

ON THE MOVE

State Strategies for 21st Century Transportation Solutions

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With Support from the Rockefeller Foundation



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A Word on the Rockefeller Foundation's Transportation Initiative

This report was funded by the Rockefeller Foundation's Promoting Equitable, Sustainable Transportation Initiative. A key goal of that initiative is to ensure that policymakers at all levels of government in the United States have actionable and practical research and analytical support to advance equitable, sustainable and economically beneficial transportation policies.

The Initiative's vision of success, as expressed in its strategy overview, includes:

- Healthier and safer lives for U.S. residents.
- More disposable income as a result of smart infrastructure choices that create communities characterized by convenient and affordable transportation options.
- Increased opportunities for prosperity and social mobility for all residents, especially the poor and vulnerable, through safe, reliable and inexpensive transportation options.
- Communities that encourage and sustain active and healthy living through well-designed, clean streets that are shared among drivers and pedestrians alike.
- Systematically organized, well-maintained multimodal transportation networks serving metropolitan regions.
- Performance-driven transportation policy, funding and implementation with outcomes that are beneficial to society: increased economic productivity, reduced greenhouse gas emissions, reduced reliance on petroleum and expanded individual opportunity.
- Transportation agencies working seamlessly with housing, energy and environment, economic development and health agencies toward a common vision and shared goals.

Executive Summary

Transportation policy and funding are at a critical juncture in the United States. Faced with budget shortfalls and a host of other challenges, state legislatures are exploring and enacting a number of innovative policies to ensure that the future mobility needs of all Americans are met in a manner that is fiscally sound and supports a broad range of policy goals.

This report explores a wide array of innovative surface transportation reform laws, policies and programs that policymakers are considering or pursuing to take the nation's transportation system well into the 21st century. Particular focus is placed on policies that promote fiscal and environmental sustainability; facilitate affordable, safe and accessible transportation choices; and achieve shared benefits such as improved public health and economic development. Every effort was taken to assemble a broad cross-section of approaches and diverse voices, to represent as fully as possible the exciting transportation reform developments occurring in state legislatures across the country.

This report is organized into four sections, each of which explores the shifting trends underlying a number of recent and proposed policy developments across the states.

➤ **Taking the Long View** examines policies that exemplify a forward-thinking, sustainable approach to providing surface transportation infrastructure and services over the long term. This includes provision of sustainable transportation funding and consideration of life-

cycle costs in transportation decision-making.

- **Using What You Have** explores effective and cost-efficient approaches that help make the most of existing infrastructure, such as fix-it-first and asset management, operations and management, and commute trip reduction.
- **Giving People Choices** highlights a variety of viable, accessible and affordable transportation options that fit citizens' needs and also synchronize with larger policy goals. Policies reviewed in this section include bicycle and pedestrian safety and travel initiatives, complete streets policies, carsharing and bikesharing, transit-oriented development and human service transportation coordination.
- **Achieving Multiple Benefits** looks at how transportation decisions can successfully achieve diverse public benefits. The section includes a discussion of the use of comprehensive performance management and examples of how transportation activities have been linked with environmental and public health planning and goals.

This report has been made possible by the support and vision of the Rockefeller Foundation.

Introduction

Transportation policy and funding are at a critical juncture in the United States. Gas tax revenues—the primary means to fund the planning, construction, operation and maintenance of transportation infrastructure and systems—are declining due to inflation, rising construction costs, and the growing use of alternative fuels and more fuel-efficient vehicles. The federal surface transportation legislation signed into law in July 2012 lasts for only 27 months and still has not addressed the core issue of creating a dedicated and reliable source of transportation funding.

Among these challenges, state legislatures are exploring and enacting a number of innovative policies to ensure that the future mobility needs of all Americans are met in a manner that is fiscally sound and supports other policy goals such as environmental sustainability; energy independence; improved public health; economic development; and safe, accessible and affordable transportation choices for citizens.

Policymakers in the 21st century are confronted with a number of trends and demographic changes that will dramatically affect Americans' future travel patterns and mobility needs.

Decline in Vehicle Miles Traveled and Use of Personal Vehicles. One major trend is the decline in vehicle miles traveled. According to the 2009 National Household Travel Survey (NHTS), the number of miles driven per person has declined since 2001 for every age group of drivers.¹ A recent report concluded that the average number of vehicle miles traveled had dropped 23 percent since 2001 for people ages 16 to 34.² Accompanying this trend is a decreasing reliance on personal vehicles. NHTS also recorded a slight dip in the average number of

vehicles per household—the first decrease since the survey was first administered in 1969—although ownership rates still are higher than in 1995.³ Nationwide, about 8 percent of the U.S. population now have no vehicle access.⁴

Increase in Use of Other Travel Modes. The decline in reliance on personal vehicles is reflected by an increase in use of other travel modes. Americans took 10.4 billion trips by transit in 2011, an increase of 2.3 percent over 2010 and the second most transit trips for any year since 1957.⁵ Ridership was up an additional 5 percent in the first quarter of 2012, compared to the first quarter of 2011.⁶ Affordability likely plays a role in this trend; estimates are that an individual can save more than \$10,000 per year by riding public transit instead of driving.⁷

Bicycling and walking also are on the rise as transportation alternatives. From 1990 to 2009, the number of individual walking trips increased from 18 billion to 42.5 billion; bicycling trips increased from 1.7 billion to 4 billion during the same time period.⁸ In addition, since 2000, the number of bicycle commuters has increased by 40 percent nationwide.⁹ Today, 12 percent of all trips in America are made by foot or by bicycle; minority and low-income groups especially rely on walking for transportation.¹⁰ Alternatives to individual vehicle ownership such as carsharing and bikesharing also have seen impressive growth in the past decade. Nationwide, carsharing programs now have 718,596 members, and public bikesharing systems have more than 170,000 members.¹¹ Younger Americans especially are choosing to travel less or use emerging modes; compared to 2001, people between the ages of 16 and 34 now take 24 percent more trips by bicycle and 16 percent more trips by foot and have increased their transit miles by 40 percent.¹²

Changing Demographics and Population Trends. Population growth in the United States is largely centered in metropolitan areas, fueled by demand from two of America’s largest generations, the millennials and baby boomers. Urban areas, which account for 80.7 percent of the nation’s population, experienced a growth rate of 12.1 percent from 2000 to 2010, compared to 9.7 percent for the nation as a whole.¹³ The 10 largest “megaregions” are expected to account for 70 percent of the U.S. population and economic growth by 2050.¹⁴

According to real-estate trend watchers, 88 percent of millennials want to live in an urban setting.¹⁵ Americans in general are increasingly choosing housing in settings that provide a number of transportation choices. A National Association of Realtors survey found that 77 percent of respondents wanted to live in pedestrian-friendly neighborhoods, and 50 percent favored transit improvements over other options. In addition, 60 percent were willing to live in a smaller house if it meant their commute would take less than 20 minutes.¹⁶

The aging of America also presents challenges. Today, 13 percent of Americans are over age 65; by 2030, people over age 65 will make up nearly 20 percent of the nation’s population, and will total around 72 million.¹⁷ These older adults will require travel alternatives, since one in five people over age 65 does not drive.¹⁸ Older adults also show a preference for access to more travel options; for example, in a 2008 survey of Americans over age 50, 78 percent said they would support a complete streets policy in their community (see also pages 38 to 40).¹⁹

Deterioration of Existing Transportation Infrastructure. Policymakers also must deal with a transportation landscape in which existing infrastructure and systems are in a state of disrepair and continuing to decline. This presents challenges to adequately fund and maintain existing infrastructure, much less provide new capacity. Current estimates are that 32 percent of the nation’s major roads are in poor or mediocre condition, and 24 percent of its bridges are structurally deficient or functionally obsolete.²⁰ In 2009, the American Society of Civil

Engineers gave America’s infrastructure an overall “D” grade; the nation’s aviation, bridges, roads, rail and transit systems all were rated as being in mediocre or poor condition; aviation, roads and transit had worsened since 2005.²¹

Effects of Transportation on Other Policy Goals. In recent years, increasing attention has been paid to transportation’s potential effects on other policy goals and quality-of-life issues, such as environmental impacts, energy use, public health and economic development.

Transportation, energy and environmental policies are inextricably linked. Today, 95 percent of the nation’s transportation is fueled by oil; transportation consumes about 28 percent of the nation’s energy and produces 27 percent of the nation’s greenhouse gases, second only to electricity generation.²² A growing population and the need to move more goods are expected to increase transportation energy demand by 17 percent by 2035, according to the U.S. Energy Information Administration.²³ Transportation planning decisions also can affect the availability of farmland, parks, open space, wetlands and other natural or working landscapes, leading to impacts on watersheds, erosion and other natural systems.

Transportation policies also influence public health—an especially important consideration since health care costs continue to consume larger chunks of state budgets. Obesity is estimated to account for 21 percent of U.S. health care costs, and active transportation (transit, bicycling and walking) offers opportunities to include exercise as part of a daily routine; public transit riders often reach daily recommended goals for physical activity solely by walking to and from transit stops.²⁴ The effects of transportation on air quality also can affect public health. A study in the California Bay Area found that school sites near major roads had higher levels of traffic pollutants and higher incidences of respiratory problems among students.²⁵ Reductions in traffic congestion also have been linked to improved infant health and fewer hospitalizations for asthma.²⁶

In addition, transportation investments can help improve the economy. Current estimates indicate that every \$1 billion in highway and transit investments supports 13,000 jobs on average; transit projects create 31 percent more jobs per \$1 spent than new construction of roads and bridges.²⁷ Transportation investments also can catalyze other development activity. Since a Portland, Ore., street-car line was built in 2001, 10,000 housing units and 5.4 million square feet of office and retail space have been built within two blocks of the line, a total of \$3.5 billion in investments.²⁸ Further, designing communities with walking in mind can have a positive effect on property values; recent research found a positive correlation between walkable environments and increased home values in 13 of 15 markets.²⁹ Lastly, transportation is vital to the nation's economic competitiveness. As of 2008, the U.S. transportation system daily moved about 59 million tons of goods worth a total of \$46 billion. Traffic congestion alone now accounts for a 3 percent loss in gross domestic product, and the American Society of Civil Engineers predicts that, by 2040, transportation infrastructure deficiencies will cause the United States to lose more than \$72 billion in foreign exports each year.³⁰

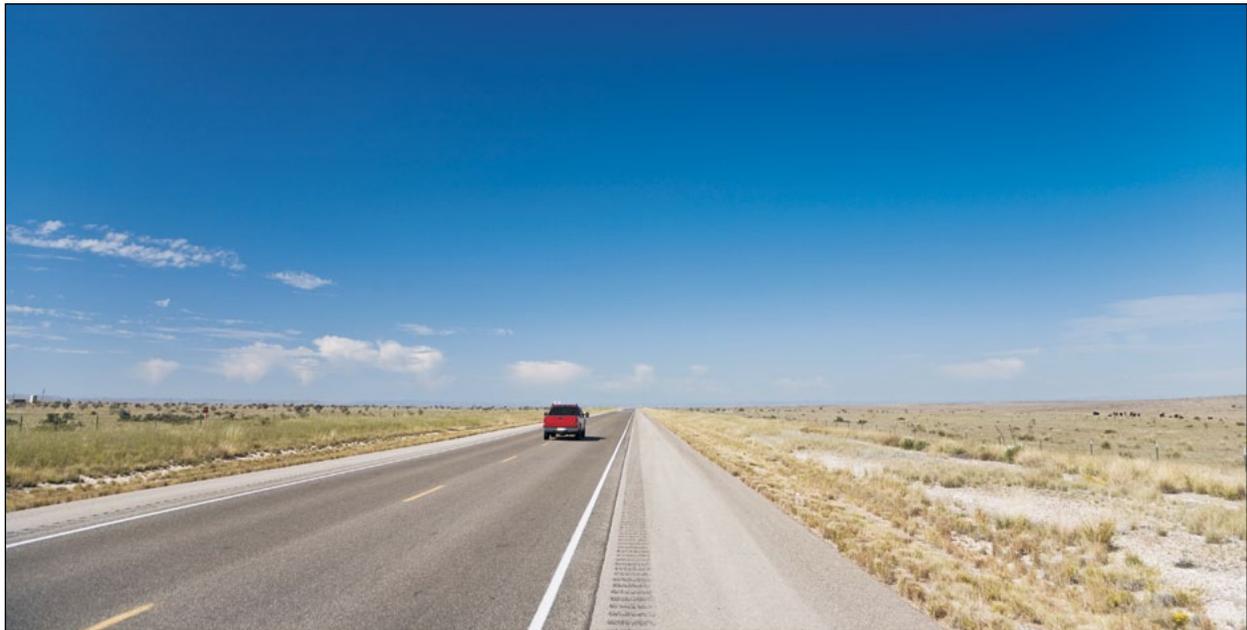
This report provides information about the wide array of innovative transportation reform laws, policies and programs that policymakers are considering or pursuing to meet these challenges and take the nation's surface transportation system into the 21st century. Particular focus is placed on policies that promote fiscal and environmental sustainability; facilitate affordable, safe and accessible transportation choices; and achieve shared benefits such as improved public health and economic development. Every effort has been taken to assemble a broad cross-section of approaches and diverse voices, to represent as fully as possible the exciting transportation reform developments occurring in state legislatures throughout the country. Highways, transit, rail, bicycling, walking and other modes are included in this analysis. This report is intended to provide a menu of possible policy op-

tions, informed by the experiences of policymakers and other experts. Not all policies are a good fit in all contexts, however, and nothing in this report should be construed as advocating for specific state policies or approaches.

This report is organized into four sections, each of which explores the shifting trends underlying a number of recent and proposed policy developments across the states.

- **Taking the Long View** examines policies that exemplify a forward-thinking, sustainable approach to providing surface transportation infrastructure and services over the long term. This includes provision of sustainable transportation funding and consideration of life-cycle costs in transportation decision-making.
- **Using What You Have** explores effective and cost-efficient approaches that help make the most of existing infrastructure, such as fix-it-first and asset management, operations and management, and commute trip reduction.
- **Giving People Choices** highlights a variety of viable, accessible and affordable transportation options that fit citizens' needs and also synchronize with larger policy goals. Policies reviewed in this section include bicycle and pedestrian safety and travel initiatives, complete streets policies, carsharing and bikesharing, transit-oriented development and human service transportation coordination.
- **Achieving Multiple Benefits** looks at how transportation decisions can successfully achieve diverse public benefits. The section includes a discussion of the use of comprehensive performance management and examples of how transportation activities have been linked with environmental and public health planning and goals.

Taking the Long View



The nation's transportation assets are long-term investments, and decisions about how to fund, design and maintain them have long-term consequences. The policies explored in this section take a forward-thinking, sustainable approach to providing transportation infrastructure and services over time. This includes provision of sustainable transportation funding; consideration of life-cycle costs in transportation planning and implementation; and use of diverse, comprehensive performance measures.

Sustainable Transportation Funding

States are facing a well-documented and worsening transportation funding crisis, characterized by a chronic shortfall between existing revenues and infrastructure needs at all levels of government. Studies have estimated the gap between total federal, state and local revenues and the cost to main-

tain the nation's highway and transit systems at \$57 billion to \$118 billion per year; to both maintain and improve them, the gap is \$113 billion to \$185 billion per year.³¹ In comparison, the approximately \$48 billion provided for transportation projects by the American Recovery and Reinvestment Act of 2009 failed to make up for even a single year's shortfall. According to the National Surface Transportation Infrastructure Financing Commission, as of 2009, forecasts agreed that the nation as a whole was spending "only about one-third to one-half of the amount required to adequately maintain the system and make key improvements."³²

DEFINITION

Sustainable transportation funding mechanisms are those that generate sufficient revenues to meet transportation investment needs over time, in a stable and predictable way.

The causes of this crisis are many, including years of underinvestment, aging infrastructure, growing transportation demand and the effects of the economic recession. Perhaps the most significant contributor, however, is the nation's reliance on motor fuel taxes to provide transportation funding. The federal government and all 50 states tax motor fuels, including gasoline and diesel; these taxes provide close to 40 percent of state revenues for highways, and 92 percent of gross federal Highway Trust Fund receipts.³³ Yet these revenues have not kept pace with needs, partly due to changing travel patterns and fewer miles driven nationwide. Improvements in vehicle fuel efficiency and growing use of alternative fuels also present serious challenges for transportation funding. A May 2012 Congressional Budget Office brief, for example, estimated that proposed corporate average fuel economy (CAFE) standards will result in a 21 percent drop in federal gas tax revenues by 2040.³⁴

Further contributing to the problem is the fixed-rate structure of the federal gas tax and most state fuel taxes, under which the same flat number of cents per gallon is charged year after year. Because most states have not raised fuel taxes in years or even decades, the taxes' actual purchasing power has plummeted due to inflation and rising construction costs. According to a recent Institute on Taxation and Economic Policy study, after accounting for growth in construction costs, the average state gas tax rate has effectively fallen by 20 percent since it was last increased; thus, states have seen the real value of these revenues drop by a nationwide total of \$10 billion each year.³⁵ Similarly, the fixed-rate federal gas tax has lost 33 percent of its purchasing power since it was last raised in 1993.³⁶

As revenues continue to fall short, federal and state investments in transportation infrastructure are at risk or, in many cases, already declining. The Congressional Budget Office estimated in early 2012 that, if current spending and revenue trends continue, the federal Highway Trust Fund would become insolvent in FY 2013.³⁷ At the state level, at least 20 states have cut their overall transportation programs since FY 2010,³⁸ and as of May 2012, high-

way and road investments were below pre-recession levels in 28 states.³⁹

The costs of ongoing underinvestment are high, since they hasten the decline of crucial but aging transportation infrastructure across the states. In 2009, the American Society of Civil Engineers gave America's infrastructure an overall "D" grade; the nation's aviation, bridges, roads, rail and transit systems all were rated to be in mediocre or poor condition, with aviation, roads and transit becoming worse since 2005.⁴⁰ According to the society, deteriorating surface transportation infrastructure cost U.S. households and businesses nearly \$130 billion in various costs and time delays in 2010 alone. If current trends continue, these costs will reach \$210 billion per year in the next eight years, and \$520 billion per year by 2040.⁴¹

Given the nationwide funding shortfalls, policymakers at all levels of government are concerned about how to generate sufficient funds for transportation investment. Equally important, however, is the sustainability of those revenues—that is, not just how much revenue comes in, but whether funding mechanisms will be stable and predictable enough to meet ongoing transportation needs, despite changes in technology and travel patterns as well as rising costs and inflation.⁴² The three examples of funding mechanisms described below have been selected from among the many options available because they specifically address the issue of funding sustainability; where relevant, other policy considerations also are explored.

It is important to note that policymakers are not only concerned about raising sufficient, sustainable funds for transportation; they also are seeking ways to stretch dollars through borrowing or otherwise leveraging existing revenues, and to make transportation investments more accountable and efficient. Indeed, a silver lining to the transportation funding crisis is a renewed focus on cost-effective, creative solutions that focus on getting the most out of existing infrastructure. For more details, see *Using What You Have*, starting on page 17.

Variable-Rate and “Indexed” Fuel Taxes

In response to concerns that fixed-rate, cents-per-gallon taxes lose purchasing power over time, some states have instead implemented variable-rate taxes on fuel. These have taken various forms. Some are tied (or “indexed”) to inflation, while others are linked to the wholesale price of fuel, or more closely resemble traditional sales taxes by assessing a percentage of the retail sales price of fuel. A variable-rate design can allow fuel taxes to automatically adjust for changes in purchasing power over time.

A total of 12 states now assess variable-rate taxes on fuel; in all but Kentucky, the variable compo-

ponents are in addition to a flat-rate excise tax (Figure 1). In Florida, Kentucky and North Carolina, tax rates specifically account for changes in purchasing power over time. Florida adjusts a state fuel tax based on the Consumer Price Index, and Kentucky and North Carolina on the average wholesale price, which tends to rise with inflation. (Maine also tied its fuel tax to the Consumer Price Index until June 2012, when the indexing was eliminated by a provision in the 2011 transportation budget bill.) California’s indexed excise tax is tied to the retail price of gasoline, since it is designed to be revenue-neutral with a sales tax that it replaced in 2010. Ne-

Figure 1. Variable-Rate Fuel Taxes



* California’s “fuel tax swap” provisions (2010 Cal. Stats., Chap. 11) replaced a then-6 percent sales tax on fuel with a new excise tax (\$0.173 per gallon in 2010-2011) that is annually indexed to be revenue-neutral with the former sales tax. This was intended to give the state more spending flexibility; excise taxes can be used for debt service, but sales taxes cannot.

* Florida has a cents-per-gallon fuel tax that is indexed to the Consumer Price Index, which is categorized here as an indexed fuel tax for clarity. Note, however, that this tax is called a “fuel sales tax” in state law.

* Georgia levies a 4 percent “prepaid state tax” on motor fuel, which is imposed at a cents-per-gallon rate that is set using a weighted average indexed retail sales price (determined semi-annually) for each type of fuel. For the purposes of this report, this is categorized as a sales tax on fuel.

* Hawaii, New Mexico and Tennessee impose additional taxes on fuel or petroleum products that are not included here because they are flat-rate—not variable or percentage-based—taxes. Of those, New Mexico’s “petroleum products loading fee” automatically decreases only if the unobligated balance in the state’s Corrective Action Fund exceeds certain amounts.

* Iowa’s fuel tax rates are adjusted annually based on the percentage of fuel sold that is blended with ethanol. These adjustments, however, are meant to be revenue-neutral; the last change to Iowa’s fuel tax rates that was intended to generate additional revenue was in 1989. The current fuel tax rate has not changed since July 2008.

Note: The term “sales tax on fuel” refers here to a special sales tax on fuel that is at least partly dedicated to transportation purposes. It does not refer to those states (such as Illinois and Michigan) that subject motor fuels to some or all of the general statewide sales tax.

Sources: American Petroleum Institute, 2012; Dierkers and Mattingly, 2009; Institute on Taxation and Economic Policy, 2011; Iowa Department of Transportation, 2008; Rall et al., 2011; Workman and Rall, *Motor Fuel Sales Taxes*, 2012; various state statutes.

braska uniquely adjusts one variable portion of its fuel tax to directly match transportation revenues to expenditures; the rate is adjusted annually to generate enough revenue to meet that year's legislative appropriations from the Highway Cash Fund. This is intended to ensure adequate funding for highway projects. The remaining seven states (plus Nebraska, which has a second variable component) assess percentage-based sales taxes or other taxes on fuel distributors or suppliers, tied to the wholesale or retail price of fuel or to petroleum companies' earnings.⁴³

Variable-rate taxes on fuel can address some of the immediate concerns about the depreciation of gas taxes due to inflation. They also retain some of the gas tax's current advantages, such as the lowest operating cost of any existing or alternative transportation funding mechanism;⁴⁴ long-standing public familiarity; and adherence to the "user fee" principle, in that those who place greater wear and tear on transportation infrastructure (either through more travel or use of heavier vehicles) pay more for its ongoing operation. In contrast to the other examples in this section, however, variable-rate taxes do not address other funding sustainability concerns, such as those related to increasing vehicle fuel-efficiency and use of alternative fuels.

A further challenge for variable-rate fuel taxes is gas price volatility. Transportation costs tend to increase more steadily than gas prices, which can rise or fall dramatically from one year to the next.⁴⁵ According to the Institute on Taxation and Economic Policy, "Linking gas tax rates (and therefore, transportation budgets) to such a volatile base can pose serious challenges for transportation officials and lawmakers alike."⁴⁶ This issue has caused some states to intervene to stabilize price-based tax rates, and others to repeal such taxes. In addition, at least

29 states have enacted price-gouging laws that can influence gas prices.⁴⁷

Another option is to place statutory restrictions on variable-rate taxes. Since 2011, West Virginia has limited variations in the average wholesale price of fuel—on which its variable-rate tax is based—to no more than 10 percent per year.⁴⁸ Other restrictions take the form of statutory floors or ceilings on the tax rate, or on the measure to which the rate is tied; at least Connecticut, Florida, Kentucky, Pennsylvania and West Virginia use this approach. If the limits are too stringent, however, a variable-rate tax can simply become a fixed-rate tax. Pennsylvania law, for example, now caps at \$1.25 per gallon the wholesale fuel price used to calculate its tax; as a result, the tax has been at its current rate since 2006. As of June 2012, the Pennsylvania legislature was considering two bills to remove the cap.⁴⁹

Variable-rate sales taxes also do not address some other policy concerns related to motor fuel taxes. For example, several studies have found that, like most other existing transportation funding mechanisms, fuel taxes are regressive; that is, low- and middle-income families pay a larger share of their income in fuel taxes than do higher-income families. In response, some states have considered tax credits to offset household motor fuel or gas tax expenses. In 2008, for example, Minnesota House File 2800 created a \$25 "lower income motor fuels tax credit" to mitigate the effects of a gas tax increase.⁵⁰ As of June 2012, Massachusetts and Michigan also were considering legislation to provide transportation-related tax credits.⁵¹ Note, however, that, according to a recent Transportation Research Board study on the equity of transportation finance mechanisms, after taking various factors into account, gas taxes may be far less regressive than has traditionally been thought.⁵²



Fuel taxes are easy to collect, but present challenges to transportation funding sustainability.

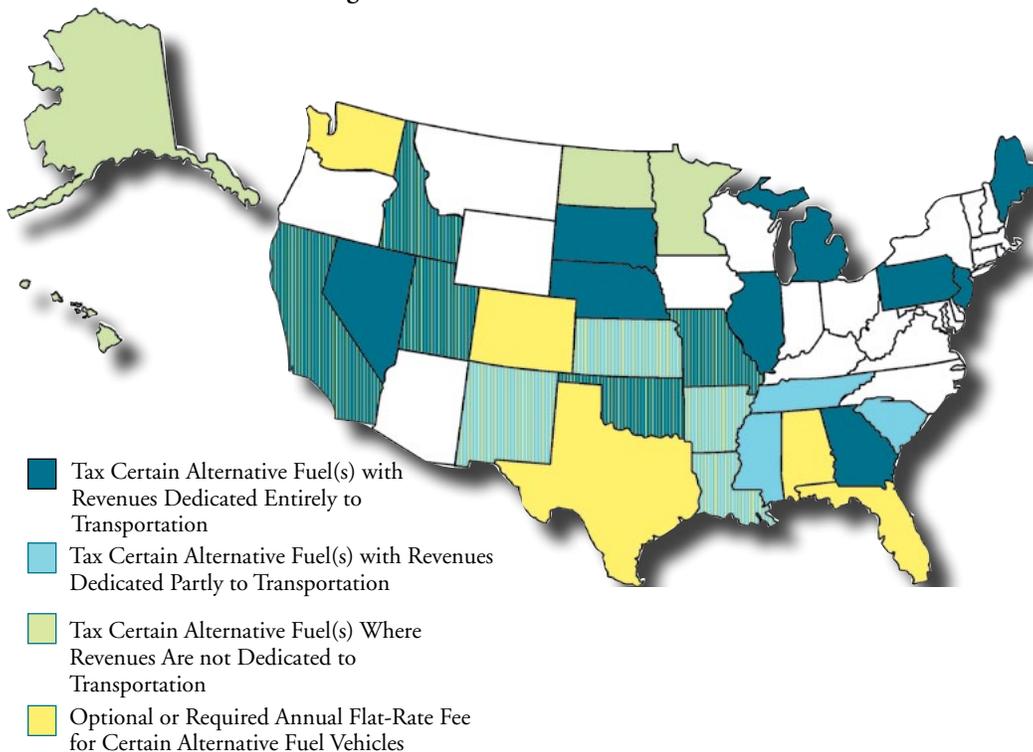
Source: Wavebreakmedia LTD/Shutterstock.com.

Taxes and Fees on Alternative Fuels and Alternative Fuel Vehicles

Today, 95 percent of the nation’s transportation is powered by oil; transportation consumes about 28 percent of the nation’s energy and produces 27 percent of its greenhouse gases, second only to electricity generation. Federal and state policies, higher fuel prices and new technologies, however, now are creating an emerging market for alternative vehicle fuels, including biofuels, natural gas and electricity.⁵³ In 2010, the U.S. Energy Information Administration predicted that the market share of alternative vehicles would increase to 49 percent of new vehicle sales by 2035.⁵⁴ Alternative fuels can help address concerns about energy security that arise from the country’s reliance on foreign oil; they also can reduce air emissions. At the same time, this trend has serious implications for the sustainability of a transportation funding system that relies heavily upon motor fuel taxes.

One state policy option is to tax or assess fees on alternative fuels or alternative fuel vehicles and dedicate the revenues to transportation purposes; this can help ensure that all users of the transportation system—even those who do not use traditional motor fuels—continue to pay for its upkeep. At least 27 states now impose a tax on some form of alternative fuel, such as ethanol, natural gas, propane, hydrogen, electricity or biodiesel; of these, 23 dedicate some or all the revenues to transportation purposes (Figure 2). In addition, in at least nine states, operators of vehicles powered by certain alternative fuels must pay an annual flat-rate fee instead of a tax on the fuel, for example by purchasing an annual permit or decal. In California, Idaho, Kansas, Louisiana and New Mexico, operators of certain alternative fuel vehicles have the option to pay either an annual fee or a tax on the fuel.⁵⁵

Figure 2. Taxation of Alternative Fuels



Note: California, Idaho, Missouri, Oklahoma and Utah tax certain alternative fuel(s) with revenues dedicated entirely to transportation, and have an optional or required annual flat-rate fee for certain alternative fuel vehicles. Arkansas, Kansas, Louisiana and New Mexico tax certain alternative fuel(s) with revenues dedicated partly to transportation, and have an optional or required annual flat-rate fee for certain alternative fuel vehicles.

Source: Workman and Rall, *Taxation of Alternative Fuels*, 2012.

In addition to taxes on alternative fuels, some states also have pursued special registration or license fees for alternative fuel vehicles. The legislatures in Nebraska, Virginia and Washington recently enacted such fees. In Nebraska, since Jan. 1, 2012, operators of vehicles fueled by electricity or any other energy source not subject to fuel taxes have paid an annual \$75 alternative fuels fee in addition to any other required fees. In Virginia, electric vehicles have paid an annual \$50 license tax since July 1, 2012. In Washington, as of Feb. 1, 2013, operators of electric vehicles will be charged a \$100 fee at the time of annual registration renewal, on top of any other required fees and taxes; this fee will expire when the Legislature imposes a vehicle miles traveled fee or tax (see next section). In all three states, the new revenues are to be used for highway maintenance and operation.⁵⁶

State legislatures are also responding to concerns about the effects of alternative fuel, hybrid and high-efficiency vehicles on transportation funding by initiating studies and commissions. In 2012, for example, New Hampshire established a commission to study the taxation of alternative fuel and electric vehicles for the purpose of funding improvements to the state's highways and bridges, and Kansas launched a broader study of the long-term feasibility of relying on the gas tax as the primary mechanism for state and local transportation funding.⁵⁷

At the same time, however, many states have also created financial incentives to encourage adoption of alternative fuel technologies. At least eight states provide a tax exemption or deduction for alternative fuels and, as of 2011, at least 15 states and the District of Columbia offered monetary incentives for electric vehicles, such as tax exemptions or credits and reduced registration fees. In addition, most of the 27 states that tax alternative fuels do so at a reduced rate, although at least Idaho, Kansas, Louisiana, Maine, Minnesota, New Jersey, Pennsylvania, South Dakota and Virginia tax some or all alternative fuels at an equivalent rate to gasoline or diesel.⁵⁸

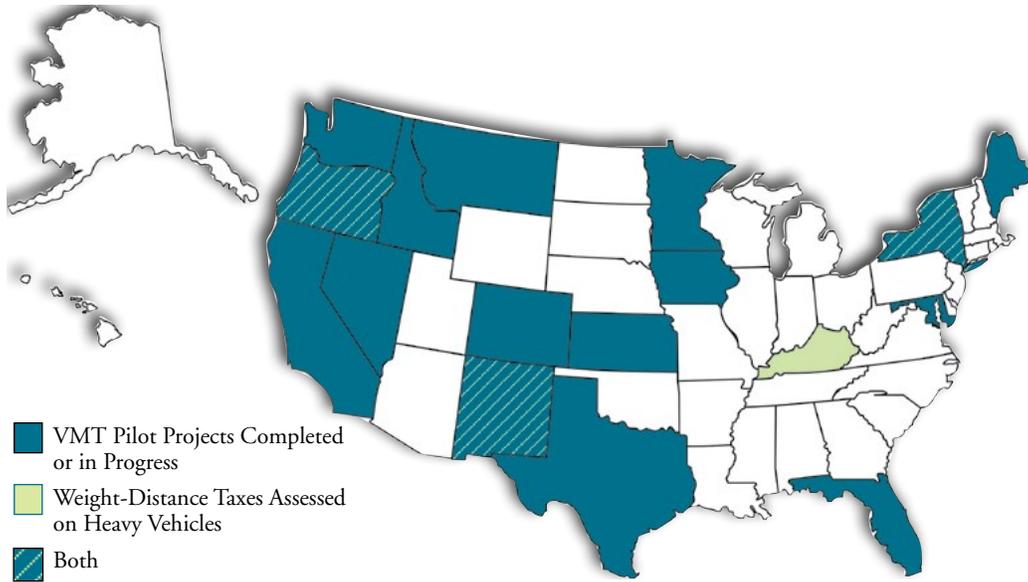
Vehicle Miles Traveled (VMT) Fees

In recent years, a growing number of transportation stakeholders have noted the potential of augmenting and eventually replacing fuel taxes with fees based directly on the number of miles motorists drive, known as "vehicle miles traveled" or VMT fees (also called mileage-based user fees, or MBUFs). By charging users per mile rather than per gallon, VMT fees unlink transportation revenues from motor fuel consumption, sidestepping the challenges to funding sustainability now posed by the growing use of alternative fuels and vehicle fuel-efficiency improvements.

VMT has the potential to replace motor fuel taxes for all vehicles; states have typically estimated that a VMT fee of 1 to 2 cents per mile for cars and trucks would generate revenues equivalent to state fuel taxes.⁵⁹ VMT fees also could simply supplement existing revenues. For example, some states have considered VMT fees for electric vehicles only (see page 12). This could address the funding sustainability issues related to alternative fuel vehicles without requiring a system-wide transition from fuel taxes to VMT fees.

Although no jurisdiction in the world now levies VMT fees on all vehicles,⁶⁰ many states are actively exploring the option. At least 18 states have completed or undertaken VMT fee pilot projects (Figure 3). Many of these were part of the University of Iowa's National Evaluation of a Mileage-Based Road User Charge from 2007 to 2011. Funded by the U.S. Department of Transportation, the \$16.5 million evaluation included field tests in California, Florida, Iowa, Idaho, Illinois, Kansas, Maine, Maryland, Montana, New Mexico, North Carolina and Texas. As shown in Figure 3, Kentucky, New Mexico, New York and Oregon also now assess a type of VMT fee for heavy vehicles, in the form of taxes based on both miles traveled and vehicle weight.⁶¹

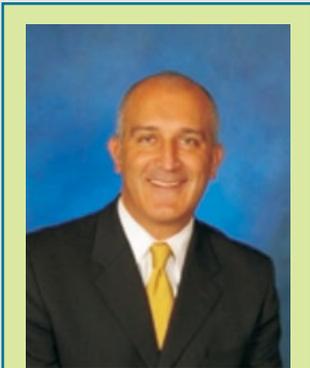
Figure 3. Fees by the Mile: Vehicle Miles Traveled (VMT) Fee Pilot Projects and Weight-Distance Taxes



Sources: Delcan Corporation, Calmar Telematics and Greater Buffalo Niagara Regional Transportation Council, 2011; Federal Highway Administration, *Road Pricing: Study Reports: Mileage-Based User Fees (VMT Fees)*, n.d.; Nevada Department of Transportation, 2012; Rall, 2009; Reeves and Ungemah, 2012; Slone, 2010; Whitty, May 2012.

State Case Study

Testing the Concept: Oregon's VMT Pilot Project



Senator Bruce Starr (R),
Oregon

Perhaps the best-known VMT fee pilot project in the United States is Oregon's Road User Fee Pilot Program. In 2001, the Oregon legislature created a 12-member Road User Fee Task Force to examine transportation funding alternatives.⁶² "As well as the gas tax has served the road needs of Oregonians in the past, it has become a declining revenue source," says Senator Bruce Starr, chair of the task force. "The Road User Fee Task Force was created to design a new revenue collection system for road funding to ultimately replace the gas tax. Oregon will be well-served in finding a solution to this concern before it becomes an emergency."⁶³



After 16 months spent studying 28 different funding options, the task force focused on a mileage-based charge, and in 2006, the state Department of Transportation (DOT) began its pilot project to test a VMT fee. The project used a "pay-at-the-pump" revenue collection model that involved 285 volunteer vehicles, 299 drivers and two gas stations in Portland. Vehicles were fitted with GPS devices that recorded vehicle miles driven in differently priced "zones," then transferred the data to the participating gas stations' point-of-sale systems. The devices did not, however, store or transmit specific vehicle locations or trip data due to privacy concerns (see also page 14). The gas stations' systems used the data to calculate and add the mileage charge to the customer's bill and to subtract the state gas tax.⁶⁴

At the end of the pilot project, the Oregon DOT concluded that its VMT fee concept—including congestion and other pricing options—was viable. Other major findings were that paying at the pump worked; the program could be phased in along with the gas tax and integrated with current systems; privacy was protected; the burden on businesses and potential for evasion were minimal; and the costs of implementation and administration were low.⁶⁵

Oregon's VMT fee concept was not without critiques, however, especially in relation to privacy of travel data, the cost and complexity of compliance, and the perceived need for a large government bureaucracy to manage the new system.⁶⁶ According to Jim Whitty, manager of the Oregon DOT's Innovative Partnerships and Alternative Funding Office, legislative involvement became even more important once the project attracted debate. "When the legislature created the Road User Fee Task Force in 2001," says Whitty, "the best decision was to put four legislators on it, a Republican and Democrat from each chamber. When the whole topic became controversial, having somebody from each caucus who knew what was going on was very helpful."⁶⁷

In 2011, the Oregon legislature enacted House Bill 2138, directing the task force to consider additional factors when proposing pilot programs to the DOT. The task force then adopted policies directing the DOT to test a new concept starting in fall 2012. This project will respond to critiques by allowing participants to choose how they will report miles driven and pay their bill. Choices include a non-technology option and a flat annual tax that can sidestep reporting altogether. The new test also will outsource most system functions to the private sector, limiting the public role to auditing and enforcement. The volunteers for this test will include DOT management, task force members, state transportation commissioners and members of the legislature.⁶⁸

According to the project website, "The purpose of providing the volunteers choices is to demonstrate the rudiments of a new mileage charging system that is built upon an open marketplace... ODOT believes experiencing the new road charging system will inform participants of the viability of a future system of charging by the mile and remove doubt about the state's ability to implement an acceptable system that will generate revenue for our transportation system."⁶⁹

Since 2008, at least 11 states have considered 20 legislative measures that proposed to establish or study state-level VMT fees (Table 1).⁷⁰ Of those, though, only one has been enacted. Washington's House Bill 2190, enacted this year, funds a study of the operational feasibility of a road user assessment and—pending subsequent appropriations—authorizes a limited pilot project on such a system for electric vehicles. (In two other measures—Washington House Bill 2660 from 2012 and Colorado Senate Bill 108 from 2009—provisions concerning VMT pilot programs were removed before enactment.⁷¹)

Interest also exists in VMT fees at other levels of government. The National Surface Transportation Infrastructure Financing Commission called VMT

fees "the consensus choice of the future" for federal transportation funding, and urged transition to this model by 2020.⁷² The California Legislature adopted Senate Joint Resolution 5 in 2011, which asked the president and Congress to enact legislation to conduct a study on the feasibility of VMT in order to facilitate creation of a reliable and steady federal transportation funding mechanism. In New Jersey, however, a resolution was introduced (but not enacted) in 2010 to oppose a nationwide VMT fee.⁷³ Related to local VMT fees, state legislation was introduced (but not enacted) in Texas in 2011 to allow certain counties to seek voter approval for a range of local transportation funding options, including local VMT fees of up to \$0.01 per mile traveled.⁷⁴

Table 1. Legislation to Establish or Study State-Level Vehicle Miles Traveled (VMT) Fees

Legislative Action	Total Bills and Resolutions	Total States	States (Year Introduced)
Establishes VMT Fees for Electric Vehicles and/or Plug-In Hybrids	5	4	Arizona (2011 HB 2603, 2012 HB 2257) Massachusetts (2011 SB 1490***) Mississippi (2011 HB 796) Oregon (2011 HB 2328)
Establishes or Authorizes a VMT Fee Pilot Program or Study	14	8	California (2010 SB 1299) Colorado (2009 SB 108**) Hawaii (2009 SB 1611, 2011 SB 1131, 2011 SB 819, 2011 HB 1531) Indiana (2012 HB 1356) Massachusetts (2011 HB 2660) Texas (2011 HB 1669, for electric vehicles only) Virginia (2011 SJR 328, 2011 SJR 94) Washington (2012 HB 2660**, 2012 SB 6455**, 2012 HB 2190*)
Requires State to Develop a Framework for a VMT Fee	1	1	Oregon (2009 HB 2120)
TOTAL	20	11	

Note: The “total states” column does not total because some states are in more than one category.

* Enacted/Adopted as of June 24, 2012

** Introduced with VMT Provisions that Later Were Removed

*** Pending as of June 24, 2012

Source: National Conference of State Legislatures, *Transportation Funding Legislation Database*, 2012.

VMT fees are widely considered to be one of the more viable options to keep transportation funding sustainable over time, especially given trends toward use of alternative fuels and greater vehicle fuel-efficiencies. In addition to greater funding sustainability, other possible advantages of VMT include the following.

- **Sensitive and Flexible Pricing.** The more sophisticated VMT collection systems could allow federal, state and local jurisdictions to assess VMT fees based not only on total miles driven, but also on such factors as time of day, type of road, vehicle weight and fuel economy, among others. This type of sensitive, flexible pricing could be used to advance a broad range of policy goals. For example, a state could charge a reduced VMT fee for farm vehicles, low-emission vehicles, veterans or low-income families.

A VMT system also could support congestion pricing, where motorists are charged more for using certain roads during peak periods. This practice could send strong price signals that could help encourage efficient use of limited transportation capacity and reduce traffic delays, thereby decreasing overall fuel consumption and emissions (see also pages 22 to 23).⁷⁵

- **User Fee Principle.** Another potential benefit of VMT fees is greater adherence to the “user fee” principle, wherein those who use the transportation system more pay more for its upkeep. In 2006, a Transportation Research Board report noted that the user fee principle of the fuel tax might be eroding in practice due to non-highway applications of the revenues and growing dependence on non-user fee sources. The report identified mileage charges as “the most promising technique for directly assessing road users for the costs of individual trips.”⁷⁶

- **Use of Proven Technology.** Several possible methods for assessing and charging VMT fees have been identified, from the simple (e.g., annual odometer inspections) to the sophisticated (e.g., on-board computers with GPS and wireless communications). Technologies for the more advanced systems already exist and have been shown to work both in pilot tests and in actual practice in Europe.⁷⁷



Vehicle miles traveled (VMT) fees could be assessed by annual odometer inspections, or by more sophisticated systems.

Source: MC_PP/Shutterstock.com.

VMT fees have limitations, however. First, they do not address every issue related to funding sustainability. For instance, VMT fees are not inherently responsive to inflation; to retain

their purchasing power over time, they—like gas taxes—would need to be indexed or periodically increased by legislative action. A 2009 Transportation Research Board report warns that this could “engender the same level of political resistance as the prospect of raising fuel taxes does today.”⁷⁸ Other concerns as well as practical barriers also exist, including the following.

- **Need for Public Policy Frameworks.** State and federal laws currently do not authorize or provide comprehensive policy contexts for VMT fees. As an example, federal law now prohibits states from tolling highways that use federal funds, including Interstate highways, except for limited pilot projects. Enabling legislation or additional exceptions might be needed to allow VMT fees to be levied on these highways.⁷⁹ States also would need substantial public policy frameworks that would, in turn, help determine technology requirements and other implementation details, such as how the system would calculate mileage, transmit data to a tax collection agency, collect revenues, prevent fee evasion and handle potential equipment fail-

ures. Some of the questions to be resolved in policy include:

- What level(s) of government should levy VMT fees?
- Should VMT fees replace or supplement fuel taxes, and who should pay?
- Should fees be voluntary or required?
- How should the system be phased in?
- How should revenues be allocated, and for what use?

These and many other public policy issues would need to be decided before VMT fees could be broadly implemented.⁸⁰

- **Cost.** Today, motor fuel taxes are more cost-effective than any other existing or alternative transportation funding option. Across states, the administrative, collection and enforcement costs for motor fuel taxes represent less than 1 percent of the total revenue collected; operating costs for VMT systems, however, have been estimated at between 4 percent and 8 percent of revenue.⁸¹ A transition to VMT fees also could entail substantial up-front capital costs. For higher-tech options, on-board units alone could cost \$50 or more per vehicle.⁸² One study estimated total start-up costs at around \$250 per vehicle, based on the Dutch VMT system;⁸³ in comparison, the average American pays \$208 per vehicle each year in federal and state gas taxes combined.⁸⁴ Lower-tech options such as official odometer inspections would offer lower capital costs but higher operating costs, and would require major changes to DMV operations and databases.⁸⁵

These costs potentially could be reduced by integrating VMT fee collection into existing systems through a pay-at-the-pump option, such as in Oregon’s pilot project. Some costs also might be recouped through future efficiencies due to automation. In addition, if congestion pricing is used to achieve more efficient use of

existing facilities, further savings might result from a reduced need for new highway expansion.⁸⁶ Finally, the National Surface Transportation Financing Commission asserted that these costs must be weighed “against the poor long-term sustainability of the motor fuel tax as our nation’s primary source of surface transportation funding ... and the fact that ... there are few if any other viable options for meeting long-term highway and transit spending needs.”⁸⁷

- **Public Acceptance.** Road pricing approaches such as tolling and VMT fees are commonly viewed as unpopular with the public. Recent reports, however, indicate this may be due at least in part to poor public understanding of transportation funding in general, and that support increases when the public can see a direct relation between what they pay and the services they receive.⁸⁸ Exposure to VMT fees specifically also may help. Ninety-one percent of participants in Oregon’s pilot project, for instance, said they would continue paying VMT fees if given the option.⁸⁹ Nevertheless, drivers who are used to easy-to-pay, anonymous, almost invisible fuel taxes may find it difficult to switch to unfamiliar, highly visible VMT fees, especially if they do not understand the reasons for the change. Efforts to pursue VMT fees will likely need to emphasize measuring and understanding public opinion and include rigorous public education and outreach.⁹⁰
- **Privacy Concerns.** Because some VMT fees would vary based on when and where people travel, very real concerns exist among policymakers and the general public about protection of personal privacy. In 2009, for example, the Missouri legislature considered (but did not enact) legislation to prohibit use of GPS or other location-tracking technology to monitor travel for the purpose of a VMT fee.⁹¹ Existing proposals and pilot projects have taken steps to ensure the privacy and security of travel data,

and technical approaches have been demonstrated.⁹² Even so, if VMT fee systems are not well designed and executed, privacy could, in fact, be at risk. Two significant challenges must be overcome, according to the National Surface Transportation Financing Commission, if VMT fees are to be seriously considered in the United States: “[F]irst, any system must ensure adequate safeguards to personal privacy; second, the public agency or agencies charged with implementing [VMT fees] must gain the confidence of policy makers and the public that these safeguards exist and will be effective.”⁹³

- **Equity Concerns.** Questions have been raised about the equity of VMT fees, particularly their fairness to lower-income and rural drivers. Studies to date show no clear trends; rather, the effects of VMT fees on different groups are complex, and depend heavily upon the details. If flat-rate, comprehensive fees were to replace fuel taxes, for example, they could have approximately the same distribution across income levels and geographic areas as fuel taxes do now. Lower-income and rural drivers might even benefit from such fees compared to the current system because both groups tend to drive less fuel-efficient vehicles, and thus now pay more per mile of travel in fuel taxes; VMT fees could instead equalize the cost per mile across all vehicles. More complex rate structures that incorporate congestion pricing, favor certain vehicle types or have other variations, however, might have other effects—as might voluntary programs that assess fees only for equipped vehicles. Other user benefits and costs, such as how revenues are allocated, could also have some effect.⁹⁴ At the same time, VMT fees offer an opportunity, unlike fuel taxes, to be structured to address specific equity concerns. A recent Texas study, for example, suggested that rural areas could benefit from a system that discounted mileage accrued on private property, since ranchers and farmers are more likely to generate significant mileage on their own land.⁹⁵

Life-Cycle Costs

State policymakers also can look toward sustaining vital transportation infrastructure over the long-term by taking total life-cycle costs into account during transportation decision making. Life-cycle costs are the total costs created by an infrastructure investment, including “initial construction, operation, maintenance, environmental, safety and other costs reasonably anticipated during the life of the project, such as recovery after disruption from natural or manmade hazards.”⁹⁶ Considering the total costs ensures that the focus is not only on the up-front delivery of

DEFINITION

Life-cycle costs are the total costs that can be reasonably anticipated for an infrastructure investment during the entire life of the project.

infrastructure, but also on how cost-efficient the investment will be over time. By accounting for total life-cycle costs, states can build longer-lasting and more affordable projects, stretching the amount of money available for other investments.

One way states can promote consideration of total life-cycle costs is by including life-cycle cost analysis (LCCA) in their decision-making processes. The Federal Highway Administration (FHWA) LCCA methodology recommends taking the following steps to establish life-cycle costs: Establish alternative design strategies; determine activity timing; estimate agency costs; estimate user costs; and determine life-cycle cost. FHWA has developed LCCA informational materials and has presented an instructional workshop in more than 40 states.⁹⁷

State Case Study

Counting the Costs: Illinois' Life-Cycle Cost Analysis Law



In Illinois, the legislature has taken strong steps to ensure that life-cycle costs are effectively included in transportation decision making. The legislature enacted Senate Bill 314 in 2009, which requires the Illinois Department of Transportation (IDOT) to “develop and implement a life-cycle cost analysis for each state road project under its jurisdiction for which the total pavement costs exceed \$500,000.” The law also requires IDOT to use material with the lowest life-cycle cost to “ensure that state and state-appropriated funds are utilized as efficiently as possible.”⁹⁸

Illinois' Legislative Audit Commission conducted an audit of IDOT's life-cycle cost analysis for road construction in 2012.⁹⁹ The audit found that, while IDOT was performing LCCAs on new construction and reconstruction projects, it usually was not doing so for rehabilitation projects. The audit concluded that, considering the requirements of the law and “the existence of pavement alternatives, IDOT should be performing LCCAs on rehabilitation projects involving structural overlays.” Because repaving represents the vast majority of paving projects (and some exemptions in the law), only 6 percent of projects examined by the Legislative Audit Commission had received a LCCA. The audit also found that many of the LCCAs were over three years old, costs and conditions could have changed considerably. Further, IDOT was not including user costs in its LCCAs, as suggested—but not required—by the law.

The Illinois audit found that, overall, IDOT's LCCA process functioned similarly to those in other states. As states continue to refine their LCCA processes and learn from each other, the FHWA and their own experiences, future changes in how LCCAs function are likely.

States also can pursue life-cycle efficiencies through innovative approaches to infrastructure delivery. Design-build, for example, is a contracting method that combines the design and construction phases of a project into a single fixed-fee contract. As of late 2010, 38 states and Puerto Rico had authorized design-build for transportation projects (Figure 4).¹⁰⁰ In addition, public-private partnerships (PPPs) can bundle even more elements of project delivery—including design, construction, finance, operations and maintenance—into a single contract with the private sector. As of March 2012, 32 states and Puerto Rico had authorized PPPs for highways

and bridges (Figure 5).¹⁰¹ In theory, these integrated approaches can encourage contractors to reduce costs across an asset’s entire life cycle, for example, through “innovative design that reduces construction costs, high-quality project delivery that lowers the cost of maintenance or improvements, or up-front maintenance that avoids cost rebuilds down the road.”¹⁰² Note, however, that many analysts have advised that states conduct comprehensive project analyses with life-cycle cost estimates to assess whether alternative methods truly offer better value for money in comparison to traditional delivery.¹⁰³

Figure 4. Design-Build Enabling Statutes for Transportation Projects as of October 2010

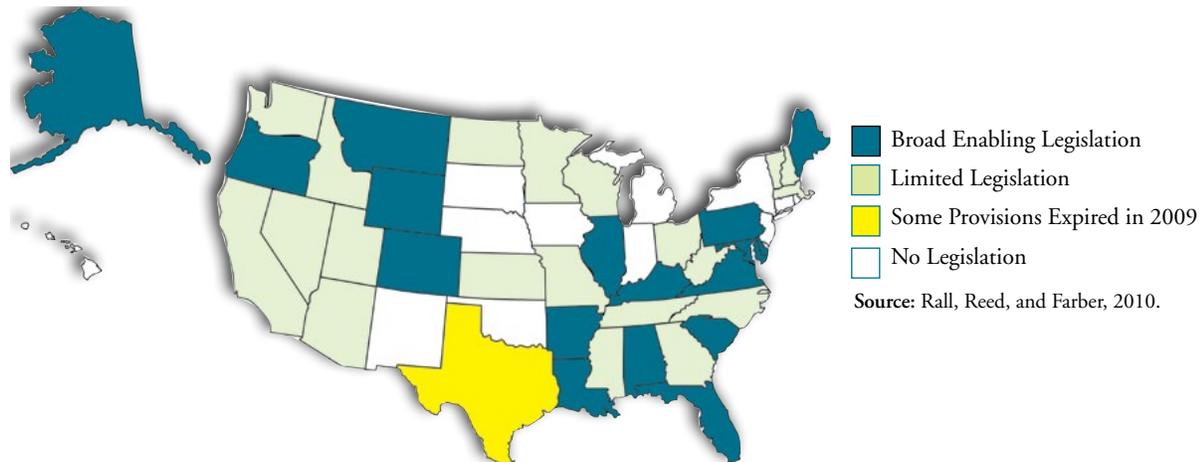
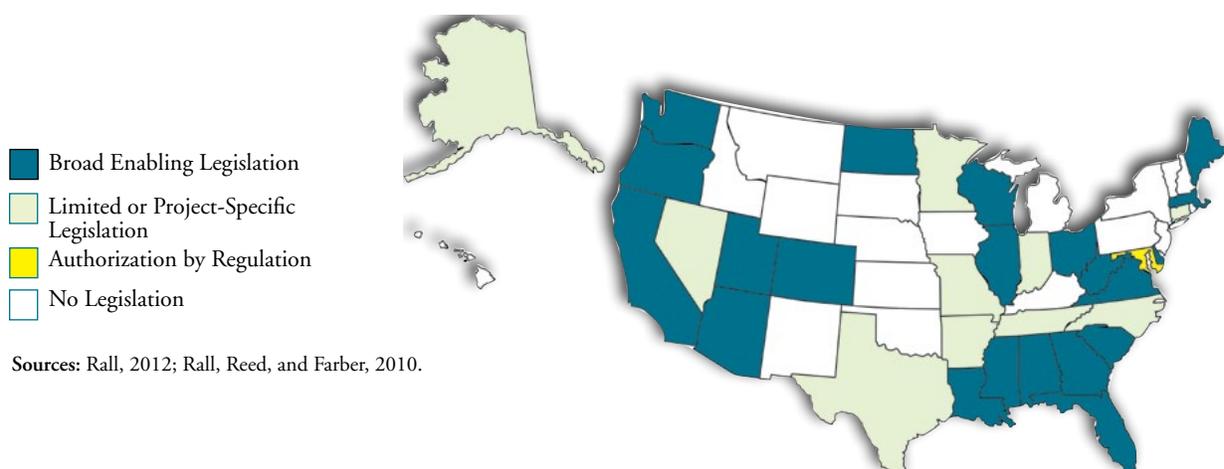


Figure 5. Public-Private Partnership (PPP) Enabling Statutes for Highway and Bridge Projects as of March 2012



Using What You Have



Across the country, transportation agencies are facing growing challenges as they attempt to provide enough roadway capacity to meet demand. Traffic growth on congested roads, rising construction costs and limited funding for capacity expansion, constrained rights-of-way, declining revenues for transit operations, local interests and environmental concerns are encouraging states to explore innovative options that can help achieve key transportation policy goals by making the most of existing infrastructure and leveraging limited resources. This section discusses viable alternatives to new capacity that instead allow states to efficiently and effectively use what already is available. These alternatives include fix-it-first and asset management approaches; operations and management strategies; and commute trip reduction.

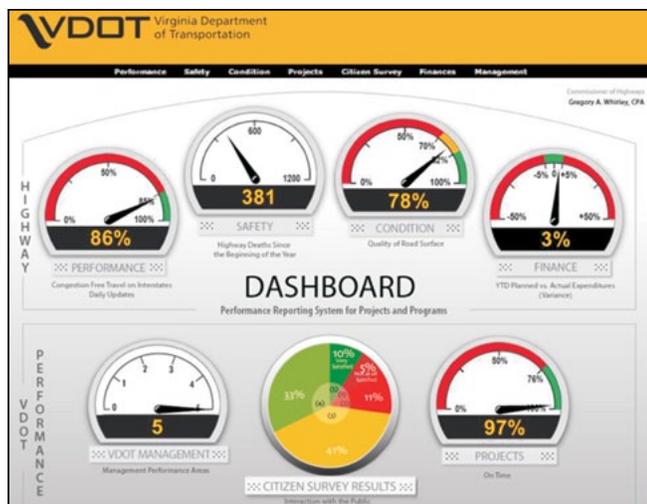
Fix-it-First and Asset Management

America's infrastructure currently is in a state of disrepair, with 32 percent of the nation's major roads in poor or mediocre condition.¹⁰⁴ The tightening vise of declining tax revenues and funding sources

DEFINITION

Fix-it-first and asset management are budgeting and construction policies that prioritize maintaining existing transportation infrastructure in a state of good repair over system expansion.

for transportation projects is affecting states' ability to provide basic transportation services, such as ensuring existing infrastructure is safe and in good condition. Substandard roads not only affect citizens in terms of compromised safety, reliability and efficiency, but also cost them more. A report from AASHTO calculates that an average driver will incur between \$335 and \$746 in extra vehicle operating costs due to poor roads.¹⁰⁵



The Virginia Department of Transportation shares its performance with the public using an online dashboard.

Source: Virginia Department of Transportation.

At the same time, between 2004 and 2008 alone, more than 23,000 lane miles were added across the United States. Adding new infrastructure can be a recipe for further decreasing the quality and safety of existing assets. According to Smart Growth America (SGA), during those four years, an average of 57 percent of state road expenditures went to expand or build new roads, which made up 1.3 percent of total lane miles; less than half of available state funds were left to maintain a whopping 98.7 percent of the nation's lane miles.¹⁰⁶ SGA estimates that, "every new lane-mile a state builds costs, on average, an estimated \$22,300 a year to consistently keep in a state of good repair."¹⁰⁷ This means the 23,000-plus lane miles added from 2004 to 2008 will increase repair needs by more than \$500 million per year nationally.¹⁰⁸ According to SGA, only four states—Florida, Michigan, New Jersey and New York—and the District of Columbia were spending enough money to keep their roads in good condition.¹⁰⁹

In the case of transportation funding, an ounce of prevention is clearly worth a pound of cure. The American Association of State Highway and Transportation Officials (AASHTO), which represents state departments of transportation (DOTs), estimates that \$1 spent on repairs while a road is still in "fair" condition can prevent costs of \$6 to \$14 to later rebuild the same road once it has deteriorated.¹¹⁰ A Federal Highway Administration study found that

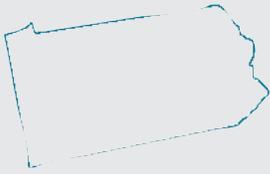
allowing a road to deteriorate before repairing it can double the cost for each lane-mile.¹¹¹ Roads are not the only systems in need of maintenance; the FTA recently estimated a need for \$77 billion to bring public transit systems to a state of good repair.¹¹²

Rather than expand capacity in a time of declining vehicle miles traveled, state legislatures and DOTs are reevaluating and scaling back planned highway expansion, focusing instead on maintaining the safety and performance of existing infrastructure. Sometimes referred to as "fix-it-first," this policy orientation requires that a state have adequate performance measures in place to accurately assess and catalog the condition of their roads (see also pages 52 to 54). Some states have no quantitative standards or lack the benchmarks needed to accurately evaluate progress.¹¹³ Of those states that measure progress, at least Idaho, North Carolina, Virginia and Wyoming also have created on-line "dashboards" so citizens can view state road maintenance statistics.¹¹⁴ Because fix-it-first policies mean fewer ribbon cuttings and associated publicity, using an online dashboard to highlight safety and road and bridge conditions successes can allow DOTs and policymakers to demonstrate to the public the benefits of wise asset management.

State legislatures can support fix-it-first in a variety of ways. Although legislative authority varies from state to state, involvement of the legislature can include establishing broad transportation policy goals and specific requirements in legislation; transportation project selection or approval; appropriation and allocation of state or federal transportation funds; development of DOT performance measures; audits and program evaluations; and review of periodic reports from DOTs. These and other legislative oversight roles offer mechanisms by which legislatures can affect the overall policy orientation of state transportation programs.¹¹⁵ In addition, legislators can provide leadership and draw attention to the issues facing the nation's infrastructure. In these and other ways, state legislatures can help encourage greater investment in existing transportation assets.

State Case Study

Fixing It First: Pennsylvania's Smart Transportation



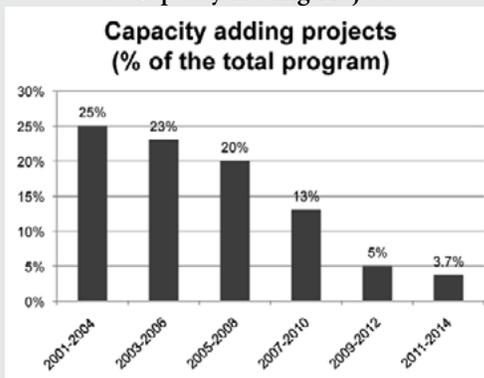
In 2004, Pennsylvania found itself at a transportation tipping point—more bridges were becoming structurally deficient than could be repaired, given the struggling economy and lack of stable transportation funding. Land used for new development in the state had grown by 12 percent, despite a population growth of only 1 percent.¹¹⁶ This development pattern was creating an unsustainable future, since more capacity was required to maintain an existing infrastructure that already was suffering due to underinvestment

for repairs. At the time, Pennsylvania's 2003-2006 Transportation Investment Program (TIP)—the list of official state capital projects—was slated to spend 23 percent of the budget on new capacity.¹¹⁷

Realizing that Pennsylvania was headed in an unsustainable direction, then-Transportation Secretary Al Biehler announced that the Pennsylvania Department of Transportation (PennDOT) was re-evaluating 26 TIP projects, valued at around \$5 billion. This was the opening salvo in a larger years-long process to re-orient PennDOT's mission and priorities, an effort that eventually was named Smart Transportation. "We need to maintain and preserve our highway system first and then begin to think about other influences at work—global warming, greenhouse gas emissions, where we live and work—that affect traffic congestion and our quality of life," Biehler said in 2009.¹¹⁸ Of the 26 re-assessed projects, 14 were deferred completely; six more advanced only after a rigorous internal process that reshaped their scope and led to lower costs.¹¹⁹

The support of engineers and PennDOT staff was integral to implementing the new priorities of Smart Transportation. Once the new emphasis on flexibility and cost-savings permeated PennDOT, the new policies and procedures led to lower costs and quicker projects, often due to the reduced size of many projects. PennDOT also emphasized Context Sensitive Design, a planning approach that attempts to support community quality-of-life concerns and preserve the environment and character of an affected area. This approach typically entails earlier communication with and support from local community stakeholders, which can lead to lower project costs by avoiding costly changes late in the planning process.

Figure 6. Percent of Pennsylvania Transportation Investment Program (TIP) Budget Dedicated to Capacity-Adding Projects



Source: MacDonald et al., 2011.

An emphasis on context-sensitive design has dovetailed with PennDOT's effort to ensure that the requirements of the National Environmental Policy Act (NEPA) are integrated into the planning process at the outset. Because NEPA requirements can be extensive and overwhelming, they can lead to serious cost overruns and wasted staff time if they are not met correctly. PennDOT's revised process for projects now includes community participation, early NEPA planning and an internal screening of alternative options. Projects to be included in the TIP now must use this process, which leads to more certainty in final decisions and fewer missteps and cost overruns later in the project.

The results of Pennsylvania's move toward fix-it-first are encouraging thus far. Compared with the 2003-2006 TIP that directed 23 percent of the budget to new capacity, the 2011-2014 TIP expenditures for new capacity were only 3.7 percent (Figure 6), a

dramatic drop and a telling sign that PennDOT's reforms have been successful.¹²⁰ Despite the reprioritization, a 38 percent decline in the purchasing power of transportation revenues from 2004 to 2011 due to rising construction costs has reduced the actual amounts available for maintenance.¹²¹ This new reality portends future belt-tightening and validates Pennsylvania's push to focus on fix-it-first. Biehler noted while still secretary that, "Our focus is fix it first—paying attention to basic day-to-day practices that help us be more successful. Otherwise, you can spend too much time and money chasing after potholes while watching the system fall farther and farther behind."¹²²

Operations and Management

DEFINITION

Operations and management refer to diverse strategies and technologies that better operate existing infrastructure and help transportation systems perform better without having to build new roads.

Another way to achieve a variety of transportation policy goals—while focusing on effective use of existing infrastructure—is to better manage and operate roadways so the system can meet

customer expectations, regardless of the demands placed on it. Called “transportation operations and management,” this approach to making the most of existing transportation infrastructure consists of a set of strategies that can enhance system performance for both motorists and transit users, without costly new construction. In general, considering not only how transportation is designed, built and maintained, but also how it is managed and operated, is vital to ensuring the overall system achieves its intended purposes.

Operations and management strategies tend to be low-cost, low-impact and easy to implement, with high benefit-cost ratios and both short- and long-term benefits. They include:

- Improving day-to-day performance by managing travel demand and system access;
- Reducing recurring traffic jams through highway management and use of advanced technologies called “intelligent transportation systems” or ITS;
- Mitigating occasional congestion due to traffic accidents, work zones, weather and special events; and
- Streamlining freight transportation through size and weight policies and relevant technologies.

Operations and management also can include commute trip reduction programs (covered in more depth starting on page 30), providing travelers

with real-time information (see pages 25 to 27) and complete streets policies (see pages 38 to 40).

Operations and management strategies—especially when combined with preservation efforts—typically have aimed to improve mobility by reducing the effects of congestion and increasing traffic flow on existing infrastructure. In this sense, effective operations and management work to “take back” roadway capacity that otherwise would be lost to inefficiency and traffic jams. This is a key benefit, given the growing problem of traffic congestion in the United States. According to the Texas Transportation Institute’s most recent Urban Mobility Report, in 2010, congestion in the nation’s urban areas wasted 1.9 billion gallons of fuel (equivalent to about two months of flow in the Alaska Pipeline) and 4.8 billion hours (equivalent to the time Americans spend relaxing and thinking in 10 weeks). The total cost of that extra time and fuel was \$101 billion and, assuming the status quo continues, is predicted to rise to \$175 billion by 2020 (in 2010 dollars).¹²³

By reducing traffic congestion, operations and management strategies not only increase mobility but also can immediately lower fuel consumption and air emissions by cutting down on vehicle idling and stop-and-go traffic, especially in densely populated areas. Studies have shown that operations and management strategies reduce greenhouse gas emissions by between 3 percent and 20 percent.¹²⁴ These numbers are especially significant given that transportation consumes about 28 percent of the nation’s energy and produces 27 percent of its greenhouse gases, second only to electricity generation.¹²⁵ As a viable alternative to new construction, these strategies also can support land preservation and reduce sprawl.¹²⁶

In addition to their environmental benefits, operations and management strategies also can positively affect other policy goals such as safety, accessibility and travel choices, economic vitality and preservation of existing communities.¹²⁷ Actions to improve traffic flow, for example, can reduce crashes and fatalities and help keep roadways available for all users. Cutting down on wasted time and fuel—especially

given record gas prices—can help keep transportation affordable for more people; facilitating efficient and reliable freight movement supports economic competitiveness and growth; and efficient use of existing infrastructure reduces the need for large-scale new construction that may negatively affect local communities. Further, these strategies create jobs. About 50 percent of intelligent transportation systems project spending is for direct labor, for example, compared to about 20 percent for new highway construction.¹²⁸ Examples of operations and management strategies and some of their potential benefits are described below.

Demand Management

Techniques to manage travel demand are increasingly important, especially as resources to build new capacity dwindle. Demand management includes efforts to reduce total travel demand or shift trips to off-peak periods. According to the Federal Highway Administration, demand management originally was intended to “provide alternatives to single occupancy commuter travel to save energy, improve air quality and reduce peak period conges-



High-occupancy vehicle (HOV) facilities help move traffic along by setting aside lanes for carpools and other vehicles.
Source: Metropolitan Washington Council of Governments.

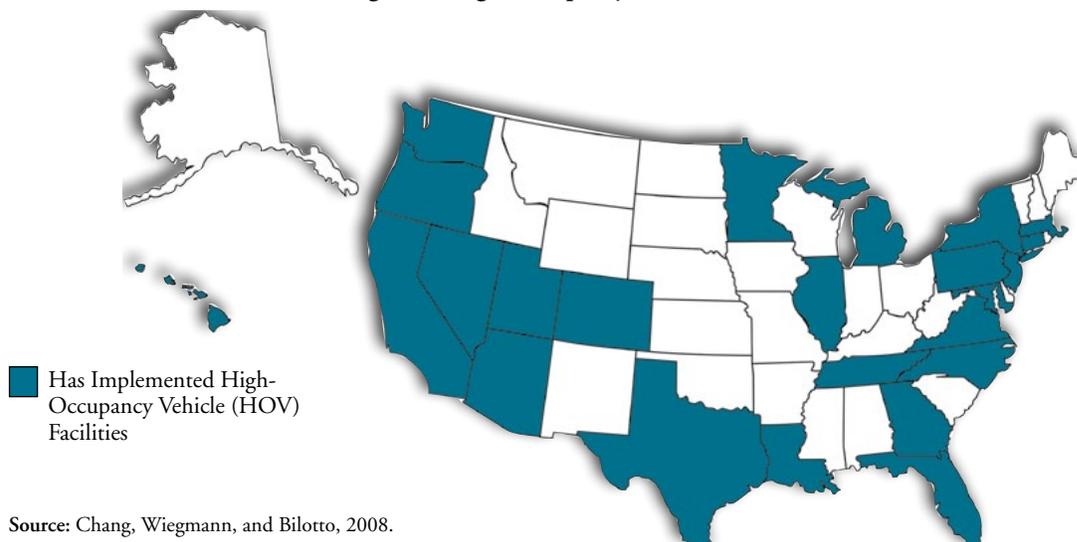
tion;” today, objectives also include optimizing overall system performance.¹²⁹

High-occupancy vehicle (HOV) facilities are one technique that can help manage demand. Setting aside HOV lanes for certain vehicles only—particularly buses, vanpools and carpools—offers

incentives of shorter and more reliable travel times. Also known as carpool, commuter or express lanes, these help improve efficiency by increasing overall vehicle occupancies and by diverting vehicles from the most congested lanes. HOV lanes are designed to maximize movement of people rather than vehicles; they typically carry more than 1.5 times as many people as other lanes, even when they appear to be less crowded, and move about 35 percent of the people on rush hour highways in approximately 19 percent of the vehicles.¹³⁰ At least 24 states have implemented HOV lanes (Figure 7).¹³¹

HOV lanes also can be used to advance other policy objectives. The federal Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for

Figure 7. High-Occupancy Vehicle (HOV) Lanes



Source: Chang, Wiegmann, and Bilotto, 2008.

Users (SAFETEA-LU), enacted in 2005, gave states additional flexibility to exempt some vehicles—such as qualified low-emission and energy-efficient vehicles—from the minimum vehicle occupancy requirements on HOV lanes.¹³² At least Arizona, California, Colorado, Georgia, Hawaii, Maryland, Nevada, North Carolina, Texas, Utah and Virginia now have state laws that allow low-emission, hybrid or alternative fuel vehicles to use HOV facilities, regardless of occupancy.¹³³

A second tool for managing demand is congestion pricing (or value pricing), which charges drivers more to use certain lanes or roads. Tolls or fees can vary by time of day, by location or in response to real-time traffic levels. The Port Authority of New York and New Jersey, for example, launched a variable pricing program in 2001 that offers eligible users of the E-ZPass electronic toll collection system a 20 percent discount for off-peak tolls on interstate bridges and tunnels; this action reduced morning peak traffic by 7 percent (ending the rush hour as much as 20 minutes earlier) and evening peak traffic by 4 percent.¹³⁴ This is among the more than 70 projects that have been supported by the federal Value Pricing Pilot Program.¹³⁵

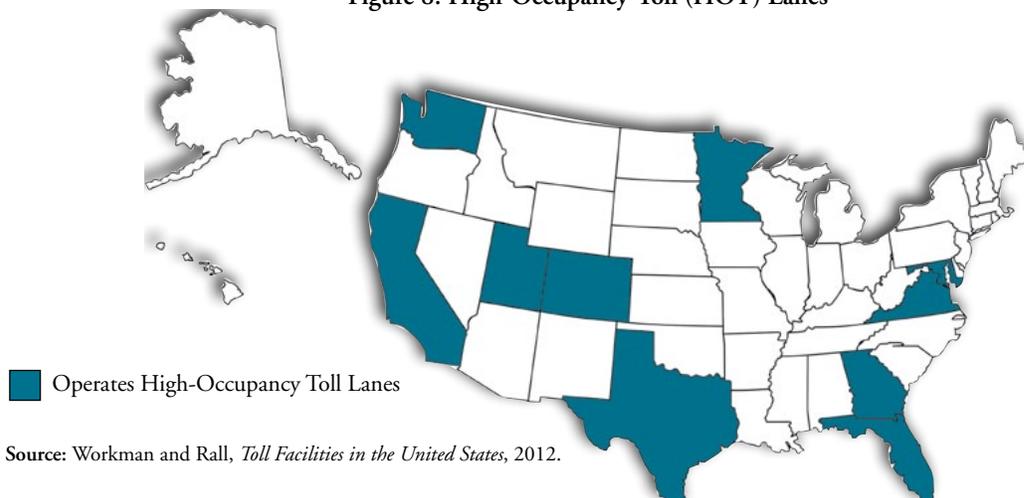
Another example of congestion pricing is high-occupancy toll (HOT) facilities—another of the new HOV lane exceptions provided by SAFETEA-

LU¹³⁶—which charge low-occupancy vehicles a toll to access HOV lanes, not only effectively making use of otherwise unused HOV lane capacity, but also raising new toll revenues.¹³⁷ HOT lanes also can incorporate real-time variable pricing. San Diego’s “FasTrak” HOT lanes program on I-15, for example, varies the toll to access HOV lanes based on how congested the lanes are, which helps keep traffic flowing.¹³⁸

Although concerns about equity have been raised for HOT lanes (sometimes pejoratively called “Lexus lanes”), studies show that low-income travelers both use and support these facilities, especially when time is of the essence, such as when picking up a child from a day care that assesses late penalties.¹³⁹ In addition, by removing even a small fraction of vehicles from congested roadways, all users—even those on the free lanes—can move more quickly.¹⁴⁰

Before a HOT lane can be implemented, a toll agreement must be executed between the Federal Highway Administration, the state department of transportation and operating agencies.¹⁴¹ In addition, use of toll revenues is subject to certain requirements in federal law (23 U.S.C. §129).¹⁴² As of 2012, at least 10 states operate HOT lanes (Figure 8).¹⁴³

Figure 8. High-Occupancy Toll (HOT) Lanes



Source: Workman and Rall, *Toll Facilities in the United States*, 2012.

According to the Federal Highway Administration, “There is a consensus among economists that congestion pricing represents the single most viable and sustainable approach to reducing traffic congestion.”¹⁴⁴ As with other operations and management strategies, by mitigating traffic problems, congestion pricing also realizes significant environmental benefits. Cities that have implemented congestion pricing widely have reduced particulate matter, nitrogen oxides and carbon dioxide emissions by 10 percent to 20 percent.¹⁴⁵ As a further potential benefit, pricing strategies also can help provide a sustainable funding source for transportation. One study estimated immediate revenues of up to \$500 million per year and long-term revenues of up to \$1 billion per year from turning a region’s freeway shoulders into dynamic priced lanes during peak traffic periods.¹⁴⁶

Other demand management strategies that focus more on working with employers and traveler education, rather than on how transportation agencies operate the system, are covered in the commute trip reduction section of this report (starting on page 30).

Electronic Tolling

Often included in congestion pricing projects, electronic tolling reduces delays at toll booths by using technology to collect tolls more efficiently and conveniently. Some automated systems read vehicle transponders at toll plazas, allowing users to pass through dedicated or mixed-use lanes more quickly. “Open road tolling” systems collect tolls as drivers pass below sensors at freeway speeds, bypassing toll booths completely.

Electronic tolling reduces congestion and delay, which motivates drivers to participate so they can cut down on travel time. As with other operations and management strategies, electronic tolling also can successfully lower fuel consumption and vehicle emissions from stop-and-go traffic and idling vehicles. For example, New Jersey Turnpike’s E-ZPass

system has saved 1.2 million gallons of fuel per year across 27 toll locations, and installation of electronic toll collection at Baltimore, Md., toll plazas has reduced emissions by up to 63 percent.¹⁴⁷ Such reductions can noticeably improve conditions that affect public health. One recent study links adoption of E-ZPass in New Jersey and Pennsylvania with a significant improvement in the health of infants whose mothers live near those toll plazas, due to the immediate drop in vehicle emissions.¹⁴⁸ Electronic tolling systems also improve safety by preventing accidents. The addition of open-road tolling to one Florida toll plaza, for instance, decreased crashes by an estimated 22 percent to 26 percent.¹⁴⁹

Active Traffic Management

Active traffic management techniques such as ramp metering, variable speed limits, reversible lanes and use of shoulder lanes during peak periods help to improve traffic flow in congested corridors, making the flow more stable and predictable. These improvements can accommodate rush hour traffic for a relatively low cost without adding new capacity that might not be used at other times.¹⁵⁰ Use of active traffic management is widespread. Reversible lanes—which take advantage of underused lanes by reversing their traffic flow during certain times to accommodate travel patterns—have been used in at least 33 states and the District of Columbia, including on the Southeast Expressway in Massachusetts and the Golden Gate Bridge in California.¹⁵¹ Ramp metering, which uses traffic signals at on-ramps to control the rate of vehicles entering a freeway, has been used in at least 29 metropolitan areas.¹⁵² Again, because these techniques lower traffic congestion, they also can reduce the number and severity of accidents as well as fuel consumption and air emissions. For example, ramp metering has been shown to reduce crashes by 15 percent to 50 percent and achieve up to 55 percent fuel savings. The benefit-cost ratio for a ramp metering system in Minneapolis-St. Paul was estimated at 15:1.¹⁵³

Traffic Signal Improvements

Effective operation, coordination and timing of traffic signals are highly cost-effective transportation improvement options that also result in significant mobility, safety and environmental benefits. Retiming or synchronizing traffic signals based on optimized traffic signal timing plans has been shown to decrease delays by 13 percent to 94 percent and reduce fuel consumption by up to 9 percent. Traffic adaptive signal control systems—which adjust signal timing based on real-time traffic conditions—can reduce delay by an additional 18 percent to 20 percent compared to fixed-time signal control, with further drops in fuel consumption and vehicle emissions.¹⁵⁴ Overall, each \$1 invested in traffic signal improvements can return \$40 or more to the public in time and fuel savings, while cutting emissions by up to 22 percent.¹⁵⁵

Traffic Incident Management

Traffic incident management encompasses a wide range of activities that work to detect, manage and clear traffic incidents—including crashes, stalled vehicles and roadway debris—in order to restore traffic flow as safely and quickly as possible. These activities can include use of freeway service patrols and technologies for traffic surveillance and collision notification as well as provision of real-time information (see next section). Traffic incident management, as with other operations and man-

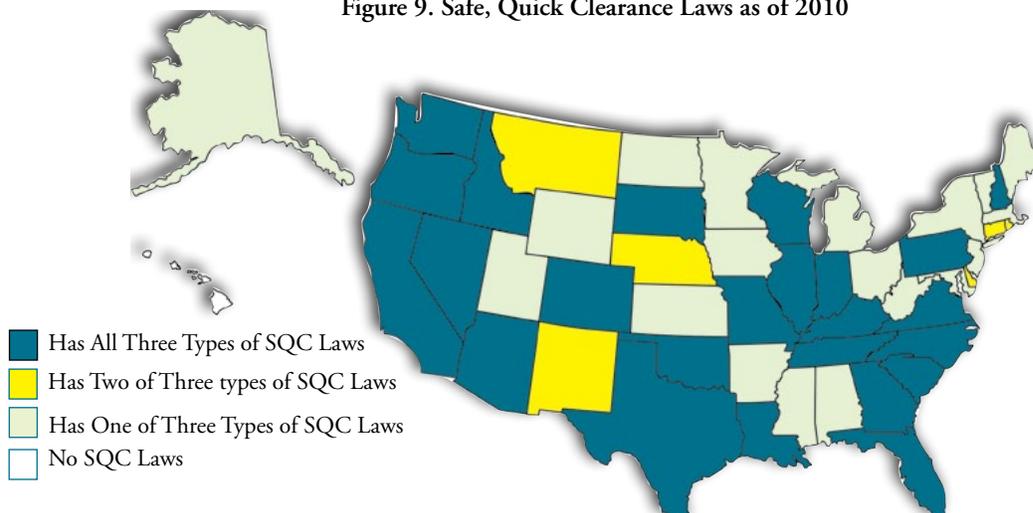


Driver removal or “move it” laws can support the safe, quick clearance of minor accidents.
Source: Robert Pernell/Shutterstock.com.

agement strategies, improves safety by reducing the risk of secondary crashes. Studies have found that traffic incident management programs typically reduce the duration of traffic incidents by between 30 percent and 40 percent, and the most successful programs by up to 65 percent. These programs also cut down on wasted time and fuel. In Georgia, the NaviGator incident management program reduced annual fuel consumption by 6.83 million gallons and annual vehicle emissions by more than 2,900 tons.¹⁵⁶

Certain state traffic safety laws also are designed to support safe, quick clearance of traffic incidents and to protect both responders and motorists. These include “move it,” “remove it” and “move over” laws. Driver removal or “move it” laws require motorists involved in minor crashes to move their vehicles out

Figure 9. Safe, Quick Clearance Laws as of 2010



Source: Federal Highway Administration, *Educational Outreach for Safe, Quick Clearance (SQC) Laws and Policies*, 2010.

of travel lanes before they exchange information or while they wait for responders to arrive. Authority removal or “remove it” laws authorize designated public agencies to remove abandoned vehicles and spilled cargo from the roadway to restore traffic flow. “Move over” laws require drivers to slow down and, when possible, change lanes when they approach incident responders and stopped emergency vehicles.¹⁵⁷ As of 2010, every state except Hawaii had enacted at least one of these three types of laws, and 30 states had enacted at least two (Figure 9).¹⁵⁸ The laws’ content varies widely, however, in terms of breadth, authority, how emergency scenes are defined and how motorists must respond.

Real-Time Travel Information

Providing timely and accurate (or “real-time”) information to transportation system users also can improve system performance and better manage daily operations. Some traveler information strategies—such as dynamic messaging signs, highway advisory radio, telephone service and websites—have been used for decades. Now, state departments of transportation (DOTs), transit agencies and private companies also are using newer technologies to make information more readily available to system users; these include mobile applications for smart phones, social media platforms, in-vehicle navigation systems and computerized displays at transit stations.

Providing real-time information improves overall reliability, safety and quality of the travel experience. Up-to-date information allows motorists to reschedule or re-route trips away from traffic congestion, major accidents, work zones, unsafe weather conditions, closures, and transit service delays or changes.¹⁵⁹ Real-time information can improve transit user satisfaction and encourage ridership—especially for new customers—by making transit more convenient and easier to navigate. The Chicago Transit Authority’s real-time bus information, for example, was found to increase ridership by 1.8

percent to 2.2 percent. Chicago’s system includes dynamic message signs with audio announcements at 400 bus stops and a “Bus Tracker” that shares buses’ current GPS locations and expected arrival times via the Web, e-mail updates, text messages and smart phone applications.¹⁶⁰ In addition, real-time information can make transit safer by reducing the need for passengers to wait outside in poor weather or unfamiliar neighborhoods; this can be especially important for vulnerable users such as children, older adults and people with disabilities.

State legislatures have supported real-time travel information with funding or by requiring use of such systems. Some also have authorized localities to pursue funding for these technologies. California, for example, enacted legislation in 2010 allowing counties to put to a vote of the county planning agency board an increase in the vehicle registration fee of up to \$10 for transportation congestion reduction projects, including traveler information systems and improvements in transit services through technology.¹⁶¹

Dynamic Message Signs. Permanent and portable dynamic message signs display information next to roadways about weather conditions, congestion, delay times and detours. For highway work zones, major crashes or special events such as sporting events, the signs can alert motorists to problems and suggest alternative routes.¹⁶² Sign operation typically is automated, but decisions to post messages are made by state and local agencies.¹⁶³ Early warning messages for accidents can help decrease secondary crashes. Integrating dynamic message signs into an incident management program (see previous section), for example, reduced crashes by 2.8 percent in San Antonio, Texas.¹⁶⁴ In 2011, the Texas Legislature directed the DOT to actively manage a system of changeable message signs on highways to provide information about traffic incidents, weather conditions, road construction and alternative routes.¹⁶⁵

511 Telephone and Web Information Services. States and metropolitan areas use telephone and Internet services to report up-to-date travel information. According to the Federal Highway Administration, travelers' information telephone services are deployed in 39 states (Figure 10).¹⁶⁶ The nationally recognized number for these services is 511; in 2004, travelers placed more than 1 million calls per month to 511 systems.¹⁶⁷ Many DOTs and transit agencies also post 511 information on their websites. In Ohio, the legislature is considering a measure to implement a statewide program similar to the 511 system that currently operates in the Cincinnati region.¹⁶⁸

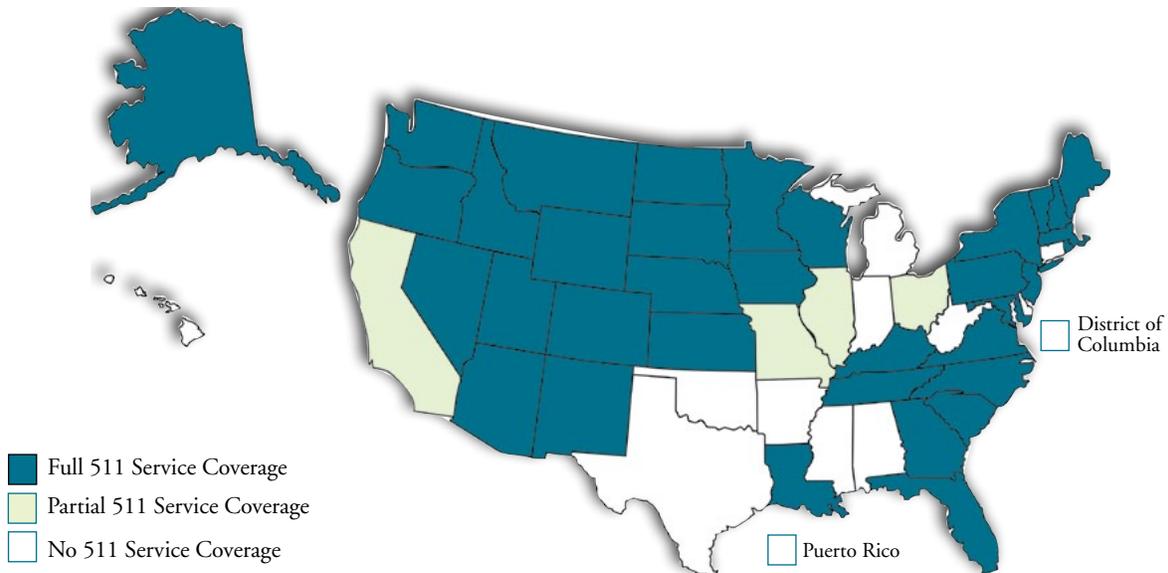


Real-time transit information now can be accessed on smart phones.
Source: Apple Inc.

a national survey, 45 of 276 transit agency systems provide some information on mobile devices; 15 of these systems offer the information to riders in real-time.¹⁶⁹ Mobile applications can help riders see schedules, trip times and needed transfers. Providing information through cell phones and mobile applications can cost less than traditional communications such as dynamic message signs. Agencies also, however, must find additional resources to develop, manage and maintain mobile applications, and the costs are not well documented.¹⁷⁰ Some agencies use a hybrid system of in-house development and private companies, such as Nextbus, which uses Google Maps to provide information for 82 transportation systems online; the service also can combine various transit systems.¹⁷¹

Mobile Applications. With the proliferation of smart phones, DOTs, transit agencies and private developers have found creative ways to provide real-time travel information to the public. According to

Figure 10. Locations with 511 Services as of August 2011



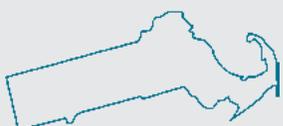
Source: Federal Highway Administration Office of Operations, *511 Travel Information Telephone Services*, n.d.

Social Media. States are actively using social media platforms to provide travel information to the public. According to the American Association of State Highway and Transportation Officials, at least 29 state DOTs use Twitter to relay information about traffic incidents, road closings and other emergencies.¹⁷² The Idaho DOT's Twitter automatically generates tweets for new 511 data.¹⁷³ Overall, state DOTs and transit agencies report that social me-

dia effectively reach the public with time-sensitive travel information.¹⁷⁴ DOTs and transit agencies may face barriers and challenges, however, including content management, resource requirements and staffing, and a number of other legal and practical concerns such as cyber security and privacy.¹⁷⁵ To avoid distracted driving, DOTs also encourage drivers to access the information after they pull off of the road or highway.¹⁷⁶

State Case Study

Letting the Free Market Do the Work: Massachusetts' Data-Sharing



While many real-time travel information systems are developed by third parties before they are implemented by transit agencies and local governments, states can also be involved in the process by collecting key data and making it available to third-party developers.

The Massachusetts Department of Transportation (MassDOT) now provides its data openly to developers on its website. The licensing agreement allows individual citizens and companies to use the real-time and static information to build mobile applications for consumers. More than 50 applications are available in Massachusetts because of this state DOT practice, and residents are using them to access public transportation or stay informed about traffic conditions.¹⁷⁷

Allowing for third-party development can save public money and avoid any legal barriers to developing a similar application internally. “Where there is valuable, customer-relevant data owned or maintained by state or local governments, it can be good practice to make it public, says Joshua Robin, director of innovation at the Massachusetts Bay Transportation Authority of MassDOT.¹⁷⁸ “It opens up tremendous economic and other opportunities, and can spur a lot of innovation at the local level. It helps government and helps citizens.”¹⁷⁹

Transit Operations

The operations and management strategies described here generally support the mobility of all roadway users, including transit vehicles, by reducing congestion and delay and improving the overall efficiency of existing transportation infrastructure. Also, high-occupancy vehicle (HOV) facilities typically are free for transit vehicles and carpools.

In addition, some operations and management strategies have been designed to specifically support transit. One such strategy is “transit signal priority,” which uses technology to give priority to transit vehicles at traffic intersections, for example,

by extending green lights for buses that are behind schedule. Transit signal priority improvements can cost less than \$5,000 per intersection if existing equipment is used, can achieve bus travel time improvements of up to 15 percent, and can result in significant decreases in bus fuel consumption and emissions. Other technologies—such as real-time travel information (see see previous section), automated vehicle location systems and passenger counters, vehicle assist and automation systems for bus rapid transit (see also page 47), and computer-aided dispatch—can help improve transit planning, scheduling and management, ultimately reducing passenger wait times and improving transit reliability.¹⁸⁰

All these transit operations and management strategies can help increase mobility and travel choices by enhancing the performance of existing services, making transit more dependable and convenient for all users. This is especially important for disadvantaged populations and communities, especially those who—due to income, disability or age—cannot operate a personal vehicle and rely on transit as a travel option. Service quality improvements also can attract new ridership, reducing the number of low-occupancy vehicles on the roadway and thus overall congestion, fuel consumption and emissions. In addition, these systems can help transit agencies meet demand and prepare for projected growth without building more infrastructure or purchasing more vehicles.

The Legislative Role in Operations and Management

Some operations and management strategies—such as the use of various intelligent transportation systems technologies—can be planned and implemented by state departments of transportation or

transit agencies without the need for significant legislative involvement. The support of the state legislature, however, can play a major role in advancing certain operations and management strategies. For example, legislatures may authorize, require or request state agencies to implement specific operations and management initiatives; they also can mandate studies or appropriate funds.

Since 2009, states have considered more than 1,800 legislative measures—and passed nearly 500 of these—to support transportation operations and management strategies. About half the enacted measures concern freight operations, especially truck size and weight policies. The rest are wide-ranging and include bills that, for example, appropriate funds for intelligent transportation systems, active traffic management, traffic signal optimization and other activities; set policy for HOV and HOT facilities, including occupancy exemptions; authorize electronic tolling, open-road tolling, congestion pricing or reversible lanes; enact safe, quick clearance laws; and require various studies or pilot programs.¹⁸¹

State Case Study

Putting It All Together: Washington's SR 520 Urban Corridor



Washington state is using a variety of operations and management strategies to reduce congestion and make the most of existing roadway capacity, and Seattle is leading the way. Seattle experiences some of the worst traffic jams in the nation; it is now ranked the eighth most congested city in the United States, with more than 87 million hours of delay each year.¹⁸² Construction costs, environmental impacts and geographical constraints, however, in most cases prevent widening the roads to address the problem. Instead, in 2008, the Washington State Department of

Transportation (WSDOT) launched its “Moving Washington” program, which focuses on improving the state’s most congested corridors. It combines three specific strategies: operating the existing transportation system more efficiently, providing travel choices that help manage demand, and adding road capacity strategically where feasible. The program’s goals are to improve travel times by 10 percent, reduce crashes by 25 percent, improve trip reliability by 10 percent, and provide alternative travel choices for commuters in major corridors.¹⁸³

One congested corridor that has benefited from the Moving Washington strategy is State Route 520 (SR 520), which connects Seattle to communities and employment centers on the east side of Lake Washington. The nearly 50-year-old SR 520 floating bridge is vulnerable to earthquakes and windstorms and in urgent need of replacement. SR 520 now is in the midst of a large-scale improvement effort that blends several operations and management strategies in a single corridor and also strategically adds capacity.



Washington's SR 520 project incorporates overhead message signs with variable speed limits.

Source: Emily Pace, WSDOT.

Congestion pricing and open-road tolling were added in 2011 to mitigate traffic and help finance a complete bridge replacement that is scheduled to open in 2014. The new bridge adds two HOV lanes for a total of six lanes—two more than the existing structure—plus new, wider shoulders. Active traffic management systems (called “Smarter Highways” by WSDOT) also were incorporated in the corridor in 2010 in the form of overhead message signs that display variable speed limits, lane status and real-time traffic information. Corridor improvements also include enhanced transit service as well as improved telecommuting and demand management programs (see next page). These improvements have been supported in part by a \$154.5 million award from the federal Urban Partnership Agreement program, which

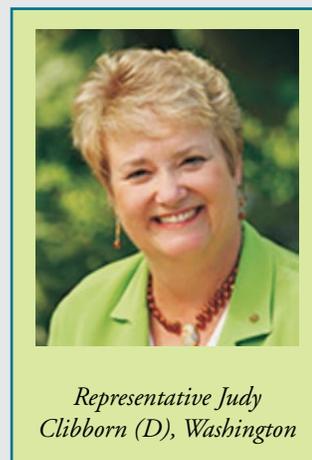
has provided funding to six cities across the country—including Seattle—to improve traffic flow through what it calls the “4 Ts”: tolling, transit, transportation demand management and technology.¹⁸⁴

“There’s no single solution to relieving congestion,” says WSDOT Toll Division Director Craig Stone. “All the strategies used on SR 520 complement each other and WSDOT’s Moving Washington strategy. By using new tools and technologies, we can better manage congestion and make our busiest freeways more efficient.”¹⁸⁵

The Washington Legislature has had a substantial role in advancing the SR 520 project since 2007, when it first declared the need for the bridge replacement and HOV facilities with Senate Bill 6099.¹⁸⁶ In 2008, House Bill 3096 provided more design and financing details and formed the SR 520 Tolling Implementation Committee to evaluate tolling issues. In 2009, House Bill 2211 authorized variable tolling in the corridor starting in 2011 and created the SR 520 Legislative Workgroup, made up of legislators and transportation officials, to recommend finance and design options. Bills in 2009 and 2010 issued bonds and appropriated funds for specific project elements including the HOV facilities, open-road tolling, active traffic management and a carpooling pilot project. Senate Bill 6392 in 2010 clarified the use of toll revenues from SR 520, set requirements for the HOV lanes and created work groups to make recommendations concerning transit improvements. After voters approved Initiative Measure No. 1053 in 2010 to allow only the Legislature to impose or increase any fee (including tolls), the Legislature enacted Senate Bill 5700 in 2011 to again allow the variable tolls on SR 520 to move forward. Most recently, in 2012, passage of House Bill 2814 allowed work on the project to proceed during environmental appeals, avoiding a potential year-long delay.¹⁸⁷

“Whenever you have new and complicated projects like the 520 bridge project,” says Representative Judy Clibborn, Washington House Transportation Committee Chair, “consensus is very hard to attain. It is essential that you have the political support in both the legislature and the local governments. It is not enough to have the technical skills and the path laid out to build a project. Legislative support includes voting for revenue or tolls, educating the public, taking hard stands, and leading from start to finish. Getting projects done is the only way to gain credibility with the citizens. That is what political leadership means.”

Results of the SR 520 project so far have been encouraging, but implementation is in the early stages and mobility, congestion reduction and safety benefits are still under evaluation. The U.S. Department of Transportation is funding a comprehensive evaluation of each Urban Partnership Agreement project; results of Seattle’s evaluation are expected in 2013.¹⁸⁸



Representative Judy Clibborn (D), Washington

Commute Trip Reduction

DEFINITION

Commute trip reduction programs work with employers and communities in highly congested areas to provide transportation alternatives to commuting in single-occupancy vehicles.

Nationally, 76 percent of commuters drive alone to work, clogging roadways during peak travel hours.¹⁸⁹ In addition to operations and management strategies that manage demand generally (see

pages 21 to 23), several strategies can be used to reduce the need and demand for single-occupancy vehicle (SOV) commute trips in particular. Com-

muters often receive financial benefits for driving, such as free parking spots, but no equivalent benefits are offered for using public transit or carpooling. Commute trip reduction efforts may include encouraging carpooling and transit use, bicycling and other modes of transportation. They may allow flexible work schedules that avoid peak congestion times or concentrate work duties in fewer days, known as compressed work weeks; they may have formal goals and regulatory requirements, such as reducing SOV trips by 10 percent; or they may promote information-sharing, technical assistance and education.

State Case Study

Slashing Solo Trips: Washington's Commute Trip Reduction Program



Perhaps the most comprehensive state effort to reduce single-occupancy commute trips operates in Washington state. In 1991, the Washington Legislature created the Commute Trip Reduction (CTR) program. The original legislation states that “reducing the number of commute trips to work made via single-occupant cars and light trucks is an effective way of reducing automobile-related air pollution, traffic congestion and energy use.”¹⁹⁰ The intent of the law is “to require local governments in those counties experiencing the greatest automobile-related air pollution and traffic congestion to develop and implement plans to reduce single-occupant vehicle commute trips.”¹⁹¹

In 2006, the Commute Trip Reduction Efficiency Act¹⁹² placed more emphasis on the land use aspect of commute trip reduction; giving local jurisdictions increased flexibility; moving responsibility for commute reduction goals from employers to local jurisdictions; and focusing the program on areas of the state experiencing the greatest levels of congestion on state highways. The law also set clear goals to reduce SOV driving by 10 percent at CTR worksites and to reduce vehicle miles traveled per employee by 13 percent.

CTR requires any county with a designated “Urban Growth Area,” and each city within such an area with a certain amount of traffic delay, to adopt a commute trip reduction plan. Employers within an Urban Growth Area, including government agencies, with more than 100 employees who arrive at work between 6 a.m. and 9 a.m. must participate in CTR, with exemptions for construction and agricultural employers. Employers must have a designated transportation coordinator who distributes information about transportation alternatives; develop a commute trip reduction plan with the appropriate local jurisdiction; and undergo regular reviews and evaluations. Local governments provide technical assistance and services to employers to help them achieve the goals, and may provide their own outreach and service programs directly to commuters.¹⁹³ The CTR board, appointed by the governor, establishes program guidelines, ensures statewide consistency, and makes recommendations to the Legislature. The CTR budget for the 2011-2013 biennium is \$5.5 million, \$3.9 million of which goes to local jurisdictions and \$1.6 million of which goes to the Washington State Department of Transportation to administer the program.

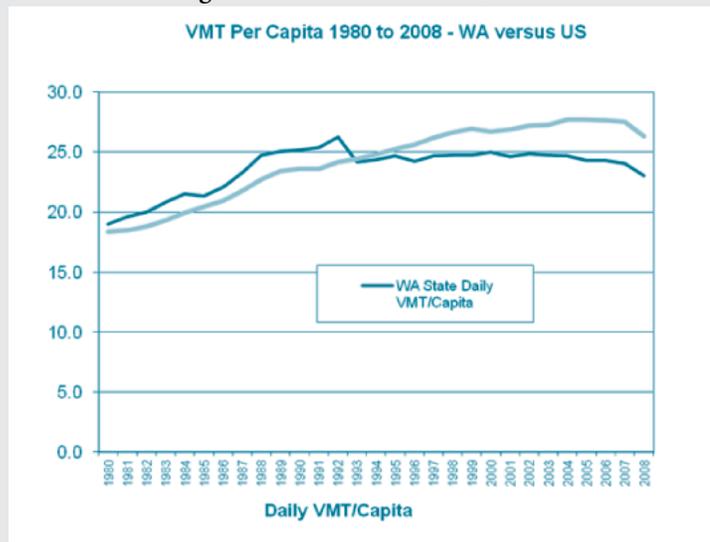
Allowing flexibility in reaching the program’s goals seems to be a hallmark of CTR’s success. Representative Judy Clibborn, chair of Washington’s House Transportation Committee, thinks CTR works “because it uses the partnership with the private sector and user to meet the needs of individual businesses and regions. It is not a one-size-fits-all. In some places, a bus pass works; in others, it is a vanpool. Using state dollars to help get people to work in ways other than an SOV helps congestion for the commuter.”¹⁹⁴ Data from CTR participants points to use of a variety of approaches to reduce drive-alone rates. Carpooling, public transit and bicycling were found to be the most popular; employees also used vanpools, walking and compressed work weeks.¹⁹⁵

The data indicate that CTR has significantly affected participants’ travel behavior. After the program was implemented in 1991, the number of miles traveled by Washington drivers dropped well below the national average (Figure 11). Similarly, in 2010, the national rate for driving alone was 76 percent, but Washington’s drive-alone rate was the seventh lowest nationally, at 73 percent, and only 63 percent of CTR drivers drove alone.¹⁹⁶ In addition, the 574,000 commuters with access to the program that year saved more than \$22 million.¹⁹⁷ According to Clibborn, CTR “saves commuters, and their families, money. Parking, gas and time are all saved by connecting commuters to existing transit, matching to carpools, or connecting them to van pools.”¹⁹⁸ Further, between 2007 and 2010, CTR employees reduced greenhouse gas emissions by 71,500 metric tons and fuel consumption by 8 million gallons.¹⁹⁹

CTR also has proven its ability to catalyze private-sector investments to help worker mobility and increase business efficiency. For every state dollar spent in 2006 on CTR activities, private businesses spent \$16, for a total of \$45 million that year.²⁰⁰ This may aid business competitiveness; between 2007 and 2010, CTR employers increased employment by 2.8 percent, while the state as a whole saw a 4.7 percent drop in employment.²⁰¹ “Having choices for their commuters gives businesses a recruiting edge,” says Clibborn. “Quality of life is a big draw for our state, and making it easier to get to and from work by working together is seen as a win/win situation. It helps move their goods, since the commute is less congested. It also saves on parking costs for either the business or the employee.”²⁰²

Although CTR successfully reduced SOV commuter trips, it touches only a comparatively small amount of travel in the state due to its relatively narrow scope. CTR worksites represent about 20 percent of the commute market share and 6 percent of statewide vehicle miles traveled.²⁰³ Nevertheless, the program’s success has not gone unnoticed. WSDOT’s new framework for future transportation investments—called “Moving Washington” (see also pages 28 to 29)—includes managing travel demand as a key component in making wise and efficient transportation decisions.

Figure 11. Vehicle Miles Traveled Per Capita in Washington and the United States, 1980-2008



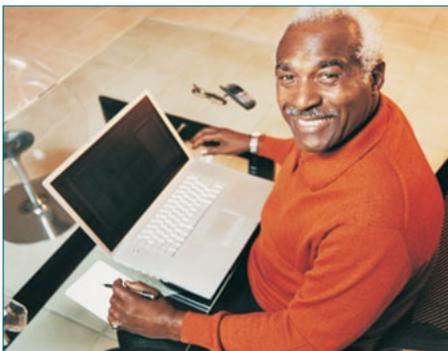
Source: Washington State Department of Transportation (WSDOT), March 1, 2010.

Commuter reduction efforts also may entail programs that reduce trips by allowing employees to carry out job duties from somewhere other than the employer's main office—often their home; this is known as telework or telecommuting. An employer and employee typically arrange the telework structure, with occasional in-office work days. To address concerns about how telecommuting may affect productivity and accountability, employers may choose to grant telework status only to employees who have proved to be reliable.

In 2006, Georgia became the first state to enact a telework tax credit (see next page).²⁰⁴ Nebraska, Oklahoma and Virginia are among other states that have provided tax credits or incentives to businesses that start telework programs. The Virginia General Assembly enacted a tax credit in 2011. Like Georgia's program, it also offers a credit of up to \$1,200 for eligible expenses, with a cap of \$50,000 per organization. Eligible expenses also include up to \$20,000 to conduct a telework assessment. The credit is available for the 2012 and 2013 calendar years, and awards per year may not exceed \$1 million.²⁰⁵ The Nebraska Legislature enacted a telework tax credit in 2010, but with a twist. The law gives priority to hiring employees who live in rural and/or high-poverty areas.²⁰⁶ Oklahoma authorized a telecommuting pilot program in 2011.²⁰⁷

Estimates of how many employees telecommute nationally varies widely, depending on the definition; 2.8 million people (not including self-employed workers) claim their home as their primary place of work, while the Telework Network claims 20 million to 30 million people work from home at least

one day a week.²⁰⁸ Telework is a popular option with some employees. A Cisco survey of telecommuting employees found that just over half of their American employees were willing to trade a higher



By allowing people to work from home, telecommuting programs can help reduce rush hour traffic.

Source: Denver Regional Council of Governments.

salary for more work flexibility; workers globally prefer this option 66 percent of the time.²⁰⁹ Cisco also estimated \$277 million in increased productivity globally related to telecommuting.²¹⁰ AT&T found increases in worker productivity and decreased costs associated with renting or owning buildings.²¹¹

In a survey of a state agency and a federal agency, most respondents agreed that telecommuters were equally or more productive, although managers were less emphatic in their agreement than other employees.²¹²

Telecommuting may especially reduce longer commutes, saving employees transportation costs and lessening congestion and air emissions. An analysis of a California telecommuting pilot program in the early 1990s found a significant decrease in vehicle miles traveled and emission reductions by telecommuters.²¹³ Overall, however, research on the effects of telework is relatively sparse, so it may be wise for states to establish clear goals for what telecommuting should accomplish and closely track and evaluate the results.

State Case Study

Working from Home: Georgia's Telework Tax Credit

In 2006, Georgia became the first state in the nation to enact a telework tax credit.²¹⁴ Employers were eligible for up to \$20,000 to plan and develop a telecommuting program. They then could receive tax credits of up to \$1,200 per telecommuter for eligible expenses—such as computers and Internet connectivity—depending on the frequency with which each employee worked from home and whether they lived in non-attainment areas, where air pollution levels consistently exceed permissible levels as determined by the U.S. Environmental Protection Agency.



Representative Chuck Martin (R), Georgia

Representative Chuck Martin, sponsor of the legislation, notes that, “At some point you can’t build enough lanes on a highway to satisfy the demands at a peak time. If we encourage telecommuting, we move some folks off the lanes at peak times. It helps make the Atlanta region a good place to live and work.”²¹⁵ Martin believes that telecommuting can be a win-win-win by helping reduce congestion at peak travel times; enabling families to spend more time together; and moving companies into the next generation of doing business. He also noted telecommuting’s ability to reduce the costs of driving and vehicle maintenance.²¹⁶

The credits, available through 2011, were capped at \$2 million to \$2.5 million annually; a total of almost \$5 million was awarded to more than 230 businesses.²¹⁷ Martin says he did not envision the tax credit program as an ongoing subsidy but, rather, as a spur to move businesses toward adoption of telecommuting.

Georgia also has aggressively promoted telecommuting within state government since 2003 through the Work Away program, which encourages eligible state employees to work from home. The program provides training and guidance on how to build a case for telecommuting and ensuring it works for all respective parties. The state also created an official Georgia Telework week.

Giving People Choices



As travel patterns and demands change, policymakers must be able to creatively provide a variety of transportation options that not only fit citizens' needs, but also synchronize with larger policy goals such as encouraging economic development, preventing environmental impacts and reducing government spending. This section explores how states are working to providing a variety of viable, accessible and affordable transportation options. Policies reviewed in this section include bicycle and pedestrian safety and travel initiatives, Complete streets policies, carsharing and bike-sharing, transit-oriented development and human service transportation coordination.

DEFINITION

Bicycle and pedestrian safety and travel initiatives enhance safety and mobility for bicyclists and pedestrians through improved planning and infrastructure, combined with education and enforcement.

Bicycle and Pedestrian Safety and Travel Initiatives

Bicycling and walking are healthy, affordable transportation options that states can help make safe and convenient. Each year, thousands of Americans are injured and hundreds are killed while bicycling and walking. According to the National Highway Traffic Safety Administration, in 2010, 4,280 pedestrians were killed and an estimated 70,000 were injured in motor vehicle crashes. Approximately 620 bicyclists were killed in crashes that year, and approximately 52,000 were injured. Pedestrian fatalities have declined during the past 15 years, from 5,489 pedestrian deaths in 1994 to 4,280 in 2010, although a small increase in deaths occurred in

2010.²¹⁸ However, the drop in pedestrian deaths has not occurred at the same rate as the decrease in fatalities for motorists.²¹⁹ A bone of contention for safety advocates is that, while bicyclists and pedestrians account for 14 percent of fatalities, only 1.5 percent of eligible federal transportation funding was spent on infrastructure improvements for bicycling and walking from 2005 to 2008.²²⁰

From 1990 to 2009, walking trips increased from 18 billion to 42.5 billion, and from 7.2 percent to 10.9 percent of all trips.²²¹ Bicycling trips increased from 1.7 billion to 4 billion during the same time period.²²² This is important to safety, since more pedestrians and bicyclists on the street may actually decrease collision rates, a dynamic sometimes known as “Safety in Numbers.” Research shows that, “the likelihood that a given person walking or bicycling will be struck by a motorist varies inversely with the amount of walking or bicycling.”²²³ Researchers and transportation planners have theorized that the decrease in crashes is due to motorists adjusting their driving behavior to account for increased bicycling and walking traffic.

Members of minority groups are especially vulnerable to injury or death when walking. In 2009, African Americans made up 17.9 percent of pedestrian deaths, despite the fact that they represent only 12.5 percent of the nation’s population; Hispanic pedestrian deaths were at 18.5 percent, although they represent only 13.9 percent of the population.²²⁴ This is due in part to the fact that these groups walk more. African Americans take 26 percent more walking trips than white residents, and Hispanic Americans take almost 45 percent more trips by foot than non-Hispanic white residents. Walking often may be the only option for these groups; in particular, 19 percent of African American and 13.7 percent of Hispanic households do not have a vehicle, compared to 4.6 percent of white households.²²⁵

An area’s design and infrastructure also can affect safety and mobility for bicyclists and pedestrians. Research strongly suggests that traffic incidents are disproportionately more likely to occur in low-in-

come areas that are less likely to have the necessary infrastructure necessary to facilitate safe walking. An analysis of 154 communities across the nation found that low-income areas were much less likely to have infrastructure such as sidewalks, street lighting, crosswalks and traffic calming devices.²²⁶ For example, only 49 percent of low-income settings had sidewalks, compared to 89 percent in high-income areas.²²⁷ This dynamic seems to lead to more traffic incidents and fatalities in such areas, in part because traffic volume is sometimes funneled through lower-income neighborhoods. A recent study from Montréal indicates that low-income areas tend to have higher traffic fatality and death rates for motorists, pedestrians and bicyclists.²²⁸

State legislatures typically have supported bicycle and pedestrian safety and travel through strategies such as increased fines and funding streams for safety enforcement; safe bicycle passing laws; driver’s education; providing funding for infrastructure, especially in targeted areas such as near schools or transit stops; and implementing complete streets policies (see next section, starting on page 38). The new federal surface transportation reauthorization signed into law in July 2012, however, made significant changes to federal funding for transportation “alternatives”—including bicycle and walking improvements—that will affect how states support these modes. Besides reducing funding for such alternatives by 30 percent, the new law (known as MAP-21) now sends half of each state’s allocation directly to metropolitan planning organizations and gives states additional flexibility over the rest. States now can use the funds for other purposes such as recreational trails or safe routes to school—both of which no longer have dedicated funding—or for “the planning, designing or constructing of certain kinds of roadways.” In general, the new federal funding mechanisms create less certainty and more competition between bicycling and pedestrian projects and other modes, and gives states more leeway and responsibility to decide how much to prioritize bicycling and walking improvements in an era of many competing demands on already limited public funds.

State Case Study

Getting There Safely: Washington, D.C.'s Pedestrian and Bicycle Initiatives

Washington, D.C., was designed by famed architect Pierre L'Enfant in 1791 with walking in mind; he used grand boulevards and monumental buildings to create a pleasing experience. In the past century, however, these same boulevards became thoroughfares for some of the heaviest vehicle traffic in the nation. This has affected both the walking environment and safety for the thousands of civil servants and tourists who walk through the city daily.

Pedestrian and bicycle safety is critically important in Washington, D.C.; almost 12 percent of commuters walk to work, and 2 percent ride bicycles. It is important to note that 37 percent of workers in the District commute by transit, which usually also entails significant walking, and 24 percent of households do not own cars.²²⁹ In 2010, according to the District Department of Transportation (DDOT), in Washington, D.C., 768 crashes involved pedestrians, with 738 injuries and 14 fatalities. Bicyclists were involved in 436 crashes, with 336 injuries and two deaths.²³⁰ In 2010, both bicycling and walking crashes were higher compared to previous years, although the general trend shows a decline in pedestrian crashes.²³¹ Bicyclist crashes have increased in absolute numbers, but have declined relative to overall bicycle trips, which have increased significantly in the last decade.²³²



*Councilmember Mary Cheh
(D), District of Columbia*

District Councilmember Mary Cheh, chair of the Committee on Environment, Public Works and Transportation, believes that creating a welcoming environment for transportation modes such as bicycling and walking is essential. “The ability to travel quickly and safely through our city, and to never need to take a car,” says Cheh, “is a major competitive advantage for us when compared to other cities our size. This feature of Washington allows people to lower their transportation costs significantly.”²³³

Recognizing the importance of a safe walking and bicycling environment for District residents and tourists, the District Council has taken some of the strongest steps in the nation to increase bicycle and pedestrian safety. In 2008, the Council enacted two pieces of legislation to create and fund the Pedestrian and Bicycle Safety and Enhancement Fund.²³⁴ At least \$1.5 million per year will be deposited into the fund from neighborhood parking fines and fine increases for certain violations that endanger pedestrians and bicyclists—such as failing to yield to a pedestrian in a crosswalk, parking in a bike lane, overtaking a vehicle stopped for a pedestrian, and colliding with a pedestrian. The fund must be used solely to enhance the safety and quality of pedestrian and bicycle transportation.

Cheh believes that, “When you can do true apples to apples comparisons, adding bicycle and pedestrian infrastructure is often much cheaper than auto-oriented projects on a per-user basis. It makes sense right now to maximize our investment in walking and bicycling to attract as many walkers and cyclists as possible.”²³⁵

According to Jim Sebastian of DDOT’s Active Transportation Program, the fund has been used for actions such as innovative bike lanes, new traffic signals for pedestrian crossings, rapid flash beacons, bikes for traffic control officers, pedestrian bulb-outs, bike safety education, bait bikes for police (to combat theft), and a number of other infrastructure and enforcement activities.²³⁶ The 2008 legislation also directed DDOT to post signs at key crosswalks and intersections warning that failure to yield to pedestrians in a crosswalk is punishable by a \$250 fine.

The fund has been helpful for projects where using federal or other dollars may present delays or complications. “The enhancement fund,” explains Cheh, “creates a sort of fund of last resort that can be used when our various pots of federal or grant money can’t be used quickly, or the project that we need doesn’t conform to the strict rules for these expendi-

tures. The fund allows us to continue moving forward, no matter what funding dilemma might come up from other sources.”²³⁷

Bicycle facilities in Washington, D.C., have grown rapidly in the last decade, from 2.7 miles of bike lanes in 2000 to 55 miles in 2012.²³⁸ This appears to have led to increased bicycling in the city; residents who bicycle to work for most of their commute trips rose from 1.2 percent in 2000 to 3.1 percent in 2010.²³⁹ This trend mirrors a recent analysis of bicycling infrastructure in 90 of the largest 100 American cities that concluded: “Cities with a greater supply of bike paths and lanes have higher bike commute levels—even after controlling for other factors that may affect cycling levels.”²⁴⁰ Increased facilities for bicyclists have assumed particular importance since the District now features the nation’s largest public bikesharing program, Capital Bikeshare.

In 2010, the District also took a major step toward ensuring equity and mobility for pedestrians by enacting the Sidewalk Assurance Act.²⁴¹ As the bill was debated, Cheh declared that, “Kids shouldn’t have to walk in the street on the way to school because the District has not provided the needed infrastructure. This bill is a common-sense, pedestrian-safety measure...”²⁴²

The legislation requires roads to include a sidewalk on at least one side if the road is being reconstructed or when curb or gutter replacement is slated. Priority areas for sidewalk installation include school areas; access routes to parks and recreational facilities; transit stops; locations where the lack of a sidewalk creates substantial pedestrian safety risks; and roadway segments for which residents have petitioned to have sidewalks. Exemptions from this requirement are possible for reasons that include lack of need or physical constraints, but the reasoning for an exemption must be posted on DDOT’s website to ensure transparency. In some cases, residents are opposed to sidewalks; the law requires outreach and public notice on the issue.

Cheh strongly believes that creating safe and convenient traffic conditions for walking and bicycling in Washington, D.C., will lead to a cleaner, healthier and more economically competitive city. She noted the synergy between the District’s fit residents and the high rates of incidental exercise, as well as other important benefits of bicycling and walking such as reduced traffic congestion and air emissions. She also cited the significant cost savings that can be realized by using these travel choices, and believes they are part of the reason “we have become the No. 1 city for recent college graduates, which is helping to attract new businesses that want to both hire and cater to this workforce.”²⁴³



Bicycle and pedestrian facilities have been proven to increase bicycling and walking and can support safer conditions for all transportation users.

Source: Cyclists on Key Bridge, on the morning of Bike to Work Day. Washington, D.C.; M.V. Jantzen, License Terms.

Complete Streets

Current street design in some settings may not facilitate safe walking, bicycling or transit access due to high vehicle speeds, long distances across a street, a lack of sidewalks and other factors. In the past decade, many states have begun to address these issues by re-orienting their transportation programs to account for the transportation modes and needs of all citizens—transit riders, motorists, pedestrians, bicyclists and others—regardless of their age and ability. Commonly referred to as “complete streets,” this approach seeks to ensure that all users can safely reach their destinations using a variety of transportation options.

Minnesota state law defines complete streets as:

The planning, scoping, design, implementation, operation, and maintenance of

DEFINITION

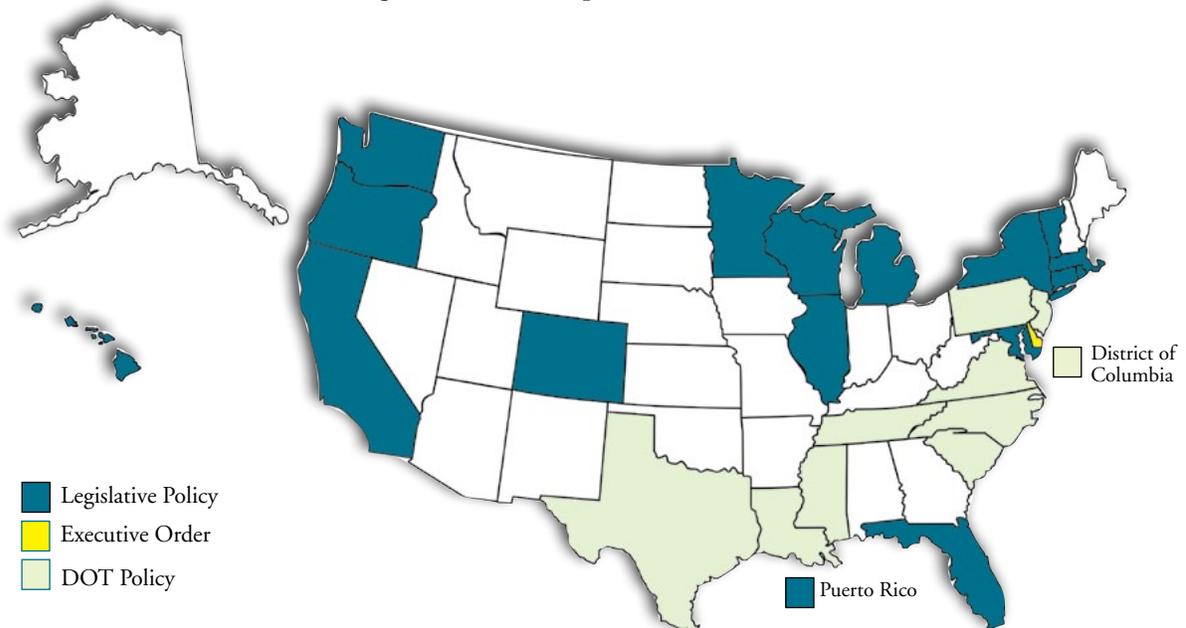
Complete streets is an approach that takes into account the safety and accessibility needs of all users—including motorists, pedestrians, transit users, bicycles, and commercial and emergency vehicles—when planning, designing, building, operating and maintaining roadways.

roads in order to reasonably address the safety and accessibility needs of users of all ages and abilities. Complete streets considers the needs of motorists, pedestrians, transit users and vehicles, bicyclists, and commercial and emergency vehicles moving along and across roads, intersections, and crossings in a manner that is sensitive to the local context and recognizes that the needs vary in urban, suburban, and rural settings.²⁴⁴

Twenty-six states, the District of Columbia and Puerto Rico have some form of statewide complete streets policy (Figure 12).

Some states also act to support complete streets policies at the local level. In 2009, for example, the Michigan Legislature gave communities with complete streets policies priority for federal Transportation Enhancement funds, which are most com-

Figure 12. State Complete Streets Policies



Source: National Conference of State Legislatures, 2012.

only used for bicycle and pedestrian improvements.²⁴⁵ Although this language was included only in the 2009 budget, adoption of a complete streets policy also is one factor Michigan's Department of Transportation considers when awarding competi-

tive grants.²⁴⁶ In another example, the Minnesota law encourages, but does not require, local road authorities to adopt their own complete streets policies (see state case study below).

State Case Study

A Well-Rounded Approach: Minnesota's Complete Streets Policy



Complete streets sometimes are mischaracterized as providing facilities solely for bicycles and pedestrians. An overwhelming majority of adopted complete streets policies, however, are less mode-specific, instead focusing on ensuring a well-rounded transportation planning process. A 2010 analysis of complete streets policies by the National Complete Streets Coalition ranked Minnesota's as the strongest state legislatively derived policy.²⁴⁷ The policy was especially lauded for acknowledging that context and need must be considered when implementing complete streets. The report also highlighted the policy's inclusive approach in regard to various travel modes and abilities.²⁴⁸

Minnesota's law requires the state transportation commissioner to implement a complete streets policy and include a progress report in the Minnesota Department of Transportation's (MnDOT) biennial budget submission to the Legislature. It also encourages—but does not require—local road authorities to adopt complete streets policies that can exceed the state requirements; this has helped ensure local participation and necessary technical expertise at the local level. To date, 28 local governments have adopted complete streets policies, according to MnDOT. Senator D. Scott Dibble notes that a critical mass of engineers now seems to support complete streets; this is essential to the policy's success.²⁴⁹

In addition, Minnesota's law also requires the commissioner to provide written reasons for denial of a local request for variance from state engineering standards in relation to complete streets. Ensuring that reasonable exceptions are not used arbitrarily to dilute the strength and scope of the policy's intent has become a staple of complete streets policies.

Recent trends have been to use work groups or task forces to capture the opinions and expertise of stakeholders such as bicyclist and pedestrian groups, freight and motorist groups, advocates for disabled and older Americans, health practitioners and others. Minnesota's law set the framework for, and required that MnDOT create, a complete streets policy. An external advisory group is responsible for developing the policy. The advisory group includes representatives of municipal government, public transit agencies, construction and trade groups, environmental agencies and health groups. Representative Bernie Lieder, who was the House Transportation Committee chair when the policy was enacted, also has been an active member. Other states that have used formal groups to help develop complete streets policies and practices include Hawaii, Louisiana and Michigan.



*Senator D. Scott Dibble
(DFL), Minnesota*

A strong priority of many complete streets policies is to meet the travel needs of the nation's older adults. According to the 2010 census, 13 percent of Minnesota's population—683,121 people—are over age 65 and nationwide, by 2030, people over age 65 are expected to represent nearly 20 percent of the nation's population.²⁵⁰ Older Americans' mobility can be compromised by a lack of transportation choices. More than half of non-drivers over age 65 stay home on a given day, and older non-drivers make 15 percent fewer trips to the doctor; 59 percent fewer shopping and eating trips; and 65 percent fewer trips for social, family and religious activities than their driving peers.²⁵¹ MnDOT's work plan to implement complete streets recommends creating a program targeted toward older adults and partnering with nonprofits, health practitioners and others to identify and respond to these challenges.

In addition to enhancing mobility and safety, Dibble believes complete streets also promote efficient use of government dollars. Complete streets, he says, "make better use of our existing streets. More people can use our streets and address their mobility needs. It also keeps our communities more vital and vibrant; streets can add to our quality of life, not detract from it."²⁵²

Carsharing and Bikesharing

DEFINITION

Carsharing and bikesharing are membership-based services that allow people access to a shared car or bicycle by the hour for errands and short trips.

Carsharing is a free-market alternative that can offer important mobility options for those who do not need or want to own a car, but who may need to use one for a few hours to grocery shop or visit a relative. Carsharing typically

is a membership-based service that provides members of a carsharing organization access to an insured vehicle at a pre-determined location for a defined period of time; a certain amount of allowable miles or free dedicated parking may be included. As of January 2012, 25 U.S. car sharing programs claimed 718,596 members.²⁵³

Carsharing can significantly reduce individual transportation costs. AAA estimates the average cost of owning and operating a car to be \$6,735 to \$11,360 per year.²⁵⁴ One study found monthly transportation savings ranging from \$154 to \$435 for carsharing members in the United States.²⁵⁵ Reduced traffic congestion may be another benefit of carsharing, since the average member's vehicle miles traveled has been shown to decline by 27 percent to 43 percent.²⁵⁶ Further, carsharing reduces greenhouse gas emissions due to significant emissions

reductions for some households and use of more fuel-efficient vehicles in carsharing programs.²⁵⁷

An off-shoot of the carsharing concept, personal or peer-to-peer (P2P) vehicle-sharing, allows a vehicle owner to rent out his or her car when it is not in use. P2P typically includes gas, insurance and a certain amount of miles per day; a renter must refill whatever gas is used, but otherwise pays an hourly rental fee set by the owner. People who want to rent a car can surf a P2P site to find cars available at differing locations, sizes and prices. P2P systems offer the advantage of operating anywhere a willing car owner lives, if a personal vehicle-sharing system is available to facilitate the transaction. One such system, RelayRides, takes 15 percent of the rental fee but charges no member fee.

Bikesharing, which also allows short-term, as-needed use of vehicles, also is typically membership-based. Bikesharing provides short-term bicycle rentals in settings such as public transit stations, government office buildings and shopping centers. Bicycles can be rented and returned at system-wide stations to facilitate short, flexible, one-way or round trips. Members of the Twin Cities' system, Nice Ride Minnesota, reported that 56 percent of trips were less than three miles.²⁵⁸ Many bikesharing systems are closely linked with transit stops to help public transit riders complete the first or last

mile of their trip. In Denver, 31 percent of riders reported using bikesharing in combination with transit.²⁵⁹ As of January 2012, 15 IT-based public bikesharing systems were operating in the United States, accounting for 172,070 members and 5,218 bicycles.²⁶⁰ Ridership has increased dramatically for some systems, such as those in Washington, D.C., and Denver. In 2012, a total of 17 bikesharing start-ups are expected, including those in Chicago, New York City and San Francisco.²⁶¹ Like carsharing, bikesharing can save users money. A recent survey of Washington, D.C.'s, bikesharing program found that members saved an average of \$819 in transportation costs annually.²⁶² The survey also found notable reductions in carbon dioxide emissions.²⁶³

State Support for Traditional Carsharing

Several states have enacted policies to support carsharing. In recognition of the practice's environmental benefits, a new Illinois law made carsharing organizations eligible for Illinois Environmental Protection Agency grants for purchase of new electric vehicles.²⁶⁴ Washington offers tax credits to employers that give employees who use carsharing and other transportation options financial incentives of up to \$60 per employee per year.²⁶⁵

In 2011, the California Legislature linked carsharing to larger land use policy goals with Senate Bill 310, which created the Transit Priority Program (TPP). The intent of the program is to reduce vehicle miles traveled by promoting development that supports transit use.²⁶⁶ TPP development projects are eligible for reduced permitting costs, expedited review, and increased density and height allowances. The law provides that a TPP project must provide for carsharing onsite or nearby, if such a program is available in the city or county; the developer must provide one carsharing vehicle for the first 20 units, and one for every 50 thereafter.²⁶⁷ California also enacted legislation authorizing a municipality to "designate certain streets or portions of streets for the exclusive parking privilege of motor vehicles participating in a carsharing or ridesharing program."²⁶⁸ The vehicle must be assigned a permit by the local authority.

In some states and municipalities, short-term carsharing is taxed at very high rates. Hoboken, N.J., for example, taxes a one-hour rental at 62.56 percent.²⁶⁹ Legislation that would exempt car-sharing organizations from paying these rental taxes has been introduced in New Jersey the last two legislative sessions, and now is pending.²⁷⁰ Hawaii introduced similar legislation in 2012 that would have exempted from the rental tax an eligible carsharing rental of less than six hours in a day.²⁷¹ In Massachusetts, the Department of Revenue previously assessed a convention center surcharge of \$10 for each car rental. The state revised the charge in 2005 so that members of eligible car-sharing organization pay the charge only for the first rental each.²⁷² Legislation also is pending in Massachusetts that would require creation of regulations to define carsharing and include it as a principle for land development in smart growth planning.²⁷³

State Support for P2P



Representative Barbara Bailey (R), Washington

In the past three years, legislatures in California, Oregon and Washington have enacted laws to help increase P2P vehicle-sharing and clarify how it works. The laws are meant to allow a person to defray some or all the costs of owning a car but still be able to drive as needed. Representative Barbara Bailey, co-

sponsor of the Washington legislation, said she was intrigued that P2P can be economical for both the vehicle renter and the owner. "Some of my constituents want a car, but they don't need a car 100 percent of the time," she says.²⁷⁴

The California, Oregon and Washington laws closely mirror each other. Each state's law requires the vehicle owner to be part of a personal vehicle-sharing program, defined as a business that facilitates sharing private passenger motor vehicles for

noncommercial use.²⁷⁵ Each state requires the insurance coverage offered by the personal vehicle-sharing program to be at least three times the minimum requirement for a private vehicle. To address rental car agency concerns that P2P could be a form of competition, each law clarifies that the annual revenue generated by an individual who participates in a P2P program cannot exceed the annual expenses of operating a vehicle, including maintenance, fuel, depreciation, insurance and any costs associated with P2P participation. Susan Shaheen of the Transportation Sustainability Research Center at UC Berkeley notes that, “Vehicle owners that share their autos in states lacking personal vehicle-sharing legislation risk non-renewal of primary insurance policies, as well as premium spikes resulting from increased use.”²⁷⁶



Peer-to-peer (P2P) carsharing allows users to lower their costs of driving while still having access to a vehicle when needed.

Source: RelayRides.

further legal clarification may be needed to clarify the regulatory landscape for personal vehicle-sharing.²⁷⁸

State Support for Bikesharing

In Colorado, Denver’s and Boulder’s B-Cycle systems received a total of \$673,000 from the Colorado Department of Transportation to create 11 new bikesharing stations along a heavily-used transit corridor in Denver and five at public transit stops in Boulder.²⁷⁹ The revenues came from a transit

funding mechanism created by Senate Bill 108 in 2009. The legislation, which drew on various vehicle fees, set aside \$10 million per year for transit-related projects, including “designated bicycle or pedestrian lanes of highway and infrastructure needed to integrate different transportation modes within a multimodal transportation system, that enhance the safety of state highways for transit users.”²⁸⁰



Bikesharing can complement transit trips and provide helpful mobility options.

Source: Denver B-Cycle.

In the Washington, D.C., region, state actions helped create and expand Capital Bikeshare, a multi-state bikesharing system that now is the nation’s largest. In Virginia, Arlington County received \$250,000 from the state Department of Rail and Public Transportation to start a bikesharing pilot program. The funding is credited with attracting private and county money and eventual creation of Capital Bikeshare.²⁸¹ Arlington County now is completing a Capital Bikeshare transit development plan modeled after Virginia’s Transit Development Plans. The county will submit this plan to the state to demonstrate bikesharing’s transit capabilities and position Capital Bikeshare to be eligible for the same funding and assistance provided to other transit systems.²⁸² In 2012, the Maryland legislature enacted Senate Bill 151 which provided an appropriation of \$250,000 to Montgomery County to build a system to link with Capital Bikeshare. The appropriation will help to extend mobility options throughout the region. The county also has applied for a \$1 million grant from the Maryland Department of Transportation to help build the system.

Transit-Oriented Development

Across the United States, in large cities such as Seattle and Miami and smaller metropolitan areas such as Hartford, Conn., and Fort Collins, Colo., new transit systems are being built to improve mobility, reduce congestion and spark economic activity. In 2012 alone, more than 30 metro areas are building new transit lines, and many more projects are slated to begin within the next few years.²⁸³ Future transit riders may find themselves stepping onto a new light-rail car in Houston, boarding a streetcar in Cincinnati, or hopping on bus-rapid transit in Tampa. All these systems promise to help reshape the cities they are serving and bring new transportation options to their residents.

Creating new transit systems is only part of the equation, however. Public transit is much more likely to enhance the overall transportation network if a neighborhood's or city's development patterns encourage transit ridership. Policymakers, private businesses and community advocates nationwide are working to build and encourage transit-oriented development (TOD) that is within walking distance of transit lines and stops and that includes housing, commercial uses and other amenities.

Florida's statutes define TOD to mean a project:

“... that is or will be served by existing or planned transit service. These designated areas shall be compact, moderate to high density developments, of mixed-use character, interconnected with other land uses, bicycle and pedestrian friendly, and designed to support frequent transit service operating through, collectively, or separately, rail, fixed guideway, streetcar, or bus systems on dedicated facilities or available roadway connections.”²⁸⁴

TOD can encourage transit ridership, improve quality of life and build value in communities. The Center for Transit-Oriented Development believes

DEFINITION

Transit-oriented development (TOD) refers to compact, mixed-use community development with ready access to quality transit service, designed to support or encourage transit ridership.

a TOD project should “increase ‘location efficiency’ so people can walk and bike and take transit; boost transit ridership and minimize traffic; provide a rich mix of housing, shopping and transportation choices; generate revenue for the public and private sectors and provide value for both new and existing residents; and create

a sense of place.” Cities typically support TOD because it spurs development and removes existing tax exemptions, providing local governments with additional property and sales tax revenues.

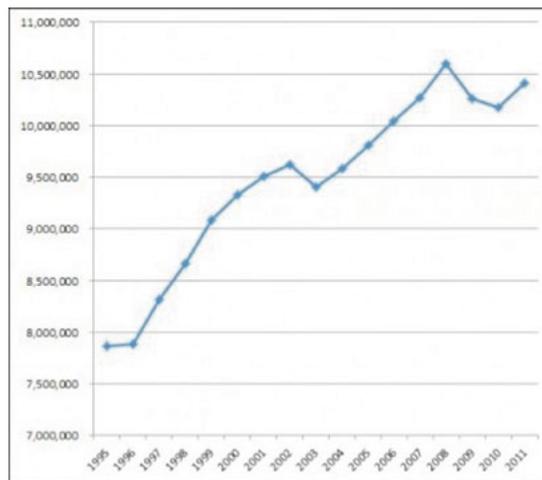
Trends Contributing to Increasing Transit Demand

Demand for public transportation is on the rise. Americans took 10.4 billion trips by transit in 2011, an increase of 2.3 percent over 2010 and the second most transit trips for any year since 1957 (Figure 13).²⁸⁵ Consumers increasingly want to live and work in walkable communities that offer transportation choices.

A recent National Association of Realtors survey found that 77 percent of respondents wanted to live in pedestrian-friendly neighborhoods, and 50 percent favored transit improvements over other options.²⁸⁶

This desire for transit access also is shaping property values. A Denver study found that renters would pay 4 percent more on average for units near light-rail stops, and developers have been paying about 25 percent more for land within a quarter-mile of rail stops.²⁸⁷

Figure 13. Increase in Transit Ridership, 1995-2011



Source: American Public Transit Association (APTA), 2012.

Affordability plays a significant role in this trend. The 2012 Emerging Trends in Real Estate report notes that, “living smaller, closer to work, and preferably near mass transit holds increasing appeal as more people look to manage expenses wisely.”²⁸⁸ It is estimated that an individual can save more than \$10,000 per year by riding public transit instead of driving, and transit use rose with gas prices throughout 2011.²⁸⁹ Potentially higher housing costs in areas near employment centers can be offset by lower transportation costs, with the additional benefits of avoiding long commutes in congested traffic.²⁹⁰

Demographics also are fueling this demand. Baby-boomer empty nesters and millennials—two of the largest generations in American history—total around 150 million people, and are especially attracted to and moving to TOD-like environments. According to real-estate trend watchers, 88 percent of millennials want to live in an urban setting.²⁹¹

Transit access accompanied by TOD also is gaining in popularity because it can catalyze substantial economic investment in local communities. Since a Portland, Ore., streetcar line was built in 2001, for example, 10,000 housing units and 5.4 million square feet of office and retail space have been built within two blocks of the line, for a total investment of \$3.5 billion.²⁹²



Development that complements transit can increase the ability to access transit easily.

Source: Utah Transit Authority.

State Support for Transit-Oriented Development

State legislatures have begun to assert their role in shaping transit-oriented development near existing and developing transit lines and stations. Today, statutes in 22 states deal with TOD in some capacity. These range from states that simply define TOD to those that provide funding and incentives to encourage TOD to create more transit choices for its citizens, drive economic development, and mitigate congestion and environmental impacts.

States support TODs in several ways. California, Connecticut, Massachusetts, Minnesota and

New Jersey have grant or tax-credit programs that provide funds to municipalities, transit agencies, developers and others to plan and build TOD projects. While many developers and governments think of TOD in terms of fixed-rail service, Florida, Maine and Minnesota include bus service as part of their TOD definitions, and Texas specifically makes bus rapid transit service eligible (see page 47). On the other hand, New Jersey’s Urban Transit Hub Tax Credits are available only for nine designated Urban Transit Hubs that offer rail service.

State Case Study

Spurring Ridership: Utah's Transit-Oriented Development



In Utah, the Legislature has taken strong steps to support transit-oriented development. The state's Wasatch Front region, home to the Salt Lake City metro area and more than 75 percent of Utah's population, has seen massive expansion of public transit options in the past decade. From a single light-rail line that opened in 1999, the Utah Transit Authority (UTA) now operates three "TRAX" light-rail lines with more than 40 stations encompassing 35 miles. In addition, UTA built and now operates a 45-mile commuter train, the "FrontRunner," to serve the many daily commuters from the northern Wasatch Front to job centers located in the region's center. UTA also operates 10 miles of bus rapid transit (see page 47).

By the end of 2015, another 9.5 miles of TRAX, 44 miles of commuter train serving the southern part of the Wasatch Front, and two miles of a new streetcar line will be added.²⁹³ These expansions have been matched by increasing transit ridership, which was up by 6.4 percent in 2011 alone.²⁹⁴ UTA surveys indicate that about 70 percent of riders do so by "choice" — meaning they do not completely rely on public transit but use it because it meets their needs. Transit therefore must be reliable, convenient and welcoming to retain such riders.²⁹⁵

Transit choices are helping re-shape the region, and leaders in the Legislature and at UTA have taken note. Utah developed a mechanism for public-private partnerships to help spur TOD and transit ridership. In 2010, the Utah Legislature passed Senate Bill 272, which enabled the UTA to become a limited liability partner in five mixed-use TODs near UTA transit stations and rights-of-way where UTA owns property that is not needed for transit-critical operations.²⁹⁶ UTA owns about 200 acres of underutilized, tax-exempt land because it does not have eminent domain authority and frequently must procure larger-than-necessary parcels when purchasing the land to build new transit lines.

Under Senate Bill 272, UTA may contribute property it owns along transit lines to a limited liability partnership. UTA also acts to provide oversight and ensure that project decisions are not only financially prudent, but will result in increased ridership and revenues for the transit system. The private developer—selected through a request for qualifications process—must make an equity contribution to the partnership of at least 25 percent of the value of the property contributed by UTA. The program's main goal is to increase density along transit routes, enabling easier access to UTA services and increasing the likelihood of ridership. UTA will receive a return on its capital contribution and a share in the profits to offset future operating expenses that otherwise would be funded by taxes. The pilot program has already partnered in two large mixed-use developments, slated to break ground in 2012 and 2013.

State leaders felt TOD was an appropriate mechanism to help transit pay for itself, encourage ridership by creating housing and services near transit stops, and catalyze economic investment and tax revenue for communities. Representative Bradley Last, House sponsor of Senate Bill 272, notes, "Well-designed TOD will simply increase the demand for UTA services. TOD will help to maximize use of the investments that have already been made because some people will use the UTA system as their main, or perhaps only, source of transportation. As TOD catches on, it may well justify the expansion of UTA services to other areas where large TODs are developed. It is all about supply and demand!"²⁹⁷



*Representative Bradley Last
(R), Utah*



*Representative Greg Hughes
(R), Utah*

Such cooperation between the Utah Legislature and UTA would have been unheard of only a few years ago. The current chair of UTA's board is Representative Greg Hughes, a Republican who was appointed to the board to strengthen legislative oversight. Hughes, who joined the board thinking transit was an overbuilt and over-subsidized social service, set out to prove that mass transit in Utah was not fiscally prudent. He now firmly believes, however, that transit is a cost-effective alternative to new roads—noting, for instance, a recently built multimillion dollar roadway intersection that will reach maximum capacity within five years—that is essential to reducing congestion, thus also benefitting non-transit-users.²⁹⁸ In addition, Hughes believes TOD will help the region achieve one of its land-use goals by helping to concentrate growth.²⁹⁹

Last and Hughes both believe TOD will help give Utahans more transportation options. Cities are creating TOD around transit stations where UTA does not own land. One example is the recently opened City Creek Center in downtown Salt Lake City that offers urban mixed-use amenities, including direct light-rail access, hundreds of residential units, a vast conglomerate of stores anchored by Nordstrom's, and dozens of high-rise office buildings. Last believes that, "As the population becomes more concentrated and travel becomes more of a problem, ... many people will see the value of living where they have easy access to public transportation and other amenities."³⁰⁰ Last also sees the desirability of TOD for older Americans, adding that, "TOD will be a great option for many older people who need easily accessible services and transportation as well as social opportunities."³⁰¹

TOD also can serve as an economic development tool and can attract the young, creative workers needed to thrive in a 21st century economy. Last notes that, "The governor, the Legislature, and county and city governments all over the state are actively involved in economic development activities. Utah is attracting more high-quality companies who require well-educated and well-trained employees. Some of the employees move from other cities where public transit and limited use of cars is more prevalent. TOD could be a very natural fit. Also, people who move to Utah often want to enjoy the outdoor activities for which Utah is famous. TOD could be a great option for someone who wants to ski, hike and bike in their spare time rather than doing yard work or washing the car."³⁰²

The future points to additional TOD projects along the Wasatch Front as more transit systems are planned and completed and ridership numbers continue to rise. Hughes is proud of efforts in Utah to work across party lines to enable UTA's work. "What Utah is doing is a big contrast with Congress," he says. "In Utah, Republicans and Democrats are standing shoulder-to-shoulder to develop a long-term plan for the state."³⁰³

What Is Bus Rapid Transit?

Bus rapid transit (BRT) is an enhanced, limited-stop bus system that operates on dedicated lanes. The goal of BRT is to marry the cost-savings and flexibility of buses with the speed, efficiency, reliability and other amenities—such as off-bus fare collection, technological advances and easy-access level boarding—of light-rail. Since the exact definition of BRT remains up for debate, it is difficult to pinpoint how many systems exist. Various sources point to BRT operations in 11 to 16 states.³⁰⁴ A number of other regions are developing BRT, including Austin, Texas; Hartford, Conn.; and the congested US-36 corridor between Denver and Boulder in Colorado, where a new 18-mile BRT line will be the centerpiece of a new multi-modal project intended to significantly improve travel times.³⁰⁵

States also have dedicated funding to support BRT development. Connecticut law includes BRT as part of the definition of transit-oriented development, and the state has granted more than \$1 million to create TOD on a BRT line between Hartford and New Britain. Laws in Florida, Illinois, Louisiana, Maine, Minnesota, Missouri, Pennsylvania, Tennessee, Texas, Virginia and Washington also mention, define or provide that BRT is eligible for funding assistance.

The comparative ease, timeliness and efficiency of BRT are important benefits to attract new riders and help reduce congestion. Los Angeles County Metropolitan Transportation Authority (MTA) unveiled BRT on two corridors in the region and saw service speeds improve by 23 and 29 percent, respectively. Both corridors also saw huge leaps in ridership of 26 percent and 33 percent; a third of the increase was from new transit riders.³⁰⁶ California's Department of Transportation has adopted official policies that support BRT development and integration into the state highway system.³⁰⁷ BRT also is cost-effective. Although it usually requires some level of improvements, BRT typically uses existing infrastructure, making it an attractive option for policymakers who are leery about the potentially higher costs to build rail systems. An analysis of nine BRT systems and 18 light-rail systems found an average capital cost of \$13.5 million per mile for BRT, versus \$34.8 million per mile for light-rail.³⁰⁸ Business owners, however, may prefer the permanence and perceived economic development opportunities of rail lines.



Bus rapid transit combines many of the amenities and advantages of rail with the cost-effectiveness of buses.

Source: Moving 'Lanta Forward Blog.

Human Service Transportation Coordination

When exploring how states are providing viable, affordable and accessible transportation choices, it is vital to consider policies designed specifically to serve the people who need options the most: the large number of Americans who for reasons of age, disability or income lack access to personal transportation. Today, thousands of federal, state, local and private entities are involved in providing or supporting special transportation services to ensure access to life-sustaining activities such as jobs, education and medical appointments. The dispersion of numerous transportation programs across agencies, however, can lead to inconsistent services, with duplication in some areas and gaps in others. Many who need transportation are left unserved or underserved, especially those in rural and urban communities, low-income and indigent groups, veterans, people with disabilities, older adults and Medicaid recipients. Most states now engage in some form of coordination among transportation and human services organizations to offer more transportation choices to these disadvantaged groups.

Human service transportation coordination is when state human service and transportation agencies, providers of public transit and other transportation services, and other stakeholders cooperate to improve the performance and efficiency of their services. Generally, coordination means better resource management as well as shared power, management and funding among agencies. Providers can work together to link transportation networks or share resources while still maintaining autonomy and authority over individual services.

Coordination has many identified benefits, including increasing capacity for specialized transit; improving overall system performance; and balancing the needs of various populations. In densely populated areas, coordination can save money

by addressing service duplication and inefficient scheduling; in rural areas where there are long distances between destinations and limited transportation services, coordination may be especially useful in addressing service gaps.³⁰⁹ A recent report also identified several potential economic benefits of coordination, including additional revenues for transit; improved efficiency and productivity, by reducing costs and increasing services; and local economic development and job creation.³¹⁰

DEFINITION

Human service transportation coordination is when state human service and transportation agencies, transportation providers and other stakeholders work together to improve transportation access and choice for all users, especially people with limited mobility and special needs.

Coordination requires a great deal of trust and cooperation among stakeholders, however, as well as constant and consistent efforts to keep agreements functioning and all parties working together.³¹¹ The Transportation Research Board notes that coordination “may be initially more expensive, more difficult, and more time consuming to achieve than most agency representatives initially perceive.”³¹² Further, special outreach, especially in rural areas, may be necessary to reach residents, transportation providers and community organizations to improve awareness of the services for which they qualify.³¹³

A 2005 NCSL study found human service transportation coordination efforts of some kind in all 50 states.³¹⁴ Coordinated approaches can include harmonization of program standards, shared use of resources, synchronized planning and dispatch, multi-agency program discussion and various other techniques.³¹⁵ State legislatures have been most involved in creating coordinating councils at the state and regional levels.

Coordinating Councils

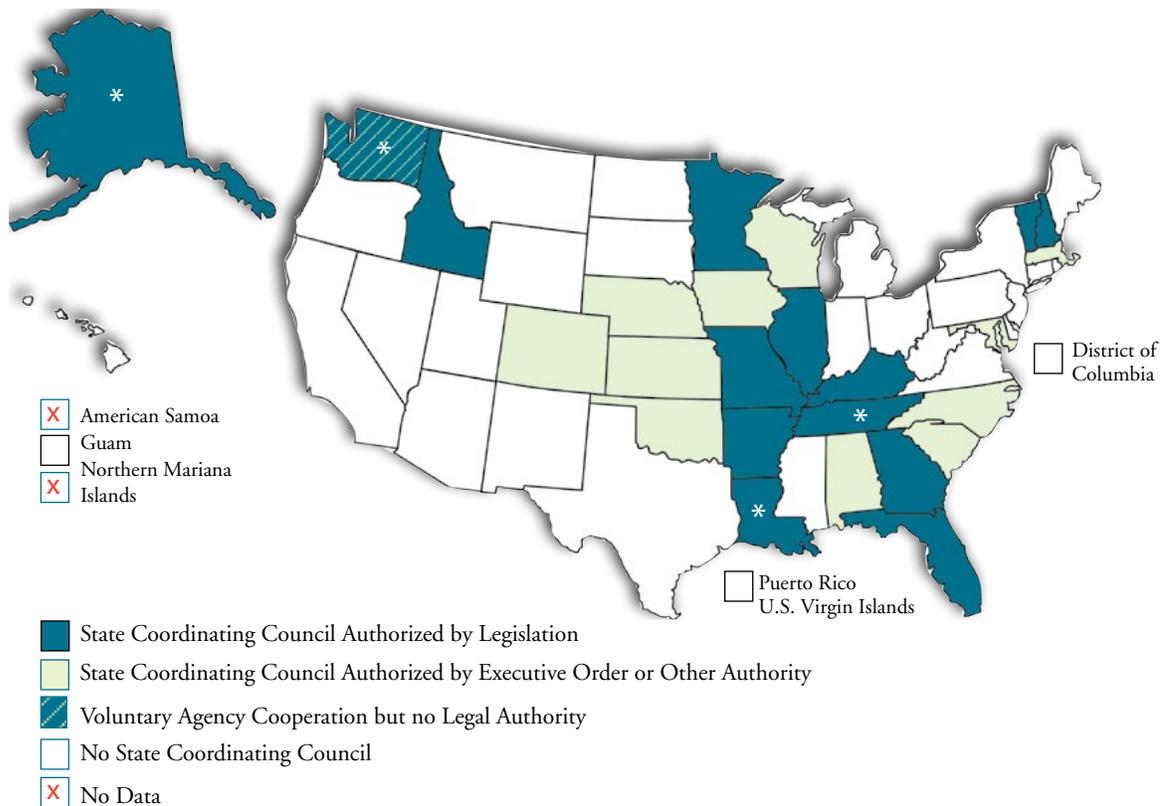
Most states have coordinating councils in place at one or more levels of government. In general, coordinating councils provide a venue for discussion among government agencies and other transportation providers to better coordinate transportation services. Their main objectives typically are to identify service needs, gaps and duplication as well as

opportunities for collaboration. Councils also may work to coordinate use of resources among their members. For example, state coordination can help state departments of transportation (DOTs) decide how to allocate state and federal transit funds.

At least 25 states have active human service transportation coordinating councils at the state level, 13 of which are authorized by state legislation (Fig-

ure 14).³¹⁶ State coordinating council members may include representatives from state departments of transportation, health, human services, veterans or workforce development; transit agencies and other transportation providers; cities and counties; regional planning bodies; universities; or other stakeholders such as school boards, community organizations, advocacy groups, veterans' organizations or local businesses.³¹⁷

Figure 14. State Human Service Transportation Coordinating Councils by Authority



- * The council in Alaska was established by House Bill 131 in the 2012 legislative session.
- * The council in Louisiana was established in the 2011 legislative session and continued by House Concurrent Resolution 181 in 2012.
- * The council in Tennessee was established by Senate Bill 523 in the 2011 legislative session.
- * The legislation for Washington's council expired June 30, 2012, but the council continues to meet.

Sources: Farber and Reed, 2010; National Conference of State Legislatures (NCSL), NCSL's *State Transportation Coordination Database*, 2012; other unpublished NCSL research.

State Case Study

Comprehensive Coordination: Florida's Commission for the Transportation Disadvantaged

Florida's well-established, multi-level coordination system often is cited as a successful example of human service transportation coordination. Recognized by the U.S. Departments of Transportation and U.S. Department of Health and Human Services as a "best practice" model, it has won awards from the Federal Transit Administration (FTA) and the Community Transportation Association of America (CTAA).³¹⁸



Florida's system is intended to balance local flexibility with comprehensive state planning, policy and oversight, and the law clearly defines the roles of state, regional and local entities. At the state level, the Commission for the Transportation Disadvantaged (CTD) was created by the Legislature as an independent state agency in 1989 and by law includes at least five voting members with business experience, two with disabilities, and one over age 65, plus ex officio advisors from the state agencies for Children and Families, Elder Affairs, Health Care Administration, Persons with Disabilities, Transportation, Veterans Affairs and Workforce Innovation.³¹⁹ The CTD is responsible for statewide



Florida's comprehensive coordination is designed to help older adults and others who cannot transport themselves access needed transportation services.

Source: Florida Commission for the Transportation Disadvantaged.

coordination of transportation services for transportation-disadvantaged people, defined as those who, "because of physical or mental disability, income status, or age are unable to transport themselves or to purchase transportation" or children who are "handicapped, high-risk or at-risk."³²⁰

The system also includes local designated planning agencies; local coordinating boards that act as advisory bodies in their service areas; and community transportation coordinators (CTCs) that provide, contract for or broker transportation services in each county. State agencies that fund transportation services either purchase trips from a CTC or are billed directly by service operators.³²¹ The CTD now is adding mobility managers in each county within the CTCs.³²²

Data shows Florida's system is benefitting the state. A 2008 study found that \$1 in public money spent on transportation disadvantaged programs yielded a return on investment of \$8.35.³²³ Former CTD Executive Director Lisa Bacot noted in 2007 that, "It's a common sense approach to doing business ... In the last 12 years with this program, our trips have doubled, but the money we spend has decreased 35 percent. You can't argue with those numbers."³²⁴

In FY 2010, 827,469 transportation disadvantaged people in Florida received more than 51 million trips; 8.46 million of those trips were provided by the Transportation Disadvantaged Trust Fund, the state's dedicated funding source for transportation disadvantaged services and coordination. "The Transportation Disadvantaged Trust Fund makes Florida unique," says Steve Holmes, executive director of the CTD. "It allows us to help coordinate the system by providing grants to local planning agencies for transportation disadvantaged planning and to community transportation providers to fund services." In 2012, the Legislature allocated \$10 million to the Transportation Disadvantaged Trust Fund in FY 2013 and each year thereafter. This was the first time the Legislature had increased the fund.³²⁵

Many states also have coordinating councils at other levels of government. As of January 2012, at least 29 states had regional coordinating councils.³²⁶ Some regional councils—those in California and Florida, for example—were created by state legislation. Iowa state law generally requires transportation coordination but does not specify how it is to be achieved; regional coordinating councils arose as a result.³²⁷

State and regional coordinating councils can play complementary roles, and at least 13 states have both.³²⁸ State councils are effective in planning

and implementing statewide policy, while regional and local councils often include members from the community and can better attend to service issues. In some states, regional councils provide direct services or complete the local coordination plans required to receive transit assistance under federal law. Active communication between state and regional coordinating councils can help ensure that state activities stay well connected to local needs; having councils at multiple levels can be part of an overall strategy to better coordinate transportation services for those who most need them.³²⁹

Achieving Multiple Benefits



Transportation systems significantly affect other policy goals and quality-of-life issues such as environmental impacts, energy use, public health and economic development. This section examines how transportation decisions can successfully achieve diverse public benefits. Included are a discussion of the use of comprehensive performance management and two examples of how transportation activities have been linked with environmental and public health planning and goals in practice.

Performance Management

As part of the nationwide trend toward performance measurement, states across the nation now have goals and objectives against which their performance is measured. Goals typically are high-level to offer meaningful guidance

DEFINITION

Transportation performance management tracks how well and efficiently transportation systems are working by setting quantifiable goals, then measuring progress toward these goals.

and clear insight on the overall functionality of a transportation system. The intent is to give policymakers and practitioners better tools to make investments and decisions, and to increase transparency for the general public about the efficiency of the transportation system and its impact on quality-of-life measurements.

A compilation of state transportation performance measurements indicates that most states have some form of accounting for reaching key transportation goals.³³⁰ Traditionally, states have focused on measuring safety, capacity and state of good repair. During the past decade, however, states have begun to adopt performance goals and measurement tools that track a wider variety of transportation-related outcomes, acknowledging that transportation systems affect, for example, eco-

conomic development, environmental sustainability and public health. In addition, performance measures seem to be moving toward more targeted outcomes, such as increasing transit ridership or reduc-

ing transportation-related emissions. Developing and using diverse performance measures can help states ensure that their transportation decisions are achieving various policy goals.

State Case Study

Measuring More: Washington's Statewide Transportation Goals

Washington provides a good example of how states can incorporate non-traditional transportation goals and performance measures. In 2007, Senate Bill 5412 directed the Office of Financial Management (OFM) to establish “objectives and performance measures for the Department of Transportation and other state agencies with transportation-related responsibilities.”³³¹ The legislation created five statewide transportation goals, and in 2010, Senate Bill 6577 added a sixth.³³² These statewide transportation goals are:



- **Economic Vitality:** To promote and develop transportation systems that stimulate, support, and enhance the movement of people and goods to ensure a prosperous economy.
- **Safety:** To provide for and improve the safety and security of transportation customers and the transportation system.
- **Preservation:** To maintain, preserve and extend the life and utility of prior investments in transportation systems and services.
- **Mobility (addressing congestion):** To improve the predictable movement of goods and people throughout Washington state.
- **Environment:** To enhance Washington's quality of life through transportation investments that promote energy conservation, enhance healthy communities and protect the environment.
- **Stewardship:** To continuously improve the quality, effectiveness and efficiency of the transportation system.³³³

The new goals and their associated performance measures reflect a heightened awareness of the transportation sector's ability to hinder or advance other important policy goals such as economic health, using existing infrastructure and preserving the environment. The measures for environment, for example, include the amount of greenhouse gas emissions created by transportation, with a goal to reduce such emissions. This goal reinforces a 2008 state law requiring a reduction in greenhouse gas emissions.³³⁴ Another goal is to increase the number of culverts repaired to facilitate fish passage, an important issue in a state that has ample but endangered fish populations and a strong fishing industry. As with many of the goals, this entails coordination with other state agencies, in this case the Department of Fish and Wildlife.

The OFM is tasked with producing a report every two years that assesses “the state's progress in achieving its transportation goals using key performance measures and data.”³³⁵ The latest report, from 2010, found progress on most goals. Areas of particular success included a reduction in traffic fatalities, fair or good ratings for most highways and bridges, and excellent on-time performance for ferries.³³⁶ Other notable progress includes a 21 percent increase in passenger rail ridership since 2005 and reduced congestion in the Seattle area. Goals that are not being met included increasing ridership on ferries and on-time delivery of capital projects;³³⁷ the goal to reduce transportation-caused greenhouse gases

could not be assessed due to lack of data. Overall, the measures seem to provide relatively simple high-level benchmarks for tracking important transportation trends in the state.

Recognizing a lack of measures to assess and track the number of trips taken by transit, bicycling and walking, the Legislature passed House Bill 1175 in 2011, which directs the OFM to study available data regarding statewide use of these modes and to recommend additional performance measures to effectively assess the state's performance in increasing transit ridership and bicycle and pedestrian trips.³³⁸ As required by the legislation, the office reported its findings and recommendations to the Legislature's transportation committees in November 2011. The report recommended tracking the percentage change in trips by transit, bicycling and walking respectively, to provide a high-level summary of trends as required by the law. Although the Legislature had asked only for measures to assess travel trends, the report also recommended adding two more goals concerning transit, bicycle and pedestrian mobility and safety: the number of bicycle and pedestrian traffic crashes; and the percentage of state residents living within bikeable or walkable distance (defined as two miles) to goods and services.³³⁹ These measures must be integrated into future OFM biennial reports.

The state legislative role in setting transportation performance measures varies. In Maryland, Minnesota and Nevada, a legislative directive has encouraged or required a move toward transportation performance management. Other states have reported more active legislative involvement in developing or approving specific performance goals for their executive departments of transportation. In Florida and Illinois, the DOT sets goals subject to legislative review and approval, and in Kansas and New Mexico, the legislature and the executive branch develop goals cooperatively. States also are increasingly using performance-based budgeting to drive their spending decisions. At least 14 states have reported using DOT performance data in the budget and appropriations process; in Utah, the Legislature

first assesses whether goals have been met before determining funding levels.³⁴⁰

Reducing Greenhouse Gases and Increasing Transportation Choices

The debate over climate change has been vocal and contentious. Some skeptics question the validity of human-caused climate change, while others question whether the costs of reducing greenhouse gases are worth the price. Nonetheless, a number of states have moved forward with aggressive plans to curtail greenhouse gas emissions via state law and regulatory processes. This section of the report is devoted to a case study of California, which became the first state to require reductions in greenhouse gas emissions in 2006.

State Case Study

Reducing Emissions: California's Sustainable Communities and Climate Protection Act



In 2006, California's Assembly Bill 32 made it the first state to enact a statewide plan to mandate reductions in greenhouse gas emissions. The legislation requires the state to reduce greenhouse gas emissions to 1990 levels by or before 2020.³⁴¹ To achieve this, the law gave the California Air Resources Board (ARB) authority to regulate any source of greenhouse gas emissions, including cars and light trucks. According to ARB, transportation is responsible for 38 percent of greenhouse gas emissions in the state, the most of any sector.³⁴²

To reduce emissions from vehicles, in 2008, the Legislature passed Senate Bill 375, California's Sustainable Communities and Climate Protection Act, the main mechanism to meet the target reductions.³⁴³

Today, this is the only state law that requires metropolitan regions to reduce greenhouse gas emissions through their planning process. California is largely betting that emissions can be reduced by reshaping future growth patterns in the larger metropolitan areas in the state—such as Los Angeles, San Diego and the San Francisco Bay area—to accommodate denser, more transit-oriented growth.

Each of the state's 18 metropolitan planning organizations (MPOs), which consist of the largest metropolitan areas in California, now must draft a sustainable communities strategy (SCS) in its regional transportation plan that integrates transportation and housing planning to meet the goal of reducing greenhouse gas emissions. The SCS must state a vision for growth that takes into account the regional transportation, housing, environmental and economic needs and provides guidance on how the region will meet its greenhouse gas reduction target. In addition, all future plans must reflect funding choices that reduce greenhouse gas emissions and meet requirements of the law.³⁴⁴ Regional transportation plans must be updated every four or five years, depending on air quality attainment in the region.³⁴⁵ According to William Craven, the chief consultant for the California Senate's Natural Resources and Water Committee, the four largest MPOs alone—the Los Angeles, Sacramento, San Diego and San Francisco Bay area regions—account for 84 percent of vehicle miles traveled in the state; 63 percent of the state's population now lives in a region with an adopted SCS.³⁴⁶

Each SCS must be reviewed and approved by the California Air Resources Board. If the board determines that the SCS does not meet the target reductions for the region, the MPO must develop an alternative planning strategy to meet the target. In addition, ARB must “update the regional greenhouse gas emission reduction targets every eight years consistent with each metropolitan planning organization's timeframe for updating its regional transportation plan under federal law until 2050.”³⁴⁷ The hope is that sustainable communities strategies will discourage suburban development that is far from retail and employment centers and encourage retail, employment, urban infill and mixed-use development near public transportation.

As of mid-2012, Los Angeles, Sacramento and San Diego had adopted their sustainable community strategies. An analysis of their respective plans and budgets indicate that all promise heavy future funding for transit system development—32 percent in Sacramento and 47 percent each in the Los Angeles and San Diego regions.³⁴⁸ Sacramento prioritizes bicycle and pedestrian improvements more than the other regions; 8 percent of its SCS budget would fund such activities.³⁴⁹ This may reflect the smaller population and land size of Sacramento, suggesting that major investments in efficient, cost-effective transit could be more difficult, while bicycling and walking could be a more feasible option for shorter trips.

ARB approved San Diego's SCS in late 2011, but a suit has been filed claiming the SCS does not adequately reduce greenhouse gas emissions and ignores other possible negative environmental and health impacts. Among the claims is that the plan depends too heavily on an “automobile-oriented approach, which will inevitably spur sprawling growth throughout the region,” and that the SCS would increase vehicle miles traveled by 50 percent over the next few decades.³⁵⁰ According to Julie Wiley, special counsel for the San Diego Association of Governments (SANDAG), the adopted plan “represents a balanced approach to the region's transportation future that invests much more heavily in transit than previous plans.” Wiley notes that the plan received approval from ARB, the California Department of Transportation, and the U.S. Department of Transportation.³⁵¹

Los Angeles' SCS is linked to 30/10, its ambitious public transit plan. In 2008, Los Angeles County voters approved Measure R, which will fund approximately \$40 billion in transportation improvements. The 30/10 plan intends to use long-term revenue from Measure R as collateral to procure bonds and federal loans. If the 30/10 funding plan is successful, it will rapidly accelerate the construction schedule for extending existing transit lines (subway, light-rail and bus rapid transit), with 12 key projects finished in 10 years rather than 30.

Skeptics argue that California is making multiple requirements without providing the necessary funding to support the change in development and transportation systems. The sustainable communities strategy requires each region to consider in future transportation plans where its residents will work and live; however, the law does not contain any require-



L.A.'s ambitious 30/10 plan is extending a number of existing transit lines, including this bus rapid transit project that will improve mobility within the San Fernando Valley and connect with the region's MetroLink commuter rail.

Source: LA Metro.

ment for funding transit near these areas.³⁵² The law appears to assume that funding will follow transit-oriented projects. Given the fact that some of the necessary funding must come from local entities, however, it is uncertain whether money will be available for projects.³⁵³ Another criticism is that metropolitan planning organizations have no land use planning authority and are not granted such authority under Senate Bill 375. They can, however, place conditions on allocation of transportation funds.³⁵⁴

Craven notes that some communities were skeptical about the requirements and intentions of sustainable communities strategies. However, some stakeholders are realizing the possible ancillary benefits, such as improved public health, additional conservation of agricultural lands, and reduced energy and fuel costs.³⁵⁵ “Overall,” says Craven, “the benefit of more compact development is driving the implementation of Senate Bill 375 instead of climate change.”³⁵⁶ Craven believes the law’s most significant effect is changing the conversation about future growth in California. “While there is more to do,” he says, “it is clear that local governments, regional planners, nonprofit advocates and many private sector developers now are talking about a smaller urban footprint and locating jobs nearer to housing and to transit.”³⁵⁷

Senate Bill 375 contains provisions that would streamline and exempt certain urban infill or transit projects from the California Environmental Quality Act. For example, a transit priority project (TPP) is exempted from CEQA requirements if is part of a region’s SCS. A transit priority project must be within a half-mile of a major transit stop, provide at least 50 percent residential use and have a minimum density of 20 dwellings per acre.³⁵⁸

Will the requirements of Senate Bill 375 be enough to achieve California’s ambitious greenhouse gas reduction targets? The plans from the Los Angeles, Sacramento and San Diego MPOs indicate they are embracing the challenge, but shifting development and transportation patterns in the state that gave birth to modern car culture will be difficult.

What Is an MPO?

A metropolitan planning organization (MPO) is intended to help ensure regional cooperation, planning and coordination as metropolitan areas deal with mobility and land-use challenges. Many times, efforts to decrease congestion and provide efficient transportation choices in a metropolitan area are complicated by the many different jurisdiction and communities. For example, the Los Angeles MPO, the Southern California Association of Governments (SCAG), represents six counties, 191 cities and more than 18 million residents.

The development and power of MPOs are based on a number of federal actions that took place beginning in the 1960s; the Highway Act of 1973 then required establishment of MPOs in any urban setting with a population of more than 50,000. Some regions and states had created entities similar to MPOs before they were federally required. One major role of MPOs is to develop transportation improvement programs that catalog all highway and transit projects in the region that are requesting federal funds.

A portion of each state's federal Highway Trust Fund dollars are dedicated to MPOs. The 1991 federal transportation reauthorization law, the Intermodal Surface Transportation Efficiency Act (ISTEA), increased the amount of funding to MPOs and enhanced the requirement for consultation between state departments of transportation and MPOs.

Linking Transportation with Public and Environmental Health

Policymakers are increasingly recognizing the link between transportation planning and investment and public and environmental health, in terms of traffic safety, physical activity levels and air quality. Transportation planning can have serious implications for state budgets and quality of life.

Transportation infrastructure design or the lack thereof can lead to increased traffic fatalities and deaths. Roads designed to maximize vehicle speed and volume are more dangerous for all users, but particularly so for pedestrians and bicyclists.³⁵⁹ As mentioned in the bicycle and pedestrian safety section of this report (pages 34 to 37), lower-income and minority communities are less likely to have infrastructure such as sidewalks and pedestrian medians, so residents are more likely to be killed or injured in a traffic incident.

Research suggests a strong link between transportation and physical activity levels. Because they walk to and from stops, public transit users are more likely than non-transit users to meet federally rec-

ommended physical activity goals. Nationally, 29 percent of those who use transit are physically active for 30 minutes or more each day.³⁶⁰ The median daily walking time for American transit users was 19 minutes, and racial minority groups, rail users and people in high-density urban environments are more likely to meet the recommended 30 minutes of exercise. Men who commute to work on transit are 44.6 percent less likely to be overweight or obese due to increased activity.³⁶¹ Mixed-use neighborhoods such as transit-oriented developments with safer, denser, walkable streets also have been linked to increased physical activity.³⁶² Some have argued that those who tend to exercise are naturally attracted to such neighborhoods. A new light-rail line in Charlotte, N.C., however, presented an opportunity for a before-and-after analysis. The study, published in the *American Journal of Preventive Medicine*, showed that construction of the light-rail line led to increased walking and weight loss for people in its service area.³⁶³

Exposure to harmful air emissions from motor vehicles also can contribute to and exacerbate conditions such as asthma, respiratory illness, lung cancer and heart disease, among others.³⁶⁴ More than 35

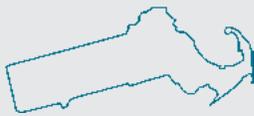
million Americans live within 300 feet of a major road.³⁶⁵ According to the American Lung Association, minority neighborhoods are disproportionately affected by tail-pipe emissions, which report that African Americans, Asian Americans and Latinos are more likely to live in neighborhoods that have poor air quality.³⁶⁶ A study in the California Bay Area found that school sites near major roads had higher levels of traffic pollutants and what appears

to be a causal link with higher incidences of respiratory problems among students.³⁶⁷ Reductions in traffic congestion also have been connected to improved infant health and fewer hospitalizations for asthma, due to the drop in air emissions.³⁶⁸

This section contains a case study of Massachusetts, a state that is actively addressing the link between transportation and public health conditions.

State Case Study

Making the Connection: Massachusetts' Healthy Transportation Compact and GreenDOT



In 2009, Massachusetts took a clear step toward confronting the link between transportation and public health. The legislature created a healthy transportation compact to increase inter-agency collaboration and “adopt best practices to increase efficiency to achieve positive health outcomes through the coordination of land-use, transportation and public health policy.”³⁶⁹

The compact includes the state’s transportation department (MassDOT) as well as the departments of Health and Human Services, Energy and Environmental Affairs, and Public Health; the secretaries of MassDOT and Health and Human Services serve as co-chairs. By formalizing collaboration between state agencies, Massachusetts hopes to achieve a more holistic and ultimately less costly and more efficient transportation system.

Massachusetts enacted a significant transportation reform law in 2009 that placed all transportation functions except for ports under the auspices of MassDOT.³⁷⁰ This restructuring, coupled with creation of the compact and other policy directives such as complete streets, led to the creation of GreenDOT, an initiative to incorporate sustainability into all aspects of MassDOT’s responsibilities. GreenDOT’s primary goals are to reduce greenhouse gas emissions; promote healthy transportation choices such as bicycling, walking and transit; and support smart growth development and land-use.



*Senator Thomas McGee
(D), Massachusetts*

“Transportation and public health are directly related in many ways,” says Senator Thomas McGee. “Alternative modes of transportation like bicycling and walking help to enhance the quality of life, and public transit helps improve air quality. Since both the Commonwealth of Massachusetts and the nation face a transportation funding crisis, it is important that programs such as GreenDOT play a role in the discussion of improving our transportation system.”³⁷¹

Massachusetts also has legislatively required a reduction in greenhouse gases. In 2008, Senate Bill 2540 created the Global Warming Solutions Act,³⁷² which requires a greenhouse gas reduction to 80 percent below 1990 levels by the year 2050. The GreenDOT goals support this reduction target; actions to date include creating bicycling and walking infrastructure and implementing the state’s complete streets policy.

Thus far, GreenDOT has undertaken several efforts to promote healthy transportation choices. The Massachusetts transit-oriented development (TOD) bond program has awarded more than \$30 million in grants to plan and build

bicycle, pedestrian and housing within one-fourth mile of a transit station. The TOD program also attempts to ensure that residents who rely most heavily on transit can live in a TOD; the program requires any grantees that build housing to ensure that at least 25 percent is affordable. Since the bond program was created by the legislature in 2004, Massachusetts seems to have invested more state money in TOD than almost any other state.

MassDOT has conducted more than 80 complete streets workshops throughout the state for local officials and leaders, and a more intense, technical course for MassDOT planners and engineers. MassDOT also has issued a challenge to software developers to develop technology that highlights how Boston's bikesharing system, Hubway, and transit can be used in tandem. These efforts appear to be meeting with success; in 2012, the League of American Bicyclists ranked Massachusetts as the third most bicycle-friendly state in the nation, up from 19th in 2010.³⁷³ According to the Alliance for Bicycling and Walking's 2012 Benchmarking Report, Massachusetts has the seventh highest rate of commuters who walk or bicycle to work—around 5.3 percent—and Boston has the largest combined pedestrian/bicycle commute rate of any large U.S. city.³⁷⁴ Massachusetts is also the ninth safest state for pedestrians and the 11th safest for bicyclists, based on the number of people using these modes and the state population.³⁷⁵

The law establishing the Healthy Transportation Compact also required the use of health impact assessments (HIAs) to determine the effect of transportation projects on public health and vulnerable population groups. An HIA is commonly defined as “a combination of procedures, methods and tools by which a policy, program or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.”³⁷⁶ MassDOT is now conducting an HIA on an elevated highway corridor in the Somerville area that not only carries a large volume of traffic, but also separates the community in two, making transportation within Somerville more dangerous and difficult. The HIA will study how a possible new, de-elevated boulevard-style design could facilitate intra-city movement, create a safer and more pleasing environment, and perhaps motivate economic development.³⁷⁷ The assessment also will study the potential effects of such a design on air quality, bicycle and pedestrian mobility, traffic safety and noise levels, among other impacts.³⁷⁸



Massachusetts is taking steps to ensure that transportation decisions support public health.
Source: Joseph Davies.

MassDOT also is prioritizing the goals of the compact and GreenDOT internally. In 2012, MassDOT became the nation's first transportation agency to be awarded a Bicycle Friendly Business designation by the League of American Bicyclists.³⁷⁹ This acknowledges MassDOT efforts—including increasing bicycle parking, establishing a pool of loaner bikes, and designating a bicycle and pedestrian coordinator in every MassDOT district office—to create facilities that enable employees and customers to easily bike to MassDOT offices.³⁸⁰

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