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# U.S. Airport Infrastructure Funding and Financing

Issues and Policy Options Pursuant to Section 122 of the  
2018 Federal Aviation Administration Reauthorization Act



For more information on this publication, visit [www.rand.org/t/RR3175z2](http://www.rand.org/t/RR3175z2)

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## Preface

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Passenger air travel is at an all-time high. In 2018, passengers boarded (enplaned) domestic flights more than 780 million times at the nation's 506 *commercial service airports*, which are publicly owned airports that serve at least 2,500 enplanements per year and receive scheduled passenger service. Demand for air travel has increased over time, and projections suggest that trend will continue. In response, commercial service airports have been investing in the infrastructure required to meet future demand for air travel. A key question for Congress is whether current levels of spending will be sufficient under existing federal policies to enable commercial service airports to make appropriate and timely infrastructure investments to meet future demand.

Congress authorized a study of commercial service airports' infrastructure needs and existing financial resources in the Federal Aviation Administration (FAA) Reauthorization Act of 2018. Section 122 of the Act directed the FAA to engage an independent research organization to consider these issues, as well as related concerns, and to "make recommendations on the actions needed to upgrade the national aviation infrastructure system to meet the growing and shifting demands of the 21st century." RAND, a nonprofit and nonpartisan policy research organization, was selected by the FAA through a competitive qualifications-based process to conduct this study. This executive summary and the full report,<sup>1</sup> like all RAND reports, are published independently by the RAND Corporation and do not require the consent or approval of the FAA or any other government agency.

The RAND research team commenced the study in late December 2018. Throughout the study period, we gathered and analyzed data, reports, and other materials relevant to funding, financing, and infrastructure conditions at U.S. airports. As required in Section 122(b) of the Act, we convened a panel of national experts drawn from a variety of stakeholder perspectives. The first meeting of this panel occurred in March 2019, and a second meeting occurred in August 2019. We also sought the perspectives of additional experts in the field. The report is the product of these research activities and fulfills the mandate of Section 122 that the independent organization (RAND) submit a report of its findings directly to Congress and the Secretary of Transportation by January 2020.

The primary audience for the report is members of Congress and their staffs as well as officials in the U.S. Department of Transportation, which includes the FAA. However, the report has been written to make this important but complex topic accessible to a broader audience. To this end, the purposes of the report are to explain how airports in the United States currently fund and finance their infrastructure needs, assess the adequacy of those mecha-

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<sup>1</sup> The full report (Miller et al., 2020) is available at [www.rand.org/t/rr3175](http://www.rand.org/t/rr3175).

nisms for maintaining a well-functioning aviation system, and present findings and recommendations to policymakers. In support of these purposes, we describe airports' planning and business processes; examine airports' interactions with the airline industry, local and state governments, and other stakeholders; and describe the federal government's role in funding, regulating, and otherwise affecting the decisionmaking behind airport infrastructure investment.

## **RAND Social and Economic Well-Being**

RAND Social and Economic Well-Being (SEW), a division of the RAND Corporation, seeks to actively improve the health, social, and economic well-being of populations and communities throughout the world. This work has been managed within SEW's Community Health and Environmental Policy program, which focuses on such topics as infrastructure, science and technology, community design, community health promotion, migration and population dynamics, transportation, energy, and climate and the environment, as well as other policy concerns that are influenced by the natural and built environment, technology, and community organizations and institutions that affect well-being. For more information, email [chep@rand.org](mailto:chep@rand.org).

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## Acknowledgments

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As a part of Section 122 of the FAA Reauthorization Act of 2018, the RAND research team was required to convene an expert panel representing a specified range of stakeholder perspectives. We were more than happy to do so. We therefore would like to begin by expressing our deep appreciation to each of the members of the expert panel. Panel members were generous with their time and responsive to our requests for information. They provided us with much-needed context and detail about the workings of the airport sector and the perspectives of their organizations. Together, they represent a wealth of experience and insight that could not easily have been acquired through other means. However, we emphasize that the findings and recommendations made in this report are attributed to the authors and not the panel. Participation on the panel does not represent an endorsement of the report by the individual panel members nor the organizations they represent, and at no point was the panel tasked with providing consensus recommendations. Panel members, listed alphabetically by last name, were

- Jim Coon, Senior Vice President, Government Affairs and Advocacy, Aircraft Owners and Pilots Association
- Shane Downey, Vice President of Government Relations, Global Business Travel Association
- Bryant Francis, Director of Aviation at the Port of Oakland
- Trish Gilbert, Executive Vice President of the National Air Traffic Controllers Association
- Adam Giombetti, Deputy CFO at Denver International Airport
- Erik Hansen, Vice President of Government Relations at the U.S. Travel Association
- Arlene Juracek, Mayor of Mount Prospect, Illinois, and Chair of the O'Hare Noise Compatibility Commission
- Charles Leocha, President of Travelers United
- Candace McGraw, CEO of Cincinnati/Northern Kentucky International Airport and Chair of the Airports Council International–North America Executive Committee
- Scott McMahon, Executive Director, Morristown Municipal Airport and Chair of the AAAE General Aviation Airports Committee
- Jeffrey Northgraves, Manager of Knox County Regional Airport
- Sharon Pinkerton, Senior Vice President, Legislative and Regulatory Policy, Airlines for America
- Chris Poinsette, CFO at Dallas/Fort Worth International Airport
- Mark Rodrigues, Assistant Director, Airport Development, Regional APCS Division, International Air Transport Association
- Brian Sprenger, Airport Director of Bozeman Yellowstone International Airport
- John Strong, CSX Professor of Business Administration at William and Mary.

In addition to panel members, we wish to thank other experts who made themselves available to the RAND team for in-person and phone interviews. These include, in alphabetical order, representatives from Airlines for America, Airports Council International–North America, Airports Council International–World, Cincinnati/Northern Kentucky International Airport, Frasca & Associates, International Air Transport Association, Landrum and Brown, LoneStar Airport Holdings LLC, the National Business Aviation Administration, United Airlines, and a retired airline executive. We wish to express particular gratitude to Ken Cushine for his generosity in ensuring we correctly understood the airport bond market.

Many experts from the FAA were crucial to our ability to acquire data from numerous FAA databases, to understand the details of the Airport Improvement Program and the Airport and Airway Trust Fund, and to learn about other aspects of FAA programs relevant to airport infrastructure. We particularly wish to thank Elliott Black, Christina Nutting, Michael Hines, Neil Kumar, Rebecca Didio, Roger Schaufele, Jr., Chia-Mei Liu, Li Ding, Peter Leboff, Jeffrey Wharff, David Duchow, Kevin Willis, Jim Brown, Scott Mitchell, Joe Manges, Beth Newman, and many others we have failed to mention, all of whom were unfailingly responsive and helpful throughout the study process, enabling us to conduct our independent assessment.

Finally, we wish to thank our RAND colleagues, Frank Camm and Lauri Rohn, for their timely and constructive reviews of our work throughout the study period as part of the RAND quality assurance process. We thank John Strong for wearing a second hat as an external reviewer in addition to being a member of our expert panel. Jessie Coe helped review our econometric methodology. Anita Chandra and Ben Preston provided us with superb management support all along the way. Kristin Leuschner and Dori Walker contributed their prodigious skills in communications and graphics to the project, for which we are grateful. Brian Dau provided exceptional and timely copyediting, and Babitha Balan provided expert oversight to the production process. And finally, we express immense gratitude to our RAND colleague, Chanel Skinner, who assisted us with meeting planning and all manner of administrative details and generally made the impossible somehow come together anyway.



## Executive Summary

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Section 122 of the Federal Aviation Administration (FAA) Reauthorization Act of 2018 directed the FAA to contract with an independent research organization to address questions and provide recommendations related to infrastructure funding and financing at commercial service airports. These airports are publicly owned, serve at least 2,500 passenger boardings per year, and receive scheduled passenger service. They provide the physical infrastructure—runways, terminals, gates, and other facilities—used by commercial airlines, travelers, and other air service providers. This executive summary presents the full report’s core findings, recommendations, and answers to the questions listed in Section 122.<sup>1</sup>

### The Nation’s Airports

Commercial service airports are categorized by the FAA as “large hub,” “medium hub,” “small hub,” “non-hub,” or “nonprimary commercial service,” according to the number of *enplanements* (passenger boardings) that occur at the airport, as shown in Table 1. The National Plan of Integrated Airport Systems (NPIAS), developed and managed by the FAA, identifies airports that are eligible to receive federal airport infrastructure funding. The NPIAS includes all 506 commercial service airports, 2,815 general aviation (GA) airports, and seven proposed airports that are anticipated to open or be under development in the next five years. GA airports serve operations—i.e., the take-off or landing of an aircraft at an airport—beyond commercial passenger transportation, including flight training, agricultural services, aerial law enforcement, and recreational flying. Some GA airports are designated as *relievers* because they help reduce congestion at nearby commercial service airports.

### Key Findings















#### **Finding 1: The Color—and Control—of Money Matters**

Airports draw revenue from a wide variety of sources, each of which comes with different rules and restrictions on how funds can be spent, as well as different conditions regarding which entities must approve the spending. As a consequence, airport operators consider more than whether sufficient dollars are available to fund an infrastructure project. They also carefully consider whether and how much funding can come from different sources. Control of funding

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<sup>1</sup> The full report (Miller et al., 2020) is available at [www.rand.org/t/rr3175](http://www.rand.org/t/rr3175).

**Table 1**  
**Characteristics of National Plan of Integrated Airport Systems Airports, 2018**

Airport Classification		Common Name	Criterion for Determining Common Name	Percentage of Total Enplanements	Total Enplanements	Number of Airports
Commercial service: At least 2,500 annual enplanements and scheduled passenger service	Primary: More than 10,000 annual enplanements	Large hub 	Airport accounts for 1 percent or more of total enplanements	 67.88	534,507,475	30
		Medium hub 	At least 0.25 percent but less than 1 percent	 18.75	147,624,888	31
		Small hub 	At least 0.05 percent but less than 0.25 percent	 9.54	75,150,646	72
		Non-hub 	More than 10,000, but less than 0.05 percent	 3.67	28,874,664	247
	Nonprimary: No more than 10,000 annual enplanements	Nonprimary commercial service 	At least 2,500 and no more than 10,000	 0.10	813,688	126
Noncommercial service: Less than 2,500 annual enplanements		General aviation 	Less than 2,500	 0.05	378,858	2,549
		Reliever 	Designated to relieve congestion at commercial service airports	 0.01	107,503	261

SOURCE: RAND analysis of T-100 segment data (Bureau of Transportation Statistics, 2019) and FAA, 2017.  
 NOTE: Enplanements are for domestic flights only. Domestic flights begin and end in the United States.

decisions is an important determinant in an airport's funding preferences. Depending on the "color of money," airports also are required to line up approvals from the appropriate combination of federal regulators, local and state governments, and airlines before proceeding to make capital investments in airport infrastructure.

### Finding 2: If You've Seen One Airport, You've Seen One Airport

Although airports across the nation face many of the same challenges, the financial capabilities and local context of each airport can vary widely. All commercial service airports face the same broad industry trends, such as growing demand for air travel, increasing plane sizes, and vulnerability of airport business models to disruptive technologies, such as ride-hailing services (e.g., Uber and Lyft), self-driving vehicles, and the use of drones. Airports also face the same federal rules and regulations on funding, safety, security, and other issues. Most airports have managed to sustain sufficient investment in runways, terminals, and other services while maintaining strong credit ratings.

However, other factors affecting airports' financial capacities vary widely from airport to airport. Some airports appear better-positioned financially to manage future growth than others. The prospect of growth in demand is closely tied to local economic conditions, which can inject a significant amount of uncertainty into airports' financial plans. Further, how financial risks are distributed between airports and airlines depends on the particulars of use-

and-lease agreements between individual airports and their tenant airlines. Differences in local governance arrangements and physical assets shape airports' opportunities for raising capital. Airports also have widely varying amounts of cash reserves, airline competition, and infrastructure-related delays, some of which reflect limitations on land availability or disagreements over local land-use policy and public priorities.

**Finding 3: There Are Known Areas in Which Infrastructure Investment Is Needed**

Airport runways are generally in good repair. This reflects the priority given to airside infrastructure—i.e., infrastructure for the operation of aircraft—in federal grants provided under the Airport Improvement Program (AIP) and the effectiveness of funding from all sources to meet airside needs. However, terminals and control towers are widely viewed as being in need of modernization, repair, or replacement. The growth in the number of enplanements has led to more crowded terminals at some airports, and many aging control towers and other air traffic control facilities require rehabilitation and upgrading. Smaller airports, which are almost wholly reliant on federal grants, struggle to generate sufficient revenues for spending on landside infrastructure for ground transportation vehicles, the processing of passengers, and other purposes.

These infrastructure limitations are one of several factors contributing to delays in the National Airspace System (NAS), and these infrastructure-related delays are thus not spread evenly across the system. Rather, a small number of capacity-constrained airports and airport pairs appear to be responsible for delays that could be partially (but not fully) addressed by sound infrastructure investment. Twenty airports (19 large hubs and one reliever) accounted for 96 percent of delays measured by the FAA's Operations Network in 2018. The top five airports alone, three of which are operated by the Port Authority of New York and New Jersey (LaGuardia Airport, John F. Kennedy International Airport, and Newark Liberty International Airport), accounted for 61 percent of delays. These delays propagate through the NAS: A flight delayed in arriving at its initial destination might be late departing for its next destination. Some of this congestion could be addressed in part through sound investments in reconfiguring or expanding infrastructure on both the airside and the landside.

**Finding 4: Easing Revenue Restrictions on the Passenger Facility Charge Would Reduce Airports' Borrowing Costs but Likely Would Increase Ticket Prices**

Airports will need to make significant investments in the coming years to sustain existing capacity and services and to accommodate growth in enplanements and commercial operations. The larger commercial service airports are likely to find ways to make the investments they deem to be critical, but increased access to higher revenue streams in the near term would enable these airports to complete approved priority projects sooner and at lower borrowing costs.

One proposed method for allowing commercial service airports to raise additional revenue is to change the cap on the fee that passengers are charged for their use of airport infrastructure at airports that choose to participate in the federally authorized passenger facility charge (PFC) program. With reference to the color of money in Finding 1, airlines cannot veto FAA-approved PFC-funded projects. The cap on PFCs has been set at \$4.50 per passenger since the 2000 FAA Reauthorization Act. Since that time, the purchasing power of a dollar of PFC revenues has eroded because of inflation; each dollar of PFC revenue buys only 60 percent of the construction materials it did in 2000. Increasing enplanements have increased capital

investment needs at many airports. It is also true that aggregate PFC revenues have grown because of increases in nationwide enplanements, increases in the number of airports using PFCs, and the increase of the PFC cap from \$3.00 to \$4.50.

Increasing the PFC cap above the current level of \$4.50 would enable those airports that seek additional PFC revenue to initiate their approved projects sooner and pay them off more quickly, lowering costs. In the aggregate, costs for some passengers are likely to increase as a consequence of the higher PFC. However, the impacts of a PFC increase on ticket prices at a particular airport may vary depending on both airport and airline decisions.

**Finding 5: Smaller Airports in Small Markets Have Limited Opportunities for Revenue Generation and Rely Primarily on Grants**

Smaller airports by definition have a smaller user base that offers fewer opportunities for raising revenue and are therefore more reliant on federal (and to a much lesser extent, state) grants than larger airports for paying the high fixed costs related to runways, taxiways, aprons, safety, and security. GA airports are not eligible to collect PFCs, a mechanism that Congress authorized exclusively for use by commercial service airports, nor do GA airports have sufficient passenger volume to support such a user fee. Instead, GA and nonprimary commercial service airports rely on AIP funding, which is redistributive by design; smaller airports receive a larger share of AIP dollars than they generate in excise tax revenues to the Airport and Airway Trust Fund (AATF), which funds the AIP and many other FAA programs. Airports must be included in the NPIAS to be eligible to receive AIP funds.

There are two general types of AIP grants: entitlements and discretionary. The FAA uses discretionary grants to target specific projects at individual airports according to need and benefit to the system as a whole. The FAA awards entitlement grants to most airports in the NPIAS, although airports that receive approval for PFC-funded projects forgo a portion of their entitlement. Under current congressionally mandated funding formulas, GA and nonprimary commercial service airports are each eligible to receive entitlement grants of up to \$150,000 per year, an amount too small to support airport construction of any consequence. Airports, however, are permitted to defer their annual entitlements over several years to accumulate sufficient funds to undertake a project.

**Finding 6: The Airport and Airway Trust Fund Has a Large and Growing Uncommitted Balance**

The AATF, which funds many FAA programs (including the AIP), took in \$750 million more in excise tax revenues than it spent in FY 2018, ending the year with an uncommitted balance of \$6.1 billion. An uncommitted balance refers to funds that have not yet been obligated for spending. The AATF's uncommitted balance is projected to grow to \$18.8 billion by the end of FY 2023, assuming passenger enplanements (and associated excise tax revenues) continue to rise. Several of the excise taxes that fund the AATF are pegged to inflation, and all of them relate to the volume of air infrastructure utilization.

Congress has the authority to obligate AATF funds for AIP grants to airports and a wide array of other underfunded capital needs. Currently, the FAA Reauthorization Act of 2018 holds the authorized level of AATF-funded AIP grants constant at \$3.35 billion over the FY 2019 to FY 2023 period, and outlays from the AATF for other FAA purposes are assumed to grow only with inflation.

### **Finding 7: Revenue Diversion Is Still an Issue**

Revenue diversion is the use of airport operating revenues for expenditures that are either not on airport property or do not directly serve aviation purposes. Revenue diversion comes in two forms that are treated differently in policy. Both are problematic. In the first form, 12 airport sponsors—i.e., the cities or other public entities that own one or more airports—were grandfathered in when Congress mandated an end to such revenue diversion practices in 1982. Airports operated by these airport sponsors are legally allowed to divert airport operating revenue, up to a statutory limit. The second form encompasses revenue diversion by any other airport sponsor, which most frequently takes the form of state or local governments diverting revenue from aviation fuel taxes to nonaviation purposes.

The argument for grandfathering was that accounting and spending practices at these airports made a clean separation of revenue between airport and nonairport uses difficult. Correcting this challenge is not impossible because the grandfathering provision has been removed for three of the 12 airport sponsors. The amount of funds being diverted is not trivial, as a 2018 U.S. Department of Transportation (USDOT) Inspector General’s report found that “[f]rom 1995 to 2015, grandfathered sponsors have reported over \$10 billion in grandfathered payments in 2015 inflation-adjusted dollars, including over \$1.2 billion in 2015” (USDOT, Office of Inspector General, 2018, pp. 1–2). The full extent of revenue collected and diverted is difficult to quantify by outside observers, including the FAA. The FAA has effective enforcement options available for discouraging the second form of revenue diversion, but the FAA’s existing enforcement mechanisms are largely unable to prevent grandfathered airports from exceeding their statutory limit.

### **Recommendations**

We recommend a portfolio of complementary changes in the PFC program, the AIP, the AATF, and in policies and procedures regarding revenue diversion. The interrelated nature of these funding programs and policies makes it important to consider these recommendations as a whole rather than in isolation. As with any proposed changes in policy, the benefits and costs of the proposed changes could result in some stakeholders being better off and others worse off, in reality or perception. In shaping our recommendations, we were guided by our findings and a vision of what funding and financing policies in support of an effective NAS should look like, informed by our analysis and consultations with experts and stakeholders. In our vision of a well-functioning system of funding and finance,

- airports are able to draw on sufficient and stable sources of revenue, in conjunction with funding from capital markets, to maintain existing capacity, accommodate growth, and support a safe and sustainable NAS in the coming decades
- federal funding is effectively, efficiently, and flexibly deployed to address needs in the NAS that are of national significance and benefit
- airports of all sizes run safe, efficient, and sustainable operations for the betterment of their communities and the NAS as a whole.

This vision and the findings discussed above provide the basis for our recommendations. Table 2 shows how our recommendations are connected to the preceding findings. Our findings are in turn supported by the details presented in this report.

**Changes to the PFC Program**

Congress has several options regarding changes to the PFC program. We present and discuss four policy options in Chapter Nine: (1) index the current cap to inflation, (2) increase the flexibility of airport revenue but do not increase cumulative revenue other than indexing the cap to inflation, (3) raise but do not remove the PFC cap and index the cap to inflation thereafter, and (4) remove the PFC cap entirely.

We recommend that Congress pursue the third option of increasing, but not removing, the PFC cap, with subsequent indexing. This option would improve airports’ abilities to make timely and efficient capital investments to meet growing future demand, while leaving in place FAA oversight of project justification and costs on passengers. Specifically, we recommend that Congress

- raise the current PFC cap of \$4.50 to approximately \$7.50 for passengers at their point of origin only
- index the new PFC cap to inflation
- eliminate 100 percent of AIP primary entitlements for medium- and large-hub airports that choose to raise their PFC above \$4.50.

We are not aware of compelling evidence or data justifying a particular level for a new cap. Any number could be chosen, but we note that if the \$4.50 cap had been indexed to inflation in 2000 using the Producer Price Index for construction materials, it would now be set at \$7.44. For this reason, we suggest that the cap in this option be around this value, perhaps

**Table 2**  
**Connection Between Recommendations and Findings**

Finding	Changes to the PFC	Changes to the AIP	Changes to the AATF	Changes to revenue diversion
Finding 1: The color—and control—of money matters.				
Finding 2: If you’ve seen one airport, you’ve seen one airport.				
Finding 3: There are known areas in which infrastructure investment is needed.				
Finding 4: Easing revenue restrictions on the PFC would reduce airports’ borrowing costs but likely would increase ticket prices.				
Finding 5: Small airports in small markets have limited opportunities for revenue generation and rely primarily on grants.				
Finding 6: The AATF has a large and growing uncommitted balance.				
Finding 7: Revenue diversion is still an issue.				

NOTE: Shaded boxes identify the findings that provide evidentiary support for the recommendation.



rounded up to \$7.50, although other levels could be chosen. Although an increase in the PFC cap would likely result in higher ticket prices for passengers traveling through airports that raised their PFC collections, there remains in place a set of guardrails to weigh the public benefits of PFC-funded projects relative to the costs imposed on passengers. Airports will continue to be required to justify the net benefits of projects proposed for PFC funding to the FAA, and the FAA retains its discretion to approve or disapprove applications for these projects. Further, airports will still need to be responsive to comments from airlines and other stakeholders when requesting a PFC increase.

To ensure that airports have sufficient and stable sources of revenue commensurate with present and future capital needs, the PFC cap should be indexed to inflation, regardless of whether the PFC cap is otherwise changed. Indexing the PFC to a construction index, such as the Producer Price Index for construction materials, would stabilize the parity of purchasing power at the current cap or a new cap set by Congress for airports making infrastructure investments. In contrast, indexing to the Consumer Price Index would hold constant the impact of PFC increases on passenger ticket prices. PFC collections in the aggregate have increased without indexing because of increases in nationwide enplanements, increases in the number of airports using PFCs, and the increase in the PFC cap from \$3.00 to \$4.50. Increases in enplanements and operations place demands on infrastructure.

Not all airports will choose to seek an immediate or longer-term PFC increase. To increase transparency regarding the intentions of airports in maintaining cash reserves beyond those required by bond rating agencies, we suggest that the FAA consider an airport's cash reserves and broader financial status when determining whether to approve an airport's request for an increase in its PFC.

We further recommend that large- and medium-hub airports that raise their PFC above \$4.50, indexed to inflation, should forgo their AIP primary entitlements dollar-for-dollar for each dollar of PFCs they collect, up to 100 percent of these entitlements. Instead, that money could more efficiently achieve the redistributive purpose of the AIP either by being focused on needs of national significance among smaller airports or by being directed to other priorities affecting the safety and sustainability of the NAS. Airports that raise their PFC above \$4.50 would remain eligible for other categories of AIP funding, including discretionary grants and cargo entitlements.

Under current law, passengers with one or more layovers must pay two PFCs: one to the origin airport and one to the first layover airport. Because an airport's PFC applies to these layover passengers, an increase in the PFC could reduce demand for flights that have layovers at that airport. This could be particularly problematic for small airports, where almost all routes go through one or two larger "feeder" airports to connect their community to the national and international system. For this reason, we recommend that any increase in the PFC cap beyond \$4.50 apply only to passengers that originate at the airport raising its PFC, while the PFC for layover passengers remains capped at \$4.50, indexed to inflation. The rationale for restricting future PFC increases to only passengers originating at that airport is to ensure that airports that increase their PFCs to meet their own capital needs do not impose costs on other airports in the process. Origin passengers represent the majority of passengers at most airports, with the notable exception of three large hubs, and layover passengers could still be charged PFCs of up to \$4.50, indexed to inflation.

## **Changes to the Airport Improvement Program**

### ***Congress Should Remove the Automatic Doubling of Airport Improvement Program***

#### ***Primary Entitlements***

Under current law, whenever Congress appropriates at least \$3.2 billion to the AIP, primary entitlements per passenger double (subject to a cap), with those increases resulting in less money available for other AIP funds, including discretionary grants. As a consequence of this policy, annual AIP funding is spread across all primary airports according to their enplanements, and the FAA has less discretion to effectively direct funds to current high-priority projects at specific airports.

We recommend that Congress remove the triggered primary entitlement increase that occurs when Congress appropriates at least at \$3.2 billion to the AIP. Those airports not voluntarily forgoing AIP entitlements in return for the ability to collect PFCs could still receive comparable levels of AIP funding over time, but the timing and magnitude of annual grants would be better aligned with the timing and magnitude of needs. Airports could compete to receive more funds in the form of larger grants from the pool of discretionary funding, when needed, but would receive fewer guaranteed funds in the form of annual entitlements.

#### ***Congress Should Consider Removing Nonprimary Entitlements***

As with primary entitlements, under current law, whenever Congress appropriates at least \$3.2 billion to the AIP, each nonprimary airport in the NPIAS receives an entitlement of up to \$150,000 instead of those funds going to more-flexible state apportionments for nonprimary airports. This amount is insufficient for major construction projects, and the existing state apportionment mechanism is both better suited to meet nonprimary airports' needs and has sufficient oversight mechanisms in place. We recommend that Congress eliminate nonprimary entitlements that occur under current law when the AIP appropriation is at least \$3.2 billion. As with the previous recommendation, airports could still compete to receive comparable levels of funding over time, but the timing and magnitude of individual distributions would be better aligned with the timing and magnitude of needs.

## **Changes to the Airport and Airway Trust Fund**

### ***Congress Should Avoid the Accumulation of Large Uncommitted Airport and Airway Trust Fund Balances, While Still Maintaining a "Rainy Day" Reserve Fund***

Existing spending guarantee mechanisms in statute are designed to prevent the accumulation of a large uncommitted balance in the AATF and to ensure excise tax revenues are spent on aviation system priorities. In practice, the enforcement mechanism is weak and is regularly ignored by Congress. Under excise tax levels set in current law, a large uncommitted balance is projected to materialize. Congress should take advantage of the existing uncommitted balance to establish and maintain a "rainy day" fund to ensure funding levels can remain stable over time. In years that experience unusually low demand for air travel, such as 2002 and 2009, actual revenues to the AATF can fall approximately \$2 billion below projected revenues. A rainy day fund containing \$4 billion to \$6 billion would be sufficient to ensure that AATF outflows, for all purposes, can remain stable even in the face of two to three years of severe revenue shortfalls. However, after seeding the rainy day fund, additional revenues should be appropriated to meet clearly identified needs, as determined by the FAA.



### ***Congress Should Include Ancillary Fees in the Domestic Passenger Ticket Tax***

Ancillary fees are charges for airline-provided services or products that some airlines sell separately from tickets, such as checked baggage, advance seat assignments, and priority boarding. These fees are excluded from the 7.5 percent Domestic Passenger Ticket Tax that helps fund the AATF. This policy favors airlines that separate ancillary fees from their base ticket price over those that do not. Airlines should be free to separate ancillary fees if they wish, but the Domestic Passenger Ticket Tax should not incentivize one business model over another by taxing ancillary services differently than bundled ticket prices. However, Congress should not be collecting additional AATF revenue without a commitment to spend it, as noted in the preceding recommendation. For this reason, we recommend that Congress ask the FAA to help determine the level of reduction in the Domestic Passenger Ticket Tax that would make the taxation of ancillary fees revenue-neutral.

### **Changes to Enforcement of Prohibitions on Revenue Diversion**

#### ***The FAA Should Increase Enforcement of Existing Rules***

Revenue diversion refers to the practice of airport sponsors spending aviation-related revenue on nonaviation purposes, a practice generally prohibited by law. Revenue diversion remains a significant problem, even though the FAA has sought to clarify its rules regarding the disposition of state-based fuel taxes in recent years. Generally, the pressure to divert revenue comes from other local interests and not airport management, which has every interest in retaining the revenues generated by airport operations. Thus, withholding AIP grants as a punishment for revenue diversion is not a well-targeted deterrence strategy. Under current law, the USDOT, if triggered by FAA enforcement action, has the authority to withhold other USDOT grants from airport sponsors (as opposed to withholding FAA grants from airport management) that remain out of compliance with revenue diversion rules. This withholding rarely occurs, but the FAA should pursue this path when compliance is not swift.

#### ***Congress Should Phase Out Grandfathering***

Twelve airport sponsors were originally granted waivers in 1982 from prohibitions on revenue diversion because of their particularly complicated arrangements for mingling revenues and expenditures across multiple public assets under their jurisdiction. The grandfathering provision has already been removed for three of these airport sponsors, proving that ending this exception is possible. Ending this exception also is important for supporting good governance at the local level.

## **Issues for Further Analysis**

### **Many Airports and Routes Lack a Healthy Level of Competition**

Lack of competition can affect passengers in several ways. We highlight two cases here. First, many airports, cities, and routes are served by only one or two airlines. Lack of competition among airlines at a given airport can result in higher costs for travelers. In practice, PFC projects provide airports with a means of accommodating new entrants without a veto by legacy carriers, but competition cannot be enhanced solely through changes in infrastructure finance policy. Second, passengers also can be affected by lack of competition among airports in a given region. Under current law, airport sponsors that manage multiple airports can use PFC

funds collected at one of their airports to pay for projects at another of their airports. This does not occur often, but when it does, it challenges the notion that PFCs are a user fee. In both cases, broader regional economic issues and trade-offs are in play that require a more comprehensive assessment.

### **Impacts of Regulations and Requirements Are Uncertain**

As previously noted, airports draw revenue from a wide variety of sources, each of which comes with its own rules and restrictions on how funds can be spent and who has approval authority. Many anecdotes have accumulated over the years about individual projects being delayed or stopped entirely as a consequence of local opposition, whether because of cost, noise, or encroachment into neighboring communities. But projects being halted or delayed by regulations or requirements is not necessarily inappropriate; impacts on other stakeholders are important considerations. This long-standing question in public policy remains a topic ripe for independent, objective, and rigorous analysis to provide Congress and other decisionmakers with clearer direction on how regulations can be harmonized and streamlined to increase their effectiveness and enhance their efficiency.

### **Revenue-Neutral Alternatives to Fuel Taxes Will Eventually Be Needed**

Fuel taxes are not the largest portion of AATF revenue. Nonetheless, progress on developing and deploying electric planes could eventually lead to declines in fuel-based tax revenues while leaving the electric planes using the same or new infrastructure untaxed (a comparable situation applies to the gas tax supporting the Highway Trust Fund). To ensure stability and equity of funding, Congress should authorize the FAA to conduct a study that considers transitional or alternative tax structures, such as weight-based or operations-based taxes, including alternatives that would be revenue-neutral relative to revenues generated by the current levels of fuel-based taxes.

### **Inventory Existing Infrastructure and Assess Infrastructure Capacity and Physical Condition**

Existing inventories and assessments of airport infrastructure have significant shortcomings. There is a need for an objective and analytically rigorous national inventory of existing airport infrastructure, air traffic control towers, and other air traffic facilities, and there is a need for an assessment of their current capacity, functionality, and physical condition. An up-to-date inventory and assessment of infrastructure conditions would provide a valuable foundation for Congress to make more-informed choices in the future about the levels of investment required across the different infrastructure types.

## **Summary of Findings on Section 122 Issues**

To ease the tracking of issues in Section 122, Table 3 provides a guide to the Section 122 findings and their locations within the full report.

**Table 3**  
**Summary of Responses to Section 122 Issues**

Subsection of Section 122	Issue	Summary of Findings	Chapter in Full Report
All Commercial Service Airports			
(c)(1)	Ability of airport infrastructure to meet current and projected passenger volumes	Twenty airports (19 large hubs and one reliever) account for 96 percent of delays measured by the FAA's Operations Network (OPSNET). Delays at most of these airports, as well as the National Airspace System (NAS) as a whole, had been declining since 2009 but have been increasing over the past three years as enplanements have increased. Some of these delays could be partially reduced by appropriate infrastructure investments.	Chapter Eight
(c)(2)	Available financial tools and resources for airports of different sizes	Airports of all sizes draw on multiple sources of funding. Larger airports tend to generate most of their revenues from their operations and take advantage of the municipal bond market. In contrast, smaller airports rely on Airport Improvement Program (AIP) and other grants for funding and have limited access to the bond market.	Chapters Four and Seven
(c)(3)	Available financing tools and resources for airports in rural areas	Rural airports, which are predominantly smaller airports, rely heavily on AIP and other grants as their major source of revenue, with these grants accounting for more than 50 percent of their revenue on average. Rural airports are less likely to participate in the bond market.	Chapter Four
(c)(4)	Current debt held by airports and its impact on future construction and capacity needs	Over the last ten years, large-hub airports have increased their debt by 34 percent, to \$73.6 billion in 2017, but their debt-to-revenue ratio has remained relatively stable. Debt and debt-to-revenue ratios across commercial service airports of all other sizes have generally held steady over the past two decades. Airports' ability to finance future construction and capacity needs will depend on their financial status, regional and local economic conditions, and other factors.	Chapter Seven
(c)(5)	Impact of capacity constraints on passengers and ticket prices	As noted in (c)(1), 20 airports account for 96 percent of delays measured by the FAA's OPSNET. These airports create delays for passengers that propagate throughout the NAS.  Separately, the average inflation-adjusted domestic ticket price fell from \$630 in 1993 to \$432 in 2018. Competition and market conditions are the primary determinants of ticket prices. We do not find evidence that capacity-enhancing projects significantly affect ticket prices.	Chapter Eight  Chapters Two and Six
(c)(6)	Purchasing power of the passenger facility charge (PFC) from the last increase in 2000 to the year of enactment of this Act	The purchasing power of the maximum per-enplanement PFC has declined, from \$4.50 in 2000 to \$2.72 in 2018, expressed in year 2000 dollars indexed to construction prices.	Chapter Six
(c)(7)	Impact to passengers and airports of indexing the PFC for inflation	If the \$4.50 PFC cap had been indexed to inflation in construction prices in 2000, the current cap on passengers would be \$7.44. If the cap were indexed to inflation moving forward, this would prevent further erosion of its purchasing power. According to historical precedent, airports' adoption of higher PFCs likely would become widespread over time.	Chapter Six
(c)(8)	How long airports are constrained with current PFC collections	PFC revenues at all large-hub airports but one are fully committed to FAA-approved projects through 2022. Eighteen of 30 large hubs have fully committed their PFC revenues until at least 2030, and six are committed until at least 2040. Among the 31 medium hubs, ten have fully committed their PFC revenues until at least 2030, while 14 will have new revenues available by 2025.	Chapter Six

Table 3—Continued

Subsection of Section 122	Issue	Summary of Findings	Chapter in Full Report
(c)(9)	Impact of PFCs on promoting competition	Analysis of existing data does not provide conclusive evidence of whether individual PFC projects have had impacts on competition. Facilities funded with PFCs may not be leased on an exclusive-use basis, and that policy element of the PFC program might support competition. Airline hubbing decisions and local economic conditions are more likely to drive significant changes in competition.	Chapter Six
(c)(10)	Additional resources or options to fund terminal construction projects	Airports typically combine funds from multiple sources to fund terminal construction projects. Many funds come from airport revenue. PFC funds can be used for non-revenue-generating portions of terminals, while AIP grants are generally focused on airside infrastructure. Expanding airports' revenue bases to include the taxing of nonairport local businesses and residents is unattractive to local governments and would increase the cost of local goods and services unrelated to air travel. Privatization is possible but rarely pursued; the Airport Investment Partnership Program, established in 1997, allows airports to explore privatization but has had few takers.	Chapters Four through Seven
(c)(11)	Resources eligible for use toward noise reduction and emission reduction projects	AIP grants and PFCs can be applied to noise reduction and emission reduction projects. We found no evidence that resources for these purposes are insufficient to meet current noise and emissions requirements.	Chapter Three
(c)(12)	Gap between the cost of projects eligible for the AIP and the annual federal funding provided	Airports consult with FAA regional staff to determine which AIP-eligible projects to submit, given program funds and priorities. This consultation process makes identifying the magnitude of a funding gap difficult in practice. The FAA's list of AIP-eligible projects exceeds annual AIP funding, but airports can and do use other funds to pay for AIP-eligible projects.	Chapters Five and Eight
(c)(13)	Impact of regulatory requirements on airport infrastructure financing needs	Airports draw revenue from a wide variety of sources, each of which comes with its own rules and restrictions on how funds can be spent and who has approval authority. A benefit of regulatory processes is that they provide an opportunity for the public to voice concerns or support for specific projects. Effects on project completion timelines and cost are likely to vary depending on local context. We were unable to estimate cumulative impacts.	Chapters Three and Four
(c)(14)	Airline competition	Over the past few decades, mergers and bankruptcies in the airline industry have led to fewer overall airlines, with four airlines currently responsible for 73 percent of available seat miles and 80 percent of enplanements. National average fares have fallen 36 percent since 1993, but fares on individual routes fluctuate. Markets with fewer passengers are likely to be served by fewer airlines.	Chapter Two
(c)(15)	Airline ancillary fees and their impact on ticket pricing and taxable revenue	Some airlines have separated ancillary fees, such as fees for baggage and reserved seats, from their base fares. Ancillary fees that have been separated from base fares are exempt from the 7.5 percent excise tax that helps fund the Airport and Airway Trust Fund (AATF). If the \$4.9 billion in baggage fees collected by airlines in 2018 had been subject to the 7.5 percent tax, AATF revenues would have been about \$367 million higher, all other factors being equal.	Chapter Five
(c)(16)	Ability of airports to finance necessary safety, security, and capacity projects	To date, airports have been able to finance necessary safety, security, capacity, and environmental projects identified in capital improvement plans. Their financial ability to continue doing so in a timely manner varies. Policy changes that increase revenue would enable some airports to initiate projects sooner and at a lower borrowing cost than they could otherwise but would likely increase passenger ticket prices.	Chapter Eight

Table 3—Continued

Subsection of Section 122	Issue	Summary of Findings	Chapter in Full Report
Large-Hub Airports			
(d)(1)	Analyze the current and future capacity constraints of large-hub airports	Nineteen large-hub airports account for 94 percent of delays measured by FAA's OPSNET. Delays at most of these airports, as well as the NAS as a whole, had been declining since 2009 but have been increasing over the past three years as enplanements have increased. Some of these delays could be partially reduced by appropriate infrastructure investments.	Chapter Eight
(d)(2)	Quantify large-hub airports' infrastructure requirements, including terminal, landside, and airside infrastructure	Infrastructure at large-hub airports served 534,507,475 domestic commercial enplanements and 11,893,110 operations in 2018. As noted in (d)(3), this use of airport infrastructure is expected to grow. We cannot say how to convert these activity levels to credible estimates of specific infrastructure requirements, because this depends largely on the flexibility of airports' current configuration, local context, market forces, and changes in technology.	Chapter Two
(d)(3)	Quantify the percentage growth in infrastructure requirements of the large-hub airports relative to other commercial service airports	The FAA's Terminal Area Forecast suggests that large-hub airports' operations will increase by 19 percent and enplanements will increase by 30 percent from 2018 to 2030. Over the same period, operations at medium hubs are forecast to grow by 17 percent, small hubs by 10 percent, and non-hubs by 6 percent. This growth will likely lead to increased infrastructure requirements, but local circumstances will determine whether changes are required and, if so, their associated costs.	Chapter Eight
(d)(4)	Analyze how much funding from the AIP has gone to meet the requirements of large-hub airports over the past ten years	In total, large hubs received about \$6 billion in AIP grants from FYs 2009 to 2018. This was 17 percent of all AIP grant dollars over that period. The percentage of large hubs' capital expenditures that comes from AIP grants has declined, down to 5 percent in FY 2018 from approximately 10 percent to 15 percent between FYs 2009 and 2015. Under present policies, large- and medium-hub airports forgo much of their AIP primary entitlement grants when imposing PFCs but retain access to other AIP grants.	Chapter Five
(d)(5)	Project how much AIP funding would be available to meet the requirements of large-hub airports in the next five years if funding levels are held constant	If appropriations, statutory entitlements, and the distribution of discretionary funds that goes to large hubs were all to remain the same as they have over the past ten years, then about \$3 billion of AIP funding would be available for large hubs over the next five years. This would represent 17 percent of the total AIP funding that would be available over this five-year period.	Chapter Five



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Passenger air travel in the United States is at an all-time high and is expected to continue growing for most airports of all sizes. Commercial service airports, which are publicly owned airports that serve at least 2,500 passenger boardings (enplanements) per year and that receive scheduled passenger service, handle 99.9 percent of those enplanements.

These airports provide the physical infrastructure—runways, terminals, gates, and other facilities—used by commercial airlines, travelers, and other air service providers.

Section 122 of the 2018 Federal Aviation Administration (FAA) Reauthorization Act directed the FAA to contract with an independent research organization to address 21 questions related to infrastructure funding and financing at commercial service airports. To provide the context for addressing Congress’s questions, the authors of this report provide a comprehensive review of the role of the federal government in airport infrastructure funding and financing. The authors also recommend a portfolio of changes in current federal policies related to airport infrastructure funding and highlight the need for further study of issues that may merit policy changes.

Consistent with Section 122, RAND as the independent research organization submitted this report directly to Congress and the Secretary of Transportation in January 2020.

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