

**GAO**

**Testimony**

*For Release  
on Delivery  
Expected at  
10:00 a.m. EDT  
Wednesday  
June 5, 1991*

**FAA BUDGET**

**Key Issues in Facilities &  
Equipment and Operations  
Accounts Need Resolution**

*Statement by*  
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Resources, Community, and Economic  
Development Division

*Before the*  
Subcommittee on Transportation  
and Related Agencies  
Committee on Appropriations  
House of Representatives



Mr. Chairman and Members of the Subcommittee:

We appreciate the opportunity to testify on the Federal Aviation Administration's (FAA) fiscal year 1992 budget request. This year's request of \$9.27 billion represents a 14-percent increase over the budget enacted for fiscal year 1991. The 1992 request continues an upward trend--since 1988 FAA's total request level has increased by 60 percent. The largest components of the budget are (1) the Facilities and Equipment (F&E) account which funds air traffic control (ATC) modernization, and (2) the Operations account which funds the paying and training of FAA's major work forces. Our testimony on the activities funded by these accounts is based on both work done over the last several years and on-going assignments. A listing of the relevant reports and testimonies is attached to our statement (see attachment V).

Our testimony today will make the following points:

- FAA's \$2.7 billion F&E appropriation request represents a 29-percent increase over the fiscal year 1991 budget. Further, FAA's estimate of the total F&E cost of ATC modernization through the year 2000 increased from \$27 billion last year to \$31 billion this year. These increases are due to continued cost growth in modernization projects and the addition of 94 projects to its modernization plan. Moreover, FAA is revising its strategy for consolidating ATC facilities. Because this strategy forms the basis for its modernization plan and \$31-billion estimate, expanding the number of consolidated facilities will have profound implications on costs, scheduling, and human resources.
- Eight of 12 major systems have experienced schedule slips since January 1990, ranging from 8 to 32 months. Schedule slips resulted in FAA's completing only one project during

1990. Schedule slips delay safety and productivity improvements and also adversely affect the budget, causing FAA to (1) develop interim projects and (2) incur costs for storing new equipment it had intended to install.

- Cost increases and schedule slips are largely due to weaknesses in FAA's acquisition process and its budgeting for acquisitions. FAA did not adhere to the acquisition policy for executive agencies outlined by Office of Management and Budget (OMB) Circular A-109 or involve top management in key decisions. FAA is attempting to reform its acquisition process and follow A-109. FAA faces a formidable challenge in resolving problems with existing acquisitions while undertaking 94 new projects. Also, FAA currently funds many development activities in the F&E appropriation account, which is intended for production. We believe that linking the budget to the acquisition phases of A-109 would better communicate cost, schedule, and progress, and provide an opportunity to tie funding approval to the successful completion of each phase.
  
- FAA's \$4.5 billion Operations appropriation request represents a 10-percent increase over the fiscal year 1991 budget. Although FAA has taken actions to remedy shortages in its work forces--air traffic controllers, maintenance technicians, and aviation inspectors--several problems remain. For example, FAA has not (1) achieved its goals for the number and distribution of full performance controllers, (2) determined the impact of greater demands resulting from aging aircraft inspections, (3) determined the best balance--in-house or contractors--to maintain the ATC system, and (4) fully trained inspectors on new technologies.

MODERNIZATION COST THROUGH 2000  
WILL LIKELY EXCEED \$31 BILLION

FAA estimates that modernization will require about \$31 billion of total F&E appropriations for fiscal year 1982 through 2000. The Congress has already appropriated about \$11 billion of this amount. FAA's \$31-billion cost estimate is a \$4-billion increase over last year's estimate and far above the \$12-billion estimate projected in 1983.

The total estimated cost of modernization through the year 2000 has increased because of increases in the cost of existing projects and the addition of new projects. For 8 of 12 of the major acquisitions that we reviewed, the total estimated cost increased in the last year. Although most of these increases were under 2 percent, the total F&E cost estimate for the Voice Switching and Control System (VSCS) increased by \$504 million, or 56 percent. Furthermore, FAA added 94 modernization projects to its new Capital Investment Plan (CIP); the 94 projects have total estimated costs of \$6.5 billion through the year 2000. As shown in attachment I, FAA is requesting funds for 60 of these 94 projects in its fiscal year 1992 budget. Of these 60 projects, 16 have funding requests ranging from \$10 million to \$48 million each. Despite the large increase during the last year in the total estimated modernization cost through the year 2000, we believe FAA has still underestimated this total cost because of a likely change in its facility consolidation plans.

FAA's current \$31-billion estimate is based on a plan approved in 1983. That plan calls for consolidating all 202 terminal radar approach control facilities and en route centers into 23 facilities. (See attachments II and III for a depiction of the current facilities and the planned consolidated facilities.) For the last several years, however, FAA has had serious reservations about the operational feasibility of this plan because

of the potential impact on the ATC system if any of these consolidated facilities experienced a catastrophic outage. FAA vulnerability studies indicate that if a consolidated facility failed, adjacent facilities could not adequately manage the airspace. This inability would substantially increase aircraft delays and the risk of tragic accidents.

Because of the vulnerability issue, FAA has studied other consolidation scenarios that would increase the number of facilities around major airports. Currently, FAA's optimum plan from an operational standpoint calls for about 53 facilities instead of the 23 in the CIP. According to FAA, this new plan would result in increased costs ranging from \$1.5 to \$3 billion over the next decade for equipment, facilities, and staff. The quantity of Advanced Automation System (AAS) and VSCS equipment needed could almost double, and as many as 30 new facilities could be needed to house terminal radar approach sites at major airports.

Since FAA has not released details of its new plan, we are not in a position to evaluate the accuracy of cost estimates or determine the effect of this proposal on current consolidation time frames. Furthermore, FAA has not completed the cost effectiveness study of consolidation alternatives that both Appropriations Committees directed in 1988. However, we believe the \$1.5- to \$3-billion estimate is probably low given that in 1988 FAA estimated a \$4 billion increase for another consolidation plan that included 44 sites, or about 9 fewer than included in its new plan.

Without a final consolidation plan delineating the number of facilities needed, FAA cannot take the steps needed now to allow consolidation to commence by June 1997, as planned. Consolidation involves many separate F&E projects and will have a major impact on FAA's work forces as well. For example, FAA must exercise or extend AAS contract options, before they expire in 1993, for

additional equipment. Consolidation also potentially involves relocating about one-third of the controller and maintenance technician work forces. FAA needs to know the location of consolidated facilities so it can survey its personnel to see how many are likely to retire or resign rather than move.

SCHEDULE SLIPS DELAY MODERNIZATION BENEFITS  
AND NECESSITATE COSTLY INTERIM ACTIONS

Delays in new modernization projects cause FAA to rely longer on its old air traffic control equipment, which has negative safety, productivity, and budgetary effects. Last year we reported that 8 of the 12 major systems that we reviewed had experienced delays of 6 months or more. This year 8 of the 12 systems that we reviewed have experienced additional schedule slips ranging from 8 to 32 months.

Specifically, FAA's two most expensive modernization projects, the AAS and the VSCS, experienced large slips in the last year. Two other projects, the Flight Service Automation System and the Meteorologist Weather Processor, are experiencing problems during deployment to the field. The first implementation date for the Flight Service Automation System may slip about 14 months. At its Technical Center, FAA determined the system had a problem with slow response time, but deployed it to the field before completely resolving the problem. Testing at the first operational site also indicates slow response times. As a result, specialists were unable to handle all flight plans in periods of peak traffic during testing. Likewise, the first implementation date for the Meteorologist Weather Processor slipped about 8 months because of problems that surfaced during operational testing. For example, the system software crashed repeatedly. According to system users at the first implementation site, even when these software problems are rectified, the system still will not meet all of their needs because they had no chance to review system requirements prior to contract award.

## Delays Affect Safety, Productivity, and Efficiency

FAA intended modernization to have a positive effect on safety indicators such as operational errors, midair collisions, and surface traffic collisions. For example, the Airport Surface Detection Equipment radar (ASDE-3) is intended to reduce runway incursions by monitoring the ground movements of aircraft and other supporting vehicles. However, the first implementation date for ASDE-3 recently slipped 20 months and is now scheduled to occur in 1992 although FAA awarded the contract in 1985. Meanwhile, runway incursions have increased 24 percent in the last year, and serious runway accidents occurred in Detroit and Los Angeles. Operational error and near-midair collision reports decreased in the last year, but might have decreased further if modernization was on schedule.

FAA also intended modernization to double air traffic controller and flight-specialist productivity by the year 2000. However, FAA now acknowledges that the present productivity trend appears to preclude this achievement. FAA now believes that a 30 to 40 percent increase in productivity by the year 2000 is more likely.

Another goal of modernization is to accommodate increased demand so that airspace users can operate with a minimum of artificial constraints and with fuel efficiency. We recently spoke with American Airlines about the impact of modernization delays on its operations. American officials believe that schedule slips in modernization projects result in less efficient routings for their airplanes and artificial restrictions on demand such as the allocation of slots to airlines at airports. They believe that FAA has undertaken some low-cost interim actions that improve efficiency and do not understand why such actions are not expanded. Such efforts include altering procedures between the Miami and Jacksonville en route centers to facilitate the flow of traffic and

conducting a study with the goal of modeling the air traffic control system to identify ways of increasing efficiency.

Modernization Delays Result in Expensive Interim Projects and Equipment Storage

The continued delays in modernization necessitate interim projects to maintain operations. FAA's Capital Investment Plan includes a chapter of such projects intended to refurbish structures, replace obsolete equipment, and relocate facilities in support of the continued operation of the existing air traffic control system. The chapter includes 59 projects, for which FAA is requesting \$431 million in its fiscal year 1992 budget. These interim projects account for \$5.8 billion of \$31 billion total modernization cost through the year 2000.

A related issue is that FAA does not have adequate information on its equipment to use in designing interim projects, a deficiency that can result in expensive projects that do not fully address FAA's needs. We raised this concern about a project to support terminal operations, the \$445 million Interim Support Plan, in a report addressed to this Subcommittee last year. Also at the request of this Subcommittee, we are evaluating problems with old equipment at FAA's en route centers. Based on our work to date, FAA has analyzed only maintenance data on total systems--which it has been able to maintain at 99-percent availability because of system redundancy and the efforts of FAA's maintenance technicians. However, we are concerned that FAA has not analyzed performance data for component equipment within the systems in sufficient detail to accurately determine its condition. Without knowing the condition of its equipment, FAA cannot accurately identify whether it must replace equipment and when it must do so. We believe this could result in other poorly designed interim projects. Most en route centers keep data on component-level equipment repair and maintenance, and FAA could use it to assess interim needs. We



plan to report on the results of our en route center work this summer.

Another cost associated with modernization delays is incurred when equipment is stored because systems or equipment do not meet contractual requirements and because of delays in developing system software. Two years ago we testified that of 24 modernization systems we reviewed, 14 had equipment stored. The value of the stored equipment was about \$59 million. FAA continues to store equipment. We recently obtained information on three modernization projects with equipment that FAA is currently paying to store at either the Logistics Center or at contractors. The stored equipment is worth approximately \$39 million, with a total storage cost to FAA of \$312,000 per year. For example, one system designed to provide data on equipment performance to maintenance technicians involves equipment worth \$15 million that must be stored because it does not meet performance specifications or the needs of systems users. FAA has not determined how to use equipment for these three systems or how long it will have to be stored.

TOP MANAGEMENT ATTENTION NEEDED TO IMPROVE FAA'S ACQUISITION PROCESS AND ITS MODERNIZATION PLAN

In April, we testified before this Subcommittee that FAA's acquisition problems can usually be traced to deficiencies in (1) identifying and justifying the need for new equipment, (2) considering alternatives and associated costs and benefits, and (3) testing and evaluating equipment before committing to production. These deficiencies generally result from a failure to adhere to a cautious, step-by-step approach to managing acquisitions and an absence of top management involvement in key decisions.

We testified that OMB Circular A-109 is the principal guidance for managing acquisitions in the federal government and emphasized

the need for the Department of Transportation (DOT) and FAA to carry through on their initiatives to adhere more closely to A-109. For example, a DOT Order issued in mid-1990 requires the DOT administrations to have approved mission need statements for all major acquisitions prior to their inclusion in the agency's budget request. FAA issued its own order implementing this guidance in February 1991. A mission need statement is critical because it identifies the purpose of a project and indicates how it meets the agency's needs. At the time of the budget submission, we found that FAA included \$89 million in its fiscal year 1992 budget for eight new projects without approved need statements. Since then, five of these projects have had their need statements approved "conditionally" by DOT; in other words, they still require changes to meet DOT's standards. Clearly, DOT and FAA have not yet fully institutionalized their orders.

Top management could also improve the way it controls and monitors acquisitions through better budgeting. We are examining the criteria FAA uses to fund modernization projects from either its F&E appropriations account or its Research, Engineering, and Development (RE&D) account. Our work indicates that FAA does not link its budget to the phases of the acquisition process. Rather than fund development from the RE&D account and production from the F&E account, FAA often budgets preproduction activities in its F&E account. While the agency has begun to make changes to its acquisition process, it has not made any changes to the way it budgets for major acquisitions. Linking its budget to the acquisition process--by segmenting funding for each major project into A-109 phases--would strengthen FAA's capacity to implement and institutionalize its reforms.

Finally, FAA faces a real challenge in resolving problems with existing acquisitions while undertaking 94 new projects. Top management attention is needed to work through problems with key existing systems such as AAS and VSCS at the same time many new

projects are in the initial, most critical acquisition phase. The growing scope of modernization increases the risk that new projects will start without a rigorous analysis of requirements and therefore fall into the same cycle of cost overruns, schedule delays, and performance problems.

#### STAFFING IMPROVED BUT PROBLEMS REMAIN

FAA has requested \$4.46 billion for fiscal year 1992, primarily to hire, pay, and train its major safety-related work forces. FAA has about 17,200 air traffic controllers, 2,500 aviation inspectors, and 9,000 maintenance technicians; it plans to hire an additional 450 controllers, 260 technicians, and 100 inspectors this year. GAO issued two reports in April 1991 on these important safety staff. The number of fully qualified controllers is still below the number existing before the 1981 strike. The inspector work force is expected to stay constant despite a growing aircraft fleet and greater demands related to aging aircraft inspections, and about one-third of FAA's maintenance technicians will be eligible to retire between 1992 and 1995. Improved distribution of its resources and additional training for staff will better enable FAA to keep pace with the latest technologies.

#### Efforts to Remedy Shortages of Experienced Controllers Have Met with Limited Success

Today, the controller work force has not achieved the level of capability--full performance level (FPL)--that existed prior to the strike. FPLs are FAA's most experienced and qualified controllers and represent the backbone of the air traffic control system. As of September 1990, only 10,800 controllers--about 2,400 below prestrike levels--were FPLs. Moreover, most facilities do not meet FAA's goal that FPLs make up 75-percent of the controller

work force (see attachment IV for selected facilities below the 75-percent goal).

In June 1989, to increase staffing at some of the busiest facilities, FAA initiated a 5-year demonstration project that pays controllers a quarterly incentive allowance of up to 20 percent of their base salary. The project is intended to attract or retain experienced controllers at nine of FAA's busiest facilities in four areas--Los Angeles and Oakland, California; Chicago, Illinois; and New York, New York. After almost 2 years, however, the project has had limited success because 45 percent of the staff added were new hires rather than the experienced controllers who were the project's target group.

The pay discrepancy between demonstration and other sites has been reduced somewhat by the recently enacted Federal Employees Pay Comparability Act of 1990. This legislation granted geographic pay adjustments of up to 8 percent for federal employees in high cost-of-living areas such as New York. Consequently, controllers in the pay demonstration project areas received the 8 percent salary increase, leaving a pay differential of 12 percent, rather than 20 percent, between busy demonstration site facilities and other sites.

FAA Has Not Determined the Impact  
of Greater Demands on Inspectors

The aviation inspector work force has grown by about 70 percent between 1983 and 1990. FAA expects to increase this work force to 2,635 at the end of this fiscal year and is proposing to add 100 inspectors in fiscal year 1992. Beyond that, given current budgetary constraints, FAA officials do not believe that this work force will grow substantially over the next few years. At the same time, however, new responsibilities are placing greater demands on inspectors. For example, they will be performing aging aircraft

inspections that include, among other things, assessing airline corrosion control programs and evaluating major structural repairs.

Level of Increased Contractor Support  
for System Maintenance Is Uncertain

In addition to controllers and inspectors, FAA has about 9,000 maintenance technicians to service a network of sophisticated communications, radar, navigational, and computer equipment--ranging from a single automated navigational aid at a remote location to busy control towers in major airports--located at over 26,000 facilities across the country. About 7,400 (82 percent) of FAA's technicians are fully qualified; the remainder are in various stages of training. FAA estimates that about one-third of the technicians will be eligible to retire through 1995 and believes the current work force cannot efficiently maintain the existing equipment while undergoing the training needed to install, test, and commission new systems. FAA has requested 260 additional technicians--3 percent of its current work force--for fiscal year 1992.

FAA believes a gap will exist between its maintenance capability and work load at least until fiscal year 1997. To help bridge that gap, FAA plans to use more contract support to maintain its air traffic control systems. FAA proposes spending about \$118 million over the next 4 years to supplement its in-house maintenance technician work force with 533 contractor personnel. Contractors now maintain 21 systems, as opposed to 6 in 1987.

We believe new legislation provides another option for FAA to bridge this gap. Last year the Congress authorized financial incentives under the Federal Employees Pay Comparability Act that allows agencies under certain circumstances to (1) pay retention allowances of up to 25 percent of employees' base pay and (2) rehire retirees to receive both full salary and retirement benefits. FAA officials told us that they plan to compare the

costs and benefits of the act with their proposal to contract out for additional technicians when the Office of Personnel Management issues governmentwide regulations. In making the analysis, FAA needs to ensure that the assumptions used reflect the continuing delays in implementing new equipment under its Capital Investment Plan. If FAA's analysis determines that additional contractor support is warranted, selecting the most effective and cost-beneficial mix of options authorized by the act would help to stretch already thin resources.

#### FAA Lacks Information to Determine Needs and Target Resources

FAA uses staffing standards to determine total controller work force needs at each facility. In 1988, we recommended that FAA revise its controller staffing standards because they were outdated and did not accurately reflect the number of controllers needed to ensure the safety of the air traffic system. FAA has recently revised its staffing standards for terminal radar approach control facilities and en route centers. It has not revised its standards for control towers, but expects to complete them by the end of this fiscal year.

One issue that will have a significant impact on the controller work force is FAA's plan to consolidate terminal radar approach facilities and en route centers. Facility consolidation and integration of technology not only involve funding considerations but also have the potential of affecting controller work force size, training requirements, and morale. Consolidations will also require revisions to controller staffing standards.

In addition, FAA relies on inspection data recorded in its Program Tracking and Reporting System as the main source to target its inspection efforts. Follow up on prior work indicates that FAA has not effectively used the data to target airlines and activities

needing greater attention. FAA's efforts have been hampered by (1) insufficient inspector training on the system, (2) obsolete computer equipment to record and process inspection reports, and (3) a lack of central analysis to examine inspection results and redirect resources accordingly. For example, FAA does not analyze inspection data to determine whether the work force meets FAA's policy goal related to the minimum level of required inspections. Rather, FAA assigns inspection resources on the basis of air carrier fleet size.

At the same time, we have reported that inspectors must develop skills to properly inspect aircraft that use new technology, such as composite materials and advanced avionics systems. Although FAA is developing new training curriculum to meet this need, the effort may not be completed for several years. Also, until its standards are revised in about mid-1992, FAA will not know the number of personnel needed to conduct the inspections.

#### FAA Has Not Corrected Shortfalls in Its Training Program

To address its work force training needs, FAA has instituted one of the largest and most diverse programs of any federal agency. FAA's Flight Plan for Training, a \$406 million, 6-year, agencywide effort, included 47 projects that FAA had expected to implement between fiscal years 1989 and 1994. We reported in June 1990 that insufficient funding, due to competing priorities within FAA, and poor planning had caused 31 projects to be behind schedule. At that time, FAA said that it would revise the plan to (1) reflect the fiscal years 1989 and 1990 experiences during which funding reached only 54 percent of the level needed to keep the plan on schedule and (2) develop a strategy to prioritize projects if full funding was not available.

FAA has not accomplished either objective. First, FAA has reduced cost estimates by less than 2 percent and expects to complete 46 projects between fiscal years 1990 and 1994 at a cost of \$391 million. Eighty-five percent or \$332 million would be needed in fiscal years 1992 through 1994 to keep the plan on track. However, given previous funding levels, FAA does not expect to fully fund the plan in fiscal year 1992. Second, a draft revised FAA plan does not include project schedules that are targeted to projected funding levels. Rather, FAA has grouped projects into high, medium, and low priority categories but has not allocated funds within the categories. By the end of fiscal year 1991, FAA expects to finalize a strategy for allocating funds to those projects that have a high potential to reduce training and recruiting program costs.

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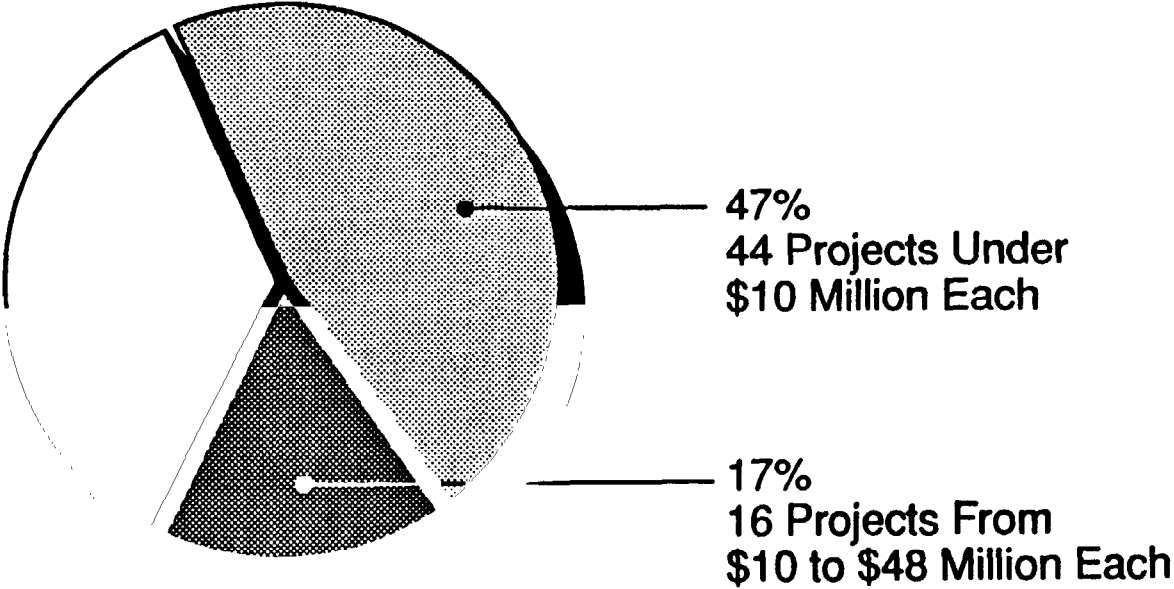
In conclusion, Mr. Chairman, the costs of FAA's modernization program continue to rise and FAA faces a series of obstacles in completing this effort. There are, however, measures FAA can take to help minimize risks and costs, and more efficiently utilize its work forces. I will be happy to respond to any questions at this time.



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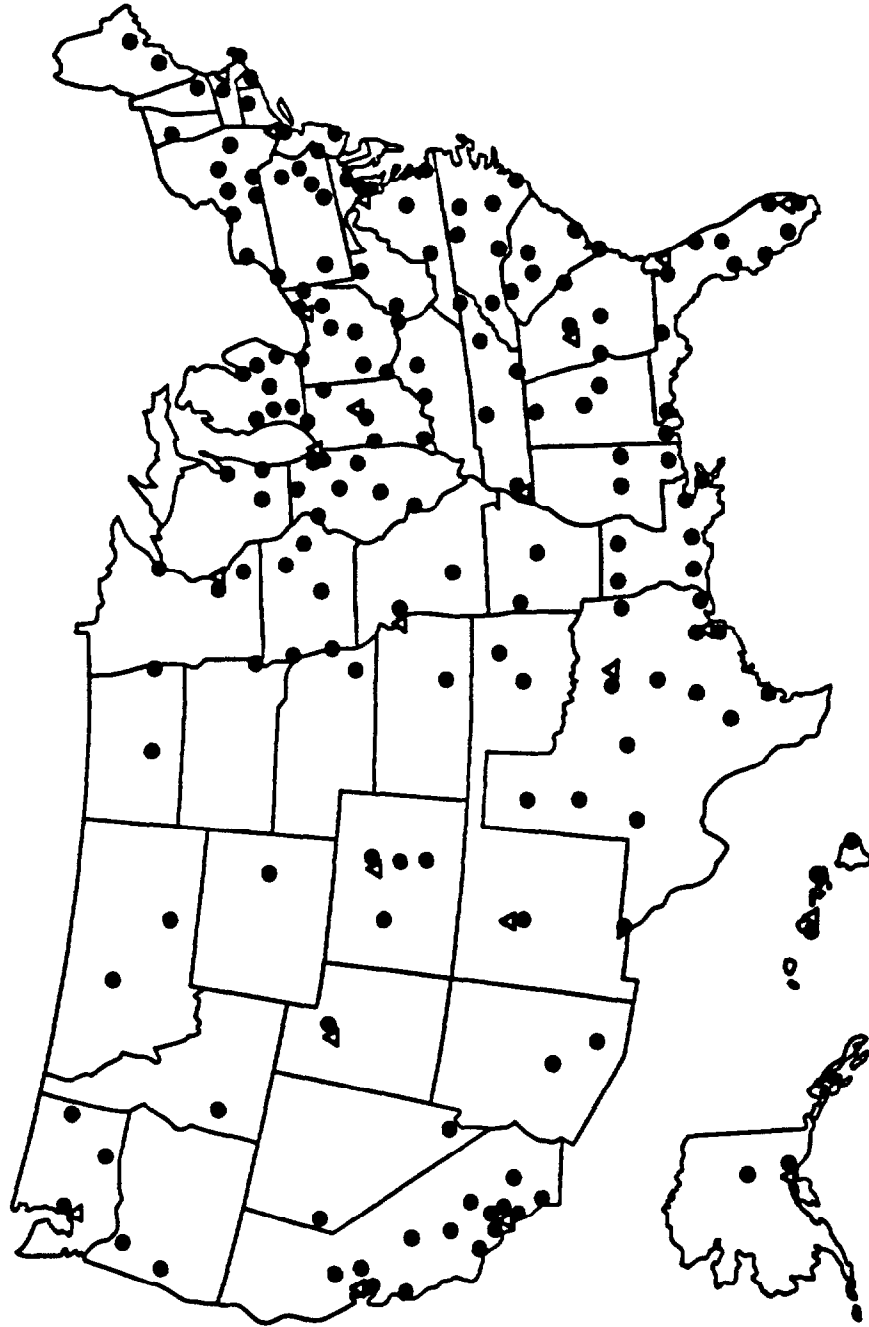
# GAO Ninety-Four New Projects in Capital Investment Plan

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■ 64% – 60 Projects in FY 92 Budget  
□ 36% – 34 Projects Not in FY 92 Budget

# GAO Current 202 En Route & Terminal Facilities

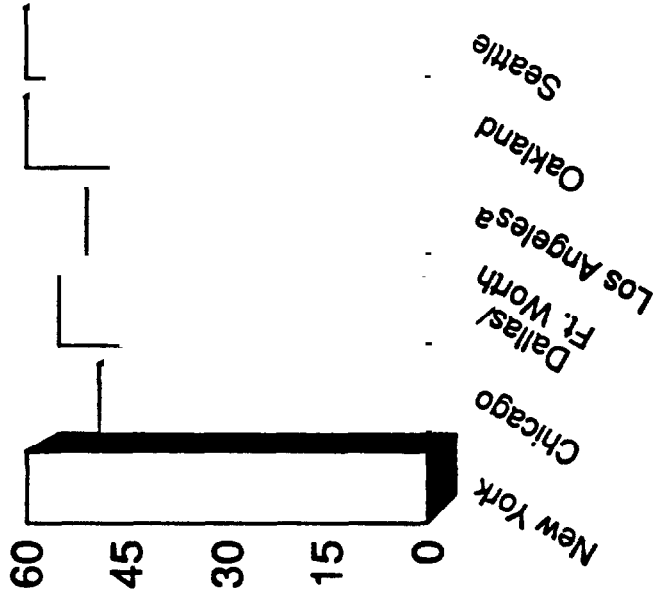


- Legend**
- Terminal Control Facilities
  - ▲ En Route Facilities



# GAO Major TRACONS with Lowest Percentage of FPL Controllers Below Target

100 Percentage  
 // 75 ——— FAA's 75% Target For FPL Controllers



<sup>a</sup>Averages Four Area TRACONS: Los Angeles, Burbank, Coast, & Ontario.

RECENT GAO REPORTS AND TESTIMONIES  
RELATED TO FAA'S F&E AND OPERATIONS BUDGETS

AIR TRAFFIC CONTROL: Status of FAA's Modernization Effort  
(GAO/RCED-91-132FS, Apr. 15, 1991).

AVIATION SAFETY: Limited Success Rebuilding Staff and Finalizing  
Aging Aircraft Plan (GAO/RCED-91-119, Apr. 15, 1991).

FAA STAFFING: New Pay Act Offers Options to Bolster Maintenance  
Work Force (GAO/RCED-91-92, Apr. 2, 1991).

AIR TRAFFIC CONTROL: The Interim Support Plan Does Not Meet FAA's  
Needs (GAO/RCED-90-213, Sept. 11, 1990).

AIR TRAFFIC CONTROL: Continuing Delays Anticipated for the  
Advanced Automation System (GAO/IMTEC-90-63, July 18, 1990).

Serious Shortcomings in FAA's Training Program Must Be Remedied  
(GAO/T-RCED-90-86, June 6, 1990).

AIR TRAFFIC CONTROL: Ineffective Management Plagues \$1.7 Billion  
Radar Program (GAO/IMTEC-90-37, May 31, 1990).

FAA Encountering Problems in Acquiring Major Automated Systems  
(GAO/T-IMTEC-90-6, Apr. 26, 1990).

Issues Related to FAA's Fiscal Year 1991 Budget Request (GAO/T-  
RCED-90-66, Apr. 18, 1990).

AIR TRAFFIC CONTROL: Status of FAA's Efforts to Modernize the  
System (GAO/RCED-90-146FS, Apr. 17, 1990).

Issues Related to FAA's Modernization of the Air Traffic Control  
System (GAO/T-RCED-90-32, Feb. 27, 1990).

AVIATION SAFETY: Management Improvement Needed in FAA's  
Airworthiness Directive Program (GAO/RCED-90-94, Feb. 16, 1990).

AVIATION SAFETY: FAA's Safety Inspection Management System Lacks  
Adequate Oversight (GAO/RCED-90-36, Nov. 13, 1989).

AIR TRAFFIC CONTROL: FAA's Implementation of Modernization  
Projects in the Field (GAO/RCED-89-92, June 28, 1989).

AVIATION SAFETY: Serious Problems Continue to Trouble the Air  
Traffic Control Work Force (GAO/RCED-89-112, Apr. 21, 1989).

AIR TRAFFIC CONTROL: FAA Should Define the Optimal Advanced  
Automation System Alternative (GAO/IMTEC-89-5, Nov. 30, 1988).

AIR TRAFFIC CONTROL: Continued Improvements Needed in FAA's Management of the NAS Plan (GAO/RCED-89-7, Nov. 10, 1988).

FAA STAFFING: Improvements Needed in Estimating Air Traffic Controller Requirements (GAO/RCED-88-106, June 21, 1988).

Ordering Information

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