United States General Accounting Office

GAO

Report to the Chairman, Committee on Transportation and Infrastructure, House of Representatives

May 2002

HIGHWAY INFRASTRUCTURE

Interstate Physical Conditions Have Improved, but Congestion and Other Pressures Continue

G A O

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Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
DOD	Department of Defense
DOT	Department of Transportation
FHWA	Federal Highway Administration
GAO	General Accounting Office
IM	Interstate Maintenance Program
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
NHS	National Highway System
TEA-21	Transportation Equity Act for the 21st Century
STIP	Statewide Transportation Improvement Program
STRAHNET	Strategic Highway Network
VMT	vehicle miles traveled

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

May 31, 2002

The Honorable Don Young
Chairman, Committee on Transportation
and Infrastructure
House of Representatives

Dear Mr. Chairman:

The Interstate Highway System, begun nearly a half century ago, has become central to transportation in the United States. Federal officials consider the Interstate Highway System the backbone of the nation's transportation system—connecting people with work, school, community services, marketplaces, and each other, while providing a greater level of safety than other roads. Federal spending on Interstate highways has also contributed to changes in residential and business land-use patterns. From 1954 through 2001, the federal government has invested over $370 billion[1] in Interstate highways—nearly half of all federal highway apportionments during this period.

In 1991, the Intermodal Surface Transportation Efficiency Act provided funding for the completion of the Interstate Highway System. Since that time, the federal government and the states have focused primarily on preserving and enhancing the capacity of the existing system. With age and constant use, the system's roads and bridges have required significant levels of maintenance. Moreover, 24 percent of all car and truck travel occurs on the Interstate System, contributing to growing levels of congestion. In 1991, we raised concerns about the condition of Interstate highways and the rising levels of congestion. Now, as Congress begins to plan the next reauthorization of federal highway programs, it is appropriate to examine the Interstate Highway System again.

Concerned about the condition of Interstate highways and bridges now and into the future, you asked us to determine (1) how the role of the Interstate Highway System has changed over time; (2) the roles of the federal and state governments in managing and funding the Interstate System; (3) the financial resources that states and the federal government have devoted to the system; (4) how physical conditions, safety, and congestion of the Interstate System have changed and how they compare to other classes of

[1]All dollar figures in this report are constant 2001 dollars, unless otherwise noted.

roads; and (5) the factors that could affect future Interstate conditions and the cost of addressing these factors.

To provide you with information addressing your concerns about the Interstate Highway System, we conducted a nationwide mail survey of all 50 states, the District of Columbia, and Puerto Rico (referred to in this report as states). We received responses from all 52 states. Our survey focused on state officials' views of the Interstate Highway System's role in their states' transportation system, including changes in their roles over the past 20 years. The survey also asked state officials for their views of the Interstate System in 10 years and their perceptions of the current condition of the system's infrastructure, safety, and congestion. A summary of responses to the survey appears in appendix II of this report.[2] We also visited five states—Arizona, Florida, Missouri, North Dakota, and Pennsylvania—to obtain more detailed information on their Interstate Systems and their plans for managing them. We also

- reviewed the Interstate Highway System's history and obtained data on how it is currently used;
- interviewed Federal Highway Administration (FHWA) officials at headquarters and division (state) offices and Department of Defense (DOD) officials;
- obtained information from FHWA on funding for the system; and
- obtained information from the U.S. Department of Transportation (DOT) on pavement conditions, bridge conditions, safety conditions, and congestion levels.

We did not review the impact of federal funding through the federal aid highway program on states' patterns or levels of investment in their Interstate and other roads and bridges. (See app. I for a more detailed discussion of our methodology.)

[2]The federal government announced in January 2002 that the level of federal highway funding to states would decline in fiscal year 2003 because of a decrease in revenue to the federal Highway Trust Fund. All respondents returned their surveys before that date, so they could not take this potential decrease in funding into account in their responses.

Results in Brief

The role of the Interstate Highway System has expanded over time. The original purposes were to provide for efficient long-distance travel, support defense, and connect metropolitan and industrial areas. The majority of the state transportation officials we surveyed said that, today, the most important role that the Interstates perform, other than supporting safe travel, is moving freight traffic across their states. They also said that the original purposes continue to be important but that the Interstate's importance for freight movement had increased greatly in importance over the last 20 years. For example, truck traffic on the Interstates accounted for over 41 percent of total truck miles traveled in 2000. The states also reported that Interstate highways are important for their economic development. In addition, the role of urban mobility has also grown in importance. While the original planners of the Interstate Highway System may not have seen them as essential to moving people within cities, 39 states now report that Interstate highways are very important for travel within urban areas; these highways account for only 4 percent of the capacity on urban roads, but they carry 24 percent of all metropolitan traffic. Finally, 30 states responded that getting people to airports is an increasingly important role for Interstate highways—a reflection of the increase in air travel.

The federal government's role is primarily to provide funding for and oversight of the system, while the states do most of the "hands-on" work of maintaining and planning for the future of the Interstate System. Since 1991, when it provided final funding for the completion of the Interstate System, Congress has continued to provide funding for the maintenance of the system. However, the percentage of funds the federal government has provided specifically for use on the Interstate System has declined from more than half of all federal highway aid prior to 1992 to 17.5 percent during the period 1992 through 2001. FHWA was originally heavily involved in selecting Interstate routes, overseeing their construction, and ensuring that they were adequately maintained, but state departments of transportation now handle many of these duties. FHWA continues to have oversight responsibilities for significant Interstate projects carried out by the states, as well as the state's planning process that leads to the allocation

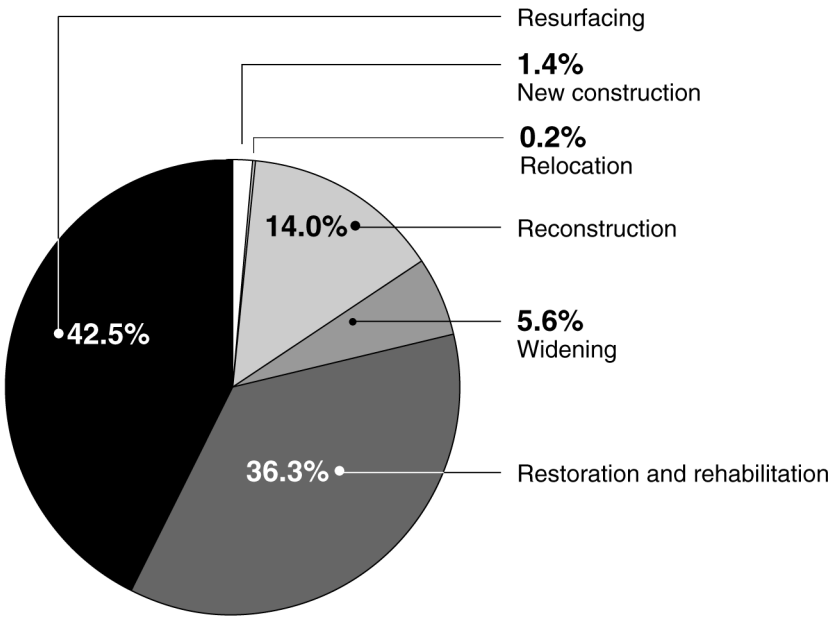
of state and federal funds to projects on various classes of roads.[3] States are expected to plan and carry out their investments in Interstate and other highways and to ensure that Interstate highways are adequately maintained. States also fund a portion of Interstate projects, though to a much smaller extent than the federal government.

Combined federal and state spending on the Interstate System increased from about $13.0 billion in 1992 to about $16.2 billion in 2000. States are generally required to pay 10 percent of the cost of an Interstate project; however, we found that the average nonfederal (state and other) share of urban Interstate projects was about 15 percent and 11 percent for rural projects.[4] This federal and state spending focused largely on the preservation and maintenance of the existing system. As shown in figure 1, the kinds of projects undertaken after 1991 show the shift from construction to maintenance: of all miles of Interstate projects undertaken, 1.4 percent was for new construction, 5.6 percent was for widening the roads, and the remaining 93.0 percent was for projects to reconstruct, relocate, restore and rehabilitate, or resurface pavement.

[3]In a previous report, we expressed concern over how well FHWA performs this oversight of large dollar projects—U.S. General Accounting Office, *Transportation Infrastructure: Managing the Costs of Large-Dollar Highway Projects*, GAO/RCED-97-47 (Washington, D.C.: 1997). We also testified about FHWA's oversight on May 1, 2002--U.S. General Accounting Office, *Transportation Infrastructure: Cost and Oversight Issues on Major Highway and Bridge Projects*, GAO-02-702T (Washington, D.C.: May 2002).

[4]These percentages refer only to the nonfederal share of projects that use federal funding.

Figure 1: Types of Interstate Pavement Projects from 1992 through 2000, by Miles



Source: FHWA's *Highway Statistics.*

Over the past decade, the physical condition of the Interstate Highway System has improved; the safety of the system has stayed steady; and congestion has increased. Interstate highways are also in better physical condition and are safer than other classes of roads, although they are generally more congested. When surveyed about the condition of the pavement on their Interstate highways, 39 states responded that their pavement is in good or excellent condition. This is consistent with FHWA statistics, which show that pavement condition improved over the past decade—8.6 percent of the pavement was in poor condition in 1990, compared with 3.4 percent in 2000. However, pavement condition varies across the country. For example, while half of the states have less than 2 percent of their Interstate pavement in poor condition, 4 states have more than 12 percent of their pavement in poor condition. In addition, the number of structurally deficient Interstate bridges declined by over 22 percent from 1992 through 2000. States also reported that their Interstates continue to provide a safe means of travel, and federal data reinforce this view. Interstate fatality rates remained about steady over the past decade, and Interstates continue to have lower fatality rates than other types of roads. On the other hand, DOT and other data show that congestion on

urban Interstate highways increased and is generally worse than on all other classes of roads. Traffic is increasingly dense on urban Interstates, and the amount of time required for an average trip during peak travel periods increased by about 12 percent from 1990 through 2000. States also identified congestion on some of their rural Interstate roads as an emerging issue.

The states expect that increases in traffic, the aging of the infrastructure, and constraints on funding will affect their ability to maintain physical and safety conditions of their Interstate Systems and to alleviate congestion, but the costs to address the factors pressuring their Interstates were difficult to determine. First, FHWA and almost all states expect the volume of both car and truck traffic to increase over the next 10 years, and most states reported that the expected increase in traffic would negatively affect the physical condition of pavement and bridges, safety, and levels of congestion on their Interstates. In addition, states expect the continued aging of the Interstates to have a negative effect on the conditions of their pavement and bridges. Transportation officials we spoke with were also concerned that large, expensive projects might restrict the availability of funds for maintaining the rest of their systems. Finally, budgetary pressures at the state and federal level may make it difficult to increase spending on the Interstate System. It is difficult to determine the cost of addressing these factors, in part because the federally required short-term plans that states develop for investing in their highways are designed to provide a realistic list of projects that can be completed with expected revenue. As a result, states' plans might not identify the funding needed to address all of the pressures states expect on their Interstate highways. Some states we visited prepared longer-term plans that estimated the funding necessary to meet their goals for their highway systems, including their Interstates, and these plans showed a gap between expected revenue and what states would like to invest.

We obtained comments on a draft of this report from DOT and DOD officials. They generally agreed with the report.

Background

The Federal-Aid Highway Act of 1944 established the Interstate Highway System but did not provide specific funding for construction. In the Federal-Aid Highway Act of 1956, Congress declared that the completion of a "National System of Interstate and Defense Highways" was essential to the national interest. The act called for new system design standards, began an accelerated construction program, established a new method for

apportioning funds among states, and set the federal government's cost share for Interstate construction projects at 90 percent.[5] At the same time, the Highway Revenue Act of 1956 introduced a dedicated source for federal highway expenditures, providing that revenue from certain federal motor fuel and other motor vehicle related taxes be credited to the Highway Trust Fund. The federal government, from 1954 through 2001, invested over $370 billion on Interstates through apportionments to the states, more than on any other class of road. Today, FHWA, within DOT, administers a variety of federal highway programs supported by the trust fund—collectively referred to as the Federal-Aid Highway Program.

The Interstate Highway System, as it came to be known, has particular design characteristics. Its roads are generally divided highways with at least four lanes of traffic and wide shoulders. The Interstate avoids intersections by having other roads pass over or under it, and it has access control—that is, vehicles generally join or leave the flow of traffic by a limited number of access or exit ramps. (See fig. 2.) Certain characteristics were meant to facilitate military movement, such as the requirement for 16 feet of clearance under bridges that pass over Interstate highways.[6] A distinctive red, white, and blue shield denotes Interstate highways.

[5]The federal share of Interstate project costs was set at 90 percent, but in states with large areas of federal public land, the federal share is increased proportionately up to a 95-percent limit.

[6]The states are required to coordinate with DOD on exceptions to the 16-foot vertical clearance standard. According to DOD officials, DOD typically concurs with the exemptions.

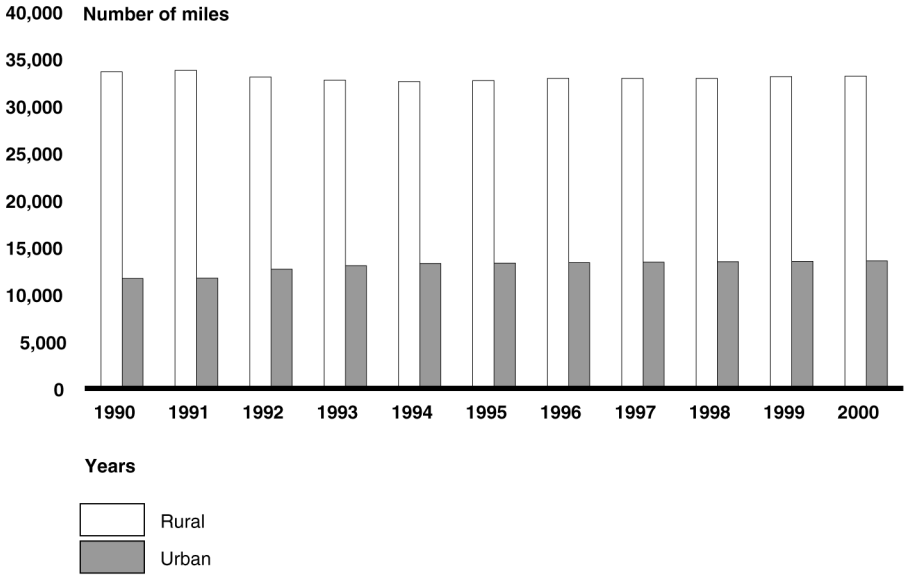
Figure 2: Overview of Interstate Section

The Interstate Highway System, as of 2000, extended over 46,000 miles in length and 209,655 lane miles.[7] In 1991, Congress provided final funding for the completion of the Interstate System. From 1990 through 2000, Interstate mileage grew by about 3.1 percent, or 1,405 miles in length, or 11,491 lane miles during the decade. Growth occurred primarily in urban areas. Overall, urban mileage climbed by 1,885 miles, or 16.2 percent,

[7]Lane miles are the number of lanes in a mile of road. For example, a four-lane road, 2 miles long, would equal 8 lane miles.

during this period, while rural Interstate mileage declined by 480 miles, or 1.4 percent. (See fig. 3.) Some of the urban mileage gain occurred as new road mileage expanded the system. The rest occurred as urban boundaries grew to take in Interstate highway miles that were originally in rural areas.

Figure 3: Urban and Rural Interstate Mileage, 1990 through 2000



Source: FHWA's *Highway Statistics.*

According to FHWA, Interstate highways are a principal part of an overall network of roads throughout the nation. The Interstate System composes 29 percent of the estimated 161,000-mile National Highway System (NHS) designated by Congress in 1995. The NHS also includes other arterial roads of national interest. The entire Interstate Highway System is also part of the Strategic Highway Network (STRAHNET), an approximately 61,000-mile network of roads designated as important to the U.S. military.[8]

Currently, both the federal government and states fund the construction and maintenance activities on the Interstate Highway System. Each year, billions of dollars are provided to the states for the construction and repair of highways through various highway programs. Under one such program—the Interstate Maintenance Program (IM)—federal funds support projects for resurfacing, restoring, rehabilitating, or reconstructing portions of the Interstate System. Those projects generally require a 10 percent state match, while projects on other classes of roads generally require a 20 percent match. Under certain circumstances, states may transfer funds among various highway programs. For example, subject to certain limitations, states may transfer IM funds to other programs and use them on other classes of roads (with a 20 percent match). Similarly, states may also transfer funds from other funding categories to their IM program and use them for qualifying projects on Interstate highways. The Interstate Maintenance Discretionary Program provides funding for the kinds of projects funded under the IM program. In addition, Bridge Discretionary Program funds can be used on Interstate bridges. FHWA solicits candidates for the discretionary programs and selects projects for funding from applications. Finally, the Highway Bridge Replacement and Rehabilitation Program provides funds for states to replace or rehabilitate deficient highway bridges located on any public road, including the Interstate System.

In 1991, we reported on Interstate conditions.[9] In that report, we raised concerns about the poor condition of Interstate highways and about

[8]The NHS is a system of designated highways that serve major population centers, international border crossings, intermodal transportation facilities, and major travel destinations. The NHS includes all Interstate highways, plus other principal arterials, the STRAHNET, major STRAHNET connectors, high-priority corridors, and intermodal connectors. There is a separate funding category specifically for the NHS.

[9]U.S. General Accounting Office, *Transportation Infrastructure: Preserving the Nation's Investment in the Interstate Highway System*, GAO/RCED-91-147 (Washington, D.C.: Aug. 2, 1991).

FHWA's oversight of them. Among other things, we suggested that the DOT report to Congress on the levels of investment required for Interstate maintenance and on the progress being made to achieve adequate maintenance. DOT included information in Appendix A of the *1999 Conditions and Performance Report*[10] that was partially responsive to this recommendation.

The Role of the Interstate Highway System Has Expanded Over Time

According to state officials, the Interstate Highway System plays an important and expanding role in the country's transportation system. The original purposes of the system were to provide for efficient long-distance travel, support defense requirements, and connect metropolitan and industrial areas. Most states agree that these roles continue to be important but emphasized that several additional important roles have emerged in recent years. For example, most state officials see the Interstates as increasingly supporting economic growth and moving freight, as well as getting passengers to airports and supporting urban travel.

Interstates Were Developed to Support Long-Distance Travel and National Defense and Connect Metropolitan Areas

The Interstate Highway System was primarily developed to address (1) the public's demand for efficient long-distance travel, (2) the needs of the military, and (3) the nation's economic development through the connection of metropolitan and industrial areas.[11] The expectations for the Interstate Highway System are described in the following sections.

- The public's desire for easy long-distance travel manifested itself in the early 1900s through an increase in car ownership and a growing interest in cross-country travel. Along with this increase in vehicle ownership came a significant increase in travel and tourism, quickly making cross-country travel a major recreational activity for millions of Americans.

[10] *1999 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, U.S. Department of Transportation (May 2000). DOT prepared this report in response to requirements for reports to Congress on the condition, performance, and future capital investment requirements of the nation's highway and transit systems. This edition also includes the results of a study on Interstate needs required by Section 1107(c) of the Transportation Equity Act for the 21st Century.

[11] The Federal-Aid Highway Act of 1956 stated that the system was to: serve the principal metropolitan areas, cities and industrial centers; support the national defense; and connect with routes of continental importance in Canada and Mexico.

- The system allows the nation's military a means to expeditiously reach military cross-country installations and ports for deployment. In 1922, the United States Army developed the "Pershing Map," which illustrated for the first time the major roads of prime importance during times of war. Each of the routes that the Army identified in the map was included with those roads eligible for federal aid. The military importance of the Interstate System was emphasized in 1956 when legislation named the Interstate Highway System the National System of Interstate and Defense Highways.

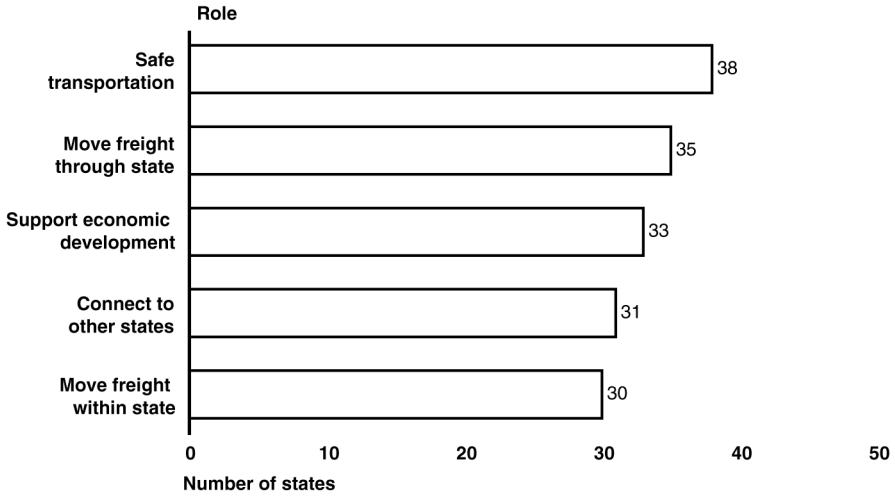
- By connecting metropolitan and industrial areas, the Interstate System was also meant to promote the nation's economic growth and development. Without an efficient, far reaching national highway system, merchants found it difficult to move their goods to market in a timely manner. The 1944 *Interregional Highways* report[12] explained that the Interstate System was also intended to serve the nation's economic needs in agricultural production, mineral production, forestry, and manufacturing centers.

Interstates' Role in Moving Freight and Supporting Economic Development Have Increased in Importance

According to state officials, the previously mentioned roles continue to be important, but the role of the Interstate System in freight movement has increased significantly. State officials we spoke with said that the Interstate System plays a significant role in their economy by facilitating the movement of goods by truck. State officials are concerned about economic development in their states and see the Interstates, especially in terms of freight movement, as playing a significant role in economic development. In responding to our survey, officials reported that today, after affording safe transportation, the most important roles of the Interstates include moving freight and supporting economic development. (See fig. 4 for the number of states classifying the importance of different Interstate functions.) Officials from 33 states indicated that supporting their state's general economic development is a very great role for the Interstate System. Officials from 35 states responded that moving freight through their state is a very great role for their Interstates, and 30 states believed that moving freight within their state is a very great role.

[12]The National Interregional Highway Committee was appointed by the president in 1941 "to investigate the need for a limited system of national highways…" The committee included highway officials and planners from the federal, state, and local governments.

Figure 4: Number of States Characterizing the Role of Their Interstate Highways as Very Great for Particular Purposes



Source: GAO survey data.

According to state officials, moving freight on their Interstate System is an important focus of their transportation programs. For example, state of Florida transportation officials told us that although reducing congestion for cars is important, maintaining mobility for freight traffic on their Interstate System is very important for industries in their state. For example, three Interstate routes connect the state's dairy industry with other areas of Florida, which consume 85 percent of the milk produced in the state. In addition, Ohio's survey response indicated that the Interstate System was very important for moving freight. The state estimates that its Interstate and multilane freeway system currently carry about 85 percent of all the state's freight and "Keeping the state's Interstate [S]ystem moving smoothly and freely is not only important to the economy of the state, but also to the nation's economy."

The role of the Interstate System in carrying freight has increased significantly over the past 20 years. According to our survey results, 45 of the state departments of transportation reported that the role of the Interstate System in moving freight *through* their state had increased; officials from 43 states responded that the Interstates had a greater role moving freight *within* the state.

Our nation's freight is currently moving extensively by truck on the Interstate System, and this movement is important to economic development. The most recent U.S. Commodity Flow Survey (1997)[13] reported that trucks carry over 69 percent of the tons shipped in the United States and 72 percent of the value of goods shipped in the country. In addition, truck traffic on the Interstates made up over 41 percent of total truck miles traveled in 2000. An FHWA report and a consultant's report explain that freight movement has significantly contributed to improving the country's economic efficiency and productivity by, among other things, making "just-in-time" delivery more feasible, thereby reducing warehouse and manufacturing costs.

Roles Supporting Urban Mobility Are Becoming More Important for Interstates

Officials from 39 states identified the Interstate System's support of travel within metropolitan areas as a great or very great role. Officials from 33 of the states said that this role has become greater in the past 20 years. When the Interstate System was planned, it was expected to provide efficient travel through the country and to connect major metropolitan areas where feasible. However, according to FHWA, Congress never expected the Interstate System to accommodate local traffic. Now a number of trips on urban Interstates, such as commuting trips, are completed within an urban area, rather than going through or beyond the urban area. For example, while urban Interstates make up about 4 percent of all urban lane miles, they carry about 24 percent of all urban traffic. According to states, the Interstate System provides efficient urban travel, and as such, urban users want easy access to it. In addition, according to North Dakota officials, the urban area of Fargo, North Dakota has encompassed Interstate 29 and the Interstate is now sometimes used as a local street.

Finally, some of the states that we surveyed said that Interstate highways are increasingly important for moving people to specific locations that may not have been seen as important when the Interstate was designed. For example, 30 states reported that moving people to airports is a greater or much greater role now than previously. Airport enplanements have grown rather steadily over the past 20 years—increasing by almost 129 percent from 1980 through 2000.

[13]"1997 Economic Census-Transportation-1997 Commodity Flow Survey," U.S. Department of Transportation and U.S. Department of Commerce (Dec. 1999).

Both the Federal and State Governments Have a Role in Managing and Funding the Interstate System

Since establishing the Interstate Highway System, the federal government has provided both funding for and oversight of the system. While still providing funding for the system, the federal government's oversight focus is currently on ensuring that states have the procedures in place to manage the Interstates, as well as providing some project-level oversight. State departments of transportation manage most of the "hands-on" work of constructing, maintaining, and planning for the future of the Interstate System. States also fund a portion of Interstate projects, though to a much smaller extent than the federal government.

The Federal Government Funds the Interstate Highway System and Oversees States' Management of the System

Congress, FHWA, and the Department of Defense (DOD) play important roles with respect to the Interstate Highway System, including funding and overseeing state planning activities, and financing the majority of construction and maintenance of the system.

Congress Establishes and Funds Highway Programs

By passing authorization and appropriations legislation, Congress plays a significant role with respect to federal highway programs, including Interstate-related programs. Authorization legislation, such as the Intermodal Surface Transportation Efficiency Act of 1991(ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21), enacted in 1998, provide funding for various highway programs and related activities, establish mechanisms for the distribution of those funds, and set forth eligibility requirements for the highway programs, including the Interstate programs, limiting how the funds made available may be used. Among other things, annual appropriation acts make amounts from the Highway Trust Fund available for payment of obligations incurred for various highway programs.

Funding for the Interstate System has been a major part of total federal highway funding, since 1954, when federal funding for Interstate construction began. However, the proportion of apportionments to states, specifically for the Interstate activities,[14] has decreased over time as compared with overall highway program apportionments.

- In 1960, the annual Interstate apportionment was $12.2 billion (in 2001 dollars), or 72.8 percent of that year's federal highway apportionments to states.

- From 1954 through 1991, total apportionments for Interstate construction and preservation reached $331.2 billion, or 56.8 percent of federal highway funding apportioned to states for the period.

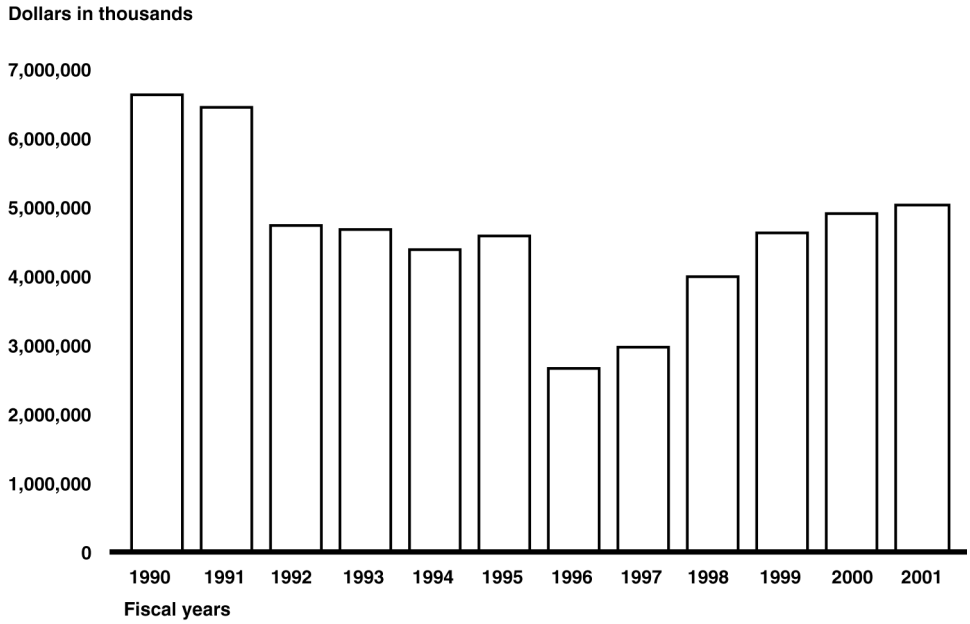
- From 1992 through 2001, Interstate highway apportionments were $39.1 billion, or 17.5 percent of funding apportioned to states. With ISTEA, Congress scaled back funding apportioned to states specifically for Interstate highways to $23.9 billion or 20.3 percent of federal highway apportionments from 1992 through 1997. In addition, Interstate apportionments were $15.2 billion, or 14.3 percent, of federal highway apportionments for the next 4 years under TEA-21. (See fig. 5.) ISTEA also created the NHS and the Surface Transportation Program.[15] Those programs accounted for 18.0 percent and 21.8 percent, respectively, of the $223.8 billion in federal highway apportionments made to the states from 1992 through 2001.

As Congress considers reauthorization of the surface transportation programs in 2003, it will face decisions about the continued level of federal involvement in managing and financing the Interstate System.

[14]Apportionments refer to funds distributed by statutory formula for various types of highway programs or activities. Since 1954, funds have been apportioned for projects on the Interstate System; however, the focus of Interstate funding provisions has changed over time from construction to preservation and maintenance.

[15]The Surface Transportation Program provides flexible transportation funding for states and localities. Eligible uses include projects on any federal-aid highway, bridges on any public road, and transit projects.

Figure 5: Apportionments for Interstate Highways, 1990 through 2001



Note: In 2001 dollars.

Source: FHWA's *Highway Statistics.*

Even after providing final funding for Interstate completion in 1991, Congress has continued to designate new Interstate routes. In 1991, Congress also found that the Interstate System, or comparable highways, did not adequately serve many of the nation's regions and identified high-priority corridors for development on the NHS to help meet the demands for increased capacity. Since 1991, 43 of these high-priority corridors have been designated, 10 of which were designated to become part of the Interstate System.[16] In addition, authorization and appropriations acts have designated funding specifically for certain identified high-priority projects, which may include improving access to Interstate highways, reconstructing Interstate interchanges, extending Interstate highways, or performing work on roads other than Interstates.

[16]Designation of a road as a future Interstate highway does not necessarily guarantee specific funds for construction of the road.

FHWA Oversees State Activities

FHWA's role in managing the Interstate System has changed from project-specific oversight to primarily overseeing state processes and procedures and specific projects. While FHWA was heavily involved in selecting routes for the Interstate System, for overseeing their construction, and ensuring that the system was adequately maintained, much of the responsibility for managing them now falls to the states. FHWA is also responsible for overseeing certain high-cost projects on the Interstate System.[17] FHWA reviews and approves project designs; approves plans, specifications, and estimates; concurs in contract awards; and inspects projects.[18]

Today, FHWA does not have significant responsibilities for Interstate maintenance. For about two decades—until 1998[19]—each state was required by statute to annually certify that the Interstate highways in their state were being maintained in accordance with federal requirements. The law authorized sanctions against states that did not adequately maintain their Interstate highways; but, they were rarely applied. TEA-21 repealed the statutory provisions regarding maintenance certification in 1998. However, if FHWA finds that highways constructed with federal funds are not being properly maintained, it is required to inform the state and withhold federal approval of future state-highway projects in all or part of the state if the condition is not corrected within 90 days.

[17]In May 2002, we testified on how FHWA is carrying out oversight on large dollar projects—U.S. General Accounting Office, *Transportation Infrastructure: Cost and Oversight Issues on Major Highway and Bridge Projects*, GAO-02-702T (Washington, D.C.: May 2002).

[18]By law, FHWA may not assume more oversight responsibility than was permitted under TEA-21, unless agreed to by a state. As a result, with respect to Interstates, states may be responsible for all resurfacing, restoring, and rehabilitation projects, and construction and reconstruction projects less than $1 million. The extent of FHWA's oversight for Interstate projects is typically an agreement with each state's department of transportation.

[19]The Surface Transportation Assistance Act of 1978 required the Secretary of Transportation to establish guidelines for ensuring the maintenance of the Interstate System. In 1980, DOT promulgated related regulations—requiring states to develop an initial Interstate maintenance program and to annually certify that they were adequately maintaining the Interstate System in accordance with the program's guidelines. FHWA inspected state maintenance efforts and determined whether a state should be certified as having adequately maintained its Interstates.

Although construction of the Interstate System is essentially complete, the agency may approve additions to the existing Interstate Highway System when states request such an addition. When FHWA receives requests for additions to the existing system from states, it considers, among other things, whether the proposed new segment is a logical addition or connection to the Interstate System and whether it meets Interstate geometric[20] and safety standards. Although both Congress and FHWA designate specific additions to the Interstates, the nation does not currently have a centralized system for determining whether new routes are needed and building them. Similarly, the agency approves adding access points (interchanges and ramps) to the existing system and system design exceptions.

FHWA is also responsible for overseeing states' planning processes by reviewing and approving statewide transportation improvement programs (STIPs). These federally required plans cover at least 3 years and describe the state's planned construction, maintenance, and other highway projects, including Interstate projects. FHWA's review of the STIP primarily focuses on whether the required processes were followed rather than on the content of the plan. (See app. III for more details about the planning process.)

FHWA also has other responsibilities related to the Interstate System. For example, the agency sets performance goals, as required by the Government Performance and Results Act of 1993 (Results Act), for pavement quality, bridge condition, highway congestion, and safety.[21] Although FHWA does not have Interstate-specific performance goals, its performance goals do include Interstate highways. For example, FHWA's safety goal is to reduce highway fatalities and injuries by 20 percent by 2008. FHWA's performance goal for pavement quality applies to the NHS, which includes the entire Interstate System. These are FHWA's goals, and states are not required to meet them for their Interstates or other roads. Finally, other FHWA responsibilities include providing technical assistance

[20]Geometric standards are guidelines FHWA adopts from the American Association of State Highway and Transportation Officials' policy for constructing the physical layout of roads such as shoulder width.

[21]The Results Act is intended to shift the focus of government decisionmaking, management, and accountability from activities and processes to the results and outcomes achieved by federal programs. The act requires federal agencies to establish performance goals and report yearly on the extent to which these goals were achieved.

and management tools, such as investment-analysis models, to aid in the planning process at state transportation agencies; conducting transportation-related research; and disseminating the results throughout the country.

DOD Works with FHWA and States to Meet Defense Requirements

DOD played an important role in establishing the Interstate Highway System. However, state officials reported that this role has not increased significantly in the past 20 years. DOD participated in selecting the Interstate highway routes, and according to DOD and FHWA officials, DOD works with federal and state transportation officials to ensure that the Interstate System meets its national defense requirements. In 1981, DOD, in partnership with FHWA, identified public highways to make up the STRAHNET.[22] This network of highways gives the military the ability to move equipment and personnel expeditiously over the highway system from military installations to ports for deployment. The STRAHNET consists of 61,044 miles plus 1,700 miles of connectors that link over 200 important military installations and ports to the network. All of the nation's Interstate highways are included in the STRAHNET. STRAHNET and its major connectors were incorporated into the NHS in 1995.[23] This continues to emphasize the military importance of these highways. According to DOD officials, the working relationship between DOD and FHWA, and the conditions on the Interstate System, are adequate.

States Plan, Construct, Maintain, and Help Fund the Interstate System

States handle many of the responsibilities for managing the Interstates as well as providing some funding. State responsibilities include developing plans for maintaining the physical and operational conditions and the safety of Interstate highways. States are required to develop at least two planning documents—a 20-year Statewide Transportation Plan and a short-term Statewide Transportation Improvement Program (STIP) that covers at least 3 years. The plans outline how the states will use available funds to maintain the physical and operational conditions and the safety of their Interstates. To develop these planning documents and maintain their Interstates, states use a variety of approaches. See appendix III for a description of states' planning processes. In addition, state departments of

[22]According to the Military Traffic Management Command, while DOD has worked with FHWA and the states to identify routes important to the national defense since at least 1956, the first STRAHNET was designated in 1981.

[23]See footnote 8.

transportation are responsible for the day-to-day operations of constructing and maintaining the Interstates. Finally, state governments provide some funding for the Interstate Highway System; however, they spend less on the Interstates than does the federal government. States raise highway funds to match federal funds and to pay for other state highway projects and programs.

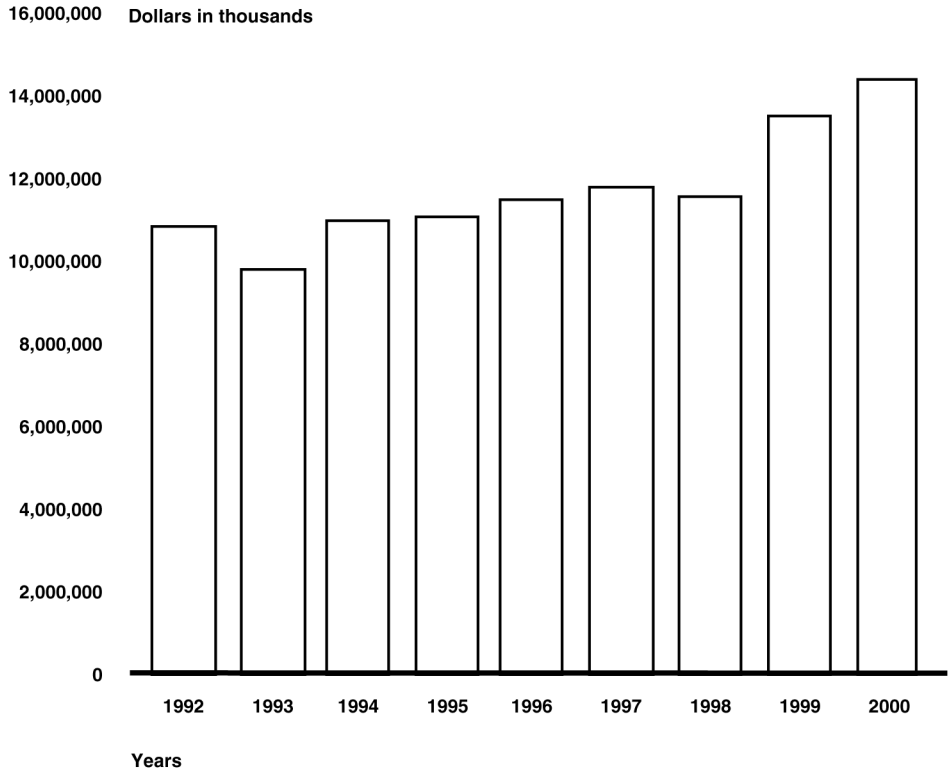
Since 1992, Most Interstate Highway Investments Have Been for Preservation or Capacity Additions

The federal and state governments have invested heavily in Interstate highways. Because 97.4 percent of the system's length in 2000 was complete before 1992, much of the subsequent investment was to preserve and maintain the existing system. When states added to the system's size, they did so mainly in urban areas. From 1992 through 2000, the type of Interstate pavement and bridge construction projects also shifted from new construction to primarily maintenance.

Overall Spending on Interstates Has Grown

Outlays, that is, expenditures of federal, state, and other funds for projects on Interstate highways have generally increased since 1992. State spending of federal, state, and local funds for Interstates grew from $13.0 billion in 1992 to $16.2 billion in 2000. States reported total capital outlays for Interstates of $105 billion, or an average of $11.7 billion per year in 2001 dollars from 1992 through 2000. (See fig. 6.) Besides capital outlays, states also had routine Interstate maintenance outlays that averaged $1.6 billion per year. These outlays, which generally consist of nonfederal funds, were for routine tasks like sealing cracks and patching potholes, which help keep the pavement in good condition, but did not cover capital improvements like resurfacing, rehabilitation, or reconstruction.

Figure 6: Capital Outlays for Interstate Highways from All Funding Sources, 1992 through 2000



Note: In 2001 dollars.

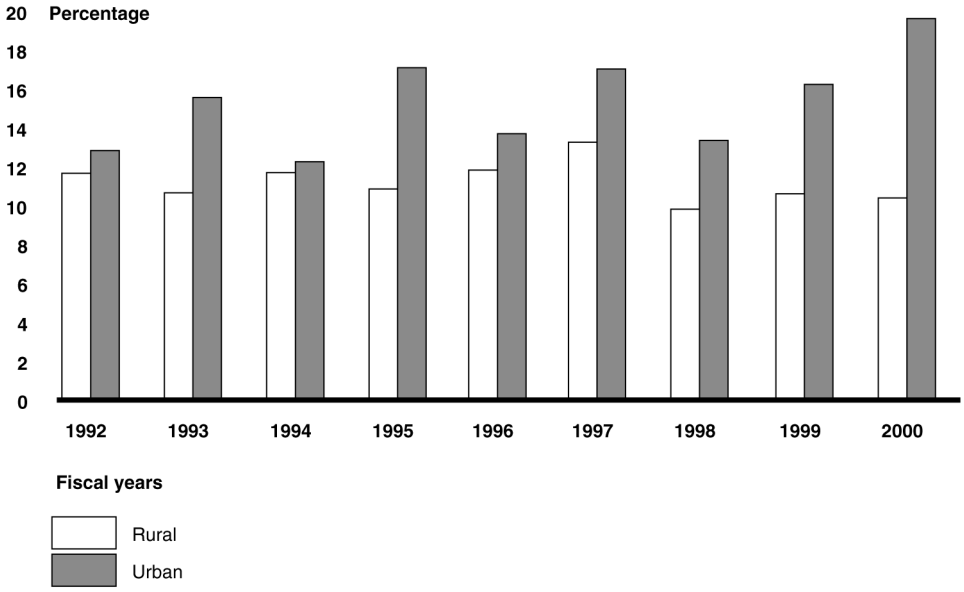
Source: FHWA's *Highway Statistics.*

States Have Spent More on Urban Interstates

From 1992 through 2000, states allocated more of their Interstate investments of federal, state, and other funds to urban highways (68.4 percent of outlays) than to rural highways (31.6 percent of outlays). Furthermore, states have invested higher levels of state or local funds in urban projects than in rural projects. Specifically, federal Interstate obligation data for projects show that, from 1992 through 2000, rural

Interstate projects averaged 11.2 percent in state or local funding, while urban projects averaged 15.1 percent in state or local funding.[24] (See fig. 7.)

Figure 7: Nonfederal Share of Interstate Projects



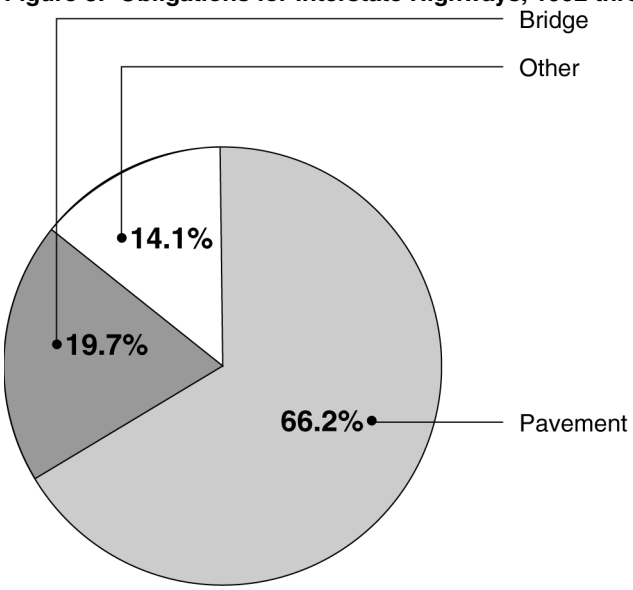
Source: FHWA's *Highway Statistics.*

States Are Spending More for Preservation of Pavement and Bridges

States spent available funds for different types of projects on their Interstate Systems, including pavement, bridge, and other related items (including safety, traffic operations, and environmentally related projects). FHWA reported obligations of $48.5 billion for Interstate highway projects from 1992 through 2000. Of this amount, 66.2 percent, or $32.1 billion, was for pavement projects, 19.7 percent, or $9.6 billion, was for bridge projects, and the rest, $6.8 billion, was for other related items. (See fig. 8.)

[24]States need match only 10 percent of a lane addition project's costs if the added lanes are high-occupancy vehicle lanes. Otherwise, states must match 20 percent of a lane addition project's cost. Moreover, these percentages refer only to the nonfederal share of Federal-Aid projects.

Figure 8: Obligations for Interstate Highways, 1992 through 2000

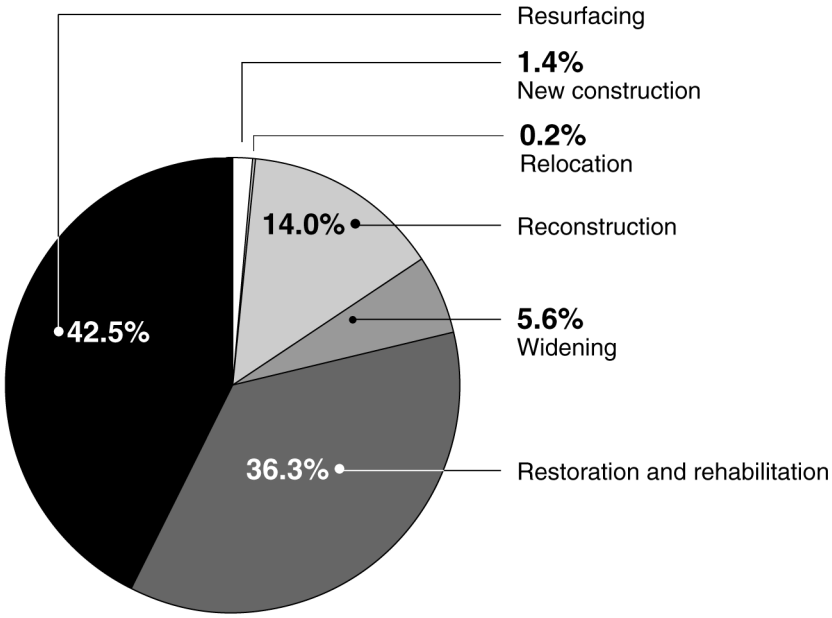


Note: Expenditures total $48.5 billion (in 2001 dollars).

Source: FHWA's *Highway Statistics.*

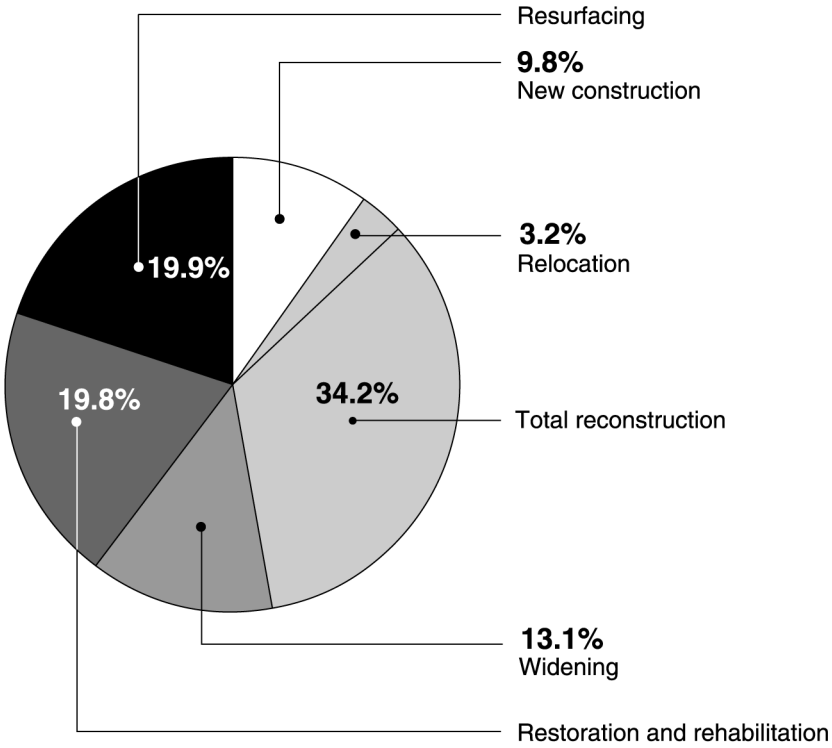
Accounting for the largest area of expenditures, Interstate pavement projects since 1992 were clearly focused on existing roadways. Among pavement project miles, 98.6 percent were to improve existing highways; only 1.4 percent for new construction. (See fig. 9.) Costs for improving existing highways were $29.0 billion, or 90.2 percent of total pavement costs. Only 424 miles, or 1.4 percent of Interstate projects' length, were for new construction. (See fig. 10.) Costs for new construction were $3.1 billion, or 9.8 percent of total pavement costs.

Figure 9: Interstate Pavement Project Miles, 1992 through 2000



Source: FHWA's *Highway Statistics.*

Figure 10: Interstate Pavement Project Dollars, 1992 through 2000



Source: FHWA's *Highway Statistics.*

Interstate pavement construction projects from 1990 through 2000 shifted toward maintaining the existing system. Based on FHWA obligation data, new pavement construction project miles declined during the period, while reconstruction project miles tended to decline during the period and pavement maintenance project miles—restoration and rehabilitation, and resurfacing—increased.

In addition, Interstate bridge projects[25] were more likely for preservation or replacement than for new construction. Among the 11,530 bridge projects

[25]FHWA's bridge project classifications are as follows: new bridge—new bridge that did not replace or relocate an existing bridge; bridge replacement—total replacement of a deficient bridge with a new bridge in the same traffic corridor; major bridge rehabilitation-major work to restore a bridge's structural integrity or to correct major safety defects; minor bridge rehabilitation—minor structural repairs, patching, curbs and gutters, etc.

reported, 10,363, or 89.9 percent, were replacement or rehabilitation projects.

Most Interstate Conditions Have Improved, but Congestion Has Grown

The Interstate's physical conditions (pavement and bridge) and safety are in good overall shape; however, congestion has grown. Pavement conditions improved from 1992 to 2000, and officials from 39 states now regard their pavement as good or excellent. Officials from a majority of state highway departments predict pavement will still be in good condition 10 years from now. However, officials from 23 states predict that, in 10 years, they will be falling behind in dealing with the condition of their Interstate pavement. Bridge conditions parallel pavement conditions: since 1992, bridge conditions have generally improved, and officials from a majority of states report bridge conditions are currently good or excellent, but officials from 19 states predict the condition of their bridges will worsen 10 years from now. Safety on the Interstate System has remained relatively stable. Interstate fatality rates declined from 1990 to 1992 and remained fairly stable after 1992. A majority of state officials rated the safety of travel on their Interstates as good or excellent today, and 41 predicted it will remain so 10 years from now. Moreover, DOT data showed that pavement, bridge, and safety conditions are better on Interstates than on other roads. But unlike pavement, bridge, and safety factors, Interstate congestion has gotten worse. One measure showed that rush hour travel time on urban Interstates increased 12 percent from 1990 through 2000. State officials in nearly half of the states reported that urban congestion is already high, and officials from 41 states predicted it will be high 10 years from now. State officials reported high rural congestion in only 1 state now, but expected it in 18 states within 10 years.

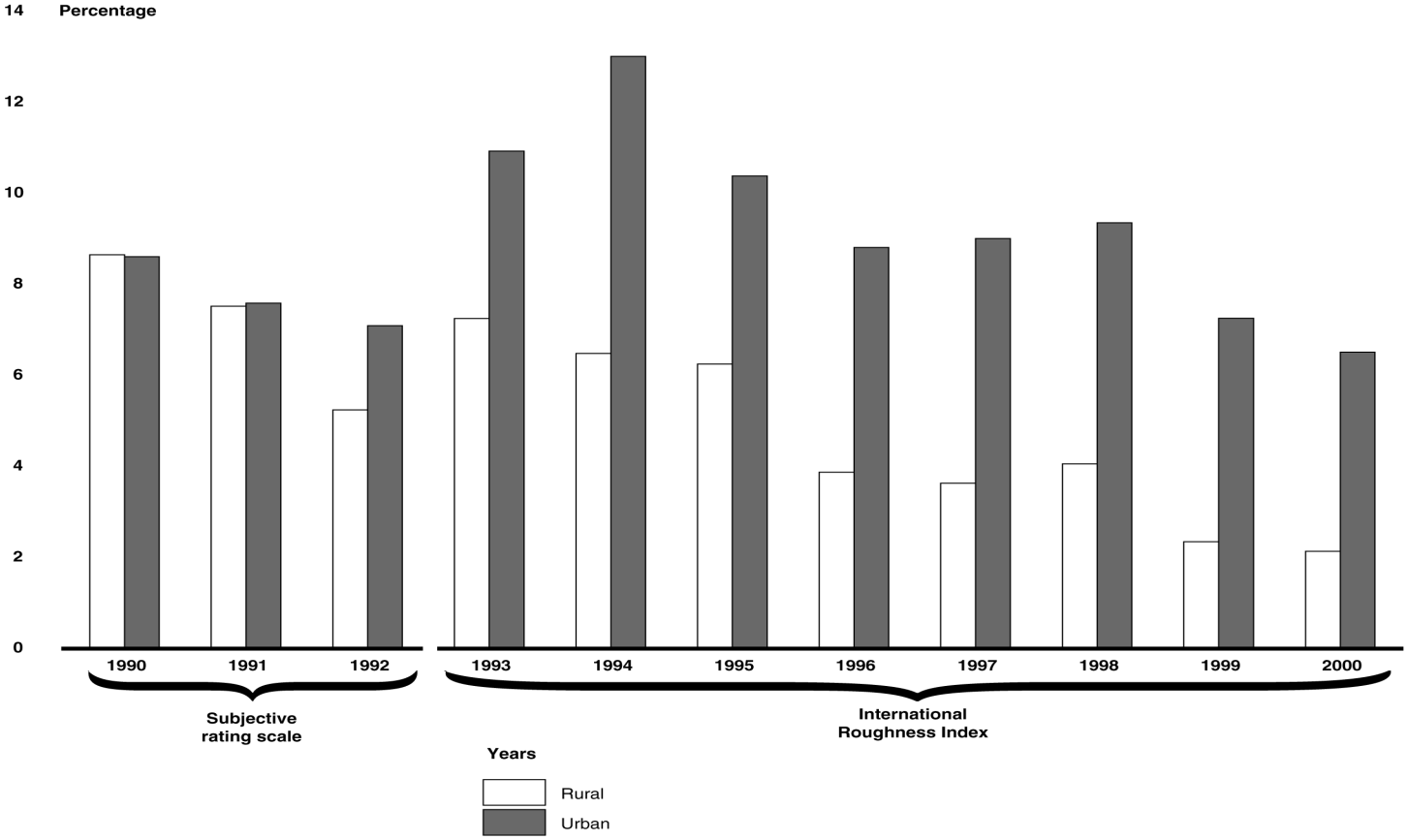
Pavement Conditions Have Improved

Generally, Interstate pavement conditions have improved since 1990. According to FHWA data, 8.6 percent of Interstate pavement, or 3,897 miles, was in poor condition in 1990. By 2000, the share of poor Interstate miles[26] had dropped to 3.4 percent, or 1,560 miles. In addition, pavement data for 1990 through 2000 show that urban Interstates have a higher

[26]Since 1995, FHWA's *Highway Statistics* reports have portrayed pavement conditions in International Roughness Index unit categories without quality descriptions. Thus, FHWA reported that 1,560 miles of Interstate pavement in 2000 had a roughness index over 170 inches per mile. We use the term "poor" to describe this pavement, following the descriptive approach used in DOT's *Condition and Performance* reports.

percentage of poor mileage than rural Interstates, but both have improved since 1990 (see fig. 11). The improvement pattern was not continuous partly because FHWA asked the states to adopt a new condition measure. States had historically reported pavement condition using a subjective rating scale. By 1992, states were also reporting pavement data with a more objective statistic called the International Roughness Index. In 1993, FHWA adopted the roughness index as a required statistic for reporting pavement conditions on Interstates. States needed new measuring devices to adopt the International Roughness Index. When these devices were later upgraded, some states such as North Dakota, noticed an improvement in their pavement condition statistics.

Figure 11: Percentage of Poor Interstate Pavement—Urban Versus Rural, 1990 through 2000



Source: FHWA's *Highway Statistics.*

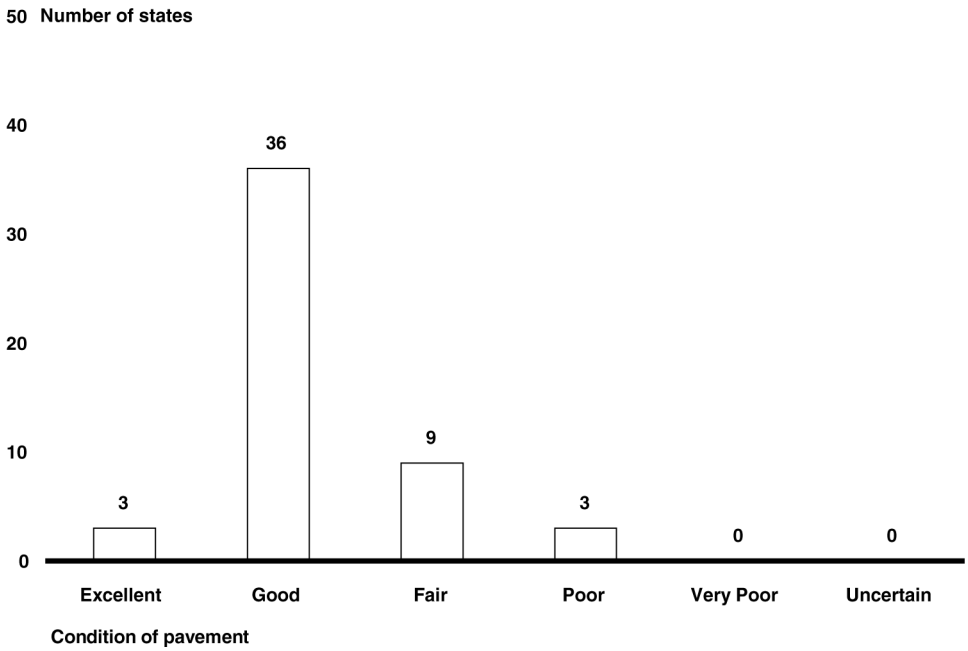
Two factors may have contributed to the long-term improvement in Interstate pavement. First, the federal government has increased its commitment to pavement quality, along with highway funding in general. FHWA has supported quality pavement management by promoting better planning and techniques for building smoother, longer-lasting roads. In addition, state highway programs have received increased federal funding since TEA-21 "guaranteed" certain overall funding levels based on Highway Trust Fund revenue. (See fig. 6 for increases in Interstate capital outlays during this period.) Second, state transportation departments have increased their commitment to Interstate pavement quality. This commitment may be ongoing, as in Florida, which adopted a statutory requirement in 1984 requiring goals for the quality of the pavement on its state highways. Or the commitment may come in response to customer feedback, as when Pennsylvania initiated a pavement upgrade program in response to truckers' surveys criticizing conditions on the state's roads.

Interstate Pavement Is in Good Overall Condition, but Some Sections Are in Poor Condition

Of 51 respondents, 39 states reported that their Interstate pavement is currently in good or excellent condition; 9 said that their pavement is in fair condition; 3 reported poor Interstate pavement conditions; and none reported very poor conditions. (See fig. 12.) In addition, state pavement data submitted to FHWA for 2000 showed that for the nation as a whole, 63.5 percent of pavement was in good or very good condition,[27] 18.2 percent was in fair condition, and 18.3 percent was in mediocre or poor condition. Half of the states reported that less than 2.0 percent of their pavement was in poor condition. FHWA's pavement categories describe a pavement's need for upcoming improvement as interpreted from a roughness index.

[27]Our survey asked states to rate their pavement quality on a scale of very poor to excellent. This scale was not necessarily designed to match FHWA's pavement condition categories that are based on International Roughness Index data.

Figure 12: Survey Responses about Current Pavement Conditions



Source: GAO's survey.

Rural Interstate pavement, which gets less heavy traffic, is in better condition than urban Interstate pavement, according to data that the states supply to FHWA. According to an FHWA report on pavement conditions in 2000, only 14.4 percent of rural mileage is in poor or mediocre condition, compared with 28.2 percent of urban mileage.

While the overall condition of Interstate pavement is generally good, it is much worse in certain states than our aggregate survey responses or nationwide pavement condition statistics suggest. For example, according to FHWA data, while 18.3 percent of the nation's Interstate pavement is in mediocre or poor condition, 10 states have at least one-third of their pavement in mediocre or poor condition. Four of these states have more than 12.0 percent of their pavement in poor condition, compared with a nationwide rate of 3.4 percent for pavement in the poor condition category. Missouri, one of our case study states, has 4.1 percent of its Interstate pavement in the poor category, fairly close to the nationwide level.

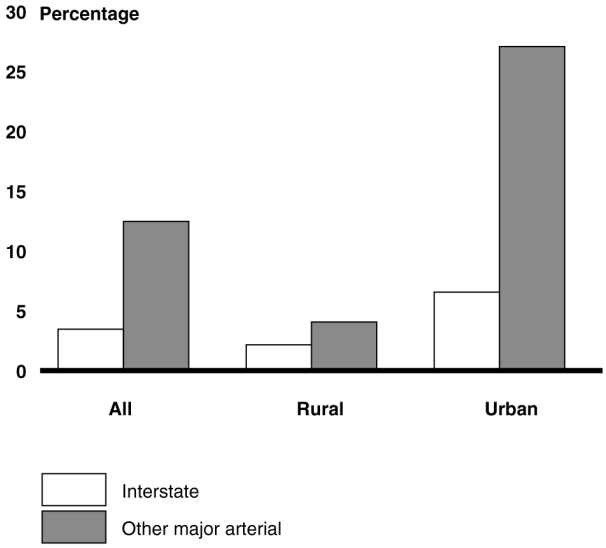
However, 40.1 percent of its Interstate pavement is in mediocre condition.[28] According to a draft long-range transportation plan, many of Missouri's Interstates need total reconstruction. State officials said that they plan to focus on I-70 between St. Louis and Kansas City, one of the oldest segments on the Interstate System, where, by state criteria, one-third to one-half of the pavement is poor or very poor.

Compared with "other major arterials," Interstates are in better condition in both rural and urban areas. According to Interstate standards,[29] in urban areas, 6.5 percent of Interstates are in poor condition, compared with 27.0 percent of other "urban major arterials." In rural areas, 2.1 percent of Interstates are in poor condition, compared with 4.0 percent of "other major arterials." (See fig. 13.)

[28]According to an official in Missouri's Department of Transportation, the state has a higher percentage of pavement it considers poor for state purposes. However, we used state data as reported in FHWA's *Highway Statistics 2000*.

[29]Unlike our analysis in figure 13, FHWA generally uses lower condition standards to rate classes of roads that are not Interstates. FHWA's criteria for the best road categories (very good and good) are the same no matter which class of roads is being considered. But the ranges of fair, mediocre, and poor roads are more stringent for Interstates than for other roads. For example, non-Interstate highways are considered to be in poor condition once their roughness index exceeds 170 inches per mile.

Figure 13: Percentage of Roads with Poor Pavement—Interstates Versus Other Major Arterials (2000)



Source: FHWA's *Highway Statistics.*

FHWA has no requirements or standards for states to keep their Interstate highways in a particular condition. However, FHWA's *Fiscal Year 2002 Performance Plan* included a pavement condition goal for the NHS, which includes the Interstate Highway System. FHWA originally determined that, by 2008, 93 percent of NHS pavement should have acceptable ride quality—meaning an International Roughness Index of 170 inches per mile or less. As a whole, the NHS had met this goal as of 2000, and the Interstate portion of the NHS met this goal by 1996. Since the 2008 goal had already been met, FHWA revised its performance goal. The current goal emphasizes that highly traveled roads should be in good condition and requires that, in 2002, 92 percent of vehicle miles on the NHS will be traveled on pavement that meets the acceptable ride standard.

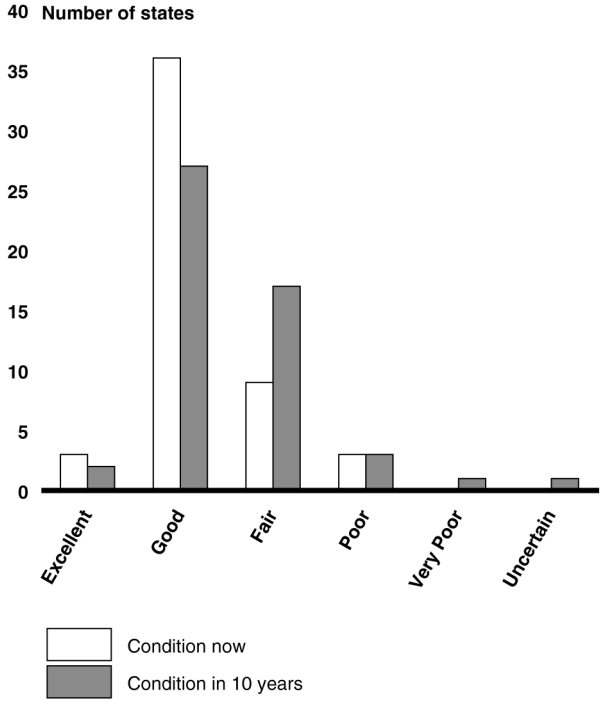
Expectations of Future Interstate Pavement Conditions Vary

We did not find agreement on whether Interstate pavement conditions will be as good in a decade as they are now. A majority of state officials

responding to our survey predict[30] that Interstate pavement will still be in excellent or good condition 10 years from now. However, 21 respondents predict that their pavement will be in fair or worse condition. Compared with their assessments of current conditions, our respondents' assessments of future conditions predict less pavement in good or excellent condition and more pavement in fair, poor, or very poor condition. Officials from 23 states predict that, in 10 years, they will be falling behind in dealing with the condition of their Interstate pavement. In addition, officials from 44 states predict that the portion of their transportation spending devoted to improving Interstate pavement conditions will increase (27 states) or stay the same (17 states). (See fig. 14.)

[30]We asked state officials to predict future pavement condition, given expected levels of funding. See appendix II, Survey of States' Views on the Future of the Interstate System, question 6. The same funding assumption applies to all survey predictions discussed later in this report.

Figure 14: Interstate Pavement Conditions Today and Expected 10 Years from Now, Given Expected Levels of Funding



Source: GAO's survey.

DOT recently predicted[31] that, given expected future investment levels, states could improve Interstate pavement conditions over a 10-year planning period. However, DOT's primary funding projection could be higher than states assumed in responding to our survey. DOT projected that states would increase their Interstate funding levels from 2.8 to 3.0 percent annually in constant dollar terms from 2003 to 2007, consistent with historic trends. State officials might not assume such funding increases, according to a FHWA official. Thus, the funding level in DOT's analysis

[31] *1999 Status of the Nation's Highways, Bridges and Transit: Condition and Performance*, May 2, 2000, Appendix A Interstate Needs. According to DOT's analysis, expected future investments could produce improvements of 3.8 to 6.7 percent in the average pavement condition statistic. This prediction assumes that federal funding for Interstates could increase through 2003 as provided for in TEA-21 and would remain at the 2003 level in constant dollar terms through 2007. DOT also analyzed the impact of lower funding levels on future pavement conditions, showing that pavement conditions could decline, consistent with the results of our survey.

might be higher than state officials expect, which could account for DOT's prediction of better future pavement conditions.

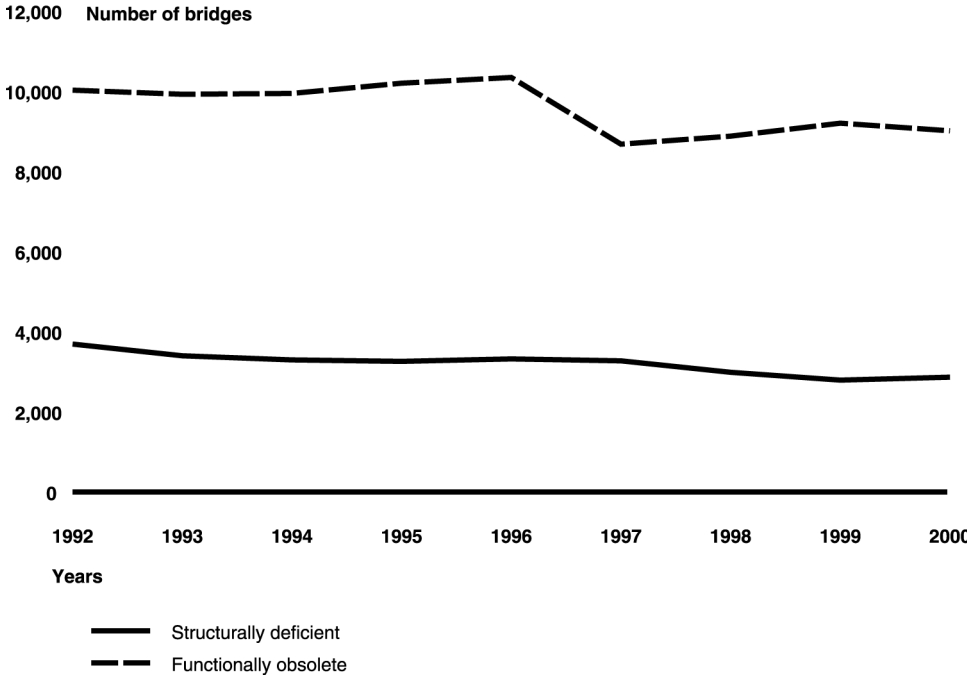
Interstate Bridge Conditions Have Generally Improved

The number of deficient Interstate bridges has declined over the last 8 years. Specifically, the number of structurally deficient bridges declined by over 22 percent from 1992 through 2000. In addition, FHWA information also shows that the bridge deck area associated with structurally deficient Interstate bridges decreased by over 27 percent during the same period.[32] Structurally deficient bridges can have restrictions on the weight of vehicles using them or may need to be closed and repaired before they can be used again. In addition, the number of functionally obsolete bridges declined by more than 10 percent over the same period. However, the deck area associated with functionally obsolete bridges increased 9 percent over this period. Functionally obsolete bridges are not up to design standards and generally face less serious problems than structurally deficient bridges—for example, shoulders that are not as wide as the roadway leading to the bridge. Figure 15 shows the decreasing trend in number of deficient bridges.[33]

[32]FHWA provided this information for Interstate bridges that are eligible for federal-aid funds but had not received funding during the past 10 years.

[33]We are focusing our discussion on the number of deficient bridges because, according to FHWA, this is a more widely used indicator than bridge component ratings. In addition, component ratings are more difficult to discuss on a national level because they provide more detail and a broader perspective on the specific condition of a bridge's deck, superstructure and substructure.

Figure 15: Number of Deficient Interstate Bridges from 1992 through 2000



Source: FHWA data.

Interstate Bridge Conditions Are Currently Good

Overall, state officials responding to our survey reported that their bridges are currently in good condition. Of the states responding to our survey, 31 said that the overall condition of their Interstate bridges is good or excellent; another 19 said it is fair. As of April 2001, 5 percent of the nation's Interstate bridges were structurally deficient. In addition, another 16 percent were functionally obsolete.

Interstate bridges are generally in better condition than those on other classes of roads. According to 1998 FHWA data, about 27 percent of urban Interstate bridges were deficient,[34] compared with a range from over 27 percent for "urban other freeways and expressways" to over 38 percent for both "urban minor arterials" and "urban collectors." In addition, 16 percent of rural Interstate bridges were deficient, compared with a range from 17

[34]Includes both structurally deficient and functionally obsolete bridges.

percent for "rural other principal arterials" to over 36 percent for "rural local roads."

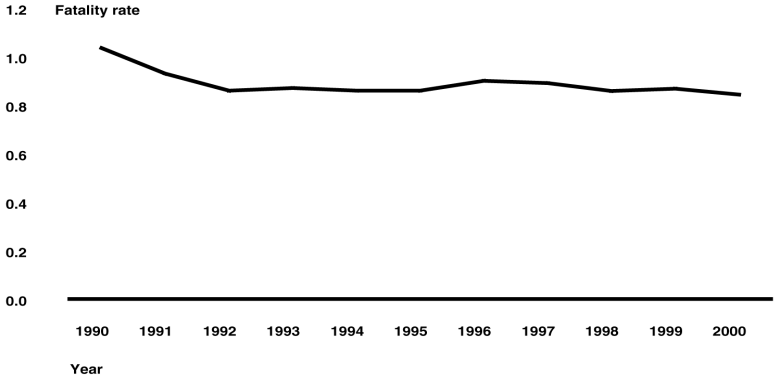
Expectations of Future Interstate Bridge Conditions Vary

Some state officials said that they are optimistic about future bridge conditions—24 expect conditions 10 years from now to be good or excellent. However, others are aware of problems bridges could face in the future. Nineteen state respondents believed that their state would fall behind in maintaining the condition of their bridges over the next 10 years, given the expected level of funding. However, they were not as concerned about falling behind on their Interstate bridges, as they were about the problems they would face with congestion and pavement condition. (See fig. 21.) In addition, officials from 32 states expect to increase the portion of their budget spent on Interstate bridges.

Interstate Safety Has Been Mainly Stable

The fatality rate on the Interstate System has been relatively steady, after falling early in the 1990s. The number of fatalities on Interstate highways has increased over the past decade, but so has the level of traffic, as indicated by the number of vehicle miles traveled (VMT).[35] (See fig. 16.)

Figure 16: Fatality Rates on the Interstate Highway System, 1990 through 2000, in Terms of Fatalities Per 100 Million VMT



Note: This figure contains data from the 50 states and the District of Columbia, but it does not contain data from Puerto Rico.

Source: FHWA and the National Highway Traffic Safety Administration.

[35]VMT is a measure of the level of travel on roads: 1 VMT is equal to one vehicle traveling 1 mile on a road.

Safety Is Better on Interstates Than on Other Roads

Relatively speaking, Interstate highways are the safest of all highway classifications. We recently reported[36] that among urban road types, "other principal arterial" roads had the highest 1999 fatality rate[37] at 1.27—compared with 0.61, the lowest fatality rate, on urban Interstate roads. Similarly, we reported that among the rural road types, "rural local roads" had the highest 1999 fatality rate at 3.79—compared with 1.24, the lowest fatality rate, on rural Interstate roads. In addition, 45 states we surveyed said that the current level of safety on their Interstates was good or excellent.

Several factors, including unique design characteristics, may contribute to the Interstate System's higher level of safety. According to a 1999 FHWA report,[38] most of the Interstate mileage in the country met geometric design criteria that support safe transportation in 1997. These criteria refer to the physical layout or alignment of a roadway. FHWA and states recognize guidelines established by the American Association of State Highway and Transportation Officials (AASHTO)[39] as the appropriate design standards for many of their roads. The Interstate System meets these guidelines to a great extent—over 99 percent of urban Interstate mileage and about 97 percent of rural Interstate mileage. Almost all of the rural Interstate mileage not meeting the guidelines is in rural Alaska; about 50 percent of the urban Interstate mileage not meeting the guidelines is in Puerto Rico. Other design characteristics are also important to safety:

- According to FHWA, the vast majority of Interstate mileage has full access control[40]—which FHWA policy classifies as critical to maintaining Interstate safety and mobility. Research shows that highways without access control have higher crash rates than those with access control.

[36]U.S. General Accounting Office, *Federal Highway Funding by Program and Type of Roadway, With Related Safety Data*, GAO-01-836R (Washington, D.C.: July 16, 2001).

[37]The fatality rate here is measured as the number of deaths per 100 million VMTs. DOT uses fatality rate rather than crash rate because the data are more reliable.

[38]See footnote 10.

[39]*A Policy on Geometric Design of Highways and Streets*, American Association of State Highway and Transportation Officials (2001).

[40]Access control means that access to the highway is regulated to limit interference with through traffic.

- According to FHWA, the vast majority of Interstate mileage also consists of divided highways with at least four lanes. AASHTO's guidance reports that a study on the effect of the Interstate Highway System on crashes found a lower crash rate on divided highways than on undivided highways.

- The uniformity of Interstate highway design plays a part in safety by reducing the number of decisions drivers make and thus minimizing the number of crashes related to driver error.

FHWA also believes that other factors, including increased seat belt use and reduced alcohol-impaired driving, have contributed to lowering the fatality rate and the number of fatalities on the nation's highways—including Interstate highways.

Interstates Are Expected to Remain Safe

State officials responding to our survey expect the safety of Interstate travel in their states to remain relatively safe. Among 51 responses, 41 said the safety of Interstate travel in 10 years will be good or excellent, 9 said travel safety would be fair, and 1 said safety would be poor. A majority of officials—29—said the portion of state transportation spending for improving safety in their states would stay about the same over the next 10 years, though 19 predicted some increase or a moderate increase.

Interstate Highways Have Become More Congested

As congestion on the country's roadways has increased, so has congestion on the Interstate System. Whether measured in terms of traffic density or travel time, congestion has increased over the past decade. Furthermore, Interstate highways are generally more congested than other freeways and other principal arterials.

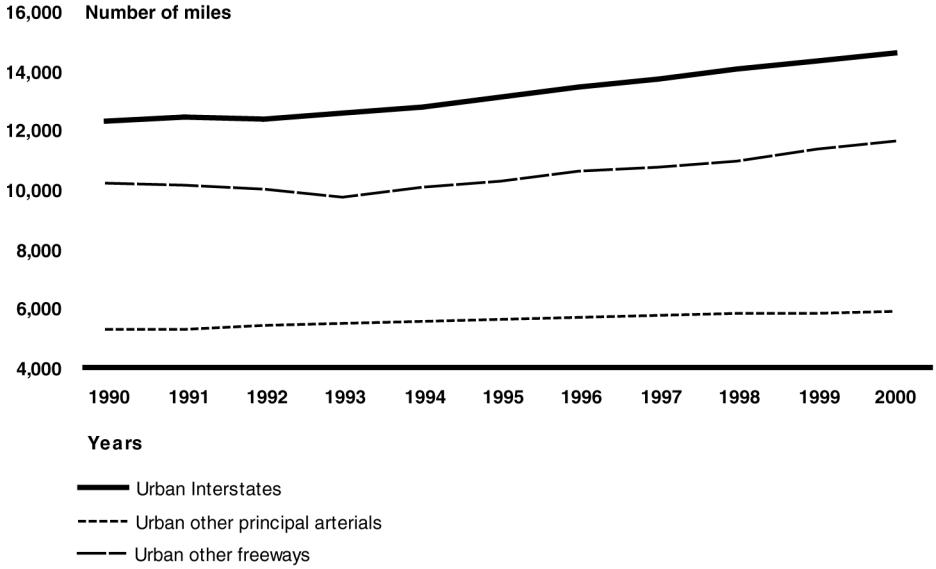
While there is no single indicator for congestion, we looked at FHWA's "daily vehicle miles traveled per lane mile"[41] to measure traffic density.[42] As figures 17 and 18 show, the overall density of traffic on all major U.S. roads has been increasing over the past decade and traffic density is higher on

[41]Daily vehicle miles of travel per lane mile is a basic measure of how much travel is being accommodated on our highway systems since it is a count-based metric. Daily vehicle miles traveled is the average daily traffic of a section of roadway multiplied by the length (in miles) of that section of roadway.

[42]FHWA used this indicator in its *Fiscal Year 1999 Federal Highway Administration Performance Plan* and the biennial *Conditions and Performance* report.

urban highways than on rural ones.[43] In addition, the traffic density on urban Interstate highways is higher than on other classes of urban road. (See fig. 17.)

Figure 17: U.S. Average Urban Daily Vehicle Lane Miles Traveled by Class of Road, 1990 through 2000

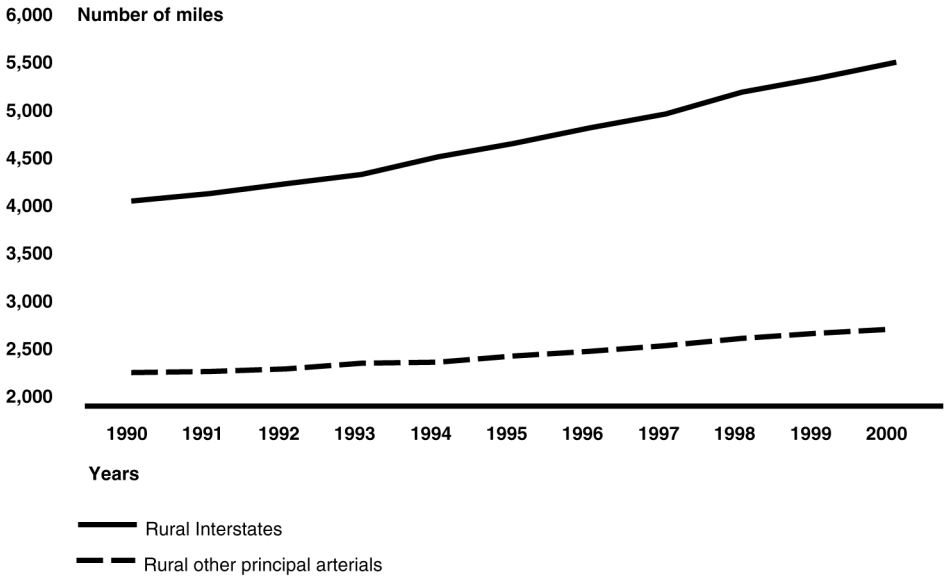


Source: FHWA's *Highway Statistics.*

Although the density of traffic on urban Interstate highways is higher than on rural Interstates, traffic on rural Interstate highways is increasing at a faster rate than on any other classes of road. From 1990 through 2000, the daily vehicle lane miles traveled on rural Interstates increased at an average annual rate of 3.3 percent. By comparison, the daily vehicle lane miles traveled on rural principal arterials increased at an annual rate of 1.9 percent. (See fig. 18.) In addition, daily vehicle miles traveled on urban Interstates increased at an annual average rate of 1.7 percent, and the rate increased by 1.3 percent on other urban freeways and expressways.

[43]The five classes of roads that we compared were (1) urban Interstates, (2) urban freeways and expressways, (3) urban other principal arterial streets, (4) rural Interstates, and (5) rural other principal arterial streets.

Figure 18: U.S. Average Rural Daily Vehicle Lane Miles Traveled by Class of Road, 1990 through 2000



Source: FHWA's *Highway Statistics.*

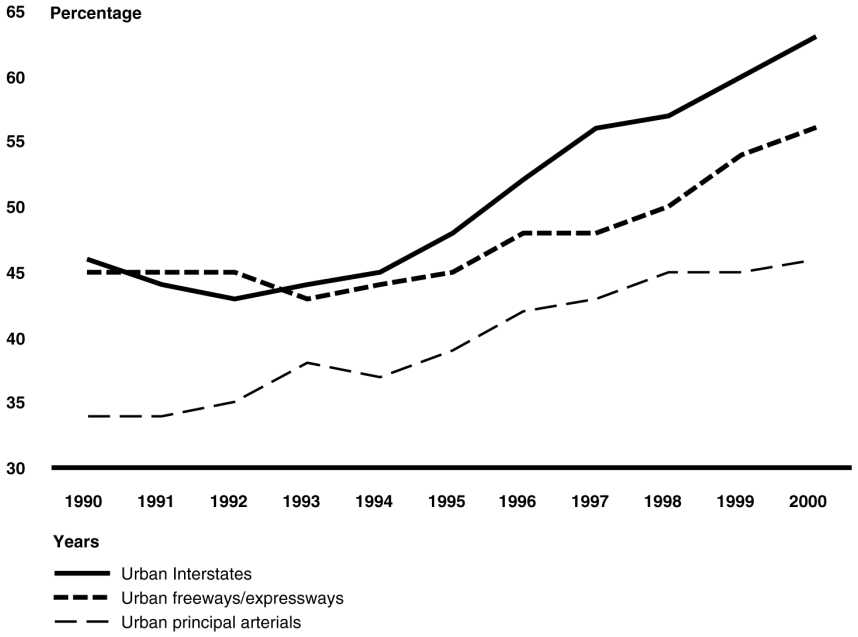
While daily vehicle lane miles traveled measures traffic density, it does not indicate the effect of congestion on drivers, especially the amount of time it takes them to reach their destinations. The Texas Transportation Institute[44] has developed measures that address a central concern of urban drivers—how travel time is affected by congestion. One measure—the travel time index—indicates how much more time it takes to travel during a peak period than at other times of day. The travel time index indicates that urban Interstate congestion has increased from 1990 through 2000, and congestion levels are higher on the urban Interstate System than on any other class of roads, including urban freeways and expressways and urban principal arterials. (See fig. 19.)

During the past decade, the travel time index increased by about 12 percent. This statistic provides information about drivers' experiences as

[44]The Texas Transportation Institute has been conducting an Urban Mobility Study since 1982. The study's purpose is to develop useful congestion figures from generally available data sources and to provide information on trends in mobility levels. To accomplish this goal, the Institute considers multiple congestion measures—one of which we will focus on in this report.

well as the level of congestion on the road because it accounts for delays due both to the traffic demand on the road and to roadway incidents, like accidents. For example, a travel time index of 1.63 means that a trip that takes 30 minutes in an off-peak (noncongested) period would, on average, take 63 percent longer, or almost 19 extra minutes in the peak period—in other words, the trip would take an average of about 49 minutes rather than 30 minutes when the road is congested. In addition, the Texas Transportation Institute data show that delay from incidents is greater than recurring delay from traffic. Specifically, their Mobility Report 2001 states that delay from incidents accounts for 54 percent of total delay.[45]

Figure 19: Percent Increase in Urban Travel Time During the Peak Period by Class of Road, 1990 through 2000



Note: Interstates show a 3 percentage point decrease in travel time from 1990 to 1992. According to Texas Transportation Institute officials, this is partially due to the urban boundary redefinitions that usually get included in the first and second years after a Census.

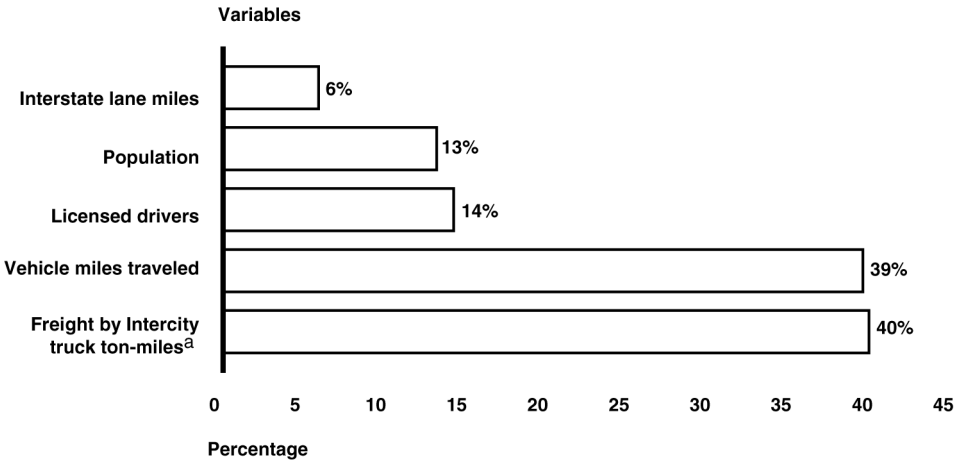
Source: Texas Transportation Institute data obtained through FHWA.

[45]*The 2001 Urban Mobility Report, Texas Transportation Institute and The Texas A&M University System (May 2001).* This estimate may be low since according to the Mobility Report, the high percentages of congestion due to incidents are found in areas where congestion levels are lower, and the Institute's report only covers 68 urban areas.

Many Factors Account for Growth in Congestion

Many factors can contribute to congestion. As figure 20 shows, increases in overall population and the number of licensed drivers are factors that could each cause more cars to be on the road during peak hours. The Census Bureau reports that, from 1990 to 2000, the population increased by about 13 percent nationwide. In addition, according to FHWA, the number of licensed drivers increased by 14 percent during the past decade. These, along with other factors, resulted in a 39 percent increase in the number of miles traveled in the United States in the past decade. Freight movement by truck also increased by 40 percent over the first 8 years of the decade. However, Interstate capacity in terms of lane miles increased by only 6 percent over the past decade. Finally, expansion of metropolitan areas and the choices people make about where they live and work also contribute to congestion.

Figure 20: Percent Change of Variables Related to Congestion, 1990 through 2000



[a]Freight data were only available for 1990 to 1998.

Source: Prepared by GAO based on data from FHWA's *Highway Statistics*, U.S. Census Bureau's *Census 2000 Brief*, and Bureau of Transportation Statistics' *National Transportation Statistics 2000*.

Currently Worse on Urban Interstates, Congestion Is Expected to Increase on Both Urban and Rural Interstates

Officials from 24 states rated the present level of congestion on their urban Interstates as "high" or "very high," and officials from 21 states rated their urban Interstate congestion as "average." By contrast, no officials rated rural congestion as "very high," and just one official rated the level of congestion on rural Interstates as "high"; officials from 27 states rated congestion on their rural Interstates as "average."

In response to our survey, nearly all states expressed concern about future congestion on their urban Interstates. For example,

- 42 states predicted that, 10 years from now, they would be falling behind in terms of alleviating urban congestion and

- 41 states expected to rate urban congestion in the next 10 years as high or very high. (See app. II.)

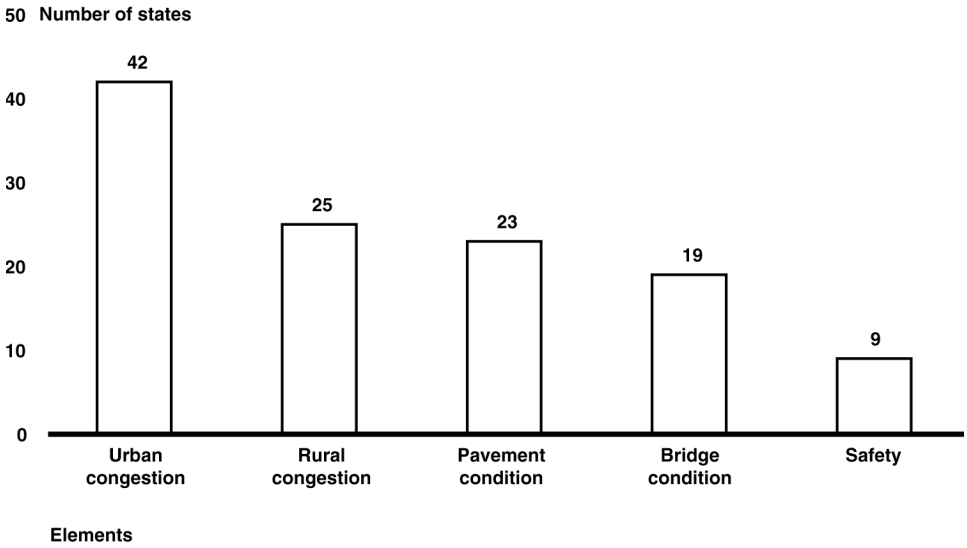
State respondents generally do not expect that their efforts to alleviate congestion will be entirely successful. Although 34 states indicated that they expect to spend a greater portion of their budget on urban congestion over the next 10 years, 42 states believe they will be falling behind in dealing with urban congestion. In addition, in its *1999 Condition and Performance* report, FHWA predicted that congestion would worsen—that is, average travel time costs would continue rising—if investment and allocations stay at the current expected levels. In its reauthorization of surface transportation programs, Congress could decide to select methods for investing federal resources in the Interstates and other highway programs to help address local congestion problems in urban areas. To assist in making these decisions, we asked states about policies and tools that can be used in alleviating congestion. (See app. IV for the states' responses.)

Although states are particularly concerned about urban congestion levels, they also think that rural congestion will increase, especially on specific routes. Officials from 18 states expect to rate rural congestion as "high" or "very high" in the next 10 years. For example, rural congestion is increasing on the I-70 corridor—a 140-mile-long stretch through the Rocky Mountains of Colorado. This section serves in moving skiers and truckers through the mountains. However, traffic congestion has become an increasing problem along this corridor, in part due to population growth in the surrounding areas—and will continue to worsen over the years.

Increases in Traffic, the Age of the Interstates, and Funding Constraints May Negatively Affect Interstate Conditions; However, the Costs to Address These Factors Are Uncertain

States expect certain factors, especially the levels of truck and car traffic, the age of the Interstates' pavement and bridges, and funding constraints to negatively affect the conditions of their Interstates over the next 10 years. FHWA data also indicate that traffic, especially the volume of truck traffic, will increase. In addition, many states believe they will be "falling behind" in satisfying the users of their systems, especially in terms of congestion. (See fig. 21.) Transportation officials have also indicated that large-dollar projects may negatively affect states' financial ability to maintain their systems. States responding to our survey indicated that they plan to spend larger portions of their budgets addressing these Interstate pressures. However, identifying the states' cost to maintain and improve their systems is difficult. States' STIPs, required to include only projects that can be built with estimated revenues, show how states plan to use the funding they estimate will be available, rather than the funding they estimate will be needed for their Interstates. Some states have developed plans that provide some insight into what it will cost to maintain conditions or reach specific goals. These estimates indicate that states perceive Interstate needs as larger than estimated funding.

Figure 21: Number of States Expecting Performance on Their Interstate Systems to Fall Behind in the Next Decade



Source: GAO's survey.

Increasing Truck Traffic to Have Greatest Negative Effect on Interstate Conditions

According to our survey, states expect truck traffic to have a negative effect on the most elements of Interstate conditions including physical conditions (pavement and bridges), safety, and rural congestion. (See table 1.) For example, all 52 states expect truck traffic to increase over the next 10 years, and 49 states said that they expect this to negatively affect the condition of their pavement. Current estimates used by FHWA also show freight movement by truck increasing by 28 percent from the end of 2001 through the end of 2010.[46] Finally, an alliance of primarily southern and southeastern states released a 2001 study that estimates an annual 6.9 percent increase in Latin American truck traffic in the United States (resulting in almost a doubling in 10 years). Ninety-six percent of this truck traffic will be on Interstates.

Table 1: The Number of States Identifying the Negative Effects of These Factors on Interstate Highway Conditions

	Elements of Interstate condition				
Factor	**Pavement condition**	**Bridge condition**	**Safety**	**Urban congestion**	**Rural congestion**
Truck traffic volume	**49**	**46**	**45**	49	**43**
Traffic volume	44	41	43	**51**	41
Percent of truck traffic	48	45	44	44	40
Age of structures	38	45	[a]	[a]	[a]

Note: Fifty-one of 52 states replied to questions about how these factors affect pavement, safety, and rural congestion.

[a]Not applicable.

Source: GAO survey data.

State officials' concerns about increases in truck traffic may reflect, in part, the estimated highway costs of damage to the pavement or bridge of each additional truck-mile driven compared with the cost of a car. A recent

[46]FHWA has developed a Freight Productivity Program to understand freight demands, assess implications for the surface transportation system, and develop policy and program initiatives to improve freight efficiency. The Freight Analysis Framework is the policy and systems analysis tool developed to support this effort.

FHWA study[47] explains that while car drivers pay about the same share of user taxes as their share of highway costs, heavy truck operators commonly pay less than their share of highway costs. Specifically, FHWA estimated that an additional mile of Interstate car travel cost of 0.1 cent in terms of pavement damage, while an additional mile of Interstate truck travel had a pavement damage cost as high as 12.7 cents on rural Interstates and 40.9 cents on urban Interstates. In 1994, we recommended that FHWA conduct this highway cost-allocation study.[48]

In addition to increases in truck traffic, estimates that FHWA uses show that passenger traffic will increase by 17 percent from the end of 2001 through the end of 2010—an increase from 2.7 trillion vehicle miles traveled to 3.1 trillion. States are also concerned about increases in traffic volume. Of the 52 states we surveyed, 51 predict that overall traffic volumes will increase over the next 10 years. Fifty-one of the states expect this increase in traffic volume to negatively affect urban congestion, and 41 of 51 respondents believe that the changes in traffic volume will negatively affect rural congestion.

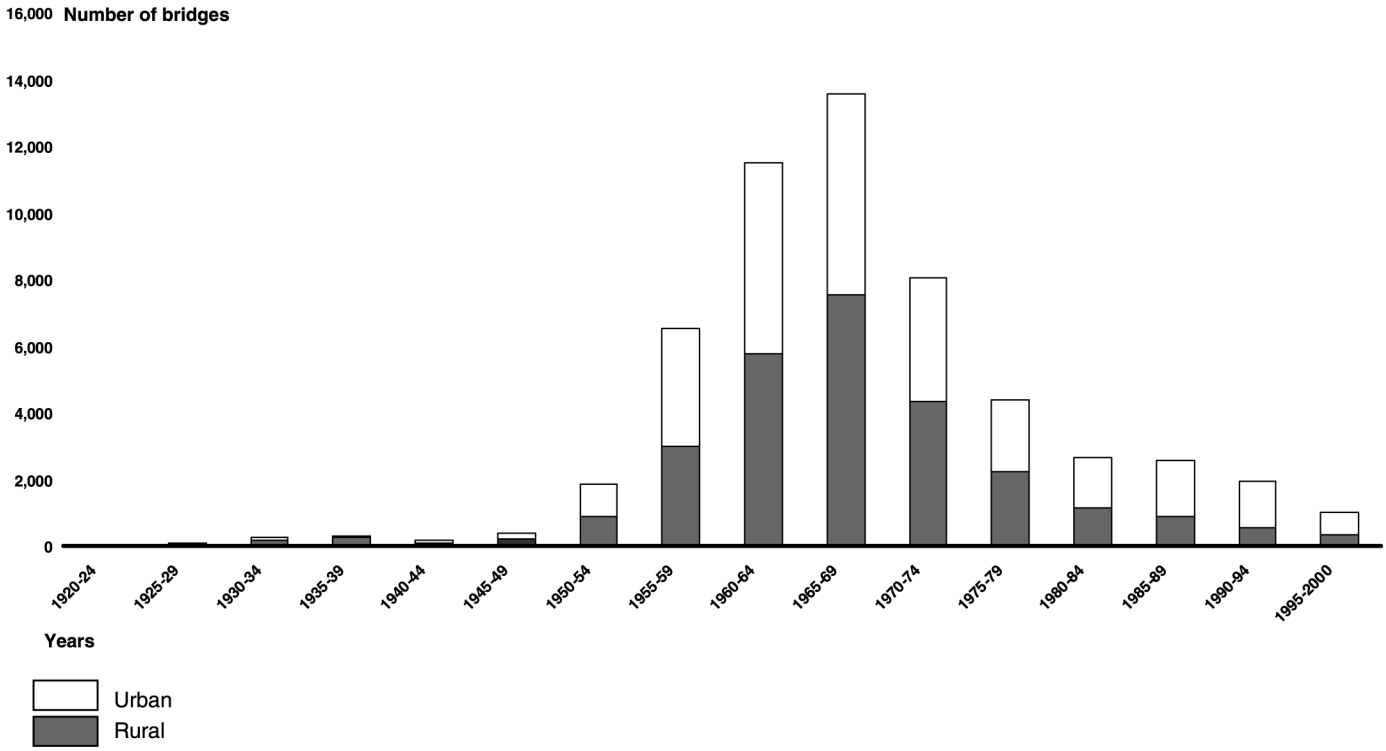
Another factor negatively affecting the condition of Interstate pavement and bridges is the age of the infrastructure. For example, half of the Interstate bridges are currently over 33 years old. Figure 22 shows when all Interstate bridges were built. Officials from one state we visited explained that many of their state's Interstate bridges were built about 40 years ago and are reaching the end of their estimated 50-year design life.[49] In addition, 45 states believe age may jeopardize their bridge conditions, while 38 states expect age to negatively affect their pavement conditions 10 years from now.

[47]*Addendum to the 1997 Federal Highway Cost Allocation Study Final Report*, May 2000.

[48]U.S. General Accounting Office, *Highway User Fees: Updated Data Needed to Determine Whether All Users Pay Their Fair Share*, GAO/RCED-94-181 (Washington, D.C.: June 7, 1994). We recommended that DOT conduct a new highway cost-allocation study, which it accomplished in August 1997 and updated in May 2000. We also said that Congress should consider policy options to increase equity and promote more efficient use of the nation's highways.

[49]Pavement has shorter life expectancy than bridges, usually ranging from 15 to 40 years depending on factors including the type of material used. Routine and preventive maintenance can extend the life of the bridges. In addition, one state's transportation plan indicated that the older bridges are not necessarily in danger of falling down, although they may be outdated.

Figure 22: Year Interstate Bridges Were Built



Note: When the Interstate was built, it incorporated some portions of already existing roadways; therefore, some Interstate bridges were built before the official establishment of the program.

Source: FHWA data.

Cost of Large-Dollar Projects and Other Economic Conditions Could Negatively Affect States' Highway Programs

Transportation officials are concerned that some states may face an increasing number of large-dollar projects such as work on bridges or interchanges that may constrain spending for those states' other projects for a number of years. For example, Missouri is looking at reconstructing the 200-mile I-70 corridor at a cost of $2.5 billion to $3.0 billion. In addition, the Woodrow Wilson Bridge, which moves north-south traffic on I-95 around Washington, D.C., is expected to cost over $2 billion and is being funded by two states and FHWA. According to a Maryland official, over the 6-year project, funding for the bridge accounts for 45 percent of expenditures on major projects in the state's capital budget.

In addition, 40 states are facing budget shortfalls for 2002. Furthermore, the amount of funds available for federal highway programs may decrease for

fiscal year 2003,[50] depending on congressional action. These potential reductions in federal and state funds could reduce the funds available for maintaining the Interstates and increase states' estimated funding shortfalls.

Costs to Maintain Interstates Are Uncertain

It is difficult to identify state needs on the Interstate System and to determine what level of funding is needed to meet these needs. When surveyed, most states indicated that they expect to spend the same or increasing portions of their transportation budgets to maintain Interstate conditions. However, when states provided information on their planned expenditures, the amounts did not show a consistent upward trend, rather they varied considerably from year to year. (See table 1 in app. III.) State and FHWA officials explained that one common reason for these increases and decreases is that work on Interstates is not done in a vacuum; that is, Interstate projects must be weighed against projects on other classes of roads, such as expressways or "principal arterials." For example, North Dakota officials explained that they are completing projects, which are focused on improving the condition of their Interstate highways. They expect to shift their attention and funding toward projects on other classes of roads.

In addition, states' federally required plans do not usually provide information on all needs and related costs. States' short-term STIPs do not identify funds needed to maintain Interstate conditions because they include lists of proposed projects that can be built with estimated revenues.[51] Therefore, as state and federal officials explain, STIPs reflect affordability rather than identifying projects that are needed and would be constructed if additional funding were available. In addition to STIPs, states are required to develop long-term (20-year) plans. However, these plans may not contain specific projects and cost estimates, and thus do not provide information on states' needs and related costs.

Nevertheless, some states have developed additional transportation plans that identify long-term funding gaps for various parts of their highway

[50]U.S. General Accounting Office, *Highway Financing: Factors Affecting Highway Funding Fluctuations and Revenue Trends*, GAO-02-527T (Washington, D.C.: Mar. 20, 2002).

[51]See appendix III for description of state planning processes and role of required federal planning documents.

networks, including the Interstates.[52] For example, North Dakota is developing a needs estimate for its state roads (excluding urban Interstates). The state defined its need by using criteria for pavement, bridge, design, and safety conditions. State officials estimated the funds needed to bring the roads (except urban Interstates) to the desired physical condition and level of performance as nearly a billion dollars more than available. According to state officials, eliminating the backlog will require either an increase in revenue or a decrease in service. In addition, in 2001, Florida officials estimated that to meet capacity needs on its Intrastate System[53] (including Interstates), it would need $20 billion more through 2010 than the $11 billion it expects to have. Missouri's draft 2000 long-term plan also indicates that the state's needs outweigh the available funds.

Concluding Observations

Interstate highways continue to play a vital role in moving people and freight in this country. Over the past few decades, however, they have taken on an important and expanded role in facilitating travel within urban areas. They have also become central to moving freight and, as a result, to economic growth. These roles will continue to be important; however, they have consequences that will challenge the federal government and state and local governments in assuring that Interstate highways continue to provide efficient travel and remain in relatively good condition. In particular, the challenges for Interstate highways include

- finding effective methods of easing traffic congestion, particularly in urban areas;
- providing for efficient freight movement given increases in both passenger and freight traffic; and
- responding to the effect of traffic on roads and bridges given the continued aging of these structures.

[52]We did not verify the accuracy of these plans.

[53]Florida's Intrastate Highway System is about 3,750 miles of the state highway system, which serves regional commerce and high-speed and long-distance travel. The state's system encompasses the Interstate System as well as the turnpike and other major expressways and arterials, which carry 32 percent of the state's traffic and 70 percent of its truck traffic on the state highway system.

Agency Comments and Our Evaluation

We provided a draft of this report to DOT and DOD for their review and comment. DOT officials, including the Team Leader for Highway Needs and Investment Analysis within FHWA, provided oral comments. They generally agreed with the observations in the report, and they also provided technical comments, which we incorporated in the report as appropriate. DOD officials, including the Chief, Office of Special Assistant for Transportation Engineering, Military Traffic Management Command, provided technical comments, which we incorporated as appropriate.

We conducted our review from March 2001 through April 2002 in accordance with generally accepted government auditing standards.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 7 days after the date of this letter. At that time, we will send copies of this report to cognizant congressional committees; the Secretary of Transportation; and the Administrator, Federal Highway Administration.

If you or your staff have any questions about this report, please contact me at (202) 512-2834. Appendix V lists the key contacts and contributors to this report.

Sincerely yours,

JayEtta Z. Hecker
Director, Physical Infrastructure Issues

Objectives, Scope, and Methodology

With the upcoming reauthorization of the surface transportation programs, the House Committee on Transportation and Infrastructure asked us to report on Interstate highways and bridges. Accordingly, this report examines the condition of the Interstate System, including, (1) how the role of the Interstate System has changed over time; (2) the roles of the federal and state governments in managing and funding the Interstate System; (3) the financial resources that states and the federal government have devoted to the system; (4) how physical conditions, safety, and congestion of the Interstate System have changed and how they compare to other classes of roads; and (5) the factors that could affect future Interstate conditions and the cost of addressing these factors.

To determine how the role of the Interstate System has changed over time, we reviewed historical documents. We also conducted a nationwide mail survey of state transportation agencies in all 50 states, the District of Columbia, and Puerto Rico. Our survey focused on state officials' views on the changing role of Interstate highways in their states' transportation systems; the usefulness of various approaches for addressing operations and maintenance of their Interstate highways and bridges; their views on the Interstate System in 10 years; and their perceptions of the current condition of their Interstate System's infrastructure, safety, and congestion. We received survey responses from all 52 governments—most states responded to most of the questions. A summary of responses to the survey appears in appendix II of this report.

To develop our mail survey, we discussed potential survey topics with state officials in two states to determine how to design our survey questionnaire. Then, we conducted pretests of our questionnaire with transportation officials in four states. We selected states for our survey development phase to provide perspectives from a variety of geographic areas and from states with various types of weather, population patterns, and other factors that affect Interstate planning. Each of the four pretests consisted of a visit with state officials by our staff to ensure that (1) questions were readable and clear, (2) terms used were clear, (3) the survey did not place undue burden on state governments that would result in a lack of cooperation, and (4) the survey was independent and unbiased in its point of view. Appropriate changes were incorporated into the final survey based on our pretesting. In addition to our pretesting, we discussed our questionnaire with an official at FHWA headquarters and representatives of the AASHTO in Washington, D.C. We incorporated comments from these discussions, as appropriate.

To determine which officials should receive our survey, we used AASHTO's *Reference Book* to identify the appropriate state officials. We verified our selection by contacting FHWA division officials in most of the 52 locations. During the return period, an unprecedented terrorist incident occurred on September 11, 2001. Although it is possible that the responses completed after this date may have differed from those received beforehand, our analysis of the question of the role of the Interstates in moving military personnel and equipment shows that answers did not differ for these two time periods. We received the last survey included in our analysis on November 21, 2001.

To address our second objective, we reviewed historical Federal-Aid Highway Program data obtained from FHWA, which discussed why the Interstate System was developed and the roles Congress, FHWA, DOD, and states played and how they have evolved into the current roles. We also interviewed FHWA and DOD staff about their roles and identified current federal requirements related to the Interstates. Finally, we examined federal apportionments to the states for Interstates as well as other activities.

For our third objective, we analyzed FHWA's obligation of funds for Interstate-related projects. We also reviewed outlays from all levels of government for Interstate-related projects, as reported by states on an annual basis.

For the fourth objective, we used the responses to our survey described previously. To compare conditions of Interstate highways to other classes of roads as well as obtain trend information on Interstate highway conditions, we reviewed DOT's published data on actual highway conditions and its forecasts of potential future conditions. To learn how officials assess Interstate highway conditions in their states, we interviewed officials in Arizona, Florida, Missouri, North Dakota, and Pennsylvania. We selected these states to obtain perspectives from a variety of regions with various types of weather, population differences, and other factors that affect Interstate planning.

In addition, to determine the current condition of the Interstate System in terms of congestion, we relied on a number of measures reported by FHWA. We requested FHWA to obtain Texas Transportation Institute analysis of congestion levels on Interstate highways in comparison with other classes of roads. We also reviewed DOT's Bureau of Transportation Statistics and U.S. Census Bureau data on factors related to congestion

trends. Furthermore, to assess safety, we reviewed data from the National Highway Traffic Safety Administration's Fatality Analysis Reporting System, and FHWA data on trends in fatality rates and number of fatalities.

To address the last objective, we analyzed state survey responses and discussed the factors with state and FHWA officials during our site visits, as necessary. We focused on factors such as demographic changes or changes in traffic, but we did not focus on the influence of federal funding through the existing Federal-Aid Highway Program on state's decisions about their investment in Interstate roads and bridges. To examine states' plans for Interstate investment, we asked states to provide information on their planned costs for their Interstate highways in our survey. We reviewed states' written plans for investment in Interstate highways and other roads. Again, we also visited the five states mentioned earlier to obtain more detailed information on their planning. Additionally, we interviewed FHWA division officials to obtain a general overview of FHWA's approach to assisting states with their Interstate System plans.

We conducted our review from March 2001 through April 2002 in accordance with generally accepted government auditing standards.

Survey of States' Views on the Future of the Interstate System

United States General Accounting Office

Survey of States' Views on the Future of the Interstate System

Introduction

The U.S. General Accounting Office (GAO) is an agency of the legislative branch that reviews federal programs for the U.S. Congress. We are currently surveying the state departments of transportation as part of a study on the future of the Interstate system of highways and bridges. We are asking the states for information on their plans and priorities for the Interstate system.

Without your state's response, we will not be able to accurately report to the Congress on the national plans and priorities for the Interstate system. Your participation is vital so that we can report to the Congress on issues facing the Interstate system over the next decade.

We made every effort to minimize the amount of information we request by going to federal data sources where available. We also visited six states to discuss ways to make this survey as easy as possible for all states. Your prompt participation will help us avoid costly follow-ups. If you have any questions about our study or this survey, please contact:

Cathy Colwell
Phone: 312-220-7655 (Chicago)
E-mail: colwellc@gao.gov

or,

Rick Calhoon
Phone: 312-220-7620 (Chicago)
E-mail: calhoonr@gao.gov

Please return your questionnaire in the enclosed envelope. If the envelope is missing, please send the questionnaire to:

Ms. Cathy Colwell
U.S. General Accounting Office
200 W. Adams, Suite 700
Chicago, IL 60606-5219

Thank you very much for taking time to contribute to this study.

Please provide the following information:

Name of state: _____

Your name: _____

Your title: _____

Phone: _____

E-mail: _____

Note: Questionnaire responses were received from 52 states; however, not all responded to each question. The number of responses is noted in ( ). These responses include those who checked "does not apply/uncertain."

1. Ten years from now, how would you expect to rate your state's overall progress in satisfying the users of your Interstate system on (1) the smoothness of the ride and (2) the level of congestion, considering your currently expected funding? *(Check one for each column.)* (N=52)

	(A) Smoothness of the ride *(Check one.)*	(B) Level of congestion *(Check one.)*
1. Falling behind	N=13	N=42
2. Staying even	N=28	N=09
3. Pulling ahead	N=11	N=0
4. *Uncertain*	N=0	N=01
5. Other *(Please specify.)*	N=0	N=0

1

2. How do you rate the importance ***today*** of your state's Interstate system for each of the following roles? *(Check one for each row.)* (N=52)

	Very great role (1)	Great role (2)	Moderate role (3)	Some role (4)	Little/No role (5)	*Uncertain/ Does not apply* (6)
a. Providing a safe mode of transportation throughout our state	N=38	N=12	N=01	N=0	N=0	N=01
b. Supporting our tourism industry	N=22	N=23	N=05	N=02	N=0	N=0
c. Supporting our state's general economic development	N=33	N=17	N=02	N=0	N=0	N=0
d. Providing efficient travel within urban areas	N=14	N=25	N=12	N=01	N=0	N=0
e. Connecting our state to other states	N=31	N=15	N=04	N=0	N=0	N=02
f. Connecting our state to a neighboring country by highway	N=10	N=07	N=07	N=07	N=04	N=17
g. Connecting passengers to ocean, lake, and river ports	N=03	N=11	N=09	N=10	N=09	N=10
h. Connecting passengers to railways	N=03	N=05	N=13	N=17	N=11	N=03
i. Connecting passengers to airports	N=11	N=23	N=14	N=03	N=01	N=0
j. Connecting freight to ocean, lake, and river ports	N=10	N=14	N=15	N=06	N=01	N=06
k. Connecting freight to airports	N=10	N=17	N=19	N=04	N=02	N=0
l. Connecting freight to railways	N=08	N=18	N=09	N=12	N=03	N=02
m. Moving goods and freight within our state	N=30	N=19	N=02	N=0	N=01	N=0
n. Moving goods and freight through our state	N=35	N=13	N=01	N=0	N=0	N=03
o. Providing rest facilities for truck drivers	N=04	N=12	N=19	N=14	N=02	N=01
p. Providing evacuation routes for emergencies such as natural disasters	N=11	N=17	N=12	N=11	N=01	N=0
q. Moving military personnel and equipment	N=15	N=19	N=11	N=05	N=02	N=0

r. You may list any other important roles for your state's Interstate system.
(N=01 state provided comments)

2

3. How has the role of your state's Interstate highways and bridges changed over the last 20 years for each of the following? *(Check one for each row.)* (N=52)

	Much greater role (1)	Greater role (2)	About the same (3)	Lesser role (4)	Much lesser role (5)	*Uncertain/ Does not apply* (6)
a. Providing a safe mode of transportation throughout our state	N=07	N=25	N=19	N=0	N=0	N=01
b. Supporting our tourism industry	N=09	N=26	N=17	N=0	N=0	N=0
c. Supporting our state's general economic development	N=11	N=30	N=11	N=0	N=0	N=0
d. Providing efficient travel within urban areas	N=11	N=22	N=15	N=4	N=0	N=0
e. Connecting our state to other states	N=04	N=18	N=28	N=0	N=0	N=02
f. Connecting our state to a neighboring country by highway	N=05	N=11	N=18	N=0	N=01	N=17
g. Connecting passengers to ocean, lake, and river ports	N=02	N=07	N=33	N=0	N=0	N=10
h. Connecting passengers to railways	N=02	N=09	N=31	N=03	N=02	N=05
i. Connecting passengers to airports	N=08	N=22	N=20	N=02	N=0	N=0
j. Connecting freight to ocean, lake, and river ports	N=05	N=22	N=18	N=01	N=0	N=06
k. Connecting freight to airports	N=09	N=22	N=21	N=0	N=0	N=0
l. Connecting freight to railways	N=05	N=18	N=24	N=02	N=01	N=02
m. Moving goods and freight within our state	N=16	N=27	N=09	N=0	N=0	N=0
n. Moving goods and freight through our state	N=23	N=22	N=05	N=0	N=0	N=02
o. Providing rest facilities for truck drivers	N=05	N=17	N=22	N=06	N=0	N=02
p. Providing evacuation routes for emergencies such as natural disasters	N=04	N=14	N=33	N=01	N=0	N=0
q. Moving military personnel and equipment	N=03	N=12	N=33	N=04	N=0	N=0

r. You may list any other important changes in roles for your state's Interstate system.

(N=0 states provided comments)

3

4. Many factors affect the conditions of Interstate highways and bridges. Over the next 10 years, how do you expect each of the following factors to increase or decrease for your state? *(Check one for each row.)* (N=52)

	Greatly increase (1)	Generally increase (2)	Stay about the same (3)	Generally decrease (4)	Greatly decrease (5)	*Does not apply/ Uncertain* (6)
a. Overall traffic volume on our Interstate system	N=20	N=31	N=01	N=0	N=0	N=0
b. Volume of truck traffic on our Interstate system	N=34	N=18	N=0	N=0	N=0	N=0
c. The percentage of traffic on our Interstate system that is trucks	N=16	N=26	N=09	N=01	N=0	N=0
d. The size and weight of trucks using our Interstate system	N=05	N=25	N=21	N=0	N=0	N=01
e. Number of incidents/accidents on our Interstate system	N=04	N=35	N=12	N=01	N=0	N=0
f. The accident rate on our Interstate system	N=01	N=08	N=31	N=12	N=0	N=0
g. The amount of construction on our existing Interstate system	N=09	N=23	N=17	N=02	N=01	N=0

4

5. Over the next 10 years, to what extent do you expect each of the following conditions to get better or worse for your state? *(Check one for each row.)* (N=52)

	Much better (1)	Better (2)	About the same (3)	Worse (4)	Much worse (5)	*Does not apply/ Uncertain* (6)
a. The condition of our Interstate bridges	N=0	N=15	N=22	N=14	N=01	N=0
b. The condition of our Interstate highway surfaces	N=0	N=15	N=25	N=12	N=0	N=0
c. The condition of the underlying substructure of our Interstate highways	N=0	N=06	N=29	N=15	N=02	N=0

5

Condition of your Interstate pavement

6. Please rate the condition of your state's Interstate pavement (1) today and (2) 10 years from now, given expected levels of funding. *(Check one for each column.)* (N=51)

	(A) Today *(Check one.)*	(B) In 10 years *(Check one.)*
1. Excellent	N=03	N=02
2. Good	N=36	N=27
3. Fair	N=09	N=17
4. Poor	N=03	N=03
5. Very poor	N=0	N=01
6. *Uncertain*	N=0	N=01
7. Other *(Please specify.)*	N=0	N=0

7. Ten years from now, how would you expect to rate your state's overall progress in dealing with the condition of your Interstate pavement, given expected levels of funding? *(Check one.)* (N=51)

1. [ ] Falling behind N=23
2. [ ] Staying even N=21
3. [ ] Pulling ahead N=07
4. [ ] *Uncertain* N=0
5. [ ] Other *(Please describe.)* N=0

8. Over the next 10 years, what change, if any, do you expect in the ***portion*** of your state's transportation spending devoted to improving the condition of your Interstate pavement? *(Check one.)* (N=51)

1. [ ] Great increase N=02
2. [ ] Moderate increase N=06
3. [ ] Some increase N=19
4. [ ] Stay about the same N=17
5. [ ] Some decrease N=03
6. [ ] Moderate decrease N=02
7. [ ] Great decrease N=0
8. [ ] *Uncertain* N=01
9. [ ] Other *(Please describe.)* N=01

6

9. Over the next 10 years, what effect do you expect each of the following factors to have on the overall condition of your state's Interstate pavement? *(Check one for each row.)* (N=51)

	Very positive (1)	Generally positive (2)	No impact (3)	Generally negative (4)	Very negative (5)	*Does not apply/ Uncertain* (6)
a. Changes in overall traffic volume on our Interstate system	N=0	N=0	N=07	N=41	N=03	N=0
b. Changes in the volume of truck traffic on our Interstate system	N=0	N=0	N=02	N=31	N=18	N=0
c. Changes in the percentage of Interstate traffic that is trucks	N=0	N=0	N=03	N=33	N=15	N=0
d. Changes in the size and weight of trucks using our Interstate system	N=0	N=0	N=11	N=30	N=10	N=0
e. Changes in the age of the pavement on our Interstate highways	N=0	N=04	N=09	N=30	N=08	N=0
f. The current condition of our Interstate highways' surfaces	N=0	N=12	N=20	N=16	N=03	N=0
g. The current condition of our Interstate highways' underlying substructure	N=02	N=08	N=19	N=15	N=07	N=0

h. Please list any other important factors below.

(N=07 states provided comments)

7

Condition of your Interstate bridges

10. Please rate the condition of your Interstate bridges (1) today and (2) 10 years from now, given expected levels of funding. *(Check one for each column.)* (N=52)

	(A) Today *(Check one.)*	(B) In 10 years *(Check one.)*
1. Excellent	N=02	N=01
2. Good	N=29	N=23
3. Fair	N=19	N=23
4. Poor	N=01	N=04
5. Very poor	N=0	N=0
6. *Uncertain*	N=0	N=0
7. Other *(Please specify.)*	N=01	N=01

11. Ten years from now, how would you expect to rate your state's overall progress in dealing with the condition of your Interstate bridges, given expected levels of funding? *(Check one.)* (N=52)

1. [ ] Falling behind N=19
2. [ ] Staying even N=27
3. [ ] Pulling ahead N=05
4. [ ] *Uncertain* N=01
5. [ ] Other *(Please describe.)* N=0

12. Over the next 10 years, what change, if any, do you expect in the ***portion*** of your state's transportation spending devoted to improving the condition of your Interstate bridges? *(Check one.)* (N=52)

1. [ ] Great increase N=03
2. [ ] Moderate increase N=03
3. [ ] Some increase N=26
4. [ ] Stay about the same N=18
5. [ ] Some decrease N=02
6. [ ] Moderate decrease N=0
7. [ ] Great decrease N=0
8. [ ] *Uncertain* N=0
9. [ ] Other *(Please describe.)* N=0

8

13. Over the next 10 years, what effect do you expect each of the following factors to have on the overall condition of the Interstate bridges in your state? *(Check one for each row.)* (N=52)

	Very positive (1)	Generally positive (2)	No impact (3)	Generally negative (4)	Very negative (5)	*Does not apply/ Uncertain* (6)
a. Changes in the age of our Interstate bridges	N=0	N=02	N=05	N=38	N=07	N=0
b. Changes in overall traffic volume on our Interstate system	N=0	N=0	N=11	N=38	N=03	N=0
c. Changes in the volume of truck traffic on our Interstate system	N=0	N=0	N=06	N=32	N=14	N=0
d. Changes in the percentage of Interstate traffic that is trucks	N=0	N=0	N=07	N=31	N=14	N=0
e. Changes in the size and weight of trucks using our Interstate system	N=0	N=0	N=10	N=28	N=13	N=01

f. Please list any other important factors below.

(N=05 states provided comments)

9

Level of congestion on urban Interstate highways

14. Please rate the level of congestion on your urban Interstate highways (1) today and (2) 10 years from now, given expected levels of funding. *(Check one for each column.)* (N=52)

	(A) Today *(Check one.)*	(B) In 10 years *(Check one.)*
1. Very high	N=07	N=17
2. High	N=17	N=24
3. Average	N=21	N=07
4. Low	N=05	N=02
5. Very low	N=0	N=0
6. Uncertain	N=0	N=0
7. Other *(Please specify.)*	N=02	N=02

15. Ten years from now, how would you expect to rate your state's overall progress in dealing with congestion on your urban Interstate highways, given expected levels of funding? *(Check one.)* (N=52)

1. [ ] Falling behind N=42
2. [ ] Staying even N=07
3. [ ] Pulling ahead N=02
4. [ ] *Uncertain* N=01
5. [ ] Other *(Please describe.)* N=0

16. Over the next 10 years, what change, if any, do you expect in the ***portion*** of your state's transportation spending devoted to reducing congestion on your urban Interstate system? *(Check one.)* (N=52)

1. [ ] Great increase N=05
2. [ ] Moderate increase N=12
3. [ ] Some increase N=17
4. [ ] Stay about the same N=10
5. [ ] Some decrease N=03
6. [ ] Moderate decrease N=03
7. [ ] Great decrease N=01
8. [ ] *Uncertain* N=01
9. [ ] Other *(Please describe.)* N=0

10

17. Over the next 10 years, what effect do you expect each of the following factors to have on the level of congestion on your urban Interstate highways? *(Check one for each row.)* (N=52)

	Very positive (1)	Generally positive (2)	No impact (3)	Generally negative (4)	Very negative (5)	*Does not apply/ Uncertain* (6)
a. Changes in pavement conditions	N=0	N=01	N=36	N=13	N=02	N=0
b. Changes in overall traffic volume on our Interstate system	N=0	N=0	N=01	N=35	N=16	N=0
c. Changes in the volume of truck traffic on our Interstate system	N=0	N=0	N=03	N=36	N=13	N=0
d. Changes in the percentage of Interstate traffic that is trucks	N=0	N=0	N=08	N=31	N=13	N=0
e. Changes in the number of incidents/accidents on our Interstate system	N=0	N=03	N=08	N=34	N=07	N=0
f. The amount of construction on our existing Interstate system	N=0	N=04	N=12	N=33	N=03	N=0

g. Please list any other important factors below.

(N=05 states provided comments)

11

Level of congestion on *rural* Interstate highways

18. Please rate the level of congestion on your rural Interstate highways (1) today and (2) 10 years from now, given expected levels of funding. *(Check one for each column.)* (N=52)

	(A) Today *(Check one.)*	(B) In 10 years *(Check one.)*
1. Very high	N=0	N=01
2. High	N=01	N=17
3. Average	N=27	N=19
4. Low	N=15	N=09
5. Very low	N=05	N=03
6. Uncertain	N=0	N=0
7. Other *(Please specify.)*	N=04	N=03

19. Ten years from now, how would you expect to rate your state's overall progress in dealing with congestion on your rural Interstate highways, given expected levels of funding? *(Check one.)* (N=52)

1. [ ] Falling behind N=25
2. [ ] Staying even N=23
3. [ ] Pulling ahead N=0
4. [ ] *Uncertain* N=02
5. [ ] Other *(Please describe.)* N=02

20. Over the next 10 years, what change, if any, do you expect in the ***portion*** of your state's transportation spending devoted to reducing congestion on your rural Interstate system? *(Check one.)* (N=52)

1. [ ] Great increase N=0
2. [ ] Moderate increase N=04
3. [ ] Some increase N=11
4. [ ] Stay about the same N=24
5. [ ] Some decrease N=06
6. [ ] Moderate decrease N=03
7. [ ] Great decrease N=0
8. [ ] *Uncertain* N=02
9. [ ] Other *(Please describe.)* N=02

12

21. Over the next 10 years, what effect do you expect each of the following factors to have on the level of congestion on your rural Interstate highways? *(Check one for each row.)* (N=51)

	Very positive (1)	Generally positive (2)	No impact (3)	Generally negative (4)	Very negative (5)	*Does not apply/ Uncertain* (6)
a. Changes in pavement conditions	N=0	N=03	N=34	N=09	N=02	N=03
b. Changes in overall traffic volume on our Interstate system	N=0	N=0	N=08	N=35	N=06	N=02
c. Changes in the volume of truck traffic on our Interstate system	N=0	N=0	N=06	N=31	N=12	N=02
d. Changes in the percentage of Interstate traffic that is trucks	N=0	N=01	N=08	N=31	N=09	N=02
e. Changes in the number of incidents/accidents on our Interstate system	N=0	N=02	N=17	N=27	N=03	N=02
f. The amount of construction on our existing Interstate system	N=0	N=04	N=22	N=21	N=02	N=02

g. Please list any other important factors below.

(N=02 states provided comments)

13

The safety of Interstate travel

22. Please rate the safety of travel on your Interstate highways (1) today and (2) 10 years from now, given expected levels of funding. *(Check one for each column.)* (N=51)

	(A) Today *(Check one.)*	(B) In 10 years *(Check one.)*
1. Excellent	N=12	N=07
2. Good	N=33	N=34
3. Fair	N=06	N=09
4. Poor	N=0	N=01
5. Very poor	N=0	N=0
6. *Uncertain*	N=0	N=0
7. Other *(Please specify.)*	N=0	N=0

23. Ten years from now, how would you expect to rate your state's overall progress in dealing with the safety of Interstate travel in your state, given expected levels of funding? *(Check one.)* (N=51)

1. [ ] Falling behind N=09
2. [ ] Staying even N=32
3. [ ] Pulling ahead N=08
4. [ ] *Uncertain* N=02
5. [ ] Other *(Please describe.)* N=0

24. Over the next 10 years, what change, if any, do you expect in the ***portion*** of your state's transportation spending devoted to improving the safety of Interstate travel? *(Check one.)* (N=51)

1. [ ] Great increase N=0
2. [ ] Moderate increase N=07
3. [ ] Some increase N=12
4. [ ] Stay about the same N=29
5. [ ] Some decrease N=01
6. [ ] Moderate decrease N=0
7. [ ] Great decrease N=0
8. [ ] *Uncertain* N=02
9. [ ] Other *(Please describe.)* N=0

14

25. Over the next 10 years, what effect do you expect each of the following factors to have on the safety of travel on your Interstate highways? *(Check one for each row.)* (N=51)

	Very positive (1)	Generally positive (2)	No impact (3)	Generally negative (4)	Very negative (5)	*Does not apply/ Uncertain* (6)
a. Changes in pavement conditions	N=0	N=09	N=25	N=16	N=01	N=0
b. Changes in bridge conditions	N=0	N=06	N=32	N=12	N=01	N=0
c. Changes in overall traffic volume on our Interstate system	N=0	N=0	N=08	N=38	N=05	N=0
d. Changes in the volume of truck traffic on our Interstate system	N=0	N=0	N=06	N=36	N=09	N=0
e. Changes in the percentage of Interstate traffic that is trucks	N=0	N=0	N=07	N=35	N=09	N=0
f. Changes in the size and weight of trucks using our Interstate system	N=0	N=0	N=13	N=31	N=07	N=0
g. The amount of construction on our existing Interstate system	N=0	N=02	N=20	N=26	N=02	N=01

h. Please list any other important factors below.

(N=04 states provided comments)

15

26. How useful, if at all, are the following tools and activities for addressing the current operations and maintenance of your state's Interstate highways and bridges? *(Check one for each row.)* (N=52)

	Usefulness for your Interstate system					
	Very useful (1)	Moderately useful (2)	Somewhat useful (3)	Not very useful (4)	Do not use (5)	*Too early to tell/ Uncertain* (6)
a. Bridge management system (for example, tracking the condition of bridges to set repair priorities)	N=33	N=09	N=06	N=0	N=0	N=04
b. Pavement management system (for example, tracking the condition of the pavement to set repair priorities)	N=37	N=08	N=05	N=01	N=0	N=01
c. Preventive maintenance activities to extend the life of the pavement (for example, joint repair, pavement patching, and shoulder repair)	N=30	N=14	N=06	N=0	N=01	N=01
d. Modern materials and techniques for asphalt and concrete paving of roads	N=18	N=25	N=09	N=0	N=0	N=0
e. Modern materials and techniques for bridges (for example, high-performance concrete and high-performance steel)	N=17	N=22	N=12	N=0	N=0	N=01
f. Work zone management to minimize congestion	N=22	N=20	N=08	N=0	N=0	N=02
g. Traffic incident management (for example, protocols for handling accidents) (N=51)	N=21	N=12	N=12	N=0	N=04	N=02
h. Systems for alerting drivers to bad weather conditions	N=11	N=13	N=16	N=03	N=06	N=03
i. Technology for handling high volume traffic (for example, variable message signs, ramp metering, and electronic tolls)	N=14	N=15	N=13	N=02	N=03	N=05
j. Incentives for reducing congestion (for example, reserving lanes for high occupancy vehicles and varying tolls by time of day)	N=03	N=12	N=06	N=04	N=22	N=05
k. Providing alternative transportation modes to reduce Interstate traffic (for example, buses, rail, and ferries)	N=05	N=07	N=13	N=15	N=09	N=03

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	Usefulness for your Interstate system					
	Very useful (1)	Moderately useful (2)	Somewhat useful (3)	Not very useful (4)	Do not use (5)	*Too early to tell/ Uncertain* (6)
l. Redesigning highway sections to address traffic bottlenecks	N=23	N=16	N=13	N=0	N=0	N=0
m. Adding lanes to increase capacity	N=27	N=17	N=08	N=0	N=0	N=0
n. Providing trucker services (for example, rest areas and weigh-in-motion units)	N=08	N=21	N=17	N=04	N=02	N=0

o. You may list others below.

(N=05 states provided comments)

17

27. In your opinion, how easy or difficult would it be for your state to provide matching funds over the next 3 years under the options for increasing federal funding as listed below? *(Check one for each row.)* (N=52)

If the amount of federal funding to your state were increased by…	**Funding the matching amount over the next 3 years would be…**					
	Very easy (1)	Somewhat easy (2)	Neither easy nor difficult (3)	Somewhat difficult (4)	Very difficult (5)	*Uncertain* (6)
a. 2 percent	N=33	N=11	N=05	N=02	N=0	N=01
b. 5 percent	N=30	N=11	N=06	N=03	N=01	N=01
c. 10 percent	N=14	N=22	N=05	N=07	N=03	N=01
d. 15 percent	N=12	N=15	N=10	N=07	N=06	N=02
e. 20 percent	N=11	N=13	N=06	N=11	N=08	N=03

f. You may add any comments below.
(N=14 states provided comments)

28. In your opinion, how easy or difficult would it be over the next 3 years for your state to obtain the additional qualified design resources (engineering services, etc.) to use the options for increasing federal funding as listed below? *(Check one for each row.)* (N=52)

If the amount of federal funding to your state were increased by…	**Obtaining qualified design resources over the next 3 years would be…**					
	Very easy (1)	Somewhat easy (2)	Neither easy nor difficult (3)	Somewhat difficult (4)	Very difficult (5)	*Uncertain* (6)
a. 2 percent	N=35	N=07	N=07	N=03	N=0	N=0
b. 5 percent	N=31	N=09	N=09	N=03	N=0	N=0
c. 10 percent	N=20	N=16	N=10	N=04	N=02	N=0
d. 15 percent	N=12	N=17	N=13	N=07	N=02	N=01
e. 20 percent	N=11	N=11	N=15	N=10	N=04	N=01

f. You may add any comments below.
(N=09 states provided comments)

18

29. In your opinion, how easy or difficult would it be for your state to obtain the additional qualified construction resources (labor, equipment, materials, and managers) over the next 3 years to use the options for increasing federal funding as listed below? *(Check one for each row.)* (N=52)

If the amount of federal funding to your state were increased by…	**Obtaining qualified construction resources over the next 3 years would be…**					
	Very easy (1)	Somewhat easy (2)	Neither easy nor difficult (3)	Somewhat difficult (4)	Very difficult (5)	*Uncertain* (6)
a. 2 percent	N=34	N=09	N=08	N=01	N=0	N=0
b. 5 percent	N=31	N=10	N=10	N=01	N=0	N=0
c. 10 percent	N=14	N=20	N=11	N=07	N=0	N=0
d. 15 percent	N=07	N=15	N=17	N=12	N=0	N=01
e. 20 percent	N=07	N=10	N=19	N=12	N=03	N=01

f. You may add any comments below.

(N=09 states provided comments)

19

State Financial Data

NOTE: These next three questions will require research by you or your staff.

30. What years does your current, approved Statewide Transportation Improvement Program (STIP) cover? *(Enter month and year, e.g., "06 2001.")*

Month and year STIP begins: _____ _____ (N=51)

Month and year STIP ends: _____ _____ (N=51)

Note: Responses were not recorded for states, which left column "A" blank (i.e. N≠51). Also, columns B & C are not mutually exclusive so figures may not add up to column A responses. Finally, responses for column A were used for Appendix III. If responses were unclear, we conducted follow-up calls with those states. This follow-up information is not included here.

31. ***For as many years as data are available,*** please report below your documented estimates of costs for projects planned for your Interstate highways and bridges through 2006. Such estimates should be documented in financially constrained plans such as your current, approved STIP. Please indicate in Column B whether this estimate is based on your STIP or on another document (Column C). In Column D, please indicate whether or not each estimate was increased to take inflation into account.

Year of estimate	Costs for planned Interstate projects, 2001 to 2006						
	(A) Estimate of total costs for planned Interstate projects including all sources of funding (local, state, federal, etc.) *(Enter dollar amount.)* Check box below if no estimate for that year.	(B) Is this estimate from your current, approved STIP? *(Check one.)*		(C) Is this estimate from another financially constrained plan? *(Check one.)*		(D) Was this estimate increased to take inflation into account? *(Check one.)*	
		Yes (1)	No (2)	Yes (1)	No (2)	Yes (1)	No (2)
2001	$ _____(N=51)_____ [ ] No estimate available (N=0)	N=37	N=07	N=18	N=15	N=22	N=27
2002	$ _____(N=50)_____ [ ] No estimate available (N=0)	N=31	N=09	N=22	N=14	N=23	N=27
2003	$ _____(N=49)_____ [ ] No estimate available (N=01)	N=28	N=10	N=23	N=13	N=22	N=27
2004	$ _____(N=42)_____ [ ] No estimate available (N=04)	N=19	N=14	N=25	N=12	N=21	N=25
2005	$ _____(N=36)_____ [ ] No estimate available (N=09)	N=14	N=14	N=24	N=11	N=19	N=22
2006	$ _____(N=30)_____ [ ] No estimate available (N=16)	N=12	N=11	N=20	N=11	N=16	N=19

20

32. What percentage of the federal highway funds (Interstate Maintenance, National Highway System, Surface Transportation Program, etc.) your state received from 1998 through 2000 was spent on projects for your Interstate system? *(Check one for each column.)* (N=51)

	1998 *(Check one.)*	1999 *(Check one.)*	2000 *(Check one.)*
a. 10 percent or less	N=05	N=01	N=03
b. 11 to 20 percent	N=16	N=16	N=15
c. 21 to 30 percent	N=14	N=15	N=11
d. 31 to 40 percent	N=08	N=11	N=10
e. 41 to 50 percent	N=04	N=05	N=08
f. 51 to 60 percent	N=03	N=01	N=02
g. 61 to 70 percent	N=0	N=01	N=0
h. 71 to 80 percent	N=0	N=0	N=02
i. 81 to 90 percent	N=0	N=01	N=0
j. 91 to 100 percent	N=01	N=0	N=0

21

33. Please add any comments you wish on the issues in this survey or other matters related to the future of Interstate highways and bridges in your state.

(N=19 states provided comments)

Thank you very much for participating in our survey.

22

State Planning Processes

States must meet specific planning requirements set forth by federal law. In addition, state transportation agencies may face state-level requirements. Within these requirements, states develop plans to allocate available funds throughout their transportation systems.

Federal law requires each state to develop at least two planning documents—a 20-year Statewide Transportation Plan and a short-term Statewide Transportation Improvement Program (STIP) that covers at least 3 years. The STIP should include a list of proposed projects that is financially constrained—that is, projects that can be built with estimated revenues. States must submit their proposed STIPs to FHWA and the Federal Transit Administration for joint approval at least every 2 years; however, the STIPs may be amended at any time, subject to federal approval.

Some states also have policies or laws that direct the use of their funds. These directives are taken into consideration when planning projects. For example, Florida officials are concerned about the safety and preservation of the current system. First, the state addresses safety in all their transportation projects. Next, it is the state's policy to preserve the existing system before spending anything on new construction. In addition, Florida law requires that at least 50 percent of the amount of new funds available for capacity construction must go towards the state's Intrastate system.[54] Also, in Arizona, according to a statewide agreement, 50 percent of the funding available to the Arizona Department of Transportation must be spent on state highway projects within the Phoenix and Tucson metropolitan areas, and the remaining 50 percent must be spent on state highway projects outside these two metropolitan areas.

To develop these planning documents and maintain their Interstate highways, states use a variety of planning approaches. For example, Florida has a complex system relying on policies, measurable objectives, and performance monitoring to make its investment decisions. Florida officials develop a 20-year long-range policy plan. Based on this 20-year plan, they develop a 10-year program and resources plan containing program funding levels given estimated revenues. Finally, the officials develop and update annually a 5-year list of projects. To help select specific projects that meet their goals, Florida officials use decision support

[54] Florida's Intrastate Highway System is about 3,750 miles of the state highway system, which includes Interstate highways in the state. See footnote 51.

software to consider a multitude of data, including pavement condition surveys, biennial bridge inspections, routine maintenance, safety data, and analyses of congestion levels. Arizona is revising its long-term planning process. In the meantime, Arizona is using an interim process to develop its 5-year construction program.

To identify states' plans to meet Interstate needs over the next few years, we asked states to provide information on the level of funding directed toward the Interstates. Table 2 shows the amount states plan to spend in 2001 and the increases and decreases compared with 2001 throughout the 5 subsequent years. The states in bold indicate states included in our site visits.

Table 2: Percent Increase/Decrease in Planning Interstate Project Cost (2002-2006)

	Cost	Percent increases/decreases from 2001 costs				
State	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Alabama	$135,311,556	111	147	-31	61	-
Alaska	$106,590,000	35	16	6	31	43
Arizona	$89,194,000	5	35	20	32	112
Arkansas	$387,600,000	18	-95	-	-	-
California	$1,500,000,000	-37	3	19	-8	7
Colorado	$582,495,000	10	-9	-4	-6	-9
Connecticut	$190,460,000	-12	12	-	-	-
Delaware	$43,406,000	-44	-22	-44	-70	-70
District of Columbia	$50,000,000	0	-18	-34	-	-
Florida	$747,600,000	146	-4	34	17	-29
Georgia	$107,883,000	305	770	194	204	187
Hawaii	$13,000,000	-9	477	81	-	-
Idaho	$102,484,500	-	-	-	-	-
Illinois	$463,000,000	45	39	-6	-23	-31
Indiana	$165,691,860	-52	-32	-	-	-
Iowa	$46,816,000	116	91	115	276	186
Kansas	$117,000,000	-4	63	-20	-24	-66
Kentucky	$145,000,000	14	3	-6	-22	-45
Louisiana	$75,000,000	0	0	-	-	-
Maine	$12,700,000	32	-28	-	-	-
Maryland	$63,100,000	25	34	15	-23	-69

(Continued From Previous Page)

	Cost	Percent increases/decreases from 2001 costs				
State	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Massachusetts	$113,900,000	-27	-67	-63	-68	-70
Michigan	$445,120,000	0	-18	-36	-51	-58
Minnesota	$101,000,000	169	99	-37	-65	-73
Mississippi	$250,000,000	-78	-48	-52	-40	-
Missouri	$250,000,000	42	21	-62	-92	-89
Montana	$77,826,000	-21	-25	-37	-	-
Nebraska	$70,402,000	14	13	-4	8	4
Nevada	$159,000,000	85	81	6	44	12
New Hampshire	$46,000,000	-42	-64	-41	-68	-44
New Jersey	$87,658,800	22	48	-	-	-
New Mexico	$85,100,000	-45	-46	-41	-59	-52
New York	$195,000,000	-26	-13	56	-23	-28
North Carolina	$233,640,000	-31	-21	-24	-61	-47
North Dakota	$48,156,176	24	35	-14	24	-1
Ohio	$331,000,000	82	5	-17	17	-23
Oklahoma	$51,000,000	41	-8	-67	-56	-30
Oregon	$96,000,000	-20	-6	-30	2	-
Pennsylvania	$345,951,240	5	-7	-	-	-
Puerto Rico	$93,958,800	61	74	-98	-87	-90
Rhode Island	$45,900,000	2	16	62	64	80
South Carolina	$245,893,000	-11	-25	-27	-36	-
South Dakota	$86,151,000	-21	-28	-26	-28	-25
Tennessee	$192,000,000	19	-3	-17	-	-
Texas	$1,155,967,467	11	17	24	24	-
Utah	$787,142,151	-19	-37	-47	-	-
Vermont	$17,983,620	52	-	-	-	-
Virginia	-	-	-	-	-	-
Washington	$181,035,354	52	8	-49	-55	-
West Virginia	$68,865,000	-23	65	64	-	-
Wisconsin	$119,050,584	-5	-3	14	63	32
Wyoming	$95,555,300	-26	-32	-35	-43	-23

Note: Dollar amounts were adjusted to 2001 dollars. The state data may be either fiscal or calendar year.

Source: GAO's analysis of the states' responses to survey question 31. (See app. II.)

Tools for Addressing Congestion

States' views differ on effectiveness of congestion relief tools. We surveyed the states about the tools they were using to relieve congestion and the tools' usefulness. Although we identified below some of the tools mentioned on our survey, based on our case study states, we found that different tools may be more effective in one state than in another. For example, adding lanes may be a useful tool to deal with congestion for states with relatively low population density; however, this tool may not be useful for states with relatively high population densities—particularly in their urban areas, where the ability of adding lanes is limited since many urban areas have the maximum number of lanes that will fit into available space.

States reported using a variety of tools and varied in their assessment of the tools' usefulness. For example:

- Increasing capacity through the addition of lanes. Forty-four states indicated that adding lanes to increase capacity is very useful or moderately useful.

- Redesigning problematic highway sections. Three-fourths of the 52 states found redesigning highway sections to address traffic bottlenecks to be very useful or moderately useful.

- Using traffic incident management tools. About two-thirds of the state departments of transportation stated that traffic incident management tools (e.g., protocols for handling accidents) were very useful or moderately useful.

- Using technology for handling high-volume traffic—such as variable message signs, ramp metering, and electronic tolls—42 states found these to be useful.

- Providing alternative transportation modes to reduce Interstate traffic (e.g., buses, rail, and ferries)—12 states found these to be very useful or moderately useful.

- Providing incentives to drivers to reduce congestion. While 30 states used these techniques—for example, reserving lanes for high-occupancy vehicle and varying tolls by time of day—only 15 states believed them to be very useful or moderately useful.

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