

# State Infrastructure Spending and the Federal Stimulus Package

**Abstract** - Nearly one-quarter of the \$787 billion in the American Recovery and Reinvestment Act of 2009 is devoted to spending and tax credits for infrastructure investments. The sums available (about six months of public infrastructure spending) and the requirements to spend on "shovel ready" projects mean that this program is a short-term boost, rather than an opportunity to create broad based change in the U.S. infrastructure profile. Some key exceptions are energy, broadband technology, and high speed rail, where federal spending can break new ground. Looking ahead, the availability of stimulus funds should not distract attention from infrastructure finance reform, particularly in transportation.

## INTRODUCTION

Infrastructure is an important component of the \$787 billion American Recovery and Reinvestment Act of 2009 (ARRA), with over \$143 billion in public works spending planned and another \$29 billion in tax credits for infrastructure investments.<sup>1</sup> This article outlines how this stimulus package fits into the nation's overall infrastructure spending profile and provides a sense of what we should expect to see (and not see) as a result of the new program, drawing on an analysis of the program and interviews with state and local officials in California in May, 2009.

As a background to this discussion, we begin with some context on the nation's infrastructure spending profile and current debates on infrastructure needs and funding sources. We then discuss how the federal stimulus package fits into this picture, in terms of overall spending volumes and areas of focus. The final section highlights some of the longer-term challenges of infrastructure finance that need to be resolved in the United States, with a particular focus on the transportation sector.

This analysis leads to several key conclusions. First, although there is no consensus on the extent of unmet infrastructure needs, there is increasing evidence that the nation's

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National Tax Journal  
Vol. LXII, No. 3  
September 2009

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<sup>1</sup> H.R. 1 was signed into law on February 17, 2009. Information on the program can be found at <http://www.recovery.gov/>. Detailed construction spending information in the bill is from the Associated General Contractors of America's website (<http://www.agc.org/stimulus>). Estimates of tax credits are from <http://www.propublica.org/special/stimulus-plan-taxcut-list>.

infrastructure finance system suffers from serious flaws, most notably an insufficient reliance on user fees to pay for facilities in order to help manage demand. Second, the federal stimulus should largely be viewed as a short-lived boost to business-as-usual infrastructure spending. The focus on shovel-ready projects limits the amount of “vision” that can be incorporated into new construction. Some important exceptions are in the areas of energy, information technology, and (potentially) high-speed rail investments, where federal funding has increased many-fold. Third, the infrastructure spending in the stimulus bill should not distract policymakers from addressing longer term challenges to infrastructure finance. In particular, changes are needed in the way we fund our transportation infrastructure, including an increase in fuel taxes and a shift toward mileage-based fees, using new toll collection technology. The next federal transportation spending bill provides an opportunity to begin moving in this direction.

#### INFRASTRUCTURE FINANCE: TRENDS AND ISSUES

Public entities fund the bulk of infrastructure investments in transportation, drinking water and wastewater, schools, natural resource management (e.g., parks and flood control), prisons, and postal facilities. In 2004, the Congressional Budget Office estimated that public capital outlays amounted to roughly \$287 billion (Table 1). Another \$214 billion was spent by private entities, which cover most investments in energy, telecommunications, and freight rail, and significant

investments in schools. Overall, federal contributions accounted for roughly 15 percent of the total, with the largest share going to transportation. State and local contributions (42 percent of the total) were heavily weighted toward transportation, schools, and water and wastewater utilities. State and local governments also spend most of the federal dollars, which are distributed as grants and low-interest loans.<sup>2</sup> Within states, local governments generally account for roughly two-thirds of all state and local capital spending (de Alth and Rueben, 2005).

Data on long term trends in public spending suggest that 2004 was fairly typical of recent years. Figure 1 shows these trends along two metrics: real per capita spending, and spending as a share of GDP. Annual spending estimates are only available for transportation and water infrastructure; the figure also reports estimates of per capita spending on all sectors, using data from the Census of Governments. Two quite different trends are apparent. On the one hand, real per capita investments have been on the rise. By the early 2000s, capital outlays reached close to \$900 per person for transportation and water, and over \$1,200 for all sectors, more than double the level in the early 1980s.<sup>3</sup> On the other hand, although public capital outlays have been relatively constant as a share of GDP over this interval, they have not kept pace with longer term trends in GDP growth.

These disparate trends point to a question that has received much attention in infrastructure circles for some time now: are we investing “enough”? Since the late 1980s, a variety of advocacy groups have been calling for increased public

<sup>2</sup> For transportation and water, federal grants and loans to state and local governments consistently account for over 80 percent of federal capital outlays (see data tables accompanying Congressional Budget Office (2008)).

<sup>3</sup> The Census of Government series, which relies on detailed data from state and local governments, shows an uptick in spending during the 1960s, due in part to a boom in highway spending. The annual series likely undercounts state and local spending in this decade.

## State Infrastructure Spending and the Federal Stimulus Package

**TABLE 1**  
CAPITAL OUTLAYS ON INFRASTRUCTURE IN 2004 BY SOURCE  
(Billions of 2008 dollars)

	Public		Total		Total	Federal share (%)
	Federal	State & Local	Public	Private		
<b>Transportation Infrastructure</b>						
Highways	37.3	45.1	82.3	n.a.	82.3	45
Mass Transit	9.4	9.9	19.1	0.0	19.1	49
Freight Railroads	0.0	0.0	0.0	7.9	7.9	0
Passenger Railroads	0.9	0.0	0.9	0.0	0.9	100
Aviation	6.9	8.4	15.3	2.5	17.8	39
Water Transportation	0.9	2.1	3.0	0.1	3.1	28
Total Transportation	55.2	65.4	120.6	10.5	131.1	42
<b>Utilities and Other Infrastructure</b>						
Drinking and Waste Water	3.2	31.4	34.6	n.a.	34.6	9
Energy	2.1	9.5	11.6	85.2	96.8	2
Telecommunications	4.8	n.a.	4.8	84.7	89.5	5
Pollution Control/Waste Disposal	1.0	2.2	3.2	4.4	7.7	13
Postal Facilities	1.1	0.0	1.1	0.0	1.1	100
Prisons	0.4	3.2	3.6	n.a.	3.6	10
Schools	0.5	93.2	93.7	29.4	123.1	0
Water and Other Natural Resources	8.8	5.3	13.9	n.a.	13.9	63
Total Utilities and Other	21.7	144.7	166.5	203.7	370.2	6
<b>Total</b>	<b>77.0</b>	<b>210.1</b>	<b>287.1</b>	<b>214.2</b>	<b>501.3</b>	<b>15</b>

Notes: For details on data categories, see Congressional Budget Office (2008).

Values converted to 2008 dollars using the Bureau of Labor Statistics deflator for materials and components for construction (WPUSOP2200).

Source: Congressional Budget Office (2008).

spending on the nation's infrastructure, emphasizing unmet needs.<sup>4</sup> Perhaps foremost among these groups is the American Society of Civil Engineers (ASCE), which issues "infrastructure report cards" for the nation and individual states.<sup>5</sup> The ASCE's latest national report card, issued a month after the stimulus bill was passed, gave the United States a grade of "D" and called for \$2.2 trillion in public infrastructure spending over the next five years; roughly doubling infrastructure spending relative to their estimate of baseline spending

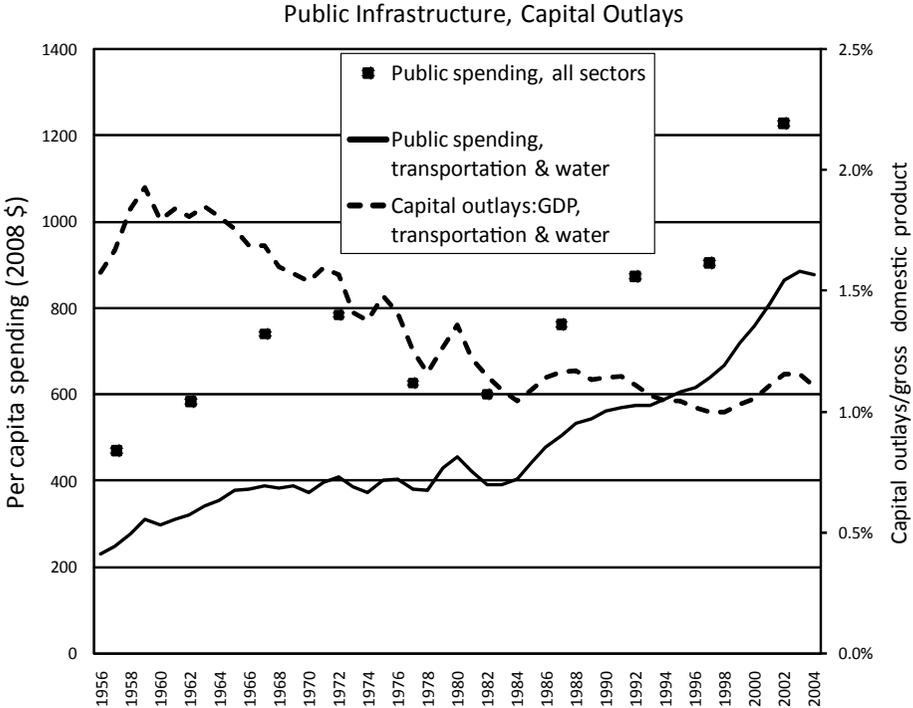
(American Society of Civil Engineers, 2009).

Estimates of unmet needs (or "gap" analysis) typically point to signs of deterioration and deferred maintenance of infrastructure facilities, and are constructed by adding up engineering estimates of what it would take to get to a uniformly good condition and level of service (Hanak and Barbour, 2005). Although they often highlight the costs of lower-than-desired investment (e.g., the added costs to drivers from congestion

<sup>4</sup> A particularly influential report was prepared by the National Council on Public Works Improvement (1988), a congressionally chartered commission. This report launched the idea of infrastructure report cards discussed in the text.

<sup>5</sup> See <http://www.infrastructurereportcard.org/> for links to the national and state report cards. Regional report cards have also been done for some states by local chapters (e.g., California). Other groups advocating more federal spending include sector-specific associations (e.g., the Water Infrastructure Network (2002)) and ad hoc networks of elected officials (e.g., Building America's Future, a coalition led by Pennsylvania Governor Edward Rendell, California Governor Arnold Schwarzenegger, and New York City Mayor Michael Bloomberg, which advocates for more federal spending, described at: <http://www.investininfrastructure.org/>).

Figure 1. Public Sector Capital Outlays, 1956–2004



Notes: Real per capita series is deflated using the Bureau of Labor Statistics deflator for materials and components for construction (WPUSOP2200). The estimate of all public spending combines state and local capital outlays for all sectors from the Census of Governments with federal transportation and water spending not transferred to state and local governments from the Congressional Budget Office series. It underestimates total public spending if any federal spending on other sectors (see Table 1) is not transferred to these entities. Sources: Congressional Budget Office (2008), accompanying data sets (for transportation and water series); Census of Governments (various years), as reported in de Alth and Rueben (2005) (for all spending series); Bureau of Economic Analysis (for gross domestic product series).

delays and rough roads), these estimates generally do not assess whether there is an overall economic justification for additional investment.<sup>6</sup> In particular, needs estimates tend to undervalue the potential for demand management to lower investment costs. Because they often advocate increased public spending

from general tax revenues, they tend to be biased (at least implicitly) against the idea that user funding (through various types of fees, such as fuel taxes, tolls, and utility rates) should play a larger role. Yet for most sectors (with exceptions such as public K–12 education, which is taxpayer funded on equity grounds), user fees are

<sup>6</sup> See also Congressional Budget Office (2008), which provides some estimates of economically justifiable investments in the transportation sector, and raises questions about the economic justification of additional public investments in many other infrastructure areas.

the most appropriate way to pay for infrastructure, because they provide a built-in mechanism to manage demand.

Although the debates on how much new infrastructure investment the nation needs are unlikely to be resolved any time soon, there is a growing consensus that funding systems in some key sectors are inadequate. In particular, the longstanding user fee-based system for road and transit funding—founded on per gallon federal and state fuel taxes—has been in decline, as inflation and fuel efficiency gains have eroded real revenues relative to system usage (Wachs, 2003a; Puentes and Prince, 2003). But raising fuel taxes is politically difficult. Federal fuel taxes have not been increased since 1993, a pattern mirrored in large states such as California, where the last increase occurred in 1994.

As a result, the federal highway trust fund—which covers federal contributions to highways and mass transit—has been at risk of depletion because revenues have not been increasing in line with outlays authorized under the last two transportation spending acts (Committee for the Study of the Long-Term Viability of Fuel Taxes for Transportation Finance, 2006; Congressional Budget Office, 2008; National Surface Transportation Infrastructure Finance Commission, 2009). Declining contributions of state fuel taxes have prompted a rise in the use of general local sales tax increments for transportation spending, which does not send the same price signal to road users (Wachs, 2003b). In California, where Governor Schwarzenegger has made infrastructure revitalization a central element of his administration's policy platform, the solution has also included major increases in general obligation bond funding for

transportation, water, and flood management—all sectors where user fees would be more appropriate (Hanak, 2009). Finding ways to revitalize the user-fee based system for infrastructure will be the key to long-term sustainable infrastructure finance.

### THE ROLE OF THE STIMULUS PACKAGE

Of course, the justification for federal spending on infrastructure in the context of a deep economic recession is somewhat different. Infrastructure has been featured as a major source of job creation by the Administration and other proponents of the stimulus package.<sup>7</sup> Overall, the \$143 billion of infrastructure spending amounts to roughly six months of public capital outlays, and twice annual federal outlays (Table 2). Spending is earmarked for a wide range of sectors, ranging from traditional areas of federal capital investment such as transportation and water resources, to areas which have typically received less federal funding, such as energy, telecommunications, social and health facilities, and schools. In addition, the stimulus bill provides for roughly \$9 billion in tax credits to facilitate municipal bond issuance and \$20 billion in renewable energy tax credits, which will largely benefit private sector investors and households.

Allocation of the funds is occurring through several mechanisms. Some monies are being distributed to states based on established formulas (e.g., highways, mass transit, and drinking and wastewater facilities), with the states then responsible for reallocating to local entities. In other cases, federal agencies are determining how to allocate

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<sup>7</sup> The non-partisan Congressional Budget Office (2009) assumes that this spending will not crowd out private investment, and estimates that it has a GDP multiplier of 2.5. For a skeptical view on job creation from public works investments, see Utt (2009).

**TABLE 2**  
 STIMULUS CONSTRUCTION FUNDS AND 2004 PUBLIC CAPITAL OUTLAYS  
 (Billions of 2008/2009 dollars)

	2004 Capital Outlays		2009 Stimulus
	Public	Federal	
Transportation	120.6	55.2	49.3
Water, pollution, natural resources	51.7	13.0	23.4
Energy	11.6	2.1	22.6
Other public facilities	4.7	1.5	16.4
Social & health facilities	n.a.	n.a.	15.7
Schools	93.7	0.5	8.8
Telecommunications	4.8	4.8	7.2
<b>Total</b>	<b>287.1</b>	<b>77.0</b>	<b>143.4</b>

Notes: Table 1 likely undercounts spending on other public facilities (e.g., federal buildings); 2004 columns include postal service and prisons only.

Social and health facilities include roughly \$8 billion for housing.

Sources: Table 1 (2004 capital outlays in 2008 dollars) and Associated General Contractors of America (stimulus construction spending, 2009 dollars) [http://www.agc.org/cs/the\\_stimulus\\_where\\_the\\_opportunities\\_are](http://www.agc.org/cs/the_stimulus_where_the_opportunities_are)

funds to state and local projects based on their own assessments of priorities and shovel-readiness (e.g., the U.S. Bureau of Reclamation for water infrastructure in the western United States). Finally, state and local entities must officially compete for some resources based on merit. For example, this is the case for some of the energy funds.

To maximize the stimulative effect of the investments, the emphasis has been on projects that are “shovel ready,” which in practice means ready to go out for design and construction bids by September 2010 or sooner.<sup>8</sup> The actual spending path is likely to stretch out somewhat into the coming decade, given the time it takes to execute construction projects (Figure 2).

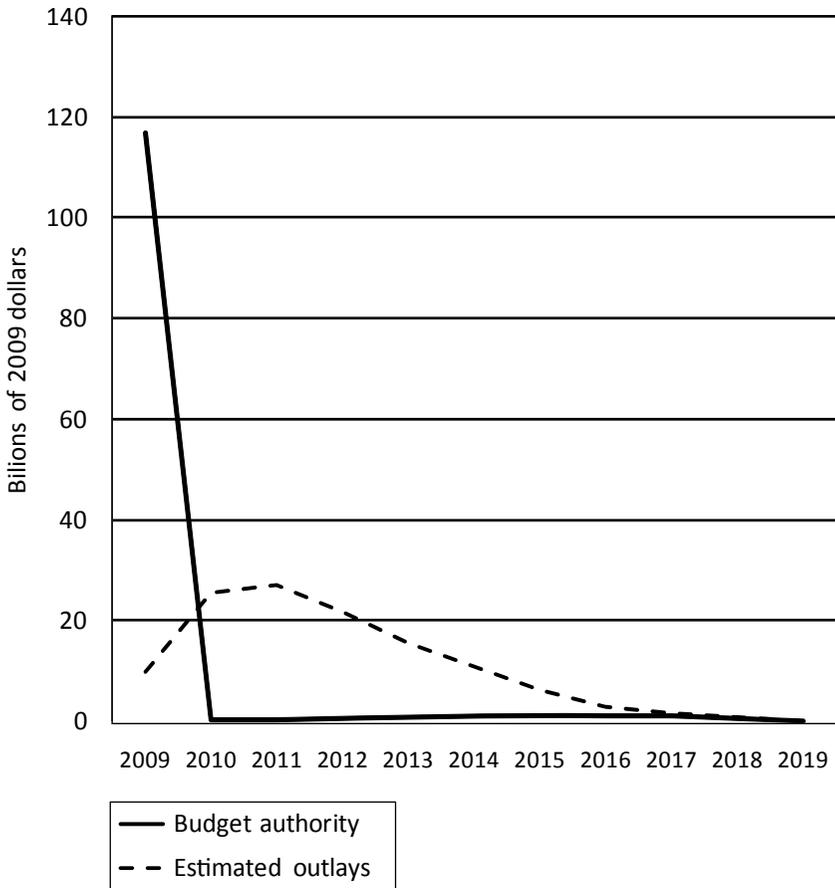
The emphasis on rapid approval of projects has meant that states have had to scramble to identify good candidates. This task has been complicated by the requirement that the stimulus funds not be used as a substitute for funds already allocated to specific projects. The need for speed plus the non-replacement requirement has been particularly constraining in the transportation sector. Because transporta-

tion planners do not generally do detailed environmental reviews before funding is available, there are few unfunded “shovel-ready” projects on the shelf. For projects further out in the planning pipeline, the long lead times for environmental reviews make them poor candidates for shovel-readiness. As a result, for much of the highway and road spending (\$27.5 billion is earmarked under ARRA), we should expect to see basic repaving projects, rather than game-changing investments. As one San Francisco Bay Area transportation official noted, this is a far cry from the public works projects in the 1930s, which produced such iconic structures as the Golden Gate Bridge.

Thus, for the traditional areas of publicly funded infrastructure—including water and wastewater treatment, flood control, and schools, in addition to transportation—the stimulus provides a welcome boost to business-as-usual spending, allowing for more rapid spending on projects already in the pipeline. Because state and local budgets have been hard hit by the recession, the federal funds are likely to provide a certain amount

<sup>8</sup> The Associated General Contractors of America’s website has detailed information on distribution mechanisms and deadlines for the different spending categories, at <http://www.agc.org/stimulus>.

Figure 2. Projected Spending Path for Key Infrastructure Areas under ARRA



Notes: Figure shows budget authority and estimated outlays of the American Recovery and Reinvestment Act of 2009 for Titles IV (energy and water), VII (water and environment) and XII (transportation and housing). Source: Congressional Budget Office, 2009, Table 2.

of replacement spending, despite the attempts of the legislation to avoid this.<sup>9</sup>

There are, however, several areas where the stimulus funds do have game-changing potential. The first is energy, where a combination of public spending and tax

credits creates substantial new resources for public and private investments in renewable energy sources and transmission, energy efficiency in buildings, grid modernization, and alternative fuel vehicles. These funds position the federal

<sup>9</sup> Federal authorities have shown some flexibility on this point for California transportation spending. Projects already launched with state bond monies risked being cut off when the state’s budget woes caused it to stop issuing bonds in December 2008. The state is using stimulus funds to continue some of these projects, and it will use future bond sale receipts to pay for stimulus-funded projects.

government to launch programs in line with the more activist approach to greenhouse gas emission reductions sought by the new administration. To give a sense of the change in scale, the California Energy Commission, which administers the state's energy program, expects to get \$226 million in funds from the stimulus package, whereas federal allocations in the recent past have been in the range of \$1–3 million per year. Although some of the energy-related spending is dedicated to research and development, numerous investments related to renewable sources, the grid, and energy efficiency can be rolled out fairly quickly. Another potential game-changer is broadband technology, where an unprecedented amount of funds (\$7.2 billion) is being made available to expand access in underserved areas and to underserved populations.

Finally, there has been much talk and media focus on the \$8 billion earmarked for high-speed rail projects (Gertner, 2009). President Obama has announced that he intends that the federal government "jumpstart" this technology in the United States with the stimulus funds and with an additional \$1 billion per year in regular budgetary appropriations over the next five years (Knowlton, 2009). Although new federal spending in this area is certainly welcome to the states and agencies that are in the planning stages for high-speed rail, it is important to recognize its relative scale. In contrast to energy or broadband spending, the high-speed rail funds are not sufficient to enable any significant investments on their own. As an example, California's planned rail project, which is the furthest along, has an estimated price tag of over \$40 billion.

#### LONGER-TERM FUNDING ISSUES

For all its short-term benefits, the spotlight on infrastructure occasioned by the stimulus package has also raised some apprehension among infrastructure

providers, who worry that it may result in lower subsequent regular appropriations. This may be a valid concern, if Congress and the public have the impression that the current effort provides a bigger boost than it actually does. For transportation agencies, a particular concern relates to the reauthorization of multi-year transportation spending legislation. The current six-year law is due to expire at the end of September 2009, and it is likely to take additional time before new legislation is completed.

The last two transportation spending acts took steps in the direction of infrastructure finance reform, by making it easier for federally-supported projects to introduce toll-based revenues and by facilitating public-private partnerships and the use of "design-build" contracting methods, which can save time and cut costs by consolidating bids for design and construction (Hanak and Rueben, 2006). As noted above, however, spending availability has been threatened by a shortage of fuel tax revenues for the highway trust fund, and this promises to be a worsening problem without changes in the revenue stream.

In the short-term, transportation analysts generally agree that it is necessary to increase the level of fuel taxes to provide an adequate funding stream for federal and most state transportation programs. But there is also recognition that over the longer term, it makes better sense to replace fuel taxes with tolls, or mileage fees, as a source of transportation finance. Fuel taxes have always been a second-best solution, relative to mileage-based charges; they were introduced in the 1920s when the transaction costs associated with tolling were too high to make it practical except in limited cases. With the rise in fuel economy (and eventually, a shift away from fossil-fuel-based locomotion), this revenue stream will continue to diminish without regular increases in rates.

Meanwhile, recent innovations in electronic toll collection (ETC) technology

make it possible to apply mileage-based charges on a system-wide basis. This technology—increasingly used for collection at bridges, tunnels and toll roads—could be used comprehensively to charge drivers for miles traveled, thereby replacing fuel taxes. It can actually improve upon fuel taxes, because fees can be varied according to the types of road and the level of congestion, two factors that affect the costs of road use. ETC makes system-wide mileage-based fees possible, because it is both less costly and less cumbersome than traditional toll booths. The system relies on a global positioning system (GPS) receiver, which uses satellite signals to determine location. An onboard set of digital maps, an odometer feed, a rate table for computing distance charges, and some form of wireless communication technology are used to calculate and report billing data.

The potential advantages of this type of transportation funding system are considerable—it can align user incentives with investments, enhancing both efficiency (by encouraging reduced road use) and equity (especially compared with revenue sources like sales taxes). Relative to the fuel tax, it can also better align the incentives of transportation agencies (who require stable funds to provide new roads and maintain existing ones) with the environmental goals of reducing fossil fuel use (Wachs and Taylor, 2005).

This method is gaining considerable ground outside of the United States (especially in Europe), with the only U.S. pilot ETC project in the state of Oregon.<sup>10</sup> Given the central role of federal funding for transportation projects, federal leadership is required to shepherd in this new

system. In February, 2009, a commission formed under the current transportation spending act to address transportation finance issues made this transition a cornerstone of its recommendations for reform (National Surface Transportation Infrastructure Finance Commission, 2009). It argued for the aggressive use of pilot projects with mileage-based fees under the next transportation spending act, to prepare for an overall phase-in by 2020. It also argued for an increase in the gas tax of \$0.10 per gallon, an increase in the diesel tax of \$0.15 per gallon, and commensurate increases in special fuel taxes as interim measures.

These recommendations did not initially fall on receptive ears in the new Administration.<sup>11</sup> Gas tax increases are never popular, and less so in a flailing economy. There is little doubt that the more dramatic changes associated with the introduction of mileage-based fees will require strong powers of persuasion. But evidence emerging from California's more limited attempts to introduce ETC-based congestion pricing on new toll roads suggests that a resistant public can be won over once it sees the benefits in terms of greater options for mobility (Hanak and Rueben, 2006). In a state where road tolling was once a political non-starter, financially strapped regional transportation agencies are now moving aggressively to develop high-occupancy toll (HOT) or "express" lanes.<sup>12</sup>

Looking beyond the horizon of the federal stimulus, the likelihood of longer-term federal and state fiscal constraints may have a silver lining if it can encourage the return to more solid foundations for infrastructure funding in sectors in which

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<sup>10</sup> See Sorensen and Taylor (2005a, 2005b) for a comprehensive review.

<sup>11</sup> Following an endorsement of the idea of a mileage tax from Secretary of Transportation Ray LaHood, a White House spokesperson announced that this new type of tax "... is not and will not be the policy of the Obama administration" Galbraith (2009).

<sup>12</sup> For instance, the San Francisco Bay Area's Metropolitan Transportation Commission (2009) recently released plans to convert and develop 800 miles of HOT lanes as part of its new long-term plan.

user fees are the most appropriate source of revenues.

### Acknowledgements

The author thanks Sarah Swanbeck and Davin Reed for helpful research assistance in support of this work, the participants of the National Tax Association Spring Symposium, May 21–22, 2009, Washington, D.C., for helpful discussions, and the William and Flora Hewlett Foundation for financial support for PPIC's infrastructure finance research. Views expressed do not necessarily reflect the views of the staff, officers, or the Board of Directors of the Public Policy Institute of California.

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