United States Government Accountability Office

Report to Congressional Requesters

February 2020

AIRPORT INFRASTRUCTURE

Information on Funding and Financing for Planned Projects

Accessible Version

GAO-20-298

GAO Highlights

Highlights of GAO-20-298, a report to congressional requesters

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Why GAO Did This Study

U.S. airports are important contributors to the U.S. economy, providing mobility for people and goods, both domestically and internationally. About 3,300 airports in the United States are part of the national airport system and eligible to receive federal AIP grants to fund infrastructure projects. To help fund these projects, certain categories of airports are also authorized by federal law to collect PFCs, which passengers pay when buying tickets.

GAO was asked to examine airport-funding sources and planned infrastructure projects. This report examines, among other issues: (1) levels of federal and other funding that U.S. airports received from fiscal years 2013 through 2017 for infrastructure projects, (2) projected costs of planned infrastructure investments at U.S. airports from fiscal years 2019 through 2023, and (3) any challenges selected airports identified in obtaining projects' funding and financing.

GAO analyzed airport-funding data for AIP grants, PFCs, airport-generated revenue, and other sources for fiscal years 2013–2017—the most recent years for which data were available—and FAA's and Airports Council – North America's cost estimates of airports' planned infrastructure projects for fiscal years 2019–2023. GAO also interviewed FAA officials; representatives from airline and airport associations, and bond-rating agencies; officials from 19 selected airports representing airports of different sizes and with the highest planned development costs, among other things; and representatives from eight selected airlines, selected based on factors such as passenger traffic.

What GAO Found

From fiscal years 2013 through 2017, U.S. airports received an average of over $14 billion annually for infrastructure projects. The three largest funding sources are below:

- Funding from federal Airport Improvement Program (AIP) grants has remained relatively constant, at an annual average of $3.2 billion. Smaller airports (small hub, non-hub, and general aviation) collectively received more AIP funding compared to larger airports (large and medium hub).
- Revenue from federally authorized passenger-facility charges (PFC), a per-passenger fee charged at the ticket's point of purchase, increased by 9 percent, with an annual average of $3.1 billion. Increases in passengers and PFC revenue at larger airports contributed to this increase.
- Airport-generated revenue (e.g., concessions and airline landing fees) increased by 18 percent, with an annual average of $7.7 billion. While both larger and smaller airports experienced increases in these revenues, the larger airports made up 92 percent ($7.1 billion) of these revenues.

In addition to these sources, some airports obtained financing by issuing bonds, secured by airport revenue or PFCs. According to Federal Aviation Administration (FAA) data, larger airports were able to generate more bond proceeds than smaller airports in part because larger airports are more likely to have a greater, more certain revenue stream to repay debt.

Airports' planned infrastructure costs for fiscal years 2019 through 2023 are estimated to average $22 billion annually (in 2017 dollars)—a 19 percent increase over prior estimates for fiscal years 2017 through 2021. These costs are expected to increase in part because airports are planning to invest in more terminal projects. For example, cost estimates for AIP-eligible terminal projects increased about 51 percent when compared to FAA's prior 5-year estimate. FAA and airport association representatives stated that terminal projects can be more expensive than other projects because of the scale of the improvements, which can include renovating terminals to repair aging facilities and accommodate larger aircraft and growth in passengers.

Officials from GAO's 19 selected airports cited several challenges to funding infrastructure projects. For example, officials stated that the funding and revenue they receive from combined sources may not be sufficient to cover the costs of planned infrastructure projects. The officials also raised concerns about being able to finance future airport-infrastructure projects because they have already obligated their current and future PFCs to service debt on completed and ongoing infrastructure projects. According to FAA data, in fiscal years 2013 through 2017, airports paid a total of $12 billion—or 78 percent of total PFC revenues collected—for debt service. Bond-rating agencies, however, continue to give airports high or stable ratings, and rating agencies' representatives stated that airports' access to capital markets continues to remain favorable. Some airport officials stated that to address funding challenges, they have deferred some needed infrastructure investments or completed projects in phases, steps that increased construction times and costs.

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Abbreviations

A4A	Airlines for America
AATF	Airport and Airway Trust Fund
ACI-EUROPE	Airports Council International - EUROPE
ACI-NA	Airports Council International - North America
ACI-World	Airports Council International - World
AIP	Airport Improvement Program
CATS	Certification Activity Tracking System
EU	European Union
FAA	Federal Aviation Administration
IATA	International Air Transport Association
MII	majority-in-interest
NAS	National Airports System (Canada)
NASAO	National Association of State Aviation Officials
NPIAS	National Plan of Integrated Airport Systems
PFC	passenger facility charge
SOAR	System of Airports Reporting

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February, 13, 2020

The Honorable Peter DeFazio
Chairman
Committee on Transportation and Infrastructure
House of Representatives

The Honorable Rick Larsen
Chairman
Subcommittee on Aviation
Committee on Transportation and Infrastructure
House of Representatives

U.S airports are important contributors to our economy and fulfill a variety of vital roles, from supporting scheduled commercial air service for the traveling public, to supporting freight transportation and disaster relief. Since 1998, we have reported on airport funding and financing.[1] Our 2003 and 2014 reports highlighted challenges to airport funding and financing during a time when aviation activity was slowing or even declining at many airports. However, in recent years the financial outlook of U.S airports has improved, due in part to increased demand for air travel and the improved economy following the 2007 through 2009 recession.[2] According to Federal Aviation Administration (FAA) data, the number of people boarding planes—known as passenger "enplanements"—has increased from 829 million passengers in 2016 to 900 million passengers

[1]Prior GAO reports and testimonies on airport funding and financing include: GAO, *Airport Funding: FAA's and Industry's Cost Estimates for Airport Development*, GAO-17-504T (Washington D.C: Mar. 23, 2017); *Airport Finance: Information on Funding Sources and Planned Capital Development*, GAO-15-306 (Washington, D.C.: Apr. 28, 2015); *Airport Funding: Aviation Industry Changes Affect Airport Development Costs and Financing,* GAO-14-658T (Washington, D.C.: June 18, 2014); *Airport Finance: Observations on Planned Airport Development Costs and Funding Levels and the Administration's Proposed Changes in the Airport Improvement Program*, GAO-07-885 (Washington, D.C.: June 29, 2007); *Airport Finance: Past Funding Levels May Not Be Sufficient to Cover Airports' Planned Capital Development*, GAO-03-497T (Washington, D.C.: Feb. 25, 2003); and *Airport Financing: Funding Sources for Airport Development*, GAO/RCED-98-71 (Washington, D.C.: Mar. 12, 1998).

[2]Fitch Ratings, *2019 Outlook: U.S. Transportation Infrastructure* (Dec. 5, 2018).

in 2018 (an increase of 8 percent) and is expected to continue to grow over the next 20 years.[3]

Maintaining and improving infrastructure at U.S. airports is critical to help ensure safety and security and to meet increasing passenger demand. Currently, airports in the National Plan of Integrated Airport Systems (NPIAS) are eligible to receive federal Airport Improvement Program (AIP) grants to help fund airport infrastructure projects.[4] Commercial service airports—if they choose and subject to federal approval—are also authorized to collect a local passenger facility charge (PFC) from each passenger.[5] PFC revenues can be used for many of the same types of projects as AIP grants, but can also be used for debt service to finance infrastructure projects. There are varying perspectives on whether airports have the funding needed to address planned infrastructure needs. According to the Airports Council International—North America (ACI-NA)—an airport industry association—U.S. airports lack the necessary funding to modernize and expand outdated infrastructure. However, according to Airlines for America—the U.S. airline trade association—U.S. airports currently have adequate access to funding sources for their infrastructure needs.

You asked us to examine airport-funding sources, planned infrastructure projects, and funding mechanisms in other countries. This report discusses

- levels of federal and other funding that U.S. airports received from fiscal years 2013 through 2017 for infrastructure investments,
- projected costs of planned infrastructure investments at U.S. airports from fiscal years 2019 through 2023, and
- any challenges selected airports face in obtaining airport infrastructure funding and financing.

[3]Specifically, the FAA forecasts U.S. airline passenger enplanements will increase from 857 million in 2017 to over 1 billion in 2039.

[4]The NPIAS is a 5-year inventory, prepared by FAA, of planned infrastructure projects at U.S. airports that are significant to the national air transportation system and thus eligible to receive federal AIP grants. FAA publishes the NPIAS for Congress every two years.

[5]Commercial service airports are defined by 49 U.S.C. § 47102 as public airports that the Secretary of Transportation determines have at least 2,500 passenger boardings (enplanements) each year and receive scheduled passenger aircraft service.

We also examined how selected airports in other countries fund and finance airport infrastructure investments. This information is presented in appendix I.

To determine how much federal and other funding airports received from fiscal years 2013 through 2017 for infrastructure investments, we obtained and analyzed information on the main sources of airport funding, which include funding from federal grants and state grants, revenue from PFCs, airport-generated net income, capital contributions, and amounts of financing airports received from bond proceeds and other debt financing. All dollar amounts calculated from multiple years are presented in adjusted 2017 dollars. For data on airport-generated net income and capital contributions, we obtained and analyzed airport financial data from FAA's Certification Activity Tracking System (CATS) for fiscal years 2013 through 2017.[6] For AIP grants, we analyzed information from FAA's System of Airports Reporting (SOAR) database on AIP grants awarded by FAA from fiscal years 2013 through 2017. For PFCs, we obtained and analyzed data from the SOAR database on PFC collection amounts at all airports that collected PFCs from fiscal year 2013 through fiscal year 2017. We assessed the reliability of FAA's CATS data on airport financial information and FAA's SOAR data on AIP grants and PFC collection amounts by reviewing existing information about the data and the system that produced them, and consulting with agency officials who are knowledgeable about the data. We determined that the data were sufficiently reliable for the purposes of this report. For information on state grants, we used data from a survey that we conducted in 2014, with the assistance of the National Association of State Aviation Officials (NASAO); these data included all U.S. states and the territory of Guam. Results from this survey were reported in our 2015 report and in NASAO's August 2015 report, *NASAO State Aviation Funding and Organizational Data Report*.[7] We also spoke with NASAO officials about more recent trends in state funding.

[6]FAA uses CATS to gather and disseminate federally mandated airport financial information based on annual financial reports filed by commercial airports. We relied on fiscal year 2013 through 2017 data because it was the most recent 5 year period where complete data were available.

[7]See GAO-15-306. Comprehensive data on how much funding airports received from states from 2013 through 2017 are not available.

To determine projected costs of planned infrastructure investments at U.S. airports from fiscal years 2019 through 2023, we reviewed data from FAA's *Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2019–2023*. We also examined ACI-NA's report on airports' capital development needs for 2019–2023, which was released in February 2019.[8] In this report, planned infrastructure investments refers to development needs that airports have identified for the 2019–2023 period and that are reflected in FAA's and ACI-NA's reports. Consistent with how we present information about the sources of funding that airports received, projected cost dollar amounts calculated from multiple years are presented in adjusted 2017 dollars. To identify changes over time in airport's project costs of planned infrastructure investments, we also reviewed FAA's NPIAS report for fiscal years 2017–2021 and ACI-NA's report on airports' capital development needs for 2017–2021 and compared the estimates in those reports to the fiscal years 2019–2023 estimates. ACI-NA's estimates of U.S. airport infrastructure project costs differ from the FAA's due to scope, methodology, and other reasons. For both the FAA's and ACI-NA's estimates, we assessed the methodologies for estimating the costs of airport planned development by reviewing FAA's and ACI-NA's documents and interviewing FAA officials and ACI-NA representatives. We found the FAA and ACI-NA estimates to be sufficiently reliable for estimating planned capital development.

To identify any challenges airports face in obtaining infrastructure funding and financing, we reviewed documents and interviewed officials from FAA, 19 selected U.S. airports, and airport industry representatives to obtain information about infrastructure funding sources, planned infrastructure investments, and challenges to obtaining airport funding and financing. We selected airports representing different hub sizes, airports with the highest planned infrastructure costs, and airports with increasing and decreasing enplanements in calendar years 2013 through 2017.[9] We also interviewed an airline association and eight selected U.S. airlines to obtain their views on airport infrastructure funding and financing issues. We selected airlines with the highest passenger traffic, as

[8]ACI-NA's report which was issued in February 2019, is titled *2019-2023 Terminally Challenged: Addressing the Infrastructure Funding Shortfall of America's Airports*.

[9]The term "hub" is defined in federal law to identify commercial service airports as measured by passenger boardings, and the airports are grouped into four categories (49 U.S.C. § 40102 (29), (31), (34) and (42)). We relied on 2013 through 2017 data because it was the most recent data available at the time of our analysis.

measured by revenue passenger miles; legacy and low cost carriers; and domestic airlines that provide service outside the United States.[10] The information gathered from selected airport and airline interviews is not generalizable to the airport and airline population.

We also examined how foreign airports fund and finance infrastructure development. Foreign airports' ownership, regulatory, and funding structures are different from U.S. airports. As a result, benchmarking of airline rates and charges, passenger fees, and other sources of infrastructure funding is not possible due to these differences. To provide illustrative examples of the range of approaches to funding infrastructure at foreign airports, we obtained documents from and interviewed international airport associations, international aviation industry stakeholders, and representatives from four out of the five foreign airports that we selected as case studies. These airports included: Toronto Pearson International Airport (Canada), Frankfurt Airport (Germany), Heathrow Airport (United Kingdom), Helsinki Airport (Finland), and Changi Airport (Singapore). Representatives from Frankfurt Airport provided written responses and documents for our review. We selected foreign airports that had different airport ownership structures, that had the highest international passenger traffic, and that U.S. carriers serviced. The information gathered from these case studies is not generalizable to all foreign airports. See appendix I for summary information about funding and financing of airport infrastructure in our case studies of foreign airports. More detailed information on our scope and methodology is presented in appendix II.

We conducted this performance audit from September 2018 to February 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

[10]Revenue passenger miles are the number of miles paying passengers are transported and are a measure of passenger traffic.

Background

U.S. Airport System

The United States has more than 19,000 airports, which vary substantially in size and the type of aviation services they support. Of these, roughly 3,300 airports are designated by FAA as part of the national airport system and are therefore eligible for federal assistance for airport capital projects.[11] The national airport system consists of two primary types of airports—"commercial service" airports—which are publicly owned, have scheduled service, and board at least 2,500 or more passengers per year—and "general aviation" airports—which have no scheduled service and board fewer than 2,500 passengers.[12] Federal law divides commercial service airports into various categories of airports, based on the number of passenger boardings, ranging from large hub airports to commercial service non-primary airports (see fig. 1).

Figure 1: Commercial Airport Categories for U.S. Airports Based on 2017 Boardings of U.S. Passengers

Commercial airport category	Minimum required percentage of total annual passenger boardings	Annual passenger boardings per airport category		Number of airports
		Percentage	Number	
Large hub	1% or more	72.0%	617,598,283	30
Medium hub	At least 0.25%, but less than 1%	16.2%	138,949,064	31
Small hub	At least 0.05%, but less than 0.25%	8.3%	71,157,137	70
Nonhub	More than 10,000, but less than 0.05%	3.4%	28,881,284	255
Commercial service non-primary	At least 2,500 and no more than 10,000	0.1%	627,545	125

Source: GAO analysis of the Federal Aviation Administration's (FAA) 2017 enplanement data. | GAO-20-298

[11] 49 U.S.C § 47103.

[12] 49 U.S.C § 47102(7) and § 47102(8).

Data Table for Figure 1: Commercial Airport Categories for U.S. Airports Based on 2017 Boardings of U.S. Passengers

Commercial airport category	Percentage of total annual passenger boardings	Percentage of annual passenger boardings per airport category	Number of annual passenger boardings per airport category	Number of airports
Large hub	1% or more	72.0	617598283	30
Medium hub	At least 0.25%, but less than 1%	16.2	138949064	31
Small hub	At least 0.05%, but less than 0.25%	8.3	71157137	70
Nonhub	More than 10,000, but less than 0.05%	3.4	28881284	255
Commercial Service Nonprimary	At least 2,500 and no more than 10,000	0.1	627545	125

Note: The term “hub” is defined in federal law to identify commercial service airports as measured by passenger boardings, and the airports are grouped into four hub categories. (49 U.S.C. § 40102 (29), (31), (34) and (42)).

Consistent with our prior work, we have grouped airports into two broader categories: larger airports, which includes large and medium hubs, and smaller airports, which includes small hubs, non-hubs (also referred to as “non-hub primary”), and non-primary commercial service airports as well as reliever airports, general aviation airports, and new airports.[13] The majority of passenger traffic is at larger airports, which accounted for 88 percent of all commercial airport enplanements in 2017. From 2013 to 2017, enplanements have increased at airports of all hub sizes. Specifically, commercial airport enplanements at larger and smaller airports increased by 16 percent and 15 percent, respectively, during this time period.

Federal Grants

National system airports are eligible to receive federal funding from AIP grants for infrastructure development. AIP funds are first authorized in

[13]Reliever airports are airports designated by the Secretary of Transportation to relieve congestion at a commercial service airport by providing access to airlines and providing additional general aviation access to the community. 49 U.S.C. § 47102 (23).

FAA reauthorization acts, and Congress then appropriates funds for AIP grants from the Airport and Airway Trust Fund, which is supported by a variety of aviation-related taxes, such as taxes on tickets, cargo, general aviation gasoline, and jet fuel.[14] While AIP grants are an important source for airports' infrastructure funding, the amount of funding authorized for the AIP grant program has not changed since 2012.[15] In 2018, Congress passed the FAA Reauthorization Act of 2018, which authorized annual AIP grant levels at $3.35 billion annually through fiscal year 2023 and authorized additional amounts for supplemental discretionary funding each year from 2019 through 2023, starting at $1.02 billion and increasing each year thereafter. In addition, the Consolidated Appropriations Act of 2018 appropriated $1 billion in supplemental annual funding from the general fund for the AIP discretionary grant program. Subsequently, in February 2019, the Consolidated Appropriations Act of 2019 provided $500 million from the general fund to the AIP discretionary grant program.

The distribution of federal AIP grants is complex. It is based on a combination of formula funds—also referred to as entitlement funds—that are available to national system airports, and discretionary funds that FAA awards for selected eligible projects. Entitlement funds are apportioned by formula to airports and may generally be used for any eligible airport improvement or planning project.[16] Discretionary funds are approved by FAA based on FAA selection criteria and a priority system, which FAA uses to rank projects based on the extent to which they reflect FAA's nationally identified priorities.[17] AIP grants must be used for eligible and

[14]AIP is funded through the FAA authorization legislation and subsequent appropriations.

[15]The 2012 FAA Modernization and Reform Act authorized funding for AIP grants through fiscal year 2015 at an annual level of $3.35 billion. Pub. L. No. 112-95, § 101(a), 126 Stat. 11, 15.

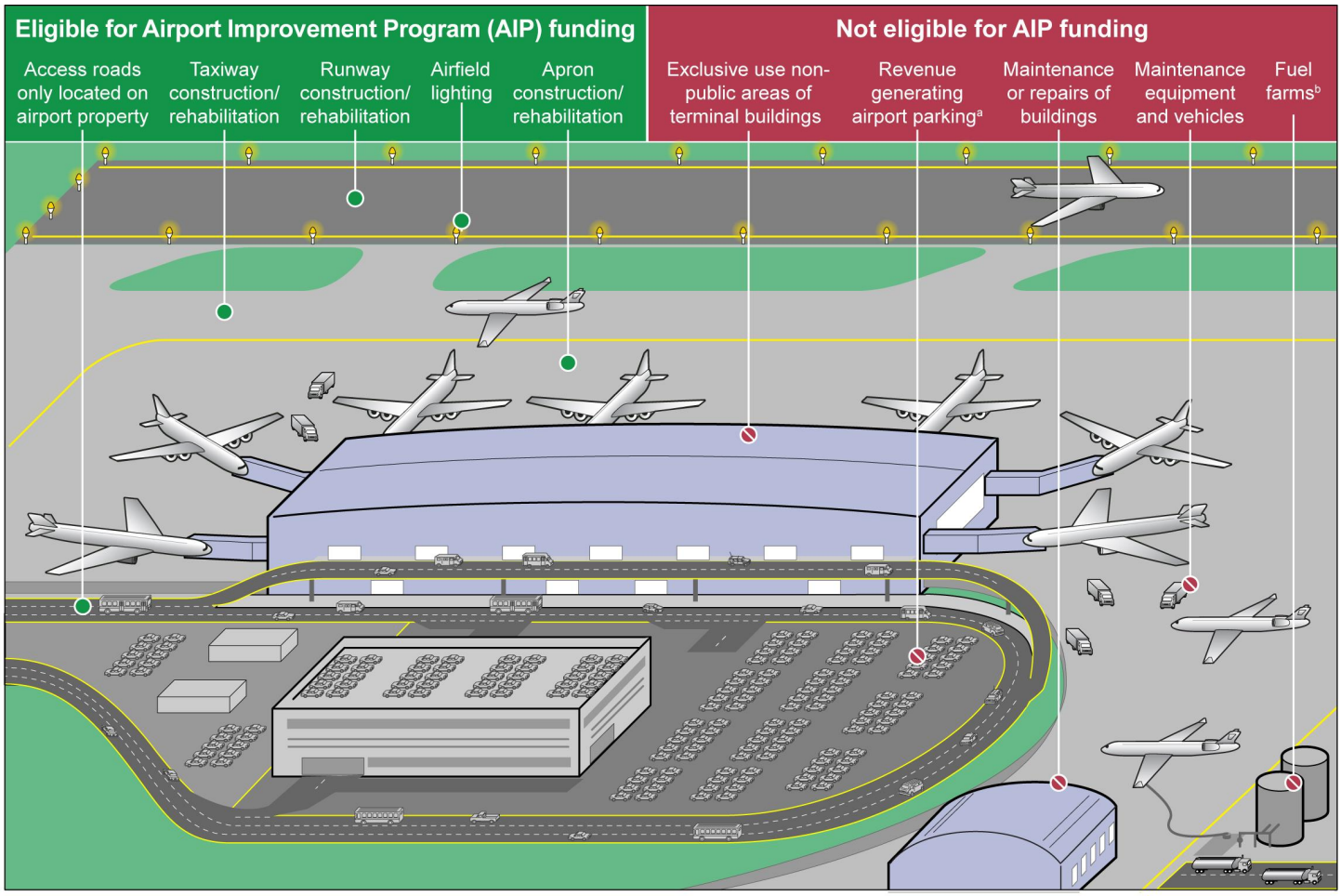
[16]Entitlement funds are first apportioned by formula to specific airports or types of airports. These funds are divided into four categories: primary airports, cargo service airports, general aviation airports, and Alaska supplemental funds. Each category distributes AIP funds by a different formula. After entitlement funds have been apportioned, the remaining funds are defined as discretionary funds. 49 U.S.C. §47114.

[17]Discretionary funding includes funding that was not distributed under the apportioned entitlements, as well as the forgone PFC revenues that were deposited into the small airport fund. Allocations of discretionary funds are subject to three set-asides for airport environment programs, military airport program funding, and a special set-aside for certain types of reliever airports. Of the remaining discretionary funds, 75 percent must be used for preserving and enhancing capacity, safety, and security at primary and reliever airports. The remaining 25 percent, known as remaining pure discretionary, may be used for any eligible project at any airport. 49 U.S.C. § 47115-47116.

justified projects, which are planned and prioritized by airports, included in their capital improvement plans, and reviewed and approved by FAA staff and the Secretary of Transportation.[18] Generally, most types of airfield improvements—such as runways, lighting, navigational aids, and land acquisition—are eligible for AIP funding. AIP-eligible projects for airport areas serving travelers and the general public—called "landside development"—include entrance roadways, pedestrian walkways and movers, and common space within terminal buildings, such as waiting areas. See figures 2 and 3 for more information about the types of projects eligible for AIP funding. For all AIP-funded projects, the airport must provide a share of matching funds. The federal share is from 75 to 95 percent depending on the size of the airport or type of project.

[18]Federal law establishes which types of airport development projects are eligible for AIP's funding. 49 U.S.C. § 47102(3).

Figure 2: Examples of Projects Eligible and Not Eligible for the Airport Improvement Program's (AIP) Funding

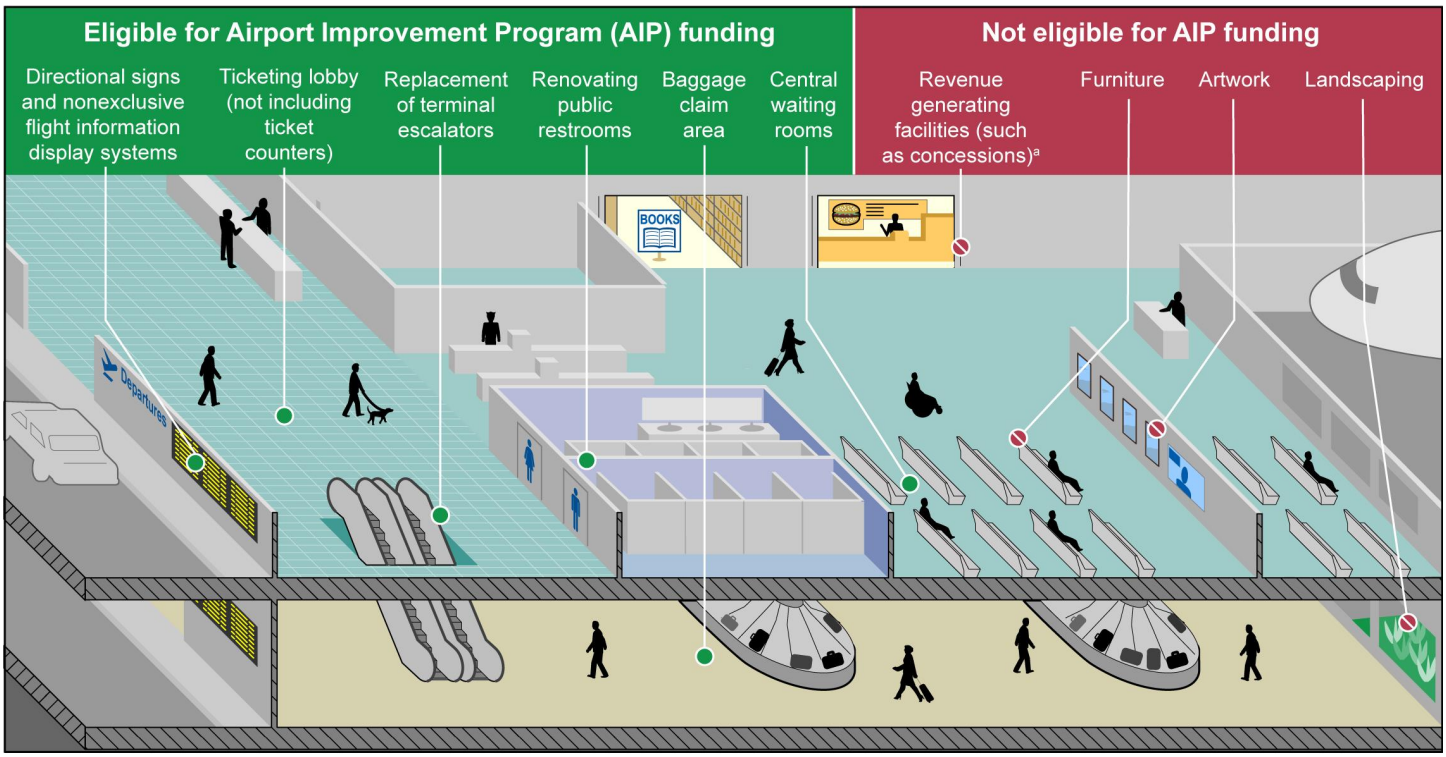


Source: GAO presentation of Federal Aviation Administration (FAA) information. | GAO-20-298

[a]Airport parking is eligible for nonrevenue parking lots at non-hub primary and non-primary airports.

[b]Fuel farms may be conditionally eligible at non-primary airports.

Figure 3: Examples of Terminal Building Areas Eligible and Not Eligible for the Airport Improvement Program's (AIP) Funding



Source: GAO presentation of Federal Aviation Administration (FAA) information. | GAO-20-298

[a]Revenue-producing areas are ineligible at large, medium, or small hub airports. However, these projects may be eligible at all other commercial service airports that are public use per 49 USC § 47119(a)(1) and where a sponsor has certified that any needed airport development project affecting safety, security, or capacity will not be deferred due to the revenue-producing project.

Passenger Charges

Revenue from PFCs is another means of support for airport infrastructure projects. PFCs are federally authorized fees which were established in 1990 to help pay for infrastructure at commercial service airports.[19] Although PFCs are local funds subject to the airport's control, FAA oversees the PFC program and approves applications by airports to collect PFC revenues. PFCs are currently capped at $4.50 per flight segment with a maximum of two PFCs charged on a one-way trip or four PFCs on a round trip, for a maximum of $18 total. On behalf of the airports, airlines collect the PFC at the time of the ticket purchase and

[19]49 U.S.C. § 40117.

remit the PFC, minus an administrative fee, to the airport. To meet future planned infrastructure costs, airports have sought an increase in the cap on PFCs. However, airlines oppose a PFC increase because they believe airports already receive sufficient PFC revenues and that higher ticket prices could reduce passenger demand and airline revenues. We have previously reported that increasing the PFC cap would significantly increase PFC collections available to airports under three scenarios GAO modeled but could also marginally slow passenger growth and growth in revenues to the Airport and Airway Trust Fund (AATF).[20]

Airports have more flexibility in using PFCs to fund infrastructure projects as compared to AIP funding. Airport infrastructure projects eligible for PFC funding must meet one or more of the following:

- preserve or enhance safety, security, or capacity;
- reduce noise or mitigate noise impacts; or
- increase air carrier competition.[21]

Airports are able to fund projects with PFC revenues that might not be eligible for AIP funding, such as passenger terminal projects and development at gates, airline ticketing areas, and passenger check-in facilities at hub airports. In addition to being applied to FAA approved eligible projects, PFCs can be used as a match for AIP grants or to finance the debt on approved projects.

Airports' Costs for Planned Infrastructure Projects

FAA and ACI-NA each produce reports summarizing 5-year estimates of U.S. airports' infrastructure project costs. More specifically, FAA is required to publish a 5-year estimate of AIP-eligible development every 2

[20]GAO, *Commercial Aviation: Raising Passenger Facility Charges Would Increase Airport Funding, but Other Effects Less Certain*, GAO-15-107 (Washington D.C.: Dec. 11, 2014).

[21]Specifically, PFC projects must meet one or more of the requirements of 49 U.S.C. § 40117(a)(3) which include: (1) preserve or enhance safety, security, or capacity of the national air transportation system; (2) reduce noise or mitigate noise impacts resulting from an airport; or (3) furnish opportunities for enhanced competition between or among air carriers.

years. FAA provides this information in its *NPIAS report*.[22] FAA relies on airports, through their planning processes, to identify individual AIP-eligible projects for funding consideration and inclusion in the NPIAS. The ACI-NA also collects data on all proposed capital development projects at U.S. airports and every 2 years publishes a report of U.S. airports' 5-year infrastructure cost estimates.[23]

Airports Received an Average of about $15 Billion Annually for Infrastructure Development from a Variety of Sources, Including Grants and Revenue

From fiscal years 2013 through 2017, national system airports received an annual average of about $15 billion in funding from a variety of sources for infrastructure development projects, including:[24]

- federal AIP grants (about $3.2 billion annually);[25]
- airport revenue from passenger charges (about $3.1 billion annually), and airport-generated revenue (about $7.7 billion annually); and
- capital contributions (about $715 million annually).

[22]FAA's most recent report, which provides estimates of AIP-eligible development for fiscal years 2019 through 2023, is titled *Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2019-2023*. FAA's cost estimate includes estimates for AIP-eligible projects as required by statute.

[23]As previously discussed, ACI-NA's most recent report is titled *2019-2023 Terminally Challenged: Addressing the Infrastructure Funding Shortfall of America's Airports*. The report provides estimates of airport infrastructure needs for fiscal years 2019 through 2023. ACI-NA's cost estimate includes estimates for AIP-eligible and AIP-ineligible projects.

[24]Dollar amounts in this section are presented in adjusted 2017 dollars. All funding figures provided are annual averages for fiscal years 2013 through 2017. More recent data on state grant funding were not available, as we will discuss later in the report.

[25]AIP grant funding reflects grants awarded to airports during each of the fiscal years shown (fiscal years 2013 through 2017), as subsequently amended through January 29, 2020. FAA officials said that AIP grants issued in any given year may be subsequently amended using funds available from the current year, or funds recovered from a different fiscal year. Therefore, the annual AIP grant summary figures reported here will vary from the annual figures shown in prior GAO reports, including our 2015 report (GAO-15-306).

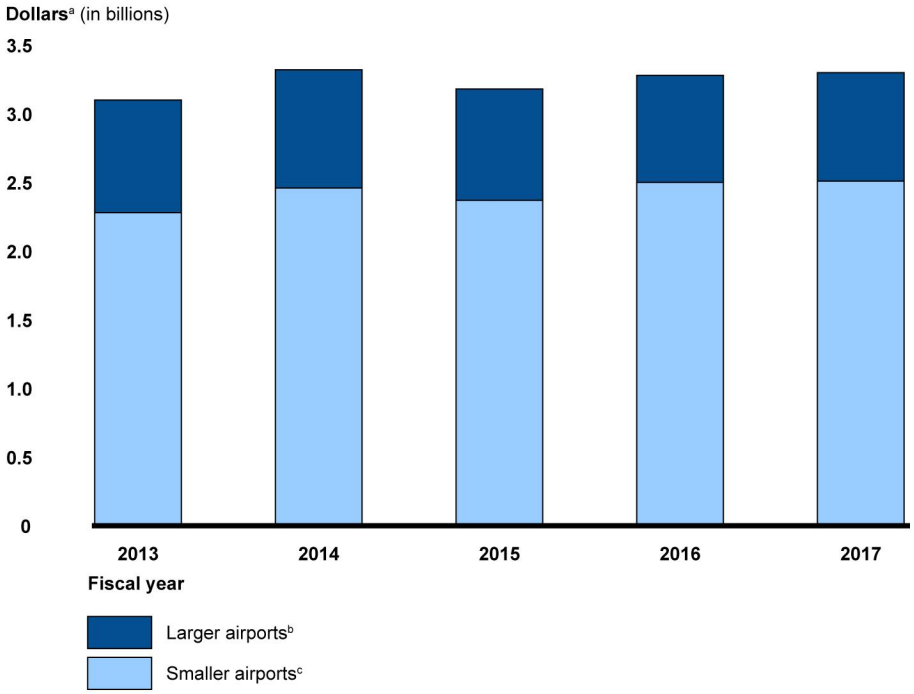
These figures, however, do not represent the full amount of funding that is available to airports for infrastructure development. For example, some airports also received funding from state grants and bond proceeds through debt financing to fund airport infrastructure investments. In addition, the proportion of funding that larger and smaller airports received from these sources varies.

Federal AIP and State Grant Funding Has Remained Relatively Constant

From fiscal years 2013 through 2017, the total amount of AIP grants that national system airports received has generally remained constant.[26] As shown in figure 4 below, the amount of AIP grant funding that airports received ranged from $3.1 billion to $3.3 billion annually for fiscal years 2013 through 2017. Overall, airports received an average of $3.2 billion annually in AIP grants. The total amount of AIP grant funding that FAA allocates to airports may vary slightly year to year for many reasons. For example, according to FAA, each year a small amount of AIP funding is returned from prior-year grants and the FAA is permitted to re-obligate those funds on either existing or new grants.

[26]FAA officials said that in 2013, FAA had a one-time transfer of $253 million from AIP grants to operations due to sequestration. As a result, the data show that the AIP grant funding is lower in 2013. Pub. L. No. 113-9, § 2(c), 127 Stat. 443.

Figure 4: Airport Improvement Program's (AIP) Grants to Airports by Size, Fiscal Years 2013–2017



Source: GAO analysis of the Federal Aviation Administration's (FAA) System of Airports Reporting data. | GAO-20-298

Data Table for Figure 4: Airport Improvement Program's (AIP) Grants to Airports by Size, Fiscal Years 2013–2017

Fiscal year	Larger airports	Smaller airports
2013	2276619	820209
2014	2458548	855716
2015	2371017	807050
2016	2500801	782376
2017	2509984	792867

[a]Dollar amounts are in adjusted 2017 dollars. AIP grant funding reflects data as of January 29, 2020.

[b]Larger airports include large and medium hubs. For fiscal years 2013 through 2017, the number of larger airports that received AIP grants ranged from 55 to 59.

[c]Smaller airports include predominantly small hubs, non-hubs, and non-primary commercial service airports, as well as a few reliever airports, and general aviation airports. For fiscal years 2013 through 2017, the number of smaller airports that received AIP grants ranged from to 1,324 to 1,392.

Collectively, smaller airports received more AIP grant funding compared to larger airports during this time period. As shown in figure 4, from fiscal years 2013 through 2017, smaller airports received the largest share of AIP grant funding, approximately 75 percent, (an annual average of $2.4

billion), compared to 25 percent received by larger airports (an annual average of $812 million). Larger airports are generally able to rely on other sources of revenue generated from airport-generated revenue and PFCs due to higher enplanements compared to smaller airports. In addition, the amount of AIP grants' funding that smaller hub airports received increased by about 10 percent between fiscal years 2013 through 2017, while the amount of AIP's funding for larger airports decreased by 3 percent in the same time period. However, smaller airports receive less funding per AIP grant compared to larger airports. For example, smaller airports received an average of $897,000 per grant, while larger airports received an average of $5 million per AIP grant.

Some airports also received state funding, primarily in the form of grants used as matching funds for federal AIP grants. Data for fiscal years 2013 through 2017 on states' grant funding are not available. However, in 2015, we conducted a survey of airports, in collaboration with NASAO, for fiscal years 2009 through 2013, and reported that states provide an annual average of $477 million to national system airports.[27] According to NASAO officials we interviewed for our current work, states' grant-funding levels have remained unchanged.

Airport Revenue—the Largest Source of Funding for Larger Airports—Has Gradually Increased

From fiscal years 2013 through 2017, airports collected revenue from a variety of sources, including PFC charges and airport-generated revenue (both aeronautical and non-aeronautical), which have both increased during our 5-year time period.[28] Some airports also received funding from capital contributions, but that amount has decreased from fiscal year 2013 through 2017.[29] Airport revenue is the largest source of funding for larger airports. Specifically, larger airports generated an annual average

[27]GAO-15-306.

[28]Aeronautical revenues are derived from the operation and landing of aircraft, passengers, or freight. Non-aeronautical revenues are derived from other airport sources, such as terminal concessions and parking fees.

[29]Capital contributions are generally funding provided to airports by the airport's sponsor (often a state or municipality) or by other sources such as an airline. As referenced later in this report, capital contributions for airport infrastructure projects make up a small amount of funding compared to other sources of funding.

of $10.4 billion in airport revenue (or 90 percent of all airport revenue) during our 5-year time period. Smaller airports generated less airport revenue, with an annual average of $1.2 billion (or 10 percent of all airport revenue), compared to larger airports. Larger airports' ability to generate more airport revenue reflects that PFCs and airport-generated revenue could be driven by the higher levels of passenger enplanements and airline activity associated with current economic conditions.[30] According to FAA officials, while total airport revenue has increased over this time frame, it does not necessarily mean that airports have more revenue available for new capital expenditures. For example, airport revenue is also used to pay for existing debt service and operating costs, which according to FAA officials, has also increased during this time period.

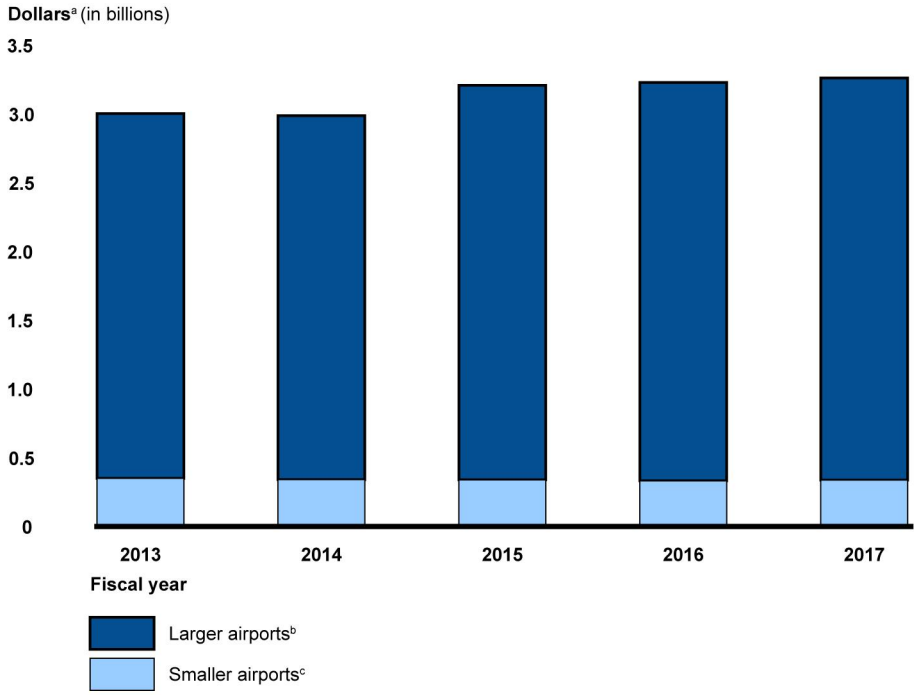
Passenger Charges

Overall, from fiscal years 2013 through 2017, U.S. airports collected an annual average of $3.1 billion in PFC revenue.[31] As shown in figure 5, during this period, the annual average for PFC collections for all airports increased by 9 percent from $3 billion to $3.3 billion. Because PFCs are generated by the number of enplaned passengers, this increase was mostly driven by a 16 percent increase in passenger enplanements during this period for both smaller and larger airports.

[30]The International Air Transport Association (IATA) has reported that economic gross domestic product (GDP) growth is a fundamental driver of air travel demand.

[31]PFC revenue reported here is not comparable to PFC revenue in our 2015 report. We used a different methodology to calculate PFC revenue from our 2015 report on airport finance. See GAO-15-306.

Figure 5: U.S. Airport's Passenger Facility Charge (PFC) Collections by Airport Size, Fiscal Years 2013–2017



Source: GAO analysis of the Federal Aviation Administration's (FAA) System of Airports Reporting data. | GAO-20-298

Data Table for Figure 5: U.S. Airport's Passenger Facility Charge (PFC) Collections by Airport Size, Fiscal Years 2013–2017

Fiscal year	Smaller Airports	Larger Airports
2013	349472	2653450
2014	340572	2646800
2015	338892	2868600
2016	331509	2897380
2017	337114	2924700

[a]Dollar amounts are in adjusted 2017 dollars.

[b]Larger airports include large and medium hubs. For fiscal years 2013 through 2017, the number of larger airports reporting annual financial data to FAA ranged from 55 to 60.

[c]Smaller airports include predominantly small hubs, non-hubs, and non-primary commercial service airports, as well as a few reliever airports, and general aviation airports. For fiscal years 2013 through 2017, the number of smaller airports reporting annual financial data to FAA ranged from to 1,323 to 1,392.

As shown in figure 5, larger airports collected most (89 percent) of the PFC revenues in fiscal years 2013 through 2017. In addition, although both larger airports and smaller airports experienced an increase in

passenger enplanements in fiscal years 2013 through 2017, larger airports experienced a 10 percent increase in PFC revenue while smaller airports experienced an overall decrease in PFC revenue during this period of about 3 percent. According to FAA officials, smaller airports may have experienced an overall decrease in PFC revenues because airports' PFC collections may cease when they have fully collected the approved amount for a project. According to FAA, this cessation is particularly true for smaller airports that do not have multiple projects for which PFC collections have been approved for a long period of time. In addition, if an airport has approved collections but one or more airlines make significant reductions in activity levels, this factor can also slow the rate of collections at airports. Larger airports hold a larger market share of flights, representing 88 percent of enplanements. Ratings agency representatives said that larger airports rely more on PFCs and bonding to fund infrastructure projects.

Airport-Generated Revenue

From fiscal years 2013 through 2017, U.S. airports generated an annual average of $7.7 billion in airport-generated revenue.[32] During this period, airport-generated revenue increased 18 percent, from $7.1 billion to $8.4 billion for all airports.[33] Overall, both larger and smaller airports generated more income over this time period, with larger airports generating substantially more revenue compared to smaller airports. Specifically, from fiscal years 2013 through 2017, larger airports generated an annual average of $7.1 billion in revenue, and smaller airports generated an annual average of $567 million in revenue.

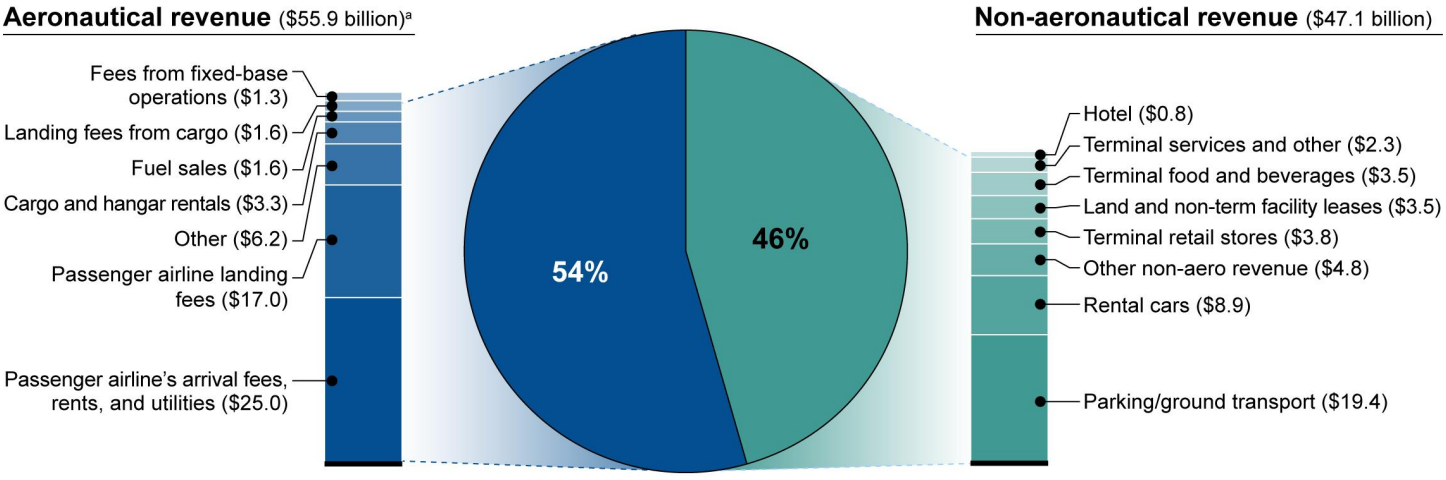
Airport-generated revenue consists of both "airside" aeronautical revenues derived from the operation and landing of aircraft, passengers, or freight, as well as "landside" non-aeronautical revenues derived from

[32]We calculated airport-generated revenue by taking U.S. airports' total operating revenue plus interest income, subtracted by the subtotal of operating expenses prior to subtracting depreciation. The annual average of $7.7 billion in airport-generated revenue reflects annual averages of $20.6 billion in operating revenues, plus $274 million in interest income, minus $13.2 billion in operating expenses (before subtracting depreciation expense).

[33]We used a different methodology to calculate airport-generated revenue from our 2015 report on airport finance by not subtracting an estimated amount of PFCs used to pay for interest expense from the airport's total interest expense. See GAO-15-306. As a result, airport-generated revenue reported here is not comparable to airport-generated revenue in our 2015 report.

terminal concessions and parking fees. Of the $103 billion in airport-generated revenue over our 5-year time period, 54 percent came from aeronautical revenues and 46 percent came from non-aeronautical revenues (see fig. 6). Commercial service airline rates and charges—which include passenger airline's landing fees and passenger arrival fees, rents, and utilities—made up 75 percent of the total $55.9 billion in aeronautical revenue. The remainder came from a variety of other fees and taxes paid by airlines, general aviation, the military, and other aeronautical sources. Of the non-aeronautical revenues, parking and ground transportation accounted for the greatest portion (41 percent), followed by rental cars operations revenue (19 percent). Aeronautical revenues increased by 11 percent and non-aeronautical revenues increased by 16 percent over the time period.[34]

Figure 6: Total Aeronautical and Non-Aeronautical Revenue for All U.S. Airports, Fiscal Years 2013–2017



Source: GAO analysis of Federal Aviation Administration's (FAA) Certification Activity Tracking System data. | GAO-20-298

Data Table for Figure 6: Total Aeronautical and Non-Aeronautical Revenue for All U.S. Airports, Fiscal Years 2013–2017

Revenue type	Non-Aeronautical	Aeronautical
Number	45883800	54416700
Percentage	54%	46%

[34]As we have previously reported, to increase non-aeronautical revenue, airports are developing or enhancing the number and types of services within airport terminals for passengers and visitors, such services as upscale shops and personal services; airports are also developing services for passengers and businesses outside of the terminal areas but on airport property such as hotels and business centers. See GAO-13-261.

Aeronautical Revenue type	Pass. Arrival Fees, Rents, Utils.	Pass. Airline Landing Fees	Other Aero. Revenue	Cargo & Hangar Rental	Fuel Sales	Landing Fees from Cargo	Fees from Fixed-Base Operations	Total
Billions of dollars	25.1	17	6.2	3.3	1.6	1.6	1.3	55.9

Non-aeronautical revenue type	Parking/Ground Transport	Rental Cars	Other Non-Aero Revenue	Terminal Retail Stores	Land & Non-Term Facility Leases	Terminal Food & Beverages	Terminal Services & Other	Hotel	Total
Billions of dollars	19.4	8.9	4.8	3.8	3.5	3.5	2.3	0.84	47.1

[a]Dollar amounts are in adjusted 2017 dollars.

Capital Contributions

Capital contributions for airport infrastructure projects make up a small amount of funding in comparison to other sources, such as airport-generated revenue and AIP funding. These contributions—made on an individual project basis—may be provided by an airport's sponsor (often a state or municipality) or by other sources such as an airline. According to FAA data on commercial airports' annual financial reports for fiscal years 2013 through 2017, commercial airports received an annual average of $715 million in capital contributions. Of this amount, $471 million, or 66 percent, went to larger airports, and $244 million, or 34 percent, went to smaller airports. The amount of capital contributions varies by year and by hub size. According to FAA officials, the sources of capital contributions funding (i.e., airport sponsor, state, air carriers, or other airport users) vary depending on the type of project and funds available.

Some Airports Also Received Bond Proceeds through Debt Financing for Airport Infrastructure Investments

Airports can also obtain financing for airport infrastructure projects by issuing bonds. Airport bonds entail leveraging future funding to pay for projects. This financing mechanism enables airport authorities to borrow money up front to finance infrastructure projects; this money can then be paid back with interest over a longer time period. U.S. airports may qualify for tax-exempt bonds to support airport projects for federal tax purposes because the airports are owned by states, counties, cities, or public authorities. The tax-exempt status enables airports to issue bonds at

lower interest rates than taxable bonds, thus reducing a project's financing costs. FAA officials said that because airports use some PFCs and airport-generated revenue to pay off debt service, not all revenue generated from these two sources is available for additional infrastructure investment.

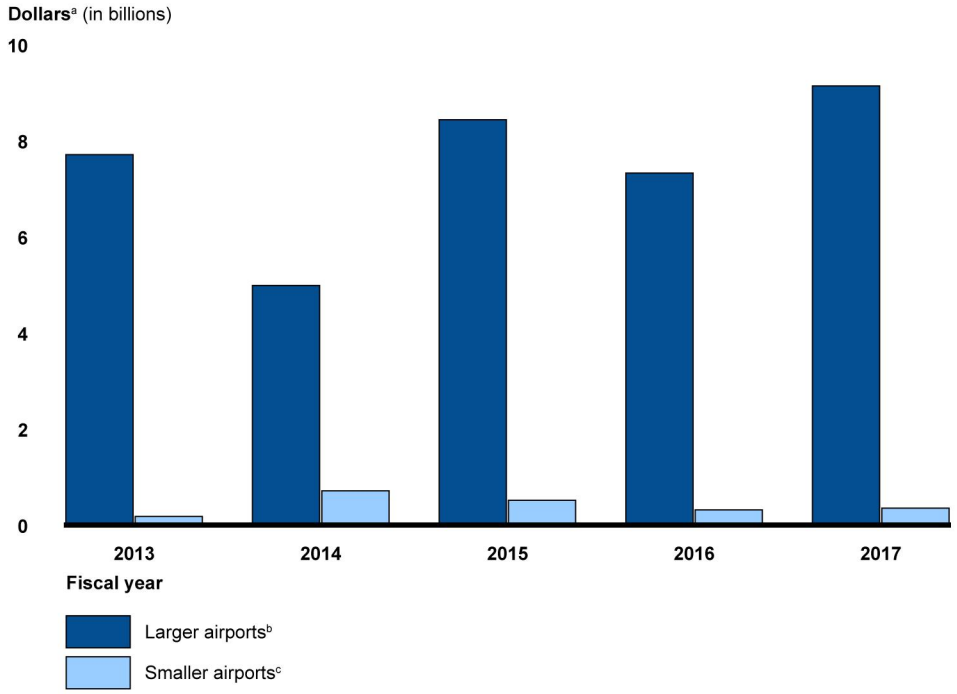
FAA collects data in its financial reporting database of an airport's total indebtedness. Based on our analysis of this data, from fiscal years 2013 through 2017, airports had averaged $84.6 billion in total bond debt per year. The total indebtedness measure provides an overall aggregate of the level of long-term bond debt held by airports for the year. FAA's data do not differentiate indebtedness for each type of bond, nor do its data differentiate between existing, new, or refinanced bonds. As a result, we were not able to analyze how much airports obtained on average for new projects by issuing bonds from fiscal years 2013 through 2017. In addition, we were not able to determine whether U.S. airports borrowed increasing amounts of new bond proceeds from fiscal years 2013 through 2017 to meet infrastructure needs. Moreover, FAA does not collect data on the time frame that airports anticipate to pay back bonds, as FAA officials said that airports have the latitude to determine their own debt-payment schedules.

During fiscal years 2013 through 2017, larger airports received the vast majority of bond proceeds, representing 95 percent of the total (see fig. 7). This amount includes debt from all long-term bonds.[35] We previously reported that bond financing has traditionally been an option more commonly exercised by larger rather than smaller airports because they are more likely to have a greater and more certain revenue stream to support debt repayment.[36] We have also reported that when smaller airports issue bonds, they make greater use of general obligation bonds that are backed by tax revenues of the airport sponsor, which is often a state or municipal government. FAA officials added that larger airports tend to issue airport revenue bonds, which are backed solely by airport revenue, while some smaller airports may be able to benefit from bond proceeds issued by the broader county or municipal government and backed by that entity's taxing authority.

[35]Long-term bonds include bonds backed by: general airport revenue bonds, general aviation bonds, and general obligation bonds; double-barrel PFC bonds, which are backed by both PFCs and airport revenues; and PFC-backed bonds.

[36]GAO-15-306.

Figure 7: U.S. Airports' Bond Proceeds for Fiscal Years 2013 through 2017



Source: GAO analysis of Federal Aviation Administration's (FAA) Certification Activity Tracking System data. | GAO-20-298

Data Table for Figure 7: U.S. Airports' Bond Proceeds for Fiscal Years 2013 through 2017

Fiscal year	Larger airports	Smaller airports
2013	7707683	178480
2014	4984490	713160
2015	8435570	514482
2016	7325363	315231
2017	9137060	350127

[a]Dollar amounts are in adjusted 2017 dollars.

[b]Larger airports include large and medium hubs. For fiscal years 2013 through 2017, the number of larger airports reporting annual financial data to FAA ranged from 55 to 60.

[c]Smaller airports include predominantly small hubs, non-hubs, and non-primary commercial service airports, as well as a few reliever airports, and general aviation airports. For fiscal years 2013 through 2017, the number of smaller airports reporting annual financial data to FAA ranged from to 1,323 to 1,392.

Projected Planned Airport-Infrastructure Costs Have Increased to an Average of $22 Billion

Annually and Include More Investments in Terminal Projects

We Estimated Average Annual Costs of $22 Billion for Planned Airport-Infrastructure Investments for Fiscal Years 2019 through 2023

Based on our analysis, airports' planned infrastructure costs are projected to average $22 billion annually for fiscal years 2019 through 2023. To arrive at this estimate, we combined FAA's $7 billion estimate of AIP-eligible planned infrastructure costs and ACI-NA's $15 billion estimate of planned infrastructure costs for projects that are not eligible for AIP grants.[37] Our $22 billion estimate would represent an increase of 19 percent from FAA's and ACI-NA's fiscal years 2017 through 2021 infrastructure cost estimates.[38] This increase is largely driven by an increase in ACI-NA's estimate of AIP-ineligible planned projects. Specifically, ACI-NA's annual average of about $15 billion in planned AIP-ineligible costs reflects an increase of $3.3 billion or 28 percent when compared to the annual average estimate of AIP-ineligible projects from ACI-NA's fiscal year 2017–2021 estimates. Similarly, FAA's annual average of $7 billion in planned AIP-eligible costs reflects an increase of $289 million or 4 percent from FAA's fiscal year 2017–2021 estimates.[39] A variety of factors may be contributing to the increase in FAA's and ACI-NA's cost estimates, factors that we will discuss later in the report.

[37]FAA's estimate is in 2017 dollars. ACI-NA's original estimates are in current year dollars. For our analysis we adjusted ACI-NA's estimate to 2017 dollars so as to be comparable to FAA's estimate. To provide a comprehensive estimate of future airport development costs, we combined FAA and ACI-NA data. We used FAA's estimate for AIP-eligible projects and used ACI-NA's estimate for AIP-ineligible projects. This is the same approach we used in 2003, 2007, and 2015. See GAO-03-497T, GAO-07-885, and GAO-15-306.

[38]To identify changes in FAA and ACI-NA's recent estimates, we compared FAA's and ACI-NA's fiscal years 2019–2023 estimate to FAA's and ACI-NA's fiscal years 2017–2021 estimates. We combined FAA's 2017–2021 $6.7 billion estimate of AIP-eligible planned infrastructure costs and ACI-NA's 2017–2021 $11.9 billion estimate of AIP ineligible projects to arrive at a combined 2017–2021 estimate of $18.6 billion. These estimates are in 2017 dollars.

[39]According to FAA officials, while the NPIAS cost estimates are derived from airports' plans, the estimate for AIP-eligible projects is a projection of airports' needs, as not all planned projects receive AIP funding.

Overall, larger airports (large and medium hub) accounted for 75 percent of the $22 billion annual cost estimate and make up a greater percentage of the estimated increase in planned development costs when comparing the fiscal years 2017 through 2021 and fiscal years 2019 through 2023 estimates. For example:

- Among planned AIP-eligible projects, estimated annual planned-development costs increased from $1.4 to $1.7 billion (an 18 percent increase) for large hub airports and from $641 to $735 million (a 15 percent increase) for medium hub airports, according to FAA's cost estimates. By comparison, estimated planned development costs for small hub and non-hub airports decreased by 3 and 2 percent respectively over the same time period.
- Among AIP-ineligible projects, ACI-NA estimates show that annual planned development costs increased more significantly for medium hub airports. Specifically, ACI-NA's report shows that annual planned development costs for AIP-ineligible projects increased by 22 percent for large hub airports, 71 percent for medium hub airports, and 29 percent for small hub airports.

ACI-NA representatives stated that the increase in medium hub airport's planned development (for both AIP-eligible and AIP–ineligible projects) is due to the underinvestment at medium hub airports in prior years. Specifically, ACI-NA representatives stated that in response to the loss of air service immediately following the 2007–2009 recession, some medium hub airports scaled back their capital investments. ACI-NA representatives stated that as passenger traffic has recovered with economic growth, medium hub airports are now investing in previously deferred improvements. According to ACI-NA's report on airports' capital development needs for 2019–2023, medium hub airports–such as Austin-Bergstrom International Airport (Austin airport), Norman Y. Mineta San Jose International Airport, and Dallas Love Field Airport–are undertaking major infrastructure improvement programs. According to officials from Austin airport, the airport recently completed a 10-year plan for its capital development program, with an estimated cost of $3.5 billion, for a new terminal, concourse, airfield improvements, runway improvements, and improved landside access. Austin airport officials stated that the airport is 20 years old and nearing the end of its lifecycle, and airport officials are trying to manage aggressive growth while rebuilding the airport.

The sources of funding and types of infrastructure projects that smaller and larger airports have planned also differ. For example, smaller airports have more AIP-eligible planned costs compared to larger airports,

according to FAA cost estimates. Specifically, smaller airports accounted for about $4.6 billion (or 66 percent) of AIP-eligible project costs for all airports but, according to ACI-NA cost estimates, only $878 million (6 percent) of AIP-ineligible projects. In addition, among AIP-eligible projects, while the top four types of infrastructure projects that larger and smaller airports have planned are similar (see table 1), estimated costs are more concentrated among the top two project-type categories for smaller airports. Specifically, reconstruction projects, which are projects to replace or rehabilitate airport facilities such as runways, and projects to meet FAA standards for airport design represented about 79 percent of smaller airports' AIP-eligible estimated project costs.

Table 1: Estimated Costs of Eligible Projects for Federal Aviation Administration's (FAA) Airport Improvement Program by Airports' Size, Annual Averages for Fiscal Years 2019–2023

2017 dollars (in millions)

Project type	Description	Larger airports[a]	Smaller airports[b]
Reconstruction	Replace or rehabilitate airport facilities, primarily airfield pavement and lighting	$894 (37%)	$1,736 (38%)
FAA standards	Accommodate new or different aircraft by bringing runways, taxiways, and aprons up to FAA design standards	$447 (19%)	$1,866 (41%)
Terminal	Accommodate more passengers, larger aircraft, new security requirements, and increased competition among airlines by modifying, replacing, and constructing passenger terminal buildings	$437 (18%)	$382 (8%)
Airfield capacity	Reduce delay or accommodate more passengers, cargo, aircraft operations, or based aircraft with, for example, new or extended runways, taxiways, and aprons	$420 (18%)	$210 (5%)
Safety	Enhance safety by, for example, lighting or removing obstructions, acquiring fire and rescue equipment, and improving runway safety areas	$29 (1%)	$161 (4%)
Noise	Mitigate noise by, for example, relocating households and providing sound insulation of residences and public buildings	$84 (4%)	$37 (1%)
Environmental	Mitigate environmental effects by, for example, constructing deicing handling and recycling facilities, replacing affected wetlands, and investing in low emission airport technologies	$66 (3%)	$49 (1%)
Access	Highway and transit access to the airport (within the airport's property line)	$7 (0%)	$86 (2%)
New Airport	Proposed new airports for communities that do not have an airport, or with an airport that can neither be expanded to meet forecasted demand nor improved to meet minimum standards of safety and efficiency	$0 (0%)	$56 (1%)
Security	Enhance security by, for example, installing perimeter fencing and security devices	$2 (0%)	$10(0%)
Other	Examples include fuel farms, navigational aids, utilities, and parking lots	$0 (0%)	$31 (1%)
Total	**Total**	**$2,387 (100%)**	**$4,625 (100%)**

Source: GAO analysis of FAA data. | GAO-20-298

Note: Dollar amounts and percentages may not sum to totals because of rounding.

[a]Larger airports include large and medium hubs.

[b]Smaller airports include small hubs, non-hubs, non-primary commercial service airports, reliever airports, and general aviation airports.

ACI-NA's data do not break out AIP-ineligible project costs by project type. As a result, we were not able to determine what types of projects constitute the largest shares for AIP-ineligible project costs. However, ACI-NA does provide information about project type across all the projects in its cost estimate. According to ACI-NA's representatives, the

types of projects that are generally not funded with AIP grants that airports need to fund include landside projects, such as terminal projects; rental car and parking facility projects; concession redesign projects; and airport access projects.

Total Planned Infrastructure-Project Costs Have Increased in Part due to Terminal Projects

The increase in planned infrastructure costs for fiscal years 2019 through 2023 can be attributed in part to an increase in planned terminal projects during this 5-year time period. Specifically, both FAA's and ACI-NA's cost estimates show an increase in planned terminal projects. For example, according to FAA's estimates of planned projects funded by AIP grants, terminal projects now represent the third largest share of total estimated costs from fiscal years 2019 through 2023 and experienced the greatest percentage increase over the previous 5-year period. As shown in table 2, overall annual average cost estimates for terminal projects increased by 51 percent between the two periods. Environmental projects was the only other project category that had significant increases (about 38 percent), while estimated costs for many other types of projects decreased. According to FAA officials, the increase in environmental projects is due to increases in environmental-related NPIAS costs (such as mitigation of development impacts and costs for environmental studies) at large and medium hub airports and additional noise mitigation at hub airports.

Table 2: Changes in Estimated Costs of Eligible Projects for the Federal Aviation Administration's (FAA) Airport Improvement Program, Fiscal Years 2017–2021 and 2019–2023

2017 dollars (in millions)

Project type	Description	Estimated average annual costs (2017–2021)[a]	Estimated average annual costs (2019–2023)	Percentage change
Reconstruction	Replace or rehabilitate airport facilities, primarily airfield pavement and lighting	$2,362	$2,629	11%
FAA standards	Accommodate new or different aircraft by bringing runways, taxiways, and aprons up to FAA design standards	$2,226	$2,313	4%
Terminal	Accommodate more passengers, larger aircraft, new security requirements, and increased competition among airlines by modifying, replacing, and constructing passenger terminal buildings	$541	$820	51%
Airfield capacity	Reduce delay or accommodate more passengers, cargo, aircraft operations, or based aircraft with, for example, new or extended runways, taxiways, and aprons	$759	$630	-17%
Safety	Enhance safety by, for example, lighting or removing obstructions, acquiring fire and rescue equipment, and improving runway safety areas	$216	$191	-12%
Noise	Mitigate noise by, for example, relocating households and providing sound insulation of residences and public buildings	$151	$121	-20%
Environmental	Mitigate environmental effects by, for example, constructing deicing handling and recycling facilities, replacing affected wetlands, and investing in low emission airport technologies	$83	$115	38%
Access	Highway and transit access to the airport (within the airports' property line)	$156	$93	-40%
New airport	Proposed new airports for communities that do not have an airport, or with an airport that can neither be expanded to meet forecasted demand nor improved to meet minimum standards of safety and efficiency	$66	$56	-14%
Security	Enhance security by, for example, installing perimeter fencing and security devices	$98	$12	-88%
Other	Examples include fuel farms, navigational aids, utilities, and parking lots	$25	$31	25%
Total	**Total**	**$6,683**	**$7,012**	**5%**

Source: GAO analysis of FAA data. | GAO-20-298

Note: Dollar amounts and percentages may not sum to totals because of rounding.

[a]The Federal Aviation Administration's 2017–2021 estimates for planned airport-improvement-program eligible projects were converted from 2015 dollars to 2017 dollars.

Similarly, according to ACI-NA's analysis, for fiscal years 2019 through 2023, terminal projects represented 53 percent of the total infrastructure-

development costs among both AIP-eligible and AIP-ineligible projects. Terminal projects included terminal building projects (37 percent) and projects to provide access to the terminal (16 percent). FAA and ACI-NA representatives stated that terminal projects can be more expensive than other types of projects because of the scale of these improvements. For example, terminal projects may involve complex vertical construction, an array of special systems such as baggage and passenger screening systems, and integration of security and access control systems, all of which can contribute to the overall higher cost of these projects. In contrast, runway and airfield infrastructure generally rely on common design standards and standard construction methods according to ACI-NA representatives.

Additionally, officials from most (16 out of 19) of the airports that we spoke to stated that they are planning terminal improvement projects over the next 5 years. Officials from these airports told us they are focused on making terminal improvements because existing terminals are aging and in need of repairs and to accommodate an increase in passenger enplanements due in part to airlines using larger aircraft holding more passengers. Examples of planned terminal projects at selected airports and factors contributing to these investments are below.

- **Large hub airport terminal project.** Officials from a large hub airport that we spoke to stated that they have two ongoing major terminal projects. The first project will expand and renovate the airport's north terminal. The 468,000-square-feet facility will include a new upper-level mezzanine, seismic upgrades, and an upgraded baggage-handling system, among other improvements. According to airport officials, capacity constraints and the age of the terminal were factors for renovating the terminal. Phase 1 of the project began in February 2017 and was completed in mid-2019. As of July 2019, nine gates are operational. The second phase of construction is expected to be completed in mid- 2021. The estimated cost of the project is projected at $658 million. The airport is also developing a new international arrivals facility at its airport. According to airport officials, this facility is intended to significantly enhance the international passenger experience, and improve the arrival process for international passengers without adding new gates. Airport officials stated that the current facility is not able accommodate the city's growing demand for international travel. The facility is estimated to cost about $968 million and is expected to open in the fall of 2020.
- **Medium hub airport terminal project.** According to officials from a medium hub airport, growth in passenger traffic is driving the need for

a new terminal at that airport. International traffic at the airport has tripled between 2012 and 2017, with airlines adding three new service destinations to Europe. According to airport officials, the existing terminal will soon reach its capacity to handle international arrivals, and the first phase of the terminal project was substantially completed in 2019 and cost about $350 million.

- **Small hub airport terminal project.** Officials from a small hub airport stated that airlines have started replacing existing aircraft with larger aircraft, and this process has placed capacity constraints at their terminal. The terminal was built in 1948, and the passenger waiting area was built in the 1960s when airlines providing service to the airport were using aircraft with 100 seats. Now, however, airlines are using larger aircraft, which can accommodate up to 180 seats. Airport officials stated that they are beginning construction of a new terminal, which will expand passenger capacity at the airport. The overall estimated costs of the terminal project are $513 million, and the project is expected to be completed in 2028, pending additional funding.

FAA officials and ACI-NA representatives agreed that the increased focus on terminal projects is due in part to airlines changing their business models and aircraft fleets and an increase in passenger traffic. The officials stated that as part of the industry's fleet rationalization efforts, airlines are eliminating some smaller aircraft and replacing them with larger aircraft to increase passenger-seating capacity. FAA officials added that passenger growth at large and medium hub airports is also contributing to the increase of AIP-eligible terminal costs, as airports need to expand terminals to add capacity. According to FAA, terminal projects at large and medium hubs are generally funded through PFCs and other funding sources rather than through AIP funding. For its *2019–2023 NPIAS report*, however, FAA officials said they asked airports to provide information about AIP-eligible projects regardless of whether they were planning to apply for AIP funding for the projects. According to FAA officials, this factor may also have contributed to the apparent increase in AIP-eligible terminal costs. According to FAA, another factor driving the increase in terminal costs is that seven airports have planned major

terminal projects over the next 5 years. The costs of these projects are reflected in FAA's AIP-eligible cost estimate.[40]

In addition to an increased focus on terminal projects, FAA officials, ACI-NA representatives, and selected airports cited other factors that are contributing to an increase in infrastructure costs estimates, such as increased construction costs, an overall healthier economy, increased traffic, airline consolidation, and airlines' strategic shift to focus on hub operations. For example, according to Nashville International Airport's officials, a growing economy has resulted in more competition for construction materials and skilled workers, competition that has increased construction costs in the Nashville area and has resulted in higher airport development costs. According to ACI-NA representatives, other larger cities such as Salt Lake City, Los Angeles, and Seattle have also reported cost escalation in their construction markets.

Selected Airports Cited Challenges Related to Funding Sources, AIP Eligibility Criteria, and Competing Airport and Airline Priorities

Selected Airports Stated That Insufficient Funding Is a Challenge and That They Are Taking Steps to Address These Challenges

[40]These airports include Des Moines International Airport, Kansas City International Airport, Baltimore/Washington International Thurgood Marshall Airport, Ronald Reagan Washington National Airport, Minneapolis-St. Paul International/World-Chamberlain Airport, John Glenn Columbus International Airport, and Louisville International-Standiford Field Airport.

Selected Airports Stated That Planned Infrastructure Costs Exceed Current Funding

Officials from most (18 out of 19) selected airports we interviewed stated that the funding and revenue available to them from existing funding sources—such as AIP grants and PFC revenues—may not be sufficient to cover the costs of future and planned infrastructure projects. For example, 14 airport officials we spoke to stated that the amount of funding that they have received in the past and that they anticipate receiving in the future from AIP formula or discretionary grants will not be sufficient to cover the costs of their future planned AIP-eligible projects. Airports may use a variety of other funding sources to pay for AIP-eligible projects. As such, differences between available AIP funding and AIP-eligible cost estimates do not necessarily reflect a funding shortfall. In addition, the NPIAS estimates represent planned AIP-eligible project costs and do not reflect actual expenditures.[41]

Below are some examples of AIP-eligible projects that airport officials stated will be a challenge to complete without additional funding:

- **Airfield safety projects.** Officials from a small hub airport stated that they have two major airfield-safety projects planned that are intended to align their airport's current runway and taxiway to FAA safety standards. According to airport officials, their airport has been on the FAA's top-10 list of airports with highest "incursions" for 4 consecutive years, and officials stated these airfield improvements would help them mitigate runway incursions at their airport.[42] According to airport officials, these projects are expected to cost about $230 million, which they stated is a significant cost for an airport of their size. Their primary source of funding is AIP funding and PFC revenues; however, their current AIP formula funding and PFC revenues are not sufficient to cover the cost of the projects. Without additional funding, officials

[41]We compared the annual amount of AIP funding that airports received from fiscal years 2013 through 2017 to FAA's estimates of AIP-eligible projects during the same time frame and found that planned AIP project costs exceeded the amount of funding airports received. As previously discussed, from fiscal years 2013 through 2017, airports received an average of about $3.2 billion annually (in 2017 dollars) in AIP grant funding. In contrast, average annual cost estimates for AIP-eligible projects were $9.2 billion (in 2017 dollars) over the same time frame, according to FAA's 2013–2017 NPIAS report. We converted FAA's estimate of $8.5 billion from 2012 dollars to 2017 dollars.

[42]Runway "incursion" incidents involve the incorrect presence of an aircraft, vehicle, or person on a runway.

said that they will need to complete the project in phases, which could lead to a multi-year project ranging from 4 to 12 years to complete. Airport officials stated that a multi-year project of this length would significantly affect their airport operations and increase overall costs. They also stated that ideally, it would be most efficient to execute the project in fewer phases to reduce costs and to benefit airport users, as construction may negatively affect airport operations.

- **Runway rehabilitation project.** Similarly, officials from another small hub airport said their airport receives about $5 million annually in AIP formula funding, which they said is not sufficient to cover the costs of their planned runway pavement rehabilitation and reconstruction project. The total cost of the project is about $20 million. According to airport officials, if they are unable to find alternate sources of funding for the project, they will have to postpone the runway project, and such a postponement would have a significant effect on their airport operations.
- **Runway replacement project.** Officials from a medium hub airport are planning to invest in a new runway project that is expected to cost about $350 million. The existing runway is nearing the end of its useful life and needs to be replaced. They anticipate receiving approximately $4.5 million annually in AIP formula funding and plan to apply for discretionary AIP funding as well. They stated that currently, this airport's PFC revenues have been obligated until 2032 and that therefore, they are not able to use this funding source to pay for the runway. According to airport officials, without these funding sources the airport will be required to use their existing bonding capacity to pay for this critical infrastructure, a move that would reduce their future bonding capacity for future critical infrastructure improvements.

Fourteen airport officials also stated that revenue generated from PFCs is also not sufficient to cover the costs of planned infrastructure. For example, officials from one large hub airport stated that they have been successful in being able to keep up with the pace of growth at their airport, but based on their forecasts, they anticipate that they would be unable to meet infrastructure demands without an increase in PFC funding. Officials from six airports stated that because the PFC cap has remained at $4.50 since 2000 and has not been adjusted for inflation, the value of the PFC has decreased. In 2015, we reported that an inflation adjusted PFC cap would be $6.46.[43] Representatives from eight airlines

[43]This represented the 2016 equivalent of the current cap of $4.50 when indexed to the Consumer Price Index starting in 2000 when the cap was first instituted. See GAO-15-306.

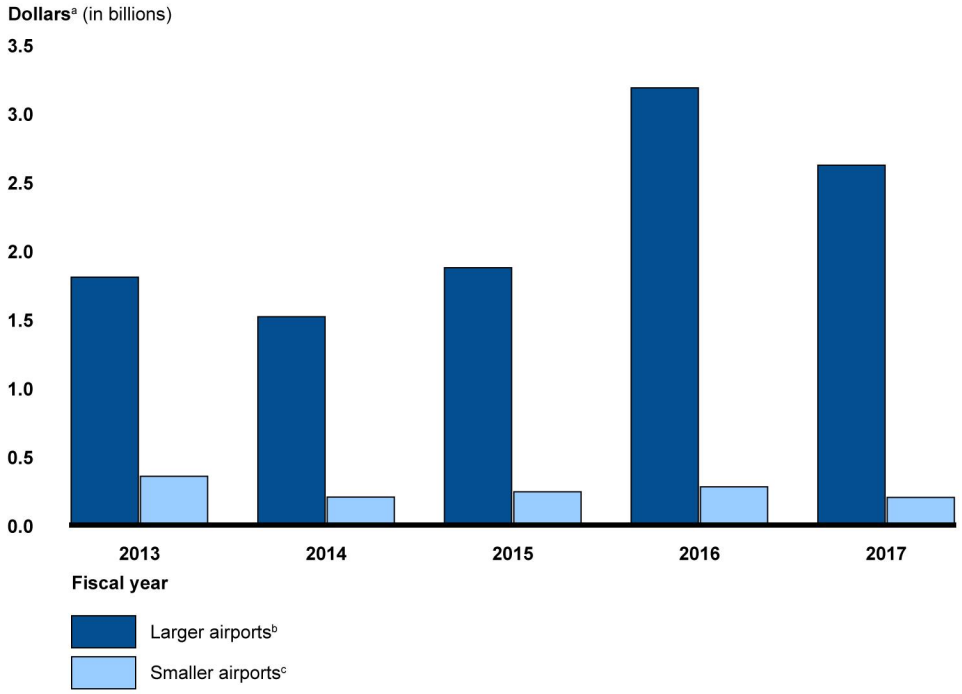
that we spoke to, however, disagree that the PFC cap should be increased citing increases in passenger traffic, increases in PFC revenues, and availability of other adequate sources of funding. According to FAA officials, increases in passenger traffic and other changes have also increased the need for capital facility investments.

About Half of the Selected Airports We Spoke to Identified Challenges with Taking on Additional Debt for Infrastructure Investments

Officials from about half of the airports (nine out of 19) that we spoke to—including a mix of smaller and larger airports—stated that that the revenue their airport generates from PFCs are already obligated toward current infrastructure projects, which they stated could affect their ability to use debt financing for future infrastructure projects. An additional three airports we spoke to stated that they plan to use PFC revenues to finance planned infrastructure projects and that they anticipate that these revenues will be obligated over a long term period—about 30 years—limiting their ability to use debt financing for other projects.

FAA's financial data show that airports committed a significant share of their PFCs to debt service during fiscal years 2013 through 2017. Specifically, of the $16 billion in PFC revenues (or an annual average of $3.1 billion) collected in fiscal years 2013 through 2017, airports paid a total of $12 billion for debt service (or an annual average of $2.5 billion)—which is about 78 percent of total PFC revenues generated during this time period. The debt service includes payments on new bonds, existing bonds, and refinanced bonds which, as previously noted, are collectively tracked in FAA's database. As shown in figure 8, over our 5-year time period, larger airports accounted for the vast majority (over 90 percent) of the PFCs dedicated to debt service.

Figure 8: Revenue from Passenger Facility Charges and Offsets Used for Debt Service by U.S. Airports, Fiscal Years 2013–2017



Source: GAO analysis of Federal Aviation Administration's (FAA) Certification Activity Tracking System data. | GAO-20-298

Data Table for Figure 8: Revenue from Passenger Facility Charges and Offsets Used for Debt Service by U.S. Airports, Fiscal Years 2013–2017

Fiscal year	Larger airports	Smaller airports
2013	1.8058	0.355434
2014	1.51741	0.203405
2015	1.87407	0.242456
2016	3.1846	0.278647
2017	2.62116	0.200899

[a]Dollar amounts are in adjusted 2017 dollars.

[b]Larger airports include large and medium hubs. For fiscal years 2013 through 2017, the number of larger airports reporting annual financial data to FAA ranged from 55 to 60.

[c]Smaller airports include predominantly small hubs, non-hubs, and non-primary commercial service airports, as well as a few reliever airports, and general aviation airports. For fiscal years 2013 through 2017, the number of smaller airports reporting annual financial data to FAA ranged from 1,323 to 1,392.

According to ACI-NA's report on airports' capital development needs for 2019–2023 and some selected airport officials, because airports have already committed a significant portion of their current and future PFCs to

servicing debt on current or completed projects, airports will have less PFC funding available for future projects. According to ACI-NA's report on airports' capital development needs for 2019–2023, the entire national airport system is carrying a combined debt of $91.6 billion from past projects and may be unable to pay for future needed projects unless the existing cap on PFCs is increased. Officials from three small hub airports stated that they are currently facing challenges obtaining financing for infrastructure projects, because they are already fully leveraged and have pledged their PFCs over the mid- to long-term. For example, officials from a small hub airport said that they obtained $120 million in financing, which will be carried until 2040, to build a parking garage and concourse. They said that because the airport is at capacity for debt issuance, they cannot take on any new debt for additional infrastructure projects. FAA data show that as of August 2019, 117 airports (about 30 percent) have obligated their PFCs past 2030 and that 30 airports (about 8 percent) have obligated their PFCs past 2040. One airport has obligated its PFCs through 2070.

While some airports we spoke to raised concerns about being able to use debt financing for future airport-infrastructure projects, representatives from two rating agencies that we spoke to stated that for the airports they rate, the bond market is currently favorable, allowing for easier and economical access to financing.[44] Rating representatives stated that currently, the outlook for domestic airports is either stable or positive due to the fact that airport passenger traffic growth has exceeded the gross domestic product's growth, and airport ratings have remained consistent. For example, according to one rating agency, since 2012, its airport ratings have remained consistent and the annual airport outlook in those years has been "stable" or "stable to positive." FAA officials added that while the perspective of rating agencies, bond insurers, and underwriters are important, a favorable credit rating does not mean that an airport should make the decision to take on additional debt. Moreover, according to FAA officials, for airports that need airline approval to issue debt, a favorable credit rating may not be sufficient to persuade the airlines of the need for the additional investment.

[44]Representatives from the rating agencies we spoke to said that they primarily rate large and medium hub airports. One rating agency said that they rate some small airports.

Selected Airports Are Taking Steps to Address Funding Challenges

Officials from 13 airports we spoke to stated that they are taking several actions to address funding challenges. These airport officials stated that they have deferred or delayed infrastructure investments, completed projects in phases in order to be able to fund projects in stages, or are looking for other ways to generate airport revenues from passenger services or leases. For example, officials from one airport we spoke to stated that their airport has developed a strategy of breaking up infrastructure projects into phases so as to utilize available FAA funding. According to these airport officials, this strategy lengthens the construction time and results in higher construction costs, but helps the airport to align its project needs with available FAA funding. Another airport official we spoke with said that the airport is introducing a dynamic-pricing parking program to generate additional parking revenue and that the program is expected to bring in an additional 5 to 15 percent in parking revenue.

Several Airports Said Eligibility Criteria for AIP Grants Do Not Always Align with an Airport's Priorities

Officials from about half (11 out of 19) of our selected airports stated that AIP's eligibility funding criteria are too narrow and do not allow airports to fund the infrastructure projects that they currently need, such as terminal projects. FAA's AIP handbook provides guidance on the criteria to determine which components of a project are eligible for AIP funding. AIP-eligible projects, outlined in statute, include airport planning, airport development, noise compatibility planning, and noise compatibility projects.[45] Certain airport projects, such as revenue-producing parking facilities, hangars, revenue portions of terminals, off-airport roads, and off-airport transit facilities are not eligible for AIP funding. Some terminal projects, however, are eligible for AIP funding, such as a terminal structure shell's development and development of public use areas directly related to the movement of passengers and baggage in terminal facilities within an airport. This eligibility includes public use spaces that passengers may need to occupy as part of their air travel or utility support space needed to make the public space operational, including the mechanical and electrical rooms.

[45]49 U.S.C. § 47102(3).

Four airport officials we spoke to stated that they have infrastructure projects planned that are eligible for AIP discretionary funding, but that due to FAA's criteria for AIP discretionary funding and FAA's process for prioritizing projects, it is difficult for airports to receive discretionary funding for these projects. According to FAA officials, the eligibility criteria for AIP projects funded through entitlement and discretionary funding are the same. Discretionary funding, however, has some additional restrictions. For example, large, medium, and small hub airports are not eligible to use discretionary funding for terminal building projects. General aviation airports, however, may use discretionary funding for some airport terminal projects. In addition, unlike with entitlement funding, discretionary funding is not reimbursable and airports cannot apply for discretionary funding for projects that have already begun construction.

In addition, unlike entitlement funding, not all airports receive discretionary funding. Airports must compete for the limited amount of discretionary funding available each year based on FAA's AIP prioritization. According to FAA officials, while discretionary funding criteria do not change year to year, FAA may fund projects with discretionary funding one year, but a similar project may not receive discretionary funding a different year due to the project mix that year. FAA officials also stated that in September 2019, FAA updated its Formulation of the NPIAS and Airports Capital Improvement Plan order, which lays out the criteria and prioritization process for selecting projects for discretionary funding.[46] According to FAA officials, projects with the highest priority include safety- and runway-related projects, such as runway signage or resolving complex geometry causing runway incursions. FAA officials stated that other projects have lower priority and ranking in the AIP discretionary-funding prioritization process. Below are examples from airport officials that stated they have certain projects planned that are eligible for AIP discretionary funding but that they believe will likely not rank high in FAA's prioritization:

- **Non-airfield projects.** According to officials from a large hub airport we interviewed, the airport has made several investments in their airfield in the last few years and does not have any major airfield projects planned. These officials stated that they do have several non-airfield projects planned that are AIP-eligible, such as renovating gate holding areas in the terminal. However, airport officials stated that

[46]U.S. Department of Transportation, Federal Aviation Administration, *Formulation of the NPIAS and ACIP, Order Number 5090.5*, September 3, 2019.

non-airfield projects do not compete well for AIP discretionary funding based on FAA's prioritization process. As a result, they do not anticipate that they will receive AIP funding for these projects.

- **Airfield projects.** Similarly, airport officials from one medium hub airport explained that some of the airfield projects that they have planned, are eligible for AIP discretionary funding, but are not considered "high priority" projects according to FAA prioritization criteria. For example, they currently have a taxiway and apron upgrade project planned, but this project may not compete well against other projects when considering FAA's AIP prioritization process. According to this airport official, runways are the highest priority and almost always get AIP funding. The official added, however, that the farther away you get from the runway, the less likely it is that you will be able to get AIP funding for the project.

In addition, five airport officials noted that while overall AIP grant-funding levels have remained relatively constant in recent years, demand for discretionary AIP grant funding has increased, thereby increasing competition for this funding. According to FAA officials, the amount of funding that FAA has available for discretionary grants changes year-to-year. For example, the amount of discretionary funding allocated to airports annually can vary based on an airport's decisions to carry entitlement funding over multiple years, as entitlement funding that is carried over becomes discretionary. According to FAA officials, because a very high percentage of discretionary funding comes from funding that has been carried over, it is difficult for airports to plan for or count on this funding being available in any given year. Between fiscal years 2013 through 2017, the amount of discretionary funding that was awarded averaged $1.6 billion annually. Of this amount, the amount representing "pure" discretionary funding averaged $56 million annually or about 4 percent of total AIP discretionary funding. Pure discretionary funding refers to the amount remaining after discretionary set-asides have been funded. FAA distributes pure discretionary funding to eligible projects at any airport on a competitive basis.

As previously discussed, an additional $1 billion in supplemental discretionary AIP funding was appropriated in 2018, and an additional $500 million was appropriated in discretionary AIP funding in 2019. However, according to FAA officials, the number of applications they received for this funding exceeded the amount of funding that was available. Specifically, according to officials, FAA received more than 2,500 funding requests totaling more than $10 billion in 2018 for the $1 billion authorized as supplemental discretionary AIP grant funding. As of

May 2019, FAA has awarded or anticipates awarding $985 million in supplemental discretionary AIP grant funding to 164 airports in 50 states, the District of Columbia, and Puerto Rico. The supplemental grants fund projects ranging from runway reconstruction and rehabilitation, to the construction of taxiways, aprons, and terminals.

Competing Airport and Airline Priorities May Affect Airport Infrastructure Investments

About half (12 out of 19) of the airport officials we spoke to stated that competing airport and airline priorities for capital infrastructure investments can pose challenges to funding infrastructure projects and can delay projects. For example, some of these officials stated that if an airline does not agree that there is a business case or that an infrastructure project is justified, then that lack of agreement can affect the airport's ability to fund the project or delay the project altogether. The extent to which airlines are involved in the decision-making of airport infrastructure investments varies by airport and depends on the type of "use-and-lease" agreement between the airport and the airline. These agreements set forth the terms and conditions for establishing airline rates and charges and investing in capital improvements. Some agreements have a "majority-in-interest" (MII) provision, which requires airports to obtain airlines' approval for certain infrastructure investments. One large hub airport stated that they have an MII agreement, requiring airlines' approval of certain projects and project financing strategies. They further explained that debt financing would affect their airline rates and charges and would therefore require the airport to obtain approval from airlines before using general airport-revenue bonds on a project. While airport officials would like to add more gates to the airport and finance that project with general airport revenue bonds, these officials stated that some airlines may not support unassigned gate additions because it could increase competition. According to FAA officials we spoke with, some airports have been able to move toward shorter-term agreements with greater flexibility to adapt to changing needs; however, many agreements still include some form of MII provisions.

According to officials from four smaller airports, airlines are less likely to support infrastructure-related increases in airline rates and charges at smaller airports than at larger airports. For example, a non-hub airport stated that smaller airports have a more difficult time negotiating higher rates and charges with airlines because of competition from other nearby airports. ACI-NA representatives also stated that medium hub airports

that are not connecting hubs for the three large U.S. network airlines have less of an opportunity to receive capital investments from network airlines compared to larger airports.

Representatives from all eight airlines that we spoke to stated that the types of airport infrastructure projects that they see a need for are demand-driven infrastructure development projects that expand airfield capacity, increase the number of gates at an airport, or address safety. Of these airlines, six also stated that they see a need for infrastructure development at larger airports in particular. For example, representatives from one airline stated that they want to collaborate with airports on capital development projects that are scalable and where passenger enplanements are increasing. In addition, representatives from five airlines that we spoke to said that they would like to have more input on airport infrastructure investment decisions. In addition, representatives from five airlines raised concerns that airlines do not have a role in decisions on how airports can invest PFC revenues. According to our prior work, PFCs provide airports a source of funding for airport development over which they have greater local control and airlines have more limited say in their use as compared to the use of airport terminal rents or landing fees.[47]

In addition, representatives from two airlines we spoke to said that FAA exercises limited oversight of infrastructure projects funded by PFCs, and that this limited oversight results in airports' using PFC funding for projects that airlines do not see a need for. The representatives stated that FAA largely approves most PFC applications for projects and that they believe FAA should do more to ensure that airports are not using PFC revenues for unnecessary capital development not supported by airlines. For example, one airline objected to the use of over $1.5 billion of PFC funds for the multi-phase construction of the Phoenix Sky Train linking light rail, parking, and terminals, as representatives believed that there was not an adequate business case to justify the construction of the Sky Train. According to these airline officials, because the airport used PFC revenues for the project, other necessary terminal improvements have been largely debt funded. According to FAA officials, when reviewing PFC applications, they assess the extent to which the airport has demonstrated a need for the project. FAA officials stated that airports are familiar with FAA criteria and will generally not submit projects that

[47]GAO-15-107.

will not meet the criteria and that could be denied. In addition, FAA officials stated that while it is unusual for FAA to deny an application, they have denied individual projects.

Agency Comments

We provided a draft of this report to the Department of Transportation (DOT) for review and comment. DOT provided technical comments, which we incorporated as appropriate.

We are sending copies of this report to the appropriate congressional committees, DOT, and other interested parties. In addition, the report is available at no charge on the GAO website at http://www.gao.gov.

If you or your staff have any questions concerning this report, please contact me at (202) 512-2834 or krauseh@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.

Heather Krause
Director, Physical Infrastructure

Appendix I: Ownership and Infrastructure Funding and Financing of Foreign Airports

Foreign Airports' Ownership Models and Primary Infrastructure-Funding Sources Differ from U.S. Airports

More Foreign Airports Are Privately Owned or Operated Compared to U.S. Airports

Traditionally, airports around the world were primarily owned and managed by national governments, but that has changed over time. Beginning in the 1980s and through the 1990s, governments outside of the United States began shifting toward privatization and deregulation of airports. According to the 2016 Airports Council International - World's (ACI-World) inventory of privatized airports worldwide, 614 commercial service airports (14 percent) have private sector participation.[1] Although ACI-World estimates that a majority (86 percent) of the 4,300 airports with scheduled traffic around the world are publicly owned by a government or government entity, airports with private sector participation handle over 40 percent of all global air traffic.

Today, there is a range of airports' ownership and operating models. Through a literature review of ACI-World's, the Airports Council International - EUROPE's (ACI- EUROPE), the International Civil Aviation Organization's, and the International Air Transport Association's reports

[1]Airports Council International-World, *Policy Brief: Airport Ownership, Economic Regulation and Financial Performance*, (Montreal, January 2017). ACI-World is an international association that represents the world's airports. ACI-World has several regional offices, including ACI-North America and ACI-EUROPE. The United States comparatively, has about 500 commercial service airports, almost all of which, aside from one airport, are publicly owned and operated.

and other documents, we identified five general types of airport ownership structures outside of the United States:[2]

- **Government owned and operated:** The airport is fully owned and operated by a public authority or by a mixture of public authorities at a local, regional, national, or transnational level.
- **Government owned and privately operated:** The airport is government owned but the airport operator—considered as the entity that is responsible for the day-to-day operation of airport services and facilities—is a private company.
- **Partially privatized:** The airport is partially privatized (e.g., mixed public-private ownership), meaning the airports' shares are owned by a combination of private investor(s) and public authorities of the country where the airport is located.
- **Fully privatized:** The airport is fully owned and operated by a commercial company wholly owned by private individuals or enterprises.
- **Not-for-profit, private corporation:** The airport has been transferred to or leased by a not-for-profit corporation. The not-for-profit corporation is expected to be financially self-sufficient and fully responsible for funding all operating and infrastructure costs.

While U.S. airports are predominantly publicly owned and operated, private participation, like private ownership or private operation contracts, is more common at airports in other countries.

Airport Ownership in the United States

In the United States, nearly all of the 3,330 commercial-service or general-aviation airports, designated as part of the national airport system, are publicly owned by local and state governments, regional

[2]The International Civil Aviation Organization is an international body of the United Nations that, among other things, promulgates international standards and recommended practices related to global aviation. The International Air Transport Association is an international trade association representing approximately 290 airlines worldwide or 82 percent of total air traffic.

airport authorities, or port authorities.[3] Airport ownership in the United States has evolved under a public model since the 1920s as a way to promote the development of the U.S. aviation industry. In 1996, the Federal Aviation Reauthorization Act of 1996 established the Airport Privatization Pilot Program,[4] which reduced some of the barriers to privatizing airports, and allowed for commercial service airports to be leased and for general aviation airports to be sold or leased. However, as we have previously reported, 18 years following the program's inception, two airports have privatized, with one of these airports reverting to public control.[5]

While participation in the Airport Privatization Pilot Program has been very limited, some airports have entered into public-private partnerships with private entities through management contracts for terminals, which may be leased or outsourced to airlines or other contractors, or for food, rental car, and other concession agreements. For example, the Paine Field Snohomish County Airport in Washington, previously a general aviation airport, entered into a ground-lease agreement with a private airport developer—Propeller Airports—to build and operate a small passenger terminal for commercial service. The terminal was open for commercial service in March 2019, and is depicted in figure 9. Propeller Airports is responsible for the landside infrastructure investments and terminal maintenance. Snohomish County is responsible for maintaining and operating the airside infrastructure, which includes the runways and taxiways, but leases the aprons and the terminal land to Propeller Airports.

[3]There are some exceptions to this broad generalization of public ownership. For example, general aviation airports, the largest category of airports, are generally defined as airports that do not fit any other FAA classification and include a small number of privately owned, public-use airports. In addition, the federal government owns two primary hub airports, Washington-Reagan National Airport and Washington Dulles International Airport, which are operated under a long-term lease arrangement with the Metropolitan Washington Airports Authority. The U.S. Department of Defense also owns portions of joint-use airports where the airfield facilities are shared between military and civilian use. FAA, *Report to Congress National Plan of Integrated Airport Systems (NPIAS), 2013-2017* (Washington, D.C.: Sept. 27, 2012).

[4]The FAA Reauthorization Act of 2018, Pub. L. No.115- 254, §160, 132 Stat. 3186, 3220, replaced the Airport Privatization Pilot Program with the Airport Investment Partnership Program.

[5]GAO, *Airport Privatization: Limited Interest Despite FAA's Pilot Program,* GAO-15-42 (Washington, D.C.: Nov. 19, 2014). The FAA has recently approved the privatization of a third airport—Airglades Airport in Hendry County, Florida—however, as of January 2020, the property has not yet been transferred.

Figure 9: Snohomish County (Paine Field) Airport Terminal

Source: GAO. | GAO-20-298

Airport Ownership in Other Countries

Privatized airports are more prevalent in foreign countries. According to a 2016 report by ACI-EUROPE, which examined ownership structures of airports across Europe, about 41 percent of European airports are fully privately owned or partially privatized.[6] According to ACI-World, 75 percent of airports with passenger traffic in Europe have private sector involvement through fully privatized airports or public-private partnerships. Latin America-Caribbean airports (60 percent) and Asian airports (45 percent) have the second and third highest private sector involvement.[7] Industry stakeholders we interviewed said that in some Asian countries, such as Japan and Singapore, airports that were previously government owned have already privatized or are transitioning to privatization. In

[6]ACI-EUROPE, *The Ownership of Europe's Airports* (2016).

[7]ACI-World, *Policy Brief: Airport Ownership, Economic Regulation and Financial Performance* (2017).

addition, while ownership models can vary by country, they can also vary within a country. For example, according to ACI-EUROPE's 2016 report, the United Kingdom's airports are 53 percent fully private, 26 percent partially privatized, and 21 percent fully public.

As we have previously reported, different airport ownership structures, motivations, and financing have driven airport privatization in other countries.[8] For example, in several countries, the national government built, owned, and operated the country's airports prior to privatization. We previously reported that national ownership enables a central government to direct the sale of its airports and can make for a more streamlined privatization transaction, reducing transaction costs for both the public-sector owner and private-sector bidders. Foreign governments may also be more motivated to privatize their airports than U.S. public-sector airport owners. According to the International Civil Aviation Organization, foreign governments' reasons for privatizing their airports vary, including an identified need for private-sector capital investments in existing or new airports and a national move toward privatization of public assets or companies. We have previously reported that airports in other countries often have less access to public funds or tax-exempt bonds than publicly owned and operated U.S. airports, making them more reliant on private financing for airport improvements.[9] Our prior work found that a key factor that can hinder U.S. airport privatization is the loss of some federal AIP funds and the loss of easy access to tax-exempt financing.

Selected Foreign Airports Generally Do Not Rely on Government Funding for Infrastructure Projects

Most of the five foreign airports we selected for our review do not receive government funding. We selected and reviewed five airports in other countries that represent each type of ownership structure previously discussed. Representatives from our five selected foreign airports all said that they rely on aeronautical revenue, which includes revenue from passenger charges and airline rates and charges as the primary source for capital development.[10] Representatives from four of our selected foreign airports said that they rely on debt financing for infrastructure

[8]GAO-15-42.

[9]GAO-15-42.

[10]Foreign airports also generate revenue from non-aeronautical sources (e.g. concessions, parking, etc.) for funding.

funding as well. Representatives from only one selected airport, Changi Airport in Singapore, said that they have received government funding for infrastructure projects. Table 3 below summarizes the main sources of infrastructure funding available to these selected airports.

Table 3: Reported Ownership Structure and Infrastructure-Funding Sources of Selected Foreign Airports as of October 2019

		Aeronautical revenue[a]				
Foreign airport	**Ownership structure**	**Airline rates and charges**	**Passenger charges**	**Non-aeronautical revenue[b]**	**Debt financing**	**Government funding**
Helsinki Airport, Finland	Government owned and operated	Funded	Funded	Funded	Funded	Not funded
Changi Airport, Singapore	Government owned and privately operated	Funded	Funded	Funded	Not funded	Possible Funding
Frankfurt Airport, Germany[c]	Partially privatized	Funded	Funded	Funded	Funded	—
Heathrow Airport, United Kingdom	Fully privatized	Funded	Funded	Funded	Funded	Not funded
Toronto Pearson International Airport, Canada	Not-for-profit, private corporation	Funded	Funded	Funded	Funded	Not funded

Legend:

Source: GAO review of international airport documents and interviews with international airport representatives| GAO-20-298

[a]Aeronautical revenues are derived from the operation and landing of aircraft, passengers, or freight.

[b]Non-aeronautical revenues are derived from concessions and leases to non-aeronautical tenants.

[c]Information regarding whether Frankfurt Airport receives any government funding was not available.

Aeronautical Revenue

Airline Rates and Charges

Representatives from the selected airports we interviewed said that they generate infrastructure funding from various sources of aeronautical revenue, including airline rates and charges. Some foreign airport representatives told us that revenue from airline rates and charges are not required to be used for aeronautical-related costs or infrastructure, or within the airport. Some airports, such as Helsinki Airport, may operate within a consortium network, where revenue is shared among all airports in the network to cover costs. Additionally, some airports have regulations for setting airline rates and charges. For example, the Civil Aviation Authority in the United Kingdom regulates Heathrow Airport's airline rates and charges. Selected airport representatives we spoke with said that

they consult airlines when adjusting airline rates and charges. For example, the Helsinki Airport official said that the airport updates its airline charges once a year and that airlines have an opportunity for the airlines to appeal the change.

Representatives from the International Air Transport Association and the Steer Group Inc. said that some foreign airports may have higher airline rates and charges compared to some airports in the United States due to several factors, including the need to generate returns for private financing and flexibility in setting rates and charges, as outlined below.[11]

- **Generating returns for private financing.** Foreign airports with private investment or financing may have higher rates because they need to generate returns to pay back private financing. Privately owned airports may also be under pressure to generate returns for investors and therefore need to further divert revenue from funding infrastructure.
- **Flexibility in setting rates and charges.** Foreign airports generally have greater flexibility to set airline charges to meet airport needs, a flexibility that may result in higher rates and charges. For example, Canadian airports are generally able to set and adjust airline and passenger charges as needed, and charges vary by airport. In Singapore, Changi Airport has a passenger charge and a pre-funding levy for its new terminal project. Airports in the United Kingdom, including Heathrow Airport, have a regulator that sets the airline and passenger charge cap, and adjusts it every 2 years.

In addition, foreign airports have limited airline input on determining airport capital investments and fees charged to airlines. For example, according to ACI-WORLD, airports consult airlines on airport charges and on capital developments, but airport proposals can usually be implemented even if airlines do not support them, as long as a due and proper consultation process is held. An international airline stakeholder said that the extent of airline input on airport capital investment and fees charged to airlines is dependent on the country's specific regulatory model and the willingness of the airport operator to consult with airlines, but that in some countries, airline consultation is limited. Representatives from our selected foreign airports said they generally keep airlines informed. For example, the Toronto Pearson International Airport has a

[11]The Steer Group is a global business consultancy that provides aviation-consulting services.

consultative committee approach with airlines on larger projects costing over $50 million. If the airlines do not approve a project through the consultative committee, the project must be put on hold for one year before it can proceed.

Passenger Charges

Other sources of aeronautical revenue include passenger charges. As of October 2019, for the foreign airports we reviewed, passenger charges ranged from the U.S. dollar equivalent of $9.65 to $58.58 per local traffic passenger (see table 4). Industry stakeholders and international airport association stakeholders said that U.S. airports have a unique ownership and funding model compared to foreign airports. U.S. airports have an element of public control of funding through the federal Airport Improvement Program (AIP) grants and passenger facility charges (PFC), as projects funded through these sources must receive approval from the Federal Aviation Administration. According to these stakeholders, U.S. airports are subject to different regulations related to setting passenger charges. As a result, we have determined that the comparability of these charges is limited. In addition, differences in ownership models, private investment, and funding between U.S. and foreign airports also limited the comparability of these charges. Table 4 provides an overview of passenger charges and levies at selected airports in other countries.

Table 4: Examples of Departing Passenger Charges at Selected Foreign Airports as of October 2019

Airport and country	Fee type	Fee charged - local traffic[a]	Fee charged - connecting traffic[b]
Helsinki Airport (Finland)	Passenger charges	$9.65 U.S. dollars[c]	$4.60 U.S. dollars
Changi Airport (Singapore)	There are three types of passenger fees:		
	• Passenger service and security fee[d]	$24.11 U.S. dollars	$4.40 U.S. dollars
	• Aviation levy[e]	$4.47 U.S. dollars	—-
	• Airport development fee[f]	$7.91 U.S. dollars	$2.20 U.S. dollars
Frankfurt Airport (Germany)	Passenger service charges	Fees range from $20.37 to $28.23 U.S. dollars[g]	$14.51 U.S. dollars
Heathrow Airport (United Kingdom)	Passenger charges	Fees range from $18.89 to $58.58 U.S. dollars[h]	Fees vary depending on the time of travel and destination of the flight. Fees range from $17.08 to $52.97 U.S. dollars for the summer season Fees range from $9.44 to $29.29 U.S. dollars for the winter season
Toronto Pearson International Airport (Canada)	Airport Improvement Fees	$18.82 U.S. dollars	$3.01 U.S. dollars[i]

Source: GAO Analysis of Foreign Airport Fee Information. | GAO-20-298

[a]Local traffic, or direct traffic, refers to airline traffic between an origin and a destination airport, either on a non-stop flight segment or on a flight with a single flight number.

[b]Connecting traffic refers to travel between aircraft identified by different airline designators and flight numbers. Finavia, a public corporation that operates the majority of the airports in Finland, uses the term “transfer traffic” instead of “connecting traffic”.

[c]Fees are presented in US dollars. We converted foreign currencies to US dollars using the 2019 Federal Reserve average annual rate, which we calculated by averaging available Federal Reserve 2019 monthly rates .

[d]The Passenger Service and Security Fee will be adjusted annually by S$2.50 ($1.83 U.S. dollars) for departing origin and destination passengers who travel from April 1, 2019 over the next 5 years, with the last increase on April 1, 2024.

[e]The Civil Aviation Authority of Singapore charges an aviation levy on Changi Airport passengers. Revenue generated from this levy funds the aviation authority’s activities in growing and regulating the Singapore civil aviation system and does not go toward Changi Airport.

[f]Changi Airport’s airport development fee is a prefunding charge used to fund the airport’s new terminal 5 project.

[g]Frankfurt Airport’s passenger service fees vary depending on whether the destination of the flight is within Germany, to a European Union country, or to another international destination.

[h]Heathrow Airport’s passenger fees vary depending on whether the destination of the flight is within the United Kingdom, to a European Union country, to another international destination or to a remote or rural location.

[i]The connecting fee applies to both domestic and international flights where the connecting flight occurs within 4 hours of arrival.

Selected foreign airports adjust passengers' charges based on the airport's building and infrastructure needs and the cost imposed by passengers on the airport system. How and when these airports make adjustments varies. For example, one of our selected airports has a government entity that regulates passenger charges. More specifically, the Civil Aviation Authority in the United Kingdom regulates Heathrow Airport's passenger charges. Every 5 years, the Civil Aviation Authority determines the maximum amount that the airport can charge based on the costs incurred by the airport. Other selected airports consider adjustments on an "as needed" basis, including the Toronto Pearson International Airport. Representatives from the Toronto Pearson International Airport said that they set and adjust passenger charges as needed to fund infrastructure investments. The airport assesses charges annually and only adjusts the passenger charges if there is a material imbalance between required cost recoveries against charges. Airport officials also stated the airport increases airline rates and passenger charges only when needed to generate sufficient revenue to cover the costs of planned infrastructure.

Similar to airline rates and charges, selected foreign airport representatives told us that there generally are no restrictions on how the airports use revenue from passenger charges for infrastructure or operational costs. Industry stakeholders said that some airports, such as Heathrow Airport, do not have revenue diversion limitations, so revenue generated from passenger charges at the airport is not required to be reinvested back into the airport. Comparatively in the United States, airport revenue is regulated and generally speaking, revenue generated by the airport must go toward certain costs at the airport.

Debt Financing

Most of our selected foreign airport representatives (4 out of 5) also said that they rely on debt financing, through private bonds or commercial loans. Industry stakeholders said that airport debt financing internationally is similar to that in the United States, but foreign airports generally do not have access to the municipal bond market. Airports' bonds are generally tax exempt in the United States. Representatives of our selected foreign airports said that they use various types of debt financing, including commercial loans from financial institutions; equity or debt financing, such as bonds in commercial capital markets; or loans from private investors.

Government Funding

Most of our selected foreign airports (3 out of 5) do not receive government funding. International airport associations said that the extent to which an airport receives government funding may depend on whether the government owns the airport or has a role in operating the airport. For example, Changi Airport officials said that the Singaporean government is providing Changi's government-owned, privately operated airport an unspecified amount of government funding for their new Terminal 5 project. In another example, Toronto Pearson International Airport does not receive government funding; however, in Canada, small or rural airports can receive some funding from the Canadian Airports Capital Assistance Program. Similarly, Finavia officials said that although the Helsinki Airport is publicly owned and operated, it does not receive any government funding.

To provide information about how each of the five, selected foreign airports fund and finance infrastructure projects, we developed the following case studies. These airports were selected based on selection criteria of ownership models and passenger traffic. The case studies provide information on main sources of funding and financing for the airports' infrastructure developments, factors considered when setting airline and passenger charges, coordination with airlines on capital development, and recent and planned infrastructure investments for each selected foreign airport.

Figure 10: Helsinki Airport's New Departure Gate Area, Opened in June 2016

(see attached PDF in portfolio)

Figure 11: A Rendering of Helsinki Airport's Terminal Expansion Project
(see attached PDF in portfolio)

Figure 12: Terminal 3 at Changi Airport
(see attached PDF in portfolio)

Figure 13: Rendering of the Planned Third Runway at Heathrow Airport

(see attached PDF in portfolio)

Figure 14: Recently Completed Terminal Expansion Project at Toronto Pearson International Airport

(see attached PDF in portfolio)

Appendix II: Objectives, Scope, and Methodology

This report discusses (1) levels of federal and other funding that U.S. airports received from fiscal years 2013 through 2017 for infrastructure investments, (2) projected costs of planned infrastructure investments at U.S. airports from fiscal years 2019 through 2023, and (3) any challenges selected airports face in obtaining airports' infrastructure funding and financing. We also examined how selected airports in other countries fund and finance airport infrastructure investments. This information is presented in appendix I.

To obtain information for all objectives, we reviewed relevant literature, including academic and industry literature on airport funding and financing in the United States and in other countries. We also reviewed laws, regulations, agency guidance, and prior GAO reports related to this topic.

To determine what federal and other funding U.S. airports received from fiscal years 2013 through 2017 for infrastructure investments, we obtained and analyzed information on the main sources of airport funding which included: funding from federal Airport Improvement Program (AIP) grants and state grants, revenue from passenger facility charges (PFC), airport-generated revenue, capital contributions, and amounts of financing airports received from bond proceeds and other debt financing. Because comprehensive data on airport capital spending is not available, we framed our research objective to examine funding received rather than how much airports expended on infrastructure projects. We selected fiscal years 2013 through 2017 because it was the most recent 5-year period where complete data were available. For each funding source, we determined average annual-funding amounts for fiscal years 2013 through 2017 for all U.S. national system airports, as well as separately for larger airports and smaller airports. We defined larger airports to include large and medium hubs, and smaller airports to include small hubs, non-hubs, non-primary commercial service, reliever, and general aviation airports. We also analyzed how the amounts of funding received have changed from fiscal years 2013 through 2017. We presented all funding amounts in 2017 dollars.

We obtained funding data from various sources, as follows:

- **AIP funding:** To determine how much funding airports received from federal AIP grants, we obtained and analyzed data from the Federal Aviation Administration's (FAA) System of Airports Reporting (SOAR) database on AIP grants awarded by FAA during our study period. This database includes detailed information about AIP grants and PFC applications, approvals, and collections. We analyzed the AIP grant data to determine total annual funding by airport type for fiscal years 2013 through 2017, as well as average annual funding by airport type and project type over the same time period.
- **State grants:** Data on state funding for fiscal years 2013 through 2017 are available but are not complete, and we were not able to obtain additional information to verify the data's reliability. As part of our 2015 review of airports' infrastructure funding, we conducted a survey in 2014 with the assistance of the National Association of State Aviation Officials (NASAO), to determine how much funding airports received from state grants for fiscal years 2009 through 2013.[1] Results from this survey were reported in our 2015 report and in NASAO's August 2015 report, NASAO State Aviation Funding and Organizational Data Report. For this review, we interviewed NASAO officials and they confirmed that the level of state funding has largely remained unchanged since the 2015 study. Therefore, we incorporated information from the 2015 survey into our current report.
- **PFCs:** To determine how much funding airports received from PFCs, we obtained and analyzed data from the SOAR database on PFC collection amounts at all airports that collected PFCs during fiscal years 2013 through 2017. Because we were unable to obtain data on airports' expenditures of PFC revenues by project type from fiscal years 2013 through 2017, we instead obtained data on airports' FAA-approved applications from 1992 through February 2019 showing the types of projects on which airports intended to spend their PFC revenue.
- **Airport-generated revenue:** For airport-generated revenue, which we defined as revenue available for capital development, we obtained and analyzed airport financial data from FAA's Certification Activity Tracking System (CATS).[2] Examples of airport-generated revenue

[1]See GAO-15-306. For this report, we surveyed NASAO's state aviation official point of contact in each state as well as the U.S. territory of Guam. We received completed surveys from 46 of 51 state aviation officials (a 90 percent response rate).

[2]FAA uses CATS to gather and disseminate federally mandated airport financial information based on annual financial reports filed by commercial airports.

include aeronautical revenue (including revenue earned from leases with airlines and landing fees) and non-aeronautical revenue (such as earnings from airport terminal concessions and vehicle parking fees). We analyzed the financial data to determine the amount of airport-generated revenue that airports had available for infrastructure investments, as well as amounts by airport type, for each fiscal year 2013 through 2017. We calculated airport-generated revenue by using data for the total operating revenue of an airport, subtracted by the subtotal of operating expenses, prior to subtracting depreciation, which yields operating income plus interest income. For data precision, we used a different methodology to calculate airport-generated revenue than that of our 2015 report on airport finance by not subtracting an estimated amount of PFCs used to pay for interest expense.[3] As a result, airport-generated revenue reported here is not comparable to airport-generated revenue in our 2015 report.

- **Airport capital contributions:** To determine how much funding airports received from capital contributions, we analyzed the same set of airport financial data from CATS that we used for airport-generated revenue, discussed above. We used the line item for capital contributions (8.5 Capital Contributions) in CATS for our analysis.
- **Airport bonds:** In addition to the sources of airport funding listed above, this report also separately discusses information on airport bonding—a common financing mechanism for some airports. We analyzed FAA financial data from the CATS database on the amounts of financing that airports received from bond proceeds (line item 14.1). We also interviewed representatives at two ratings agencies—Fitch Ratings and Moody's Investors Service—and a representative from Piper Sandler (formerly Piper Jaffray) to obtain their perspectives on the availability of airport bond financing.

We assessed the reliability of FAA's CATS data on airport financial information and SOAR data by reviewing documentation about the data and the systems that produced these data. We also interviewed FAA officials knowledgeable about the collection, maintenance, and security of these data. We also reviewed documentation that also relied on the FAA's CATS and SOAR data and that was collected for our prior review of airport infrastructure funding and financing for a similar purpose.[4] We determined that these data were sufficiently reliable to report funding and

[3]GAO-15-306.

[4]GAO-15-306.

financing that airports received from AIP, PFCs, airport-generated revenue, capital contributions, and bond revenue for fiscal years 2013 through 2017.

To determine the projected cost of airports' planned capital development from fiscal years 2019 through 2023, we combined (1) FAA's most recent estimate for AIP-eligible development from its *Report to Congress National Plan of Integrated Airport Systems (NPIAS) 2019-2023*, released in September 2018, and (2) Airports Council International – North America's (ACI-NA) most recent estimate for AIP-ineligible development for the same time period, as reported in its February 2019 report, *Terminally Challenged: Addressing the Infrastructure Funding Shortfall of America's Airports*. We developed estimates of infrastructure development costs for all national system airports, as well as by airport type. We also presented estimates of AIP-eligible development costs by project type; these estimates were based on estimates in the NPIAS report. We did not, however, present estimates of AIP-ineligible data by project type because ACI-NA's data do not readily support such a presentation. We presented all dollar amounts in 2017 dollars.[5] To identify changes in airports' project costs of planned infrastructure investments, we also reviewed FAA's NPIAS report for fiscal years 2017–2021 and ACI-NA's report on airports' capital development needs for fiscal years 2017–2021, and we compared the estimates in those reports to the fiscal years 2019–2023 estimates.[6]

ACI-NA's estimates of U.S. airports' infrastructure project costs differ from those of FAA's due to scope, methodology, and other reasons. For example, the ACI-NA cost estimate includes estimates for AIP-eligible and AIP-ineligible projects, while FAA only includes AIP-eligible projects as required by statute. ACI-NA's estimate also includes projects that have

[5]FAA's NPIAS presents estimated planned development costs in 2017 dollars, whereas ACI-NA's report presents estimated planned development costs in 2018 dollars. In order to combine FAA's and ACI-NA's estimates, we adjusted ACI-NA's estimates from 2018 dollars to 2017 dollars using the Bureau of Economic Analysis's gross- domestic-product price index.

[6]We adjusted FAA's and ACI-NA's 2017–2021 cost estimates to 2017 dollars to ensure they were comparable with FAA's and ACI-NA's 2019–2023 cost estimates.

already identified funding sources as well as those that have not.[7] By comparison, FAA only includes projects without identified funding. The methodology that FAA and ACI-NA use to develop their estimates also differs. For example, FAA developed its estimates for the fiscal year 2019 through 2023 time period by reviewing information from airport plans that were available through 2017. According to ACI-NA's report on airports' capital development needs for 2019–2023, its cost estimates for fiscal years 2019–2023 are based on a survey of 86 airports completed in 2018. This number represents the airports with 90 percent of all enplanements in 2017. ACI-NA survey respondents were asked to report all infrastructure costs, including interest, construction and management costs, architectural and engineering costs, and contingency costs. FAA's estimate does not include interest and contingency costs. We reviewed FAA documentation describing the methodology for producing the NPIAS cost estimate from airport-planning documents, and interviewed FAA officials. We determined FAA's estimate of AIP-eligible planned infrastructure costs to be reliable for the purposes of our report. Similarly, we reviewed ACI-NA's methodology for developing its report on airports' capital development needs for 2019–2023 and interviewed ACI-NA representatives about their methodology for developing this estimate. We determined that ACI-NA's response rates, shares of enplanements represented by the airports that responded, and ACI-NA's estimation methodology were sufficiently reliable for the purposes of presenting an estimate of planned infrastructure costs for AIP-ineligible projects.

To obtain information about any challenges airports face in obtaining airport funding and financing, we reviewed documents from and conducted interviews with representatives from ACI-NA and airport officials from 19 selected U.S. airports. We also interviewed representatives from the American Association of Airport Executives. Through our document review and interviews, we obtained information about the sources of funding and financing that airports currently receive, planned infrastructure projects, and challenges to obtaining funding and

[7]According to ACI-NA's most recent report, ACI-NA asked airport survey respondents to provide information on costs for infrastructure development for committed projects, which included projects where financing was secured or was expected to be secured, and for uncommitted projects, which included projects in airport master, layout, or capital plans that could not proceed due to inadequate funding. ACI-NA representatives stated that 77 percent of the costs of planned development for all airports in their most recent cost estimate are for committed projects. According to ACI-NA, respondents were asked to include only projects they expected the airlines would support or would not block, and for which they expected to obtain all environmental and other approvals.

financing for these projects. We selected airports representing different hub sizes, airports with the highest planned development costs as reported in FAA's NPIAS fiscal years 2019–2023 report, airports with increasing and decreasing enplanements in calendar years 2013 through 2017, airports that were mentioned in our literature review and that were recommended by FAA and other stakeholders whom we interviewed, and we considered the geographic location of the airport. We also visited three locations from our selected airports to discuss and view examples of airports' planned infrastructure projects. The airports we visited included Seattle-Tacoma International Airport, Spokane International Airport, and Paine Field Airport. See table 4 for a list of all the airports where we conducted interviews.

Table 5: Selected Large Hub, Medium Hub, Small Hub, and Non-Hub U.S. Airports Where GAO Conducted Interviews

Airport name
Large hub airports
• Chicago O'Hare International Airport
• Hartsfield-Jackson Atlanta International Airport
• Seattle-Tacoma International Airport
• Newark Liberty International Airport
Medium hub airports
• Buffalo Niagara International Airport
• Raleigh-Durham International Airport
• Eppley Airfield Airport (Omaha)
• Austin-Bergstrom International Airport
• Nashville International Airport
• Kansas City International Airport
Small hub airports
• Des Moines International Airport
• Memphis International Airport
• Long Beach /Daugherty Field Airport
• Piedmont Triad International Airport
• Tucson International Airport
• Spokane International Airport
Non-hub airports
• Chicago Rockford International Airport

• Aspen-Pitkin County Sardy Field Airport
• Snohomish County (Paine Field) Airport

Source: GAO. | GAO-20-298

We also interviewed representatives from Airlines for America (A4A)—the U.S. airline association—and representatives from eight selected U.S. airlines to obtain their views on airport infrastructure funding and financing issues. We selected airlines with the highest passenger traffic, as measured by revenue passenger miles.[8] In addition, we selected airlines representing legacy and low cost carriers, and airlines that provide service outside the United States. Selected airlines that we interviewed were: Alaska Airlines, American Airlines, Delta Air Lines, Frontier Airlines, JetBlue Airways, Southwest Airlines, Spirit Airlines, and United Airlines. Collectively, the selected airlines transported about 90 percent of total U.S. passenger traffic in 2018. Because we used a nonprobability sample of airport and airlines to interview, our interviews are not generalizable.

Last, to obtain information about how foreign airports fund and finance infrastructure development, we reviewed documents from and conducted interviews with international airport associations, international aviation-industry stakeholders, and representatives from four of the five foreign airports that we selected as case studies. These airports included: Toronto Pearson International Airport (Canada); Frankfurt Airport (Germany); Heathrow Airport (United Kingdom); Helsinki Airport (Finland); and Changi Airport (Singapore). Representatives from Frankfurt Airport provided us with written responses and documents for our review. See table 5 for a list of international organizations and foreign airports where we conducted interviews. For each of the five selected foreign airports, we collected information about airport infrastructure funding at the airports, including the sources of funding and financing the airports use, types of projects the airport has planned, and factors they consider when setting airport charges, among other topics. In addition, for each of our case studies, we presented financial information in the appropriate foreign currency as well as in U.S. Dollars (USD) in parentheses. We converted foreign currency information to U.S. Dollars using Federal Reserve data on foreign exchange rates. For 2018 data, we used the Federal Reserve

[8]Revenue passenger miles are the number of miles paying passengers are transported and are a measure of passenger traffic.

2018 annual rate. For 2019 data, we calculated a Federal Reserve 2019 annual rate.[9]

The primary criterion that we used to select foreign airports as case studies was the ownership model of the airport. To ensure our selection included a mix of ownership models, we selected airports that fit each of the following ownership models:

- Government owned and operated
- Government owned and privately operated
- Partially privatized
- Fully privatized
- Not-for-profit, private corporation

As secondary criteria, we selected foreign airports with the highest passenger traffic among international airports, airports which had service by U.S. carriers, and airports located in regions where it would be feasible to obtain information and interview officials. Because we used a nonprobability sample of foreign airports to interview, our interviews are not generalizable. While our case studies of foreign airports and their experiences with funding and financing airport infrastructure are not generalizable to all foreign airports, they provide a range of examples of how foreign airports fund and finance airport infrastructure.

Table 6: Selected International Airport Associations, Industry Stakeholders, and Foreign Airports at which GAO Conducted Interviews

International airport associations
• Airports Council International – World
• Airports Council International - EUROPE

Industry stakeholders
• Calgary Airport Authority
• International Air Transport Association
• Steer Group Inc.

[9]At the time of our analysis, October 2019 was the most recent available monthly rate. As a result, for 2019 data, we calculated the 2019 annual rate by averaging all available Federal Reserve 2019 monthly rates.

Foreign airports
• Frankfurt Airport (Germany)[a]
• Heathrow Airport (United Kingdom)
• Helsinki Airport (Finland)
• Toronto Pearson International Airport (Canada)
• Changi Airport (Singapore)

Source: GAO. | GAO-20-298

[a]Representatives from Frankfurt Airport provided us with written responses and documents for our review.

We conducted this performance audit from September 2018 to February 2020 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix III: GAO Contact and Staff Acknowledgments

GAO Contact

Heather Krause, (202) 512-2834 or krauseh@gao.gov

Staff Acknowledgments

In addition to the contact named above, Jean Cook and Susan Zimmerman (Assistant Directors); Maria Mercado (Analyst-in-Charge); Pin-En Annie Chou; Jessica Du; Sharon Dyer; David Hooper; Delwen Jones; Grant Mallie; Josh Ormond; Pam Snedden; Kelly Rubin; and Rebecca Rygg made key contributions to this report.

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