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HIGHWAY INFRASTRUCTURE

Physical Conditions of the Interstate Highway System Have Improved, but Congestion and Other Pressures Continue

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Mr. Chairman and Members of the Committee:

I appreciate the opportunity to testify on the conditions of the Interstate Highway System and estimates of its future needs. My testimony today is based primarily on our May 2002 report.[1]

As you know, the Interstate Highway System, begun nearly half a century ago, has become central to transportation in the United States. The Interstate System extends over 46,000 miles in length and includes about 210,000 lane miles.[2] The system carries over 24 percent of all vehicle miles traveled in the nation, while making up just 2.5 percent of total lane miles. Funding for the Interstate System has been a major part of total highway funding since 1954, when Interstate construction began. From 1954 through 2001, federal funding for Interstates totaled over $370 billion (2001 dollars)—about 46 percent of all apportionments administered by the Federal Highway Administration (FHWA) during this period.

Given the significance of the Interstate Highway System, our statement will address the following: (1) How have the operations, physical conditions, and safety of the Interstate Highway System changed over time and how do they compare to other classes of roads? (2) What factors are likely to affect the condition of the Interstate highways in the future? (3) What are FHWA's estimates of the future cost of maintaining Interstate conditions? and (4) How useful are the estimates for highway investment requirements in the Department of Transportation's (DOT) *Conditions and Performance Report*? To obtain information on Interstate conditions, we conducted a nationwide mail survey in 2001 of the 50 states, the District of Columbia, and Puerto Rico[3] and visited five states to obtain more detailed information.[4] We also reviewed Federal Highway Administration data. Finally, to provide information on FHWA's estimate of future investment requirements, I will discuss information on FHWA's

[1]U.S. General Accounting Office, *Highway Infrastructure: Interstate Physical Conditions Have Improved, but Congestion and Other Pressures Continue*, GAO-02-571 (Washington, D.C.: May 2002).

[2]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.

[3]I will refer to this group as states throughout my statement.

[4]We selected Arizona, Florida, Missouri, North Dakota, and Pennsylvania to obtain perspectives from a variety of regions with various types of weather, population differences, and other factors that affect Interstate planning.

highway model based on our June 2000 report to this committee and the Senate Committee on Environment and Public Works[5] and a review of language for DOT's *Draft Conditions and Performance Report*.

In summary:

- Congestion on Interstate highways has increased over the last decade, while the physical condition of the Interstate has generally improved, and the level of safety has remained steady. For example, a measure of traffic density—daily vehicle lane miles traveled—increased over 31 percent from 1990 through 2000. In addition, a measure of how congestion affects drivers—the travel time index— increased by about 12 percent during the past decade. At the same time, FHWA statistics show that Interstate pavement condition improved over the past 10 years– 8.6 percent of the pavement was in poor condition in 1990, compared with 3.4 percent in 2000. Although overall physical conditions have improved, conditions of specific sections of Interstate can vary. For example, FHWA statistics show 10 states have at least one-third of their pavement in mediocre or poor condition as compared with 18.3 percent of highways in that condition nationwide. Finally, FHWA data show that while Interstate highways are generally more congested than other classes of roads, they are in better physical condition and are safer than other classes of roads.

- Some of the factors states expect to negatively affect the conditions of their Interstate highways in the future include increases in passenger and freight traffic, aging infrastructure, and financial constraints. States responding to our survey reported that they expect the overall traffic (passenger and freight) on their Interstate system to increase over the next decade. The states expect this increase in traffic to most negatively affect the condition of their pavement and congestion. For example, 51 states responding to our survey indicated that traffic volume would negatively affect congestion in their urban areas. Concerns about increased congestion arise because population, licensed drivers, and freight all increased over 12 percent over the past decade, while Interstate lane miles increased only 6 percent. In addition, the age of the infrastructure is a factor impacting the future conditions of pavement and bridges. For

[5]U.S. General Accounting Office, *Highway Infrastructure: FHWA's Model for Estimating Highway Needs Is Generally Reasonable, Despite Limitations*, GAO-00-133 (Washington, D.C.: June 2000).

example, half of the Interstate bridges are currently over 33 years old.[6] Finally, some states may face an increasing number of large-dollar projects (such as bridge repairs), state budget shortfalls, and uncertain funding for federal highway programs, all which may affect the amount of funds available for Interstate projects.

- FHWA's estimates of future annual Interstate highway investment requirements vary depending on the goal transportation officials have for performance of the Interstate system. For example, based on modeling used in DOT's *1999 Conditions and Performance Report*, the estimated annual cost to maintain current pavement conditions is $16.4 billion (2000 dollars). The estimated annual cost to achieve another potential goal, maintaining user costs (including costs to drivers such as their travel time and costs of operating a vehicle) is $17.3 billion (2000 dollars). Recent spending on capital investment on Interstates falls below these estimates at $14.1 billion for 2000. In addition, FHWA has revised its model used to estimate investment requirements for use in its next *Conditions and Performance Report*. According to an FHWA official, these revisions might be expected to increase the estimated investment requirements to maintain user costs.

- In 2000, we evaluated the model that FHWA uses to forecast Interstate and other highways' pavement preservation and highway capacity requirements and found that this model can be useful as a general guide for assessing relative investment requirements over time. However, the model has some limitations; namely, it does not fully account for uncertainties associated with its methods, data, and assumptions. We recommended that FHWA (1) clarify that there are uncertainties associated with the estimates and clearly identify sensitivity analyses that illustrate these uncertainties and (2) explain in its *Conditions and Performance Reports* that one portion of the highway investment requirements is based on benefit-cost analysis and that the other portion was calculated using less reliable methods. The agency agreed with these recommendations. FHWA has also taken additional steps to improve the quality of its highway investment needs forecasts.

[6]Officials from one state we visited explained that many of their bridges are reaching the end of their estimated 50-year design life. However, maintenance can extend the life of the bridges.

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 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 Federal-Aid Highway Act of 1956 also established a new method for apportioning funds among states and set the federal government's cost share for Interstate construction projects at 90 percent.[7] 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. From 1954 through 2001, the Federal government invested over $370 billion (2001 dollars) on Interstates through apportionments to the states, more than on any other class of road. After 1991, Federal apportionments for Interstate highways declined from their earlier construction period levels, but remained substantial. From 1992 through 2001, federal apportionments for Interstate highways were 17.5 percent of FHWA's total highway apportionments, compared to 18.0 percent for the National Highway System[8] and 21.8 percent for the Surface Transportation Program.[9] 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 System, as of 2000, extends over 46,000 miles in length and 209,655 lane miles. In 2000, the system accounted for 2.5 percent of the nation's total estimated lane miles, while it carried over 24 percent of total

[7]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.

[8]The National Highway System is a system of interconnected principal arterial routes which serve major population centers, international border crossings, ports, and other intermodal transportation facilities and major travel destinations; meets national defense requirements; and serves interstate and interregional travel. It contains all Interstate routes.

[9]Surface Transportation Program includes funding for most types of highway projects such as construction and resurfacing on most classes of roads, except for roads classified as local or rural minor collectors.

vehicle miles traveled. 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. Additions to the Interstate system can be made by adding lanes to existing roadways, state requests for and FHWA approval of new Interstate mileage, and Congressional designations of new Interstates.

Currently, both the federal government and states fund the construction and maintenance activities on the Interstate Highway System. Each year, the federal government provides billions of dollars 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. 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 federal cost share of 80 percent). Similarly, states may also transfer funds from other funding categories to their IM program and use them for qualifying projects on Interstate highways. Other programs that can be used to fund Interstate projects include the Interstate Maintenance Discretionary Program, the Bridge Discretionary Program, and the Highway Bridge Replacement and Rehabilitation Program.

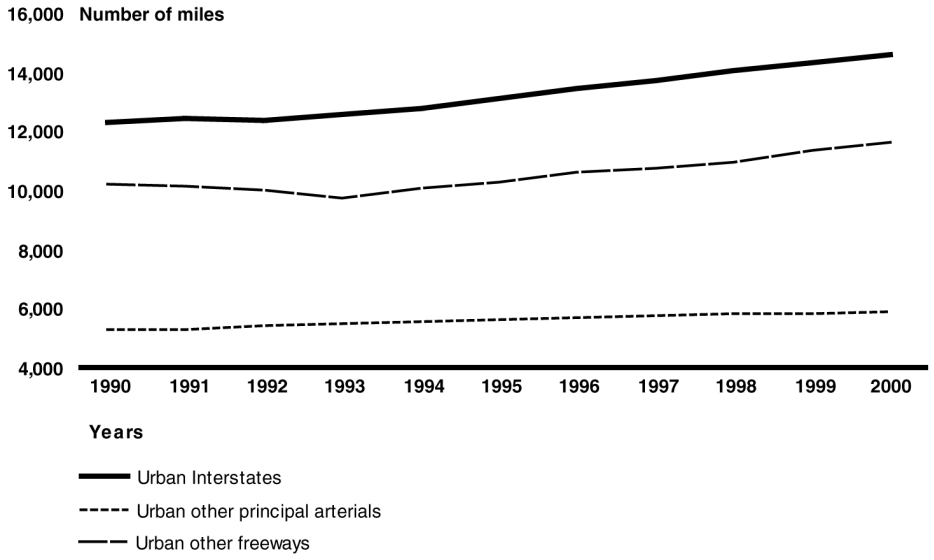
Congestion on Interstates Has Grown, but Physical Interstate Conditions Have Improved

Congestion on the Interstates has grown and Interstates are generally more congested than other freeways and principal arterials. However, the Interstate's physical conditions (pavement and bridges) are in good overall shape, and Interstate highways are also in better physical condition and are safer than other classes of roads. Finally, although Interstate conditions are relatively good nationwide, the conditions are not even across the country.

Interstate Highways Have Become More Congested and Generally More Congested than Similar Roads

Whether measured in terms of traffic density or travel time, congestion has increased over the past decade. We looked at FHWA's "daily vehicle miles traveled per lane mile"[10] to measure traffic density.[11] The overall density of traffic on Interstates has increased—31.7 percent over the past decade, an average annual increase of about 3 percent. Also, traffic density is higher on urban highways than on rural ones.[12] Finally, the traffic density on urban Interstate highways is higher than on other classes of urban roads. (See fig. 1.)

Figure 1: U.S. Average Urban Daily Vehicle Miles Traveled by Lane Mile, by Class of Road, 1990 through 2000



Source: FHWA's Highway Statistics.

[10]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 on a section of roadway multiplied by the length (in miles) of that section of roadway.

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

[12]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.

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 class 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 increased at an annual rate of 1.9 percent on rural principal arterials[13] and at a rate of 1.7 percent on urban Interstates.

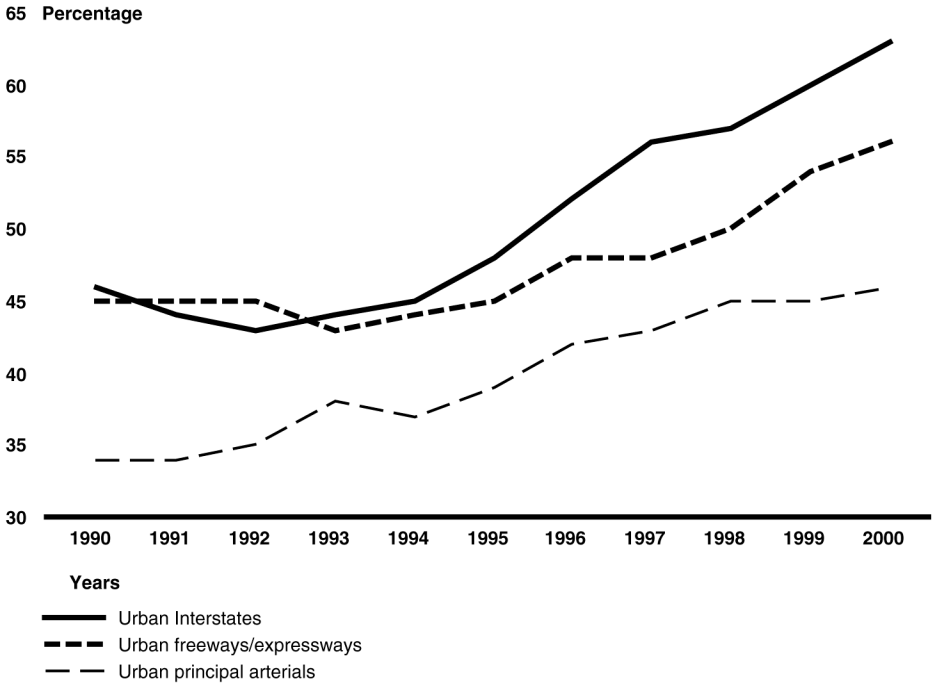
Another measure of congestion—the travel time index—indicates how much more time it takes to travel during a peak period than at other times of day.[14] During the past decade, the travel time index on Interstates increased by about 12 percent. This statistic provides information about drivers' experiences as 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, the value on urban Interstates in 2000, 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 when the road is congested, rather than 30 minutes when it is not congested.[15] This statistic also shows that congestion levels are higher on the urban Interstate System than on other classes of roads, specifically urban freeways and expressways and urban principal arterials. (See fig. 2.)

[13]Arterials are roads that allow the highest traffic speeds and often have multiple lanes and a degree of access control.

[14]The Texas Transportation Institute has developed measures that address a central concern of urban drivers—how travel time is affected by congestion.

[15]The Texas Transportation Institute data also 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.

Figure 2: Percent Increase in Urban Travel Time During the Peak Period by Class of Road, 1990 through 2000



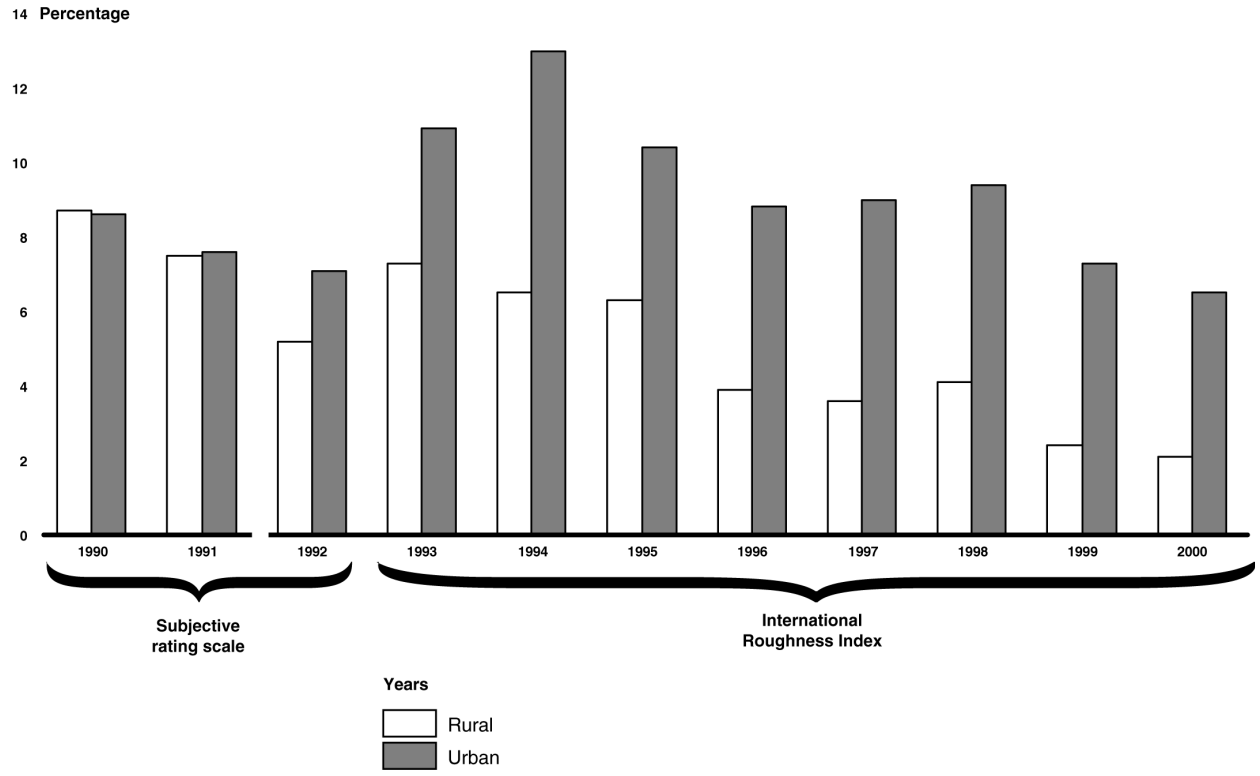
Note: Interstates show a 3-percentage point decrease in travel time from 1990 to 1992. According to Texas Transportation Institute officials, this is partially due to the urban boundary redefinitions that usually get included in the first and second years after a census.

Source: Texas Transportation Institute data obtained through FHWA.

Interstate Pavement Conditions Have Improved and Are Generally Better Than On Other Roads

FHWA statistics show that Interstate pavement conditions have generally improved since 1990. According to these statistics, 8.6 percent of Interstate pavement, or 3,897 miles, was in poor condition in 1990. By 2000, the share of poor Interstate miles[16] had dropped to 3.4 percent, or 1,560 miles.[17] (See fig. 3)

Figure 3: Percentage of Poor Interstate Pavement—Urban versus Rural, 1990-2000



Source: FHWA's Highway Statistics

However, the condition of Interstate pavement varies across the country. State pavement data submitted to FHWA for 2000 showed that for the

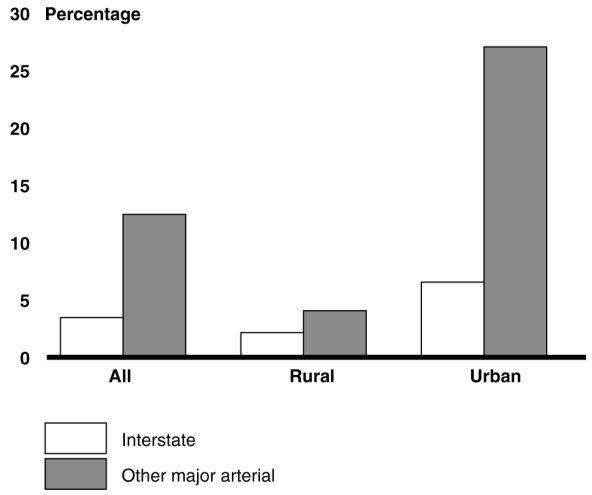
[16]Since 1995, FHWA's *Highway Statistics* reports have portrayed pavement conditions in International Roughness Index unit categories without quality descriptions. Thus, FHWA reported that 1,560 miles of Interstate pavement in 2000 had a roughness index over 170 inches per mile. We use the term "poor"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

[17]The improvement pattern was not continuous partly because FHWA required the states to adopt a new condition measure, International Roughness Index.

nation as a whole, 63.5 percent of pavement was in good or very good condition, 18.2 percent was in fair condition, and 18.3 percent was in mediocre or poor condition. However, 10 states have at least one-third of their pavement in mediocre or poor condition. In addition, of 51 survey responses, 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. [18]

Compared with "other major arterials," Interstates are in better condition in both rural and urban areas.[19] See figure 4 below showing the difference in percent of poor pavement."

Figure 4: Percentage of Roads with Poor Pavement—Interstates Versus Other Major Arterials (2000)



Source: FHWA's Highway Statistics.

[18]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, which are based on International Roughness Index data.

[19]Unlike our analysis in fig. 4, 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 220 inches per mile.

Interstate Bridge Conditions Have Improved and Are Generally in Better Condition than Those on Other Roads

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. [20] In addition, the number of functionally obsolete bridges declined by more than 10 percent over the same period. [21] As of April 2001, 5 percent of the nation's Interstate bridges were structurally deficient and another 16 percent were functionally obsolete. State officials responding to our survey generally 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. However, although the number of bridges with deficiencies is decreasing, the conditions vary by state. For example, FHWA data shows that in 2001, states varied from having no structurally deficient Interstate bridges to almost 22 percent deficient.

In addition, Interstate bridges are generally in better condition than those on other classes of roads. According to 1998 FWHA data, about 27 percent of urban Interstate bridges were deficient,[22] 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 percent for "rural other principal arterials" to over 36 percent for "rural local roads."

Interstate Safety Has Been Mainly Stable and Better Than on Other Roads

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).[23]

[20]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.

[21]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.

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

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

Relatively speaking, Interstate highways are the safest of all highways. We recently reported[24] that among urban road types, "other principal arterial" roads had the highest 1999 fatality rate[25] 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.

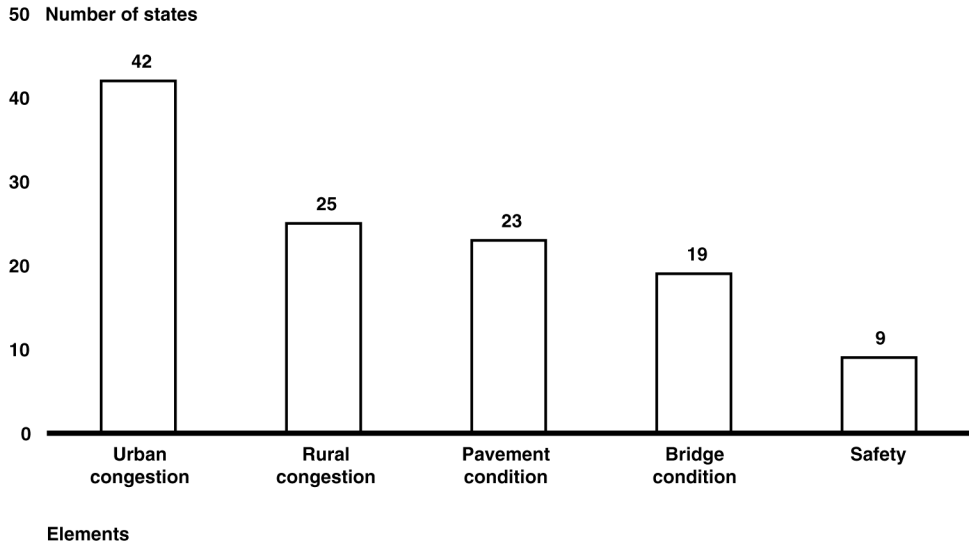
Future Condition of Interstates Could be Affected by Increases in Traffic, the Age of the Interstates, and Financial Uncertainty

State department of transportation officials expect the performance of their Interstates to fall behind over the next 10 years, especially in terms of congestion. (See fig. 5). These officials pointed to certain factors, including increasing passenger and truck traffic, age of their infrastructure, and financial constraints that could negatively affect the condition of their Interstates, not only in terms of congestion, but also in terms of pavement conditions and safety.

[24]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).

[25]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.

Figure 5: Number of States Expecting Performance on Their Interstate Systems to Fall Behind in the Next Decade



Source: GAO survey.

Increasing Traffic Expected to Have the Greatest Negative Effect on Interstate Conditions

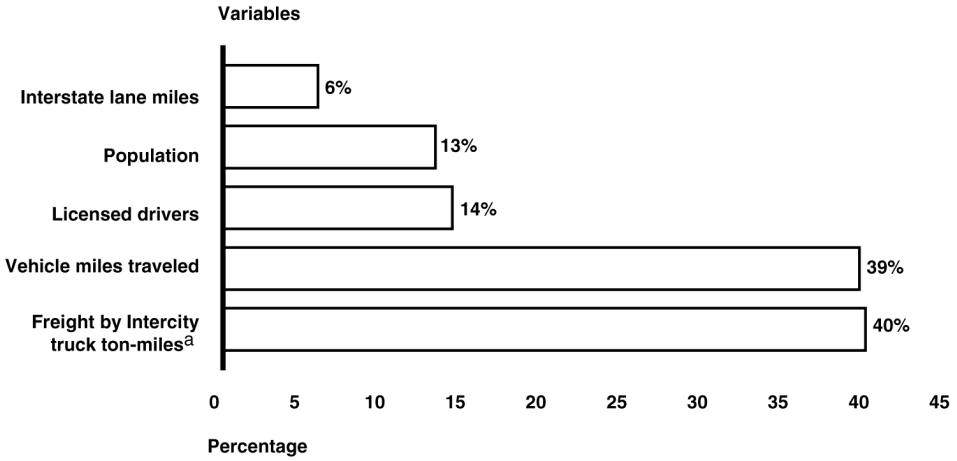
Passenger traffic is expected to increase and states expect the total traffic volume to negatively affect many Interstate conditions, especially urban congestion. Estimates that FHWA uses show that passenger traffic will increase by 17 percent from the end of 2001 through 2010—an increase from 2.7 trillion vehicle miles traveled to 3.1 trillion. Although 39 states reported that their Interstate system played a great or very great role in providing efficient travel within urban areas, they are still concerned that increases in traffic volume will negatively affect urban congestion. Specifically, 51 states said that traffic volume would negatively affect congestion in their urban areas.

In addition, states and FHWA data indicate that truck traffic is expected to increase in the future. Specifically, all of the states expect truck traffic to increase over the next 10 years. In addition, estimates used by FHWA show freight movement by truck increasing by 28 percent from the end of 2001 through the end of 2010. Finally, an alliance of primarily southern and southeastern states released a 2001 study that estimates a 6.9 percent annual increase in Latin American truck traffic in the United States (resulting in almost a doubling over the 10-year period). Ninety-six percent of this truck traffic will be on Interstates. Forty-nine of the states said that

they expect this increase in truck traffic to negatively affect the condition of their pavement. In addition, 49 states expect truck traffic to increase urban congestion.

States' concerns about increases in passenger and freight traffic and their relation to Interstate congestion are illustrated below. As figure 6 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. 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.

Figure 6: Percent Change of Variables Related to Congestion, 1990 through 2000



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

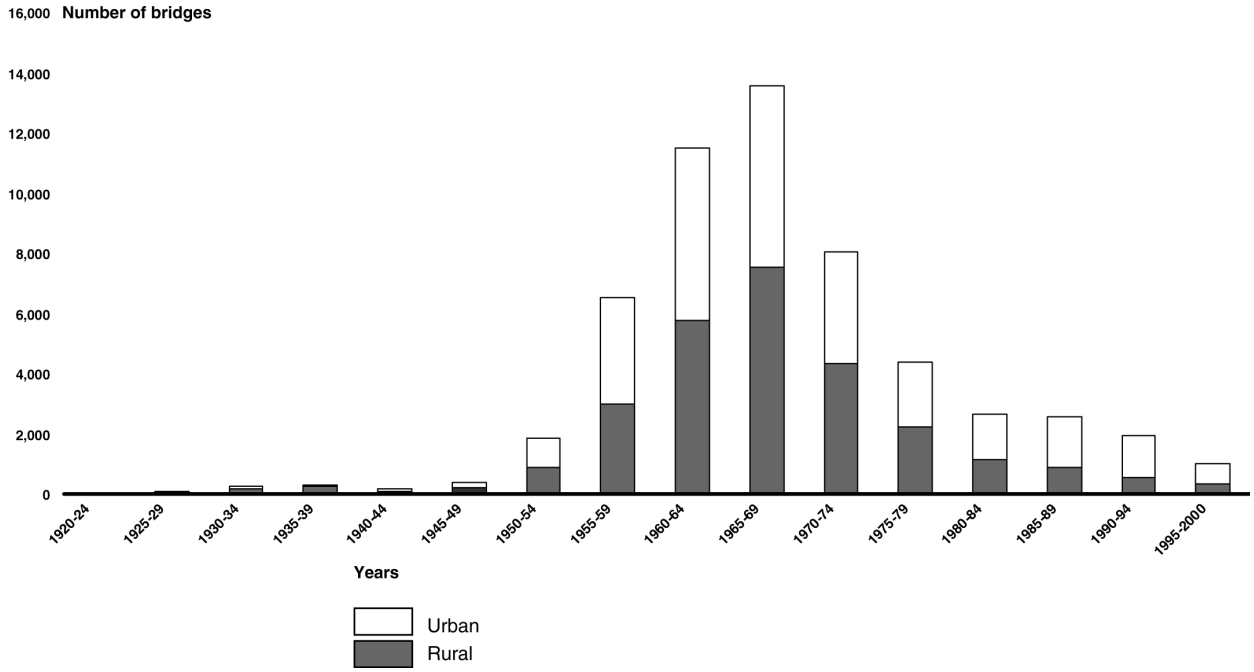
Source: Prepared by GAO using data from FHWA *Highway Statistics*, U.S. Census Bureau Census *2000 Brief*, and Bureau of Transportation Statistics *National Transportation Statistics 2000*.

Age of Infrastructure also Negatively Affecting Physical Condition of the Interstate System

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. (See fig. 7.) 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.[26] In addition, officials in 45 states believe age may jeopardize their bridge conditions: officials in 38 states expect age to negatively affect their pavement conditions 10 years from now.

Figure 7: Year Interstate Bridges Were Built



Note: When the Interstate System 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, which 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

[26] Pavement has a shorter life expectancy than bridges, usually ranging from 15 to 40 years depending on such factors as the type of material used. Routine and preventive maintenance can extend the life of the bridges.

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 May we reported that 40 states were facing budget shortfalls for 2002. Currently, the National Association of State Budget Officers reports that 45 states either currently face a budget shortfall or had one at some point during fiscal year 2002. Furthermore, the amount of funds available for federal highway programs in fiscal year 2003 is uncertain,[27] depending on congressional action. Potential reductions in state funds and the uncertainty of federal funding levels could reduce the funds available for maintaining the Interstates.

Estimates of Costs to Maintain Interstates Vary

FHWA's estimate of future annual Interstate highway investment requirements to maintain current conditions is $16.4 billion and its estimate to maintain user costs is $17.3 billion based on modeling used in the *1999 Conditions and Performance Report* (2000 dollars).[28] The maintain current conditions scenario estimates the investment requirements needed to maintain average pavement condition. The maintain user costs scenario focuses on benefits to highway users such as reductions in travel time costs, crashes, and vehicle operating costs. Under the maintain user cost scenario, FHWA would expect the effect on individual user costs to vary. For example, the *1999 Conditions and Performance Report* explains that if about $60 billion (2000 dollars) was spent on all highways, travel times should rise by 1.5 percent while vehicle operating costs would fall by 1.2 percent.

Spending on Interstates in 2000 fell below these estimates at $14.1 billion. This amount reflects investment by all levels of government—federal, state, and local. According to an FHWA official, however, enhancements of the model used to estimate investment requirements might be expected to increase the estimate to maintain user costs in the next *Conditions and Performance Report*. For example, the model has been modified to consider the effects of delay due to incidents such as crashes, making

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

[28] These estimates are for 1998 through 2017. The cost of these scenarios has been converted to 2000 dollars using FHWA's Composite Bid Price Index.

potential benefits from capacity improvements more cost effective. This may raise the estimated cost to maintain current user costs and current expenditures may be farther behind cost to maintain current user costs.

FHWA's Model for Estimating Highway Needs Is Generally Reasonable, Despite Limitations

In 2000, we reported on FHWA's approach for estimating future Interstate and other highway investment requirements and evaluated the model that FHWA used to forecast investment requirements for pavement preservation and capacity. We found that this model can be useful as a general guide for assessing the relative investment requirements over time. Furthermore, we found no other transportation model that could assess the benefits and costs of alternative improvement options at the national level. However, we found that the model does not fully account for uncertainties associated with its methods, data, and assumptions. To help users understand the potential impact of these uncertainties, FHWA provided sensitivity analyses to demonstrate how much model estimates could change if the value of key inputs or assumptions were changed.

We did not evaluate the tools that FHWA used to forecast Interstate needs for bridges, new construction, or transportation enhancements like safety, traffic operations, and environmental improvements. These methods were not based on benefit-cost analysis, and FHWA viewed them as less reliable than the pavement preservation and highway capacity model. Forecasts of highway costs not estimated by FHWA's pavement preservation and capacity model accounted for less than half of FHWA's 20-year Interstate needs forecasts in its *1999 Conditions and Performance Report*.

We recommended that FHWA clarify, when presenting estimates from its pavement preservation and highway capacity model, that there are uncertainties associated with the estimates and refer readers to the sensitivity analyses that illustrate these uncertainties. We also recommended that FHWA explain in its *Conditions and Performance Reports* that one portion of each highway investment requirement is from the pavement preservation and highway capacity model and is based on benefit-cost analyses and that the other portion was calculated using less reliable methods, as well as the percentage that each of these portions constitutes of the overall estimate. The agency agreed with these recommendations and, provided draft language they plan to include in the *2002 Conditions and Performance Report*, which addresses our recommendations.

In addition to the revisions to the highway preservation and capacity model discussed earlier, FHWA took other steps to improve the quality of its highway investment needs forecasts. For example

- FHWA is using a new model as the primary tool for estimating future bridge preservation needs. According to FHWA, compared to its previous model, this model has three advantages. It filters out improvements that are not cost-beneficial; it is more accurate in determining the value of routine bridge repair and rehabilitation; and, its estimates more closely reflect state and local bridge management strategies.

- FHWA is directly modeling new highway and bridge construction needs by using the highway preservation and capacity model. FHWA had previously estimated new construction costs based on a fixed percentage of existing highway needs forecast by the highway and bridge models.

Concluding Observations

Although Interstate highways as a whole are in good physical condition and are relatively safe when compared to other classes of roads, Interstates will likely move an increasing amount of people and freight in urban areas and throughout the country. The Interstate highways will face increasing traffic and congestion, given the comparatively small growth in lane miles. Therefore, federal, state, and local government officials will face many challenges as they work to assure that the Interstate component of the nation's transportation system continues to provide efficient travel and remain in relatively good condition, given uncertain economic conditions. In particular, these challenges 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 and the potential shortfall of funds to meet needs.

Mr. Chairman, this concludes my prepared remarks. I would be happy to answer any questions you or other Members of the Committee may have at this time.

Contact and Acknowledgements

For questions regarding this testimony please contact Katherine Siggerud on (202) 512-2834 or at siggerudk@gao.gov. Individuals making key contributions to this testimony included Richard Calhoon, Catherine Colwell, and Josephine Perez.