport air emissions.

Terminal Building

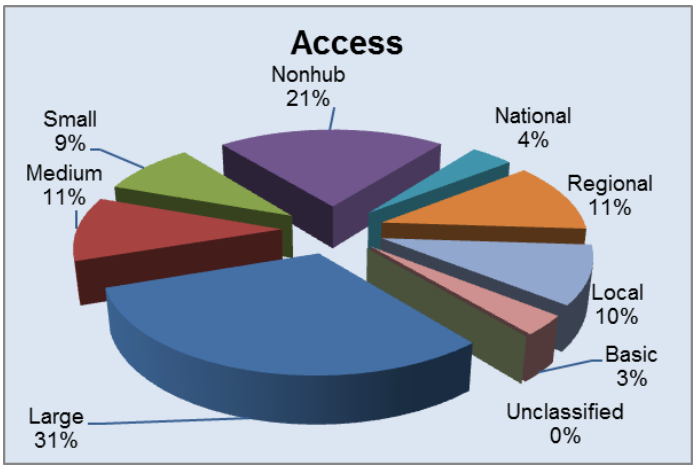
Terminal building costs are incurred for development to accommodate more passengers and different aircraft (small regional jets and new large aircraft). Although this is the fourth largest development category, accounting for 6 percent ($1.95 billion) of the NPIAS costs, terminal costs have decreased 69 percent over the last 4 years and 79 percent since 2009. The NPIAS only includes the public-use portion of terminals that are AIP eligible (about 50 to 60 percent) and excludes revenue-generating areas[66] such as areas that are leased by a single tenant or used by concessions, such as gift shops and restaurants.



The development is concentrated at the busiest commercial service airports (18 percent large hubs, 13 percent medium hubs, 32 percent small hubs, and 29 percent nonhubs). A major factor in the large decrease in needs for terminal development is due to a 78-percent ($1.2 billion) decrease in terminal development costs at large hub airports and a 54-percent ($287 million) decrease at medium hub airports. This reflects the funding of several terminal projects through PFCs, completion of some projects, and the deferral of a few projects beyond 2019. Increases in this category are at small and nonprimary commercial service airports, which saw 19-percent and 69-percent increases in development costs respectively.

Surface Access

Access includes the portion of airport ground access (highways and transit) that is within the airport property line and eligible for grants under the AIP. The large hub airports account for 31 percent (down from $293 in 2013 to $281 million) and medium hub airports account for 11 percent of the access development needs (down 81 percent to $96 million). Surface access currently accounts for 3 percent ($908 million) of the NPIAS costs, down 34 percent from the last report. The FAA currently has research underway to assess the most critical surface access problems identified by airport sponsors. This includes curbside improvements and improving passenger access to the airport terminal from surface transportation facilities. The FAA has recently introduced goals to encourage airport sponsors and state and local officials to develop airport master

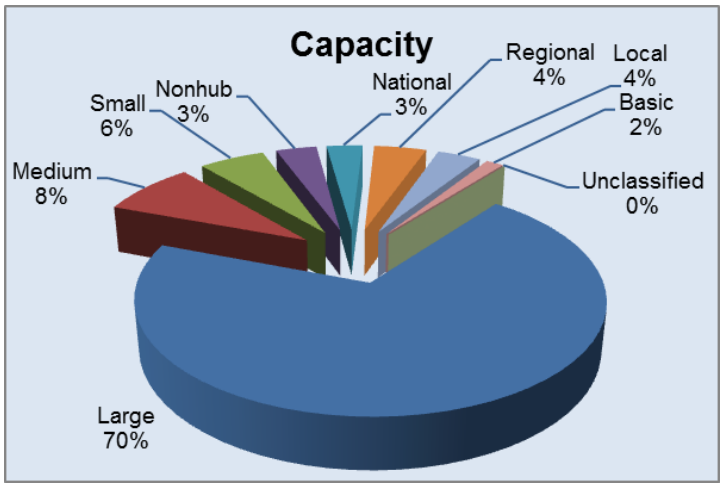


[66] Some smaller public-use airports such as nonhub primary airports can use AIP funds for public-use areas of a terminal that are revenue producing.

plans and airport system plans that consider passenger convenience, airport ground access, and access to airport facilities. As new airport master planning begins to explore and analyze these aspects of the airport, the decreasing trend in access projects may reverse as new and innovative surface projects are identified.

Airfield Capacity

Airfield capacity is development that will improve an airport for the primary purpose of reducing delay and/or accommodating more passengers, cargo, aircraft operations, or based aircraft. This is the third largest development category, accounting for 15 percent ($4.9 billion) of the NPIAS, and includes new runway, taxiway, and apron construction and extensions. Large hub airports account for 70 percent of the development to improve capacity or reduce delay.



Development to improve airfield capacity decreased 50.2 percent from the last report. This decrease may be due to the completion of major runway extensions or new runways opening in the last 2 years (three runway extensions at Anchorage international, Hartsfield-Jackson Atlanta International, and San Antonio International; one new runway opened at Chicago O'Hare International; and one relocated runway opened at Port Columbus International). The Chicago O'Hare commissioning of Runway 10C/28C marked the completion of the construction of Phase I (started in 2006) for the Chicago O'Hare airfield reconfiguration. The remaining airfield capacity development included in this 5-year plan will help to reduce congestion. However, problems will remain in certain large metropolitan areas such as New York and Los Angeles. The FAA will continue to focus on the need for additional capacity and increased efficiency at those locations.

New Airports/Helipads

New airports and helipads are proposed in the NPIAS for communities that generate a substantial demand for air transportation and either do not have an airport or have an airport that cannot be improved to meet minimum standards of safety and efficiency. In addition, new commercial service and general aviation airports are recommended for communities where existing airports are congested and cannot be expanded to meet the forecast demand for air transportation. During the next 5 years, 11 general aviation airports, 2 nonprimary commercial service airports, and 1 primary airport are anticipated to open or be under development. This category also includes continuing AIP-eligible capital costs for new airports and helipads that recently opened. It accounts for 0.8 percent ($295 million) of all NPIAS development. Development costs in this category decreased by 54 percent from the last report, in part because some new airports that were under development have now been completed or are no longer being considered.

Other

This category of development accounts for about 0.8 percent ($257 million) of the total development in the NPIAS. It includes fuel farms, utilities, and construction and rehabilitation of parking lots. National, regional, local, and basic nonprimary airports account for 50 percent of this development.

CHANGING THE WAY WE LOOK AT NONPRIMARY AIRPORTS

The new airport categories for general aviation airports identified in the ASSET study have been incorporated into this NPIAS report. Table 10 contains the development totals for each airport category by purpose of development, using the same development categories shown in Tables 8 and 9.

Table 10: 2015–2019 NPIAS Costs by Airport and Development Category (2013 $ millions)

Category	National	Regional	Local	Basic	Unclassified	Total
Safety	$76	$74	$86	$30	$0	$267
Security	$67	$63	$115	$76	$0	$321
Reconstruction	$572	$1,333	$1,578	$650	$1	$4,133
Standards	$769	$1,880	$2,740	$1,277	$2	$6,669
Environmental	$7	$11	$22	$11	$0	$52
Noise	$40	$23	$4	$0	$0	$67
Capacity	$150	$218	$180	$73	$0	$621
Terminal	$30	$44	$63	$19	$0	$155
Access	$36	$105	$88	$30	$0	$259
Other	$4	$29	$59	$37	$0	$130
New Airport	$0	$0	$0	$0	$0	$217
Total	**$1,752**	**$3,781**	**$4,935**	**$2,204**	**$3**	**$12,675**
Percentage	**5.2%**	**11.3%**	**14.7%**	**6.6%**	**0.0%**	**38%**

Development to bring an airport up to current design standards recommended by FAA is the largest category for each new airport category. The second largest development category is replacing or rehabilitating airport pavement and lighting systems. The development requirements contained in the previous edition of the NPIAS (2013–2017) are shown in Table 11.

Table 11: 2013–2017 NPIAS Costs by Airport and Development Category (2011 $ millions)

Category	National	Regional	Local	Basic	Unclassified	Total
Safety	$76	$87	$70	$17	$7	$257
Security	$31	$70	$117	$55	$42	$315
Reconstruction	$567	$1,151	$1,408	$505	$226	$3,857
Standards	$824	$2,215	$2,968	$1,013	$533	$7,553
Environmental	$16	$10	$25	$14	$4	$69
Noise	$59	$13	$4	$0	$0	$76
Capacity	$167	$218	$169	$56	$32	$642
Terminal	$48	$62	$70	$22	$10	$212
Access	$48	$110	$104	$43	$13	$318
Other	$8	$28	$49	$27	$16	$128
Total	**$1,843**	**$3,964**	**$4,984**	**$1,751**	**$884**	**$13,427**
Percentage	**4.3%**	**9.3%**	**11.7%**	**4.1%**	**2.1%**	**31.5%**

The table below reflects the number of existing NPIAS airports by category, as well as the percentage of enplanements, based aircraft, and percentage of total development.

Number of Airports	Airport Category	Percentage of 2012 Total Enplanements[1]	Percentage of All Based Aircraft[1]	Percentage of NPIAS Cost[2]
29	*Primary*–Large Hub	70.7	0.7	25.1
33	*Primary*–Medium Hub	17.0	1.8	10.8
76	*Primary*–Small Hub	8.9	4.6	10.4
251	*Primary*–Nonhub	3.2	10.9	15.4
389	**Primary Subtotal**	**99.8**	**18**	**62**
84	*General Aviation*–National		11.0	5.2
459	*General Aviation*–Regional		23.2	11.3
1,263	*General Aviation*–Local		22.5	14.7
863	*General Aviation*–Basic		3.8	6.46
270	*General Aviation*–Not Classified		1.0	0.0
2,939	***Nonprimary Subtotal***		**62**	**38**
3,328	***Existing* NPIAS Airports**	**99.8**	**80**	**100**

[1] The remaining 0.2 percent of enplanements occurred at non-NPIAS airports.

[2] Based on active aircraft fleet of 202,865 aircraft in 2013. There are 40,570 active aircraft based at non-NPIAS facilities (16,053).

ANTICIPATED SOURCES OF FUNDING

There are four major sources of funds used to finance airport capital development: airport cash flow, bond proceeds, Federal/State/local grants, and PFCs. Access to these sources of financing varies widely among airports, with some large airports able to generate and apply significant cash flow to capital projects, and the small commercial service and general aviation airports often requiring subsidies from local and State governments to fund operating expenses and finance modest improvements.

Over the last 12 years, AIP grants have exceeded $3 billion annually. For the last 11 years, PFC collections have exceeded $2 billion annually (in many cases leveraged to pay debt service or much larger bond issues). In 2013, the commercial service airports reported grant receipts totaling $2.01 billion and PFC collections totaling $2.81 billion. These same airports reported total expenditures of $5.09 billion in capital expenditures and construction for airport development projects, including projects eligible for AIP grants and projects ineligible for AIP grants, like automobile parking garages and hangars. [67]

Approximately $7.8 billion in airport bonds were issued in 2012.[68] This was due in part to an exemption from the Alternative Minimum Tax for general airport revenue bonds. This exemption made airport revenue bonds more attractive to investors and reduced the interest rates for the airport. The exemption expired at the end of 2011.

The AIP serves as an effective investment tool to fund safety, security, and airfield projects that rank highest in national priority. The PFC Program has broader eligibility than the AIP, particularly for terminal projects, noise compatibility measures, and costs associated with debt financing, and is available in significant and generally predictable amounts to large and medium hub airports. As a result, airports, especially large and medium hubs, have been directing the majority of their PFC revenues to landside projects such as terminal development, ground access systems, noise mitigation, and the financing costs of these projects. The majority of nonhub primary airports use PFC revenues as the local "match" funds for AIP grants.

ADDITIONAL COSTS NOT INCLUDED IN THE NPIAS

The NPIAS only includes development that is eligible to receive Federal grants under the AIP. It does not include ineligible airport development, such as automobile parking structures, hangars, air cargo buildings, or the revenue-producing portion of large passenger terminal buildings.[69] It also does not include:

- Development eligible under the PFC Program but ineligible under the AIP, such as leased gates and related areas;
- Improvements to highway and transit systems beyond the airport property line;
- Improvements to air traffic control and navigation aids that may be funded by the FAA's Facilities and Equipment Program, including most equipment for NextGen;
- Costs associated with modifying terminals to accommodate explosive detection systems. The FAA is prohibited from funding these projects with AIP funding. However, these projects remain eligible under the PFC Program and under the Transportation Security Administration's grant program;
- Development needed to address capacity shortfalls where no clear solution has yet emerged;

[67] Airport Operating and Financial Summary, FY 2013 (FAA Form 5100-127).
[68] This is the proceeds from the sale of bonds (refinancing as well as new bonds) by commercial service airports during 2012 on FAA Form 5100-127.
[69] The authorizing legislation allows nonprimary entitlement funds to be used for hangars, provided FAA believes the airport has an adequate plan for financing all airside needs.

- Changes in eligibility for AIP resulting from the FAA Modernization and Reform Act of 2012, which was signed on February 14, 2012, including zero-emissions vehicles and infrastructure and airport energy efficiency projects as well as recycling plans now required by law as part of airport master plans; and
- Costs associated with planning (master plans, regional and State system plans, and environmental studies). Between 2015 and 2019, total costs for airport planning (airport master plans, regional and State system plans, and environmental studies) are estimated at $354 million.