

# Highway Finance: Revenues and Expenditures

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An overview of the current financing structure for highways is provided. Beginning with public-sector financing, the various highway-based revenue sources, and revenues from these sources that are used for highways, are identified. An analysis of trends for some of these sources is given, focusing on highway user charges. Expenditures for highways are addressed and disaggregated into noncapital and capital outlays. For capital outlays, trends are identified and the source of funds by level of government is shown. A discussion of capital outlay on the federal-aid system by level of government and type of improvement follows. Finally, a brief discussion of private-sector financing is provided. In 1989 the public sector spent \$67.7 billion for maintenance and capital improvement of highways. Noncapital highway expenditures, including maintenance and operations of highways, administration, highway law enforcement, safety, and debt service on highway bonds and notes, were \$38 billion in 1989—53 percent of all highway expenditures. Capital outlay expenditures by the public sector totaled over \$33 billion in 1989. The federal government funded 43 percent of the total highway capital outlay of \$33 billion in 1989. Of this total, \$25 billion was spent on the federal-aid systems. Private-sector financing includes projects funded and developed by the private sector; it has been estimated that \$9.6 billion of highway improvements was financed by the private sector in 1989.

Public-sector financing includes all funding for highways that is managed by the public sector, including projects built with revenue from exactions, development fees, special district assessments, and so on. In 1989 all levels of government together provided \$73.6 billion for highway programs. The federal government funded \$16.5 billion, the states \$36.9 billion, and counties, cities, and other local entities the remaining \$20.2 billion. Federal funds, primarily supplied by the Highway Trust Fund, accounted for 22.5 percent of the total funding for highways in 1989, down from 24.8 percent in 1980. The states accounted for half of all funding for highways; a ratio unchanged during the past decade. Since 1980 local governments have almost doubled their funding for highways, raising their share of total funding from 25.7 to 27.4 percent.

Of the total \$73.6 billion allocated for highways in 1989, \$2.4 billion was placed in reserve and \$3.5 billion was used for debt retirement, leaving a balance of \$67.7 billion to be spent on highway programs.

In current dollars, highway spending by all governments totaled \$10.2 billion in 1960. For 1989 the amount was \$67.7 billion. In constant dollars, highway spending increased from \$27.5 billion in 1960 to \$36.7 billion in 1989. However, as

shown in Figure 1, real annual spending actually declined below the 1960 level several times during the 1970s. Since 1980 constant dollar spending has been increasing almost annually.

In constant dollars, per unit of travel, expenditures have dropped by more than half since 1960. Constant dollar expenditures per unit of travel increased slowly from 1980 through 1985 but since then have again begun to decline.

## REVENUE SOURCES FOR PUBLIC-SECTOR FINANCING OF HIGHWAYS

Funding for the \$73.6 billion appropriated for highway programs in 1989 came from a number of sources, including user charges, general funds and other non-highway-based revenue instruments, benefit charges, investments and miscellaneous fees, and bond issues. An overview of these revenue sources is presented in Table 1.

### User Charges

User charges are the largest single source of revenue for public-sector financing of highways. User charges are imposts levied on owners and operators of motor vehicles because of their use of the public highways. These imposts consist chiefly of motor fuel taxes, registration fees, driver license fees, weight-distance taxes, titling taxes, other fees closely connected to the ownership and operation of motor vehicles, and tolls. For this discussion, user charges are grouped into three categories: motor fuel taxes, motor vehicle taxes and fees, and tolls. Although \$54.2 billion was raised from these revenue sources in 1989, only \$44.3 billion was used for highways.

### Motor Fuel Taxes

Motor fuel taxes are imposed on highway usage of gasoline, diesel, gasohol, and other special fuels, with the largest share of revenue coming from gasoline and diesel fuel taxes. This revenue source is used by all three levels of government. The excise taxes imposed on each type of fuel differ depending on the governmental level and jurisdiction.

Total gasoline excise taxes paid at retail include the federal tax (which was 9.1 cents in 1989 and increased to 14.1 cents on December 1, 1990), state gas taxes, and any local gas tax.

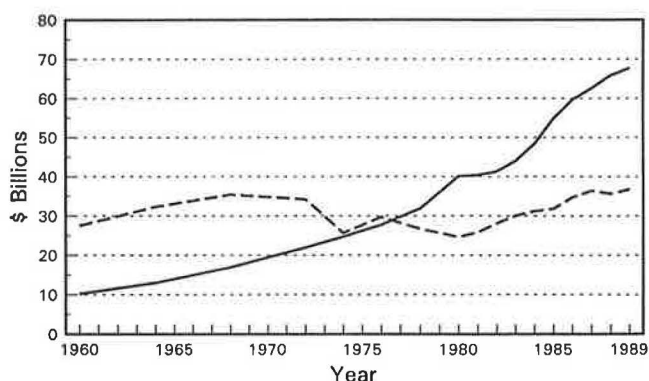


FIGURE 1 Total highway expenditures, 1960–1989.

The average state gas tax weighted by state fuel consumption was 14.19 cents/gal in 1989; it had increased to 15.76 cents/gal by January 1991. Current state gasoline excise taxes range from 7.5 to 23 cents/gal. Some states permit local option gas taxes, and local governments have elected to use this option in 13 states.

The federal diesel tax was 15.1 cents/gal in 1989; it increased to 20.1 cents/gal on December 1, 1990. The weighted national average state special fuel (diesel) tax is 14.76 cents/gal, slightly more than the state gasoline tax.

Total motor fuel tax revenue used for highways was \$29.5 billion in 1989—40 percent of revenues. Federal levies were \$11.9 billion, states \$17.0 billion, and local governments \$0.5 billion.

#### Motor Vehicle Taxes and Fees

This category includes an assortment of taxes and fees on motor vehicles and users. Following is a list of most of these revenue-raising instruments:

- Registration fees,
- Driver license fees,
- Weight-distance taxes,
- Motor carrier taxes,

- Dealer licenses,
- Certificates of title,
- Plate fees or wheel taxes,
- Sales taxes that apply specifically to motor vehicles, and
- Personal property taxes levied only on motor vehicles.

Revenue from these sources used for highways totaled \$11.8 billion in 1989—16 percent of the total. Federal revenue from motor vehicles was \$2.2 billion, state revenue \$9.3 billion, and local revenue \$0.3 billion.

#### Tolls

States and local governments operate toll systems of all sizes, from minor crossings to statewide and regional toll transportation systems. At present, 29 states operate 37 toll roads and 44 toll bridges. In addition, 20 county and 27 municipal toll facilities, mainly bridges, exist nationwide. Toll facilities provided \$3.01 billion for highway financing in 1989. State toll facilities generated \$2.50 billion, and local toll facilities provided \$0.51 billion.

#### Total Revenues from User Charges

Total revenues used for highways from user charges in 1989 were \$44.3 billion, or 60 percent of all revenues used to finance highways. This amount is the same share of highway investments financed from user charges in 1987. Reliance on user charges as a source of revenues reached a peak of 73 percent in 1964.

#### Non-Highway-Based Financing

Non-highway-based financing includes revenue instruments that have little or no direct connection with the highway user tax base. In some cases, these imposts provide dedicated revenues for highways. However, most of these revenues are placed in the general fund and are subsequently apportioned for highways. The most frequently used revenue instruments in this category include general taxes on property and sales

TABLE 1 Revenue Sources for Public-Sector Financing of Highways, 1989

Revenue Source	Federal	State	Local	Total	Percent
<b>User Charges:</b>					
Motor Fuel Taxes	11.92	17.03	0.54	29.49	40%
Motor Vehicle Taxes	2.20	9.32	0.32	11.84	16%
Tolls	—	2.50	0.51	3.01	4%
<b>Subtotal</b>	<b>14.12</b>	<b>28.85</b>	<b>1.37</b>	<b>44.34</b>	<b>60%</b>
<b>General Funds and Other Non-Highway Based Revenue Instruments</b>	<b>0.99</b>	<b>1.52</b>	<b>8.95</b>	<b>11.46</b>	<b>16%</b>
<b>Benefit Charges:</b>					
Property Taxes and Assessments	—	—	4.54	4.54	6%
Other Taxes and Fees	0.07	1.37	1.01	2.45	3%
<b>Subtotal</b>	<b>0.07</b>	<b>1.37</b>	<b>5.55</b>	<b>6.99</b>	<b>9%</b>
Investment Income and Miscellaneous Receipts	1.36	2.09	2.33	5.78	8%
Bond Issue Proceeds	—	3.06	2.00	5.06	7%
<b>Total</b>	<b>16.54</b>	<b>36.89</b>	<b>20.20</b>	<b>73.63</b>	<b>100%</b>

Note: Revenue values are in billions of dollars.  
Source: Highway Statistics, 1989, Table HF-10.

and the income tax. Local governments rely most heavily on non-highway-based revenue sources to finance their highway programs.

Although most of these revenue sources have no specific connection with the highway tax base, some, including general sales taxes that apply to motor fuel and vehicles and personal property taxes that apply to a range of personal property including motor vehicles, are sometimes considered highway-based revenues. In Table 1, any revenues that cannot be attributed to the other revenue categories are assumed to come from this source.

### Benefit Charges Including Private Cost Sharing

Benefit charges include charges on activities, usually related to land use, that derive a benefit from highways. Following is a partial list of revenue-raising instruments considered to be benefit charges:

- Real property taxes imposed by single function highway districts,
- Assessments levied for construction and maintenance of roads and streets or for local debt service,
- Impact fees, and
- Severance fees imposed to compensate for the impact of the extraction activity on highways.

The term "benefit charge" implies a requirement to pay. Although not specifically a benefit charge, voluntary contributions from private property owners of land for right-of-way or cash against the cost of a new public facility are also considered benefit charge revenue. Contributions from private property owners are variously referred to as donations, negotiated contributions, developer agreements, and exactions.

The first three revenue-raising instruments listed are a form of institutionalized cost sharing. Local governments (often with required state support) raise funds for specific transportation improvements through systematic and simultaneous cost sharing with multiple private parties whose properties are directly served by a transportation improvement.

In contrast to the ad hoc and usually extremely localized contributions or exactions, these methods require the establishment of a systematic and equitable assessment process within a specific area (district). The specific group of property owners who will benefit directly through transportation improvement-induced changes in economic activity (including property values) is assessed.

Three models are typically used in the United States:

- *Benefit Assessment Districts.* Periodic earmarked fees for transportation that apply to new development in the highway environment.
- *Tax Increment Financing.* Property value increases that apply to all property owners in a transportation-affected area.
- *Traffic Impact Fees.* Fees required of property developers on the basis of specific development attributes and applied as a condition of development.

Funds from direct beneficiaries are thus generated to help pay for public projects that would otherwise place a burden on a local jurisdiction's general tax base.

Funding for projects built by the private sector and turned over to a governmental jurisdiction after completion, with no impact on either the jurisdiction's revenues or expenditures for highways, is not included. Funding for these types of projects is considered private-sector financing and is discussed separately.

These revenue instruments are used primarily at the local level and are difficult to quantify. According to highway statistics data collected from the states, at least \$4.5 billion was raised from property taxes and assessments and \$2.5 billion from other taxes and fees.

### Investments and Miscellaneous Fees

By investing highway funds until needed, many highway agencies are able to realize interest income or profit on the purchase and sale of securities. Other miscellaneous income includes rentals and permit fees. Revenues from this source used for highways were \$5.78 billion in 1989, or 8 percent of total revenues—the same share of total revenue as in 1987. This revenue source is used by all levels of government.

### Bond Issues

Proceeds from bond issues used for highways were \$5.0 billion in 1989. State agencies raised \$3.1 billion and local governments \$2.0 billion. Revenue from this source was 7 percent of the \$73.6 billion allocated to highways in 1989—the same as in 1987.

### Highway-Based Revenues Compared with Non-Highway-Based Revenues Used for Highways

Highway-based revenue sources include most bond issues, investments and miscellaneous fees, user charges, and benefit charges. Together they provided approximately \$62.16 billion (84 percent) of the revenues used to finance highways in 1989. If revenues from general taxes on property and sales imposed on motor vehicles and motor fuel were included, the share of revenues used for highways derived from highway-based revenue sources would be higher. Non-highway-based revenue sources provided approximately \$11.47 billion (16 percent).

### REVENUE TRENDS FOR SELECTED HIGHWAY USER REVENUE SOURCES

This section contains an analysis of trends in revenue generated by various user charges from 1960 to 1989. In addition to overall trends, trends in revenue per vehicle mile of travel (VMT) and per vehicle are considered for motor fuel tax revenue and motor vehicle revenue, respectively.

#### Federal Motor Fuel Tax Revenue Trends

In 1989 federal motor fuel taxes generated \$13.5 billion in revenues for the Highway Trust Fund; \$11.9 billion of this revenue was spent on highway improvements. Since 1960 rev-

enues from federal motor fuel tax revenues used for highways have increased by \$9.6 billion in current dollars and \$0.3 billion in constant dollars. Constant dollar revenues from this revenue source reached a peak of \$6.9 billion in 1966. The low point in constant dollars for revenue from this source, \$2.7 billion, was reached in 1980.

### State Motor Fuel Tax Revenue Trends

In 1960 state motor fuel taxes raised \$3.3 billion for highway use. By 1989 the yield was \$17.0 billion, or 5.2 times greater. The gain in revenue resulted from the compounding effects of a doubling in motor fuel consumption (2.3 times) and state tax rates (2.4 times). However, inflation in highway construction has dramatically reduced the productivity of the state motor fuel tax dollar, resulting in a constant dollar yield in 1989 of \$9.2 billion—only \$0.4 billion more than the 1960 yield.

Current revenue from state motor fuel taxes used for highways has increased almost annually since 1960. The rate of increase, however, slowed from 1973 to 1980. When expressed in constant dollars, revenues from this source actually declined during this period. Since 1980 real revenue has again increased almost annually, as it did from 1960 to 1973, because of lower inflation and the increase in state motor fuel tax rates.

### Federal Motor Vehicle Tax Revenue Trends

Total motor vehicles registered in the nation reached 192 million in 1989. Revenues from vehicle registration used for highways were \$2.2 billion in 1989, compared with \$0.6 billion in 1960. Current dollar revenues reached a peak of \$2.4 billion in 1979, with a per-vehicle revenue of \$15.27. Per-vehicle revenue in 1989 was \$11.48.

In constant dollars, revenues from this source have declined since 1960, with a low of \$0.9 billion being reached in 1983 and 1984. The constant dollar revenue peak of \$3.1 billion occurred in 1969.

### State Motor Vehicle Tax Revenue Trends

Taxes on motor vehicles produced \$15.5 billion in total revenue for the states in 1989; of this, \$9.3 billion was used for highways. Current dollar revenue raised for highways in 1989 was more than six times that of 1960, resulting from the combination of an increased number of vehicles (73 versus 192 million) and an increased average fee per vehicle. Together these two factors overcame the effect of inflation in highway construction, resulting in a real increase in revenue from this source of approximately \$1 billion from 1960 to 1989. However, constant dollar revenues actually declined below the \$4.0 billion level reached in 1960 for several years during the 1970s and early 1980s, with a low of \$3.2 billion in 1980.

### Toll Revenue Trends

In 1989 state and local revenue used for highways from road and crossing tolls was \$3.0 billion in current dollars and \$1.6

billion in constant dollars. Since 1960 toll revenues have increased 22 percent in constant dollars; however, this increase has not been steady. From 1960 to 1972, constant dollar toll revenues generally increased, reaching a high of \$1.8 billion in 1972. From 1975 to 1980, revenues declined. Since 1980 constant dollar revenues from tolls have increased 61 percent, from \$1.0 billion to \$1.6 billion, but remain less than constant dollar revenues in 1972. Toll revenue as a share of total revenue for financing highways was 4 percent in 1989—the same as in 1960.

### User Charge Revenue Trends

Total revenues from user charges in current dollars have increased from \$8.4 billion in 1960 to \$54.2 billion in 1989 and in constant dollars from \$22.8 billion in 1960 to \$29.4 billion in 1989. Constant dollar revenues from this source reached a peak of \$29.4 billion in 1969 (see Figure 2). A gradual decline in revenues accelerated in the early 1970s—between 1973 and 1974, real revenue dropped approximately 25 percent. The low point in constant dollar revenues, \$15.8 billion, was reached in 1980.

Annual constant dollar revenues per vehicle from user charges were \$306 in 1960 and \$154 in 1989. Annual per vehicle user charge revenues peaked at \$308 in 1964 and reached a low of \$103 in 1981.

However, not all revenues raised from highway user charges are used for highways. In current dollars, user charge revenues used for highways were \$8.1 billion in 1960 and \$44.3 billion in 1989. Comparable revenues in constant dollars were \$22.0 billion in 1960 and \$24.7 billion in 1989 (see Figure 3).

Annual constant dollar revenues per vehicle used for highways from user chargers were \$295 in 1960, the high for the period, and \$125 in 1989. Annual per vehicle user charge revenues used for highways reached a low of \$85 in 1980.

In 1960, 3.5 percent of constant dollar revenues from user charges was not spent on highways. By 1989 the percent of revenues being diverted from use for highways had increased to 16 percent.

### HIGHWAY NONCAPITAL EXPENDITURES AND TRENDS

This section presents a brief overview of noncapital highway expenditures from 1960 to 1989. Noncapital highway expendi-

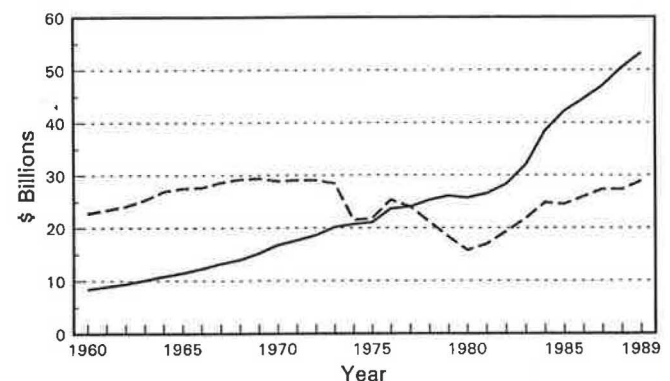


FIGURE 2 Total revenues from user charges, 1960–1989.



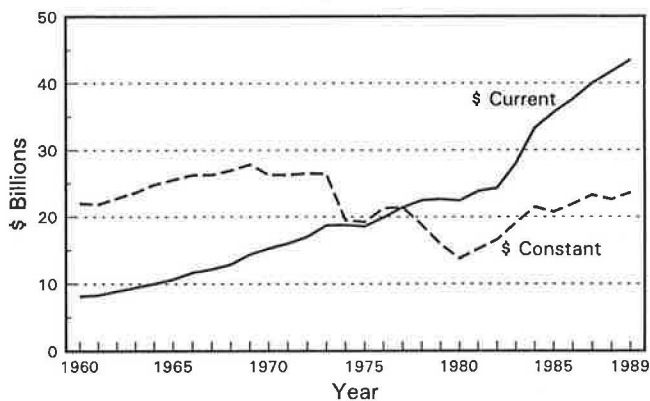


FIGURE 3 Total revenues used for highways from user charges, 1960–1989.

tures include maintenance and operations of highways, administration, highway law enforcement, safety, and debt service on highway bonds and notes. The noncapital highway bill for the public sector was \$38 billion in 1989, or 53 percent of all highway expenditures (see Table 2).

#### Maintenance and Traffic Services

The most expensive noncapital highway activity is roadway maintenance and operations. Maintenance costs include routine and regular expenditures required to keep highways in usable condition (such as patching repairs, bridge painting, and other maintenance-of-condition costs) and traffic service costs (such as snow and ice removal, pavement marking, signs, signals, litter cleaning, and toll collection expenses). Expenditures for maintenance and traffic services are not eligible for federal aid.

A total of \$19.7 billion was spent by state, county, and municipal governments in 1989 to keep roads and streets in serviceable condition. The 1989 maintenance and operation spending was 7.5 times that of 1960 and continues to account for about one-fourth of all highway costs.

#### Administration and Safety

Both highway administration and highway safety expenditures have experienced substantial growth over the past three decades. Spending for administration, including highway planning and research, in 1989 was more than 11 times that of 1960, and its share of all disbursements was up from 4.6 to 7.5 percent. Highway safety expenditures have grown the most, with a 20-fold increase since 1960. Highway safety now commands 9 percent of all spending, compared with 3 percent in 1960.

#### Debt Service

Highway debt service cost is the only noncapital highway cost showing a reduced share of total outlays. The sum of interest on debt and the annual redemption of bonds accounted for 9.5 percent of all costs in 1960, but debt service required 8.9 percent of all disbursements in 1989.

#### HIGHWAY CAPITAL EXPENDITURES

Highway capital expenditures are those outlays associated with highway improvements, including land acquisition and other right-of-way costs; preliminary and construction engineering; new construction, reconstruction, resurfacing, rehabilitation, and restoration costs of roadways and structures; and installation of traffic service facilities such as guardrails, fencing, signs, and signals. All of these expenditures are eligible for federal aid.

Governments spent a total of over \$33 billion on capital outlay in 1989 (see Table 2). In 1960 capital expenditures accounted for 58 percent of all highway spending; for 1989 the share was 47 percent. For every 1,000 VMT in 1989, \$15.80 was spent on highway capital improvements.

#### Capital Expenditures for Capacity and Preservation

Capital spending on highways can be differentiated on the basis of whether it adds additional capacity or preserves ex-

TABLE 2 Disbursements for Highways by Functions for Selected Years, All Units of Government

Year	Capital Outlay	Maintenance and Operations	Adminis- tration, etc.	Highway Patrol and Safety	Interest on Debt	Subtotal Current Disbursements	Debt Retirement	Total
1960	6,290	2,640	483	327	420	10,160	601	10,761
1964	8,252	3,060	684	474	515	12,985	752	13,737
1968	10,346	4,003	1,017	940	606	16,912	1,071	17,983
1972	12,275	5,443	1,600	1,671	950	21,939	1,270	23,209
1974	13,102	6,573	1,857	2,061	1,079	24,672	1,445	26,117
1976	13,927	7,735	2,209	2,633	1,234	27,738	1,567	29,305
1978	14,938	9,785	2,590	3,160	1,368	31,841	1,593	33,434
1980	20,337	11,445	3,022	3,824	1,456	40,084	1,711	41,795
1981	19,734	12,165	3,439	3,884	1,202	40,424	2,464	42,888
1982	19,052	13,319	3,152	4,068	1,690	41,281	2,046	43,327
1983	20,224	14,240	3,347	4,309	1,872	43,992	2,172	46,164
1984	23,123	15,008	3,604	4,937	1,641	48,313	2,411	50,724
1985	26,647	16,589	4,174	5,241	2,148	54,799	2,737	57,536
1986	29,179	17,643	4,677	5,549	2,505	59,553	2,793	62,346
1987	30,674	18,152	4,973	5,962	2,788	62,549	2,685	65,234
1988	32,883	19,110	4,961	6,108	2,773	65,835	2,755	68,590
1989	33,274	19,679	5,380	6,453	2,871	67,657	3,478	71,135

Note: Values are in millions of dollars.

Source: Highway Statistics, HF-12, various years, and HF-10, October 1990.

isting physical conditions. Capacity improvements include reconstruction with added lanes and wider lanes, and major widening as well as new construction on new right-of-way. Preservation improvements include pavement reconstruction, resurfacing with shoulder or alignment improvements, and resurfacing. As shown in Table 3, capacity improvements account for 53 percent of spending on nonlocal roads; preservation improvements account for 47 percent.

### Highway Capital Expenditure Trends

Highway capital outlay by all units of government has grown from \$6.3 billion in 1960 to \$33.3 billion in 1989 (see Figure 4). In constant dollars, today's spending is comparable to that of the 1960s. The constant dollar low point in capital spending for highways during this period was the \$12.5 billion spent in 1980. After 1980 capital outlay increased in constant dollars until 1987, reaching a plateau in the past few years.

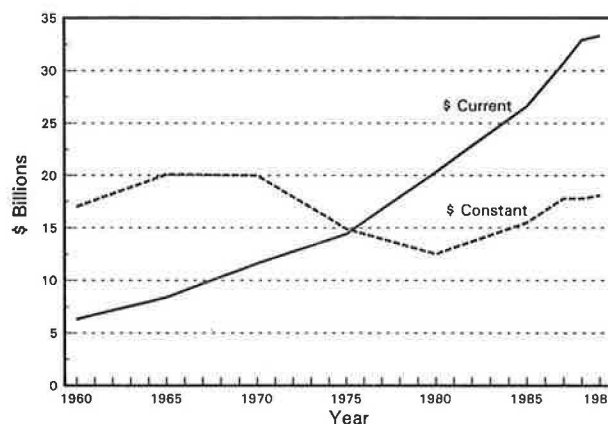
Total highway capital outlay per mile of travel has almost doubled since 1960 in current dollars but is down over 60 percent in constant dollars. Inflation increased highway costs nearly five-fold from 1960 to 1989, and real highway spending dropped from over \$23 per 1,000 VMT in 1960 to \$8.58 per 1,000 VMT in 1989. Since 1980 relative price stability, along with a 64 percent increase in current highway capital spending, resulted in a modest growth in real spending per unit of travel. Still, today's real spending per mile of travel is less than half the 1960 level.

### Capital Financing by Level of Government

By law, federal-aid program funds have been legislatively restricted, or earmarked, for capital improvements only. Although the amount spent by state and local governments for capital improvements is known, the source of these funds cannot be accurately determined because they are not necessarily earmarked. The analysis in this section is based on the assumptions that (a) all federal funds are spent on capital outlay and (b) the rest of the funding for capital improvements comes from state and local own-source revenues. No attempt is made to differentiate between state and local revenue sources for capital improvements.

**TABLE 3** Spending by Major Improvement Categories on Nonlocal Roads

Major Improvement Category	Percent
<b>System Performance</b>	
Pavement and safety improvements on arterials and collectors	24%
Bridge replacement/rehabilitation on arterials and collectors	16%
Operational improvements to arterials and collectors	6%
<b>Capacity Improvements</b>	
Capacity additions to arterials and collectors	25%
New highway/bridge construction to arterials and collectors	29%
<b>Total</b>	<b>100%</b>



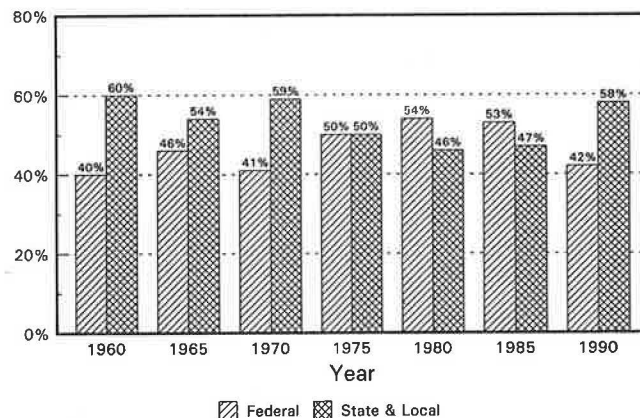
**FIGURE 4** Highway capital outlay for all units of government, 1960-1989.

### Federal Government

The federal government provided funds for 43 percent of the total highway capital outlay of \$33 billion in 1989 (see Figure 5). With the exception of approximately \$1 billion provided by other federal agencies, all of these funds came from FHWA. The federal share of highway capital outlay in 1989 was down from a high of 56 percent in 1980. After the 5 cent/gal increase in the federal gas tax took effect, the federal share was 55 percent in 1985; since then it has been going down. The current federal share of 43 percent replicates its 1970 level.

### State and Local Governments

State and local governments supplied over half of all funds for highway capital improvements in 1989, as they did during the period from 1960 to 1975. The combined state and local share of capital outlay gradually declined during the late 1970s before leveling off at approximately 45 percent during the early 1980s. Since 1985 the state and local share of capital outlay has been increasing annually.



**FIGURE 5** Highway capital outlay by level of government.

## HIGHWAY CAPITAL OUTLAY ON FEDERAL-AID SYSTEMS

The federal-aid system consists of those roadways that are eligible for federal aid. The federal-aid highway system is divided into four administrative classifications: Interstate, primary, secondary, and urban. Although all roads that are functionally classified as arterials or collectors are eligible, a road becomes part of the federal-aid highway system only when it is designated by a state. Total capital outlay on federal-aid highway systems is estimated to account for \$25 billion of the \$33 billion expended for capital outlay in 1989 (see Table 4). On the basis of state expenditure data only, capacity improvements account for 54 percent of these expenditures. This amount is comparable to the 53 percent spent on capacity improvements on all nonlocal roads. Highway capital outlay for each federal-aid system is discussed in the following paragraphs.

### Interstate System

The federal-aid Interstate system (FAI) capital outlay amounted to \$8.2 billion for 1989. As shown in Table 4, expenditures on the rural Interstate were \$2.5 billion, or \$13.08 per 1,000 VMT. Expenditures on the urban Interstate were \$5.7 billion, or \$21.06 per 1,000 VMT.

The funding of the Interstate highway system is largely a federal-state activity, with federal funds dominating. In 1989, 79 percent of the funding for capital expenditures on the Interstate system came from the federal government. The remaining 21 percent came from the states. Of this, roughly half was spent to match federal funding on projects in the federal-aid participating program. The other half of state funding was spent on projects with no federal involvement.

Interstate improvements are mainly for system preservation. Less than 30 percent of capital outlay on the Interstate system is spent for new construction.

### Federal-Aid Primary System

The next system of national significance is the federal-aid primary (FAP) system. Outlays from all sources on the FAP system were \$10.6 billion in 1989. On the rural FAP system, 1989 expenditures were \$17.62 per 1,000 VMT; on the urban system, expenditures were \$18.76 per 1,000 VMT (see Table 4).

The FAP system is almost totally located on highways under the jurisdiction of the states, making the program essentially

a federal-state activity. In 1989 the federal share of spending was 44 percent on the rural FAP system and 54 percent on the urban FAP system. All of the remaining funding for the FAP system came from state and local revenues.

New construction accounts for almost 30 percent of all capital expenditures on the overall FAP system.

### Federal Urban and Secondary Systems

The next tier of federal involvement addresses major areawide traffic generators under the federal-aid urban and secondary (rural) systems.

The federal-aid urban system (FAUS) functionally consists of the non-FAP urban principal arterials, most minor arterials, and more than 70 percent of collectors in urban areas. Total capital outlays on the FAUS in 1989 were \$3.6 billion. Expenditures per 1,000 VMT were \$7.70 in 1989.

State and local governments are the primary funding sources for FAUS improvements. Federal funds account for 33 percent and state and local funds cover 67 percent of all capital costs.

On the basis of state expenditure data only, new construction accounts for approximately 20 percent of capital expenditures on the FAUS. This finding assumes that local spending patterns by improvement type are the same as state expenditure patterns. Because of high land values in urban areas, right-of-way (ROW) and engineering costs account for almost one-fourth of all FAUS costs.

The federal-aid secondary (FAS) system serves basically a rural collector or farm-to-market function. An estimated \$2.7 billion was expended on the FAS system by all levels of government in 1989. The federal government provided 29 percent of these funds. Spending per 1,000 VMT was \$15.06 in 1989.

Most improvements on the FAS system involve the preservation of roads and bridges. Only one dollar in five goes toward new highways.

## PRIVATE-SECTOR FINANCING OF HIGHWAYS

Private-sector financing includes projects funded and developed by the private sector, for example, local roads that are part of a development project or intersection improvements required by a development agreement. Private-sector financing of roads that are part of a development project has been a common practice for a number of years. Projects of this type are often referred to as on-site development. Recently, private-sector financing has expanded to include off-site development, that is, projects outside the boundaries of a spe-

TABLE 4 Total Highway Capital Outlay Per 1,000 VMT, 1989

System	Capital Outlay (\$ billions)	Travel (VMT) (billions)	Expenditures per 1,000 VMT
Interstate - Rural	2.5	191.1	13.08
Interstate - Urban	5.7	270.7	21.06
FA Primary - Rural	5.6	317.8	17.62
FA Primary - Urban	5.0	266.5	18.76
FA Urban	3.6	463.3	7.77
FA Secondary	2.7	179.3	15.06
Total Federal-Aid Systems	25.1	1,688.7	14.86
Non Federal-Aid Systems	8.2	418.3	19.60
All Systems	33.3	2,107.0	15.80

cific development project. Projects of this type include improvements to an intersection, widening of an adjacent roadway that is affected by a new development, or a toll road developed by private investors.

Although there is a growing body of anecdotal evidence concerning private-sector financing, there is little hard data. It has been estimated that, in 1989, \$6.4 billion was invested by the private sector for on-site highway improvements and

\$3.2 ( $\pm$ \$2.1) billion off-site. However, these are extremely rough estimates and should be viewed as preliminary. Further effort is needed to gather reliable data on this important and growing area of highway financing.

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