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DEPARTMENT OF
TRANSPORTATION

Enhancing Policy and
Program Effectiveness
Through Improved
Management



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Comptroller General
of the United States

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To the President of the Senate and the
Speaker of the House of Representatives

This report on the Department of Transportation is one of a series of GAO management reviews of federal departments and agencies. Our purpose was to assess the Department's management, analyze problems and determine their underlying causes, and recommend actions to improve operations. The report illustrates how the Department can build on and institutionalize the Secretary's efforts for better planning and implementation of policy and safety program initiatives, redefine its role in managing and overseeing grants programs, and strengthen its financial, information, and procurement systems.

We are sending copies of this report to the Secretary of Transportation; the Director, Office of Management and Budget; interested congressional committees and subcommittees; and individual members

A handwritten signature in black ink that reads "Charles A. Bowsher". The signature is written in a cursive, flowing style.

Charles A. Bowsher
Comptroller General
of the United States

Executive Summary

Purpose

The Department of Transportation has played a key role in this nation's efforts to provide for the safe and efficient movement of people and goods. Comprising such diverse organizations as the Coast Guard, Federal Aviation Administration, and Federal Highway Administration, the Department has spent hundreds of billions of dollars on activities that touch everyone's daily life.

This report is one in a series of GAO management reviews of federal departments and agencies. GAO concentrated on the Department's major missions and current Secretarial initiatives and related the performance of management systems to key programs and to the information needs of Department officials. GAO has identified opportunities to improve Department-wide management.

A forthcoming supplement to this report provides further details on GAO's findings and recommendations. Copies of the supplement will be provided to Department officials, congressional staff, and other groups working on transportation issues and will be available upon request.

Background

The Department's nine administrations manage over 100 programs, ranging from construction grants, operating subsidies, safety regulation, and consumer information to air traffic control and the operation of two major airports. The Department has almost 100,000 employees and an annual budget of about \$27 billion.

The past few years have been a time of change. Much of the Department's focus has shifted from helping to build a national transportation system to helping to maintain it. The Department's role in and relationship with the transportation community are also changing as federal regulatory philosophies have changed and greater reliance is placed on state and local governments and the private sector to operate transportation programs and systems. Moreover, the Department is carrying out its role in an environment characterized by a rapid rate of technological innovation and increasing budget constraints.

Results in Brief

GAO concentrated on identifying ways that the Department can strengthen management performance to achieve major policy and program goals. This includes ways for the Department to build on and institutionalize achievements gained from such efforts as the National Air Transportation Inspection Program, the Department's Safety Review Task Force, and other initiatives by the Secretary of Transportation to

improve management control. Needed improvements include (1) a continuing, systematic approach for measuring progress in achieving safer transportation, (2) reassessing and clarifying the Department's role in administering grants, (3) modernizing the Department's financial, information resource, and procurement systems, (4) providing a Department-wide focus for human resource management, and (5) a stronger role for the Office of the Secretary in policy direction and management.

Principal Findings

Achieving Safer Transportation

Secretary Elizabeth H. Dole has made enhancement of transportation safety one of the highest and most visible priorities of her administration. Since early 1983 she has taken numerous actions to identify safety problems and needs across all modes of transportation. The Secretary has undertaken a variety of initiatives—including rulemakings, inspections, enforcement actions, and publicity campaigns—to increase the safety of the nation's transportation system. Since 1984, the Secretary's Safety Review Task Force has conducted reviews of Department safety programs and made numerous recommendations for management and program improvements. GAO found efforts underway throughout the Department to implement the Task Force's recommendations. Through improved definition of safety program objectives, as well as adoption of appropriate measures of effectiveness and productivity standards, GAO believes the Department would be able to achieve even greater success in enhancing all of its safety programs. It could do this while continuing to promote and implement government-wide goals of deregulation, defederalization, and deficit reduction. For example,

- Using the Department's Air Carrier Inspection program, GAO illustrates how management can further its efforts to develop and apply performance indicators as a way to link the ultimate goal of accident prevention with ongoing program activities. Those indicators include such things as the frequency and severity of inspection violations at the various air carriers. Some of these indicators can be used to measure safety risk and identify carriers likely to exceed acceptable risk guidelines. They can also be used to assure that managers get timely, relevant information for targeting limited inspection resources.
- GAO uses the Department's Commercial Vessel and Railroad Safety programs to illustrate how the Department can establish standards for the

quality, timeliness, and efficiency of its services. By using such standards to set an example, the Department would have the means to measure the performance of its resources and to strengthen program results (See ch 2)

Clarifying the Grants Role

Grant programs accounted for over 60 percent of the Department's budget authority in fiscal year 1986

Various changes in the structure and administration of grant programs have reduced the Department's control over its recipients now have greater authority to manage grant funds according to their own needs. Grant program goals and objectives have changed and more changes are planned.

Department initiatives such as its legislation on urban mass transit and federal highway program requirements for triennial reviews by the Department Administration of its grantees, are examples of the Department's response to change to achieve better management.

GAO believes that the Department now has the authority to impact the changes and resolve some of the more appropriate federal role in administering grant programs. major role issues are (1) how the Department and grantees share program accountability, considering the changes in responsibility that have taken place, and (2) the Department's abilities, functions, and requirements need to be re-evaluated to best achieve that level of accountability.

Clarifying the Department's role is essential to developing a strategy to deal with continuing grant program problems identified by GAO and others. The Department's role is defined will largely determine the Department's role and how it should be organized to manage its programs. Chapter 3 presents a range of strategies for consideration by the Department. Some of the approaches may require legislative clarification.

Improving Management Systems

Modernizing departmental financial management, ensuring productive use of information, and strengthening procurement procedures are major challenges facing the Secretary and her managers. At the same time, they collectively represent an opportunity for the Department to more effectively respond to policy choices, make resource allocation decisions, and achieve program objectives. For example, GAO found that

- Completing and implementing the Department-wide accounting system under development will help resolve existing financial management weaknesses, strengthen internal controls, and aid development of an integrated budget, accounting, and information system.
- Three computer systems supporting Department grant programs and two systems supporting safety programs have had cost and time overruns and operational problems relating to data reliability, response time, hardware capacity, and duplication of information. These problems could have been prevented or mitigated by following Department procedures required for system development.
- Problems with the procurement process could be identified and corrected if systems evaluation and certification were completed. Problems noted by GAO and others include such things as unanticipated parts shortages and nonadherence to such procedural requirements as price analysis and transaction approvals.

Building on the work already underway within the Department to improve and strengthen these management systems, GAO offers an agenda of actions needed to help achieve both long- and short-term objectives in each area. (See ch. 4.)

Managing Human Resources

The 1981 strike by air traffic controllers exposed serious personnel management problems within the Federal Aviation Administration (FAA). Facing up to the challenge this represented, as well as the numerous internal and external changes confronting the agency and its people, FAA has undertaken a major effort to not only improve employee relations but also change the way it manages the valuable resource its people represent. FAA's new emphasis on the strategic management of its human resources is patterned after similar, successful efforts in the private sector and resembles in important respects innovative initiatives recently undertaken elsewhere in the federal government. Other administrations within the Department are also facing significant changes in their operating environments. These changes include modifications to the range and scope of their activities inspired by government-wide defederalization, deregulation, and deficit reduction emphases, as well

as changes in the composition of the labor force, advances in technology, and pressures to increase productivity. The National Highway Traffic Safety Administration's highway safety grant program, for example, is changing from a traditional grant-in-aid, standards-achievement type program to one in which the federal government seeks to play a catalyst role, promoting safety efforts and innovative program development at the local level. GAO discusses the FAA human resource management effort and why such an undertaking may be beneficial Department-wide. (See ch. 5.)

**Formulating, Implementing,
and Monitoring
Transportation Policy**

The Department is responsible for identifying transportation problems and providing leadership in the development of national transportation policies. Departmental policy leadership is exercised in various ways, including through the development of proposals for consideration by the President and the Congress. Under the Secretary's leadership the Department has been active in developing far-reaching policy proposals, and Department officials can point to a number of noteworthy achievements, particularly in the area of safety policy. At the same time, however, GAO found that the Department could be more successful in carrying out its policy leadership role if it were to adopt a more systematic and strategic approach to policy formulation, implementation, and monitoring. GAO also found that increased attention to the data collection and analysis needs implicit in this role would further enhance the Department's ability to successfully influence transportation policy. Among the benefits GAO foresees from adopting such actions are an improved ability to

- build upon and institutionalize the type of program and policy assessments represented by the efforts of the Secretary's Safety Review Task Force;
- anticipate problems, develop solutions, and evaluate results,
- formulate legislative proposals and shape policy in a variety of other areas, and
- develop a research and development strategy that directs increasingly limited resources to areas of priority need and those where the potential payoffs are greatest. (See ch. 6.)

Recommendations

GAO is recommending a series of specific actions to be taken by the Secretary of Transportation. These actions are aimed at furthering and institutionalizing the Secretary's efforts for better planning and implementation of policy and safety program initiatives and strengthening

the Department's financial, information, and procurement systems GAO provides examples and suggestions on how its recommendations might be implemented, including ways for the Department to build on initiatives already underway (See chs 2, 4, and 6.) GAO is also recommending that the Department redefine its role in managing and overseeing grant programs and provide a prominent Department-wide focus for human resource management To achieve these objectives, GAO provides alternative organizational approaches and highlights some of the considerations basic to management decisions in these areas. (See chs. 3 and 5)

Agency Comments

The Department generally agreed with the majority of GAO's recommendations, noting that the report provides constructive comments that can help it build on the momentum already underway on many initiatives

The Department, however, took exception to several of the characterizations and conclusions concerning the management and policy processes and program administration contained in chapters 3 and 6 In general, GAO continues to believe that a more strategic and systematic approach to policy and program management would improve the Department's chances for achieving its goals and objectives GAO addresses the Department's concerns at the end of each of these chapters The full text of the Department's comments is included as appendix I

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Abbreviations

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| ADP | automatic data processing |
| BMCS | Bureau of Motor Carrier Safety |
| CICA | Competition in Contracting Act of 1984 |
| DOT | Department of Transportation |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FAR | Federal Acquisition Regulations |
| FHWA | Federal Highway Administration |
| FMFLA | Federal Managers' Financial Integrity Act of 1982 |
| FRA | Federal Railroad Administration |
| GAO | General Accounting Office |
| HRM | human resource management |
| IRM | information resource management |
| IRS | Internal Revenue Service |
| NAPA | National Academy of Public Administration |
| NAS | National Airspace System plan |
| NATI | National Air Transportation Inspection program |
| NHTSA | National Highway Traffic Safety Administration |
| OIG | Office of Inspector General |
| OISTP | Office of Information Systems and Telecommunications Policy |
| OMB | Office of Management and Budget |
| OST | Office of the Secretary of Transportation |
| R&D | research and development |
| RSPA | Research and Special Programs Administration |
| TSARC | Transportation Systems Acquisition Review Council |
| UMTA | Urban Mass Transportation Administration |

Introduction

Since its creation in 1967, the Department of Transportation (DOT) has played a major role in helping to develop one of the finest transportation systems in the world. Between fiscal years 1967 and 1985, annual Department expenditures increased from \$5.8 billion to \$25 billion. In constant 1967 dollars, Department outlays increased 22 percent each year during this period.

Today, with such diverse objectives as enhancing transportation safety, reducing economic regulation, and increasing reliance on user charges, the Secretary of Transportation oversees

- a national highway system built with federal/state cooperation, but now shifting from building to maintenance;
- a commercial aviation system with the lowest accident rate of any mode of transportation, yet striving to keep pace with technological changes and rapid growth;
- a railroad industry revitalized by reduced economic regulation after years of decline;
- a merchant marine with an increasingly aged fleet facing greater international competition;
- public mass transit systems struggling to become economically viable elements of urban living; and
- coastal and inland waterway safety for commercial and recreational boaters and an increasing role in illegal drug interdiction.

Transportation Environment: Realities of Managing the Department

DOT was designed to be a highly decentralized organization. The Office of the Secretary of Transportation provides policy direction, coordination, and review. The nine operating administrations carry out departmental programs and activities under broad delegations of authority from the Secretary.

DOT's operating administrations issue regulations, set standards, conduct inspections, provide other direct services, and administer grants and subsidies. In fiscal year 1985 the Department had budget authority of nearly \$29 billion and funded about 109 programs, in fiscal 1986 its budget authority was reduced to approximately \$27 billion.

Managing DOT is a complex and challenging task. The Department must balance the concerns and demands of transportation shippers, consumers, users, states, municipalities, and a host of other interests. For

example, the Department deals regularly with 29 congressional committees, more than 100 transportation interest groups, and over 40 major intergovernmental groups

DOT continues to adjust to four recently enacted laws changing the government's role in economic regulation of trucking, railroads, airlines, and interstate busing. At the same time it has been working to improve its regulation and oversight of transportation safety. Also, in response to the President's policy and legislative agenda, DOT has proposed a substantially reduced federal role in some areas of transportation. For example, the Department proposed and has recently received legislative approval to sell Conrail to the private sector and transfer Dulles and Washington National Airports to a regional authority.

Objectives, Scope, and Methodology

Our objectives in doing this broad-based review of the management of the Department were to identify how DOT can

- better anticipate emerging issues,
- provide programs and services more efficiently and effectively,
- assure the integrity of key management support systems (financial, information, and procurement), and
- better manage human resources

To address these objectives, we

- Analyzed Department policy and program planning, implementation, and monitoring by examining five safety programs, Department-wide research and development (R&D) activities, data collection and analysis, and the Secretary's role in providing policy direction and oversight
- Interviewed congressional staff, interest groups, state and local officials, current and former DOT officials, and academicians familiar with the Department and its programs to obtain diverse perceptions regarding important transportation issues
- Reviewed the findings of internal DOT reports, including four studies completed by the Secretary's Safety Review Task Force in the areas of air carrier, motor carrier, hazardous materials, and railroad safety, and identified efforts and initiatives underway in the Department to strengthen management activities
- Analyzed prior GAO and Office of the Inspector General (DOT/OIG) reports, building and using an automated data base to identify historical trends and cross-cutting management issues

- Reviewed the administration and oversight of three grant programs, using tests of grantee adherence to grant agreements, and tests of compliance with the management systems and processes used by the administrations.
- Reviewed DOT's financial, information, and procurement systems by (1) testing accounting transactions and internal controls, (2) testing for compliance with DOT procedures used to develop information systems, and (3) analyzing procurement requests over \$100,000
- Reviewed the Federal Aviation Administration's (FAA) plans for improving human resource management.

Our review was conducted in accordance with generally accepted government standards

From the inception of our review, the Secretary of Transportation and her top managers supported our work. We found this support very helpful. For example, discussions with representatives of the Secretary's Safety Review Task Force, as our work progressed, proved highly effective in jointly exploring practical management solutions to emerging safety issues.

Ways to Strengthen the Department's Management of Safety Programs and Resources

Under Secretary Dole's leadership, DOT has taken significant strides toward improving its management of safety programs and resources. We believe the Department should build on and sustain the progress it has achieved by implementing better ways to define objectives and evaluate effectiveness for its safety programs. Our review identifies three ways to do this.

- Develop and apply operational measures of effectiveness, such as the frequency of noncompliance with safety standards, to define safety program objectives, monitor performance, and allocate resources
- Establish and use standards of quality, timeliness, and efficiency for program delivery to set productivity improvement goals and measure productivity change
- Compare planned with actual program results based on effectiveness measures and productivity standards.

Collectively, these actions will strengthen the Department's ability to (1) measure progress in achieving safer transportation, (2) balance safety with its deregulation, defederalization, and deficit-reduction goals, (3) determine safety resource needs, and (4) deliver program services effectively and efficiently while assuring accountability for program results.

Much of our review effort focused on DOT safety activities because Secretary Dole has made transportation safety a high priority. The Secretary has defined her goal in simple terms: make the safest system in the world ever safer. To support this goal, the Secretary launched a series of top-level reviews and related actions to emphasize safety Department-wide, and during our review we found efforts ongoing throughout the Department to strengthen safety program management. Our review shows that the Department would be even better equipped to assess its success in meeting the Secretary's goal if (1) program objectives were clearly defined in terms that facilitate measuring progress in achieving safer transportation and (2) program managers systematically used relevant indicators to compare performance with objectives. Both actions depend on acquiring and analyzing accurate and timely data regarding program workloads, resource utilization, and related activities.

Knowing how well safety programs work is especially important in today's fiscal and regulatory climates. As the Secretary stated in testimony before the House Subcommittee on Surface Transportation, she and the Congress face difficult choices as they work to reduce the federal deficit without compromising their mutual commitment to maintain a safe and efficient transportation system. The need to control federal

spending, together with continuing efforts to deregulate the transportation sector and limit the federal role in transportation affairs, places a premium on the Department's ability to evaluate its programs and manage limited resources as effectively and efficiently as possible

Operational Measures of Effectiveness: A Better Way to Define Objectives, Monitor Performance, and Allocate Resources

The ultimate goal of DOT safety programs is to prevent accidents and their consequences, death, injury, and property damage. Progress in meeting this goal is frequently assessed on the basis of changes in accident rates, fatality rates, or related indices. While DOT has used accident rates to set program goals and assess overall performance, in most instances the relationship between accident rates and specific program tasks, such as safety inspections, is too remote and tenuous to be accurately measured. Moreover, because accident rates reflect what has already happened, their relevance to accident prevention is limited. For these reasons, management must develop and apply more specific measures to evaluate program operations and determine the most effective ways of using its resources. We call such measures "best proxies" because they serve as substitutes for accident rates. Like accident rates, best proxies stand between the ultimate goal of accident prevention and individual program tasks. Unlike accident rates, they directly measure task results and are useful for identifying unsafe conditions before accidents occur.

For example, one objective in the area of inspections could be to reduce the frequency of noncompliance with safety regulations and standards. Defining the objective in this way provides a direct link between the work inspectors do and the results they can achieve. Monitoring performance in meeting the objective, in turn, provides timelier data to identify safety problems and direct resources at high-risk conditions.

Today the Federal Aviation Administration is collecting and reviewing certain inspection data to support detailed analyses of air carrier safety compliance. Similarly, the Federal Railroad Administration, the Coast Guard, the Federal Highway Administration's Bureau of Motor Carrier Safety, and the Research and Special Programs Administration are either planning to gather required data or have recently implemented data collection systems in the areas of rail, commercial vessel, motor carrier, hazardous materials, and pipeline safety. DOT officials told us that the data obtained will be used to develop improved effectiveness measures for the agencies' inspection and other safety enforcement activities.

To fully illustrate best proxies, the following sections discuss FAA's initial efforts to deal with the impact of airline deregulation on its air carrier inspection program, actions subsequently taken by DOT to improve the program, and how FAA has begun to build on those actions to develop a more systematic approach to safety inspection. FAA's program is instructive because management has to balance the goal of assuring adequate inspection coverage with the goals of facilitating airline deregulation and containing the federal deficit. FAA was unable to keep those goals in balance primarily because it was not equipped to evaluate program needs amid rapid changes in the deregulated industry environment. Ongoing improvements initiated by Secretary Dole are intended to help FAA regain and sustain this balance. Other DOT administrations with safety programs also must balance competing goals as the Department continues to work for economic deregulation, defederalization, and deficit reduction.

**Air Carrier Inspection:
Importance of Balancing
Safety With Other Goals**

As a result of the Airline Deregulation Act of 1978, many new carriers joined the commercial airline industry while existing carriers expanded or restructured their operations in response to increased competition. These changes benefited the public with lower fares and broader services. They also increased the workload of FAA's inspection staff when FAA was under pressure to reduce spending.

To enforce compliance with safety regulations and standards, FAA inspectors—in addition to inspecting ongoing operations and maintenance practices—certify the qualifications of new air carriers and major changes in the operating scopes of existing carriers. Industry growth following deregulation greatly increased the demand for FAA certification. To be sure, FAA could not have predicted the magnitude of that demand. But once deregulation became law, FAA had no system for monitoring the impact of industry growth on inspector workloads and staffing needs. Instead, top management set the overall goal of reducing accident rates and delegated decisions on the frequency and scope of inspection work to managers in the field. Until recently, those managers were not provided with definitive guidance or direction on the minimum levels of inspection to be done.

Working short-handed and without clear guidance, local managers gave priority to certification to support deregulation and cut back on inspection work. At the same time, many carriers, due to rapid growth and other factors, were having safety compliance problems. Because FAA had

stopped collecting nationwide workload data, it did not have information to assess the trade-offs between certification and inspection and the consequences for carrier compliance with safety requirements. In addition, although FAA had assured the Congress that it could deal with workload demands by increasing productivity, no system was put in place to measure resource efficiency and determine whether productivity was improving.

Furthermore, FAA had not updated the staffing standards used in formulating its annual budget to account for significant changes in the types and mix of program tasks, such as additional inspector time required to certify new carriers. As a result, resources were not accurately matched with workload, and FAA could not defend the program against mandated budget cuts. Meanwhile, to meet the goal of reducing accident rates, field offices defined annual objectives and monitored performance in terms of program outputs, including the number of inspections they planned to conduct. Since accidents often result from conditions (e.g., bad weather) that are difficult to relate to inspection work, monitoring outputs did not provide the information FAA needed to evaluate the impact of inspection on safety.

Because of these conditions, FAA appeared unresponsive to public safety concerns and lost some control over program decisions. For example, despite early warnings from the Congress, the National Transportation Safety Board, and internal management ranks that additional inspectors would be required to meet workload demands, FAA did not significantly increase inspection staffing until 1981. Furthermore, the following year it cut the staff to support the goal of reducing the federal deficit, then increased it 2 years later under pressure from the Congress. Until September 1985, nearly 7 years after deregulation became law, FAA was not equipped to tell the Congress how many inspectors it needs.

Today FAA is revamping its program as a result of actions launched by the Secretary in 1984. The Secretary's initiatives resulted in an FAA plan to overhaul program operations and the decision, announced in September 1985, to substantially increase program staff. Four key initiatives were:

- National Air Transportation Inspection (NATI) Program. Conducted by FAA in 1984, NATI involved an intensive 3-month study of air carrier safety compliance and FAA's inspection program. The study inspected the flight operations and airworthiness of 327 carriers and recommended several actions to standardize interpretation and application of

safety requirements, provide inspectors with timelier information to conduct their work, and assure that safety rules and regulations are kept current to reflect changes in industry practices. A panel of outside experts, convened by FAA to evaluate safety conditions based on the study's findings, also identified several actions for strengthening program management.

- Task Force Report on Flight Standards Safety This report, issued in August 1985, was the first in a series of safety program reviews by the Secretary's Safety Review Task Force. Among other things, the Task Force recommended that FAA improve the timeliness and responsiveness of its rulemaking system, standardize safety regulations and policies, and strengthen communications both internally and with the aviation community.
- Safety Activity Functional Evaluation (SAFE) Project. SAFE is FAA's blueprint for overhauling the inspection program. For example, the project's job-task analysis and resultant staffing standards, completed in 1985, were the basis for the Secretary's decision to add 500 inspectors over a 3-year period.
- Flight Standards National Aviation Safety Inspection Program. This is FAA's annual plan for conducting standardized, routine safety inspections as well as special, in-depth inspections of selected carriers and support facilities. The initial program plan, implemented in February 1986, represents management's first step toward institutionalizing the methodology developed for the 1984 NATI study. The plan for 1986 focused inspection work on certain engine repair stations and on commercial carriers that derive significant income from military charter flights. Such carriers were targeted as a result of a December 1985 airline accident that killed 248 U.S. military personnel and 8 crew members.

Based on these and related initiatives, FAA is making a comprehensive, systematic effort to update safety regulations; realign inspector duties and responsibilities to more closely fit conditions in the airline industry; use automated program data to determine staffing requirements; revise its criteria and procedures for hiring and training inspectors, strengthen its ability to anticipate changes in the program environment; and assure that inspection offices receive accurate, timely, and consistent policy and program guidance. For example, inspection findings under the 1986 national inspection plan are being collected and reviewed by FAA headquarters. Headquarters officials told us that they are systematically analyzing reported findings. They intend to use the results of their analyses to formulate future annual inspection plans, develop operational effectiveness measures, and furnish field offices with resource management guidance.

**NATI Provides
Methodological Framework
for Developing Best Proxy
Measures**

The NATI study, Safety Review Task Force report, and earlier reviews by DOT's Inspector General and others show that the effectiveness of FAA's program depends on the quality of inspection work and the currency and relevancy of the regulations inspectors enforce. The Secretary's Safety Review Task Force also has stressed the importance of assuring efficient use of staff and targeting limited resources in FAA's and other DOT inspection programs.

Our review of the findings reported by NATI and FAA's panel of experts illustrates how best proxies of accident rates could be developed to better evaluate inspection work and safety regulations. It also illustrates how best proxies could be applied to estimate safety risks and target resources at high-risk conditions. While we use FAA's program for illustration, best proxies are applicable to other DOT safety programs as well, such as commercial vessel, railroad, motor carrier, and recreational boating.

Safety Conditions Found by NATI

The NATI study concluded that most air carriers (about 95 percent of those inspected) were meeting FAA safety requirements. On the other hand, it reported more than 4,000 carrier deficiencies (noncompliance with FAA regulations or use of unsafe operating practice) and resulted in 16 companies suspending or curtailing operations or withdrawing pilots from service. Among the types of deficiencies reported were (1) aircraft not properly equipped with emergency equipment, (2) lack of, inaccurate, or incomplete records on flight and duty time, cabin crew training, and flight crew qualifications, and (3) inexperienced, unqualified, over-extended, and/or ineffective carrier management personnel.

FAA's panel of experts determined that about 47 percent of the carrier deficiencies reported by NATI had presented a direct or adverse effect on flight safety or a high potential for an unsafe condition. It also determined that about 12 percent of NATI inspections evidenced an unsatisfactory safety condition, based on the number and severity of deficiencies cited in inspection reports. Table 2.1 summarizes the parameters and key findings of the panel's evaluation.

**Chapter 2
Ways to Strengthen the Department's
Management of Safety Programs
and Resources**

Table 2.1: Frequency and Severity of Carrier Safety Deficiencies as Determined by FAA Review Panel Based on NATI Inspections

| | | Rate ^b |
|---|--------|-------------------|
| Parameters of Panel's evaluation: | | |
| NATI inspections reviewed | 13 634 | |
| NATI-reported safety deficiencies | 4 606 | |
| Inspections finding no deficiency | 66.2% | |
| Inspections finding a deficiency | 33.8% | |
| Severity of 4,606 safety deficiencies:^a | | |
| Level 1 severity | 572 | 4.2 |
| Level 2 severity | 1 890 | 13.9 |
| Level 3 severity | 2 144 | 15.7 |
| Carrier safety conditions:^c | | |
| Satisfactory condition | 11 815 | 86.6 |
| Unsatisfactory condition | 1 601 | 11.7 |

^aThe panel applied these criteria in judging severity levels

Level 1 Safety was not directly or adversely affected or the potential to affect safety was extremely low

Level 2 Little effect or little potential effect on safety

Level 3 Safety was directly or adversely affected or a high potential for an unsafe condition existed

^bFrequency per 100 inspections

^cA safety condition was rated "unsatisfactory" if an inspection report contained (1) at least one level 3 deficiency or (2) three or more level-2 deficiencies or four or more level 1 deficiencies or (3) four or more deficiencies of any severity level. Conditions not meeting any of these criteria were rated "satisfactory"

In addition, the panel assessed the quality of FAA's inspection work based on its review of over 13,000 inspection reports. It determined that

- About 6 percent of the reports, representing over 900 inspection staff hours, either (1) were illegible or (2) did not show that an inspection had been done, were not written in accordance with established guidelines, and/or provided little or no useful information to local supervisors
- Forty-one percent of the reports, while generally complying with guidelines, contained little or no elaboration of findings and provided minimal information to supervisors

Linking Outputs With Results to Evaluate Effectiveness

Using techniques like those employed by the NATI review panel, FAA could develop best proxies based on inspection data reported under its national inspection program to establish a closer link between program outputs and their results. By applying those proxies to set objectives and monitor performance, it could get timelier and more complete information to evaluate inspection work and the regulations inspectors

enforce Table 2.2 illustrates how specific types of proxies could be defined and used for these purposes

Table 2.2: How Best Proxies Could Be Defined and Used in FAA's Inspection Program to Define Objectives, Monitor Performance, and Evaluate Effectiveness

| Best proxies | Applications |
|--|---|
| Frequency of total safety deficiencies per carrier | In addition to levels of output, define annual inspection objective as reducing the average rate of total safety deficiencies, rate of most severe deficiencies, and/or rate of unsatisfactory safety conditions. Monitor performance in meeting objective and compare with trends in accident rates. For example, if accident rates rise while deficiency rates fall, management should evaluate whether it is doing the right kinds—in addition to the right numbers—of inspection tasks. |
| Frequency of most severe deficiencies per carrier (e.g., review panel's severity level 3) and/or | |
| Frequency of unsatisfactory safety condition per carrier | Classify carrier deficiencies by regulatory areas or specific safety rules, then analyze for patterns or trends. A low deficiency rate may indicate that a regulation is being effectively enforced—or that the regulation is obsolete. Conversely, a high deficiency rate may signal inadequate enforcement and/or the need to clarify the regulation. |
| | Compare reported safety deficiencies with the causes and contributing factors of accidents identified by the National Transportation Safety Board. Investigations by the Board have shown that the types of deficiencies reported by NATI, such as inadequate carrier training programs, have contributed to aviation accidents. |
| Quality of inspection report based on compliance with standards on information to be included and reporting thoroughness | Define annual objective as maintaining (or improving) the level of compliance with inspection report quality standards and monitor individual reports for compliance. Marginal quality could signal, for example, that more training or better guidance is needed to assure satisfactory performance. |

Targeting Resources Based on Safety Risk

Using similar techniques, FAA could develop criteria for targeting inspection resources at high-risk conditions. Targeting is important because FAA (and other DOT administrations doing safety inspections) will never have enough resources to inspect all carriers all of the time. Our analysis shows that resource targeting involves four elements:

- Risk measures based on carrier deficiency rates, unsatisfactory condition rates, or other best proxies of accident rates that management develops
- The level or levels of risk (e.g., deficiency rate or rates) defined by management as guidelines for making resource allocation decisions
- Risk precursors—factors or conditions that can predict, on a reasonably reliable basis, which carriers are likely to present a level of risk exceeding established guidelines

- Most importantly, the professional judgment of program managers and staff in making resource decisions.

Risk measures Several years ago DOT's Inspector General recommended that FAA analyze inspection results to identify and focus resources on carriers with disproportionately large numbers of safety noncompliances. The Inspector General had suggested, in other words, that FAA use noncompliance as a measure of risk, with larger numbers of noncompliances representing higher risk and, accordingly, greater need for inspection coverage. The same concept can be applied using carrier deficiency rates, unsatisfactory condition rates, or other best proxies. For example, we found that among NATI-inspected carriers, the higher the risk—as measured by total deficiency, severity 3, and unsatisfactory condition rates—the smaller the number of carriers affected.

Risk levels. Targeting also depends on defining levels of risk as guidelines for deciding where to direct inspection resources, based on the inverse relationship between deficiency rates and number of carriers affected. For example, if management were not willing to accept any safety deficiencies (i.e., zero risk), it would have to inspect all carriers and no resource targeting could occur. On the other hand, if it were willing to accept deficiencies having little or no effect on safety, the NATI findings indicate that inspections would target about 75 percent of the carrier population. And if management were willing to accept severity 3 rates below, say, 10 percent, inspections would target about half the population.

The levels of risk that FAA should set as targeting guidelines is a decision it must make based on available resources and the views of the Secretary, the Congress, and other concerned parties. But it is important to recognize that FAA has always accepted risk in doing inspections although the level has not been measured and decisions on how much to accept have implicitly been made by individual inspection offices. The Secretary's decision to hire more inspectors implies that the risk FAA accepted, albeit unmeasured, has been too high.

Risk precursors Management also needs a way to reckon which carriers are likely to exceed safety risk guidelines in order to target inspection work. The NATI study offers some help in this regard. It reported that carriers experiencing compliance problems usually had one or more of the following characteristics:

- A major change in operating scope, such as significant route expansion, fleet expansion, or introduction of new type of aircraft
- A relatively large amount of maintenance and/or training done by outside contractors rather than in-house
- Inadequate internal audit procedures to assure self-compliance with safety policies, practices, standards, and federal regulations
- Financial, labor-management, or other corporate problems such as rapid turnover of key personnel
- Management skills and philosophy incompatible with sound practices, such as slighting safety for the sake of marketing or financial considerations

Inspection offices could routinely monitor these various factors to identify carriers most likely to experience safety compliance problems. Information on changes in carrier operating scope or equipment should be readily available since significant changes in those areas require revision and approval of the authorizing certificates held by FAA field offices. Similarly, information on carrier management personnel, training and maintenance arrangements, and internal audit procedures should be documented in the records those offices maintain. The problems frustrating routine monitoring have been (1) equipping inspection offices with the automated systems to efficiently manage voluminous records, (2) providing inspection staff with the training to deal with new industry practices, and (3) keeping safety rules and regulations current to account for the ramifications of new practices and industry changes. The initiatives undertaken by the Secretary and followup actions underway at FAA are aimed at correcting those problems.

Professional judgment. The judgment of program managers and staff in deciding where to put resources is critical because no best proxy or rule of risk can substitute for their professional knowledge, experience, and skill. On the other hand, FAA has to provide its people with the tools to fully exercise professional judgment. Best proxies and their applications are tools for making judgments on a more informed and consistent basis.

**Productivity
Improvement: A
Systematic Way to
Promote Effective and
Efficient Use of
Limited Resources**

FAA's program illustrated how best proxies of accident rates could be applied to define objectives that are both measurable and operational in order to better evaluate effectiveness. This section illustrates how DOT could use productivity standards and goals to complement the use of best proxies. In addition to measuring resource efficiency (output per unit of input), productivity improvement measures the quality and timeliness of program delivery, based on standards that management defines. Service quality and timeliness are important because emphasizing efficiency at their expense is ultimately counterproductive.

The need to increase government productivity is receiving increased attention. In line with his deficit-reduction goal, the President launched a government-wide effort to put productivity improvement into mainstream program services. This is a challenge for many agencies, including DOT; productivity efforts have traditionally focused on ways to cut costs for agency support services (e.g., consolidating or contracting-out common administrative functions), rather than the quality, timeliness, and efficiency of mainstream program delivery. By integrating productivity improvement with planning, we believe DOT would promote effective and efficient use of limited resources and strengthen accountability for program results. The Coast Guard's commercial vessel safety program provides a good illustration.

**Commercial Vessel Safety:
Need to Deliver Quality,
Timely, and Efficient
Program Service**

The Coast Guard's program is aimed at minimizing the loss of life, personal injury, and property damage associated with vessels and other facilities engaged in commercial, scientific, or exploratory operations in the marine environment. Program activities include reviewing and approving vessel construction plans, developing safety standards, inspecting vessels for compliance with standards, documenting vessel and pleasure craft registry, and investigating marine accidents.

Like other government programs, commercial vessel safety has been sandwiched by budgetary constraints and demands for public services. Between 1980 and 1986, staffing declined by about one-third while program responsibilities were essentially unchanged. To meet demand with available resources, the Coast Guard has delegated performance of certain services, including some vessel inspections, to third parties. At the same time, it has called for maintaining or ensuring "current" or "adequate" levels of service without fully defining what those levels are. These conditions, together with changes in the maritime industry, pressures to cut spending, and a lack of good standards for determining

resource needs, have complicated the job of ensuring quality, timely, and efficient program delivery

For example, legislation enacted in 1978 calls for the Coast Guard to annually inspect each manned and unmanned exploratory or production platform (e.g., drilling rig) located on the Outer Continental Shelf. Because of insufficient resources, in 1982 the Coast Guard was able to inspect only 3 percent of the unmanned platforms in the Gulf of Mexico. Coverage in subsequent years was greatly increased with the aid of supplemental funds. Similarly, in 1984 the average backlog for vessel documentation service had reached 33 days for commercial vessels and 80 days for pleasure craft, although management's objective is to provide those services within 1 and 5 days, respectively. As a result of increased management attention, the backlogs were greatly reduced during 1985-86.

On the other hand, our review of available data found that inspection efficiency declined by roughly 20 percent between 1980 and 1984. Both input (staff years) and output (completed tasks) declined as workloads fell and staffing was reduced in response to depressed conditions in the U.S. maritime industry. Output fell at a faster clip mainly because of a shift in vessel construction and repair work from domestic to overseas sites and efforts to focus inspections on older vessels with relatively poor safety records. Although the Coast Guard had closed overseas offices in an effort to cut costs, inspection staff ended up spending relatively more time traveling and less time inspecting. Older vessels, meanwhile, took more time to inspect. In addition, because of international agreements and recurring safety problems, the Coast Guard reinstated certain periodic inspections that had been discontinued. Further, as the recession bottomed out in the maritime industry, the government decided to upgrade its military sealift capacity. This entailed the acquisition of a large number of ships that require Coast Guard inspection. As a result of these conditions, by 1986 inspection staffing was about 4 percent below estimated requirements. Based on analysis of industry and workload trends, management expects the shortfall to increase unless efficiency increases and/or additional resources are obtained.

Throughout 1980-86, management did not have valid staffing standards to determine resource needs. Because of changes in the program environment, such as the shift of vessel repair work to overseas sites and

the increasing complexity of vessel designs, the standards used in formulating annual budgets did not fully reflect the time required to perform program tasks. As a result, resource cuts were programmed into the budget based on inaccurate standards.

Integrating Productivity Improvement With Planning to Assure Accountability

The program plan for commercial vessel safety is the product of a systematic process used throughout the Coast Guard to define goals, set priorities, and formulate annual budgets. This process is an excellent vehicle for integrating productivity with planning, provided that management (1) defines standards for the quality, timeliness, and efficiency of program delivery, (2) uses those standards to determine staffing needs and set annual performance improvement goals, and (3) collects and analyzes sufficient operating data to measure productivity changes and progress in meeting established goals.

As shown in table 2.3, the Coast Guard's goal for vessel inspections has not been defined and measured in fully operational terms.

Table 2.3: Coast Guard Goal for Vessel Safety Inspections

| Inspection goal | Measure used |
|--|---|
| Ensure that the current level of safety is maintained on all inspected vessels while achieving a 15% improvement in resource utilization by 1990 | Historical average annual tonnage loss rate U.S. vessels Personnel hours |

The vessel loss rate does not provide a good measure of the relationship between "current levels" of safety and inspection work. While the rate is measurable, it is not operational because Coast Guard and third-party inspectors cannot be held accountable for annual changes in the rate. Inspectors can and should be held accountable, however, for the quality, timeliness, and efficiency of their work. While the program plan calls for a 15-percent improvement in resource utilization (i.e., efficiency), the Coast Guard, until 1985, did not collect data on the time taken to complete inspection tasks. Nor has it measured performance based on the time those tasks normally should take.

Recent management actions to reorganize inspection activities and obtain better program data have set the stage for developing productivity standards and improved effectiveness measures. In August 1986, the Coast Guard combined and realigned inspection and licensing functions formerly housed under separate vessel and port safety programs.

In addition, in 1985 it implemented the resource component of its automated Marine Safety Information System. The system is now providing detailed operating data, including the number and types of safety violations by individual vessel and class, actual hours spent doing inspections, time traveling to and from inspection sites, time taken to maintain administrative records, and time lost as a result of delays in completing inspections as scheduled. Management plans to use these data to develop more thorough and specific staffing standards. Finally, the Coast Guard has begun to collect exposure data (i.e., vessel traffic levels) for domestic shipments and intends to expand data collection to foreign shipments as well. Because exposure data are very useful in risk analysis (and essential for computing meaningful accident and casualty rates), management's ability to evaluate safety hazards and overall safety performance should increase significantly.

Once it has assembled adequate data, the Coast Guard can start developing productivity and effectiveness measures. As in the case of FAA's inspection program, potential measures of effectiveness include the frequency and/or severity of safety violations. And to strengthen accountability for program delivery, standards of quality, timeliness, and efficiency could be defined and used to set annual productivity goals as part of the current planning process. The Coast Guard's inspection goal, for instance, could be stated as:

"Meet established standards of quality and timeliness for the delivery of inspection service while increasing resource efficiency by 15 percent (as measured by actual number of completed inspections in relation to actual hours spent)."

Defining the goal in this manner provides a framework to monitor performance and measure changes along each productivity dimension—quality, timeliness, and efficiency—essential to the delivery of public services.

Using Operational Measures and Productivity Standards to Determine Resource Needs and Compare Plans With Results

The FAA and Coast Guard programs illustrated how operational measures and productivity standards could help management define objectives, monitor performance, and evaluate effectiveness. This section extends the use of those techniques to the determination of resource needs by looking at the Federal Railroad Administration's (FRA) inspection program. FRA's program also illustrates how productivity standards could be used to assess progress and assure accountability in meeting program goals.

Railroad Safety: Problems and Progress in Managing Inspection Resources

FRA has broad authority to regulate and enforce rail safety under a series of laws enacted since 1970. The agency's principal safety statute, the Federal Railroad Safety Act of 1970, which was passed following a large increase in accidents, established the foundation for FRA's current inspection, rule-making, and related program activities. Although rail safety has significantly improved over the past decade, FRA's management of inspection resources has been criticized in GAO and DOT studies. For example:

- In 1980 the Congress directed the Secretary to submit a systems safety plan that would provide a methodology for determining the frequency and schedules of inspections. The resultant plan, prepared by FRA, set the overall goal of improving safety by 20 percent by the end of 1985, specific reductions were targeted at five high-priority areas such as passenger fatalities. Shortly after issuing its plan, however, FRA dismissed its 20-percent goal as totally arbitrary and characterized its plan as merely a statement of principles. GAO, meanwhile, criticized the plan for not explaining the rationale for safety objectives and how progress in achieving them would be assessed.
- In 1982 GAO questioned whether FRA's inspection force was effectively allocated since the allocation scheme had hardly changed in 10 years and no comprehensive assessment had been made to determine whether resources were matched with needs. In 1984, DOT's Inspector General raised the same question, after finding apparent mismatches in inspector allocations among FRA's eight regions, and recommended that management periodically evaluate inspector deployment nationwide.
- In 1985, however, Secretary Dole's Safety Review Task Force found that FRA had no formal plan or procedure for allocating resources to ensure maximum flexibility and effectiveness, and recommended that FRA take certain actions to improve inspection planning, monitoring, and resource allocation.

FRA has made significant progress in implementing the actions recommended by the Secretary's Task Force. For example, it is implementing a productivity measurement system to identify ways of increasing resource efficiency and to permit closer tracking of regional performance in meeting planned objectives. Additionally, in March 1986 management developed a staffing model for assessing the size of the inspection force and allocations of inspection personnel by regions and safety disciplines. Our review of this staffing model and FRA's annual inspection plans identifies additional actions to build on and enhance the agency's progress in improving resource management.

Determining Resource Needs

Based on its staffing model, FRA has determined that the size of its inspection force is nearly "optimal." This determination rests on strong statistical relationships between (1) a decline in the annual casualty accident rate and (2) concomitant increases in both total inspection output and average output per inspector (efficiency). FRA's model represents a systematic attempt to assess work force requirements in terms of optimizing resource efficiency. While the model relies on increased efficiency to justify staffing levels, however, it is not based on the actual time spent completing inspection tasks or on standards relating to the time those tasks normally should take. Moreover, although efficiency is certainly an important factor, the number of inspectors needed to achieve improved safety also depends on the quality of FRA's inspection work, inspection programs run by the states, and the industry's investment in new track, equipment, and related facilities. By not taking these factors into account, FRA may be imputing to resource efficiency safety improvements that would have occurred apart from increases in inspection output.

For example, between 1979 and 1983 the number of casualties and accidents per million train miles underwent a steady and rather dramatic decline, falling at the rate of 10.5 percent per year. FRA itself attributes much of the decline to economic deregulation and the industry's increased resources to maintain and invest in roadway and other improvements that have made rail operations safer. Our review of publicly reported financial data for Class I railroads¹ found that the decline in the casualty/accident rate between 1979 and 1983 was accompanied by increases in annual operating revenues, maintenance expenditures, and capital outlays for roadway and structures, whether measured on the basis of current or constant dollars. To be sure, attributing all or most of the decline in the rate solely to the industry's improved financial condition would be no more valid than attributing the decline entirely to increased inspector efficiency. Nevertheless, in all likelihood the industry's financial condition under deregulation has supported safety improvements that, in turn, have some consequence for the number of inspectors FRA needs.

¹Class I railroads have annual gross operating revenues in excess of \$50 million (1978 dollars) and represent the bulk of industry activity. In 1985, they employed about 94 percent of the nation's railroad workers and accounted for 89 percent of total train miles, 88 percent of train accidents, and 83 percent of casualties.

FRA recognizes that it needs more detailed and complete information on inspection effectiveness and efficiency to evaluate resource requirements. In October 1986, management launched a comprehensive program to collect and analyze nationwide productivity data and to develop and implement, by 1988, specific productivity standards and effectiveness measures. According to FRA officials, the program signifies management's commitment to bring about and institutionalize significant changes in the way inspection activities are managed. They also stressed that the program needs time to bear fruit and that its success depends on how well management sustains its commitment and enlists the cooperation and support of inspection managers and staff.²

Comparing Planned With Actual Program Results

FRA's new program is also intended to strengthen accountability for achieving inspection goals. Since 1981, FRA regional offices have prepared annual plans establishing specific objectives, including the number and types of inspections to be done. Our review of the plans for 1984-86 found that the regions set objectives that they frequently exceeded and that were often much lower than accomplished in the previous year despite little change in resources. For example, in 1985 the regions planned to inspect about 289,000 miles of track; they actually inspected nearly 486,000 miles. In 1986, with virtually the same number of track inspectors, the regions planned to inspect 352,000 miles, or about 28 percent less than inspected in 1985. Large variances also occurred in the regions' resource efficiency. In the hazardous materials area, for instance, the average output per inspector planned for 1986 varied by as much as 75 percent among regions. Although program headquarters reviewed the regions' plans to compile a national inspection plan, it did not question or analyze the reasons for the large variances in outputs and efficiency.

We recognize that variances in outputs, efficiency rates, or other performance indicators can occur for reasons largely beyond management's control, such as inherent differences in geographical coverage, variations in density of train traffic and track, or the need to redirect resources in response to unpredictable events. On the other hand, when significant variances are not systematically analyzed, management

²In this regard, FRA and other agency officials pointed out that garnering staff support for productivity measurement systems or other major changes in program operation is often complicated by perceptions that those systems or changes are a threat to job security, lead to senseless "numbers games," and/or result in intrusive management practices. Their point is well taken. As discussed in chapter 5, DOT's success in meeting the demands of a changing environment and implementing new ways of doing business ultimately depends on how effectively it deals with the needs and concerns of its people.

limits its ability to understand their underlying causes and to identify potential opportunities for achieving productivity gains. FRA's program is aimed in part at gaining a better understanding of why performance variances occur and applying the knowledge gained to increase efficiency while maintaining acceptable levels of inspection quality and timeliness. Once the program is fully operational, management should be better equipped to compare planned with actual results and assure accountability for meeting goals.

Need for Accurate and Timely Data and Analysis to Support Program Management

In five reports on individual DOT safety programs, the Secretary's Safety Review Task Force cited the need and made recommendations to improve the completeness and accessibility of inspection, enforcement, and other safety data. Similarly, during our review we noted several instances where efforts to implement productivity or other management improvements were hampered by delays in obtaining accurate and timely program data and/or analyses. At the Coast Guard, for example, extended delays in implementing the Marine Safety Information System delayed management's efforts to collect and analyze data needed to update inspection staffing standards. Moreover, while management is now getting those and other data for developing improved productivity and effectiveness measures, it is concerned whether the Coast Guard has the resources to conduct detailed analyses and assure that available data are fully and productively used. Our review shows that problems in getting timely, accurate data and in providing analytical support are directly related to two conditions that cut across the Department and require Secretarial attention: (1) weaknesses in DOT's information and related management support systems and (2) reductions in the collection and analysis of data to support DOT policymaking as well as program management. Both areas are discussed in subsequent chapters, together with appropriate actions for ensuring that the Department's data requirements are met.

Conclusions

The importance of the Department's safety programs in achieving a safer and more efficient transportation system requires that program objectives are carefully defined, performance is properly monitored, and results are thoroughly assessed. It also requires a long-range effort and commitment to bring about and sustain systemic improvements in the management of safety program resources. The Secretary has recognized these requirements, as shown by her initiatives in the area of air carrier safety, the work of her Safety Review Task Force, and the ongoing

efforts of the various administrations to implement the Task Force's recommendations. We believe the Department can build on and institutionalize the progress it has made by developing and using operational effectiveness measures, productivity standards, and the related techniques presented in this chapter. By doing so, the Department will strengthen its ability to evaluate performance in achieving safer transportation, balance potentially conflicting goals, determine safety resource needs, and ensure effective and efficient use of its resources.

Recommendations to the Secretary of Transportation

To enhance and sustain the progress DOT has achieved in improving its management of safety programs and resources, we recommend that the Secretary.

- Direct that operational measures of effectiveness be developed and applied for safety programs throughout the Department to link the overall goal of safer transportation with ongoing program activities and to provide the basis for setting program objectives, monitoring performance, and allocating resources.
- Require that productivity standards, including the definition and use of standards of quality, timeliness, and efficiency for delivery of services, be used to integrate productivity improvement with safety program planning throughout the Department and to establish and implement annual productivity improvement goals.
- Ensure that current and accurate staffing standards (e.g., standard hours for completing program tasks) are used in formulating safety program budgets throughout the Department.

Agency Comments and Our Evaluation

In commenting on our draft report, DOT generally agreed on the need to build upon and institutionalize the progress it has made in improving its management of safety programs and resources. As testimony to its commitment to bring about and sustain additional improvements, the Department pointed to the work of the Secretary's Safety Review Task Force in making specific recommendations for individual programs and to efforts ongoing within individual administrations to develop and use best proxy measures, productivity measures, and related techniques for strengthening resource planning and management. In the Department's view, the actions underway within individual safety programs are consistent with our recommendations.

We agree that the various actions being taken for individual programs are consistent with our recommendations. At the same time, we want to

Chapter 2
Ways to Strengthen the Department's
Management of Safety Programs
and Resources

emphasize the importance of the Secretary's role in sustaining those actions DOT-wide over the long run so that the Department can fully capitalize on its recent achievements. The successful development and application of best proxy measures, productivity standards, and the related techniques we present require that management continuously collect and analyze relevant information on program workloads, resource use, and accomplishment of planned goals. Identifying what works to enhance program performance and efficiency and then systematically applying these techniques across the Department's programs will, in our view, best assure that the improvements achieved to date will not be lost and that progress will continue to be made.

DOT Needs to Reconsider Its A Grants Management

Our review shows that because of transportation environment, DOT must re-evaluate its current role and strategy. The combination of increased emphasis, shift of authorities and reduced federal staffing underlie the need for DOT to comprehensively reexamine how it manages its grants and emphasize on

- the most efficient and effective methods and functions among DOT and the participating programs;
- how DOT and the other participating agencies can be better coordinated considering the sharing of authority and resources;
- the organizational structure and processes that best carry out the defined functions and responsibilities.

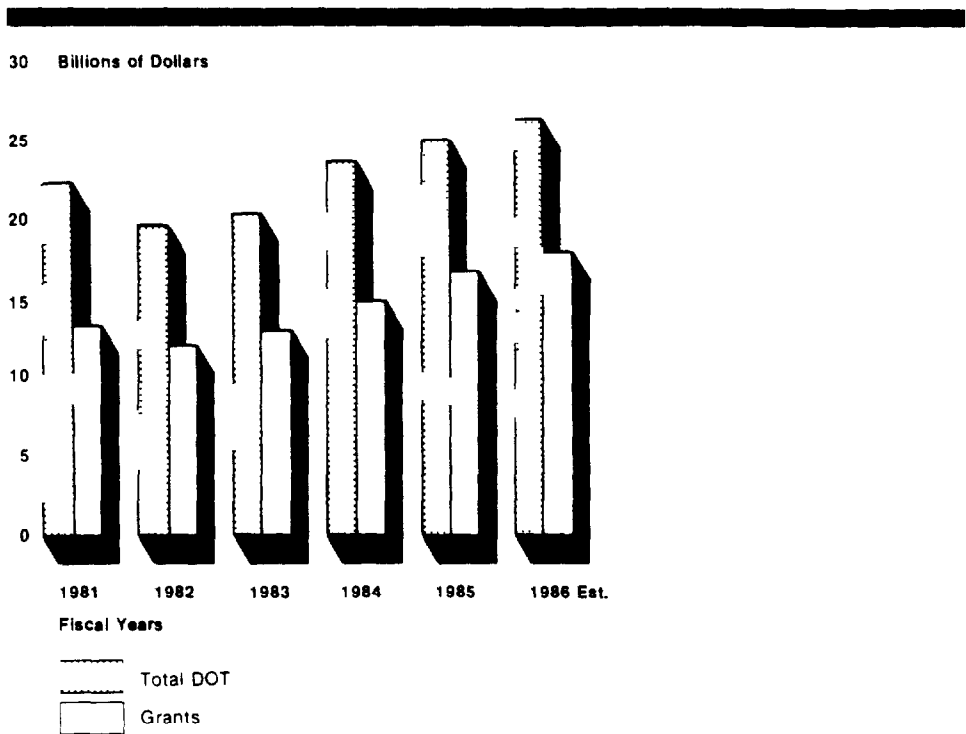
The change in the grants environment has taken place in a piecemeal fashion, that is, at different times and in different areas. DOT should regard the individual grant programs as a system and to improve the administration of the system, DOT needs to assess the collective impact of the changes and how it has responded. The re-examination should lead to additional changes in the grant programs and possibly in the organizational action.

This chapter discusses the changes in the grants environment, alternatives and strategies that the DOT should consider in the future, taking into account considerations such as which grants management occur

Background: Grants Are Critical to DOT's Mission and to Our National Transportation System

DOT has provided over \$180 billion in grants to state and local governments. About two-thirds of DOT's authority for fiscal year 1986 is shown in figure 3.1, grants have accounted for 60 percent of DOT's outlays.

Figure 3.1: DOT Budget Outlays for Grant Programs



Most often, state and local governments are recipients of grants, using the money for a wide range of activities primarily related to construction, preservation, and safe operation of the infrastructure of highways, mass transit facilities, airports, and rail installations. Table 3.1 lists some of DOT's major grant activities, illustrating the diversity of size, scope, purpose, allocation methods, and recipients.

Chapter 3
 DOT Needs to Reconsider Its Approach to
 Grants Management

Table 3.1: DOT's Major Grant Activities

| Program (operating administration) | Primary allocation methods | Recipients | FY 1986 funding (in millions) |
|---|----------------------------|-----------------------------|-------------------------------------|
| Construction: | | | |
| Federal-aid highway program (FHWA) | Formula | States | \$13 357.0 |
| Mass transportation capital grants (UMTA) | Discretionary | Transit authorities | 1 052.7 |
| Mass transportation formula grants (capital, operating expenses, planning) (UMTA) | Formula | States/ transit authorities | 2 057.6 |
| Airport improvement (FAA) | Formula/ discretionary | Airport authorities/ states | 885.2 |
| Local rail service assistance (track rehabilitation and planning) (FRA) | Formula/ discretionary | States | 14.4 |
| Safety: | | | |
| Highway safety (NHTSA/FHWA) | Formula | States | 130.7 |
| Motor carrier safety (FHWA) | Discretionary | States | 16.3 |
| Recreational boating safety (Coast Guard) | Formula | States | 28.7 |
| Natural gas pipeline safety (RSPA) | Formula | States | 4.3 |
| Railroad safety (FRA) | Discretionary | States | 1.4 |

The following examples illustrate the importance of the grant programs to our transportation system. DOT grants have provided

- financial and technical assistance for the construction and preservation of over 834,000 miles of road on the Interstate, primary, secondary, and urban highway systems;
- funding for the purchase of 56,000 buses and 6,300 rail cars, and construction of over 350 miles of urban rail transit routes;
- funding for about 9,000 airport planning and development projects from 1970 through 1981; and funding of over 500 planning, 1,300 runway, and 100 terminal development projects from October 1981 to May 1985, and
- financing for numerous state and local transportation safety activities, such as those contributing to enactment of child safety seat-use laws

About 90 percent of DOT grant funds are distributed to state and local governments according to formulas established by law. For example, 75 percent of the National Highway Traffic Safety Administration's (NHTSA) highway safety grants are distributed to the states based on the ratio of a state's population to the total population of the nation, and 25 percent are distributed on the ratio of a state's public road mileage to the total national public road mileage.

Grantees are responsible for carrying out the projects and activities financed by grants according to federal technical and administrative standards and requirements. They also generally bear part of the cost of grant-financed projects. The amount they pay varies—for example, 10 percent for Interstate highway construction projects and 50 percent for pipeline safety projects.

The Grants Environment Is Changing

Changes in many of the Department's grant programs, especially over the past few years, have resulted in grantees having greater flexibility to plan and manage federal funds according to their own priorities and procedures. Some of these changes have occurred at the state or local level; others have occurred at DOT. For example, many grantees now have increased flexibility to select projects to meet their needs and to design projects to their own standards and requirements.¹ This increased decision-making authority largely mirrors the experience gained by grantees in implementing and running grant programs themselves.

At DOT, decreasing control and influence over the use of grant funds is reflected in a more indirect oversight role that is characterized by evaluations instead of day-to-day and direct project monitoring and control. Reduced grantee reporting, less direct project involvement by DOT staff, and fewer federal planning and implementing requirements are other examples of this change. Moreover, increasingly fewer DOT staff are assigned to carry out grant-related functions.

In this period of change, clearly defined roles and responsibilities are important for effective, efficient operation of the grant programs. Such clarity would facilitate development of effective management and oversight functions, create a means for effectively dealing with persistent grant administration problems, and provide the strongest environment for considering and implementing additional grant program changes currently being proposed.

A major issue in clarifying roles is how the Department and the grantees are to share accountability for the programs and the problems that

¹Grantees, however, must still comply with numerous federal requirements. Federal aid highway projects are to be designed in accordance with minimum standards approved by Federal Highway Administration (FHWA) and meet other federal requirements. State-developed standards must be approved by the FHWA in order for projects to be eligible for federal reimbursement. FAA also has long-established standards for the design, operation, and maintenance of airports which are the basis for grant eligibility.

develop, considering the shift in authority and the greater sharing of program responsibilities between DOT and the grantees

**Illustration of Change:
Federal-Aid Highway
Program**

Having undergone at least three major changes, the federal-aid highway program provides a good illustration of the dynamic grants administration environment

- The program focus has shifted from new construction to the preservation of existing roads. In the past, the Interstate Highway System was a new construction effort that demanded considerable attention and investment. Now, however, the Interstate System is essentially complete, and most federal-aid highway funds are used for preservation rather than initial construction.
- Grantees have increased flexibility to design their own projects. For example, FHWA delegates major highway project administration functions to the states under the certification acceptance program, which permits states to substitute their standards, processes, and procedures for federal ones and to eliminate the requirement for FHWA review and approval of project design before construction can begin.² Ten states currently operate under full certification acceptance, and many others operate under the concept for parts of their programs. In addition, FHWA's 1982 regulation on resurfacing, restoration, and rehabilitation work allowed each state to develop its own design standards for such projects, subject to approval by the FHWA office in the state.
- FHWA is increasingly relying on evaluations of grantee management systems and processes to oversee the program, rather than on day-to-day, individual project review and approval. Increased funding levels for the federal-aid program coupled with FHWA staff reductions (down 30 percent from 1975 to 1984) have provided two major reasons for the shift away from project-by-project monitoring.

More Change Is Proposed

The President's fiscal year 1987 budget proposed establishing a transportation block grant program for states and large urban areas, to eliminate the Urban Mass Transit Administration's (UMTA) Section 3 mass transportation capital grants program, and to combine FHWA's Interstate and primary programs. The new block grant program would mandate

²Before granting a state's request to operate under certification acceptance, FHWA must determine that the state laws, standards, etc., will accomplish the policies and objectives of federal highway legislation. FHWA must also conduct a final inspection of each project after its completion. In addition, certification acceptance does not cover federal requirements such as the Civil Rights Act of 1964 and the National Environmental Policy Act of 1969.

that a set portion of the funds be made available to areas of over 200,000 population. State and local officials would determine what combination of highway and mass transportation projects best meet their transportation needs, and the block grant program would become the major source of federal funding for mass transportation.

These proposed changes, if enacted, could have a direct impact on DOT and the way it administers grant programs. Such changes in program design offer the Secretary an opportunity to examine all aspects of the Department's grant delivery and oversight, including grant program staffing levels and skills, and organizational structure.

DOT's Continuing Role in Program Administration

Although grantees now have greater flexibility and DOT's oversight is often more indirect, the Department continues to have an important role in administering its grant programs. DOT officials told us that where it has been appropriate, the Department has proposed programs in FHWA and FAA to give states even greater flexibility in project selection. At the same time, however, they said that in areas of strong federal interest, such as the Interstate and primary highways, and where discretionary programs have led to the construction of inefficient projects, federal oversight and influence have actually increased.

Federal/grantee role changes also have not meant that FHWA has eliminated its project and technical involvement. For example, FHWA's Washington headquarters office, with field office collaboration, continues to review major and complex bridge proposals. According to DOT officials, these reviews have been directly responsible for savings of more than \$250 million since 1978 through the use of alternate bridge designs and other applications of current technology that the states and their consultants have accepted only through FHWA leadership. DOT officials also told us that through special program emphasis areas and other instructions to the field offices, FHWA has established a policy of high-level project and technical involvement. They said FHWA is getting more involved in the technical aspects of grants management because of the need for more effective application of technology to the complex problems of highway pavement and bridge reconstruction and rehabilitation.

FHWA recently reorganized its Washington headquarters, in part to address on a continuing basis the needs of high technology rehabilitation and reconstruction. According to DOT officials, the reorganization provides a strong engineering management function for national leadership in applying high technology solutions to ensure the most efficient use of

available funds. The Department envisions the promotion and sharing of highway technology to be a paramount role of FHWA for the foreseeable future.

Grants Administration Problems Persist

We surveyed the types of grant program administration/ implementation problems occurring in DOT by examining 301 GAO reports issued on the Department from October 1978 to September 1983 and 349 DOT/OIG reports issued from October 1982 to March 1984. These reports identified numerous grant problems of various types across DOT. Common categories of problems were inadequate funds control, property management, and technical oversight. As the following examples show, problems in grant delivery and oversight continue to occur:

- In a NHTSA region, we found items of grant-financed property that had not been inventoried in 2-1/2 years, items not accounted for in the grantee inventory, and property sold without the federal share being returned to NHTSA.
- Construction management practices for a people mover system and two subway segments at two transit authorities were found inadequate. Guideway beams and supporting columns for the people mover were not constructed to meet specifications at one authority. At the other, industry testing standards for poured concrete were not followed, nor was there adequate followup when tests disclosed deficiencies in the concrete (DOT/OIG, Sept. 1985).
- Because a state's construction decisions were not always based on sound engineering and economic analyses, FHWA approved \$21.4 million in federal-aid funds for relatively unused highway and bridge structures. For example, a bridge constructed at a cost of \$1 million was still not in use after 2 years due to lack of connecting roadways, no definite plans existed to make the bridge usable in the near future (DOT/OIG, May 1985).
- UMTA grantees were submitting required self-certifications, but they were not always complying with and did not always understand the UMTA regulations with which they certified compliance (GAO, Feb. 1985).

Although DOT and the grantees may be addressing specific problems as they are identified, the fact that problems continue to develop raises the question of whether existing DOT grant oversight mechanisms are effective. Further, the shift in authority and flexibility to the grantees and DOT's more indirect monitoring role raise the more basic question of who is responsible for grant oversight. We believe that establishing clear accountability and clarifying roles and responsibilities in this changing

grants management environment is essential to deciding how these problems should be dealt with at federal and grantee levels

Department Initiatives to Improve Administration of Its Grants

The Department has several initiatives underway to improve grants administration. For example, UMTA is implementing Surface Transportation Assistance Act of 1982 requirements for triennial reviews of grantees. Performed at least every 3 years for each recipient of UMTA Section 9 grant funds, the reviews involve more extensive examination of the grantees' operations than UMTA had done; they are intended to provide UMTA with feedback on grantee compliance with federal statutory and administrative requirements. According to Department officials, they also help the grantees better understand the requirements and what they should be doing to comply. UMTA is also in the process of implementing a new grants management information system aimed at more effectively tracking and controlling grants.

Department officials told us that FAA's grant program is currently being evaluated as part of the Department's efforts to develop legislation to reauthorize the program. They also said that the Department considered various options for structuring and managing UMTA and FHWA grants during the development of the proposed Surface Transportation Reauthorization Act of 1986, and successor legislation currently being considered by the Congress.

Reconsidering Grants Strategy: Alternative Approaches

We recognize that there are several approaches that would provide the means to address grants management issues and concerns and improve program efficiency and effectiveness. The major alternatives are

- Direct individual DOT administrations to undertake their own separate assessment for their programs
- Establish a working group comprised of representatives of the administrations to examine grants management and oversight Department-wide, with detailed implementation of recommended actions to be undertaken by individual administrations
- Establish a task force, committee, or working group to examine grants management and oversight as a departmental function or activity without the constraints of the individual programs and administrations

Each of these alternatives has advantages and disadvantages, but several points are particularly worth noting. The second alternative—as compared with the first—would encourage the administrations to

exchange ideas, information, and experiences. The third alternative, by providing a Department-wide perspective on grants management, would present DOT with broader opportunities to consider such actions as realigning staff across administrations and combining programs or offices.

Considerations in
Redefining DOT's Role in
Grants Management

The selection of a new grants role and strategy for DOT involves the collective examination of factors important to grants management. These include

- Program design. How have program goals, objectives, and requirements changed? What is their consistency with DOT goals and philosophies for federal grantee administration and oversight responsibilities and relationships?
- Grantee capability and delivery network. How capable are grantees to administer the programs? Do they have requisite experience? Are necessary resources available to them?
- Staffing levels and skills. How much and what mix of skills are needed? Where are they needed?
- Organizational structure. How should DOT be organized to deliver and monitor grants?
- Accountability and risk of loss. What level of accountability is required of each participant, considering the risk of loss?
- Support systems. Do the financial and grants management information systems provide the data needed to control and manage the grants?
- Available audit resources. What audit resources are available at the federal, state, and local levels to help ensure that funds are used efficiently and effectively according to federal requirements?
- Employee motivation and morale. What effect would a change in grants management have on DOT employees?
- Sanctions and penalties. What recourse does DOT have against grantees for noncompliance with federal requirements?

Alternative Grants
Management Strategies Also
Exist

A range of alternative strategies exist—from those entailing limited involvement and few restrictions upon grantees to those determining who receives grant funds and requiring close control of how funds are spent.

For purposes of discussion, four basic grants management strategy types are listed below; they illustrate the variations possible in setting and controlling authority and responsibility. Numerous combinations of

these are possible, and DOT might need to employ more than one strategy because of the diversity of its programs and grantees. If adopted, some of these may require legislative changes.

- Block grants. Grantees would be assigned major control and accountability with limited DOT role and minimal federal requirements.
- Categorical grants. Much authority and control over how funds are used would remain with DOT. Grantees would implement projects with federal review and approval at various stages.
- Modified block grants, with federal emphasis on major projects. DOT would have primary responsibility and control over major projects only. Others would be treated as block grants with grantees having primary responsibility and control.
- Modified categorical grants, with reliance on grantee assurances or systems. Grants would be categorical with authority and responsibility for aspects of the programs delegated to the grantees through such procedures as certification, acceptance, or grantee self-certification.

Major considerations in selecting block grants versus categorical grants are the capability of the grantees and the emphasis on ensuring that national objectives (as opposed to local objectives) are addressed. The modified categorical approach would permit DOT to retain overall control and delegate aspects of program administration to grantees as desired. The modified block grant strategy would provide DOT greater opportunity to draw on the experience, expertise, and resources of grantees and direct more of its own resources to other projects and activities.

Conclusions

DOT grant programs have undergone some basic changes as their goals and objectives have changed and the fundamental roles and responsibilities of the Department and its grantees have been revised. The cumulative effect of these changes—which largely have taken place over the past few years—has been greater grantee control over the use of grant funds, including more flexibility to select the projects they want and to design and implement them to their own standards and requirements.

These changes have been made at various times and in different ways to the individual programs. One result has been that the sharing of program responsibility and management accountability among DOT and the grantees has not yet been clearly delineated. DOT needs to examine the collective impact of these changes and its response to them on the day-to-day implementation and oversight of the programs and clearly define

its grants management role vis a vis the grantees' Central to role definition is the issue of accountability and how it is best achieved

Clearly defining DOT's grants role is important to the efficient and effective implementation of the programs. In addition, the role and the strategy selected for carrying it out largely determine how DOT should be organized and how much and what type of staff and other resources it needs to manage and oversee the programs. Well-defined roles and responsibilities are essential to effectively deal with continuing grant administration/implementation problems, as they would establish clear accountability for the problems and responsibility for corrective action. The extent of these problems, their impact on the programs in terms of inefficiencies and ineffectiveness, their causes, and the best way to overcome them would be considerations in deciding on appropriate DOT roles and responsibilities.

As evidenced by its current and recently completed initiatives, DOT has been working to address grant administration/implementation problems and to improve grants management. We believe that the Department can build on and further the effectiveness of these efforts with a comprehensive, Department-wide examination of the accountability question and how the various program and policy changes and initiatives have affected detailed program implementation, oversight, and management. Such an examination should lead to revisions in the Department's grants management. Changing federal requirements, federal-grantee relationships, and the administration of the programs to effect these revisions may require legislative proposals and congressional action.

Recommendations to the Secretary of Transportation

The Secretary should strengthen DOT's grant programs by

- reassessing and defining DOT's role in managing and overseeing its grants programs and
- developing a grants management strategy appropriate for carrying out that role.

Agency Comments and Our Evaluation

In commenting on our draft report, DOT agreed with our recommendations concerning grants management and said it will continue to assess and improve the oversight and management of its grant programs. DOT supported the approach of each operating administration undertaking

its own assessment and coordinating with other administrations as appropriate

As DOT grant programs and grantees have matured, the use of grant funds has changed, and various legislative and administrative changes have altered DOT/grantee responsibilities and relationships. The need to comprehensively assess the collective impact of these changes on DOT's grants management role and strategy has become increasingly important. As previously discussed, a variety of approaches might be employed to make this assessment, ranging from the program-by-program or mode-by-mode approach to the more comprehensive and generic DOT-wide approach. The individual administration approach supported by DOT is probably the easiest because it is limited to a smaller number of programs and administering offices. However, in our view, the alternatives—based on the DOT-wide task force/committee/work group approach—would provide a better opportunity for the administrations to exchange ideas, information, and experiences and to consider a wider range of choices as to how to administer the grant programs.

In further commenting on the draft report, DOT said that it wanted to clarify certain grants management functions and responsibilities that it believed were not clearly defined in the report. These clarifications generally concerned the need for a greater elaboration and appreciation of DOT's role in administering and overseeing the programs. For example, DOT noted that certification acceptance does not permit the states to entirely eliminate FHWA project design reviews. DOT said that FHWA has established a strong design-monitoring program which features a variety of project- and process-oriented review techniques and includes both certification acceptance and noncertification acceptance projects. DOT also provided information on changes that the Department has made since the completion of our review.

These clarifications and additional information have been added to the body of this chapter, as appropriate. For example, we have added language to clarify that the elimination of FHWA project design review under certification acceptance refers only to FHWA review and approval of the design of each project before its construction can begin, and not to reviews that may be performed as part of periodic FHWA evaluations of the states' design processes or other technical and oversight activities.

requirements. One of DOT management's greatest challenges today is federal budget retrenchment and its attendant pressures to improve organizational effectiveness and productivity. In the present fiscal climate, increasing the agency's efficiency to use resources to produce services is the only alternative to reducing services or even totally eliminating the organizations that provide them. Since all federal agencies are competing for increasingly limited fiscal resources, no agency can be assumed to have a perpetual lease on life or be exempt from the requirement of regularly justifying its existence.

In addition, all DOT administrations and offices are affected to some degree by technological advances in information processing and retrieval, communications, office automation, and other areas relating to their missions and operational responsibilities. All are affected in some way by government-wide policies on deregulation, privatization, and redefinition of the role of the federal government. All must deal in varying degrees with demographic and societal trends and changes in work force composition, attitudes, and expectations.

Because of this, we believe that the Department could benefit from following the examples of FAA, IRS, EPA, and other organizations that have adopted strategic human resource management to deal with the challenge of change and the need to effectively carry out organizational missions. In the present environment a more proactive approach to planning, recruiting, developing, and using DOT's human resources would increase DOT's chances for success in achieving its goals and performing its diverse missions.

Recommendations to the Secretary of Transportation

Because change management and strategic human resource management require sustained effort and attention over the long-term, we recommend that the Secretary take additional steps to focus on human resource management DOT-wide. These steps should include the following:

- Provide visibility and tangible evidence of top management commitment by establishing a prominent organizational focus for strategic human resource management at both the operating administration and OST levels.
- Develop a DOT-wide awareness of the importance and value of change management and strategic human resource management.
- Develop the selection, appraisal, reward, and development functions needed to support HRM activities and spur management improvement.

HRM responsibilities should be assigned so that HRM will have appropriate visibility and prominence, it will be credible to DOT personnel, and sufficient resources will be made available to implement it effectively. To satisfy these conditions, HRM functional responsibilities could be vested in an Associate Deputy Secretary or an Assistant Secretary for Human Resource Management at the OST level and, following the FAA example, in separate Associate Administrators for Human Resource Management—at least in the larger operating administrations. Alternatively, HRM responsibilities might be vested in the existing Assistant Secretary for Administration in OST and, in the case of the operating administrations, in the Associate Administrators for Administration. This latter alternative, however, entails the risk that HRM may simply become submerged in DOT's day-to-day administrative concerns, in GAO's view, it also deprives HRM of the visibility and organizational prominence that signal high-level commitment and seriousness of purpose.

Developing a DOT-wide awareness of HRM will require both an educational effort and initiation of a constructive dialogue between management and employees. As in FAA, restatement of the agency's mission and goals in light of today's realities and requirements is a good beginning.

Agency Comments and Our Evaluation

DOT agreed with our assessment of the need for strategic human resource management but disagreed on the approach to achieve a Department-wide emphasis on HRM. In particular, DOT did not believe that the organizational alternative of a separate Associate Deputy Secretary or Assistant Secretary for HRM at the Office of the Secretary level and separate Associate Administrators for HRM at the operating level would best assure the visibility, top management involvement, and institutional support needed to make HRM a success. DOT expressed the strong belief that functional HRM responsibilities can be carried out by existing organizations, including the Assistant Secretary for Administration and Associate Administrators for Administration. Such responsibilities are in fact already being carried out, according to DOT, and the recent creation of a Personnel Planning, Research and Systems Division under the Assistant Secretary for Administration demonstrates the intention to build an even greater HRM capability agencywide.

The creation of a new Division within the Office of the Secretary, which the Department indicates will serve as the nucleus for building a DOT-wide HRM capability, represents an important step towards the goal of institutionalizing HRM. Significant too is the Department's assurance that

it will guard against HRM becoming submerged in day-to-day administrative concerns. However, based on our knowledge of HRM, as applied elsewhere in the private and public sectors, and our understanding of what is required to build and sustain a viable HRM effort, we continue to believe that organizational prominence and top management involvement are extremely important to success. HRM experts we consulted unanimously believed that HRM succeeds and produces desired results only to the extent that it receives the commitment, attention and participation of top managers and these managers, in turn, are able to integrate HRM into the organization's other strategic planning and management activities. While this does not mean that only one particular organizational set-up will do, it does suggest that successful planning for and management of human resources demand a significant investment of time and effort on the part of top leadership. By their example they will set the tone for the rest of the organization and determine how HRM is perceived and supported by the organization as a whole.

A Strategic and Systematic Management Approach Can Strengthen DOT Policymaking

Under the 1966 legislation that established DOT and serves as its basic charter, the Department is responsible for identifying and studying national transportation problems and providing leadership in formulating national transportation policy. One of the principal ways that DOT policy leadership is intended to be exercised is through developing and recommending proposals to the President and the Congress. Under Secretary Dole's direction, DOT has developed a number of far-reaching policy proposals, including proposals to further deregulate the transportation industry, to redefine and reduce the federal role in transportation, and to shift the cost of providing necessary transportation services to those who primarily benefit from these services. In the area of safety policy, in particular, the Department can point to a number of achievements that collectively attest to the high priority Secretary Dole has attached to transportation safety. These actions include the passage of legislation to improve highway safety and the adoption and implementation of rules to enhance safety across all transportation modes. Examples of the latter include regulatory standards for anti-lacerative auto windshields, requirements for high-mounted auto stop lamps, and regulations mandating the safety retrofitting of rail tank cars to improve fire and puncture resistance.

Notwithstanding the Department's numerous policy achievements, there are further opportunities for success in the policy arena, particularly in the area of legislation. These include some of DOT's most basic objectives relating to defederalization and budget reduction, as well as priority safety objectives such as the proposal to create a National Traffic Safety Administration.

Our findings, together with those of earlier studies and reports, suggest that a better integrated and more strategic approach to policymaking would enable the Secretary to provide stronger policy direction and management. This in turn, we believe, would tend to strengthen the Department's ability to exercise policy leadership and enhance its influence as a key participant in the formulation of national transportation policy. The Secretary's basic mechanisms for developing, implementing, and monitoring transportation policy currently include the annual budget process, legislative proposals, rulemaking, and Secretarial initiatives. These are largely applied along separate tracks and primarily serve short-term needs. Furthermore, DOT's effectiveness in the policy arena as well as its ability to evaluate programs greatly depends on having relevant and timely information. Our review shows that cutbacks in the collection and analysis of transportation data have reduced the information supporting DOT policymaking and program management.

We believe that a more integrated and strategic policy framework, coupled with more productive use of available information resources, would help the Department to better anticipate transportation problems, balance potentially conflicting goals, and achieve policy results. We also believe this framework would enable closer integration of policymaking with program management and support system needs.

The preceding chapters discussed selected safety programs, grants management, management support systems, and human resource management as examples of areas where significant opportunities exist to strengthen the management of activities that cut across the various DOT administrations. This chapter provides additional examples of the need for improved policymaking and describes key elements of an integrated, strategic policy framework for the Office of the Secretary. It also provides examples of areas where DOT could redirect resources to get better information for policy analysis and evaluation.

Benefits of a More Strategic and Systematic Approach to Policymaking

We see opportunities to improve policy formulation, implementation, and monitoring by more clearly defining goals, objectives, and priorities and by devoting greater attention to long-term policy issues and requirements. Some of the specific benefits we foresee from adopting a more systematic, integrated, and strategic policy framework include an improved ability to

- Build upon and institutionalize the kinds of program and policy assessments represented by the efforts of the Secretary's Safety Review Task Force
- Anticipate and deal with environmental changes, such as the impact of deregulation on commercial airline operations and requirements for effective air traffic control
- Employ empirical data and analysis in support of policymaking in areas such as motor carrier and rail deregulation, safety regulation, and user fees
- Define and measure operational program objectives for assessing progress in meeting safety goals and the impact of policy changes
- Achieve consistency in policies and regulations across transportation modes, such as rules governing alcohol and drug abuse, seat safety standards, and hazardous materials transportation
- Address in a timely and responsive fashion safety proposals put forward by the National Transportation Safety Board and others
- Target limited resources, such as funds available for transportation research, to areas of greatest importance and potential payoff

Another benefit that we see resu-
grated, and strategic policy fram-
explicit statements of policy goal
well as the longer term—is the fo-
on issues of national importance
between DOT and its major consti-
illuminate and help resolve poten-
and objectives, and generate the
acceptance and success of DOT po-
Secretary of Transportation Will

“Public officials have a special respon-
policies and plans of their Governmen-
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that must be made to bring about a be-
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The following sections provide e-
quences of not having a systema-
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and how they can support policy-
itoring. The discussion of policy-
the crucial importance of inform-
both in the policy area and in the
discussion of Coast Guard user fee-
tion of policy options can undermi-
policy objectives. The discussion o-
the importance of clearly defined s-
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Reductions in Data Collection and Analysis Affect DOT's Policy Role

DOT has significantly reduced its
tion data for reasons that includ-
data relating to the transportat-
national transportation system-
ness of program activities are o-
promoting policy goals and asse-
sions. Though fiscal conditions
DOT can get better information t-
productive types of data and ar-
tractor surveys, DOT has reduce

forming and achieving its goals. In program areas, such as recreational boating and highway hazards, it is using limited resources to collect and analyze data that are only marginally productive.

Reasons for and Consequences of Cutbacks in Transportation Data

DOT officials and outside policy experts cited several reasons for cutbacks in data collection and analysis. One is the effort to reduce overall spending by reducing the costs associated with collecting, processing, and analyzing data. A second is the Department's and the administration's desire to reduce the burden on the private sector in reporting data and responding to federal surveys. A third is the less explicit but widely perceived goal of redefining and reducing the federal role in transportation by curtailing data collection activities which, by their very presence, might bring about unwarranted expectations of federal action. In this latter regard, however, it should be noted that reducing the federal role could actually increase the need for data, to ensure compliance with safety and other requirements.

Although reductions in data collection are often justified in terms of cost savings and reducing the burden on the public, they are not made without imposing certain costs of their own. Among the costs are diminished capabilities to

- identify problems in areas such as transportation safety, measure the magnitude of those problems, and assess alternative strategies for problem solution;
- support and defend desired policy changes; and
- demonstrate the benefits of successfully implemented policies.

Cutbacks in census surveys illustrate some of these costs. Over the years, the Department of Commerce's Bureau of the Census has furnished DOT, under contract, with basic information to develop, implement, and monitor transportation policies. Some examples are

- forecasting future passenger and vehicle travel as a basis for establishing public investment needs for various forms of transport,
- estimating exposure rates for classes of automobile passengers and vehicle types for the promotion and regulation of highway safety, and
- justifying and implementing such policies as user charges, deregulation, and federal investments in highways, waterways, ports, and other transportation infrastructure.

Reductions in the amount and timeliness of information from census surveys, as well as from contractor studies and other sources, have hindered management efforts to further key goals. In the area of economic regulation, for example, DOT officials told us that the unavailability or limited availability of current data has constrained the Department's ability to analyze actual or projected consequences of deregulatory actions and proposals. As a result, the Department has had to rely increasingly on theoretical arguments relating to the benefits of competition and the salutary effects of deregulation. This, in turn, has lessened DOT's influence in regulatory or other policy proceedings outside the agency. For example:

- During November 1985 oversight hearings on motor carrier deregulation, the House Public Works Committee asked DOT to provide information on the impact of deregulation on pricing and economic concentration in the trucking industry. The Department responded in general terms, without detailed support, because it lacks current data. DOT economists and regulatory specialists told us that a relatively easy updating of an earlier study would have enabled the Department to respond more fully and satisfactorily.
- Appearing before the Interstate Commerce Commission in support of a proposal to end collective rate-making in the motor carrier industry, DOT was requested to submit information on the anticipated benefits of further deregulation. Limited in its ability to provide analysis of empirical data, the Department relied heavily on theoretical arguments in making the case for deregulation.

Data deficiencies and gaps have also hampered DOT's efforts to enhance transportation safety, as pointed out by the Secretary's Safety Review Task Force. The Task Force's September 1986 report on motor carrier safety, for example, noted that a major explanation for the program's long-standing weaknesses was "insufficient data and analysis on which to base the safety program." The Task Force found that "the information necessary to enable BMCS to identify priority safety problems and develop effective countermeasures is either incomplete or nonexistent" and recommended a substantially improved data collection and analysis effort involving both the federal government and the states. Similarly, in its February 1986 report on DOT's hazardous materials transportation safety activities, particularly in the Research and Special Programs Administration (RSPA), the Task Force identified a number of data-related problems adversely affecting program effectiveness. In one area alone—registration—the Task Force cited what it called an "information gap dilemma." It noted that

RSPA does not have an accurate reading of how many shippers or carriers are subject to its regulations or know where all hazardous materials shippers are located. It is a fair question how effective an enforcement program can be without such basic information on the industry subject to regulation.

The following case studies further illustrate the costs that DOT incurs when working without good information. In the case of recreational boating, limited information hinders the Coast Guard's ability to assess the impact of a major shift in responsibilities from the federal to the state level. In the case of highway hazards, the data collected and analyzed by FHWA do not meet the goal of assuring cost-effective use of highway safety funds. Both cases illustrate that opportunities exist to get better information by redirecting available resources.

Recreational Boating Safety: Getting Information to Evaluate Policy Results

Between fiscal years 1980 and 1984, direct costs of the recreational boating program (in constant dollars) fell by nearly one-half as the Coast Guard, to reduce spending and promote defederalization of transportation programs, (1) cut program staff and greatly reduced its direct on-water enforcement of boating safety laws and (2) encouraged increased enforcement and safety education by the states. During calendar years 1980-84, the boating fatality rate fell from 9.5 deaths per 100,000 vessels to 6.8, an all-time low. One is thus led to the conclusion that the change in program emphasis has worked well in improving safety. Such a conclusion may indeed be justified, but it is difficult to know for sure. Our review found, for example, that:

- Management has little information on the impact of state boating enforcement and education programs with which to promote effective use of federal safety grant funds. In 1985 the Coast Guard tried to assess the relationship between state program budgets and boating fatalities but concluded that available data were insufficient to determine whether a relationship exists. We examined the Coast Guard's data and reached the same conclusion.
- In announcing the record low fatality rate for 1984, the Secretary stated that greater public awareness of the dangers of alcohol and boating and stricter enforcement by some states are helping to save lives. However, there is no way to verify whether these factors are responsible for the lower fatality rate, because the Coast Guard has little information on the number of persons reached by public campaigns, the effectiveness of state enforcement efforts, or the incidence of alcohol abuse in boating deaths.

- Moreover, while information on causes of deaths and accidents is important for identifying boating hazards, because of limited reporting the Coast Guard does not have sufficient data to evaluate safety risks and strategies. For example, among 30 categories used to report boating fatalities, “unknown” causes—the largest of all categories—accounted for about 22 percent of deaths between 1981 and 1985. Information also is sparse in other areas important to analysis of risk, including the demographic and economic characteristics of the national boating population, number of boaters attending safety courses, and the effectiveness of manufacturer safety inspections.

The Coast Guard could make better use of its limited data collection resources by focusing on improving the quality of fatality reporting and by evaluating the effectiveness of state boating safety programs. The resources required for these undertakings could be made available, at least in part, by abandoning reports of nonfatal boating accidents. The current system for nonfatal accidents has been marginally productive, primarily because it relies on self-reporting by boat operators. While delivering lots of accident reports (about 5,300 in 1985), the system is covering at most only 10 percent of nonfatal accidents nationwide. Moreover, though reports are often incomplete, the Coast Guard accepts them as submitted. As a result, while management collects, processes, and annually reports extensive statistics on nonfatal accidents, it does not have accurate and reliable data for analyzing safety risks and evaluating how well state programs are working to prevent accidents and injuries.

On the other hand, more complete data are available on fatal accidents because the majority of states themselves investigate boating deaths and report their findings to the Coast Guard. A standardized investigation form, developed by the Coast Guard to promote more consistent and thorough state investigations, provides the opportunity for management to (1) set and apply standards of quality for investigative work and (2) identify and work with any states having quality-related problems, particularly in regard to reporting causes of fatalities. Resources also could be directed to in-depth evaluation of selected state programs to obtain detailed information on why some states may be more successful than others in improving boating safety.

Elimination of Highway
Hazards: Targeting
Resources to Promote Cost-
Effective Use of Federal
Safety Dollars

Since 1973 the Federal Highway Administration has given the states about \$1.6 billion to eliminate roadway obstacles and fund other projects for reducing the risk of death, injury, and property damage at hazardous highway locations. Federal law and regulations require the states to evaluate their projects and the Secretary (through FHWA) to assess and report annually on the results of the state evaluations. The Congress anticipated that based on the states' evaluations FHWA would develop criteria that the states could use to establish project priorities, thereby assuring cost-effective use of federal highway funds. FHWA's assessment process, however, is consuming resources to obtain, analyze, and report data that do not provide valid criteria for selecting highway safety projects.

FHWA has not produced valid criteria because (1) the states vary widely in their evaluation methods and capabilities and (2) FHWA has not established and enforced regulations to assure that methodologically sound evaluations are done. In 1985, for example, 14 states and 1 territory, representing about 35 percent of federal-aid highway apportionments, were excluded from FHWA's assessment because they did not, or could not, provide the traffic count data FHWA needs to compute benefit-cost ratios and related effectiveness criteria for safety improvements. For the process to produce valid and reliable criteria, FHWA would have to prescribe rigorous evaluation standards, including methodological procedures, and vigorously enforce state compliance. And for the states to be able to comply, the federal government would have to fund substantial investments in state data collection and evaluation systems. Both requirements conflict with the philosophical thrust and fiscal realities of today's regulatory environment as well as FHWA's traditional role in administering federal-aid highway funds.

Based on our review and discussions with federal, state, and private highway authorities, evaluation resources would be more productively spent by doing targeted, methodologically sound studies on selected projects. While states have been evaluating projects for over 10 years to meet federal requirements, FHWA has not produced criteria to assure that federal funds are wisely spent. Targeted evaluations, on the other hand, could furnish the states with information to make cost-effective decisions as well as further DOT goals by:

- Allowing greater flexibility to design sound methodologies and to conduct innovative research on precursors of roadway risks, such as speed variance and traffic conflict, which states can use to identify and correct hazardous conditions before accidents occur.

- Complementing ongoing research under the federal-aid highway program and capitalizing on existing federal-state working relationships
- Making more productive use of available state data and evaluation systems while promoting administration policy to give the states broad discretion in deciding how to spend highway funds

Coast Guard User Fees: The Importance of Exploring Policy Options and Integrating Management Systems

A key measure of an agency's success in the policy arena is the extent to which its policy proposals garner public and congressional support and the ease with which such proposals, once accepted, can be implemented. To further the goals of deficit reduction and equitable distribution of federal costs, DOT, since 1981, has submitted five proposals seeking legislative authorization of user fees for selected Coast Guard services. No legislation has been enacted to date, however. Our review found that problems in gaining political support and in determining how much should be charged to various users were not identified and examined before the proposals were submitted for congressional action. Those problems arose because DOT did not explore policy options fully and did not have the accounting information required to formulate, support, and implement its proposals.

User fees for Coast Guard services are admittedly controversial and may never gain enough support to be enacted in the form DOT would like. But by submitting inadequately formulated and supported proposals, the Department reduced its chances for success. If DOT had thoroughly examined policy options before submitting its proposals, including the advantages and disadvantages of excise taxes and other alternative fee assessment methods, we believe that it could have anticipated and responded more effectively to the political and operational problems frustrating accomplishment of its goals.

We noted the following specific problems in DOT's proposals and related methodology for establishing fee schedules:

- DOT did not respond to expressed congressional concerns that users of Coast Guard services already pay excise taxes similar to the fees to be imposed, or to concerns that user charges were not related to direct, quantifiable benefits.
- Revenue targets were set arbitrarily (by OMB) and because of limitations in the Coast Guard's accounting and other information systems, DOT could not establish a direct link between costs, services, and specific users of most services, as required by applicable OMB circulars.

- The cost base underlying the proposals was reduced arbitrarily in order to meet predetermined revenue targets and because the Coast Guard's accounting systems do not capture and separate out the costs of national defense and other functions that must be excluded from the base
- DOT's proposals considered operating costs only, although governing regulations require identification of all costs attributable to recipients of special benefits

Research and Development: The Importance of Articulating Goals and Priorities

Under the Department's legislative charter, the Secretary is responsible for stimulating technological advances in transportation and providing leadership in identifying and solving transportation problems. DOT's charter specifically provides for the conduct of research and development (R&D) as a means to meet this responsibility. Since 1967, DOT has spent more than \$6 billion on R&D and is currently spending about \$500 million annually. Since 1972, however, R&D outlays have declined in constant dollars, forcing the Department to weigh competing demands for scarce resources. According to a 1985 OST "Status Report" on coordinating and overseeing Department R&D, DOT has reacted to this decline in funding by shifting emphasis from research supporting long-term growth in the national economy and continued improvement in the quality of life to research supporting departmental operating programs such as FAA's air traffic control activities. Between 1975 and 1985 the status report shows, the share of total research funds spent on research in support of DOT operating programs doubled, while the share spent on more basic research in support of long-term economic growth and other broad national needs fell by about two-thirds.

The Congress, the Grace Commission, and private research groups have expressed concern over the shift in R&D emphasis and its implications for technological innovation and U.S. competitiveness. Those observers, together with DOT's Inspector General and GAO, have also called on the Department to develop a strategy to ensure that limited R&D resources are directed at the needs and priorities, not only of DOT, but also of state and local governments and the transportation industry. In this regard, a May 1984 report of the House Committee on Science and Technology found that

"the goals and objectives of existing transportation research programs are not well related to overall transportation system goals. There is little agreement or understanding of what the transportation system should be or what kind of society it should serve. Without clear goals, planners have been unable to adequately define the integrated set of research objectives necessary to support those goals. This has led to a fragmented approach to funding transportation infrastructure research.

largely directed at developing incremental solutions to current local problems which are often duplicative. There is currently no strategic, integrated long-range plan for R&D expenditures which could ensure that adequate funding is being focused on the critically important, large-scale problems."

Partially in response to such concerns, the Department has implemented certain organizational and procedural measures to improve R&D planning and oversight. Those measures, including establishing a DOT R&D Coordinating Council and R&D management review and appointing a Secretarial Science Advisor, represent significant steps toward providing direction to research and development activities in the Department. Nevertheless, we believe that additional opportunities exist to link R&D activities to Secretarial priorities and industry needs, target scarce resources where the potential payoffs are greatest, and provide top-level management oversight for R&D activities. The following steps provide a means to realize these opportunities and also illustrate the kinds of actions carried out under a systematic, integrated, and strategic policy framework:

- Assessing needs, to provide benchmarks for determining information and knowledge requirements
- Assessing the state of the art, to identify and synthesize what is known as a result of R&D activity.
- Developing short- and long-term analytic agendas, to close information and knowledge gaps identified by comparing what is known with what is needed
- Selecting R&D priorities based on DOT's overall policy goals and near- and long-term research policy issues
- Identifying programs and projects to meet information and knowledge needs
- Developing annual plans to implement programs and projects
- Periodically reviewing programs to monitor progress and redirect resources as needed.

How to Build a Better Policy Framework

The material presented in this and previous chapters shows that Secretarial leadership is needed to integrate policymaking with program management and support system requirements. To fulfill its role in shaping and implementing transportation policy and programs, DOT needs a well-defined framework at the Secretarial level to formulate persuasive policy proposals, design effective programs, and ensure adequate systems support. The absence of such a framework, including clearly defined goals, objectives, and priorities, impairs the Department's ability to anticipate and identify transportation problems, develop timely and

effective solutions, and provide effective support to program delivery and goal accomplishment

A wide variety of processes and procedures can be used to develop, implement, and monitor policy, and the particular ones employed by an agency head are mainly a matter of preference. In DOT's case, a strong tradition and culture of independence among the operating administrations are relevant considerations in setting implementing procedures. But whatever procedures are used, our findings in this and earlier chapters show that the Department's policy framework should contain the elements identified in table 6.1 and, further, that those elements must be interrelated to provide management direction and support.

Table 6.1: Elements of an Integrated, Strategic Policy Framework

| | |
|---|---|
| 1 | Articulation of short- and long-term goals, objectives, priorities, and policy agendas |
| 2 | Thorough development and exploration of policy options before decisions are made |
| 3 | Review of policies and proposals for consistency with Secretarial goals and priorities |
| 4 | Systematic identification, collection, and analysis of data needed to support policy formulation, design, and evaluation and to monitor changes in the fiscal, regulatory, and operating program environments |
| 5 | Direct linkages among planning, budget formulation and execution, accounting, program evaluation, and supporting financial information, and related management systems |
| 6 | Periodic reviews to monitor progress in achieving goals and objectives based on (1) operational measures of effectiveness and (2) analyses of workload, efficiency, and other operating data pertinent to performance assessments |
| 7 | Delineation of organizational responsibilities within the Office of the Secretary to carry out processes and procedures supporting policy formulation, design, and evaluation |

Recommendations to the Secretary of Transportation

To better integrate policy with program management and support system requirements and to promote productive use of the information resources available to support policymaking, we recommend that the Secretary

- Establish a framework to direct and support the development, implementation, and monitoring of transportation policies. Such a framework should include the basic elements enumerated in table 6.1.
- Initiate an assessment of (1) the Department's policy-related data requirements and responsibilities, including an inventory and evaluation of the data currently collected, data no longer collected, and the costs, if any, imposed by the unavailability of data, and (2) the most cost-effective means of meeting the Department's present and expected needs for transportation data collection and analysis.

Agency Comments and Our Evaluation

In commenting on our draft report, DOT disagreed with our characterization of the effectiveness of its policymaking functions. DOT stated that its policy procedures have worked well to advance Secretarial objectives. It also expressed the view that Secretary Dole has been highly effective in defining goals, objectives, and priorities—for both the short and long term—and communicating these within the Department and the administration and to the Congress and the general public. DOT observed that the Secretary's goals are apparent in both short-term and longer term initiatives she has taken and in the notable successes achieved in deregulation, defederalization, user tax financing of transportation operations, and enhancement of transportation safety. Acknowledging that it would "obviously like to have succeeded with more of [its proposals]" and that "management processes can always be improved," DOT nonetheless affirmed its belief that it already has the proper policy processes and systems in place and has established an excellent record of successful policymaking and implementation.

In recommending that the Department adopt a more strategic, systematic, and integrated framework for policy development and implementation, we sought to acknowledge the Department's achievements and to recognize the success of procedures it has used to formulate and implement policy/program initiatives. We appreciate the Department's belief that the procedures it has followed in the policy area have served it well and satisfy the needs of top management. We can appreciate as well the Department's view that its success in carrying out its policy agenda is the ultimate measure of how effective these procedures have been.

At the same time, however, our interest lies in identifying ways to further improve management effectiveness as well as ways to increase the rate of success of management initiatives. In a period of budgetary retrenchment and scaled-back federal involvement in transportation—no less than in a period of budget growth and program expansion—it is vitally important to have the right kinds of information, procedures, and controls in place to ensure effective policy and program decision-making and efficient use of resources. We believe that the kinds of effectiveness measures, staffing and productivity standards, program evaluation activities, cost accounting and financial management tools, etc., that we have recommended in this report are prerequisites to effectively integrating the budgetary, regulatory, legislative, and other components of policymaking and to developing and defending sound policy and program initiatives.

Beyond that, we believe it is essential for continued organizational effectiveness that succeeding administrations not have to “reinvent the wheel,” in the sense of having to construct from scratch a system for managing policy and program decisionmaking. Developing, strengthening, conserving, and passing on an effectively operating policy management framework collectively represent an important management legacy. They also, in our view, constitute a significant stewardship custodial responsibility.

The Department’s comments on specific aspects of our policy discussion and our evaluation of those comments follow.

Data Collection and Analysis

The Department disagreed with GAO’s conclusion that the reduction in collection and analysis of transportation data has hindered its ability to promote policy goals and assess results. The Department stated that as a general policy it has concentrated on reducing data collection where the same information is already available through other sources. However, in identified areas where data collection and analysis were found to be lacking, the Department said that it has moved aggressively to correct this situation. It added that it continues to review this area to ensure that it has access to information needed to carry out its mission and that the cost and effort required to achieve this are appropriate.

Our report recognizes that certain types of data related to transportation and to the Department’s responsibilities (e.g., in the area of safety) have never been available and that the current leadership can claim credit for initiating actions to fill some of these gaps. One example we cite is the recommendation of the Safety Review Task Force on Motor Carrier Safety that DOT substantially improve data collection efforts to enable BMCS to identify priority safety problems and develop effective countermeasures. On the other hand, as also discussed in this chapter, we identified a number of areas where reductions or delays in collecting and analyzing data have hampered DOT’s ability to monitor trends and developments in transportation and limited its ability to provide timely, objective analysis of the consequences of policy initiatives—both actual and proposed—in such areas as economic deregulation, defederalization, and user financing of program activities.

Highway Hazards

In the area of highway hazard elimination, the Department disagreed with our position that evaluation resources would be more productively spent by doing targeted, methodologically sound studies on selected

safety improvement projects and that such studies would result in better criteria for assuring cost-effective use of federal highway funds. It stated that the current criteria and methodology, consistent with FHWA program regulations and guidelines, fully meet the intent of the Congress and result in the cost-effective use of available federal funds. It also stated that program experience has amply demonstrated that fixed or uniform nationwide criteria for determining what features are most hazardous or what corrective measures work best on existing highways cannot be prescribed in advance. For these reasons, the Department stated that redirecting resources as GAO suggests would compromise the program's objectives and would not ensure better information upon which to base project decisions. At the same time, the Department stated that it has already recognized the problems we noted in attempting to obtain comprehensive evaluation data on a project-by-project basis. In this regard, the Department stated that FHWA has advised its field offices that representative, in-depth evaluations by the states, in lieu of before-after analyses of all projects, are acceptable and should be encouraged.

We recognize that the Congress intended the states to have principal responsibility for identifying and correcting highway hazards and for evaluating the effectiveness of safety improvements in reducing accidents. We also recognize that developing uniform, nationwide criteria for project selection may well be impractical. Our point was simply that the cost-benefit ratios and related effectiveness measures published annually by FHWA have been based on before-after analyses that are flawed methodologically and, consequently, do not provide valid measures for deciding which safety improvements to fund. We continue to believe that targeting evaluation resources both comports with the states' primary program role and is more likely to produce meaningful information for the states to use in making their project decisions. FHWA's effort to encourage the states to do such evaluations is consistent with our suggestion.

Coast Guard User Fees

DOT did not agree with our conclusion that its inability to gain acceptance for Coast Guard user fee proposals can be attributed, in part, to a lack of basic information needed to document and support such proposals and to deficiencies in exploring alternative approaches. The Department noted that its proposals were met with considerable opposition from the affected constituencies and were defeated primarily because of this opposition rather than because of any deficiencies in the merits of the proposals.

While we acknowledged in our discussion the political sensitivity and controversiality of user fees and the possibility that DOT might never be able to gain sufficient support to enact them in the form it would like, we also pointed out—and continue to believe—that DOT could improve its chances for success by fully considering the alternatives available to it, the advantages and disadvantages associated with each, and the kinds of information that need to be used to effectively support and persuasively defend each alternative. While the climate may or may not be ripe at the moment for the acceptance of revenue-raising proposals of the type sought by the Department, there is no reason to believe—particularly in view of foreseeable budget/fiscal conditions—that the climate cannot or will not change. We believe the Department would be better equipped to take advantage of such a change if it were to begin to develop the accounting and financial systems, cost data, and other types of information needed to document and justify its proposals. Such proposals, we believe, would stand a far greater chance of gaining political acceptance than DOT's prior proposals, which were based on arbitrary revenue targets and without demonstrated relationship between benefits received and the actual costs of providing those benefits.

Research and Development

The Department agreed with our assessment of the importance of linking R&D activities to Secretarial priorities and industry needs, targeting scarce resources where the potential payoffs are greatest, and providing top-level management oversight for R&D activities. The Department stated that it has recently taken steps to accomplish these objectives—for example, ensuring top-level management oversight of modal R&D programs through the Secretary's Science and Technology Advisor—and agreed with our assessment that additional opportunities exist to link Secretarial priorities with investments in R&D. The Department also indicated that it currently has under consideration measures for developing a more strategic R&D policy additional to those suggested by GAO.

Letter Dated February 10, 1987, From the Deputy Secretary of Transportation



THE DEPUTY SECRETARY OF TRANSPORTATION
WASHINGTON DC 20590

February 10, 1987

Mr. J. Dexter Peach
Assistant Comptroller General
Resources, Community, and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

Enclosed are two copies of the Department of Transportation's comments concerning the U.S. General Accounting Office (GAO) draft report entitled, "Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management." As recognized in your report, the Department is taking aggressive actions to enhance its policy and program effectiveness.

This report will aid us as we assess and continue our initiatives and actions to improve our management processes and ensure safety. We recognize that your report is the result of extensive consultation and cooperation between members of both of our staffs throughout the course of your review. Beyond those actions cited in the report, I am sure both of our staffs have benefited from the exchange of ideas and perspectives regarding those suggestions for improving the Department's management practices.

You will note in our comments that while we generally agree with many of the recommendations GAO makes, we disagree with several of the characterizations and conclusions concerning our management and policy processes and program administration. We are also anxious to review the supplement to this report, when published, which as stated in this report will provide further details on the findings and recommendations. Therefore, I have asked the respective staffs within the Department to continue the dialog with GAO on various aspects of this report and the supplement to ensure that all major recommendations and concerns are addressed.

We appreciate the opportunity to review and comment on this report. If you have any questions concerning our reply, please call Jon Seymour on 366-2332.

Sincerely,

A handwritten signature in cursive script that reads "Jim Burnley".

Jim Burnley

Enclosures

DEPARTMENT OF TRANSPORTATION (DOT) REPLY
TO
GENERAL ACCOUNTING OFFICE (GAO) DRAFT
REPORT OF OCTOBER 24, 1986
ON
ENHANCING POLICY AND PROGRAM EFFECTIVENESS
THROUGH IMPROVED MANAGEMENT

I. SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

This report is one in a series of the GAO management reviews of Federal departments and agencies. It concentrates on the DOT's major missions and current Secretarial initiatives and attempts to relate the performance of management systems to key programs and to the information needs of Departmental officials. The draft report presents findings and recommendations in five areas: (1) Safety Programs; (2) Grants Management; (3) Management Support Systems; (4) Human Resource Management; and (5) Policy Formulation and Implementation. The GAO report notes that:

1. Secretary Dole has made transportation safety one of the Department's "highest and most visible" priorities and that the Secretary's Safety Review Task Force has made numerous recommendations for management and program improvements. GAO believes, however, that the Department can achieve even greater success in enhancing its safety programs through improved definition of safety program objectives and adoption of appropriate measures of effectiveness and productivity standards (Chapter 2).
2. Various changes in the structure and administration of grant programs have reduced DOT's control and involvement. GAO believes that DOT needs to assess the collective impact of these changes and resolve basic questions regarding the appropriate Federal role in administering transportation grants (Chapter 3).
3. Major challenges of the Department are modernizing financial management, ensuring productive use of information, and strengthening procurement procedures. Various improvement initiatives are currently underway but these efforts should be structured into a formal agenda to ensure their successful implementation. The report offers an agenda of action needed to achieve both long- and short-term objectives in each administrative area (Chapter 4).

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4. Federal Aviation Administration (FAA) new emphasis on human resource management should be mirrored throughout DOT since other administrations within DOT are also facing significant changes in their operating environments as a result of defederalization, deregulation, deficit reduction emphasis, etc (Chapter 5)
5. The Department has been active in developing far-reaching policy proposals, and Department officials can point to a number of noteworthy achievements, particularly in the area of safety policy. Nevertheless, GAO believes that DOT could be more successful in carrying out its policy leadership role if it were to adopt a more systematic and strategic approach to policy formulation, implementation and monitoring (Chapter 6).

II. GAO'S RECOMMENDATIONS

GAO recommends a series of specific actions aimed at furthering and institutionalizing the Secretary's efforts for better planning and implementation of policy and safety program initiatives, and strengthening the Department's financial, information, and procurement systems. GAO provides examples and suggestions on how its recommendations might be implemented, including ways for the Department to build on initiatives already underway (Chapters 2, 4 and 6). GAO also recommends that the Department redefine its role in managing and overseeing grant programs and provide a prominent Department-wide focus for human resource management. To achieve these objectives, GAO provides alternative organizational approaches and highlights some of the considerations basic to management decisions in these areas (Chapters 3 and 5).

III. SUMMARY OF THE DEPARTMENT OF TRANSPORTATION POSITION

The GAO report includes several broad recommendations for making overall management improvements within the Department. Generally, the Department agrees with these recommendations. Furthermore, we believe that initiatives already underway within the Department address many of the issues raised in the report.

However, we take exception with several of the characterizations and conclusions concerning our management and policy processes and program administration. Therefore, most of our comments relate to those aspects of the report.

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The report provides constructive comments which can help the Department build on the momentum already well underway on many initiatives. It contains many positive statements about our comprehensive initiatives and actions to improve management and ensure safety. Further, it provides an additional source and perspective to aid in the continual assessment of our progress and development of future plans. Our specific comments on each chapter are contained in the following paragraphs.

Chapter 2 - Safety Programs and Resources

The Department agrees with GAO on the need to build on and institutionalize the progress already made in developing and using operational effectiveness measures, productivity measures, and related techniques. GAO has addressed many of the same areas that were subjects of recommendations from the Secretary's Safety Review Task Force. However, the Task Force did not seek to apply general measures throughout the Department as GAO recommends, but instead made specific recommendations for improvements recognizing the particular situation and problems of each Operating Administration. Actions are underway to implement many of the recommendations made by the Task Force. These include the use of operational measures such as frequency of safety violations to target inspections, the FAA's refinement of their staffing standards, and the Federal Railroad Administration's efforts to develop and implement a nationwide inspector allocation plan based on accident rates and projection of future risk. These actions illustrate our efforts to improve our safety programs and are consistent with the intent of the GAO's recommendations.

Chapter 3 - Grants Management

The Department agrees with GAO's recommendations concerning grants management and will continue to assess and improve the oversight and management of the grants program. GAO has recognized the Department's initiatives and progress. The Department supports continuation of the current strategy where each Modal Administration undertakes its own assessment and coordinates with other administrations as appropriate. This strategy is consistent with the alternative approaches suggested by GAO.

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The Department would like to clarify certain grants management functions and responsibilities which were not clearly defined in the report. For example, GAO states that there have been changes in grant programs which have resulted in grantees now having authority and flexibility to design projects to their own standards and requirements. In the Federal-aid highway program, the Federal role in project design standards has changed very little over the years. Federal-aid projects must be designed in accordance with standards approved by the Federal Highway Administration (FHWA) and must be in compliance with numerous other Federal requirements. State-developed standards must be approved by the FHWA in order for projects to be eligible for Federal reimbursement. Similarly, FAA has long-established standards for the design, operation and maintenance of airports which are the basis for grant eligibility.

GAO also states that DOT's control and influence over the use of grant funds have decreased. Where it has been appropriate, the Department has proposed programs in FHWA and FAA where States will have greater flexibility in project selection. These programs are targeted at areas where there is less of a Federal interest such as urban and rural roads and small commercial service and general aviation airports. However, when discretionary programs can improve efficiencies, and in areas of strong Federal interest, such as the Interstate and primary highway programs, Federal oversight and influence has actually increased. For example, the Urban Mass Transportation Administration (UMTA) has increased its control and influence over the use of discretionary grant funds by initiating a program of hiring contractors to perform project management oversight. UMTA's contractors monitor projects to help assure that grantees' projects are properly staffed, managed and executed in accordance with the grantees' established procedures, plans and specifications.

In the highway program, FHWA is getting more involved in the technical aspect of grants management because of the need for more effective application of technology to the complex problems of pavement and bridge reconstruction and rehabilitation. The review of major and complex bridge proposals by the FHWA

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Washington Headquarters Office, with field office collaboration, has been directly responsible for savings of more than \$250 million since 1978 through alternate design strategies and other applications of current technology which the States and consultants have accepted due to FHWA leadership. Also, through special program emphasis areas, as well as through other instructions to the field offices, FHWA has clearly set forth a policy of high level project and technical involvement, rather than de-emphasis of this type of involvement as implied in the GAO report

Finally, GAO states that clearly defined roles and responsibilities in the Department would facilitate development of effective management and oversight. The Department continually reviews roles and responsibilities for effective grants management, and makes appropriate adjustments. For example, the FHWA Washington Headquarters was recently reorganized, in part to address the needs of high technology rehabilitation and reconstruction. Further, the reorganization provides a strong engineering management function for national leadership in applying high technology solutions to ensure the most efficient use of available funds. The Department envisions the promotion and sharing of highway technology to be a paramount role of the FHWA for the foreseeable future.

Illustration of Change Federal-Aid Highway Program

The Department would like to clarify two FHWA functions which have been characterized in the report as State functions for which FHWA has little responsibility. First, GAO indicates that the Interstate System is essentially complete and that most Federal-aid highway funds are used for preservation work for which the States have been primarily responsible. Preservation includes resurfacing, restoration, rehabilitation, and reconstruction of existing highways, all of which are eligible work items under the Federal-aid highway program and, therefore, subject to a continuing Federal oversight role. This should not be confused with maintenance which has always been and continues to be a State responsibility.

Secondly, GAO indicates that under Certification Acceptance (CA), the States may substitute their standards, processes, and procedures for Federal ones. It should be noted that pursuant to

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23 U.S.C. 117, the FHWA must determine that the State laws, standards, etc., will accomplish the policies and objectives of Title 23 U.S.C. and must conduct a final inspection of each project. Moreover, CA does not cover requirements of such non-Title 23 legislation as the National Environmental Policy Act of 1969 and the Civil Rights Act of 1964, as amended. Finally, it should also be noted that the number of States opting for the CA has not increased significantly in the past several years.

Further, GAO states that CA also permits the States to eliminate FHWA project design reviews. This is not true. The FHWA has established a strong design monitoring program for implementation by its division offices in each State, featuring a variety of project-and-process-oriented review techniques and including both CA and non-CA projects.

Chapter 4 - Management Support Systems

The Department agrees with a number of the suggestions GAO has outlined for meeting the challenges presented by our management support systems. As the report recognizes, the Department has initiatives underway and is working hard to develop other solutions to financial, information, and procurement needs, and improve efficiency and effectiveness in delivery of programs and services. We feel confident that the progress, to date, resulting from the Department-wide accounting system, cash management, information resource management, and procurement initiatives are a measure of the benefits to be derived in both the short- and long-term.

We are already realizing benefits from our Information Resource Management Advisory Council in policy development and consolidated approaches towards managing and acquiring information resources. For example, a major FAA office automation workstation procurement has been expanded to include the entire Department. This action should result in a standard approach to workstations (microcomputers) in the Department and a lower unit cost as a result of a larger acquisition. Software development efforts are also being shared. Presently, the Coast Guard is evaluating FAA's approach to logistics automation and the use of common software modules and/or processing facilities.

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Further, accounting and financial management initiatives are resulting in significant reductions in cash in the hands of grantees and interest savings to the Federal government.

These are just a few of the many initiatives that are already ongoing throughout the Department. As GAO recommends, our management support systems will continue to receive the attention needed to provide for their modernization and improved effectiveness and efficiency.

Chapter 5 - Human Resource Management

While the Department agrees with the need for strategic planning for human resource management (HRM), we disagree on the approach necessary to sustain a Department-wide focus on the subject as recommended by GAO. Specifically, we do not share GAO's opinion in the need to have HRM functional responsibilities vested in additional bureaucratic layers and organizational entities, i.e., a separate Associate Deputy Secretary or Assistant Secretary for HRM at the Office of the Secretary (OST) level or separate Associate Administrators for HRM at the Operating Administration level. We strongly believe that these functional responsibilities can and are being carried out by existing organizations, including the Assistant Secretary for Administration and Associate Administrators. For example, the establishment of a new Personnel Planning, Research and Systems Division within OST and the initiative undertaken by this organization clearly shows that the Department has developed a nucleus for building a greater Department-wide human resource planning capability.

We also believe there are benefits and efficiencies in having a number of administrative functions housed in the same organization, which would not be possible if HRM were established as a separate organization. The Department and the Operating Administrations have developed numerous successful and innovative HRM programs, and the various personnel organizations in DOT are working cooperatively on a variety of projects. We do not believe that this situation would be improved with a separate HRM organization.

Our HRM programs, developed through our existing structure, has shown that the Department will not allow HRM to become submerged in the day-to-day

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administrative concerns of the Department as suggested by GAO. HRM will continue to receive the visibility and organizational prominence consistent with this Department's strong commitment to its objectives.

We are open to additional discussions with GAO on this issue to explain our views, as well as to discuss other aspects of the chapter such as the assessment that FHWA's work force is moving from an engineering, technical assistance mode to a financial management role.

Chapter 6 - Policy Formulation and Implementation

The Department disagrees with the GAO's characterization of the effectiveness of the Department's policymaking functions as being applied along separate tracks and primarily serving short-term needs. Secretary Dole has been especially effective in defining goals, objectives, and priorities, both for the short- and long-term, and in communicating those goals within the Department, the Administration, to the Congress, and to the general public. The management systems that GAO mentions -- the budget process, the regulatory agenda, and the legislative agenda -- have been used consistently to promote the Secretary's goals, and, as GAO notes, the Secretary has an excellent record of success for her major initiatives.

Secretary Dole's name has become closely associated in the public's mind with transportation safety and economic deregulation of transportation industries. Within the Federal Government and among transportation professionals, she is equally well known for her strong support of user financing for Federal transportation activities and of defederalization of transportation operations. Those goals are well known throughout the Department, and DOT policy officials at all levels incorporate those goals in their policy recommendations.

The Secretary's goals are apparent in both short- and long-term initiatives she has taken. For example, at the recommendation of her Safety Review Task Force and as part of a major initiative to enhance motor carrier safety, the Secretary proposed a 200 percent increase in the money provided to States to support their inspection activities as well as a doubling of

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Federal Safety Specialists She succeeded in winning Administration support for her proposal in development of the FY 1987 Budget and won Congressional approval in October 1986. Another part of her Safety Review Task Force's recommendation on motor carrier safety will require a longer period to accomplish and is being pursued through regulation, assignment of safety ratings to all interstate motor carriers for safety fitness, and establishment of a comprehensive data base to track their safety performance.

Her use of the budget process to promote her goals can be illustrated by the increase in the portion of the DOT budget financed by user fees: 63 percent of DOT's budget came from user fees in 1983, that had risen to 66 percent by 1986, even though Congress resisted some of her initiatives which would have increased this percentage further. The Department will continue to pursue initiatives to increase that percentage and has proposed in the FY 1988 Budget to finance 85 percent of the budget by user fees.

GAO suggests that the shortcomings of this Department's policymaking are illustrated by our failure to accomplish all that it has sought in the policy arena. No Cabinet department has been successful in 100 percent of its initiatives, but we believe this Department has an exceptionally good record. With Secretary Dole's aggressive leadership, Congress has agreed to the sale of Conrail and the lease of Dulles and National Airports to a regional commission. Those are two major steps in defederalizing transportation operations that are more appropriately the responsibility of private or local entities.

A major accomplishment of the Secretary, in light of years of controversy over automobile air bags, was the issue of the FMVSS 208 rule that, for the first time, is actually saving lives. We believe GAO is in error when citing the failure to establish the National Traffic Safety Administration as an example of a priority safety objective we failed to achieve. Creation of that agency was proposed in the FY 1986 Budget. However, before legislation was submitted to effect it, the Secretary decided that her objectives could be better accomplished by organizational changes within FHWA and her motor carrier safety initiative. Working jointly with the motor carrier industry, the Department has effectively realized its program objectives.

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Obviously, we would like to have succeeded with more of our proposals, and management processes can always be improved. However, we believe that DOT has the proper processes and systems and has established an excellent record of successful policymaking and implementation.

In addition to the general comments on policy formulation, the Department would like to clarify for GAO certain program functions which were not clearly defined in the report

Data Collection and Analysis

The Department disagrees with GAO's conclusion that a reduction of the collection and analysis of transportation data has hindered the Department in promoting policy goals and assessing results. The Department has identified areas where data collection and analysis were lacking and has moved aggressively to correct them. As a general policy, the Department has concentrated on reducing data collection where the same information is already available through other sources and established user fees for data collected and used by the Department but also used by other outside groups, such as Aviation Information. Further, we are initiating new data collection where the information is required to support the Federal role but is not collected by any other source, such as FAA's new and more efficient collection of data on its inspection process, and the recently authorized addition of certain pavement-related data elements to the existing Highway Performance Monitoring System, which measures and inventories the physical condition and usage of the Nation's highways. The Department is also developing plans for the 1988 Commodity Transportation Survey and the National Personal Transportation Survey. DOT continues to review the data collection and analysis role to ensure that the Department has access to necessary information required to carry out our mission and that the cost and effort required to do this is not duplicative and fairly shared by the users.

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Elimination of Highway Hazards

GAO indicates that, in the case of highway hazards, the data collected and analyzed by FHWA do not assure cost-effective use of federal highway safety funds. GAO believes that in order to evaluate which state projects are most effective in eliminating hazards, the Department should target selected projects instead of allowing each state to develop its own evaluation criteria and methodology.

The FHWA has issued procedures to be followed by the States in implementing the hazard elimination program (23 USC 924). These include both the essential components of a comprehensive process and criteria to be considered in establishing priorities. Program experience has amply demonstrated, however, that fixed or uniform nationwide criteria for what features are the most hazardous or what corrective measures work best on existing highways (the focus of this program) cannot be prescribed in advance. It is not just a problem of obtaining valid and reliable evaluation data; safety improvements that work well at some locations may have a substantially different effect at others for a wide variety of reasons.

FHWA does assist the States in their selection process through the collection and dissemination of State evaluation results, and continuing research in many related areas affecting highway safety. When their safety effectiveness has been generally established, devices and procedures are incorporated into guidelines and standards for both new and existing highways. We believe the current process fully meets the intent of Congress and results in the cost-effective use of available Federal funds. Redirecting available resources as GAO recommends would compromise these objectives and would not assure better information upon which to base project decisions.

We have already recognized the problems noted by GAO in attempting to obtain comprehensive evaluation data on a project-by-project basis.

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In order to improve the evaluation process, we advised field offices that representative in-depth evaluations, in lieu of before-after accident experience on all projects, are an acceptable alternative and should be encouraged. State applications of this approach are being periodically reaffirmed during our field reviews of the States' process.

Coast Guard User Fees

The Department does not agree with GAO's conclusion that the lack of political support for a user fee was directly related to DOT's deficiency in exploring policy options and lack of information. The Department examined various fee and excise tax proposals and the impact on users. There were numerous meetings between legislative and executive branch representatives to discuss the legislative initiative. The proposal was met with considerable opposition from the constituency, and the Department believes that it was defeated because of this opposition rather than because of the merits of the proposal. The Senate never held hearings on any of these legislative proposals to discuss the issues.

The Department will continue to explore policy options for a Coast Guard user fee and work with the Congress on the proposal.

Research and Development (R&D)

The Department has recently taken steps which provide linkage of R&D activities to Secretarial priorities and industry needs, concentrate resources where potential payoffs are greatest, and provide top-level management oversight for R&D activities as suggested by GAO.

DOT has ensured top-level management oversight of modal R&D programs through the Secretary's Science and Technology Advisor. The Science Advisor conducts a centralized review of all modal R&D program and budget proposals and makes recommendations to the Secretary to ensure that all R&D activities are consistent.

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with overall policy, address industry needs, and have an acceptable expectation of payoff. The Science Advisor's review ensures that all R&D is properly planned and scheduled, coordinated within the Department and with other government agencies and with the private sector in areas of mutual interest and benefit. The Science Advisor also ensures active and continued coordination by meeting with the Department's R&D Council and by serving as DOT's central point of contact with the private sector and the academic community. Further, the Science Advisor continues to monitor the progress of R&D programs to ensure their consistency with approved plans.

We agree with GAO that additional opportunities exist to link Secretarial priorities with R&D activities. We are currently considering other steps within the Department for developing a more strategic policy for R&D in addition to those suggested by GAO.