

# How States and Territories Fund Transportation

An Overview of Traditional and Nontraditional Strategies



NGA Center for  
BEST PRACTICES

# Executive Summary

The nation's transportation system faces many pressures, including a growing imbalance between system use and system capacity, erosion of traditional funding sources, greater infrastructure costs, and shrinking sources of credit resulting from the current economic crisis. In response, states and territories<sup>1</sup> are actively exploring how they can make better use of existing and new approaches to fund and finance transportation. This report provides states with an overview of traditional funding mechanisms, profiles of new and innovative programs at work in the United States and overseas, and a summary of each state's surface transportation funding approaches. The report covers state-driven mechanisms<sup>i</sup> only and is meant to help states identify strategies to consider in addressing their revenue needs alongside federal and local approaches.

## Traditional Funding and Financing

State transportation revenue from traditional sources, which account for the majority of state spending on highway transportation, totaled over \$100 billion in 2007.<sup>2</sup> Those funding sources are primarily dedicated to highways but vary by state and may also fund bridges, rail, and ports.

### Fuel Taxes

All states have some kind of motor fuel tax; notably, Alaska's tax is under one-year suspension until August 2009. In 2009, state motor fuel taxes averaged 21.72 cents per gallon for gasoline (ranging from 7.0 to 32 cents per gallon), 22.62 cents per gallon for diesel, and 21.54 cents for gasohol.<sup>3</sup> State gasoline taxes generated approximately \$36 billion in 2008.<sup>4</sup>

### Sales Taxes on Fuel or Other Fuel Industry Taxes<sup>5</sup>

Nine states add a sales tax to gasoline purchases or tax fuel distributors or suppliers. Five states use a sales tax on gasoline that ranges from 2 percent to over 7 percent; three states tax fuel distributors' gross earnings, gross receipts, or income for transportation purposes; in one state, motor fuel suppliers must collect a prepaid state tax on all motor fuel sold.

### Vehicle Registration Fees

All states collect some form of vehicle registration fee, which amounted to a total collection of almost \$20 billion in 2008. However, two states do not explicitly fund transportation with these revenues.

### Traditional Bond Proceeds

Nearly all states have transportation bonding authority.<sup>6</sup> New state bond obligations in 2007 were valued at \$19.8 billion.<sup>7</sup> This included general obligation bond issuances across 20 states and territories.<sup>8</sup> With traditional bonds, states repay bondholders from user revenues, including taxes, vehicle-related fees, and toll receipts.

### Tolls

There are approximately 150 toll roads, bridges, and tunnels in the United States that operate in 27 states. Forty of these toll facilities are administered by state operating authorities. In 2006, state-administered toll facility revenue (including state revenue generated under the interstate and international authorities) accounted for about 5 percent of total state transportation funding. Tolls generated \$7.6 billion in state revenues in 2007.<sup>9</sup>

### General Funds

Thirty-two states have general fund revenues that collectively account for approximately 6 percent of total state highway funding. In 2007, state general fund proceeds directed to transportation projects amounted to just over \$8 billion. State general funds are established through income taxes, sales taxes, property taxes, and other state and local fees. A number of states use dedicated state transportation trust funds to manage and disperse some or all of their transportation funds.

### Other Sources (Fees, Taxes and Other Funds)

Twenty states use one or more other sources of funding, including inspection fees; driver license fees; advertising; a rental car tax; state lottery/gaming funds; oil company taxes; vehicle excise taxes; vehicle weight fees; investment income; and other licenses, permits, and fees revenue.

## Nontraditional and Innovative Funding and Financing

States are also using nontraditional and innovative approaches to funding and financing, including sources of revenue, new financing mechanisms, new funds management techniques, and new institutional arrangements. These might be new sources for bond repayment or electronic road tolls that charge based on time of use. Although traditional sources still produce the majority of state transportation revenues, new and innovative approaches have generated billions of dollars to fund state transportation projects over the past decade or so. Since 1990, new federal bonding programs and credit assistance has leveraged over \$29 billion in new revenue, spread across almost all states.<sup>10</sup> Leading categories of new and innovative transportation financing being used in the states or overseas include the following:

<sup>i</sup>This report defines state funding as state government revenues dedicated for surface transportation needs; this may include state and local sources.

# Executive Summary

## **GARVEE Bonds**

Grant Anticipation Revenue Vehicles, or GARVEE bonds, are any debt financing instrument (bond, note, certificate, mortgage, or lease) that a state issues whose principal and interest are repaid primarily by future federal-aid funds.<sup>11</sup> Before their creation in 1995, states could not use federal-aid funds to support bonding. As of 2008, 30 states and territories authorized GARVEEs, with 32 issuances worth \$9.3 billion, accounting for approximately 40 percent of state bonds for transportation purposes.<sup>12</sup> An additional five states issued eight “indirect” GARVEEs that pledge other future sources of federal highway funds for debt service and repayment.<sup>13</sup>

## **Private Activity Bonds**

Private Activity Bonds (PABs) are debt financing instruments authorized for highway and intermodal transfer stations in 2005. As of December 2008, eight PABs worth over \$4.9 billion had been issued in six states.<sup>14</sup> Tax-exempt PABs are limited to straight-line depreciation, and only 25 percent of the money can be used for real estate. The total amount of private activity bonding that a state can issue is subject to annual federal limits.

## **ARRA Bonds**

The American Recovery and Reinvestment Act of 2009 (ARRA) provided for two new transportation bonds, Build America Bonds (BABs) and Recovery Zone Bonds (RZBs). In the first several months of availability, public issuers sold nearly \$8 billion in BABs, including a successful \$1.375 billion issue by the New Jersey Turnpike Authority. ARRA established a \$10 billion national bond cap for RZBs, but none have been used to date.

## **Federal Credit Assistance**

Through the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan program, the federal government provides states direct loans, loan guarantees, and lines of credit for major transportation infrastructure projects. Traditionally, these types of projects were supported by federal grants. As of April 2009, 17 projects in 12 states and territories have used TIFIA financing with a value of \$6 billion.

## **State Infrastructure Banks**

State Infrastructure Banks (SIBs) are revolving loan funds to finance highway and transit projects.<sup>15</sup> SIBs are in place in 35 states, although more than 95 percent of the funding is concentrated in eight states, and one state accounts for more than half. They became widespread in 1998 when the federal government expanded eligibility and provided \$150 million in seed funding for initial capitalization.<sup>16</sup> To date, SIBs have provided \$6.2 billion in loans for 693 different transportation projects.<sup>17</sup>

## **Congestion and Cordon Pricing**

Congestion pricing is designed to shift demand to less-congested areas or time periods by charging motorists for road use, or varying charges, during times of peak demand. Cordon pricing similarly charges users for entry into a congested area, such as a city center, during some portion of the day. Although only a few states use congestion fees and none have cordon pricing, these tools are used in a number of countries as a means of both demand mitigation and revenue generation (for example to help fund transit options). The United Kingdom, Norway, and Sweden have been operating successful congestion and cordon pricing schemes for several years; Singapore created the first congestion pricing program in the 1970s.

## **Public-Private Partnerships**

Public-private partnerships (PPPs) establish a contractual agreement between a public agency and a private sector entity to collaborate on a transportation project. Twenty-six states have some sort of PPP enabling legislation, and 24 states have used some form of public-private partnership for surface transportation, including roads, freight facilities, and transit, for a total of 71 projects.<sup>18</sup> PPP activity is much greater outside the United States, where partnerships have been used to fund more than four times as many projects as have been undertaken here.

## **Vehicle Miles Traveled Fees**

Vehicle miles traveled (VMT) fees charge drivers directly for each mile traveled; the fees replace a traditional motor fuel tax. States are beginning to examine using VMT fees, including one pilot and one weight-mile tax. VMT-based fees are in place for trucks in Germany, Switzerland, and Austria. VMT-based fees are due to be utilized in the Netherlands by 2014 and in Denmark by 2016.

## **Other Sources (Impact Fees, Traffic Camera Fees, Container Fees, Emissions Fees)**

Other types of new or innovative vehicle or user fees are also employed by states and internationally to generate revenue. Twenty-three states and a number of European countries are using impact fees to help fund new infrastructure and transportation projects. Meanwhile, 23 states and many European countries are using traffic cameras to generate revenue for surface transportation. Several European and Asian countries rely on vehicle emissions fees, which are currently not in use in the United States.

Table 1 summarizes states' use of traditional and nontraditional financing approaches.

**Table 1. State Traditional and Nontraditional Funding Sources**

State	Fuel Taxes	Sales Taxes on Fuel	Vehicle Registration Fees	State Bonding Authority	Tolls	General Funds
<b>Traditional Financing</b>						
Alabama	✓		✓	✓		✓
Alaska	✓			✓		✓
Arizona	✓		✓	✓		
Arkansas	✓		✓	✓		✓
California	✓	✓	✓	✓	✓	✓
Colorado	✓		✓	✓		
Connecticut	✓	✓	✓	✓		✓
Delaware	✓		✓	✓	✓	✓
Florida	✓		✓	✓	✓	
Georgia	✓	✓		✓	✓	✓
Hawaii	✓	✓	✓	✓		
Idaho	✓		✓	✓		
Illinois	✓		✓	✓	✓	✓
Indiana	✓	✓	✓	✓	✓	
Iowa	✓		✓	✓		
Kansas	✓		✓	✓	✓	✓
Kentucky	✓		✓	✓		✓
Louisiana	✓		✓	✓	✓	✓
Maine	✓		✓	✓	✓	
Maryland	✓		✓	✓	✓	
Massachusetts	✓		✓	✓	✓	
Michigan	✓	✓	✓	✓	✓	
Minnesota	✓		✓	✓		✓
Mississippi	✓		✓	✓		
Missouri	✓		✓	✓		✓
Montana	✓		✓	✓		
Nebraska	✓		✓	✓		✓
Nevada	✓		✓	✓		
New Hampshire	✓		✓	✓	✓	✓
New Jersey	✓	✓	✓	✓	✓	✓
New Mexico	✓		✓	✓		
New York	✓	✓	✓	✓	✓	✓
North Carolina	✓		✓	✓		
North Dakota	✓		✓	✓		✓
Ohio	✓		✓	✓	✓	✓
Oklahoma	✓		✓	✓	✓	✓
Oregon	✓		✓	✓	✓	✓
Pennsylvania	✓		✓	✓	✓	✓
Rhode Island	✓		✓	✓	✓	
South Carolina	✓		✓	✓	✓	✓
South Dakota	✓		✓			
Tennessee	✓	✓	✓			✓
Texas	✓		✓	✓	✓	✓
Utah	✓		✓	✓	✓	✓
Vermont	✓		✓	✓		✓
Virginia	✓		✓	✓	✓	✓
Washington	✓		✓	✓	✓	
West Virginia	✓		✓	✓	✓	✓
Wisconsin	✓		✓	✓		✓
Wyoming	✓		✓			✓
American Samoa*						
Guam*	✓					
Northern Mariana Islands*						
Puerto Rico	✓				✓	
Virgin Islands*						
<b>Total</b>	<b>52</b>	<b>9</b>	<b>48</b>	<b>47</b>	<b>27</b>	<b>31</b>

\*In most instances, data and information for transportation funding and financing mechanisms in these territories was unavailable.

**Table 1 continued**

Other	Grant Anticipation Revenue Vehicles (GARVEE)	Private Activity Bonds	Federal Credit Assistance (TIFIA)	State Infrastructure Banks	Public-Private Partnerships	Vehicle Miles Traveled Taxes	Other	
<b>Nontraditional Financing</b>						<ul style="list-style-type: none"> <li>• Denotes that a state has authority to use these financing strategies but has not yet done so</li> <li>•• Denotes a Pilot Program</li> <li>a = Vehicle Inspection Fees</li> <li>b = Vehicle Rental Taxes</li> <li>c = Advertising Revenue</li> <li>d = State Lottery and Gaming Funds</li> <li>e = Oil Company Taxes</li> <li>f = Vehicle Excise Taxes</li> <li>g = Vehicle Weight Fees</li> <li>h = Licenses, Permits, and Fees</li> <li>i = Investment Income</li> <li>j = Impact Fees</li> <li>k = Traffic Cameras</li> <li>l = Weight-Mile Tax for Trucks</li> </ul>		
✓a,c	✓				✓			✓j
✓b,h	✓	✓		✓	✓			✓j,k
✓d	✓			✓	✓			✓j,k
✓c	✓		✓	✓	✓			✓j,k
✓d	✓			✓	✓			✓j,k
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✓b	•	✓	✓	✓	✓			✓j,k
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	✓			✓	✓			✓k
	✓	✓		✓	•			✓k
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✓b,e			✓	✓	✓		✓k	
	✓		✓	✓	✓		✓k	
	✓			✓			✓k	
	✓			✓			✓k	
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				✓			✓j,k	
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	•	✓	✓	✓	✓		✓j,k	
				✓	✓		✓j	
				✓			✓j	
✓b,f,g,h	✓	✓	✓	✓	✓		✓j,k	
	✓			✓	✓		✓j,k	
✓b,h				✓			✓j	
				✓				
	✓		✓	✓				
	✓							
<b>21</b>	<b>31</b>	<b>6</b>	<b>12</b>	<b>35</b>	<b>25</b>	<b>1</b>	<b>35</b>	

# Introduction

## Chapter 1—Introduction

The roads, rails, bridges, and transit systems that make up our nation's surface transportation system are essential to mobility, commerce, and economic development. At its best, this system can enhance economic competitiveness, increase safety, and enhance quality of life. However, a growing imbalance between system use and system capacity, erosion of traditional funding sources, greater infrastructure costs, and an economic crisis that has strained funding are making it increasingly difficult to sustain critical functions.<sup>19</sup>

Overall, U.S. roads, rails, and bridges received grades of D-, C-, and C, respectively, in the American Society of Civil Engineers' 2009 infrastructure report card. The investments provided under the American Recovery and Reinvestment Act (ARRA) are helping states fill some critical near-term needs in this area; however, current long-term prospects suggest an increasingly strained system in many parts of the country. This strain is leading states to reexamine existing approaches to funding and financing transportation,<sup>20</sup> while also exploring new and innovative approaches, particularly ones being used successfully in other countries.

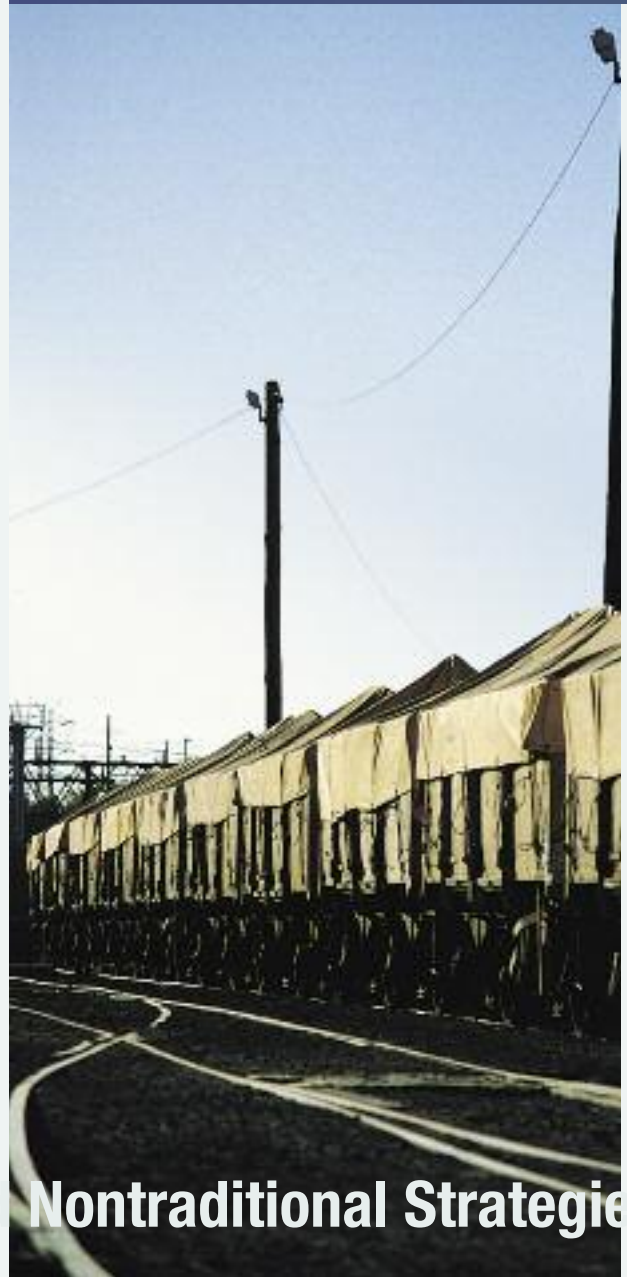
Part I of this report provides states with information to help them identify strategies to consider for addressing their revenue needs. Specifically, it offers:

- An overview of traditional state mechanisms to fund transportation, and
- Profiles and case studies of new and innovative funding and financing programs at work in the states and in other countries, including new U.S. bonding provisions under ARRA.

Part II of this report contains state-by-state profiles detailing state use of traditional and innovative funding and financing approaches.

### QUANTIFYING THE TRANSPORTATION STRAIN

- Vehicle miles traveled are expected to increase 1.4 percent per year from 2009 to 2016, creating the need for \$166 billion in transportation infrastructure funding.
- If transit ridership grows yearly by 3.5 percent (equivalent to the average growth of the last decade), investment would need to increase to \$59 billion yearly, by 2015, from \$13.3 in 2006.
- Congestion nationwide cost drivers 4.2 billion hours of wasted time, 2.9 billion gallons of wasted fuel, and the economy \$200 billion in lost productivity.

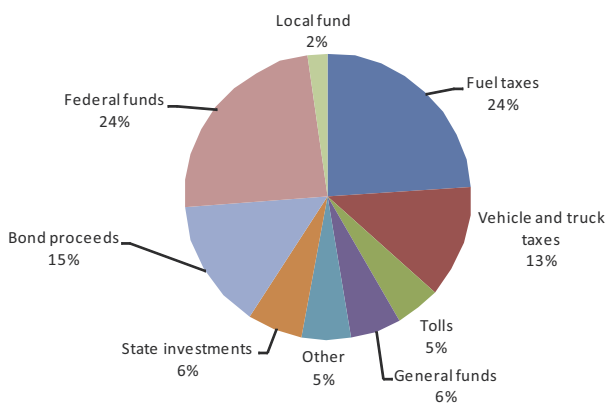


## Chapter 2— TRADITIONAL STATE APPROACHES

### TO FUND AND FINANCE TRANSPORTATION

Total state expenditures for transportation, including transit and airports, are significant: On average, they make up 10 percent of state and local budgets.<sup>21</sup> States generate more than 40 percent of transportation revenue through taxes, tolls, and other sources, compared to 36 percent from local governments and 21 percent from the federal government.<sup>22</sup> Figure 1 illustrates the split for highways only.

**Figure 1: State Revenue Sources for Highways, 2007**



Source: Federal Highway Information data, April 2009.

**Transit Funding.** In 2006, U.S. transit investment was \$13.3 billion. Most of the spending on transit systems came from federal transit funds rather than direct state funds. The traditional sources of funding for transit providers have been federal formula funds and federal grants, as well as individual transit system fare box revenues. The federal Mass Transit Account of the Highway Trust Fund (HTF) receives 2.86 cents from the federal motor fuel tax of 18.4 cents. The Federal Transit Administration distributes these funds along with detailed guidance to states on the planning and development of transit projects.<sup>23</sup> Federal transit grants require state matching, and the state share can be derived from any of the sources shown.

The majority of state revenues for highways, roads and bridges are derived from the following sources, in rough order of significance:

- Fuel taxes;
- Sales taxes on fuel or additional fuel industry taxes;<sup>24</sup>
- Vehicle registration fees;

- Bond proceeds;
- Tolls;
- General funds; and
- Other sources.

Table 2 shows how state reliance on each of the traditional sources of revenue has shifted in recent years, with greater relative growth in revenue from vehicles taxes, bonds, and tolls than from fuel taxes or general funds.

**Table 2: Change in Revenue Sources Used by States for Highways, 2001-2006**

	% Increase	Absolute Change (in \$ M)
Fuel taxes	11	\$3,158
Sales and use taxes, severance taxes, and other state taxes	29	\$1,112
Vehicle and truck registration fees and taxes	28	\$4,183
Bond proceeds	27	\$2,510
Tolls	42	\$1,970
General funds	18	\$747

Source: Highway Statistics Series, various tables, various years

### Fuel Taxes

All states have some kind of motor fuel tax; notably, Alaska's tax is under one-year suspension until August 2009. In 2009, state motor fuel taxes averaged 21.72 cents per gallon for gasoline (ranging from 7.0 to 32 cents per gallon), 22.62 cents per gallon for diesel, and 21.54 cents for ethanol.<sup>25</sup> Approximately one-third of state-generated transportation funds are derived from these fuel tax receipts, which totaled \$36.6 billion in 2008.<sup>26</sup> The declining value of these revenues has led some states to consider adjusting their fuel taxes. During the just-concluded 2009 legislative sessions, 15 states considered raising state fuel taxes, motor vehicle fees, or both.<sup>27</sup> None of the proposals were enacted, with one decision still pending. Six states index their gasoline taxes to inflation—a design that enables them to account for changes in purchasing power over time. **Florida** and **Maine** adjust state gas taxes by the consumer price

index; **Nebraska** by a state funding formula; and **Kentucky, North Carolina, and West Virginia** link their gas tax to the fuel wholesale price, which tends to grow with inflation.

## **Sales or Additional Taxes**

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In addition to state fuel taxes, nine states add a sales tax to gasoline purchases or tax fuel distributors or suppliers. **California, Indiana, and Michigan** have sales taxes ranging from 2 percent to more than 7 percent, and **New York** adds 8 cents per gallon to the state sales tax.<sup>28</sup> Other states tax fuel distributors' gross earnings, receipts, or income for transportation purposes: **Connecticut, Hawaii, and New Jersey** tax gross earnings, income, or gross receipts, respectively. In **Georgia**, all state motor fuel suppliers must collect a prepaid state tax on all motor fuel sold. In **Indiana** none of the sales tax revenues are used to fund highways.

## **Vehicle Registration Fees and Taxes**

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All states collect some form of vehicle registration fee, a total collection of \$20 billion in 2008. However, two of the states do not explicitly fund transportation with these revenues. State registration fees vary from a flat fee to ones based on vehicle value, weight, age, horsepower, and number of cylinders. Twenty-seven states impose a general fee for registering any vehicle; eight others levy a variable, weight-based fee; and the remaining 15 states use a combination of these factors.<sup>29</sup>

## **Bonds**

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Every state except South Dakota, Tennessee, and Wyoming has authority to issue state transportation bonds.<sup>30</sup> State and local governments issue general obligation transportation bonds to finance transportation projects whose costs exceed available revenue for a given year. New state bond obligations in 2007 were valued at \$19.8 billion.<sup>31</sup> At the end of 2006, outstanding state bond obligations reached a record \$96.5 billion, up from \$28.4 billion in 1990.<sup>32</sup> This represents more than 48 bond issuances across 30 states and territories. Traditionally, states repay bond financing from user revenues, including state taxes, fuel taxes or vehicle-related fees, and toll receipts.

## **Tolls**

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There are approximately 150 toll roads, bridges, and tunnels in the United States, operating in 27 states. Tolls are collected by a variety of entities, including state departments of transportation; special tollway, bridge, tunnel, or port authorities; and federally approved interstate agencies and international agencies. They include 48 administered by state operating authorities. Of the state operating authorities, four have been designated interstate authorities by federal law, and four are designated international authorities in conjunction with Canada. In these cases, the states collectively operate the toll facilities for common purposes.<sup>33</sup> In 2006, state-administered toll facility revenue (including state revenue generated under the interstate and international authorities) accounted for about 5 percent of total state transportation funding.<sup>34</sup> Tolls generated about \$7.6 billion in state revenues in 2007.<sup>35</sup>

## **General Funds**

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Thirty-two states have general fund revenues that collectively account for approximately 7 percent of total state highway funding.<sup>36</sup> In 2007, state general fund proceeds directed to transportation projects amounted to just over \$8 billion. State general funds are established through income taxes, sales taxes, property taxes, and other state and local fees.

## **Other Traditional Funding Sources**

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Twenty states use one or more other sources of funding, including inspection fees; driver license fees; advertising; a rental car tax; state lottery/gaming funds; oil company taxes; vehicle excise taxes; vehicle weight fees; investment income; and other licenses, permits, and fees revenue. States also fund transit through fare box revenues and federal grant programs, such as the Congestion Mitigation and Air Quality (CMAQ) program.<sup>37</sup>

## Chapter 3—NONTRADITIONAL AND INNOVATIVE WAYS TO FUND AND FINANCE TRANSPORTATION

Recognizing the need for new ways to complement and address gaps in traditional funding sources, states are looking to a number of innovative funding and financing tools for transportation. According to the Federal Highway Administration (FHWA), innovative financing encompasses a combination of techniques and mechanisms that include new or nontraditional sources of revenue; new financing mechanisms designed to leverage resources; new funds management techniques; and new institutional arrangements.<sup>38</sup> It also includes new approaches to more traditional instruments, such as new bonding authorities and congestion-pricing-based tolling.

Leading categories of new and innovative transportation funding and financing include the following:

- New debt financing strategies, including new bonding authority, federal credit assistance, and state infrastructure banks;
- Congestion and cordon pricing;
- Public-private partnerships;
- Vehicle miles traveled fees; and
- Other programs such as international vehicle emissions fees, impact fees, container fees, and traffic camera fees.

### **New Approaches to Debt Financing**

In recent years states have expanded their use of debt financing, or bonds,<sup>39</sup> using a number of innovative approaches, including Grant Anticipation Revenue Vehicles (GARVEEs); private activity bonds; and two new programs under the American Recovery and Reinvestment Act, Build America and Recovery Zone Bonds. Between 2001 and 2006, revenue from state and local public bond proceeds increased by more than 26 percent from \$9.4 billion to \$11.9 billion.<sup>40</sup>

#### **Grant Anticipation Revenue Vehicles (GARVEEs)**

GARVEEs, or GARVEE bonds, are any debt financing instrument (bond, note, certificate, mortgage, or lease) issued by a state whose principal and interest are repaid primarily by future federal-aid funds.<sup>41</sup> Authorized under Section 122 of Title 23, U.S. Code, GARVEEs generate up-front capital for major transportation projects at tax-exempt rates. They can be used for almost any highway project or transit project, including the purchase of transit vehicles or connections to intermodal ports and stations.<sup>42</sup> Before their creation in 1995, states could not use federal-aid funds to support bonding.

As of 2008, 30 states and territories were authorized to use federal-aid funds provided under Section 122 Title 23, U.S.C. GARVEE bonds, with 32 issuances worth \$9.3 billion, or approximately 40 percent of state bonds for transportation purposes.<sup>43</sup> An additional five states issued eight “indirect” GARVEEs that pledge other future sources of federal highway funds for debt service and repayment. Through the end of 2007, the total dollar amount of state GARVEE-related transactions had grown to \$7.6 billion. Individual issuances range from relatively small amounts of under \$40 million in **New Mexico** and **Ohio** to extremely large issuances of over a half-billion dollars in **California**, **Colorado**, and **Georgia**. A \$750 million GARVEE issuance has been approved for a single project in **Maryland**.<sup>44</sup>

As of 2008, 30 states and territories are authorized to use federal-aid funds provided under Section 122 Title 23, U.S.C. GARVEE bonds, with 32 issuances worth \$9.3 billion. An additional five states issued eight “indirect” GARVEEs that pledge other future sources of federal highway funds as sources of debt service and repayment.

#### **Private Activity Bonds**

Private Activity Bonds (PABs) were authorized for highway and intermodal transfer stations in 2005. That year, the Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) amended the Internal Revenue Code to include “qualified highway or surface freight transfer facilities” as eligible projects for tax-exempt private activity bonds (PABs), which can finance projects that meet certain public purpose criteria. In other words, any conceivable highway project, as well as intermodal transfer stations, is eligible for PABs. Tax-exempt PABs are limited to straight-line depreciation, and only 25 percent of the funds can be used for real estate. The total amount of private activity bonding that a state can issue is subject to annual federal limits.<sup>45</sup> Currently, the nationwide volume cap for PABs is \$15 billion, as authorized by SAFETEA-LU.

As of December 2008, eight PABs worth over \$4.9 billion had been issued in six states.<sup>46</sup> Included is \$580 million approved for the Virginia Capital Beltway HOT Lanes project on I-495.

# NONTRADITIONAL

## **New Bonding Authority Under the American Recovery and Reinvestment Act**

In addition to formula-based transportation funding, the American Recovery and Reinvestment Act of 2009 (ARRA) also provided a new set of debt financing tools,<sup>47</sup> including two bonds for transportation, Build America Bonds and Recovery Zone Bonds.<sup>48</sup>

**Build America Bonds (BABs)** are taxable bonds to be issued during 2009 and 2010 only by state and local governments. As with tax-exempt bonds, the eligible uses of BABs are broad and could include capital expenditure projects for surface transportation. The ARRA does not place a dollar limit on issues of these bonds.

BAB issuers may elect to receive a subsidy from the federal government equal to 35 percent of the coupon interest paid to the bondholders. Alternatively, the issuer can elect to allow bondholders to receive a tax credit equal to 35 percent of the interest they receive on certain BABs (excluding private activity bonds). The tax credit is strippable, and unused credits may be carried forward by the holder into subsequent tax years.

An example provided by the U.S. Treasury Department: If a state or local government were to issue a BAB and paid to the bondholder \$100 of interest on the bond, Treasury would then make a payment directly to the state or local government of \$35. Thus, the state or local government's net interest expense would be only \$65 on a bond that actually pays \$100 to the bondholder.

One of the primary policy reasons for creating BABs is to expand the investor base for municipal bonds to large institutional buyers such as pension funds and sovereign wealth funds, which do not benefit from tax-exempt bonds. Taxable BABs also may help free up capacity in the tax-exempt bond market. In the first several months of their availability, public issuers sold over \$9.4 billion in BABs, including a successful \$5 billion issue by the New Jersey Turnpike Authority.

**California, New York, New Jersey, and Wisconsin** have sold \$7.6 billion worth of Build America Bonds.<sup>49</sup> The first issue of BABs, worth \$3.65 billion, is estimated to have saved Stevens Point, Wisconsin, \$146,300 relative to traditional tax-exempt bond financing. Other issuers include the Metropolitan Transportation Authority, which runs New York City's buses, subways, and commuter railroads; the New Jersey Turnpike; and the state of California, which will use the proceeds of its direct-payment BAB for schools, roads, and parks.

**Recovery Zone Bonds.** ARRA also authorized a subset of BABs called Recovery Zone Bonds. A "recovery zone" is a geographic area designated by the issuer based on significant economic distress (e.g., poverty, unemployment, high foreclosure rate).

Recovery Zone Bonds offer a refundable credit of 45 percent of the interest paid and must be used for "qualified economic development purposes," which includes public infrastructure construction. ARRA established a \$10 billion national cap for this subset of BABs. The statute requires the amount to be shared among the states based on their 2008 employment data; each state then distributes its allocation to counties and municipalities.<sup>50</sup>

## **Federal Credit Assistance/TIFIA**

Through the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan program, the federal government provides credit assistance for nationally or regionally significant transportation projects. TIFIA provides three forms of assistance to eligible state project sponsors: direct loans, loan guarantees, and lines of credit. TIFIA credit assistance can cover up to 33 percent of total project costs. Eligible projects must be supported at least partially with user charges or other nonfederal, dedicated funding sources and must be designed to attract private investment in transportation infrastructure.<sup>51</sup> As of April 2009, 17 projects in 12 states and territories have used TIFIA financing worth \$6 billion. In **Texas**, for example, a TIFIA loan agreement was executed with a private partner to construct two segments of a new 91-mile tollway. About one-third of the project's \$1.3 billion total cost is a direct TIFIA loan, 15 percent of the cost is borne by the private partners, and a little more than half comes from bank loans.<sup>52</sup>

## State Infrastructure Banks (SIBs)

SIBs provide states with a new mechanism to finance large transportation projects through direct loans at attractive interest rates; the revenues from loan repayment and interest are used to fund subsequent loans. One key element of a SIB is that it offers states a flexible funding source, which can be tied to a set of state-established criteria that evaluate a project's benefits (such as economic development) and significance. Thus, SIBs can help states focus their financing assistance on projects that require an accelerated construction schedule; can help them leverage other federal and/or private capital; or help them achieve state objectives such as environmental, economic, or safety benefits.<sup>53</sup> States may capitalize SIBs with funds from a variety of sources, including bonds and up to 10 percent of their federal highway and transit capital funds.

SIBs are in place in 35 states, although more than 95 percent of the funding is concentrated in eight states, and one state accounts for more than half. They became widespread in 1998 when the federal government expanded eligibility and provided \$150 million in seed funding for initial capitalization. To date, SIBs have provided \$6.2 billion in loans for 693 different transportation projects.

**South Carolina**, which established the South Carolina Transportation Infrastructure Bank in 1997, is a leader in SIB financing. In fact, the state represents more than 50 percent of the value of SIB loan agreements nationwide. **Ohio** used \$40 million in state general revenue funds and \$120 million in federal highway funds, including National Highway System and Surface Transportation Program funds, to launch its SIB.<sup>54</sup> Other states, including **Arizona**, **Florida**, and **Texas**, have also used some federal funding for SIB capitalization.<sup>55</sup> Figure 2 shows the states operating state infrastructure banks.

**Figure 2: State Infrastructure Banks, or Equivalent, 2006**



Source: Federal Highway Administration, State Infrastructure Bank (SIB) Activity for Highways—2005 (Table FA-22)

## Proposed National Infrastructure Bank

There has been significant discussion at the federal and state level around the concept of a new federal infrastructure bank. Some have suggested that, as SIBs do, a federal infrastructure bank could supplement existing funding sources by making direct loans, offering loan guarantees, issuing bonds, and possibly leveraging private capital. Others have suggested that the federal infrastructure bank replace, rather than supplement, a number of existing funding programs, such as current federal transportation and water programs in which the federal government either funds state and local projects directly or passes money through to states and localities to fund projects.<sup>56</sup> The proposal envisions that project proponents would apply for financial support from the infrastructure bank through a competitive process and be selected by the bank's board of directors (which could include a combination of elected, appointed, or nongovernment officials) based on specified criteria.

## Congestion and Cordon Pricing

Congestion pricing is designed to shift demand to less-congested areas or time periods by charging motorists for road use or varying charges during times of peak demand.<sup>57</sup> Under cordon pricing vehicles are charged for entry into a congested area, such as a city center, during some portion of the day. Although only a few states use congestion fees, and none use cordon pricing, these tools are in use in a number of countries as a means of both demand mitigation and revenue generation (for example, to help fund transit options). The United Kingdom, Norway, and Sweden have operated successful congestion and cordon pricing schemes for several years; Singapore created the first congestion pricing program in the 1970s.

### State Examples

The **Minnesota** DOT and the Twin Cities Metropolitan Council, among only a few U.S. locations using congestion fees, are planning to convert bus-only lanes to "priced dynamic shoulder lanes," on I-35 in Minneapolis. Transit vehicles and carpoolers will be allowed to use the lanes without paying the toll. The toll revenues will be used to initiate a bus rapid transit (BRT) network in the corridor, including vehicle purchases and the construction of stops and other infrastructure, such as park-and-ride lots. Transit fare reductions also will be funded from toll revenues.

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**New Jersey** and **New York** have increased tolls during weekday peak hours and discounted tolls during off-peak hours to help spread roadway demand. Lee County, **Florida**, discounts off-peak tolls. Other regions and states, including **California** and **Virginia**, have established a variety of high-occupancy-vehicle and pricing projects for express lanes.

In **California**, SR91 is a 12-lane freeway that connects the employment centers of Orange County to the residential developments in San Bernardino, Riverside, and Corona. Population growth in the region has put a severe strain on the SR91 to accommodate commuting traffic. Before the implementation of four toll lanes, the average commuting time for the people using the SR91 was about 65 minutes each way. Toll lane users are required to purchase an automatic vehicle identification (AVI) device that is used to collect tolls electronically. The additional capacity that the toll lanes provide has resulted in a 20-minute reduction in peak-period travel time on the free lanes. The lanes also guarantee free-flow speed of 65 miles per hour. Toll revenues will be used to pay for operations and maintenance of the lanes and repay the construction debt. Any excess revenue is expected to be used for regional transportation improvements or to subsidize public transit.<sup>58</sup>

## *International Examples*

Related to congestion pricing, cordon pricing is a fee charged for any vehicle that enters the cordoned area, usually a city center. While it is not used in the United States, many cities around the world have some type of cordon pricing system.

**Singapore** introduced the first cordon pricing program in 1975, charging drivers to enter downtown during morning rush hours. It moved to a fully automated, electronic charging system in 1998 and expanded the system to include variable charges throughout the day. The result was a 13 percent reduction in traffic and a 22 percent increase in vehicle speed.

**London** added a program in 2003 that charges vehicles \$13 to enter the central city. It has reduced congestion 40 percent and roundtrip travel times by 13 percent. Bus service has become dramatically faster and more reliable, and bicycling has increased. However, a planned expansion did not provide enough of a benefit and was rescinded. London is worth watching, as the current mayor plans to focus on using advanced technologies to save on the cost of operating the program.

Bergen, **Norway**, reduced congestion between 5 percent and 10 percent by creating a toll ring around the city. It achieved the reduction despite a relatively low toll rate, with fees between \$0.80 and \$1.75.

**Stockholm** originally introduced cordon pricing in 2006 as part of a six-month pilot program. It has produced an 18 percent decline in vehicle trips, as the city's car population remained level. Although this cordon pricing program cost approximately \$200 million to establish, officials have announced that the system generated a profit of nearly \$60 million over its first full year. On a separate front, it has encouraged the use of low-emission vehicles, such as electric and hybrid cars, by reducing charges for these vehicles. Other data show a 5 percent to 10 percent reduction in traffic accidents involving injuries, a 14 percent decline in air pollution, and annual growth in same-store retail sales in central Stockholm. The charge was heavily contested at its outset, but public opinion has swung in its favor. Stockholm's cordon pricing system benefits from the city's density, which has led to traffic congestion. At about 1.2 million people, Stockholm is similar in size to nine U.S. cities.

## **Public-Private Partnerships**

Public-private partnerships (PPPs) establish a contractual agreement between a public agency and a private sector entity to collaborate on a transportation project. PPPs entail various provisions to allocate resources, risks, and rewards among the parties.<sup>59</sup> An important element of successful PPPs for states is creating a public policy framework and criteria for developing PPPs, as well as establishing the internal expertise and external relationships to ensure that state objectives are carried out effectively in any PPP arrangement. More than 26 states have some sort of PPP enabling legislation, and 24 states have used some form of PPP for 71 surface transportation projects, including roads, freight facilities, and transit.<sup>60</sup> PPP activity is much greater outside the United States, where such partnerships have been used to fund more than four times as many projects as here. Selected examples from states and around the world are described below.

## *State Examples*

A leading type of PPP, in which states sell or lease state toll roads to private companies to raise transportation revenue, gained momentum after the city of Chicago, **Illinois**, and the state of **Indiana** finalized such arrangements in 2005 and 2006.<sup>61</sup> The deals raised significant upfront capital: \$1.8 billion for a 99-year lease of the Chicago Skyway Toll Bridge and \$3.8 billion for a 75-year lease of the Indiana Toll

Road. Chicago used the proceeds to refinance city debt, for new school construction, and to create a \$500 million rainy day fund. Indiana applied the capital to the state's 10-year highway construction plan. **Indiana** applied the capital to the state's 10-year highway construction plan, local road funding, and a trust fund to pay for highway improvements over the course of the lease. The state also received commitments from the concessionaire to modernize the toll road through immediate added capacity projects and the development of an electronic tolling system. In addition to receiving the concession payment, Indiana shifted total liability for future maintenance of the toll road to the concessionaire. This is estimated to be \$4.5 billion over the course of the lease. The state also shifted any financial risk from decreased traffic to the concessionaire.

The **Virginia** Department of Transportation signed contracts in 2008 with two private companies to construct high-occupancy toll (HOT) lanes along a portion of the Capital Beltway in Northern Virginia. The first such project in Virginia, it will provide lanes dedicated for buses and carpools with more than three passengers. Non-high-occupancy vehicles will be able to access the lanes by paying a toll, with the exact fee changed dynamically based on current traffic. The goal is to keep these lanes free of traffic congestion at all times, including rush hour and other periods of heavy volume. The total project cost, including financing, is estimated at \$1.929 billion, which includes a \$409 million grant from the state. The private concession is for 85 years, including five years for construction, with the new lanes expected to open in early 2013.<sup>62</sup>

In April 2009, **Florida** announced a state-led PPP aimed at mitigating road congestion. Using a \$603 million TIFIA loan from the U.S. Department of Transportation, the state will work with a private contractor to build three reversible HOT lanes in the median of I-595, linking two key interchanges on I-75 and I-95. The partnership will result in improvements being made 15 years sooner than they would have been with Florida's traditional means of building new lanes. The partners in this PPP, Florida Department of Transportation (FDOT) and ACS Infrastructure Development, agreed to a \$1.65 billion dollar contract. The 35-year agreement calls for ACS to build, finance, and operate the toll road. FDOT will set and collect the tolls on the facility and make payments to ACS annually based on the company's successful operation of the road. Tolls will vary according to traffic volume throughout the day.<sup>63</sup> The TIFIA loan helped Florida leverage more than \$750 million from private sector banks and more than \$200 million in private equity to meet the projected \$1.8 billion cost.

In **Illinois**, a notable public-private effort has led to the creation of the Chicago Region Environmental and Transportation Efficiency Program (CREATE), which centers on a plan to streamline the regional freight rail network through an initial capital investment of \$1.5 billion. CREATE, a partnership among USDOT, the state of Illinois, the City of Chicago, Metra, Amtrak, and the nation's freight railroads, seeks to devise new economic development plans for local communities that will allow railroads to improve intermodal interchanges and reduce the number of truck movements across the Chicago region.

In 2006, **Rhode Island** completed the state's first Freight Rail Improvement Project (FRIP) through a partnership using federal, state, and private funds; state funds include GARVEEs and conventional bonds. The \$225 million project included the construction of 12 miles of new track, five miles of track upgrades north of Providence, and five miles that will remain as shared track. The FRIP makes freight rail feasible but also builds on the Rhode Island Department of Transportation's efforts to expand commuter rail service in the state. Beyond upgrading existing facilities, the partnership is expected to spur greater coordination between the state and the private sector in implementing strategic transportation projects.

In 2000, **New Jersey** Transit opened the \$2 billion Hudson Bergen Light Rail system, using a "design-build-operate-maintain" contract. The agreement was the first of its kind in the United States for a major transit service. The state partnered with the 21st Century Rail Corporation, whose members include Washington Group International, which operates and maintains the system, and Kinkisharo USA, which maintains the vehicle fleet. Station construction along the 20.6-mile, 23-station system was partially funded by developers, who subsequently built new housing around the stations conservatively estimated to be worth \$5.3 billion.<sup>64</sup>

### *International Examples*

Despite growing experience in the United States, the use of PPPs to develop transportation infrastructure is more widespread in other parts of the world in terms of projects and amounts, as demonstrated in Table 3.<sup>65</sup> In fact, PPPs have funded approximately 15 percent of infrastructure projects throughout Europe. This means that countries around the world have considerable experience developing, managing and deploying PPPs, which can be beneficial to states.<sup>66</sup>

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**Table 3: Number and Value of PPPs by Region, 1985-2008**

Region	Total Completed	Total Cost (\$US B)	% of Total	Avg. Project Value (\$US M)
Africa	7	\$4	2	\$400
Asia	72	\$45	20	\$675
Europe	91	\$58	25	\$690
Latin America	83	\$19	23	\$255
North America	106	\$47	30	\$435
<i>Canada/Mexico</i>	35	\$11	10	
<i>United States</i>	71	\$36	20	
<b>Total</b>	<b>359</b>	<b>\$172</b>	<b>130</b>	<b>\$540</b>

Source: FHWA Case Studies of Transportation Public-Private Partnerships around the World

The following are some leading examples of innovative PPPs. Each includes a description of the project type and structure and the role of the public and private sectors, along with reasons that the project is considered innovative.<sup>67</sup>

**Canada** maintains one of the most well-funded and effective PPP funds. Formed in 2007, PPP Canada, Inc. administers a \$1.2 billion fund to support and invest in PPP infrastructure projects. In addition to providing other public units and private firms with valuable information regarding the PPP process, the unit and its fund operate within a broader Canadian infrastructure plan, Building Canada, which has committed \$32 billion over seven years to promote a growth-oriented, sustainable development infrastructure program. PPP Canada, Inc. is leading a growing strategy among investment portfolios worldwide, including pension funds and other public and private entities, to seek opportunities for investing in privately developed infrastructure, including ARRA-funded projects. State pension funds in **Alaska, California, Illinois, and Texas** are notable examples of participants in the United States.

Melbourne, **Australia**, a city of almost four million, is home to CityLink, a large toll road project in and around the city. The 14-mile project to link the region's existing roadways was built by Transurban, a private infrastructure and road developer, under a long-term public-private concession agreement. The \$1.9 billion project is completely owned and operated by Transurban. The project is unique because it is exclusively electronically tolled (i.e., it does not use any conventional toll booths). It is almost entirely a series of ramps, bridges, and tunnels, and it employs sound tubes that encircle the road rather than sound barriers to reduce noise. Transurban built the new capacity of the project as a series of tolled roadways and also added tolls

to roads that were upgraded. Transurban receives the revenues from all tolls collected, and it is largely credited for the technological innovations. This type of PPP, with its emphasis on private sector-led innovation, is worth noting.

The Mesopotamia Provinces bridge, in **Argentina**, is another project that was designed and built by the private sector in a PPP. Mesopotamia Provinces, in the northeastern part of Argentina, are divided by two rivers, which creates access and congestion challenges in

the region. The national government sought to build a new bridge that would improve travel, facilitating trade and economic development, but it lacked available capital. Therefore, it decided to undertake a design-build-operate-maintain approach and offer project equity to attract a private partner. Following a competitive bidding process run by the Argentine Ministry of Economy and Public Works, the government awarded a concession to an international consortium of construction companies. The concessionaire took ownership of the facility while the bridge was being built but then transferred ownership back to the government. It still operates the tolls on the bridge. The equity stake during construction provided the consortium an asset that helped it obtain lower-cost capital. The completed bridge has increased trade between the provinces and other countries, supporting the project's goal of economic development. Only a few design-build-operate-maintain PPPs exist in North America.

With its population of 16 million and lengthy coastal roadways, **Chile** exhibits some similarities to Florida (population 18 million). Although Chile has a fairly centralized system of government with experience building roads, it focused its PPP system on its road infrastructure. In this case, procedural and institutional mechanisms were devised by a responsible sector ministry, and between 1993 and 2001 Chile awarded 21 road concessions worth \$5 billion, based on competitive bidding. The bidding attracted 27 responses, and participants included more than 40 companies from Chile and 10 other countries. The PPP program was designed to start with smaller road projects to test the market and reduce the risk to the private sector. The overall road network was completed on schedule, and the PPP program is viewed by international experts as

transparent and competitive, with only one minimum revenue guarantee required of the private sector partners. A comprehensive survey of users, consultations with local and national leaders, and focus groups graded the Chilean concessions system—the full set of road projects—at 6 on scale from 1 to 7.

**Ireland** is world leader in developing PPPs. It uses two separate units to divide the tasks of informing and financially supporting PPPs. The Central PPP Policy Unit's primary responsibilities are to develop the framework, including legislation, to support the PPP process, while disseminating best-practice information. The companion program, the National Development Finance Agency, operates in the financial sector, applying commercial financial evaluation standards to ensure that the Exchequer maximizes the public investment returns. The agency also oversees the procurement process in the health, justice, and education sectors. Since 2005, both units have received votes of confidence from the central government in the form of expanded responsibilities. Despite the economic downturn, Ireland is moving forward on several new PPP road projects anticipated to begin in 2009.

The **United Kingdom** maintains a broad range of PPPs through the country's Private Finance Initiative (PFI). The PFI, which is used by both the central and local governments, secures private funding for public sector institutions, which are in turn partially privatized. One of the widest ranging PPPs is Westminster's agreement with Network Rail (NR), which is responsible for the all of the country's rail infrastructure. NR is still considered part of the state because of its managing members and "not for dividend" status, but it may leverage private sector funding and maintains multiple income streams. One of the PFIs major projects was the modernization of the West Coast Main Line. In addition to NR, the Newcastle and Sunderland metro system was extended and modernized via multiple PPPs. The management of London's Underground system and the redesign of King's Cross Station were also developed by the PFI under separate PPPs.

Loosely following the UK model, **Germany** has privatized some aspects of its transportation systems. It currently has 22 tolled projects on federal highways that have been pre-financed by the private sector, amounting to \$5.9 billion (including \$1.7 billion in capital costs). Efforts to privatize some bridges and tunnels have proved more challenging because stakeholders did not anticipate that drivers would change their routes—even traveling great distances—to avoid paying bridge or tunnel tolls. As a result, this privatization scheme is now under further study. Like Germany, the United States has a vast local road network, and oppo-

nents of proposed toll project have voiced concerns about new tolls causing drivers similarly to divert trips to local roads, leading to additional strain on these surrounding roadways.

Other examples of PPPs for new high-speed rail and light rail projects also exist. The Charles de Gaulle (CDG) Express, a high-speed rail link between the CDG airport and downtown Paris, **France**, is a PPP involving no direct public expenditures. A new extension of the French high-speed rail system from Paris to Bordeaux also has not required direct public investment. A local light rail system in Rennes, which was built from the ground up between 1997 and 2002, was partially financed through the private sector. In the UK multiple light rail systems throughout the country are managed by private firms.

**France** and **Spain** have a joint PPP to construct a new high-speed passenger and freight rail line. An Italian firm, NTV, is set to become that country's first private sector operator of high-speed rail beginning in 2011. Melbourne recently opened a new, award-winning, multimodal station, the Southern Cross Station, which was built and is managed by a private consortium. The consortium receives revenue each year from the government.

## **Vehicle Miles Traveled Fees**

Vehicle miles traveled (VMT) fees charge drivers directly for each mile traveled; they replace the traditional motor fuel tax. States are just beginning to examine using vehicle miles traveled fees, with a pilot in one state and research projects in a handful of others.<sup>68</sup> VMT-based fees are in place for trucks in Germany, Switzerland, and Austria. VMT-based fees are due to be utilized in the Netherlands by 2014 and in Denmark by 2016.

### *State Examples*

**Oregon** has piloted a VMT fee in Portland. In 2006-2007, the state's department of transportation equipped 285 vehicles in the Portland area with GPS receivers that identify the location of the vehicle and its speed, then register the miles driven within certain zones at certain times (in-state, out-of-state, urban area, and rush hour). The receiver registered the mileage driven in each zone and uploaded the information to a central database automatically at refueling stations. The Oregon pilot program required a revenue-neutral fee of 1.2 cents per mile, meaning that the charge to users would be approximately the same as the gas tax but would be applied on a mileage basis instead of a fuel consumption basis.<sup>69</sup> The Oregon DOT addressed privacy concerns by using a recorder that could only register mileage driven in specific zones at specific times. As each

mile is recorded in each zone, the previous record is erased, making it impossible to associate driving behavior with any specific location at any specific time. In 2009, the legislature introduced House Bill 2120, calling for further development of technology for implementing a vehicle miles traveled fee to eventually replace the gasoline tax, as well as new pilot programs to implement congestion pricing in the state and study how its use may reduce traffic congestion.

In **Iowa**, a 2005 study estimated that a 1-cent-per-mile fee, approximating a 20-cent gas tax, would generate \$316 million per year, based on 31.6 billion miles traveled in Iowa annually. Currently the University of Iowa is coordinating a study to assess driver acceptance of VMT fees.<sup>70</sup> The pilot program is field testing a VMT tax collection system in six states: **California, Idaho, Iowa, Maryland, North Carolina** and **Texas**. **Colorado, Idaho, and Minnesota** also have identified the VMT fee as one possible way to fund infrastructure maintenance and new transportation facilities. An additional study on VMT fee strategies, sponsored by the National Cooperative Highway Research Program, is anticipated to be completed in July 2009.<sup>71</sup>

Related to a VMT fee is a weight-mile tax. A weight-mile tax is a form of taxation that is based on the combined weight of the vehicle and the number of miles that it travels. In **Oregon**, truck operators pay a weight-mile tax instead of fuels taxes. In its current form, Oregon's weight-mile tax is based on the weight of the vehicle, the distribution of that weight on the axles, and the distance traveled.

### *International Examples*

A VMT charge is in use on the autobahns of **Germany**, where trucks pay a variable VMT tax based on total vehicle emissions as well as miles traveled. Starting in 2011, the **Netherlands** will implement a VMT tax for trucks, and one for passenger cars begins in 2014. Denmark will transition to a VMT by 2016. The Netherlands scheme combines the per-kilometer tax (initially a flat rate but capable of varying based on road category and time of day) with other fixed transportation taxes, such as a 25 percent sales tax on new cars, a vehicle tax based on the price and weight of the car, and a tax based on the type of fuel used. All these taxes will be bundled into one tax that users will pay based on kilometers driven. The goals of this approach are to discourage unnecessary driving by translating all fixed costs of driving to variable costs; to meet obligations under the Kyoto Protocol to reduce carbon emissions; to reduce traffic congestion; and to provide funding for road maintenance. The system will protect the privacy of users by using a system similar to the one piloted in Oregon.

Another type of vehicle fee that could be used in the United States would take the form of a federal weight-distance tax on commercial trucks (or some subset thereof) to more closely align truck VMT charges with the costs imposed on the system, especially by heavy trucks. This is being considered in many countries in Europe, including Germany, Ireland, the Netherlands, and Denmark.

### **Other Sources of New and Innovative Funding**

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Other types of new or innovative funding sources employed by states and internationally include impact fees, container fees, traffic camera fees, and vehicle emissions fees.

#### **Impact Fees**

Impact fees are traditionally used to fund infrastructure needs necessary to support land use changes related to growth and development. Currently 23 states have adopted acts that authorize impact fees.<sup>72</sup> One subset of these is transit impact fees, which are one-time payments used to fund transit capital improvements. However, because state transit capital expenses, such as new vehicles and infrastructure, are often covered by federal transit grants and subsidies, transit impact fees have rarely been used by states although they are in use at the local level. Operating costs are a smaller portion of transit costs and more likely to be a local government expense. Two states, **California** and **Florida**, have special authorizing authority to collect impact fees to pay operating expenses, including maintenance, repair or alteration of transit facilities. The San Francisco Transit Impact Development Fee Ordinance, enacted in 1981, is the only impact fee in the United States dedicated to both transit capital and operations.<sup>73</sup>

#### **Container Fees**

An innovative approach to funding freight infrastructure is seen in the case of the Alameda Corridor, a rail expressway connecting the ports of Los Angeles and Long Beach, **California**, to transcontinental rail yards near downtown Los Angeles. These two ports are the major gateways to Asian markets. The cities, ports, nearby communities, and policymakers desired to improve freight movement and minimize effects on local communities. The project was designed to create an efficient connection to all domestic markets via Los Angeles' primary rail facility. The \$2.4 billion project used debt financing issued by Los Angeles County and container fees to finance the bonds. Adding a small container fee to waterborne vessels and railroads made it possible for the county to secure bond funding for half of the total project cost. The project also serves as an example of a PPP because it

included participation by federal, state, and local government partners, as well as both ports and BNSF Railroad. The resulting improved rail line has eliminated 200 rail-street crossings, shorted automobile travel, and eliminated 1.4 million truck trips per year.

### **Traffic Camera Fees**

A traffic enforcement camera is an electric device used to photograph and fine vehicles breaking a speed limit, running a red light, or breaking some other road safety law. Most cameras are mounted in boxes or on poles beside the road or at an intersection and are connected to a sensor. The sensors are programmed to be able to detect vehicles speeding or driving through red lights. Traffic camera fee revenues are typically used to supplement general funds but can also be used to generate funds for transportation purposes.

The Federal Highway Administration reported “a modest to moderate economic benefit” to jurisdictions that installed red-light cameras and cited average yields of \$39,000 to \$50,000 annually at each intersection where they were used.<sup>74</sup> Localities have generated upwards of \$1 million per year from these devices, with New York City raising \$89 million since 1994 and Dallas, **Texas**, earning \$6.2 million in fiscal year 2007-2008.<sup>75</sup> In May 2009, the city of Chicago announced that it was considering a plan to raise \$200 million in new annual revenue by photographing and subsequently fining drivers without insurance.<sup>76</sup> Earlier statewide estimates in **Illinois** cited a potential \$50 million annually in profit for the state from speed cameras.<sup>77</sup> Six states, including **Arkansas, Nebraska, Nevada, New Jersey, West Virginia, and Wisconsin**, have severely restricted or banned the use of these cameras because of legal uncertainties, including privacy concerns.<sup>78</sup> Traffic cameras have been used extensively overseas, notably in Australia and Great Britain, where revenues are mostly dedicated to general funds.<sup>79</sup>

### **Vehicle CO<sub>2</sub> Emissions, Taxes, and Fees**

Although no such system is currently in use in the United States, a number of other countries, mostly in Western Europe, have added or adjusted vehicle taxes and fees so that they are calculated according to amount of carbon dioxide (CO<sub>2</sub>) emissions per kilometer (km) driven. In addition to raising revenue, these fees are designed to encourage vehicle manufacturers to produce cars and trucks that minimize CO<sub>2</sub> emissions.

For example, in 2005 **France** increased registration fees for higher-emission vehicles, including larger cars and trucks and sport utility vehicles, which represent about 10 percent of all new car purchases in France. Vehicles that emit 200 grams or more of CO<sub>2</sub> per km pay a pollution tax included in the one-time vehicle registration fee.<sup>80</sup>

The **United Kingdom** has two primary vehicle taxation policies. Both the Vehicle Excise Duty (VED) and the Company Car Tax are based on CO<sub>2</sub> emissions levels. VED levels are based on a combination of engine size, emissions, and fuel type. Company Car Taxes are calculated as a percentage of the list price, ranging from 15 percent for the lowest-emitting vehicles to 35 percent for the highest emitters.<sup>81</sup>

In **Spain**, registration tax depends on CO<sub>2</sub> emissions: zero percent for cars producing less than 120 grams per km, 4.75 percent for cars between 121 and 160 grams, 9.75 percent between 161 and 200 grams, and 14.75 percent if the vehicle produces more than 201 grams of CO<sub>2</sub> per km.

In **Sweden**, the tax is also based on a vehicle's CO<sub>2</sub> emissions. For alternative-fuel vehicles, hybrid vehicles, and electric cars, the tax is reduced according to CO<sub>2</sub> emissions.

# CONCLUSION

States are taking a combination of traditional and innovative approaches to fund and finance their transportation investments. There is an opportunity to expand and enhance the use of many of these, and in particular to learn from the innovative approaches being used overseas.



# California

## Transportation Network

Road Lane Mileage	382,917	Port Traffic (20-foot Equivalent)	18,189,061
Transit Ridership (# of trips)	1,350,005,700	Air Traffic (Enplanements)	90,103,577

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 18	\$3,266,398,000	100%	Gasoline: 1994
	Diesel: 18			Diesel: 1995
<i>Fuel taxes for vessels, agriculture, and off-highway vehicles go into separate funds for those areas.</i>				
	Miles of State Toll Roads	Number of State Toll Bridges and Tunnels	Total State Revenue (2007)	
Toll Fees	6	7	\$425,812,000	
<i>There are an additional 77 miles of locally operated toll roads, one locally operated toll bridge, and one privately operated ferry system.</i>				
State General Fund	\$1,350,971,000 (Fiscal Year 2008)			
State Transit Funding	\$1,058,050,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
Sales Taxes	Yes			
Other Funding Sources	Advertising revenue			
<b>Total Estimated Budget</b>	<b>\$11,338,089,000 (Fiscal Year 2008)</b>			

## Innovative Financing

State Infrastructure Bank	Two loans at a value of \$1.12 million
GARVEE Bonds	Two issuances at a value of \$712.5 million
Federal Credit Assistance (TIFIA)	One issuance at a value of \$140 million
Public-Private Partnerships	Ten transportation projects have utilized private design and build procurements, as well as design, build, operate, and maintain contracts.
Impact Fees	Yes
Traffic Cameras	Yes

## Transportation Network

Road Lane Mileage	183,252	Air Traffic (Enplanements)	26,208,057
Transit Ridership (# of trips)	94,811,400		

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 22	\$567,680,000	100%	Gasoline: 1991
	Diesel: 20.5			Diesel: 1992
<i>Unspecified appropriations for oil inspection costs, telecommunications support, license plate production, HAZMAT transportation emergency services, and border inspection.</i>				
	Miles of State Toll Roads	Number of State Toll Bridges and Tunnels	Total State Revenue (2007)	
Toll Fees	6.6	0	\$1,505,680	
<i>There are an additional 47 miles of locally operated toll roads.</i>				
State Transit Funding	\$3,541,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
Other Funding Sources	State gaming/lottery revenue			
<b>Total Estimated Budget</b>	<b>\$1,375,859,271 (Fiscal Year 2008)</b>			

## Innovative Financing

State Infrastructure Bank	Four loans at a value of \$4.4 million
GARVEE Bonds	Six issuances at a value of \$1.665 billion
Public-Private Partnerships	Six transportation projects have utilized private design and build procurements as well as a 99-year lease of the Northwest Parkway.
Impact Fees	Yes
Traffic Cameras	Yes

## Transportation Network

Road Lane Mileage	99,198	Air Traffic (Enplanements)	1,798,730
Transit Ridership (# of trips)	4,035,000		

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2008)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 25 Diesel: 25	\$232,541,300	Gasoline: 93.07% Diesel: 95.46%	1996
<i>1.28% of gasoline tax used for waterways improvement fund; 1.28% of gasoline tax used for snowmobile trails; remainder of deduction used for law enforcement.</i>				
State Transit Funding	\$312,000 (2009)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
<b>Total Estimated Budget</b>	<b>\$493,966,900 (Fiscal Year 2009)</b>			

## Innovative Financing

GARVEE Bonds	Two issuances at a value of \$367.3 million
Impact Fees	Yes

## Transportation Network

Road Lane Mileage	149,277	Air Traffic (Enplanements)	1,517,929
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## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 27 Diesel: 27.8	\$191,314,000	98.4%	1994
<i>Deductions are intended to represent fuel used in boats, snowmobiles, aviation, and off-road vehicles.</i>				
State Transit Funding	\$285,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
<b>Total Estimated Budget</b>	<b>\$512,158,252 (Fiscal Year 2008)</b>			

## Innovative Financing

GARVEE Bonds	Two issuances at a value of \$167.5 million
Impact Fees	Yes

## Transportation Network

Road Lane Mileage	71,255	Air Traffic (Enplanements)	25,228,319
Transit Ridership (# of trips)	78,508,000		

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 24.75 Diesel: 27.75	\$520,679,000	Gasoline: 96.95% Diesel: 97.28%	1992
<i>0.75 cents/gal dedicated to petroleum storage tank remediation; watercraft fuel tax used for boating facilities.</i>				
State Transit Funding	\$113,696,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
Other Funding Sources	Vehicle rental taxes			
<b>Total Estimated Budget</b>	<b>\$648,400,000 (Fiscal Year 2008)</b>			

## Innovative Financing

GARVEE Bonds	GARVEE bonds are authorized but no projects have utilized them.
Federal Credit Assistance (TIFIA)	One issuance at a value of \$50.5 million
Public-Private Partnerships	Two transportation projects have utilized private design and build and design, build, and operate contracts.
Impact Fees	Yes

# Oregon

## Transportation Network

Road Lane Mileage	123,408	Port Traffic (20-foot Equivalent)	260,128
Transit Ridership (# of trips)	108,920,000	Air Traffic (Enplanements)	8,316,517

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 24 Diesel: 24	\$357,258,000	100%	1993
	<i>Aviation fuel taxes used for aviation advancement; unspecified amounts for boating and ATVs.</i>			
Toll Fees	<i>There are two locally operated toll bridges and three locally operated ferry systems.</i>			
State General Fund	\$4,504,713 (2007-2009)			
State Transit Funding	\$11,013,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
Other Funding Sources	State gaming/lottery funds; vehicle weight fees			
<b>Total Estimated Budget</b>	<b>\$3,518,469,459 (2007-2009)</b>			

## Innovative Financing

State Infrastructure Bank	20 loans at a value of \$34.773 million
GARVEE Bonds	GARVEE bonds are authorized but no projects have utilized them.
Public-Private Partnerships	Two transportation projects have utilized private design and build procurements.
Impact Fees	Yes
Traffic Cameras	Yes

## Transportation Network

Road Lane Mileage	92,314	Air Traffic (Enplanements)	10,678,164
Transit Ridership (# of trips)	41,511,800		

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 24.5	\$368,502,000	100%	1997
	Diesel: 24.5			
<i>Off-highway vehicle facilities receive the lesser of 0.5% of tax receipts or \$1.05 million; taxes on fuel for boats used for boating facilities; unspecified amount for law enforcement and tourism.</i>				
	Miles of State Toll Roads	Number of State Toll Bridges and Tunnels	Number of State Ferry Systems)	Total State Revenue (2007)
Toll Fees	44	0	1	\$822,000
<i>There is one mile of privately operated toll road.</i>				
State General Fund	\$389,490,000 (Fiscal Year 2008)			
State Transit Funding	\$91,837,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
<b>Total Estimated Budget</b>	<b>\$1,639,486,300 (Fiscal Year 2008)</b>			

## Innovative Financing

State Infrastructure Bank	One loan at a value of \$2.88 million
Public-Private Partnerships	Two transportation projects have utilized private design and build procurements.
Impact Fees	Yes

# Washington

## Transportation Network

Road Lane Mileage	174,430	Port Traffic (20-foot Equivalent)	3,898,438
Transit Ridership (# of trips)	189,485,300	Air Traffic (Enplanements)	17,903,549

## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2007)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 37.5 Diesel: 37.5	\$1,159,697,542	Gasoline: 97.86% Diesel: 99%	2008
<i>1% of fuel tax dedicated to off-road vehicles; 1.139% of gasoline tax dedicated to marine study costs; unspecified amount dedicated for snowmobile facilities.</i>				
Toll Fees	Miles of State Toll Roads	Number of State Toll Bridges and Tunnels	Number of State Ferry Systems	Total State Revenue (2007)
	0	1	12	\$162,259,690
<i>There are four locally operated ferry systems and one privately operated ferry system.</i>				
State Transit Funding	\$198,272,000 (2006)			
State Bonding Authority	Yes			
Vehicle Registration Fees	Yes			
Other Funding Sources	Vehicle rental taxes; vehicle excise taxes; licenses, permits, and fees revenue; and vehicle weight fees			
<b>Total Estimated Budget</b>	<b>\$7,931,000,000 (2007-2009)</b>			

## Innovative Financing

State Infrastructure Bank	3 loans at a value of \$2.376 million
Public-Private Partnerships	The Tacoma Narrows Bridge was a private design and build project, financed with state-issued transportation bonds.
Impact Fees	Yes
Traffic Cameras	Yes

# Wyoming

## Transportation Network

Road Lane Mileage	58,263	Air Traffic (Enplanements)	500,772
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## Traditional Funding Sources

	Current Rate (cents per gallon)	Total Revenue (2009 Estimate)	Percentage to Transportation	Last Changed
Fuel Tax	Gasoline: 14 Diesel: 14	\$101,050,275	92.86%	1998
<i>1 cent/gal for underground storage tank fund (suspended if account greater than \$10 million); revenue from boats or snowmobiles used for those purposes; unspecified amount for Technology Transfer Center.</i>				
State General Fund	\$103,207,631 (Fiscal Year 2008)			
State Transit Funding	\$1,681,454 (2008)			
Vehicle Registration Fees	Yes			
State Taxes on Fuel	Yes			
<b>Total Estimated Budget</b>	<b>\$622,726,306 (Fiscal Year 2008)</b>			

## Innovative Financing

State Infrastructure Bank	14 loans at a value of \$112.322 million
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