

June 2006

# HIGHWAY FINANCE

## States' Expanding Use of Tolling Illustrates Diverse Challenges and Strategies



G A O

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Highlights of [GAO-06-554](#), a report to congressional requesters

## Why GAO Did This Study

Congestion is increasing rapidly across the nation and freight traffic is expected to almost double in 20 years. In many places, decision makers cannot simply build their way out of congestion, and traditional revenue sources may not be sustainable. As the baby boom generation retires and the costs of federal entitlement programs rise, sustained, large-scale increases in federal highway grants seem unlikely. To provide the robust growth that many transportation advocates believe is required to meet the nation's mobility needs, state and local decision makers in virtually all states are seeking alternative funding approaches. Tolling (charging a fee for the use of a highway facility) provides a set of approaches that are increasingly receiving closer attention and consideration. This report examines tolling from a number of perspectives, namely: (1) the promise of tolling to enhance mobility and finance highway transportation, (2) the extent to which tolling is being used and the reasons states are using or not using this approach, (3) the challenges states face in implementing tolling, and (4) strategies that can be used to help states address tolling challenges.

GAO is not making any recommendations. GAO provided a draft of this report to U.S. Department of Transportation (DOT) officials for comment. DOT officials generally agreed with the information provided.

[www.gao.gov/cgi-bin/getrpt?GAO-06-554](http://www.gao.gov/cgi-bin/getrpt?GAO-06-554).

To view the full product, including the scope and methodology, click on the link above. For more information, contact JayEtta Z. Hecker at (202)512-2834 or [heckerj@gao.gov](mailto:heckerj@gao.gov).

## HIGHWAY FINANCE

# States' Expanding Use of Tolling Illustrates Diverse Challenges and Strategies

## What GAO Found

Tolling has promise as an approach to enhance mobility and finance transportation. Tolling can potentially enhance mobility by reducing congestion and the demand for roads when tolls vary according to congestion to maintain a predetermined level of service. Such tolls can create incentives for drivers to avoid driving alone in congested conditions when making driving decisions. In response, drivers may choose to share rides, use public transportation, travel at less congested times, or travel on less congested routes, if available. Tolling also has the potential to provide new revenues, promote more effective investment strategies, and better target spending for new and expanded capacity. Tolling can also potentially leverage existing revenue sources by increasing private-sector participation and investment.

Over half of the states in the nation have or are planning toll roads to respond to what officials describe as shortfalls in transportation funding, to finance new highway capacity, and to manage road congestion. While the number of states that are tolling or plan to toll has grown since the completion of the Interstate Highway System, and many states currently have major new capacity projects under way, many states report no current plans to introduce tolling because the need for new capacity does not exist, the approach would not generate sufficient revenues, or they have made other choices.

According to state transportation officials who were interviewed as part of GAO's nationwide review, substantive challenges exist to implementing tolling. For example, securing public and political support can prove difficult when the public and political leaders argue that tolling is a form of double taxation, is unreasonable because tolls do not usually cover the full costs of projects, and is unfair to certain groups. Other challenges include obtaining sufficient statutory authority to toll, adequately addressing the traffic diversion that might result when motorists seek to avoid toll facilities, and coordinating with other states or jurisdictions on tolling projects.

GAO's review of how states implement tolling suggests three strategies that can help facilitate tolling. First, some states have developed policies and laws that facilitate tolling. For example, Texas enacted legislation that enables transportation officials to expand tolling in the state and leverage tax dollars by allowing state highway funds to be combined with other funds. Second, states that have successfully advanced tolling projects have provided strong leadership to advocate and build support for specific projects. In Minnesota, a task force was convened to explore tolling and ultimately supported and recommended a tolling project. Finally, tolling approaches that provided tangible benefits appear to be more likely to be accepted than projects that offer no new tangible benefits or choice to users. For example, in California, toll prices on the Interstate 15 toll facility are set to keep traffic flowing freely in the toll lanes.

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**Abbreviations**

BEA	Bureau of Economic Analysis
EIS	environmental impact statement
FHWA	Federal Highway Administration
GDP	gross domestic product
HOT	high occupancy toll
HOV	high occupancy vehicle
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
MPO	metropolitan planning organization
PPP	public-private partnership
PPTA	Public-Private Transportation Act of 1995
ROD	Record of Decision
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SEP-15	Special Experimental Projects 15
State DOT	State Department of Transportation
TEA-21	1998 Transportation Equity Act for the 21 <sup>st</sup> Century
TIFIA	Transportation Infrastructure Finance and Innovation Act of 1998
TOT	truck-only toll
TTC	Trans Texas Corridor
U.S. DOT	U.S. Department of Transportation
VMT	vehicle miles traveled

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United States Government Accountability Office  
Washington, D.C. 20548

June 28, 2006

The Honorable James M. Inhofe  
Chairman  
Committee on Environment and Public Works  
United States Senate

The Honorable Christopher S. "Kit" Bond  
Chairman  
Subcommittee on Transportation and Infrastructure  
Committee on Environment and Public Works  
United States Senate

The nation's highways are critical to providing for and enhancing mobility—the free flow of passengers and goods—and to sustaining America's economic growth. Mobility gives people access to goods, services, recreation, and jobs; gives businesses access to materials, markets, and people; and promotes the movement of personnel and materiel to meet national defense needs. During the twentieth century, motor fuel taxes were the mainstay of highway financing, and during the latter part of that century the construction of the 47,000 mile Interstate Highway System dominated the agendas and activities of state and federal highway decision makers. In the twenty-first century, state and local transportation officials are on the front lines of transportation decision making and face a new and daunting set of challenges. Congestion is increasing rapidly across the nation, particularly in urban areas, and freight traffic is expected to almost double in 20 years. In many places, decision makers cannot simply build their way out of congestion, and traditional revenue sources may not be sustainable. As the baby boom generation retires and the costs of federal entitlement programs rise, sustained, large-scale increases in federal highway grants seem unlikely. To provide the robust growth that many transportation advocates believe is required to meet the nation's mobility needs, state and local decision makers in virtually all states are seeking alternative funding approaches. Tolling (i.e., charging a fee for the use of a highway) provides a set of approaches that are increasingly receiving closer attention and consideration.

As requested, this report provides information on states' experiences with tolling and provides some insights on issues that state transportation officials have encountered when considering or implementing a tolling approach. Specifically, this report examines (1) the promise of tolling to enhance mobility and finance highway transportation, (2) the extent to

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which tolling is being used in the United States and the reasons states are using or not using this approach, (3) the challenges states face in implementing tolling, and (4) strategies that can be used to help states address the challenges to tolling.

To fulfill our objectives, we reviewed and analyzed research reports and analytical studies; interviewed a wide range of stakeholders, including state and local transportation officials, project sponsors, and private-sector representatives; conducted a nationwide survey of state departments of transportation; and conducted semistructured interviews with state department of transportation officials. We also performed a correlation analysis to identify the extent to which state financial and demographic characteristics are associated with states' use of tolling. In addition, we interviewed transportation stakeholders in six states that were either planning toll projects or constructing toll projects. In addition to our survey and semistructured interviews, states planning toll roads were identified through an analysis of states' participation in Federal Highway Administration (FHWA) tolling programs, including the Interstate System Reconstruction and Rehabilitation Pilot Program and the Value Pricing Pilot, and states constructing toll roads were identified through an analysis of relevant reports and studies. During our review, we determined that a number of states with toll bridges or tunnels do not have or are not considering the tolling of roads. We, therefore, decided to exclude toll bridges and tunnels from our definition of states tolling or planning to toll to more accurately report on the challenges to tolling. Although we discuss the federal role with regard to states' experience with tolling, we did not assess the effectiveness of federal toll programs or the potential effects of federal grant programs on states' experience with the approach. (See app. I for our objectives, scope, and methodology.) We performed our work from June 2005 through June 2006 in accordance with generally accepted government auditing standards.

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## Results in Brief

Tolling has promise as an approach to enhance mobility and finance transportation. A tolling approach can potentially help enhance mobility by managing congestion. Congestion impedes both passenger and freight mobility and is increasing as a result of rapid population growth and more vehicles traveling farther on our roads. Applying tolls that vary with the level of congestion—congestion pricing—can potentially reduce congestion and the demand for roads because tolls that vary according to the level of congestion can be used to maintain a predetermined level of service. Such tolls create additional incentives for drivers to avoid driving

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alone in congested conditions when making driving decisions. In response, drivers may choose to share rides, use public transportation, travel at less congested (generally off-peak) times, or travel on less congested routes, if available, to reduce their toll payments. For example, a study of the State Route 91 Express Lanes in California found that when tolls increased 50 percent during peak hours, traffic during those hours dropped by about one-third. As concerns about the sustainability of traditional financing sources continue to grow, tolling also has promise to improve investments and raise revenue. The per-gallon fuel tax, the mainstay of transportation finance for 80 years, is declining in purchasing power because fuel tax rates are not increasing, and more fuel-efficient vehicles and alternative-fueled vehicles undermine the long-term viability of fuel taxes as the basis for financing transportation. In this environment, tolling potentially has promise to promote more effective infrastructure investment strategies by better targeting spending for new and expanded capacity. For example, among other factors, toll project construction is typically financed by bonds, and projects must pass the test of market viability and meet goals demanded by investors, although even with this test, there is no guarantee that projects will always be viable. Tolling can also potentially enhance private-sector participation and investment in major highway projects. Tolling's promise is particularly important in light of long-term pressures on the federal budget.

According to our survey of state transportation officials, 31 of the 50 states and the District of Columbia have or are planning toll roads, including 24 states that are operating toll roads and 7 states that are planning to toll. Tolling grew in the 1940s and 1950s and, after a period of slower growth, states' tolling again began to expand in the 1990s. In total, 23 states are in some phase of planning new toll roads. Officials in the 31 states that have toll roads or are planning toll roads indicated that their primary reasons for using or considering the use of a tolling approach was to address transportation funding shortfalls, finance new capacity, and manage congestion. For example, in Texas, tolling is being used to finance major new capacity projects, such as the Trans Texas Corridor (TTC)—a proposed multiuse, statewide network of transportation routes that will incorporate existing and new highways—and to manage congestion in Houston and other metropolitan areas. Transportation officials in some states, however, have told us that tolling is not feasible because of limited need for new capacity, insufficient tolling revenues, and public and political opposition to tolling. For example, officials from nearly every state that is not pursuing tolling mentioned some form of public or political opposition to toll roads. In New Jersey, officials told us that opposition to new toll

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roads is strong because many state border crossings and major highways are already tolled.

State transportation officials face two types of challenges that are broadly related to securing support for and implementing a tolling approach to finance transportation. The first type of challenge, according to transportation officials, is the difficulty of obtaining public and political support in the face of opposition from the public and political leaders in states where tolling is being considered and applied. According to transportation officials with whom we spoke, opposition is largely based on arguments that (1) fuel taxes and other dedicated funding sources are used to pay for roads and tolling is, therefore, a form of double taxation; (2) a tolling approach is unreasonable because tolls often do not cover the costs of a project; and (3) applying tolls can produce regional, income, and other inequities. For example, a Wisconsin transportation official told us that Wisconsin is not implementing a tolling approach because the public generally believes that fuel taxes already pay for roads and tolls would adversely affect the state's tourist economy, while Kentucky and Arkansas officials said that it would be difficult to undertake tolling unless toll roads could be largely financially self-sufficient. In Florida, concerns about regional inequity led local governments to pass a law that led to the state's taking action to ensure that spending on facilities in three counties was commensurate with toll collections in those three counties. The second type of challenge is the practical difficulty of implementing tolling, including obtaining the statutory authority to toll, addressing the traffic diversion that might result when motorists seek to avoid toll facilities, and coordinating with other states or jurisdictions. For example, Minnesota had legislation authorizing tolling, but conditions built into the legislation, most importantly, local government veto authority that could be exercised without recourse, prevented transportation officials from implementing a specific project. As a result, when state decision makers identified a toll project that would convert underused high occupancy vehicle (HOV) lanes to high occupancy toll (HOT) lanes that would allow non-HOV's to use the lanes for a fee—the Interstate 394 optional toll lane project—state decision makers pursued specific legislation that exempted HOV to HOT lane conversions from local veto, thus providing an opportunity to advance the Interstate 394 optional toll lane project several years later.

Through our review of the ways states use tolling, we have identified three broad strategies that have both short-term and long-term relevance for state transportation officials who are considering tolling. The first strategy that transportation officials can consider involves developing policies and



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laws that facilitate the use of tolling to finance transportation. In developing such a framework, transportation officials can, first, build support for the approach by establishing a rationale for its use and then secure the legislative authority to use the approach. For example, to expand the use of tolling and to leverage tax dollars by allowing state highway funds to be combined with other funds, Texas enacted legislation that enabled transportation officials to realize these goals. The second strategy that transportation officials can consider involves providing leadership to build support for individual projects and addressing the challenges to tolling in project design. For example, in Minnesota, a task force of state and local officials, citizens, and business leaders was convened in 2001 to explore a range of road pricing options, including the conversion of HOV lanes to HOT lanes, and make recommendations to elected officials. Since tolling had been fairly controversial in the past, decision makers believed that a task force would provide a more credible and independent voice to the general public. Ultimately, the task force supported the HOV to HOT conversions and, with the governor's support and the passage of legislation authorizing the conversion, the project was implemented. The last strategy that transportation officials can consider involves selecting a tolling approach and a project that provides tangible benefits. Promoting a project that provides tangible benefits can potentially help transportation officials justify both the costs of the project and the fees that users will be required to pay for the service. Although tolling can take different forms and decisions about its use are state specific, in concept, a tolling structure that varies with the level of congestion—congestion pricing—offers increased predictability and, as a result, provides tangible benefits to users. While actual experience with congestion pricing is still fairly limited in the United States, projects in operation illustrate how transportation officials have advanced projects seeking to achieve the potential benefits that may result from congestion pricing. For example, toll prices on Interstate 15 in San Diego are set dynamically, changing every 6 minutes, which has succeeded in keeping traffic flowing freely.

The U.S. Department of Transportation reviewed a draft of this report. Officials from the Department indicated that they generally agreed with the information provided and provided technical clarifications, which we incorporated as appropriate.

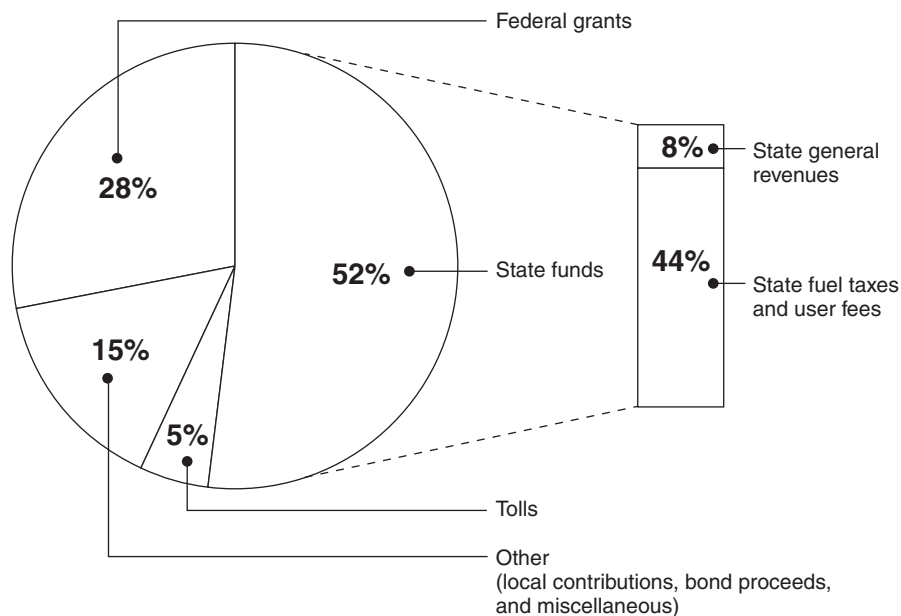
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## Background

The responsibility for building and maintaining highways in the United States rests with state departments of transportation in each of the 50

states, the District of Columbia, and Puerto Rico. In addition, local governments finance road construction through sources such as property and sales taxes. In 2004, state governments took in about \$104 billion from various sources to finance their highway capital and maintenance programs—44 percent of these revenues came from state fuel taxes and other state user fees, and 28 percent came from federal grants. Sources of state highway revenues in 2004 are shown in figure 1.

**Figure 1: State Highway Revenue Sources, Fiscal Year 2004**



Source: FHWA.

FHWA administers federal grant funds through the federal-aid highway program and distributes highway funds to the states through annual apportionments established by statutory formulas. Once FHWA apportions these funds, they are available to be obligated for the construction, reconstruction, and improvement of highways and bridges on eligible federal-aid highway routes and for other purposes authorized in law. Within these parameters, responsibility for planning and selecting projects generally rests with state departments of transportation (DOT) and with metropolitan planning organizations, and these states and planning organizations have considerable discretion in selecting specific highway projects that will receive federal funds. For example, section 145 of title 23

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of the United States Code describes the federal-aid highway program as a federally assisted state program and provides that the federal authorization of funds, as well as the availability of federal funds for expenditure, shall not infringe on the states' sovereign right to determine the projects to be federally financed.

About 5 percent of the highway revenues to the states in 2004 came from tolls. In 2005, the United States had about 5,000 miles of toll facilities in operation or under construction, including about 2,800 miles, or 6 percent, of the Interstate Highway System, according to FHWA.<sup>1</sup> Tolling of roads began in the late 1700s. From 1792 through 1845, an estimated 1,562 privately owned turnpike companies managed and charged tolls on about 15,000 miles of turnpikes throughout the country.<sup>2</sup> Between 1916 and 1921, the number of automobiles in the United States almost tripled, from 3.5 million to 9 million, and as automobile use increased, pressure grew for more government involvement in financing the construction and maintenance of public roads.<sup>3</sup> In 1919, Oregon became the first state to impose a motor fuel tax to finance roadway construction.<sup>4</sup> In 1916, the Federal Aid Road Act provided states with federal funds to finance up to 50 percent of the cost of roads and bridges constructed to provide mail service. This act and its successor, the 1922 Federal Highway Act, prohibited tolling on roads financed with federal funds.

In the 1930s and 1940s, President Roosevelt led the thinking for developing a series of interconnected systems of toll roads that crossed the United States, which was the beginning of the idea of an interstate highway system. Then, between 1940 and 1952, 5 states opened such highways,

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<sup>1</sup>Federal Highway Administration, *Toll Facilities in the United States Interstate System Toll Roads in the United States, Table T-1, Part 3* (Washington, D.C.: Jan. 1, 2005) and Federal Highway Administration, *Toll Facilities in the United States Facts* (Washington, D.C.: Jan. 1, 2005).

<sup>2</sup>Turnpike is a term used interchangeably with toll road, which is a highway that requires toll collections from all drivers (usually with the exception of emergency vehicles). Typically, the tolls are used to support operations and maintenance, as well as to pay debt service on the bonds issued to finance the toll facility.

<sup>3</sup>Tom Lewis, *Divided Highways: Building the Interstate Highways, Transforming American Life* (New York: Penguin, 1997).

<sup>4</sup>National Bureau of Economic Research, *Political Processes and the Common Pool Problem: The Federal Highway Trust Fund* (Cambridge, MA.: June 2000).

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which they financed through tolls.<sup>5</sup> The first of these highways, the Pennsylvania Turnpike, was completed in 1940. During this time, about 30 states considered building toll roads, given the success of Pennsylvania. In 1943, Congress passed an amendment to the Federal Highway Act, directing the Commissioner of Public Roads to conduct a survey for an express highway system and report the results to the President and Congress. However, there was no determination as to how such a system would be funded. President Eisenhower supported a toll system financed with bonds to be paid back with toll revenues until the bonds were paid off, at which time the tolls would be removed. A committee appointed by President Eisenhower also recommended a highway program financed with bonds, but proposed that federal fuel tax revenues, instead of tolls, be used to pay back the bonds. Ultimately, the Federal-Aid Highway Act of 1956 authorized the creation of a Highway Trust Fund to collect federal fuel tax revenues and finance the construction of the Interstate Highway System on a pay-as-you-go basis. The act prohibited tolling on interstate highways and all federally assisted highways; as a consequence, states built few new toll roads while the Interstate Highway System was under construction. However, many of the toll roads built before 1956 were eventually incorporated into the Interstate Highway System, and tolling on these roads was allowed to continue. Tolling was also allowed, on a case-by-case basis under very specific conditions and with a limited federal funding share, for interstate bridges and tunnels.

During the 1990s, as interstate construction wound down, states again began considering and implementing tolling. At the same time, some of the federal restrictions on the use of federal funds for tolling began to ease. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) liberalized some of the long-standing federal restrictions on tolling by permitting tolling for the construction, reconstruction, or rehabilitation of federally assisted non-Interstate roadways and by raising the federal share on interstate bridges and tunnels to equal the share provided for other federal-aid highway projects. The 1998 Transportation Equity Act for the 21st Century (TEA-21) established a new pilot program to allow the conversion of a free interstate highway, bridge, or tunnel to a toll facility if needed reconstruction or rehabilitation was possible only with the

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<sup>5</sup>Lewis, *Divided Highways*.

collection of tolls.<sup>6</sup> The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005, continued all of the previously established toll programs and added new programs. The federal tolling-related programs that have been authorized in surface transportation legislation are shown in table 1.

**Table 1: Tolling-Related Programs Authorized in Surface Transportation Legislation**

<b>Program</b>	<b>Purpose</b>
Value Pricing Pilot Program	Authorized in ISTEA in 1991, this program is a pilot program for local transportation programs to determine the potential of different value pricing approaches to manage congestion, including projects that would use tolls on highway facilities.
Interstate System Reconstruction and Rehabilitation Toll Pilot Program	Authorized in TEA-21 in 1998, this program allows tolls on three pilot projects in different states to reconstruct an existing interstate facility.
Express Lanes Demonstration Program	Authorized in SAFETEA-LU in 2005, this program allows 15 demonstration projects to use tolling on interstate highways to manage high congestion levels, reduce emissions to meet specific Clean Air Act requirements, or finance additional Interstate lanes to reduce congestion.
High Occupancy Vehicle (HOV) Facilities	Authorized in SAFETEA-LU in 2005, this program permits states to charge tolls to vehicles that do not meet occupancy requirements to use an HOV lane even if the lane is on an interstate facility.
Interstate System Construction Toll Pilot Program	Authorized in SAFETEA-LU in 2005, this program permits tolls on three pilot projects by a state or compact of states to construct new interstate system highways.
Section 129 of title 23, United States Code	Section 129 authorizes federal participation in specific toll activities that are otherwise generally prohibited under Section 301, also from title 23.

Source: FHWA.

SAFETEA-LU also created a National Surface Transportation Infrastructure Financing Commission to consider revenue sources available to all levels of government, particularly Highway Trust Fund revenues, and to consider new approaches to generating revenues for financing highways. The commission's objective is to develop a report recommending policies to achieve revenues for the Highway Trust Fund that will meet future needs. The commission is required to produce a final report within 2 years of its first meeting.

In addition to SAFETEA-LU's new tolling provisions and enhancements to existing programs, FHWA offers an innovative credit assistance program,

<sup>6</sup>Federal Highway Administration, *Federal-Aid Highway Toll Facilities* (Washington, D.C.: June 16, 2005).

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which can be used to develop toll roads, and an experimental program, which can be used to test innovative toll road development procedures. The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) permits FHWA to offer three kinds of credit assistance for nationally or regionally significant surface transportation projects: direct loans, loan guarantees, and lines of credit. Because TIFIA provides credit assistance rather than grants, states are likely to use it for infrastructure projects that can generate their own revenues through user charges, such as tolls or other dedicated funding sources. TIFIA credit assistance is aimed at advancing the completion of large, capital intensive projects—such as toll roads—that otherwise might be delayed or not built at all because of their size and complexity and the financial market’s uncertainty over the timing of revenues from a project. The main goal of TIFIA is to leverage federal funds by attracting substantial private and other nonfederal investment in projects. FHWA has also encouraged experimental projects through the Special Experimental Projects 15 (SEP-15) program, which is intended to encourage the formation of public-private partnerships for projects by providing additional flexibility for states interested in experimenting with innovative ways to develop projects, according to FHWA officials. SEP-15 allows innovation and flexibility in contracting, compliance with environmental requirements, right-of-way acquisition, and project finance.

In addition, the Department of Transportation’s Office of Transportation Policy is proposing a pilot program—the Open Roads Pilot Program—to explore alternatives to the motor fuel tax. Under this pilot, the Office of Transportation Policy is proposing to make funds available to up to five states to demonstrate on a large scale the viability and effectiveness of financing alternatives to the motor fuel tax. Goals of the program would be to: (1) demonstrate whether or not there are viable alternatives to the motor fuel tax that will provide necessary investment resources while simultaneously improving system performance and reducing congestion, (2) identify successful motor fuel tax substitutes that have widespread applicability to other states, and (3) provide a possible framework for future federal reauthorization proposals.

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## Tolling Has Promise as an Approach for Enhancing Mobility and for Financing Transportation

As congestion increases and concerns about the sustainability of traditional roadway financing sources grow, tolling has promise as an approach to enhance mobility and to finance transportation. Tolls that are set to vary with the level of congestion can potentially lead to a reduction in congestion and demand for roads. Such tolls can create additional incentives for drivers to avoid driving alone in congested conditions when making their driving decisions. In response, drivers may choose to share rides, use public transportation, travel at less congested (generally off-peak) times, or travel on less congested routes, if available, to reduce their toll payments. Tolling is also consistent with the important user pays principle, can potentially better target spending for new and expanded capacity, and can potentially enhance private-sector participation and investment in major highway projects. Tolling's promise is particularly important in light of long-term fiscal challenges and pressures on the federal budget.

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## In the Face of Increasing Congestion, Tolling Holds Promise as an Approach to Enhance Mobility

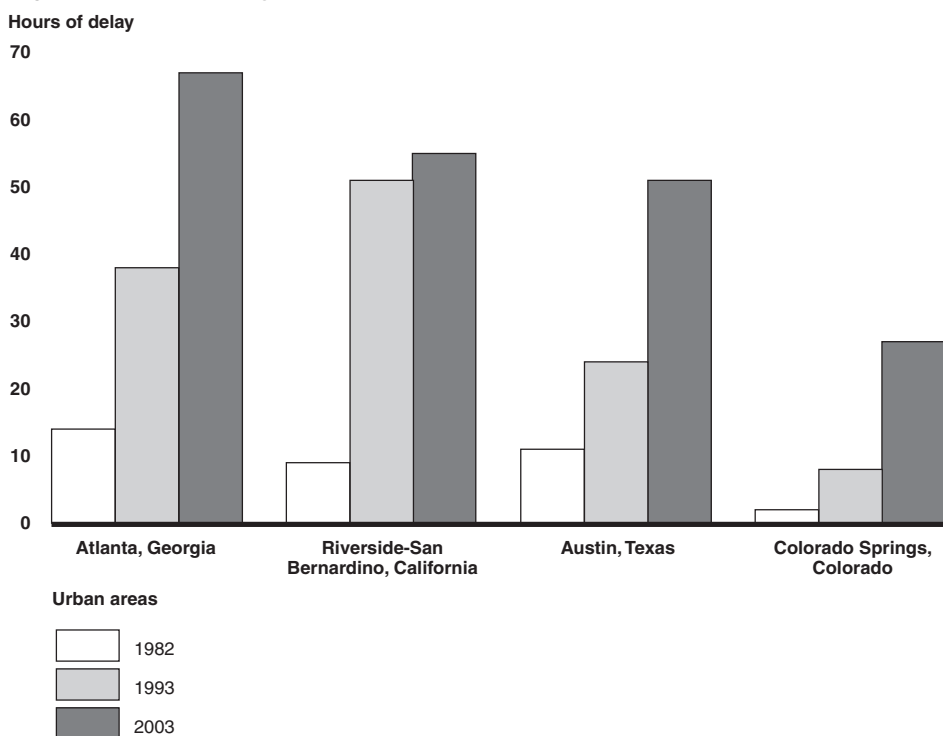
Tolling can be used to potentially enhance mobility by managing congestion, which is already substantial in many urban areas. Congestion impedes both passenger and freight mobility and ultimately, the nation's economic vitality, which depends in large part on an efficient transportation system. Highway congestion for passenger and commercial vehicles traveling during peak driving periods doubled from 1982 through 2000. According to the Texas Transportation Institute, drivers in 85 urban areas experienced 3.7 billion hours of delay and wasted 2.3 billion gallons of fuel in 2003 because of traffic congestion.<sup>7</sup> The Texas Transportation Institute estimated that the cost of congestion was \$63.1 billion (in 2003 dollars), a fivefold increase over two decades after adjusting for inflation. On average, drivers in urban areas lost 47 hours on the road in 2003, nearly triple the delay travelers experienced on average in 1982. During this same period, congestion grew in urban areas of every size; however, very large metropolitan areas with populations of more than 3 million were most affected. (See fig. 2 for examples of congestion growth in selected urban areas.) Freight traffic—which has doubled since 1980 and in some locations constitutes 30 percent of interstate system traffic—added to this congestion at a faster rate than passenger traffic, and FHWA projects

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<sup>7</sup>Texas Transportation Institute, *2005 Urban Mobility Report* (College Station, TX: May 2005).

continued growth, estimating that the volume of freight traffic on U.S. roads will increase 70 percent by 2020.

**Figure 2: Annual Delay per Traveler in Selected Urban Areas, 1982, 1993, and 2003**



Source: GAO analysis of Texas A&M University data.

A number of factors, as follows, are converging to further exacerbate highway congestion:

- Most population growth in the nation occurs in already congested metropolitan areas. In 2000, the U.S. Census Bureau reported that 79 percent of 281 million U.S. residents lived in metropolitan areas. Nationwide, the population is expected to increase by 54 million by 2020, and most of that growth is expected in metropolitan areas.
- Vehicle registrations are steadily increasing. In 2003, vehicle registrations nationwide stood at 230 million, a 17 percent increase in just 10 years.



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- Road usage, as measured by vehicle miles traveled (VMT), grew at a steady annual rate of 2.8 percent from 1980 through 2003. For the 10-year period between 1994 and 2003, the total increase in VMT was 22 percent.
  - Road construction has increased at a slower pace than population growth, vehicle registrations, and road usage. For example, from 1980 to 2000, VMT increased by 80 percent while urban lane miles increased 37 percent.

In light of this increasing congestion, a tolling structure that includes congestion pricing can potentially reduce congestion and the demand for roads during peak hours. Through congestion pricing, tolls can be set to vary during congested periods to maintain a predetermined level of service. One potential effect of this pricing structure is that the price that a driver pays for such a trip, including the toll, may be equal to or close to the total cost of that trip, including the external costs that drivers impose on others, such as increased travel time, pollution, and noise.<sup>8</sup> Such tolls create financial incentives for drivers to consider these costs when making their driving decisions. In response, drivers may choose to share rides, use transit, travel at less congested (generally off-peak) times, or travel on less congested routes to reduce their toll payments.<sup>9</sup> Such choices can potentially reduce congestion and the demand for road space at peak periods, thus potentially allowing the capacity of existing roadways to accommodate demand with fewer delays.

Actual experience with congestion pricing is still fairly limited in the United States, with only five states operating such facilities and six states planning

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<sup>8</sup>As we reported in 2003, economists generally believe that charging surcharges or tolls during congested periods can enhance economic efficiency by making them take into account the external costs they impose on others in deciding when, where, and how to travel. In congested situations, external costs are substantial and include increased travel time, pollution, and noise. The goal of efficient pricing on public roads, for example, would be to set tolls for travel during congested periods that would make the price (including the toll) that a driver pays for such a trip equal or close to the total cost of that trip, including external costs. GAO, *Reducing Congestion: Congestion Pricing Has Promise for Improving Use of Transportation Infrastructure*, [GAO-03-735T](#) (Washington, D.C.: May 6, 2003). For further discussion of the research on congestion pricing, see Transportation Research Board, *Curbing Gridlock: Peak-Period Fees to Relieve Traffic Congestion* (Washington, D.C.: January 1994).

<sup>9</sup>[GAO-03-735T](#).

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facilities.<sup>10</sup> Some results show that where variable tolls are implemented, changes in toll prices affect demand and, therefore, levels of congestion. For example, on State Route 91 in California, the willingness of people to use the Express Lanes has been shown to be directly related to the price of tolls. A study by Cal Poly State University for the California DOT estimated that a 10 percent increase in tolls would reduce traffic by 7 percent to 7.5 percent, while a 100 percent increase in tolls would reduce traffic by about 55 percent.<sup>11</sup> By adjusting the price of tolls, the flow of traffic can be maintained in the toll lanes so that congestion remains at manageable levels. In the Minneapolis-St. Paul area, a Minnesota DOT study of a proposed system of variable priced HOT lanes called MnPASS estimated that, over time, average speeds and vehicle mileage would increase, while vehicle hours traveled would decrease.<sup>12</sup> By 2010, with tolled express lanes and free HOV lanes, the daily vehicle mileage on the entire system is projected to be 3.6 million compared with 3.2 million if the highways are not tolled. Average overall speed on the system is expected to be 47 mph compared with 42.8 mph if the system is not implemented. Finally, congestion pricing has been in use internationally as well. Canada, Great Britain, Norway, Singapore, and South Korea all have roadways that are tolled to manage demand and reduce congestion. For example, in 1996, South Korea implemented congestion tolls on two main tunnels. Traffic volume decreased by 20 percent in the first 2 years of operation, and average traffic speed increased by 10 kilometers per hour.

Although congestion pricing was dismissed by some decision makers in the past partly because motorists queuing at toll booths to pay tolls created congestion and delays, advances in automated toll collection have greatly reduced the cost and inconvenience of toll collection. Today, nearly every major toll facility provides for electronic toll collection, greatly reducing the cost and inconvenience of toll collection. With electronic toll collection, toll fee collection for using a facility can be done at near highway cruising speed because cars do not have to stop at toll plazas. However, as we reported, there are no widely accepted standards for

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<sup>10</sup>According to our survey of state DOTs, the five states currently operating facilities are California, Minnesota, New York, Texas, and Virginia. States that are planning facilities include California, Colorado, Maryland, Virginia, Texas, and Washington.

<sup>11</sup>Cal Poly State University, *Continuation Study to Evaluate the Impacts of the SR 91 Value-Priced Express Lanes Final Report* (San Luis Obispo, CA: December 2000).

<sup>12</sup>Cambridge Systematics for Minnesota Department of Transportation, *MnPASS System Study, Final Report* (Cambridge, MA: Apr. 7, 2005).

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electronic toll systems, which could become a barrier to promoting the needed interoperability between toll systems.<sup>13</sup>

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## Tolling Holds Promise as an Approach to Finance Transportation Projects

Tolling holds promise to improve investment decisions and raise revenues in the face of growing concerns about the sustainability of traditional financing sources for surface transportation. For many years, federal and state motor fuel taxes have been the mainstay of state highway revenue. In the last few years, however, federal and motor fuel tax rates have not kept up with inflation. Between 1995 and 2004, total highway revenues for states grew an average of 3.6 percent per year, with average annual increases of 4.9 percent for federal grants and 3 percent for revenues from state sources, according to FHWA data. However, these increases were smaller than increases in the cost of materials and labor for road construction and are not sufficient to keep pace with the robust levels of growth in highway spending many transportation advocates believe is needed.<sup>14</sup> The federal motor fuel tax rate of 18.4 cents per gallon has not been increased since 1993, and thus the purchasing power of fuel tax revenues has been steadily eroded by inflation. Although the Highway Trust Fund<sup>15</sup> was reauthorized in 1998 and 2005, no serious consideration was given to raising fuel tax rates. Most states faced a similar degradation of the value of their state motor fuel tax revenues—although 28 states raised their motor fuel tax rates between 1993 and 2003, only three states raised their rates enough to keep pace with inflation. State gasoline tax rates range from 7.5 cents per gallon in Georgia to 28.5 cents in Wisconsin. Seven states have motor fuel tax rates that vary with the price of fuel or the inflation rate—including one state that repealed the linkage of its fuel tax rate to the inflation rate effective in 2007. Figure 3 shows the decline in the purchasing power in

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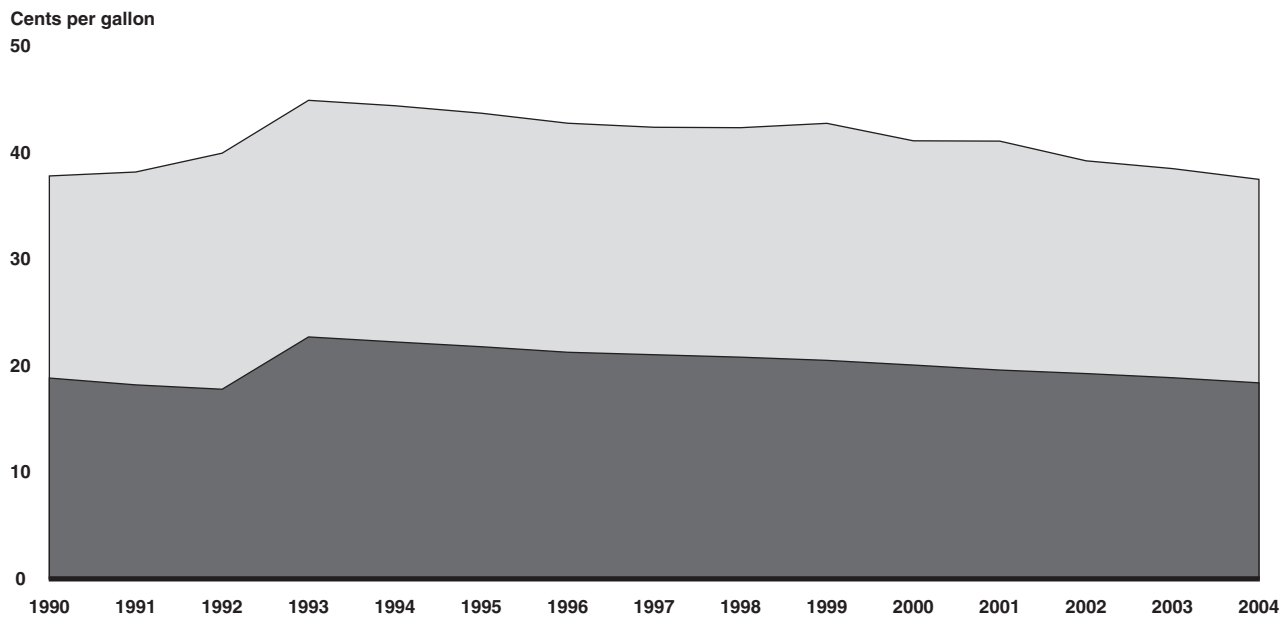
<sup>13</sup>GAO, *Highway Congestion: Intelligent Transportation Systems' Promise for Managing Congestion Falls Short, and DOT Could Better Facilitate Their Strategic Use*, GAO-05-943 (Washington, D.C.: Sept. 14, 2005).

<sup>14</sup>Brookings Institution, *Improving Efficiency and Equity in Transportation Finance* (Washington, D.C.: April 2003); Eric Kelderman, *Road Funding Takes a Toll on States* (Washington, D.C.: Feb. 17, 2006); and Transportation Research Board, "Special Report 285: The Fuel Tax and Alternatives for Transportation Funding" (Washington, D.C.: 2005).

<sup>15</sup>Highway user tax receipts, such as motor fuel taxes, are deposited into the Highway Trust Fund and distributed to the states according to formulas based on vehicle miles traveled, motor fuel used on highways, and other factors, which are specified in law. GAO, *Surface and Maritime Transportation: Developing Strategies for Enhancing Mobility: A National Challenge*, GAO-02-775 (Washington, D.C.: Aug. 30, 2002).

real terms of revenues generated by federal and state motor fuel tax rates since 1990.

**Figure 3: Combined Federal and Average State Motor Fuel Tax Rates**



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
<b>Total gas tax rate</b>	37.82	38.20	39.97	44.92	44.41	43.72	42.78	42.39	42.35	42.76	41.12	41.09	39.24	38.52	37.50
<b>State average gas tax rate</b>	18.97	19.98	22.16	22.21	22.17	21.92	21.50	21.35	21.54	22.25	21.05	21.49	19.97	19.63	19.10
<b>Federal gas tax rate</b>	18.85	18.21	17.80	22.71	22.24	21.79	21.27	21.04	20.81	20.51	20.07	19.60	19.27	18.88	18.40

Average state motor fuels tax  
 Federal motor fuels tax

Sources: GAO analysis of DOT and FHWA data.

Note: Tax rates are in 2004 inflation-adjusted dollars. Totals for 1992, 1995, 1996, 2000, and 2003 are rounded. State average gas tax rate is a "weighted average."

Even if federal and state motor fuel tax rates were to keep pace with inflation, the growing use of fuel-efficient vehicles and alternative-fueled vehicles would, in the longer term, further diminish fuel tax revenues. Although all highway motorists pay fuel taxes, those who drive hybrid-powered or other alternative-fueled vehicles consume less fuel per mile than those who drive gas-only vehicles. As a result, these motorists pay less fuel tax per mile traveled. According to the U.S. Energy Information Agency, hybrid vehicle sales grew twentyfold between 2000 and 2005 and

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will grow to 1.5 million vehicles annually by 2025. In the past five years, hybrid vehicle sales grew in the United States twentyfold, from 9,400 in 2000 to over 200,000 in 2005. Moreover, the U.S. Energy Information Agency projects that hybrid vehicle sales will grow to 1.5 million annually by 2025. Sales of alternative-fueled vehicles, such as alcohol-flexible-fueled vehicles, are projected to increase to 1.3 million in 2030, with electric and fuel cell technologies projected to increase by 2030 as well.

As concerns about the sustainability of traditional roadway financing sources grow, tolling can potentially target investment decisions by adhering to the user pays-principle. National roadway policy has long incorporated the user pays concept, under which the costs of building and maintaining roadways are paid by roadway users, generally in the form of excise taxes on motor fuels and other taxes on inputs into driving, such as taxes on tires or fees for registering vehicles or obtaining operator licenses. This method of financing is consistent with one measure of equity that economists use in assessing the financing of public goods and services, the benefit principle, which measures equity according to the degree that readily identifiable beneficiaries bear the cost. As a result, the user pays concept is widely recognized as a critical anchor for transportation policy.<sup>16</sup>

Increasingly, however, decision makers have looked to other revenue sources—such as income, property, and sales tax revenues—to finance roads. Using these taxes results in some sacrifice of the benefit principle because there is a much weaker link to the benefits of roadway expenditures for those taxes than there is for fuel taxes.<sup>17</sup> Tolling, however, is more consistent with user pay principles because tolling a particular road and using the toll revenues collected to build and maintain that road more closely link the costs with the distribution of the benefits that users derive from it. Motor vehicle fuel taxes can provide a rough link between costs and benefits but do not take into account the wide variation in costs required to provide different types of facilities (i.e., roads, bridges, tunnels, interchanges) some of which can be very costly.

Tolling can also potentially lead to more targeted, rational, and efficient investment by state and local governments. Roadway investment can be

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<sup>16</sup>Texas Transportation Institute, *2005 Urban Mobility Report* (College Station, TX: May 2005).

<sup>17</sup>Brookings Institution, *Improving Efficiency and Equity in Transportation Finance* (Washington, D.C.: April 2003).

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more efficient when it is financed by tolls because the users who benefit will likely support additional investment to build new capacity or enhance existing capacity only when they believe the benefits exceed the costs. When costs are borne by nonusers, the beneficiaries may demand that resources be invested beyond the economically justifiable level. Tolling can also provide the potential for more rational investment because, in contrast to most grant-financed projects, toll project construction is typically financed by bonds sold and backed by future toll revenues, and projects must pass the test of market viability and meet goals demanded by investors. However, even with this test there is no guarantee that projects will always be viable.<sup>18</sup>

A tolling structure that includes congestion pricing can also help guide capital investment decisions for new facilities. As congestion increases, tolls also increase and such increases (sometimes referred to as “congestion surcharges”) signal increased demand for physical capacity, indicating where capital investments to increase capacity would be most valuable. At the same time, congestion surcharges would provide a ready source of revenue for local, state, and federal governments, as well as for transportation facility operators in order to help fund these investments in new capacity that, in turn, can reduce delays. Over time, this form of pricing can potentially influence land-use plans and the prevalence of telecommuting and flexible workplaces, particularly in heavily congested corridors where external costs are substantial and congestion surcharges would be relatively high.

Tolling can also be used as a tool for leveraging increased private-sector participation and investment. In March 2004, we reported that three states—California, Virginia, and South Carolina—had pursued private-sector investment and participation in major highway projects. Since that time, Virginia has pursued additional projects, and Texas has contracted with a private entity to participate and invest in a major highway project.<sup>19</sup> Tolling can be used to enhance private participation because it provides a mechanism for the private sector to earn the return on investment it

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<sup>18</sup>As we reported in 2004, three of the four toll road projects that were built with private participation and investment and were open to traffic at that time were not financially successful. See GAO, *Highway and Transit: Private Sector Sponsorship of and Investment in Major Projects Has Been Limited*, [GAO-04-419](#) (Washington, D.C.: Mar. 25, 2004).

<sup>19</sup>In addition, the City of Chicago and the State of Indiana have contracted with private entities to operate existing facilities.

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requires to participate. Involving the private sector allows state and local governments to build projects sooner, conserve public funding from highway capital improvement programs for other projects, and limit their exposure to the risks associated with acquiring debt.<sup>20</sup>

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### In the Long Term, Tolling Holds Promise for Addressing the Transportation Challenges Ahead

Federal and state policymakers have begun looking toward future options for long-term highway financing. For example, SAFETEA-LU established the National Surface Transportation Infrastructure Financing Commission to study prospective Highway Trust Fund revenues and assess alternative approaches to generating revenues for the Fund. SAFETEA-LU also authorized a study, to be performed by the Public Policy Center of the University of Iowa, to test an approach to assessing highway use fees based on actual mileage driven. This approach would use an onboard computer to measure the miles driven by a specific vehicle on specific types of highways. A few states have also begun looking toward the long-term financing options. Oregon, the first state to enact a motor fuel tax, is sponsoring a study on the technical feasibility of replacing the gas tax with a per-mile fee. During 2006, volunteers will have onboard mileage-counting equipment added to their vehicles and will, for one year, pay a road user fee equal to 1.2 cents a mile instead of paying the state's motor fuel tax.

But beyond the questions of financing and financing sources, broader issues and challenges exist. As the baby boom generation ages, mandatory federal commitments to health and retirement programs will consume an ever-increasing share of the nation's gross domestic product (GDP) and federal budgetary resources, placing severe pressures on all discretionary programs, including those that fund defense, education, and transportation. Our simulations show that by 2040, revenues to the federal government might barely cover interest on the debt—leaving no money for either mandatory or discretionary programs—and that balancing the budget could require cutting federal spending by as much as 60 percent, raising taxes by up to 2 ½ times their current level, or some combination of the two. As we have reported, this pending fiscal crisis requires a fundamental reexamination of all federal programs, including those for highways. This reexamination should raise questions such as whether a federal role is still needed, whether program funding can be better linked to performance, and whether program constructs are ultimately sustainable. It is in this context

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<sup>20</sup>[GAO-04-419](#).

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that tolling has promise for addressing the challenges ahead. In particular, we have suggested that a reexamination of the federal role in highways should include asking whether the federal government should even continue to provide financing through grants or whether, instead, it should develop and expand alternative mechanisms that would better promote efficient investments in, and use of, infrastructure and better capture revenue from users.

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### States' Use of Tolling to Address Funding Shortfalls, Finance New Capacity, and Manage Congestion Is Expanding; but for Some States, Tolling Is Not Viewed as Feasible

According to our survey of state transportation officials, there are toll road facilities in 24 states and plans to build toll road facilities in 7 other states. Tolling grew in the 1940s and 1950s, but after a period of slower growth, states' tolling began to expand again in the 1990s. The 5 states that began tolling after 1990 are currently planning additional toll roads. Officials in states that have toll roads or are planning toll roads indicated that their primary reasons for using or considering the use of a tolling approach were to address transportation shortfalls, finance new capacity, and manage congestion. Transportation officials in some states, however, told us that tolling is not now seen as feasible because there is little need for new tolled capacity, tolling revenues would be insufficient, and they would face public and political opposition to tolling.

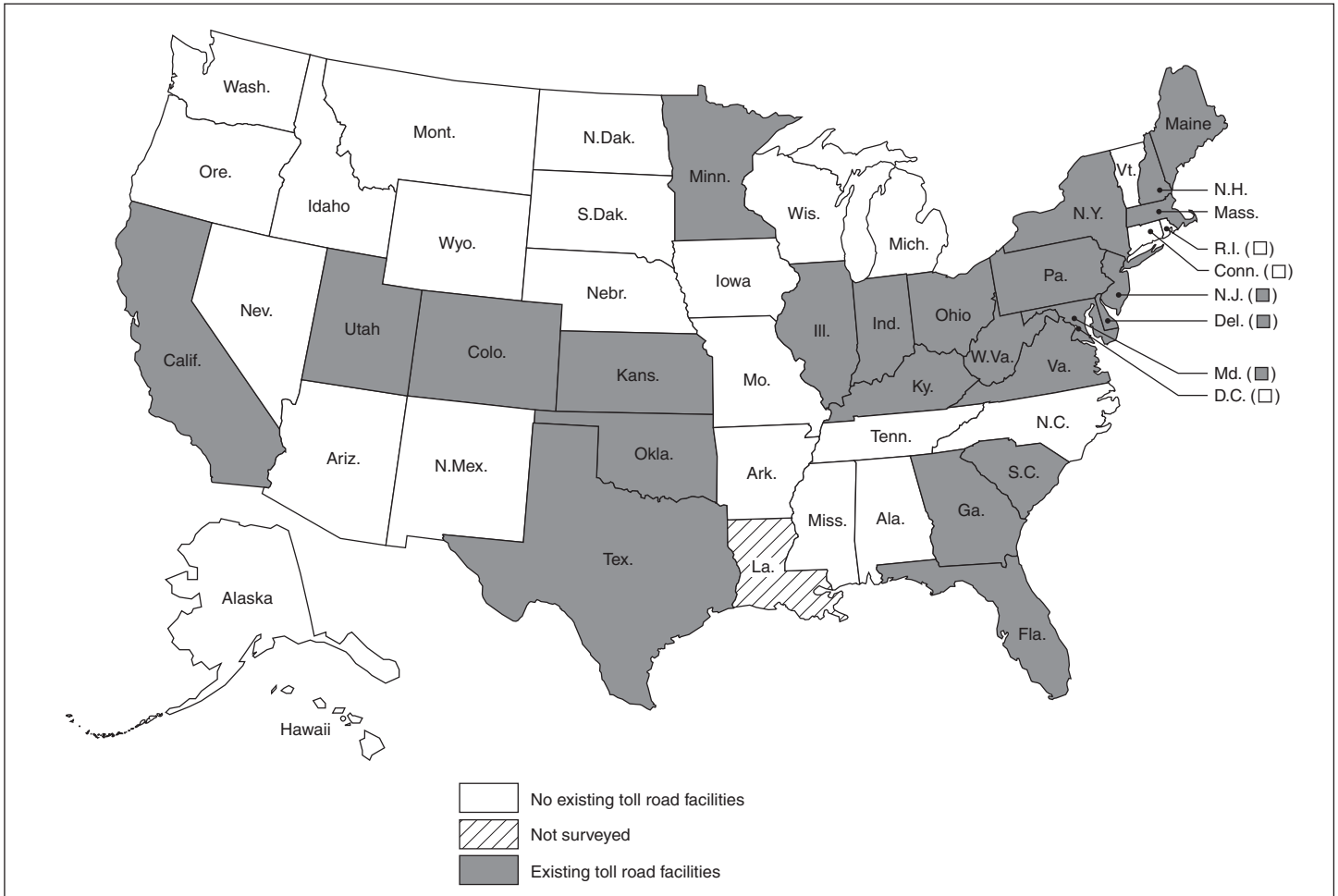
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### Nearly Half of the States Have Operating Toll Roads, and More States Are Planning Toll Roads

Currently, there are toll road facilities in 24 states throughout the United States, and there are plans to build toll road facilities in 7 additional states. Figure 4 shows the states that have at least one existing toll road, according to our survey of transportation officials from all 50 states and the District of Columbia and our review of FHWA toll-related programs. (See app. III for the survey questions.)



**Figure 4: Existing Toll Road Facilities**



Source: GAO.

Tolling grew in the 1950s, slowed for several decades, and again began to expand rapidly in the 1990s. Five states—California, Colorado, Minnesota, South Carolina, and Utah—opened their first toll roads from 1990 to 2006 and, according to our survey of state transportation officials, all five are currently planning, or in some stage of building, at least one new toll road. Large states that have recently built toll roads, such as California, Florida, and Texas, are also moving ahead with plans to build and expand systems of tolls. In Texas, for example, the DOT’s Turnpike Authority Division is developing a proposed multiuse, statewide network of transportation

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routes that will incorporate existing and new highways called the TTC,<sup>21</sup> while three other regional toll authorities<sup>22</sup> in Austin, Dallas, and Houston are also planning toll roads. In California, a state legislative initiative in 1989 led to the development of toll roads in Orange County, including the State Route 91 Express Lanes and State Route 125 in San Diego. And in Florida, the DOT-run Florida Turnpike Enterprise operates nine tolled facilities that include almost 500 miles of toll roads and is studying the feasibility of implementing tolling to manage congestion on other facilities, including Interstate 95 in Miami-Dade County.

According to our survey of state transportation officials and our review of state applications to FHWA tolling pilot programs, a total of 23 states have plans to build toll road facilities.<sup>23</sup> (Fig. 5 summarizes the status of states' plans for highway tolling.) Eleven of these states have received the required environmental clearances and have projects that are under design or in construction. The remaining 12 states do not have projects that have proceeded this far, but do have plans to build toll road facilities, according to their respective state transportation officials. Of these 23 states,

- 16 have existing toll roads and are planning additional toll roads,<sup>24</sup> and

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<sup>21</sup>Plans for TTC include TTC 35, which is projected to parallel Interstate 35 and Interstate 69.

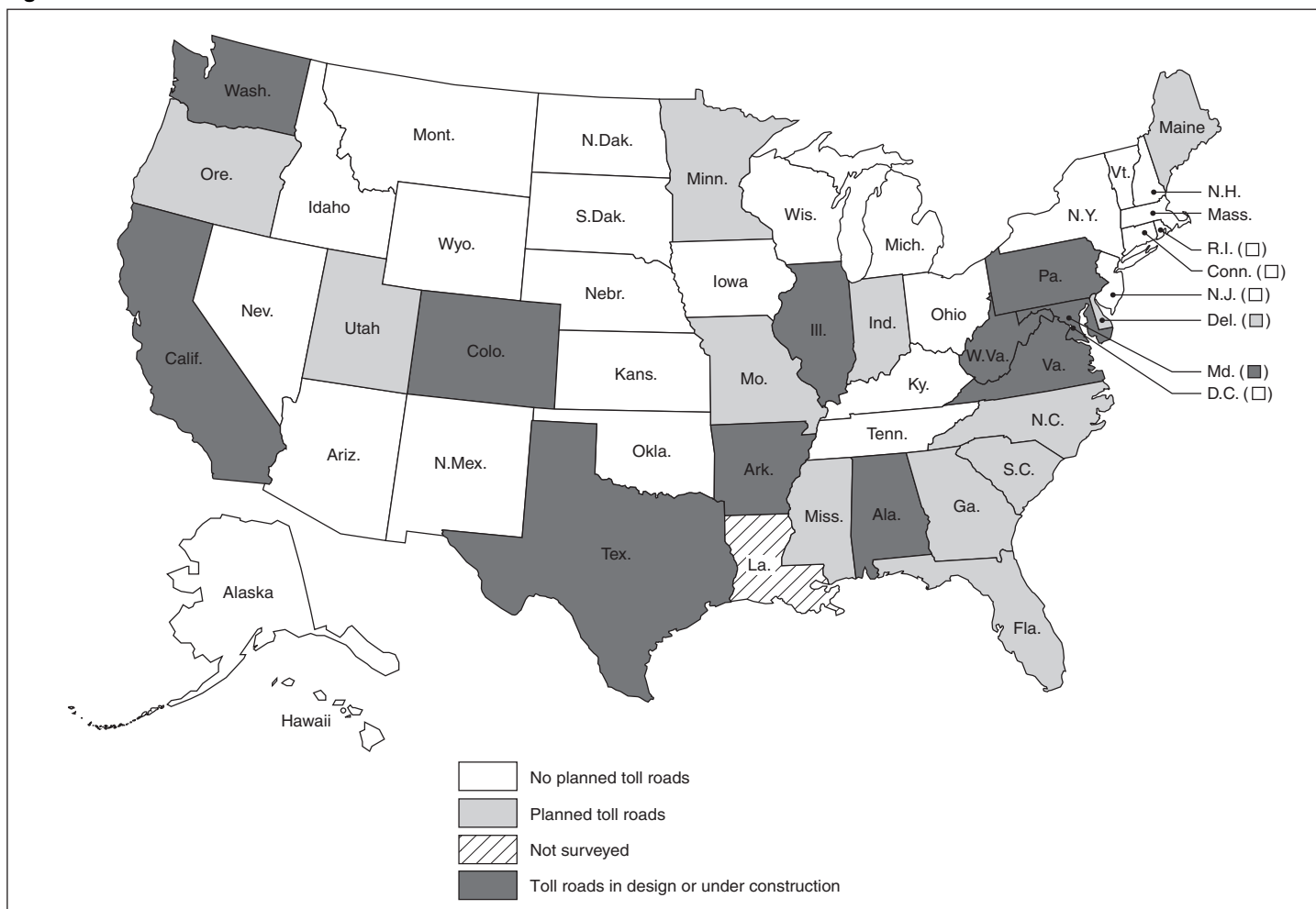
<sup>22</sup>The Central Texas Regional Mobility Authority in the Austin area, the Harris County Toll Road Authority in the Houston area, and the North Texas Tollway Authority in the Dallas area.

<sup>23</sup>In our count, we included affirmative responses to our survey questions regarding (1) planned toll road facilities that were in design/right-of-way or construction and (2) plans for toll road facilities that were not yet in design or construction but for which an environmental review and Record of Decision had been completed. We compared the responses to these questions with information obtained from our interviews with state DOT officials and from state applications to FHWA's tolling programs, including the Interstate System Reconstruction and Rehabilitation Pilot Program and the Value Pricing Pilot. In four instances, data from these sources were inconsistent. We contacted DOT officials in these states to resolve these inconsistencies and adjusted the survey results accordingly.

<sup>24</sup>The 16 states include California, Colorado, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, Pennsylvania, South Carolina, Texas, Utah, Virginia, and West Virginia.

- 7 are planning their first toll roads.<sup>25</sup>

**Figure 5: Planned Toll Road Facilities**



Source: GAO.

<sup>25</sup>The 7 states include Alabama, Arkansas, Mississippi, Missouri, North Carolina, Oregon, and Washington.

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## Some States Use Tolling to Address Funding Shortfalls, Finance New Capacity, and Manage Congestion; Other States Find Tolling Not Feasible or Have Made Other Choices

Officials in most states planning toll roads indicated that the primary reasons for considering a tolling approach were to address what state officials characterized as transportation funding shortfalls, to finance and build new capacity, and to manage congestion. States that are not planning to build toll roads have found that tolling is not feasible or have made other choices.

### States Use Tolling to Address Transportation Funding Shortfalls

Transportation officials indicated that one of the primary reasons for using or considering a tolling approach was to respond to what the officials described as shortfalls in transportation funding. In Georgia, for example, an official told us that tolling has become a strategy because there is a significant gap in transportation funding, and the motor fuel tax rate is the lowest in the country, 7.5 cents per gallon. In North Carolina, where the North Carolina Turnpike Authority was established in 2002, an official told us that traditional funding is not adequate to address transportation needs. North Carolina has estimated that, over the next 25 years, it will need \$85 billion in new transportation projects to accommodate the state's growth. With a projected shortfall of \$30 billion and what the official described as a lack of political will to increase motor fuel tax rates, the state has adopted tolling as one strategy to address transportation needs. In Utah, state transportation officials have estimated a \$16.5 billion shortfall through 2030 in funding for highway projects and are considering tolling, along with other funding alternatives. Finally, an official told us that, in spite of a motor fuel tax rate increase in 2003 and a \$200 million bonding program, Indiana has a 10-year, \$2.8 billion shortfall in highway funding and is viewing tolling as one financing tool to close the gap. The Indiana DOT has operated the Interstate 80/Interstate 90 Indiana Toll Road for 50 years and would like to apply that experience in operating toll roads to new roads.

In other states, transportation officials conducted financial assessments on specific highway projects and determined that, to complete the projects, tolling would be required as a source of revenue. For example, in Missouri, a funding analysis performed by the Missouri DOT found that the estimated construction costs for the Interstate 70 reconstruction exceed the available federal, state, and local funding sources, and the project cannot be advanced without tolling or other revenue increases. Missouri DOT estimates that the Interstate 70 reconstruction project will cost between \$2.7 and \$3.2 billion and that, with a current funding shortfall of \$1 billion

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to \$2 billion annually, tolling is being actively considered to close that gap.<sup>26</sup> Likewise, studies by the Texas DOT determined that tolling would be required on particular highway projects. For example, reconstructing a 23-mile portion of Interstate 10 near Houston was estimated to cost \$1.99 billion. Available federal, state, and local funds amounted to \$1.75 billion, a shortfall of \$305.2 million. The Harris County Toll Road Authority invested \$238 million for the right to operate tolled lanes within the facility. In addition, the Texas Transportation Commission, which oversees the state DOT, ordered that all new controlled-access highways should be considered as potential toll projects that will undergo toll feasibility studies. The commission views tolling as a tool that can help stretch limited state highway dollars further so that transportation needs can be met. Moreover, states are looking for whatever financial relief tolling can provide. In some states, tolling is being considered, even though toll revenues are expected to only partially cover the costs of particular projects. In Mississippi, for example, the state DOT indicated that tolling may be advanced if toll revenues cover 25 percent to 50 percent of a facility's cost. In Arkansas, tolling is being considered if toll revenues fund as little as 20 percent of the initial construction costs, provided tolls pay for operations and maintenance.

To identify state characteristics that are linked with state decisions to toll, we performed a correlation analysis to examine the relationship between those decisions and various state demographic and financial characteristics. Although certain characteristics in a state's finances and tax policies might be related to financial need, our correlation analysis found only limited relationships between various state financial and demographic measures and states' decisions to toll or not to toll. For example, although we found a slight inverse relationship between a state's decision to toll and the level of its motor fuel taxes, this relationship is not strong enough to conclude that states planning toll roads are more likely to be the ones with lower motor fuel tax rates than other states. However, we found that both the size of the state, whether measured by population or by VMT, and whether it is growing rapidly, again measured by population or VMT growth, are directly related to states' decisions to toll. (For more information on the results of our correlation analysis, see app. II.)

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<sup>26</sup>The Interstate 70 reconstruction project has been approved as one of the slots in the Interstate System Reconstruction and Rehabilitation Pilot Program. Federal approval is necessary for states to toll interstate highways.

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## States Use Tolling to Finance New Capacity

According to transportation officials, states are using or considering a tolling approach to finance new capacity that cannot otherwise be funded under current and projected transportation funding scenarios. Such new capacity may be in the form of new highways or new lanes on existing highways. For example, in Colorado, the state DOT is studying the investment of \$3 billion in increased highway capacity, with 10 percent, or \$300 million of the investment, coming from federal, state, and local governments and the remainder coming from tolls. With a \$48 billion shortfall projected through 2030 and the percentage of congested lane-miles projected to increase by 161 percent, tolling is being considered. Projections by the state DOT in Colorado suggest that revenues are sufficient to allow for only spot improvements on a few transportation corridors over the next 25 years and, without tolling, none can undergo a major upgrade, and new capacity cannot be added.

Some states are using tolling to supplement their traditional motor fuel tax transportation funding through private-sector involvement and investment. Tolling is being used as a means to gain access to private equity and to shift the investment risk, in part, to the private sector. Currently, 18 states have some form of public-private partnership (PPP) legislation, allowing for innovative contracting with the private sector. Many of the 18 states have PPP programs that were established to allow for toll concession agreements to finance highway projects. For example, Oregon and Texas are specifically looking to attract private investment as a new source of financing. The TTC, as shown in figure 6,<sup>27</sup> is being financed, in part, through a series of PPPs. The Texas DOT has contracted with Cintra-Zachry to develop a long-term development plan for the corridor, which includes the potential to construct and operate the first 316-mile portion of TTC 35, from Dallas to San Antonio. Cintra-Zachry has pledged an investment of \$6 billion and a payment of \$1.2 billion for the right to build, operate, and collect tolls for up to 50 years on the initial segment of TTC 35. In Oregon, the Office of Innovative Partnerships and Alternative Funding—an Oregon DOT office empowered to pursue alternative funding, including

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<sup>27</sup>This is a conceptual illustration that shows a complete build out. TTC will be phased in as transportation demand warrants and private sector funding makes it feasible. Since it will be developed based on transportation demand, it is conceivable that not all elements will be developed concurrently and may not be located adjacent to each other as shown in the illustration. Depending on environmental and engineering factors, transportation modes may diverge. Input from the ongoing public meetings will help determine plans for the TTC. Two projects are being pursued by Texas DOT, TTC 35 and TTC 69. Both are under environmental review, and neither right-of-way acquisition nor construction has been federally approved.

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private investment through tolling—has received proposals from the Oregon Transportation Improvement Group, a consortium led by the Macquarie Infrastructure Group, to complete two tolled facilities in the Portland area. In both Texas and Oregon, the projects were approved under SEP-15, which enabled the two states to waive certain federal requirements and to negotiate with the project developers before awarding contracts. Acceptance of the projects under SEP-15 does not commit federal-aid funding for the projects, and FHWA retains the right to declare the project ineligible for federal-aid funds at any time during the SEP-15 process until there is formal FHWA project approval.

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**Figure 6: Conceptual Drawing of the Trans Texas Corridor**



Source: Texas Department of Transportation.

Growing freight traffic is also prompting some states to consider using tolls to pay for capacity enhancement. Examples include Interstate 81 in Virginia and Interstate 70 in Missouri. According to the original design of Interstate 81, built beginning in 1957, truck traffic would account for 15 percent of traffic on the highway; truck traffic now accounts for up to 35

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percent, and traffic levels are expected to double by 2035. Interstate 70, originally designed to carry up to 14,000 vehicles per day in rural areas, now carries up to 58,000 per day, and truck traffic, which was intended to be 10 percent of total traffic, is now 25 percent. Both interstates are major freight routes where truck traffic is expected to continue to increase. In 2003, the Virginia DOT received FHWA conditional provisional approval under the Interstate System Reconstruction and Rehabilitation Pilot Program to toll vehicles other than cars and pickup trucks (freight trucks and buses) on Interstate 81. Likewise, for Interstate 70, the Missouri DOT received conditional provisional approval in July 2005 to participate in the same pilot program. In certain cases, proposals for truck-only toll (TOT) lanes seek to manage congestion while increasing capacity by diverting trucks from passenger routes to dedicated lanes. TOT lanes are being considered on heavy freight routes, including Interstate 81 in Virginia, TTC in Texas (see fig. 7), and routes throughout the Atlanta Metropolitan Region in Georgia.

## States Use Tolling to Manage Congestion

While growing congestion and traffic volumes have increased the demand for additional highway capacity, transportation officials told us that tolling is being considered as a tool to manage congestion. Applying tolls that vary with the level of congestion—congestion pricing—can reduce congestion and the demand for roads because tolls that vary according to the level of congestion can be used to maintain a predetermined level of service. Such tolls create additional incentives for drivers to avoid driving alone in congested conditions when making driving decisions. In response, drivers may choose to share rides, use public transportation, travel at less congested (generally off-peak) times, or travel on less congested routes, if available, to reduce their toll payments.

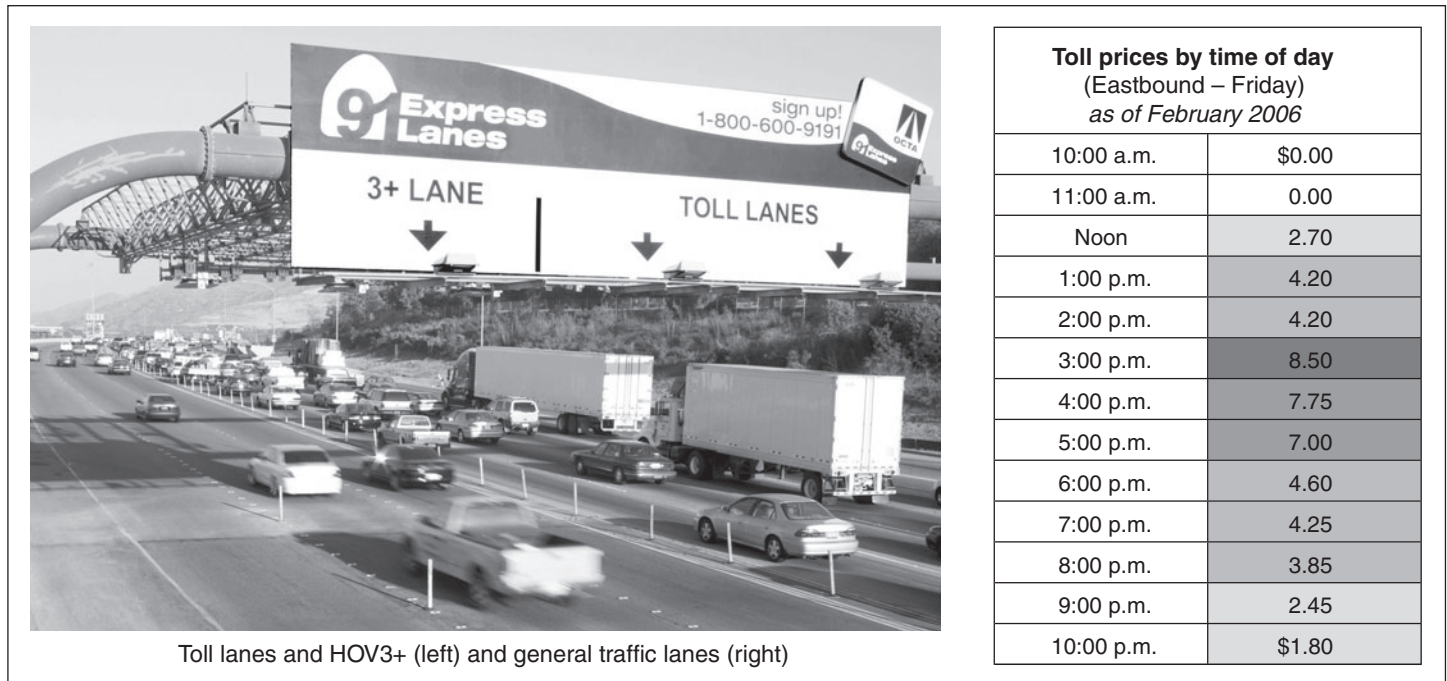
Tolling for congestion management can take the form of HOT lanes, which are adjacent to nontolled lanes. HOT lanes are used to manage congestion by creating a tolling structure that varies toll prices according to the level of congestion. Such a tolling structure can reflect the external costs that users of the facility impose on others. In some cases, HOV lanes that had been underused have been converted to HOT lanes, allowing HOVs to continue to use the lane as an HOV lane but allowing single-occupancy vehicles to use the lane provided they are willing to pay a toll. In 5 of the 23 states planning toll roads, efforts to manage congestion on existing capacity is prompting tolling. California, Colorado, Texas, Virginia, and Washington all have HOT lane projects planned that will use variably priced tolls to alleviate congestion by managing the level of traffic. All of these states have received grants under FHWA's Value Pricing Pilot to either



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develop or implement the projects. In California, the State Route 91 Express Lanes, as shown in figure 7, opened in 1995, and the Interstate 15 Express Lanes, opened in 1998, have dedicated, tolled lanes where the flow of traffic is managed through toll prices that vary daily and hourly. Tolls on State Route 91 range from as little as \$1.10 to as much as \$8.50. During periods of heavier demand and congestion, toll prices are higher so that fewer people will use the lanes, and a consistent flow of traffic can be maintained. In Texas, the Katy Freeway in Houston was originally designed to carry 80,000 vehicles per day. With traffic now exceeding 200,000 vehicles per day, the Texas DOT, in cooperation with FHWA, opened HOV-3 lanes (lanes that could only be used by carpools of 3 or more passengers) to vehicles with two passengers who pay a toll as express toll lanes in 1998. Texas DOT is also building managed lanes, scheduled to open in 2009, that will have peak toll pricing between 6:00 a.m. and 11:00 a.m. and between 2:00 p.m. and 8:00 p.m. The result, in both cases, is a system in which commuters pay a toll for access to less congested lanes. More recently, in Minnesota, where Minneapolis and St. Paul have been experiencing rapid growth in congestion and, according to the Minnesota DOT, HOV lanes were underused, the state legislature authorized the conversion of the Interstate 394 HOV lanes to HOT lanes. The Interstate 394 MnPASS optional toll lanes project opened in May 2005 with “dynamic pricing” to adjust tolls from anywhere from 25 cents to \$8.00, according to traffic levels.

**Figure 7: California State Route 91 Express Lanes and Toll Rates**



Source: Orange County Transportation Authority.

Note: Shading represents varying toll prices.

In some states, tolling or variable pricing—in which toll rates differ depending on conditions such as the time of day or location—is used specifically to manage freight congestion. In October 2005, for example, the Delaware DOT launched an initiative designed to address problems with freight congestion on the Delaware Turnpike (Interstate 95) by encouraging trucks to travel at night. Tolls on trucks between 10:00 p.m. and 6:00 a.m. are 75 percent less than tolls during more congested daytime hours. Another effort that incorporates variable pricing, but is not a traditional form of facility-based tolling, is a road user fee system that is being developed with an FHWA Value Pricing Pilot grant by the Oregon Office of Innovative Partnerships and Alternative Funding in cooperation with Oregon State University. The system assesses mileage-based fees in place of motor fuels taxes, and the fees vary for miles traveled during rush hour and within cordoned downtown areas.

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## Many States Find That Tolling Is Not Feasible or Have Made Other Choices

The reason most frequently cited by state transportation officials for not tolling is that tolling is not feasible. More specifically, there is little need for new tolled capacity, tolling revenues would be insufficient, or there is public and political opposition to tolling as follows:

- **Little need for new tolled capacity.** Transportation officials in many states indicated that low traffic volumes, a lack of congestion, and low demands for additional capacity make tolling impractical. In states such as Montana, North Dakota, South Dakota, and Wyoming, the population density and percentages of urban vehicle miles traveled are too low to support tolling.
- **Insufficient revenues.** In some states, tolling is not considered because toll revenues would not cover the costs of projects. In some cases, the issue involves traffic volumes that are so low that a tolling approach would be impractical. In those states, transportation officials explained that even if a tolling approach were to be considered, tolls would have to be prohibitively high to fund capacity enhancements and would likely result in traffic diversion to nontolled, alternative routes. For example, a transportation official in Kansas told us that there are few routes in Kansas that have a high enough level of traffic to make them viable for tolling. Therefore, opportunities for tolling are limited under the classic definition of feasibility, for which toll revenue must be adequate to fund construction, maintenance, and operations of a facility. Under this definition, most roads would not generate sufficient revenues from tolls to fund new highway capacity. In other cases, where traffic volumes are higher, transportation officials told us that a tolling approach is not even considered unless it can be demonstrated that the project will be self-sustaining. In Massachusetts, for example, an evaluation of HOT lanes determined that the toll rates people would be willing to pay would not raise enough revenue to fund the capital expenses to construct the facility.
- **Public and political opposition.** Officials from many states that are not pursuing tolling mentioned some form of public or political opposition to toll roads that has dissuaded transportation professionals from pursuing tolling. The public or political opposition is so strong, according to officials in some states, that tolling is studied only with great caution and sensitivity, if at all. While some states mentioned the lack of a tolling culture as a reason for not tolling, other states that have tolled roads for years cited the long-standing presence of toll roads as a reason for not planning to expand tolling. In New Jersey, New

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Hampshire, and Ohio—states with long-established toll roads—state officials said the presence of tolls has instilled public opposition to them. For example, New Jersey officials told us that opposition to new toll roads is strong because many state border crossings and major highways are already tolled. In other cases, DOTs face political opposition to tolling. In Mississippi, where other toll projects are still being considered, the state DOT withdrew its application to toll Interstate 10 under the Interstate System Reconstruction and Rehabilitation Pilot Program in response to political opposition.

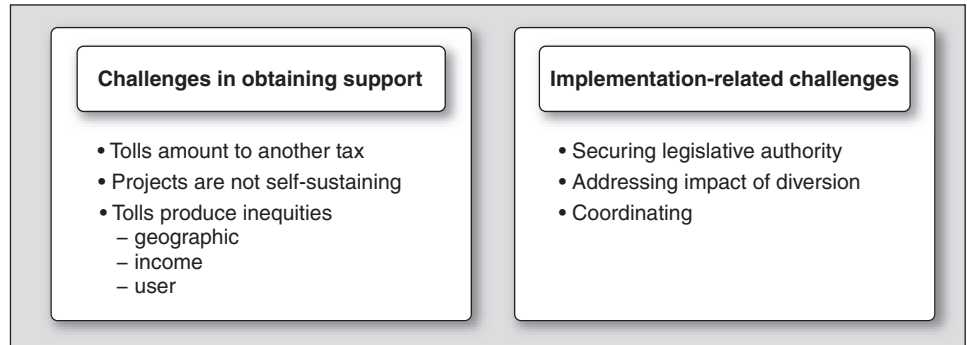
States that do not toll and are not planning to construct toll roads have also chosen options other than tolling to finance highway construction and maintenance. For example, 13 states that are not planning toll roads have used “GARVEE bonds” as grant anticipation financing to borrow funds and pledge future federal-aid highway revenues for repayment. South Carolina used state infrastructure bank loans and federal credit assistance, along with state and local funds, for its “27 in 7 Accelerated Program” through which it is completing \$5 billion worth of highway infrastructure capacity and improvements in 7 years, compared with the 27 years it estimated would be needed under conventional financing means. A smaller number of states, such as Iowa and Tennessee, have remained committed to a primarily pay-as-you-go approach, building new capacity only when money becomes available through motor fuel tax revenues or other state revenues.

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## States That Are Considering and Implementing a Tolling Approach Face Two Broad Types of Challenges

Drawing on our analyses of states’ experience with tolling and on a review of selected published research on tolling, we have identified two broad types of challenges that transportation officials have encountered when attempting to implement tolling: (1) the difficulty of obtaining political and public support in the face of opposition from the public and political leaders and (2) the difficulty of implementing tolling given a lack of, or overly restrictive, enabling toll legislation; concerns about potential traffic diversion resulting from toll projects; and a need to coordinate with other states and regions when toll projects cross jurisdictional boundaries. (See fig. 8.) While these two broad types of challenges may make a tolling approach difficult to adopt or implement, states have nevertheless identified specific ways to resolve or mitigate the challenges. We discuss the strategies that states have used to address tolling challenges in the following section of this report.

**Figure 8: Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

## Garnering Political and Public Support Is the Most Often Cited Challenge to Tolling

State transportation officials who are implementing or are considering implementing tolling say that garnering political and public support is perhaps the greatest challenge to tolling. Some studies have also reported this challenge. For example, in a recently issued report, the Transportation Research Board cited studies that identified the unpopularity of toll roads and public skepticism as fundamental obstacles to employing a tolling approach.<sup>28</sup> The report identified the inconvenience of paying tolls, being forced to pay twice, and inequities that a tolling approach would produce as the most commonly expressed objections.<sup>29</sup> The Congressional Budget Office noted in its report that opponents of toll roads often charge that such roads are unfair to motorists with low incomes who may not be able to afford them. This concern is intensified if it involves trips to work and the motorist has few alternatives.<sup>30</sup> In a policy brief issued by the Brookings Institution, the author notes that a drawback of tolls is that people think these tolls would be just another tax, forcing them to pay for something

<sup>28</sup>Transportation Research Board, "Special Report 285: The Fuel Tax and Alternatives for Transportation Funding" (Washington, D.C.: 2005).

<sup>29</sup>At the same time, the study acknowledged that the evidence on public opinion is mixed and that some toll roads find public acceptance.

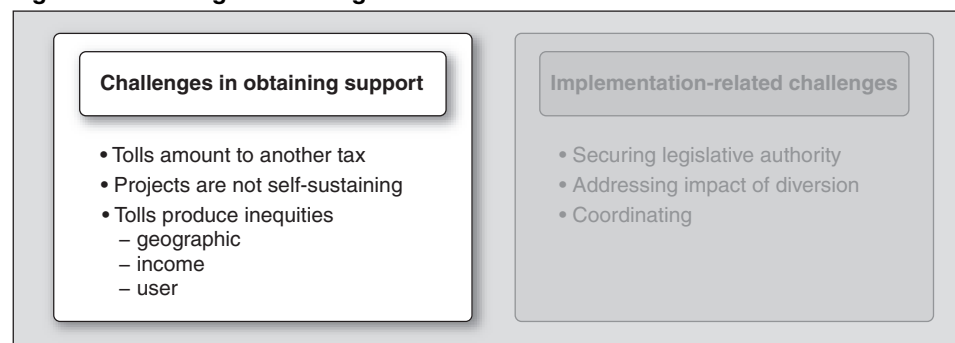
<sup>30</sup>Congressional Budget Office, *CBO Memorandum: Toll Roads: A Review of Recent Experience* (Washington, D.C.: February 1997).

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they have already paid for through gasoline taxes.<sup>31</sup> We have also noted in prior work that political opposition to tolling has been substantial because of concerns about equity and fairness.<sup>32</sup> According to our analysis, a number of factors influence public and political perceptions about tolling. (See fig. 9.)

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**Figure 9: Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

**Double taxation arguments.** The most frequent objection to tolls is the argument that motorists traveling on toll roads are being asked to pay twice; that is, a new roadway toll is being levied in addition to existing taxes. States have a number of dedicated sources of revenues that are used to finance highway capital programs. According to transportation experts, the public generally believes that transportation costs are already being paid for through motor fuel, property, and sales taxes, as well as license and registration fees, and in the case of trucks, special tire taxes and weight-distance fees. Therefore, new road user fees, such as tolls, are often viewed as new taxes.

Transportation officials in a number of states reported that concerns about double taxation limited their consideration of a tolling approach to varying degrees. In Wisconsin, where tolling is not being implemented, a transportation official told us that the public understands that the fuel

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<sup>31</sup>The Brookings Institution, *Policy Brief: Traffic: Why It's Getting Worse, What Government Can Do* (Washington, D.C.: January 2004).

<sup>32</sup>[GAO-03-735T](#).

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excise tax and other user fees are used to fund highway construction. Therefore, the public would view tolling as another tax being imposed on them. This type of concern can be compounded when tolls are being proposed for an existing facility. For example, in Missouri, consideration of tolling to pay for Interstate 70's reconstruction faced opposition, in part, because the public believes that the interstate highway has already been paid for, according to state DOT officials. Missouri citizens generally regard tolls as government's way of making users pay again, according to state transportation officials. This view is supported by Missouri's history of commitment to free roads. Citizens in Texas have voiced similar arguments against tolls. In Houston, for example, plans to convert State Highway 249 to a tolled road have met with some resistance on the grounds of double taxation. At the public hearing organized to hear views on the conversion, officials estimated that an overwhelming majority of those in attendance were against the conversion because they felt that the road had already been paid for. Strong opposition can arise even before a roadway has been completed. A proposal to toll a nearly completed portion of U.S. Route 183 north of Austin was retracted after citizens expressed strong opposition. Transportation officials told us that these citizens believed that since the road was nearly complete, introducing tolls would amount to double taxation.

**Projects are not self-sustaining.** Transportation officials told us that they often find it difficult to demonstrate that tolling is reasonable and necessary because revenues collected from toll projects usually do not fully cover project costs. In Oregon, for example, a financial analysis of toll proposals indicated that the proposals under consideration would not be economically feasible through the collection of tolls alone, according to transportation officials. A private consortium was selected to negotiate with the state DOT for the purpose of advancing the projects. However, in the view of this consortium, the new toll road can be financially viable only if existing parallel roads are tolled. In some states, transportation officials stated toll projects are not even considered unless it can be demonstrated that the project will be self-sustaining. In Kentucky, for example, a transportation official told us that traffic volumes alone can rarely financially sustain rural roads through tolling and emphasized that it would be difficult to garner public support for a toll project that required partial subsidization. A transportation official in Arkansas told us that while tolling is considered if revenues fund at least 20 percent of initial construction costs, a toll project would only be considered if it can be shown that toll revenues would cover all operations and maintenance costs. In Florida, toll proposals must pass a financial feasibility test and

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prove that the proposed projects will be self-sustaining before the projects are further considered for advancement. According to Florida Turnpike Enterprise officials, the standard for feasibility is that by the twelfth year of operation, projected revenues must cover at least 50 percent of operating costs and debt service and by the twenty-second year of operation, projected revenues must cover all costs and debt service.

**Concerns about inequities.** Another objection to the use of tolling involves concerns about the inequities that the approach would produce. According to our review, groups that could be adversely affected by tolling often object, as follows, on the basis of geographic inequity, income inequity, and user inequity:

- **Geographic inequity.** Concerns about geographic inequity reflect the belief that certain regions will benefit disproportionately from a tolling approach while other regions will be unfairly disadvantaged. Using a tolling approach to address a transportation need in one part of a state might free up federal and state funding that might have otherwise been used to address that need. This available federal and state funding could then be used to support roads in another part of the state, creating an unfair burden on those motorists that are being tolled. In Florida, for example, there have been concerns about the distribution and use of funds collected for projects in one region (southern Florida) being distributed to and used for projects in another region of the state (northern Florida). In the 1990s, three southern counties—Palm Beach, Broward, and Dade—secured legislation that would require the Florida Turnpike Enterprise to calculate the dollar amount collected in those counties and determine how much of that amount was returned to the counties to be used on their facilities. As a result, the Florida Turnpike Enterprise created a formula to implement that law, reflecting the need to balance collections in those counties with what is being spent on facilities in those counties.
- **Income inequity.** Concerns about the unequal ability of lower-income and higher-income groups to pay tolls are often cited by transportation experts as an important political barrier to the



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acceptance of a tolling approach.<sup>33</sup> Those opposing tolls on the basis of income inequity argue that since tolls would represent a higher portion of the earnings of lower-income households using the tolled road, tolling imposes a greater financial burden on them and, therefore, is unfair. In Maryland, this concern resulted in removing HOT lanes from consideration in state transportation plans, according to FHWA. In June 2001, the governor decided to remove HOT lanes from the state transportation plan because of the perceived inequity of linking an easier commute with a person's ability to pay. However, in the following year, the governor's office initiated a revised feasibility study of value pricing that included investigating and addressing the equity issues that were raised earlier, while encouraging the air quality and congestion relief benefits of HOV lanes.

- **User inequity.** User inequity involves the belief that some classes of system users are being unfairly disadvantaged. The trucking industry, freight industry, and businesses may view tolling in this light. For example, a transportation official in Virginia told us that a proposal to toll only trucks on Interstate 81 is generally viewed by truckers as an unfair burden being imposed on them. This transportation official also noted that if the proposal is implemented, truckers will seek alternative routes to avoid the tolls. In Missouri, officials representing fuel marketers, fuel retailers, gas stations, and convenience stores told us that they consider a tolling proposal unfair. According to the industry officials, these businesses have spent millions of dollars on their exit locations along the interstate and believe they have paid their fair share of taxes. Consideration of a tolling approach to enhance mobility on the interstate could potentially have an adverse impact on these businesses because some customers may choose alternative routes.

**General views on government.** According to transportation officials with whom we spoke, public opposition to tolling can be exacerbated by a

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<sup>33</sup>Transportation Research Board, "Special Report 285: The Fuel Tax and Alternatives for Transportation Funding" (Washington, D.C.: 2005) and *Road Value Pricing: Traveler Response to Transportation System Changes* (Washington, D.C.: October 2003); Brookings Institution, *Traffic: Why It's Getting Worse, What Government Can Do* (Washington, D.C.: January 2004); Congressional Budget Office, *CBO Testimony: Congestion Pricing for Highways* (Washington, D.C.: May 6, 2003) and *CBO Memorandum: Toll Roads: A Review of Recent Experience* (Washington, D.C.: February 1997); and [GAO-03-735T](#).

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mistrust of government generally. They said that when government proposes tolls as a way to finance transportation, the public generally considers the tolls as a new tax.

This mistrust can also be directed specifically at state transportation departments. For example, in 1992, the Missouri DOT proposed a 15-year plan that included a number of promised projects that would be undertaken with an increase in the state's gas tax. However, according to state transportation officials, after gaining support for the increase, the state DOT did not deliver the promised projects as scheduled. These officials said this failure to deliver contributed to the public's mistrust of the DOT and its resistance to attempts by the DOT to secure toll authority over the years. In some states, concerns about the cost and management of major highway and bridge programs have reflected dissatisfaction with the performance of state transportation departments. For instance, as we reported in 2002, a legislative commission in Virginia reported on cost overruns and schedule delays in the state's highway program in 2000 and found that cost estimates prepared for projects were substantially below the final costs. This commission identified a potential funding gap of around \$3.5 billion in the state's \$9 billion, 6-year transportation plan. Such concerns about past performance can present challenges for transportation officials who are attempting to advance a tolling approach.

Mistrust can also extend to private entities involved in toll road development. As we reported in 2004, states engaging private-sector sponsorship and investment can relinquish political control over their ability to set toll rates and to carry out infrastructure improvements on competing publicly owned roadways. For example, California could not make any improvements along State Route 91—a project privately financed with a combination of equity, bank, and institutional debt—until the year 2030 because a noncompete clause created a 1.5 mile protection zone along each side of the corridor. According to officials from the Orange County Transportation Authority, public pressure on the state DOT to improve the nontolled portion of the road motivated the county to purchase the road back from the private consortium.

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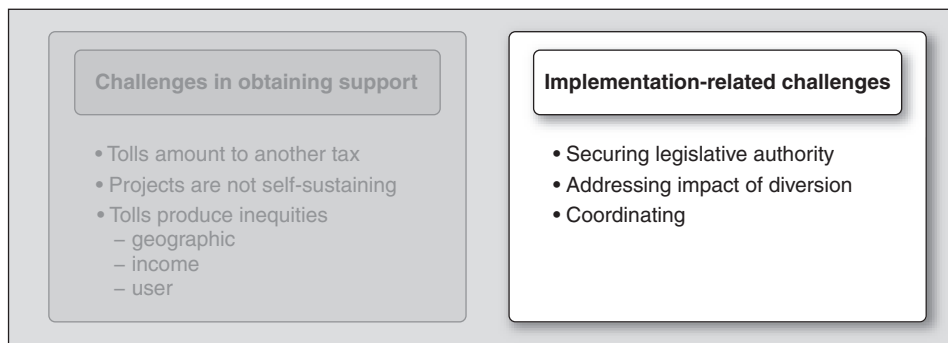
## State and Local Transportation Officials Face Formidable Challenges in Implementing Tolling Approaches

In some states, transportation officials told us that they face challenges in implementing toll projects. (See fig. 10.) We identified the following three implementation-related challenges:

- Secure legislative authority to toll.
- Address the impact of traffic diversion caused by tolling.
- Coordinate with other states or regions.

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**Figure 10: Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

**Secure the authority to toll.** Not having, or having restrictions built into, enabling toll legislation poses a challenge for some transportation officials as they develop tolling options. They told us that limited legislative authority for tolling hampered their ability to consider a full range of options to address the transportation needs in their states. Ultimately, these transportation officials sought methods other than tolling to address transportation needs or delayed the development of an identified toll project as they pursued tolling legislation.

Missouri's experience illustrates the challenges transportation officials face when the state DOT does not have the statutory authority to use a tolling approach to advance a project. State transportation officials are considering turning Interstate 70 into a toll road to finance capacity improvements. However, voters would first have to approve an amendment to the state constitution to put toll roads under the state DOT's jurisdiction—a measure that voters rejected in 1970 and 1992. To avoid another rejection, state DOT officials are exploring alternative financing

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methods under existing authority, including the use of a nonprofit corporation to build, operate, and maintain the toll project. Transportation officials emphasize, however, that under this option, the entity would not be able to spend state highway revenues for the project—the same restriction that would prevent the state DOT from advancing a toll project—because state funds can be used only for the purposes enumerated in the state constitution, and toll roads were not one of those purposes.

Restrictions in enabling legislation can also hamper attempts to implement toll projects. For example, in the mid-1990s, the Minnesota legislature authorized a study of public-private partnerships and tolling as one approach to address congestion and leverage state transportation investments. In conjunction with that study, the state DOT requested public-private partnership tolling proposals and received five proposals in response from private firms. Ultimately, the state DOT recommended a proposal to build Trunk Highway 212 as a toll facility and proceeded to complete a development agreement with a private partner. However, the proposal was vetoed under the provision of the enabling legislation that gives veto authority to local units of government affected by a project. As a result, the Trunk Highway 212 project is now being completed under traditional methods and, according to transportation officials, is taking longer to complete due to funding limitations. New legislation, passed in 2003, eliminated the local veto authority for converting HOV lanes to HOT lanes on existing facilities, giving transportation officials more flexibility to implement a tolling approach. This legislation, which followed a DOT study of HOV lane usage on Interstate 394, authorizes the conversion of the HOV lanes on Interstate 394 to HOT lanes to improve their efficiency. Subsequently, through a design-build-operate agreement, a private partner was secured to bring resources to the table and run the operation.

**Address concerns about traffic diversion.** Traffic diversion resulting from tolling may adversely affect people, municipalities, and businesses. Concerns about such diversion have surfaced in comments by municipalities, businesses, and the trucking industry on a proposal to toll trucks on Interstate 81 in Virginia, according to state transportation officials. Affected Virginia municipalities have suggested, for example, that trucks will leave the interstate to avoid tolls and wind up on local roads. Such diversion has the potential to create congestion, increase accident and fatality rates, and increase the municipalities' costs of maintaining these roads. The affected municipalities have also expressed concerns about the potential negative effects on economic development that may

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result from the loss of business along toll routes. According to a recently completed study that considered a number of different proposals, traffic diversion is likely to occur if Interstate 81 is tolled.<sup>34</sup> The study estimated that up to one in four trucks would divert to nearby parallel routes if a high toll rate<sup>35</sup> was applied to commercial vehicles.

Concerns about traffic diversion are not limited to new toll roads. The Ohio Turnpike opened in the 1950s and, in the 1990s, traffic studies revealed that commercial vehicles were increasingly diverting onto parallel untolled roads, creating safety and other concerns. In response, the governor released the Northern Ohio Freight Strategy in October 2004, which included a policy to reduce tolls on commercial vehicles in order to redirect traffic back to the Ohio Turnpike. Subsequent traffic studies revealed this strategy was mostly successful.

**Coordinate on projects that involve multiple states or jurisdictions.**

Coordination among states and regional jurisdictions is likely to become a growing issue because increasing traffic congestion in metropolitan areas is likely to require regional solutions. Without good coordination with neighboring jurisdictions, individual jurisdictions may find it difficult to solve traffic congestion. Even if one jurisdiction manages to reduce congestion within its system, it may simply shift that congestion to an adjacent jurisdiction. Yet numerous factors could make coordination difficult. For example, the need for coordination is especially critical if states adopt separate tolling legislation with varying, perhaps incompatible, provisions and begin tolling. Other potential challenges include ensuring the interoperability of toll collection facilities when toll proposals involve more than one state, addressing differences in state toll legislation, and mitigating geographic inequities by fairly apportioning the anticipated benefits and disadvantages of toll projects among all stakeholders.

Oregon's experience illustrates how some of these issues might present challenges for transportation officials who are attempting to advance interstate toll projects. Oregon officials cited differing statutory authorities

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<sup>34</sup>U.S. DOT, Federal Highway Administration, and the Virginia Department of Transportation, *I-81 Corridor Improvement Study: Tier 1 Draft Environmental Impact Statement*, November 28, 2005.

<sup>35</sup>The study estimated that 12 percent would divert to nearby parallel routes if a low toll rate was applied to commercial vehicles. The study used a high toll rate of \$0.07 per mile per axle and a low toll rate of \$0.04 per mile per axle.

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between Oregon and neighboring Washington as a potential coordination issue. In Oregon, transportation officials have the authority to enter into PPPs when advancing a tolling approach, while their counterparts in Washington do not yet have the authority to do so if proposals for partnerships are unsolicited. As a result, stakeholders involved with the Columbia River Crossing Project on Interstate 5, which Oregon officials are attempting to pursue as a toll project with a private partner, are seeking to promote legislation in both states that will provide explicit authorization to advance the project. The Oregon officials also noted that coordination would be necessary to address geographic inequities that might arise from the project, explaining that more of the toll revenues could come from Washington, since motorists there commute into Portland. Transportation officials in both states will need to take this into account as they work towards an equitable apportioning of the project's costs and benefits.

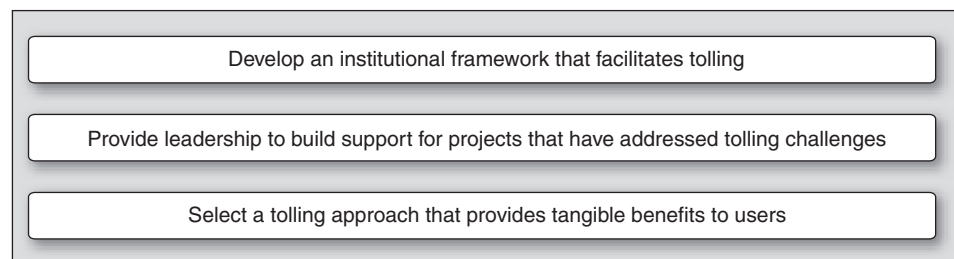
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## Three Broad Strategies Can Help State Transportation Officials Address Challenges to Tolling

As shown in figure 11, our review of state practices in implementing tolling suggests three broad strategies that can help transportation officials address challenges to its adoption and implementation. These strategies have both short-term and long-term relevance for states as they consider new transportation finance options to supplement traditional approaches. Transportation officials in states that are currently implementing or considering tolling as a means to raise revenue or mitigate congestion can consider these strategies in the short term to build support and smooth implementation of the tolling approaches under consideration. In the longer term, transportation officials in states that are not currently tolling, but choose to begin to do so, can consider these strategies to build support for tolling.

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**Figure 11: Strategies to Address Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

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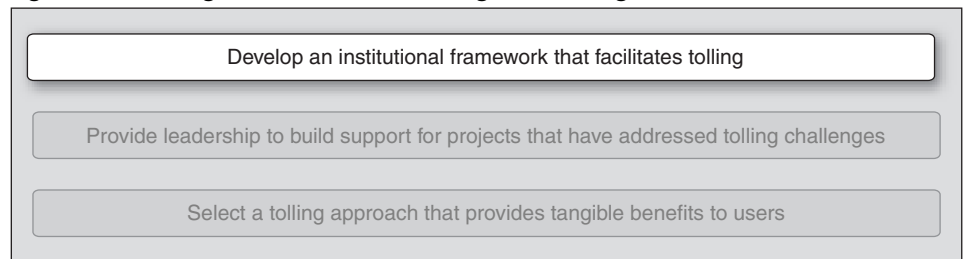
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## Develop an Institutional Framework That Supports Tolling

The first strategy that transportation officials can consider involves developing an institutional framework that facilitates tolling. In developing such a framework, transportation officials can consider building support for a tolling approach with the public and decision makers in the state and securing enabling tolling legislation. (See fig. 12.) Developing such a framework through these two means involves identifying and articulating the goals to be achieved by the tolling approach in the context of larger state policy goals.

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**Figure 12: Strategies to Address Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

**Building support.** Building support for a tolling approach includes two interim steps—establishing a rationale for tolling and defining the underlying motivations for its use. Together, these steps provide a basis for gaining political and public support before seeking and securing adequate tolling legislation.

Establishing a solid rationale for tolling involves linking the specific reasons, or goals, for tolling with state policy goals for transportation.<sup>36</sup> For example, linking a tolling goal, such as managing congestion, to a broader state goal, such as using existing infrastructure more efficiently, can provide a basis for its use. Similarly, a tolling goal of supplementing transportation funding with new revenues could contribute to a broad state

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<sup>36</sup>This discussion of tolling goals assumes that the approach makes economic sense and is a viable and reasonable option for making transportation improvements in the state. It also assumes that all options under consideration for transportation improvements have been assessed in an adequate context. When it is determined that a tolling approach is a viable and reasonable option for making transportation improvements and should, therefore, be made available as another tool to finance transportation, the development of tolling goals can help transportation officials strengthen their case for tolling.

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policy goal of funding investment in transportation systems with revenues generated directly from users.

Articulating the underlying motivations for using a tolling approach can also help transportation officials build support for and accomplish broader transportation goals and tailor tolling goals to accomplish those ends. For example, consideration of a tolling approach might be motivated by a desire to accomplish other goals, such as finding a replacement for the gas tax or attracting private investment for transportation. Irrespective of the motivations that guide the development of the goals, advocates of tolling have to make a compelling case for its use to build public acceptance for it and make it politically viable. Goal setting can help transportation officials articulate the motivations for using the approach, identify the goals to be achieved by its use, and demonstrate how the tolling goals will tie into broader state goals. Such a process can help decision makers formulate a transparent and comprehensive rationale for the use of tolling and gain public and political support for it.

**Secure legislative authority.** Securing tolling legislation is the next step in developing an institutional framework for tolling. Although there are common reasons for tolling, the form legislation takes in each state often depends on the motivations for using the approach and ultimately the goals to be achieved through it. Our review of legislative efforts in Texas, Virginia, Oregon, and Florida illustrates how legislation evolved in response to different motivations and tolling goals. Following are some of these legislative efforts:

- **Leveraging transportation dollars.** Texas enacted legislation that provided for a broader application of tolling than currently existed and established a funding mechanism that supported a broader use of tolls in the state's transportation system.<sup>37</sup> This legislation facilitates tolling by realizing two goals—to expand the use of tolling and to leverage tax dollars by allowing state highway funds to be combined with other funds to build toll roads. This combination of funds makes toll roads more feasible, since the entire cost of the project does not have to be repaid with tolls. Virginia's Public-Private Transportation

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<sup>37</sup>2003 Tex. Sess. Law Service, Ch. 1325. The bill provided for the establishment of the TTC, establishment of guidelines for the creation of Regional Mobility Authorities, use of PPPs, provision of toll equity money for new toll projects, and application of tolls on nontolled roads.



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Act of 1995 (PPTA) allows qualifying local governments and certain other political entities to enter into agreements authorizing private entities to acquire, construct, improve, maintain, and operate qualifying transportation facilities. The public entities may either solicit or accept unsolicited proposals from private sources. Private-sector sponsorship and investment in transportation projects could help states realize both an established tolling goal to accelerate project delivery and a goal to leverage tax dollars by securing private investment in transportation projects.

- **Operating like a business.** In some cases, there is a motivation to “reinvent government” by operating in a more businesslike manner. Public agencies of all types have pursued innovation and best practices found in the private sector to improve the cost-effectiveness and timeliness of product delivery. A goal that embodies these motivations can take many forms in legislation. In Florida, for example, legislation was passed in 2002 that turned the Florida Turnpike, operated by the Florida DOT, into a business organization as a way to preserve, improve, and expand the turnpike system. State decision makers were interested in operating the turnpike as a business for the state and employing private-sector methods in the areas of management, finance, organization, and operation. The goals for the enterprise are to increase revenues, expand capital program capabilities, and improve customer service.
- **Transitioning to a new system of transportation finance.** The sustainability of the current financing system has been called into question, and as we have reported, a fundamental reexamination of the present system will be necessary to increase the cost-effectiveness of spending and to mitigate congestion.<sup>38</sup> Some transportation experts believe that shifting to a fee structure that more directly charges vehicle operators for their actual use of roads would improve the operation of the road system and better target investment. For example, Oregon’s efforts to explore mileage charges provide some insights into how legislation can be developed to carry out such an ambitious goal. A road user fee proposal, passed by the state legislature in 2001, created a user fee task force to design a method of charging drivers for their use of the state’s roads as an

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<sup>38</sup>GAO, *21<sup>st</sup> Century Challenges: Reexamining the Base of the Federal Government*, GAO-05-325SP (Washington, D.C.: February 2005).

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alternative to the current system of gas taxes. The task force proposed the eventual imposition of a mileage fee in place of existing gas taxes and pilot testing for the mileage fee as the first step toward implementation. An institutional framework, such as the framework under development in Oregon, can help states that are seeking to test or implement new methods of highway financing to realize such goals.

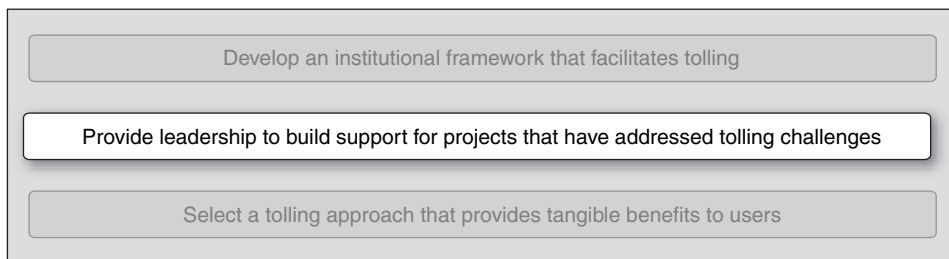
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### Provide Leadership to Build Support for Individual Projects and Address Tolling Challenges in Project Design

The second strategy that can facilitate the use of tolling involves implementing two interrelated and critical components: (1) providing leadership to build support for and advance individual projects and (2) addressing challenges to tolling in project design. (See fig. 13.) We have found that having a strong advocate or advocates—committed both to building support for projects and to ensuring that the projects move forward—is crucial to the success of a project. A corollary to providing committed leadership is ensuring that leaders endorse those projects that most effectively address challenges to tolling in project design.

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**Figure 13: Strategies to Address Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

**Providing leadership.** Although leadership can take different forms, our review revealed that a strong advocate can help build support for a toll project. Transportation agency representatives or political leaders are likely candidates to move a project to public acceptance. For example, in Texas, the Governor and key legislators took the lead in developing and supporting initiatives that would facilitate the use of tolling to finance highway construction. Their efforts led to the enactment of legislation that enabled the state DOT to invest in toll projects. In Indiana, the Governor and the DOT Commissioner have supported tolling as an approach to finance transportation projects by promoting it in the media and in the

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legislature. However, in some instances, public distrust of political and governmental agencies may require a leader to emerge from another arena. For example, in Minnesota, a task force of state and local officials, citizens, and business leaders was convened in 2001 to explore a range of road pricing options, including the conversion of HOV lanes to HOT lanes, and make recommendations to elected officials. Since tolling had been fairly controversial in the past, decision makers believed that a task force would provide a more credible and independent voice to the general public. Ultimately, the task force supported HOV to HOT conversions, and with the Governor's support and the passage of legislation authorizing the conversion, the Interstate 394 HOT lanes project was implemented.

As a spokesperson for a project, a leader can explain to the public how tolling will address a state's particular transportation situation. Through the communication of essential ideas and values that a toll proposal encompasses, support for the project can be solidified. Communicating the benefits that tolling can provide for motorists, such as increased efficiency, travel time savings, and choices about when and where to drive, could increase the likelihood of buy-in from the public and political leaders. For example, after examining congestion pricing options in Minnesota, a task force of state legislators, mayors, as well as business, environmental, and transportation leaders recommended that the state should proceed with a demonstration project. This led to the passage of legislation in 2003 supporting the conversion of HOV lanes on Interstate 394 into optional toll lanes, which would allow solo drivers to access the HOV lanes for a fee. With the help of a communications consultant, a project team led by the University of Minnesota's Hubert H. Humphrey Institute worked to address the concerns of the public and communicate the benefits of the project to the general public. The primary benefits of the project that were conveyed included free access and priority for carpools and bus users, premium speeds in express lanes that are maintained by tolls that vary with demand, and access to the express lanes to single-occupancy vehicles willing to pay a toll. Surveys conducted prior to project implementation revealed that 69 percent of those surveyed were aware of and understood the purpose of the project, and 64 percent believed that allowing single-occupancy vehicles to use the carpool lanes by paying a toll was a good idea. A leader can also stress that tolls can help make up for shortfalls in public funds, allowing needed highway improvements to be completed sooner. According to some transportation officials, this point is particularly relevant when the public does not share a state transportation leader's view of the state's needs, or of the challenges associated with addressing those needs within the current fiscal environment, or both.

One effective way to communicate the benefits of tolling is through organized public education, outreach, and marketing efforts. Through such efforts, the public can be informed about the transportation situation in the state and the various options that are available to address transportation needs. For example, in California, strong political figures, as well as state and local officials, acted as champions for individual toll projects. Seeking to maximize the efficiency of the transportation system through congestion pricing, these leaders and officials promoted two congestion pricing projects—the Interstate 15 project and the State Route 91 project—using public education and outreach to inform the public about the objectives of the projects and to demonstrate how the objectives would be achieved.

**Addressing challenges.** In identifying toll projects to promote, responsible leaders will likely be interested in projects that mitigate the challenges to tolling. Therefore, addressing concerns about double taxation, inequity, diversion, and coordination in project design can help transportation officials build support for toll projects and secure committed advocates for the projects.

When considering a tolling approach, transportation officials can identify ways to effectively address identified challenges and gain a better understanding of the potential impact of the approach through data collection and analysis. Understanding the potential effects of a toll project on traffic flows, specific groups, business activity, and commercial transportation can be particularly useful to transportation officials as they build measures into the project’s design to address identified challenges. Table 2 includes examples of questions and data needs that transportation officials might consider as part of their data collection and analysis.

**Table 2: Questions That Can Be Considered When Planning and Designing Toll Projects**

Question	Purpose
How will traffic be diverted and who will suffer?	Analyzing how tolls would affect personal, business, and commuting trips could help decision makers estimate the extent to which traffic would be diverted. From these estimates, transportation officials can develop strategies to address the impact of this diversion on affected groups.
To what extent will tolls meet the project’s goals?	Determining the extent to which tolls will meet the project’s financial and other goals could help project sponsors make decisions about setting the proper toll. If tolls are too low, they will not generate enough revenue to pay for the project or, in the case of congestion pricing, they will not divert sufficient traffic to relieve congestion.

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(Continued From Previous Page)

Question	Purpose
Who loses and how do we compensate them?	Analyzing the effects that a toll project might have on specific groups enables transportation officials to address many questions about the equity consequences of the project. The data that could be collected include important household and lifestyle characteristics, including (but not limited to) income, residential location, commuting patterns, number of vehicles, number of workers, family size, annual travel, and employment type and location. Without these data, it would be difficult to estimate the consequences for the groups that could be most affected. Analysis would provide better estimates of the extent to which a tolling approach would shift drivers to carpools and transit and would provide more insight into how transit operators might be able to expand service and how transit service might benefit lower-income users.
How will the project affect business activity and commercial transportation?	Given the importance of transportation to the economy of metropolitan areas and the widespread perception that congestion increases business costs, transportation officials could consider examining the impact of tolling on business activity and commercial transportation when considering the use of a tolling approach. However, this can be difficult for transportation officials because little is known about the magnitude of congestion costs. <sup>a</sup> Factors affecting this include the logistics patterns of firms; the frequency, origin, and destination of trips; and the ability of firms to adapt to congestion without affecting costs. Research on how a tolling approach would affect commercial carriers operating on those facilities could also provide some insights.

Source: GAO analysis of relevant literature.

<sup>a</sup>Transportation Research Board, *Curbing Gridlock: Peak-Period Fees to Relieve Traffic Congestion* (Washington, D.C.: January 1994).

To address general objections to tolling, transportation officials can also consider potential arguments that might be raised on the grounds of double taxation and inequity and think about ways to address these arguments. Addressing these types of concerns is complex because the fairness of shifting to tolling depends on the fairness of the existing system of finance and on how it would be changed by a shift. It can be argued, particularly in states where sales and property taxes are important sources of financing for the transportation system, that the existing system is not very equitable. In contrast, a tolling approach raises revenues directly from those users willing to pay for the service. Furthermore, the economics literature suggests that concerns about inequity can be mitigated to some degree if revenues are distributed in a way that addresses those concerns.

Transportation officials can address concerns about double taxation and inequity during project design as a way to counter potential opposition on these grounds. Setting goals for a project that reflect its intended purpose and addressing any key challenge that could affect the achievement of the goals can help transportation officials directly respond to the concerns. For example, if the project goal is to use a tolling approach to relieve congestion, transportation officials could set the toll to reflect the external

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costs associated with peak period use of the road, and the toll revenues could be dedicated to maintaining, operating, and adding capacity to the facility. This approach might convince users that the toll is not just another tax that would be used for other purposes. In contrast, if the project goal is to address inequities, revenues could be distributed quite differently. Revenues could be distributed to disadvantaged groups in the form of tax rebates or improvements in roads and transit in certain areas. If businesses in specific areas are adversely affected by a project, toll revenues might be used to improve transportation services in those regions. For the Interstate 394 HOT lanes project, state decision makers established the project goals of improving efficiency and maintaining free-flow speeds for transit and carpools using the converted HOV lanes. These goals led to decisions on how the toll revenues would be distributed. The law requires that half of the excess revenues generated from HOT lane facilities be used to improve and maintain transit service.

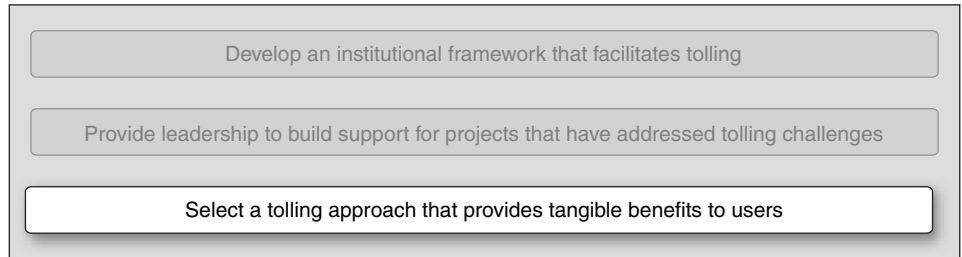
Addressing the coordination issues involved in designing regional and multistate projects is perhaps more daunting. No ideal institutional mechanism appears to be available for managing a regional program; nevertheless, some states have created new institutions to address interstate coordination issues. For example, Oregon and Washington formed a bistate task force to coordinate planning for improvements that cross state borders. The task force includes officials from both state governments, representatives from the affected metropolitan planning organizations (MPO), members of the business community, and residents of each state. The task force is charged with considering all modes of transportation that could potentially ease congestion and improve capacity on Columbia River crossings. The two states are jointly conducting environmental impact studies on highway expansion and transit improvements. The Oregon and Washington DOTs, the Portland and Vancouver MPOs, and the transit authorities from both states are jointly leading this study on the impact of capacity enhancement. Involving officials from both states in evaluating the project can help ensure that projects are equitable and effective in addressing the needs of both states.

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### Select a Tolling Approach That Provides Tangible Benefits to Users

When proposing a tolling approach, transportation officials should consider promoting one that will produce tangible benefits to users while justifying both the costs of the project and the fees that users will be required to pay for the service. (See fig. 14.) The prospect of such benefits increases the likelihood of the project's acceptance and can help allay general objections to tolling.

**Figure 14: Strategies to Address Challenges to Tolling**



Source: GAO analysis of information provided by state transportation officials.

Although tolling can take different forms and decisions about its use are state specific, transportation experts have noted that projects that use congestion pricing offer predictability and choice to the user and may be less likely to arouse fierce opposition than projects that offer no new benefits or choice.<sup>39</sup> For example, HOT lane projects, which include both priced and free lanes, offer the benefit of faster trip times for a price in HOT lanes and the choice of a “free,” but probably slower, trip in general purpose lanes. Pricing the entire facility might result in more efficient rationing of limited space on congested roads,<sup>40</sup> but congestion tolls on entire facilities or networks tend to meet with resistance despite their economic efficiency. HOT lanes, on the other hand, may be less likely to encounter resistance because they offer premium service for those willing to pay the fee. While actual experience with road pricing in the United States is still fairly limited, proponents of HOT lanes cite several benefits as follows:<sup>41</sup>

<sup>39</sup>GAO-03-735T; Transportation Research Board, “Special Report 285: The Fuel Tax and Alternatives for Transportation Funding” (Washington, D.C.: 2005); Reason Foundation, *Building a Case for HOT Lanes: A New Approach to Reducing Urban Highway Congestion* (Los Angeles, CA: April 1999); and FHWA, *A Guide for HOT Lane Development* (Washington, D.C.: March 2003).

<sup>40</sup>Economists say that in deciding to drive on a congested highway, each road user is inherently imposing external costs on other road users by causing delay. A congestion toll requires motorists to take account of those costs.

<sup>41</sup>Federal Highway Administration, *A Guide for HOT Lane Development* (Washington, D.C.: March 2003); Transportation Research Board, *Road Value Pricing: Traveler Response to Transportation System Changes* (Washington, D.C.: October 2003); Reason Foundation, *HOT Networks: A New Plan for Congestion Relief and Better Transit* (Los Angeles, CA: February 2003) and *Building a Case for HOT Lanes: A New Approach to Reducing Urban Highway Congestion* (Los Angeles, CA: April 1999); and Senate Committee on Environment and Public Works, *Testimony on Peak-Hour Traffic Congestion*, March 19, 2002.

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- First, according to reports and studies issued by FHWA, the Transportation Research Board, the Reason Foundation, and the Brookings Institution, they provide a premium service for a fee to those travelers who have a special need and are willing to pay the fee. Through variable pricing, traffic flows freely even during the height of rush hours. The use of price and occupancy restrictions to manage the number of vehicles traveling on them enables HOT lanes to maintain volumes consistent with uncongested levels of service.
  - Second, studies and reports issued by FHWA and the Reason Foundation note that HOT lanes reduce traffic congestion in the general-purpose lanes by diverting some solo drivers to the HOT lanes, thereby benefiting those drivers who use conventional lanes.<sup>42</sup>
  - Third, according to FHWA and others, HOT lanes can make better use of underutilized carpool (HOV) lanes, thereby alleviating political pressure to decommission them. HOT lanes may provide an opportunity to improve the efficiency of existing or newly built HOV lanes by filling excess capacity that would not otherwise be used. At the same time, HOT lanes continue to serve as HOV lanes for carpools and buses.
  - Finally, reports and studies issued by FHWA and the Reason Foundation note that HOT lanes generate revenue for transportation improvements. Tolls can generate revenue for highway and transit improvements, such as Bus Rapid Transit.<sup>43</sup>

HOT lanes have been implemented on Interstate 15 in San Diego, State Route 91 in Southern California, the Katy Freeway and U.S. Route 290 in Houston, and Interstate 394 in Minneapolis. These cases illustrate how transportation officials have advanced projects seeking to achieve the

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<sup>42</sup>If diversion of traffic to HOT lanes reduces peak-period congestion in the general purpose lanes, the lower congestion may attract additional peak-period drivers in those lanes. These drivers might be people who previously used alternative routes, traveled at other times of day, or used mass transit to avoid the congestion, but who would prefer to use the general purpose lanes at peak periods if congestion in those lanes at those hours were reduced. The result may be as much congestion as before the HOT lanes were open because only when congestion returns to that level will other potential users of the general purpose lanes at peak periods no longer have this new incentive to switch to those lanes. For additional information, see Anthony Downs, *Brookings Institution Policy Brief #128: Traffic: Why It's Getting Worse, What Government Can Do* (Washington, D.C.: January 2004).

<sup>43</sup>Bus Rapid Transit refers to frequent bus service operating in special lanes.



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potential benefits that may result from the approach. For example, to guarantee free-flowing traffic, toll prices on the Interstate 15 HOT lanes project are set dynamically, changing every 6 minutes to keep traffic flowing freely in the HOT lanes. In providing motorists with choice and providing premium services, the State Route 91 Express Lanes provide a level of emergency and safety surveillance that, according to surveys conducted by the private firm operating the toll facility, some drivers choose to pay to use the toll lanes even when there is no congestion on the adjacent free lanes. To optimize the use of existing infrastructure, more productivity was sought on the Katy Freeway. HOVs are defined as cars with three or more people during certain peak hours. The Katy Freeway QuickRide program allows cars with two persons to use the HOV lanes if they pay a toll. Daily use by paying users has been between 150 and 200 vehicles for peak periods, and peak hour travelers using the facility save an average of 18 minutes compared with travelers on the nonpriced lanes.<sup>44</sup> Finally, linking the conversion of the HOV lanes to transit to increase mobility and equity was taken into account on the Interstate 394 and Interstate 15 projects. Toll revenues generated on the Interstate 394 HOT lanes are designated for facility and transit improvement and a large portion of surplus revenues on Interstate 15 are used for new bus service.

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## Concluding Observations

As congestion threatens the nation's mobility at a time when motor fuel taxes—the principal source of funding for highway improvements—have not kept up with rising costs, federal and state policy has generally been not to increase motor fuel taxes, and state and local decision makers are increasingly looking to a range of alternative mechanisms, including tolling, to advance their surface transportation programs. Over half the states have either adopted tolling or are seriously considering tolling—and this number may increase. A tolling approach can, under the right circumstances, be an attractive choice to state or local governments because of the range of potential benefits—generating new revenues, managing congestion, financing new capacity—that it may provide. But these potential benefits come only by honestly and forthrightly addressing the challenges that a tolling approach presents. State and local governments may be able to address these challenges by pursuing strategies that focus on developing an institutional framework that facilitates tolling, by demonstrating leadership, and by pursuing toll projects that provide tangible benefits to

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<sup>44</sup>North Central Texas Council of Governments, *Regional Value Pricing Corridor Evaluation and Feasibility Study* (Arlington, TX: June 2005).

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users. While perhaps not applicable to every state to the same degree or in the same way, these strategies form a basis for overcoming potential impediments to tolling and developing a meaningful and effective tolling approach that best suits the environment in each state.

In the twenty-first century, demographic trends will drive mandatory federal spending commitments and potentially overwhelm the ability of the federal government to deliver and grow its discretionary programs. This looming crisis requires a fundamental reexamination of existing government programs and commitments, and state and local governments will be challenged to consider new ways of delivering their programs. Regardless of the demand for highway improvements, sustained, long-term, large-scale increases in federal highway grants and state and local spending seem unlikely. In this context, a tolling approach is more than just finding new sources of money. Should states choose to undertake it, a tolling approach has the potential to promote efficiency in the use of infrastructure, allocate costs to users and capture revenue from beneficiaries, stimulate private financing and investment, and provide cost-effective solutions to mobility challenges if viewed as fair and equitable by the public.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Transportation for review and comment. Officials from the Department indicated that they generally agreed with the report and provided technical clarifications, which we incorporated as appropriate.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to congressional committees with responsibilities for transportation issues; the Secretary of Transportation; and the Administrator, Federal Highway Administration. We will also make copies available to others upon request. In addition, this report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

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If you or your staff have any questions about this report, please contact me at [heckerj@gao.gov](mailto:heckerj@gao.gov) or (202)512-2834. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix IV.

A handwritten signature in black ink that reads "JayEtta Z. Hecker". The signature is written in a cursive style with a large, stylized initial "J" and "H".

JayEtta Z. Hecker  
Director, Physical Infrastructure Issues

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# Objectives, Scope, and Methodology

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The objectives of this report were to examine (1) the promise of tolling to enhance mobility and finance highway transportation, (2) the extent to which tolling is being used in the United States and the reasons states are using or not using this approach, (3) the challenges states face in implementing tolling, and (4) strategies that can be used to help states address the challenges to tolling. We noted where federal programs have played a role in state tolling decisions and projects, but we did not evaluate the effectiveness of those programs.

To examine the promise of tolling to enhance mobility and finance highway transportation, we reviewed reports and studies issued by federal agencies and academia, as well as articles from relevant trade journals; relied on perspectives gained from our past work on transportation finance; and analyzed relevant studies and reports issued by transportation experts. To identify the issues related to the transportation system in terms of funding and mobility, we analyzed data on population patterns and growth from U.S. Census reports and vehicle miles traveled and motor fuel tax trends from the Federal Highway Administration's (FHWA) *Highway Statistics* reports for 1982 to 2004. We also analyzed data from the *2005 Urban Mobility Report*<sup>1</sup> to determine congestion levels and congestion costs for selected cities in the United States. To supplement the information obtained through our literature review, we interviewed officials of the American Automobile Association; International Bridge, Tunnel and Turnpike Association; the American Association of State Highway and Transportation Officials; and the Environmental Defense Fund.

To determine the extent to which tolling is being used in the United States, we designed and administered an Internet survey of state department of transportation (DOT) officials and performed a correlation analysis to examine the extent to which state financial and demographic characteristics are associated with their status on using tolling. (For more information about the correlation analysis, refer to app. II.) Our review focused on toll roads and therefore, did not include toll bridges and tunnels.

**Survey.** The questionnaire asked about each state's current and planned toll road facilities. We sent the questionnaire to the directors of state DOTs in 49 states and Washington, D.C. We did not send a questionnaire to the

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<sup>1</sup>Texas Transportation Institute, *2005 Urban Mobility Report* (College Station, TX: May 2005).

Louisiana DOT because we administered our survey only a few weeks after Hurricane Katrina struck New Orleans and the Gulf Coast.

To minimize nonsampling error, such as measurement errors that can be introduced when respondents do not understand questions or when they do not have information to answer a particular question, we undertook several quality assurance steps. Our social science survey specialists designed draft questionnaires and conducted pretests with state DOT officials in four states. During these pretests, we assessed the extent to which respondents interpreted questions and response categories consistently, the time respondents needed to complete the survey, and the extent to which respondents had the information needed to answer the survey questions. Using the results of these pretests, we revised the questionnaire.

We administered the survey to the directors of state DOTs via the Internet during September and October 2005, e-mailing the directors a Web link to our questionnaire and requesting that they or their designees complete it. We received responses from 49 states and Washington, D.C.—a 100 percent response rate. We analyzed the data using statistical software.

We compared the responses to key survey questions with information obtained from our interviews with state DOT officials and from state applications to the FHWA's tolling pilot program. In four instances, data from these sources were inconsistent. We contacted DOT officials in these states to resolve these inconsistencies and adjusted the survey results accordingly.

**Semistructured interviews.** To determine the reasons states use or do not use tolling, the challenges to tolling, and the strategies that have been used to address the challenges, we conducted semistructured interviews with state transportation officials from all states except Louisiana, and interviewed stakeholders in six states that we visited to determine the reasons states use or do not use the approach, the challenges to using the approach, and the strategies that have been used to address the challenges. We did not gather information directly from the public.

We developed a set of questions to ask in semistructured interviews of state transportation officials to gain more detailed information on states' reasons for tolling or not tolling and the challenges states face in tolling. Having visited 6 states and interviewing transportation officials there, and excluding Louisiana, we conducted semistructured interviews from the

remaining states. We did not interview transportation officials in Louisiana because our semistructured interviews were conducted shortly after Hurricane Katrina struck New Orleans and the Gulf Coast. To determine the appropriate state official to interview in each state, we relied on information from FHWA Division Administrators for the respective states. After gathering the information from FHWA, we contacted and interviewed the state officials and conducted our interviews. We analyzed the data from the semistructured to identify major themes.

**Site visits.** To supplement information from our survey and semistructured interviews, we visited six states that were in various stages of planning or constructing diverse types of toll projects. We selected the states for their diversity in terms of geography, transportation needs, and tolling plans. The states were Minnesota, Mississippi, Missouri, Oregon, Texas, and Virginia. We visited those six states to obtain more detailed information on the challenges states are encountering and the strategies states employ or are considering employing to toll. We judgmentally selected four states where tolling was either planned or under way and two states where tolling had been proposed and rejected by a vote of either the citizens or the legislature. During our site visits, we interviewed state, local, and FHWA officials.

To identify strategies that can be used to address the challenges to tolling, we analyzed the results of our review on tolling efforts and built on the perspectives gained from our past work on federal investment strategies. We also analyzed reports and studies issued by transportation experts and academia on finance reform to identify broad strategies that can be used to help transportation officials adopt and implement a tolling approach.

We performed our work from June 2005 through June 2006 in accordance with generally accepted government auditing standards.

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# Correlation Analysis

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To identify state characteristics that are linked with states' decisions to toll roads, we performed a correlation analysis that examined the relationship between those decisions and various state demographic and financial characteristics. These characteristics included, but were not limited to, population; per-capita income; gross state product; vehicle miles traveled; capital expenditures on highways; and local, state, and federal highway trust fund appropriations. To perform this analysis, we updated the data that we had collected from the Federal Highway Administration (FHWA) and Bureau of Economic Analysis (BEA) for our previous reports,<sup>1</sup> and converted them to inflation-adjusted 2004 dollars using BEA's chain-type price index for gross domestic product (GDP), as well as its state highway and streets chain-type price index. For those characteristics that represented measures of change, we used the changes in these factors from 1990 to 2000 to be consistent with the years when the U.S. Census of Population and Housing was conducted and, for those characteristics that represented measures of levels, we used data from 2002. We chose 2002 because data for some characteristics were not available for more recent years. We divided states into two groups, tolling and nontolling, based on information gathered from our state survey and FHWA documentation. We considered the associations between tolling and nontolling with each demographic or financial characteristic singly and did not control for the effects of other characteristics on these tolling decisions (as we would do in a multivariate analysis). For this reason, the results of our correlation analysis indicate a simple statistical relationship between tolling status and a study characteristic and do not imply causality. Interactions may be more complex when multiple characteristics are simultaneously associated with tolling status. In addition, our results may be sensitive to how we defined tolling status.

Although certain characteristics in a state's finances and tax policies might be related to financial need, our correlation analysis found only limited relationships between various state demographic and financial measures and whether states are and are not planning toll roads. (See table 3.) For example, we found the following:

- There is wide variation in state motor fuel tax rates among the states, ranging, as discussed earlier, from 7.5 cents to 28.1 cents per gallon in

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<sup>1</sup>GAO, *Trends in Federal and State Highway Investment*, [GAO-03-744R](#) (Washington, D.C.: June 18, 2003) and GAO, *Federal-Aid Highways: Trends, Effect on State Spending, and Options for Future Program Design*, [GAO-04-802](#) (Washington, D.C.: Aug. 31, 2004).

2002, and we investigated whether state motor fuel tax rates are correlated with decisions to toll. While a slight inverse relationship exists between a state's decision to toll and the level of its motor fuel taxes, the slightness of this relationship suggests that states planning toll roads are not much more likely to be the ones with lower motor fuel tax rates than other states.

- While state incomes vary greatly, a state with higher motor fuel tax rates is also more likely to have higher fuel tax revenues as a percentage of its gross state product than states with lower motor fuel tax rates. As with fuel tax rates, a slight inverse relationship exists between a state's decision to toll and the level of its fuel tax revenues as a percentage of its gross state product. However, the slightness of this relationship suggests that states planning toll roads are not much more likely to be the ones with lower fuel tax revenues as a percentage of their gross state product than other states.
- The extent to which motor fuel taxes are disbursed to nontransportation uses could contribute to what state officials characterized as general shortfalls in highway funding. The relationship between states planning toll roads and the use of motor-fuel tax revenue is only slight, suggesting that states planning toll roads are not much more likely to have more of their fuel tax revenues used for nontransportation programs than other states.

Although there appears to be little relationship between state finance and tax policy characteristics and tolling, our analysis indicates that there are some other factors that are related to states' decisions on tolling. For example, both the size of the state, whether measured by population or by vehicle miles traveled (VMT), and whether it is growing rapidly, again measured by population or VMT growth, are directly related to states' decisions to toll. These relationships are consistent with statements made by state transportation officials on the use of tolling to fund highways due to increasing demand for highway travel. In addition, our analysis revealed a relationship between federal funding and a state's decision to toll. Each state collects federal motor fuel taxes that are deposited into the Highway Trust Fund and receives grants through the federal-aid highway program according to formulas specified in law. The states that are planning toll roads are moderately associated with the federal-aid "donor states"—those states that contribute more to the Highway Trust Fund than they receive in federal highway grants. Thus, donor states are statistically more likely to be



planning toll roads than donee states—those states that receive more in grants than they collect.

**Table 3: Results of Correlation Analysis**

<b>Factors</b>	<b>Decision to toll<sup>a</sup> correlation coefficient (number of observations)</b>
Motor fuel tax rate (in cents per gallon)	-0.052 (51)
Fuel tax revenue as percent of gross state product	-0.005 (51)
Percent of fuel tax revenues used for nonhighway purposes	-0.095 (50) <sup>b</sup>
Population	0.309 (51)
Percentage change in population	0.140 (51)
Vehicle miles traveled (in millions)	0.368 (51)
Percentage change in vehicle miles traveled	0.295 (51)
Highway Trust Fund apportionment/payment ratio	-0.319 (51)

Source: GAO.

Note: Data from 2002 were used in the correlation analysis, except for the percentage change in population and the percentage change in vehicle miles traveled, both of which measure values in 2000 against values in 1990. Motor fuel tax rates were expressed in 2004 dollars. It is worth noting that the correlation coefficient indicates a statistical association between the study variable and tolling/nontolling status of a state without controlling for the effects of other characteristics on these tolling decisions as in a multivariate analysis.

<sup>a</sup>1=yes, 0=no.

<sup>b</sup>We did not include data for the District of Columbia.

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# Survey Questions

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## Current Toll Road Facilities

Question 1:

Are there any toll road facilities in your state? Please do not count any tolled bridges or tunnels as toll roads.

1. Yes
2. No (Skip to question 10.)

Question 2:

Are any of these facilities new roads that were built on new alignments?

1. Yes
2. No

Question 3:

Were any of these facilities previously untolled?

1. Yes
2. No

Question 4:

Are any of these facilities new lanes added to roadways that were previously untolled?

1. Yes
2. No

Question 5:

Are any of these facilities HOT lanes (in which single occupancy vehicles can gain access to HOV lanes by paying a toll)?

1. Yes
2. No

Question 6:

Do any of these facilities charge tolls that vary by time of day?

1. Yes
2. No

Question 7:

In what year did the first toll road facility in your state open to traffic? (Please do not consider facilities that opened before 1938.)

Question 8:

In what year did the most recent toll road facility in your state open to traffic? (Please do not consider facilities that opened before 1938.)

Question 9:

Which of the following agencies participate in managing the toll road facilities in your state?

1. State Department of Transportation
2. Public toll authority
3. Other state agency
4. Local or regional government agency
5. Private entity

Planned Toll Road Facilities

Question 10:

Are there plans in your state to build any toll road facilities for which an Environmental Review and a Record of Decision have been completed?

1. Yes
2. No (Skip to question 19.)

Question 11:

Are any of these facilities in the design or right-of-way stage?

1. Yes
2. No

Question 12:

Are any of these facilities in the construction phase?

1. Yes
2. No

Question 13:

Are there plans for any of these facilities to be new roads built on new alignments?

1. Yes
2. No

Question 14:

Are there plans to toll a roadway that is currently untolled?

1. Yes
2. No

Question 15:

Are there plans for any of these facilities to be new lanes added to roadways that are currently untolled?

1. Yes
2. No

Question 16:

Are there plans for any of these facilities to be HOT lanes (in which single occupancy vehicles can gain access to HOV lanes by paying a toll)?

1. Yes
2. No

Question 17:

Are there plans for any of these facilities to charge tolls that vary by time of day?

1. Yes
2. No

Question 18:

Which of the following agencies would participate in managing these planned toll road facilities?

1. State Department of Transportation
2. Public toll authority
3. Other state agency
4. Local or regional government agency
5. Private entity

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Final Questions

Question 19:

Are there plans in your state to build any toll road facilities for which an Environmental Review or a Record of Decision have NOT been completed?

1. Yes
2. No

# GAO Contact and Staff Acknowledgments

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**GAO Contact**

JayEtta Z. Hecker (202)512-2834

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**Staff  
Acknowledgments**

In addition to the individual named above, Steve Cohen, Assistant Director; Mark Braza; Jay Cherlow; Bess Eisenstadt; Simon Galed; Moses Garcia; Bert Japikse; Terence Lam; Liz McNally; and Don Watson made key contributions to this report.

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## GAO's Mission

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