



Federal Aviation Administration
U.S. Department of Transportation

National Plan of Integrated Airport Systems (NPIAS) 2023–2027



National Plan of Integrated Airport Systems (NPIAS) 2023–2027

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TABLE OF CONTENTS

Background	2
Summary	3
Overview of the Airport System	3
Attributes and Strategic Goals	3
The Airport System	4
Airports in the NPIAS	5
Primary Airports	6
Nonprimary Airports	7
Review of Categories and Roles	9
National Capacity Outlook	10
Capacity Constrained	11
Congested	11
Users of the System	11
Financial Performance of the Airport System	14
Airport Development	17
Overview	17
Capital Planning Process	17
Development Summary	19
By Airport Type	20
By Development Purpose	21
Development Categories	21
Safety and Security	21
Rehabilitation/Reconstruction	22
Airport Design Standards	23
Environment	23
Noise	25
Airport Capacity	25
Terminal Improvements	26
Surface Access	26
New Airports	27
Air Traffic Control Towers	27
Other	27
Development Clarifications	28
Appendix A: List of NPIAS Airports	A-1
Explanation of Terms and Abbreviations Used in Appendix A	A-1
New NPIAS Airports – Anticipated to Open by 2027	A-2
Existing NPIAS Airports, by State	A-2
Appendix B: National and State Maps of NPIAS Airports	B-1
Appendix C: Statutory and Policy Definitions; Data Sources; and NPIAS Process	C-1
Statutory Definitions	C-1
Nonprimary Policy Definitions	C-2
Data Sources for the Criteria Used to Determine Nonprimary Airport Roles	C-3
NPIAS Process	C-4

BACKGROUND

The National Plan of Integrated Airport Systems (NPIAS) for Fiscal Years (FY) 2023 to 2027 is published as required by 49 U.S.C. § 47103. The Federal Aviation Administration (FAA) is also required to maintain the plan for developing public-use airports in the United States and include the kind and estimated cost of eligible airport development necessary to provide a safe, efficient, and integrated system of public-use airports. Throughout this document, the term “airport” includes landing areas developed for conventional fixed-wing aircraft, helicopters, and seaplanes.

This NPIAS identifies the amounts and types of airport development eligible for Federal funding under the Airport Improvement Program (AIP) and the Infrastructure Investment and Jobs Act (Public Law 117–58, also referred to as the Bipartisan Infrastructure Law (BIL)) over the next five years. BIL establishes formula and competitive grants for airport terminal projects, on-airport rail access projects, and airport-owned air traffic control towers, which historically have received little or no AIP funding.

Airport capital development needs are driven by current and forecasted traffic, use and age of facilities, and changing aircraft technology, all of which require airports to update or replace equipment and infrastructure. FAA includes development identified through the airport capital planning process in the NPIAS. Many of the projects are eligible for federal funding but can also be covered by other sources of funding (i.e., Passenger Facility Charge (PFC) revenues, state/local grants, airport revenue or financing).

FAA utilizes a variety of data (aviation related activity, ownership, aeronautical functions serving the public interest, etc.) to determine the appropriate category and hub/role of each NPIAS airport. Airports meeting the commercial service requirements (public airports with more than 2,500 enplanements a year and scheduled service) are updated every year. All other airports are updated every other year and remain as shown in appendix C of the published NPIAS.

Cost estimates in the NPIAS are obtained primarily from airport sponsors through locally developed airport planning documents (e.g., master plans and airport layout plans) and annual capital improvement plans. The estimates only include development eligible for federal funding to be undertaken by airport sponsors (as opposed to nonpublic projects undertaken by airport tenants, such as airlines and air cargo operators). During this development cycle, every effort was made to include all airport infrastructure, sponsor-owned towers, rail access and terminal development needs that can be funded under the AIP and BIL. The development reflected in this publication is based on planning documents and information available through March 2022.

SUMMARY

This edition identifies 3,287 existing public-use airports and eight proposed nonprimary airports anticipated to open by 2027. It also contains current airport categories and estimates approximately \$62.4 billion in eligible and justified airport development between 2023 and 2027. This is an increase of almost \$19 billion (43 percent) from the NPIAS issued two years ago with increases across all airport types and development categories, including projects identified by airport sponsors (through March 2022) for funding under AIP and BIL. Note, the 5-year BIL funding adds new eligibility for grants for airport terminal projects, on-airport rail access projects, and airport-owned air traffic control towers, which historically have received little or no AIP funding.

3,287 NPIAS Airports:

- Includes 5,050 runways
- Houses 154,511 aircraft
- Accommodates 662 million enplanements
- Supports 90.8 million aircraft operations

OVERVIEW OF THE AIRPORT SYSTEM

Transportation systems (including air, rail, highways, and waterways) connect communities, business, and people and provide critical support functions. Airports are critical to the national transportation system and contribute to a productive national economy and international competitiveness. This includes the 46 million people¹ living in rural areas where an airport may provide the community with critical access to the national transportation system.

ATTRIBUTES AND STRATEGIC GOALS

The national airport system, envisioned in the first National Airport Plan issued in 1946, has been developed and nurtured by close cooperation with airport sponsors and other local agencies, as well as Federal and State agencies. FAA Order 5090.5, *Formulation of the NPIAS and ACIP* contains the enduring principles guiding Federal involvement in the national airport system which continue to be periodically reaffirmed by the FAA and the aviation industry.

The guiding principle for Federal infrastructure investment, as stated in Executive Order 12893, is that Federal investments should be cost beneficial.² This Executive Order also included other key principles that the FAA supports through its administration of the NPIAS, including support of State and local planning and information management systems; support for private sector participation; and support for effective administration of grant programs like the AIP.

In addition to the above listed principles, the U.S. Department of Transportation's (DOT) Strategic Plan for FY 2022–FY 2026³ sets the direction for DOT to provide a safe, efficient,

¹ For additional information see: [Rural America at a Glance: 2021 Edition \(usda.gov\)](https://www.usda.gov/rurality/2021-edition)

² The FAA implements these principles by issuing 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. All development projects must be justified based on existing or reasonably anticipated civil aeronautical activity levels.

³ DOT's FY 2022–26 Strategic Plan is available at: [FY 2022-26 U.S. DOT Strategic Plan | US Department of Transportation](https://www.transportation.gov/strategic-plan).

convenient, and competitive transportation system. These are reflected in six strategic goals (safety; economic strength and global competitiveness; equity; climate and sustainability; transformation; and organizational excellence) supported by strategic objectives that reflect the outcomes DOT is seeking to achieve. The Strategic Plan also provides a framework to guide the investments contained in President Biden’s landmark Bipartisan Infrastructure Law, to ensure they create good-paying jobs, help tackle the climate crisis, and grow the economy sustainably and equitably for generations to come.

FAA has also adopted these goals with a focus on the aviation mode. The NPIAS supports DOT and FAA goals for the air transportation system through six key areas: safety, capacity, environmental performance, runway pavement condition, surface transportation accessibility, and airport financial performance. These areas are included in the appropriate sections throughout this publication.

THE AIRPORT SYSTEM

The Nation’s airports have evolved and fulfill diverse roles in the transportation system. An airport’s role is not necessarily limited by its size, location, or facilities. Airports move people and cargo; serve agricultural needs; provide critical access to remote communities by providing emergency medical access; support private transportation using small piston aircraft or sophisticated jets; and provide aeronautical access to manufacturers, assemblers, and repair stations that support airlines and operators of all sizes in a global aerospace marketplace.

In 2021, there were 720,605 active pilots, 5,791 commercial aircraft, and an estimated 205,870 general aviation aircraft performing more than 94 million annual operations at almost 20,000 landing areas in the United States. This includes 14,784 private-use (closed to the public) and 5,069 public-use (open to the public) facilities, such as airports, heliports, and seaplane bases as shown in table 1⁴.

Table 1: Numbers and Type of Existing Airports in the United States (April 2022)

Type of Facility	Total U.S. Facilities	Private-Use Facilities	Public-Use Facilities	Existing NPIAS Facilities
Airport	13,098	8,315	4,783	3,247
Heliport	6,059	6,004	55	8
Seaplane Base	534	312	222	32
Ultralight	113	110	3	
Gliderport	36	31	5	
Balloonport	13	12	1	
Total	19,853	14,784	5,069	3,287

The FAA works closely with local planning organizations and State aviation agencies to identify public use airports that are important to the airport system for inclusion in the NPIAS. About 65 percent of the public-use airports are included in the NPIAS which includes all commercial service airports and selected general aviation airports that meet requirements. An airport must be

⁴ The data source for Table 1 is FAA Form 5010 available online at: [Airport Data and Information Portal \(faa.gov\)](https://www.faa.gov/airports/airport-data)

included in the NPIAS to be eligible to receive a grant under the AIP and BIL. There are 1,782 public use airports that are not included in the NPIAS, generally because they do not meet the minimum entry criteria,⁵ are located at inadequate sites, cannot be expanded or improved to provide a safe and efficient airport, or are located within a 30-mile radius of at least one NPIAS airport.

AIRPORTS IN THE NPIAS

This NPIAS contains 3,287 existing and eight proposed nonprimary airports anticipated to open by 2027 and identifies the roles the airports serve in the national airport system. Approximately 98 percent (3,232) of the NPIAS airports are owned by public entities (generally city, county, or state) and less than 2 percent (55) are privately-owned airports.

Of the 333 million people in the United States:

- 92% are within 30 miles of a primary airport
- 99.7% are within 30 miles of a NPIAS airport (includes primary and nonprimary)
- 63% of NPIAS airports are located in metropolitan or micropolitan statistical areas
- 37% of NPIAS airports provide rural areas with access to the National Airport System

NPIAS airports are grouped by statute into two major categories: primary and nonprimary. Appendix C contains the airport definitions contained in statute and policy along with the criterion and process used in developing the NPIAS. Table 2 reflects the number of existing NPIAS airports by category, as well as the percentage of enplanements, runways, based aircraft, total operations, and total development.

Table 2: Activity and Development at NPIAS Airports

Airport Category	Number of Airports	Percentage of Airports	Percentage of Paved Runways	Percentage of 2021 Total Enplanements	Percentage of All Active GA Aircraft	Percentage of Total Operations	Percentage of NPIAS Cost
Large Hub	30	1	2	69	1	10	32.0
Medium Hub	35	1	2	18	2	5	14.9
Small Hub	80	2	4	9	5	7	9.7
Nonhub	238	7	9	3	10	10	12.2
Primary Subtotal	383	11	17	99	18	32	68.8
National	107	3	4		12	11	5.3
Regional	501	15	17		22	25	9.0
Local	1,179	36	34		20	23	10.3
Basic	904	28	23		3	7	6.0
Unclassified	213	7	5		1	2	0
Nonprimary Subtotal	2,904	89	83	0.07	58	68	30.6
Total NPIAS Airports	3,287	100	100	100	76	100	100

¹Based on active general aviation fleet 204,380 aircraft in 2020. The remaining aircraft are based at other, non-NPIAS airports.

⁵ The NPIAS entry criteria is contained in FAA Order 5090.5, Formulation of the National Plan of Integrated Airport Systems (NPIAS) and the Airports Capital Improvement Plan (ACIP), available online at: [5090.5 - Formulation of the National Plan of Integrated Airport Systems \(NPIAS\) and the Airports Capital Improvement Plan \(ACIP\) – Document Information \(faa.gov\)](#)

PRIMARY AIRPORTS

Primary airports are defined in 49 U.S.C. § 47102(16) as public airports receiving scheduled air carrier service with 10,000 or more enplaned passengers per year. The statute further groups primary airports into four sub-categories: large hub, medium hub, small hub, and nonhub, based on each airport's enplanement totals. Calendar Year (CY) 2021 enplanements determine FY 2023 airport categories and passenger apportionments. There are 383 primary airports based on CY 2021 data.

Primary airports account for 99 percent of passenger enplanements, 32 percent of aircraft operations and 69 percent (\$43 billion) of the total development costs of \$62 billion contained in the NPIAS with the type of development needed varying by hub category.

Large Hubs	<p>Large hubs are defined by statute (49 U.S.C. § 47102(11)) as those airports that each account for 1 percent or more of total U.S. passenger enplanements. Combined, the large hub airports account for 69 percent of all passenger enplanements and 32 percent of the planned development. Some large hub airports 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.</p> <p>Large hub airports tend to concentrate on commercial airline and freight operations and have limited general aviation activity. These airports have identified almost \$20 billion in eligible development through 2027. They have identified projects that focus on terminal improvements (constructing, expanding, and modifying), reconstruction of pavement, and capacity improvements (new or expanded airfield pavement, such as taxiways, aprons, and runways).</p>
Medium Hubs	<p>Medium hubs are defined by statute (49 U.S.C. § 47102(13)) as airports that each account for between 0.25 percent and 1 percent of total U.S. passenger enplanements. The medium hub airports account for 18 percent of all U.S. enplanements and 15 percent of the development needs. Medium hub airports usually have sufficient capacity to accommodate air carrier operations and a substantial amount of general aviation activity.</p> <p>Medium hub airports have identified \$9.3 billion in development in this NPIAS. They have identified projects that focus on terminal improvements, reconstruction of airfield pavement, and bringing the airport up to design standards as their main focus through 2027.</p>
Small Hubs	<p>Small hubs are defined by statute (49 U.S.C. § 47102(25)) as airports that account for 0.05 percent to 0.25 percent of total U.S. passengers. The small hubs airports account for 9 percent of U.S. enplanements and 10 percent of the development needs. These airports are typically uncongested, do not have significant air traffic delays and can generally accommodate a great deal of general aviation activity.</p>

	Small hub airports account for \$6 billion of the development identified in this NPIAS. They have identified projects that focus on reconstructing airfield pavement and terminal improvements.
Nonhub Primary	<p>Commercial service airports that account for less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements are categorized as nonhub primary airports (49 U.S.C. § 47102(14)). The nonhub primary airports together account for 3 percent of all enplanements. These airports are also used by general aviation aircraft with an average of 98 aircraft based at the airport.</p> <p>Nonhubs constitute the largest number of primary airports and account for 12 percent (\$7.6 billion) of the development needs. They have identified projects that focus on airfield reconstruction, bringing the airport up to design standards, and terminal improvements.</p>

NONPRIMARY AIRPORTS

Nonprimary airports are defined in 49 U.S.C. § 47114(c)(3)(A) and includes nonprimary commercial service airports⁶ (public airports receiving scheduled passenger service and between 2,500 and 9,999 enplaned passengers per year), general aviation airports⁷, and reliever⁸ airports. These airports primarily support general aviation aircraft. Nonprimary airports are grouped into five categories based on existing activity (e.g., the number and types of based aircraft and volume and types of flights), geographic factors, and public interest functions. These categories are national, regional, local, basic, and unclassified. The FAA reexamined the roles of nonprimary airports, gathered current data, and coordinated with airport sponsors between October 2021 and April 2022. Each airport’s updated category and role is reflected in appendix A. The list of the criteria used for each category is shown on page 2 of appendix C.

The 2,904 nonprimary airports included in the NPIAS account for 58 percent of the active general aviation fleet, 68 percent of aircraft operations, 83 percent of runways, and 31 percent (\$19 billion) of the total AIP-eligible development costs of \$62.4 billion through 2027. Development at nonprimary airports tends to focus on pavement reconstruction (runway, taxiway, and apron) and improvements to meet current airport design standards (improving taxiways, runways, and aprons).

⁶ A commercial service airport is defined in 49 U.S.C § 47102(7).

⁷ A general aviation airport is defined in 49 U.S.C § 47102(8).

⁸ A reliever airport is defined in 49 U.S.C. § 47102(23). The term “reliever” is relevant in a small number of instances where a commercial service airport still experiences significant congestion. However, a significant number of airports with reliever designation no longer meet reliever status since the airports they are relieving are no longer considered congested. Since the term is still defined by statute, the FAA included the designations in this NPIAS.

National	<p>National airports are located in metropolitan areas near major business centers and support flying throughout the Nation and the world. These airports provide pilots with attractive alternatives to the primary airports. National airports have very high levels of activity with many jets and multiengine propeller aircraft. They average 224 total based aircraft, including 38 jets.</p> <p>National airports account for \$3.3 billion (5 percent) in eligible development through 2027. These airports have identified projects that focus on reconstructing airfield pavement, bringing airports up to design standards, and improving safety (e.g., improving runway safety areas).</p>
Regional	<p>Regional airports are also in metropolitan areas and serve relatively large populations. These airports support regional economies with interstate and some long-distance flying and have high levels of activity, including some jets and multiengine propeller aircraft. About 45 of these airports have limited air carrier service. Regional airports average about 90 total based aircraft, including 3 jets.</p> <p>Regional airports account for 9 percent (\$5.6 billion) of the development identified in this NPIAS. These airports have identified projects that focus on reconstructing airfield pavement, bringing airports up to design standards, and improving terminals.</p>
Local	<p>Local airports are a critical component of our general aviation system, providing communities with access to local and regional markets. Typically, local airports are located near larger population centers but not necessarily in metropolitan areas. These airports account for 36 percent of all NPIAS airports and have moderate levels of activity with some multiengine propeller aircraft. About 42 of these airports have limited air carrier service. Local airports average about 33 based propeller-driven aircraft and no jets.</p> <p>Local airports account for 10 percent (\$6.5 billion) of the development identified in this NPIAS. These airports have identified projects that focus on reconstructing airfield pavement and bringing airports up to design standards.</p>
Basic	<p>Basic airports fulfill the principal role of a community airport providing a means for private general aviation flying, linking the community with the national airport system, and making other unique contributions. In some instances, the airport is the only way to access the community and provides emergency response access, such as emergency medical or fire fighting and mail delivery. These airports have moderate levels of activity with an average of nine propeller-driven aircraft and no jets. Many of these airports are located in rural areas.</p> <p>Basic airports account for 6 percent (\$3.7 billion) of the development identified in this NPIAS. These airports have identified projects that focus on reconstructing airfield pavement and bringing airports up to design standards.</p>
Unclassified	<p>Unclassified airports tend to have limited activity and include 173 public-owned and 40 privately-owned airports. Sixty-five percent have between 0 and 4 based aircraft (56 airports have 0 based aircraft). Since the 2021 NPIAS, the activity or circumstances improved for 27 airports which changed from unclassified to basic</p>

	<p>(22), local (3), or regional (2). Conversely, activity declined for 28 airports and they went from regional (1) or basic (27) to unclassified.</p> <p>Of the 40 privately-owned unclassified airports, 19 are privately-owned general aviation airports that do not meet the reliever criteria and have never received a development grant. These 19 privately-owned GA airports are ineligible for all federal funding. There are 21 privately-owned airports that had been designated as a reliever more than thirty years ago. The majority of these 21 have not met the reliever criteria in at least 22 years and there is no indication that they will ever be able to meet the requirements. But because they have retained the reliever designation they remain in the NPIAS and eligible for federal funding. Consistent with their role in the national airport system, the 213 unclassified airports have no development needs identified through 2027.</p>
New Airports	<p>Eight new nonprimary airports anticipated to open by 2027 are included in this NPIAS. Most of these facilities are replacing existing NPIAS GA airports. The new airports anticipated to open by 2027 are shown separately in appendix A which does not identify new airports expected to open beyond 2027 (e.g., new airports to serve Chicago or Las Vegas areas or replacement airports in Alaska). Inclusion of a new location in the NPIAS does not represent actual approval of the proposed airport from a planning, environmental, or financial perspective.</p> <p>New airports account for 0.5 percent (\$342 million) of the NPIAS development.</p>

REVIEW OF CATEGORIES AND ROLES

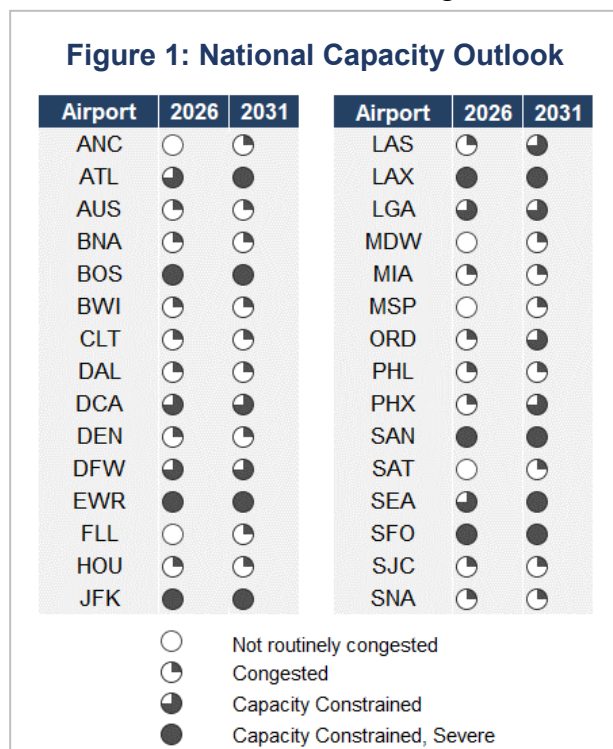
The FAA reviews all the airports in the NPIAS on an annual and biennial basis and adjusts their hub/role in the Federal system, consistent with statute and policy.

However, in 2021 the FAA began a specific review of 170 airports that had been unclassified since 2013 to determine the appropriateness of their continued inclusion in the NPIAS. After coordination, 15 long-term unclassified locations were removed from the NPIAS. However, resolution could not be reached on the majority of these locations before work on this publication began. As a result, this publication contains 147 airports that have been unclassified since 2013 (6 consecutive NPIAS publications).

In addition, the FAA reviewed the airports that were designated as relievers for large, medium, and small hub airports more than 30 years ago to determine the appropriateness of the designations. Unfortunately, the FAA was unable to reach resolution on this issue before work on this publication began. As a result, the 2023 publication continues to include 245 “reliever” airports.

NATIONAL CAPACITY OUTLOOK

A national capacity evaluation was completed by the FAA⁹ in 2022. This evaluation identifies airports that are runway capacity constrained, or at risk of becoming runway capacity constrained by 2026 and 2031. Figure 1 shows that 11 airports are expected to be runway capacity constrained in 2026 and increasing to 14 in 2031. An additional 16 airports are at risk of



significant congestion by 2031. While aircraft operations can continue to grow at capacity constrained airports, the operations growth is expected to result in increasing levels of significant congestion and reduced levels of efficiency. Several factors were used in this evaluation:

- Forecast IFR operations at large and medium hub airports as projected in the 2021 Terminal Area Forecast (TAF), released in May 2022. The updated TAF predicts robust industry recovery from the COVID-19 pandemic in the next several years. Generally, changes to forecast activity at an airport (up or down) is the single most significant factor for future changes to the capacity outlook at that location.
- The ratio of hourly operational demand to available runway capacity at the airport across 365 days, between 7 a.m. and 11 p.m., with varying levels of traffic and weather.
- Historical air traffic control call rates along with expected increases in capacity due to NextGen¹⁰ and related National Airspace System (NAS) modernization improvements are incorporated into the capacity estimate. See also the Airport Capacity Profiles¹¹ for airport-specific evaluations.
- Gate constraints are not directly used in the evaluation.
- New runways are reflected in the assessment only after being approved through National Environmental Policy Act evaluations. Accordingly, the new runway at CLT is included in the 2031 evaluation.
- Airports with insufficient runway capacity identified by the FAA as subject to schedule facilitation or schedule limitations under the International Air Transport Association's Worldwide Slot Guidelines Levels 2 or 3 or the High Density Rule¹² are generally considered capacity constrained for the purposes of this evaluation.

⁹ Contact the FAA Office of Airports' [Airport Planning and Environmental Division](#) for further information on the methodologies used in this section.

¹⁰ Additional information about the Next Generation Air Transportation System (NextGen) is available at: <http://www.faa.gov/nextgen/>.

¹¹ The Airport Capacity Profiles are available online at: [Airport Capacity Profiles \(faa.gov\)](#).

¹² Further information on slot administration is available online at: [Slot Administration | Federal Aviation Administration \(faa.gov\)](#).

Capacity Constrained

Airports that exceed 80 percent of their hourly capacity, for at least 50 percent of the time, are considered to be capacity constrained. If 80 percent of hourly capacity is exceeded 75 percent of the time, the capacity constraint is considered to be severe. Airports that exceed 60 percent of their hourly capacity, for at least 50 percent of the time, are considered congested.

At airports that are repeatedly shown to be capacity constrained in this or prior evaluations, a new well-located runway is often the best solution for substantive improvements to capacity to serve fixed-wing aircraft. At the same time, NextGen capabilities¹³ are also needed to enable efficient operations to and from new and existing runways, including flight procedures and air traffic control automation technologies. At a few airports where it is not feasible to add or expand runways, demand management strategies may be necessary.

Congested

Airports that are congested, but not yet capacity constrained, may or may not warrant major capacity development. The congestion is reflective of a vibrant, busy airport that provides robust air service to its community. In many cases, incremental efficiency improvements may be sufficient to meet future demands. However, the airport should monitor ongoing trends and assess possible development needs in its planning efforts.

USERS OF THE SYSTEM

The national airport system is a reflection of the types of aircraft using the airfields, passengers using the terminals, and associated economic activity. These users include commercial airline service, air cargo, general aviation, military, unmanned aircraft systems (UAS), and commercial space launches and reentries.

Commercial Airline Service	Commercial airline service represents the most widely known aspect of the aviation industry and includes the carriage of passengers on aircraft. In 2021, more than 655 million people boarded aircraft in the United States. About 93 percent of those passengers traveled domestically and 7 percent traveled to international destinations. About 450 NPIAS airports are used by air carriers conducting scheduled passenger service. These airports account for about 99 percent of passenger boardings and 37 percent of all aircraft operations. Three hundred twenty-four of the commercial service airports have air traffic control towers.
Air Cargo	Air cargo (domestic and international freight air/express and mail) is moved in both the bellies of passenger aircraft and in dedicated all-cargo aircraft. Air cargo flights tend to be concentrated at busy commercial service airports and usually occur during off-peak periods. The principal need for airport development to support cargo operations is related to cargo sorting and transfer facilities developed by the package express carriers and online retailers. Airports accommodating air cargo must have high-capacity, all weather runway systems to support reliable operations. Air transportation is generally the

¹³Information on NextGen capabilities is available online at: [Key Programs \(faa.gov\)](https://www.faa.gov/nextgen)

	<p>preferred mode for the shipment of high-value, lightweight, and perishable goods.¹⁴ In 2020, 10 of the 25 busiest international freight gateways (seaports, land ports, and airports) by value of shipment were airports.¹⁵</p>
General Aviation	<p>Ninety percent of NPIAS airports are classified as nonprimary and serve mainly general aviation activity. 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 the FAA surveys the general aviation community through General Aviation and Part 135¹⁶ Activity Survey. This survey asks 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.</p> <p>The results of the CY 2020 by types of uses are available online at General Aviation and Part 135 Activity Surveys Federal Aviation Administration (faa.gov). The percentages are based on the number of actual hours flown. The single largest use category of general aviation aircraft is personal use (33.8 percent) and includes recreational flying, family use, and tourism, as well as flying to stay current with license requirements. It is notable that instructional uses comprise the second largest use category and continue to increase. The majority of commercial airline pilots are trained through civilian training systems. Instructional training for pilots is typically conducted at general aviation airports, to preserve commercial service airport capacity and reliability for airline schedules.</p> <p>The results of the survey demonstrate the role general aviation plays in accommodating commerce throughout the United States. 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.</p>
Military	<p>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 21 military installations that allow civilian aircraft activity. Many of the facilities are included in the NPIAS.</p>

¹⁴ Air cargo accounts for less than 1 percent of imports and exports by weight.

¹⁵ Source: DOT, Bureau of Transportation Statistics, Top U.S. Foreign Trade Freight Gateways by Value of Shipments at: [Top U.S. Foreign Trade Freight Gateways by Value of Shipments | Bureau of Transportation Statistics \(bts.gov\)](https://www.bts.gov/publications/reports-and-statistics/top-us-foreign-trade-freight-gateways-by-value-of-shipments).

¹⁶ 14 CFR, part 135, Operating Requirements: Commuter and On Demand Operations and Rules Governing Persons On Board Such Aircraft.

	<p>The U.S. Department of Defense has also 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 of 2022, the military has agreements in place with 69 civilian airports. The FAA invests in these airports based on the justification for civilian operations and works with the military to identify funding for infrastructure in support of military operations. Working together results in economies of scale.</p>
Drones and Unmanned Aircraft Systems (UAS)	<p>Drones include an aircraft without a human pilot onboard, a ground-based control station, and a communications link connecting all the components. They come in a variety of shapes and sizes and serve diverse purposes. The FAA is working closely with stakeholders to address the regulatory requirements necessary to accommodate and integrate drone operations without impacting the safety and efficiency of the traditional air transportation system. Additional information is available online at Unmanned Aircraft Systems (UAS) Federal Aviation Administration (faa.gov).</p>
Urban Air Mobility and Advanced Air Mobility	<p>A more complex type of emerging operation by a new user group is Urban Air Mobility (UAM) and Advanced Air Mobility (AAM). UAM envisions a safe and efficient aviation transportation system that will use highly automated aircraft that will operate and transport passengers or cargo at lower altitudes within urban and suburban areas. AAM builds upon the UAM concept by incorporating use cases not specific to operations in urban environments. Additional information is available online at Urban Air Mobility and Advanced Air Mobility Federal Aviation Administration (faa.gov).</p>
Commercial Space Launches and Reentries	<p>There are Federal sites, exclusive (private) use sites and commercial spaceports in the U.S. The FAA licenses and regulates commercial space launches and reentries and the operation of commercial space launch and reentry sites. 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 service providers. It 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.</p> <p>Vehicles are launched from FAA licensed launch sites referred to as commercial spaceports. The FAA has licensed 14 commercial spaceports. Currently, 7 licensed launch sites and 1 licensed reentry site are collocated with public-use NPIAS airports accommodating both aviation and space operations in six states (Alabama, California, Colorado, Oklahoma, Texas, and Florida). These locations are indicated by an asterisk in appendix A. Additional information is available online at Office of Spaceports Federal Aviation Administration (faa.gov).</p>

FINANCIAL PERFORMANCE OF THE AIRPORT SYSTEM

The NPIAS airports are owned and operated by thousands of State and local agencies and a few private owners. This makes compiling comprehensive data on the financial operations of all existing NPIAS airports difficult. However, the FAA Authorization Act of 1994 requires commercial service airports to report financial data annually, including revenue and expense information. Because the remaining NPIAS airports are not required to report financial information, there is limited financial data available for general aviation airports.

The FAA uses data provided by commercial service airports from FAA Form 5100-127, Operating and Financial Summary, for each fiscal year to evaluate the financial performance of the airports.¹⁷ Data collected in these forms including aeronautical and nonaeronautical revenues; operating and nonoperating expenses; beginning and ending balances for net assets; and operating statistics. Four hundred and sixty-six commercial service airports reported total airport revenue of \$30 billion in 2020. Total expenses and depreciation totaled \$27.2 billion. Table 3 provides a summary of 2020 revenue and expenses by hub type.

The costs of airport operations and maintenance are a function of the age of the facilities and the nature of airline activity and other day-to-day operations. There is considerable variation in net income by hub type and year with large hubs accounting for 40 percent of the net income reported in 2020. There is also a variation in revenue sources and expenditures among airports. Table 3 provides a summary of 2020 revenue and expenses by hub type.

Approximately \$13.3 billion in airport bonds were issued in 2020 for commercial service airports as reported on FAA Form 5100-127. They also reported grant receipts totaling \$5.5 billion¹⁸ (up from \$2.2 billion in 2018) and PFC collections totaling \$2.1 billion (down from \$3.7 billion in 2018). Additionally, capital expenditures and construction for airport development projects totaling \$20.3 billion were reported.

Commercial service airports have several sources to fund airport development projects, including bond proceeds, PFC revenues, airport-generated funds, and tenant and third-party financing, as well as Federal, State, and local grants. 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. A significant percentage of the development projects at major U.S. airports is financed 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.

¹⁷ Source: Data collected by the FAA on FAA Form 5100-127 for fiscal years ending in 2020 (as of April 2022). Available in the Certification Activity Tracking System (CATS) at: [\(CATS\) Certification Activity Tracking System Ver: 2019.10.2 \(faa.gov\)](#). Numbers may not add exactly due to rounding.

¹⁸ This includes \$2 billion in funds awarded as economic relief to eligible airports affected by the pandemic through the Coronavirus Response and Relief Supplemental Appropriations Act, 2021 (Pub. L. 116-260).

Capital markets evaluate the creditworthiness of an airport based on several factors. These factors include the demand for air service in the region, economic growth potential, the type of passenger demand, the number of commercial airports in the region, and the quantity and diversity of service provided by the airlines, as well as diversification of other revenue sources (including nonaeronautical revenues). Large and medium hub airports have historically had strong credit ratings. Nonhub primary and nonprimary commercial service airports typically have more limited and less diverse revenue streams. As a result, smaller airports tend to rely more heavily on grants than larger airports to finance capital improvements.

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, large and medium hub airports in particular generally direct the majority of their PFC revenues to terminal and landside projects, including debt financing costs and noise mitigation. The majority of nonhub primary airports use PFC revenues as the local matching funds for AIP grants.

Over the last 20 years, AIP grants have exceeded \$3 billion annually. Additionally, through supplemental appropriations in FY 2018 through 2022, an additional \$2.8 billion in AIP discretionary funding was provided for development projects through FY 2024.¹⁹ In March 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act (Pub. L. 116-136) provided \$10 billion in funds to be awarded as economic relief to eligible U.S. airports, which were experiencing a severe downturn in operating revenues, affected by the COVID-19 pandemic.

In December 2020, the Coronavirus Response and Relief Supplemental Appropriations Act, 2021 (Pub. L. 116-260) provided \$2 billion in funds to be awarded as economic relief to eligible U.S. airports affected by the COVID-19 pandemic. In March 2021, the America Rescue Plan Act (Pub. L. 117-2) provided \$8 billion in funds to be awarded as economic relief to eligible U.S. airports affected by the COVID-19 pandemic. The majority of airports elected to use most of the \$20 billion in total funds to offset operating costs and/or debt service, rather than for new capital investment, including \$1 billion to provide relief from rent and minimum annual guarantees to eligible airport concessions.

In November 2021, President Biden signed the Bipartisan Infrastructure Law, providing \$25 billion in investment in air transportation over the next five years. BIL includes \$5 billion for air traffic facilities, \$15 billion for airport infrastructure to increase safety and expand capacity, and \$5 billion for airport terminals, on-airport rail, and airport-owned towers.

¹⁹ Additional information is available at: [Airport Improvement Program \(AIP\) 2021-2023 Supplemental Appropriation \(faa.gov\)](https://www.faa.gov/airports/airports-program/airport-improvement-program-aip-2021-2023-supplemental-appropriation).

**Table 3: 2020 Airport Operating and Financial Summary (FAA Form 5100-127),
Commercial Service Airports (\$Millions)**

Category	30	31	79	326	466
	Large Hub	Medium Hub	Small Hub	Nonhub	Total
Aeronautical Operating Revenue					
Aeronautical Operating Revenue					
Landing Fees	\$2,721	\$543	\$178	\$68	\$3,510
Terminal Rents	4,305	738	324	113	5,480
Cargo and Hangar Rentals	539	97	99	93	\$828
Fixed-Base Operator Revenue	134	51	54	65	\$304
Apron Charges/Tie Downs	98	58	25	8	\$189
Fuel Sales and Taxes	181	43	38	123	\$385
Other Aeronautical Fees	660	253	52	102	\$1,067
Total Aeronautical Operating Revenue	\$8,638	\$1,783	\$770	\$572	\$11,763
Nonaeronautical Operating Revenue					
Parking and Rental Car	\$2,615	\$984	\$646	\$200	\$4,445
Concessions	891	161	78	16	\$1,146
Terminal Rents	308	56	37	12	\$413
Land Rental and Nonterminal	430	118	114	153	\$815
Other Nonaeronautical Fees	757	122	125	67	\$1,071
Total Nonaeronautical Operating Revenue	\$5,001	\$1,441	\$1,000	\$448	\$7,890
Nonoperating Revenue (Expenses) and Capital					
Passenger Facility Charges	\$1,468	\$368	\$200	\$68	\$2,104
Grant Receipts	2807	510	1038	1113	\$5,468
Interest	917	166	66	22	\$1,171
Other	723	300	228	418	\$1,669
Total Nonoperating Revenue	\$5,915	\$1,344	\$1,532	\$1,621	\$10,412
TOTAL REVENUE	\$19,554	\$4,568	\$3,302	\$2,641	\$30,065
Operating Expenses					
Personnel Compensation and Benefits	\$4,028	\$984	\$784	\$519	\$6,315
Contractual Services	3,629	870	384	232	\$5,115
Communications and Utilities	666	175	119	83	\$1,043
Supplies and Materials	398	105	109	96	\$708
Insurance, Claims, and Settlements	162	44	35	30	\$271
Other	1,148	260	169	161	\$1,738
Total Operating Expenses	\$10,031	\$2,438	\$1,600	\$1,121	\$15,190
Nonoperating Expenses					
Interest Expense	\$3,183	\$489	\$179	\$49	\$3,900
Other	0	0	0	0	\$0
Total Nonoperating Expenses	\$3,183	\$489	\$179	\$49	\$3,900
TOTAL EXPENSES	\$13,214	\$2,927	\$1,779	\$1,170	\$19,090
Depreciation	\$5,180	\$1,203	\$975	\$698	\$8,056
NET INCOME	\$1,160	\$438	\$548	\$773	\$2,919
Other Information					
Capital Expenditures	\$12,855	\$1,849	\$4,169	\$1,383	\$20,256
Bond Proceeds	11,789	1012	215	242	\$13,258
Sale of Property, Contributed Capital, Other	56	43	16	7	\$122
Reporting Year Debt Payments	12,348	1,658	1,091	301	\$15,398
Indebtedness at End of Year	\$87,250	\$13,107	\$4,169	\$1,369	\$105,895

AIRPORT DEVELOPMENT

OVERVIEW

The FAA uses a comprehensive process to guide airfield development. It includes airport master planning, FAA airspace studies, airfield modeling, capacity/delay analysis, and benefit-cost analyses (BCA) for larger capacity projects. The largest factors affecting airport facility requirements and capital investment are the current type and level of operations and the forecasted future demand for air transportation.

The FAA issues an annual aerospace forecast that is a top-down (national level) forecast for aviation activity in the United States for the next 20 years. The national forecast²⁰ examines current commercial operations (passenger and cargo) and general aviation, as well as emerging aircraft operations (e.g., commercial space, UAS, and AAM) and projects future activity. The FAA also develops a bottom-up TAF for each individual NPIAS airport.²¹ These forecasts are prepared to meet the budget and planning needs of the FAA and to provide information that may be useful for State and local authorities, the aviation industry, and other stakeholders.

The airport development reflected in this NPIAS was gathered in 2021 and early 2022. The FAA made every effort to gather and capture development projects identified as a result of 5-year BIL funding for infrastructure, towers, and terminal. However, given time constraints for publication, this NPIAS does not capture all infrastructure needs that were being analyzed in the spring and summer of 2022. The FAA anticipates the next NPIAS (NPIAS, 2025-2029) will show further growth in airport infrastructure needs as airports develop capital improvement plans that utilize all available Federal funding.

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 airport system.

CAPITAL PLANNING PROCESS

The development needed to provide an adequate national airport system as demonstrated in this NPIAS is derived from locally prepared airport master plans, airport system plans,²² capital improvement plans, and airport inspections. These airport planning documents consider all significant aviation requirements and are 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. Airport sponsors provide project cost estimates to the FAA and these planning estimates are compiled in the NPIAS. The FAA evaluates and may adjust these estimates when evaluating the project for a grant award.

FAA planners compile data on development that is eligible for AIP funding and likely to be justified by the aviation activity forecast over the next 5 years. Forecasts of future levels of

²⁰ FAA Aerospace Forecast, FY 2021-2041, is available online at: https://www.faa.gov/data_research/aviation/.

²¹ The 2021 TAF is available online at: <https://taf.faa.gov/>.

²² An airport master plan is a detailed, long-term development plan for an individual airport. Airport system plans (regional and State) provide an analysis of performance and interaction of an entire aviation system to understand the interrelationships among and between individual airports.

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 at individual airports. This process results in a reasonable and documented estimate of future airport project requirements. However, the actual timing and cost of development may vary from the airport master plan (e.g., projects may be deferred or developed in phases to reduce immediate costs or an unexpectedly rapid increase in aeronautical activity may justify accelerating certain development).

The NPIAS also uses State airport system plans as a data source. The State airport system plan includes airport locations considered important to State air transportation objectives, as well as those that could be of sufficient national interest to be included in the NPIAS. The State or regional system plan typically identifies broad needs or priorities within its jurisdiction, rather than detailed projects and cost estimates. Aviation system plan recommendations on capital development at individual airports (or for a State airport system) are usually secondary to airport master plan information.

The FAA expects airports to consult with airlines and other user groups about major airport investment programs. Airlines typically exercise a high level of interest and raise questions about the scope and timing of significant development proposals, ranging from new airports and ground access projects to certain terminal and airfield improvements. The NPIAS generally reflects the FAA's conclusions about the scope and timeframe for proposed development.

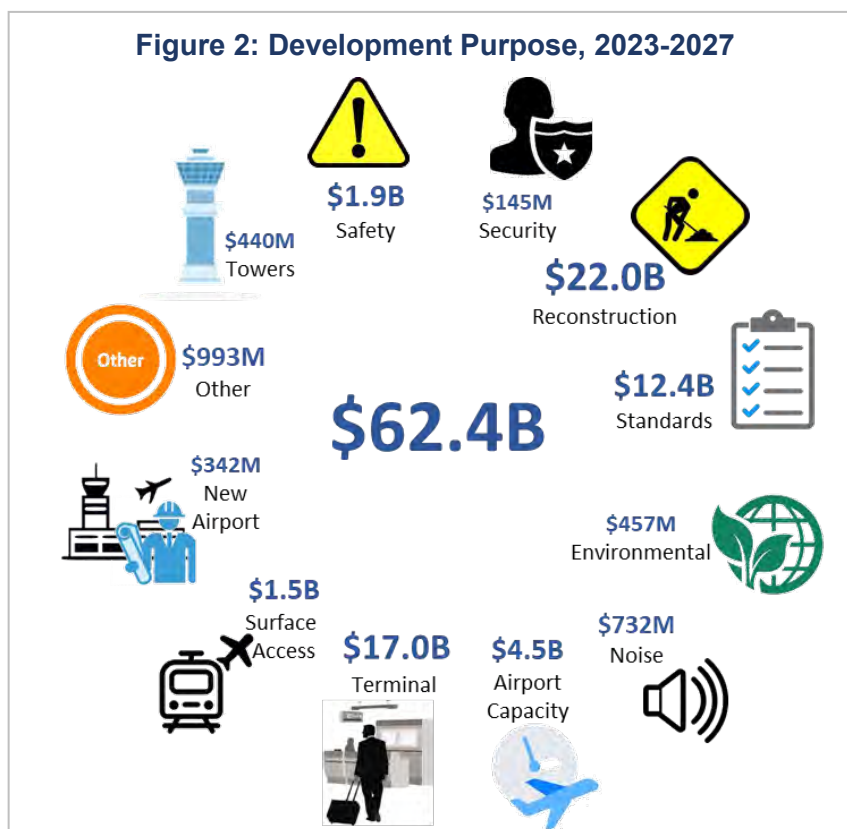
All development projects reflected in the NPIAS have been determined by the FAA to be eligible for funding and to be justified within the five-year timeframe. However, the planned development exceeds the funding available each year. In addition, although some projects are eligible, the individual airport may not have access to sufficient Federal funds for the project²³ or to sufficient local funds to pay the non-Federal share of the project. Therefore, although all of these five-year capital estimates are eligible, some projects may be funded by other sources, including PFC revenues or other airport revenue or financing provisions, or be re-scoped or deferred to later years.

²³ There are two basic categories of AIP funding: apportioned funds (also known as entitlements) and discretionary funds. Entitlement funds are apportioned by formulas contained in statute and the remaining amount of AIP funding is discretionary funding. Additional information is available online at: https://www.faa.gov/airports/aip/grant_histories/annual_reports/.

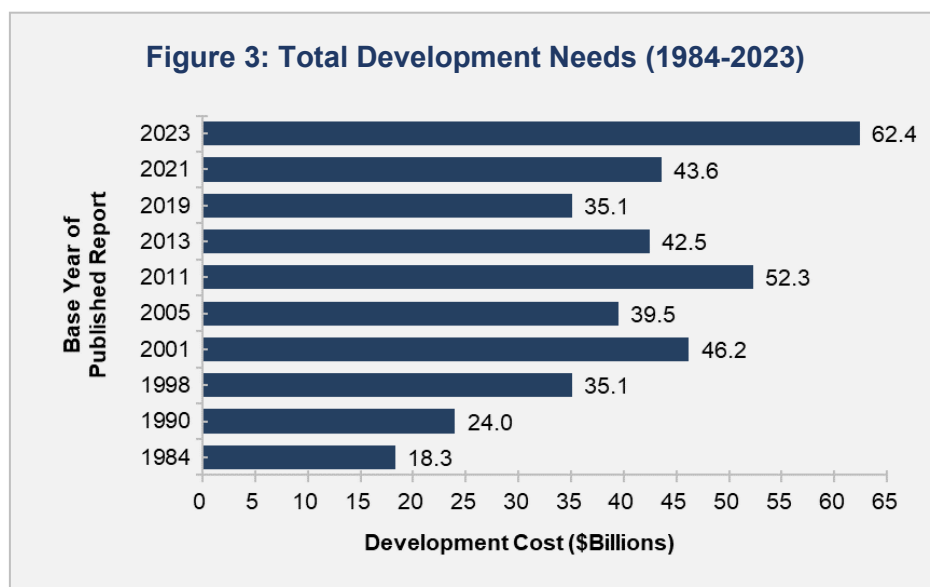
DEVELOPMENT SUMMARY

This NPIAS reflects \$62.4 billion in costs associated with capital development projects needed between 2023 and 2027.

The \$62.4 billion total comprises approximately 18,700 projects and reflects development needs for 3,287 existing airports and eight new airports²⁴. The development needs for an airport are based on eligible and justified projects consistent with the role of the airport in the national airport system. Projects are categorized by the principal purpose of the development as shown in figure 2.



The 2023 estimates contained in this NPIAS are 43 percent higher than 2021, as shown in figure 3.²⁵ These estimates were compiled in FY2021 and into early FY 2022. Since the last NPIAS was prepared, construction costs have increased 3.0 percent.²⁶ The 5-year BIL funding also adds new eligibility for grants for airport terminal projects, on-airport rail access projects, and airport-owned air traffic control towers, which historically have received little or no AIP funding.



²⁴ While 92 percent of NPIAS airports have AIP-eligible development identified, 274 airports do not have development identified, including 213 unclassified airports.

²⁵ Select historical NPIAS publications over the last 39 years are shown for context. Since 2001, the NPIAS has been issued every 2 years. Costs were gathered in preparation for the publication and are not adjusted for inflation.

²⁶ Source: Civil Works Construction Cost Index System calculated by the U.S. Army Corps of Engineers, September 30, 2021. Comparing construction costs for FY 2019 and FY 2021.

For this NPIAS, 12 development purposes and 10 airport types are identified. Development totals by purpose and airport type are shown in table 4.

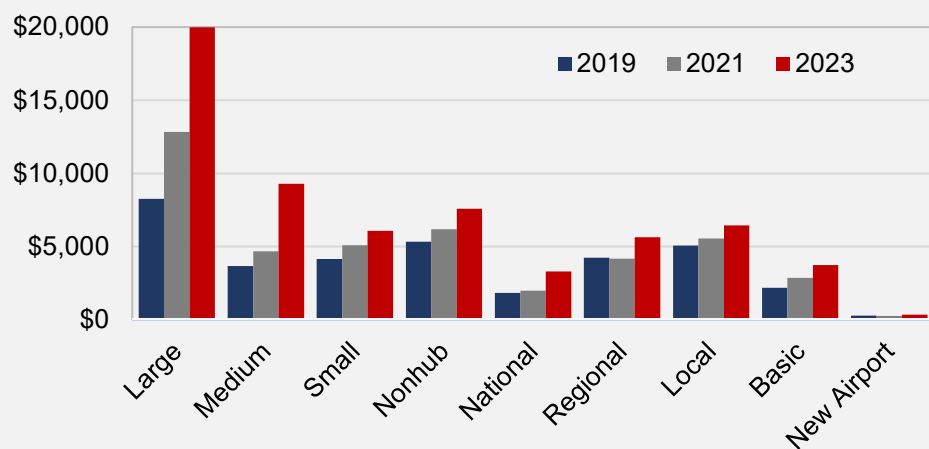
Table 4: 2023–2027 NPIAS Costs by Development Purpose and Airport Type
(2021 Dollars; \$ Millions)

Development Purpose	Large Hub	Medium Hub	Small Hub	Nonhub	National	Regional	Local	Basic	Unclassified	New Airport	Total	%
Safety	\$290	\$107	\$199	\$343	\$361	\$210	\$212	\$137	\$0	\$0	\$1,859	3.0%
Security	\$28	\$12	\$20	\$58	\$2	\$11	\$5	\$8	\$0	\$0	\$145	0.2%
Reconstruction	\$3,895	\$3,805	\$2,587	\$3,176	\$1,468	\$2,513	\$2,773	\$1,839	\$0	\$0	\$22,055	35.3%
Standards	\$1,775	\$1,328	\$727	\$2,117	\$897	\$1,661	\$2,552	\$1,375	\$0	\$0	\$12,433	19.9%
Environment	\$228	\$86	\$62	\$47	\$6	\$12	\$12	\$4	\$0	\$0	\$457	0.7%
Noise	\$556	\$31	\$39	\$86	\$12	\$8	\$0	\$0	\$0	\$0	\$732	1.2%
Capacity	\$2,536	\$487	\$222	\$348	\$175	\$405	\$196	\$100	\$0	\$0	\$4,468	7.2%
Terminal	\$9,687	\$3,254	\$2,043	\$1,187	\$50	\$454	\$225	\$59	\$0	\$0	\$16,958	27.2%
Surface Access	\$751	\$183	\$45	\$137	\$182	\$73	\$79	\$73	\$0	\$0	\$1,523	2.4%
New Airport	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$342	\$342	0.5%
Other	\$190	\$0	\$1	\$64	\$29	\$164	\$398	\$146	\$0	\$0	\$993	1.6%
ATC Towers	\$55	\$0	\$120	\$30	\$115	\$120	\$0	\$0	\$0	\$0	\$440	0.7%
Total	\$19,992	\$9,294	\$6,065	\$7,594	\$3,298	\$5,629	\$6,451	\$3,741	\$0	\$342	\$62,405	
Percentage	32.04%	14.89%	9.72%	12.17%	5.28%	9.02%	10.34%	6.00%	0.00%	0.55%	100.00%	

By Airport Type

Figure 4 highlights the change in total eligible development by airport type in 2019 (pre-COVID), 2021, and 2023. The eligible development needs increased at all airport types. The most significant increases in development are projected for large hubs (56 percent), medium hubs (99 percent), and national airports (66 percent). The \$18.8 billion increase in eligible development is due in part to additional funding availability under BIL, especially for terminal improvements, sponsor-owned air traffic control towers and multi-modal facilities.

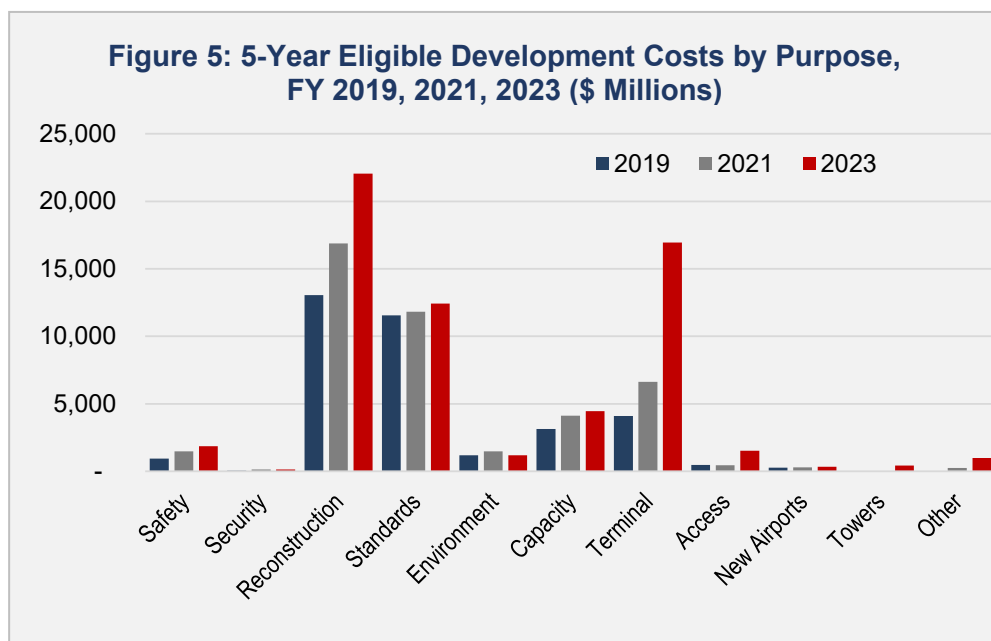
Figure 4: 5-Year Eligible Development Costs by Airport Type
FY 2019, 2021 and 2023 (\$ Millions)



By Development Purpose

All projects eligible for Federal funding are categorized based on the principal purpose of the development. Increases in all development types are anticipated over the next 5-years. Terminal development (rehabilitation or expansion) is the highest development

category for large and medium hub airports. This edition contains estimates for a new development type, sponsor-owned air traffic control towers.



DEVELOPMENT CATEGORIES

Safety and Security

Safety and security projects include development that is required by Federal regulation, airport certification procedures, or design standards. These projects are intended primarily for the protection of human life.

The FAA uses Federal funding to enhance airfield safety and support the Agency's goal of reducing accidents, fatalities, and runway incursions. Projects included in the safety category include obstruction lighting and removal, continued improvements to runway safety areas (RSAs) and Engineered Materials Arresting Systems (EMAS), acquisition of aircraft rescue and fire fighting (ARFF) equipment required by 14 CFR part 139,²⁷ and construction or expansion of ARFF buildings. Also, included are special emphasis projects required by legislation (Wendell H. Ford Aviation Investment and Reform Act) such as the application of grooving or friction treatment to primary and secondary runways.

For airports where it is not possible to acquire sufficient land to meet RSA standards through full physical compliance, the FAA issued a specification for EMAS. An EMAS is designed to stop an over running aircraft by exerting predictable deceleration forces on its landing gear as the EMAS material deforms. EMAS have been installed at 121 runway ends at 70 airports, and there

²⁷ 14 CFR part 139, requires the FAA to issue airport operating certificates to airports that meet specific requirements as shown online at: [What is Part 139? – Part 139 Airport Certification \(faa.gov\)](https://www.faa.gov/airports/airportsafety/part139/).

are plans to install EMAS at 8 airports over the next several years. To date, there have been 18 incidents where EMAS has safely stopped 18 overrunning aircraft with a total of 419 crew and passengers aboard those flights.

Safety development totals almost \$1.9 billion, an increase of \$370 million from the last NPIAS. The primary airports account for 51 percent of the safety projects.

Security projects include security fencing, access control from aircraft movement areas to the terminal, and other security enhancements required by 49 CFR part 1542. Security development totals \$145 million.

These two categories account for 3.2 percent (\$2.0 billion) of the funding needs identified in this 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.

Rehabilitation/Reconstruction

Airfield pavement needs regular preventive maintenance to seal cracks and repair damage, which decreases the frequency of major rehabilitation cycles. Preventive maintenance or rehabilitation may be needed on a 4- to 7-year cycle while more significant rehabilitation may be necessary 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).

The FAA's longstanding goal is to ensure that at least 93 percent of paved runways at airports in the NPIAS are maintained in excellent, good, or fair condition. Data for FY 2021 indicates that 97.8 percent of runways at NPIAS airports are rated excellent, good, or fair. While 98.5 percent of the runway pavement at commercial service airports are rated excellent, good, or fair, it is important to note that even a runway in "poor" condition is still safe for flight operations. It simply requires more frequent inspections and often more intensive pavement maintenance (e.g., patching and crack sealing). By the time a runway is in poor condition, the FAA expects the airport to be well underway with the necessary planning and engineering design work to rehabilitate the runway (if it is still needed for flight operations).

Development to reseal, rehabilitate, or reconstruct airport facilities, runway, taxiway, and apron pavement and lighting systems that have deteriorated due to weather or use is categorized as rehabilitation. Failure to replace deteriorating pavement increases airport maintenance costs and can result in damage to aircraft propellers and engines and pooling water and ice deposits that can jeopardize braking and directional control and eventually cause 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.

This category is the largest development category accounting for 35 percent or \$22 billion of NPIAS funding needs and includes sealing, rehabilitation, and reconstruction of airfield pavement, lighting, marking and signage. It increased by 30 percent and reflects an increase in pavement rehabilitation costs by almost all type of NPIAS airport.

Airport Design Standards

The FAA helps airports maintain safe conditions by developing airport design standards based on airport design categories that apply to facilities throughout the system. FAA airport design standards have evolved over time and provide the necessary dimensions to accommodate the changing aircraft fleet, such as with the standards for RSAs. Airports agree, to the extent practical, to meet these FAA design standards when they accept Federal funds for capital improvements to their facilities. The FAA standards address physical layout characteristics, such as runway length and width; separation between runways, taxiways, and taxilanes; RSAs; lighting; signs; and markings. The standards also address material characteristics (e.g., pavement, wiring, and luminance of lights) and issues such as ARFF equipment, training and operations, snow removal plans and supporting equipment, and wildlife hazard management.

Many airports were designed and built 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 must be improved to correct confusing layouts, and aircraft parking areas must be adapted to accommodate larger aircraft. Standards development at general aviation 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 or group will account for at least 500 annual local and itinerant operations at an airport before including the development in the NPIAS.

Standards projects include development that is needed to bring an existing airport into compliance with design criteria recommended by the FAA. It also includes development that is needed to comply with FAA technical and operational specifications. Examples of these projects include strengthening, widening, relocating, or extending runways and taxiways, and associated lighting; expansion of existing or construction of new aprons; acquiring equipment (e.g., snow removal, deicing, weather reporting, and approach lighting and guidance systems); and constructing buildings for equipment primarily for snow removal equipment or aircraft hangars. Additionally, Federal funding may be used to study alternatives to reduce the number of runway incursions at an airport or for infrastructure improvements to address unclear taxiway markings, lighting, signage, or taxiway layout issues. Included in this NPIAS is \$243 million to mitigate problematic airport geometry.

This development category accounts for 20 percent (\$12.4 billion) of the NPIAS funding needs.

Environment

Airport development projects that require FAA approval or funding are actions subject to the National Environmental Policy Act (NEPA) review. The FAA must assess potential environmental impacts and will not approve a federal action until any required NEPA compliance and other applicable Federal, State, and local laws and requirements have been met. The FAA coordinates with other Federal State, Tribal and local agencies to conduct concurrent reviews, coordinate permit approvals, and prepare joint environmental documents, where applicable.

Community concern about environmental issues can complicate plans to expand existing airports or develop new airports. The problems can be particularly serious in metropolitan areas where there is high aviation demand and strong pressure to develop residential and other noncompatible land uses near airports. Historically, communities have been concerned about noise levels, but they are also concerned about air quality, water quality, traffic congestion, environmental justice, and other environmental issues.

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 U.S. National Ambient Air Quality Standards under the Clean Air Act. The FAA provides financial support for airport air quality mitigation through the AIP and the PFC Program.

Historically, airports were located near waterways and wetlands. Today, activities at these airports, if not properly designed and managed, have the potential to impact water quality. In particular, airport construction activities and seasonal aircraft and runway anti-icing/deicing operations are concerns. The FAA continues to work with other Federal and State agencies, airport operators, airlines, and industry groups to address various water quality issues.

The environment category includes projects designed to achieve an acceptable balance between airport operational and safety requirements and environmental goals. These projects include replacing impacted wetlands, removing wildlife attractants, constructing deicing containment facilities, acquiring energy efficient equipment, and purchasing specialized equipment or infrastructure to help reduce airport-related air quality impacts.

This category accounts for 0.7 percent (\$456 million) of the NPIAS costs with large hub airports accounting for 50 percent of total costs. Thirteen of these environmental projects are for constructing deicing containment and treatment facilities. Approximately \$77 million in eligible equipment and projects have been identified through 2027 for the Voluntary Airport Low Emissions (VALE)²⁸ Program. Another \$146 million in eligible projects for the Zero Emission Vehicle²⁹ and Infrastructure Pilot Program are identified through 2027 at primary airports. Energy Efficient equipment or infrastructure projects are identified at 7 commercial service airports totaling \$50 million.

²⁸ The VALE Program improves air quality and provides air quality credits. For more information see: [Voluntary Airport Low Emissions Program \(VALE\) \(faa.gov\)](https://www.faa.gov/programs/vale).

²⁹ The Zero Emission Vehicle and Infrastructure Pilot Program improves air quality and facilitates use of zero emissions technologies at airports. For more information see: [Airport Zero Emissions Vehicle and Infrastructure Pilot Program \(faa.gov\)](https://www.faa.gov/programs/zero-emissions-vehicle-and-infrastructure-pilot-program).

In addition, the FAA has launched an Airport Climate Challenge to help achieve the U.S. Aviation Climate Goal of net-zero greenhouse gas emissions from the U.S. Aviation Sector by 2050.³⁰ Airports can take advantage of several FAA funding programs to meet this goal, including grants for low- or zero-emission vehicles, renewable energy production, energy assessments and other efforts.

Noise

Considerable effort has been expended over the past 5 decades to provide relief to noise-impacted areas in part by funding noise mitigation projects under the AIP. Noise mitigation projects include: new, and modifications to, aircraft operational procedures; residential and public building sound insulation; land acquisition; relocating residents from noise-impacted areas; and noise attenuating airport infrastructure. Noise compatibility efforts also promote preventive measures, such as comprehensive planning, coordination with local land use jurisdictions, zoning, subdivision ordinances, incorporating noise attenuation into building codes, and real estate disclosure.

Development in this category includes projects to meet the expectations of residents of the surrounding area for a quieter environment. It also includes projects to mitigate noise for residences, schools, places of worship and public buildings; noise monitoring systems; and aviation easements. This development supplements the noise reductions that have been achieved by quieter aircraft and supports the review and implementation of noise abatement flight procedures.

This category accounts for 1.2 percent (\$732 million) of NPIAS costs with 76 percent of the costs at large hub airports. Costs are concentrated at airports with frequent flights by jet aircraft. This development is part of an extensive Federal and industry program involving land use planning, quieter aircraft, and noise abatement procedures that have significantly reduced the estimated number of people exposed to significant noise.

Airport Capacity

Development that will improve an airport for the primary purpose of reducing delay and/or accommodating more passengers, cargo, aircraft operations, or based aircraft is labeled as capacity.

This is the fourth largest development category accounting for 7.2 percent (\$4.5 billion) of the NPIAS and includes new runways, taxiways, and apron construction and extensions. Large hub airports account for 57 percent of this development. While terminal building development often accommodates more passengers and is generally considered capacity development, in this NPIAS it is shown separately.

³⁰ The U.S. aviation goal encompasses carbon dioxide emissions from (1) domestic aviation from U.S. and foreign operators, (2) international aviation from U.S. operators, and (3) airports located in the U.S. For more information see the U.S. 2021 Aviation Climate Action Plan at: [FAA, U.S. Airports Team up to Meet 2050 Net-Zero Climate Challenge | Federal Aviation Administration](#)

Development to improve airfield capacity increased only slightly from the last NPIAS. While remaining airfield capacity development included in this five-year plan will help to reduce congestion, capacity constraints will remain in certain large metropolitan areas. The FAA will continue to focus on the need for additional capacity and increased efficiency in those metropolitan areas and the locations identified in figure 1.

New airport infrastructure continues to play a role in increasing capacity. This is true even with the capacity and efficiency benefits that are being realized with the NextGen program to modernize the NAS. Going forward, both new runways and NextGen improvements are needed to improve efficiency at capacity-constrained airports.³¹

Terminal Improvements

Terminal building costs are incurred for development to accommodate more passengers and changes in aircraft fleet. Although terminal development tends to be concentrated at the busiest commercial service airports, nonprimary airports also identify limited terminal projects. Historically, the NPIAS only included the public-use portion of terminals that were eligible for AIP funding (about 50 to 60 percent of the terminal area) and excluded revenue-generating areas,³² such as areas that are leased by a single tenant or used by concessions (e.g., gift shops and restaurants).

However, the expanded 5-year eligibility under BIL (specifically costs for gates and related areas), which mirrors PFC eligibility, provided an opportunity to capture an additional \$779 million in terminal projects in this publication. These terminal projects are anticipated to expand capacity at airport terminals, increase energy efficiency, promote competition, and provide greater accessibility for individuals with disabilities.

This is the second largest development category accounting for 27 percent (\$17 billion) of the NPIAS costs, with the 76 percent of this development identified at large and medium hubs. Terminal costs have increased for the last 8 years. Funding of terminal projects, especially at large and medium hubs, tended to be accomplished through PFCs and other non-Federal funding sources.

Surface Access

Statistics for major airports in the United States show a limited but important role for public transportation to airports. The airports with high passenger traffic are more likely to have two or more other transport modes. Nationwide, air and rail transit are linked at 29 airports, including 6 airports served by more than one rail mode. Current plans include the extension of rail to three additional airports: Washington Dulles International (opening in late 2022), Los Angeles International (anticipated opening in 2024), and Daniel K. Inouye International in Honolulu (anticipated opening in 2031). In addition, several other communities are examining potential rail extensions or mass transit projects to get passengers to the airport.

³¹ FAA's NextGen Update is available online at: [This is NextGen – Where We Are Today \(faa.gov\)](https://www.faa.gov/nextgen)

³² Some smaller public-use airports can use AIP funds for public-use areas of a terminal that are revenue producing.

The FAA encourages airport sponsors and State and local officials to develop airport master plans and airport system plans that consider passenger convenience, airport ground access, and equitable access to airport facilities. As airport master planning explores and analyzes these aspects of the airport, new and innovative surface projects may be identified

Access includes the portion of airport ground access via highways and transit that is within the airport property line and eligible for Federal funding. Surface access currently accounts for 2.4 percent (\$1.5 billion) of the NPIAS costs. The large and medium hub airports account for 61 percent of the access development needs (\$934 million). A multi-modal project at a large hub airport under the expanded BIL eligibility is included in this publication.

New Airports

New airports in the NPIAS are serving 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. During the next 5 years, seven general aviation airports and one commercial service airports are anticipated to open. New airport costs account for 0.5 percent (\$342 million) of all NPIAS development. This category includes eligible costs for new airports opening by 2027 and new airports being planned or under construction with an opening date after 2027 (i.e., new Chicago or Las Vegas airport).

Air Traffic Control Towers

This is a new stand-alone development category for this version of the NPIAS accounting for 0.7 percent (\$440 million). Included in this category is approximately \$170 million to construct or modify Federal contract air traffic control tower buildings or equipment eligible through the FAA Reauthorization Act of 2018.

This version also includes the development authorized under BIL to construct, repair, improve, rehabilitate, modernize, replace, or relocate an airport control tower; acquire and install air traffic control, communications, and related equipment in an airport control tower; and construct a remote tower certified by the FAA including acquisition and installation of air traffic control, communications, or related equipment for sponsor-owned control towers participating in the FAA contract tower program and the contract tower cost share program (FCT). It also includes the development authorized under BIL to relocate, reconstruct, repair, or improve a sponsor-owned tower. Through April 2022, approximately \$270 million for improvements to sponsor-owned control towers was included in the NPIAS.

Other

This category of development accounts for about 1.6 percent (\$993 million) of the total development in the NPIAS. It includes construction and rehabilitation of fuel farms, hangars, utilities, and parking lots. Nonprimary airports account for 75 percent of this development.

Development Clarifications

- Airport development continues to be based on eligible and justified needs and priorities consistent with the role of the airport in the national airport system.
- Project cost estimates compiled in the NPIAS are provided by airport sponsors and in many cases are planning estimates developed prior to design and full environmental evaluation, which may introduce additional costs. The FAA may adjust these estimates when evaluating the project for a grant award.
- The development estimates reflect the costs at the time and do not reflect constant dollars. These estimates do not include contingency costs (increases in cost based on changes in design, construction uncertainty, or environmental mitigation) or normal price escalation due to inflation (annual increase in costs).
- While planning (master plans, regional and State system plans, environmental studies, and wildlife hazard assessments and management plans) costs are eligible for funding, they are not included in this publication estimating development costs. For the five-year period covered by this NPIAS, planning costs total \$410 million with nonprimary airports accounting for 58 percent and primary airports accounting for 42 percent.