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DOT'S BUDGET

Challenges Facing the Department in Fiscal Year 1997 and Beyond

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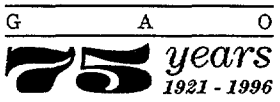

Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to discuss the many challenges facing the Department of Transportation (DOT) and its various modal administrations during fiscal year 1997 and beyond. With more than $35 billion in fiscal year 1996 appropriations, DOT is responsible for ensuring the safe and efficient movement of people and goods and cost-effective investment in the nation's transportation infrastructure, including its highways and transit systems, airports, airways, ports, and waterways. Pressures to reduce the federal budget will increase competition among the various transportation administrations for scarce federal funds. Our testimony is based on reports we have recently issued as well as ongoing work for the Congress. In summary, we found the following:

- Surface transportation activities account for about 66 percent of DOT's current fiscal year budget. DOT will distribute billions to the states to preserve and improve our surface infrastructure. As we recently reported, the complex formula that the Federal Highway Administration (FHWA) uses to distribute funds includes data and factors that are not meaningful because the outcome is largely predetermined. However, any change to the formula could cause some states to receive more funds and others to receive less in comparison with current funding. For those states that receive less, the existing gap between highway needs and available funding could widen.

Large-dollar transportation projects can experience cost increases, schedule delays, and financing problems. Our ongoing examination of four highway and mass transit projects, costing over $1 billion each, reaffirms that sound project management and oversight can help to ensure that scarce resources are effectively spent.

Each year over 40,000 people are killed in highway accidents that cost society billions of dollars. Increased use of seat belts is a low-cost way to provide greater crash protection. In addition, the recent rash of railroad accidents draws attention to the importance of surface transportation safety. Major infrastructure investments will be needed to address safety problems, such as eliminating the most dangerous railroad grade crossings and building sufficient facilities to inspect—and minimize the potential damage to the infrastructure by—trucks entering this country from Mexico as a result of the North American Free Trade Agreement. In 1994, over 500 people died and over 1,760 were injured as a result of motor vehicle accidents at public railroad crossings. DOT estimates that it could

cost between $4 billion and $11 billion to construct overpasses or underpasses to eliminate 2,250 of the nation's most dangerous railroad crossings. DOT will have to balance the large investment needed for safety enhancements against the lives and societal costs—property damage and health care—that can be saved.

Amtrak will continue to need a significant infusion of federal capital to improve its system, particularly along the Northeast Corridor from Washington, D.C., to Boston, Massachusetts. Amtrak has already invested about $3.5 billion in the Northeast Corridor and anticipates that more than $2.2 billion will be needed to expand and improve the quality of high-speed service. In total, Amtrak estimates it will need $5.5 billion over the next 6 years for capital improvements.

- Meeting cost and schedule estimates remains a challenge as the Federal Aviation Administration (FAA) modernizes the air traffic control (ATC) system. Further cost increases will reduce FAA's ability to fund its systems and could cause additional schedule delays in fielding equipment needed to ensure the safe and efficient movement of passengers and cargo. Ultimately, FAA must address a root cause—its organizational culture—of the cost overruns and schedule slippages that have plagued the ATC modernization program.

  FAA has projected a funding shortfall of over $12 billion between fiscal years 1997 and 2002. At the request of this Subcommittee, we are examining the reasonableness of this estimate. Regardless of the amount of the shortfall, if any, because of scarce resources, FAA will have to operate more efficiently and identify opportunities to enhance revenues. In addition, decisions will have to be made about funding the set-asides for military and reliever airports. The funds for these set-asides have generally not been used as intended, and their continued funding will reduce the funds available for other airport activities. In addition, FAA has reduced funding for technical training for inspectors and other employees, yet the agency must ensure that funding limitations do not adversely affect safety.

- Over the next several years, the Coast Guard is considering installing or upgrading its vessel traffic service systems (VTS) in as many as 17 of the nation's ports. Our ongoing work shows that widespread support was lacking for VTS 2000 among the key stakeholders we interviewed in five of the ports under consideration. In addition, information developed for the Coast Guard indicates that new or improved VTS systems may result in only marginal safety improvements at many ports.

We will now discuss in greater detail these and other issues related to surface transportation, FAA, and the Coast Guard.

Surface Transportation

DOT's surface transportation programs support building and maintaining the nation's highways and transit systems, researching advanced technologies and new safety techniques, and overseeing safety for roads and rail. Collectively, these activities account for over $23 billion and 6,700 full-time-equivalent positions in the fiscal year 1996 budget. In addition, Amtrak, which has about 20,000 employees, received $635 million in fiscal year 1996 from operating and capital grants, funds to improve its portion of the Northeast Corridor, and a payment for retirement and unemployment benefits.

The Past Largely Dictates the Distribution of Highway Funds

Under the federal-aid highway program, DOT distributes billions of dollars annually for the construction and repair of highways and related activities. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) authorized $122 billion for the program for fiscal years 1992-97. In response to a mandate in ISTEA, we recently reported on the formula by which highway funds are distributed to the states.[1] Because the number of options for a new formula is almost unlimited and the selection of a highway apportionment formula is a judgment for the Congress to make, the report describes concerns with the existing formula and provides the advantages and disadvantages of seven illustrative alternatives to the existing formula.

The federal highway funding formula is a complex, iterative process that is based on an array of data and factors. Although federal-aid highway funds are apportioned among the states in 13 funding categories, 4 programs account for 70 percent of the funds apportioned.[2] We found that, to a significant extent, the underlying data and factors in the formula are not meaningful because the funding outcome is largely predetermined. This predetermination occurs because a state's share of the annual combined funding for the four largest highway programs is fixed throughout the 6-year life of ISTEA, even though funding for each individual program ostensibly derives from a separate calculation. Furthermore, some of the

[1]Highway Funding: Alternatives for Distributing Federal Funds (GAO/RCED-96-6, Nov. 28, 1995).

[2]The apportionment share represents fiscal year 1995 distributions for the four largest highway programs—Interstate Maintenance, Bridge Replacement and Rehabilitation, the National Highway System, and the Surface Transportation Program.

factors used in the formula's calculations for major programs are based, in part, on outdated information, are unresponsive to changing conditions, and often do not reflect the current extent or use of the nation's highway system.

Our November 1995 report identified four overarching objectives entwined in the current process for distributing highway funds: (1) maintaining and improving the highway infrastructure; (2) returning the majority of funds to the state where the revenue was generated; (3) advancing selected goals, such as improving air quality and conserving energy; and (4) safeguarding the states' historical funding shares. One or more of these objectives could be the foundation for a new formula. For instance, the Congress could choose to emphasize just one objective, such as preserving the highway infrastructure, an objective aligned with formula factors that reflect the use and extent of each state's highway network, such as lane-miles and vehicle-miles traveled.

Another objective focuses on the idea that the states ought to recoup a substantial portion of what they deposit into the Highway Trust Fund. If the formula were restructured to encompass a pure return-to-origin approach, each state's contribution to the Trust Fund would simply be returned to that state, which does not currently occur. Some state transportation officials support this approach because it would guarantee that all or a substantial amount of the revenues collected in their states would be returned to them. However, the return-to-origin approach would not be universally attractive because a number of states would lose funds. In 1993, distributions of federal highway funds—as a percentage of the states' contributions to the Highway Trust Fund's highway account—ranged from 83 percent for South Carolina to 707 percent for Hawaii. Some transportation officials observe that this redistribution is to be expected, since federal highway taxes are collected to address such national objectives as preserving the National Highway System, not merely to return the funds to their source.

Alternatively, two or more objectives and their associated factors could be blended to balance multiple goals. In addition, a portion of highway funds could be provided as incentive payments to advance specific goals, such as improving the condition of the highway infrastructure above a certain defined floor. Regardless of which objective or combination of objectives is chosen, some states may receive more funds than under the existing formula and others, less. For those states receiving less, the gap between highway needs and funding could widen. The Congress could temper these

effects by also incorporating the objective of safeguarding historical funding shares into the formula. This objective could be accomplished through a component designed to place a cap on the maximum percentage of loss that any individual state could be expected to bear as a result of the changes.

State Infrastructure Banks—an Attempt to Leverage Funds

The National Highway System Designation Act of 1995 contains provisions that give the states additional flexibility in how they use the federal funds distributed to them. For example, the legislation allows a pilot program of up to 10 states to establish state infrastructure banks (SIB) using up to 10 percent of the federal funds apportioned to them for various highway and mass transit programs in fiscal years 1996 and 1997. As we testified last year, a SIB is an infrastructure investment fund that states can create to make loans and provide other forms of financial assistance to surface transportation projects.[3] The central argument for SIBs is that they can sustain and potentially expand a fixed sum of federal capital, often by attracting private investment. Specifically, the states could use these banks to produce a less costly source of capital for viable projects through various financing techniques, such as subsidized interest rates or letters of credit. SIBs are not a financial panacea, but they offer the potential for some states to help bridge the gap between infrastructure needs and resource commitments. The extent that they will be able to do so can at least be partially judged through the pilot program.

Although the state officials we contacted in theory welcome additional flexibility in the use of federal highway funds, some state officials and industry experts with whom we met remain skeptical about the value of specific SIB financing tools for some states. For example, large, sparsely populated states are apt to have difficulty making use of SIBs because they have few potential projects that could generate revenues sufficient to repay loans. Some infrastructure finance experts also question whether even densely populated areas will have a number of economically viable projects sufficient to sustain an infrastructure bank. They also question the prospects for attracting private sector involvement because existing legislation restricts tax-free debt for private purposes. A number of observers have noted that the states are likely to leverage their infrastructure bank with tax-free debt, which would largely preclude private participation in projects financed by the bank. Critics also assert that SIBs may produce few benefits that states with good credit cannot

[3]Surface Transportation: Reorganization, Program Restructuring, and Budget Issues (GAO/T-RCED-95-103, Feb. 13, 1995).

obtain on their own directly from the capital markets. On the other hand, the proponents of SIBs point to the need to try innovative financing tools because a significant gap exists between infrastructure needs and resource commitments.

Cost Increases and Other Problems Plague Four Large Projects and Reaffirm the Need for Federal Oversight

DOT and the states are funding a number of large-dollar—over $1 billion—highway and transit projects. Our ongoing examinations of four such projects for this Subcommittee show that each has the potential to experience substantial cost increases and lengthy construction delays and reaffirms the need for oversight by FHWA and/or the Federal Transit Administration (FTA). This oversight needs to ensure that financing is available to fund the project before FHWA and FTA commit federal dollars and that cost growth and schedule slippages that erode already limited funds are controlled.

Let me spend a few minutes highlighting our findings on the four projects that you asked us to examine: the (1) Central Artery/Tunnel in Boston, Massachusetts; (2) Cypress Viaduct in Oakland, California; (3) Bay Area Rapid Transit (BART) system extension to the San Francisco International Airport; and (4) Los Angeles subway system.

Central Artery/Tunnel Construction

At over $1 billion a mile, the Central Artery/Tunnel project—a 7.5-mile, federally aided highway project—is one of the largest and most expensive highway construction projects ever undertaken. Although ISTEA provided the final apportionments for this and other Interstate Construction projects, over $5 billion of the more than $10 billion likely to be needed to construct this project remains to be spent. As of March 5, 1996, FHWA was reviewing Massachusetts' most recent plan to finance this project to completion. On the basis of our ongoing work, we believe that (1) the plan does not clearly identify the project's total costs and the costs may be understated, (2) funding may not be sufficient to complete the project by 2004 and critical short-term funding problems exist, and (3) Massachusetts will face significant challenges to both build the project and maintain its statewide road and bridge improvement program.

Massachusetts' finance plan does not provide a total cost figure for this project. Understanding the project's cost is further complicated by the state's having excluded over $1 billion that was included in past estimates. These exclusions include some previously incurred costs that FHWA recorded as project costs. As a result, Massachusetts and FHWA do not

agree on how much federal and state funding has been obligated for the project to date.

On the basis of our analysis, the project's costs would total $10.4 billion if you consider the excluded costs and inflation. The $10.4 billion figure assumes that the state meets its aggressive cost containment goals. The project could experience further cost increases if the goals are not met. For example, costs can increase when the state moves from preliminary designs to detailed plans and specifications. Although these increases have averaged 18 percent on this project and FHWA suggested using 10 percent, the state assumes that no increases will occur in the future. We commend the state's cost containment initiatives and believe that the state is serious about containing costs on this project. However, with only a limited track record, the estimate assumes that the design effort and the state's other cost containment efforts will be 100 percent successful. It allows little room for anything to go wrong, just at the time when the inherently risky underground tunneling work in downtown and South Boston is beginning.

In addition, funding may not be sufficient to complete the project by 2004. To meet its ambitious schedule and complete the project by 2004, Massachusetts plans to make extensive use of advance construction to begin numerous projects, most of them in fiscal years 1996 and 1997, and to pay for them over a period of several years. The state expects to issue 26 contracts, totaling $3.7 billion, in this manner. However, when the bills come due, available funds may not be sufficient to pay them—Massachusetts' finance plan shows project shortfalls from 1996 through 2000 of up to $1.9 billion. It is difficult to see how DOT can approve these contracts without a definitive strategy on how the state will pay for them.

The state's finance plan identifies several options to address the shortfall, including short-term borrowing, extending the schedule, reducing the scope, and reducing funding for statewide transportation programs. For example, the state is studying the feasibility of establishing a metropolitan highway system in Boston and issuing toll-financed revenue bonds to help finance the Central Artery/Tunnel project. Even under the more optimistic federal funding scenarios assumed in the finance plan, shortfalls would exist requiring the state to draw on one or more of these options. Moreover, both short-term borrowing and extending the schedule would increase the project's costs. Therefore, it is essential that FHWA and the state agree on a course of action as soon as possible.

Even if Massachusetts does not reduce funding for its statewide transportation program, the state faces significant challenges to maintain its statewide road and bridge improvement program. Between 1992 and 1995, the federal contribution to the statewide road and bridge program, other than the Central Artery/Tunnel project, was over $200 million annually. The finance plan shows that the federal contribution could be reduced to as little as $130 million a year by 1998. Furthermore, the state's transportation improvement program for fiscal years 1996-98, approved by FHWA in December 1995, shows a significant shift of federal funds from some statewide programs to the Central Artery/Tunnel project. For example, funding for the state's bridge program will be reduced from $88 million in fiscal year 1994 to $18 million in fiscal year 1998 to provide funds for the Central Artery/Tunnel project. According to Massachusetts' officials, the state is committed to maintaining a $400 million annual statewide construction program and would increase the amount of state funding if needed to make up any funding gaps.

Cypress Viaduct Reconstruction

In October 1989, the Loma Prieta earthquake struck northern California, causing severe damage to the San Francisco and Oakland Bay areas. The Congress provided California with over $1.3 billion in emergency relief funds to help repair damage to several roadways, including a two-tiered portion of Interstate 880, known as the Cypress Viaduct.

As of February 1996, the California Department of Transportation (Caltrans) estimates that the total cost of rebuilding the Cypress Viaduct will be $1.13 billion. About $1.01 billion, or 89 percent of the total cost, will be federally financed through the emergency relief program; California will finance the remainder. Because of public opposition to rebuilding the Cypress along its original alignment, Caltrans studied the impacts of several new alignments during an environmental review. Ultimately, Caltrans selected an alignment that shifted the highway from the residential area where it was previously located into an area containing active rail yards. The environmental review process, coupled with protracted negotiations with the railroads, has contributed to the fact that over 6 years have passed since the earthquake and only one-third of the 4-mile construction effort has been completed. Caltrans estimates that it can complete construction by 1998.

The current cost estimate is about $210 million higher than what Caltrans projected in 1991 because it underestimated the costs of constructing the freeway, managing traffic, relocating rail yards, and acquiring rights-of-way. As a result of these cost increases, Caltrans estimates a

$54 million shortfall in emergency relief available for other earthquake projects funded through the emergency relief program. Although Caltrans does not anticipate further cost increases, risks remain because major construction projects worth about $550 million are still in the early stages of construction.

FHWA's actions to implement recommendations from the environmental review process appear to conflict with its regulations to administer the emergency relief program. FHWA's regulations allow the use of emergency relief funds for relocations only when the relocations are clearly economically justified to prevent future recurring damage. FHWA approved funding to significantly realign the Cyprus Viaduct without making such a finding. The alternative chosen was costlier, required more extensive construction, and added cost and schedule risks compared with replacing the highway along its original alignment. The initial cost estimate to replace the destroyed facility along the original alignment was $306 million. Because of the expanded scope of the project, driven largely by the environmental process, the project is now estimated to cost $1.13 billion.

FHWA's emergency relief guidance does not clearly address a situation in which the environmental review process recommends improvements that produce additional risks, costs, and delays beyond those required to fix or replace the damaged facility. The question then becomes whether improvements and costs above those required to fix or replace the facility should be funded from emergency relief or traditional transportation funds. DOT has the opportunity to address this issue as it reviews changes needed to its regulations and guidance for administering the emergency relief program. This issue is important because emergency relief funding is in addition to the states' annual highway apportionments. Therefore, without emergency relief funding, these activities would have to compete for funding with other projects.

BART Extension to the San Francisco International Airport

Unlike the other infrastructure projects discussed in our testimony, BART's proposed rail/subway extension to San Francisco International Airport is still in the preliminary engineering phase; construction has not started nor has FTA signed a full-funding grant agreement with BART.[4] As a "new starts" project under section 3 of the Federal Transit Act, BART proposes to spend $1.11 billion ($710 million in federal funds) to extend service to the airport.

[4]In practice, a full-funding agreement is essentially a contract between DOT and a grantee that specifies each party's financial commitment, the time frame for a project's completion, and remedies, should one or more parties default on the agreement.

BART's cost estimate includes about $100 million in savings from design changes that the Congress requested in 1995. However, costs could increase if several assumptions that BART used to develop the estimate are not realized. For example, the estimate includes a 15- to 20-percent cost saving from using innovative design-build contracting procedures. BART would award both design and construction contracts to the same firms. Because this type of contract is a pilot project within FTA, the agency has limited information on the actual savings that may occur. The design-build savings are important because the project's budget contingency for potential cost overruns is about $80 million, or only 7 percent of the project's total cost. Furthermore, the cost estimate assumes that construction will begin in mid-1996. Although FTA officials did not rule out the possibility that construction could begin at that time, as of February 1996, BART was still completing the final environmental impact statement, seeking the required environmental permits, and completing its financing plan. Delayed construction could increase nominal costs due to inflation.

BART's financing plan is not complete. However, in its most recent draft plan, BART assumes that the Congress will appropriate an average of $81 million over 8 years or $107 million over 6 years. Since federal funding depends on annual appropriations, costs could increase if the project is not funded at these assumed levels. The required $710 million federal commitment amounts to a 64-percent share for the entire project. The local share will be financed primarily by the state, San Mateo County Transit, and the airport authority. Officials from these contributors stated that their ability to provide resources beyond their current commitment is limited. Furthermore, BART's financial advisers are exploring the use of tax-exempt commercial borrowing to cover projected cash-flow shortfalls of up to $330 million during construction. The amount of borrowing needed will depend on the level and timing of federal appropriations. The interest and administrative expenses for such borrowing will increase the project's total costs by as much as $53 million.

The BART extension to the airport is at a critical point in terms of the need for FTA oversight and congressional scrutiny of the project. FTA still has to approve environmental documents and the project's financial plan before executing the full-funding grant agreement. Of particular concern is the possibility that federal funds beyond the amount assumed in the finance plan would be needed because funds from other sources may be limited. For example, BART has stated that it cannot spend its own funds on the project, San Mateo County Transit has limited its total capital

contribution, airport funds may be used only on airport property, and the state has not indicated that additional funds would be available.

Los Angeles Subway Construction

The Metropolitan Transportation Authority (MTA) of Los Angeles County, California, has designed an integrated transportation network called the Metro System. To develop part of that system, MTA has signed three full-funding grant agreements with FTA to cover the final design and construction of a heavy rail subway system called the Red Line. These agreements committed the federal government to a total of $2.8 billion, or about 51 percent of the project's estimated $5.5 billion cost.[5] The 23.4-mile Red Line project consists of three segments. Segment one—4.4 miles—is in service; construction of segment two—6.7 miles—is about 69 percent complete. The third segment—12.3 miles—is divided into three extensions: the construction of the North Hollywood extension is 18 percent complete; the design of the East Side extension is 39 percent complete; and the design of the Mid-City extension has been put on hold while MTA assesses other alignment options.

As of January 1996, MTA estimated a $300 million increase over the $5.5 billion estimated in the full-funding grant agreements. The increase was due in part to MTA's Board approving changes in the project's scope that added station entrances and the costs incurred to clean up groundwater and soil contamination, purchase property on the right-of-way for a station realignment and upgrade stations to comply with the Americans With Disabilities Act. The January 1996 estimate is expected to increase. For example, during the construction of segment two, the much-publicized collapse of Hollywood Boulevard into the subway tunnel created a 70-by-70-foot-wide sinkhole and resulted in MTA firing the contractor. Contract costs resulting from the firing and the rebid work will add about $67 million to the project's cost. In addition, potential construction delays on the North Hollywood extension and design delays on the East Side extension may increase costs. Furthermore, because of the discovery of high concentrations of hydrogen sulfide gas in the planned tunnel for the Mid-City extension, MTA is considering other options, such as a subway with above-ground stations. The estimated additional costs of the options range from about $130 million to $190 million. Finally, pending lawsuits from retail establishment owners affected by excessive settlement on Hollywood Boulevard and from the contractor fired by MTA after the sinkhole incident, could also substantially increase costs.

[5]Although the full-funding grant agreements provide an upper limit for funding this project with new start transit funds, other federal funds are available. If these funds are included, the total federal share of the project increases to about $3.1 billion.

Although the project's total costs continue to increase, funding any increases beyond the federal commitments in the full-funding grant agreements will, in principle, be the responsibility of MTA. One exception may be the costly options being considered for the Mid-City extension. According to FTA officials, while they could amend the full-funding grant agreements to provide additional federal funds for the new alignment, they will instead encourage MTA to seek other funding sources. At this time, MTA says that it does not anticipate requesting additional federal funds. The question then becomes how MTA will finance these and other potential cost increases. FTA officials believe that MTA has the financial capacity to absorb even substantial increases by using revenues from Los Angeles County sales taxes that are dedicated to other rail and transit projects.[6] However, this action could lead MTA to defer or cancel other transit projects for which it has targeted some of the revenues.

Over the years, the Los Angeles subway project has experienced poor construction management and ineffective quality control programs that have resulted in cost increases and schedule delays. Although FTA for a number of years had recommended that MTA change its quality control processes, FTA was unable to compel MTA to make this change until it suspended future federal funding to the project from October 5, 1994, to November 10, 1994. As we reported in our high-risk work, FTA has implemented systems and training to address our concerns that oversight of such projects as the Los Angeles subway was superficial and inconsistent and that FTA rarely exercised its enforcement powers to compel grant recipients to fix long-standing problems.[7] Given the cost and potential risks with underground tunneling, FTA needs to take more timely enforcement actions to ensure that MTA addresses key recommendations.

Resolving Some Surface Transportation Safety Issues Will Cost Billions

According to DOT's National Highway Traffic Safety Administration (NHTSA), over 40,000 people are killed annually in the United States in highway-related accidents that cost society over $130 billion in lost income, property damage, medical expenses, and other costs. In addition, the recent rash of railroad accidents draws attention to the importance of surface transportation safety. The current and former Secretaries of Transportation have stated that safety is the number one priority at DOT, and we recently issued three reports in this area—options to improve

[6]MTA could also draw on FTA urbanized area formula funds and work with the state to tap other federal programs, such as the Surface Transportation Program and the Congestion Mitigation and Air Quality Program (both highway programs).

[7]High-Risk Series: An Overview (GAO/HR-95-1, Feb. 1995).

railroad grade crossing safety, the potential impact on highway safety and infrastructure of Mexican trucks entering the United States as a result of the North American Free Trade Agreement (NAFTA), and increasing safety belt use.[8] Increasing safety belt use requires little investment since motor vehicles already are equipped with seat belts and sufficient enforcement personnel exist. However, improving railroad grade crossings and ensuring the safety of Mexican trucks could cost billions but save many lives and reduce societal costs.

Rail Grade Crossing Efforts

In 1994, over 500 people died and over 1,760 were injured as a result of motor vehicle accidents at public railroad crossings. On October 25, 1995, most Americans were reminded of the dangers that drivers face every day when they travel over a railroad crossing in the United States. On that day, in Fox River Grove, Illinois, 7 high school students were killed and 30 injured when a commuter train, traveling at 70 miles per hour, hit a school bus. The potential for tragedies like Fox River Grove is significant—the United States has over 168,000 public highway-rail intersections. The level of warning provided motorists at these crossings varies from no visible warning devices to such active devices as lights and gates. About 60 percent of all public crossings in the United States have only passive warning devices—typically, highway signs known as crossbucks.

In August 1995, we reported that the federal investment in improving railroad crossing safety has resulted in a noticeable decline in railroad crossing deaths and injuries. The states have received about $5.5 billion (in constant 1995 dollars) in rail crossing funds since the Rail-Highway Crossing Program—also known as the section 130 program—was established in 1974. Combined with a decline in the total number of crossings since 1974, the 2-decade investment in railroad crossing safety has resulted in significant reductions in accidents and fatality rates—a 61-percent and a 34-percent decline, respectively. However, since 1985, progress in reducing crossing deaths has been limited. Federal dollars available for railroad crossing improvements have declined in real terms since 1977, as well. Consequently, the question for future rail crossing safety initiatives will be how best to target available resources to the most cost-effective approaches.

Our report discussed several strategies for targeting limited resources to address railroad crossing safety problems. One means is to review the

[8]Railroad Safety: Status of Efforts to Improve Railroad Crossing Safety (GAO/RCED-95-191, Aug. 3, 1995); Commercial Trucking: Safety and Infrastructure Issues Under the North American Free Trade Agreement (GAO/RCED-96-61, Feb. 29, 1996); and Motor Vehicle Safety: Comprehensive State Programs Offer Best Opportunity for Increasing Use of Safety Belts (GAO/RCED-96-244, Jan. 3, 1996).

formula DOT uses to apportion section 130 dollars to the states. Our analysis of the 1995 section 130 apportionments found that some states were not receiving funds in proportion to three key risk factors: accidents, fatalities, and total crossings. Senators Lugar and Coats have introduced legislation to allocate funds to those states that have the highest number of grade crossings and the most fatalities and accidents.[9]

Another means to target resources for railroad crossing safety resources is to focus available dollars on strategies that offer the greatest benefits for reducing accidents. These strategies include the following:

- Closing railroad crossings. The Federal Railroad Administration's goal is to close 25 percent of the existing crossings nationally.
- Installing new technologies. For example, improved four-quadrant gates with vehicle detectors that cost about $1 million per crossing may be justified where accidents persist at signaled crossings or where danger to rail passengers becomes an issue.
- Developing education and enforcement strategies. DOT and the states are developing such programs to change drivers' behavior because motorists disregard warning signals and drive around descended gates. For example, Ohio—a state with an active education and enforcement program—reduced accidents at crossings with active warning devices from 377 in 1978 to 93 in 1993—a 75-percent decline.

In June 1994, DOT issued a Grade Crossing Action Plan and in October 1995 established a Grade Crossing Safety Task Force to conduct a comprehensive national review of highway-rail crossing design and construction measures. We are examining the task force's March 1, 1996, report to assess how its recommendations expand or complement DOT's Action Plan.

The Action Plan set a national goal of reducing accidents and fatalities by 50 percent from 1994 to 2004. As we noted in our report, whether DOT attains the plan's overall goal will depend on (1) how well it coordinates the efforts of the states and railroads; (2) whether the states take the actions proposed in the plan; and (3) whether DOT can obtain the required congressional approval to use existing funds in ways that are not allowable under ISTEA, such as eliminating the local match for the costs associated with closing crossings.

[9]In addition, the Congress recently required the Secretary of Transportation to issue regulations establishing sanctions and fines for commercial vehicle operators who violate railroad and highway crossing laws.

Finally, the Action Plan's proposal will cost more money. Secretary Peña has announced a long-term goal of eliminating 2,250 crossings where the National Highway System intersects Principal Rail Lines. Both are vital to the nation's interstate commerce, and closing all of these crossings is generally not feasible. The alternative is to construct a grade separation—an overpass or underpass. This initiative alone could cost between $4.5 billion and $11.3 billion—a major infrastructure investment.

NAFTA's Potential Impact on Safety and Infrastructure

NAFTA, which was agreed to by Canada, Mexico, and the United States, provided that on December 18, 1995, Mexicans could apply for authority to deliver and backhaul cargo between the border states of the United States and Mexico, and beginning in the year 2000, cross-border trucking would be allowed full access within the three countries.[10] This action could create additional funding burdens for federal, state, and local governments for more facilities and personnel to inspect trucks from Mexico and for rebuilding the infrastructure that could be damaged by overweight trucks.

Truck traffic from Mexico into the United States increased about 27 percent from 1992 through 1995. Of the four states bordering Mexico, about 66 percent of this traffic entered Texas and about 24 and 10 percent entered California and Arizona, respectively. Truck traffic from Mexico into New Mexico is negligible. Before NAFTA, motor carriers from the United States had not generally been permitted to operate in Mexico.

In early December 1995, we briefed DOT and several congressional offices, including this Subcommittee, about potentially significant safety and infrastructure concerns about trucks from Mexico that were operating in the commercial zones within the United States. We found that many trucks from Mexico operating in the commercial zones are in poor condition, overweight, and do not meet many U.S. safety standards. The four U.S. border states and FHWA have acquired limited overall inspection data on trucks from Mexico. Arizona, the only state that could specifically identify trucks from Mexico, reported that 63 percent of such trucks inspected in 1994 were placed out of service compared with 24 percent for all trucks inspected statewide. During our observation of inspections of 217 trucks from Mexico at the four U.S. border states, we noted that about 50 percent did not meet U.S. regulations. We observed trucks with broken suspensions, substandard tires, inoperable brakes, and extremely overweight or unsecured loads, including hazardous materials. Yet readiness for enforcing truck safety varies significantly among the four U.S. border states and is not aligned with the expected enforcement

[10]Canada and the United States have permitted expanded trucking operations since the early 1980s.

burden. Texas faces the greatest enforcement burden but has relatively limited resources—enforcement personnel and facilities—to cope with the increased truck traffic from Mexico.

On December 18, 1995, the Secretary of Transportation announced that although Mexican trucks would continue to have access to the commercial zones and applications would be accepted from Mexican trucking companies to do business beyond the zones, DOT would not finalize the applications until consultations are completed between the United States and Mexico to improve safety. Also, on December 18, 1995, federal, state, and local officials in the four U.S. border states began an intensified effort to inspect trucks arriving from Mexico at nine U.S. border locations. Through the first 8 weeks of this effort, about 52 percent of the nearly 5,300 trucks inspected and about 13 percent of drivers were placed out of service. By comparison, in the United States during fiscal year 1994, about 28 percent of the trucks and over 8 percent of the drivers were placed out of service as a result of inspections.

To help the states' efforts, DOT and the U.S. Customs Service are developing a strategy to allow more regular use of Customs' space for purposes of enforcing truck safety. Customs controls the primary facilities immediately adjacent to border entry locations. Until November 1995, state truck inspectors had limited use of these facilities, especially in urban locations. In November 1995, DOT, Customs, and Texas officials agreed to a comprehensive cooperative enforcement effort that includes truck inspections by state officials within Customs' facilities.

Increasing Safety Belt Use

At the request of this Subcommittee, we reported in January 1996 on the nation's progress in achieving DOT's 75-percent goal for safety belt use by 1997 and federal and state strategies that could increase the use of belts. Traffic accidents annually result in over 40,000 deaths and over $130 billion in costs to society. About 20,000 of the people who die and another 600,000 people who are injured were not using safety belts. NHTSA believes that increasing the use of seat belts is the most effective way to lower the nation's death toll from highway accidents. NHTSA estimates that 10,000 deaths, 200,000 injuries, and $20 billion in societal costs could be avoided annually if all occupants of motor vehicles wore safety belts. As of December 1995, 48 states and the District of Columbia had a law on the mandatory use of safety belts that covered some occupants for certain types of motor vehicles. New Hampshire and Maine had no such law, and ISTEA requires them to transfer up to 3 percent of their federal highway funds to their state highway safety programs.

The recently enacted National Highway System Designation Act permits the states to determine the maximum speed limit within their boundaries. Some states plan to raise the limit 20 miles per hour above the current 55 miles per hour. Montana permits drivers during daytime hours to travel at whatever speed they deem "reasonable and proper." Vehicles traveling at higher speeds that are involved in accidents will need increased crash protection. One low-cost option is to increase the use of safety belts.

According to NHTSA, in 1994 the use of safety belts ranged from a low of 32 percent to a high of 84 percent. Those states that have been the most successful in increasing belt use generally have comprehensive programs that include primary enforcement laws, visible and aggressive enforcement, and active public information and education programs. Primary enforcement laws permit enforcement officials to stop and ticket a vehicle's occupants solely for not using their safety belts. In contrast, secondary enforcement laws allow a vehicle's occupants to be ticketed for not using safety belts only if they have been stopped for another violation. Of the 10 states we visited, the 3 states with primary enforcement laws averaged rates of belt use about 20 percentage points higher than the states with secondary enforcement laws.

The increased use of safety belts has the potential to avoid thousands of deaths and serious injuries and save billions in medical costs, lost productivity, and other expenses annually. In addition, increased speed limits reinforce the need for greater crash protection, such as that provided by safety belts. The federal government's role in encouraging the use of seat belts is a policy decision for the Congress. If the Congress wants to promote comprehensive programs nationwide, it could encourage states to adopt primary enforcement laws that cover all occupants in all vehicles in which belts are installed. Those states that do not enact comprehensive legislation could continue to be subject to the ISTEA provision requiring a transfer of up to 3 percent of their federal-aid highway funds to their highway safety programs.

Amtrak Continues to Need Significant Appropriations

Since May 1971, when Amtrak took over the responsibility for operating the nation's remaining intercity rail passenger service, the federal government has provided the corporation with about $18 billion, primarily to cover annual operating losses and to make capital investments. Roughly $3.5 billion has been appropriated so far specifically for the Northeast Corridor. Despite this federal (and some state) support, Amtrak's financial condition deteriorated, especially during the early 1990s. Rising costs,

stagnant ridership, and revenue forecasts that failed to materialize caused Amtrak to underestimate its subsidy needs. As a result, Amtrak was left with a negative working capital balance and a projected cash shortfall of $240 million in September 1995. At the same time, federal budget considerations made it more difficult for the Congress to continue its historic levels of support for Amtrak.

To address its financial crisis, Amtrak undertook a major corporate restructuring and developed a Strategic Business Plan designed to make Amtrak more efficient and to eliminate the need for a federal operating subsidy by the year 2002. Restructuring involved dividing Amtrak's operations into strategic business units (West Coast, Northeast Corridor, Intercity, and Parent) and decentralizing decisionmaking. Amtrak's goal of operating self-sufficiency in 6 years is predicated on several assumptions. These include continued federal capital assistance to introduce high-speed rail service in the Boston-New York market and to upgrade service on other routes; legislation giving the company greater authority to contract out such services as maintaining equipment, which is now done in-house; increased contributions from state and local governments; and work rule concessions from labor to improve productivity. It is too early to tell whether Amtrak will be successful in achieving operating self-sufficiency by 2002.

Amtrak's strategic business plan also assumes that the company can eventually eliminate the need for federal operating subsidies but not federal capital support. Amtrak estimates it will need $5.5 billion over the next 6 years for infrastructure improvements, rolling stock, facilities, and technology. The Northeast Corridor Strategic Business Unit's 1996-2001 plan is focused on improving the quality of service through electrification and introduction of high-speed service, requiring a minimum $2.29 billion capital investment through 2001. The Unit also proposes to generate over $50 million annually by using its infrastructure to transport and distribute electric power. Amtrak is revising this proposal since federal legislation authorizing the company to distribute and sell power was not passed. In addition, Amtrak would like to receive half a cent from the Highway Trust Fund to meet its capital needs. Amtrak believes that such a dedicated capital funding source is critical to its long-term survival.

Air Transportation Programs

The Federal Aviation Administration (FAA), which is responsible for carrying out DOT's air transportation programs, received $8.2 billion in fiscal year 1996 appropriations, including $1.9 billion for facilities and

equipment, $1.5 billion for the Airport Improvement Program, and $4.6 billion for operations, which pays for over 47,000 safety inspectors, maintenance technicians, air traffic controllers, and other employees. About 70 percent of FAA's total fiscal year 1996 budget comes from the user-funded Airport and Airway Trust Fund; the remaining 30 percent comes from the Department of the Treasury's general fund. Since the excise tax receipts, which are deposited in the trust fund, expired on December 31, 1995, FAA estimates that the forgone revenue is about $16 million a day and nearly $1 billion to date.

Progress Has Been Made, but Challenges Remain for FAA's Modernization Program

FAA estimates that the total cost of the modernization program between 1982 and 2003 will be $35 billion. FAA's facilities and equipment appropriation funds the ATC modernization program. For each of the past 6 years, we have reported on the cost and schedule status for the largest modernization projects. As agreed with this Subcommittee, we will continue to monitor FAA's efforts.

As you are aware, FAA is developing new procurement and personnel systems that will take effect on April 1, 1996. FAA intends to use a phased approach to improve its entire acquisition and personnel management systems. Initially, FAA is focusing on streamlining the procurement process to acquire ATC equipment and materials in a more timely and cost-effective manner. In the personnel area, FAA is developing a system to provide it with greater flexibility to accomplish its mission. The new procedures will address such areas as hiring, training, and compensation. In addition to these reform efforts, about 20 months ago, FAA began a number of initiatives to help ensure that the ATC modernization program meets its cost and schedule estimates. For example, FAA restructured its automation effort into the Air Traffic System Development Program with three major components: en route, terminal, and tower. FAA took this action to help resolve long-standing cost, schedule, and technical problems associated with the Advanced Automation System (AAS)—the one-time centerpiece of the modernization program.

In the en route environment, FAA continues to work on the Display System Replacement project, a scaled-back replacement of the AAS' Initial Sector Suite System. According to FAA officials and various status reports, the Display System Replacement, which provides new controller work stations, is on track with respect to cost and schedule estimates. The project's cost remains at about $1 billion, and first-site implementation is scheduled for October 1998. FAA's contractor, Loral Corporation,

completed software development in January 1996 and expects to begin formal testing of the software in August 1996. In the interim, FAA and Loral are pretesting the software and planning for delivery of the equipment. Last year, we noted our concerns about the number of program trouble reports on the Initial Sector Suite System software, some of which would be used for the Display System Replacement. FAA has made progress in closing program trouble reports. In April 1995, FAA had 464 such reports related to the Display System Replacement; as of February 1996, only 37 remained open.

For the terminal environment, FAA plans to upgrade controller workstations and supporting computer equipment at about 160 facilities across the country. FAA canceled the AAS' Terminal Advanced Automation System and replaced it with the Standard Terminal Automation Replacement System (STARS). FAA initially underestimated the software requirements for STARS and overestimated how much of the software would be commercially available. On April 1, 1996, FAA plans to enter into fixed-price contracts with three contractors to develop and test software. On the basis of this effort, FAA plans to award a production contract to one company on October 1, 1996, and to implement STARS in December 1998. FAA's initial estimate of program costs was $940 million. According to FAA officials, the uncertainty surrounding the development of STARS software could result in a 1-year slip in implementation and could increase the program's costs. FAA expects to release revised cost and schedule estimates sometime this spring.

For several reasons, the transition to STARS equipment will pose a major challenge for FAA. First, FAA has an aggressive implementation schedule—it expects to deploy about 160 systems between 1998 and 2003. Second, FAA must consider site-specific conditions when installing the systems. Some facilities have the space for new equipment; others have little space. Third, such factors as staffing and training needs will vary from facility to facility. Finally, FAA will have to factor in its plans for consolidating terminal facilities so that it will not install new STARS equipment in a facility that will be closed. Unless the transition is handled well, FAA may incur unnecessary costs to store new STARS equipment while waiting for facilities to be modernized. We believe that the STARS transition will merit scrutiny in the coming months.

As for other modernization projects, FAA has made progress in fielding equipment. For example, over the past year, FAA has commissioned 35 Mode Select radars and 8 Terminal Doppler Weather Radars. It has also

commissioned the Voice Switching and Communication System at eight sites. For the major acquisitions that we track, however, most will not be completely fielded until the year 2000 and beyond (see app. I). In addition, costs for six projects increased and four decreased over the last year, resulting in a net cost increase of $174 million. (App. II shows cost and schedule data for the major projects.)

Despite FAA's efforts to deploy some new systems, FAA will not meet certain milestones for the Global Positioning System (GPS).[11] In 1994, in response to recommendations from government and industry groups, FAA accelerated its schedule from 2000 to 1997 for developing and implementing the Wide Area Augmentation System (WAAS). WAAS will permit GPS to qualify as a primary means of civil air navigation in domestic airspace. FAA also committed to develop a ground-based Local Area Augmentation System that will allow GPS to be used as a primary means of navigation for supporting the most demanding precision approaches. During the past year, FAA certified the first GPS receiver and approved GPS as a primary means of oceanic navigation. FAA also completed a feasibility study on the Local Area Augmentation System and determined that the system will enable aircraft to fly all types of precision approaches.

However, last month we reported that FAA will not meet its 1997 milestones for the use of GPS, enhanced by WAAS, as a primary means of civil air navigation for three phases of flight—en route, terminal, and nonprecision approaches.[12] FAA officials have said that WAAS would be commissioned by mid-1998, if the project is developed and implemented as planned. As a result, FAA expects to accelerate GPS by 2 years, not the 3 years it committed to in 1994. We remain concerned about schedule slippages because the revised schedule provides a tight time frame for developing WAAS and difficulties could affect the system's development and implementation.

In a May 1995 report, we recommended that FAA (1) develop a comprehensive plan for augmenting GPS and transitioning to it and (2) update the plan regularly.[13] We emphasized that the plan include, among other things, cost and schedule estimates for developing and

[11]GPS satellites transmit radio signals that allow properly equipped air, land, and sea users to calculate the time and their position and speed in any location and weather condition without having to rely on other navigational aids for backup.

[12]Global Positioning System Augmentations (GAO/RCED-96-74R, Feb. 6, 1996).

[13]National Airspace System: Comprehensive Plan for Global Positioning System Is Needed (GAO/RCED-95-26, May 10, 1995).

implementing the local area augmentation systems. FAA had said that it expected to complete the plan by the end of February 1996 but has not done so. We continue to urge FAA to develop cost and schedule estimates for the local area systems because they are important tools for decisionmakers to evaluate the extent to which FAA is meeting its milestones and to assess the agency's funding needs for GPS.

FAA Has Efforts Under Way to Change Its Organizational Culture

Over the years, we and others have chronicled persistent cost, schedule, and performance problems associated with FAA's major systems acquisitions for modernizing the ATC system. We have found that technical difficulties and weaknesses in FAA's management of the acquisition process were the primary causes of these problems.[14] Organizational culture is one managerial factor that we examined in reviews of acquisition management at the Defense Department and other federal agencies, but not at FAA. Organizational culture is widely defined as the underlying assumptions, beliefs, values, attitudes, and expectations shared by an organization's members, which affect their behavior and the behavior of the organization as a whole. At your request, Mr. Chairman, we have undertaken work to determine whether FAA's organizational culture has contributed to its continuing cost, schedule, and performance problems. We expect to report to the Subcommittee in the near future.

We found that FAA's culture is a root cause of its problems in modernizing the ATC system. Our work has identified shortcomings in FAA's focus on its mission, accountability, coordination, and adaptability. For example, we found that poor coordination caused delays in installation of new equipment. Organizations perform better when employees involve each other in decisions, resolve differences constructively, and cooperate across organizational lines. In the case of airport surface detection systems, the project office did not involve field offices in planning for equipment installation. If they had, the concern about radars proving too heavy for existing towers would have been known earlier. One major factor for the poor coordination is the organization of key players in the acquisition process into different departments or "stovepipes" based on functional specialty—engineers, air traffic controllers, and equipment technicians. FAA will need to devise structures and incentives to foster coordination.

[14]Advanced Automation System: Implications of Problems and Recent Changes (GAO/T-RCED-94-188, Apr. 13, 1994) and Air Traffic Control: Uncertainties and Challenges Face FAA's Advanced Automation System (GAO/T-RCED-93-30, Apr. 19, 1993).

It will not be easy to address the shortcomings in coordination and other aspects of FAA's acquisition culture. Organizational theory and research underscore the complexity of cultural change—an effort that typically takes many years to implement. In the federal government, most efforts to change an organization's culture have focused on people working more effectively across organizational lines to encourage more risk-taking, more empowerment of lower-level employees, less hierarchy, and fewer rules. FAA has embarked on a similar course. In November 1994, FAA developed a reform strategy that is based on the creation of cross-functional, empowered teams—called Integrated Product Teams (IPTs). IPTs are tasked with developing and fielding the agency's major system acquisitions. We believe that using IPTs as a primary means of changing the culture is a noteworthy effort and a significant step toward creating a more constructive organizational culture.

Before significant progress is made, however, FAA will need to proceed with building IPTs and expanding its strategy to bring about cultural change to affect all acquisition stakeholders. The agency's progress to date has been modest. For example, only 1 of 13 cross-functional teams has developed a management plan that includes three elements—team operating procedures, authority limits, and performance measures—considered by FAA as essential for successful IPT implementation. Furthermore, FAA's reform strategy has so far limited cultural change efforts to members of IPTs—only a small percentage of stakeholders in the acquisition process. Research has shown that targeting a small segment of an organization is less likely to lead to effective change because the existing culture continues to shape the values, beliefs, and behaviors of the majority of the organization.

FAA Projects a Funding Shortfall

FAA estimates that its requirements ($59.3 billion) will exceed available funding ($47.2 billion) by $12.1 billion between 1997 and 2002 as a result of the Joint Budget Resolution.[15] FAA contends that making cuts to absorb the shortfall could have a serious impact on aviation safety, efficiency, and security.

FAA's estimate of a funding shortfall was an effort to show, at one point in time, the problems that may lie ahead for the agency in a continued climate of constrained spending for aviation. This Subcommittee and others are still debating the balanced budget resolution and other revenue

[15]Funding targets under the Joint Budget Resolution are not agency-specific. FAA has prorated its share of the projected funding on the basis of its historical share of transportation funding.

issues involving user fees and ticket taxes that fund a large part of FAA's activities. Because these issues are not resolved, this Subcommittee asked us to examine the methods and assumptions FAA used to estimate the revenues, costs, and impacts associated with the funding shortfall.

Our work has just started, and we expect to report our results to the Subcommittee later this year. Our initial efforts focused on FAA's funding history. FAA's estimates assume that the agency's future share of overall transportation funding will reflect past history. That history is mixed. We found that FAA's growth in budget authority over the past 5 years has been slightly lower than DOT's overall growth. Looking back a decade, however, FAA's growth in budget authority has greatly surpassed the rest of DOT.

We have also started to examine FAA's cost estimates for the operations account, which the agency estimates will account for about $35 billion of the $59 billion in outlays. FAA projects an average annual increase of 6 percent in operating costs. Although this rate of growth is consistent with FAA's increase in total operations outlays for the 10-year period ending in 1996, it appears optimistic in the current budget climate. For example, over the past 5 years, FAA experienced a 3 percent annual rate of growth. We also found that FAA's projections do not reflect any savings that could be achieved from its current efforts to streamline its procurement and personnel rules. FAA estimated that these savings could be as much as $2.4 billion over the next 5 years. Also, the projected shortfall was predicated on FAA's hiring an additional 1,500 air traffic controllers by the year 2002. FAA now projects that it will hire 750 controllers. Regardless of the amount of the shortfall, FAA will have to identify ways to operate more efficiently, target its limited resources to the most serious problem areas, identify opportunities to enhance revenues, and ensure that funding limitations do not adversely affect safety.

Potential Exists to Redirect Some Set-Asides for the Airport Improvement Program

The Airport Improvement Program (AIP) helps airports fund planning and development projects that enhance capacity, safety, security, and noise mitigation. FAA has designated about 3,300 airports as critical to the national airport system and eligible for AIP funding. FAA allocates most AIP funds on the basis of a legislated entitlement formula and set-aside categories earmarked for specific types of airports or projects. It has the discretion to allocate the remainder of the funds on the basis of the needs identified by the airports. From 1982 through 1994, FAA allocated about $16 billion in AIP funds for improvements at 2,780, or about 84 percent, of the airports eligible to receive these funds. We will now discuss two

specific aspects of the AIP—military airport and reliever airport programs—that have generally not met their intended purposes and whose continued funding will reduce the funds available for other airport activities.

Military Airport Program Set-Aside

In 1990, the Congress established an AIP set-aside for the Military Airport Program (MAP) to assist current and former military airports located in congested metropolitan areas in converting to viable civilian aviation airports. The MAP set-aside is 2.5 percent of the AIP allocation. In fiscal year 1996, the Congress temporarily reduced the MAP set-aside to 1.8 percent, or about $26 million. When establishing the program, the Congress cited three main conditions that an airport must meet to be eligible for funds under this program: (1) It must be a former or current military airport, (2) it must have the potential for conversion to either a public-use commercial service or reliever airport, and (3) its "conversion in whole or in part...would enhance airport and air traffic control system capacity in major metropolitan areas and reduce current and projected flight delays." In 1994, the Congress amended the act and stipulated that only airports with more than 20,000 hours of annual delays in takeoffs and landings by commercial passenger aircraft would be eligible for the set-aside, if the airports reduced congestion and met the above three criteria. Also, the Congress expanded potential participation in the program from 12 to 15 airports.

We reported in 1994 that 9 of the 12 airports selected had operated as joint or civilian airports for 10 or more years, and many had the types of facilities that the program was designed to develop, such as terminals, parking facilities, and utilities.[16] However, eight of the airports used MAP funds much like other AIP entitlements or discretionary grants for such projects as runway and taxiway resurfacing—projects that are not unique to MAP participants. We also found that 5 of the 12 were not located in congested air traffic areas and were unlikely to increase capacity or reduce congestion at large metropolitan airports systemwide.

Since our report, FAA has taken several actions to address the MAP-related issues we identified. First, FAA tightened the eligibility criteria that airports must satisfy to enter the program. No longer will FAA allow airports into the program unless they have the potential to reduce delays at airports with 20,000 hours of annual delays. Second, FAA has required that all airports participating in the program submit a 5-year capital plan that

[16]Airport Improvement Program: Military Airport Program Has Not Achieved Intended Impact (GAO/RCED-94-209, June 30, 1994).

identifies conversion- and capacity-related projects requiring the flexibility of MAP funds. Third, FAA has "graduated" 7 of the 12 MAP airports because they had participated for 5 years and did not have additional conversion- or capacity-related projects that required MAP funds. By the end of fiscal year 1997, FAA expects that all five remaining airports will have graduated. FAA has identified two airports (not in the program) that meet its eligibility criteria, are interested, and have the potential to be added to the program.

The small number of potential airport candidates raises questions about the need for a special MAP set-aside. If the MAP set-aside did not exist, the needs of military airports could be addressed in other ways. For example, airports with commercial service could be eligible to receive AIP entitlement grants and to compete for AIP discretionary funds. Airports without commercial service could receive AIP apportionment or discretionary funds if they were classified as reliever or general aviation airports.

Reliever Airport Program Set-Aside

FAA can set aside 5 percent of AIP funds for relieve airports. In fiscal year 1996, the Congress temporarily reduced the reliever set-aside to 3.3 percent, or about $48 million. The Congress created this set-aside so that such airports could better (1) relieve congestion at commercial airports and (2) provide additional general aviation access to the community. Since 1982, FAA has designated 329 airports as relievers; most are located near major metropolitan areas.

In 1994, we reported that the conditions that created the need for the reliever set-aside do not exist today.[17] As far as congestion is concerned, FAA does not consider general aviation to be a significant factor in congestion at commercial airports—between 1983 and 1991 the proportion of general aviation traffic decreased by 38 percent at the nation's congested commercial airports. FAA attributed the decrease to an overall decline in general aviation activity, not the presence of reliever airports.

FAA's projections for general aviation traffic suggest that the future role of reliever airports in alleviating congestion and delays would likely remain small. The forecast projects a significant increase in such large general aviation aircraft as turboprops and turbojets that constitute about 5 percent of the general aviation fleet. But most reliever airports cannot accommodate the larger general aviation aircraft. According to aviation

[17]Airport Improvement Program: Reliever Airport Set-Aside Funds Could Be Redirected (GAO/RCED-94-226, June 30, 1994).

association officials, pilots of larger general aviation aircraft generally prefer airports that have at least a 5,000-foot runway, navigational aids (i.e., an instrument landing system) that allow all-weather operations, and a location near major business centers. FAA does not consider facilities or proximity to major business centers when it designates reliever airports. In addition, FAA does not determine whether reliever airports are strategically located near areas that may incur future growth in larger general aviation traffic. Of the 246 reliever airports linked to a nearby commercial airport, only 67, or 27 percent, have the facilities desired by pilots of larger general aviation aircraft. Of the 67, only 32 are located near congested airports.

In addition, FAA and aviation industry officials consider access to general aviation facilities to be sufficient—and often more than sufficient—in most areas where relievers are located. According to officials from 22 reliever airports located in 5 major metropolitan centers with whom we met, they considered their airports to be underutilized. They pointed to the shrinking size of the general aviation market as a cause and said that the shrinking market was forcing them to compete for customers.

In our report, we recommended and FAA agreed to develop criteria to determine (1) when reliever airports could provide relief from congestion caused by general aviation traffic, (2) how much general aviation access is required nationwide, and (3) whether the number of relievers is appropriate for serving current and future general aviation traffic. As of February 1996, FAA had not issued the criteria.

FAA's Funding for Technical Training Has Decreased Significantly

Between fiscal years 1993 and 1996, decreases in FAA's overall budget have significantly reduced the funding available for technical training. Within FAA's operations budget, the Human Resource Management (HRM) account funds (1) training, (2) HRM services such as managing labor relations and employee benefits, and (3) mandatory workmen's compensation. Although the HRM budget has decreased 21 percent since fiscal year 1993, the reductions have not been shared equally among the three account components. Specifically, training has decreased 42 percent from $147 million to $85 million, HRM services has declined 4 percent from $52 million to $50 million, and mandatory workmen's compensation has increased by 9 percent from $73 million to $80 million.

Within the training category, the reductions have affected technical training more than management training. Technical training, provided

primarily by the FAA Academy in Oklahoma City and its contractors, has been reduced by $53 million. Technical training includes flight training for safety inspectors who oversee commercial and private pilots and training on new and existing air traffic equipment for controllers and mechanics. In contrast, funding for management training at FAA's Center for Management Development in Palm Coast, Florida, has experienced a more modest 9-percent decrease from about $11 million to about $10 million annually since fiscal year 1993. The Center provides training in leadership development, labor-management relations, facilitator skills, and managing change.

FAA's reduced funding for technical training has occurred at a time when it has received congressional direction to hire over 230 additional safety inspectors in fiscal year 1996. To achieve this staffing increase, FAA will have to hire about 400 inspectors to overcome attrition. New staff must be provided initial training at the FAA Academy to prepare them to assume their new duties effectively. The cost of this training, combined with overall training budget reductions, constrains FAA's ability to provide its existing inspectors with the training essential to effectively carry out the agency's safety mission.

FAA has identified $94 million needed to fund mission-related essential technical training in fiscal year 1996 but has a budget of $74 million for this purpose. For example, the budget for Regulatory Standards and Compliance is $5.2 million short of the amount identified for essential training. Specific effects of this shortfall include: delaying the training of safety inspectors hired during the fourth quarter of 1996 and canceling 164 flight training, airworthiness, and other classes planned to serve over 1,700 safety inspectors. In addition, FAA says that it needs $277,000 more to provide recurrent and initial training for test pilots who certify the airworthiness of new aircraft.

In contrast to the 42-percent decrease in funds for technical training, FAA's Center for Management Development has experienced a 9-percent funding decrease since fiscal year 1993. At a time when FAA's overall staffing has decreased from about 56,000 in fiscal year 1993 to about 47,600 this fiscal year and when the agency has significantly reduced management and administrative staff, these decreases have not been reflected in the Center's costs or level of activity. The number of courses offered and students taught at the Center from fiscal years 1993 through 1995 has increased, while the opposite is true at the FAA Academy.

In addition, a recent study by an FAA contractor concluded that the agency could save between $3.4 million and $6.3 million over the next 10 years by relocating the Center's functions to the FAA Academy. The study also identified such intangibles as adverse employment impacts in the Palm Coast area that could be considered in making a relocation decision. FAA management currently supports retention of the Center. In an era of constrained budgets where funding shortfalls for essential technical training have become a reality, FAA must find ways to make the best use of all available training resources. Moving the Center's functions to the FAA Academy provides one such opportunity—particularly since FAA's 10-year lease on the Center expires in August 1997.

Coast Guard

In fiscal year 1996, the Coast Guard received about $3.4 billion—a decrease of about $282 million from fiscal year 1995—for salaries and benefits for over 42,000 employees; acquisition, construction, and improvement activities; retirement pay; and other activities. To help meet the reduced funding levels, the Coast Guard implemented a number of initiatives—estimated to be worth about $82 million in savings in fiscal year 1996.

These initiatives included eliminating 870 military and civilian positions, downsizing 23 of its 185 small-boat units, and decommissioning 3 of its 240 cutters. For fiscal year 1997 and beyond, the Coast Guard has initiated a streamlining plan to save nearly $1 billion by the year 2005. This plan includes reorganizing headquarters and field units, enhancing training delivery, closing Governors Island, and creating Centers of Excellence, which will consolidate the expertise needed to perform those functions generally not requiring face-to-face interaction with customers.

At the request of the Subcommittee on Coast Guard and Maritime Transportation, House Committee on Transportation and Infrastructure, we have been examining the Coast Guard's plan for a new major acquisition—the Vessel Traffic Services (VTS) 2000. A VTS system typically consists of remote surveillance sensors, such as radar or closed-circuit television, and a central data gathering location where personnel monitor conditions and pass information by radio to mariners. The Coast Guard spent about $19 million in fiscal year 1995 to operate and maintain VTS systems in eight ports nationwide. As part of its VTS 2000 proposal, the Coast Guard is considering installing new or upgraded systems in as many as 17 ports across the country. The Coast Guard expects that VTS systems would help to prevent collisions and groundings in U.S. territorial waters.

As we testified last year before this Subcommittee, the Coast Guard estimates that the VTS 2000 System will cost between $260 million and $310 million to build and about $56 million to operate each year if installed at all 17 locations.[18] Under its current plan, the Coast Guard, which has spent an average of $7 million a year on the program since 1993 on such activities as contract support, systems engineering, and systems design, will increase its funding requests to about $30 million annually beginning in fiscal year 1998. The increased funding requests likely will come at a time of continued emphasis on deficit reduction, leaving the Congress with difficult questions on whether or how to fund the program. Our ongoing work has identified several questions that need to be addressed as the Congress deliberates these issues.

First, to what extent do major stakeholders (shippers operating in the ports, marine pilots, and port authorities) support acquiring and funding a VTS 2000 System? Widespread support for VTS 2000 was lacking among key stakeholders we visited in 8 of the 17 ports. Stakeholders at five ports were predominantly negative about the system, two others were about evenly split, and one was predominantly uncertain. Many who opposed it believed that the system would likely be more expensive than what their port needs. Stakeholders in six of the eight ports that we visited opposed user fees or other funding approaches that would transfer the funding of VTS 2000 from the federal government to those who use it.

Second, if major stakeholders are not supportive of VTS 2000, to what extent are they interested in acquiring and funding lower-cost VTS systems? Although support for funding VTS 2000 was generally absent, support among those we interviewed was greater for VTS systems they perceived to be less expensive than VTS 2000. Four of the eight ports that we visited have no VTS systems, while the other four have some form of a VTS system. Support for funding the improvements was generally present at five ports, mixed at two, and completely absent at one. Stakeholders at two ports that had no system favored having some type of VTS capability. At the four ports that have VTS systems, users at two provide financial support, and key stakeholders at the other two expressed a willingness to fund VTS operations if necessary to ensure that VTS coverage continues. Many stakeholders with whom we met indicated that financial assistance, liability protection, and the Coast Guard's role in privately funded systems are issues that need to be addressed.

[18]Coast Guard: Issues Related to the Fiscal Year 1996 Budget Request (GAO/T-RCED-95-130, Mar. 13, 1995).

Third, what is the current status of the Coast Guard's development of VTS 2000? Information from Coast Guard studies shows that the benefits of a new VTS system are not clearly established at many of the 17 sites. For example, six of the proposed sites have existing Coast Guard or privately funded VTS systems that provide safety benefits similar to those of a new VTS system; five other sites, according to Coast Guard studies, have relatively low or even negative safety benefits compared with the costs to install a new VTS system. Another site is planning to install its own privately operated VTS system until the Coast Guard installs VTS 2000. However, the limited benefit of VTS 2000 at some locations should not cloud the acknowledged need that exists to improve waterway safety. The available information indicates that several ports under consideration are likely to receive substantial safety benefits from the installation of a VTS system. The Marine Board of the National Research Council is assessing the role of the public and private sectors in funding VTS systems. The Coast Guard expects to use this information in making its siting decisions.

This concludes our prepared statement. We will be happy to respond to any questions you might have.

Status of FAA's Major Modernization Projects

Major projects	Last-site implementation: Year: Original estimate	Last-site implementation: Year: 1996 estimate	Last-site implementation: Years delayed	Number of operational systems: Planned	Number of operational systems: Commissioned: Since 2/95	Number of operational systems: Commissioned: Current total
En route Automation	2000[a]	2000	N/A	21 systems	0	0
Terminal Automation	2003	[b]	N/A	163 systems	0	0
Tower Automation	2000	[c]	N/A	70 towers	0	0
Aeronautical Data Link (ADL)	1998	2000	2	22 DLPs/ 57 TDLS[d]	0	0
Air Route Surveillance Radar-4 (ARSR-4)	1991	1997	6	40 radars	0	0
Airport Surveillance Radar-9 (ASR-9)[e]	1992	1998	6	120 radars	21	102
Airport Surface Detection Equipment-3 (ASDE-3)	1990	1999	9	38 radars	12	20
Automated Surface Observing System (ASOS)[f]	1997	2000	3	537 units	50	52
Integrated Terminal Weather System (ITWS)	2000	2002	2	37 systems	0	0
Flight Service Automation System (FSAS)	1989	1995	6[g]	61 stations	2	61
Mode Select	1993	1998	5	133 systems[h]	35	37
Oceanic Automation Program (OAP)	[i]	[i]	N/A	3 systems	0	0
Terminal Air Traffic Control Automation (TATCA)	[i]	[i]	N/A	TBD	N/A	N/A
Terminal Doppler Weather Radar (TDWR)	1998	[i]	N/A	45 radars	8	11
Voice Switching and Control System (VSCS)	1992	1997	5[j]	21 units	8	8
Wide Area Augmentation System (WAAS)	2001	2000[k]	N/A	1 system	0	0

(Table notes on next page)

N/A = Not applicable.

[a]Date reflects current estimate for the Display System Replacement (DSR) project, initiated as part of the June 1994 restructuring of the Advanced Automation System into three distinct areas—en route, terminal, and tower automation.

[b]The Standard Terminal Automation Replacement System (STARS) schedule is currently being rebaselined.

[c]The Tower Control Computer Complex (TCCC) is currently being rebaselined.

[d]TDLS is the Tower Data Link Services, an interim system that will eventually be replaced by the TCCC. DLP is the data link processor, an element of the en route data link and designed to produce six basic weather products via Mode S.

[e]ASR-9 was not one of the 15 reported on in our 1995 status report but had been included in previous reports.

[f]ASOS is one of three systems under the Automated Weather Observing System (AWOS) project, which also includes AWOS and AWOS Data Acquisition System (ADAS). AWOS achieved first site implementation in 1989 and FAA has since commissioned 193 of 200 AWOS ordered. Remaining installations in Alaska are scheduled to be completed by September 1996.

[g]The schedule reflects original FSAS project only. Last-site implementation schedule for the Operational Supportability and Implementation System (OASIS)—a replacement project currently included in FSAS—is being rebaselined. Currently, no OASIS has been implemented.

[h]Eleven additional Mode S units have been purchased under the Interim Support Plan. The systems commissioned are those that have been upgraded to full Mode S capability.

[i]Last-site implementation dates are currently indefinite.

[j]The schedule reflects the first phase of the project, when systems are scheduled to be installed in existing en route controller workstations. Last-site implementation date for the second phase of the project, when the system will interface with the DSR, is estimated in 2000.

[k]The original last-site implementation date was based on the assumption that the last contract option would be exercised. The 1996 date is for the last-site implementation of the basic contract with no contract options assumed.

Summary of Costs and Schedules for FAA's Major Modernization Projects

Projects	Description and anticipated benefits	2 - year comparison of total F&E cost estimates (In millions of current dollars)			2 - year comparison of first- and last-site implementation schedules		
		1995	1996	Change	1995	1996	Change
En-Route Automation (DSR)	- Replaces hardware, software, and controllers' workstations at en route ATC facilities.	$1,055	$1,055	None	First-site: 09/98 Last-site: 01/00	10/98 05/00	+1 month +4 months
Terminal Automation (STARS)	- Replaces hardware, software, and controllers' workstations at terminal facilities.	940.2	940.2	None	First-site: 12/98 Last-site: 12/03	Indefinite Indefinite	N/A
Tower Automation (TCCC)	- Provides an infrastructure which will furnish an extensible open systems, standards-based platform on which to field the surface movement advisory, new capacity, safety, and efficiency enhancements at a lower cost, high reliability, and with a common computer human interface.	259.2	259.2	None	First-site: 04/97 Last-site: 12/00	Indefinite Indefinite	N/A
ADL	- Digital communications system that provides a a variety of weather and ATC information between ground and airborne automation systems. - Improves two-way air-to-ground communications and contributes to the system's safety and capacity by enhancing accessibility to information, enhancing accessibility to information, relieving congested voice frequencies, and reducing workloads.	221.3	223.4	+2.1	First-site: 07/95a Last-site: 05/99b	08/95a 05/00b	+1 month +12 months
					aDates for Tower Data Link Services bDates for en-route data link.		
ARSR-4	- Provides for long-range surveillance radar, en route navigation, air defense, and drug interdiction. - Decreases costs by replacing older radars that have become difficult to maintain and reducing number of site operators required.	399.7	409.7	+10.0	First-site: 09/95 Last-site: 06/97	02/96 06/97	+5 months +2 months
ASDE-3	- Enables tower controllers to monitor ground movement of aircraft and other vehicles during periods of low visibility and darkness. - Increases surface safety and capacity by replacing aging and less reliable radar equipment.	247.3	238.6	-8.7	First-site: 11/93 Last-site: 11/99	11/93 11/99	None None
ASR-9	- Provides highly accurate monitoring of aircraft movement/position within a 60-mile radius of the airport terminal. - Displays weather and aircraft information simultaneously.	627.7	626.7	-1.0	First-site: 05/89 Last-site: 05/98	05/89 05/98	None None
AWOS/ ASOS	- Obtains data such as wind velocity, temperatures, altimeter setting, cloud height, and visibility. - Processes and transmits weather data to pilots via a synthesized computer voice. - Improves safety at small, nontowered airports and reduces observation errors at large airports.	255.3	255.4	+0.1	First-site: 07/89 Last-site: 12/97c	07/89 12/00c	None +36 months
					cDates for ASOS only; last-site implementation for AWOS is 9/96		

Project	Description and anticipated benefits	2-year comparison of total F&E cost estimates (In millions of current dollars)			2-year comparison of first- and last-site implementation schedules		
		1995	1996	Change	1995	1996	Change
FSAS	- Improves pilots access to automated weather data and simplifies flight plan filing. - Increases flight service efficiency and mitigates cost of additional staff and facilities to meet demand of flight services.	$412.7	$395.4	-17.3	First-site 06/91 Last -site 09/95	06/91 09/95	N/A N/A
OASIS	- Replace and enhance the current flight service automation system (FSAS) model 1 full capacity with a system that also integrates graphic weather display system functionality. The current M1FC system is becoming insupportable.	127.8	127.8	None	First-site: 05/98 Last-site: 05/01	Indefinite Indefinite	
ITWS	- Integrates data from terminal weather sensors such as TDWR and LLWAS to provide short-term automated weather information. - Improves predictions of short-term weather changes in easily understood graphical and textual form, enabling air traffic personnel to isolate terminal area weather hazards and improve flight safety.	250.7	326.7	+76.0	First-site: 03/00 Last-site: 06/01	11/00 03/02	+8 months +9 months
Mode S	- Is a secondary surveillance radar that identifies, locates, and tracks aircraft by interrogating a device, called a transponder, on board the aircraft. Also provides a communication channel between the aircraft and ground facilities. - Improves safety by locating aircraft more accurately than current secondary surveillance radar and expands capacity.	450.9	455	+4.1	First-site: 03/94d Last-site: 12/96	03/94d 12/98	None +24 months
					dDate for initial Mode S capability for terminal sites.		
OAP	- Combines into a common system, hardware and software packages from various systems under development to improve the automation of ATC over the oceans. - Improves traffic flow while promoting maximum fuel efficiency and minimal travel times.	236.5	236.5	None	First-site: Indefinite Last-site: Indefinite	Indefinite Indefinite	N/A N/A
TATCA	- Provides controllers with several new automated tools to better sequence, space, and schedule time of arrival and departure of aircraft. - Addresses present-day needs for increased airport capacity through the introduction of new technology and automation aids.	138.0	246.5	+ 108.8	First-site: 12/97 Last-site: Indefinite	12/96 Indefinite	-12 months N/A
TDWR	- Detects hazardous weather around airports, such as microbursts, gust fronts, wind shifts, and precipitation. - Promotes safety by providing alerts of hazardous weather conditions in terminal areas and of changing wind conditions that influence runway usage.	380.9	380.5	-0.4	First-site: 07/94 Last-site: Indefinite	07/94 Indefinite	None N/A

Project	Description and anticipated benefits	2-year comparison of total F&E cost estimates (in millions of current dollars)			2-year comparison of first- and last-site implementation schedule		
		1995	1996	Change	1995	1996	Change
VSCS	- Replaces and improves voice ground-to-ground and air-to-ground communications at ATC facilities. - Increases controllers' efficiency in handling air traffic.	$1452.9	$1452.9	None	First-site: 06/95 Last-site: 01/00	06/95 05/00	None +4 months
WAAS	- Enhances GPS, a satellite-based system that provides precise time and position information to aircraft. WAAS augments GPS signals to satisfy civil air navigation requirements in all phases of flights. - WAAS benefits include increased operational safety, extensive user cost savings, reduced ground infrastructure costs, increased national airspace capacity, reduced aircraft separation, increased precision approach capabilities, simplified avionics, global standardization, and positive position location for air traffic management.	512.6	512.6	None	First-site: 09/97 Last-site: 06/01	03/96 06/00	+6 months -10 months

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