EXECUTIVE SUMMARY

Personal Mobility

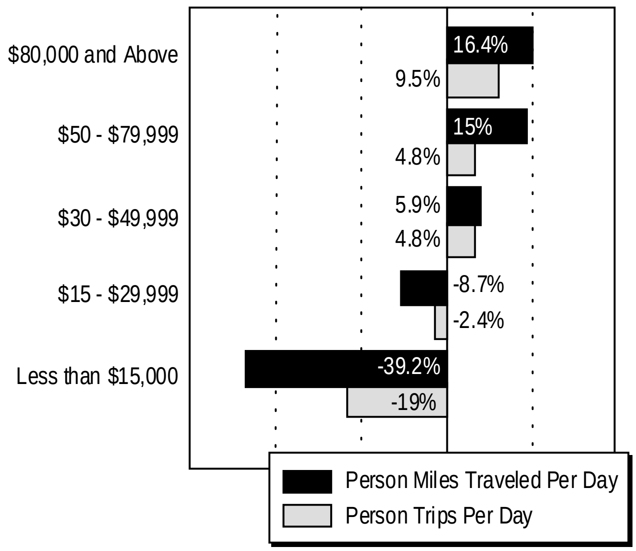
Mobility links us to the economic, social and political benefits of our society. A transportation system that provides mobility is accessible, integrated and efficient and offers flexibility of choices. Our extensive intermodal transportation system helps make Americans one of the most mobile populations in the world.

Measures of Mobility for the 1995 NPTS Sample

Percent Aged 16+ Licensed to Drive		89%
Percent in Households With a Vehicle		94%
Average Daily Travel per Person:		
	Person Trips	3.88
	Person Miles	29.3
	Vehicle Trips	2.42
	Vehicle Miles	19.3

Per Capita Trips and Miles by Income

Percent Above or Below U.S. Average



However, there are groups in our society that face significant mobility challenges. The Nationwide Personal Transportation Survey (NPTS) provides information so we can better understand how income, gender, age, and race impact mobility.

While travel by single adults and adults without children does not vary by gender, travel by men and women with younger children is starkly different. **In particular, working mothers make more trips and cover more miles than at any other time in the past three decades**.

Household income appears to be the single most significant determinant of mobility. All aspects of travel are related to income – the amount of travel, the area in which a person travels, and vehicle ownership.

People in low-income households have fewer travel options and a much smaller radius of access to goods and services than those in higher income households. The high cost of acquiring, registering, insuring and maintaining a vehicle places vehicle ownership out of range for many low-income households.

Different mobility issues face the elderly because they typically drive less, live in more remote locations, and may require special services and facilities. Many of the poor elderly are single women, often minorities, who live alone. As our population ages, these issues will become more critical.

Examining income in conjunction with race adds another dimension to the discussion of mobility. For example, even in the same income group, African-Americans take 15 percent fewer trips and travel almost a quarter less miles per person per day than whites.

Although all elements of the population have increased their mobility over time, many challenges still exist. A transportation system that meets the mobility needs of all Americans must use both traditional and innovative approaches.

EXECUTIVE SUMMARY

System and Usage Characteristics: Highway and Bridge

Public road mileage in 1997 reached 3.95 million miles. **This mileage was overwhelmingly *local* and *rural***. However, while locally owned mileage increased between 1987 and 1997, rural mileage has decreased as metropolitan areas have expanded to incorporate mileage that was formerly rural.

About 3.11 million miles were in rural areas in 1997, or 79 percent of total mileage. **The share of rural mileage decreased** by about 0.2 percent annually between 1987 and 1997.

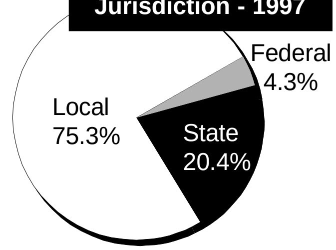
Percentage of Highway Miles, Lane Miles, and Vehicle-Miles Traveled by Functional System - 1997

Functional System	Miles	Lane-Miles	VMT
Rural Highways			
Interstate	0.8	1.6	9.4
Other Principal Arterial	2.5	3.0	8.9
Minor Arterial	3.5	3.5	6.4
Major Collector	10.9	10.6	7.9
Minor Collector	6.9	6.6	2.1
Local	54.1	51.8	4.5
Subtotal Rural	**78.7**	**77.1**	**39.1**
Urban Highways			
Interstate	0.3	0.9	14.2
Other Freeways & Expressways	0.2	0.5	6.3
Other Principal Arterials	1.4	2.2	15.1
Minor Arterials	2.3	2.8	11.6
Collector	2.2	2.3	4.9
Local	14.9	14.3	8.7
Subtotal Urban	**21.3**	**22.9**	**60.9**
Total Highway	**100.0**	**100.0**	**100.0**

About 2.97 million miles were locally owned in 1997, 75.3 percent of the national road system. Federally owned roads comprised 169,000 miles in 1997 (4.3 percent), and State-owned roads comprised 808,000 miles (20.4 percent). Locally owned road mileage has steadily increased, by an average of 0.4 percent annually. State road mileage has remained relatively constant.

Federal ownership has dropped by about 2.3 percent annually largely because of reclassification of some routes to non-public road status.

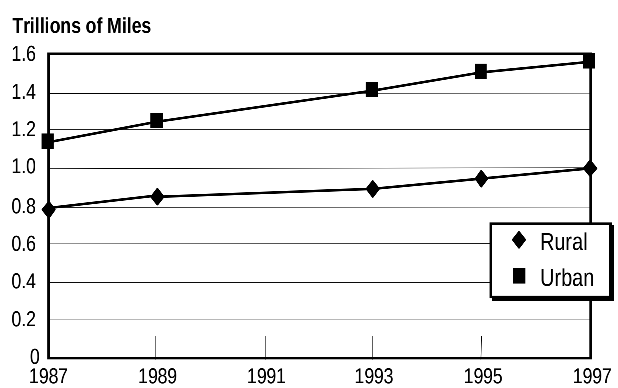
Highway Mileage by Jurisdiction - 1997



While highway mileage is mostly rural, a majority of highway travel occurs in urban areas. Overall, nearly 61 percent of total vehicle miles traveled (VMT) of 2.5 trillion miles in 1997 was urban travel. Urban travel grew at an average annual rate of 3.2 percent since 1987, while rural travel increased by about 2.6 percent annually. **VMT increased on every highway functional system.**

VMT for combination trucks has grown faster than VMT for passenger vehicles since 1987, increasing at an average annual rate of 3.8 percent.

Highway Vehicle (VMT): 1987-1997



The 582,976 bridges in the Nation are a critical element of the infrastructure network. Approximately 47 percent of bridges are State-owned, while 51 percent are locally owned. The remaining 2 percent are federally owned, privately owned, or their ownership is unknown or unclassified.

EXECUTIVE SUMMARY

System Characteristics: Transit

Mass transit in the U.S. performs three public policy functions: providing *basic mobility* to the poor, disabled, young, and old; encouraging *location efficiency* through dense, mixed-use development; and assisting in *congestion management* by providing an alternative to automobile travel, especially in peak periods.

Data from the 1995 NPTS indicate that congestion management accounts for 35 percent of transit trips, while basic mobility and location efficiency account for 40 percent and 25 percent, respectively. Transit trips fulfilling a congestion management function are predominantly work trips and are significantly longer on average than trips associated with the other two functions. They are also considerably more peaked during the morning and afternoon rush hours. A significantly larger percentage of basic mobility trips are made by bus.

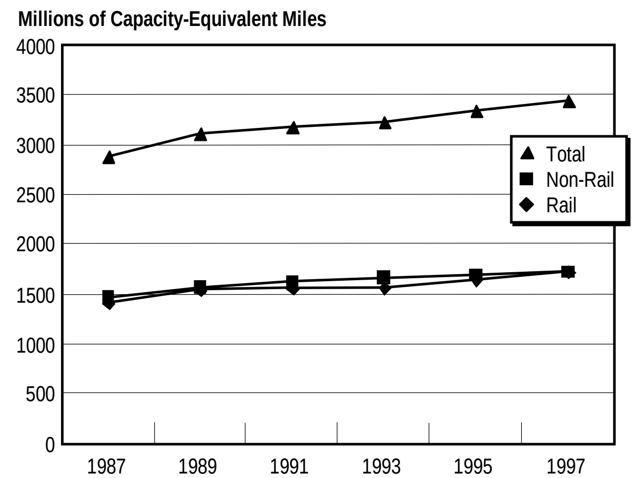
In 1997, there were 149,468 transit vehicles, 9,922 miles of track, 2,681 stations, and 1,179 transit maintenance facilities in operation in the U.S.

Transit systems operated 8,602 route miles of rail service in 1997, an increase of 44.2 percent since 1987. Non-rail route miles were up 10.4 percent since 1987 to 156,733.

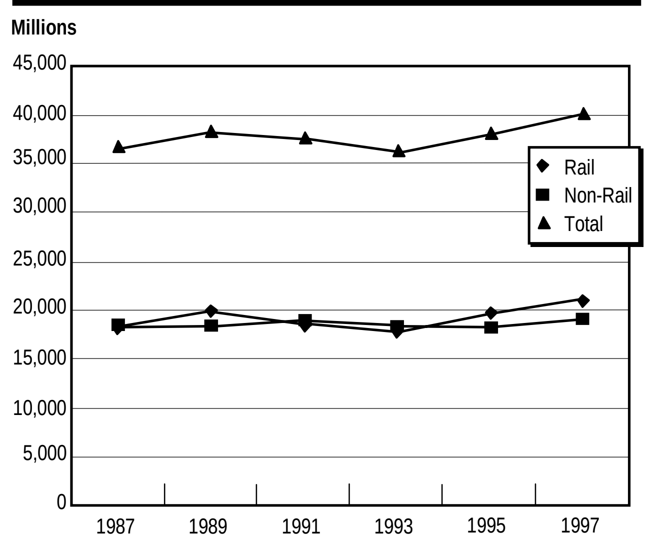
Transit system capacity, measured in vehicle revenue miles (adjusted for vehicle capacity), increased 19.7 percent from 1987 to 1997. Rail capacity increased 22.4 percent, while non-rail increased 17.1 percent. Capacity for rail and non-rail in 1987 was almost identical, at 1.72 billion miles each.

Transit passenger miles increased by 10.9 percent between 1993 and 1997, from 36.22 billion to 40.18 billion. This reversed a slight decline from 1989 to 1993. Growth was most pronounced for rail transit modes, which increased 18.3 percent, from 17.87 billion to 21.14 billion passenger miles.

Transit Capacity 1987-1997



Transit Passenger Miles 1987-1997

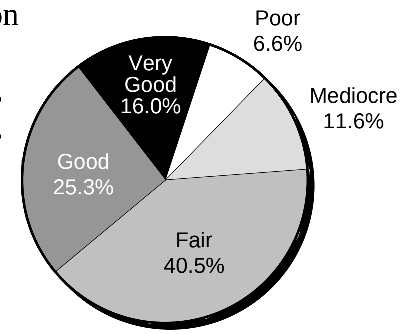


Transit vehicle occupancy decreased from 1987 to 1997, from 12.7 passengers per vehicle (adjusted for capacity) to 11.7. Vehicle occupancy increased from 1993 to 1997, however, with rail modes going from 11.4 passengers per vehicle to 12.3, and non-rail modes remaining constant at 11.1 over that period.

EXECUTIVE SUMMARY

System Conditions: Highway and Bridge

Pavement Condition 1997

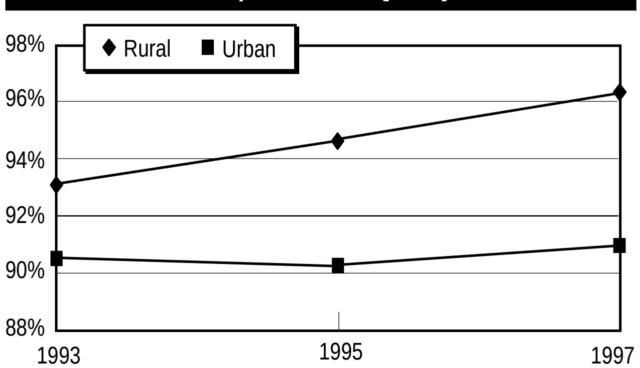


In 1997, overall pavement condition was rated 16.0 percent very good, 25.3 percent good, 40.5 percent fair, 11.6 percent mediocre and 6.6 percent poor. These ratings are based on the International Roughness Index (IRI), a measure of "ride quality" for higher functional classes, and on the Present Serviceability Rating (PSR) for lower functional classes. **Since 1993, the percentage of road miles in poor condition has dropped from 8.6 percent to 6.6 percent.**

Supporting the largest share of vehicle travel, Interstate pavement condition has continued to improve. **The percentage of all Interstate mileage with acceptable ride quality increased from 91.2 percent in 1993 to 92.4 percent in 1997.**

The percentage of Interstate mileage in the urban areas with acceptable ride quality (not "poor") increased from 90.5 percent in 1993 to 90.8 percent in 1997. In the rural areas, Interstate pavement mileage with acceptable ride quality increased from 93.1 percent to 96.2 percent since 1993.

Percentage of Interstate Mileage with Acceptable Ride Quality

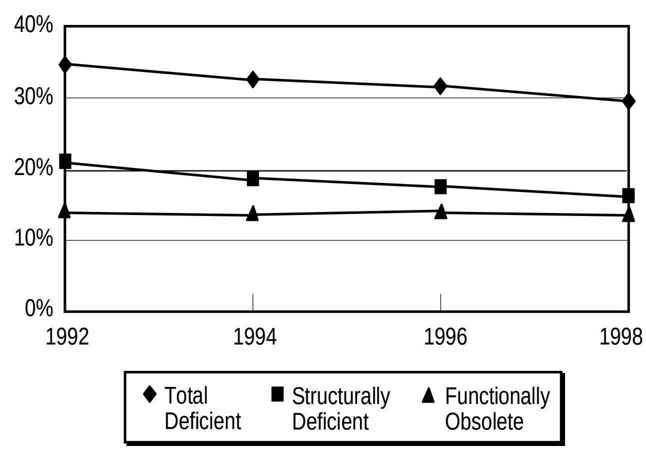


Generally, for all functional systems, the pavement conditions in rural areas were slightly better than in urban areas.

In 1997, approximately 65 percent of rural roads meet horizontal (curve) design standards and 60 percent meet vertical design standards. In addition, 53 percent of urban mileage and 66 percent of rural mileage have 12+ foot lanes.

The common indicator used to evaluate the condition of our Nation's bridges is the number of deficient bridges. There are two types of deficient bridges: structurally deficient and functionally obsolete. **The number of deficient bridges on our transportation system have been steadily declining. In 1998, only 29.6 percent of our Nation's bridges were deficient;** 16.0 percent of bridges were structurally deficient while 13.6 percent were functionally obsolete.

Bridge Conditions: 1992-1998



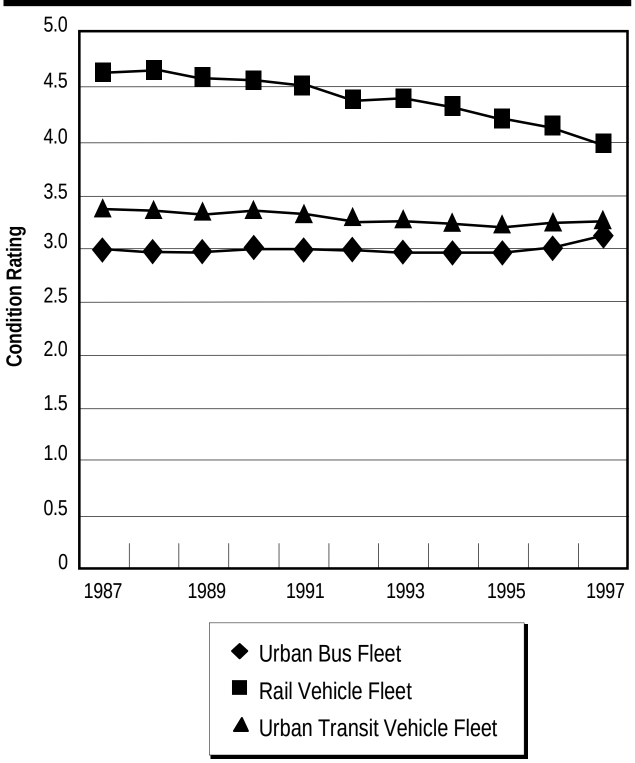
Bridges on the Interstate have the lowest percentage of deficient bridges (16.4 percent in rural areas and 26.8 percent in urban areas) of all functional classes. A larger percentage, 32.5, of bridges in urban areas are deficient than those in rural areas, 28.8. Over half of the deficient bridges are under local governments' jurisdiction.

This report incorporates new information on and improved modeling of bus vehicle and maintenance facility conditions, based on a national sample of vehicles and facilities. Similar improvements for rail vehicle conditions will be in the next report.

Rating	Condition Definition
5.0	Excellent
4.0	Good
3.0	Adequate
2.0	Substandard
1.0	Poor

The average condition of urban bus vehicles in 1997 was 3.1, or "adequate." Sixty-three percent of the urban bus vehicle fleet consists of full-size buses, whose average condition has remained steady at 3.0 for the last decade.

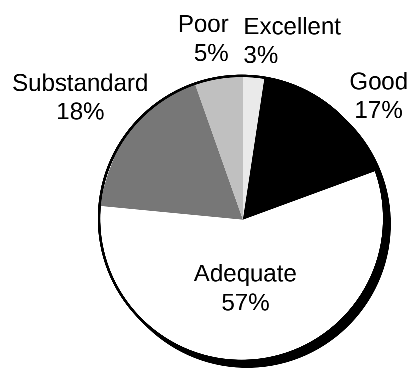
Urban Transit Vehicle Fleet Condition



The average condition of rail vehicles in 1997 was 4.0, or "good." The downward trend in rail vehicle condition is primarily due to the deterioration of the Nation's heavy rail vehicle fleet, comprising 60 percent of rail vehicles, whose average condition rating declined from 4.7 in 1987 to 3.9 in 1997. Fourteen percent of urban bus facilities are less than 20 years old. Fifty-three percent are between 10 and 30 years old, and 33 percent are over 30 years old.

Most urban bus maintenance facilities, 57 percent, are considered to be in adequate condition. Twenty percent are in good or excellent condition, and 23 percent are in substandard or poor condition.

Condition of Urban Bus Maintenance Facilities



The decrease in the condition rating of urban buses and urban bus maintenance facilities relative to conditions reported in previous cycles is due primarily to updated and improved modeling of bus vehicle condition derived from the National Bus Condition Assessment.

The percentage of urban transit rail track in good or excellent condition increased from 43 percent in 1984 to 73 percent in 1997. The percentage of rail maintenance facilities in good or excellent condition increased from 28 percent in 1984 to 60 percent in 1997.

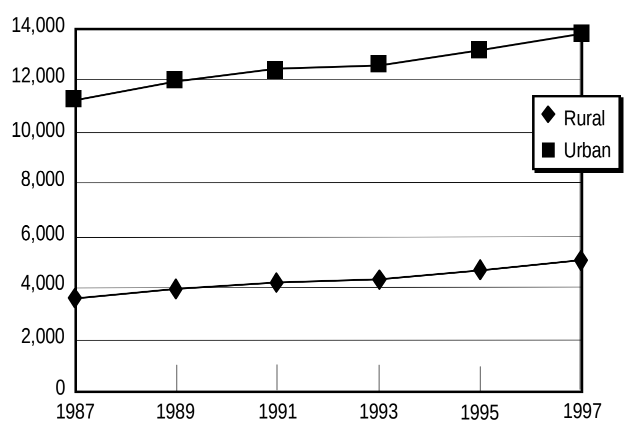
EXECUTIVE SUMMARY

Operational Performance: Highway and Bridge

Congestion is a growing concern on the nation's transportation system. Not only does congestion make driving more inconvenient and unsafe, but it increases transportation costs for many American businesses. The Texas Transportation Institute (TTI) estimates that in the 68 metropolitan areas studied in 1997, **Americans wasted 6.7 billion gallons of fuel and 4.3 billion hours of time because of delay. The total cost to American motorists in these areas is about $72 billion annually**.

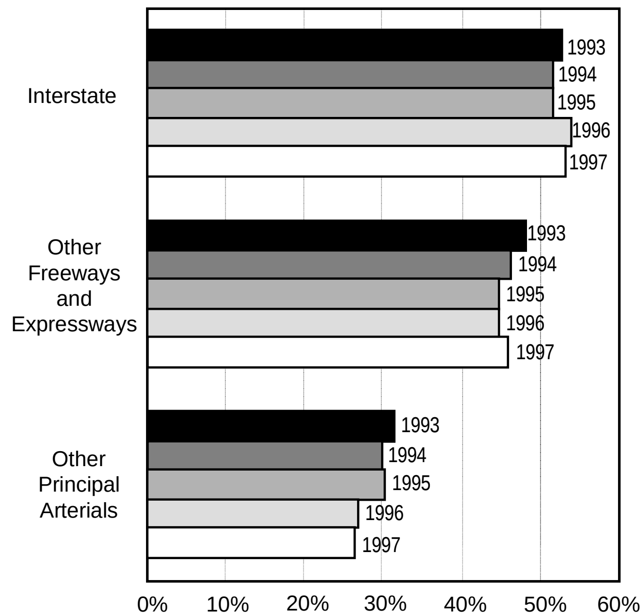
Travel (DVMT) per lane mile has increased on all systems over the past 10 years. While DVMT has grown for both rural and urban highways, it increased at a faster rate on rural routes. **DVMT grew by 3.40 percent on rural Interstates between 1987 and 1997**.

Interstate DVMT per Lane-Mile



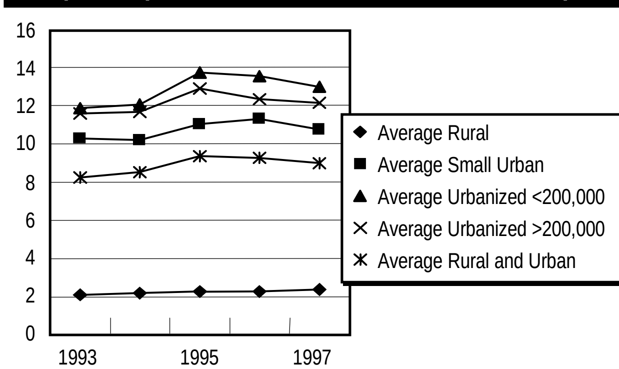
Another way to measure operational performance is to examine peak-hour travel equal or greater than the 0.80 volume-service flow (V/SF) threshold. This measures only the severity of peak-hour congestion, not its extent or duration. **More than half of peak-hour Urban Interstate travel occurs under congested conditions**.

Peak-Hour Congested Travel on Urban Principal Arterial Highways



Delay increased on all highways between 1993 and 1997, rising from 8.3 to 9.0 hours per 1000 VMT. While calculated delay declined on most urban highway systems from 1995 to 1997, the reason for this is unclear. A longer time period is needed to determine if this is the beginning of a trend. Daily delay is measured by hours per thousand vehicle miles traveled, and it primarily occurs in urbanized areas (over 50,000 population).

Daily Delay (Hours per Thousand Vehicle Miles Traveled)



EXECUTIVE SUMMARY

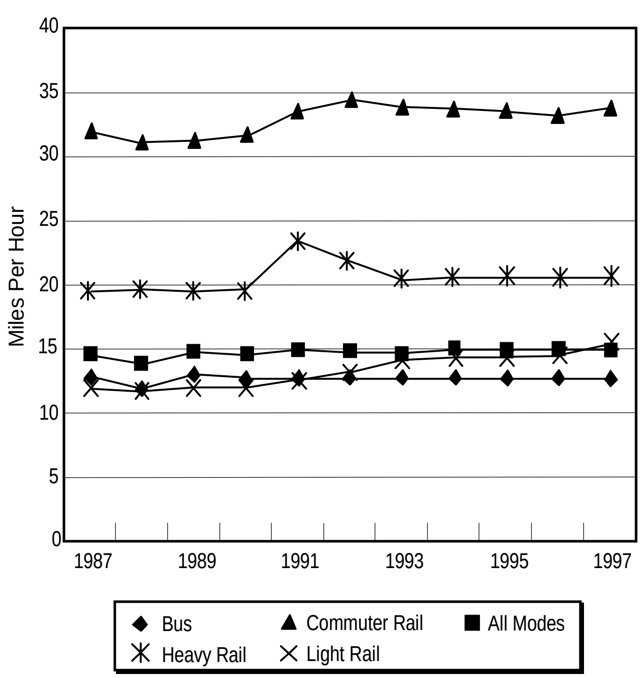
Operational Performance: Transit

Transit operational performance is measured at the system level by average operating speeds and vehicle utilization. Transit performance is measured at the passenger level by waiting times, reliability, and seating conditions.

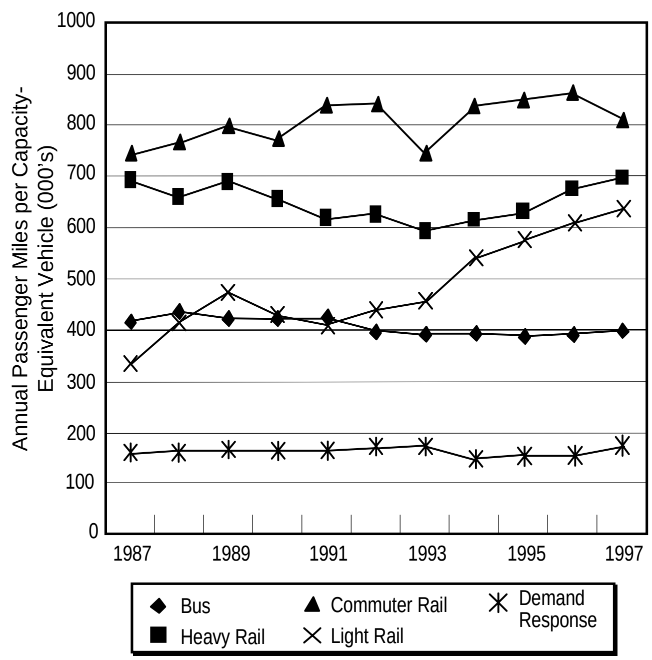
Average transit operating speeds were 20.3 miles per hour in 1997. The average speed for rail modes was 26.1 miles per hour, while average speeds for non-rail modes was 13.8 miles per hour. These figures have been relatively constant for several years.

Vehicle utilization is measured as passenger miles per vehicle, adjusted to reflect differences in vehicle capacity among different modes. Vehicle utilization is heaviest for rail modes, including commuter rail (815 thousand passenger miles per capacity-equivalent vehicle), heavy rail (696 thousand), and light rail (638 thousand). Utilization is substantially lower for non-rail modes, such as bus (400 thousand) and demand response (170 thousand), even accounting for the smaller size of these vehicles.

Average Transit Mode Operating Speeds 1987-1997



Vehicle Utilization Rates 1987-1997



Average waiting times and reliability (variation in waiting times) vary by public policy function. Average waiting times for basic mobility passenger were greater (at 12.1 minutes) than for location efficiency (8.9 minutes) and congestion management (7.3 minutes), and were also more variable.

Seating conditions, measured by the percentage of passengers who find a seat unavailable upon boarding, are roughly equivalent for each of the three market niches filled by transit, at 25 to 30 percent.

Seating Conditions by Market Niche

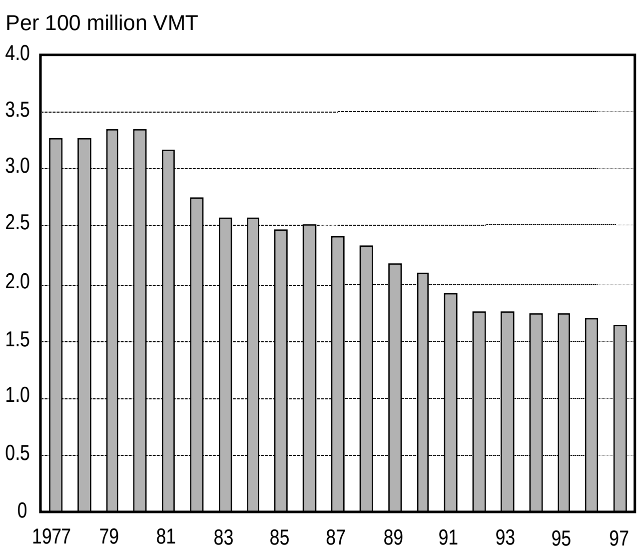
	Seat Unavailable Upon Boarding
Basic Mobility	29.7%
Location Efficiency	26.3%
Congestion Relief	25.0%

Safety

Through a variety of measures including education programs, aggressive law enforcement, and infrastructure-related safety improvements, significant improvements in highway safety have been achieved. While much remains to be done, the progress to date is one of the most important transportation "success stories" of the past 20 years.

Fatalities have fallen from 50,331 in 1978 to 42,013 in 1997. The fatality rate has plunged over a longer period. In 1966, the fatality rate was 5.5 per 100 million VMT; it had dropped to 1.6 by 1997. **This plummeting fatality rate occurred even as the number of licensed drivers grew by nearly 80 percent.**

Fatality Rate (1977-1997)

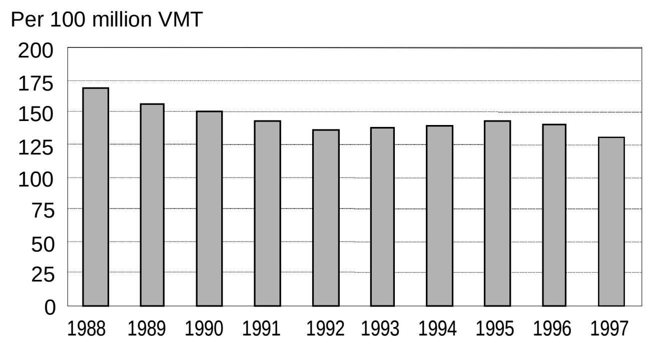


The injury rate has also declined, dropping from 169 per 100 million VMT in 1988 to 133 in 1997.

Four types of crashes have been identified for emphasis in future programs:

- Single vehicle run-off-the-road crashes account for 36 percent of all highway-related fatalities. This represents about 15,000 fatalities each year.

Injury Rate (1988-1997)



- Pedestrian crashes represent 13 percent of all highway-related fatalities. This includes about 5,300 fatalities, and approximately 77,000 pedestrians are injured each year.
- Speeding is a contributing factor in a third of all fatal crashes. This represents about 13,036 fatalities and 742,000 injuries annually.
- Large truck crashes resulted in about 5,350 fatalities and 133,000 injuries in 1997.

The reduced fatality rates can be attributed to several factors, including increased safety belt use, air bags, road safety devices, and a sharp decline in alcohol-related crashes. **Surveys showed that 69 percent of vehicle occupants used seat belts by 1997**. Seat belt usage in conjunction with vehicular air bag systems provide additional protection in potentially fatal crashes. **The proportion of fatalities attributable to alcohol dropped from about 57 percent in 1982 to 39 percent in 1997.**

Transit safety incidents involving injuries and deaths had noticeable decreases from 1990 to 1997. Over this seven-year period, safety incidents involving transit fell from 251 per 100 million PMT (persons-miles-traveled) to 165, and fatality rates declined considerably, from 0.89 per 100 million PMT to 0.73.

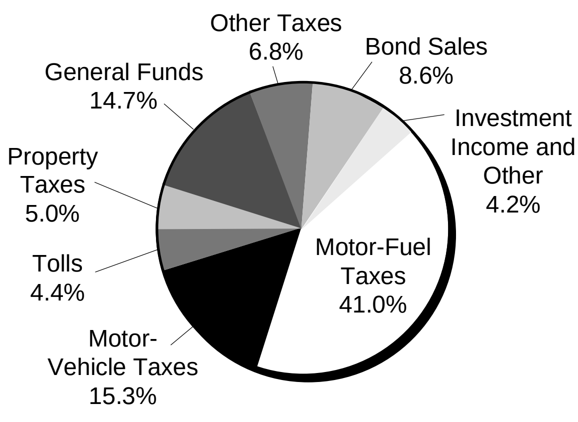
EXECUTIVE SUMMARY

Finance: Highway and Bridge

Taken together, **all levels of government spent $101.3 billion for highways in 1997.** The Federal Government funded $21.1 billion (20.8 percent). States funded $52.7 billion (52.1 percent). Counties, cities and other local government entities funded $27.5 billion (27.1 percent).

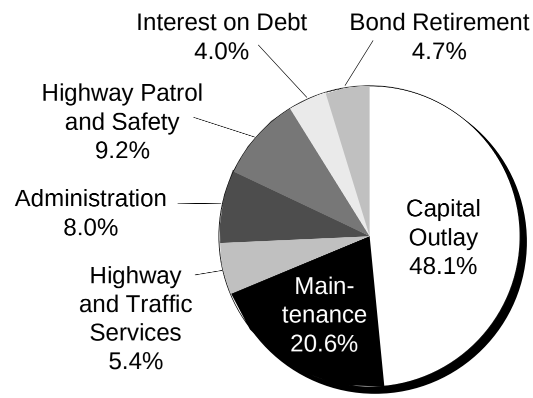
Highway-user revenues—the total amount generated from motor-fuel taxes, motor-vehicle fees, and tolls—were $89.9 billion in 1997. Of this, $64.7 billion was spent on highways. This represented 60.8 percent of total revenues generated for highways in 1997 (including amounts placed in reserves for expenditure in future years). Highway-user revenues would have been sufficient to cover 88.8 percent of all highway expenditures if the full amount had been used for highways.

Revenue Sources for Highways - 1997



Total highway expenditures increased 8.3 percent between 1995 and 1997. Highway spending rose faster than inflation over this period, growing 2.0 percent in constant dollar terms. Since a low point in 1981, highway spending has grown 50.2 percent in constant dollars. Expenditures for highway law enforcement and safety have been growing faster than other types of highway expenditures.

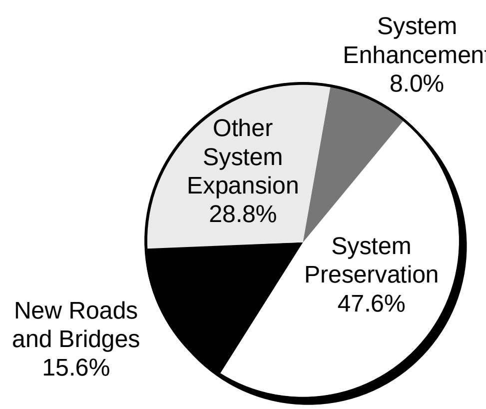
Highway Expenditures by Type - 1997



Capital outlay grew to $48.7 billion in 1997, a 10.2 percent increase since 1995. **Federal funds accounted for $20.0 billion, or 41.1 percent of total capital outlay.** Since 1987, the Federal share has remained in a range from 41 to 46 percent.

Approximately $23.2 billion of capital funds (27.2 percent) were used for system preservation; $7.6 billion went for new roads and bridges; $14.0 billion went for adding new lanes to existing roads; and $3.9 billion went for system enhancements, such as safety, operational or environmental improvements.

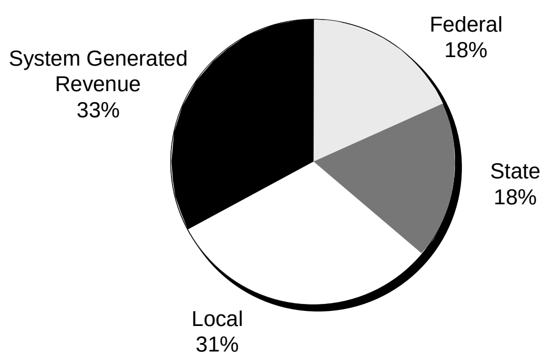
Distribution of Highway Capital Outlay by Improvement Type - 1997



Finance: Transit

Public funding for transit in 1997 totaled $17.5 billion. Twenty-seven percent of public funding came from the Federal government, an increase over recent years. Public funding for transit increased at an annual rate of 1.3 percent in real (inflation-adjusted) dollars from 1990 to 1997. This growth was substantially greater than that seen during the 1980s, but is well below the large growth rates in public funding for transit experienced in the 1960s and 1970s.

Transit System Revenue Sources



Public funding accounted for just over two-thirds of transit revenues in 1997. Local government was the largest jurisdictional source, at $8.1 billion. The most significant tax sources were general appropriations (18.7 percent of revenues), fuel taxes (16.5 percent), and sales taxes (14.7 percent). Passenger fares accounted for 27.5 percent of revenues, and other system revenues (e.g., advertising) accounted for 5.2 percent.

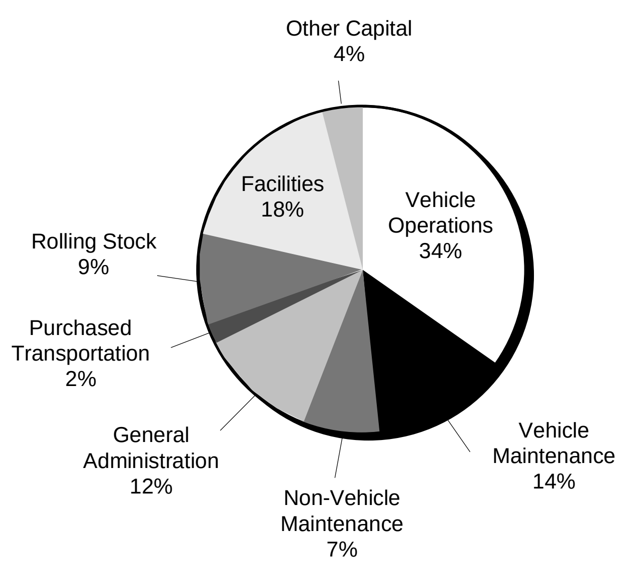
Federal capital assistance increased significantly between 1994 and 1997, from $2.5 billion to $4.1 billion. State and local capital spending remained relatively constant between 1995 and 1997, after increasing steadily since 1990. As a result, the Federal share of capital funding reversed its previous declines and stood at 54 percent in 1997.

In 1997, total spending for transit capital projects was $7.6 billion. Fifty-eight percent of capital spending was for facilities, while 29 percent was spent on vehicles and the remaining 13 percent was spent on other capital expenditures.

Operating expenses for transit totaled $17.5 billion in 1997. Fifty percent of operating expenses went to vehicle operations, 31 percent to vehicle and non-vehicle maintenance, and 20 percent on administration and purchased transportation.

Bus operations accounted for a majority of operating expenditures in 1997, totaling $9.8 billion. Heavy rail operations were next largest at $3.5 billion, followed by commuter rail at $2.3 billion. From 1988 to 1997, operating expenses increased 40 percent for bus operations, 300 percent for demand response services, 139 percent for light rail, and 21 percent for commuter rail. Operating expenses for heavy rail decreased by 1 percent.

Transit Capital and Operating Expenditures by Type - 1997



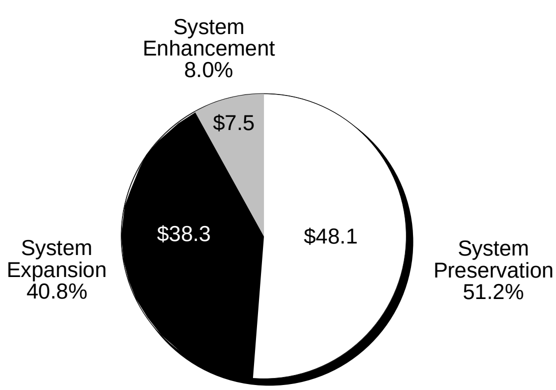
Capital Investment Requirements: Highway and Bridge

The scope of the investment requirements outlined in this report has been expanded to cover all types of highway capital outlay. In previous editions of the report, improvements primarily related to system enhancement (including safety, traffic operations and environmental improvements) and economic development were excluded.

The average annual **Cost to Improve Highways and Bridges** for the 20-year period 1998–2017 is **$94.0 billion.** This represents the investment by all levels of government required to implement all cost beneficial improvements on highways ($83.4 billion Maximum Economic Investment scenario) plus the investment required to eliminate all bridge deficiencies ($10.6 billion Eliminate Deficiencies scenario).

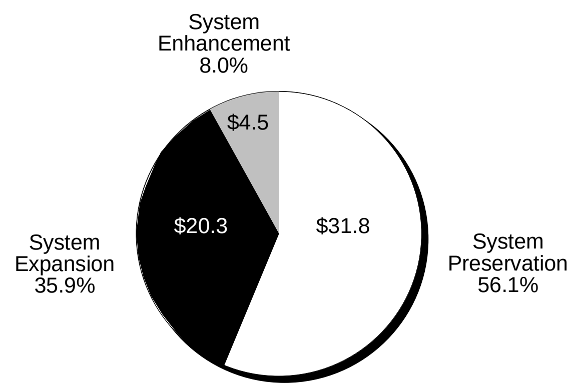
Investment requirements for system preservation comprise 51.2 percent of the total $94.0 billion Cost to Improve Highways and Bridges. Investment requirements for system expansion account for 40.8 percent, while investment requirements for system enhancement make up 8.0 percent of the total.

Distribution of Cost to Improve, by Improvement Type



The average annual investment over 20 years by all levels of government required for the **Cost to Maintain Highways and Bridges is $56.6 billion.** Included in this total are the highway Maintain Conditions scenario ($50.8 billion) which maintains pavement condition, and the bridge Maintain Backlog scenario ($5.8 billion), which maintains the backlog of current bridge deficiencies.

Distribution of Cost to Maintain, by Improvement Type



This highway Maintain Conditions scenario consists of a mix of preservation, expansion, and enhancement improvements intended to attain the highest possible level of benefits for highway users, while achieving its goal of maintaining pavement conditions. At this level of investment, **pavement condition would be maintained, but highway system performance would decline.** Average highway user costs (including travel time costs, vehicle operating costs, and crash costs) would rise.

An additional $3.1 billion from all levels of government would be required annually to maintain highway user costs. Maintaining travel time costs would require an additional $17.1 billion annually.

EXECUTIVE SUMMARY

Capital Investment Requirements: Transit

This report uses combinations of four scenarios to estimate capital investment requirements for the Nation's transit systems over the period 1998-2017. The Maintain Conditions scenario invests in transit capital in order to maintain average asset conditions over the 20-year period. The Improve Conditions scenario makes additional investments in order to bring the average condition for each major asset type up to at least a level of "good." The Maintain Performance scenario adds new transit capacity in order to maintain current vehicle usage levels as transit passenger travel increases. The Improve Performance scenario makes additional improvements to improve the quality of service provided by reducing headways and/or increasing coverage.

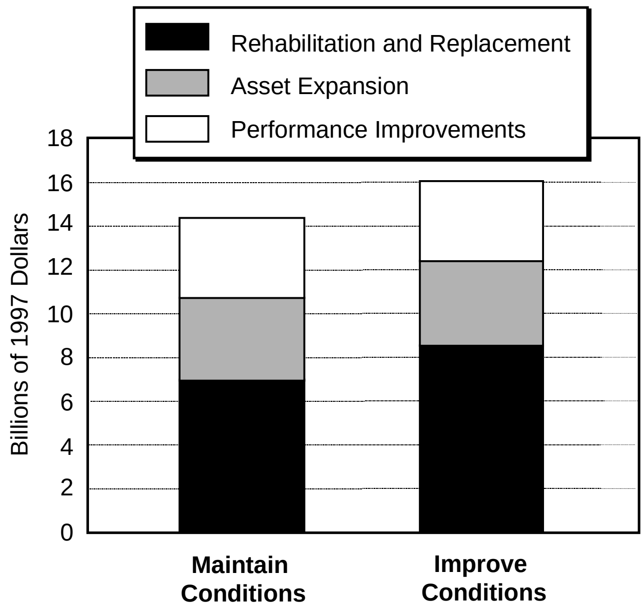
Summary of Transit Average Annual Investment Requirements 1998-2017 (in Billions of $1997)

Conditions	Performance	Average Annual Cost
Maintain	Maintain	10.8
Maintain	Improve	14.4
Improve	Maintain	11.1
Improve	Improve	16.0

The average annual investment required under the Cost to Maintain Conditions and Performance is $10.8 billion in 1997 dollars. The average annual Cost to Improve Conditions and Performance is $16.0 billion.

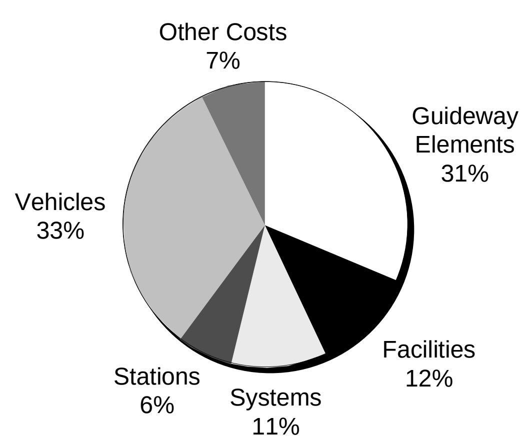
Sixty-five percent of investment under the Maintain Conditions and Performance scenario is in Rehabilitation and Replacement. Fifty-four percent of investment under the Improve Conditions and Performance scenario is devoted to Rehabilitation and Replacement, while the remainder is split between Asset Expansion and Performance Improvements.

Annual Cost to Maintain and Improve Conditions by Improvement Type



The greatest investment requirements are for vehicles and for guideway elements, such as tracks, tunnels, and bridges. Vehicles are the largest expense under the Maintain Conditions and Performance scenario, while guideway elements are the largest expenditure under the Improve Conditions and Performance Scenario.

Cost to Maintain Conditions and Performance by Asset Type



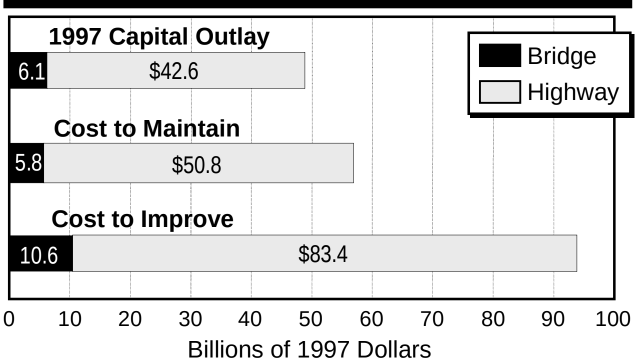
EXECUTIVE SUMMARY

Comparison of Spending and Investment Requirements: Highway and Bridge

While this report does not recommend any specific level of investment, a comparison of the investment requirement scenarios with current and projected spending levels provides some insights into the likelihood that the level of performance implied by the scenarios will be attained.

Federal, State, and local highway and bridge capital outlay expenditures totaled $48.7 billion in 1997. Capital outlay expenditures by all levels of government would need to increase by 16.3 percent above this 1997 value to reach the $56.6 billion Cost to Maintain Highways and Bridges level. Similarly, an increase of 92.9 percent would be required to reach the $94.0 billion Cost to Improve Highways and Bridges level.

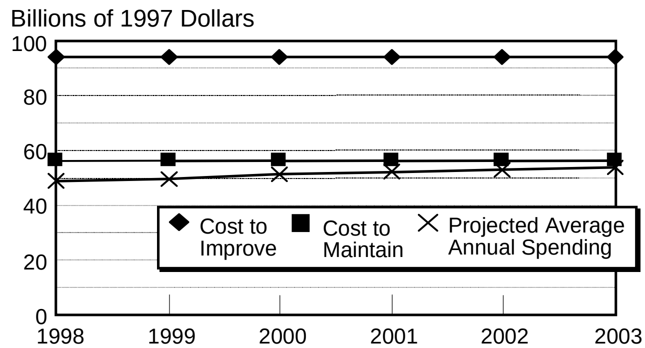
1997 Capital Outlay vs. Highway and Bridge Investment Requirement Scenarios



Capital improvements to existing bridges totaled $6.1 billion in 1997, above the $5.8 billion level of the bridge Maintain Backlog scenario (included in the Cost to Maintain).

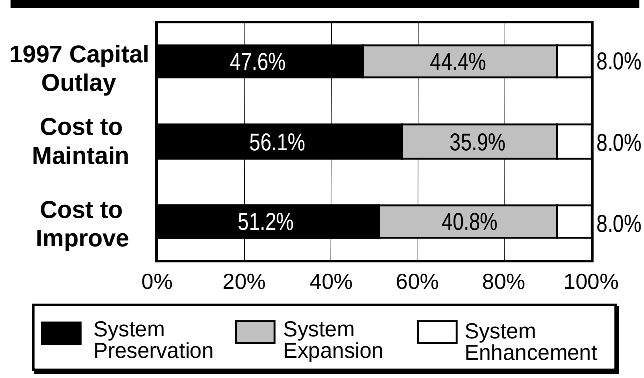
Recent editions of the C&P report have shown that capital spending has been growing more quickly than the investment requirements. This trend is expected to continue in the near future, as the implementation of the TEA-21 will result in significant increases in Federal highway funding. Assuming the continuation of recent trends in State and local government funding patterns, capital spending should reach the Cost to Maintain level by 2003. While the Cost to Maintain is 16.3 percent higher than 1997 capital spending, this difference is expected to shrink to 5.7 percent over the full 1998-2003 period.

Projected Average Annual Spending vs. Cost to Maintain and Cost to Improve, 1998-2003



In 1997, 47.6 percent of highway capital outlay went for highway and bridge preservation. If future funding remains near current levels, the analytical models used to develop the investment requirement scenarios in this report suggest that a greater share of capital investment should be devoted to system preservation. For the Cost to Maintain, 56.1 percent of the projected investment requirements are for system preservation. If funding increases significantly, the models recommend increasing system expansion investment more quickly, so only 51.2 percent of the Cost to Improve is for system preservation.

Investment Requirements and 1997 Capital Outlay, Distribution by Improvement Type



EXECUTIVE SUMMARY

Comparison of Spending and Investment Requirements: Transit

Transit capital expenditures totaled $7.636 billion in 1997. This total is well below the estimated annual investment requirements for the 20-year period from 1998-2017. The estimated annual capital investment that would be necessary to Maintain Conditions and Performance is 41 percent greater than actual 1997 spending by all levels of government. The investment required to Improve Conditions and Performance is more than double actual 1997 capital spending by Federal, State and local governments. The relative differences between actual spending and the investment requirement scenarios are similar to those estimated in the 1995 and 1997 reports.

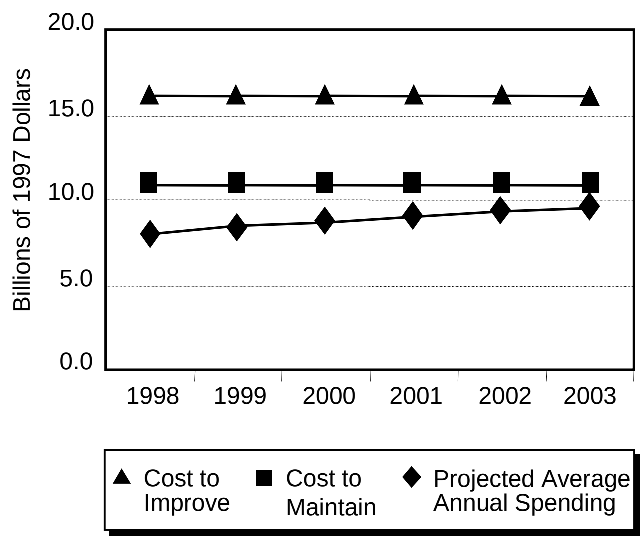
The percent difference between spending and investment requirements is larger for investments in vehicles than in non-vehicles under the Maintain Conditions and Performance scenario, while the opposite is true under the Improve Conditions and Performance scenario.

Average Annual Transit Investment Requirements Versus 1997 Capital Expenditures

	Percent Above Actual Spending
Cost to Maintain Conditions & Performance	41.0%
Cost to Maintain Conditions & Improve Performance	88.7%
Cost to Improve Conditions & Maintain Performance	45.5%
Cost to Improve Conditions & Performance	110.2%

TEA-21 authorizes substantial increases in Federal funding for mass transit. This increase in funding is expected to lead to large increases in capital spending by transit operators. At the guaranteed funding levels specified in TEA-21, total annual transit capital expenditures are projected to grow from $8.1 billion in 1998 to $12.3 billion ($10.8 billion in 1997 dollars) in 2003.

Average Annual Spending Versus Investment Requirements 1998-2003



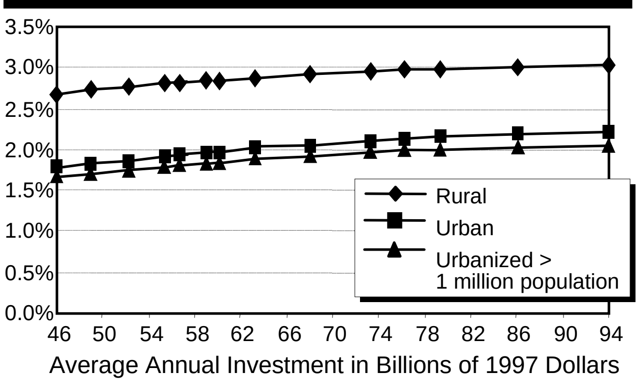
This increase in transit capital expenditures under TEA-21 would substantially reduce the gap between actual expenditures and investment requirements. Investment requirements to Maintain Conditions and Performance exceed projected capital spending for the period 1998–2003 by just 13 percent, while the investment needed to Improve Conditions and Performance is 68 percent larger than projected expenditures.

Investment requirements under both the Maintain and the Improve Conditions and Performance scenarios are slightly backloaded, with greater investment in the latter half of the 20-year period. Substantial investment also occurs in the initial 5-year period, as the backlog of existing vehicle and infrastructure deficiencies is eliminated.

Impacts of Investment: Highway and Bridge

The highway VMT forecasts used to develop the 1995 C&P report and earlier editions were static; one fixed growth projection was used for each highway segment. The VMT forecasts used to develop the investment requirements in this report are dynamic. A single set of forecasts is entered into the Highway Economic Requirements System (HERS) for each sample section, but the model then applies **travel demand elasticity procedures** which change the VMT projections depending on how the conditions on that section are predicted to change over time. If lanes are added, the model assumes that additional travel will be induced. If a highway becomes more congested, the model assumes some drivers will shift to other routes, switch to transit, or forgo some trips entirely. As a result, HERS predicts that travel will grow at different rates, depending on the overall level of investment.

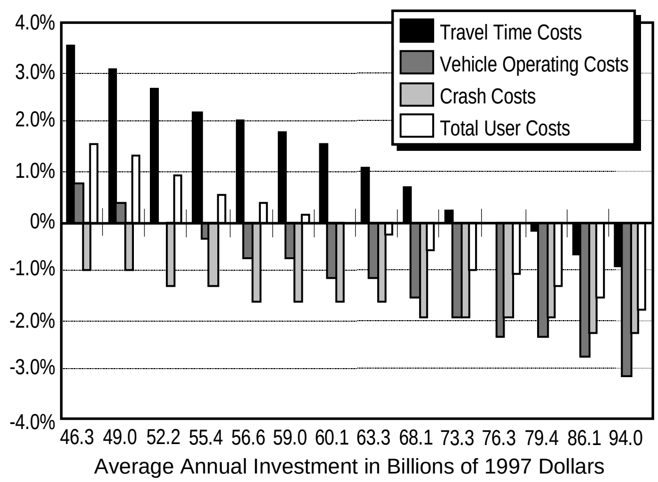
Projected Average Annual VMT Growth Rates 1998-2017, for Different Possible Funding Levels



For example, at current funding levels, HERS predicts VMT in urbanized areas over 1 million in population will grow by an average annual rate between 1.66 and 1.70 percent. (This is consistent with an aggregate projection of 1.68 percent, compiled from a survey of Metropolitan Planning Organizations.) If average annual spending increased from $48.7 billion to $94.0 billion, this rate would increase to 2.06 percent.

The mix of improvements recommended by the HERS model would have different impacts on each component of total highway user costs. If the recommended mix were to be followed, crash costs would be reduced at all levels of investment, as the model predicts there would be a relatively greater rate of return on improvements aimed at reducing crashes than on those aimed at reducing congestion. Maintaining travel time costs at current levels would be significantly more expensive than maintaining overall user costs.

Projected Change in 2017 Highway User Costs Compared to 1997 Levels, for Different Possible Funding Levels



There has been a change in the types of highway capital improvements being made in recent years away from new construction, and towards system preservation. This shift is consistent with recent improvements in pavement and bridge conditions.

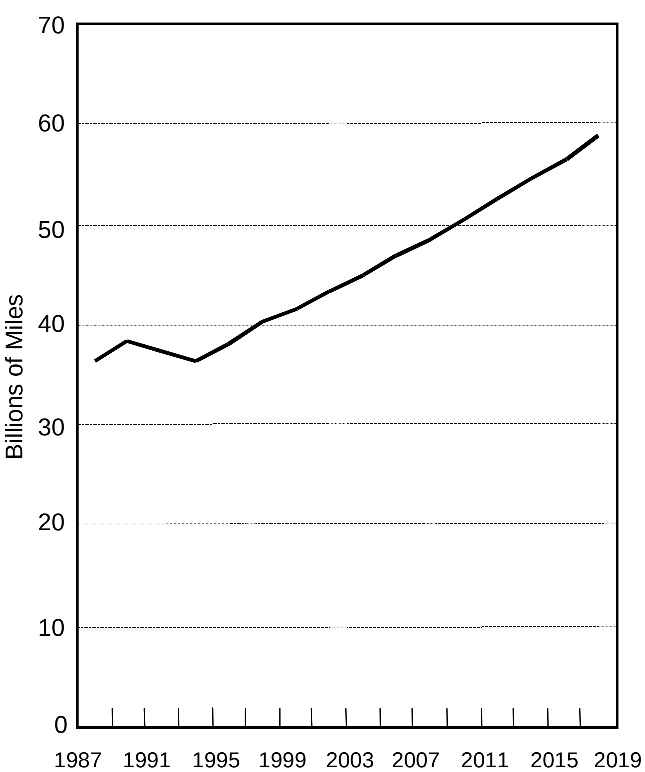
Recent increases in travel density have not resulted in corresponding increases in delay or congestion. This implies that existing facilities are being used more effectively. This may be due in part to increased investment in traffic operational improvements.

Impacts of Investment and Sensitivity Analysis: Transit

The Transit Economic Requirements Model (TERM), from which the estimated transit investment requirements are obtained, is structured to accommodate transit passenger growth by adding more capacity, rather than actively affecting travel growth rates by improving service and lowering the user costs of transit riders.

Projections of future transit travel growth are obtained from metropolitan planning organizations (MPOs) in large urbanized areas. The weighted average transit passenger mile growth rate of the most recently available forecasts is 1.9 percent. At this rate, total annual transit passenger miles in the U.S. would grow from 40.2 billion in 1997 to 58.7 billion in 2017.

Projected Transit Passenger Mile Growth



Despite the estimated gap between funding and investment requirements, transit conditions and performance have been relatively stable over the past 10 years, with the exception of the Nation's heavy rail vehicle fleet, which has shown significant aging and deterioration.

One of the most important parameters used in estimating investment requirements is the annual growth rate in transit passenger miles, obtained from the MPO forecasts. In order to test the sensitivity of the estimated investment needs to the growth rate forecasts, investment needs were additionally estimated using three alternative growth rates: 2.85 percent (50 percent greater growth than forecast), 0.95 percent (50 percent less growth), and zero percent growth. Investment requirements under the Maintain Conditions and Performance scenario would be 20 percent larger under the higher growth rate, 18 percent smaller using the lower growth rate, and 35 percent smaller under zero passenger mile growth. Investment requirements under the Improve Conditions and Performance scenario are somewhat less sensitive to the growth rate than they are under the Maintain scenario.

The most significant improvements made to TERM for this report were in the way it relates asset age to asset condition. Data on urban buses and urban bus maintenance facilities were obtained during the National Bus Condition Assessment, an effort aimed primarily at providing data to improve the statistical specification of asset deterioration over time. The new deterioration curves imply a more rapid decrease in bus condition in the early years of use, and a more gradual decline in condition over the remainder of the useful life of the vehicle.

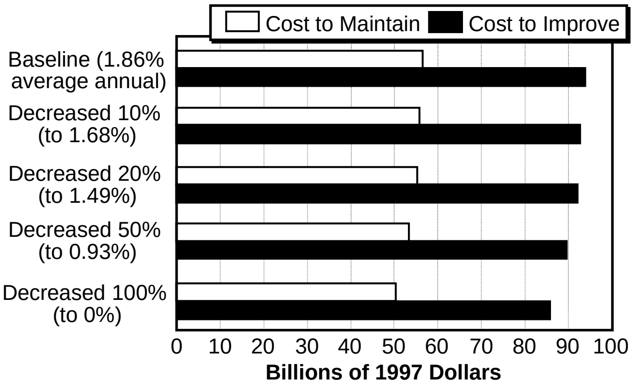
Sensitivity Analysis: Highway and Bridge

The accuracy of the investment requirements in this report depends on the validity of the underlying assumptions used to develop the analysis. Changing these assumptions would reduce or increase the Cost to Maintain Highways and Bridges and the Cost to Improve Highways and Bridges.

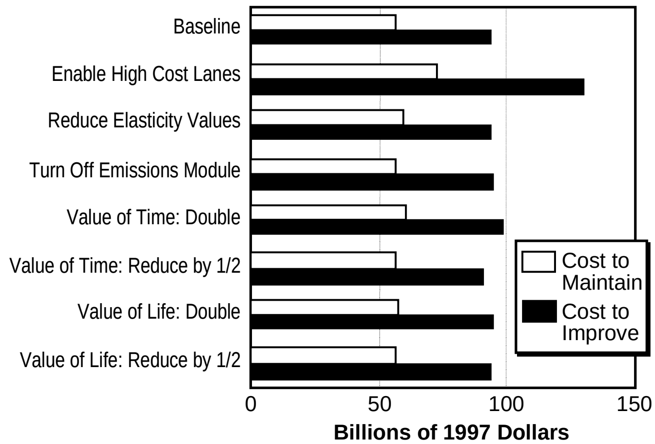
The HERS model assumes that the travel baseline forecasts for each highway section in the model represent not what future travel will be, but what it would be, if investment rose to the level required to keep highway user costs constant. **If the State-supplied baseline HPMS projection of 2.16 percent average annual growth were increased to the 2.84 annual rate observed over the last 20 years, the Cost to Maintain and Cost to Improve Highways and Bridges would increase by 15.5 and 14.1 percent respectively.**

If the baseline HPMS projection for large urbanized areas were reduced by 10 percent (0.18 percentage points) from 1.86 percent to 1.68 percent, the Cost to Maintain and Cost to Improve would fall by 1.6 percent and 1.1 percent respectively. Reducing the large urbanized area baseline growth rate to zero would reduce the Cost to Maintain and Cost to Improve by 11.0 percent and 8.6 percent respectively.

Impact of Reducing Baseline VMT Growth Projections in Urbanized Areas > 1,000,000 on Average Annual Investment Requirements



Impact of Other Alternate Assumptions on Average Annual Investment Requirements in 1998-2017



In previous reports, the HERS model was allowed to consider adding "high cost" lanes to a section, even if widening wouldn't ordinarily be feasible. High cost lanes represent the cost required to double-deck a freeway, build a parallel route, or purchase expensive right-of-way. This feature was turned off for this report. **Allowing HERS to consider high cost lanes would increase the Cost to Maintain and Cost to Improve by 28.7 percent and 38.0 percent respectively.**

The HERS travel demand elasticity values were increased in this report, and the HERS emissions module was turned on. Reducing the elasticity values to the levels used in the 1997 C&P report would increase the Cost to Maintain by 4.9 percent but reduce the Cost to Improve by 0.8 percent. Turning off the HERS emissions module would increase the Cost to Maintain and Cost to Improve by 0.1 percent and 1.1 percent respectively.

Doubling the value of time or value of life in HERS would increase the Cost to Improve by 4.9 percent or 0.5 percent respectively. Cutting them by half would reduce the Cost to Improve by 3.8 percent or 0.2 percent respectively.