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NATIONAL AIRSPACE SYSTEM MODERNIZATION

Observations on Potential Funding Options for FAA and the Next Generation Airspace System

Statement of Gerald L. Dillingham, Ph.D,
Director, Physical Infrastructure Issues

Susan J. Irving Ph.D. Director,
Federal Budget Analysis Strategic Issues

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Highlights

Highlights of GAO-06-1114T, a testimony before the Subcommittee on Aviation, Committee on Transportation and Infrastructure, House of Representatives

Why GAO Did This Study

The transition to the Next Generation Air Transportation System (NGATS)—a system intended to safely accommodate a possible tripling of air traffic by 2025—will become one of the federal government's most comprehensive and technically complex undertakings, and a preliminary estimate indicates it will also be expensive. However, the current approach to managing air transportation is becoming increasingly inefficient and operationally obsolete. In 2003, Congress authorized the creation of the Joint Planning and Development Office (JPDO) to coordinate the efforts of several federal partner agencies—including the Federal Aviation Administration (FAA), in which JPDO is housed—to plan for and develop NGATS.

GAO's testimony addresses (1) the current estimate and uncertainties over NGATS costs, (2) advantages and concerns that stakeholders have raised about the current approach to collecting revenues from national airspace users to fund FAA, (3) the advantages and disadvantages of adopting alternative funding options for FAA, and (4) the advantages and disadvantages of authorizing FAA to use debt financing for capital projects.

This testimony is based in part on GAO's analysis of FAA and JPDO documents and interviews with officials of those two agencies.

www.gao.gov/cgi-bin/getrpt?GAO-06-1114T.

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What GAO Found

No comprehensive estimate of NGATS costs has been developed. However, an advisory committee to FAA has developed a limited, preliminary cost estimate, which has not yet been endorsed by any agency. This estimate suggests that with NGATS, FAA's costs would average about $1 billion more per year (in today's dollars) over the next 20 years than FAA's appropriations for fiscal year 2006. The estimate is preliminary in part because JPDO has not yet completed its enterprise architecture, (a blueprint for NGATS) which will be needed to inform a reliable cost estimate.

Some stakeholders support the current excise tax system because they believe it has been successful in funding FAA, has low administrative costs, and distributes the tax burden in a reasonable manner. Others, including FAA, state that under the current system, there is a disconnect between the revenues contributed by users and the costs those users impose on the national airspace system (NAS) that raises revenue adequacy, equity, and efficiency concerns. Trends over the past 25 years in, and FAA's projections of, both inflation-adjusted fares and average plane size suggest that the revenue collected under the current funding system has fallen and will continue to fall relative to FAA's workload, supporting revenue adequacy concerns.

Adopting alternative funding options to collect revenues from NAS users would have advantages and disadvantages. The degree to which alternative funding options could address concerns about the current excise tax system ultimately depends on the extent to which the contributions required from users actually reflect the costs they impose on the system. Given the diverse nature of FAA's activities, a combination of alternative options may offer the most promise for linking revenues and costs.

Allowing FAA to use debt-financing for capital projects, such as the replacement of facilities and equipment associated with the transition to NGATS, also presents advantages and disadvantages. Some stakeholders see debt financing as attractive because they believe it could provide FAA with a stable source of revenue to fund capital developments, while at the same time spreading the costs out over the life of a capital project as its benefits are realized. Debt-financing raises significant concerns, however, because it encumbers future resources, and expenditures from debt proceeds may not be subject to the same congressional oversight as expenditures from appropriations. Concerns about borrowing costs, oversight, and encumbering future resources are particularly important in light of the federal government's long-term structural fiscal imbalance.

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify at today's hearing on potential options for funding the transition to the next generation air transportation system (NGATS)—a system intended to safely accommodate a possible tripling of air traffic by 2025. As you know, in 2003, Congress authorized the creation of the Joint Planning and Development Office (JPDO) to coordinate efforts by several federal partner agencies (including the Federal Aviation Administration (FAA), in which JPDO is housed) to plan for and develop NGATS. NGATS is envisioned as a major redesign of the air transportation system that will include precision satellite navigation; digital, networked communications; an integrated weather system; and layered, adaptive security. The NGATS transformation effort will be an enormously complex undertaking, and a preliminary estimate indicates it will also be expensive. However, the current approach to managing air transportation is becoming increasingly inefficient and operationally obsolete. In fact, JPDO has estimated that failing to modernize to meet future demand for air transportation could result in billions of dollars in economic losses to the nation.

Although JPDO is responsible for planning the transformation to NGATS and coordinating the efforts of its partner agencies, FAA will be largely responsible for implementing the policies and systems necessary for NGATS. Considering how to fund the near-term sustainment or modernization of our air transportation system takes on added importance given competing funding demands and the federal government's long term fiscal outlook. Our recent work, contained in a report that will be released to the public soon,[1] analyzed the current funding structure, which relies mainly on revenues collected from national airspace system (NAS) users, and alternative funding options.

We and others have pointed out that the federal budget is on an unsustainable path. Although the drivers in this outlook are federal health and retirement programs, we have also said that a fundamental reexamination of the base of federal programs and activities is important to create a sustainable government appropriate for the 21st century.[2] Given

[1]GAO, *Aviation Finance: Observations on Potential FAA Funding Options*, GAO-06-973 (Washington, D.C.: September 2006).

[2]GAO, *21st Century Challenges: Reexamining the Base of the Federal Government*, GAO-05-325SP (Washington, D.C.: February 2005).

the uncertain fiscal environment in which the air transportation system operates, and will likely continue to operate during the transformation to NGATS, my testimony today is designed to provide this committee with information on a preliminary cost estimate for the NGATS transformation and potential options for funding FAA. Specifically, my statement today will briefly address the (1) current estimate and uncertainties over NGATS costs, (2) advantages and concerns that stakeholders have raised about the current approach to collecting revenues from national airspace users to fund FAA, (3) advantages and disadvantages of adopting alternative funding options for FAA, and (4) advantages and disadvantages of authorizing FAA to use debt financing for capital projects.

To answer these questions, we reviewed relevant economic literature, policy analysis, congressional testimony, industry group publications, and stakeholders' responses to questions FAA asked them about its funding and alternative options.[3] We also interviewed key stakeholders, including officials from FAA, JPDO, the Office of Management and Budget (OMB), the Congressional Budget Office (CBO), and the Department of the Treasury (Treasury); representatives of aviation industry groups; and academic and financial experts. In addition, we examined FAA budget data, Airport and Airway Trust Fund (Trust Fund) revenue data, FAA and JPDO forecasts, and aviation activity data. We also obtained information on an estimate of FAA's future costs under NGATS but did not review in detail the methodology or assumptions used to develop this estimate. We conducted our work between May 2005 and August 2006 in accordance with generally accepted government auditing standards.

In summary:

- Understanding the costs involved in the transition to NGATS is critical to its planning and implementation, yet no comprehensive estimate of these costs currently exists. An FAA advisory committee has developed a limited, preliminary cost estimate, which officials have emphasized is not yet endorsed by any agency. This estimate suggests that with NGATS, FAA's costs would average about $1 billion more per year (in today's dollars) over the next 20 years than FAA's appropriations for fiscal year 2006. However, the NGATS enterprise architecture (a blueprint for the systems and integration required under NGATS) has not yet been developed. Consequently, the estimate should be seen as providing only a

[3]In September 2005, FAA provided stakeholders with information on its operations and costs and asked for responses to questions about how to fund the agency.

sense of the order of magnitude of the potential increased costs to FAA. In addition, this estimate does not include the costs that the other partner agencies or the industry might incur in their implementation of NGATS systems and technologies. A more precise estimate of the total NGATS cost should emerge following the development of the NGATS enterprise architecture.

- Some stakeholders support the current excise tax system because they believe it has been successful in funding FAA, has low administrative costs, and distributes the tax burden in a reasonable manner. Others, including FAA, state that under the current system, there is a disconnect between the revenues contributed by users and the costs those users impose on the NAS that raises revenue adequacy, equity, and efficiency concerns.[4] Trends over the past 25 years in, and FAA's projections of, both inflation-adjusted fares and average plane size suggest that the revenue collected under the current funding system has fallen and will continue to fall relative to FAA's workload and costs, supporting revenue adequacy concerns. Comparisons of revenue contributed and costs imposed by different flights provide support for equity and efficiency concerns.

- Adopting alternative funding options to collect revenues from NAS users would have advantages and disadvantages. The degree to which alternative funding options could address concerns about the current excise tax system ultimately depends on the extent to which the contributions required from users actually reflect the costs they impose on the system. Given the diverse nature of FAA's activities, a combination of alternative options may offer the most promise for linking revenues and costs. Switching to any alternative funding option would raise administrative and transition issues, such as the need to develop the administrative capacity to implement new charges.

- Allowing FAA to use debt-financing for capital projects, such as the replacement of facilities and equipment associated with the transition to NGATS, also presents advantages and disadvantages.[5] Some stakeholders have suggested that debt-financing—such as bonds—could be a means of

[4]Stakeholders that support the current funding system include the Aircraft Owners and Pilots Association and the National Business Aviation Association; stakeholders that have expressed concerns about the current funding system include the Air Transport Association and the FAA.

[5]In addition to debt-financing, some stakeholders have identified other methods of funding capital investments, such as leasing or contracting out services (e.g., flight service stations). An analysis of these other methods was beyond the scope of this testimony.

funding FAA capital projects. These stakeholders argue that debt-financing is attractive because an agency could obtain capital assets without first having to secure funding through the appropriation process, while at the same time spreading the costs out over the life of a capital project as the project's benefits are realized. Debt-financing raises significant concerns, however, because it encumbers future resources, and expenditures from debt proceeds may not be subject to the same congressional oversight as expenditures from appropriations. In addition, debt-financing raises issues regarding federal borrowing costs that are particularly important in light of the federal government's long-term structural fiscal imbalance.

Background

NGATS is envisioned as a system that will meet the needs of the year 2025. Planning for NGATS began in 2003, when Congress passed Vision 100,[6] the legislation that authorized JPDO. Vision 100 requires the office to operate in conjunction with multiple government agencies, including the Departments of Commerce, Defense, Homeland Security, and Transportation; FAA; the National Aeronautics and Space Administration; and the White House Office of Science and Technology Policy. JPDO submitted an integrated plan for NGATS to Congress in December 2004. In developing the integrated plan, the partner agencies agreed on a vision statement for the future system and on eight strategies that broadly address the goals and objectives for NGATS.

Among its efforts, JPDO has begun developing an enterprise architecture—one of the most critical planning documents in the NGATS effort. An enterprise architecture is akin to blueprints for a building. It is meant to provide a common tool for planning and understanding the complex, interrelated systems that will make up NGATS. JPDO intends for the enterprise architecture to describe FAA's operation of the current NAS, JPDO's plans for NGATS, and the sequence of steps needed for the transformation to NGATS. JPDO expects that the enterprise architecture will provide the means for facilitating coordination among the partner agencies and private sector manufacturers, the alignment of relevant research and development activities, the integration of equipment, and the development of a more reliable cost estimate for NGATS. JPDO officials expect the first complete draft of the enterprise architecture to be issued in 2007.

[6]Pub. L. No. 108-176, Vision 100—Century of Aviation Reauthorization Act, December 12, 2003.

FAA, which will bear much of the responsibility for implementing NGATS, engages in three primary activities: aviation safety oversight, air traffic control (ATC), and airport infrastructure development.[7] The costs associated with each of these activities generally depend on the nature of the specific service FAA provides and how it is used. FAA safety activities include the licensing of pilots and mechanics, as well as the inspection of various aspects of the aviation system, such as aircraft and airline operations. FAA states that the costs associated with these safety activities are primarily driven by the volume of each (e.g., the number of licenses and inspections). ATC includes a variety of complex activities to guide and control the flow of aircraft through the NAS. According to FAA, the costs imposed by each flight are influenced by the amount and nature of the specific services that a flight uses, and whether a flight operates at peak periods. FAA supports airport infrastructure development through the Airport Improvement Program (AIP). Unlike safety and ATC services, AIP expenditures are not the direct result of costs imposed by users of the NAS. FAA distributes AIP funding according to congressional priorities established in authorizing and appropriating legislation.

FAA is funded through appropriations from both the Trust Fund and the General Fund of the U.S. Treasury (General Fund). The Trust Fund was established by the Airport and Airway Revenue Act of 1970[8] to help fund the development of a nationwide airport and airway system. It provides funding for FAA's capital accounts, including the AIP, which is a multibillion dollar grant program that provides funding for airports; the Facilities and Equipment account, which funds technological improvements to the air traffic control system; and the Research, Engineering, and Development account, which funds continued research on aviation safety, mobility, and environmental issues. In addition, the Trust Fund supports part of FAA's operations.

To fund these accounts, the Trust Fund is credited with revenues collected from system users through the following dedicated excise taxes:

- 7.5 percent tax on domestic airline tickets

[7]FAA is also responsible for commercial space licensing and oversight; this line of business is beyond the scope of this testimony.

[8]Pub. L. No. 91-258.

- $3.30 domestic passenger segment tax (excluding flights to or from rural airports)[9]
- 6.25 percent tax on the price paid for transportation of domestic cargo or mail[10]
- $0.043/gallon tax on domestic commercial aviation jet fuel
- $0.193/gallon tax on domestic general aviation gasoline
- $0.218/gallon tax on domestic general aviation jet fuel
- $14.50/person tax on international arrivals and departures, indexed to inflation[11]
- 7.5 percent tax on mileage awards (frequent flyer awards tax)
- $7.30 per passenger tax on flights between the continental United States and Alaska or Hawaii (or between Alaska and Hawaii), indexed to inflation.[12]

Trust Fund revenues totaled $10.7 billion in fiscal year 2005. The ticket tax was the largest single source of Trust Fund revenue in fiscal year 2005, totaling about $5.2 billion, or about 48 percent of all Trust Fund receipts. The ticket tax was followed by the passenger segment tax and the international departure/arrival taxes, which each totaled about $1.9 billion; fuel taxes, which totaled $870 million; the cargo/mail tax, which totaled $461 million; and interest income, which totaled $430 million. Figure 1 shows the shares received from each source during fiscal year 2005.

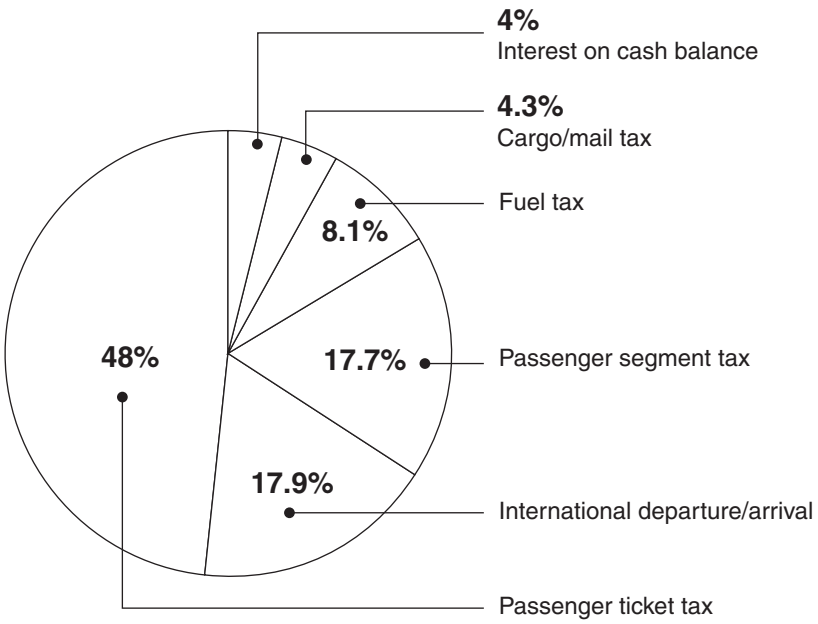
[9]The domestic segment tax is levied on each domestic segment a passenger travels on a flight. For example, a passenger traveling on a flight from New York to Seattle, with a connection in Chicago, travels two segments—one from New York to Chicago, and a second from Chicago to Seattle. The segment tax is $3.30 in 2006; this tax rate changes annually because it is indexed to the Consumer Price Index.

[10]This is also known as the waybill tax.

[11]The international arrival and departure taxes are $14.50 in 2006; both rates change annually because they are indexed to the Consumer Price Index.

[12]The per passenger tax on flights between the continental United States and Alaska or Hawaii (or between Alaska and Hawaii) is $7.30 in 2006; the rate changes annually because it is indexed to the Consumer Price Index.

Figure 1: Trust Fund Revenues by Source, Fiscal Year 2005



Source: GAO analysis of FAA data.

In addition to Trust Fund revenues, in most years General Fund revenues have been used to fund FAA. The General Fund contribution has varied greatly, ranging from 0 percent to 59 percent of FAA's budget. From fiscal year 1997, the year when existing Trust Fund excise taxes were authorized, through fiscal year 2006, the General Fund contribution has averaged 20 percent of FAA's total budget. About $2.6 billion was appropriated for fiscal year 2006 from the General Fund for FAA's operations. This amount represents about 18 percent of FAA's total appropriation.

There is Currently No Comprehensive Estimate of NGATS Costs

Understanding the costs involved in the transition to NGATS is critical to the NGATS planning effort, yet no comprehensive estimate of these costs has been developed. This cost information is particularly important to Congress, which will have the authority to make NGATS funding decisions. To begin estimating NGATS costs, JPDO is holding a series of investment analysis workshops with stakeholders,[13] including representatives from commercial and business aviation; general aviation (GA); equipment manufacturers; ATC systems developers; airports; and regional, state, and local planning bodies. According to JPDO, participants in these workshops are asked to discuss and comment on the appropriateness of JPDO's current assumptions about factors that drive private sector costs.

Although JPDO expects that these workshops will provide information to be used in developing a range of potential costs for NGATS, an enterprise architecture is needed to further define and better understand how a number of factors will drive NGATS costs. One of these drivers is the technologies expected to be included in NGATS. Some of these technologies are more complex and thus more expensive to implement than others. A second driver is the sequence for replacing current technologies with NGATS technologies. A third driver is the length of time required for the transformation to NGATS, since, according to JPDO, a longer period would impose higher costs. JPDO's first draft of its enterprise architecture could reduce some of these variables, thereby allowing improved estimates of NGATS costs.

While JPDO is beginning to explore the issue of cost estimates for NGATS, an advisory committee to FAA—the Research, Engineering and Development Advisory Committee (REDAC)—has developed a limited, preliminary cost estimate, which officials have emphasized is not yet endorsed by any agency.[14] REDAC estimated that FAA's budget under the NGATS scenario would average about $15 billion per year through 2025, or about $1 billion more annually (in today's dollars) than FAA's fiscal year 2006 appropriation. REDAC estimated that the cost for a status quo (i.e.,

[13]JPDO held its first workshop in April 2006 and its second workshop in August 2006. No date has been announced at this time for the third workshop.

[14] In developing their estimate, REDAC used FAA's projected facilities and equipment costs under an NGATS scenario as well as REDAC's own estimates for the costs of operations; airport improvements; and research engineering and development—the remaining three components of FAA's appropriation.

no NGATS) scenario would also be about $15 billion per year through 2025.[15] These estimates came out roughly equal, on average, because future FAA spending would be higher under NGATS than under the status quo in the early years but lower than under the status quo toward 2025. This relationship is due primarily to the expectation that, under the NGATS scenario, capital expenditures would be higher than under the status quo scenario in the near term, but operations costs would be lower because of productivity improvements in the longer term. Moreover, the NGATS cost estimate assumes that capital costs decrease sharply toward 2025. Officials who developed this estimate explained that the estimate treats NGATS as an isolated event. In reality, these officials acknowledge that planning for the subsequent "next generation" system will likely be underway as 2025 approaches and the actual modernization costs could therefore be higher in this time frame than the estimate indicates.

In addition, this estimate should be viewed within the context of a number of factors. First, REDAC does not believe that maintaining the status quo is a viable option because it would provide insufficient capacity to meet projected future demand. REDAC stated that it presented the status quo option "for analytical purposes only since the current approach to air traffic control and management in use in the United States cannot be scaled up to handle the projected growth in traffic." In fact, JPDO has estimated the annual economic cost of not meeting future demand; by 2020, JPDO estimates this cost at $40 billion per year. Second, the REDAC estimate does not include the costs of the intermediate technology development work—a key step in developing NGATS.

Last, and most important, this estimate was developed before JPDO completed important planning documents and does not include estimates of the other partner agencies' costs of implementing NGATS. For example, the estimate does not include costs that the Department of Homeland Security might incur to develop and implement new security technologies. JPDO's first complete enterprise architecture, which would include security, is not expected until the middle of 2007. Additional partner agency costs, along with other costs such as those for training of

[15]In this testimony, we describe REDAC's "base case" scenarios, which assumed that FAA's operations costs would increase between 2006 and 2010, but then remain constant through 2025 (except for inflation), as productivity increases offset the higher cost of increased demand. The working group also developed estimates for lower-cost "best case" and higher-cost "worst case" scenarios using differing assumptions of productivity gains.

personnel in new technologies, must be explored to have a complete picture of NGATS costs.

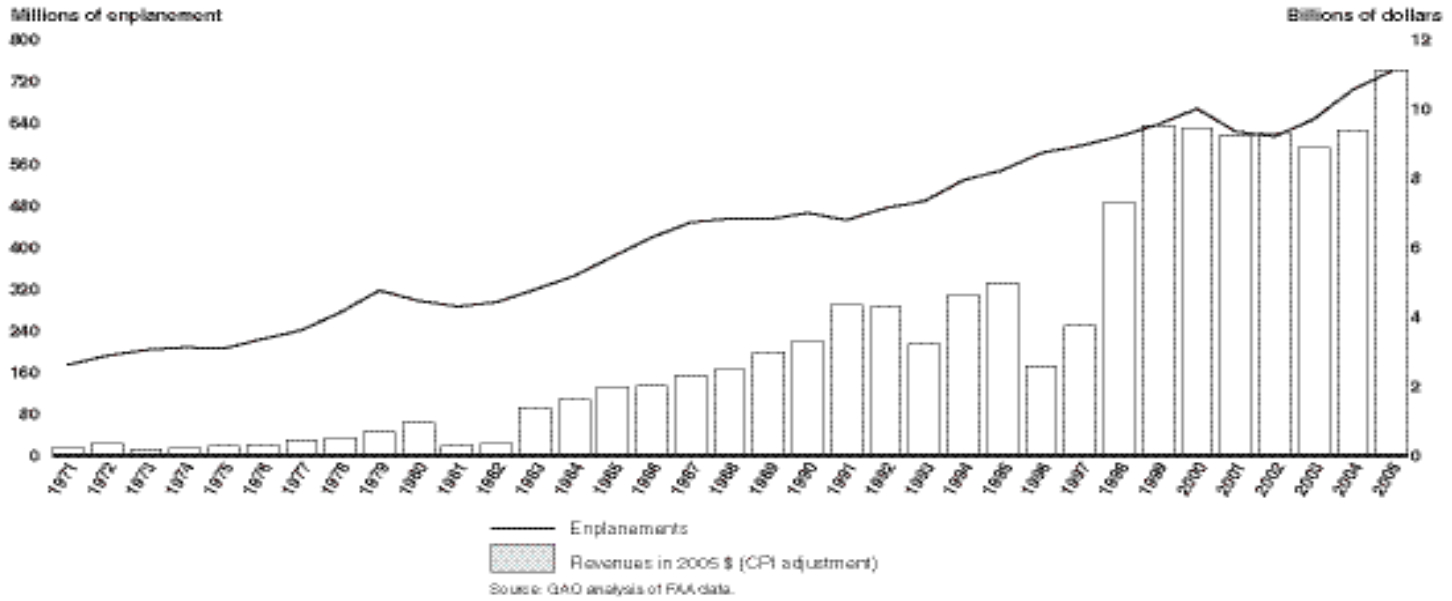
Some Stakeholders Favor FAA's Current Funding System, but Others Raise Concerns about Revenue Adequacy, Equity, and Efficiency

Our report on potential FAA funding options outlines several concerns stakeholders have raised about the current funding structure that supports the Trust Fund.[16] Our observations from that report bear directly on questions about funding NGATS, because the bulk of the NGATS implementation—and, presumably, the costs of that implementation—will fall to FAA. Some stakeholders support the current excise tax system, stating that it has been successful in funding FAA, has low administrative costs, and distributes the tax burden in a reasonable manner. Other stakeholders, including FAA, state that under the current system there is a disconnect between the revenues contributed by users and the costs those users impose on the NAS that raises revenue adequacy, equity, and efficiency concerns. Aviation trend data, FAA projections, and FAA cost estimates support revenue adequacy, equity, and efficiency concerns. However, the extent to which revenue and costs are linked depends critically on how the costs of FAA services are assigned to NAS users. Thus, to assess the extent to which the current approach or any other approach aligns costs with revenues would require completing an analysis of costs, using either a cost accounting system or cost finding techniques to distribute costs to the various NAS users.

Some stakeholders believe that maintaining the current funding structure for FAA is appropriate because it has been successful in funding FAA for many years, suggesting that there is no urgent reason to change it. According to these stakeholders, the revenues collected from users under the current funding system, along with General Fund revenues provided by the Congress, have been sufficient for the United States to develop a safe and efficient aviation system. As the number of air travelers grew, so did revenues going into the Trust Fund. Even though revenues fell during the early years of this decade as the demand for air travel fell, they began to rise again in 2004 (see fig. 2) and FAA estimates they will continue to increase. In addition, according to these stakeholders, the administrative costs are relatively low.

[16] GAO-06-973

Figure 2: Trust Fund Revenues and Passenger Enplanements, 1971 through 2005



Notes: Trust Fund revenue is presented by fiscal year and is adjusted to 2005 constant dollars. Lapses in tax authorizations were the cause of significant revenue decreases in 1981-1982 and 1996-1997. Enplanements are presented by calendar year and are total system scheduled enplanements for the United States.

Another argument for maintaining the current funding structure advanced by some industry stakeholders and analysts is that this structure reasonably allocates the funding burden between commercial aviation and GA. Under the current funding structure, system users who are subject to commercial taxes—including commercial airlines, air taxis, and many fractional ownership operations—contribute about 97 percent of the tax revenue that accrues to the Trust Fund. The remaining GA operators, which include operators of purely private corporate and individual aircraft, contribute about 3 percent. Representatives of the GA segment of the industry contend that collecting the bulk of the user-contributed revenues from the commercial segment is appropriate because the air traffic control system exists at its current size to accommodate the demands of commercial aviation and GA users should not be asked to contribute more than the incremental costs that result from also providing services to GA aircraft. Although the incremental costs are not precisely known, GA representatives have told us that they believe that the revenues currently collected from fuel taxes are a rough approximation of the incremental costs that FAA incurs to provide services to GA aircraft.

According to FAA, all of the agency's cost studies to date have concluded that GA users pay less than the costs they impose on the system, while commercial operators pay more than the costs they impose on the system.

The disconnect between sources of Trust Fund revenues and FAA costs under the current funding system raises concerns that it will not produce adequate revenue in the future to keep pace with FAA's workload increases and, consequently, FAA's costs. The principle of revenue adequacy requires a funding system to produce revenues that keep pace with costs over time. Costs for FAA are largely driven by FAA's workload. However, under the current funding system, increases in FAA's workload will not necessarily be accompanied by revenue increases because users are not directly charged for the costs they impose on FAA from their use of the NAS. Rather, Trust Fund revenues are primarily dependent on the prices of tickets (the domestic ticket tax) and the number of passengers on a plane (the domestic ticket tax, the domestic passenger segment tax, and the international passenger tax); neither is related to workload, which includes controlling flights and safety activities. Long-term industry trends and FAA forecasts of declines in air fares and the growing use of smaller aircraft support revenue adequacy concerns.

To illustrate the disconnect between revenues and costs, table 1 provides an example of the revenues generated by different aircraft making similar flights. The use of multiple flights by smaller aircraft to carry the same number of travelers as one larger aircraft increases FAA's workload, but will not necessarily be accompanied by increased revenues from system users to fund the additional costs associated with the additional workload. Example 1 shows the taxes that would be generated from transporting 105 passengers from Los Angeles to San Francisco by (1) one flight using a common narrow-body jet (Boeing 737), and (2) three flights using a common regional jet (CRJ-200). In this case, the narrow-body jet has the capacity to carry 132 passengers, while each regional jet has the capacity to carry 48 passengers. As the table shows, differences in FAA's workload are not reflected in the revenues. According to FAA, if all other factors are equal (e.g., time of flight), the total ATC costs of the three regional jet flights will be about three times the cost of one narrow-body flight. Revenues from the three regional jet flights, however, total only about $37, or 3 percent, more than the revenue generated by the one narrow-body jet flight. Revenue increases are not linked to cost increases because under the current system, revenues are primarily influenced by the number of passengers, the average price of tickets, and the amount of fuel used—not the costs imposed on FAA through the use of its services.

Table 1: Estimated Excise Tax Contributions from Various Flights

Approximately 300 mile flight from Los Angeles to San Francisco					
	Example #1		Example #2		
Plane type	One 737 flight	Three CRJ-200 flights	One 767 flight	One 737 flight	One Learjet 35 flight
Number of seats	132	144	231	132	[a]
Number of passengers	105	105	180	89	[a]
Average fare ($)	$100	$100	$82	$84	[a]
Fuel consumed (gallons)	937	1,797	1,646	937	190
Ticket tax	$788	$789	$1,100	$565	$0
Passenger segment tax	$348	$348	$544	$270	$0
Waybill tax	$2	$0	$27	$2	$0
Fuel tax	$40	$78	$71	$40	$41
Total Revenue	**$1,178**	**$1,215**	**$1,742**	**$877**	**$41**

Source: GAO analysis of FAA data.

[a]Not applicable.

The disconnect between revenues and workload can work both ways; increases in the number of passengers on planes (e.g., larger planes or higher load factors[17]) or increases in fares can result in higher revenues relative to workload. In fact, load factors have increased over the past several years, and fares have increased over the past year. However, long-term trends and FAA's projections for both domestic fares and plane size suggest that Trust Fund revenues have declined relative to FAA's workload, and will likely continue to do so for the next several years.

Domestic airfares, adjusted for inflation, have steadily declined over the past 25 years, from an average of $233 in 1981 to $148 in 2005.[18] This

[17]A load factor is the percentage of a flight's total available seat miles used to transport passengers.

[18]We have adjusted airfare data to 2005 dollars.

reduction represents an average decline of about 1.9 percent per year.[19] Even though there have been increases in fares over the past year, FAA projects that average fares will continue to decline over time. In FAA's most recent forecast, inflation-adjusted domestic yields—a proxy measure for fares—are projected to decline approximately 8.5 percent over the next 10 years.[20] Trends in the average size of airplanes also suggest the Trust Fund is collecting less revenue relative to workload than in the past, and FAA projections suggest this decline will continue. Since smaller planes carry fewer passengers and burn less fuel, reductions in average plane size mean that lower ticket tax, segment tax, and fuel tax revenue accrues to the Trust Fund relative to FAA's workload.

In addition to revenue adequacy issues, the disconnect between revenues contributed and costs imposed also raises equity issues. Example 2 in table 1 shows FAA's estimates of the revenue contributions made by various flights. Since FAA estimates that similar flights impose similar costs on the agency, the substantial differences in the revenue contributions of these flights raise issues of fairness. One such issue is that similar commercial flights may contribute very different amounts of revenue. In this example, a 767 flight contributes nearly twice as much as the 737 flight. A second equity issue is the fairness of the distribution of the funding burden between commercial airlines and GA operators. Domestic commercial passenger flights[21] are subject to, among other potential excise taxes, the passenger ticket tax, the passenger segment tax, the cargo waybill tax, and the jet fuel tax. GA flights (excluding those that carry commercial passengers) are subject only to a fuel tax. As a result, the revenue contributions of similar commercial and private GA flights may be substantially different. In this example, a private Learjet flight contributes approximately $40, while the commercial flights of a 767 and a 737 contribute $1,742 and $877, respectively.

Although commercial and GA flights might receive the same services from FAA, suggesting that the large difference in revenue contribution raises equity concerns, there is debate over whether commercial and GA flights should be assigned the same costs for similar flights because of

[19]This is the annual compounded rate of decline.

[20]Yield is the amount of money an airline collects for every mile a passenger travels.

[21] This includes some flights typically considered GA flights, such as air taxis and some fractional ownership operations.

disagreements about how to assign the fixed costs associated with the ATC system. Commercial aviation industry representatives favor assigning those costs among all system users in proportion to their use of the system. GA representatives, on the other hand, state that the system exists at its present size to serve the needs of the commercial aviation industry, and that GA should be assigned only the incremental costs that would not exist apart from the need to serve GA. Without a consensus on how to assign ATC costs among users, it is not possible to assess the extent to which the current approach or any other results in a distribution of the funding burden between commercial airlines and GA operators that approximates the distribution of costs attributable to those groups.

Finally, the disconnect between revenues contributed and costs imposed raises efficiency issues. For users to make efficient decisions about their use of the NAS, their price for using the system (the taxes or charges they pay) should accurately reflect the costs their use imposes on the system. Existing price differences suggest that the current funding structure creates incentives for inefficient use of the NAS. Users who pay more in taxes than the costs they impose may use the system less than is optimal, while those who pay less than the costs they impose may use the system more than is optimal. An airline's decision about how many flights to operate to serve a market illustrates how the current system does not provide incentives for efficient use of the system. In example 1 from table 1 (the same one used for the revenue adequacy discussion), an airline is deciding how many daily flights to operate for the Los Angeles to San Francisco market. It estimates that the market demand at the fare it is charging totals 105 passengers per day, and faces the choice of providing one daily flight with a narrow-body jet (Boeing 737), or three daily flights with a regional jet (CRJ-200)—assuming all flights depart during peak periods. In this scenario, the revenue collected from three regional jet flights—$1,215—is about 3 percent more than the revenue collected from one narrow-body jet flight—$1,178. FAA states however, that each flight would impose similar costs on the agency, so FAA's costs would be roughly 3-times more for the three regional jet flights than for the one medium jet flight. In this example, however, there is little financial incentive ($37) for the airline to avoid imposing additional costs on FAA by using one flight instead of three flights.

Alternative Funding Options for FAA Present Both Advantages and Disadvantages

Alternative options for funding FAA—which includes funding NGATS because the bulk of its implementation (and, presumably, its costs) will fall on FAA—have advantages and disadvantages. The degree to which alternative funding options could address concerns about the current excise system ultimately depends on the extent to which the contributions required from users reflect the costs they actually impose on the system.[22] Our forthcoming report on options for funding FAA will examine six options, including two that would modify the current excise tax structure and four that would adopt more direct charges to users. This testimony briefly summarizes our observations for two of those six options.[23]

One example of a possible modification to the current system would be to increase the current aviation fuel taxes—which levy a specific amount per gallon of fuel—to replace revenue lost by eliminating the remaining excise taxes and charges. Fuel taxes compare favorably with other existing excise taxes from a revenue adequacy perspective because they are more directly linked to workload; all things being equal, increases in workload over time would likely result in fuel tax revenue increases. Over time, however, the incentive a fuel tax creates to conserve fuel and make technological advances—while beneficial—is likely to erode the fuel tax's ability to generate revenue. Thus, it is likely the fuel tax rate would have to be raised from time to time to ensure adequate revenue in the long run. The extent to which a fuel tax would address equity issues appears to be limited. Although FAA states that there is a correlation between the time a plane spends in the NAS and fuel consumption, the extent to which fuel consumption correlates with the costs imposed on FAA has not been established. First, there may be a relationship between time in the system and en-route control costs, but the relationship between time in the system and the costs of other FAA activities, such as terminal costs, is not obvious. Second, even if the fuel tax were limited to funding en-route

[22]It is important to note that without more detailed information and an understanding of the costs different flights impose on the NAS, any assessment of the current system or alternative funding options is only preliminary. The degree to which alternative funding options could address revenue adequacy, equity, and efficiency concerns, relative to the current system, ultimately depends on the extent to which the contributions required from users actually reflect the costs they impose on the system. More precise assessments of the current or alternative funding options are possible only if cost finding techniques are used throughout FAA.

[23] The other four funding options considered in the forthcoming report are (1) weight/distance fees, (2) flight segment fees, (3) certification fees, and (4) increasing the passenger segment tax to replace revenues lost from the elimination of the passenger ticket tax.

costs, the connection between fuel consumption and those costs appears to be incomplete. For example, since heavier planes burn more fuel per mile than lighter planes, they would be required to contribute more for spending the same amount of time in the system. As with equity issues, the potential for a fuel tax to address efficiency issues appears limited because the connection between revenues and costs is incomplete. A fuel tax can create an incentive for operators to minimize their fuel consumption, and therefore their time in the NAS. To the extent that time in the system correlates with costs imposed, this incentive can lead to improved efficiency. However, any relationship between time in the system and costs imposed on FAA appears to be limited to en-route control costs.

En-route charges represent an option to switch to a more direct user charge. Such a charge would be based on the time users spend in the NAS or the distance they travel through the NAS. An en-route charge, relative to the current funding system, would be likely to improve the system's revenue adequacy because it could incorporate a cost component into the charging formula that could be adjusted regularly to reflect any changes in costs. This approach could ensure, over time, that revenues match costs. As with the fuel tax, the ability of en-route charges to address equity and efficiency issues raised by the current system appears to be limited. According to FAA, there is a strong relationship between time and distance in the system and the en-route costs imposed by users. Thus, if en-route charges were limited to funding en-route control costs, they might address equity issues raised by the current system by equating charges to costs imposed, depending on how costs are assigned. Furthermore, en-route charges for en-route control would create clear financial incentives to use the system more efficiently; less use of the system would lead to proportionately lower charges. However, there is no obvious relationship between time or distance in the system and other FAA activities—terminal control services and safety activities. As a result, if en-route charges were used to fund all FAA activities, their ability to address equity and efficiency issues is unclear.

Switching to any alternative funding option would raise administrative and transition issues. For example, any cost-based funding system would require FAA to complete the appropriate cost analysis using either a cost accounting system or cost finding techniques. Some stakeholders who support the adoption of direct user charges also support a change in FAA's governance structure—for example, commercializing air navigation services—but we found no evidence that the adoption of direct charges would require a governance change. Recent reforms in France show how a

government agency has moved toward a cost-based system to fund the air navigation services it provides without changing the underlying governance structure.

Using a combination of workload-related taxes or charges to fund FAA might best address the revenue adequacy, equity, and efficiency concerns associated with the current funding structure, given that the costs of FAA's ATC and safety activities are driven by different factors. No single option that we reviewed creates a direct link between revenues and all components of FAA's activity costs. Fuel taxes, weight/distance charges, or en-route charges based on time or distance spent in the NAS could be used to create a more direct link with FAA's costs of providing en-route ATC services. A segment tax for passengers or a flight segment charge could be used to create a more direct link with the costs of FAA's terminal services. Certification charges could be used to create a more direct link with the costs of FAA's various safety-related activities. Thus, some combination of options, such as en-route charges to fund en-route costs, flight segment charges to fund terminal control costs, and certification charges to fund some safety costs, might best address concerns with the current system by providing a better link between revenues and costs than any of these options used separately. According to one stakeholder, however, state that the administrative expense of using multiple funding options might outweigh the benefits of such an approach. According to FAA, other air navigation service providers, such as those in the European Union, have been able to administer direct charges without incurring excessive administrative costs.

Debt Financing for FAA Raises Budgetary Concerns

Over the years, agencies have used a variety of financing approaches to acquire capital assets. All of these approaches have both advantages and disadvantages. From an agency's perspective, acquiring needed capital without first having to secure sufficient appropriations to cover the full cost of the asset is very attractive, especially in an era of limited resources and growing mission demands. However, from a governmentwide perspective, such approaches—including debt financing—raise serious concerns because they ultimately may result in higher overall costs. Given the federal government's long-term structural fiscal imbalance, any action that may increase costs requires sound justification and careful consideration before it is adopted.

Supporters of debt financing for FAA cite a number of advantages. One is the argument that debt financing could provide FAA with a stable and predictable revenue source for funding capital developments. FAA

officials state that the uncertainty associated with the appropriation process makes planning for a large, complex, and expensive air traffic control system difficult. Another cited advantage is that debt financing would allow the costs of capital projects to be repaid as the benefits are received, better aligning costs and benefits. Finally, supporters of debt financing, including some investment firms, state that the private capital market may offer disciplinary mechanisms—such as bond covenants—that may encourage FAA to finance itself more efficiently. Treasury officials question whether the private capital market would provide any market discipline to FAA debt obligations because investors may perceive that the obligations are backed by the federal government and not just agency revenues.

If Congress allowed FAA to use debt financing, it could grant statutory authority for FAA to borrow either through the Treasury or directly from the private capital market. In either case, for FAA to use debt financing, Congress would have to provide the agency with statutory authority to borrow. There is variation in the legal, financial, and structural ways borrowing authorities for other government entities have been established. For example, some government entities produce their own revenue to pay for borrowing costs, whereas others pay with appropriations.[24] Federal entities that have borrowing authority include the Bonneville Power Administration (BPA), the U.S. Postal Service, and the Tennessee Valley Authority.[25] If FAA were provided with borrowing authority, all revenue options to repay the funds—excise taxes, user fees, or appropriations—could be considered. According to some investment banks and the Treasury, no organizational changes such as a change to a government corporation or corporate entity would be needed.

The use of debt financing by FAA to pay for capital projects raises budgetary concerns. If Congress grants FAA borrowing authority, the

[24]GAO, *Budget Issues: Agency Authority to Borrow Should Be Granted More Selectively*, GAO-AFMD-89-4 (Washington, D.C.: Sept. 15, 1989).

[25]BPA is a self-supporting agency in the Department of Energy that borrows from the Treasury, which in turn borrows from the public, to finance capital investments, such as new transmission facilities that it owns. BPA receives no appropriations and is solely funded by revenues from power sales, which it uses to finance its operations and to make debt payments. BPA received direct borrowing authority from Congress in 1974 and has a borrowing cap of $4.5 billion. Because it is a federal agency that is performing a federal function, it is borrowing for federal purposes, and its assets are federally owned, the interest rate on BPA debt to Treasury is equal to the rate on debt of comparable maturity issued by government corporations.

associated costs are likely to be higher if the agency borrows directly from the private capital market instead of through the Treasury. According to Treasury and representatives of investment firms, the Treasury would likely be charged a lower interest rate to borrow money from the private capital market than FAA and thus could pass along these lower costs to FAA. Interest rates charged to FAA would likely be higher because bonds issued by FAA would likely be viewed as a greater credit risk than Treasury bonds because debt issued by the Treasury is backed by the full faith and credit of the U.S. government, while FAA debt would not be. Instead, FAA debt would be backed by specific revenue sources. In addition, if FAA borrowed directly from the private capital market, the transaction costs of borrowing would likely be higher than if FAA borrowed through the Treasury; investment banks that serve as debt underwriters charge fees for these services, while the Treasury would charge a minimal administrative fee, if any. Given these advantages, Treasury officials told us that it is the department's long-standing policy that all debt issued by federal entities, including FAA, should be issued solely to the Treasury because centralized financing of all such debt through the department is the least expensive, most efficient means of financing this debt. If FAA capital spending is financed through appropriations and results in an increase to the deficit, the cost to the government is comparable to the costs of borrowing through the Treasury.[26]

Borrowing costs are particularly important in light of the federal government's long-term structural fiscal imbalance. Absent a change in policy, federal health and retirement programs will consume an ever increasing share of the nation's federal budgetary resources and gross domestic product, placing severe pressures on all discretionary programs, including those that fund defense, education, and transportation. Our more optimistic simulations show that by 2040, federal revenues as a share of the economy will not be sufficient to cover any discretionary programs—and that balancing the budget could require raising taxes by almost 60 percent or reducing federal spending by about a third. Accordingly, any program or policy change that may increase costs requires sound justification and careful consideration before adoption.

[26]Although funding through appropriations might appear less costly to FAA because borrowing from the Treasury would require FAA to make interest payments to the Treasury, from the broader perspective of the federal government as a whole, there is no difference if the government is running a deficit.

Mr. Chairman, this concludes my statement. I would be pleased to answer any questions that you and Members of the Subcommittee may have.

Contact and Staff Acknowledgments

For further information on this testimony, please contact Gerald Dillingham at (202) 512-2834 or dillinghamg@gao.gov. Individuals making key contributions to this statement include Ashley Alley, Jay Cherlow, Maria Edelstein, Colin Fallon, Carol Henn, David Hooper, Andrew Huddleston, Edmond Menoche, Faye Morrison, and Rich Swayze.

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