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# Funding Innovations for California Infrastructure: Promises and Pitfalls<sup>1</sup>

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## *Abstract*

Sustained, rapid population growth and a variety of fiscal constraints have challenged the ability of California's state and local governments to provide and maintain adequate levels of civil infrastructure. The Governor has proposed a ten-year program to revitalize the state's infrastructure. We examine the current state of infrastructure spending and the extent to which new public and private sources can be mobilized to build for the future. With a focus on two main areas of public infrastructure needs – transportation and water resources – we point out the pitfalls of relying too heavily on additional bond financing or general-source revenues and focus on the potential for strategies that align the benefits of new infrastructure with the costs of provision. By aligning costs and benefits, California can help satisfy its current and future infrastructure needs while protecting the ability of future generations to make their own spending choices.

## **1. Introduction**

In his January 2006 State of the State address, California's Governor Schwarzenegger unveiled an ambitious ten-year plan to rebuild the state's infrastructure (Schwarzenegger, 2006). In doing so, he evoked the legacy of his predecessors from the 1950s and 1960s, who oversaw a major public investment program in roads, schools, and water supply to accommodate the post-war population boom.

The infrastructure challenges facing California today rival those of that earlier period, often considered a “golden era” of public investment. Although the population growth rate has slowed, the absolute increases are still substantial – on the order of

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400,000 to 500,000 new residents per year – and this pace is expected to persist well into this century (Johnson, 2005). Meanwhile, it has become more difficult to build, as Californians have become more ambivalent about the consequences of growth on the environment and the quality of life (Barbour and Lewis, 2005). They have also become more reluctant to tax themselves for public works. In the years since the 1978 passage of Proposition 13, California’s legendary property tax revolt, the state’s voters have passed additional restrictions on local taxing and fee-raising authority, making California arguably one of the most difficult places in the nation for increasing local public revenues.

The public’s reluctance to raise taxes is a consistent message emerging from opinion polls,<sup>4</sup> and it is a message that the state’s elected officials have chosen to heed. State infrastructure investments in the late 1990s and early 2000s were largely funded by floating general obligation (GO) bonds (de Alth and Rueben, 2005). Governor Schwarzenegger came into office in late 2003 on a “no new taxes” platform, and his infrastructure plan maintains that promise (Office of the Governor, 2006). The plan relies instead on various forms of debt financing, earmarking of existing revenues, and increased federal contributions. It does call for new user fees, some of which would back new private equity investments in transportation. It also aims to save costs through reforms in transportation project management and contracting.

Many of these proposals are drawn from the toolkit of “innovative financing” that has been gaining popularity with governments nationwide as they aim to stretch the infrastructure dollar. Particularly in the transportation sector, there has been growing interest in the potential for public-private partnerships, new types of user fees, and new debt-financing instruments to enable faster completion of projects, increase cost-effectiveness, and mobilize new capital resources.<sup>5</sup> Such innovations often require changes in legislation and in the way public agencies oversee or operate projects. The successful introduction of new user fees, which can help manage demand growth while generating revenues, can also require changes in public perceptions.

In this paper, we examine the potential for funding innovations to enhance California’s ability to meet its civil infrastructure needs. We compare elements of the “innovative finance” toolkit with some of the more traditional taxing instruments available to state and local governments, and we examine the trade-offs between bond and pay-as-you-go financing. This broad perspective is important, because ultimately, all civil infrastructure must be paid for by user fees or taxes. Although various debt-financing tools make it possible to augment today’s investment resources, they place a claim on future revenue streams, thereby reducing funds available for future investments as well as future current expenditures.

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<sup>4</sup> Surveys show the public equally divided between increasing taxes to provide more government services and decreasing spending. This impasse has contributed to the state’s fiscal troubles and structural deficit in the aftermath of the bursting of the stock-market bubble. The only taxes for which there is broad public support are “vice” taxes (cigarettes and alcohol) and taxes for the wealthy. See Baldassare, 2004a, 2004b, 2005, and 2006.

<sup>5</sup> See, for instance, Congressional Budget Office, 1998; U.S. Department of Transportation, 2004; General Accounting Office, 2004.

The analysis focuses on two sectors that have been singled out as particularly suited to innovation – transportation and water. In both cases, user fees have historically been an important source of revenue, in contrast to sectors funded primarily by general taxes, such as public education. Both sectors also present opportunities for increased private sector participation in operations, management, and investment. And both face funding challenges. For transportation, a central issue has been the erosion of the primary user-fee based revenue source – per gallon fuel taxes – through inflation and improved fuel efficiency. For water, the core challenge is to develop appropriate mechanisms to fund programs outside of the traditional purview of utilities, such as flood control and environmental mitigation.

The paper is organized as follows. Section two provides some background on infrastructure financing in California, including spending patterns and sources and the nature of existing funding constraints, both overall and for the two sectors of interest. Sections three and four assess the experience to date with funding innovations in transportation and water, respectively, and highlight the opportunities and potential drawbacks of new approaches. A concluding section summarizes the main findings.

## **2. Infrastructure Financing in California: Spending, Needs, and Constraints**

In 2002, California spent \$931 on infrastructure per capita, about the same level as the rest of the country.<sup>6</sup> This figure reflects a recent increase in capital expenditures, which are now comparable to the levels of the 1950s and 1960s. California invests relatively more than the national average in water supply, natural resources, and community development projects and relatively less in highways and roads. Since the late 1970s, California has also been spending substantially less on education facilities, but from 1997 to 2002, this spending rose by 70 percent in real per capita terms.

### **The Local Role**

California's local governments face a number of revenue-raising constraints. Proposition 13, passed in 1978, capped property tax increases at 2 percent per annum for existing homeowners, limited assessments to one percent of assessed value and authorized reassessments only upon resale. It also mandated supermajority (two-thirds) voter approval for the passage of special taxes. In 1986, state voters passed Proposition 62, a statutory law that mandated that a majority of voters within a locality approve any new general local taxes. In 1996, the courts declared Proposition 62 constitutional and applicable to all (charter and non-charter<sup>7</sup>) localities. In that same year, voters passed Proposition 218, a constitutional amendment that mandated majority votes for general

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<sup>6</sup> Much of the information covered in this section is from work undertaken as part of the Public Policy Institute of California's *California 2025* project and can be found in de Alth and Rueben, 2005 and Hanak and Barbour, 2005.

<sup>7</sup> As compared with "general law" jurisdictions, charter cities and counties have a charter that lays out the rules governing that area. The charter acts almost like a constitution for the local government adopting it. It can only be adopted, amended or repealed by a local majority vote. One advantage of a charter is that it allows a local government to tailor its organization and elective offices, taking into account unique local conditions and needs. Another advantage is that the charter transfers the power to adopt legislation affecting municipal affairs from the state legislature to the local government.

taxes and extended Proposition 13's supermajority requirement to local assessments and non-specific fees.<sup>8</sup> California is also one of only eight states with supermajority voter requirements on the passage of local bonds.<sup>9</sup>

Judging by the recent experience with local school bonds, these supermajority hurdles appear to be a significant constraint. After the supermajority threshold on local school bonds was lowered to 55 percent in November 2000, there was a substantial increase in local capital support to K-12 and community college facilities. Between 2001 and 2004, nearly half of the \$20 billion raised for K-12 was passed with margins below the two-thirds threshold, as was over three-quarters of the \$9.1 billion for community colleges.

### **The State Role**

On a real per capita basis, state spending on infrastructure is also roughly the same in recent years as it was during the "golden era" of the 1950's and 60's, accounting for about 30 percent of the total (in 2003 dollars, \$307 in 1965-66 versus \$299 in 2002-03).<sup>10</sup> However, the state's spending priorities and revenue sources have shifted, creating pressures on civil infrastructure. In the mid-1960s, transportation accounted for a little over half of total capital expenditures (52%); resources (mainly water) was the next largest slice (24%); and spending on higher education and K-12 facilities constituted only 9 percent each. In the more recent period, spending on K-12 facilities shot up to 69 percent of the total – reflecting not only the recent increase in education spending, but also a longer term shift in state and local responsibilities in this sector after Proposition 13. Transportation spending, meanwhile, dropped to 22 percent, resources to 5 percent and higher education to just 4 percent of state capital expenditures.<sup>11</sup>

The drop in state transportation spending reflects substantial declines in two "pay-as-you-go" funding sources – the state highway account (funded by gas and weight fees) and federal highway trust fund transfers (which declined during the 1970s, with the end of the freeway expansion era). Since the mid-1960s, the state has allocated very little general fund revenue to infrastructure projects. Instead, state capital projects are now largely financed with bonds.

Whereas local GO bonds are tied to specific new revenue streams (for instance, new parcel taxes or property tax rate increases), state GO bonds are repaid with general fund revenues. State GO bonds are relatively easy to pass, requiring only a simple majority approval by the state's voters. Unlike local bonds, moreover, ballot materials

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<sup>8</sup> An alternative is passage by a simple majority of property owners. For more information on local vote requirements and the effect on local budgets see Rueben and Cerdán, 2003.

<sup>9</sup> Missouri and North Dakota also require a two-thirds majority to pass local debt, and Idaho, Iowa, Oklahoma, Washington and West Virginia require a three-fifths vote.

<sup>10</sup> For more information on the level and composition of state infrastructure spending from state general and special funds see de Alth and Rueben, 2005, Appendix Table A4.

<sup>11</sup> We have included state funds for K-12 capital expenditures in our state capital spending estimates because there is explicit budget information on K-12 transfers for capital vs. current outlays. To the extent that state transfers to other local governments go for capital expenditures, we may be understating the state's role in these areas.

for state GO bonds do not include any explicit revenue source.<sup>12</sup> These factors help explain the fact that by 2002-2003, bond funds made up over three-quarters of state capital outlay sources, up from 42 percent in the mid-1960s. A majority of the recent GO bonds were used to finance school facilities (\$25.4 billion between 2000 and 2004, of which \$4 billion went to higher education), with others going toward natural resources (\$5.7 billion for water quality and supply and \$2.3 billion for parks and open space) and affordable housing (\$2.1 billion). Compared to local bonds, state bonds are relatively easy to pass, requiring a simple majority approval by the state's voters.

Over the next several years, the state's ability to issue large additional volumes of GO bonds has been severely curtailed by its debt service ratio, projected to exceed 6 percent between 2007 and 2011.<sup>13</sup> The high debt service level is partly a result of the substantial GO bond activity for infrastructure noted above. But it also reflects the recent state budget crisis. The state refinanced much of its outstanding debt to avoid current payment obligations, and in 2004 voters authorized \$15 billion for Economic Recovery Bonds to pay off short-term debt to balance the state budget.

Although there is no absolute standard for what constitutes "too much" state debt, a 6 percent ratio is a commonly used warning post.<sup>14</sup> High debt ratios can lower a government's bond ratings, leading to higher cost of capital. High debt financing obligations also encumber state revenues, forcing society to make trade-offs with other spending priorities. These factors need to be borne in mind when considering the state's capacity to float the new GO bonds proposed under the Governor's Strategic Growth Plan. Of the \$68 billion proposed over the 10-year program, the \$25 billion slated to appear on the ballot in 2006 would in all likelihood push the overall debt ratio well above 6 percent.<sup>15</sup> One legislative counterproposal would have lowered the 10-year total to \$49 billion but frontloaded it – with \$40 billion on the ballot in the first year – putting even greater pressure on the general fund in the short term (Furillo, 2006).

The recent experience in education facilities finance also gives ground for caution. The boom in school construction projects, made possible by massive increases in state and local bond issues, has contributed to rapid cost inflation, given the limited supply of contractors with the requisite skills (de Alth and Rueben, 2005). As a result, many school districts find themselves facing much higher bills than anticipated. This problem is a consequence of the boom and bust spending cycles commonly associated with bond funding. Alternative funding mechanisms, such as the annual per pupil

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<sup>12</sup> Local bond ballot materials include an estimate of how much property taxes are expected to increase over the bond's duration or include a new parcel tax assessment. In contrast, most state bonds are paid for out of future general fund revenues and do not include any explicit revenue source.

<sup>13</sup> The debt service ratio is the ratio of anticipated debt payments to general fund revenues for a given year. We are basing our discussion on February 2006 estimates provided by the Legislative Analyst's Office.

<sup>14</sup> For a general discussion, see Legislative Analyst's Office, 2006c. California's ability to pay back existing debt could be higher, given higher income levels and the economic health of the state. However, political considerations, including earmarking of general funds revenues and supermajority requirements to raise new taxes, can limit the states ability to take advantage of this capacity.

<sup>15</sup> The Governor's plan actually calls for a debt cap at 6 percent, but it projects a lower debt ratio, and it does not include the Economic Recovery Bond debt in the calculations (Office of the Governor, 2006). Technically, the Economic Recovery Bonds are backed by sales tax revenues that would otherwise be part of the general fund.

allocation for facilities proposed by the Legislative Analyst (2001), could provide a more predictable revenue stream.

### **Transportation: The Broken Wheel?**

Among major infrastructure sectors in California, transportation has the least functional financing system.<sup>16</sup> Historically, the primary funding source, introduced in the 1920s, has been a per gallon gas tax – a simple type of user fee that charges vehicles in rough proportionality to their road use. Since 1994, California’s state gas tax has stood at \$0.18 per gallon, slightly below the national average.<sup>17</sup> Although fuel taxes continue to fund a large share of transportation spending in California and elsewhere in the nation, they have declined considerably in importance since the 1960s as a result of inflation and gains in fuel efficiency (Wachs, 2003a; Puentes and Prince, 2003). In real terms, the California fuel tax per vehicle mile traveled today costs approximately one third of what drivers paid in 1970. Raising the gas tax is politically unpalatable; during the recent spike in fuel prices, some state legislators actually suggested removing it to provide motorists with relief.<sup>18</sup>

The gap has been filled with a variety of other taxes and fees (Wachs, 2003b). Local transportation agencies in California have relied heavily on the introduction of optional sales taxes ranging from 1/4 to 1 percent. These taxes are levied in 20 so-called “self-help” counties. They generate roughly as much revenue as the state gasoline excise tax – about \$2.5 billion per year (Crabbe et al., 2005). Some counties have also introduced transportation developer fees for new homes, either to fund specific projects or to generate local matches for general county programs.<sup>19</sup>

Meanwhile, the state has turned to ballot initiatives to draw on general fund revenues. In 1990 and 1996, voters approved GO bonds for rail transit (\$3 billion) and seismic upgrades of bridges and highways (\$2 billion). In 2002, they approved Proposition 42, which earmarks 80 percent of the 6 percent general sales tax on gas to be spent on transportation. (That revenue, previously allocated to the general fund, was expected to raise about \$1.2 billion per year). Over the past few years, most Proposition 42 revenues were borrowed to help close the state’s budget gap; the Governor’s plan proposes a constitutional amendment to eliminate this possibility in the future.

Relative to the gas tax, these new sources all have drawbacks because they do not create incentives to economize on transportation infrastructure. Only the developer fees are even remotely linked to use of the transportation system, and even they do not create ongoing user incentives to manage demand. Moreover, measures such as Proposition 42, which simply earmark existing general fund revenues for transportation, take funds away

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<sup>16</sup> Unless otherwise noted, information presented in this section draws from de Alth and Rueben, 2005 and Hanak and Barbour, 2005.

<sup>17</sup> The average total gasoline tax for the 50 states is \$0.21 (Hoo and Rueben, 2005).

<sup>18</sup> Assembly Speaker Fabian Nuñez put forth a proposal in April 2005 to eliminate the state gasoline tax (<http://www.samtrans.org/bodminutes050413.html>).

<sup>19</sup> Contra Costa, Riverside, San Bernardino, and Santa Clara all have general-purpose transportation developer fees. Orange County has used them to help finance specific toll road projects. According to data from the State Controller’s Office, these fees raised roughly \$40 million in 2002 and 2003.

from other public programs.<sup>20</sup> County sales taxes are particularly regressive, and the political process for gaining their passage limits flexibility in the use of funding and results in project mixes that are often not the most cost-effective (Taylor, et al., 2001; Wachs, 2003b). Since 1996, these sales taxes have also become more difficult to pass.<sup>21</sup>

On a real per capita basis, California spent as much on transportation in the 1990s as it did in the mid-1960s (roughly \$375 for combined capital and current expenditures).<sup>22</sup> Transportation spending actually increased significantly by the early 2000s, reaching \$525 per person in 2002. However, the composition of spending has shifted significantly, with considerable sums now going to transit (now over one-third of total transportation spending, versus 10 to 20 % in the 1960s), and significantly smaller shares for capital investments (now less than 40 %, versus more than 70 % in the 1960s).

These shifts in composition may help explain the widely held view that California is not spending enough on transportation. The costs of building new lane miles have risen much faster than inflation, and road maintenance needs have increased with the age of the freeway system (Hanak and Barbour, 2005). Both factors have contributed to a relatively slow pace of highway construction since the mid-1970s, in the face of rapidly growing vehicle use. Meanwhile, transit investments in most urban areas have not yet been matched by significant shifts in ridership. The net result has been increasing congestion on roadways. Rapid increases in goods traffic compound this problem in some Southern California corridors (Haveman and Hummels, 2004).

This state of affairs implies several challenges for transportation finance: (i) raising funds more closely tied to user incentives, to help encourage more efficient use of transportation facilities; (ii) improving the effectiveness of transportation spending; and (iii) finding ways to increase total revenues.

### **Water Management: Let It (Over)flow?**

In contrast to transportation, where state and local agencies share responsibility for an integrated network, many water-related services are primarily the responsibility of distinct local entities, with different degrees of state and federal involvement. Local water utilities secure supplies for their customers and build and operate distribution networks and treatment facilities. Wastewater utilities operate similar networks for the safe disposal of sewage. Flood control and reclamation districts maintain levees and invest in other flood management activities. A growing number of municipal governments are responsible for controlling polluted run-off. The financing challenges vary considerably across these activities, depending on the mechanisms available to local entities and the expectations regarding the state and federal role.

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<sup>20</sup> Although one might argue that the sales tax on gasoline tapped by Proposition 42 does affect user incentives, it is important to recognize that this is simply a general state sales tax applied to most goods and services.

<sup>21</sup> In 1996, with the passage of Proposition 218 and the court decisions upholding Proposition 62, sales tax increases imposed for a specific purpose (such as transportation facilities), or by a single-purpose authority (such as a county transportation authority) were determined to be special taxes requiring approval by two-thirds of the electorate. See <http://ceres.ca.gov/planning/financing/chap1.html> under "County Sales Tax Legislation".

<sup>22</sup> Data in this paragraph are from the Census of Governments, as reported in de Alth and Rueben, 2005, Appendix Table A.1.



The situation is healthiest for the two biggest ticket items – investments by water and wastewater utilities. In the late 1990s and early 2000s, their combined capital spending was in the range of \$4 to \$5 billion annually, at the high end of estimated needs.<sup>23</sup> The vast majority of these funds were generated through user fees – monthly bills and connection fees for new homes. Raising utility fees is generally a straightforward process, requiring approval by elected or appointed boards. Moreover, because current fee levels are not especially high as a share of income, there is ample scope for increases to meet new regulatory standards and increasing costs of new water supplies. On average, water and wastewater bills in 2002-03 accounted for 0.8 percent and 0.5 percent of median household incomes, and fewer than ten percent of all communities had combined rates exceeding 2 percent. (The U.S. Environmental Protection Agency considers rates of 4 percent or less to be affordable.)

The picture is quite different for local flood control and run-off programs, charges for which have been interpreted to fall under Proposition 218's strict voter approval requirements (Department of Water Resources, 2005a). No good statewide estimates are available for the costs of run-off management, but there is little doubt that new regulatory programs are straining the coffers of municipal governments. Without new revenue sources, cities will either need to cut back on existing services or fall into noncompliance due to a lack of funds.<sup>24</sup> Although Los Angeles County successfully passed a \$500 million storm water bond in late 2004 by popular vote, meeting the high public approval hurdle is not a foregone conclusion in other locations.

For flood control, in which state and federal authorities share responsibilities with local entities, there has been a growing recognition that the current programs are woefully inadequate. Total state and local capital spending in recent years has been in the range of \$40 to \$55 million.<sup>25</sup> In January 2005, a preliminary assessment by the Department of Water Resources (2005a) put investment needs at three to four times that amount. The Governor's Strategic Growth Plan, coming in the wake of Hurricane Katrina flooding, ups the ante considerably, calling for \$6 billion in spending over ten years, with half provided by the federal government, 42 percent by the state, and 8 percent by local agencies. The administration subsequently argued that the state should cover the entire program and seek federal reimbursement subsequently. Part of the justification for substantial state involvement is to maintain the levee system within the Sacramento-San Joaquin Delta, which is the conduit for freshwater exports to Southern California.

Another area with expectations of large state and federal contributions is ecosystem restoration – notably in the Delta and the wider estuary system encompassing the San Pedro and San Francisco Bays. Since 2000, over \$1 billion in state bond funds have been made available for such activities under CALFED, a joint federal-state program with environmental and water supply reliability objectives (California Bay Delta Authority, 2005). Meanwhile, relatively few funds were provided by either federal or local sources. Since 2005, the CALFED program has faced a crisis of confidence both in its ability to deliver on its objectives and in its financing plan (Little Hoover

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<sup>23</sup> Hanak and Barbour, 2005. These figures exclude capital spending by private water utilities, which serve roughly one-sixth of the state's population.

<sup>24</sup> See Hanak and Barbour, 2005 for some cost estimates.

<sup>25</sup> Data for the years 2001 to 2003, drawn from State Controller's Office Reports and Governor's Budgets.

Commission, 2005). Similar questions are looming for the proposed restoration of the Salton Sea in Southern California.

Finally, there have been calls for increased state spending on water supply projects.<sup>26</sup> Recent water bonds did provide some support to local water agencies for some types of supply increases – including conservation programs, recycling, desalination, and underground storage. However, many water agencies would like to see state investments in new surface reservoirs, both to augment supplies and increase reliability.

### **3. Financing Innovations in Transportation**

Given the funding constraints facing U.S. transportation agencies more generally, it is perhaps not surprising that some of the greatest push for innovation over the past decade has occurred in this sector. Many reforms have focused on the use of federal dollars, which remain a major component of state and local transportation budgets. Here we provide an overview of changes in federal legislation and assess how well California has fared in the adoption of some key innovations – toll roads and private equity investments, design-build contracting, and debt-financing. The section concludes with a discussion of a potential revenue source for the longer term, mileage-based fees.

#### **The Federal Role**

Financing innovations have been a major theme of federal transportation funding legislation since 1991, with the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA). The reforms have been of two broad types (Congressional Budget Office, 1998). The first is a set of cash flow tools to allow more flexibility in the timing of the use of federal funds. The second type of reform was designed to make more investment funds available through leveraging. Tools include “flexible match” (allowing public or private donations to meet state’s matching share), “toll investment credits” (allowing states to use anticipated toll revenues towards their matching share), “section 1012 loans” (allowing states to lend their federal aid funds to toll projects), “state infrastructure banks” (allowing states to use federal funds to establish revolving loan funds),<sup>27</sup> and more flexible rules regarding the use of federal aid to repay bond costs. By encouraging states to move from the traditional pay-as-you-go funding of transportation projects toward debt financing of projects capable of generating revenue streams, these tools opened up opportunities for more toll-based projects and for drawing in private investors.

Subsequent transportation legislation has continued in this tradition. In 1998, the Transportation Infrastructure Finance and Innovation Act (TIFIA) authorized the use of federal credit to leverage private co-investment in nationally or regionally significant projects.<sup>28</sup> The most recent transportation funding authorization, SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users), passed

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<sup>26</sup> See, for instance, Association of California Water Agencies, 2005.

<sup>27</sup> These banks were authorized under the National Highway System Act of 1995. See [http://www.innovativefinance.org/topics/finance\\_mechanisms/state\\_credit/statecredit.asp](http://www.innovativefinance.org/topics/finance_mechanisms/state_credit/statecredit.asp).

<sup>28</sup> See <http://tifia.fhwa.dot.gov>.

in the summer of 2005, expands opportunities to charge tolls on interstate highways and authorizes a large (\$15 billion) volume of tax-exempt private activity bonds to fund public-private partnerships (Legislative Analyst’s Office, 2006b; Hedlund and Smith, 2005). It also further relaxes the restrictions on the use of “design-build” contracting – a streamlined bidding process that can speed up implementation and lower costs.

Throughout this reform process, the Federal Highway Administration has served as a clearinghouse for information on funding innovations, including public-private partnerships and experiments in “value pricing” – a term encompassing various forms of mileage-based and congestion-based fees for use of transportation infrastructure.<sup>29</sup>

### **How Has California Done?**

California was an early leader in certain areas, with some of the country’s first modern toll roads involving private capital and some of the first high-occupancy toll (HOT) lanes and toll roads using congestion pricing. But California has been a laggard in others – notably in the use of design-build contracting and the revolving fund mechanism. And while other states – including Texas, Arizona, Florida, and South Carolina<sup>30</sup> – have continued to expand their efforts to mobilize private capital and introduce user fees to fund new highway capacity, California seems, at least until very recently, to have lost its momentum. Bills authorizing further toll roads and private equity participation stalled in last year’s legislative session, as did bills authorizing the use of design-build for transportation projects.<sup>31</sup> The Governor’s Strategic Growth Plan places considerable weight on moving forward in both areas; it envisages \$2 billion in private equity for toll lanes and HOT lanes, \$14 billion in private equity for goods movement and port mitigation, and \$0.9 billion dollars in cost savings from the use of design-build.

***Toll lanes and private equity participation.*** California’s experiments with toll lanes and the use of public-private partnerships for highway projects have had teething pains, but on balance they demonstrate the potential for this model to expand capacity while generating new funding sources. To date, all of the experiments in capacity expansion have occurred in Southern California. Several projects drew on private equity investments, while others relied on a combination of user fees and public funds. Projects include:

- a section of I-15 in San Diego (publicly funded HOT lanes in median strip with congestion pricing, fees used for road improvements), in operation since 1988, with a planned expansion of “managed lanes”;<sup>32</sup>

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<sup>29</sup> See <http://www.fhwa.dot.gov/innovativefinance/index.htm>; <http://www.fhwa.dot.gov/ppp/>; <http://www.fhwa.dot.gov/policy/vppp.htm>. See also [www.InnovativeFinance.org](http://www.InnovativeFinance.org), a website sponsored by the American Association of State Highway and Transportation Officials (AASHTO), with additional financial support provided by the Federal Highway Administration (FHWA).

<sup>30</sup> See U.S. Department of Transportation, 2004. Other sources describing state actions include General Accounting Office, 2004 and <http://www.fhwa.dot.gov/ppp/>.

<sup>31</sup> In the 2005 session, SB 371, SB 705, and AB 508 each proposed to authorize Caltrans to use design-build. AB 850 would have granted Caltrans the authority to conclude franchise agreements for toll roads and to build and operate its own HOV toll roads.

<sup>32</sup> The initial project was for a 2-lane, 8-mile stretch, at a cost of \$31.5 million. The toll revenue pays for operating costs, highway enforcement, and improvements in transit service along the I-15 corridor

- a section of SR-91 in Orange County (initial private funding and ownership, HOT lanes in median strip with congestion pricing), in operation since 1995;<sup>33</sup>
- three new toll roads in Orange County (San Joaquin Hills (1996), Foothill (first segment 1993, second segment 1999), and Eastern (1998)) – all managed by a Joint Powers Authority and partially funded by user fee-backed revenue bonds;<sup>34</sup>
- a new 11-mile toll road, SR-125, in San Diego County, due to open in 2006 (private equity funding of the toll road segment; local and federal funds for a freeway connector segment);<sup>35</sup>
- the Alameda Corridor, a grade-separated freight rail line to the Ports of Los Angeles and Long Beach (partial funding by user-fee backed revenue bonds), in operation since 2002.<sup>36</sup>
- In addition, seismic retrofitting of several Bay Area toll bridges has been partially funded by toll increases.

Only one of the new projects in which tolls were part of the funding package – the San Joaquin Hills toll road – has run into financial difficulties because of lower-than-anticipated traffic (Weikel, 2005). Although ridership has been strong on the other toll roads, SR 91 – initially privately-owned – faced a controversy over the terms of a non-compete clause with the Orange County Transportation Authority (OCTA).<sup>37</sup> Deeming the restrictions on other road construction to be onerous to its congestion relief program, OCTA purchased the road in 2003.<sup>38</sup>

The Alameda Corridor project was also controversial, as it occurred in the midst of rising public concerns over the environmental consequences of rapidly expanding port traffic. There has been some public debate over whether the project is being underutilized, but it has repaid state loans ahead of schedule.<sup>39</sup>

A more general source of debate – and a likely explanation for the legislature’s reluctance to authorize more toll road projects in recent years – has been the equity

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(<http://fastrak.sandag.org/fundrev.html>). The new “managed lanes” expansion would allow flexible use of HOT lanes in either direction, to adapt to rush hour flows.

<sup>33</sup> This 10-mile, four-lane stretch, at a cost of \$130 million, was privately funded (U.S. Department of Transportation, 2004).

<sup>34</sup> San Joaquin Hills: 15 miles, 6 lanes, \$1.1 billion; Foothill: 6.4 miles, 4 lanes, \$185 million; Eastern: 24 miles, four lanes, \$780 million (U.S. Department of Transportation, 2004 and ([http://www.thetollroads.com/home/about\\_news\\_common.htm](http://www.thetollroads.com/home/about_news_common.htm)) Cost for Foothill is approximate (total cost minus cost of Eastern).

<sup>35</sup> The project includes 9.5 miles operated as toll road, at a cost of \$642 million, and 1.5 miles of connector and interchange, at a cost of \$132 million, to be operated as a freeway (U.S. Department of Transportation, 2004 and <http://www.fhwa.dot.gov/ppp/sr125.htm>).

<sup>36</sup> This 20-mile stretch cost \$2.4 billion (U.S. Department of Transportation, 2004).

<sup>37</sup> U.S. Department of Transportation, 2004; Boarnet, DiMento, and Macey, 2002; Boarnet and DiMento, 2004.

<sup>38</sup> The County Transportation Authority paid \$207 million to purchase the lanes (Gordon et al., 2003).

<sup>39</sup> On May 6, 2004, the Alameda Corridor Transportation Authority paid off the balance of a U.S. Department of Transportation loan with interest 28 years early (Federal Highway Administration, 2004).

consequences of HOT lanes, which critics have dubbed “Lexus lanes.” However, surveys of actual toll roads suggest this may be less of a concern in practice. Ridership studies of SR-91 and I-15, for instance, found that a broad cross-section of the population uses the toll facilities.<sup>40</sup>

In our view, the overall message emerging from California’s experiments in this area is a positive one, albeit with caveats. If the project is to be paid for by a toll revenue stream, care must be taken to assess ridership potential. If it is not possible to develop terms for non-compete clauses that allow for other road improvements within a geographic area, private ownership may not be a politically viable option.<sup>41</sup> But in places where the expanded capacity provides options to drivers seeking congestion relief, they appear willing and able to pay the price. In this respect, California’s experience has been generally more positive than the experience in some other parts of the country, where toll roads have run into financial difficulties because of low ridership.<sup>42</sup> The extreme congestion on many highway passages in both Southern California and the Bay Area creates targeted opportunities for success.

These same conditions increase the likelihood that user-fee-backed investments in goods movement, such as dedicated goods lanes, can be financially viable in places like the congested Los Angeles-area shipping corridors. Such projects are likely to be extremely controversial unless they provide adequately for pollution mitigation, given the public concerns with pollution generated by the expansion of port activities and goods traffic (Schoch, 2005).

As the example of the Bay Area bridge toll increases demonstrates, tolls can also be used to help fund maintenance on existing capacity. Here, a toll system was already in place, and the program simply involved rate increases. Conversion of existing facilities to tolls may be more difficult politically. A federal pilot program introduced in 1998 authorized states to convert interstate highways to toll roads, but only one state (Virginia) had used the pilot authorization as of 2004 (General Accounting Office, 2004). Analysts from the Reason Foundation have suggested that there is considerable potential for simultaneously improving traffic flows and generating maintenance dollars in California by converting existing, underutilized HOV lanes to HOT lanes (Poole and Orski, 2003). Although this approach might be more contentious than introducing tolls on new capacity, it certainly merits investigation.

***Design-build.*** “Design-build” (DB) refers to a procurement process in which the public agency awards a single, fixed-fee contract for the majority of architectural and engineering services as well as construction of the project.<sup>43</sup> It represents a break with

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<sup>40</sup> For I-15, a study by SANDAG, the metropolitan transportation authority, found no significant differences in ethnicities or income levels among users (University of California Transportation Center, 2003). A study of SR-91 ridership found similar results (Sullivan, 1998).

<sup>41</sup> Indeed, drawing on the experience of the SR-91, possibly a “best-case” option for wholly-owned private franchising, Boarnet and DiMento, 2004 suggest that public-private partnerships are a more viable option than purely private projects.

<sup>42</sup> For instance, Virginia’s Dulles Greenway toll-road extension and Pocahontas Parkway and South Carolina’s Southern Connector (General Accounting Office, 2004; U.S. Department of Transportation, 2004). Performance of the Dulles Greenway extension apparently has improved more recently in response to housing growth in the area.

<sup>43</sup> See <http://www.fhwa.dot.gov/ppp/options.htm>, last consulted on Jan. 8, 2006.

the traditional “design-bid-build” (DBB) process, which separates the design and construction phases, and in which the design phase is sometimes conducted by in-house engineers. “Design-build-operate-maintain” (DBOM) is a variant involving further integration within a single contract; the contractor also undertakes to operate and maintain the facility once built. In both DB and DBOM, the public agency continues to finance and own the project. Variants also exist in which the project is financed and owned by the contracting firm for a specified period (e.g., “design-build-finance-operate” or DBFO). These latter forms fall more strictly into the realm of private-public partnerships.

In recent years, there has been considerable interest in the use of DB and DBOM-type contracts to speed up implementation and reduce costs of transportation projects. The basic idea is that DB can reduce miscommunication, encourage the design team to provide a plan tailored to the strengths of its construction team, and shift responsibility for many cost overruns from the public agency to the contractor, who may have a greater incentive to minimize them. Contracts including operation or maintenance functions also offer the prospect of lowering a project’s life-cycle costs.

As of late 2004, 28 states had authorized their Departments of Transportation to engage in design-build, at least on a pilot basis (U.S. Department of Transportation, 2004). California was not among them. The privately financed toll road projects noted above were able to use DB, and transit operators in the state have been authorized to do so since 2000.<sup>44</sup> However, bills authorizing state and regional transportation authorities to use this tool have been stalled in the legislature. The reticence stems not only from parties who might stand to lose from the switch (notably Caltrans engineers, represented by the Professional Engineers in California Government),<sup>45</sup> but also from neutral observers such as the Legislative Analyst’s Office (2005, 2006b), which has expressed concerns over public accountability in transportation projects using this bidding method.

The emerging evidence on design-build implementation suggests that although it provides clear advantages in terms of speeding up project delivery, it does not necessarily lower costs.<sup>46</sup> Drawing on a detailed review of experience in five states, Whittington (2005) argues that although California can benefit from the flexibility design-build affords, it should expect to make gains through a “long stretch of learning

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<sup>44</sup> The privately funded SR 91 and SR 125 both used design-build, as did the locally funded Eastern and San Joaquin Hills projects. Making use of a loophole in the law authorizing transit operators to use DB, the Orange County Transportation Authority (which is also a transit operator) also used this method to build SR-22. This loophole was closed with SB1130 in 2004.

<sup>45</sup> This group opposed DB legislation for transportation in 2005.

<sup>46</sup> In a report prepared for the California Design Build Coalition, Tom Warne and Associates, 2005 argue that DB projects cost only 4 percent more than the original bid amount, whereas DBB projects typically cost 5 to 10 percent more. However, a recent review by the US Department of Transportation, 2004 argues that cost comparisons are difficult across projects. Drawing on preliminary findings from an extensive literature review on DB projects, Whittington, 2005 argues that DB can shave roughly 30 percent off delivery schedules, enabling transportation authorities to temporarily augment their workforce with specialized personnel and more easily manage peak workloads. However, DB can also increase hourly costs of engineering and scope changes and precipitate substantial cost increases for unforeseen problems that the contractor finds unbearable, especially for large projects. Although DB may help access private investment (because investors prefer private engineers and constructors to bear schedule and cost risks), it may also limit the information available for environmental approvals.

by trial and error” and should seek productivity gains where they will be greatest, often in smaller projects. Steps to ensure accountability, performance incentives, and staffing continuity are among the measures to facilitate a successful transition.

Signs that California may be moving down the path of design-build in transportation are reflected in the recent passage of a bill authorizing its use for a specific carpool lane project in Southern California (Liu, 2006). The impetus was to speed up the implementation of this half-million-dollar project, so as not to lose earmarked federal matching funds. This time, the engineers’ union did not oppose the bill, which contains provisions requiring competitive bidding and various safety inspections and tests to be performed by Caltrans engineers. Passing more general authorizing legislation is a goal of the Governor’s Strategic Growth Plan. Such a step should help speed up project delivery, especially if it receives buy-in from Caltrans personnel. There are greater questions over whether the Plan’s anticipated cost savings from DB of nearly \$1 billion over ten years are realistic.

**Debt finance.** Many of the tools in the federal reform package encouraged more debt financing, both to leverage new funding sources and to get projects done quicker. California’s record has been mixed in the use of these instruments, but it is not clear that a state California’s size would always benefit from using them.

Debt financing is a natural method for projects backed by specific user fees, such as tolls, because the project cannot generate the stream of revenues unless it is built. Debt financing is optional for projects funded by general revenues or even earmarked taxes. When there is a choice between pay-as-you-go and debt financing, one key question is whether there are clear advantages to building the project sooner, which debt financing makes possible. If so, the fact that debt financing entails higher interest costs is offset by the earlier availability of funds to build the project.<sup>47</sup> Debt financing may actually be advantageous in periods when interest rates are very low and construction costs are expected to rise significantly. However, debt financing poses drawbacks if it relies on repayment from revenue sources that would have been used for other purposes. Moreover, as California’s recent experience with school bonds illustrates, flooding the market with bond-financed projects can, in and of itself, generate cost inflation.

With these considerations in mind, what does the record suggest for California? Most of the toll projects noted above used some form of revenue bond, backed by tolls. Many of California’s self-help counties also use revenue bonds to leverage the stream of revenues from the optional sales tax to get projects started more quickly. California has generally used pay-as-you-go financing for projects funded out of general transportation revenue sources. Although it created a State Transportation Infrastructure Bank, it has not actively used this mechanism.<sup>48</sup>

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<sup>47</sup> In economic terms, the net present value of a debt-financed project is the same as that of project financed through pay-as-you-go methods, as long as the interest rate on the debt is equal to the social rate of discount.

<sup>48</sup> The program, recently taken over by Caltrans, is only capitalized at \$3 million (Federal Highway Administration, 2003-2004). Some smaller states have used this program aggressively. Notably, South Carolina has put most of its state transportation revenues into the fund, in addition to the federal contribution (U.S. Department of Transportation, 2002).

California has made use of some tools authorizing the leveraging of federal dollars. The SR-125 and Alameda Corridor projects drew on TIFIA loan guarantees,<sup>49</sup> and California is one of ten states to make use of “Grant Anticipation Revenue Vehicles (GARVEES) - a provision allowing for bonding against future federal transportation revenues. California’s first GARVEE issue, totaling \$615 million, was floated in 2004, and will help finance a number of projects in Southern California and the Bay Area.<sup>50</sup> The Governor’s Strategic Growth Plan calls for additional GARVEE bonds of \$3.1 billion in the later years of the 10-year program. This tool can provide valuable flexibility in the use of federal funds.

The Governor’s Strategic Growth Plan also calls for some major departures from the pay-as-you-go financing tradition for the state’s share of transportation projects, with \$12 billion in GO bonds, backed by general tax revenues, and \$14 billion in revenue bonds, backed by future gas tax and weight fees. In our view, there are real questions about the desirability of this type and volume of bonding for state transportation projects, given the implications not only for current levels of debt service (an issue for GO debt), but also for the constraints it imposes on future spending (an issue for both types of debt). Using GO bonds for transportation projects decouples payment from use of the service and makes claims on future streams of general revenues. Bonding against gas tax revenues makes claims on funds that are largely relied on for maintenance expenditures. If there is a considerable excess demand for such projects relative to the steady stream of revenues generated by transportation sources, it would be more appropriate to raise additional revenues.

A final issue in debt finance concerns measures geared to make private sector debt more competitive with public debt, by giving it tax-exempt status. This tax disadvantage is considered a significant hurdle to private investment, conferring an effective interest rate premium on the order of 20 to 40 percent relative to publicly held debt (National Research Council, 2002). One of the new tools, known as a “63-20” corporation (named after its section in the federal tax code), creates a public-private governing structure that can leverage tax-exempt debt (Nossaman et al., 2001). The SR-125 toll road project made use of this structure. SAFETEA-LU provides additional opportunities through tax-exempt private activity bonds, which investors had long sought (Hedlund and Smith, 2005). Although such tools provide clear advantages to the projects themselves, tax exempt financing represents trade-offs from the economy’s standpoint. At the federal level, in particular, the question is whether the benefits of facilitating the project outweigh the cost of the corresponding loss of tax revenues.<sup>51</sup> The caps on the total amount of debt that can be issued with these bonds are intended to limit the quantity of forgone tax payments.<sup>52</sup>

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<sup>49</sup> TIFIA loan guarantees were originally slated to support the Bay Bridge retrofit, but the project’s funding package was altered when project management changed hands in 2004.

<sup>50</sup> See (<http://www.treasurer.ca.gov/bonds/garvee.pdf>) for a list of all of the GARVEE projects in California.

<sup>51</sup> See Congressional Budget Office, 1998 for a discussion of this issue. Individual states may gain if they use these tools more aggressively than other states.

<sup>52</sup> Prior to the 1960s, there were very few limits on the use of tax-exempt debt. Limits were introduced in response to increasing use of municipal debt to finance private businesses or as loans for individuals. The federal government’s ability to limit private use tax-exempt debt was further strengthened in 1988, when



### **The Longer-Term Option: From the Gas Tax to Road-Use Metering?**

Although some of the innovations discussed here can improve the efficiency of transportation spending, many were introduced with the primary aim of augmenting the pie in the face of declining fuel tax revenues. New tolls and private equity enable transportation agencies to add capacity at the margin, but they do not resolve the bread-and-butter issue of core funding for transportation.

As we have seen, the sector's main response to declining fuel tax revenues has been to augment the core budget with other taxes and fees. These measures have progressively decoupled investments from the user-fee base upon which transportation finance was founded in the 1920s.<sup>53</sup>

Rather than continuing on this path, some transportation experts see the potential to restore, and indeed improve upon, the core user-fee based finance system by taking advantage of new electronic toll collection technology (ETC). In principle, this technology – increasingly used for collection at bridges, tunnels and toll roads – could be used comprehensively to charge drivers for miles traveled, thereby replacing the gas tax. It can actually improve upon the gas tax, because fees can be varied according to the types of road and the level of congestion, two elements which affect the costs of road use.

ETC makes mileage-based fees possible, because it is both less costly and less cumbersome than traditional tollbooths. The system relies on 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.

A comprehensive study of road-use metering recently found that this method is gaining considerable ground, especially in Europe (Sorensen and Taylor, 2005a and 2005b). Austria, Switzerland, and Germany have all launched automated weight-distance truck tolls across their national highway networks, and the United Kingdom is in the process of developing a similar system. In the U.S., a number of pilot projects and studies are underway. Oregon's Department of Transportation's pilot system of road user fees and congestion tolls, designed to replace the fuel tax, will be completed in the spring of 2007. In Washington State, the Puget Sound Regional Council is testing a network-wide congestion charge system. California's Department of Transportation participated in a multi-state study, conducted by researchers at the University of Iowa, to develop a multi-jurisdictional (state-to-state) mileage fee proposal.

When the aim is to replace the fuel tax, distance-based fees do not raise the same types of equity concerns as regular toll roads. Projects have also been able to alleviate one of the key objections – invasion of privacy – by decoupling the billing function from collection of vehicle-based information on road use. Solutions to another key objection –

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the Supreme Court ruled that federal taxation of municipal debt is constitutional. This ruling made federal tax-exempt status voluntary. Currently there are fairly strict guidelines restricting municipal debt to public uses with a limited amount of private activity debt for specific uses. See Zimmerman, 1991 and 2005 for a description of the tax-exempt bond market.

<sup>53</sup> For a recent discussion of this issue in the nation context for the Transportation Research Board, see Committee for the Study of the Long-Term Viability of Fuel Taxes for Transportation Finance, 2006.

that flat mileage-based fees do not encourage drivers to use more fuel-efficient vehicles – are possible if fees are adjusted according to vehicle class.

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 sources like sales taxes). Relative to the gas tax, it can also better align the incentives of transportation agencies (who require stable funds to provide new and maintain existing roads) with the environmental goals of reducing fossil fuel use (Wachs and Taylor, 2005). With mileage-based fees, improved fuel efficiency and alternative technologies such as hybrids need not drain the transportation coffers. These many advantages lead us to conclude that California should aim to move towards a core funding system based on road-use charges. The transition is not likely to be easy – as recently as 2004, the state’s new head of the Department of Motor Vehicles was widely criticized for making such a suggestion, on both privacy and environmental grounds (Sorenson and Taylor, 2005b). Nor is there a guarantee that the system would yield all of the potential benefits. In particular, there are likely to be political pressures against introducing differentiated vehicle charges that more accurately reflect usage costs, and the same forces that make it difficult to raise the gas tax may prevent a mileage-based system from increasing net transportation revenues. Nevertheless, California has the opportunity to make progress while expanding capacity through more limited toll-based projects. As drivers become more familiar with ETC systems and congestion pricing, this should increase the public’s overall comfort level with the principle of modern road-use fees.

#### **4. Financing Innovations for Water Management**

There are some similarities in the innovation toolkits for transportation and water management, but also some important differences. As in transportation, there has been a push to consider more private sector involvement. Because the water sector has long relied on debt finance, however, there has been no reason to encourage a shift from pay-as-you-go financing. Utilities commonly float revenue bonds to finance their facilities projects, and major statewide investments have also relied on bond funding, backed either by user fees or general tax dollars. Although the Governor’s Plan relies heavily on new GO bonds (\$9 billion) for its water projects, it also aims to provide the state with a source of pay-as-you-go financing through a new water fee.

As in transportation, some of the core debates in water center on the appropriate role of user fees versus general tax dollars in the investment portfolio. Proposals from various quarters suggest a greater role for user fees and regulations to help limit the need for new investments in water supply and flood control, but these are not always politically palatable.

##### **Private Sector Participation**

Because water and wastewater utilities have a straightforward user-fee-based financing mechanism, the push toward a greater private sector role is less about raising new funds than it is about taking advantage of new technologies and benefiting from potential cost efficiencies. A National Research Council (2002) panel on the role of

privatization in this sector concluded that private firms could especially help smaller water utilities reap scale economies in various types of operations, including billing, lab work, and facilities management, even when their physical networks are separate.

Private ownership of wastewater utilities is rare in the U.S., but private firms currently own roughly one-sixth of municipal water utilities in California, comparable to the national percentage. Although some opportunities may exist for additional public utility acquisitions, many of the gains envisaged by private sector involvement could occur without a transfer of ownership, through management and operations contracts and design-build arrangements for specific facilities.

California is home to the country's first private management contract for a wastewater utility (Burlingame, 1972).<sup>54</sup> Since then, numerous utilities in the state have formed partnerships for facilities operations and service contracts with some of the large multinational firms operating in this sector such as Veolia (formerly U.S. Filter) and United Water (an affiliate of Suez), as well as smaller firms (Parsons, Eco Resources).<sup>55</sup> California's regulations have been relatively liberal regarding private participation in this sector – it is among the handful of states allowing DB and DBO within a single contract and authorizing privately-owned utilities to gain access to low-interest loans (National Research Council, 2002). Federal regulatory changes, including a 1997 law lengthening the time permitted for long-term private operating contracts and the introduction of tax-exempt private activity bonds, have facilitated such partnerships (National Research Council, 2002; Johnson et al., 2002; Deane et al, 2005).

In general, these partnerships have been relatively uncontroversial, although this is not always the case. Issues that can raise public concern include employment conditions for utility staff, rate increases (even if they may be necessary), and any other potentially unfavorable changes occurring in the wake of the hand-over. In Atlanta, for instance, a private operating contract for the municipal water utility generated public outcry when discolored water started coming out of the taps. Afterward, the city was pressured into canceling the contract.<sup>56</sup>

In recent years, there has also been some interest in private investments in the development of new supply sources. The picture that emerges is quite different from that in transportation, where public partners are increasingly encouraged to provide greater support during the environmental approval phase, given the potentially long and costly delays (see, for instance, James, 2003). Because public water agencies have access to

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<sup>54</sup> National Council for Public-Private Partnerships, n.d.

<sup>55</sup> In addition to Burlingame, Veolia's California clients include wastewater utilities in Arvin, Atwater, Diablo Grande, Lathrop, Palm Springs, Petalunam Rialto, Richmond, and the facility of the International Boundary and Water Commission (<http://www.veoliawater.com>). United Water clients include municipal utilities in Avalon, Banning, Burbank, and Western Riverside and the West Basin Municipal Water District in El Segundo (<http://www.unitedwater.com/clients/htm>). Parsons has partnered with San Diego's Water and Wastewater Departments (<http://www.parsons.com>). Eco-Resources, a division of the Southwest Water Company Services Group, operates the wastewater facilities in Corning (National Council for Public-Private Partnerships, n.d.). See Johnson, et al., 2002 and Segal and Moore, 2003 for a general discussion of contracting issues and data on national trends.

<sup>56</sup> Segal, 2004 argues that some of the problems experienced by United Water in Atlanta were a result of long-term neglect by the municipal water department, too much focus on cost-cutting by the city, and insufficient communication between the city and United on performance goals.

relatively inexpensive capital and can raise rates relatively easily, opportunities for private investment are only likely to occur under risky circumstances, such as projects facing substantial environmental and technical uncertainties. These same conditions mean that success is far from guaranteed.

Several firms with hopes of brokering water transfers in California have left the business,<sup>57</sup> and a privately owned project to sell water stored on flooded islands in the Delta has met with considerable political and legal opposition.<sup>58</sup> Similar problems faced a privately owned groundwater storage project in the Mojave Desert.<sup>59</sup> After numerous fits and starts, it appears that one privately developed groundwater banking project in Madera County has been successful. Here, the developers essentially transferred a ready-to-go project, complete with environmental permits, to a public agency. A similar project is under development in the Antelope Valley, with venture capital backing. The jury is still out on whether a private firm will succeed in its bid to build desalination plants in Carlsbad and Huntington Beach. These deals require the firm to obtain all environmental approvals; the facilities would remain privately owned and operated, with local water agencies' responsibility limited to guaranteed purchases through long-term contracts.<sup>60</sup>

### **User Fees and Regulatory Incentives**

The current debates over the appropriate split between user and taxpayer responsibility reflect California's jumbled history of paying for water investments. Wastewater utilities now rely principally on user fees, but in the decade following the 1972 passage of the Clean Water Act, the federal government heavily subsidized the investments to upgrade treatment facilities. Contracting water agencies pay for the largely urban-oriented State Water Project, whereas the largely agricultural Central Valley Project relies on generous federal subsidies. Since the adoption of the CALFED Record of Decision in 2000, there has been a broad agreement that a "beneficiary pays" principle would apply for future water investments. But water agencies have been inclined to argue that many investments – ranging from water conservation to new surface storage – primarily benefit the environment, rather than their customers, thereby meriting taxpayer support. The distinction between user fees and taxpayer sources is most important for farmers, who account for a relatively small share of the tax base but use roughly 80 percent of the water. The profit margins in most farming activities are not

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<sup>57</sup> The Western Water Company, a brokerage firm based in Richmond, California, declared bankruptcy in 2005. The Vidler Water Company, which also had hopes of brokering water sales, has been divesting itself of holdings in California groundwater banks.

<sup>58</sup> The Delta Wetlands Project, which aimed to store and transfer water from flooded Delta islands, was approved by the State Water Resources Control Board (SWRCB), but met with considerable resistance in San Joaquin County. A judge recently ruled that the SWRCB's permit was invalid, because it did not specify who would be purchasing the water (Nichols, 2005).

<sup>59</sup> The Cadiz project would have made available stored surplus Colorado River water and native groundwater to the Metropolitan Water District of Southern California (MWDSC) service area. Environmental opposition to the potential effects of groundwater withdrawals and uncertainties over the availability of Colorado River water for storage led MWDSC to drop the project from consideration in 2002 (Kasler, 2003).

<sup>60</sup> As of this writing, the environmental impact report (EIR) for the Huntington Beach project had been certified and the project had been approved by the city, but it still awaited approval by the state's Coastal Commission. The EIR in Carlsbad was still under review, and the project faced competition from an alternative proposal for a desalination facility by the San Diego County Water Agency.

high enough to support the investments in new surface storage that farm groups are advocating.

As in transportation, user fee-based finance has the built-in advantage of encouraging more efficient use of the resource, and recent studies suggest considerable scope for water savings.<sup>61</sup> It would be unfortunate if California were to rely on GO bonds to build new water supply infrastructure over the coming decades, rather than service contracts with users.

In principle, a statewide water fee could provide an incentive-compatible source of stable revenues to fund projects of regional or statewide significance, in the same way that water rates support local projects. However, the Water Resources Investment Fee proposed by the Governor's Plan does not meet this criterion. It would impose a flat monthly charge on each household, business and farm, unrelated either to the current volume of water use or the direct water benefits of future investments. We estimate that farms would only pay roughly 2 percent of the total, even though proposed investments in water supply reliability, such as improved levees or new storage, would benefit agricultural as well as urban users.<sup>62</sup>

By the same token, user incentives can play an important role in flood control. As the Department of Water Resource's (2005a) recent White Paper on Flood Management noted, there are numerous shortcomings with the current set of incentives. Local governments can approve development in flood plains, but they are not legally liable for damage caused to these properties. (Indeed, a recent court ruling held the state liable for flood-related damages caused by the failure of a privately-built levee.) Only a fraction of homeowners who face flood risks are required to hold flood insurance. Flood control and reclamation districts are hamstrung in their ability to raise fees by supermajority vote requirements. Meanwhile, floodplain development continues unabated in the Central Valley.

Without changes in this incentive structure, it is difficult to justify major taxpayer support to fund flood works. The Governor's Plan proposes a constitutional amendment to exempt local flood control agencies from Proposition 218, making it easier for them to raise fees. It also takes a step toward shifting primary liability from the state to the local land use authorities, as recommended by the White Paper.<sup>63</sup> That report also proposed a specific regional fee to help fund flood control in the Central Valley and mandatory flood insurance for homes at risk. As evidenced by the legislative history, such steps are bound

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<sup>61</sup> California Department of Water Resources, 2005b provides estimates of agricultural and urban conservation potential from recent studies. The Pacific Institute, 2005 argues that there is a potential for considerably greater savings.

<sup>62</sup> Authors' estimation, using data from the 2004 American Community Survey (households), the 2003 County Business Patterns survey (firms), and the 2002 Agricultural Census (farms) and the proposed monthly fees of \$3 per single family household, \$10 per multi-family structure, \$5 for commercial establishments, \$10 for industries, and \$10 for farms over 180 acres. Within the urban sector, households would pay the lion's share (roughly 85% of the total).

<sup>63</sup> The proposed legislation (SB 1166) would make transferring of primary liability a condition of state support for flood control works.

to be controversial, precisely because they impose more of the costs of flood management on communities and households making decisions to locate in floodplains.<sup>64</sup>

## **5. Where Can California Go From Here?**

California faces important decisions about how to provide the infrastructure to meet the needs of a growing population and economy. In planning for the future, it should weigh the costs and benefits of different funding options and consider both the short and long-term implications of new investment strategies. We believe the following criteria should be kept in mind as decisions are made.

### ***(1) Innovations that can raise funds while aligning the incentives of infrastructure customers with efficient use of the system should be encouraged.***

In some sectors, this means going back to some of the original principles of infrastructure finance. For example, funding transportation through sales tax revenues rather than through user fees is a move in the wrong direction. Although gasoline taxes are imperfect measures, they better align usage and payment than general taxes. Indeed, movement towards alternative, toll-based roads should be encouraged. Similarly, in water provision, using general obligation debt to provide new water supply, rather than revenue bonds paid for with service contracts, decouples cost from use. The State Water Project – a pillar of the “golden era” – was developed on the principle of service contracts.

In other sectors, this means breaking with tradition. In the area of flood control, for instance, the old way of doing business did not properly align incentives with future liabilities, and new laws and policies will be needed to encourage sounder development decisions. Developer fees or other taxes for new development in the Central Valley should take into account the need for flood control, and homeowners in at-risk areas should be required to take on flood insurance.

In general, this strategy implies reserving general funding sources to invest in areas where the benefits are diffuse or where there are clear social goals that make user fees inappropriate, such as public education. Public subsidies may also be warranted for some sectors where the provision of the service generates positive externalities, such as transit and some environmental programs.

### ***(2) Financing tools matter.***

California needs to assess the proper role for debt financing versus pay-as-you-go activities, recognizing that borrowing ultimately must be paid back. Current proposals fund a large portion of new infrastructure by earmarking existing and future revenues rather than by raising new revenue sources. It is one thing to engage in debt financing when there is a new revenue stream such as a toll to pay for it; it is another to expect to pay for increased spending with existing and future revenue streams. In determining how

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<sup>64</sup> For instance, the proposal to launch a regional flood assessment (AB 1665, introduced in the spring of 2005) has been stalled by stakeholder opposition. Other proposals to increase local government’s responsibility (e.g., AB 802, introduced in 2005) and to require flood insurance (AB 1898, introduced in 2006) have also been controversial. See [www.leginfo.ca.gov](http://www.leginfo.ca.gov).

much debt financing is desirable, it is important to acknowledge the explicit tradeoffs between future repayments and other spending priorities, recognizing that there is no free lunch.

These considerations favor the adoption of an infrastructure plan that relies on new funds, tied where possible to the services provided. We do not believe that the long-term earmarking of gasoline revenues, the bulk of which now provide maintenance, is prudent. The state should especially be concerned with any large investment programs that might lead to increases in the cost of providing new capacity.

***(3) Fee-raising authority should be aligned with the regulatory responsibilities of local agencies.***

When local governments are required to provide services, for example the clean-up of non-point source pollution or flood control, they need to be able to raise fees to provide for this service, even in cases where benefits are not directly tied to the fees incurred. This might entail changing limitations introduced by Proposition 218.

***(4) Responsibilities and costs should be tied to those making planning decisions.***

At present, the state faces liability for flood control, yet local governments make the land-use decisions putting residents and businesses at risk. Legislative or constitutional changes that shift the primary liability to local governments and that require full disclosure of flood risks could help to rectify this imbalance.

***(5) There is a role for increased public-private collaboration, but private projects won't replace government planning and action.***

Private equity financing has potential at the margin, but is not a widespread solution, except perhaps for investments in dedicated goods movement. The opportunities to leverage projects using private resources are greatest when the benefits can be used to repay the costs and the return on investment is well defined.

Similarly, there is room for more flexible contracting arrangements with private entities using design-build or design-build-operate contracts. These contracting agreements can help the public sector take advantage of new technology. They also can help coordinate incentives in contracts and may lead to cost savings and limit contract overruns. Even if these cost savings do not materialize, they can speed up job completion. However, these relationships are relatively untried in California in the key area of transportation. To be successful, they need to be integrated into the Caltrans system and get the support of current employees.

Finally, while increasing the role of the private sector in providing for future infrastructure, it will be important to understand the contracting risk/return tradeoff and who is ultimately liable to pay for unsuccessful projects.

**There may be a silver lining in California infrastructure funding politics.** If the public is averse to raising general taxes, this can open up opportunities for more use of specific fees, where people can see the direct benefits of the services they are paying for. At the same time, this movement toward fees for service can improve the incentive structure. Explaining the need for fees or increased revenues to pay for services offers a different path than relying on statewide GO bonds. In contrast to local bond issues,

statewide GO bond proposals typically involve little, if any, discussion of the need to pay for additional services, and they inevitably entail regional jockeying to ensure a “share of the pie.” This shift could open up more opportunities for regional fees to fund regional projects, more closely tied to the beneficiaries.

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