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Energy Issues

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General Accounting Office
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Comptroller General
of the United States

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The Speaker of the House of Representatives
The Majority Leader of the Senate

In response to your request, this transition series report discusses major policy, management, and program issues facing the Congress and the new administration in the areas of energy and science. The issues include (1) reflecting trade-offs in energy policy, (2) revising strategies for the nuclear weapons complex, (3) refocusing national laboratories on current national needs, (4) developing a long-term management focus at the Department of Energy (DOE), (5) resolving DOE's nuclear waste disposal dilemma, and (6) strengthening international nuclear safety and nonproliferation.

As part of our high-risk series on program areas vulnerable to waste, fraud, abuse, and mismanagement, we are issuing a related report, Department of Energy Contract Management (GAO/HR-93-9, Dec. 1992).

The GAO products on which this transition series report is based are listed at the end of the report.

We are also sending copies of this report to the President-elect, the Republican leadership of the Congress, the appropriate congressional committees, and the Secretary-designate of Energy.

Charles A. Bowsher

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Energy Issues

In 1991, the Persian Gulf War focused the nation's attention on the need for a long-term energy policy. Subsequently, the Congress enacted the most comprehensive energy legislation in over a decade—the Energy Policy Act of 1992. These events, together with the end of the Cold War and a consequent reduction in the demand for nuclear weapons, provide the opportunity to fundamentally reexamine the Department of Energy's (DOE) missions.

Dealing with the problems of DOE's nuclear weapons complex presents monumental challenges that will require enormous amounts of resources. The agency has begun a massive $160 billion cleanup of the legacy of 40 years of environmental abuse at weapons facilities and will need billions of dollars more to reconfigure the aging complex once it decides how and where future weapons materials can best be produced. DOE's national laboratories—some of which support the weapons program—are funded at more than $7 billion and employ over 50,000 staff; however, the agency has yet to decide the optimal future role of the laboratories and the appropriate distribution of research and development dollars in a deficit-constrained fiscal environment.

DOE has initiated sweeping organizational and management changes in response to the issues we identified 4 years ago. Responding to calls for increased oversight of the agency's many contractors—including those that operate the national laboratories and nuclear weapons facilities—DOE has also taken steps to reform its management philosophy and practices and to give contractors more incentive to act responsibly. However, DOE is still coping with the legacy of its Cold War mission and reliance on contractors; completing these changes will take time and significant leadership effort.

DOE's planned nuclear waste repository, estimated to cost up to $30 billion, appears as distant as it did when authorized a decade ago. Meanwhile, the specter of a nuclear black market accompanying the dismantling of thousands of weapons in the United States and abroad, together with the need to repair or replace potentially unsafe nuclear power plants in Eastern Europe and the former Soviet Union—at a cost of up to $50 billion—demand attention to international nuclear safety.

Reflecting Trade-Offs in Energy Policy

The United States currently relies on fossil fuels—coal, natural gas, and petroleum—to supply some 85 percent of its energy requirements. This reliance, which has evolved in response to market forces, entails economic, national security, and environmental costs. Policies that would better reflect these societal costs in energy prices could help enhance national security, foster energy efficiency, and improve our environment.

Market Forces Directing Energy Choices

Petroleum supplies about 40 percent of the nation's energy needs, and, as we noted in our 1988 transition report, the transportation sector is almost totally oil-dependent. Nearly half of the petroleum is imported. Even with the efforts initiated or continued by the Energy Policy Act of 1992, the percentage of oil needs met by imports is projected to increase, as is the portion of imports originating in volatile Middle Eastern countries.

A major reason for our reliance on oil is its relatively low price. For example, the price of gasoline in the United States, when adjusted for inflation, is lower now than in 1947. This makes it difficult for alternative motor fuels to compete and discourages

measures that increase vehicle fuel efficiency.

Similarly, some 70 percent of the nation's electricity is generated using fossil fuels—primarily coal and, increasingly, natural gas. The use of fossil fuels for generating electricity is dictated by price; with some exceptions, alternatives such as solar, wind, or geothermal energy are too expensive compared with fossil fuels. As in the transportation sector, relatively low fossil fuel prices can discourage large-scale development of alternatives and limit efforts to conserve electricity.

Market Forces Possibly Not Reflecting All Costs

The extent to which market prices reflect the societal costs of energy sources—including dependence on foreign suppliers and environmental impacts—varies and is debated among economists and policy advisors. The Council of Economic Advisors reported in 1991, for example, that national security and environmental considerations are given inadequate weight by the market forces that determine energy prices.

In addition to security concerns raised by a dependence on foreign sources, a lack of

alternatives to oil makes the nation economically vulnerable. For example, between August 1 and December 1, 1990, U.S. consumers spent $21 billion more for crude oil and petroleum products than they would have spent if the Middle East crisis had not occurred; of that amount, $8 billion was paid to foreign producers. In addition, oil combustion creates significant environmental effects. Motor vehicles generate a large portion of hydrocarbon and carbon monoxide emissions in our cities and are in large part responsible for the failure of many metropolitan areas to meet air quality standards in 1991.

Policymakers Facing Options

Some existing policies and programs encourage the development of alternatives to fossil fuels, such as solar and wind energy technologies and alternative motor vehicle fuels. However, an additional number of market incentives, regulatory and tax policies, and research and development strategies have the potential to make energy prices better reflect societal costs and promote realistic efforts to develop alternative energy sources.

Reversing current trends towards increased reliance on fossil fuels, particularly oil, will

take further steps. Higher gasoline taxes, tailpipe emissions taxes, subsidies for alternative fuels, and higher fuel economy standards are examples of options that could be used in the transportation sector. Our analysis of these and other options shows that each involves trade-offs, but they can be modified or combined so as to mitigate any adverse impact and increase their effectiveness. For example, revenues from a higher gasoline tax or a tailpipe emissions tax could be used to reduce other taxes, such as taxes on income, and possibly offset negative effects on economic growth and on low-income and rural groups.

Revising Weapons Complex Strategies in Response to Changing Events

The collapse of the Soviet Union and devastating environmental contamination and safety problems throughout the nuclear weapons complex have shifted DOE's major mission from nuclear weapons production to environmental restoration and waste management. Virtually overnight, DOE's plans for modernizing the weapons complex have become outdated, and a refocusing of cleanup priorities in the face of our nation's budget deficit is critical.

Reconfiguring the Complex

DOE's 1988 plan to modernize its 10-facility nuclear weapons complex at an estimated cost of about $50 billion was completed before the recent historic agreements to dramatically cut our nuclear weapons stockpile. The basic challenge now is to determine what our nuclear weapons production capability should be in the future, how best to reconfigure the complex in light of a changing world, how to dismantle large numbers of nuclear weapons, and how to dispose of, store, or use plutonium and other material from retired weapons.

DOE has not yet come to grips with such issues and has been slow to react to the reduced need for nuclear weapons. For

example, in a February 1991 report, we questioned the validity of DOE's plan for modernizing the weapons complex—specifically, the need for a new tritium production facility—in light of the decreasing weapons inventory and the availability of tritium from other sources. DOE finally terminated its plans for the facility—thus saving billions of dollars—in September 1992. A better understanding of the future role of the weapons complex may provide further opportunities to streamline the complex and realize greater savings.

Critical decisions are also necessary to guide the dismantling of nuclear weapons and the disposition of weapons-grade material. DOE will have to dismantle thousands of its nuclear weapons over the next several years, but the safe dismantling of so many weapons could tax the limited capabilities of DOE's current facilities. Furthermore, dismantling will create a significant inventory of weapons-grade plutonium and enriched uranium. These materials must be carefully safeguarded and stored to prevent both proliferation and accidental releases. The future disposition of this material remains unclear.

Responding to Environmental Problems

DOE faces a monumental task in addressing the legacy of environmental contamination created by nearly a half century of nuclear weapons production. The cost to clean up the complex continues to grow. In our 1988 transition report, we estimated that costs could range from $100 to $130 billion. Long-term estimates are now up to at least $160 billion—and may go higher—with annual expenditures of over $8 billion by fiscal year 1998. Also, the cleanup is likely to take longer than the 30 years that DOE originally estimated.

To demonstrate its willingness to resolve its environmental problems, DOE has signed over 80 compliance agreements with the Environmental Protection Agency and states, most of them over the past few years. However, DOE did so in some cases without knowing the costs of the cleanup or having the technologies needed to deal with a variety of cleanup problems. Escalating costs and technological uncertainties are now forcing DOE to renegotiate some of these agreements. These circumstances as well as competing national budget priorities raise broader cleanup issues—such as which sites should be cleaned up, in what order, and to what standard.

Refocusing DOE's Laboratories to Meet Current National Needs

For the past 45 years, DOE's national laboratories have spent billions of dollars building the nation's nuclear arsenal and conducting research in basic science and energy technologies. Funded at over $7 billion and staffed with over 50,000 scientific and other personnel, DOE's nine multiprogram laboratories constitute a valuable national resource. Today, the laboratories face increasing pressures to reorient their work towards more immediate national needs.

Changing Laboratory Missions

The dramatic reduction in the arms race, brought about by the collapse of the Soviet Union, has raised serious questions about the future role and structure of the three large laboratories devoted primarily to designing nuclear weapons. Furthermore, all of the laboratories face increasing pressure to direct their talented staffs and facilities to address current national priorities, such as improving the nation's economic competitiveness, cleaning up the environment, and developing U.S. infrastructure. In an era of growing national budget deficits, the laboratories can no longer assume that basic research—although highly regarded within the scientific community—will be funded at previous

levels without more evidence of useful applications.

Both DOE and its laboratories have begun taking steps to address this situation. The laboratories already conduct research in areas potentially useful to industry, such as high-performance computing, materials research, and nuclear medicine. DOE has developed new mechanisms to encourage cooperation between the laboratories and industry. However, others from outside the research community question whether this transition is worthwhile or can be successful and have suggested reassessing the need for facilities that have accomplished their missions.

All of these factors increase the pressure on DOE to outline future directions for its laboratories as well as to improve day-to-day program management. However, DOE's complicated management structure—through which laboratories report to different field offices and assistant secretaries—makes both mission direction and laboratory management difficult. Indeed, many fear that the current system may lead to gridlock at the laboratories. DOE's own advisory board describes a "loss of coherence and focus" in the laboratories that

is impairing their ability to respond to new initiatives.

Deciding which national needs the laboratories can best address is the starting point. Then, it will be necessary to reorient the laboratories in this direction. As the focus of the laboratories changes, a framework must be developed that encourages the laboratories and industry to work together in planning research efforts.

Developing a Long-Term Management Focus

Despite corrective efforts, DOE still faces long-standing management and contracting problems, which have placed the government's multibillion-dollar annual investment in DOE's activities at risk. For example, management of the nuclear weapons complex has been characterized by years of neglect of environmental, safety, and health issues. Correcting problems like these requires a sustained commitment to overcoming ingrained institutional problems.

Sustained Commitment Needed to Improve Management

Contract management weaknesses can be traced to DOE's traditional "least interference" management style stemming from the Manhattan Project of World War II. DOE gave its contractors virtual independence in managing nuclear weapons facilities and did not develop effective information systems to monitor contractors' performance.

As discussed in our high-risk series report on DOE contract management, the arm's-length approach begun then has continued for both the nuclear weapons complex and the national laboratories, creating serious problems. For example, our work has identified excessive subcontracting costs, missing classified documents, contractors'

funding of unauthorized projects, and contract clauses requiring DOE to reimburse contractors for irregular costs, such as thefts by contractor employees. DOE's failure to systematically monitor contractors' financial reporting practices has also created an atmosphere conducive to financial irregularities.

DOE has recognized its management and contracting problems and has taken many positive steps. To remedy problems caused by a fragmented structure, DOE in 1989 realigned organizational relationships to build better accountability into field and headquarters operations. DOE has also begun to revise its contract management philosophy to strengthen contractor oversight and accountability. More than 80 percent of DOE's 1991 $19 billion procurement budget went to contractors that carry out the Department's primary functions.

However, the success of the reorganization is being hampered by continuing uncertainty about new roles and responsibilities for the field managers who oversee contractors. Furthermore, poor coordination of guidance and direction on program and policy matters is making communication between

headquarters and field staff difficult and sometimes nonproductive. As a result, decision-making is delayed and clear priorities are not set for a wide range of issues.

DOE's management problems have developed over 40 or 50 years, and their solutions must also be measured over the long term. Actions taken to date are broad policy initiatives that will require years to implement. Sustained commitment to change is needed to institutionalize improvements.

Resolving DOE's Nuclear Waste Disposal Dilemma

Although a decade has passed since the Congress established a program for disposing of nuclear waste from electric utilities and several billion dollars have been invested, siting a nuclear waste repository seems as distant as it did 10 years ago.

Missed Time Frames and Escalating Costs

The Congress' original goal of having a repository in place by 1998 to accept spent (used) fuel from civilian nuclear utilities will not be met. DOE now has a target date of 2010, provided that the Yucca Mountain, Nevada, site that it is investigating is found to be suitable. However, completing the repository by that date appears unlikely because DOE has not been requesting the funds that it estimates will be needed to meet that schedule.

The cost of the waste disposal program—estimated at nearly $30 billion in today's dollars—is also being questioned. DOE has already spent over $3 billion on the program, including more than $1 billion over the last 10 years to study Yucca Mountain. DOE estimates that it will cost almost $5 billion more to complete planned site investigation activities by 2001, a deadline that it must meet to have any chance of meeting its target date for opening the

repository. To meet this time frame, DOE must successfully ramp up its investigation program almost immediately to more than twice its current scope.

Also, according to the review board that evaluates the technical and scientific validity of DOE's program, DOE may not have allowed enough time to address and resolve technical issues that could significantly affect the performance and cost of the repository.

Nonetheless, utilities believe that DOE has a binding commitment to begin accepting their waste in 1998. This question may require resolution by the courts. In the meantime, some utilities are finding it necessary to develop new spent fuel storage capacity at their nuclear plants. Although DOE plans to develop a temporary storage facility by 1998, it is having difficulty identifying a host site.

DOE is currently relying on the nuclear waste negotiator, an independent federal official, to find a state or Indian tribe willing to host a temporary storage facility. Although discussions are continuing, it is uncertain whether any state or tribe will agree in time for a facility to begin accepting waste by 1998.

In view of the dim prospects for completing a repository by 2010 and the uncertain availability of a temporary storage facility, a reassessment is needed. It is time to reconsider the alternatives for storing nuclear waste and to ensure that funding levels and time frames realistically accord with the selected alternative(s).

Strengthening International Nuclear Safety and Nonproliferation

Many of the 40 aging nuclear power plants of Soviet design operating in the former Soviet Union and Eastern Europe are viewed as too dangerous to operate over the long term and have the potential to create a Chernobyl-like accident. Furthermore, the breakup of the Soviet Union into independent states may have compromised control of nuclear materials and technologies.

Addressing Safety Concerns

Up to $50 billion may be needed to refurbish, repair, and replace nuclear reactors in the former Soviet Union and Eastern Europe. How to address this problem, including deciding whether some of the reactors should be shut down permanently, is a matter of debate. In addition, as we reported in November 1991, no international consensus or agreement exists on how to improve nuclear power reactor safety. A major question is whether binding international nuclear safety standards or some other common measures are needed to judge the safety of nuclear power reactors around the world.

DOE, along with other U.S. agencies, is seeking to enhance the safety of international nuclear power reactors by providing technical training courses,

equipment, and cost-free expert advice. DOE and others face the challenge of coordinating this assistance and reaching agreement on future needs for assistance.

Furthermore, member states of the International Atomic Energy Agency, including the United States, are currently working on a nuclear safety convention. U.S. policymakers will need to determine how guidelines or standards can best be implemented and enforced.

Addressing Nonproliferation Concerns

The discovery of Iraq's clandestine nuclear weapons program along with fears about the dispersion of nuclear weapons from the former Soviet Union has focused world concern on the importance of safeguarding nuclear materials and technology. Dismantling thousands of Soviet nuclear warheads will require the safeguarding of tons of plutonium and highly enriched uranium to prevent the emergence of a nuclear black market.

DOE is one of several federal agencies, including the Departments of State and Defense, the Nuclear Regulatory Commission, and the Arms Control and Disarmament Agency, that conduct

nonproliferation programs and activities. Among other things, DOE provides research and development support for safeguard activities, such as enhancing inspection capabilities and developing permanent disposal facilities.

DOE, in conjunction with other U.S. agencies, is negotiating a recent U.S. proposal to provide up to $800 million in aid to the former Soviet Union to dismantle and destroy nuclear weapons. DOE's expertise in materials and in the conversion of plutonium and highly enriched uranium into proliferation-resistant forms will be needed to help ensure that components from these weapons cannot be used again to make nuclear weapons. The United States has also pledged to buy 500 tons of highly enriched uranium from Russia to prevent its sale to other countries.

Proliferation of nuclear materials could have grave consequences, which the United States and other nations must address. The International Atomic Energy Agency's system to safeguard nuclear materials and technologies may be adversely affected by financial constraints, including the possible inability of a number of countries to provide their share of the financing. Among many

other questions, policymakers must determine what resources the United States and other nations need to commit to maintain the integrity and reliability of this multinational system.

Related GAO Products

Energy Policy

Energy Policy: Options to Reduce Environmental and Other Costs of Gasoline Consumption (GAO/RCED-92-260, Sept. 17, 1992).

Energy Policy: Developing Strategies for Energy Policies in the 1990s (GAO/RCED-90-85, June 19, 1990).

Energy Issues (GAO/OCG-89-16TR, Nov. 1988).

DOE Management

Department of Energy Contract Management (GAO/HR-93-9, Dec. 1992).

Department of Energy: Better Information Resources Management Needed to Accomplish Missions (GAO/IMTEC-92-53, Sept. 29, 1992).

Energy Management: Vulnerability of DOE's Contracting to Waste, Fraud, Abuse, and Mismanagement (GAO/RCED-92-101, Apr. 10, 1992).

Energy Management: Tightening Fee Process and Contractor Accountability Will Challenge DOE (GAO/RCED-92-9, Oct. 30, 1991).

Energy Management: DOE Actions to Improve Oversight of Contractors' Subcontracting Practices (GAO/RCED-92-28, Oct. 7, 1991).

Nuclear Weapons Complex

Nuclear Waste: Defense Waste Processing Facility—Cost, Schedule, and Technical Issues (GAO/RCED-92-183, June 17, 1992).

Cleanup Technology: Better Management for DOE's Technology Development Program (GAO/RCED-92-145, Apr. 10, 1992).

Nuclear Weapons Complex: Major Safety, Environmental, and Reconfiguration Issues Facing DOE (GAO/T-RCED-92-31, Feb. 25, 1992).

Nuclear Waste: Pretreatment Modifications at DOE Hanford's B Plant Should Be Stopped (GAO/RCED-91-165, June 12, 1991).

Nuclear Materials: Decreasing Tritium Requirements and Their Effect on DOE Programs (GAO/RCED-91-100, Feb. 8, 1991).

National Laboratories

Nuclear Weapons Complex: Issues Surrounding Consolidating Los Alamos and Lawrence Livermore National Laboratories (GAO/T-RCED-92-98, Sept. 24, 1992).

Nuclear Waste

Nuclear Waste: DOE's Repository Site Investigations, A Long and Difficult Task (GAO/RCED-92-73, May 27, 1992).

Nuclear Waste: Operation of Monitored Retrievable Storage Facility Is Unlikely by 1998 (GAO/RCED-91-194, Sept. 24, 1991).

International Nuclear Safety

Nuclear Safety: Concerns About the Nuclear Power Reactors in Cuba (GAO/RCED-92-262, Sept. 24, 1992).

Nuclear Power Safety: Chernobyl Accident Prompted Worldwide Actions but Further Efforts Needed (GAO/NSIAD-92-28, Nov. 4, 1991).

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Program Evaluation Issues (GAO/OCG-93-6TR).

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In response to your request, this transition series report discusses major policy, management, and program issues facing the Congress and the new administration in the area of transportation. The issues include (1) investing wisely to rebuild and enhance surface transportation infrastructure, (2) modernizing air traffic control and enhancing airports, (3) improving transportation safety, (4) increasing airline competition and access to international markets, (5) strengthening Coast Guard acquisition programs and environmental protection, and (6) consolidating financial systems and revamping grant oversight.

As part of our high-risk series on program areas vulnerable to waste, fraud, abuse, and mismanagement, we are issuing a related report, Federal Transit Administration Grant Management (GAO/HR-93-16, Dec. 1992).

The GAO products upon which this transition series report is based are listed at the end of the report.

We are also sending copies of this report to the President-elect, the Republican leadership of the Congress, the appropriate congressional committees, and the Secretary-designate of Transportation.

Charles A. Bowsher

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Transportation Issues

Rebuilding the nation's roads and bridges, managing the $32 billion air traffic control modernization program, making travel safer, and ensuring a competitive airline industry are all major transportation issues facing the new Congress and incoming administration. Resolving these issues will critically affect the nation's economy: Transportation jobs provide 15 percent of U.S. employment and account for 18 percent of Americans' purchases, or about $800 billion annually. Furthermore, investing in transportation will have a profound effect on the mobility of people, the quality of the environment, and the competitiveness of the nation in the international marketplace.

Since 1988, several significant developments have occurred that will shape the direction of this country's transportation programs far into the future. A central theme of our 1988 transition report on transportation issues was the need for a national transportation plan. In 1990, following extensive public hearings, former Secretary of Transportation Samuel K. Skinner issued the National Transportation Policy Strategy, which formed a cornerstone for transportation planning.

Building on this strategy, the Congress enacted the landmark Intermodal Surface Transportation Efficiency Act of 1991, which authorized an unprecedented $155 billion over 6 years to implement an integrated, multimodal solution to the nation's transportation problems. Implementing the requirements of this legislation and obtaining the funding necessary to do so will be among the most formidable challenges facing the new Secretary.

Even though the act authorized record funding, the costs of meeting infrastructure needs are likely to far exceed available resources: The Department of Transportation (DOT) estimates that merely maintaining the condition of the nation's highways and bridges at 1989 levels would cost about $250 billion over the next 6 years; improving conditions would cost about $425 billion. These estimates do not include funds needed for mass transit or rail systems.

This report discusses these and other major transportation challenges facing the Congress and the new administration.

Investing Wisely to Rebuild and Enhance Surface Transportation Infrastructure

Federal, state, and local governments are faced with rebuilding an aging infrastructure—highways and bridges—while simultaneously improving air quality, meeting mobility needs of people who are disabled, optimizing limited resources, reducing traffic congestion, and investing in new technologies to enhance existing transportation systems. Our reports have pointed to signs of the aging infrastructure—the ride on over 40 percent of the nation's interstate highway system is barely tolerable, and about 40 percent of the nation's bridges need repair and rehabilitation. DOT estimates that during the next 6 years nearly one-half trillion dollars will be needed to improve these conditions.

To guide and pay for these tasks, the Congress in 1991 enacted landmark surface transportation legislation. Because of the funding flexibility and intermodal concepts embodied in it, this legislation will alter the landscape for transportation decision-making throughout the 1990s. In doing so, it will give rise to a host of new challenges, including

- developing an organizational structure that facilitates investment trade-offs among

aviation, mass transit, highways, and rail;

- optimizing the use of funds because needs far outweigh available resources; and
- capitalizing on new technologies, such as high-speed rail and intelligent vehicle/highway systems.

Organizing DOT for Modal Trade-Offs

The 1991 legislation encourages using a total systems approach to select among transportation alternatives rather than focusing on only one form of transportation at a time to solve the problem at hand. However, DOT is organized into separate modal agencies, and this structure is not an optimum one to effectively implement the policy objectives of the new act.

To compensate for this shortcoming, the 1991 legislation created the Office of Intermodalism and the Bureau of Transportation Statistics. These offices will need to (1) help define the federal role in transportation problem-solving, (2) provide technical assistance to states and localities, and (3) develop and disseminate transportation data. Depending on the success these new offices have in fostering the intermodal approach and assisting states

and local governments as they decide on critical infrastructure investments, DOT may need to consider other organizational changes that coordinate the planning and financing arms of the separate modal administrations. One such change, suggested by the National Academy of Public Administration, would create a Surface Transportation Administration to encompass the missions currently performed by separate rail, highway, and transit agencies.

Optimizing Investment of Available Funding

Although the new act's $155 billion authorization over 6 years is unprecedented, infrastructure needs will continue to far exceed available resources. According to DOT estimates, the total federal, state, and local cost just to maintain highways and bridges over the 6-year period, without any improvements over 1989 levels, would be about $250 billion. Moreover, the total cost to improve the condition of highways and bridges during the 6 years is nearly double that amount—$425 billion. Neither of these estimates includes funds needed for mass transit and rail systems. Budgetary pressures and projected revenue shortfalls from fuel taxes compound the difficulties in meeting the enormous need for infrastructure improvements. For example, although about

$26 billion was authorized for surface transportation programs in 1993, obligation limitations limited the amount available to about $22 billion. Also, given current revenue estimates, even more reductions may be needed in the future because anticipated fuel tax revenues are projected to be nearly $6 billion short of supporting the full highway authorization.

To get the greatest return from the funds available to them, state and local governments need additional help from DOT. As we noted in our April 1992 report on transportation planning, DOT could assist state and local governments by developing a common basis for evaluating projects in various transportation modes—highway, mass transit, rail line, or some combination. These projects compete on their ability to meet critical objectives such as protecting the environment, meeting travelers' mobility needs, conserving energy, and staying within budgetary limits. Our report said that methods for comparing such projects were not well developed at any level of government. A compelling need also exists for DOT to develop methodologies for data collection and analysis that state and local analysts can use to compare projects. With better data and analytic tools to assess these

trade-offs, state and local governments will be in a better position to make well-informed choices among projects.

In addition, DOT will need to champion other efforts that will directly contribute to maximizing available funds. For example, ensuring that research is given appropriate priority and that its results are disseminated and promoted will foster state-of-the-art testing methods and better road materials. The Transportation Research Board estimates that reducing the cost of asphalt paving by 1 percent through research efforts would save as much as $100 million per year. In addition, supporting innovative highway contracting practices could encourage greater use of new methods and materials, promote contractor accountability, and result in higher quality transportation projects.

Emerging Technologies Offering Opportunities

New and emerging technologies, such as high-speed rail and intelligent vehicle/highway systems, could in some instances benefit the nation's overall transportation system by reducing pollution, energy usage, and congestion, and by making more efficient use of the transportation infrastructure. Although the benefits of

introducing these technologies have been discussed extensively, DOT and the Congress must resolve important issues before these technologies can be successfully implemented.

For high-speed rail, two key issues require resolution. The first of these is how to finance high-speed rail development. Several alternative systems have been proposed, but none has obtained private funding to begin construction, and federal funding has been relatively small. Our work suggests that it is very unlikely that a development strategy relying primarily on private financing will be successful. As with all other transportation modes in their developmental stages, and regardless of which high-speed rail technology is adopted, a federal financial commitment will be necessary to leverage private financing.

The second key issue is ensuring that the full range of available technologies is considered. High-speed rail technologies include magnetic levitation trains (or maglev), which are relatively expensive but can attain speeds up to 300 miles per hour; advanced steel-wheel/steel-rail systems (speeds up to 200 miles per hour); and relatively inexpensive upgrading of existing

passenger-rail systems (speeds up to 150 miles per hour). The best technology for a particular route depends on such features as the length of the route and the level of traffic. For example, maglev may be best suited to (1) long-haul routes (up to 600 miles), where its higher speeds may compete with air travel and (2) high-traffic routes with sufficient volume to recover maglev's higher costs. Upgrading existing rail systems, on the other hand, may be the most cost-effective strategy on shorter routes.

Intelligent vehicle and highway systems are a family of technologies ranging from centralized traffic control centers to in-vehicle driver information systems to fully automated freeways that are designed to make more efficient use of the nation's roads. We reported in 1991 on the promise and problems of such technologies. The Congress enacted into law much of what we recommended, including a requirement that DOT develop a program of operational field tests in accordance with a strategic research plan. DOT needs to develop such a plan because it would be a necessary step toward enabling intelligent vehicle and highway systems to fulfill their promise.

Modernizing Air Traffic Control and Enhancing Airports

The nation's air traffic control and airport systems must be upgraded to accommodate the growth in air travel that has occurred since the early 1980s and the forecasted future growth. In addition, maintenance of the existing aviation infrastructure is needed to stem deterioration. Reflecting these needs, federal capital investments in air traffic control and airports increased from $600 million in 1982 to $4.3 billion in 1992. To make the best use of these funds, the Federal Aviation Administration (FAA) needs to (1) address key issues related to air traffic control modernization and (2) strengthen its approach to airport development.

Key Issues for Air Traffic Control Modernization

Our 1988 transition report noted that the costs of air traffic control modernization were much higher than FAA had projected and that schedule delays were common. These problems continue. FAA estimates that it will spend $32 billion between 1982 and 2000 to modernize air traffic control—about $7 billion more than it estimated 4 years ago. Of the more than 200 projects in FAA's modernization effort, only 36 are completed, accounting for just 3 percent of the $32 billion. Ongoing major projects are well over budget and years behind schedule. Twelve major projects, which account for a

third of the cost of modernization, have an average schedule delay of 5 years. FAA acknowledges that these problems were not caused by a lack of funding.

The following key issues are critical to the success of FAA's modernization program: acquisition reform, facility consolidation, application of emerging technologies, and continuity of leadership.

- FAA has taken steps to strengthen its process for procuring costly and complex equipment (radars and computers) so that future cost overruns and schedule delays are minimized. A more stringent process for top management review and approval of new projects and operational testing is now in place. However, FAA still must resolve issues related to developing software and identifying users' requirements. Also, FAA continues to invest in equipment without adequately analyzing the agency's needs.

- FAA faces a critical decision in consolidating air traffic control facilities. This decision will have far-reaching implications for its modernization plan. A central underpinning of the plan is that the number of facilities will be reduced from over 200 to 23. We have raised concern about this assumption, and

FAA now acknowledges that at least another 30 facilities will be needed, each costing millions of dollars to rehabilitate and equip. Not consolidating facilities as planned could profoundly affect the modernization plan's centerpiece—the $5 billion Advanced Automation System project for replacing controllers' work stations and computers, already 6 years behind and about $2.5 billion over the initial 1983 schedule and cost projections. In November 1992, major development problems led the contractor to announce an additional schedule delay of 1 year. FAA subsequently directed the contractor to submit a plan for resolving the problems. Indecision about consolidation makes this project vulnerable to even further delays and cost increases because the number and size of the facilities are key variables in the design of the new computer systems.

- Advances in technology are causing FAA to reconsider elements of its modernization plan. For example, with satellite-guided advanced precision approaches to airports, the need for FAA to spend $2.6 billion on 1,280 microwave landing systems that perform a similar function may be significantly reduced. Furthermore, with satellite-based navigation and surveillance,

costly navigation aids and radars could be phased out.

- FAA leadership has changed frequently. Over the past 11 years, FAA has had eight different administrators and acting administrators. Strong, continuous attention from the highest levels of the agency is needed to follow through on FAA's acquisition reforms, which have been in effect only during the last 2 years. Also, past administrators have deferred resolution of difficult issues, such as facility consolidation, to their successors. Leadership stability is essential for FAA to deal effectively with these issues, carry out its revised plans, and adjust its plans as necessary.

Using Airport Development Funds to Achieve National Goals

We have identified the need for FAA to strengthen its approach to airport development. FAA's national plan for airport development has no measurable goals, such as keeping total flight delays nationwide from rising. And many view FAA's plan as a "wish list" because it includes low-priority projects at small airports that FAA ultimately will never rank high enough to fund or that the sponsoring airport cannot afford, even with federal assistance.

On the basis of our work on major airport development projects at Denver, Detroit, and Chicago, we are concerned about FAA's process for allocating the limited funds available through the Airport Improvement Program. FAA has the opportunity to leverage the program's $2 billion in federal grant funds by favoring projects that best achieve national goals, such as reducing flight delays and increasing airport capacity, while at the same time preserving environmental quality. However, to compare the ability of competing projects to achieve such goals, FAA needs better data and analytical methods. Over the next few years, we plan to evaluate the airport development program and suggest ways for FAA to better achieve the objectives set forth by the Congress.

Improving Transportation Safety

Over the last several years, DOT has focused on strengthening and rebuilding its work forces, including FAA air traffic controllers and safety inspectors at the Federal Highway Administration, the Federal Railroad Administration, and FAA. After some success, the key challenge now is to effectively deploy these resources to help reduce the many thousands of lives lost on highways and to increase the margin of safety in other transportation modes.

To meet this challenge, the Department must ensure that (1) each modal administration effectively follows through on safety initiatives begun in recent years and (2) resources are targeted to areas of highest safety risk. We have reported frequently on the strengths and weaknesses in DOT's regulation and enforcement of safety standards and recommended actions to reduce safety risks, including requiring air bags in light trucks and vans, encouraging states to pass laws for safety belt and motorcycle helmet use, and requiring improvements in hazardous material movements. DOT has responded favorably to many of our recommendations.

Follow-Through Needed

Notwithstanding DOT's positive actions to improve safety, additional management

commitment is needed because follow-through by some individual agencies has been inconsistent or in some cases has stalled. Some agencies do not have current and reliable information to allow effective oversight of safety compliance. FAA does not have an effective system to monitor inspection findings and ensure that airlines take appropriate corrective actions. This monitoring is especially important for the approximately 1,400 aging aircraft—one-third of the fleet—subject to new regulations to ensure continued aircraft safety. Similarly, DOT's highway agencies lack data on heavy truck travel and accidents to determine safety trends and accident causes that would guide actions to improve safety.

Better Targeting of Resources Needed

In our 1987 comprehensive review of DOT's management and in several reports since that time, we have recommended that DOT develop early warning indicators of safety risks and measures of safety program performance to help target its limited resources. This would help agencies like FAA that cannot reasonably be expected to have sufficient resources to conduct the thousands of inspections of aircraft, repair stations, and pilots that comprise its work

load. DOT has been slow, however, in implementing this recommendation.

For example, in response to our recommendation that FAA develop criteria for targeting aircraft inspections on the basis of risk analysis, the agency plans to evaluate a prototype targeting system in 1993; however, FAA does not plan to fully implement it for several years. We also have recommended that to better isolate and manage areas of greatest aviation risk, FAA should correct long-standing problems in its Safety Indicators Program, including unreliable data and limited user involvement in designing the data collection and analysis system. Finally, the Federal Railroad Administration only recently adopted measures that would overhaul its inspection and hazardous materials programs.

Increasing Airline Competition and Access to International Markets

Dramatic changes in the U.S. airline industry threaten the benefits of lower air fares and more choices that consumers realized as a result of the industry's deregulation. Recent bankruptcies and mergers in combination with long-standing barriers to entering the industry have reduced competition and led to a decline in the number of major U.S. airlines. With fewer firms comprising the industry and serving key airports, the competition that can promote low fares and better service may erode. The Congress and DOT need to take actions to solve the underlying problems that threaten domestic competition and to facilitate U.S. airlines' competitiveness in international markets.

Preserving Competition in Domestic Air Travel Markets

We have reported on barriers that deter competition in the U.S. airline industry, including certain aspects of airline computer reservation systems, frequent flyer programs, travel agent/air carrier relationships, and the limited access to key airport facilities for potential new entrants. These deterrents can effectively lock out potential competitors, especially at airports where one or two airlines have established dominant positions.

To address these problems, we have reported on numerous occasions that DOT needs to address practices that affect competition, such as long-term, exclusive-use leases of gates, the allocation of takeoff and landing slots at key congested airports, and various features of computer reservation systems that are owned by the largest airlines.

In addition to overcoming practices that make market entry difficult, the U.S. airlines in the weakest financial condition need greater access to capital to enhance their ability to compete effectively. Poor earnings and high debt make it difficult for these airlines to finance capital needs from earnings or from traditional domestic sources. Although several foreign airlines are currently offering to provide investment capital, existing federal law limits the proportion of voting stock that foreigners can hold in U.S. airlines and the amount of influence that they can exert as a result of their investment.

Although relaxing the law would give financially struggling U.S. airlines greater access to needed capital, it could have implications for national security, domestic and international competition, and domestic

employment. DOT may ask the Congress to consider relaxing restrictions on foreign investment. If restrictions are relaxed, the timing and extent of DOT's review process will need to be changed to ensure that foreign investments do not diminish the competitiveness of U.S. airlines or threaten national security.

Facilitating Global Competitiveness

Tomorrow's aviation industry will be dominated by airlines whose routes span the globe, and such international markets offer U.S. airlines the greatest potential for growth. However, U.S. airlines may be constrained from entering international markets by agreements between the United States and other countries that limit the number of airlines that can be designated to serve specific routes. As these agreements are renegotiated, the Congress and DOT will need to respond to protectionist forces abroad that seek to restrict the ability of the nation's airlines to compete. Because of the United States' position as the world's most attractive air travel market, DOT could, if necessary, use foreign airlines' desire to serve the United States as leverage for gaining better access for U.S. airlines to overseas markets.

Strengthening Coast Guard Acquisition Programs and Environmental Protection

In recent years, the Coast Guard has proposed numerous major acquisitions for planes, vessels, and on-shore facilities. At the same time, the Coast Guard's mission has broadened considerably to include, for example, a key role in environmental protection. Ensuring that the Coast Guard adequately manages its major acquisition programs and effectively implements recently enacted oil spill legislation will be a major challenge.

Attention to Coast Guard Acquisitions Needed

Our work has shown that the Coast Guard's acquisition process has systemic problems. In one case, these problems led to the cancellation of a major acquisition: The Coast Guard canceled its $329 million purchase of Heritage class patrol boats after we reported in July 1991 that the project was not adequately justified. Although the Coast Guard is implementing procurement reforms, the adequacy of its justifications for and management of future major acquisitions will be a continuing concern.

Environmental Protection a Shared Responsibility

Our work on oil pollution has shown a continuing need for the Coast Guard to improve its oversight of the industry's efforts to prevent environmentally dangerous

accidents. The 1989 Exxon Valdez oil spill helped produce legislative and regulatory changes to protect the environment.

Although government and industry will share the cost of these changes, many concerns are still outstanding. Among these concerns are whether (1) insurance to cover all costs related to cleaning up an oil spill will be available for shippers, (2) the industry can comply with new requirements for providing equipment to respond to a spill and for improving oil tanker design, and (3) the Coast Guard will be able to effectively monitor the industry's compliance with the many new regulations.

Consolidating Financial Management Systems and Revamping Grant Oversight

DOT needs to continue improving its financial management systems and oversight mechanisms for reducing the risk of fraud, waste, and abuse. In response to our recent reports on DOT's financial management and on the Federal Transit Administration's (FTA) grant oversight, DOT has stated its commitment to take substantive actions on our recommendations.

Better Information Needed to Control Programs

DOT has embarked on a project to consolidate 14 separate accounting systems into a single Departmental Accounting and Financial Information System. To date, estimates of this project's costs exceed $26 million. We found that while DOT has made progress in developing a consolidated accounting system, action is now needed to provide managers and the Congress with better financial information to oversee programs and operations.

The new consolidated system is currently of limited value as a managerial tool because it does not maintain detailed financial information from prior years on long-term projects. It also cannot generate timely spending reports for project management. We have recommended that, to realize the full potential of its financial management

system, the Department develop a plan containing clear objectives, resource estimates, and timetables for strengthening the system's value as a management tool.

Plan to Revamp Grant Oversight

In a series of reports issued since June 1991, we documented FTA's laissez-faire approach to overseeing transit grants, grantees' deficient internal controls, and the resulting mismanagement of hundreds of millions of federal grant dollars. In response to these and similar concerns raised by DOT's Office of Inspector General, FTA's Administrator approved a plan to revamp grant oversight, including fully implementing most of our recommendations. Although efforts to improve oversight are under way, FTA will have to be persistent to ensure that implementation of the new initiatives does not lose momentum. Besides the $35 billion in active grants that are currently at risk of mismanagement, the 1991 surface transportation legislation substantially increases authorized annual transit funding from $3.2 billion to $5 billion and allows the use of up to $70 billion in highway funds for transit needs over the next 6 years.

The current focus on expanding federal investment in infrastructure, including mass

transit, increases the need for wise allocation and careful oversight of federal funds. Until recently, FTA focused its resources on awarding grants rather than on ensuring their proper use. Successful implementation of FTA's plan to change its focus ultimately will depend on the support that the administration and the Congress give to the agency's efforts to exercise strong oversight of grant funds. If fully implemented, the new oversight strategy should better safeguard future transit funds from the risk of fraud, waste, and abuse.

Related GAO Products

Surface Transportation Infrastructure

Highway Trust Fund: Strategies for Safeguarding Highway Financing (GAO/RCED-92-245, Sept. 9, 1992).

Transportation Infrastructure: Urban Transportation Planning Can Better Address Modal Trade-offs (GAO/RCED-92-112, Apr. 2, 1992).

High Speed Ground Transport: Acquiring Rights-of-way for Maglev Systems Requires a Flexible Approach (GAO/RCED-92-82, Feb. 2, 1992).

Airway and Airport Systems

Airspace Systems: Emerging Technology May Offer Alternatives to the Instrument Landing System (GAO/RCED-93-33, Nov. 13, 1992).

Air Traffic Control: Advanced Automation System Still Vulnerable to Cost and Schedule Problems (GAO/RCED-92-264, Sept. 18, 1992).

Air Traffic Control: Challenges Facing FAA's Modernization Program (GAO/T-RCED-92-39, Mar. 10, 1992).

Airport Development: Improvement Needed in Federal Planning (GAO/T-RCED-92-30, Feb. 19, 1992).

Improving Transportation Safety

Highway Safety: Safety Belt Use Laws Save Lives and Reduce Costs to Society (GAO/RCED-92-106, May 15, 1992).

Truck Safety: The Safety of Longer Combination Vehicles Is Unknown (GAO/RCED-92-66, Mar. 3, 1992).

Aviation Safety: Problems Persist in FAA's Inspection Program (GAO/RCED-92-14, Nov. 11, 1991).

Department of Transportation: Enhancing Policy and Program Effectiveness Through Improved Management (GAO/RCED-87-3, Apr. 13, 1987).

Increasing Airline Competition

Airline Competition: Impact of Changing Foreign Investment and Control Limits on U.S. Airlines (GAO/RCED-93-7, Dec. 9, 1992).

Computer Reservation Systems: Action Needed to Better Monitor the CRS Industry and Eliminate CRS Biases (GAO/RCED-92-130, Mar. 20, 1992).

Airline Competition: Industry Competitive and Financial Problems (GAO/T-RCED-92-28, Feb. 21, 1992).

Coast Guard Programs

Coast Guard: Oil Spills Continue Despite Waterfront Facility Inspection Program (GAO/T-RCED-92-12, Oct. 24, 1991).

Coast Guard: Adequacy of the Justification for Heritage Patrol Boats (GAO/RCED-91-188, July 12, 1991).

Financial Management and Grant Oversight

Mass Transit Grants: If Properly Implemented, FTA Initiatives Should Improve Oversight (GAO/RCED-93-8, Nov. 19, 1992).

Financial Management: DOT's Accounting and Financial Information System Can Be Improved (GAO/RCED-92-238, Sept. 22, 1992).

General

Transportation Issues (GAO/OCG-89-25TR, Nov. 1988).

Transition Series

Economics

Budget Issues (GAO/OCG-93-1TR).

Investment (GAO/OCG-93-2TR).

Management

Government Management Issues (GAO/OCG-93-3TR).

Financial Management Issues (GAO/OCG-93-4TR).

Information Management and Technology Issues (GAO/OCG-93-5TR).

Program Evaluation Issues (GAO/OCG-93-6TR).

The Public Service (GAO/OCG-93-7TR).

Program Areas

Health Care Reform (GAO/OCG-93-8TR).

National Security Issues (GAO/OCG-93-9TR).

Financial Services Industry Issues (GAO/OCG-93-10TR).

International Trade Issues (GAO/OCG-93-11TR).

Commerce Issues (GAO/OCG-93-12TR).

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Transportation Issues (GAO/OCG-93-14TR).

Food and Agriculture Issues (GAO/OCG-93-15TR).

Environmental Protection Issues (GAO/OCG-93-16TR).

Natural Resources Management Issues (GAO/OCG-93-17TR).

Education Issues (GAO/OCG-93-18TR).

Labor Issues (GAO/OCG-93-19TR).

Health and Human Services Issues (GAO/OCG-93-20TR).

Veterans Affairs Issues (GAO/OCG-93-21TR).

Housing and Community Development Issues (GAO/OCG-93-22TR).

Justice Issues (GAO/OCG-93-23TR).

Internal Revenue Service Issues (GAO/OCG-93-24TR).

Foreign Economic Assistance Issues (GAO/OCG-93-25TR).

Foreign Affairs Issues (GAO/OCG-93-26TR).

NASA Issues (GAO/OCG-93-27TR).

General Services Issues (GAO/OCG-93-28TR).

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Transition Series

December 1992

Food and Agriculture Issues

GAO/OCG-93-15TR

GAO **United States**
General Accounting Office
Washington, D.C. 20548

Comptroller General
of the United States

December 1992

Speaker of the House of Representatives
Majority Leader of the Senate

In response to your request, this transition series report discusses major policy, management, and program issues facing the Congress and the new administration in the areas of food and agriculture. These issues include (1) streamlining the U.S. Department of Agriculture, (2) transforming agricultural programs to meet global competition and conserve resources, (3) reforming farm credit and risk protection, (4) reorienting rural development policy, and (5) revamping the federal system for ensuring food safety.

As part of our high-risk series on federal program areas that are vulnerable to waste, fraud, abuse, and mismanagement, we are issuing a related report, Farmers Home Administration's Farm Loan Programs (GAO/HR-93-1, Dec. 1992).

The GAO products on which this transition series report is based are listed at the end of the report.

We are also sending copies of this report to the President-elect, the Republican leadership of the Congress, the appropriate congressional committees, and the Secretary-designate of Agriculture.

Charles A. Bowsher

Contents

Food and Agriculture Issues

The U.S. Department of Agriculture (USDA), whose budget is the third largest of any civilian agency in the federal government, affects the lives of all Americans and of millions of people around the world. Created 130 years ago to conduct research and disseminate information to farmers, USDA has expanded its role greatly over time. Programs are now designed to support farm income, develop markets, boost farm production and exports, and provide consumers with food information and assistance. To carry out its mission in 1990, USDA spent about $46 billion, controlled assets of about $140 billion, and employed over 110,000 full-time employees in 36 agencies in over 15,000 locations worldwide.

USDA's many programs helped to make America a world leader in agriculture. In recent years, however, resource constraints at home and competition in agricultural markets abroad have created pressures to modify existing departmental structures and programs. Our recent work has emphasized the importance of streamlining USDA's organization and programs to deliver farm services more efficiently and economically. In addition, the importance of orienting U.S. farm programs away from production and income support—which currently cost about

$10 billion annually—toward market development and global competition has grown since we discussed the need to develop strategies for exporting commodities in our 1988 transition report. The need for such a shift is clear—between 1980 and 1990, the U.S. share of world agricultural exports declined from about 29 percent to about 22 percent.

We also raised concerns in our 1988 report about farm finance programs and risk protection, which expose the government to financial losses in the tens of billions of dollars. Since 1988, fiscal pressures have enhanced the importance of reforming farm credit and risk protection, as well as of coordinating federal programs for ensuring food safety and quality. The continuing decline of rural economies has drawn more attention to the need for revising and coordinating rural development policies, and concern about the impact of agriculture on the environment has affected and will continue to affect federal policies on water quality and land use.

Revitalizing the Department of Agriculture

Like a 20th-century dinosaur, USDA's cumbersome organization has survived changes in the Department's role and mission but has not adapted to current conditions. Today's USDA is an agglomeration of programs and structures that have remained virtually unaltered since the 1930s, despite evolutions in issues and advances in technology. To keep up with the times, USDA needs to simplify and streamline its organization, becoming more accessible and responsive to its highly diverse clients.

Reorganizing USDA

In September 1991, we issued a general management report on USDA calling for restructuring to make the Department more responsive to current conditions and more effective in managing its resources to meet domestic food and fiber needs. In our view, USDA needs not only to refocus its programs to respond to the challenges of global competition and environmental protection but also to adapt its organization to take advantage of advances in communications, computers, and transportation. At the same time, as we reported in our 1988 transition report, farm programs have become so complex that they are virtually impossible to administer.

Opportunities exist to simplify USDA's organizational structure, which currently may require farmers and others to deal with different offices, employees, and administrative procedures. We have recommended that USDA look at the efficiencies and cost savings to the U.S. taxpayer that could result from streamlining through consolidating and collocating the multiple farm service agency offices that are located in almost every county across the country. USDA and the Congress need to consider integrating the Department's farm service agency delivery system so that multiple agencies operate as a unit at local levels. While not advocating the closure of specific offices, we believe that USDA needs to examine its entire field structure in the context of its overall mission and role. To be successful in streamlining, USDA needs to use a grass-roots process to bring together a mix of agency officials, state agricultural panels, public interest groups, congressional staff, and others. Such a process can generate a wealth of ideas and facilitate acceptance of changes to follow. This process should be carried out in conjunction with efforts to simplify farm programs.

The Congress, the Office of Management and Budget (OMB), and USDA are reviewing ways

to reorganize USDA. In 1992, several congressional hearings were held on streamlining USDA and its field structure. Members of the Senate and House Agriculture committees introduced bills aimed at restructuring USDA. Although these bills were not enacted in 1992, the sponsors are expected to reintroduce them in 1993. In addition, the Secretary of Agriculture and the Director of OMB formed a joint task force on streamlining the Department. It is imperative that the new administration continue efforts to restructure the Department's organization and management and to work with the Congress to simplify farm programs.

Improving Financial and Information Management Systems

Antiquated management systems further hamper USDA's ability to make needed structural and management changes, as well as carry out day-to-day management functions. The Department's financial and information management systems do not produce the timely, complete, and reliable information needed to manage the Department.

The Department's financial systems are in poor condition. Recently, USDA's Office of Inspector General issued an adverse opinion

on the Department's fiscal year 1991 financial statements, in part because of "incomplete, inaccurate, or insufficient accounting records and supporting documentation."

Effective financial management within USDA will depend largely on successfully implementing all aspects of the Chief Financial Officers Act to gain control of USDA's finances and provide accountability and stewardship for the Department's resources. Strong leadership from the Chief Financial Officer is needed to solve long-standing problems and to focus on financial management issues requiring prompt and appropriate attention.

USDA plans to spend about $4 billion over the next few years on information systems technology to support various agricultural programs. However, USDA could waste hundreds of millions of dollars if it does not carry out the planning required to ensure that the new systems meet its current or future needs. Also, USDA needs to coordinate its major information technology investments with its pending reorganization. Strong central information resources management leadership is essential to ensure the success of USDA's future

automation efforts. In addition, USDA must finish developing its long-range business and strategic information resources plans.

In response to our recommendations on several management issues, the Secretary established the Secretary's Management Agenda as an ongoing departmentwide tracking system to monitor key departmental and agency management issues, goals, and objectives. The new administration should maintain this initiative.

Transforming Programs to Meet Global Competition and Conserve Resources

The 1985 and 1990 farm bills moved U.S. agriculture towards a greater market orientation, helping to make U.S. farm commodities more competitive in the world marketplace while maintaining farm income. However, budget constraints and increased global competition are pressuring policymakers to move faster.

Decisions on how to change farm programs in response to these pressures will be complicated by conservation and environmental considerations. Although the commodity programs have intensified production at the expense of soil conservation and water quality, attention to the environmental impacts of agriculture is growing.

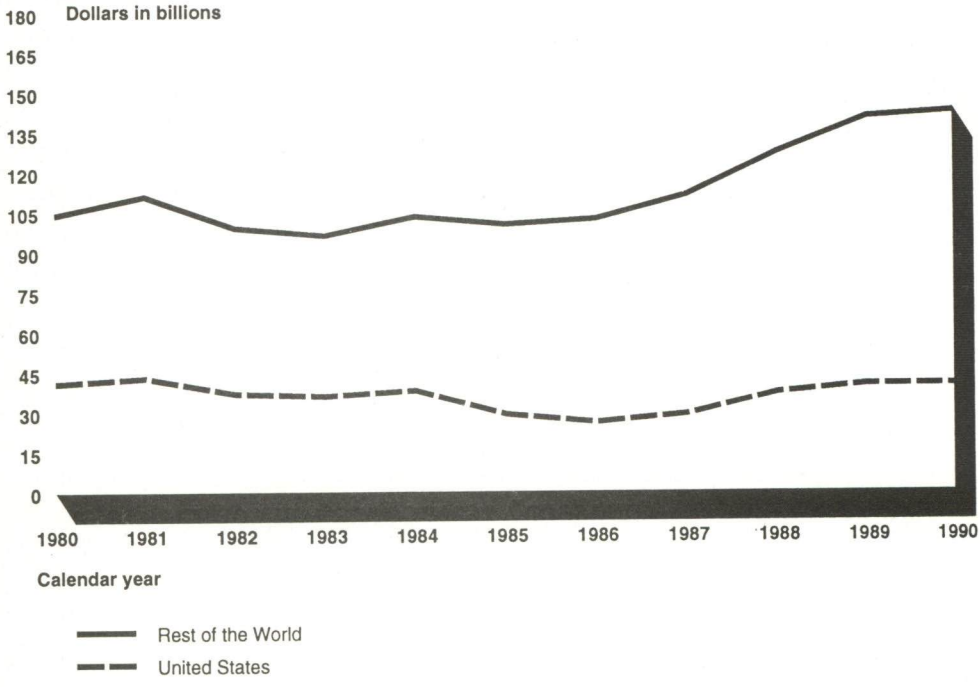
Moving Farm Policy Toward Market Responsiveness

The agricultural commodity programs established in the 1930s tied benefits to production. Through these programs, the government guaranteed producers a certain return and purchased all surpluses. Then, through export programs and policies, the government focused on disposing of surpluses generated by the commodity programs, paying little attention to developing and expanding markets. Today,

these programs cost about $10 billion annually.

Major shifts in global markets have occurred in recent years. During the 1970s, export markets afforded a ready outlet for commodity program surpluses. Throughout this period, the United States benefited from an agricultural trade boom that was due in large part to expanding agricultural markets. However, this boom ended abruptly in 1981 with the onset of a world recession. Then, throughout the 1980s, the U.S. share of world markets declined as international competition increased and trade barriers went up, as figure 1 shows.

Figure 1: Agricultural Export Trends—United States and Rest of the World



Note: Data for the rest of the world exclude trade within the European Community.

Source: GAO analysis of Foreign Agricultural Service data.

We have frequently reported on the need to orient commodity programs more to the market. We have recommended the elimination of certain programs—such as the

honey and the wool and mohair programs—that are outdated and, in some instances, benefit relatively few producers.

The 1985 and 1990 farm bills contained provisions to make some commodity programs more market oriented. The bills reduced support prices and gave producers more flexibility to plant some of their acreage in crops other than their main program crop. These reforms lessened the government's role in maintaining farm prices. Yet despite these changes, overall commodity program costs have remained high. For example, although these reforms weakened the wheat program's link between benefits and production, the program cost about $2.5 billion in 1991, compared to an average of about $3.3 billion for the period 1982-85.

Growing budgetary constraints on federal agricultural programs, together with increasing global competition, will require agricultural policies and programs to become even more flexible and responsive to market demands. Retaining policies rooted in the 1930s emphasis on production rather than conforming policies to today's market focus is risky. If U.S. agriculture is to succeed, it requires new strategies to

respond to changing world market conditions.

Since we issued our 1988 transition report, U.S. agricultural policy has pursued a two-pronged approach aimed, first, at reducing trade barriers and, second, at enhancing the competitiveness of U.S. products in world markets. In 1988, the United States was actively pursuing the current General Agreement on Tariffs and Trade negotiations to eliminate all agricultural subsidies and import barriers that distort trade. At the same time, certain USDA programs subsidizing agricultural exports were designed to counteract the agricultural subsidies of other nations. Our 1988 report raised concerns about how some of these programs were being managed. We still have these concerns. (For more detail, see our transition report, International Trade Issues, GAO/OCG-93-11TR, Dec. 1992).

After 6 years, some progress was finally made in the multilateral, global trade negotiations when a tentative compromise was reached in November 1992 in a long-standing dispute between the United States and the European Community (EC) over oilseed subsidies. Currently, this compromise, which calls for cuts in the EC's

exports of subsidized grain and production of subsidized oilseed crops, awaits ratification.

No matter how the global trade negotiations are resolved, global competition and budgetary restrictions will continue to exert pressure on farm programs and policies. In our 1988 transition report, we reported that USDA did not have a long-term agricultural trade strategy, and we urged the Department to apply strategic marketing principles to agricultural trade. In the 1990 farm bill, the Congress also recognized the need for a long-term agricultural trade strategy. The bill directed USDA to develop such a strategy and to report its progress by October 1991. USDA has yet to complete such a strategy.

Facing Environmental and Resource Conservation Challenges

U.S. agriculture has come under increasing attack for its contribution to environmental degradation. Studies have indicated that the environment is being degraded, in part, by the agricultural system it supports. Over the years, commodity programs have encouraged the intensive production of crops through methods that erode the soil and rely on the use of chemical fertilizers and pesticides. As a result, sediment and chemical residues are carried in runoff from

cropland to the nation's waters. Today, polluted runoff from agriculture affects 50 to 70 percent of the nation's monitored waters.

By the 1980s, agriculture's impact, both on and off the farm, was recognized as a key environmental problem. As a result, the Congress, in the 1985 and 1990 farm bills, significantly changed the nation's policies for conserving agricultural resources. For example, both farm bills created or expanded conservation programs to transfer over 40 million acres of environmentally fragile lands from production to conservation and wetland reserves. The bills also required farmers to comply with USDA-approved conservation plans on 142 million acres or lose their farm support payments. The annual cost of these programs, however, is about $2.4 billion.

Although the 1985 and 1990 farm bills created environmental and conservation initiatives, many challenges lie ahead because these initiatives are still in transition. As budget and other pressures influence farm policies, economic incentives to get farmers to participate voluntarily in these conservation programs may become too expensive and/or lose viability as a policy tool. Thus, new approaches that

combine education, research, technical assistance, technological innovation, and regulation will be needed to sustain agricultural and environmental goals simultaneously.

One of the many challenges facing USDA is in the area of water quality. Even though 10 of the Department's 36 agencies have water quality responsibilities, USDA does not have a comprehensive approach for addressing these responsibilities. To date, USDA has not effectively coordinated dozens of separate agency water quality programs, despite congressional direction and our recommendations to do so.

Other upcoming legislative initiatives, such as the reauthorization of the Clean Water Act, could directly influence agricultural practices. The Congress is paying close attention to nonpoint source pollution and to the role of agriculture as the main contributor to this problem.

Reforming Farm Credit and Risk Protection

Several USDA programs are aimed at helping farmers by providing loans, crop insurance, and disaster assistance. These programs expose the federal government to high risks of large financial losses. An extended discussion of the risks to the federal government posed by the Farmers Home Administration's (FmHA) farm loan programs appears in our high-risk series. Highlights of that discussion immediately follow.

Farm Credit

The Farmers Home Administration's (FmHA) farm loan programs are intended to provide temporary credit for farmers who are unable to obtain funds elsewhere. However, these loan programs continue to expose the government to large financial losses. In recent years, FmHA reduced or forgave delinquent debt totaling about $7.6 billion.

As part of our effort to examine government programs that are especially vulnerable to waste, fraud, abuse and mismanagement, we reported in April 1992 on FmHA's farm loan programs. As of September 30, 1990, almost 70 percent of the agency's $20 billion direct loan portfolio was held by borrowers who were either delinquent or whose loans had been restructured as a result of, or to avoid, delinquency.

FmHA has evolved into a continuous—rather than a temporary—source of subsidized credit for nearly half of the agency's borrowers. As repeated loan servicing has increased their debt and reduced their equity, some FmHA borrowers have actually seen their financial condition worsen.

Despite the influence of some factors beyond their control, FmHA and the Congress share responsibility for many of FmHA's problems. These problems stem from (1) ineffective implementation of loan-making, loan-servicing, and property management standards by the agency's field office lending officials and (2) loan and property management policies, some congressionally directed, that are in conflict with fiscal controls designed to minimize risk and financial loss. The Congress addressed some of FmHA's problems in the 1990 farm bill. However, FmHA's losses can be expected to continue until the Congress tells the agency how to better balance its mission of assisting financially troubled farmers with its obligation to provide that assistance in a businesslike and fiscally responsible manner.

Also, it is important to recognize that not all financially stressed farms can be saved and

that not all farm families can be expected to benefit from a government assistance program intended to keep them in farming. With this in mind, the Congress should, among other things, establish guidance on the following: (1) the level of loan losses that the Congress is willing to accept; (2) the length of time over which borrowers should be allowed to receive FmHA assistance; and (3) the kind of assistance, if any, that should be made available to unsuccessful borrowers who are ready to leave farming.

Resolving these issues is critical to demonstrating that the federal government can manage its programs and spend taxpayers' dollars efficiently. But correction of the problems in the high-risk areas can only be achieved with the full and sustained support of the Congress and the administration.

Crop Insurance and Disaster Assistance

Two other costly programs linked to commodity production and farmers' financial needs are the federal crop insurance program and the disaster assistance program. The Congress expanded the federal crop insurance program in 1980 to provide a subsidized but actuarially sound nationwide crop insurance program for

farmers and to permanently replace direct disaster assistance programs. Notwithstanding these goals, since 1981, crop insurance payments to farmers have exceeded the subsidized premiums by more than $2 billion. The Congress has continued to provide disaster assistance through ad hoc legislation, paying more than $9 billion for crop losses.

Although crop insurance was intended to replace disaster assistance payments, participation in the crop insurance program has remained relatively low. Even in years when the Congress required farmers to participate in the insurance program as a condition for receiving disaster assistance payments, participation did not reach the congressional goal of 50 percent. Our 1992 crop insurance report concluded that the Congress will have to make fundamental policy decisions involving trade-offs among crop insurance participation, actuarial soundness, and the continuing provision of ad hoc disaster payments.

Reorienting Rural Development Policy

Sources of rural America's economic vitality—such as farming and industries based on natural resources—have undergone major restructuring. As a result, many rural communities are no longer thriving.

Since 1969, rural per capita income has consistently been lower than urban income while rural unemployment rates have consistently been higher. These economic conditions may, in part, explain why so many people are leaving rural areas. Over the past 5 decades, the nation's rural population has declined from over 43 percent of the total population to only 22 percent.

Relative decline in rural populations may be a telling measure of the limited success that federal rural development assistance programs have had. In fact, according to experts in our June 1992 symposium, current federal programs are not meeting the needs of rural America. Many of the federal assistance programs target the agricultural sector even though farming is no longer a major economic base for many rural communities: In 1990, about 22 percent of the nation's approximately 2,400 rural counties relied on agriculture as an

economic base, and only about 6 percent of the rural population lived on farms.

The symposium experts also noted that even nonagricultural federal programs may not effectively serve rural areas. Such programs often (1) assume that "one size fits all," ignoring the diverse conditions of rural areas; (2) require coordination and expertise that are unavailable in some rural communities; and (3) focus on process rather than results.

USDA is the lead federal agency in rural development. Ultimately, the challenge is for the Congress and USDA, as the lead agency, along with other federal and state partners, to revise its policies for rural America to better reflect changes that have taken place over the last 50 years. This effort would include examining whether the federal funds that are already being spent in these areas are targeted as effectively as possible to ensure rural America's revitalization.

Revamping the Federal Food Safety System

A high-quality, safe, and nutritious food supply sustains public health in America. Yet our reports, as well as work by congressional committees, blue ribbon panels, and others, have consistently documented structural flaws in the federal government's food safety system. These flaws can affect public health, erode consumers' confidence in the federal government's ability to ensure food safety and quality, and damage the competitiveness of U.S. agricultural trade.

Fragmentation in the Food Safety System

Currently, 12 federal agencies spend about $1 billion annually to administer about 35 laws governing food safety and quality. Fundamental differences in agencies' missions, responsibilities, and authorities have led to inconsistent oversight, inefficient use of resources, and poor interagency coordination.

The greatest problems lie in the division of responsibility between USDA, which oversees meat and poultry, and the Food and Drug Administration (FDA), which oversees most other food products. Because these two agencies operate under different mandates, food products that pose similar health risks may undergo different levels of scrutiny. For

example, USDA carries out a massive "continuous inspection" program at slaughterhouses, which by law may operate only when one of the Department's 7,350 field inspectors is on duty. In contrast, FDA and state inspectors cover less than one-third of the 53,000 food manufacturers each year.

Overlapping responsibilities, together with resource constraints, lead in some cases to duplication and in other cases to gaps in coverage. Food establishments are sometimes inspected by both USDA and FDA because they process foods, such as soups and frozen dinners, that are regulated under different laws or because they participate in voluntary grading service programs. Federal inspections also overlap some state inspections of food companies. Meanwhile, fish—including shellfish, which is often linked with food-borne illness—is subject to voluntary inspection.

USDA and FDA have different enforcement authorities. Whereas USDA can require food processors to register for inspection, FDA cannot. Consequently, FDA is not aware of and does not inspect some food processors. For example, even though consumers are drinking billions of gallons of bottled water

every year, FDA does not have a complete list of domestic bottled water plants and therefore inspects only those plants that it does know about.

To overcome the fragmentation of responsibility for food safety and quality and to make more economical use of limited resources, federal agencies have reached over 50 cooperative agreements. However, jurisdictional disputes and disagreements between agencies have stymied these efforts. For example, USDA and FDA—both of which have authority to regulate egg products—did not develop a unified approach for reducing bacterial contamination in eggs until 1992.

Options for Revamping the System

Past efforts to correct deficiencies in the federal food safety inspection system have fallen short because the responsible agencies have continued to operate under different food safety statutes and appropriation acts. The structure of the federal regulatory system for food, which has evolved over the past century and will continue to evolve as food safety concerns emerge, may now be due for a review. It is time to examine the number of laws and agencies involved and the priorities that have governed their regulatory approaches.

Without such changes, structural problems can be expected to make major, long-overdue improvements highly unlikely.

To develop a uniform, risk-based inspection system, we recommended that the Congress hold oversight hearings to evaluate options for revamping the federal food safety and quality system, including (1) creating a single food safety agency responsible for administering a uniform set of food safety laws, (2) creating a uniform set of food safety laws that are administered by the current federal food safety agencies, or (3) establishing a blue ribbon panel to develop a model for inspection and food safety enforcement based on the public health risks posed by the products and processes. While creating a single food safety agency may be the most effective way to resolve long-standing problems, obstacles stand in the way of such a major structural change. Therefore, it may be more realistic to create a blue ribbon panel as a mechanism for developing broad-based agreement on organizational and legislative changes for modernizing the food safety system.

Related GAO Products

Management

U.S. Department of Agriculture: Revitalizing Structure, Systems, and Strategies (GAO/RCED-91-168, Sept. 3, 1991).

U.S. Department of Agriculture: Strengthening Management Systems to Support Secretarial Goals (GAO/RCED-91-49, July 31, 1991).

U.S. Department of Agriculture: Improving Management of Cross-Cutting Agricultural Issues (GAO/RCED-91-41, Mar. 12, 1991).

U.S. Department of Agriculture: Farm Agencies' Field Structure Needs Major Overhaul (GAO/RCED-91-9, Jan. 29, 1991).

Farm and Export Programs

Crop Insurance: Program Has Not Fostered Significant Risk Sharing by Insurance Companies (GAO/RCED-92-25, Jan. 13, 1992).

Agriculture Payments: Effectiveness of Efforts to Reduce Farm Payments Has Been Limited (GAO/RCED-92-2, Dec. 5, 1991).

Agricultural Trade: Determining Government Support Under the U.S.-Canada Free Trade Agreement (GAO/RCED-91-63, Feb. 11, 1991).

U.S. Department of Agriculture: Strategic Marketing Needed to Lead Agribusiness in International Trade (GAO/RCED-91-22, Jan. 22, 1991).

1990 Farm Bill: Opportunities for Change (GAO/RCED-90-142, Apr. 10, 1990).

Wool and Mohair Program: Need for Program Still in Question (GAO/RCED-90-51, Mar. 6, 1990).

Federal Price Support for Honey Should Be Phased Out (GAO/RCED-85-107, Aug 19, 1985).

Conservation

Sustainable Agriculture: Program Management, Accomplishments, and Opportunities (GAO/RCED-92-233, Sept. 16, 1992).

Agriculture: USDA Needs to Better Focus Its Water Quality Responsibilities (GAO/RCED-90-162, July 23, 1990).

Farm Credit

Farmers Home Administration's Farm Loan Programs (GAO/HR-93-1, Dec. 1992).

	Farmers Home Administration: Billions of Dollars in Farm Loans Are at Risk (GAO/RCED-92-86, Apr. 3, 1992).
Rural Development	Rural Development: Rural America Faces Many Challenges (GAO/RCED-93-35, Nov. 20, 1992).
Food Safety	Food Safety and Quality: Uniform, Risk-based Inspection System Needed to Ensure Safe Food Supply (GAO/RCED-92-152, June 26, 1992). Food Safety and Quality: Salmonella Control Efforts Show Need for More Coordination (GAO/RCED-92-69, Apr. 21, 1992). Food Safety and Quality: Who Does What in the Federal Government (GAO/RCED-91-19A and 19B, Dec. 21, 1990).
General	Agriculture Issues (GAO/OCG-89-12TR, Nov. 1988).

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Food and Agriculture Issues (GAO/OCG-93-15TR).

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Natural Resources Management Issues (GAO/OCG-93-17TR).

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Labor Issues (GAO/OCG-93-19TR).

Health and Human Services Issues (GAO/OCG-93-20TR).

Veterans Affairs Issues (GAO/OCG-93-21TR).

Housing and Community Development Issues (GAO/OCG-93-22TR).

Justice Issues (GAO/OCG-93-23TR).

Internal Revenue Service Issues (GAO/OCG-93-24TR).

Foreign Economic Assistance Issues (GAO/OCG-93-25TR).

Foreign Affairs Issues (GAO/OCG-93-26TR).

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General Services Issues (GAO/OCG-93-28TR).

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Transition Series

December 1992

Environmental Protection Issues

GAO/OCG-93-16TR

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of the United States

December 1992

The Speaker of the House of Representatives
The Majority Leader of the Senate

In response to your request, this transition series report discusses the major environmental policy, management, and program issues facing the Congress and the new administration. These issues include the challenges of (1) meeting environmental requirements with limited resources, (2) developing information to support regulatory programs and measure environmental results, (3) establishing accountability for correcting program weaknesses, and (4) strengthening global environmental protection efforts.

As part of our high-risk series on program areas vulnerable to waste, fraud, abuse, and mismanagement, we are issuing a related report, Superfund Program Management (GAO/HR-93-10, Dec. 1992).

The GAO products upon which this transition series report is based are listed at the end of the report.

We are also sending copies of this report to the President-elect, the Republican leadership of the Congress, the appropriate congressional committees, and the Administrator-designate of the Environmental Protection Agency.

Charles A. Bowsher

Contents

Environmental Protection Issues

As a result of the legislation enacted over the last 20 years, American industry and government are currently spending about $115 billion a year to meet environmental goals. The amount is expected to increase to $160 billion a year by the end of the decade. State and local governments, which will have to bear a particularly large share of this increase, face over $80 billion in investment costs for wastewater alone, and the federal government will have to spend about $200 billion simply to clean up contaminated Department of Defense and Department of Energy installations.

Under current economic conditions, meeting these financing challenges will be an important concern of all levels of government. In the next few years, the Congress and the new administration will have to deal with these difficult issues as a number of major environmental statutes—including those that govern pesticides, toxic chemicals, hazardous and solid waste disposal, surface water pollution, drinking water safety, and the cleanup of abandoned hazardous waste sites—are scheduled for reauthorization. In addition, the Congress may again consider proposals to elevate the Environmental Protection Agency (EPA) to a Cabinet department, a

move we have endorsed but which, we cautioned, would have to be accompanied by improvements in the agency's management. In the international arena, the Congress and the administration will have to consider how to implement the environmental agreements reached during the United Nations Conference on Environment and Development and weigh the environmental implications of the North American Free Trade Agreement.

In our 1988 transition report, we discussed problems in overall environmental program management; improvements needed in the management of hazardous waste programs; and the need for EPA to create a new policy for reducing urban smog, focus greater attention on environmental assessments for pesticides, and develop a comprehensive approach to controlling surface water pollution. While EPA has made some progress in each of these areas, our work over the last 4 years suggests that dealing with the root causes of these problems will require changes in policies and agencywide management practices.

Meeting Environmental Requirements With Limited Resources

Given high public expectations for environmental protection, one of the most important issues the Congress and the administration will have to contend with is the limited resources available to meet environmental requirements. Currently, the United States—both government and industry—spends about $115 billion a year to meet environmental goals. This investment is expected to rise to about $160 billion over the next decade. Altogether, the nation has invested about $1 trillion in environmental protection over the last 20 years. Despite the current economic downturn, opinion polls show that Americans support continued and even additional spending on environmental protection. Nevertheless, the federal budget deficit limits the federal government's ability to respond. State and local governments are also confronting fiscal crises, and industry's capacity to invest further is similarly constrained.

Resource limitations have particularly strained EPA. The Congress has substantially increased the agency's responsibilities for regulating hazardous waste, drinking water, and water and air pollution, among other things. However, the agency's fiscal year 1992 operating budget, in constant dollars,

was roughly the same as it was in fiscal year 1979.

With the widening gulf between EPA's responsibilities and the resources available to carry them out, EPA has often been unable to meet statutory mandates and to implement plans for addressing pollution, as the following example illustrates. The agency believes that most of the nation's remaining water quality problems stem from nonpoint, or diffuse, sources of water pollution resulting from agricultural and urban runoff. EPA has developed an ambitious plan to deal with nonpoint pollution. However, for lack of resources, the agency has hardly acted on key elements of the plan, including the development of monitoring techniques to help states determine the extent of their nonpoint source pollution problems and the effectiveness of corrective actions.

Recognizing that the federal budget deficit and the Omnibus Budget Reconciliation Act make increased funding for EPA unlikely, we have recommended a number of broad management improvements to make the agency's programs more cost-effective. EPA has begun to act on a number of these recommendations. But ensuring that these

improvements—inherently long-term in nature—are made will require the sustained attention of both the Congress and the new administration.

Risk-Based Priorities Could Better Allocate Resources

Establishing priorities among programs on the basis of the risk to public health and the environment is one of the keys to improved environmental management. Setting priorities in this way will be difficult, however, as long as public policy and, in particular, the budget allocation process are dominated by public perceptions of risk rather than by scientific and expert judgment. Currently, many environmental problems that EPA experts and others judge to be of relatively low risk, such as contamination from hazardous waste sites, receive extensive public attention and federal resources, while problems judged to be of greater risk, such as global warming and radon and other types of indoor air pollution, receive less attention and fewer resources. To correct this imbalance, we have recommended that the Congress and EPA work together to find opportunities to shift resources according to the level of risk involved.

Recognizing that risk assessments alone are not sufficient for setting environmental policy and that public opinion contributes heavily to the Congress's agenda, we have pointed out that the public must also be kept better informed about environmental risks. We have therefore recommended that EPA direct some of the agency's educational activities specifically toward informing the public about the relative seriousness of the nation's environmental problems.

The federal government will also have to set priorities for the cleanup of federal facilities. Years of neglect at Department of Defense and Department of Energy installations have left a legacy of contamination that these agencies now estimate may cost close to $200 billion to correct. These estimates do not take into account the full federal cleanup liability. The total will also include other agencies' cleanup costs, such as the Department of the Interior's, which have not yet been estimated. Although these cleanups will increasingly be competing for limited federal funds, EPA has not yet developed a system for assessing the health and environmental risks posed by federal sites relative to one another and to other environmental problems and for setting priorities accordingly.

Nonregulatory Alternatives Could Reduce Compliance Costs

To help industry achieve greater cost efficiencies in complying with environmental standards, we have advocated making greater use of nonregulatory alternatives. The current regulatory structure of command-and-control, which requires polluters to meet defined health or technology-based standards, has succeeded in dealing with large stationary sources of pollution. However, this structure has proved to be less effective and very costly for controlling smaller and more diffuse sources.

Market-based incentives—which include taxes on pollution, trading in pollutant emission "rights," and public disclosure of polluters' emissions—all give polluters a financial reason to reduce pollution without specifying how they should do so. Pollution prevention, which eliminates or reduces pollution at its source rather than try to contain or treat it after it has been generated, has already been successfully adopted by some companies, which have also realized cost savings as a result.

With the Clean Water Act, the Resource Conservation and Recovery Act, and the Safe Drinking Water Act, among others, scheduled for reauthorization, the

administration and the Congress will have numerous opportunities to supplement traditional regulation with these nonregulatory alternatives. We have therefore called for EPA to work with the Congress to identify opportunities for revising legislation.

Alternative Approaches Needed to Ensure State and Local Capacity to Respond

Finally, we are concerned about the ability of state and local governments to bear the growing financial burden associated with meeting environmental objectives. In environmental programs, as in other areas, the federal government has been shifting to state and local governments the responsibility for implementing and financing major programs. Long-term federal construction grants for wastewater treatment plants, for example, have been replaced with short-term grants to capitalize state revolving loan funds. These funds are expected to meet only about one-third of local communities' financing needs for wastewater treatment, which are estimated to exceed $80 billion nationwide. We therefore believe there is a need for alternative financing, technology, and managerial approaches to meeting the environmental requirements of states and localities.

Developing Necessary Scientific and Monitoring Information

Although EPA's regulatory programs depend heavily on scientific information on the health and environmental effects of chemicals and pollutants, these data often do not exist or, when they are available, are of poor quality or difficult to access and use. Moreover, despite the fact that environmental programs are designed to clean up or prevent unacceptable levels of pollution, EPA has not collected the information necessary to judge the success of its programs.

Data Collection and Management Need Improvement

In order to assess environmental risks and address those that are most likely to cause the greatest harm, EPA needs to have better data on acute and chronic health effects. We have therefore recommended that the agency develop a research agenda clearly focused on improving its risk assessment capabilities. EPA also needs better data on whether a particular substance is harmful to human health and the environment in order to take appropriate regulatory actions and to identify new and emerging problems. The Toxic Substances Control Act gives EPA specific legislative authority to obtain this information from chemical manufacturers. But in the 16 years since the law's passage, EPA has been reluctant to require these data.

As a result, EPA has identified for testing less than 1 percent of more than 70,000 chemicals and has complete test data for only 22 chemicals.

Even data that EPA has available are often inadequate and poorly managed. For example, EPA has three data bases for regulating disinfectants, yet EPA officials believe that as much as 60 percent of the data on disinfectant product claims are inaccurate or incomplete. Likewise, EPA maintains nine separate data base management systems to track information about pesticides awaiting reregistration, including the results of health and environmental studies. Yet, in the summer of 1991, when a trainload of metam sodium spilled into the Sacramento River, EPA was unaware of information in its files indicating that metam sodium can cause birth defects. As a result, the agency could not warn pregnant women and workers in the area of the spill of the pesticide's hazards.

Moreover, EPA has traditionally enforced environmental laws by identifying violations and taking enforcement actions separately for each environmental medium—air, water, land—and regulated substance. EPA's information systems have been designed

largely to accommodate these compartmentalized approaches. Nevertheless, some of the agency's highest priorities—pollution prevention, management for minimizing risk across multiple environmental threats, and coordinated enforcement—depend on using data in a much more integrated way.

Environmental Indicators Could Measure Program Success

Although environmental programs are designed to clean up or prevent unacceptable levels of pollution, EPA has not collected the information necessary to judge the success of its programs. While EPA has developed some measures of environmental outcomes—meeting national air quality standards, for example—the agency has generally relied on activity-based indicators, such as numbers of permits issued or enforcement actions taken, to track its progress. EPA has historically relied on activity-based measures because of the inherent technical difficulties of establishing linkages between program activities and environmental improvements and conditions. Although EPA has had a national environmental monitoring program, which is designed to measure the success of the agency's activities, the program has been cut back over the years as a result of leadership

changes and decreased funding. Because EPA has traditionally considered itself to be primarily a regulatory agency, it has focused its attention and resources almost exclusively on setting standards and issuing permits rather than on developing the information necessary to measure environmental results.

EPA has made some effort to refocus its management information system on results and has begun to develop environmental indicators to use in this system. However, considerable work remains to be done. One improvement that EPA could make is to establish a central unit for collecting, analyzing, and disseminating environmental data. We have therefore suggested that the Congress consider establishing, as part of a Cabinet department for the environment, a bureau or center for environmental statistics.

Ensuring Accountability for Correcting Program Weaknesses

After reporting for many years on weaknesses that affected the efficiency and effectiveness of virtually all of EPA's programs, we have continued to see the same basic problems, despite recommending numerous corrective actions. The result is persistent inefficiency, as programs continue to incur costs without necessarily achieving the anticipated results.

For example, in a 1990 report on the drinking water program, we found that (1) drinking water problems were going undetected, (2) many of those that were detected were not being reported to EPA, and (3) enforcement was often neither timely nor effective in bringing water systems back into compliance. To correct these problems, we recommended that the agency ensure that regions and states improve compliance with drinking water regulations. EPA responded to our findings and recommendations with written guidance to regions and states. However, without substantially improved oversight by headquarters to ensure that this guidance is followed, it is not clear that the problem will be adequately addressed.

Likewise, although problems with Superfund contractor cost control persisted for years, EPA managers did not pay sufficient attention

to contract management or follow through on promised reforms. EPA is heavily dependent on contractors, spending more than $1 billion in fiscal year 1991, most of it in the Superfund program. Because of its vulnerability to fraud, waste, and abuse, we identified Superfund as one of our high-risk areas in the federal government. As we highlight in a report on the high-risk Superfund program, Superfund's largest contractors work under cost-reimbursable contracts that promise to pay all of a contractor's allowable costs. This requires the agency to have in place effective controls to ensure that such costs are proper. We found, however, that EPA does not adequately review contractors' spending plans before approving them, check bills for reasonableness before paying them, or verify charges later by timely audits of contractors' records. While EPA has not addressed all of our concerns, it has begun several initiatives to improve contract oversight, including the development of independent cost estimates against which it can compare contractors' spending proposals.

In other areas, as well, EPA has frequently taken the first step toward corrective action but seldom followed through to ensure that its directives are carried out. For example, in

our 1988 transition report, we reported that EPA was developing an integrated financial management system and recommended that the agency provide sustained leadership and a high priority for its effort. However, 3 years later, the EPA Inspector General's office found that the system had still not been implemented because EPA had not devoted adequate resources or management attention. A lack of follow-through has also characterized attempts made by EPA to improve its enforcement programs. Following numerous GAO and EPA Inspector General reviews pointing out that EPA's regional offices and the states were not assessing penalties against violators at least as great as the amount by which the companies benefit by not being in compliance, EPA responded by reminding its regions, in a memorandum, to adhere to agency policies and to document the reasons for any penalty reductions. In a subsequent review, however, we found that little had changed; two-thirds of the closed cases we examined did not document penalty calculations, making it difficult to determine whether agency policies were followed.

To their credit, EPA's Administrator and Deputy Administrator have attempted to improve management accountability using

the annual process for assessing and reporting on material weaknesses, which is required by the Federal Managers' Financial Integrity Act (FMFIA). To oversee FMFIA, EPA created a Senior Council on Management Controls to focus high-level management attention on problems and solutions. The Council has been extremely valuable and should become a permanent mechanism for highlighting important management problems. Still needed, however, is a long-term commitment by senior managers to review the results of their corrective actions to make sure that they have been successful.

Strengthening Global Environmental Protection Efforts

Resolving today's environmental problems—including global climate change, depletion of the stratospheric ozone layer, and deforestation, among others—will require an unprecedented level of international cooperation. At the United Nations Conference on Environment and Development in Rio de Janeiro in June 1992, participating nations drew up an action program for environmentally sustainable development as well as conventions to address climate change and threats to biological diversity. But while reaching these agreements is, in itself, a noteworthy accomplishment, their effectiveness in correcting problems ultimately depends on how well the agreements are implemented. Moreover, because the costs of compliance are high, uneven implementation may place the countries that carry out the agreements at a competitive disadvantage with those that do not.

Since 1972, the number of international environmental agreements in which the United States participates, or in which it has a significant interest, has grown from fewer than 50 to about 170. Yet little is known about how well environmental agreements are being implemented. In a review of eight major international agreements, we found

that the reports that parties are supposed to provide on their compliance with agreements are often late, incomplete, or not submitted at all, and the secretariats responsible for overseeing the agreements lack the authority or resources to monitor implementation independently. In addition, many parties, particularly developing countries, lack the technical and financial capability to comply.

To strengthen international environmental agreements, we have suggested that the U.S. government could support efforts to improve information on implementation. Such information could be used to bring pressure on parties to live up to their commitments and could increase public support for meeting obligations. In addition, information on implementation could be used to target assistance to countries in need. The prospect of assistance could provide an additional incentive for such countries to report the status of their implementation efforts. In the development and ratification of treaties and in its foreign assistance and support of international institutions, the U.S. government could establish goals for improving the availability of information on implementation, increasing public access to the information, and improving the ability of

developing countries to both participate in and carry out environmental agreements.

The environment has also become a critical element in trade agreements and will have to be addressed directly in future negotiations. As the United States and its trading partners seek to phase out tariffs and traditional barriers to free trade, incompatible environmental standards can themselves be perceived as trade barriers and can stand in the way of trade liberalization. This, in turn, generates concern about the potential for trade agreements to encourage the adoption of "lowest common denominator" environmental standards that would be weaker than existing U.S. standards.

Moreover, existing trade agreements do not fully address environmental issues. The General Agreement on Tariffs and Trade (GATT)—the major international trade agreement—was developed long before countries had many environmental laws and international environmental agreements. And when the North American Free Trade Agreement (NAFTA) was created, the administration promised to deal with environmental issues in a separate process, outside of the agreement itself. However, in a review of U.S. and Mexican pesticide

standards, we found that plans by the two countries to reconcile differences in standards would not address all differences. In addition, there is an absence of enforcement and monitoring capabilities on the part of the Mexican government. The U.S. government will therefore have to recognize the potential for conflicts and search for new ways to reconcile them.

Related GAO Products

Superfund Program Management (GAO/HR-93-10, Dec. 1992).

International Environment: Strengthening the Implementation of Environmental Agreements (GAO/RCED-92-188, Aug 24, 1992).

Federal Facilities: Issues Involved in Cleaning Up Hazardous Waste (GAO/T-RCED-92-82, July 28, 1992).

Drinking Water: Widening Gap Between Needs and Available Resources Threatens Vital EPA Program (GAO/RCED-92-184, July 6, 1992).

Pesticides: Comparison of U.S. and Mexican Pesticide Standards and Enforcement (GAO/RCED-92-140, June 17, 1992).

Environmental Enforcement: EPA Needs a Better Strategy to Manage Its Cross-Media Information (GAO/IMTEC-92-14, Apr. 2, 1992).

Water Pollution: State Revolving Loan Funds Insufficient to Meet Wastewater Treatment Needs (GAO/RCED-92-35, Jan. 29, 1992).

Pesticides: EPA's Information Systems Provide Inadequate Support for

Reregistration (GAO/T-IMTEC-92-3, Oct. 30, 1991).

Water Pollution: Greater EPA Leadership Needed to Reduce Nonpoint Source Pollution (GAO/RCED-91-10, Oct. 15, 1991).

Environmental Protection: Meeting Public Expectations With Limited Resources (GAO/RCED-91-97, June 18, 1991).

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