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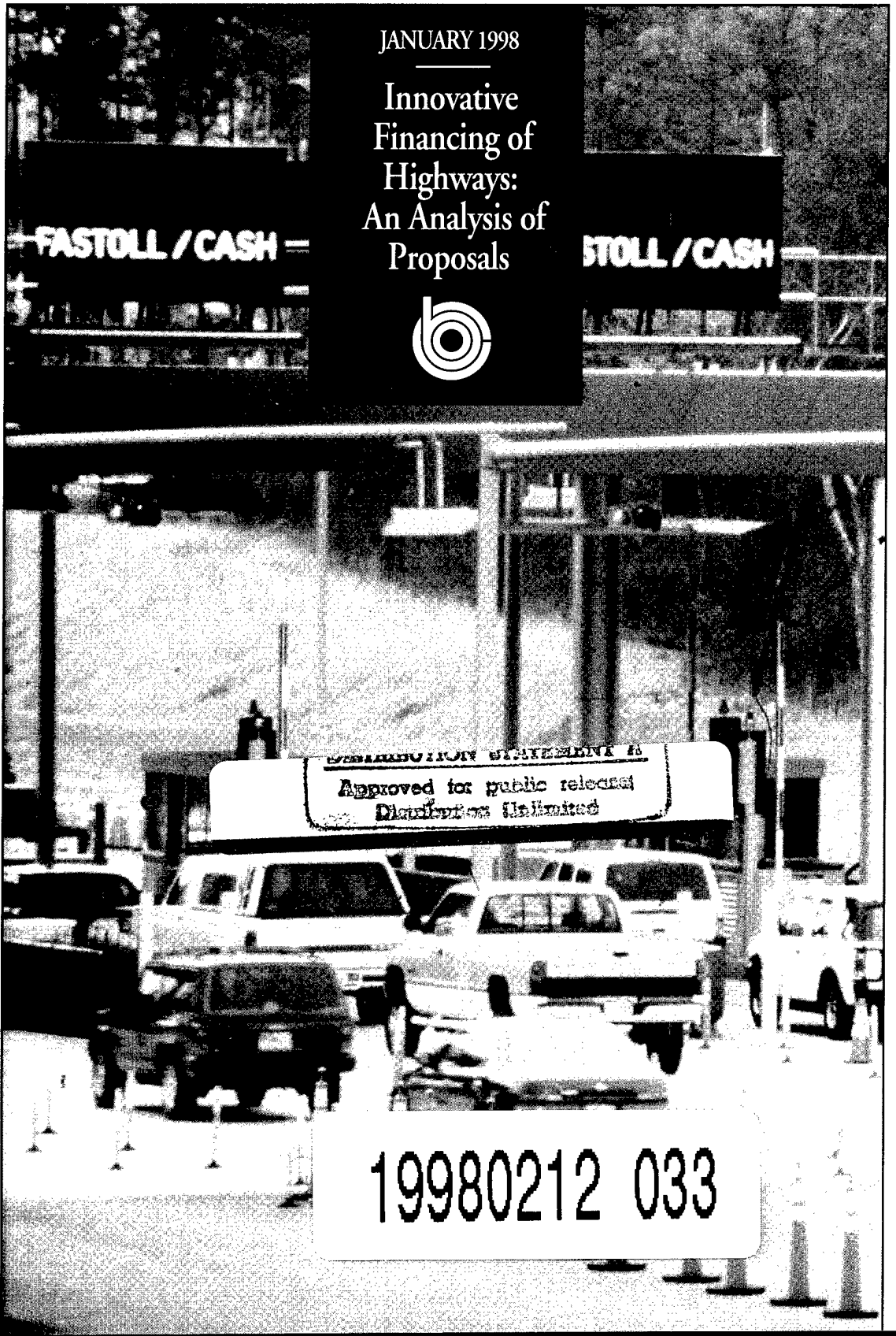

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Innovative Financing of Highways: An Analysis of Proposals

INNOVATIVE FINANCING OF HIGHWAYS: AN ANALYSIS OF PROPOSALS

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Congressional Budget Office

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NOTES

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

Cover photo, which shows toll booths on the Dulles Greenway in Virginia, by David Galen.

Preface

The federal government provides about $20 billion a year in grants to states for highways—about one-quarter of the total amount spent on roads each year by all levels of government. Most of the federal money is raised through taxes on motor fuels. States, in financing their road-building programs, also rely heavily on motor fuel taxes and on fees paid by highway users. But revenues from those user taxes and fees are insufficient to build as many new roadways as transportation officials would like. As a result, they have been exploring innovative ways of financing such projects. This study, which was prepared by the Congressional Budget Office (CBO) in response to a request by the Senate Committee on Environment and Public Works, reviews several approaches to augment traditional sources of funding. The analysis covers changes in rules governing federal aid, state infrastructure banks, federal credit assistance, and private-sector financing of roads.

Elizabeth Pinkston of CBO's Natural Resources and Commerce Division wrote the study under the supervision of Jan Paul Acton and Elliot Schwartz. Nabeel Alsalam, Clare Doherty, Peter Fontaine, Douglas Hamilton, Arlene Holen, Pearl Richardson, Robin Seiler, and Paul Van de Water of CBO all contributed helpful comments. Many members of the staff of the Federal Highway Administration (FHWA) provided information and explanations of technical matters. The author is particularly grateful to Max Inman, David Seltzer, Lucinda Eagle, Bryan Grote, and Larry Dwyer of FHWA, who reviewed drafts and offered valuable advice. Several state and local transportation officials also made useful suggestions; they include Jon Bloom, Norman Foster, Adeel Lari, Christopher Mann, Frank Smith, and Constance Sorrell. In addition, the author wishes to thank J. Richard Aronson, Stewart Butler, Randall Eberts, David Ehrlich, and David Klinges for their careful reviews and comments.

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June E. O'Neill
Director

January 1998

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Summary

Motorists want better, safer, less congested highways, but the money to build them is scarce. Transportation officials strain to juggle limited resources to meet the demands. Elected representatives could raise taxes, but voters resist. How then can transportation planners secure funding for new highway projects? To augment money raised in traditional ways, highway officials are exploring the use of innovative financing techniques.

In the past and in large part today, states have financed roads primarily through a combination of state revenues and federal aid. States have raised their share of the funds by taxing motor fuels and charging user fees—for example, for motor vehicle registration and driver's licenses and, to a lesser extent, tolls. The federal program of aid to the states for highways is also financed through motor fuel taxes and other levies on highway users. Federal aid for highways is entirely on a cash basis from the Highway Trust Fund. At the state level, most highway spending is in the form of cash raised from taxes and user fees that are accumulated in designated highway accounts. Debt financing constitutes only about 6 percent of the revenues states use for highways.

Transportation officials at all levels of government have recognized in recent years that funding from traditional sources is not keeping pace with demands for new, expanded, or improved highways. As a result, they have begun to explore new sources of highway financing. Highway officials use the term "innovative financing" to refer broadly to any funding measures other than the traditional pay-as-you-go approach. Most of the innovative measures currently under consideration entail debt financing. Although most financial experts would not consider debt financing innovative, the term is used to contrast that approach with traditional methods of funding highway projects.

The 1990s have seen significant innovation in highway financing. Encouraged by measures that the Congress adopted in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), new ideas have been proposed, discussed, tried on an experimental basis, and in some cases enacted into law. Most such measures are linked closely to an individual project, in many instances, a toll facility; they do not cover a state's overall highway program. Although they may enable state and local governments to get important projects built sooner than traditional financing would allow, they are unlikely to replace pay-as-you-go user taxes for the bulk of roadway needs. The reason is that as long as most roads are toll-free, new toll projects will be at a disadvantage in competing with them.

To some observers, "innovative" has a positive connotation suggesting a new and better approach. To others, especially when it is used to describe methods of financing, the term raises the specters of gimmickry and smoke and mirrors. Each side has some justification for its view. Some innovative techniques can work well to finance specific projects without imposing additional, unanticipated, and unwanted cost burdens. But careful scrutiny of some financing proposals may reveal that they cost more than they appear to at first glance and they shift the cost burden in hidden and unfavorable ways.

Innovative financing may enable states to increase the incomes, wealth, and well-being of their residents by building highway projects sooner than would be possible with traditional financing. Like other investments, judiciously selected highway projects have the potential to yield benefits over many years. If the benefits exceed the costs of a project, after factoring in the cost of capital that could have been used for alternative income-generating ventures, the project is a worthwhile investment for the community. Borrowing money to build it enables people to enjoy its benefits sooner.

Borrowing has risks, however, and those risks may be greater for public projects than for private investments. And even if the risks are not greater, they are, at the very least, different and thus continue to raise concerns for policymakers. Observers who brand innovative measures as gimmickry worry that the risks and costs associated with debt financing may be hidden or downplayed by enthusiasts who are eager to get a project built. For example, if a public project receives a subsidy in its borrowing (perhaps by obtaining a below-market interest rate), the subsidy should be factored into the cost of the project. Also requiring consideration are indirect subsidies, such as making the interest on bonds issued by state and local governments exempt from federal income taxes. Such subsidies impose costs on federal taxpayers that may be obscured in analyzing the merits of any individual highway project.

In the end, money to pay for highways can come only from general taxpayers or from users or other beneficiaries of highways. Innovative financing measures generally shift the burden of costs from current users of highways in general—that is, payers of taxes on motor fuels and other taxes and fees imposed on motorists—to future general taxpayers, motorists in general, and users of the specific projects built with innovative financing. Some shifting may also occur between taxpayers at the state and federal levels.

Innovative financing can affect how efficiently resources are allocated in both making and using an investment. Ventures that must attract financing from lenders or equity investors face intense scrutiny, which raises the likelihood that the investment will be a sound one. It does not, however, ensure a profitable outcome. Tight controls over costs are often critical to the success of such projects.

To the extent that they impose user fees to repay debt, projects financed by innovative means have greater potential for allocating resources efficiently than do tax-financed, toll-free highways. Tolls that reflect the marginal social cost of use of a roadway provide incentives for efficiency. In congested corridors, tolls that take into account the costs of traffic delays are a way of allocating use to motorists who place the greatest value on avoiding those delays. But highway operators do not necessarily set user fees at the efficient level. If a highway is not congested, the cost of one additional vehicle—the efficient toll rate—may be so low that revenues from a toll set at that level will not cover debt service, operations and maintenance, and other costs. In those cases, the sponsors of the project may need to charge tolls that are higher than the economically efficient level to cover their costs.

Although innovative financing is unlikely to replace the current system of pay-as-you-go financing, it can augment traditional sources of funding in specific cases and enable state and local governments to proceed with major projects sooner than they might otherwise. This study analyzes several innovative measures that have been tried or proposed in recent years. It describes the way they would raise money to accelerate projects and discusses their potential effects on the allocation and distribution of resources. It also analyzes the implications such approaches have for the federal budget.

Innovative financing measures for highways fall into several broad categories: relaxing financial restrictions on the use of federal aid, establishing financing institutions at the state level, providing federal credit assistance, and tapping private-sector resources for investment in highway projects.

Relaxing Restrictions on Federal Aid

The federal-aid highway program is characterized by a maze of requirements that states must fulfill as a condition of receiving grants. In recent years, the federal government has removed some long-standing restrictions on highway aid and given states greater latitude in their use of it. Those reforms, which help states stretch

the value of federal aid, have provided greater flexibility in three major areas: sponsoring toll roads, providing financial assistance to transportation projects built by public/private partnerships, and engaging in debt financing. The federal government has also modified the matching-share requirement, a move that states have found especially helpful. The changes have enabled states to launch highly valued projects more quickly than would have been possible under the standard funding approach. In addition, the reforms have broadened the set of projects that are eligible for federal assistance.

The federal budget is unlikely to be much affected by relaxing financial restrictions on federal highway aid. Of course, the relaxation might lead to somewhat faster spendout rates if states drew on every dollar of aid as soon as it became available instead of amassing enough money to pay up front for a large, new project. But even if federal outlays accelerated initially, over time they would probably resume a steady rate.

State Infrastructure Banks

State infrastructure banks (SIBs) are investment funds that provide loans or other forms of financial assistance to public or combined public/private sponsors of transportation projects. As loans are repaid, the proceeds can be re-lent to fund additional projects. In the National Highway System Designation Act of 1995, the Congress established a SIB pilot program and authorized the Secretary of Transportation to enter into agreements with up to 10 states to form such banks. Subsequently, the Congress opened the SIB pilot program to all states. The Department of Transportation has given definite or conditional approval for SIBs in 38 states and Puerto Rico.

SIBs give states greater flexibility in financing transportation projects than they have under the standard financial regulations of the federal-aid highway program. Such rules impose constraints on the timing and use of aid and the types of projects eligible for it. By providing flexibility, SIBs can help states get projects under way sooner. SIBs may also aid states in another aspect of highway ventures. Besides the financial rules of the federal highway program, the government imposes conditions on federal aid that may increase a project's cost. For example, a project built with federal aid must meet the prevailing-wage requirements of the Davis-Bacon Act. Under current interpretation of the law, those requirements would apply only to the first round of projects financed by SIBs and not to projects financed with recycled funds.

In addition to flexibility in financing, SIBs can offer credit enhancements to attract private investment. In making loans rather than grants, SIB financing makes federal highway aid go farther because loan repayments are available for additional highway projects. How much additional money SIBs will make available, and when, depends in large part on how much aid the federal government provides to help capitalize the SIBs. It is also a function of how the states respond, including the way in which they structure their banks.

Using SIB funding increases efficiency in investment because it loosens federal constraints on a state's choice of projects. With fewer restrictions on its decisions, a state is free to choose projects with the highest overall economic returns and not just the highest returns within each category of federal aid (as traditional financing would require). The use of SIBs may also enhance efficiency in resource allocation through the mechanisms chosen for repaying SIB loans—for example, tolls and other user fees.

SIB financing has implications for who bears the costs of a project. Issuing debt shifts the burden of costs from current general taxpayers and payers of user taxes to future taxpayers, users, and other beneficiaries. Moreover, because debt issued by the SIBs is tax-exempt, using SIB financing transfers some of the costs from taxpayers at the state and local levels to those at the federal level.

Participation in the SIB program is voluntary, an attractive feature since not all states will find this kind of tool useful. Some states have projects ready that could benefit immediately from access to SIB financing. Other states are considering whether they have viable candidates. Still others are restricted by their own laws or constitutions in their ability to take advantage of this innovative financing mechanism.

At this point, the effect SIBs would have on the federal budget seems to be relatively small. The Congress provided $150 million in 1997 to capitalize the

banks, but it appropriated no additional funds for 1998. The effect of the potential loss of revenues associated with the SIBs' tax-exempt debt must also be considered. The magnitude of the loss is hard to predict but appears minor in the near term.

Federal Credit Assistance

The Congress is considering several proposals for providing federal loans, loan guarantees, or other credit assistance to state and local governments for use in transportation projects. By making money available to lend or by promising to assist with repayment, those measures can enhance the quality of the credit that governments obtain to finance a project. They may also enable the sponsors of a project to borrow at lower interest rates.

How federal credit assistance affects efficiency, the distribution of resources, and the federal budget depends on the specific form that assistance takes. Moreover, analysis of such effects depends on whether federal credit assistance is viewed as a separate program in addition to the federal-aid highway program or as a substitute for all or part of it. In general, however, by leveraging federal aid, credit enhancements may be able to generate funding for more projects, compared with traditional outright grants of the same amount. A drawback to be kept in mind, though, is that a credit program might require additional federal bureaucracy.

Private-Sector Participation

In recent years, private firms have built two toll roads in the United States and formed partnerships with state and local governments to consider additional investments in transportation projects. Private investors are motivated by the prospect of profits, although such expectations are not always met. Viewing private participation as a source of badly needed capital, officials in some states have welcomed that investment.

The degree of private participation in highway building varies from project to project. For some ventures, it means complete private development and operation of a roadway; for others, it consists of incentive contracts in which governments have primary ownership and responsibility but private firms bear some degree of risk—and are rewarded for efficiency. Private investors generally scrutinize highway projects closely to make sure revenues will cover costs and provide a reasonable return on their investment. Their care in that regard enhances the probability that projects built with private money will use resources efficiently. Efficiency can be further enhanced by tolls or other user fees that allocate use—for example, of a congested highway—to motorists who are willing to pay.

Using private investment to fund highway projects shifts some or all of the cost and risk from governments and taxpayers to private investors and users of those roads. That change in turn reduces demands on government funds and conforms to the principle of public finance that the beneficiary pays, factors that may create greater public acceptance of privately financed toll roads. However, states need to be aware that private ventures can create new problems for them. For instance, a project may not generate enough revenues to cover operations, maintenance, and debt repayment, and the developers may then ask the state to bail them out. The agreements that governments enter into with private firms should make clear the responsibilities of all parties in the event of such contingencies.

As investors and public officials consider an increasing number of private or public/private projects, the most successful ways of financing and operating them are likely to emerge. However, the potential of private investment to fund a wide variety of highway activities at this time remains limited. The most promising candidates in the near term appear to be toll lanes that augment congested highways.

Conclusion

Which innovative financing measures are the most successful? The evidence suggests that no one approach is the magic bullet that would solve all highway financing problems. Rather, different measures work better in different situations. And of course, as economists say, there is no free lunch. The money for highway projects must come from somewhere. To some analysts, obtaining it from debt backed by tolls or from other fees im-

posed on motorists who use specific roadways is fairer and more efficient than using conventional tax financing. But tolls are not always structured efficiently, and users of toll roads also pay the same taxes on fuel that users of toll-free roads pay. Questions remain, moreover, about what will happen if a project does not generate enough revenues to repay its debt.

Until the 1990s, federal policies generally limited the ability of states to employ nontraditional financing. Relaxing restrictions on the use of federal aid has cleared the way for state and local governments to pursue new ways of financing transportation projects. Their experience suggests that the federal government could further the development of innovative financing tools by according states even greater flexibility in their use of federal aid. With freedom to experiment, state and local governments could test various approaches and adopt the measures that work best in their particular circumstances.

Chapter One

Introduction

A perennial problem for transportation officials is how to finance highways. Motorists clamor for better, safer, less congested roads, but government budgets are constrained and taxpayers balk at higher taxes. As increases in personal travel and commerce impose growing demands on the nation's highways, state governments are exploring new approaches to funding. They are seeking innovative ways to add capacity—new roads, additional lanes on existing roads, new or expanded interchanges—sooner than is now possible with traditional financing.

Traditional and Innovative Financing

Traditionally, states have financed roads for the most part through a combination of state resources and federal aid. State funds have come from taxes on motor fuels and user fees, such as fees from motor vehicle registration and driver's licenses and, to a lesser extent, tolls. Federal aid is also financed through motor fuel and other taxes on highway users. At both the federal and state levels, spending is essentially on a pay-as-you-go basis. Receipts from user taxes and fees accumulate, typically in a designated highway account, and then are spent. Debt financing—issuing bonds to pay for highway development and construction—is not widespread, although many states have used it on occasion. In summary, traditional financing involves:

- user taxes and fees, often earmarked for transportation;
- federal aid, with matching state funds; and
- current, pay-as-you-go financing.

Highway officials use the term "innovative financing" to refer broadly to any funding measures other than traditional financing. Although financial experts would hardly view debt financing as innovative, it comes under that heading insofar as highways are concerned. In fact, most innovative financing measures now being considered entail debt financing.

An additional distinction can be drawn between traditional and innovative financing. The innovative measures under consideration tend to be tied closely to an individual project or set of projects rather than applied to a state's overall highway program. They may enable state and local governments to get important projects built sooner than traditional financing would allow, but they are unlikely to replace pay-as-you-go user taxes for the bulk of roadway needs. A major reason is that most innovative financing measures involve tolls as the mechanism for recouping investments. As long as most roads in the United States are toll-free, new toll projects will be at a disadvantage in competing with them.

Some proponents of innovative financing view it as a lower-cost alternative to traditional financing. As economists often say, however, there is no free lunch. Money to pay for highways must come from somewhere. The potential sources of those funds are general taxpayers, users or other beneficiaries of highways, and borrowing paid for by future taxpayers, users, or beneficiaries (see Table 1).

Under certain circumstances, debt financing can play a socially beneficial role. If a road project yields benefits that exceed its costs, then society gains by proceeding with the investment. (Of course, such calculations must discount costs and factor in the opportunity cost of borrowed funds and any implicit or explicit subsidies.) Several concerns have led the federal government and most state governments to shy away from financing highways with debt and to opt instead to finance them primarily on a pay-as-you-go basis.

One concern is that borrowing may reduce fiscal discipline and open the floodgates for projects of limited merit. Estimates of the benefits and costs of any project are generally uncertain and often subjective. Without the restraint inherent in a pay-as-you-go approach, fiscal conservatives worry that proponents of a project will overestimate benefits and underestimate costs. Program advocates take the opposite position and worry that benefits will be undervalued and costs overstated.

Another concern to states is their creditworthiness. With too much outstanding debt, they may encounter difficulties in the credit markets. States may have trouble borrowing what they need because investors will be uncertain about repayment and require higher interest rates in compensation. Therefore, most states have statutory or constitutional limits on the amount of debt they may incur.

Given those concerns, governments have implicitly opted for a trade-off: they will risk underspending, thus forgoing earlier returns on investments, to avoid wast-

Table 1.
Potential Sources of Financing for Highways

Who Might Pay?[a]	Where Would the Money Come From?	
	If Paid Now	If Paid Later
General Taxpayers	Income taxes (federal and state) General sales taxes (state and local) Property and other taxes (local)	Debt backed by general taxes paid by future taxpayers
Users of Roads and Highways in General	Motor fuel taxes (federal and state) Excise taxes (federal) Vehicle registration taxes and fees (federal and state) Operator's licenses (state)	Debt backed by taxes on future users of highways (with or without further backing by general tax revenues)
Users of Specific Highways	Tolls (including charges for congestion)	Debt backed by toll revenues (with or without further backing by tax revenues)
Property Owners	Development impact fees (special assessments)	Property taxes and special assessments (in the future)
Developers and Businesses that Benefit from Specific Highway Improvements	Development impact fees (special assessments)	Property taxes and special assessments (in the future)

SOURCE: Congressional Budget Office.

a. The initial payer might be able to pass the cost on to another person or entity.

ing money on projects for which benefits had been incorrectly estimated to exceed costs. Another force pushing them in that direction is the increasingly frequent lack of consensus about the value of new roads. Bitter disputes between developers and environmentalists indicate that what some people view as a worthy and needed investment is to others an unconscionably costly plundering of the environment.

Innovative financing cannot solve all of the problems associated with transportation projects. What it can do is to help some projects get under way sooner than would be possible with traditional financing.

Suppose a state wants to build a new highway, such as a limited-access roadway segment connecting two major, existing highways. Under the traditional approach, a state would list the segment on its transportation improvement plan along with other projects it wants to build. Depending on the priority of that project compared with others and depending on the project's cost, it might remain on the list for several years until enough funding was available from federal aid and state sources to begin work.

The state might be able to start the project somewhat sooner if it used a funding strategy different from the pay-as-you-go method. For example, the state could take advantage of initiatives by the Federal Highway Administration (FHWA) to allow states greater flexibility in using federal aid.[1] Or it could obtain funds sooner by issuing bonds backed by taxes, tolls, or other dedicated revenues. The state could get credit assistance in marketing the bonds from a state infrastructure bank or the federal government. (Currently, federal credit assistance is limited to a few specific projects, but the Clinton Administration and the Senate have proposed broader federal credit programs.)

The state could also try to tap resources of the private sector to build the road. Public/private ventures can take several forms, with varying degrees and types of private capital at risk. At one extreme, the state could simply rely on a private firm, which would use the debt and equity it raised by itself, to finance the entire road. At the other extreme—and not strictly innovative, since this approach has been used to some extent in the past—the state could issue bonds that were backed solely by revenues from the project and not by taxes. Buyers of those so-called nonrecourse bonds take the risk that the project will not generate enough revenue to repay the debt, and they recognize that they will have no recourse to the state's taxing powers in that event. In comparison, bonds backed by taxes also tap private-sector resources: bond buyers purchase them with their private funds. But the risk is different from that of nonrecourse bonds because the bond buyers expect the government to raise taxes, if necessary, to repay the debt. That understanding changes the nature of the risk associated with the private capital.

Evaluating Innovative Financing Measures

How do the various innovative financing measures compare with one another and with traditional financing? Overall, the innovative mechanisms are more similar to each other than they are to traditional financing.

The primary motivation for innovative financing is to fill the gap between demands for new projects and the funding available from traditional sources of revenue. As a consequence, all innovative measures make funding available sooner. Some do so by borrowing, some by attracting private equity investment, some by advancing federal aid, and some by a combination of those mechanisms. Credit assistance from the federal government or the state helps support some of the debt-financing measures.

Innovative financing measures can tap a variety of funding sources to repay the debt incurred building a highway and to provide a return on equity investment. Some projects use dedicated taxes, some use tolls, and some use other fees imposed on beneficiaries of the work. The differences between those sources of funds result in different effects on economic efficiency, the distribution of the cost burden of the project, and the federal budget.

1. The Federal Highway Administration is the agency within the Department of Transportation that oversees the federal-aid highway program.

Innovative measures that entail user fees can promote efficiency in two ways.[2] First, a project that must repay debt and provide a reasonable rate of return on investment requires a certain level of revenues from tolls or other user fees or from dedicated taxes. Such a requirement implicitly subjects the project to a market test, letting it stand or fall on its merits. Knowing that in advance gives transportation planners an incentive to build projects that have the greatest expected returns and not squander funds on oversized or gold-plated projects.

Second, projects financed with user fees have the potential to allocate scarce resources to their most highly valued use. Such an allocation occurs when the price that consumers are willing and able to pay equals the marginal cost of the resources used in making the product or service available.[3] Sponsors of a project will not always set user fees to equal the marginal cost, however. To collect enough to service the debt incurred in building the highway, they might set user fees at a level that would maximize total revenue rather than efficiency. That choice might entail fees that were higher or lower than the level that would induce efficiency.

Innovative financing measures may have effects on the distribution of the cost burden that differ not only from traditional financing but also from each other. Financing projects by issuing debt shifts the burden to future users or taxpayers, which at first glance may appear unfair. Yet it is not necessarily a bad idea. For long-lived investments, it accords with the economic principle that those who use and benefit from an investment should pay for it. Still, debt financing has drawbacks—for example, if the revenues projected for a new venture turn out to be unrealistic and the project defaults on the debt. In that case, someone must pay, and the prime candidates are bondholders and taxpayers.

Innovations in the rules governing federal aid to states would also have distributional consequences. Relaxing requirements concerning the way states must match federal aid or changing provisions intended to ensure that states act accountably would reduce the federal government's control over resources. Eliminating requirements intended to achieve social objectives in the areas of safety, the environment, and labor would help highways but at a cost to those goals.

Always of major concern with any proposed changes in federal aid is their effect on the federal budget. Some innovative measures for highway financing make demands—or establish potential claims—on the budget, whereas others appear to be neutral. Some proposals would create new federal programs and provide funds in addition to those authorized under the federal-aid program. Others would not increase federal spending but would give states greater flexibility in their use of federal aid. Still others would lead to greater use of tax-exempt financing and thus reduce federal tax revenues.

To sum up, no single innovative financing mechanism stands out from the rest. Projects differ from one another, as do their prospective sponsors. Some states have been more receptive than others to debt financing, toll roads, and user fees. Of course, states do not need to adopt such measures if doing so is impracticable because the innovative financing measures under consideration are all voluntary. The measures discussed in this study illustrate the possibilities and limits of alternative financing mechanisms. In certain circumstances, those mechanisms can augment existing funding, but they are not likely to generate enough funds to replace traditional sources of revenue.

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2. Economic efficiency means allocating scarce resources to uses that are of the highest value to society as a whole.

3. If consumers are willing to pay a price that is greater than the marginal cost for a good, their willingness signals that they value the good more than the resources that go into providing it. Therefore, more of the good should be produced. If the price consumers are willing to pay is less than the marginal cost, their behavior indicates that they place less value on the good than on the resources used to produce it and those resources could produce greater value if used elsewhere.

Chapter Two

Relaxing Restrictions on Federal Aid

The federal government currently provides about $20 billion a year in grants to states for highways. That amount is about one-quarter of the annual spending for roads by all levels of government. (Appendix A provides an overview of highway funding at the federal, state, and local levels.) The Congress is debating measures that would increase federal aid to between $25 billion and $30 billion a year. Also under consideration is whether to modify some of the rules governing states' use of that aid.

The federal-aid highway program involves a maze of requirements that states must navigate if they are to receive aid. In recent years, some long-standing restrictions have been relaxed, initially through administrative action by the Federal Highway Administration and later through legislation ratifying some of FHWA's initiatives. Removing restrictions on federal aid can stretch its value to the states by giving them greater flexibility without the cost of new procedures, institutions, and bureaucracies.

Overview of the Federal-Aid Highway Program

Since 1916, the Congress has authorized—and reauthorized—federal aid to states for highways in legislation passed every few years. The legislation sets forth rules governing how states can use that aid. During the 1990s, the Congress has broadened the set of financing options open to the states.

The federal government owns and operates very few highways—mainly roads on Indian reservations, in national parks, and on other federal lands. Nevertheless, it influences the ways in which state and local governments spend their highway funds. And that influence applies not only to the $20 billion annually in federal aid for highways but also, to a lesser extent, to the $60 billion or so a year that state and local governments raise from their own sources.

The federal government has a long history of providing funds to build roads. An early rationale was that roads were an important means of bringing the nation together, linking interior agricultural markets with manufacturing and trade at ports. By the middle of the 20th century, the nation's defense also loomed large in federal policies toward highways. The Federal-Aid Highway Act of 1956, which created the National System of Interstate and Defense Highways (the Interstate System), authorized a 41,000-mile system of highways to promote commerce, provide for more expeditious movement of military supplies and personnel, and expand and improve travel opportunities for citizens.[1] The 1956 act also created the federal Highway Trust Fund, increased the federal tax on motor fuels to 3 cents a gallon, and ordered the government to deposit revenues from the motor fuel and other federal taxes on highway users into the trust fund (see Box 1).

1. Federal-Aid Highway Act of 1956, 70 Stat. 378. In an earlier measure (section 7 of the Federal-Aid Highway Act of 1944, 58 Stat. 842) passed during World War II, the Congress outlined plans for building a system of interstate highways once the war was over.

The 1956 highway act authorized federal aid for a period of three years. Since then, the Congress has reauthorized the highway program several times, generally for a period of four to six years. The most recent multiyear authorization expired at the end of September 1997. In November 1997, the Congress passed a six-month stop-gap measure while it considers proposals for reauthorization.

Box 1.
Highway User Taxes and the Highway Trust Fund

In 1956, the nation launched a massive effort to build the Interstate System. Although federal taxes on gasoline and diesel fuel predated that activity, the new highway initiative required substantial increases in revenues. Thus, in that same year, the Congress established the federal Highway Trust Fund as a way of providing a steady, predictable source of funding for highways. It also raised tax rates on gasoline and diesel fuel to 3 cents a gallon from the previous rate of 2 cents. Receipts from the taxes were earmarked for the trust fund so that the Interstate program would have a dedicated stream of funding.

Federal taxes on gasoline subsequently increased to 4 cents a gallon in 1959, 9 cents in 1983, 9.1 cents in 1987, 14.1 cents in 1990, and 18.4 cents in 1993. On December 31, 1995, the rate dropped to 18.3 cents a gallon with the expiration of the 0.1-cent-per-gallon tax designated for the Leaking Underground Storage Tank Trust Fund. Tax rates on diesel fuel were the same as the gasoline rates until 1983, when they were raised to 15 cents a gallon. In the years following, they have exceeded gasoline tax rates by 6 cents a gallon. The difference is intended to reflect the greater wear and tear on roads from heavy trucks that use diesel fuel.

For almost 30 years, all revenues from federal taxes on fuel went to the Highway Trust Fund to finance highways. But in 1983, provisions in the Surface Transportation Assistance Act of 1982 came into effect requiring that a penny per gallon in fuel taxes be set aside for mass transit. To accommodate that requirement, a transit account was established within the Highway Trust Fund. On December 1, 1990, the amount set aside for mass transit increased to 1.5 cents a gallon.

Another wedge between taxes on fuels and highway financing took shape with the passage of the Omnibus Budget Reconciliation Act of 1990 (OBRA-90). OBRA-90 not only raised the fuel tax rates by 5 cents a gallon but also for the first time directed revenues from those taxes into the general fund of the Treasury. Thus, 2.5 cents of the increase went into the general fund, and 2.5 cents went to the Highway Trust Fund. Of the amount going to the trust fund, 2 cents flowed into the highway account, and 0.5 cents went to the mass transit account. On October 1, 1995, the 2.5-cent portion of the OBRA-90 tax that had gone to the general fund was redirected to the Highway Trust Fund (2 cents for the highway account and 0.5 cents for the transit account).

The emphasis in the Congress on reducing the federal deficit brought yet another wedge on October 1, 1993. Fuel taxes increased by 4.3 cents a gallon, and all the revenues from that increase went into the general fund for deficit reduction. The budget reconciliation bill of 1997 reversed the pattern, however, and redirected revenues from that portion of the fuel tax to the Highway Trust Fund. The increase was divided in such a way that 3.45 cents now goes to the highway account and 0.85 cents goes to the transit account.

Thus, of the 18.3-cent-per-gallon federal tax on gasoline in place as of October 1997, 15.45 cents goes to the highway account, 2.85 cents to the transit account, and nothing to the general fund. Of the 24.3-cent-per-gallon tax on diesel fuel, 21.45 cents goes to the highway account, 2.85 cents to the transit account, and nothing to the general fund.[1]

Diverting revenues from highway users to the transit account and the general fund has weakened the "user-pays" principle on which the Highway Trust Fund was established. Such diversions have also contributed to debates over whether the Highway Trust Fund should be subject to controls on federal spending and whether its balances should be included in computing the federal deficit or surplus.

1. Federal Highway Administration, *Highway Statistics 1994* (October 1995), Tables FE-101A and FE-21, pp. IV-20 and IV-22. Gasohol and other fuels made with ethanol and methanol are taxed at rates that range between 11 cents and 18.3 cents a gallon; the splits between the highway and transit accounts are similar to those for gasoline and diesel fuel.

Several factors determine the amount of federal aid apportioned to each state.[2] Commonly referred to as formulas, such factors include the number of lane-miles and vehicle-miles traveled on the Interstate System and local air quality. However, no simple mathematical expression determines the amount a state will receive. Several additional provisions of the law attempt to achieve what the Congress considers to be an equitable distribution of federal funds among the states.[3]

Rules Governing the Use of Federal Aid

Once federal funds are apportioned to the states, the states are subject to federal laws and regulations regarding their distribution. Provisions of the federal-aid program are codified in title 23 of the U.S. Code. It contains about 60 sections that establish the program, spell out the policy objectives, and specify the rules for distributing federal aid. The rules tell the states what kinds of highway projects are eligible for different categories of federal aid, and they dictate requirements for states in matching the aid. They also impose requirements that are intended to advance social objectives unrelated to transportation such as environmental and employment goals. Of course, states do not have to accept federal money for highways and the restrictions that come with it. But the amount of federal aid is so large that it would be difficult for a state to decline.

Categories of Federal Aid. The federal-aid program specifies how much federal funding is available for various categories of surface transportation. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) authorizes spending on eight major highway programs and numerous smaller programs. In addition, it contains several "equity adjustment categories" that are intended by the Congress to distribute funding equitably among the states. The legislation specifies how the funding provided under those categories can be spent.[4]

The eight major programs under ISTEA are Interstate construction, Interstate substitute, Interstate maintenance, the National Highway System (NHS), the surface transportation program (STP), congestion mitigation and air quality improvement, bridge replacement and rehabilitation, and federal lands highways (see Table 2). States are allowed to transfer some funds between categories under certain conditions. For example, they may transfer up to 50 percent of NHS funds to the STP (they can transfer even more with the approval of the Secretary of Transportation), or they may transfer up to 40 percent of bridge funds to either the NHS or STP (or both).[5] A state may also shift any amount of Interstate maintenance funds to the NHS or STP as long as it certifies that it is adequately maintaining its highways on the Interstate System.[6]

The federal government also sets rules for how states may spend funds within various categories of aid. The surface transportation program, which includes most major state and local highways as well as mass transit capital projects, is subject to numerous funding constraints:

- Fifty percent of STP funds must be divided between urbanized areas with populations above 200,000 and other areas of the state, in proportion to their relative share of the state's population.
- Thirty percent can be used in any area of the state.[7]
- Ten percent must be used for safety construction.[8]

2. The U.S. Code makes distinctions between apportionments and allocations. For a technical description, see Federal Highway Administration, *Financing Federal-Aid Highways*, FHWA-PL-92-016 (May 1992), pp. 13-14.

3. In 1997, the distribution of funding was the focus of controversy as the Congress considered measures to reauthorize the highway program. The measures include distributing funds according to how much states have paid in fuel taxes, according to need, and according to the level of effort put forth by each state to finance its highways.

4. Federal Highway Administration, *Financing Federal-Aid Highways*, pp. 14-17.

5. 23 U.S.C. 104(c) and 23 U.S.C. 144(g). The transferred funds are not subject to allocation requirements specified at 23 U.S.C. 133(d).

6. 23 U.S.C. 119(f).

7. 23 U.S.C. 321(d). There are exceptions for states in which more than 80 percent of the population lives in a metropolitan area, for states in which the federal government owns more than 80 percent of the land, and for areas with less than 5,000 people.

8. 23 U.S.C. 133(d)(1).

Table 2.
Funding Authorized by Title I of the 1991 Intermodal Surface Transportation Efficiency Act, 1992-1997

Category	In Billions of Dollars	As a Percentage of Total
Major Programs		
Interstate construction	7.20	6.0
Interstate substitute	0.96	0.8
Interstate maintenance	17.00	14.1
National Highway System	21.00	17.4
Surface transportation	23.90	19.8
Congestion mitigation and air quality improvement	6.00	5.0
Bridge replacement and rehabilitation	16.10	13.3
Federal lands highways	2.60	2.2
Equity Adjustments[a]		
Donor state bonus	3.00	2.5
Interstate reimbursement	4.00	3.3
Hold harmless	3.64	3.0
90 Percent of payments guarantee	0.42	0.3
Minimum allocation[b]	5.18	4.3
Other		
Earmarked projects	6.23	5.2
Other surface transportation	3.59	3.0
Total	120.81	100.0

SOURCE: Federal Highway Administration, *Financing Federal-Aid Highways* (May 1992), pp. 35-36.

a. The Congress's intent in adding these categories was to ensure equitable distribution of funds among the states. All funds from these categories except those under minimum allocation flow to the surface transportation program.

b. Funds from this category may be used for any major program except Interstate maintenance and federal lands highways. They may also be used for hazard elimination and rail/highway crossings.

- Ten percent may be used only for "transportation enhancements," such as pedestrian and bicycle facilities, beautification, scenic highways, and historic preservation.[9]

9. 23 U.S.C. 133(d)(2).

- Up to 1/16 of 1 percent of STP funds may be used for education and training of state and local highway department employees, but those funds can pay no more than 80 percent of the cost of tuition and direct educational expenses.[10]

Other categories of aid are also constrained by rules. At least 15 percent but not more than 35 percent of the bridge apportionment must be used for bridge projects that are not on a federal-aid road.[11] The Secretary of Transportation may waive the 15 percent requirement, however, if he or she determines that the state does not need such bridge work. For states with Indian reservations, at least 1 percent of the bridge apportionment must go for bridges on reservation roads.

Two percent of the funds apportioned to states for the major categories of aid can be used only for planning and research activities, and one-quarter of that 2 percent must be used for research, development, and technology transfer. The state may claim an exception to the requirement if it certifies that expenditures for transportation planning will require more than 75 percent of the earmarked amount.[12]

Recognizing the complex nature of the federal-aid program, the Federal Highway Administration has issued a 355-page handbook that describes the types of programs and projects that are eligible for federal aid and the terms and conditions that apply.[13]

In addition to categorical aid, ISTEA authorized $6.2 billion for 539 demonstration projects.[14] Some of those projects appeared on lists of priorities that the states maintain. Some, however, were clearly of lower priority to the states than other projects for which they were seeking funds.

10. 23 U.S.C. 321(b).

11. 23 U.S.C. 144(g)(3).

12. Federal Highway Administration, *Financing Federal-Aid Highways*, pp. 14-15.

13. Federal Highway Administration, Federal-Aid Program Branch, *A Guide to Federal-Aid Programs, Projects, and Other Uses of Highway Funds*, FHWA-PD-92-018 (September 1992).

14. Federal Highway Administration, *Financing Federal-Aid Highways*, pp. 14 and 35.

Matching Shares. In general, the federal-aid highway program requires states to match federal funding. The federal share for most types of projects is 80 percent.[15] For Interstate maintenance, the federal share is generally 90 percent, but for additional lanes that are neither designated as auxiliary nor reserved for high-occupancy vehicles, the federal share is 80 percent.[16] The federal share can be larger if a substantial percentage of a state's area is Indian lands or public domain. The federal share may also be increased for certain emergency relief or safety projects.[17]

Many of the innovative financing mechanisms put forward by the Department of Transportation administratively or enacted in ISTEA or the National Highway System Designation Act of 1995 (the NHS Act) relax rules governing how states can provide their share of highway financing.

Federal-Aid Rules to Promote Social Objectives. The federal-aid highway program also contains some conditions for receiving aid that are intended to promote social objectives. A full review is beyond the scope of this study. Nevertheless, a description of several past and present conditions attached to such aid shows how aspects of the program can affect the aid's value, either by imposing rules on private individuals or firms or by making highway construction more expensive than it might otherwise be.

For example, as a result of the 1974 Arab oil embargo and subsequent shortage of motor fuels, the Congress decreed that states wanting to receive federal highway aid had to impose a maximum speed limit of 55 miles per hour. The initial objective of the condition was to reduce fuel consumption. However, when studies showed that a significant decline in automobile fatalities was also associated with the lower speed limit, pressure developed to keep the lower limit for safety reasons, even after the flow of oil resumed. Later, states were permitted to raise the speed limit to 65 miles per hour on rural highways on the Interstate System. ISTEA brought additional relaxation to the 55-mile-per-hour limit; the act allowed states to set speed limits of 65 miles per hour on some non-Interstate highways. In 1995, with the NHS Act, the Congress eliminated the federal policy on speed limits after much debate over the appropriate role of the federal government.[18] The Congress also removed a number of other requirements, such as laws that motorcyclists wear helmets, that had been imposed on states as conditions of federal highway aid.

The NHS Act added a provision requiring action by the states in regard to drinking and operating motor vehicles. Beginning in 1998, states must have enacted and be enforcing a law that considers an individual under the age of 21 who has a blood alcohol concentration of 0.02 percent or greater while operating a motor vehicle to be driving while intoxicated or driving under the influence of alcohol.[19] If the state is not fulfilling those conditions, part of its apportionments for the National Highway System, surface transportation program, and Interstate maintenance will be withheld. Beginning in 1996, the Secretary of Transportation was required to withhold 10 percent of a state's apportionments for those programs if the state did not enact and enforce legislation to revoke or suspend the driver's licenses of people convicted of drug offenses.[20]

ISTEA requires that at least 10 percent of federal aid for highway and transit projects "be expended with small business concerns owned and controlled by socially and economically disadvantaged individuals."[21] That requirement may mean that states will pay more for some aspects of their programs than they would in the absence of the provision. In addition, each state must annually survey and compile a list of such small business concerns. It must then notify the Secretary of Transportation of the percentage of firms that are controlled by women and the percentages controlled by women or by men who are considered socially and economically disadvantaged.[22]

15. 23 U.S.C. 120(b).

16. 23 U.S.C. 120(a).

17. 23 U.S.C. 120.

18. Section 205, 109 Stat. 577.

19. Section 320, 23 U.S.C. 161, 109 Stat. 589. Five percent of the funds are to be withheld in 1998 and 10 percent in subsequent years.

20. 23 U.S.C. 159.

21. Section 1003(b), 105 Stat. 1919.

22. Section 1003(b)(3), 105 Stat. 1920.

Contractors and subcontractors who perform work on highway projects built with federal aid are subject to another such requirement that may increase the cost of their operations. Even if they are able to hire workers for less, they must pay laborers and mechanics at least the prevailing wage for that kind of work in that locality.[23] The prevailing wage is determined by the Secretary of Labor according to provisions of the Davis-Bacon Act.[24]

The federal government can also use the federal highway program to achieve environmental goals. Federal aid for highways can be withheld if states do not meet standards set forth in the Clean Air Act, as amended.[25]

The present system causes some friction between state and federal governments and among the state governments as each state seeks to receive as much federal aid as possible and to have the authority to spend those funds according to its own priorities. The total amount of federal aid is limited and essentially fixed after reauthorization. As a result, the states are engaged in a zero-sum game: if one state gets more federal money, another gets less.[26] That reality has led to the search for other methods of highway financing.

Legislation Promoting Innovative Financing Initiatives

By the late 1980s, transportation planners had started to search for nontraditional means of financing new projects. The Federal Highway Administration began to explore ways of giving states greater flexibility in using debt and toll financing and strategies for encouraging investment by the private sector. It relaxed some rules on an experimental basis and suggested legislation to adopt the most promising reforms. Subsequently, the Congress passed ISTEA and the NHS Act, which ratified FHWA's initiatives and also eased other restrictions on the use of federal aid. Those changes have helped states to use their federal aid more productively.

The Intermodal Surface Transportation Efficiency Act of 1991. ISTEA brought significant changes in federal policies toward toll roads. It allowed federal-aid funds to be used on any toll facility owned by a public entity and on approved private facilities.[27] Tolls no longer had to be removed once a road was paid for (see below), and any money left over after providing proper maintenance could be used for other highways.

The toll provisions of ISTEA marked a major break with tradition. Beginning in 1916, the federal government had maintained a policy that required roads built with federal aid to be free of tolls.[28] In 1956, the Congress reinforced the policy by decreeing that highways on the Interstate System would be toll-free. Over the years, some exceptions were carved out—for existing toll roads that became part of the Interstate System, for bridges and tunnels on the system, and for cases in which states paid back the federal aid they had received for a highway. But in general, until ISTEA, the federal government had discouraged states from developing toll roads.

ISTEA also broadened the set of toll projects eligible for federal aid. Included under the new provisions were most construction and major maintenance except for highways on the Interstate System.[29] (Major maintenance comprises the so-called 4R projects: reconstruction, resurfacing, restoration, and rehabilitation.) ISTEA authorized states to use federal aid to pay from 50 percent to 80 percent of the cost of the toll projects, and it permitted states to lend the federal share of a project's cost to a public or private entity to build a toll facility. The latter provision expanded the opportunities for states to engage in debt financing and cleared the way for greater investment by private firms in highway projects.

A further change brought about by the legislation's toll provisions was in the rules governing the state's

23. 23 U.S.C. 113.

24. The Davis-Bacon Act is codified at 40 U.S.C. 276a.

25. 42 U.S.C. 7509(b)(1), 104 Stat. 2420.

26. Federal funding for highways has increased in the 1990s as many other programs within the domestic discretionary part of the budget have shrunk. However, pressures to increase federal highway funding are counterbalanced by pressures to continue to reduce domestic discretionary spending.

27. Section 1012, 23 U.S.C. 129, 105 Stat. 1936.

28. For a brief overview of federal policies toward toll roads, see Congressional Budget Office, *Toll Roads: A Review of Recent Experience*, CBO Memorandum (February 1997).

29. Section 1012, 23 U.S.C. 129, 105 Stat. 1936.

matching share. ISTEA permitted states to count toward their matching-share requirement "toll revenues that are generated and used by public, quasi-public, and private agencies to build, improve, or maintain highways, bridges, or tunnels that serve the public purpose of interstate commerce."[30] With the "toll credit" provision, the legislation made toll roads more attractive to states and encouraged them to form partnerships with the private sector.

The National Highway System Designation Act of 1995. The NHS Act contained several innovative financing provisions. It continued along the trail blazed by ISTEA, making toll roads more attractive to states by raising the federal share for toll facilities to 80 percent.[31] It also authorized a pilot program of state infrastructure banks (SIBs) for making loans and providing other financial assistance for highway and mass transit projects. Funding from certain categories of federal aid could be used to capitalize the banks; the act permitted states to deposit up to 10 percent of those funds. The NHS Act did not provide any new funding for capitalization, but the following year, the Congress appropriated an additional $150 million to be distributed to states for the SIB program.

Several other loan-related provisions of the NHS Act gave states an incentive to consider debt financing. The act provided greater latitude for states in making loans for projects, setting the terms of those loans, and using the repaid funds. And it codified states' authority to use federal aid to pay for costs related to the issuing of bonds—not only the bond principal but other charges such as interest and bond insurance.[32]

The NHS Act also contained provisions that ratified several financing measures that the Federal Highway Administration had instituted on an experimental basis. Those measures relaxed rules governing the way states met the requirement to match federal aid with state funding.

30. Section 1044, 23 U.S.C. 120, 105 Stat. 1994.

31. Section 313(a), 23 U.S.C. 129(a)(5), 109 Stat. 585.

32. Section 311, 23 U.S.C. 122, 109 Stat. 583.

Legislative Proposals in the 105th Congress

As the 105th Congress considers reauthorizing the highway and mass transit programs, innovative financing has played at best a secondary role. Indeed, the majority of the recent debate has centered on the formulas by which federal aid is doled out to the states. States that have sent more money to Washington than they have received in aid have pressed for adjustments that would return more of their money to them. Another contentious issue has been the growing balances in the federal Highway Trust Fund and the restrictions on spending those funds that are being used to meet balanced budget targets.

Yet despite its relegation to the sidelines during the reauthorization process, innovative financing has not been unaffected by the debate. The major issues that the Congress has been considering relate to innovative financing in at least two ways. First, they suggest that traditional funding continues to be limited and that state and local officials will have to be creative in making the best use of the available funds. Second, they call into question the appropriate role of the federal government in providing aid to states for highways. (See Box 2 for an overview of proposals for devolution.)

In the area of innovative financing, two legislative proposals would create federal programs offering credit assistance. The Senate's bill to reauthorize ISTEA (S. 1173) would establish a pilot program of federal credit assistance for large surface transportation projects.[33] The program would provide up to $530 million in federal budget authority to support as much as $10 billion in credit assistance. Projects eligible for assistance would be those costing more than $100 million or using more than half of a state's annual federal aid, whichever was less. Senator Chafee has also introduced legislation (S. 275) that would make tax-exempt bond financing available for up to 15 highway projects nationwide to be developed by the private sector.

The Clinton Administration has prepared its own proposal for helping states fund their highway programs. The Administration's plan would expand the

33. Title I, Subtitle C, Chapter 2.

Box 2.
Proposals for Devolution

Some policymakers have proposed eliminating most of the federal highway program and returning the job of funding highway construction and maintenance to the states. Bills introduced by Representative Kasich (H.R. 1470) and Senator Mack (S. 667), which together make up the Transportation Empowerment Act, would retain only a limited federal role that would focus on programs with a strong national interest. To that end, the proposed legislation would cut federal taxes on motor fuels from their current rates of 18.3 cents a gallon for gasoline and 24.3 cents for diesel fuel to 6.3 cents a gallon by 2002. Only 2 cents would go to the Highway Trust Fund.

Although states might welcome having greater control over their highway programs, they may take a dimmer view of their new responsibility for providing most of the funds to pay for them. Even if states raised their own taxes on gasoline by only as much as (or by less than) federal taxes were reduced, elected officials would still be vulnerable to the unwelcome charge that they had increased taxes. Some proposals address that concern by retaining the federal tax but refunding to each state approximately the amount of revenue estimated to have been collected from it. Measures of that type were proposed by Senator Warner and Representative DeLay in the ISTEA Integrity Restoration Act (S. 335 and H.R. 674, also known as the STEP 21 proposals).

In essence, those proposals would make the federal government the tax-collecting agent but substantially reduce its existing redistributive function. Why does the federal government redistribute money among the states for highway purposes? The principal economic justification for returning more money to some states and less to others is the presence of spillover benefits. If the highways of one state are used disproportionately by residents of other states (and if those users buy a disproportionate amount of fuel in other states and thus do not contribute much to the first state's tax revenues), an argument can be made that funds should be redistributed.

Another justification relies on the contributions highways make to economic development. If federal policy favors helping poorer regions of the nation by stimulating economic development, one way of advancing toward that objective will be to build highways. Highway programs create construction jobs and eventually spur industry and commerce by reducing transportation costs. However, building highways is a blunter instrument for redistributing wealth than are health or welfare policies that target aid to individuals with low incomes. As a result, highway projects are likely to be a more expensive way of aiding poor people. The stronger argument for federal redistribution of highway funds is the one of spillover benefits.

program of state infrastructure banks to all states by providing $150 million annually to assist state and local governments in capitalizing the banks.[34] It has also proposed a new federal program of credit enhancements for public or private sponsors of publicly owned projects. The program would finance projects of national significance by awarding grants to project sponsors for establishing revenue stabilization funds to back project debt. The projects would use tolls or other user charges or dedicated sources of revenue for repayment.[35] The Administration's plan proposes that obligations secured by the fund not be considered federally guaranteed under the tax code. Therefore, they could be set up as either taxable or tax-exempt debt.[36]

FHWA's Innovative Financing Initiatives

With the passage of the Intermodal Surface Transportation Efficiency Act of 1991, which authorized greater flexibility in financing, FHWA was free to consider new initiatives in funding for the nation's highways. In response to a 1994 executive order promoting more

34. Section 1022 of the National Economic Crossroads Transportation Efficiency Act of 1997, or NEXTEA (H.R. 1268 and S. 468).

35. Title V of NEXTEA.

36. Section 5005 of NEXTEA.

effective investment in infrastructure, FHWA established a program known as the Innovative Financing—Test and Evaluation Project, or the TE-045 program.[37] Its goals were to:

- speed construction;
- create incentives for states to use federal financing to its fullest;
- assist states in leveraging their funds to produce more investments; and
- obtain and disseminate information about creative techniques used by the states.[38]

The National Highway System Designation Act of 1995 subsequently ratified most of the TE-045 initiatives, which can be divided into two categories: those that enable projects to get under way sooner than they would under traditional financing and those that provide greater leverage of federal aid.

Getting Projects Under Way Sooner: Cash Flow Tools

In the past, rules relating to the timing of federal aid and the state's matching share have sometimes constrained states from proceeding with highway projects as quickly as they might have liked. For a highway project to receive federal aid, a state had to set aside the full amount of federal and state funds needed before beginning the work. That restriction often presented problems for projects that took large shares of a state's federal aid and its own highway funds. Typically, such projects required that the state put funds aside for several years until it had accumulated enough to proceed, an approach that could crowd out most other projects. FHWA developed several TE-045 initiatives to overcome those obstacles and allow states to begin projects sooner than they otherwise could. Those cash flow tools are known as advance construction, partial conversion of advance construction, phased funding, and tapered match.

Advance Construction Beyond the Authorization Period. In some instances, the innovative financing initiatives that the TE-045 program comprised expanded on techniques that FHWA was already using on a limited basis. Advance construction is a case in point. This cash flow tool allows states to finance highway projects with their own money (cash or debt) and obtain federal reimbursement later, which is useful if states can tap their own sources of funds to provide money for pressing projects but have exhausted the federal obligational authority that is available. Advance construction is also helpful for a state that must borrow funds. With such a mechanism in place, the state may be able to borrow under more favorable terms because lenders can be assured that future federal funding will be used to help repay the loans.

In the years before the TE-045 program, reaching the end of the authorization period (the federal-aid highway program has usually been authorized for four to six years at a time) effectively cut off aid for new projects until reauthorization occurred.[39] As a result, states could preserve eligibility for federal aid only on new projects that could be "converted" to draw on that aid before the federal authorization expired. That condition made it difficult to start large, multiyear projects toward the end of an authorization period, given the uncertainties about when reauthorization might occur and the lack of any commitment that more federal aid would be forthcoming. Section 308 of the NHS Act codified the funding mechanism developed under the TE-045 program and modified advance-construction provisions by allowing the Secretary of Transportation to approve projects for federal aid beyond the authorization period. (The Secretary's approval was not a guarantee of funding but rather a declaration that if aid was available later, it could be applied to that project.) The one proviso was that the project had to appear on the state's approved transportation plan.[40]

37. The TE-045 work was initiated under 23 U.S.C. 307(a), which gives FHWA authority to engage in research on highway financing as well as on many other issues related to the highway program. For a more detailed description, see Federal Highway Administration, *Rebuilding America: Partnership for Investment, Innovative Financing Handbook, Test and Evaluation 045 (TE-045)* (October 1995). The executive order is no. 12893, Principles for Federal Infrastructure Investments, January 26, 1994.

38. Federal Highway Administration, "Innovative Finance and Statewide Financial Planning" (unofficial briefing book, 1996), Unit 2, p. 5.

39. ISTEA authorized the program for the 1992-1997 period.

40. 23 U.S.C. 115(d), 109 Stat. 582.

Partial Conversion of Advance Construction. Partial conversion of advance construction helps a state's cash flow by allowing it to obtain federal reimbursement for advance-construction projects in stages. That is, states can obtain reimbursement over several years rather than waiting until the project is completed and ready to be "converted" to federal aid. The benefit of partial conversion is that it helps free up funds for other projects.

Phased Funding. FHWA has used phased funding in the past to accomplish essentially the same objective as partial conversion of advance construction. Both techniques involve a federal commitment of aid for a project before the full amount of federal funding is available to be obligated. However, phased funding posed a problem because it essentially required states to make prospective commitments of federal funds that had not yet been authorized. Highway officials therefore have dropped the use of phased funding in favor of partial conversion.[41]

Tapered Match. With tapered funding, the federal match varies by the stage of a project. It enables states to draw on federal funding to finance the entire cost of a project's development stage, for example, and then take a lower amount of federal funding for later stages. Overall, the project would still achieve an 80/20 federal/state split. Tapered funding, then, helps a state's cash flow by providing federal aid sooner than would be possible under traditional financing and at the stage of the project when it is most needed.

Leveraging Federal Dollars

The second category of TE-045 innovative financing tools attempts to make more money available by leveraging state and local funds. The options it offers are more flexible matching requirements, toll investment credits under section 1044 of ISTEA, loans under section 1012 of ISTEA, and debt financing.

Flexible Match. Before FHWA's TE-045 initiatives, a state's matching share (usually 20 percent) of a project had to come from its own or local funds. The one exception was donations of private property, which could be counted toward the share under certain conditions. The more flexible matching requirements of the TE-045 program allow states to use the value of public or private donations to meet part or all of their matching share. By augmenting state sources of funding in that way, a project can qualify for more federal aid per dollar of state money.[42] Section 322 of the NHS Act codifies the change; it explicitly allows states to credit toward their share of a project any donated funds or the fair market value of any donated materials or services that are incorporated into a project.[43]

Section 1044 Toll Investment Credits. Section 1044 of ISTEA allowed states to count certain highway spending that was funded by revenues from tolls toward the matching share required by the federal highway program. But to qualify, a state had to meet a maintenance-of-effort (MOE) test: its spending on highways in the prior year had to equal or exceed the average of expenditures for the three previous years. The TE-045 program relaxed the MOE requirement by allowing states to use toll credits as part of their matching share as long as they met the test prospectively. That is, states could show that their anticipated expenditures for the current year would be at least as large as the average of the three previous years. In addition, the TE-045 program altered the disposition of credits earned in previous years so that now they no longer lapse.

FHWA has implemented toll investment credits through administrative action.[44] However, the major reauthorization proposals of the first session of the 105th Congress—S. 1173, H.R. 2400, and the Administration's bill—would codify that change.[45] The leveraging potential of toll credits can be realized only if

41. For a more detailed discussion, see Miriam Roskin, Ann Sowder, and JoAnne Carter, *An Evaluation of the TE-045 Innovative Finance Research Initiative* (prepared for the Federal Highway Administration, November 1996), p. 26.

42. The state as a whole is still constrained by the total amount of federal aid available each year.

43. Section 322, 23 U.S.C. 323(c), 109 Stat. 591.

44. Roskin, Sowder, and Carter, *An Evaluation of the TE-045 Initiative*, p. 36.

45. The proposed changes are in section 1112 of S. 1173, section 120 of H.R. 2400, and section 1025 of S. 468.

using them prompts more toll projects than would otherwise be the case. Regardless of the leveraging effect, however, toll credits offer cash flow benefits because they reduce or eliminate the need for a state to use current cash to match federal funds.

Section 1012 Loans. Section 1012 of ISTEA permitted states to lend their federal-aid funds to toll projects (after obtaining approval from FHWA).[46] The federal government still exercised control over such transactions, however, because under ISTEA, interest rates were set by federal regulation. The NHS Act gives states the flexibility to negotiate interest rates and other terms of the loans and to offer loans to projects with dedicated sources of revenue that do not include tolls.[47] As revenues from those projects repay the loans, states may use the funds to make grants or loans for additional projects without categorical restriction.

Bond Financing. Before the TE-045 initiatives, states could use federal aid to repay the principal of bonds but not to cover other bond-related costs (except for some limited interest costs). The NHS Act ratified the administrative changes FHWA had made in relation to bonds by allowing states to use federal aid to pay for interest, issuance costs, and insurance, as well as the bond principal, on eligible projects.[48]

To sum up, most of the innovative financing techniques discussed in this section are now available to all of the states. The NHS Act ratified most of them; FHWA put the toll investment credits and partial conversion of advance construction in place through administrative action. The agency has dropped consideration of phased funding since partial conversion accomplishes the same objective. The tapered match is still under consideration.

46. These are also known as Section 129 loans because section 1012 of ISTEA amended 23 U.S.C. 129.

47. Section 313, 23 U.S.C. 129(a)(7), 109 Stat. 585.

48. Section 311, 23 U.S.C. 122, 109 Stat. 583.

Evaluating FHWA's Innovative Financing Initiatives

The TE-045 innovative financing initiatives were intended to make more funds available sooner for highway construction. Experience to date with the initiatives is limited, which is only to be expected, given the long time horizon necessary for planning and building highway projects. Nevertheless, the record shows that many states have availed themselves of the opportunities the initiatives have presented.

Financing Potential

In what sense do the TE-045 initiatives make more funds available to the states? They work primarily by making funding available sooner than it would be with the use of traditional methods of financing. But they also have the potential to tap sources of funds that otherwise might not have been used for highways. In addition, they give states greater flexibility in their selection of which projects to finance first.

Making money available sooner can enhance a state's resources in two ways. First, it can increase a state's buying power when construction costs are escalating but federal aid remains fixed in nominal terms. Second, it can generate more income and wealth for the community through investment in highway projects. The latter result assumes that states use the added flexibility to build the projects with the greatest returns on investment first.

The cash flow tools that the TE-045 program provides make federal aid to the states available sooner. The leveraging tools make more money available sooner through the use of debt financing. They also attempt to generate more money in the aggregate by attracting private equity investment.

A recent report commissioned by FHWA found that the initiatives had generated a net increase of $1.15 billion in current and expected investment. Of that total, $593 million was from private sources in the form

Table 3.
Innovative Financing Tools Used by the States Under the Innovative Financing Initiatives of the Federal Highway Administration, April 1994 to July 1996

Financing Tool	Number of Projects[a]	As a Percentage of All Projects
Flexible Match	28	39.4
Advance Construction	15	21.1
Partial Conversion of Advance Construction	14	19.7
Phased Funding	9	12.7
Tapered Match	5	7.0
Section 1012 Loans	5	7.0
Section 1044 Toll Credits	3	4.2
Bond Reimbursement	2	2.8
Other	2	2.8

SOURCE: Miriam Roskin, Ann Sowder, and JoAnne Carter, *An Evaluation of the TE-045 Innovative Finance Research Initiative* (report prepared for the Federal Highway Administration, November 1996), p. 11.

a. A total of 71 projects used at least one innovative financing tool; some projects employed more than one.

of bond proceeds and equity contributions.[49] Those funds provided about one-quarter of the financing for the 71 projects that were part of the TE-045 program (see Table 3). Most of the "new" funding was for two projects: a toll project in California that raised $482 million in bond proceeds and equity contributions, and the President George Bush Turnpike in Texas, which was funded by $534 million in bond proceeds, interest earnings, and a cash contribution from the Texas Turnpike Authority. The FHWA report estimated that 60 of the 71 projects had been accelerated; for the 43 projects for which the acceleration could be quantified, the average acceleration was 2.2 years.[50]

The tools that were most effective in advancing the availability of funds were the flexible match, the Section 1044 toll credits, and the Section 1012 loans. As noted earlier, the flexible match, which was used in 28 of the projects, enables states to draw on private and substate sources of funds (for example, local governments or turnpike authorities) to meet the state share of federal-aid projects. Using toll credits and revenues as part of the match frees up state money, which may then be spent on additional highway projects or other state priorities. The tools discussed here do not generate additional federal aid, but they may speed receipt of that aid. They also free up state resources for use in highway projects that do not qualify for federal aid.

Efficiency

The innovative financing mechanisms developed through the TE-045 initiatives may contribute to more efficient use of resources in several ways. First, by merging several categories of federal aid into one pool, states can select the highway projects they value most without being constrained by the amount of federal aid available for each individual category. That is, if a state has reached the limit of federal funds in one category but still has a project in the category that would yield greater net benefits than any project in any other category, it has the flexibility to fund the high-return project.

Second, the innovative mechanisms indirectly help to ensure that the highway projects a state builds are worthwhile. To attract private funds—both debt and equity—projects must demonstrate the ability to repay the investment. That requirement provides incentives to build the right projects and to ensure that they are the right size.

A project financed with user fees may or may not stimulate greater efficiency in the use of that resource than a project on which user fees are not imposed. To achieve allocative efficiency, the price paid by the user must reflect the marginal social cost of the resources associated with that use. On an uncongested highway, the cost of one additional automobile may be quite low—lower than the toll that would have to be charged to cover debt repayment and other costs of building and operating the road.[51] On congested corridors, however,

49. Roskin, Sowder, and Carter, *An Evaluation of the TE-045 Initiative*, pp. 15-16.

50. Ibid., p. iii.

51. There are efficient ways of covering total costs when marginal costs are less than average costs. Some of them are discussed in Congressional Budget Office, *Paying for Highways, Airways, and Waterways: How Can Users Be Charged?* (May 1992).

tolls that reflect the cost of traffic delays (or, put another way, the value to users of avoiding delays) are likely to generate enough revenue to cover the cost of the road while also promoting efficiency in the use of the roadway.

Administrative Feasibility

Thirty-nine states entered projects in the TE-045 innovative financing program. Because the program was voluntary and no additional federal funding was available for projects within the program, the large number of participants suggests that the states found the innovative mechanisms both feasible and attractive. One factor contributing to ease of use was that the initiatives were simply a relaxation of rules with which state highway officials were already quite familiar. No new bureaucracy or apparatus was needed to use them. The mechanisms were attractive because they made more financing available. The tools that were most popular in terms of the number of projects on which they were used were the cash flow mechanisms (see Table 3). In terms of dollar amount, the two largest projects made extensive use of leveraging.

The TE-045 program has generated interest in and support for innovative financing mechanisms. The National Highway System Designation Act of 1995 underscored that support by enacting into law most elements of the program. The tools give states additional flexibility in meeting their highway needs. Not all states will find the tools useful; those that do can pick and choose from among the various options. The important point is that use of these innovative mechanisms is strictly voluntary.

Implications for the Federal Budget

What effects do the innovative tools have on federal outlays? The annual amount of federal aid is fixed.[52] Greater use of TE-045 mechanisms could lead to a somewhat faster spendout of the aid if states drew on every federal dollar as soon as it became available instead of having to build up a large enough account to begin a new project. But states are adept at juggling projects to make the most of their federal aid. Consequently, the innovative tools may have less of an effect on the flow of federal funding than on the timing of individual projects. Even if the spendout rate of the aid increased initially as states undertook projects with innovative financing, eventually, federal outlays would probably resume flowing at a steady rate.

Distributional Effects

The distributional effects of FHWA's innovative funding mechanisms vary, depending on the type of project being built and its financing. The cash flow tools basically enable states to get federal aid for a project sooner than they otherwise would. If that acceleration leads to a faster spendout of federal funds, then taxpayers at the federal level will bear a greater cost than before. Projects that borrow from private lenders and repay them with revenues from user fees shift the cost burden of the project from current taxpayers to future users. Projects that repay lenders with dedicated tax revenues shift the burden to future taxpayers. Projects that use private equity investment and nonrecourse bonds run the risk that revenues will not be sufficient to repay the debt and thus provide a sufficient return to investors.

Federal-Aid Rules and Innovative Financing Initiatives: Costs and Trade-Offs

All of the innovative financing mechanisms discussed here relax restrictions that the federal-aid program imposes. Ironically, although the federal government provides substantial funding for highways, the conditions it imposes diminish the value of the funding to the states. Those conditions are the basis of impediments that have motivated the innovative financing initiatives. A central element of the federal-aid highway program—and a key condition at the heart of the TE-045 innovative financing reforms—is the matching-share requirement. Not only the flexible match but all of the cash flow tools (advance construction beyond the current period, partial conversion of advance construction,

52. The amount of contract authority is provided in legislation authorizing the federal-aid highway program. Annual appropriation legislation sets a limit on the amount that can be obligated.

phased funding, and tapered match) and the Section 1044 toll investment credits represent attempts to reduce the burden of the matching-share requirement (see Appendix B for more discussion of the requirement).[53]

From the point of view of state and local governments, the conditions associated with federal aid can be costly and can keep those governments from achieving their objectives efficiently. But the federal government may have good reasons for attaching strings to its aid. One reason is accountability, to ensure that government funds are spent properly and not squandered. Accountability may have been a motivating factor in requiring a state to set aside funding for a project before beginning it. Without such assurances, so the reasoning may have gone, a state might start a large project, run into financial difficulties in completing it, and seek a federal bailout.

Another purpose of conditions of aid is to promote federal goals. The amount of funding for the various categories of federal highway aid reflects federal priorities. In addition, some rules reflect Congressional interest in furthering environmental, labor, or other social objectives. Such requirements may raise the cost of building highways. For example, depending on conditions in the local labor market, the requirement that labor on federal-aid highway projects must be paid the prevailing wage according to the Davis-Bacon Act may cause labor costs to be higher than if a minimum level had not been set.

Other federal constraints are directed at transportation policy and have proved quite contentious. For example, highway user groups have complained about the requirement that 10 percent of the funds in the surface transportation program must be used for transportation enhancements, such as beautification, historic preservation, and bicycle facilities. They argue that highway funds should be spent on highways, not enhancements. Supporters of enhancements reply that some expenditures are needed to redress past "sins"—such as destruction of communities and the environment—associated with highway construction. They would also argue the need to ensure a balance among the preferences of motorists, bicyclists, pedestrians, environmentalists, historic preservationists, and other interest groups.

Thus, meeting federal goals must be balanced against the varying needs, conditions, and preferences of the states. On the one hand, the federal government may impose regulations as a way to achieve what it considers worthwhile social goals and financial accountability. On the other hand, if those rules are overly specific, they may impose higher costs on states and their taxpayers and prevent states from using their highway funds most effectively. Balancing competing objectives has been a recurring theme in legislation concerning the federal-aid highway program. For example, in the 1991 reauthorization, ISTEA provided additional flexibility in some aspects of the program, such as combining multiple categories of projects into the surface transportation program and allowing greater use of toll financing. However, in other areas, such as the transportation enhancements, it imposed more requirements.

During 1997, some proposals called for eliminating or substantially reducing the federal-aid highway program and turning highway policies—and financing—back to the states. Although a full critique of proposals for devolution is well beyond the scope of this study, locating responsibility for highways at the state and local levels is the direction in which many of the innovative financing proposals are headed. Such proposals give state and local officials greater authority and flexibility in funding their programs. But devolution comes with the drawback that states must raise all the money they need for highways from their own sources, without federal aid. Faced with that proposition, state and local officials may prefer to trade flexibility in financing for federal assistance.

53. The other TE-045 tools, Section 1012 loans for toll projects and coverage of bond financing costs, relate to eligibility for federal aid.

Chapter Three

State Infrastructure Banks

Around the same time that the Federal Highway Administration was developing innovative financing initiatives under the Innovative Financing—Test and Evaluation Project, it was also studying various organizational structures that might facilitate debt financing. One result of those efforts was a proposal for a program of state infrastructure banks that would provide loans or other credit assistance for transportation projects. FHWA modeled the program in part after state revolving loan funds for wastewater treatment facilities.[1] Although such banks or funds can take many different forms, they are generally established at the state level with capitalization from federal and state funding. They lend money to municipalities or other entities for the purpose of building infrastructure.[2]

The Department of Transportation (DOT) defines a SIB as "an infrastructure investment fund established to facilitate and encourage investment in eligible transportation infrastructure projects sponsored by public and/or private entities."[3] Thus, a SIB is a financial intermediary established by a state or group of states to help finance transportation projects. SIBs can provide financial assistance through loans and credit enhancement. Credit enhancement generally refers to some form of guarantee that strengthens the quality of the debt used to finance transportation projects. It typically includes such measures as bond insurance, loan guarantees, capital reserves, letters of credit, and lines of credit (see Box 3).

The State Infrastructure Bank Program

The SIB program has moved quickly from inception to implementation. The President proposed the program in his budget submission for 1996 and as part of several other bills. The Congress subsequently authorized a pilot program for SIBs as part of the National Highway System Designation Act of 1995.[4] The act authorized the Secretary of Transportation to enter into agreements with up to 10 states for establishing state and multistate infrastructure banks.

The 1997 appropriation act for transportation expanded the SIB pilot program. It authorized the Secretary of Transportation to select additional states (beyond the original 10) to participate in the program. The act also appropriated the first "new money," $150 million, to capitalize the initial pilot SIBs as well as any new ones. States may also choose to contribute to a SIB by using funding authorized by the Intermodal Sur-

1. The program of federal assistance to states for construction of wastewater treatment plants was authorized in the Clean Water Act. The Water Quality Act of 1987 established the program in which the federal government provides grants to capitalize state revolving funds. The funds are designed to lend money to communities to build facilities to treat wastewater according to the requirements of the act.

2. This study uses the terms "bank" and "revolving fund" interchangeably, although some academics prefer to use "revolving fund" when the repayments of debt are lent out again and "bank" when the proceeds are used simply to retire debt. The "revolving fund" terminology is more common for entities that finance wastewater treatment facilities, following the terminology in the Clean Water Act that provided for them. "State infrastructure bank" is the term more commonly employed for transportation, following its use in the National Highway System Designation Act of 1995.

3. Department of Transportation, "Participation in the State Infrastructure Bank Pilot Program," *Federal Register*, vol. 60, no. 249 (December 28, 1995), p. 67159.

4. Section 350, 109 Stat. 618-622.

Box 3.
Types of Financial Assistance SIBs Can Offer

Section 350(l)(3) of the National Highway System Designation Act of 1995 authorizes SIBs to:

- provide credit enhancements;
- serve as a capital reserve for bond or debt instrument financing;
- subsidize interest rates;
- ensure the issuance of letters of credit and credit instruments;
- finance purchase and lease agreements with respect to transit projects;
- provide bond or debt financing instrument security; and
- provide other forms of debt financing and methods of leveraging funds that are approved by the Secretary [of Transportation] and that relate to the project with respect to which such assistance is being provided.[1]

The Secretary has approved the following "other forms" of assistance:

- lease guarantees for highway and transit capital projects;
- certificates of participation;
- letters of credit;
- lines of credit;
- grant anticipation notes; and
- standby guarantees.

1. 109 Stat. 622.

face Transportation Efficiency Act of 1991.[5] The $150 million appropriation is from the general fund, not the Highway Trust Fund.

The Administration has continued its support for this type of organizational structure. The President's budget for 1998 requested an additional $150 million for capitalizing the SIBs. His proposal for reauthorizing the highway program, the National Economic Crossroads Transportation Efficiency Act (NEXTEA), would continue funding for the SIB program at the same levels through 2003. The Congress did not include additional funds for SIBs in the Department of Transportation's 1998 appropriation. Instead, it left the issue for consideration in authorizing legislation.

Ground Rules

Shortly after the NHS Act was passed, the Department of Transportation issued a notice in the *Federal Register* soliciting proposals by states to participate in the SIB pilot program.[6] DOT encouraged states to be creative in their applications; it gave them flexibility in determining the structure of the banks, the types of assistance the banks could provide, their sources of funding, and other features. However, the department laid down rules for several aspects of the program. For example, states can capitalize infrastructure banks with up to 10 percent of their federal funding from specified categories under the federal-aid highway and mass transit programs.[7] But they must contribute enough of their own money to match 25 percent of the federal funding (to yield the customary federal/state arrangement of an 80/20 cost split).

DOT also established certain restrictions on the use of SIB funds. Some restrictions apply only to the initial assistance that the SIB provides. The NHS Act prohibits federal funds that are contributed to the SIB from being used as grants. Instead, at least in the first round, the SIB must use its money only for loans or credit enhancements. As loans are repaid, however, the SIB can use the proceeds to make grants, although the spirit of the program is to keep recycling the funds into more projects through the use of loans. In the initial round of assistance, funding must be used for projects that are

5. States may contribute up to 10 percent of funds they receive for most categories of federal aid.

6. Department of Transportation, "Participation in the State Infrastructure Bank Pilot Program," pp. 67159-67160.

7. Under the SIB pilot program, states may deposit up to 10 percent of their 1996 and 1997 apportionments and allocations for most program categories of federal highway funds. The categories of highway funds eligible for use in SIB capitalization are National Highway System, surface transportation program, Interstate maintenance, bridge replacement and rehabilitation, minimum allocation, Interstate reimbursement, hold harmless, 90 percent payment adjustments, and donor state bonus (see Table 2 on page 8).

eligible under SIB rules. In later rounds, funds that have come to the SIB from the highway account can be used for any project allowed under the overall federal-aid highway program. (The same restrictions and flexibility apply to mass transit funds and projects.)

States' Responses to the Pilot Program

Fifteen states met the March 1996 deadline for submitting applications to participate in the initial phase of the SIB pilot program. Of those, DOT selected eight in the first round: Arizona, Florida, Ohio, Oklahoma, Oregon, South Carolina, Texas, and Virginia. For the other applicants—California, Massachusetts, Michigan, Minnesota, Missouri, Tennessee, and Washington—DOT provided advice on how to revise their submissions to improve their chance of being selected for one of the two remaining slots. All of the states that were rejected in the first round resubmitted their revised applications or asked that their original submissions be reconsidered. DOT subsequently selected California and Missouri as part of the initial group.

The NHS Act authorized the Secretary of Transportation to enter into cooperative agreements with each approved SIB state specifying the terms of the SIB's funding and operation. In recent months, DOT staff have provided technical assistance to states in developing those agreements. Ohio and Oregon were the first states to sign their agreements, and DOT sent Ohio's form to the other states as a guide. By July 1997, DOT had signed cooperative agreements with all 10 pilot states.

In response to the 1997 appropriation act, which opened the SIB program to all states, DOT solicited additional applications. By December 1996, DOT had received 26 additional proposals covering 27 states and Puerto Rico. (There were two multistate proposals, and a 28th state later joined a multistate agreement.) Thus, by May 1997, a total of 38 states plus Puerto Rico had sought approval for SIBs. In June 1997, DOT announced its approval of all the proposals and allocated the $150 million of new money appropriated for 1997 among the 39 participants in the SIB program.[8]

The Initial Set of Applications

The initial set of applications contained proposals for a variety of projects, methods of funding, and sources of repayment. However, the projects that the states proposed in their applications are not necessarily the ones they will eventually carry out. There has already been a great deal of flux—states have dropped some projects and added others. Consequently, the descriptions that follow should be considered illustrations rather than a catalog of SIB projects.

Types of Projects. Twenty-five of the 32 projects proposed for SIB financing through 1998 are highway projects.[9] Two proposals involve mass transit facilities—a van-pool leasing program in Oregon and rehabilitation of a passenger rail bridge in Cleveland. Several projects are classified as multimodal: two parking facilities, a facility for transferring freight between rail and truck modes, and an at-grade highway/rail crossing.

Most of the highway projects involve new construction, but a few involve major reconstruction. The new construction projects include bypasses, connectors, beltway segments, and interchanges. Several road-widening and realignment projects are also part of the group.

Sources of Repayment. Most of the projects that are being financed by SIBs will use dedicated tax revenues to repay loans.[10] A few will use special assessments. Four plan to use tolls, and four will impose other fees associated with the use of the project, such as fees for parking.

Leveraging. One key matter each state has to decide is whether to leverage SIB funding. One way of doing so is to issue bonds backed by SIB capital. Issuing bonds increases the amount of funding available in the near term and is referred to as leveraging because each initial

8. Department of Transportation, "29 Additional States Are Approved to Participate in State Infrastructure Bank (SIB) Pilot Program" (press release, DOT 93-97, June 19, 1997). Four of the 38 states received only conditional approval from DOT until they had passed legislation allowing them to establish a SIB. The 1997 appropriation act directed DOT to refrain from distributing the $150 million before April 1997, 180 days after the legislation was enacted. The Congress gave the Secretary of Transportation the authority to decide how to distribute the funds among the SIBs.

9. Department of Transportation, *Evaluation of the U.S. Department of Transportation State Infrastructure Bank Pilot Program: Status as of February 28, 1997* (June 1997). As of June 1997, two states were still evaluating candidate projects.

10. Ibid.

dollar of SIB funding is used to back several dollars of debt. In the absence of leveraging, only the initial amount of funding (plus any later infusions of additional aid) is available to lend. As initial loans are repaid, the repayments (including interest) become available to be lent again. A second means of leveraging SIB capital is to offer credit enhancements, such as loan guarantees, which enable the sponsors of projects to borrow money at lower interest rates.

As of September 1997, Arizona, Missouri, and Ohio had expressed interest in leveraging SIB funds by issuing bonds. The other states simply intend to make loans from their initial capital and, as the loans are repaid, to make additional loans with the repaid principal and interest. California plans to initiate a loan guarantee program under which its SIB will agree to guarantee up to 25 percent of the debt used to finance a project.

Evaluating State Infrastructure Banks

The principal goal of the SIB program is to speed up the availability of funds for transportation projects. SIBs accomplish that objective in part by attracting additional funds from the private sector that otherwise would have been invested elsewhere. Using those funds for transportation purposes affects the allocation and distribution of resources and has implications for the federal budget. Establishing and operating a SIB also place demands on the resources of state governments.

Financing Potential

How much additional money SIBs can make available for highway and transit projects, and how soon, depends in large part on three main factors: the amount and nature of federal aid; the way states respond, including how they structure their SIBs; and the success SIBs have in attracting private capital.

Additional Federal Aid. As previously mentioned, the Congress did not provide any additional federal aid when it established the SIB pilot program in 1995; it simply permitted states to deposit up to 10 percent of most categories of their existing federal aid into SIBs. In making appropriations for 1997, the Congress gave DOT an additional $150 million to award to SIBs. Although that sum was small in relation to total appropriations for highways (about $20 billion that year), the hope was that it would be enough to induce more states to apply to participate in the SIB program. No additional appropriation was provided for 1998. DOT expects that by the end of 1998, states will have allocated $324 million in federal aid to their SIBs to help fund $1.6 billion worth of projects.[11]

Opportunities Resulting from Fewer Restrictions on Federal Aid. Using the SIB mechanism, states may be able to make money available for some types of projects sooner than would otherwise be the case because the SIB accords greater flexibility in using federal aid. After a state deposits the categorical federal aid into its SIB and provides a 25-percent match from its own sources, the categorical restrictions on the use of the money within a given mode disappear or are greatly diminished.[12] As a result, a project that is so large that the state might ordinarily need several years to accumulate enough funding in its category could become affordable more immediately by drawing on SIB funding from multiple categories. In that way, SIBs can serve as intermediaries that pool federal aid from more than one category and thereby broaden the set of eligible projects. States may then be able to deploy their highway funds first on projects that have the greatest total payoffs rather than be constrained to choose the best projects within each category.

SIBs are also more flexible than traditional financing in another way. They can provide assistance for all stages of projects without restrictions on the amounts or percentages of funding that come from specific sources. However, as noted earlier, capitalization grants for the SIB require a nonfederal match of at least 25 percent.

A factor that could affect both the amount of money available for a project and its efficiency and distributional effects is the extent to which rules on fed-

11. Ibid., p. 13. DOT estimates that by the end of 1997, states will have allocated $260 million in federal aid to their SIBs to help fund $940 million worth of projects.

12. According to DOT, highway and mass transit funds must be kept separate for their initial use, but repaid funds can be blended subject to state laws. See Federal Highway Administration, "SIB Update," October 1996 (available at http://www.fhwa.dot.gov/innovativefinance/).

eral aid govern the use of funds that are repaid after the first round of SIB lending. For example, the Davis-Bacon Act requires that the prevailing wage be paid to workers on projects built with federal aid, a rule that tends to increase costs. If that requirement was imposed only on the first round of projects financed by a SIB, the costs of later projects built with recycled funds would be lower than if Davis-Bacon had been applied to them as well. Environmental regulations imposed as conditions of federal highway aid are another such example. Whether those requirements apply to later projects has not been resolved, although the Administration's proposal for reauthorizing ISTEA would apply them to recycled funds. Other proposals, however, would loosen federal requirements.

Additional Private Capital. The potential SIBs have for raising money to finance transportation projects depends on whether states leverage SIB funds by attracting additional sources of capital. Leveraging makes more funds available immediately. By providing credit enhancements, SIBs may be able to market bonds at lower interest costs. Using SIB funds to provide backing for projects may also help to draw private equity investment to a venture, including the kind of public/private initiatives described in Chapter 5.

Yet why would a state use the SIB instead of floating a bond issue directly, as many states already do for highways and other capital projects? By using a SIB, a state may bypass its own constitutional or legislative limits on debt, especially if the debt is backed only by toll or other user fee revenues and not by taxes. (As noted earlier, such debt is known as nonrecourse debt.) Of course, a state may still be constrained by its own laws restricting the amount of debt it can carry and by conditions in the financial markets.

Recycling Loan Repayments. Even if SIBs do not leverage funds to magnify the amount of funding available initially, they can still provide additional money for transportation projects during later periods. The reason is that SIBs make loans, not grants, and the loans must be repaid. The funds that are repaid, together with the interest on them, can then be lent again to additional projects. Keeping the funds within the SIB effectively earmarks them for transportation projects and protects future projects from having to compete with other state and local government programs.

Additional Funds from Returns on Investment. If the projects that states choose to finance through SIBs are ones with large payoffs, they will generate additional economic activity and wealth even beyond the amount needed to repay the loans. At least some of that activity is likely to result in additional revenues from fuel taxes and other user taxes and fees that traditionally have been earmarked for transportation. Increased economic activity will also generate additional revenues for states and localities from income, sales, and property taxes. Those revenues may not directly finance additional work on roads, but by helping provide for other public needs, they can reduce pressures on government budgets that restrict the total amount of funds available for transportation.

Keeping the SIB Capitalized. To continue operating, a SIB must maintain its capitalized value. Subsidizing projects by making loans at below-market interest rates can jeopardize a SIB's viability because repayments may be insufficient to maintain that value. Defaults could further reduce the SIB's value, as might inflation, which can erode the purchasing power of SIB funds. If the SIB's capitalized value shrinks, it will need an infusion of additional capital at some point to continue its operations.

Regardless of whether loans from SIBs are funded only by capital provided by the federal and state governments or also by borrowed capital, they must be repaid. Typically, funds for repayment will come from tolls or other user fees or taxes. Using those sources of revenue to repay loans has implications both for efficiency and for the way the costs of this kind of mechanism are distributed among taxpayers and users. In addition, the choice of repayment source could affect the federal budget.

Efficiency

To the extent that the SIB mechanism allows states to blend funds from several categories of federal aid, it lessens some constraints on states' choice of projects. Moreover, it enables them to choose projects with the highest economic returns overall and not just the highest returns within each category of federal aid. The ability to move beyond categories to focus on the "big picture" can increase efficiency in investment.

Whether resources are allocated efficiently depends largely on how loans from the SIBs will be repaid. Several SIB projects that states have proposed will repay loans with tolls and other user fees, a strategy with two beneficial economic effects. First, using tolls and fees for repayment reinforces the need to select projects for which benefits—and user-fee revenues—exceed costs.[13] It also provides incentives to make those investments the "right size" and to keep costs in check. Under such a repayment plan, gold-plated investments and investments that are too large for the expected demand (features that have characterized some public works in the past) would be discouraged.

Second, repaying loans with tolls and other user fees can provide incentives for efficiency in the use of a road project if tolls and fees are set in a way that reflects the cost of use. For example, tolls that are higher at peak periods encourage those motorists who can to shift their use to less congested roads or times, reducing traffic at rush hour on congested tollways. In addition, the revenues raised from relatively high tolls at peak hours can help fund projects that increase highway capacity. Alternatively, they can support projects to improve mass transit facilities and equipment.

As Chapter 2 notes, user-fee financing may or may not produce an efficient allocation of resources. To achieve allocative efficiency, the price paid by the user must reflect the marginal social cost of the resources associated with that use. User fees that are set with recovering costs or maximizing revenues as their primary objective may not provide incentives for the most efficient use of the resources.

In the early responses to DOT's call for applications for the SIB program, 14 proposals listed tolls as a source of loan repayment (although some proposals combined revenues from tolls and from dedicated taxes). By February 1997, only four projects cited tolls as a principal means of repayment. Many more were relying on state and local taxes on transportation and on fees that were not directly related to the use of the specific project that they were helping to fund. Using repayment sources that are not directly related to the project's use diminishes the prospects for increased efficiency resulting from user charges. But the goal of efficiency may have to give way in order to get the project built. Dedicated tax revenues may be needed to attract private investment in facilities that are desirable to build because they pass a benefit-cost test. SIBs can help reduce the cost of debt if they signal to private investors that a project is especially creditworthy or if they provide enough backing to enhance the quality of the debt.

Some of the projects mentioned in SIB proposals submitted by the states are projects to be done at the state level; most, however, are projects sponsored by municipalities, authorities, or other agencies created by state governments. Those substate entities may find it difficult to borrow money for projects even if the work has a reasonable prospect of yielding competitive returns. In contrast, states generally have experience with bond issues, together with the necessary apparatus (staff, legal and financial advisors, legal authority, and so forth). Furthermore, states are known entities to credit-rating agencies and bond buyers.

Municipalities and other substate government bodies may be less experienced and little known in the bond world, especially if they are relatively small and have not engaged in much debt financing. Such entities may have difficulty floating a bond issue, even if their finances are strong, because potential bond buyers may know little about them and consider them too much of a risk.[14] By making loans or offering credit enhancement to lesser-known entities, SIBs may overcome those obstacles.[15] A state infrastructure bank with expertise in transportation projects might be willing to overlook such problems to lend to a project with a strong potential for return. In that way, a SIB could promote efficiency in investment.

13. In general, a government should not undertake a project unless benefits exceed costs. But in the case of highways, recouping all the benefits in the form of user fees may be difficult. The existence of external benefits is one reason roads in the United States have been publicly provided and have not been required to cover costs with user fees.

14. Municipalities with poor underlying economic conditions or with a history of default may find borrowing virtually impossible. Their inability to find lenders is not a failure of the market but rather a market signal that lending under those conditions is a high-risk proposition.

15. Some states already make use of credit pooling. See Congressional Budget Office, *An Analysis of the Report of the Commission to Promote Investment in America's Infrastructure*, CBO Paper (February 1994), pp. 28-29.

In addition, by aggregating the financing of several projects into one bond issue, SIBs can reduce costs associated with issuing bonds, such as hiring legal and financial counsel and obtaining a credit rating.

For municipalities (or authorities or states) that have excellent credit ratings, using the SIB to float a bond issue may not be the wisest approach. Those entities might do better to borrow on their own instead of through an institution in which they are pooled with higher-risk borrowers. Depending on the structure of the debt (in particular, whether debt repayments can be used to cover obligations of other members of the pool), stronger borrowers might get lower interest rates by "going it alone" than by pooling with "weaker links."

Over time, if SIBs prove successful in helping finance projects at the substate level, they might encourage more such projects. The same reasoning that underlies the federal-aid highway program—that states know their specific highway needs better than the federal government—may apply at a lower level as well. That is, local communities may know their needs better than the state government. Consequently, a mechanism such as the SIB, which would provide a form of state assistance to local projects and shift more decision-making to lower levels of government, might yield more efficient investments in infrastructure than financing mechanisms at higher levels of government.

Distributional Effects

Debt financing by SIBs has two types of distributional effects that differ from the effects of traditional financing based on user taxes and fees. First, it shifts the burden of financing from current payers of user taxes to future users and other beneficiaries of the projects it funds. Depending on the source of revenues dedicated to repayment, the debt financing that SIBs provide may also shift the burden to future taxpayers in general. Second, tax-exempt debt shifts some of the burden from taxpayers at the state and local levels to those at the federal level.

SIB financing may have other distributional effects as well. For example, as mentioned earlier, federal requirements may not govern projects that states or other entities build with recycled SIB funds. Thus, if the rules of the Davis-Bacon Act regarding prevailing wages were deemed not to apply, workers might receive lower wages (unless labor markets were tight). But taxpayers and users of roads would gain from lower project costs.

Administrative Feasibility

Participation in the SIB program is voluntary. States that want to form SIBs and capitalize them with federal aid may apply to the Department of Transportation for permission. Some states found SIBs attractive even before the Congress appropriated additional funds for them in 1997. Others waited until the Congress had provided that money to submit their applications. Whether the added funds were the primary motivation or whether states just came to the conclusion that the SIB mechanism could be useful to them is not clear, although some state officials have suggested that the $150 million was an influential factor.

The 15 states that initially applied for the pilot program indicated that they thought SIBs were a feasible approach to highway financing. The second group of 26 applications by 28 states and Puerto Rico provided further evidence. DOT permitted flexibility in the organizational structure: a state could form a SIB within its highway or transportation department, in a budget or finance department, or in whatever organizational format it chose. The NHS Act allowed states to use up to 2 percent of federal capitalization grants to cover the costs of administering SIBs. All of those factors probably encouraged more states to participate.

Some states may need legislation to be able to put a SIB in place, especially if the bank is given authority to issue bonds or make loans for private ventures.[16] However, most states have experience to draw on in authorizing and establishing such an entity because most states have state revolving funds (SRFs) for wastewater treatment, after which SIBs are partially patterned. The NHS Act prohibits commingling of highway and mass transit funds with other funds. As a result, SIBs probably could not be combined with SRFs unless mechanisms were established to keep separate accounts for each program.

16. General Accounting Office, *State Infrastructure Banks: A Mechanism to Expand Federal Transportation Financing*, GAO/RCED-97-9 (October 1996), p. 18.

Implications for the Federal Budget

The only direct effect of the SIB program on the federal budget thus far is the $150 million in appropriations for 1997. The 1998 appropriation legislation did not include additional funds for SIBs.

In authorizing the SIB program, the Congress directed that disbursements to capitalize the banks be at a rate consistent with historical levels for the federal-aid highway program. Funding the SIBs in that manner assumes disbursements of 15 percent in the first year, 53 percent in the second, 16 percent in the third, and the remaining 16 percent spread out over the fourth through ninth years. The Federal Highway Administration has advised the states that they must delay actual cash deposits to their SIBs to conform to those disbursement rates. The Administration's proposal for reauthorization of ISTEA would alter the disbursement rate so that SIBs would receive 20 percent of the funds each year for five years.

The Outlook for State Infrastructure Banks

SIBs are a relatively new mechanism for funding transportation projects, and it remains to be seen whether they will fulfill their intended purpose. The next few years will determine how well the SIB structure works or whether alternative mechanisms might be of greater value.

Highway projects dominate the set of initial proposals for SIB funding. That circumstance could reflect one or more factors: a bias toward highways on the part of state transportation officials, a judgment that highways are a more pressing need than transit ventures, an absence of suitable mass transit projects, or an inability to identify sources of repayment of loans for transit projects. Identifying and reprogramming funds with which to capitalize transit accounts are another problem. The requirement contained in the NHS Act that states keep separate accounts for highways and mass transit may present an institutional obstacle in that regard.

If all states deposited 10 percent of their eligible funding for highways into SIBs, the total would be about $2 billion a year. In a survey of 15 states, the General Accounting Office found that SIBs would probably be funding less than 10 percent of the transportation projects in those states over the next five years.[17] Apparently, states are being cautious about SIBs, but if initial experiences are successful, they will be receptive to greater use of the mechanism.

Without restructuring of the entire federal-aid program, SIBs are unlikely to become a major source of highway financing in the next few years. Indeed, the General Accounting Office cited an FHWA official who said that only a small number of projects could generate enough revenue to repay loans made by SIBs.[18] Nevertheless, SIBs may enable certain types of projects—especially those for which tolls and other user fees are the source of debt repayment—to go forward sooner than they could under traditional financing.

17. Ibid., p. 2.

18. Ibid., p. 16.

Chapter Four

Federal Credit Assistance

The federal government could help to finance transportation projects by assisting the parties involved to obtain credit. Federal loans, loan guarantees, lines of credit, infrastructure banks, and government-sponsored enterprises are all approaches by which the federal government could aid in financing public, private, and mixed public/private projects. In making additional money available to lend or in promising to assist with repayment, such mechanisms can enhance the quality of the credit and enable the project's sponsors to borrow at lower interest rates. However, some approaches to credit enhancement would lead to more tax-exempt debt and result in losses of revenue to the federal government.

Federal Loans, Loan Guarantees, and Lines of Credit

Federal loans, loan guarantees, and lines of credit work in similar ways to make the debt that the sponsor of a project issues more attractive to lenders. The Congress will be considering proposals for enhancements of that kind in the near future. In addition, some of the mechanisms are being used now in a limited way for transportation projects.

Transportation Infrastructure Credit Enhancement Program

The National Economic Crossroads Transportation Efficiency Act of 1997, the Administration's proposal for reauthorizing the federal highway and transit programs, would establish a federal program of credit enhancement for transportation infrastructure. The program would aid transportation projects by making grants to sponsors of projects for capitalizing revenue stabilization funds that would back a project's debt.[1] The proposed legislation specifies that obligations secured by the stabilization funds are not to be considered federally guaranteed under the tax code. As a result, the funds can back both taxable and tax-exempt debt.

The intent behind the Administration's proposal is twofold. First, the legislation is framed to encourage development of projects of national significance that otherwise might be delayed because their risk or scope was too large for traditional financing. To be eligible, a project would have to cost at least $100 million or at least 50 percent of the state's annual apportionment of federal-aid highway funds, whichever was less. Eligible projects would also have to be supported at least in part by user charges or other dedicated sources of revenue. The Department of Transportation's second purpose in proposing the credit enhancement program is to encourage participation by the private sector in developing and building highways. The combination of user charges and private investment would put such projects to a market test, in contrast to traditional transportation projects. The Administration's proposal would authorize $100 million a year for the 1998-2002 period.

Transportation Infrastructure Finance and Innovation Act of 1997

The Transportation Infrastructure Finance and Innovation Act of 1997 (TIFIA) would establish a pilot pro-

1. Strictly speaking, the proposed program is a federal grant program that supports issuance of debt rather than a federal credit program.

gram of federal credit assistance for large highway and mass transit projects.[2] The bill would authorize $530 million in federal budget authority over six years for secured federal loans, loan guarantees, and standby lines of credit. Relevant provisions are as follows:

- Section 1314(a)(4): Credit assistance would be available for projects that generated streams of revenue through user charges or other dedicated sources of funding.
- Section 1314(a)(4)(B): This section is an amendment to the original bill that would prohibit using proceeds from tax-exempt financing for repayment.
- Section 1315(b)(4): The interest rate on secured loans made through the program would be set to equal the yield on marketable U.S. Treasury securities of a maturity similar to that of the secured loan on the date the loan agreement was executed.
- Sections 1315(b)(3) and (6): The federal government may assume junior-lien status for repayment of secured loans (that is, it would be repaid after the senior creditors). But in the event of bankruptcy, insolvency, or liquidation of the obligor, the federal government would have the same claim on assets as other creditors.
- Section 1322: The Secretary of Transportation must report to the Congress within four years about whether the objectives of this program would be best served by continuing it under DOT, by creating a government-sponsored enterprise to administer the program, or by phasing it out and relying on capital markets to fund the types of projects it had assisted.

Loan for the Alameda Corridor Project

The federal government has agreed to lend money for an intermodal project, the Alameda Corridor project, which will improve highway and rail links between the ports of Los Angeles and Long Beach and the regional rail distribution center near downtown Los Angeles. The total cost of the project is about $2 billion; the federal government is lending $400 million to the Alameda Corridor Transportation Authority (ACTA) as part of the financing. The loan will be disbursed over three years: $140 million a year each in 1997 and 1998 and $120 million in 1999. In 1997, the Congress appropriated $58.7 million, which is the estimated subsidy cost of the loan.[3]

ACTA has agreed to repay the debt over a 30-year period, which will start when the project begins to receive revenues from the participating railroads and ports. Currently, the project's expected start-up date is 2002. During the construction phase, interest on the loan will accumulate at the same rate that the Treasury pays on its 10-year securities and will be added to the principal for repayment. Once revenues begin to flow, interest will accumulate at the rate the Treasury pays on its 30-year notes.

The loan agreement provides some flexibility in repaying the federal government. If ACTA cannot meet the repayment schedule, it may postpone repayment, although interest will continue to accrue at the agreed-upon rate. That flexibility, combined with the federal government's junior-lien status, has provided key assistance to ACTA that has allowed the authority to get the project started.

Lines of Credit for Orange County Toll Roads

The federal government has provided assistance in the form of standby lines of credit to the Orange County, California, transportation corridor agencies (TCAs) for the San Joaquin Hills and Foothill/Eastern Toll Roads. The TCAs are agencies that the state of California authorized local governments to create for the purpose of

2. TIFIA is Title I, Subtitle A, Chapter 2, of the Intermodal Transportation Act of 1997 (S. 1173), the Senate's bill to reauthorize the Intermodal Surface Transportation Efficiency Act. To be eligible for the program, projects must cost at least $100 million or 50 percent of the state's most recent apportionment of federal-aid highway funds, whichever is less. However, for projects involving intelligent transportation systems, the threshold is $30 million.

3. U.S. Department of Transportation, "President Clinton Says Alameda Corridor Project Will Create Jobs and Build Trade Links to Pacific Rim" (press release, DOT 09-97, January 17, 1997). See also U.S. House of Representatives, *Making Omnibus Consolidated Appropriations for Fiscal Year 1997*, conference report to accompany H.R. 3610, Report 104-863 (September 28, 1996), pp. 527-528. The subsidy cost is defined under the Federal Credit Reform Act as the present value of the cost of a loan or loan guarantee, factoring in the possibility of defaults or interest rate subsidies.

financing and building toll roads (see the further discussion in Chapter 5). The agencies can draw on the lines of credit if revenues from tolls are insufficient to repay lenders and cover other costs. For potential lenders, the lines of credit enhance the quality of the debt the TCAs issue; the credit assistance may also encourage lenders to accept lower rates of interest, which would reduce the TCAs' cost of borrowing. In addition, interest on the debt the TCAs issue is exempt from federal income taxes. As a result, the projects enjoy a tax subsidy.

The San Joaquin Hills and Foothill/Eastern projects each obtained a line of credit from the federal government of $120 million.[4] Under the terms of the agreements, the agencies can draw on the lines over a 10-year period, with a maximum draw of $12 million a year. Any such draws must be repaid based on Treasury rates (the 30-year rate for debt service and the 3-year rate for operations).

Although the TCAs do not expect to draw on their lines of credit, the lines constitute a potential claim against federal taxpayers. Thus, the cost of the subsidy they entail must be factored into the federal budget. The budget showed $8 million in budget authority in 1995 for the subsidy associated with the line of credit of $120 million for the Foothill/Eastern project. It showed $9.6 million in budget authority in 1993 for the subsidy associated with the San Joaquin project's line of credit.

Federal Infrastructure Financing Institutions

In a federal credit program, the federal government would be directly involved in selecting and overseeing projects and in providing loans or other credit assistance. Another approach would be to make federal grants to capitalize an institution that would provide credit for transportation projects. The Intermodal Surface Transportation Efficiency Act of 1991 created an infrastructure investment commission to explore that concept.[5] Its mandate was to study the feasibility and desirability of creating a type of infrastructure security that would be attractive to pension funds. It was also charged with examining other methods of encouraging public and private investment in infrastructure facilities.

In its 1993 report, the Commission to Promote Investment in America's Infrastructure recommended several new options related to infrastructure financing. It suggested establishing a new, federally chartered national infrastructure corporation that would make loans to infrastructure projects with appropriated or borrowed funds. It also recommended creating new investment mechanisms for institutional investors, including securities issued or guaranteed by the corporation.[6] The commission further envisioned a subsidiary to the corporation that would insure debt issued by infrastructure projects.[7]

An infrastructure financing entity could take any one of several forms. It could be an on-budget federal agency that made subsidized loans or grants; a private, for-profit company capitalized initially with federal funding; or a government-sponsored enterprise (GSE) akin to Fannie Mae (the Federal National Mortgage Association) or Freddie Mac (the Federal Home Loan Mortgage Corporation).[8] As a private company or a GSE, the bank could be capitalized by issuing debt and equity. The federal government could back the debt, and the interest could be exempt from state and local income taxes. However, the interest would still be subject to federal income taxes unless a significant change in federal tax policy occurred. Section 149(b) of the Internal Revenue Code states that bonds that are guaranteed in whole or in part, directly or indirectly, by the federal government are taxable. The provision is intended to prevent so-called double-dipping—that is,

4. Subsequently, the Congress increased the line of credit for the Foothill/Eastern project to $145 million.

5. Section 1081, 105 Stat. 2020. The commission is also known as the Flanagan Commission after its chairman, Daniel V. Flanagan Jr.

6. The Commission to Promote Investment in America's Infrastructure, *Financing the Future* (February 1993), available through the U.S. Department of Transportation, Office of Economics.

7. For a detailed description and critique of the commission's report, see Congressional Budget Office, *An Analysis of the Report of the Commission to Promote Investment in America's Infrastructure*, CBO Paper (February 1994).

8. Fannie Mae and Freddie Mac are analyzed in Congressional Budget Office, *Assessing the Public Costs and Benefits of Fannie Mae and Freddie Mac* (May 1996).

when an investor receives favorable tax treatment as well as a federal guarantee.

Evaluating Federal Credit Assistance

Certainly, federal credit assistance can generate additional money for transportation projects. But will it help to allocate resources more efficiently? And who or what will bear the burden of costs under that kind of approach? The distributional and efficiency effects depend in large part on the way states or other entities structure specific projects. The implications for the federal budget depend on several things: the form of the assistance but also whether credit assistance comes in addition to funds made available in the federal-aid program or whether it substitutes for federal aid. (See Box 4 for some of the forms that a federal financing institution for infrastructure could take.)[9]

Financing Potential

The amount of money federal credit assistance could make available depends on the demand for and supply of funds. In the case of the Alameda Corridor project, the federal loan of $400 million, which required an appropriation of $58.7 million, helps to support a $2 billion effort. The Federal Highway Administration has calculated the financing potential of federal credit assistance proposed under TIFIA, the Senate's bill to reauthorize ISTEA. FHWA estimates that the $530 million in budget authority in the bill could provide as much as $10 billion in credit assistance—because only the costs of the subsidy would be recorded in the budget. That amount of budget authority could conceivably support a total investment of $30 billion, given that TIFIA would limit the federal credit share to 33 percent of project costs.[10]

The number of projects that would take advantage of such a credit program is difficult to judge. Underlying the uncertainty is how states would respond as they weighed the options of using federal credit assistance or outright grants for transportation projects. Whether states would use the credit to accelerate projects scheduled for future years, when federal grants and matching state funds became available, remains to be seen. The credit option would be less appealing if federal grants were sufficient to finance all the projects a state was ready to build. But if federal funds were insufficient to meet the state's demands, borrowing would enable it to build a needed project sooner. Of course, any projects built on credit would have to generate revenue for repaying loans.

Any analysis of the financing potential of federal credit assistance rests on whether federal credit represents additional money available to states or whether it comes out of funds from the federal-aid program. The proposals described in this chapter generally refer to new money. Under the program of state infrastructure banks discussed in Chapter 3, most of the federal funding that states could use for credit assistance would come from the federal-aid program.[11] Whether project sponsors would prefer SIB financing or direct federal credit would depend on the details of the project and the financing options that were available when the project was being planned. With more federal credit available, more projects might be proposed; however, there is no evidence to support that assumption. As for the supply of funds, investors would probably behave as they have always behaved: they would continue to buy whatever securities offered the best combination of risk and return for their situation, without regard to whether a bond issue financed a highway, sewage treatment plant, school building, or any other kind of facility.

Efficiency

How a financing option affects efficiency depends on whether the option encourages efficient allocation of

9. For more detailed analyses, see Congressional Budget Office, *An Analysis of the Report of the Commission to Promote Investment in America's Infrastructure*, and *Assessing the Public Costs and Benefits of Fannie Mae and Freddie Mac.*

10. Personal communication to the Congressional Budget Office by David Seltzer, Senior Advisor to the Administrator, Federal Highway Administration. See also Bryan Grote and David Seltzer, "Transportation Infrastructure Finance and Innovation Act of 1997," *FHWA's Innovative Finance Quarterly*, vol. 3, no. 1 (Summer 1997), p. 2. The article estimated that $800 million in budget authority, which was the amount being considered at the time the article was written, could provide as much as $16 billion in federal credit assistance and enable total investments of $50 billion.

11. The exception is the additional $150 million that the Congress appropriated for state infrastructure banks in 1997.

Box 4.
Federal Infrastructure Financing Institution

An idea that was proposed in the early 1990s but that has not been a focus of recent legislative debate is the establishment of a federal entity to provide financing for highway and other infrastructure projects.[1] The Intermodal Surface Transportation Efficiency Act of 1991 established the Commission to Promote Investment in America's Infrastructure. In 1993, the commission recommended that the Congress create two new corporations to provide credit assistance for infrastructure projects. A National Infrastructure Corporation (NIC) would purchase and bear the credit risk of municipal bonds issued by states and localities to provide long-term financing for infrastructure projects. It would also insure private firms against a portion of the risk of developing new facilities. An Infrastructure Insurance Company (IIC), which would initially be a subsidiary of the NIC, would insure infrastructure bonds issued for such projects. The commission also asked policymakers to consider easing restrictions on tax-exempt financing for infrastructure used for private activities and giving a new tax break to participants in pension plans that purchased qualified infrastructure securities.

By subsidizing the development and financing of new projects, the NIC would increase investment in municipal infrastructure. Because it would bear the credit and development risks of projects on subsidized terms, municipalities could pay lower interest rates on their infrastructure bonds and still attract investors. As a result, municipalities might be encouraged to take up such projects. The proposed changes in tax law would also provide subsidies for municipal borrowers.

The primary effect of the commission's proposals would be to divert resources from investments in business plant and equipment, housing, and other government spending to investments in infrastructure projects. Would diverting funds to the NIC and IIC from alternative uses improve the allocation of resources, thus producing more benefits to society? That might happen if infrastructure projects had spillover benefits that were not adequately taken into account or if credit markets were not functioning efficiently. But the spillover effects are unlikely to be large enough to justify federal subsidies, and no major problems with credit markets are apparent.

The new corporations the commission proposed could be organized as on-budget federal agencies or as private, federally subsidized firms. Setting up the NIC as a federal agency would mean that policymakers could obtain complete information about its activities and directly control the cost of the subsidies it provided to municipal borrowers. As an on-budget agency, the NIC would also require much smaller initial appropriations than if it was established as an off-budget entity.

If the NIC was established off-budget as a private, for-profit finance company and subsidized by a long-term federal loan with a below-market interest rate, the cost of the subsidy that the loan provided would be controlled in the appropriation process and recorded in the federal budget. The company would be subject to less direct control by policymakers than an on-budget agency and could operate as a revolving fund. But a finance company would have to stand on its own after it repaid the government's loan, which would subject the NIC to significant market discipline. A private, for-profit status would also provide a strong incentive for the infrastructure corporation to use the limited, one-time subsidy to build its capital and establish a track record rather than give ongoing subsidies to municipal borrowers.

Organizing the NIC as either an on-budget agency or a finance company would have fewer risks than establishing the corporation as a government-sponsored enterprise (GSE). If the NIC was organized as a GSE, the federal budget would not measure, and policymakers could not directly control, the subsidies provided by the implicit federal guarantee of its obligations.

The type of organizational structure chosen for the IIC would have particular ramifications, just as in the case of the NIC. As a federal agency, the IIC could not insure tax-exempt infrastructure bonds unless policymakers reversed the long-standing federal policy of not providing explicit federal guarantees of tax-exempt debt. If the company made loans at tax-exempt rates, the cost of the interest subsidies would have to be appropriated each year.

Organizing the IIC as a private, for-profit bond insurer that was partially owned by the federal government would have other effects. The federal budget would record the cost of purchasing stock in the company, but as a private insurer, the IIC would be subject to less direct control than a federal agency, and it could insure tax-exempt bonds. Moreover, it would have an incentive to manage its resources prudently because investors would be unlikely to perceive an implicit federal guarantee of the bonds it insured. By establishing a sunset date for the company, policymakers could use this organizational form to provide temporary federal support for insuring infrastructure bonds that existing insurers do not now cover.

1. This box is drawn from Congressional Budget Office, *An Analysis of the Report of the Infrastructure Investment Commission*, CBO Paper (February 1994).

transportation resources and whether it makes efficient use of capital. As noted in the discussion of state infrastructure banks, projects that are subject to market tests are likely to be more efficient than those that are not. The various proposals for federal credit subsidies require the projects to garner revenue to repay their debt. Sponsors of projects could structure such revenues to provide incentives for efficiency. For example, they could choose tolls as the revenue mechanism and then set them to vary according to congestion and other costs imposed by users. But projects might also rely on taxes that reduce efficiency. Economists generally agree that taxes (with the exception of lump-sum taxes) distort the way resources are allocated and thus impose costs on society. The taxes that support the federal-aid highway program have the favorable characteristic that they are imposed on highway users; yet even those taxes give rise to inefficiencies.[12]

Efficiency in credit assistance would entail providing only enough federal help to overcome any failure of markets for municipal bonds. But those markets appear to work as efficiently as other credit markets, and proposals for federal credit subsidies do not seem to address any sources of inefficiency that the markets might have.[13] The types of projects that would be candidates for federal credit assistance can offer no guarantees about their ability to repay loans. However, given that both borrowers and lenders lack certainty about the outcome, neither side appears to have information that would give it an advantage and justify the federal government's intervention in the market.

Are some projects too risky for private investors to finance? That claim is sometimes made about large ventures that employ novel methods or approaches. Sponsors argue that the federal government is the only entity with pockets deep enough to finance such projects and with the ability to spread the risks over a number of ventures that collectively have a reasonable probability of success (although any individual project may have as much probability of failure as of success). In addition, the federal government has a longer time horizon, lower liquidity requirements, and fewer funding constraints than most investors. Those characteristics give the government the flexibility to restructure interest and debt repayments if the startup of a project is slower than anticipated. But why not finance projects of that type privately by issuing securities that pay a high rate of interest? The venue for such activity is the market for junk bonds—that is, bonds with high credit risk. The junk bond market brings together sponsors of high-risk ventures and investors who want to include such securities in their portfolios for balance, diversification, or some other reason.

A distinctive feature as well as a component of the risk of the types of projects discussed here is that they face potential competition from government. Traditionally, such projects have been financed and owned by governments. If a government decides to build a toll-free road, financed with tax revenues, parallel to a new, privately financed toll road, investors in the latter could lose all or part of their investment. Government backing of debt for toll roads might be a way to reassure private investors about the government's intentions and persuade them to risk their money in toll projects.

Credit enhancements that make financing available at below-market rates can distort resource allocation by making subsidized projects more attractive to investors than projects that might yield greater net benefits on their own merits. But the subsidy associated with federal credit assistance for transportation projects is likely to be much smaller than the outright subsidy of the federal-aid program. To determine whether projects built with federal grants had effects on efficiency that differed from those of projects built with federal credit assistance would require knowing how the subsidies compared with the external benefits of the projects.

Finally, in evaluating the efficiency of federal credit enhancements, it is useful to consider them in relation to a baseline. If the baseline was one of no credit enhancements, the enhancements would appear inefficient in comparison. But if one used the existing program of federal highway grants as the baseline, the result would be different. Drawing the money for credit enhancements from what otherwise would be given outright to the states and using the credit assistance for projects that included private investment and user fees could tip the balance in favor of efficiency.

12. See Congressional Budget Office, *Paying for Highways, Airways, and Waterways: How Can Users be Charged?* (May 1992).

13. For a detailed discussion of the efficiency effects of a federal infrastructure bank, see Congressional Budget Office, *An Analysis of the Report of the Commission to Promote Investment in America's Infrastructure*, pp. 29-52.

Distributional Effects

Federal taxpayers bear some of the costs of projects financed with credit subsidies from the federal government. Some of the costs are out-of-pocket costs; if a project defaults, the federal government loses all or part of the money it has made available for loans, loan guarantees, or lines of credit. Even if a project succeeds, there will still be opportunity costs if the federal government has provided funding at a below-market interest rate. The reason is that the funding from the government comes at the expense of something else. Thus, it may crowd out other federal or private spending, or, in the face of a budget deficit, it may mean more borrowing by the federal government. If the government has to borrow to finance spending for the credit subsidies and if it has to pay more interest to U.S. Treasury bondholders than it receives from the loan it has made to a transportation project, federal taxpayers foot the bill.

Federal credit assistance could also have distributional effects within credit markets. Assistance for certain kinds of projects, such as transportation, would make those projects more attractive to investors than other equally worthy ventures that did not receive federal assistance. In addition, the federal government would be in a position of picking winners and losers among the projects—and among the localities and states in which they were located.

Administrative Feasibility

For the most part, the administrative structures for carrying out federal credit assistance are not specified in the various proposals. However, the federal government already has a number of credit programs, which indicates that such programs are administratively feasible. Depending on its size and scope, a credit program for transportation projects might be handled by existing offices within DOT or another federal agency, or it might require establishing a new federal bureaucracy. Regardless of the administrative structure that was finally chosen, an independent oversight agency might also be desirable.[14]

14. For a discussion of the need for oversight, see Congressional Budget Office, *Controlling the Risks of Government-Sponsored Enterprises* (April 1991).

Implications for the Federal Budget

Loans, loan guarantees, and lines of credit are not free of costs to the federal government. They bear some risk of default, and even if they are eventually repaid, they may return less interest to the government than the opportunity cost of the funds (that is, if they were lent at a below-market rate of interest). The Federal Credit Reform Act of 1990 requires the budget to reflect the budget authority and outlays needed to cover the value of cash disbursements that are not expected to be repaid to the federal government.[15] Before the act was passed, the budget counted loans, loan guarantees, and repayments on a cash basis. Thus, the full amount of a loan was recorded as an outlay in the year it was lent, and repayments were counted as receipts in the years they were made. Loan guarantees were not counted unless and until they were invoked. Those procedures made loan guarantees appear less burdensome to the federal budget and loans more burdensome than the net present value of their cost. With the advent of the Federal Credit Reform Act, loans and loan guarantees came to be scored more realistically.

When compared with outright grants, credit enhancements can have the same effect on the federal budget and yet make more funding available for highway projects. If the federal government shifted some of its aid from grants to loans, loan guarantees, lines of credit, or other enhancements, more projects could be financed.

The tax status of debt backed by the federal government (including indirect backing, such as lines of credit) is an important consideration in any decision to make more use of debt financing. If the Congress altered current tax policy to give such debt tax-exempt status, the volume of outstanding tax-exempt bonds would probably increase, which could lead to additional losses of revenue by the federal government. That risk is in large part responsible for the Congress's lack of enthusiasm for modifying policies in place since the early 1980s that attempt to limit the availability of tax-exempt financing at below-market interest rates.

15. The Federal Credit Reform Act is part of the Budget Enforcement Act (Title XIII of the Omnibus Budget Reconciliation Act of 1990). See Congressional Budget Office, *An Explanation of the Budgetary Changes Under Credit Reform*, CBO Staff Memorandum (April 1991).

Chapter Five

Private-Sector Participation

For financing and developing highways, transportation officials are looking increasingly to private-sector participation. At the same time, the confluence of several factors—legislation relaxing federal rules regarding the financing of highways, a scarcity of funds at the state and local levels, and the prospect of profitable toll projects—has encouraged the private sector to explore such investments.

The structure of private participation varies depending on specific aspects of a project. No single model has emerged as dominant; instead, the extent of private debt and equity capital and the degree of involvement in building and operating toll roads differ from project to project. A review of several ventures illustrates the range of private-sector involvement and the ways the public and private sectors have interacted. Yet one feature is present in all cases: a belief in the need for additional roadway capacity combined with insufficient government funding to provide it in a timely manner. Governments view private participation as a source of additional capital that can be raised voluntarily without resorting to taxes; private investors view toll projects as potential moneymakers. As the later discussion shows, however, those expectations are not always realized.

Increased private-sector participation in highway projects is part of a larger trend toward privatization of government services, which became increasingly popular during the 1980s. Proponents are inspired by both philosophical and economic rationales. The philosophical motivation is to reduce the size of government: the smaller the amount of activity controlled by government, the better, in that view. The economic rationale is that the profit motive of the private sector will lead firms to contain costs and use resources in the most efficient way. Government deregulation of the transportation industries beginning in the late 1970s offers evidence that less government control can lead to greater economic efficiency in some circumstances. The federal government's sale of Conrail to private investors was also a clear success in privatization. A logical question is whether changes in federal policies could induce greater private-sector investment in roads.

If private firms decide to enter the business of building and operating highways, it will not be the first time that has happened in the United States. In the late 18th and early 19th centuries, many turnpikes were built by private investors looking for ways to make profits by providing road links between interior agricultural markets and ports. The federal government also built roads in that period, seeing them as a means of bringing the nation together and promoting trade, commerce, and manufacturing. By the middle of the 19th century, however, railroads began to divert traffic from highways. Private turnpike companies withered away, and public investment in roads for the most part took the form of local streets and access roads to rail and port facilities.

The invention of the internal combustion engine toward the end of the 19th century rekindled government interest in road building.[1] State and local governments began to build roads financed by tax revenues, many of which linked farms to markets. Roads of that

1. The popularity of bicycling in the late 19th century also created a demand for paved roads with smooth surfaces.

kind were unlikely to thrive as toll facilities because they did not serve enough traffic to cover their costs with revenues from tolls.[2]

By the early 20th century, the federal government had also become involved in financing highways. Beginning with the Federal-Aid Road Act of 1916, the federal government established a policy of toll-free roads.[3] Only in the 1980s did that policy change as a result of several circumstances: development of the technology for collecting tolls electronically, which reduced the costs and delays associated with toll booths; the perceived need for more roadway capacity; and a reluctance to raise taxes on fuel. The combination of those factors led the Congress to relax restrictions on the use of tolls on highways built with federal aid.

Of course, tolls are not the only way of charging the users or beneficiaries of roadways. Some public/private efforts also raise money or obtain contributions of land or other resources from developers or businesses that benefit from improved access to their properties. But tolls are the most common user fee for highways.

The history of public and private provision of roads in this country reflects their dual nature: they have some characteristics of public goods and some characteristics of private goods. On the public side, roads provide benefits in many instances beyond those to direct users (motorists)—for example, by reducing the cost of shipping goods to consumers. Moreover, collecting fees for use of a road is not always practical. As a result, governments over the years have played a large role in providing highways. But roads have some characteristics of private goods as well. Limited-access highways can exclude motorists who are not willing and able to pay tolls. Furthermore, when roads are congested, one motorist's use of the road imposes costs in the form of delays on other users. Those mixed-good characteristics of roads both motivate and explain the formation of road-building partnerships between government and the private sector.

Exploring ways to involve both sectors in investing in highway projects can take advantage of what each sector is in the best position to offer. Governments may be better able to assume many of the risks associated with building new roads. By bearing some of those risks, governments can make investing in road projects more attractive to private entities. And as the following descriptions of projects suggest, achieving a proper balance of risks between the public and private sectors can contribute to economic efficiency and equity.

Types of Private-Sector Participation

Private-sector participation in highway projects can take many forms (see Table 4). The most common practice has been for state highway departments to contract with private firms to build roads. In recent years, however, a trend has been growing to give private firms more of a stake in the outcome of a project so that they will have incentives to provide good highways efficiently. Within the traditional contracting relationship, governments can encourage that behavior by introducing financial incentives for the contractor to build roads better and faster.

At the other end of the spectrum are primarily private ventures in road building. In those projects, private firms bear most or all of the risk and make most or all of the decisions about construction and operation. Governments typically get involved at some point, however, because they must certify that a project has fulfilled all applicable environmental requirements and give permission for charging tolls. In addition, project sponsors may need to draw on the government's power of eminent domain to obtain land for rights-of-way.

In between the extremes of public and private provision of roads are partnerships forged between government and private firms for building transportation projects. The roles and responsibilities of each partner are specified in contracts between the parties. In the majority of cases, the private sector risks some capital and is rewarded if the investment is successful. The partners often form a new entity—either a special-purpose gov-

2. José A. Gómez-Ibáñez and John R. Meyer, *Going Private: The International Experience with Transport Privatization* (Washington, D.C.: Brookings Institution, 1993), p. 165.

3. Section 1 of the Act of July 11, 1916 (popularly known as the Federal-Aid Road Act of 1916), 39 Stat. 355. For an overview of federal policies toward tolls, see Congressional Budget Office, *Toll Roads: A Review of Recent Experience*, CBO Memorandum (February 1997).

Table 4.
Sponsors and Features of Highway Financing

Sponsor	Major Features of Financing	Examples
Private Equity Investors	Finance and develop the project using private resources	Dulles Greenway (Virginia) 91 Express Lanes project (California)
Private, Nonprofit Entity	Issues tax-exempt debt backed by tolls (and without recourse to taxes) and oversees the project under the terms of the agreement between the state and the private developer	TH 212 (Minnesota) Southern Connector (South Carolina) Interstate 895 (Virginia) Tacoma Narrows Bridge (Washington) Arizona toll projects
Special-Purpose Public Agency	Issues tax-exempt debt backed by tolls (and without recourse to taxes) and oversees the project under the terms of the agreement with a private developer	E- 470 (Colorado) Orange County, California, transportation corridor agencies
State Agency	Issues tax-exempt debt backed by tolls (and without recourse to taxes)	Some turnpikes
State Agency	Issues tax-exempt debt backed by taxes	Most highway projects that are financed by debt
State Agency	Finances highway on a pay-as-you-go basis using state taxes and fees plus federal aid	Most highways

SOURCE: Congressional Budget Office.

ernment agency or a private, nonprofit corporation—to finance and oversee the project.

Another nontraditional arrangement is that of a government contracting with a private firm to operate and maintain a roadway that the government has built. Great Britain is experimenting with such a form on a limited basis, but the United States has yet to explore its possibilities in any systematic way.

Traditional Contracting

Traditionally, the private sector has built public roads under contracts with state or local governments. Typically, a state highway agency enters into separate contracts for the design and construction of a project. After approving the design, the agency solicits bids through an open competition for construction. It generally awards the contract to the qualified bidder who offers to complete the road according to the exact specifications at the lowest cost.

In 1988, the Federal Highway Administration launched an initiative promoting higher-quality construction of highways while reducing costs over a road's life cycle.[4] That effort resulted in an innovative contracting program called Special Experimental Project No. 14. FHWA identified four contracting techniques for further testing and evaluation:

- cost-plus-time bidding, in which the firm bids on both the cost of construction and the time needed to

4. Federal Highway Administration, *Rebuilding America: Partnership for Investment, Innovative Contracting Practices,* FHWA-PD-95-028 (1995), p. 1.

complete the project (the highway agency then multiplies the number of days by the cost per day to users of not having the road available);

- lane rental, in which the contractor is charged for occupying or obstructing part of the roadway and thus has an incentive to complete work expeditiously;

- design/build contracting, in which firms bid simultaneously on both the design and construction stages of the project; and

- warranty clauses, which hold the designer/builder responsible for meeting specified performance requirements for a period of years following the project's completion. A federal regulation prohibits the use of warranties on federal-aid projects except for electrical and mechanical equipment.[5] The Intermodal Surface Transportation Efficiency Act of 1991 provided an exception to that restriction under certain circumstances.[6]

Each of those innovative techniques shifts some risk from government to the private sector. In addition, the techniques offer private firms more incentives to reduce costs to motorists and the state and to improve quality. Although such approaches do not add to the available financial resources for highways—and hence are not discussed further in this study—they enable existing highway funds to go farther by decreasing costs, accelerating construction, or improving quality. They also provide a point of reference in considering new options for financing.

Private Equity Investment

At the other end of the spectrum from traditionally funded highways provided by the public sector are projects developed primarily by private firms with an equity stake. Two recently built roads would fall into that category.

The Dulles Greenway. In response to growing interest in private investment in transportation facilities, Virginia's General Assembly in 1988 authorized private development of toll roads in the commonwealth. A group of investors, the Toll Road Investors Partnership II, thought that a toll road linking Washington's Dulles International Airport and Leesburg, Virginia, would be a promising investment. Their judgment was based on residential and commercial growth in the area, which was causing increased congestion on existing arterial roads serving the corridor.

The product of their investment is the Dulles Greenway. The Greenway is a 14-mile, limited-access highway extending from the state-owned Dulles Toll Road, which carries traffic between Washington's Capital Beltway and Dulles Airport, to Leesburg.[7] The two roads connect at a toll plaza. Drivers pay one toll, which the operators of the two facilities divide. Vehicles equipped with prepaid electronic tags may drive through "Fastoll" lanes without having to stop at a toll booth; their tags are read and their accounts debited automatically.

To finance the Greenway, investors put up $40 million in cash and secured $310 million in privately placed taxable debt.[8] Ten institutional investors led by Cigna Investments, Prudential Power Funding Associates (a unit of the Prudential Insurance Company of America), and John Hancock Mutual Life Insurance Company provided $258 million in long-term, fixed-rate notes (due in 2022 and 2026). Three banks (Barclays, NationsBank, and Deutsche Bank AG) agreed to provide part of the construction funding and $40 million in revolving credit. Loans are to be repaid with toll revenues, and the financing is secured by a first mortgage and security interest in the developer's right, title, and interest in the facility.[9]

5. 23 C.F.R. 635.413.

6. Federal Highway Administration, *Rebuilding America*, pp. 7-8.

7. The Dulles Toll Road was opened in 1984 to serve the rapidly growing suburbs between the beltway and the airport. By serving local traffic, it augmented the adjacent Dulles Access Road, which the federal government built in 1962 to carry traffic to the airport. The original roadway had no outbound exits or inbound entrances between the beltway and the airport because it was not intended to carry local traffic.

8. The investors are Maggie Bryant, a local resident, and her son, Michael R. Crane; an Italian company, Autostrade International, which operates the road; and Brown & Root, a Houston-based construction company, which built the road.

9. Dulles Greenway home page, sponsored by Toll Road Investors Partnership II (available at http://www.his.com/~cwealth/greenway/index.html/).

The Greenway opened to traffic in September 1995. Initially, the toll was $1.75 each way, but when traffic fell short of projected levels, the toll was reduced to $1.00. Lowering the toll attracted more users but not enough to increase total revenues.[10] Consequently, in July 1997, the Greenway's operators raised the toll to $1.15.

The shortfall in toll revenues from the project has brought problems for its investors. They had projected toll revenues for the first year at $27 million; $7 million was to go for operating costs and $20 million toward the $30 million in annual interest. When those revenues did not materialize, the investors began to miss their quarterly interest payments of $7 million each. However, they won approval from lenders to skip the payments for the rest of the year, avoiding foreclosure through the end of 1997.[11] As of December 1997, the sponsors were discussing a further extension of their standstill agreement with the lenders.

The 1988 enabling legislation passed by the General Assembly prohibits the state from bailing out the Greenway or other such facilities. Nevertheless, after the disappointing results of the first few months of the toll road's operation, the Virginia legislature considered such action. In the end, it rejected a bailout; however, it voted to allow the speed limit on the Greenway to rise (from 55 to 65 miles per hour) in hopes of attracting more motorists.

The Greenway is a build/operate/transfer facility and becomes the property of the state after 42.5 years. Under that kind of arrangement, the people of Virginia get a road financed through tolls, not taxes, that is built sooner than otherwise would have been the case. The developers receive the profits (assuming that the market eventually provides profits) for a long enough period to recoup their investment. Virginia's State Corporation Commission limits the rate of return on the project to 18 percent, but profits appear unlikely to approach that level anytime soon.

California State Route 91 Express Lanes. The second example of a road financed with private equity is a 10-mile toll section of State Route 91 (SR 91), the Riverside Freeway, in southern California. The toll portion, which is known as the 91 Express Lanes, is in the median of the freeway. It is separated from other traffic by a buffer zone.

The 91 Express Lanes project was developed under a program authorized by the California legislature in 1989. The developer and operator is the California Private Transportation Company (CPTC), a limited partnership led by the large construction company Peter Kiewit Sons. Other partners are a French toll road company, Cofiroute Corporation, and a large, locally based construction company, Granite Construction.[12] The partnership raised $126 million in financing from several sources: $65 million in variable-rate loans from Citibank and two French banks; $35 million in a 24-year loan from Cigna; $19 million in CPTC's equity; and $7 million in subordinated debt to repay a local agency's engineering and environmental studies.[13]

Unlike the Greenway, the 91 Express Lanes are a build/transfer/operate facility. Thus, on completion of the project in 1995, the developer transferred ownership to the state. CPTC will operate the express lanes for 35 years—and pay for maintenance, law enforcement, property taxes, and other operating costs. After that period, control of the roadway reverts to the state.

The state does not directly regulate tolls, but it limits the company to a rate of return of 17 percent on the project. The road has no toll booths to impede the flow of traffic; instead, tolls are collected electronically and vary by the time of day. The operators initially considered varying the tolls instantaneously depending on the flow of traffic. For example, if too many vehicles entered the express lanes, the toll would rise to moderate the demand and prevent the toll portion from becoming congested. However, research into attitudes about real-time adjustments in tolls revealed that commuters wanted to know the cost before they started their trips. To accommodate them, planners developed a toll struc-

10. By way of comparison, the 10-mile Dulles Toll Road, with which the Greenway connects, has a maximum toll of 85 cents.

11. Peter Pae, "Agreement Buys Time for Dulles Greenway," *Washington Post*, May 29, 1997, p. A24. For an earlier report, see Peter Pae, "Struggling Dulles Greenway to Raise Toll," *Washington Post*, November 2, 1996, p. B5.

12. Peter Samuel, "Highway Aggravation: The Case for Privatizing Highways," *Cato Institute Policy Analysis*, no. 231 (June 27, 1995), p. 15.

13. Data supplied to the Congressional Budget Office by Gerald S. Pfeffer, Senior Vice President, United Infrastructure Company, in March 1997.

Table 5.
Motivation, Contributions, and Risks of Partners in Public/Private Ventures in Highway Financing

	Motivation	Contribution	Risks
State	Speed up road construction without having to issue more debt	Power of eminent domain; authority to create an entity to issue tax-exempt debt	Private partner may seek added contribution later, or social benefits might prove to be less than social costs
Private Developer	Prospect of profit under the construction contract; earlier availability of the contract for a large project	Expertise; pays for design studies; assumes the risk of a fixed-price construction project	Costs of construction may be underestimated and thus money lost on fixed-price contracts
Nonprofit Entity	Management fees or fees for bond issuance, or both	Authority to issue tax-exempt debt without being subject to state limits	Project may be terminated and money spent on development lost
Bond Buyers	Attractive return on investment in an asset	Cash	Revenues may be insufficient to make interest payments and repay debt

SOURCE: Congressional Budget Office.

ture with relatively low tolls in the middle of the night, higher tolls at peak hours, and a series of steps leading up to and down from the peaks.

Unlike the Greenway, the express lanes are adjacent to a heavily congested highway. With a ready-made demand from the day the lanes opened, projections of revenues were less uncertain than they were for the Greenway. As of February 1997, more than 80,000 vehicles had been equipped with electronic transponders to pay tolls automatically.[14] Average weekday traffic in 1996 was 25,000 vehicles, and 20 percent or more of peak-hour traffic used the express lanes.[15] The lanes have proved so popular that the road's operators raised tolls twice in 1997 with little loss of business.[16]

Public/Private Partnerships

Several new or proposed highway projects are hybrids built by partnerships between the public and private sectors. What makes public/private partnerships attractive to the participants? For state and local governments, they achieve a quicker result than would be the case if the majority of funding had to come from constrained government budgets (see Table 5). Moreover, the debt issued by the partnership is not considered debt of the state. It is not backed by state tax revenues and consequently does not jeopardize the state's ability to issue bonds for other purposes.[17] Debt repayment is typically through revenues from tolls, although the state may use tax revenues to enhance the quality of the credit or to cover other expenses. Bond buyers voluntarily purchase bonds on the basis of the contribution they expect the bonds to make to their portfolios, con-

14. Ibid. The same devices are also accepted for payment on three publicly funded toll roads in Orange County.

15. California Private Transportation Company, *1996 Annual Report* (Anaheim, Calif.: CPTC, 1996), p. 1.

16. "91 Express Lanes for Sale?" *Public Works Financing*, vol. 110 (September 1997), p. 3.

17. A state's ability to issue bonds may be constrained by constitutional or legislative limits on debt, how taxpayers view debt, and how the financial community evaluates the state's ability to repay what it has borrowed.

sidering returns, risk, diversification, maturity, tax status, and other factors.

As for the private participants, one must assume that they are in the partnership to make money. Although firms may also be motivated by the desire to produce goods or services that provide social benefits to the community, they must keep their shareholders happy, generally by earning a reasonable return on investment.[18] On the plus side, that focus on returns means private firms will probably scrutinize potential investments carefully and not undertake projects that appear unlikely to achieve an attractive payoff. Private firms are also likely to be quite cost-conscious. On the minus side, the focus on making money may cause the interests of private firms and the general public to diverge. Consequently, governments must be on their guard and must structure agreements with private firms to provide incentives to do what is good for the public along with disincentives to waste resources.

Two models of public/private sponsorship of highway projects have emerged: a special-purpose public agency and a private, nonprofit corporation. Under both forms, tax-exempt financing is available, and sponsors provide general oversight of the project.

Initiatives that have used public-agency sponsorship are the E-470 toll road in Colorado and a group of toll roads in Orange County, California, run by the transportation corridor agencies.

Colorado E-470. One of the first proposals for a public/private partnership was the E-470 toll road on the east side of Denver. The history of the project goes back to 1987. In that year, the state of Colorado passed the enabling statute that permitted the city of Aurora along with Douglas, Arapahoe, and Adams Counties to form an authority through an intergovernmental agreement. The jurisdictions established the E-470 Public Highway Authority to finance, build, and operate the highway.[19] Its board of directors is composed of elected officials from the governmental jurisdictions through which the 34-mile road will pass. The authority entered into a design/build construction contract with a wholly owned subsidiary of the Morrison Knudsen Corporation, Platte River Constructors. In addition to assuming the risks of a fixed-price construction contract, Platte River also contributed $16 million in return for second-tier subordinate bonds (bonds on which interest is paid only after more senior bondholders are satisfied).[20]

The E-470 project consists of four segments. Segment 1, a 5.3-mile stretch between Interstate 25 (I-25) on the south side of Denver and Parker Road, opened to traffic in June 1991. Segments 2 and 3, which extend about 29 miles from Parker Road to 120th Avenue on the east side of Denver, are scheduled for completion in June 1999, with some portions to be opened to traffic in June 1998. A fourth segment, which would fill the 12-mile gap between 120th Avenue and I-25 on the north side of Denver, is not part of the project as currently defined.[21] However, in 1997, the authority obtained additional financing to begin the initial design work on Segment 4 and acquire the necessary rights-of-way.

The E-470 project was initially undertaken by Arapahoe County, which issued bonds to finance the road in 1986. Shortly thereafter, the project ran into problems when a recession hit the local economy, reducing projections of toll revenue, and citizens voted against using taxes to make up for shortfalls.[22] Their action led to the creation in 1988 of the E-470 authority, which assumed primary responsibility for the bonds marketed in 1986 as well as for getting the road built.

In 1995, the authority remarketed $654 million of the 1986 bonds and released the proceeds for construction of Segments 2 and 3. Of the total, $50.8 million in bonds is backed by revenues from motor vehicle registration fees, and $587.6 million in senior bonds is backed by net revenues from tolls. Neither type of

18. Of course, stockholders have different ideas about what is reasonable. Some want a high rate of return and are willing to assume a high risk; others are willing to forgo a high rate of return to preserve a stable value of capital.

19. Lehman Brothers and George K. Baum & Company, "E-470 Public Highway Authority, Capital Improvement Trust Fund Highway Revenue Bonds" (remarketing statement, August 22, 1995), p. 3. David Klinges, Senior Vice President of Lehman Brothers, provided additional information for this section.

20. The contract holds Platte River Constructors liable for liquidated damages for each day of delay in completing the project, except in the case of certain "force majeure" events including delays associated with abnormally inclement weather conditions, endangered species, and hazardous substances.

21. Lehman Brothers and George K. Baum & Company, "E-470 Public Highway Authority," p. II-1.

22. Federal Highway Administration, *Implications of Changes in Procedures and Laws to Advance Public-Private Partnerships*, FHWA-PL-95-026 (April 30, 1995), p. 5.

bond is backed by tax revenues. (The remaining $16 million in bonds was sold to Platte River Constructors, as noted earlier.) The interest is not subject to federal or Colorado income taxes, according to bond counsel, nor is it subject to the federal alternative minimum tax.

In addition to the bond issues, the project expects to receive loans from the state and local governments. The Colorado Department of Transportation has agreed to lend up to $20 million (subject to annual appropriations) to match contributions from local governments. The authority also has the power to assess and collect fees from developers of land within 1.5 miles of the center line of the highway.[23] For businesses, the fee is based on square footage and distance to an interchange; for residential property, the fee is based on an estimate of relative use of the project by residents.

Such charges, which are known as development impact fees, are a common tool for financing new highways. The one-time charges are generally levied on both residential and nonresidential development within the established area of benefit of a roadway.

Orange County, California, Transportation Corridor Agencies. In 1986, the California legislature authorized local governments to create "joint-powers" agencies with the right to finance and build roads and collect tolls and development impact fees.[24] Orange County responded by creating two transportation corridor agencies, the San Joaquin Hills TCA and the Foothill/Eastern TCA. The agencies consist of elected representatives from 15 cities and three supervisorial districts within the county.[25]

The San Joaquin Hills TCA has built a 15-mile, six-lane toll road linking Newport Beach and San Juan Capistrano.[26] About half of the corridor was opened to traffic in July 1996, and the remainder was opened in November of that year.[27] As each segment was finished, the TCA transferred ownership of it to the state highway system, along with the responsibility for operation and maintenance. However, the TCA retains ownership of the toll collection system until all debt is retired.

The Foothill/Eastern TCA has opened 7.5 miles of roadway and is working on another 44.5 miles. The segment opened to traffic runs from Portola Parkway North near Irvine to Antonio Parkway in Rancho Santa Margarita. When completed, the Foothill corridor will extend from North Irvine to Interstate 5 south of San Clemente. The Eastern corridor connects State Route 91 and Irvine, where it splits into two legs, the eastern one connecting with the Laguna Freeway south of Interstate 5 and the western one merging with Jamboree Road south of Interstate 5 in Irvine.[28]

The San Joaquin Hills and Foothill/Eastern TCAs have identical organizational structures, powers, and staff, and they are involved in similar financing arrangements. They are separate agencies with separate books, however, because they cover different geographic areas and hence have different areas for which they can levy development fees. The debt issued by the agencies is also separate.

The two agencies combined have raised a total of about $3.6 billion to cover project costs. About 77 percent of that financing is from bonds, 7 percent from development impact fees, 9 percent from interest, 5 percent from the state, and 2 percent from other sources.[29] The bonds are nonrecourse bonds: bondholders can look only to toll revenues, development fees, and interest earnings for repayment. The bonds are not backed by local or state government, although they qualify as municipal bonds, the interest on which

23. Lehman Brothers and George K. Baum & Company, "E-470 Public Highway Authority," p. 30. For some portions of the roadway, the area subject to development impact fees extends 2.5 miles from the center line.

24. Federal Highway Administration, *Implications of Changes in Procedures and Laws*, p. 32.

25. The information presented here is drawn largely from the TCAs' web site (available at http://www.tcagencies.com/). Additional information was provided in a briefing by TCA officials and their advisors on November 25, 1996.

26. San Joaquin Hills Transportation Corridor Agency, *The Journey Begins* (undated brochure).

27. TCAs' web site (available at http://www.tcagencies.com/).

28. Ibid.

29. Ibid.

is exempt from federal income taxes. As discussed earlier, the federal government gave each of the transportation corridor agencies a standby line of credit of $120 million, which enhanced the marketability of the bonds. Current traffic and revenue projections suggest that the TCAs will not have to draw on those lines of credit.

Development impact fees have played a key role in financing the Orange County toll roads. The fees are based on the number of trips on the toll roads that development is projected to generate. Geographic locations close to the roads carry higher impact fees than those that are farther away. For residential development, rates are higher for single-family houses than for multiple-unit buildings. Commercial development fees are based on square footage.

The development impact fees have provided seed capital for the projects, a responsibility that private investors have been reluctant to assume. Private investors consider the initial stages of highway projects—especially the time spent getting the necessary environmental permits—to be a risky period. They tend to shy away from committing capital until the project gets all the approvals it requires from government regulators.

Like the 91 Express Lanes project, the Orange County toll roads are transferred to the state of California once they are opened to traffic. The state, however, gives the TCAs the toll franchise until the debt is paid off (the bonds have 40-year maturities). The state assumes tort liability as well, but unlike the arrangements for the 91 Express Lanes, it also assumes responsibility for all operations and maintenance (except as related to the collection of tolls).

Several other initiatives in states across the country are using private, nonprofit entities rather than public agencies to oversee the financing, building, and operation of roadways.

South Carolina's Southern Connector. The South Carolina Department of Transportation is working with a nonprofit community association known as the Connector 2000 Association and a private development team, the Interwest Carolina Transportation Group, on a new toll project. The 16-mile, four-lane road, the Southern Connector, will serve the Greenville area. Most of the financing will come from tax-exempt bonds issued by the association and backed by revenues from tolls.[30] The project will also receive $20 million from the state; the association plans to use it for traffic studies, valuation of rights-of-way, and financing of early construction work.[31] The state expects the federal government to approve a loan of federal-aid funds to the project as allowed under section 1012 of ISTEA.[32]

Both the private and public sectors stand to gain a great deal from this arrangement. In return for incurring the costs and risks of developing the project, the development team will receive a substantial fee. The state benefits because it gets the road built sooner than would be possible with conventional financing and because it will not be liable for any of the project's debt.

Two legal issues have delayed development, however. The first question was whether the bond issue required approval by county voters in a referendum. The courts ruled that approval was not needed because the relevant cost of the project was less than the amount that would trigger the referendum requirement.[33] The second issue was the constitutionality of a 1995 state law that gave affected counties the power to veto transportation projects with statewide effects. In August 1997, the state supreme court ruled in favor of the project's sponsors, stating that the law represented an illegal delegation of authority.[34]

The sponsors hope to complete their financing arrangements in January 1998. If they are successful, the project will be the first to proceed under that model of public/private sponsorship.

Minnesota Trunk Highway 212. The Minnesota Department of Transportation (Mn/DOT) has established an Office of Alternative Transportation Financing to explore opportunities available under ISTEA and the National Highway System Designation Act of 1995.[35]

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30. "First '6320' Nonprofit Toll Road," *Public Works Financing*, vol. 110 (September 1997), p. 7.

31. "Good News in South Carolina," *Public Works Financing*, vol. 104 (February 1997), p. 8.

32. "First '6320' Nonprofit Toll Road," p. 6.

33. "Good News in South Carolina," p. 8.

34. "First '6320' Nonprofit Toll Road," p. 7.

35. Minnesota Department of Transportation web site (available at http://www.dot.state.mn.us/).

In July 1995, Mn/DOT issued requests for proposals for developing toll facilities. It received five responses and in May 1996 selected one, a 20-mile highway running from Eden Prairie to Cologne on the southern side of the Twin Cities and known as Trunk Highway 212 (TH 212).[36] Over the summer of 1996, Mn/DOT worked on an agreement with the developers—a local not-for-profit association, the 212 Community Highway Association, and private, for-profit firms led by Interwest/DLR Group Infrastructure Corporation.

One of the ground rules under which the public/private coalition operates is that a project can be vetoed by any community involved with the road. In September 1996, one of those communities exercised its veto. As of December 1997, the sponsors were still holding out hope that the opposition could be overcome. The opposing community's primary concern appears to be a "not-in-my-backyard" objection that is common to new highways.[37] Some complaints have also arisen about subjecting motorists in one part of the metropolitan area to tolls when other commuter corridors are toll-free.

If backers of the TH 212 project can address the concerns of its opponents, the highway is likely to be Minnesota's first toll road. The plan is for the $220-million project to issue tax-exempt bonds backed by toll revenues. Again, that kind of innovative financing would allow the road to be built sooner than it would be if it had to rely on a conventional, pay-as-you-go approach. As for the proposals that were rejected in the first round, Mn/DOT left the door open to consider modifications to them. First, however, the projects must solve several problems that were responsible for their initial rejection: lack of support by affected communities, environmental concerns, and questions about the projects' financial and technical feasibility.

Arizona. In 1991, the Arizona legislature enacted legislation authorizing four transportation projects to be financed by the private sector. It amended the law in 1995 in an attempt to increase the likelihood that such projects would be developed. Several toll roads have been proposed but have faltered for lack of public support.[38] The most recent casualty is MetroRoad, a project in the Phoenix area that would have added express lanes with tolls to congested East Valley freeways and accelerated construction of the San Tan Freeway. MetroRoad had been structured as a nonprofit corporation and had planned to finance construction by issuing tax-exempt bonds. In November 1997, the project's sponsor, HDR, Inc., decided to withdraw its proposal because of concerns about the project's financial viability. A key factor in that decision was the changes the state had made in its plans for roads in the area.[39]

One venture remains: the South Mountain Toll Road, which will be about 25 miles long and provide an alternative to Interstate 10 through Phoenix. The Interwest group is working with the Arizona Department of Transportation on that $360-million effort.[40] To advance, the project must undergo scrutiny at public hearings and secure approvals from the Arizona State Transportation Board.

Virginia. In Virginia, the Public-Private Transportation Act of 1995 authorizes the state government and substate entities that meet certain qualifications to enter into agreements with private firms to acquire, build, improve, maintain, and operate qualifying transportation facilities. Private sponsors may submit their proposals to the state, which reviews and considers them in a process that is open to public scrutiny and competitive bidding.

One of the proposals submitted in response to the act is a toll road between I-95 and I-295 south of Richmond. The Virginia Department of Transportation (VDOT) began planning the link, known as the I-895 connector, about 20 years ago. The Commonwealth Transportation Board endorsed the nine-mile corridor in 1983 and approved the major design features in August 1997. VDOT has allocated $12 million for designing the road. The construction and engineering

36. "Minnesota is Set to Get its First Toll Highway," *Engineering News-Record*, McGraw-Hill (May 27, 1996), p. 16.

37. Adeel Z. Lari, "Minnesota Toll Road Public-Private Partnership: The TH 212 Preliminary Development Agreement" (presentation at the annual meeting of the Transportation Research Board of the National Research Council, January 13, 1997).

38. Federal Highway Administration, *Implications of Changes in Procedures and Laws*, p. 5.

39. HDR, Inc., "Update: MetroRoad Project Team Withdraws Project," November 12, 1997 (available at www/hdrinc.com/metroroad/update.htm/).

40. "Allstate Sues Interwest for Fraud," *Public Works Financing*, vol. 104 (February 1997), p. 6. The fraud referred to in the title refers to a sewer project.

firms of Fluor Daniel and Morrison Knudsen have formed a partnership, FD/MK, to build the facility they call the Pocahontas Parkway. The partnership is negotiating an agreement with VDOT that would establish a not-for-profit association akin to those in South Carolina and Minnesota. The association would sell about $300 million in nonrecourse tax-exempt bonds to private investors and borrow $15 million from Virginia's infrastructure bank. The debt would be repaid through tolls of up to $2. The proposed schedule calls for executing an agreement between the partnership and VDOT in early 1998, beginning construction in late 1998 or early 1999, and opening the roadway in mid- to late 2001.[41]

Another project that was proposed in response to the Public-Private Transportation Act has been withdrawn.[42] The venture was a toll road on an uncompleted section of Route 288 between the Powhite Parkway Extension in Chesterfield County and I-64 in Goochland County. The project's sponsor was the James River Parkway Associates, a joint venture of Brown and Root Civil of Houston, a large engineering and construction company, and Dewberry and Davis, an engineering firm in Fairfax, Virginia. The group proposed building the 17.5-mile road as a limited-access highway and imposing a toll of $2. The cost of the project was estimated at $320 million.

Tacoma Narrows Bridge, Washington. The Tacoma Narrows Bridge on State Route 16 is the primary link between the Seattle/Tacoma metropolitan area and the Olympic Peninsula. In 1994, the Washington State Department of Transportation, using authority provided by the state legislature the previous year, selected the United Infrastructure Company, a partnership of the Bechtel Group and Peter Kiewit Sons, to develop plans for improving the bridge.[43] The firm is conducting technical, financial, and environmental studies of alternative ways to relieve congestion.

Toll roads have been controversial in Washington State. Thus, what might in other instances have been the approach of first choice —a self-supporting toll bridge with enough profit potential to attract private investment—may not be a viable option. Voters in the affected area will have an opportunity to express their views in an advisory election in the fall of 1998.[44]

Contracting for Construction, Operations, and Maintenance

Another form of private-sector participation occurs when the government owns a toll-free road but contracts with a private firm to build, operate, and maintain it. Typically, an agreement of that kind is designed to impose some risks on the firm and thus create incentives to provide good service. Although "contracting out" has found favor among state and local officials when applied to trash collection and even public bus service, contracting for road operations has not received much attention in the United States.[45]

In the 1980s, the British government began exploring such contracting to build, finance, and operate highways.[46] Although the specifics of the model may vary, in essence, the government gives a private entity the franchise to build and operate a road and contracts to pay the operators from general governmental revenues according to the volume of traffic. The charges per vehicle are known as shadow tolls because users do not see them (or pay them) directly. Indeed, from the standpoint of users, the roads are as free as traditional toll-free highways that are financed by taxes and owned and operated by some level of the government.

41. Virginia Department of Transportation web site on its I-895 project, September 1997 (available at www.vdot.state.us/proj/895x.html/), supplemented by additional information from VDOT.

42. The reasons for withdrawal were not made public by the project's sponsors. Subsequently, VDOT announced that it would proceed with the proj-ect on its own using state funding.

43. Statement of Gerald S. Pfeffer, Senior Vice President, United Infrastructure Company, before the Subcommittee on Transportation and Infrastructure of the Senate Committee on Environment and Public Works, March 6, 1997.

44. Washington State Department of Transportation, "The Public Advisory Elections," *SOLVE 16 Fact Sheet,* no. 8 (available at http://www.wsdot.wa.gov/solve16/8.html/).

45. For discussions of contracting for municipal services, see John C. Weicher, "Making Cents: Better City Services for Less," *Outlook: Ideas for the Future from Hudson Institute,* vol. 1, no. 2 (February 1997). *Privatization Watch,* a monthly newsletter published by the Reason Foundation in Los Angeles, is another source of information.

46. URS Consultants, Inc., in association with McDermott, Will & Emery, *The Applicability of Shadow Toll Concepts in the United States* (prepared for the Federal Highway Administration, October 1995).

The British government is working with private contractors on several projects that use shadow tolls.[47] Whether the British experience can provide a useful model for the United States is not yet clear, however. The numerous differences between Great Britain and the United States (and its state and local governments) in the institutional arrangements for projects sponsored by government and the private sector may prevent a direct transfer of approaches from one nation to the other.

Evaluating Private-Sector Participation in Highway Financing

The approach to highway financing that taps private-sector resources can be evaluated according to several criteria: the amount of additional money that can be generated to finance the projects, implications for using resources efficiently, distributional consequences, administrative feasibility, acceptability to users and taxpayers, and effects on the federal budget.

Financing Potential

A primary motivation for encouraging private-sector participation in building and operating roads is to attract additional sources of funds for investment. Private investors in a highway project provide capital at the beginning of the venture and expect to recoup their investment during the project's useful life. Thus, to the extent that private participation occurs, resources can be brought to bear sooner than with traditional pay-as-you-go financing based on user taxes and fees. Because private firms do not have the power to tax, they must recover their investments through tolls or other fees. Eventually, then, roads built with private funds are paid for by future users (or by investors, if a project fails to earn enough revenue to cover costs).

So far, the amount of private equity investment in road projects has been limited. In recent years, it has been at most a few billion dollars annually, which is dwarfed by the roughly $80 billion spent on roads by federal, state, and local governments each year. And private investment in roads will remain limited as long as most highways are provided by government and financed with taxes rather than tolls. To be attractive to private investors, a project must carry the expectation of profitability. The number of projects that have the potential to offer enough value to motorists that they will be willing to pay tolls when toll-free alternatives are available appears relatively small. Such projects face substantial obstacles, which are discussed later in this chapter.

Efficiency

Involving the private sector in building and operating roads has potential benefits from the standpoint of economic efficiency. The profit motive leads private firms to invest in projects that they think will be valued highly enough by users to recoup costs. Private or public/private road projects generally charge tolls; if the tolls are set at the right level, they can help allocate resources among those who are willing and able to pay for them. Contracts between governments and private providers can be structured to provide incentives for keeping costs under control and to assign risks to the party with the most information about and ability to control them. The form of privatization that a highway project embodies and the specifics of agreements between private investors and governments have a bearing on efficiency.

Efficiency of Investment. Before a private or public/private road project is undertaken, it is put to more of a market test—in that it must attract investors—than a public road is ordinarily subjected to. Potential investors will be unwilling to take the risk of financing and building a road for which the expected demand is insufficient to recoup the investment. Yet a private road is not unambiguously more efficient than a public one. From the standpoint of society, there would probably be underinvestment if all roads were private because many road projects yield benefits beyond the amount paid for by users.

In principle, benefit-cost analysis forms the basis for selecting public road projects (although other factors may influence those decisions as well). Carrying

47. Gabriel Roth, *Roads in a Market Economy* (Brookfield, Vt.: Ashgate Publishing Company, 1996), pp. 208-209.

out such analysis requires estimating the demand for a project, which is no easy matter in the case of a good—a public road—whose price is zero. Users quite understandably tend to want more of that good because they do not perceive it as costing them anything. As a result, highway officials may overestimate the demand for such projects, and public roads may be overbuilt—that is, built larger than the actual demand might warrant. However, mistakes in estimating demand are not confined to the public sector. Incorrect judgments about either private or public projects can lead to an inefficient amount of investment, and given the characteristics of roadways, that investment is essentially sunk—the resources cannot readily be put to alternative uses.

When private road builders are also responsible for subsequent operations and maintenance, they have incentives to build roadways that are designed to meet the specific demands and characteristics of users. For example, if a highway is going to be used by heavy vehicles, a private firm that has to maintain as well as build the road will probably choose a stronger, more durable pavement. Private operators may also be more responsive than government to demands for better maintenance and smoother operations, since their incentive is to attract more traffic and hence more revenues.

Efficiency of Use. As noted earlier, most private and public/private road projects impose tolls, in contrast to public roads that generally are toll-free and financed with tax revenues.[48] On the one hand, if the sponsor of a project sets tolls at a level that reflects the marginal cost of use, such charges can help allocate resources efficiently. On the other hand, a toll set at an efficient level may not raise enough in revenues to pay for the investment. Unless a road is congested, the marginal cost of use by an automobile is relatively low. Consequently, a toll equal to the marginal cost would be unlikely to yield enough revenues to cover the cost of the investment.[49] If the toll was set high enough to recover the cost, it would impede efficiency by discouraging users who were willing to pay as much as the marginal cost but not as much as the toll.

When a road is congested, each additional motorist imposes costs related to delays on all other motorists. By acting as price signals, tolls can moderate the demand for use of the road, especially when premium rates are charged at peak hours. Sponsors of the 91 Express Lanes project in California designed its pricing structure with that in mind. The aim of the road's operators is to keep traffic flowing without delays. To do so, they are trying to set tolls at levels that reflect different demands at different times of the day and that help to moderate demand during peak hours.

Shadow tolls do not serve as a price mechanism. Instead, such charges make a road appear free to motorists, encouraging them to use or overuse it. As long as the road is not congested, overuse poses no problem because the marginal social cost of use is essentially zero. However, shadow tolls, unlike tolls that a user pays directly, do not discourage use of congested roadways.

Minimizing Costs. Advocates of privatization believe that private firms can operate less expensively than governments. Part of their reasoning involves the incentives faced by private firms, and part is based on the checks placed on governments. In many situations, private firms can react more nimbly than governments, which are constrained by procurement regulations, employment policies, and other red tape; hence, firms can be more responsive to users' demands. To provide incentives for efficient behavior by private firms, a government must design contracts with care to ensure that they reward socially beneficial behavior and discourage detrimental behavior. That is no easy task, as difficulties with other large-scale government procurements show. Procurements for major weapons systems or modern computer and communications systems for air traffic control, for example, seldom proceed without problems.[50]

Handling Risks. Investments in road projects have many uncertainties for private developers, who may need to see a great potential for profits to induce them

48. Even though many of those revenues come from taxes associated with the use of roads, such as taxes on motor fuels, the taxes are not tied to use of a specific road at a specific time. Therefore, they do not serve the same pricing function as tolls.

49. One solution to that problem is a two-part tariff that combines a fixed fee and a marginal-cost price. That and other pricing options are discussed in Congressional Budget Office, *Paying for Highways, Airways, and Waterways: How Can Users Be Charged?* (May 1992).

50. For example, see General Accounting Office, *Aviation Acquisition: A Comprehensive Strategy is Needed for Cultural Change at FAA*, GAO/RCED-96-159 (August 1996).

to assume the financial and liability risks that accompany building and operating highways. With more roads and resources, governments may be able to achieve a reasonable overall level of risk by spreading their risks among individual projects. As a government designs contracts with private firms, it must ensure that risks and returns are balanced and that it does not bear all of the risks and leave all of the returns to the private sector.

For example, who should be held liable if a design flaw contributes to accidents? For the sake of efficiency, the party in a position to affect the outcome should be held accountable because the liability will induce that party to take appropriate preventive measures. With respect to financial risks, a contractor that is only building a roadway and is not responsible for its subsequent upkeep and maintenance might stint on design and materials to keep the initial cost low. In doing so, however, the total cost of the road (including operations and maintenance) may increase over the highway's life cycle.[51]

Distributional Effects

Private investment in roads shifts some or all of the cost and risk from governments and taxpayers to private investors and users of the roads. Because investment costs must be recouped with tolls or other user fees and not with taxes, road projects financed by the private sector shift the eventual burden of costs to users of the projects and away from other motorists. The taxes and fees related to highway use that those other motorists pay go to support other highways. Of course, if a road built with private financing does not attract enough users to cover its costs, equity investors and bondholders are left to bear those expenses.

For projects that are structured as public/private partnerships and that make use of debt financing, taxpayers at the federal level as well as those of the state in which the project is located bear a share of the cost. The costs are distributed in that way as a result of "lost" revenues associated with the federal income tax exemption of interest on municipal bonds. The exemption helps agencies to market debt for their projects at a lower rate of interest than would be possible if investors had to pay income taxes on that interest.

The amount of tax-exempt debt issued for public/private road projects has been relatively small thus far and the resulting loss of federal tax revenue negligible. Still, from the standpoint of the federal government, the tax exemption is open-ended. If that model of road financing became popular, the amount of revenue forgone would mount.[52] The loss of revenue is limited, however, by two factors: the capacity of the market to absorb additional tax-exempt issues and the debt ceilings established by state and local governments. Hence, instead of reducing federal tax revenues, new bonds for toll roads might crowd out bonds for school construction or other public works.

Administrative Feasibility

Builders of roads—public and private—face a number of obstacles, but those impediments are generally greater for private firms than for governments. In addition to obtaining financing, sponsors of road projects must acquire land for rights-of-way and the applicable environmental permits. They also face potential tort liability from accidents. That vulnerability adds to the difficulty and cost of obtaining financing.

Such obstacles indicate that strictly private road development—without any governmental involvement—is exceedingly difficult. They also suggest that some roles are better suited to government and some to the private sector. In particular, the early stages of a project are probably best undertaken by public entities. Enjoying the power of eminent domain, governments face fewer obstacles to acquiring rights-of-way. And obtaining environmental permits can be easier for governments than for private developers, although still a daunting task. Without such permits, a project cannot go forward. Thus, the risks to investors in the early stages of a project are great and may be borne more easily by governments. Specifically, if a government body is undertaking a large number of projects, it can

51. Section 303 of the National Highway System Designation Act of 1995 established a program that requires states to analyze the life-cycle costs of projects on the National Highway System with price tags of $25 million or more. The measure is codified at 23 U.S.C. 106(e).

52. The open-ended tax exemption would apply if bonds qualified as public-purpose instruments. In contrast, federal law limits the volume of bonds issued by state or local agencies for private purposes. In addition, interest on private-purpose obligations is subject to the alternative minimum tax.

spread the risks among them. However, governmental resources are not unlimited, and consequently, governments must focus on projects that have the best chance of going forward.

In the case of shadow tolls, the government needs a mechanism for monitoring the performance of a private road contractor to ensure that the government is not overpaying. One possibility is high-tech sensors, which could help count vehicles. In addition, however, the government would still need an effective way of auditing the accounts.

Acceptability

Will government officials, road users, and the general public accept the idea of private or public/private road projects? As the efforts described in this chapter suggest, federal, state, and local transportation officials are interested in giving them a chance as a way of augmenting governmental resources in road building. Yet the lack of experience with private roads makes officials cautious about proceeding too quickly. For example, state and local officials must be convinced that they will not be left "holding the bag" if private ventures are unsuccessful. If a public/private road has design or construction flaws, the government may be held responsible or forced to use highway funds of its own to repair the problem. Therefore, government officials must be assured that if they participate in a public/private project, they will not lose control over public resources. They must also be confident that those resources will be used productively and prudently.

For example, consider the kinds of issues that arise regarding a public/private toll road that is due to be turned over to the government for operation and maintenance when it is opened to traffic. For one thing, the government must anticipate the need for funding those activities in the future. With relatively few such roads, the costs should not present a large burden, but if numerous roads were built under those conditions, they could impose a noticeable demand on the government's budget for maintaining roadways. To decide whether a build/transfer/operate agreement was worthwhile, of course, the government would have to compare its costs with the benefits of substituting private capital for public funds in highway construction.

The government also has an interest in seeing that roads meet certain standards so that they do not crumble prematurely or otherwise impose greater burdens on public budgets. In that regard, operators of toll roads share some of the same incentive because they want the roads to be in good condition to attract motorists and keep toll revenues high.

Private and public/private projects also need acceptance by motorists. Most such projects will be supported by tolls. But the motoring public is accustomed to toll-free use of limited-access highways as well as local roads and may object to paying tolls. Still, motorists always have an alternative: they can take the toll-free routes that they used before the new roads were built and avoid the problem of suddenly facing high tolls.

Recent experience with toll roads suggests that motorists are willing to pay tolls if they see a clear benefit—such as having additional capacity available that enables them to avoid congestion and save time getting to their destinations. A recent study funded by the Texas Department of Transportation found that the public supported the use of tolls on newly built roadways as an alternative to boosting fuel taxes.[53] However, most Texans in the survey were against imposing tolls on roads that currently do not have them, and they also opposed tolls as a mechanism for easing congestion. The last finding is surprising because the existing toll roads in Texas are in the Houston and Dallas areas, where higher tolls during peak periods could reduce congestion and save travel time for commuters who were willing to pay.

Some observers complain that toll roads are unfair to motorists with low incomes who may not be able to afford them, a concern that intensifies in considering trips to work by motorists with few alternatives. Yet the Texas study reported that the level of income of the people surveyed did not affect their preference for fuel taxes versus tolls, although people with higher incomes tended to use toll roads more often than people with low incomes. On the 91 Express Lanes in California, the income distribution of users mirrors the overall income distribution in the area.

53. Chungwon Lee and others, "A Survey Approach for the Acceptability of Highway Tolling and Congestion Pricing in Texas," *Journal of the Transportation Research Forum*, vol. 36, no. 1 (1996), pp. 43-58.

Technology is helping to overcome one long-standing complaint about toll roads: wasting time waiting in line to pay the tolls. The new toll roads make use of electronic toll collection, which reduces the costs of collection and delays. Electronic tags placed in vehicles can be read by roadside sensors and the amount of the toll debited automatically.[54] Although some observers have expressed concerns about privacy, most motorists do not find that a problem. One way of ensuring privacy is to give motorists the option of paying a cash toll at a traditional toll booth (with the traditional delays) or buying a debit card that does not identify the user.

In the end, private and public/private road ventures must be acceptable to voters and taxpayers. If private funding substitutes for or augments public funding from tax revenues, taxpayers would be likely to welcome it.

Implications for the Federal Budget

Strictly private ventures in highway financing should affect the federal budget no differently from any other private investment. Tax effects associated with earning income, taking tax credits or deductions allowed under the tax code, and incurring capital gains or losses are likely to be about the same as those of alternative investments and thus would offset them.

How public/private ventures affect the federal budget depends on how they are structured. If, for example, the federal government provides loans, loan guarantees, or lines of credit for a project, the budget will record the risk of default and any interest subsidies as federal outlays.[55] Reduced tax receipts are another potential effect; the federal government can lose revenues if a public/private partnership sells tax-exempt bonds to investors who otherwise would have purchased taxable bonds.

54. For additional discussion of electronic toll collection, see Congressional Budget Office, *High-Tech Highways: Intelligent Transportation Systems and Policy* (October 1995).

55. For detailed discussions of the way the federal budget treats loans, loan guarantees, and lines of credit, see Congressional Budget Office, *An Explanation of the Budgetary Changes Under Credit Reform*, CBO Memorandum (April 1991) and Congressional Budget Office, *Budgeting for Administrative Costs Under Credit Reform* (January 1992).

The Outlook for Private-Sector Participation

What are the prospects for increased participation by the private sector in road building? The projects described in this chapter suggest that both government officials and private firms are interested in exploring new ways to tap private-sector resources—with the expectation of reasonable returns on investment. The projects also illuminate a number of obstacles that must be overcome to make private or public/private ventures successful.

Attracting private investment requires the prospect of profit. A key question in highway projects is whether revenues from tolls or other user fees will be sufficient to repay debt to bondholders and provide an attractive return on investors' equity. The most promising candidates for tolls in the near term appear to be new roads or additional lanes on existing roads in congested corridors, as in the case of California's 91 Express Lanes. (Motorists are more willing to pay for tolls when the new capacity is readily identifiable. Otherwise, they may complain about having to pay for something that previously was "free.")

A study by J. P. Morgan Securities of 14 urban toll roads financed over the past 12 years offers some insight into the types of projects that are most promising and what sponsors look for in deciding whether to undertake such an effort.[56] The projections of revenue and traffic for most of the projects were overly optimistic. That finding may prompt potential lenders and equity investors to scrutinize such projections with more care and to require government funding or financial guarantees to reduce the risk of investing, especially at the earliest (and riskiest) stages of the project. In general, the projections that proved most accurate were based on conservative assumptions about economic activity in the traffic corridor served by the toll road. Toll revenues were most likely to meet projections in corridors that were already congested—that is, where substantial potential demand already existed.

56. Robert H. Muller, "Examining Tollroad Feasibility Studies," *Municipal Market Monitor*, J.P. Morgan Securities, Inc. (March 22, 1996).

Finding new toll projects to interest private investors may prove difficult. If state and local governments have chosen highway projects according to their rates of return on investment, it means they have already undertaken the projects with the highest net benefits, which would leave only lower-priority projects that would be less able to recoup costs through tolls. But factors other than net benefits—such as the geographic distribution of highways across a state—also enter into states' priorities. Thus, some good candidate projects may remain.

Highway funds in the near future may well remain tight at the federal and state levels, reflecting higher priorities for projects other than highways and a reluctance to raise taxes on motor fuels. If funding continues to be constrained, governments may look increasingly to ways of raising money voluntarily from the private sector (that is, not through taxes). From the taxpayer's standpoint, letting private investors bear the risk and financial burden of building new roads is attractive. Private investors can take advantage of a variety of institutional arrangements for obtaining funds, usually involving equity or debt that is repaid through toll or tax revenues in the future. Of course, to induce private investors to invest in roads, the anticipated returns must exceed those of alternative investments.

The projects described in this chapter illustrate the gradations in balancing the public and private sectors. For example, the Dulles Greenway used only private sources of funding (although it required state approvals of environmental permits, toll levels, and other matters). As noted earlier, the Greenway is a build/operate/transfer facility; it will be operated and maintained privately for 42.5 years and then turned over to the state. In comparison, the 91 Express Lanes project is also privately financed, but it follows a build/transfer/operate model. (The private firm will operate the express lanes for 35 years—and collect tolls to pay for maintenance, law enforcement, and other operating costs—after which all interest in the roadway will revert to the state.)

The public/private ventures in Arizona, Minnesota, Virginia, and South Carolina make use of nonprofit entities set up by private developers and the government to serve as sponsors of the projects. The entities can issue debt that is exempt from federal income taxes; hence, they can borrow at interest rates that are lower than the rates private firms can generally obtain. Federal taxpayers help to subsidize those projects as a result of the tax exemptions. The tax effect is the same for the public/private ventures operated by public agencies (for example, the E-470 authority in Colorado and the Orange County, California, transportation corridor agencies).

Even the toll roads with the least amount of government participation entail some involvement by government. Acquiring land for rights-of-way is virtually impossible without the right of eminent domain. And the strong opposition to new highways that frequently results from environmental concerns may also encourage investors to seek a partnership with government. From the standpoint of private developers, the difficulties and risk involved in obtaining environmental permits may lead many participants in road projects to require some kind of governmental backing in the early stages of a venture. Backing could be in the form of financing or loan guarantees for the planning and initial engineering phases. Once a project receives the needed permits and the financial risk drops substantially, private investment (either equity or debt) will then be more attractive.

Another large risk for investors is tort liability. Accidents involving deaths, injuries, and damage to the environment (as might happen in multivehicle collisions or accidents with trucks that are carrying hazardous materials) may result in sizable financial losses. Private investors may also face financial risks when the state regulates the level of tolls or the rate of return on investment.

Under the right circumstances, private investment can augment public investment in transportation. The challenge for policymakers is to prevent public/private partnerships from becoming a proposition in which the public sector pays while the private sector profits.

Appendixes

Appendix A

Highway Financing: Sources and Trends

Traditionally, highways have been financed by user taxes and fees at the federal and state levels. Although states have made some use of debt financing, the bulk of highway spending has been funded on a pay-as-you-go basis in which annual spending roughly equals annual revenues. In 1994, federal, state, and local governments together raised nearly $91 billion in revenues that were used for highway purposes.[1] Of that total, 56.5 percent came from user tax revenues (primarily from fuel taxes), and 4.2 percent came from road and crossing tolls (see Table A-1). The remainder was derived from general sources.

Highway Financing at the Federal Level

Funding provided by the federal government for highways comes from taxes imposed on highway users. Those taxes flow into the federal Highway Trust Fund. From there, the government apportions funds to states according to complicated formulas and subject to annual limits imposed in the Congressional appropriation process.

The primary source of federal revenues for highways is taxes on motor fuels (see Table A-2). In 1995, federal motor fuel taxes provided $15.7 billion for highways.[2] Those taxes also brought in $2.2 billion for mass transit and $7.7 billion for the general fund of the U.S. Treasury. Excise taxes on tires, trucks, buses, and trailers provided $2.4 billion. The heavy-vehicle use tax, which is imposed annually on vehicles whose gross weights exceed 55,000 pounds, raised $682 million.

Highway Financing at the State Level

At the federal level, highway users are the source of all revenues that go to finance highways. Revenues from highway user taxes go primarily for highways but also for mass transit.[3] In contrast, state and local governments finance some of their highway needs with general funds, and many use debt financing in addition to current taxes, tolls, and fees. Some revenues from state highway user taxes finance mass transit projects, and some are used for general purposes.

Motor Fuel Taxes

All states and the District of Columbia impose taxes on motor fuels. In 1995, tax rates on gasoline ranged from 7.5 cents a gallon (in Georgia) to 34 cents a gallon (in Connecticut), with a weighted average of 18.5 cents a gallon. (The average is very close to the federal rate.) The tax rates on diesel fuel ranged from 7.5 cents a gal-

1. Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table HF-1, p. IV-13.

2. Federal Highway Administration, *Highway Statistics 1995*, Table FE-210, p. IV-20.

3. From December 1, 1990, to September 30, 1995, 2.5 cents per gallon of federal taxes on motor fuels went to the general fund to reduce the deficit. From October 1, 1993, to September 30, 1997, an additional 4.3 cents per gallon went to the general fund.

lon (in Georgia) to 29 cents a gallon (in Rhode Island), with a weighted average of 19.8 cents a gallon. Most states also taxed gasohol and other motor fuels.

In 1995, the states grossed $26.8 billion from motor fuel taxes. Not all of those receipts went for highway purposes, however. Some went for collection expenses, some for mass transit, and some for general purposes, leaving $24.1 billion for highways (see Table A-3).

Registration, Titling, and Other Fees and Taxes on Highway Users

In addition to taxing fuel, states impose fees for titling and registering vehicles and for operator's licenses. Some states also impose taxes on motor carriers. Those fees and taxes provided $20.5 billion in receipts in 1995. Compared with receipts for fuel taxes, a much larger share of these receipts went for nonhighway purposes. About 25.0 percent went for general purposes, 13.4 percent for collection expenses, and 4.3 percent for mass transit, leaving 57.3 percent ($11.8 billion) for highways.

Tolls

In 1995, 29 states collected $3.8 billion in toll revenues. Most of the revenues ($3.5 billion, or 92.5 percent) were designated for highway purposes. About 5.1 percent went for mass transit, and 2.4 percent went for general purposes.

Bonds

Many states finance some of their highways or bridges through bonds. At the end of 1995, all but 11 states had debt outstanding for highways and bridges. Their combined indebtedness (including that of the District of Columbia) totaled $37.4 billion.

In 1995, states issued bonds with a total of $4.3 billion in par value to finance highways and bridges.[4] The bonds are to be repaid from a variety of sources. About 13.1 percent of the debt is to be repaid through motor fuel taxes; of that amount, about two-thirds is backed by the full faith and credit of the state (see Table A-4). States plan to cover 23.4 percent of the debt by using tolls. Another 45.8 percent is to be covered by highway user revenues, including fuel taxes, tolls, motor vehicle titling and registration fees, and other taxes and fees paid by highway users. Of that amount, about two-thirds is further backed by the full faith and credit of the state. Those sources of repayment together amount to 82.4 percent, indicating that future users of highways and bridges will pay for them —that is, unless the taxes and fees are insufficient. In that case, general revenues will cover bond issues that are backed by the full faith and credit of the state, and bondholders will bear the burden of the rest of the nonpayment. The remainder of the debt, 17.6 percent of the total, is to be repaid from general revenues and is backed by the full faith and credit of the state.

Aid from Other Levels of Government

States receive intergovernmental transfers from both the federal and local levels of government. In 1995, the federal government provided about $18.0 billion in aid to the states for highways. Local governments paid $1.2 billion to state governments for highways (see Table A-5).

Trends in State Financing of Highways

In the decade from 1973 to 1983, state revenues for highways nearly doubled (in nominal terms). From 1983 to 1993, they nearly doubled again. The sources of funding remained much the same, although revenues from motor fuel taxes dropped from 41.5 percent of the total in 1973 to 32.2 percent in 1983, and then edged up to 35.0 percent in 1993. Much of that difference was made up by a variety of general fund sources.

4. The $4.3-billion figure excludes debt issued by toll authorities and other transportation agencies as well as that issued by municipalities.

Highway Financing at the Local Level

In 1994, local governments received $35.4 billion in revenue that was used for highways (see Table A-6).[5] Nearly 60 percent of the money came from general sources, including property taxes, special assessments, and other general fund revenues. Twenty-five percent came in the form of aid from state governments; most of those funds were from taxes and fees imposed on users of highways. About 5 percent was from user revenues, including motor fuel taxes, motor vehicle fees, and tolls. Just under 10 percent of the money came from bond proceeds.

Local governments had $23.7 billion in outstanding obligations for highways at the end of 1994. Original issues of bonds for that year totaled nearly $5 billion.

Compared with 20 years ago, local governments today receive far less assistance (on a percentage basis) from the federal and state governments. Although state aid for highways increased in nominal terms from $1.8 billion in 1973 to $10.4 billion in 1993, its share of the total fell from 43.5 percent to 26.6 percent. Aid from the federal government rose from $295 million to $815 million over that period, but its share dropped from 7.5 percent to 2.3 percent. Local governments made up the difference, primarily through general fund sources. They also increased revenues from users and from bonds.

In summary, local highways receive much more support from general sources than from taxes and fees on highway users. That trend contrasts sharply with the federal and state governments. At those levels, all or most of the funding for highways is from users.

5. Federal Highway Administration, *Highway Statistics 1995*, Table LGF-1, p. IV-99. Statistics for local governments lag behind those of the federal and state governments by one year.

Table A-1.
Types of Revenue Used for Highway Financing, 1994

Category	In Billions of Dollars	As a Percentage of Total
Highway User Taxes		
Federal	15.83	17.3
State	34.39	37.7
Local	1.33	1.5
Subtotal	51.55	56.5
Road and Crossing Tolls	3.84	4.2
Appropriations from General Funds	12.43	13.6
Property Taxes	4.83	5.3
Other Imposts	4.33	4.7
Miscellaneous Receipts[a]	7.03	7.7
Bond Receipts[b]	7.30	8.0
Total	91.31	100.0

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table HF-1, p. IV-13, as updated on January 10, 1997.

a. Includes interest earned on Highway Trust Fund reserves.

b. Excludes short-term notes and refunding bond issues.

Table A-2.
Revenues Flowing to the Highway Trust Fund, 1995

Category	In Billions of Dollars	As a Percentage of Total, Excluding Interest	As a Percentage of Total, Including Interest
Motor Fuel Taxes			
To highway account	15.74	74.9	70.9
To transit account	2.19	10.4	9.9
Excise Taxes on Tires[a]	0.40	1.9	1.8
Excise Taxes on Trucks, Trailers, and Buses[a]	2.01	9.6	9.1
Heavy-Vehicle Use Tax[a]	0.68	3.2	3.1
Subtotal	21.02	100.0	94.7
Interest			
To highway account	0.55	n.a.	2.5
To transit account	0.62	n.a.	2.8
Subtotal	1.17	n.a.	5.3
Total	22.19	n.a.	100.0

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table FE-210, p. IV-20.

NOTE: n.a. = not applicable.

a. Revenues from these taxes go to the highway account only.

Table A-3.
Disposition of Revenues from State Highway Users, 1995

Category	In Billions of Dollars	As a Percentage of Total
Motor Fuel Revenues Used for:		
Highways	24.08	90.0
Mass transit	1.40	5.2
General purposes	1.07	4.0
Collection expenses	0.21	0.8
Total	26.76	100.0
Motor Vehicle Revenues Used for:		
Highways	11.75	57.3
Mass transit	0.88	4.3
General purposes	5.13	25.0
Collection expenses	2.76	13.4
Total	20.52	100.0
Toll Revenues Used for:		
Highways	3.49	92.5
Mass transit	0.19	5.1
General purposes	0.09	2.4
Total	3.77	100.0
All Revenues	51.04	n.a.

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table SDF, p. IV-63.

NOTE: n.a. = not applicable.

Table A-4.
Revenues Available for Repaying State Highway Bonds

Source	In Millions of Dollars	As a Percentage of Total
Tolls	1,006.2	23.4
Motor Fuel Taxes		
Backed by the state's full faith and credit	381.0	8.9
Not backed by the state's full faith and credit	183.2	4.3
Subtotal	564.2	13.1
Highway User Revenues[a]		
Backed by the state's full faith and credit	1,363.0	31.7
Not backed by the state's full faith and credit	605.0	14.1
Subtotal	1,968.0	45.8
General Revenues	756.7	17.6
Total	4,295.1	100.0

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table SB-1, pp. IV-82 to IV-83.

NOTE: The numbers in the table represent obligations issued or assumed during 1995.

a. Some states combined all highway user revenues and did not report fuel taxes and tolls separately.

Table A-5.
Sources of State Financing for Highways, 1995

Source	In Billions of Dollars	As a Percentage of Total
Revenues from Highway Users		
Motor fuel taxes	24.08	35.1
Motor vehicle and motor carrier taxes	11.75	17.1
Road and crossing tolls	3.49	5.1
Subtotal	39.32	57.4
Revenues from General Sources		
Appropriations from general funds[a]	1.61	2.3
Other state imposts	1.82	2.7
Miscellaneous	1.91	2.8
Subtotal	5.33	7.8
Bond Proceeds		
Original issues	4.32	6.3
Refunding issues	0.35	0.5
Subtotal	4.67	6.8
Payments from Other Governments		
Federal Highway Administration	17.59	25.7
Other federal agencies	0.46	0.7
Local government payments	1.16	1.7
Subtotal	19.21	28.1
Total	68.53	100.0

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table SF-1, p. IV-65.

a. This amount represents gross general fund appropriations for highways minus the amount of highway user revenues placed in state general funds.

Table A-6.
Sources of Local Financing for Highways, 1994

Source	In Billions of Dollars	As a Percentage of Total
Revenues from Highway Users		
Motor fuel and motor vehicle taxes	1.33	3.8
Road and crossing tolls	0.54	1.5
Subtotal	1.87	5.3
Revenues from General Sources		
Appropriations from general funds	9.64	27.2
Property taxes and special assessments	4.83	13.7
Other local imposts	2.03	5.7
Miscellaneous	4.28	12.1
Subtotal	20.78	58.7
Bond Proceeds		
Original issues	3.11	8.8
Refunding issues	0.12	0.3
Subtotal	3.22	9.1
Payments from Other Governments		
State highway user imposts	7.46	21.1
Other state payments	1.38	3.9
Federal Highway Administration	0.28	0.8
Other federal payments	0.39	1.1
Subtotal	9.51	26.9
Total	35.38	100.0

SOURCE: Federal Highway Administration, *Highway Statistics 1995* (January 1997), Table LGF-1, p. IV-99.

Appendix B

The Matching-Share Requirement

Designing a program of federal aid to state or local governments is a complicated endeavor.[1] Even when federal policymakers are in complete agreement about the objectives of a program, structuring it so that it does not have unintended and undesired consequences can be a challenge. The debate leading to the recent overhaul of federal welfare policy is an example of the difficulty of fashioning a program that achieves certain goals without providing incentives for people to undercut the program's purpose.

A key feature of the federal-aid highway program is the matching-share requirement. In general, states must match with their own resources the federal aid they receive for highway projects. For most projects, the federal government pays 80 percent and the state 20 percent of the costs. Several innovative financing initiatives have been designed to make that requirement more flexible, which raises questions about the requirement's purpose and effects.

Rationale for the Requirement

Several federal grant programs—including the highway program—require state or local governments to match the federal funds provided.[2] The usual rationale for a match requirement is to ensure that states have an incentive to provide an economically efficient level of services in the area that the program covers. A state comparing the costs of a project with the benefits to its own citizens might underinvest, ignoring the benefits to people living in other states. To overcome that problem, the federal government may want to subsidize state spending on highways with tax dollars collected at the national level.[3] Theoretically, the federal share should reflect the extent to which benefits of the program spill over to citizens of other states. (That is, the relative shares paid by the federal and state governments should reflect the relative benefits to out-of-state and in-state users.) Another part of the argument for requiring that states put some of their own money at stake through a match is that it may give them incentives to pick their projects more carefully than they would if the money were completely "free."

Judging the relative benefits of a project to in-state and out-of-state motorists is not an easy task. One

1. A number of elements go into designing such a program. For comprehensive discussions of federal aid programs, see J. Richard Aronson and John L. Hilley, *Financing State and Local Governments*, 4th ed. (Washington, D.C.: Brookings Institution, 1986); George F. Break, *Financing Government in a Federal System* (Washington, D.C.: Brookings Institution, 1980); Edward M. Gramlich, "Intergovernmental Grants: A Review of the Empirical Literature," in Wallace E. Oates, ed., *The Political Economy of Fiscal Federalism* (Lexington, Mass.: D.C. Heath and Company, 1977), pp. 219-240; Richard A. Musgrave and Peggy B. Musgrave, *Public Finance in Theory and Practice*, 4th ed. (New York: McGraw-Hill, 1984), pp. 537-545; and Oates, *The Political Economy of Fiscal Federalism*.

2. According to the Council of Economic Advisers, most federal grant programs do not require a match. See Council of Economic Advisers, *Economic Report of the President* (February 1996), p. 114.

3. Federal spending on highways is financed by user taxes. Consequently, there is less of a distributional effect than if it were financed by general tax revenues.

study estimated that on an average interstate highway, only 30 percent of the traffic was from out of the state.[4] If that share held for all roads built with federal aid, theoretically, the federal share of highway funding should be 30 percent and the state share 70 percent.

The principal economic effect of a matching requirement is to change the price of the good or service being subsidized relative to the prices of other goods and services. Consider a program in which the federal government pays an 80 percent share, as is the case for much of the federal-aid highway program. The state spends one dollar, which is matched by four dollars from the federal government (as long as the spending cap that applies to federal-aid funds has not been reached), to buy five dollars' worth of highways. The federal contribution makes highways appear relatively cheaper than unsubsidized programs and is supposed to induce greater spending on highways by the states.

In theory, programs that require matches should be open-ended if they are to make the most use of the price effect (that is, the effect on the distribution of resources that results from changes in the relative prices of highways and other goods). If a state or local government reaches the amount needed to get the maximum federal aid available under the cap, any additional dollar spent by the state buys only that dollar's worth of goods or services. The federal highway program does not adhere to that design principle, however, because budgetary control requires a ceiling on spending. Therefore, the program combines a match and a cap.

In addition to a price effect, a matching-grant program has an income effect (that is, an effect on the distribution of resources that results from a change in purchasing power). The additional federal aid leaves the state with more money for other purchases—or for reducing taxes.

4. Edward M. Gramlich, "How Should Public Infrastructure be Financed?" in Alicia H. Munnell, ed., *Is There a Shortfall in Public Capital Investment? Proceedings of a Conference Held at Harwich Port, Massachusetts, June 1990*, Conference Series No. 34 (Boston: Federal Reserve Bank of Boston, 1990), p. 227.

Expected Effects of a Matching Grant

Since the late 1960s, when federal grant programs began to proliferate, economists have tried to determine the effects of federal grants on spending by state and local governments. They have questioned how the amount of aid affects state and local spending decisions and tried to assess what role the structure of that aid plays—that is, whether the aid is open-ended or capped; whether it requires state or local governments to match federal funds; and whether it comes in the form of a grant, loan, or credit. Does federal aid entice states to spend more money on a program, or does it substitute for the money that the states would otherwise have spent? Does aid cause states to reduce taxes or shift money to other programs? Economists have advanced various theories about the expected effects of federal grants.

Government as Economic Agent

One line of reasoning views state and local governments as rational economic entities that, like households, make spending decisions based on their preferences and income constraints. The median voter within the community determines the amount of taxes and government spending. The community would consider an unrestricted federal grant (net of taxes needed to finance the federal government) to be additional income and would allocate it according to the median voter's preferences. That hypothetical voter would probably want to devote some of the grant money to additional government spending and return some to taxpayers through tax reductions.[5]

Even if the grant was for a specific purpose, the recipient could use the money to replace its current spending for that purpose (that is, out of its own funds) and reallocate the money that was made available. If one assumed that a state or local government's budget was initially allocated so that at the margin, the benefits

5. For a discussion of the effect of accounting for federal taxes, see J. Richard Aronson and Vincent G. Munley, "(Non) equivalence in a Federalism: Dual Tax Shares, Flypaper Effects and a Leviathan," *Public Choice*, vol. 89 (1996), pp. 53-62.

from the last dollar spent on each program were equal to each other, spending all of the increase in income on one program would probably not yield the most additional benefits. Instead, a rational economic player would distribute the additional income among various goods and services and return some to citizens in the form of reduced taxes. The exact distributional effects would depend on the income elasticities associated with the various government programs.[6]

Additional intergovernmental aid increases the income to the community. If the community had a relatively small economic base, it might use the additional money to meet such basic needs as improving the safety of its drinking water or repairing schools to comply with fire codes. A wealthier community might already be meeting such needs. Therefore, it would be able to spend the additional resources on, for example, a sports stadium.

Bureaucratic Model

Another line of reasoning, the "bureaucratic model," begins with the premise that governments do not function like households. Rather, they are run by officials who have their own preferences, one of which is to expand the programs they administer, either because of a commitment to those programs or because running a larger program will give them more power, prestige, and pay.[7] Under this model, additional federal aid for a given program area would probably be spent on that area.

Fiscal Illusion

Still a third model theorizes that voters suffer from "fiscal illusion" in that they fail to perceive the true marginal price of public expenditures.[8] Money received from the federal government appears to be free. Therefore, such aid is easier to spend than money raised from local taxes (an example of the "easy come, easy go" philosophy).

Interactive Model

Yet another set of theoretical models attempts to characterize the interrelationships among the many entities involved in decisions about government spending. In such models, which economist George Break calls interactive, "no single group dominates, there are numerous goals and instruments to be considered, and decisions must be made in spite of a high degree of uncertainty about the effects of different policy actions."[9] Interactive models place greater weight than the other models on the specific institutional arrangements associated with a given federal grant program and the recipient community; as a result, interactive models offer fewer generalizable predictions. One conclusion, however, is that states might find budgeting on an incremental basis more feasible than using a grand zero-based allocation, as suggested by the government-as-economic-agent models.

Empirical Findings

To answer the question of how states respond to federal aid, researchers need to estimate how much states would spend on a program in the absence of federal aid and compare that with spending in the presence of federal aid. Although the task sounds easy in principle, it is more difficult in practice. In principle, one holds constant all other factors to isolate the effect of federal aid. But in the real world, other factors are continually changing. Researchers use multiple regression analysis to handle that problem. They set up models in which state spending on a program is a function of numerous variables, such as income, population, factors related to demand for the program (for example, miles of highway, number of registered motor vehicles, number of vehicle-miles traveled), and the amount of federal grants for the program in question and for other pro-

6. The income elasticity of a program is a measure of how much the demand for that program increases in response to an increase in income.

7. See, for example, William A. Niskanen Jr., "The Peculiar Economics of Bureaucracy," *American Economic Review*, vol. 58 (May 1968), pp. 293-305.

8. Paul N. Courant, Edward M. Gramlich, and Daniel L. Rubinfeld, "The Stimulative Effects of Intergovernmental Grants: Or Why Money Sticks Where it Hits," in Peter Mieszkowski and William H. Oakland, eds., *Fiscal Federalism and Grants-in-Aid* (Washington, D.C.: Urban Institute, 1979), p. 6.

9. Break, *Financing Government in a Federal System*, p. 93.

grams. They then use statistical tests to determine the size and significance of the variables.

Empirical results on the effect of federal grants in general are mixed, and results with respect to highways specifically are meager. Several econometric studies have found evidence that state and local governments treat federal grants differently from other additions to their resources. Economists would expect rational entities to allocate federal aid among their programs in the same way they would allocate an increase in general tax revenues. But both casual observation and empirical evidence suggest that states tend for the most part to spend federal aid on the intended program.[10] That is, grant money tends to "stick where it hits," giving rise to the term "flypaper effect."[11] Nevertheless, research findings are mixed: some find evidence of a flypaper effect, whereas others do not. In instances in which an effect is found, questions may arise about whether it is real or whether it results from incorrect specification of the econometric model or problems with the data.[12]

Very few studies have focused on the effects of the federal-aid highway program on decisions about state and local spending. The two most relevant studies are of limited use because they apply to earlier versions of the program before the Intermodal Surface Transportation Efficiency Act of 1991 was passed. Nevertheless, their findings are interesting, and they indicate how the program as it is currently structured may affect states.

In a 1987 study of the non-Interstate part of the highway program, Harry Meyers concluded that federal aid largely displaces state spending on highways.[13] He found that an additional dollar of federal aid would displace about 63 cents of state spending. That is, states would use 63 cents of the federal dollar to substitute for spending from their own resources, leaving a net increase in spending on highways of 37 cents associated with the additional dollar of federal aid. The study suggested, however, that states allocated some of the savings at the state level to local road projects.

In another study of the non-Interstate highway program published in 1974, Edward Miller compared the amounts states spent on federal-aid highways with the amount they would have had to spend to obtain the maximum amount of federal aid.[14] Miller found that only eight states and the District of Columbia were within the limits of the caps. The rest of the states were spending more than the amount needed to maximize federal aid. For them, the marginal dollar spent on highways was entirely from their own sources; it was not matched by federal aid. Hence, no price effect occurred at the margin. Those findings indicate that federal funds were being used for what states would have spent money on anyway, even in the absence of federal aid. During the study period, 1959 to 1969, the federal match was 50 percent for most of the program components that were the subject of the research. Whether state spending decisions changed as the federal match rose is a matter for future inquiry.

10. States, of course, must comply with the rules imposed by the federal government on the use of federal aid. Education grants must be spent on education, highway grants on highways, and so on. But over the long run, states may come to expect to receive federal grants for specific purposes. As a result, they may reallocate their general funds under the assumption that federal aid will provide resources for some activities and they can then devote a larger share of their general funds to unaided programs.

11. The term is attributed to Arthur Okun. See Gramlich, "Intergovernmental Grants: A Review of the Empirical Literature," p. 226.

12. For a recent review of econometric studies of the effects of federal grants, see James R. Hines Jr. and Richard H. Thaler, "Anomalies: The Flypaper Effect," *Journal of Economic Perspectives*, vol. 9, no. 4 (Fall 1995), p. 219.

13. Harry G. Meyers, "Displacement Effects of Federal Highway Grants," *National Tax Journal*, vol. 40, no. 2 (June 1987), pp. 221-235.

14. Edward Miller, "The Economics of Matching Grants: The ABC Highway Program," *National Tax Journal*, vol. 27, no. 2 (June 1974), pp. 221-229.