



Congressional Budget Office

Testimony

**Statement of
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The Highway Trust Fund and Paying for Highways

**before the
Committee on Finance
United States Senate**

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Notes

Unless otherwise noted, all years referred to are federal fiscal years, which run from October 1 to September 30.

Numbers in the text and tables may not add up to totals because of rounding.

Chairman Baucus, Senator Hatch, and Members of the Committee, thank you for the invitation to testify on issues related to the funding of highways. My testimony draws on several publications of the Congressional Budget Office (CBO) that discuss highways and other infrastructure related to transportation, water resources, and wastewater.¹ Although the testimony is focused on highways, the principles discussed here are relevant to all infrastructure that is financed by the public sector.

Summary

This testimony reviews the status of the Highway Trust Fund and examines three questions facing the Congress:

- How much should the federal government spend on highways?
- How should the federal government direct the use of those funds?
- How should the federal government raise those funds?

Status of the Highway Trust Fund

The United States spends about \$160 billion annually on highways, with about one-fourth of that total, or roughly \$40 billion, coming from the federal government. Federal highway spending is funded mainly through taxes on gasoline and other motor fuels that accrue to the Highway Trust Fund. In recent years, the Congress has spent more on highways than the revenues accruing to the fund for that purpose, and it has supplemented the trust fund's balance with money from the general fund of the Treasury.

The law that authorizes collection of taxes for and spending from the Highway Trust Fund is set to expire on September 30, 2011. Even if the provisions of that law are extended, the trust fund will be unable to meet its obligations in a timely manner by the summer or fall of 2012, CBO projects, unless transfers similar to those in the past are made, other sources of revenue are identified, or spending is reduced.

How Much Should the Federal Government Spend on Highways?

The Congress has a range of options for future spending on highways, and the one it selects will influence the amount and distribution of economic benefits from the nation's network of highways and roads. Those options include the following:

- Limit spending to the amount that is collected in current taxes on fuel and other transportation activities; doing so would result in spending that would be about \$13 billion per year below the current amount.

1. See Congressional Budget Office, *Alternative Approaches to Funding Highways* (March 2011); *Spending and Funding for Highways*, Issue Brief (January 2011); and *Public Spending on Transportation and Water Infrastructure* (November 2010).

- Maintain current capital spending, adjusted for inflation.
- Spend enough to maintain the current performance of the highway system; doing so would require about \$14 billion per year more than current spending.
- Fund projects whose benefits exceed their costs; doing so would require even more spending than maintaining current services, up to about \$50 billion more than current spending, depending on the degree to which benefits would be expected to exceed costs.

The additional spending needed to meet specific performance goals or to fund projects whose benefits exceed their costs would be less if highway users paid tolls that varied with congestion. Doing so would reduce demand for future spending by providing an incentive to use those roads less during congested periods. Although the size of that reduction is uncertain, the Federal Highway Administration (FHWA) estimates that the spending required to maintain current services or realize additional benefits from highways could be one-quarter to one-third less than current estimates if congestion pricing was widely adopted.

How Should the Federal Government Direct the Use of Highway Funds?

From the point of view of economic efficiency, the authority to make decisions about which highway projects to undertake is best placed with those who have the incentive and the information to weigh all of the costs and benefits of the decisions. Whether the federal government or state or local governments are more likely to make more efficient decisions about highway projects depends on who receives benefits from those decisions and who bears the costs.

The Congress currently directs resources for highway infrastructure through three mechanisms:

- About 80 percent of the money the federal government spends goes to grants to state governments under formulas that allocate funds for such purposes as construction, rehabilitation of existing roads, and safety programs. The remaining 20 percent goes to specific projects or purposes identified by the Congress or by the Secretary of Transportation.
- The federal government lends money to state and local governments and provides loan guarantees that reduce their cost of borrowing. Although that leverage allows more projects to be built today with a given amount of federal funds, the borrowed money ultimately must be repaid—either by state and local taxpayers or by highway users. The reduction in the cost to state and local governments imposes a cost on federal taxpayers, who bear the risk of default; that cost would otherwise be borne by the borrowers through the interest rates they would pay.
- The federal government also reduces the cost of borrowing for state and local governments by offering tax preferences for bonds they issue. Tax-exempt bonds use a well-established tax preference. However, they are not generally considered

cost-effective because the federal revenues that are forgone may be significantly greater than the reduction in state and local borrowing costs. In recent years, the Congress has authorized tax credit bonds, which allow bondholders to claim a credit against their tax liability (or, in certain cases, to bond issuers, who can claim a credit payable by the Secretary of the Treasury). Such bonds can be a less expensive way for the federal government to reduce the cost of borrowing by state and local governments.

Some funding mechanisms concentrate decisionmaking authority with the federal government; others offer greater latitude for state and local governments. Currently, state and local governments choose most federally funded projects. However, concerns about that process have motivated proposals for a federal infrastructure bank that might use the results of cost–benefit analyses to select projects. In addition, a federal infrastructure bank could lower the cost of borrowing by providing credit assistance and thus could attract private financing; however, it would impose the cost of such credit assistance on federal taxpayers.

How Should the Federal Government Raise Funds for Highways?

Funding for highway infrastructure ultimately comes either from highway users or from taxpayers, regardless of how the financing of a project is structured. Taxes, tolls, and fees imposed on highway users now fund about half of highway spending by federal, state, and local governments; the rest comes from the Treasury’s general fund and from similar state and local funds. Judging from estimates of the costs of highway use, a system that charged for the full cost of travel would have most if not all motorists paying substantially more than they do now—perhaps several times more, potentially providing more than sufficient revenue for spending on highways.

As with other decisions, concerns about fairness are important in determining where to find the required funds. For example, whether increased user charges would impose relatively greater burdens on low-income and rural users would depend on the structure of those charges.

Increasing the charges that users pay also could promote more efficient use of the highway system. Although taxes currently are charged for fuel, most of the costs of using a highway—including pavement damage, congestion, accidents, and noise—are tied more closely to the number of miles traveled than to the amount of fuel consumed. Fuel consumption depends not only on the number of miles traveled but also on fuel efficiency, which differs among vehicles and changes with driving conditions; therefore, charging highway users for the full costs of their use, or charging in proportion to the full costs, could not be accomplished solely through fuel taxes. Charging users according to costs would require a combination of fuel taxes and per-mile charges, sometimes called vehicle-miles traveled (VMT) taxes. Imposing such prices on system use would promote efficiency by encouraging motorists to use highways only when the benefits to them outweigh the full costs of that use. Alternatively, revenues could be raised from sources unrelated to transportation. That approach, however, would not promote efficient use of highways.

Table 1.

Estimated Revenues and Interest Credited to the Highway Trust Fund, by Source, 2011

(Billions of dollars)

	Highway Account	Mass Transit Account	Total	Share of Total Trust Fund Revenues and Interest (Percent)
Gasoline Tax	20.2	3.9	24.0	65
Diesel Tax	7.6	1.0	8.7	24
Tax on Trucks and Trailers	2.2	0	2.2	6
Use Tax on Certain Vehicles	1.0	0	1.0	3
Truck Tire Tax	0.4	0	0.4	1
Interest Credited	0.4	0.2	0.6	2
Total	31.8	5.1	36.9	100

Source: Congressional Budget Office.

The Highway Trust Fund

The federal government's surface transportation programs are financed mostly through the Highway Trust Fund, an accounting mechanism in the federal budget that comprises two separate accounts, one for highways and one for mass transit. The trust fund records specific cash inflows from revenues collected on excise taxes on the sale of motor fuels, trucks and trailers, and truck tires; taxes on the use of certain kinds of vehicles; and interest credited to the fund (see Table 1). In some years, the Congress has enacted laws to transfer money from the general fund of the Treasury to the Highway Trust Fund to ensure that the fund retains a positive balance. The Highway Trust Fund also records cash outflows for spending on designated highway and mass transit programs. (Some transit programs receive appropriations from the Treasury's general fund.) The largest component of spending, by far, is for the federal-aid highway program (see Table 2).

Excise taxes on motor fuels generate 89 percent of the Highway Trust Fund's revenues and interest, mostly from the tax of 18.3 cents per gallon on gasoline and ethanol-blended fuels. Under current law, most of that tax—14 cents per gallon—is set to expire on September 30, 2011. The remaining 4.3 cents per gallon will no longer be credited to the trust fund but will go to the Treasury's general fund. The gasoline tax is the source of about two-thirds of the fund's total revenues and interest. The second-largest source is the diesel fuel tax of 24.3 cents per gallon, which accounts for about one-quarter of the fund's revenues and interest. The balance comes from the other taxes and interest that are credited to the fund. Most of the revenue from fuel taxes is credited to the highway account of the trust fund, but 2.86 cents per gallon of all fuel

Table 2.**Components of the Highway Trust Fund, 2011**

(Billions of dollars)

	Estimated Revenues and Interest ^a	Budget Authority and Obligation Limitations ^b	Estimated Outlays
Highway Trust Fund	36.9	52.7	44.3
Highway account	31.8	44.3	36.7
Federal-aid highway program	n.a.	43.0	35.4
Motor carrier safety program	n.a.	0.6	0.5
Highway traffic safety program	n.a.	0.7	0.7
Mass transit account	5.1	8.4	7.6

Source: Congressional Budget Office.

Note: n.a. = not applicable.

- a. Revenues are deposited in the highway and mass transit accounts but are not designated for specific purposes. Those designations come from budget authority as specified in legislation such as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users.
- b. Obligation limitations enacted in appropriation acts limit the amount of budget authority available to most Highway Trust Fund programs. The amounts shown are the sum of obligation limitations and budget authority that is not subject to any such limitation.

taxes credited to the Highway Trust Fund goes to the mass transit account, which receives about 14 percent of the trust fund's revenues and interest.

Spending from the Highway Trust Fund is determined by authorization acts that provide budget authority for highway programs, mostly in the form of contract authority (the authority to incur obligations in advance of appropriations).² Annual spending from the fund is largely controlled by limitations on the amount of contract authority that can be obligated in a particular year, and such obligation limitations are customarily set in annual appropriation acts.³

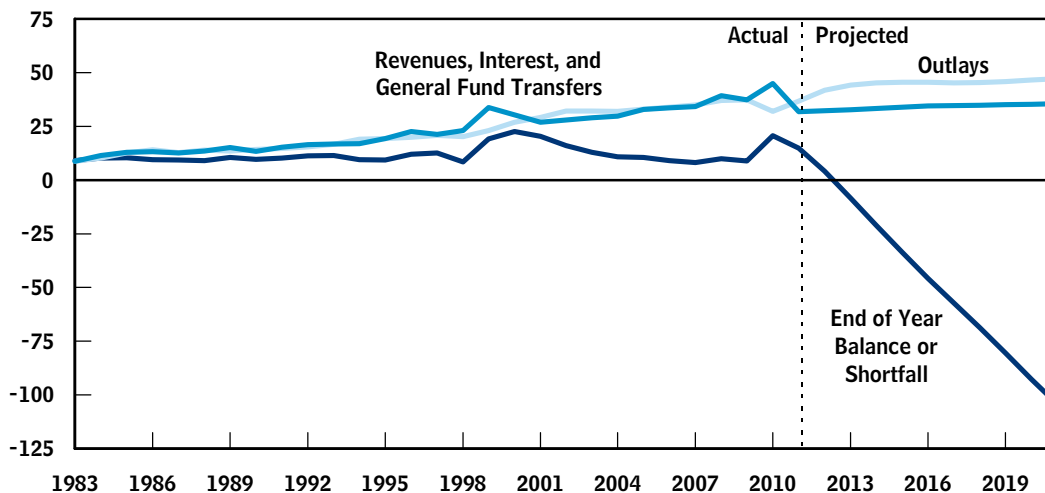
The most recent authorization law to govern spending from the trust fund is the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (often called SAFETEA-LU), which expired in 2009 but has since operated under a series of short-term extensions, the latest of which is set to expire on September 30, 2011. SAFETEA-LU provides specific amounts of contract authority and authorizes appropriations for some programs that are not funded through contract authority. It also

2. An authorization act is a law under the jurisdiction of a committee other than the House or Senate Committee on Appropriations. Budget authority is the authority provided by law to incur financial obligations that will result in immediate or future outlays of federal government funds.
3. An obligation limitation is a provision of a law or legislation that restricts or reduces the availability of budget authority that would have become available under another law (in this case, the authorizing law).

Figure 1.

Status of the Highway Account of the Highway Trust Fund

(Billions of dollars)



Source: Congressional Budget Office.

Note: Under current law, the Highway Trust Fund cannot incur negative balances. The negative balances shown above illustrate the projected inability of the fund to pay obligations as they are incurred by the states. If the Highway Trust Fund was unable to meet its obligations in a timely manner, spending on programs financed by the fund could continue more slowly, to keep pace with tax collections. The Department of Transportation has stated that if the fund faced a shortfall, it would ration the amounts it reimburses to states in order to maintain a positive balance in the fund.

specifies annual obligation limitations, which may be superseded each year by limitations set in appropriation acts.

History of the Highway Trust Fund's Revenues and Outlays

Highway Trust Fund balances once were stable, but over the past decade, the fund's receipts have fallen behind its expenditures. Balances in the highway account of the Highway Trust Fund were steady during the 1980s and the first half of the 1990s, in the vicinity of \$10 billion (see Figure 1). The most recent increase in the gasoline tax occurred in 1993; after the Taxpayer Relief Act of 1997 redirected 4.3 cents of that tax from the general fund to the Highway Trust Fund, the unexpended balance in the highway account began growing rapidly. Then, an agreement to spend down balances in the trust fund, which began with the enactment of the Transportation Equity Act for the 21st Century (known as TEA-21) in 1998, also eliminated the practice of crediting interest to the trust fund. Since 2001, outlays, which were boosted by TEA-21 and SAFETEA-LU, have generally exceeded revenues.

On several occasions since 2008, the Department of Transportation (DOT) has indicated that the trust fund would not meet its obligations on time without a transfer from the Treasury's general fund. Since then, the Congress has appropriated a total

of \$34.5 billion from the general fund to the Highway Trust Fund. In 2010, the Hiring Incentives to Restore Employment Act (Public Law 111-147) authorized the most recent transfer from the general fund and the resumption of interest credits to the trust fund. That law also shifted certain refunds for tax-exempt use of motor fuels, such as fuel consumed by state and local governments, from being paid out of the Highway Trust Fund to being paid out of the general fund, also boosting trust fund balances. Because of the infusion of general revenues, at the end of 2010, the account balances were positive: The highway account had \$20.7 billion and the transit account had \$8.9 billion.

Projections of the Highway Trust Fund's Revenues and Outlays

CBO estimates revenues and outlays independently to project what the trust fund's balances might be in the future. Revenues depend on the collection of various taxes. Under the rules that CBO follows in constructing its baseline revenue projections, the expiring excise taxes dedicated to the Highway Trust Fund are assumed to be extended beyond their scheduled expiration. Outlays depend on the obligation limitations set in appropriation acts as well as on the timing of spending for obligations that are incurred. For its projections, CBO assumes that policymakers will continue to control spending through such limitations. Furthermore, for the purpose of those projections, the agency assumes that appropriation acts will set obligation limitations equal to those enacted in the 2011 DOT appropriation act, adjusted for inflation.

If the current taxes are extended beyond their 2011 expiration date, CBO estimates, revenues and interest credited to the Highway Trust Fund will grow from \$36.9 billion in 2011 to \$40.9 billion in 2021. Over that period, the estimated rate of increase is projected to average a little more than 1 percent per year, which largely reflects expected growth in gasoline and diesel fuel consumption.

CBO bases its estimates of trust fund outlays for a given set of obligation limitations primarily on historical spending patterns, which reflect states' multiyear projects to plan and build roads, bridges, and other transportation infrastructure. Most obligations for the highway account involve capital projects on which money is spent over several years. (The federal-aid highway program, for example, typically spends about 25 percent of its budgetary resources in the year they are made available for spending; the rest is spent over the next several years.) Most of the highway account's existing obligations will therefore be met using tax revenues that have not yet been collected, because the obligations far exceed the amounts currently in the account. CBO estimates that at the end of 2011, the balance in the highway account will be \$14.8 billion but outstanding obligations will total about \$75 billion (by comparison, at the end of 2007, outstanding obligations totaled about \$45 billion).

Even if lawmakers set obligation limitations to increase at the rate of inflation, CBO estimates, outlays from the highway account would rise from \$32.0 billion in 2010 to \$36.7 billion in 2011 and subsequently to \$41.9 billion in 2012. That increase is largely attributable to the fact that general funds appropriated under the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5) temporarily displaced

some spending from the highway account in 2009 and 2010. States had greater incentive to use ARRA funds than highway account funds because they were required to obligate ARRA funds more quickly than highway account funds and because they did not need to contribute any state or local resources to projects using ARRA funds, as is the case for projects funded from the highway account. Now that funds from ARRA have mostly been spent, CBO expects that state governments will spend the unused balances from appropriations for regular programs of the trust fund. In addition, CBO anticipates that about \$2 billion from the highway account will be transferred to the mass transit account between 2011 and 2012 as states use some highway money for transit projects, as they are allowed.

Under those baseline assumptions, outlays would exceed revenues and interest credited to the highway account by about \$5 billion in 2011 and by almost \$10 billion in 2012. As a result, the highway account would be unable to meet its obligations sometime toward the end of fiscal year 2012 or early in fiscal year 2013, CBO estimates.⁴ In all, outlays would exceed revenues and interest credited to the highway account by about \$115 billion (or 31 percent) between 2011 and 2021.⁵ If obligation limitations were held constant at 2011 amounts rather than increasing with inflation, that gap would be \$85 billion (or 19 percent).

The situation for the Highway Trust Fund's mass transit account is similar. Under CBO's baseline projections and including transfers from the highway account, the obligation limitation for mass transit would grow from \$9.3 billion in 2010 to \$9.4 billion in 2012. Outlays would exceed revenues and interest credited to the mass transit account by about \$2.5 billion in 2011 and by about \$3.2 billion in 2012. The mass transit account would be able to meet obligations in a timely manner through 2012 but would be unable to meet some such obligations during 2013. Subsequently, projected spending from the transit account would exceed receipts by \$4 billion to \$5 billion a year, CBO projects.

Thus, future obligations for spending on transportation programs funded by the Highway Trust Fund will need to be significantly lower than in 2011, revenues available to the trust fund will need to be significantly higher, or both. If the Congress chose solely to cut spending, those cuts would need to decrease spending by about

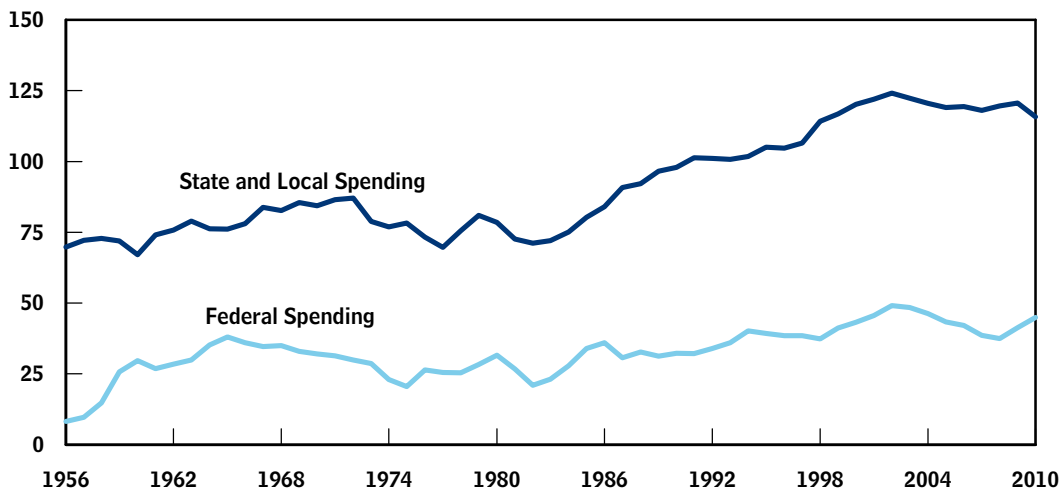
4. Under current law, the Highway Trust Fund cannot incur negative balances. If the trust fund is unable to meet its obligations in a timely manner, spending could continue more slowly, to keep pace with tax collections. DOT has stated that, in the event of a shortfall, reimbursements to states would be rationed to maintain a positive balance.

5. CBO's projections of spending from the trust fund are based on historical averages, but actual spending will differ from projections from year to year depending on such factors as the states' construction schedules and plans. Future revenues might differ from CBO's projections depending on changes in the price of oil, the economy, and the fuel efficiency of vehicles. Small deviations from the projections of spending and revenues, however, would not significantly affect the status of the Highway Trust Fund or the expected imbalance between obligations and resources.

Figure 2.

Spending for Highways, by Level of Government

(Billions of 2010 dollars)



Source: Congressional Budget Office based on information from the Census Bureau and the Bureau of Economic Analysis.

Note: State and local spending from 2008 through 2010 were estimated by updating prior-year spending for changes in the value of state and local highways.

one-third. If the Congress chose to boost revenues, it could do so by increasing taxes that are dedicated to the Highway Trust Fund or by making transfers from the Treasury's general fund.

How Much Should the Federal Government Spend on Highways?

Almost all spending on highway infrastructure in the United States comes from public funds. The private sector participates in building, operating, and maintaining highways, but the federal government and state and local governments typically determine which projects to undertake and how much to spend on them. Despite several prominent examples of private financing for highways, private spending constitutes just a small share of the total. Spending by federal, state, and local governments has increased over the past half-century (see Figure 2). In 2010, the federal government spent \$45 billion and state and local governments spent \$116 billion on highways.

Determining whether the federal government—rather than state or local governments—should fund infrastructure projects depends, at least in part, on whether a project will benefit the nation as a whole more than it will a particular state or locality. Economic efficiency could be improved if the federal government limited its support to projects (such as the Interstate highways) that offer significant multistate benefits, leaving state and local governments to fund projects with more localized benefits. If the people who benefit from a project bear its costs, the likelihood is diminished that

too large a project (or too many projects) will be undertaken or that too many infrastructure services will be consumed relative to the resources needed to provide them. In the past, the Congress also has considered other factors, including equity among the states and between urban and rural areas, in choosing which projects to fund.

Economic Returns on Public Spending for Highways

Highway spending has contributed to the nation's economic growth and prosperity and can continue to do so, depending on how and where funds are spent. Specifically, public investment in infrastructure can increase economic output by raising the stock of capital in the economy, thereby increasing the productivity of labor. Increasing transportation infrastructure would, in general, make it easier to move materials and workers to production facilities, supply finished goods to consumers, and transport service providers and customers to places of business. Consequently, workers would produce and deliver more in a given time and at a given cost. A more productive national economy would result in more goods and services and more resources for further investment and continued growth.

Over the past three decades, economists have produced a wide range of estimates of the benefits of investing in infrastructure.⁶ A review of the literature indicates that the returns on investment in public capital in the United States are positive, although they are lower than some early estimates suggested. The literature also suggests that the returns on the initial phase of a system of public investments can be large but that the economic payoff declines as the system expands. In particular, economic gains from investing in highways appear to have been greatest during the initial construction of the Interstate Highway System and to have fallen off since then. According to one study of data spanning the period from 1953 to 1987, that initial construction made vehicle-intensive industries in particular more productive, but capital spending after the system was essentially completed in 1973 appeared not to have affected productivity in those industries.⁷ Another study, which focused on the period after 1973, showed that even into the 1990s, the costs of logistics fell in vehicle-intensive industries because of highway improvements, although not as much as they had during the 1970s.⁸ One 2006 report stated that every dollar of capital or maintenance spending for highways in 1996 reduced annual congestion costs to drivers by \$0.11 that year.⁹

6. See Congressional Budget Office, *Issues and Options in Infrastructure Investment* (May 2008); and *The Economic Effects of Federal Spending on Infrastructure and Other Investments* (June 1998).

7. See John Fernald, "Roads to Prosperity? Assessing the Link Between Public Capital and Prosperity," *American Economic Review*, vol. 89, no. 3 (June 1999), pp. 619–638.

8. See Chad Shirley and Clifford Winston, "Firm Inventory Behavior and the Returns from Highway Infrastructure Investments," *Journal of Urban Economics*, vol. 55, no. 2 (May 2004), pp. 398–415.

9. Congestion costs reflect both the amount of gasoline consumed and the value of the time that motorists lose to traffic delays. See Clifford M. Winston and Ashley Langer, "The Effect of Government Highway Spending on Road Users' Congestion Costs," *Journal of Urban Economics*, vol. 60, no. 3 (November 2006), pp. 463–483.

Total benefits over time would be greater, but whether they would be enough to justify the costs would depend on what else would be forgone to pay for more highway investment and the rate at which new or improved highways deteriorate.

Options for Federal Spending

The Congress faces difficult decisions about how much to spend on highways. The options include the following:

- Spend only what is collected from highway users through the gasoline and other taxes that are credited to the Highway Trust Fund;
- Maintain current capital spending, adjusted for inflation;
- Spend enough to maintain the highway system's current performance; or
- Fund projects whose expected benefits exceed costs by a particular amount.

Those options could be coupled with policies to manage use of highways by imposing congestion pricing during periods of peak demand.

Spend Revenues Credited to the Highway Trust Fund. The highway account of the trust fund received \$30 billion in 2010 (see Figure 3). CBO projects that if current highway taxes are extended beyond their 2011 expiration date, revenues and interest credited to the Highway Trust Fund will rise at an average annual rate of a little more than 1 percent per year over the coming decade. That growth rate is slower than the expected growth in nominal gross domestic product, which CBO anticipates will increase by about 4 percent annually over the next 10 years—in part because fuel tax revenues depend on how much fuel is consumed and because fuel efficiency is expected to increase. Revenues for the highway account are projected to average \$34 billion annually over the 2011–2021 period.

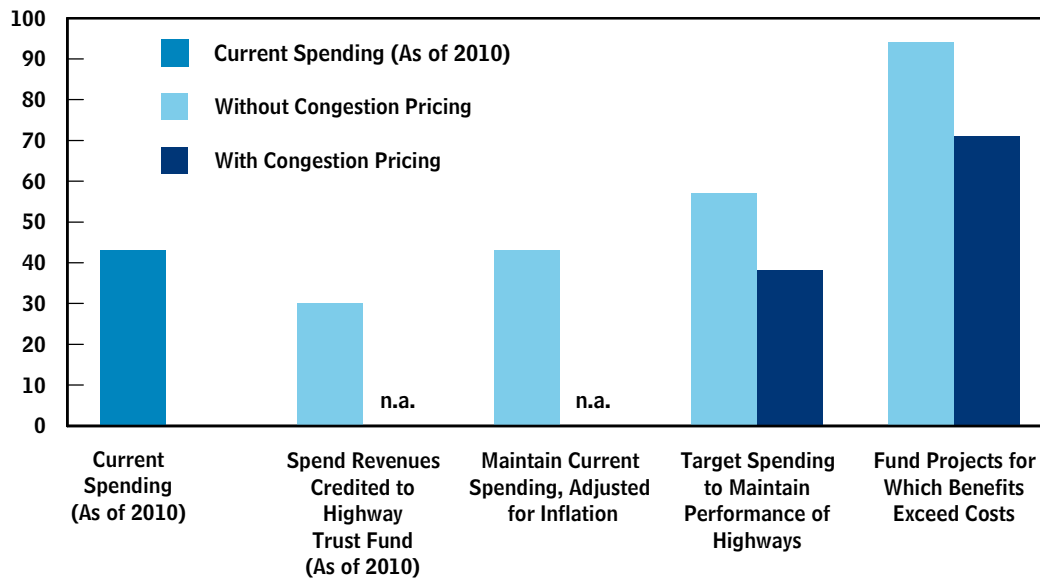
Maintain Current Capital Spending, Adjusted for Inflation. Total federal spending on highway infrastructure for 2010 amounted to \$45 billion. Historically, federal spending for highway infrastructure has been predominantly for capital spending. Of that \$45 billion, \$43 billion was spent on capital projects, and \$2 billion was spent on operations and maintenance. Real spending (that is, spending adjusted for inflation, in this case because of the rising costs of highway construction) by the federal government for highway construction has increased, on balance, over the past 30 years (see Figure 4). However, real spending declined in the middle of the 2000s, when the cost of materials increased sharply because of higher demand, attributable in part to a boom in residential and commercial construction in the United States and in part to increased demand from countries such as China.

Target Spending to Maintain Performance of Highways. Spending could instead be targeted to achieve specific goals for highway system performance, such as

Figure 3.

Selected Options for Annual Federal Capital Spending for Highways, With and Without Congestion Pricing

(Billions of 2010 dollars)



Source: Congressional Budget Office based on Department of Transportation, Federal Highway Administration and Federal Transit Administration, *2008 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, Chapter 8.

Notes: Current spending is for capital projects and excludes \$2 billion spent by the federal government for operations and maintenance.

n.a. = not applicable.

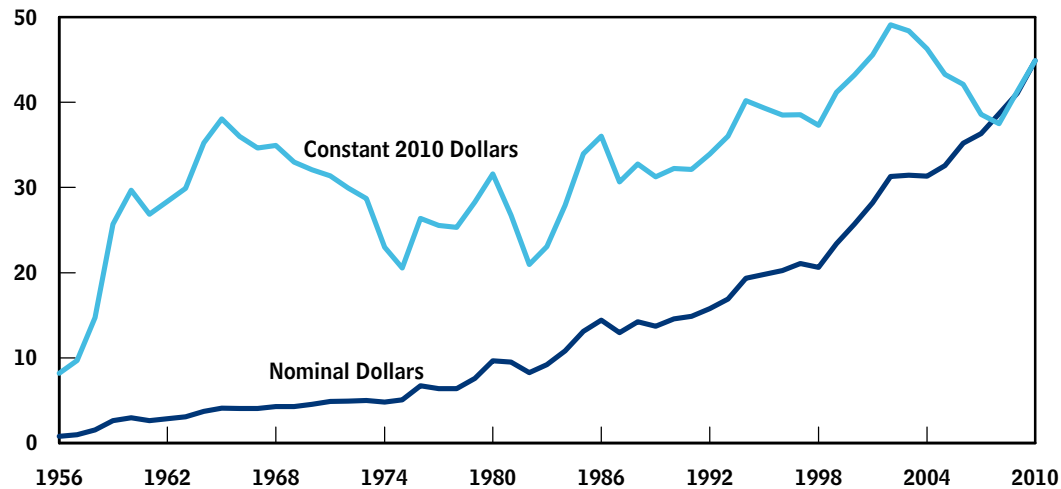
maintaining average delays or pavement quality. According to the FHWA, if current spending for highway capital was maintained over the coming decades, even adjusted for inflation, the performance and quality of the highway system would decline. On the basis of the FHWA's most recent projections (using 2006 data), CBO estimates that maintaining the current performance of the highway system would require \$127 billion per year in combined capital spending by federal, state, and local governments.¹⁰ Historically, federal capital spending has constituted about 45 percent of all such spending. If the FHWA's assessment is accurate, and if the federal government

10. See Department of Transportation, Federal Highway Administration and Federal Transit Administration, *2008 Status of the Nation's Highways, Bridges, and Transit: Conditions and Performance*, pp. ix, xii. The FHWA's report defines the system's performance in terms of average user costs, including the costs of travel time, operations, and accidents. The FHWA's estimate is similar to the \$131 billion (in 2008 dollars) estimated by the Congressionally chartered National Surface Transportation Infrastructure Financing Commission for the average annual spending needed to maintain the current performance of the highway system. See National Surface Transportation Infrastructure Financing Commission, *Paying Our Way: A New Framework for Transportation Finance* (February 2009), p. 53. Unless otherwise noted, figures in the text that are based on the FHWA's spending estimates are expressed in 2010 dollars.

Figure 4.

Total Federal Spending for Highways, in Constant and Nominal Dollars

(Billions of dollars)



Source: Congressional Budget Office based on information from the Department of Commerce, Bureau of Economic Analysis.

funded a share of that total in proportion to its historical average, then the federal portion would be about \$57 billion per year. That amount exceeds what the federal government actually spent in 2010 by \$14 billion, or about one-third. State and local governments also would need to increase their spending significantly to meet that target.

Fund Projects for Which Benefits Exceed Costs. By the FHWA's estimates, the amount of public spending that could be justified for projects whose benefits outweigh their costs would be \$209 billion per year. If the federal government maintained its historical share of funding, federal annual capital spending for highways would need to be about \$94 billion, an increase of about \$51 billion from the \$43 billion spent in 2010; that increase would represent more than a doubling of federal spending.

Selecting projects carefully can increase the highway system's contribution to the performance of the economy. Even within a group of projects for which the benefits exceed the costs, some projects will offer greater returns than others. Systematically ranking and funding projects to identify those with the highest net benefits, and then undertaking those projects, could yield a large share of total possible benefits at a lower overall cost. For example, if benefits had to exceed costs by some stated amount (such as 20 percent or 50 percent), those estimates of future spending would be lower. According to the FHWA's analysis, \$188 billion per year would pay for all projects whose benefits outweighed their costs by at least 20 percent; and \$165 billion would pay for projects whose benefits exceeded costs by at least 50 percent. In either

scenario, travel delays and user costs would be less than they are currently, and pavement quality would be expected to improve.

The size of returns on investments in infrastructure depends on the investments undertaken and the type and amount of infrastructure already in place. For example, the FHWA groups capital spending into three categories, one each for expanding, enhancing, or rehabilitating highways. According to the FHWA's analysis of future needs, spending for Interstate highways should shift over time, going more toward expansion and less toward rehabilitation if the goal is to sustain the system's performance.¹¹

Use Congestion Pricing. If highway users were charged fees that reflected the costs of driving when traffic was especially heavy, the existing infrastructure would be used more efficiently and the demand for future spending would be lower. Specifically, congestion pricing would result in fewer trips whose value to the driver was less than the costs of additional congestion imposed on other drivers. To the extent that some drivers would avoid paying a fee by choosing not to drive during peak hours, congestion would be reduced; the eventual outcome would be less need for spending on highways.¹²

According to the FHWA's estimates, widespread use of congestion pricing would reduce by nearly one-third the amount of capital investment needed to sustain the operational performance and condition of the highway system—from \$127 billion per year to about \$85 billion per year. The federal share, at the historical average of 45 percent, would be \$38 billion—a little less than federal highway spending in 2010. Congestion pricing could reduce spending by about one-quarter, from \$209 billion to \$158 billion, for the set of projects for which benefits exceed costs. On the basis of historical averages, the federal share of that figure would be \$71 billion.

How Should the Federal Government Direct the Use of Highway Funds?

A second major issue facing the Congress is how best to direct federal spending for highways. From the point of view of economic efficiency, which level of government directs the use of highway funds should depend on who will benefit from the projects and who will bear the costs. The level of government with the incentives and information to weigh all of the costs and benefits is best positioned to make efficient decisions about highway investment.

If guided by that general principle, the federal government would select highway projects of national importance that provide broad geographic benefits, whereas state and

11. Department of Transportation, *2008 Status of the Nation's Highways, Bridges, and Transit*, Chapter 8.

12. For a comprehensive discussion of the benefits and challenges of congestion pricing, including options for its design and implementation for highways, see Congressional Budget Office, *Using Pricing to Reduce Traffic Congestion* (March 2009).

local governments would be better situated to select highway projects if the benefits accrue primarily in their jurisdictions and their taxpayers would fund the projects. For projects that involve a mix of federal, state, and local benefits, efficiency is enhanced when decisionmaking can be coordinated among federal, state, and local governments and the costs can be shared. In contrast, transfers from the federal government may cause state and local governments to undertake some projects for which the costs exceed the benefits simply because federal money is available to be spent.

Some mechanisms that have been proposed would change the way the federal government directs a portion of spending for infrastructure, including highways, by placing decisions about which projects to fund in the hands of a federal infrastructure bank that selects projects on the basis of cost–benefit analysis rather than according to the geographic distribution of funds among the states. Concerns about project selection also have motivated federal and state initiatives to encourage private entities to finance highways.

Federal funds to support highway projects currently are provided in three different forms: grants to states; loan guarantees and other forms of credit assistance to states and localities; and tax preferences for debt issued by state and local governments for their own projects or for those undertaken by private entities on behalf of the public sector. In addition, partnerships between state and local governments and private entities sometimes use federal funds to support highway projects.

Federal Grants to States

About four-fifths of the funding appropriated to DOT for highways under SAFETEA-LU from 2005 to 2009 was distributed according to formulas. Those formulas allocated spending to states through various programs for constructing, improving, and maintaining highways and bridges; enhancing safety; reducing pollution; planning; and promoting alternative forms of transportation.¹³ The formulas apply criteria that typically are related to the use and extent of state roadways (such as each state’s share of highway lane-miles, vehicle-miles traveled, or fuel use) to determine a state’s share of funds. An additional formula program, the Equity Bonus program, guarantees that each state’s share is at least a specified percentage of that state’s contributions to the highway account of the Highway Trust Fund. Once the Congress determines the formulas and the grants have been allocated, the states select the projects.

In most cases, the law requires that state and local governments match some portion—generally 20 percent—of federal highway funds.¹⁴ If capital spending is anticipated to provide predominantly local benefits, however, the federal government

13. See Department of Transportation, Federal Highway Administration, *Highway Statistics 2009* (December 2009), Table FA-4A, for a list of 2010 apportionment formulas. For descriptions of various programs see Department of Transportation, Federal Highway Administration, “Fact Sheets on Highway Programs,” www.fhwa.dot.gov/safetealu/factsheets.htm.

14. In general, the match is smaller for some projects on Interstate highways and for projects in states with high concentrations of tribal or federal land.

could place more of the responsibility of paying for highway infrastructure with state and local governments by increasing the required matching rate. Evidence suggests that if federal spending decreases, state spending will increase somewhat. Confirming earlier analyses, the Government Accountability Office has reported that states reduced their own funding to offset roughly half of the increase in the federal highway grants that occurred during the 1990s.¹⁵ Effectively, although an 80 percent federal contribution might be required to induce state and local spending on some projects that generate primarily national benefits, a smaller federal contribution might have been sufficient to foster state and local spending on most projects. Raising the state and local matching rate above 20 percent would reduce the ability of those governments to substitute federal grants for their own funding and thereby divert to other uses some funds they otherwise would have spent on highways.

Moreover, formula grants are not closely linked to the performance of the transportation system. Although the current formulaic approaches to dividing federal resources for highways among the states may address notions of equity, the formulas do not necessarily promote the most economically advantageous projects. For example, the economic benefits of highway spending may be greater in areas with more traffic congestion or in areas of greater anticipated population growth and economic activity, but the current approach may direct federal resources to other areas. Similarly, costs to construct and improve highways could depend more on population density and geographic features than on other factors that are more important in the formulas, such as the size of a state's highway system and its recent volume of highway use.¹⁶

The remaining one-fifth of highway funding provided by SAFETEA-LU was allocated through mechanisms other than formulas to special-purpose programs and specific projects. The funds were divided among states on the basis of criteria specified in law or at the discretion of the Secretary of Transportation. About half of that amount was directed by the Congress to individual projects, such as building a specific bridge or widening a particular stretch of road. The Congress may specify particular projects for reasons it deems appropriate—equity, efficiency, or some other consideration—but to the extent that the selection of those projects gives little weight to efficiency, the federal government could promote efficiency by encouraging the funding of high-value projects through more systematic analyses of costs and benefits.

On occasion, highway funding has been distributed competitively to states and localities that apply for DOT funding. ARRA authorized \$1.5 billion for the Transportation Investment Generating Economic Recovery program (known as TIGER),

15. See Government Accountability Office, *Federal-Aid Highways: Trends, Effects on State Spending, and Options for Future Program Design*, GAO-04-802 (August 2004), www.gao.gov/products/GAO-04-802.

16. For a discussion of the importance of performance metrics for transportation, see National Transportation Policy Project, *Performance Driven: A New Vision for U.S. Transportation Policy* (Washington, D.C.: Bipartisan Policy Center, June 2009), www.bipartisanpolicy.org/library/report/performance-driven.

which provided grants that would fund up to 100 percent of the cost of various highway, bridge, transit, rail, and port projects. DOT chose state and local recipients on the basis of the results of cost–benefit analyses, among other criteria, and recipients had to demonstrate a significant benefit from the project for the nation, a region, or a metropolitan area.

Federal Loans and Loan Guarantees

The federal government also directs resources to state and local governments by providing and guaranteeing loans for infrastructure. Such credit assistance reduces state and local governments’ costs because it allows borrowing at interest rates that are lower than otherwise might be available. Specifically, in providing loans and loan guarantees, the federal government assumes the risk that would be borne by a lender and paid for by a borrower in the form of higher interest rates.

The cost to the federal government of providing loans and loan guarantees largely depends on the cost of each loan and the number of loans made:

- The cost of each loan or loan guarantee depends on the creditworthiness of the projects financed by the loan and the structure of the loan. Creditworthiness depends on the borrower’s likelihood of defaulting on the loan and on the lender’s prospects for recovering the amounts owed if a default occurs. The loan’s cost also depends on the structure of the loan, including the loan’s period of repayment; the effective interest rate, including fees; whether the debt is subordinate to other debt (meaning that it is repaid only after other debts are repaid in the event of default); and whether the borrower can choose to defer payments to the federal government.
- The number of loans and loan guarantees made depends on demand and on limits on the amount of loans or loan guarantees that the government is authorized to make. Demand for loans and loan guarantees depends on the size of the subsidies provided and on how those subsidies compare with subsidies offered through the tax code and by other federal programs for financing infrastructure. Demand also is limited by the total value of loans that the federal government is authorized to make or guarantee. In some cases, appropriation acts specify a maximum amount of loans or guarantees. For most credit programs, however, the budget authority appropriated for the subsidy cost ultimately limits the number of loans issued or guaranteed.

The Federal Credit Reform Act of 1990 (FCRA) requires the subsidy costs of loans and loan guarantees to be calculated on an accrual basis—unlike most items in the federal budget, which are calculated on a cash basis—and those subsidy costs must be recorded in the budget when loans are disbursed and loan guarantees are committed to. As a result, the lifetime cost of a credit commitment is recognized in the year in which the loan or loan guarantee is made. The budgetary impact of most federal credit programs is calculated by that method.

The lifetime cost of a direct loan or loan guarantee is calculated as the net present value of expected cash flows over the life of the loan or loan guarantee (including any fees paid by the borrower to the government).¹⁷ Under FCRA, net present value is estimated by discounting cash flows back to the time a loan is disbursed or commitment of a loan guarantee is made using the interest rates on Treasury securities of comparable maturity. (For example, cash flows that will occur one year after disbursement are discounted using the rate on one-year Treasury securities; flows that will occur five years out are discounted using the five-year rate; and so on.)

The budgetary cost of a credit program tends to be lower than the budgetary cost of an economically equivalent grant or benefit payment because FCRA accounting does not provide a comprehensive measure of the economic cost of credit assistance. Through its use of Treasury rates for discounting, FCRA implicitly treats market risk—a type of risk that investors require compensation to bear—as having no cost to the government. Specifically, FCRA’s procedures incorporate the expected cost of defaults on government loans or loan guarantees but not the cost of uncertainty about the magnitude of those defaults. Investors require compensation (a “market risk premium”) to bear certain types of risk. The market risk premium on a risky loan or guarantee compensates investors for the increased likelihood of sustaining a loss when the overall economy is weak and resources are scarce; that likelihood is reflected in higher expected returns and lower prices for assets that carry more market risk. Taxpayers bear the investment risk for federal credit obligations. When a borrower defaults on a loan, the loss ultimately must be covered by higher taxes or by reduced spending on other programs. By omitting the cost of market risk and thereby understating the economic cost of federal credit obligations, FCRA accounting may lead policymakers to favor credit assistance over other forms of aid that have a similar economic cost.¹⁸

An important aspect of the budgetary treatment of federal credit programs is that agencies must receive an appropriation equal to the estimated subsidy cost before they can make or guarantee a loan. In the case of direct loans, FCRA specifies that loan repayments are unavailable for future spending; those repayments are already accounted for in the estimated net present value of the loan, so they are not available to “revolve” into new loans. Such a revolving fund is the model on which many state infrastructure banks are based. However, for the federal government, those repayments represent part of the financing for the original loans and are implicit in the

17. Present value is a single number that expresses a flow of current and future payments in terms of an equivalent lump sum received today. Thus, a \$100 million, 30-year loan disbursed in 2011 that is determined to have a subsidy cost of 10 percent would be recorded as \$10 million in budget authority and \$10 million in outlays on the budget that year. The cash flows repaid to the government over the next 30 years (principal and interest) would not be recorded on the budget (except for credit reestimates, which are adjustments made to the original subsidy rate).

18. Moreover, subsidy rates computed under FCRA exclude federal administrative costs, even those that are essential for preserving the value of the government’s claim to future repayments, such as loan servicing and collection costs; those costs are accounted for separately in the budget.

subsidy calculation. Allowing loan repayments to be used for new loans—without any additional appropriation to cover the subsidy costs of the new loans—would raise the effective subsidy cost on the original loans to 100 percent (the same as for grants).

Because the federal budget records the lifetime cost of loans and loan guarantees rather than the initial amount of lending, loans and loan guarantees with a given budgetary cost lead to more money flowing initially to projects than if that same budgetary cost was incurred through grants or other direct payments to the states. As a result, credit assistance initially provides greater leverage for federal funds than grants and other direct payments do. Unlike grants and other direct payments, however, funds borrowed under credit assistance programs ultimately must be repaid by state and local governments or by users of the projects that are financed by the credit.

A program created by the Transportation Infrastructure Finance and Innovation Act of 1992 (TIFIA) provides credit assistance for highways and other types of surface transportation infrastructure. Some recent proposals would create a federal infrastructure bank to offer similar assistance under a different organizational structure.¹⁹ Whether federal credit assistance is provided through a federal program or a special entity, however, it involves similar budgetary costs to the federal government. Therefore, differences between the existing TIFIA program and an infrastructure bank would be primarily operational, concerning the scope of infrastructure to fund, the kinds of credit assistance to provide, the selection process for projects, the amount of leverage to provide for federal funds, and the amount of private-sector participation to encourage or require.

Transportation Infrastructure Finance and Innovation Act. The TIFIA program offers federal loans to qualifying state and local projects for up to 35 years at the interest rate on a Treasury security of similar maturity. (For example, 4.26 percent was the rate for a 30-year Treasury bond as of May 5, 2011.) It also provides loan guarantees and lines of credit. TIFIA assistance can be used for up to one-third of a project's costs.

DOT administers the TIFIA program and selects projects on the basis of criteria, established by statute, that include an analysis of a project's benefits and costs and whether it has national or regional significance. Loans made by the federal government at Treasury rates for risky projects represent taxpayer-financed subsidies, and riskier projects involve larger subsidies. TIFIA loans are restricted to projects that are considered relatively safe—as evidenced by a high rating from a credit-rating agency—to keep the subsidy rate relatively low. (Subsidy rates average around 10 percent.) As access to credit became more restricted during the recent financial crisis, demand for TIFIA assistance outpaced availability, and project selection became competitive.

19. Other government programs that provide credit assistance for infrastructure projects include the Environmental Protection Agency's grants for states' revolving loan funds for water projects and states' infrastructure banks, all of which are capitalized with federal funds and administered by states.

Several features of the TIFIA program attract private finance. The program subsidizes credit assistance, and TIFIA loans encourage private-sector participation by having lower priority for repayment than private debt in the event of a default.²⁰ TIFIA's loan terms also allow private managers to defer repayment for up to five years after a project's completion—a valuable benefit, for example, if there is uncertainty about how much toll revenue a highway project will generate.

From fiscal year 2005 through fiscal year 2010, the TIFIA program provided about \$5 billion in loans for highways, transit, and intermodal projects, supporting \$18 billion worth of projects. As authorized by SAFETEA-LU and its extensions, TIFIA received about \$732 million of budget authority over that period.

Proposals for a Federal Infrastructure Bank. In recent years, the Congress has considered several proposals for establishing a federal bank to fund infrastructure projects through loans and grants. The President's budget requests have suggested creating a similar entity. In principle, an infrastructure bank could use any of several methods to finance projects, including providing federal loans, lines of credit, and guarantees for private loans. Moreover, some proposals suggest mechanisms for disbursing grants to fund projects that would not create enough revenue to repay a loan.

An infrastructure bank could focus on financing transportation infrastructure, or it could define infrastructure more broadly to include sewers, wastewater treatment facilities, drinking water supply facilities, broadband Internet access, or even schools. A federal infrastructure bank could be located within an existing federal agency, such as DOT or the Treasury, or it could be created as a separate entity. Most proposals would have such a bank select projects on merit, considering, for example, their likely impact on the national or regional economy.

Some financial and transportation analysts contend that making funds available through an infrastructure bank would encourage state and local governments to work together across jurisdictional lines and transportation modes to plan and complete comprehensive projects. For example, an infrastructure bank could participate in developing projects that involve more than one mode of transportation—although the Congress could encourage this otherwise through language authorizing more funding for mass transit or other projects involving more than one mode of transportation. As another example, an infrastructure bank could fund cross-jurisdictional projects by helping different government entities gain coordinated access to credit markets.

Other analysts point to the potential capacity of an infrastructure bank to use cost-benefit analysis effectively in project selection. The capacity of state and local governments to complete such analyses varies significantly, and proponents believe

20. However, upon bankruptcy, insolvency, or liquidation of an asset backed by a TIFIA loan, that loan would have equal priority with private debt in its claim for repayment.

that a bank could help bolster that capacity nationwide, thus leading to better selection of projects overall.

In addition, some financial and transportation analysts suggest that an infrastructure bank could encourage more private funding of infrastructure projects by using funds more efficiently than occurs under the current system of distributing formula grants. By providing federal funds that reduce the amount of private investment a project requires, for example, an infrastructure bank could allow projects that rely on tolls or other funding mechanisms to offer returns sufficient to attract private-sector participation. As a result, private-sector entities, in conjunction with state and local governments, could choose to fund projects that, in the absence of federal financial assistance, would not be built.

Regardless of how it was constituted, however, an infrastructure bank would be unlikely to supplant the established methods of distributing most federal infrastructure funds. One limitation is that few surface transportation projects are good candidates for bank funding because they mostly do not involve toll collections or other mechanisms for charging users directly to repay construction loans. Furthermore, about three-quarters of current federal funds spent on surface transportation are used to maintain existing infrastructure. Those projects are not good candidates for funding from an infrastructure bank because, in general, they would not generate revenue that could be used to repay loans.

Tax Preferences

The federal government provides several types of tax preferences for infrastructure financing. Tax-exempt bonds use the well-established tax preference of paying interest that is not subject to federal income tax. Such bonds can be issued to finance either the functions of state and local governments or certain projects undertaken by the private sector. A second, more recent type of tax preference for infrastructure financing is used by tax credit bonds. Such bonds come in two basic forms: those that provide a tax credit to the bondholder in lieu of interest and those that provide a tax credit to the bond issuer, payable by the Secretary of the Treasury. Tax-exempt and tax credit bonds alike transfer some of the cost of borrowing from state and local governments and the private sector to the federal government in the form of forgone federal tax revenues.

In contrast to grants and credit assistance, tax preferences are outside the annual appropriation process, so the federal government may exercise less oversight over their allocation. Also, because forgone revenues do not appear directly in the federal budget, the use of tax preferences can mask the full scope of the government's financial activities. Moreover, some tax preferences are an inefficient way to deliver a federal financial subsidy to state and local governments. With a tax exemption for interest income, for example, state and local borrowing costs are reduced by significantly less than the federal revenues that are forgone, and the remainder of that tax expenditure

accrues to bond buyers in the highest income tax brackets. Modifying federal tax preferences for infrastructure financing by increasing the use of tax credit payments made directly to borrowers can improve both budgetary practice and economic efficiency.²¹

Tax-Exempt Bonds. Federal tax exemptions for interest income from government bonds (and qualified private activity bonds—bonds issued by a government on behalf of a private entity—under certain circumstances) enable issuers of such debt to sell bonds that pay lower rates of interest than do taxable bonds with the same maturity, risk, and so on. Because purchasers of tax-exempt bonds demand a return that is at least as high as the after-tax yield they could obtain from comparable taxable bonds, the amount by which the return from tax-exempt bonds is lower than the yield on comparable taxable bonds depends on the income tax rate of the marginal (or market-clearing) buyer of tax-exempt bonds.²²

The amount of subsidy that state and local borrowers receive by issuing tax-exempt bonds is largely determined indirectly by the federal tax code. Data on tax-exempt and taxable bond transactions allow estimation of the marginal tax rate faced by the market-clearing buyer of tax-exempt bonds and, thus, the amount that states and localities save in financing costs by issuing such bonds. In 2007, the average yield on (taxable) high-grade corporate bonds was 5.6 percent, and the average yield on tax-exempt municipal bonds of similar creditworthiness was 4.4 percent—a difference of 1.2 percentage points, or approximately 21 percent of the taxable return. That 21 percent also represents the marginal tax rate at which an investor would be indifferent between purchasing a taxable bond yielding 5.6 percent and a tax-exempt bond yielding 4.4 percent. Thus, the market-clearing investor in 2007 paid income tax at a rate of 21 percent—which is also the average implicit income tax rate observed for such buyers of tax-exempt bonds during the two decades just before that, according to the staff of the Joint Committee on Taxation.²³ Investors' appetite for risk, the desired time-horizon of their investments, and other bond-specific features can also influence the demand for taxable and tax-exempt debt. The implicit tax rate of the marginal buyer of tax-exempt bonds fell to an average of about 15 percent per year from 2008

21. For a more complete discussion of how federal tax preferences operate in financing investment in highways and other infrastructure, see Congressional Budget Office and Joint Committee on Taxation, *Subsidizing Infrastructure Investment with Tax-Preferred Bonds* (October 2009).

22. Issuers of tax-exempt debt need to increase the interest rate they pay until the pool of bond purchasers is large enough to purchase all of the debt the issuers are bringing to market. The marginal buyer of tax-exempt bonds will typically demand a higher tax-exempt yield than someone in a higher income tax bracket does. Issuers raise the interest rate enough that the yield on tax-exempt bonds is competitive with the rate of return on taxable instruments (after taking taxes into account) to draw in bond buyers from lower income tax brackets. The market-clearing buyer thus determines the interest rate that issuers of tax-exempt bonds must pay—and, implicitly, the savings in financing costs that issuers enjoy relative to issuing taxable debt.

23. See Joint Committee on Taxation, *Present Law and Issues Related to Infrastructure Finance*, JCX-83-08 (October 24, 2008), p. 28, www.house.gov/jct/x-83-08.pdf.

to 2010 because turbulence in financial markets led investors to favor less risky debt—such as U.S. Treasury securities—which reduced the yield on those securities relative to tax-exempt debt.²⁴

However, the loss in federal revenues results from both the market-clearing investor and investors in higher income tax brackets. Several analysts suggest that about 80 percent of the tax expenditure from tax-exempt bonds translates into lower borrowing costs for states and localities, with the remaining 20 percent taking the form of a federal transfer to bondholders in higher tax brackets.²⁵ If 20 percent of the federal revenue loss from tax-exempt bonds accrued to that group without lowering borrowing costs, and if the outstanding stock of tax-exempt debt for infrastructure during the 2010–2014 period instead took the form of tax credit bonds designed to deliver the same amount of interest subsidy per year, the federal government would save more than \$32 billion (20 percent of an estimated \$162 billion in tax expenditure).²⁶ Moreover, a direct appropriation of funds would purchase more infrastructure per dollar of impact on the federal budget.

Tax Credit Bonds. Starting in the late 1990s, the Congress turned to tax credit bonds as a way to finance public expenditures. In their early form, tax credit bonds allow bondholders to receive a credit against federal income tax liability instead of—or in addition to—the cash interest typically paid on the bonds. The amount of tax credit equals the credit rate, which is set by the Secretary of the Treasury, multiplied by the face amount of the holder’s bond. Because bondholders pay taxes on the amount of credit they claim, tax credit bonds do not, in contrast to tax-exempt debt, provide a revenue transfer to investors in high marginal tax brackets. As a result, the revenues forgone by the federal government through tax credit bonds reduce state and local borrowing costs dollar for dollar. Tax credit bonds also allow the amount of federal subsidy to be determined independent of other federal policy decisions (such as marginal income tax rates). Thus, tax credit bonds offer the promise of increasing

24. CBO calculation based on Council of Economic Advisers, *Economic Report of the President* (February 2011), Table B-73, p. 276, www.gpoaccess.gov/eop/.

25. See Dennis Zimmerman, *The Private Use of Tax-Exempt Bonds: Controlling Public Subsidy of Private Activity* (Washington, D.C.: Urban Institute Press, 1991), pp. 103–104; and James Poterba and Ramirez Verdugo, *Portfolio Substitution and the Revenue Cost of Exempting State and Local Government Interest Payments from Federal Income Tax*, Working Paper 14439 (Cambridge, Mass.: National Bureau of Economic Research, October 2008), www.nber.org/papers/w14439.

26. In addition to being an inefficient means of providing a subsidy for debt financing, tax-exempt bonds also are regressive: The amount by which the benefits captured by an investor exceeds the issuer’s cost savings increases with the investor’s marginal tax rate. One study estimates that eliminating the tax exemption on state and local debt would reduce after-tax income primarily for taxpayers in the highest income quintile—and particularly for individuals in the top 1 percent of the income distribution. See Leonard Burman, Eric Toder, and Christopher Geissler, *How Big Are Total Individual Income Tax Expenditures, and Who Benefits from Them?* Discussion Paper 31 (Washington, D.C.: Urban Institute, December 2008), p. 11, www.urban.org/publications/1001234.html.

the efficiency and equity with which federal resources are allocated to support infrastructure and other investments.

ARRA authorized Build America Bonds, a new type of tax credit bond that was sold only in 2009 and 2010. State and local governments were authorized to issue Build America Bonds either as traditional tax credit bonds or, if certain conditions were met, as direct-pay tax credit bonds (known as qualified Build America Bonds). In contrast to earlier tax credit bonds, Build America Bonds have an interest rate (or coupon) that is set by the issuer rather than by the Secretary of the Treasury. In the direct-pay scenario, a credit equal to 35 percent of each interest payment could be claimed by the issuer in lieu of a tax credit going to the bondholder. Because state and local governments issuing direct-pay Build America Bonds are not liable for taxes on that credit, they pay less interest than they would for Build America Bonds that provide the credit to the bondholder. As a result, the direct-pay version of Build America Bonds proved to be the one used by issuers. Sales of those bonds financed \$38 billion in transportation spending in 2009 and 2010.²⁷

Direct-pay tax credit bonds offer several advantages over other types of tax-preferred bonds. Making a payment directly to state and local governments to compensate them for the interest they pay on a direct-pay tax credit bond is a more cost-effective way to provide a federal financing subsidy than offering a tax exemption on interest income. And unlike other tax preferences, interest subsidies on direct-pay bonds appear as outlays in the federal budget, making the cost of that financial subsidy more transparent and, in principle, enabling comparison with other federal outlays for the same purposes. Also, because the yields provided to holders of direct-pay tax credit bonds are similar to the yields of other taxable securities, direct-pay tax credit bonds are more attractive to tax-exempt entities than other tax credit bonds and thereby potentially increase the pool of funds available to state and local governments to finance their investments in infrastructure and other activities.

Public–Private Partnerships

Public and private financing are distinguished by the entity that issues debt or raises equity to provide the funds for a project. In the traditional approach to building highways, a state or local government uses its own tax receipts, federal grants, public bond issues, and sometimes toll revenues to cover the costs of construction. In public–private partnerships that include private financing, the private partner enters into contracts with a state or local government to build and finance a highway in exchange for future payments from the public sector or the right to collect toll revenues. To finance construction, the private entity usually raises equity or borrows in the private capital market. It does so with the expectation that some combination of future toll revenues and payments from state and local governments will cover the project's costs, which include debt payments and a market return to equity holders.

27. Section 301 of the Hiring Incentives to Restore Employment Act extended the direct-pay provision to other tax credit bonds: new clean renewable energy bonds, qualified energy conservation bonds, qualified zone academy bonds, and qualified school construction bonds (also authorized by ARRA).

Although private sources can provide additional financing for infrastructure, that financing needs to earn a return over time—and the ultimate sources of payment for the return on private financing are the same as the sources of public financing, namely taxes or user fees. Therefore, private financing does not provide truly new resources for infrastructure investment.

Still, an argument is sometimes made that public–private partnerships can accelerate the availability of funds for infrastructure investment by tapping private capital markets in ways that governments cannot or will not. That contention holds only in the context of the legal constraints that states and localities face and in the context of their budgetary practices. For example, many states and localities have statutory or constitutional limits on borrowing, and budgetary practices used to assess borrowing generally include standard debt instruments but may not include other types of future obligations, such as those made through public–private partnerships. Although some limits are informal or easily bypassed, many limits cannot be raised without voter approval or a legislative supermajority. When limits cannot be raised, states may turn to private debt or equity to finance roads. Traditional financing is therefore restricted not only by constituent aversion to taxes, which provide the stream of revenues that make bond issuance possible, but also by statutory or constitutional limits on borrowing.

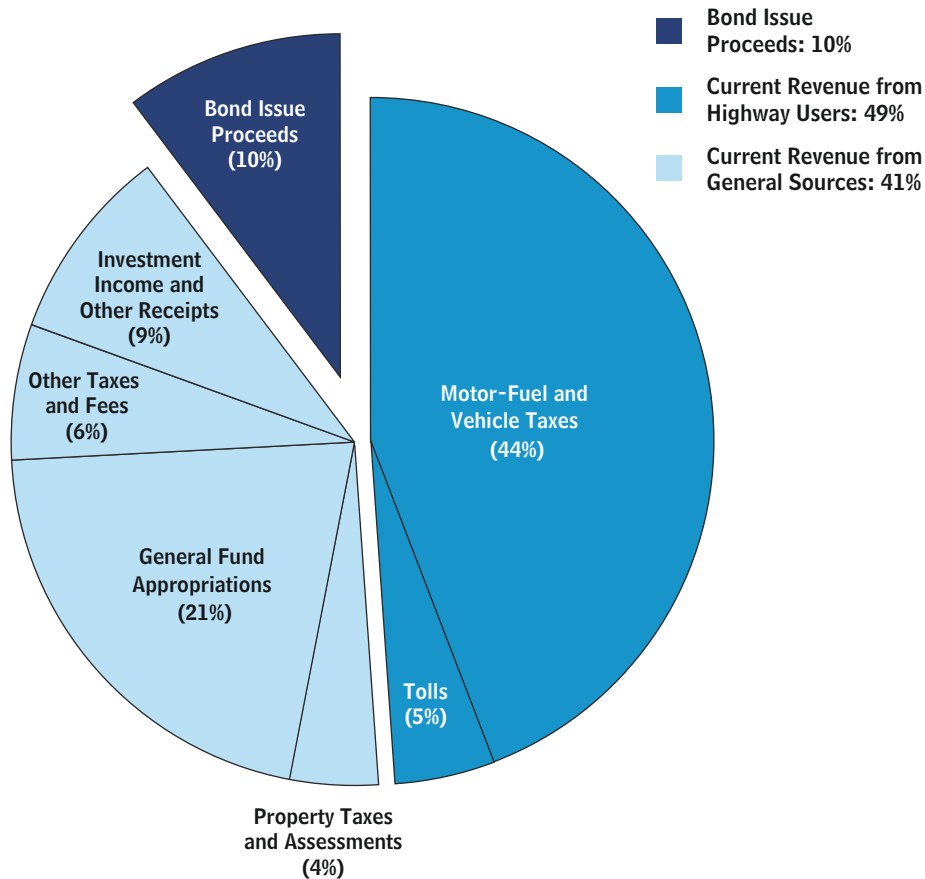
Several privately financed highway projects that relied on toll revenues have struggled financially, beset by inaccurate revenue projections and encumbered with high debt service payments. As a result, subsequent projects that are still under construction have been put together differently, reducing the private partner’s exposure to the uncertainty of demand for driving on the highway and keeping down debt service payments, which have amounted to the largest continuing cost for past projects with private financing. States more commonly offer private partners state revenues—so-called availability payments—instead of, or in addition to, tolls; in doing so, they assume a part of the risk that tolls will fall short of expectations. Project debt service payments are being reduced by increasing the amount of public financing through state and federal programs, such as the use of private activity bonds and the federal TIFIA program. Those changes have brought public–private partnerships with private financing more in line with the traditional methods of financing highway construction.

How Should the Federal Government Raise Funds for Highways?

About 10 percent of all funding for highways, by all levels of government, comes from issuing bonds (see Figure 5). The remaining 90 percent comes from the combination of current revenue collected from highway users and, to a slightly lesser extent, current revenue collected from general sources. Of course, all of the costs of building and

Figure 5.

Sources of Funding for Highways, All Levels of Government, 2008



Source: Congressional Budget Office based on Department of Transportation, Federal Highway Administration, *Highway Statistics 2008* (December 2009), Table HF-10.

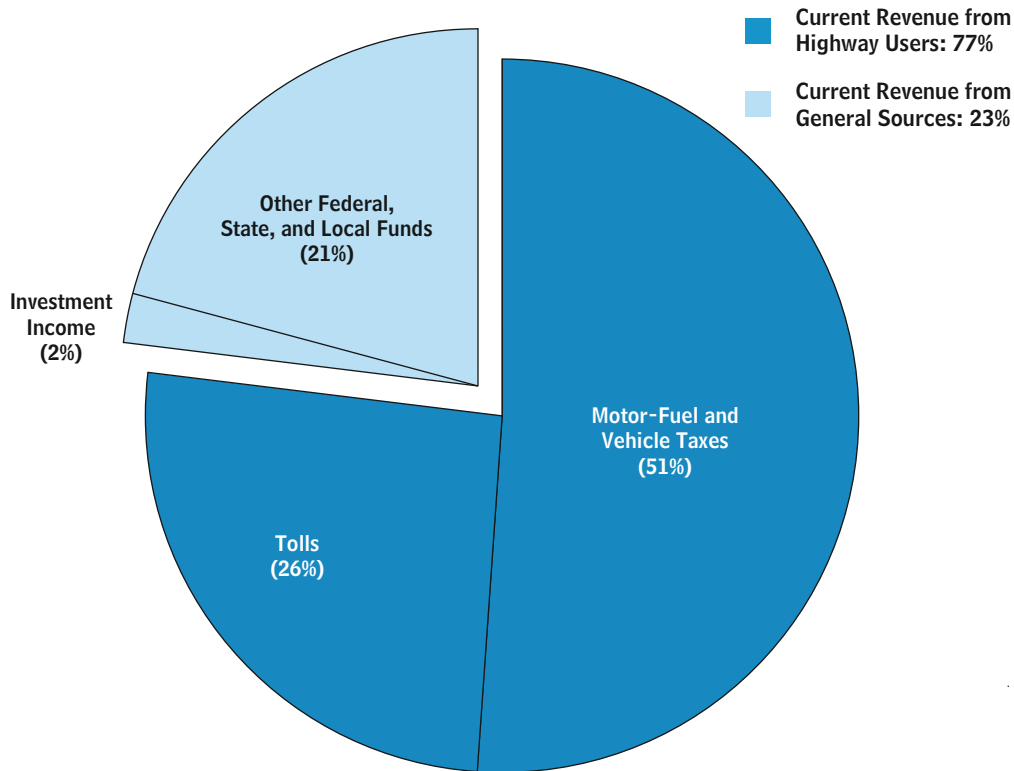
maintaining highways are ultimately borne by users and taxpayers, regardless of whether governments or private entities pay for highways now or borrow funds and repay them over time. About three-quarters of the amount paid for debt service on bonds comes from taxes and tolls imposed on highway users; the balance comes from general revenues and interest income (see Figure 6).

Approaches to funding highways can be evaluated in terms of equity and economic efficiency. Equity is a subjective attribute that can be assessed in several ways. Observers of highway funding often gauge equity by considering the share of funding that is obtained from taxes paid by highway users (rather than from general taxpayer funds), from people in households that fall into various income categories, or from people in rural versus urban households.

The economic efficiency of a funding approach depends partly on its effects on users' travel behavior and partly on what it costs to implement. Charging users for the costs

Figure 6.

**Sources of Funding for Paying Debt Service on Bond Issues,
All Levels of Government, 2008**



Source: Congressional Budget Office based on Department of Transportation, Federal Highway Administration, *Highway Statistics 2008* (December 2009), Table SB-3.

Note: Excludes proceeds from sales of other bonds.

that their travel imposes on society would create incentives for people to limit highway use to trips for which the benefits exceed the costs, thus reducing or eliminating overuse of highways and helping identify the economic value of investments in highways. However, the costs of collecting and enforcing such user charges also influence the efficiency of that approach.

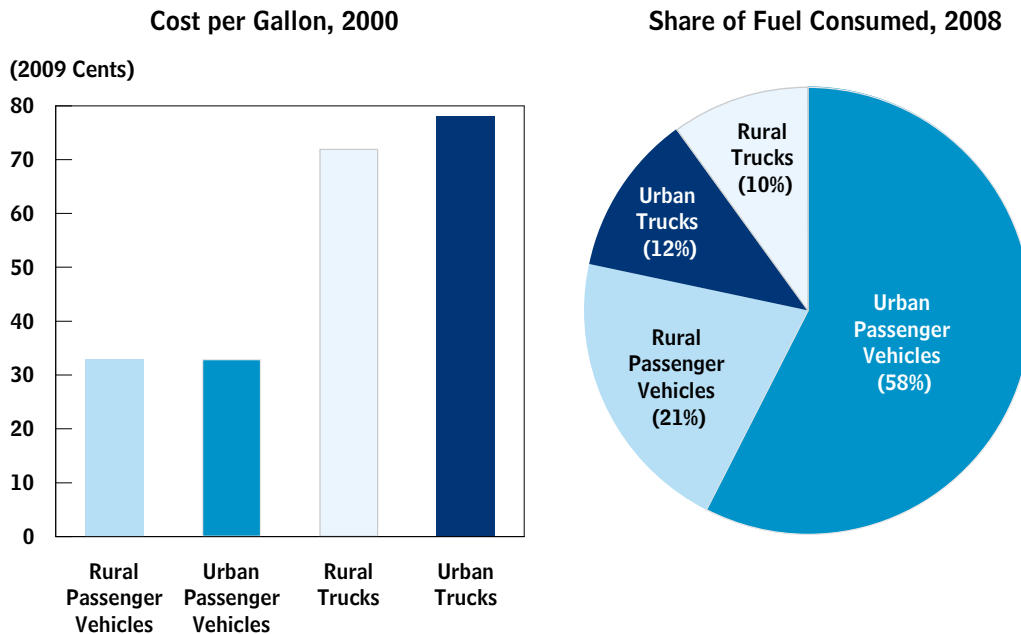
User Charges

Economic efficiency is promoted when highway users are charged according to the marginal (or incremental) costs of their use, including external costs that are imposed on society. A combination of a fuel tax and a mileage-based tax (a VMT tax) that accounts for the type and weight of a vehicle and the location and time of its use could provide incentives for reducing the full range of driving's social costs and could generate funds for federal spending on highways.

The external costs of highway use vary widely depending on the characteristics of a vehicle and where it is driven. Some external costs are associated directly with the use

Figure 7.

Estimated Fuel-Related Costs and Fuel Consumed in Various Years



Sources: Congressional Budget Office based on Ian W.H. Parry, "How Should Heavy-Duty Trucks Be Taxed?" *Journal of Urban Economics*, vol. 63, no. 2 (March 2008), p. 660; and Department of Transportation, Federal Highway Administration, *Highway Statistics 2008* (December 2009), Table VM-1.

Notes: Passenger vehicles have two axles and four tires and include automobiles and light trucks (pickup trucks, minivans, and sport-utility vehicles).

Fuel use shares exclude motorcycles and buses.

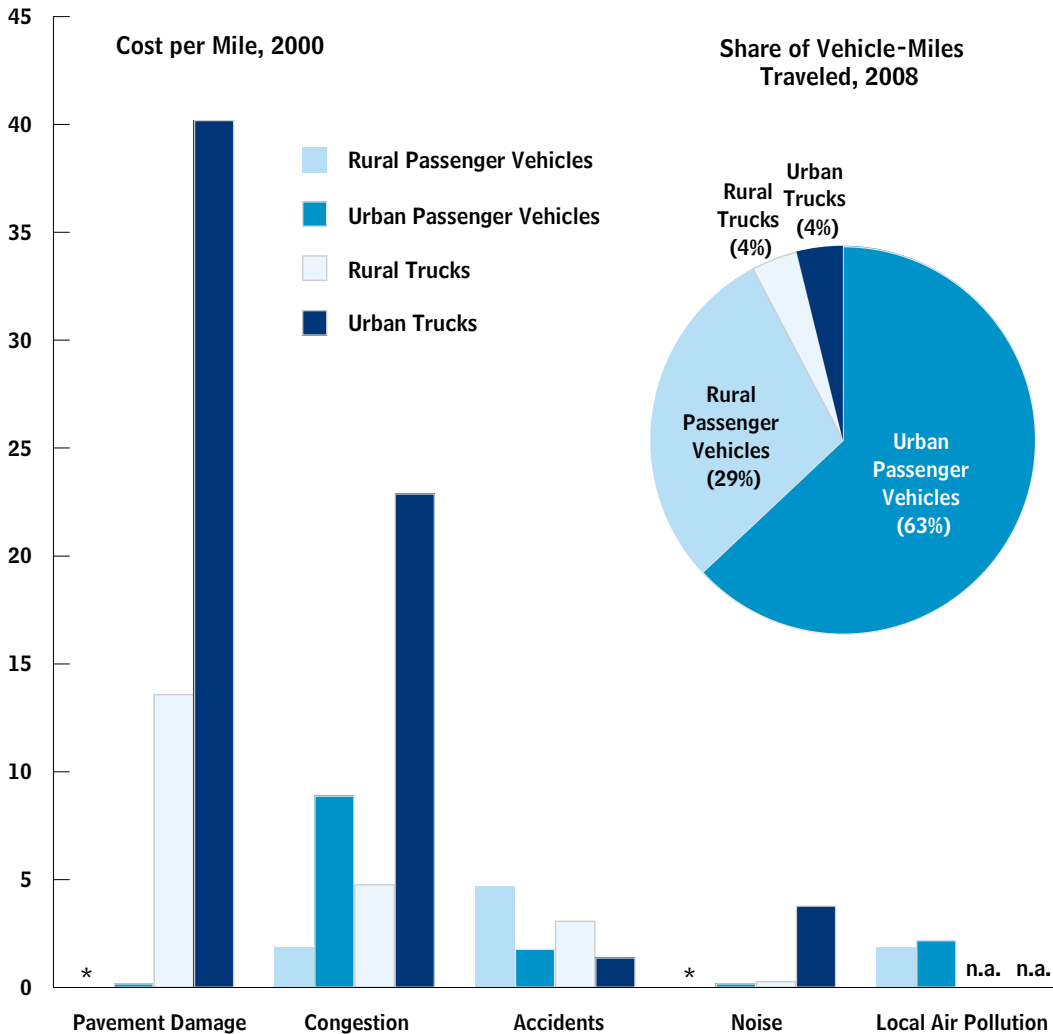
Local air pollution costs are classified as mileage related for passenger vehicles and fuel related for trucks.

of motor fuel, such as the costs of local air pollution from trucks, climate change, and dependence on foreign oil. Those costs are estimated to average more than 30 cents per gallon for passenger vehicles and more than 70 cents per gallon for trucks (see Figure 7). Other external costs are related to the miles traveled by vehicles, such as the costs of road congestion, pavement damage, and accidents. Although the external costs imposed on society by trucks are greater than those imposed by passenger vehicles on a per-mile basis, the much higher volume of passenger vehicle travel means that those vehicles also contribute substantially to external costs from vehicle-miles traveled (see Figure 8). Specifically, passenger vehicles account for more than 90 percent of vehicle-miles traveled, with passenger vehicles in urban areas alone accounting for more than 60 percent. Passenger vehicles' contribution to traffic congestion in urban areas imposes estimated costs of about 10 cents per mile, on average,

Figure 8.

Estimated Mileage-Related Costs and Vehicle-Miles Traveled in Various Years

(2009 cents per mile)



Sources: Congressional Budget Office based on Department of Transportation, Federal Highway Administration, *1997 Federal Highway Cost Allocation Study Final Report* (1997), Tables V-22 (noise), V-23 (congestion), V-24 (accidents), and V-26 (pavement damage); *Addendum to the 1997 Federal Highway Cost Allocation Study Final Report* (May 2000), Table 13; and *Highway Statistics 2008* (December 2009), Table VM-1.

Notes: Passenger vehicles have two axles and four tires and include automobiles and light trucks (pickup trucks, minivans, and sport-utility vehicles).

Mileage shares exclude motorcycles and buses.

Local air pollution costs are classified as mileage related for passenger vehicles and fuel related for trucks.

* = less than 0.5 cents per mile; n.a. = not applicable.

constituting one of the largest sources of total external costs of motor vehicle use. Estimates of pavement damage by trucks, the largest per-mile external cost of truck use, average roughly 15 cents and 40 cents per mile in rural and urban areas—making those vehicles another significant source of external costs, even though truck travel represents less than 10 percent of all miles traveled. For different trucks, pavement damage costs vary widely, depending on the weight of the truck and the number of axles over which the weight is distributed. Accidents, noise, air pollution, and other fuel-related costs from passenger vehicles and trucks represent smaller shares of external costs.

Just as the external costs of highway use are related to fuel use and miles traveled, user charges can take the form of fuel taxes and mileage-based fees. Those charges differ in the administrative costs they entail, how efficiently they match the external costs that users impose, and in the extent to which they are borne by people in different income groups or different locations.

Fuel Taxes. Viewed according to different conceptions of equity, fuel taxes offer a mix of positive and negative characteristics. They satisfy a “user-pays” criterion, but they also can impose a larger burden relative to income on people who live in low-income or rural households. Fuel taxes impose a burden even on households that do not own passenger vehicles by raising transportation costs, which are reflected in the prices of purchased goods.

Fuel taxes have two desirable characteristics for efficiency: They cost relatively little to implement (the government collects taxes from fuel distributors, and users pay the taxes when they purchase fuel), and they offer users some incentive to curtail fuel use, thus reducing some of the social costs of travel. At best, however, a fuel tax discourages some travel too much and other travel too little, because it does not reflect the large differences in cost for use of crowded roads compared with uncrowded roads or for travel by trucks that have similar fuel efficiency but cause different amounts of pavement damage. Moreover, for a given tax rate on fuels, the incentive to reduce mileage-related costs diminishes over time as more driving is done in vehicles that are more fuel efficient.

VMT Taxes. VMT taxes and fuel taxes have qualitatively similar implications for equity. Like fuel taxes, VMT charges satisfy the user-pays principle, but they impose larger burdens relative to income on people in low-income or rural households. To the extent that members of such households tend to drive vehicles that are less fuel efficient, such as pickup trucks or older automobiles, however, those highway users would pay a smaller share of VMT taxes than of fuel taxes.

VMT taxes would provide stronger incentives than fuel taxes could for efficient use of highways if VMT taxes were aligned with the costs imposed by users, because most of those costs are related to the number of miles driven. Appropriately aligned, VMT taxes could meet various goals, including paying for pavement damage, reducing

congestion (and thus curtailing the need to spend money on highway expansion and highway maintenance), or fostering efficient use with regard to all social costs.

If VMT taxes were intended to maximize or even significantly improve the efficiency of highway use, they would need to vary greatly by vehicle type, by time and place of travel, or both. For example, because pavement damage increases sharply with vehicle weight but decreases with the number of axles on a vehicle, the portion of VMT taxes assessed to maintain pavement could be small or nonexistent for passenger vehicles but substantial for heavy-duty trucks, particularly those with high weight per axle. Similarly, every vehicle would be assessed more to travel on crowded urban roads during peak hours than in off-peak hours or to travel on less congested roads at any time. The rates charged for peak-hour travel would be set in keeping with specific local or regional conditions, including the duration and severity of daily congestion, rather than on the basis of national averages.

VMT taxes' effect on efficiency also would depend on how much it costs to put the taxes in place and to collect the money. Estimates of what it would cost to establish and operate a nationwide program are rough. One source of uncertainty is the cost to install metering equipment in the nation's cars and trucks. Having the devices installed as original equipment under a mandate to vehicle manufacturers would be relatively inexpensive but could lead to a long transition; requiring all vehicles to be retrofitted with devices could be faster but much more costly, and the equipment could be more susceptible to tampering than factory-installed equipment might be. Despite the various uncertainties and impediments, some transportation experts have identified VMT taxes as a preferred option.

The idea of imposing VMT taxes that vary by time and place has raised concerns about privacy because the process of assessing such taxes could give the government access to specific information about how individual vehicles are used. Various approaches have been suggested to allay those concerns, including restricting the amount of travel-related information that could be used for billing or restricting the kind of information conveyed to the government; making devices appealing to the public by allowing businesses to use them to provide other services, such as real-time traffic reports or electronic payment for parking; and allowing users to choose not to pay per-mile charges but to pay higher fuel taxes instead. (Under such proposals, the optional fuel taxes would be set at rates high enough to appeal only to users with the greatest privacy concerns.)

A system of VMT taxes need not apply to all vehicles on every road. Indeed, there are already less comprehensive systems of direct charges for road use: Toll roads, lanes, and bridges are common in the United States, and several states and foreign countries place weight-and-distance taxes on trucks. Expansion of existing systems could focus on highly congested roads or on entry points into congested areas; that targeted approach could cost less to implement if it required relatively simple in-vehicle equipment. Alternatively, the focus could be on specific vehicle types, such as trucks.

Although only 4 percent of the nation's fleet is made up of trucks (excluding light-duty trucks), they account for roughly 25 percent of all costs that highway users impose on others, including almost all of the costs associated with pavement damage.

General Revenues from Taxpayers

Two arguments can be made in support of funding highways with broad-based taxes, such as income taxes: First, the incremental costs of collection would be negligible, and second, large amounts could be raised through small changes in tax rates. The staff of the Joint Committee on Taxation has estimated that raising all tax rates on ordinary individual income by 1 percentage point would yield an average of \$48 billion per year from 2012 to 2021—more than all of the current Highway Trust Fund taxes combined.²⁸ Moreover, funding highways through broad-based taxes meets at least one standard of equity: Such taxes do not impose a larger burden relative to income on rural or low-income users.

In other respects, however, the use of general revenues poses significant disadvantages. In particular, the approach gives users no incentive to reduce the mileage- or fuel-related costs of their highway use, and it does not satisfy the user-pays standard of equity. Moreover, even small increases in existing rates would hamper efficiency by exacerbating existing deviations from efficient prices, thus further distorting many individual decisions. The distorted decisions would include reductions in work and saving, shifting of income from taxable to nontaxable forms, and shifting of spending from ordinary to tax-deductible goods and services.

28. See Congressional Budget Office, *Reducing the Deficit: Spending and Revenue Options* (March 2011), p. 139.