

Funding and Financing

Introduction

A third crossing will require an innovative funding and financing framework due to the project's complexity and the uncertain future of federal and state support. Our analysis of this topic applies the academic literature concerning the development of cost estimates and the equity implications of various funding mechanisms to a potential new crossing. Case study analysis and conversations with experts also inform our discussion. This section is organized as follows:

- *Improving Cost Estimation Accuracy*
- *Equity Concerns in Fundraising and Distribution*
- *Constrained and Ideal Funding Scenarios*
- *Case Studies – Denver and Sao Paulo*
- *Key Recommendations*

Establishing trust between project managers, private financiers, and public taxpayers is essential to the successful completion of megaprojects and can easily be undone by financial mismanagement. Recent transportation megaprojects in the Bay Area and elsewhere have brought this issue to the forefront with significant project delays and major cost overruns.³¹⁴ Focusing on strategies that minimize risk and maximize transparency and accountability is particularly important in the context of a new crossing, as a number of funding strategies require legislative or voter approval.

Improving Cost Estimation Accuracy

Though in-depth engineering and environmental analyses have not yet been conducted, preliminary cost estimates for a new crossing are between \$8 and \$12 billion.³¹⁵ While assigning new cost estimates is beyond the scope of this project, predicted costs of major infrastructure projects are often significantly lower than actual costs.³¹⁶ Additionally, many secondary costs like financing costs, transaction costs, and maintenance and operations costs are not included in public deliberations or sufficiently considered in overall project cost estimating. To address these issues, we propose several risk management techniques, including reference class forecasting, which adjusts costs estimates to align with comparable completed projects.³¹⁷

Headline Costs Are Systematically Underestimated

A study of thirty-three large bridge and tunnel projects found final costs averaged 33.8% higher than estimated costs,³¹⁸ a difference attributable to optimism bias and “strategic misrepresentation” of project realities. Regardless of whether this systematic underestimation is

³¹⁴ Trapenberg Frick, *Remaking the San Francisco–Oakland Bay Bridge*.

³¹⁵ AECOM Consult, Inc, “San Francisco Bay Crossings Study Update.”

³¹⁶ Flyvbjerg, Holm, and Buhl, “Underestimating Costs in Public Works Projects”; Bent Flyvberg, Mette K. Skamris Holm, and Søren L. Buhl, “What Causes Cost Overrun in Transport Infrastructure Projects?”

³¹⁷ Flyvbjerg, “From Nobel Prize to Project Management.”

³¹⁸ Flyvbjerg, Holm, and Buhl, “Underestimating Costs in Public Works Projects.”

intentional, cost estimates usually do not account for the possibility of typical project changes, conflicts, or accidents.

Additional Cost Considerations: Finance Costs, Transaction Costs, and Maintenance & Operations Costs

Finance Costs

While the public can generally grasp the scale and opportunity cost of the headline estimate, the financing structure of most megaprojects involves borrowing funds that must be repaid later with interest. Debt repayment can add significant expense, as the additional revenue from the project must exceed the interest rate if the financing structure is not to contribute a net cost. This typically does not happen, though, as benefits and ridership estimates are as systematically overestimated as costs are underestimated. Megaprojects often result in interest payments over the lifetime of the loans that exceed the value of the principal.³¹⁹

Transaction Costs

Transaction costs include contract and legal fees, inspection fees, financing and negotiating fees, and other administrative expenses. These costs are typically considered external to a project and are rarely accounted for in project estimates.³²⁰ Megaprojects are particularly susceptible to high transaction costs due to the need for highly specialized expertise (increasing outside contracting) and the amount of uncertainty at each phase of the project.³²¹

Megaproject contracting has historically been structured with a design-bid-build (DBB) process, which separates design and construction. Recently, though, a design-build (DB) process, where one private firm completes both the design and construction of a project, has become more popular. It's unclear if DB actually leads to lower costs, however, as the reduction in transaction costs seems to be passed along to the construction phase.³²²

As such, the efficiency savings from DB may be entirely captured by the contractor.

Maintenance & Operations Costs

Project cost estimates typically end with the start of operations. However, there is rarely public discussion of how the eventual maintenance and operations of additional service will be funded and what level of ongoing funding will be required. For transit projects, user fees in the form of fares are a primary source of funding for operations and maintenance, with 74% of BART's³²³ and 60% of Caltrain's³²⁴ operating costs paid for by passenger fares. It is imperative to address how new transit

³¹⁹ Wachs, "A Dozen Reasons for Raising Gasoline Taxes."

³²⁰ Whittington and Dowall, "Transaction-Cost Economic Analysis of Institutional Change toward Design-Build Contracts for Public Transportation."

³²¹ Arena and Molloy, "The Governance Paradox in Megaprojects"; Oliver E. Williamson, "Transaction-Cost Economics: The Governance of Contractual Relations."

³²² Whittington, "When to Partner for Public Infrastructure?"

³²³ BART, "BART 2015 Factsheet."

³²⁴ Caltrain, "Caltrain Preliminary FY2016 Operating Budget," 201.

projects will affect current fares and how any deficit between farebox recovery and operational expenses will be covered.

Mitigating Cost Estimate Inaccuracies: Risk Management & Reference Class Forecasting

Comprehensive risk management and increased cost estimate accuracy can improve both the public trust and private-sector interest in a project. This can greatly improve the likelihood of a successful project by easing the ability to secure taxpayer funds and leading to more competitive bids for the construction. In order to properly manage the risk of cost inflation and minimize inaccuracies, agencies responsible for megaproject delivery should present project milestone deadlines as ranges, plan for a lengthy and costly environmental review process, and use reference-class forecasting in cost estimation.

Present Dates for Key Milestones as Ranges

Project delays can cause construction cost increases of roughly 5% per year,³²⁵ as well as increased financing costs due to accrued interest payments and the need to quickly assemble additional funding. Missed payments stemming from these delays can further increase costs by hurting credit ratings and requiring higher interest payments to obtain additional financing. Obtaining and publicizing accurate project costs and schedules from the beginning can help avoid this situation, lowering finance and transaction costs over the life of the project.

Plan Strategically for Environmental Review Process

Litigation during the environmental review process can lead to schedule delays, increased financing costs, and legal fees, and the effect of this potential litigation must be included in both time and cost estimates. Additionally, the design process should be nearly finalized before beginning construction to lower the risk of these lawsuits. While this can be challenging for DB projects, where the sequencing of environmental review has not typically synced with project selection, state governments in Texas and Oregon have begun to require a certain level of environmental review before selecting a final proposal.³²⁶ Agencies could also secure all necessary permits and approvals and complete environmental review themselves before involving the private sector.

Utilize Alternative Cost Estimating Methods: Reference-Class Forecasting

Rather than exclusively trying to predict costs for the particular project, agencies should also employ reference-class forecasting, which looks at the final cost of completed projects with similar type, complexity, and governance as the project at hand.³²⁷ This process helps

³²⁵ Bent Flyvbjerg, Mette K. Skamris Holm, and Søren L. Buhl, "What Causes Cost Overrun in Transport Infrastructure Projects?"

³²⁶ Whittington and Dowall, "Transaction-Cost Economic Analysis of Institutional Change toward Design-Build Contracts for Public Transportation."

³²⁷ Flyvbjerg, Garbuio, and Lovallo, "Better Forecasting for Large Capital Projects | McKinsey & Company."

to minimize optimism bias by forcing estimates to be grounded in real-world outcomes. This method can be used to estimate specific components of a project in addition to the cost of the project as a whole. Similar to presenting a project timeline, it is also important to present all cost estimates as ranges in order to recognize the inherent uncertainty.

Equity Concerns in Fundraising & Revenue Distribution

The Transportation Research Board's special report "Equity of Evolving Transportation Finance Mechanisms" highlights the following frameworks for evaluating equity concerns in transportation funding:

- *Benefits received*: People who use the service or infrastructure should pay for it
- *Ability to pay*: Payment should be progressive and increase with income
- *Return to source*: Transportation investment should be geographically distributed in proportion to the amount paid in taxes
- *Costs imposed*: People who impose negative externalities should pay additional fees

Any decision on a funding mechanism must take these competing visions of equity into account. Additionally, the assessment of the merits of a particular funding mechanism must be in relation to the most likely alternative. For example, while fuel taxes are regressive in that they represent a higher percentage of income for low-income individuals, they are less regressive than a sales tax add-on, which is the typical source of local transportation funding.

Sales tax measures are politically popular and have successfully funded transit projects in Los Angeles, San Francisco, and Alameda Counties.³²⁸ Despite this, we believe sales taxes to be one of the more strongly and obviously regressive potential funding mechanisms. As the following analysis does not include sources we believe to be inequitable, we do not discuss a sales tax in greater depth.³²⁹

Funding Scenarios

It is challenging to predict what funding and financing opportunities will be available in the coming decades. To address this uncertainty, we have created both ideal and constrained scenarios (see Table 9). The constrained scenario accounts for the current economic and political realities of transportation funding, while the ideal scenario includes sources that are more politically challenging. There is also discussion of funding sources not included in either scenario due to equity concerns or extreme feasibility limitations. While these funding sources are analyzed within the context of a new crossing, they can also be considered in a Performance Pricing alternative. Lastly, the majority of the sources identified in the funding scenarios are mode-agnostic and would be available for either BART or standard rail, unless otherwise specified.

³²⁸ SPUR, "Proposition K - Transportation Sales Tax"; LA Metro, "Measure M"; Alameda County Transportation Commission, "Measure BB Passed with 70 Percent Voter Support: Funds 30-Year Transportation Expenditure Plan : Alameda CTC."

³²⁹ Additionally, the abundance of sales tax measures in recent ballot cycles has put many Bay Area cities closer to the statutory limit of 10.5% on sales tax rates (AB 464, Mullin & Gordon, 2015).

The main funding sources we have identified include loans, grants, user fees, special assessment districts, and value capture mechanisms. With the exception of a few mechanisms that were analyzed using the land use and travel models, sources are not assigned specific dollar amounts. Each source is identified as an option for capital expenditures (C) and/or operations and maintenance (O&M).

Table 9: Funding scenario assumptions for federal sources

<i>Funding Source</i>	<i>Available in Constrained Scenario?</i>	<i>Available in Ideal Scenario?</i>	<i>Capital (C) / Operations & Maintenance (O&M)</i>
Federal	Federal Transit Grants	X	C, O&M
	Federal Loans	X	C
	Seismic and Resilience Funds (Federal and Regional)	X	C
State	State Right-of-Way Assets	X	C
	California's High Speed Rail Bond of 2008 (Proposition 1A)	X	C
	California Infrastructure and Economic Development Financing Bank	X	C
Local	Bonds / BART Bond 2016	X	C
	Geographic Fundraising Mechanisms (Special Assessment Districts & Value Capture Mechanisms)	X	C, O&M
	Regional Measure 3	X	C, O&M
	Regional Measure 4		C, O&M
	Congestion Pricing		C, O&M
	BART Fare Restructure	X	C, O&M
	Accessory Funding: Naming, Advertising & Fiber Optics	X	C, O&M

Federal Sources

Federal Transit Grants

Gas taxes have traditionally been the main revenue source for standard transportation grant programs. The primary federal transit funding program for capital projects falls under the Capital Investment Grants authorized under Section 5309 of Title 49, U.S. Code. There are also specific grants available for operational expenditures and preventative maintenance such as the Urbanized

Area Formula Grants.³³⁰ Other funding sources are available for projects that decrease congestion such as the Congestion Mitigation and Air Quality Improvement Program (CMAQ). Recent Bay Area transportation projects have received significant federal grant funding. The first phase of the Transbay Terminal amounts to \$2.2 billion. Of that total, the project received \$402 million in Federal Railroad Administration (FRA) grants through the American Recovery and Reinvestment Act of 2009 (ARRA) and \$68 million in Federal Transit Administration (FTA).³³¹ The Central Subway (total: \$1.6 billion) received over \$940 million from the New Starts program and \$41 million in Congestion Mitigation and Air Quality (CMAQ) Improvement Program (SFMTA, n.d.).³³²

Constrained Scenario

The Government Accountability Office includes “Funding the Nation’s Surface Transportation System” on its High Risk List of 32 agency and program areas in need of transformation.³³³ The federal gas tax has not been raised since 1993. The revenue per mile of travel raised by this tax has been steadily decreasing due to the effect of inflation, increasing vehicle fuel efficiency. At the same time, the cost of transportation projects has increased dramatically due to increased land and labor costs and environmental regulations, among other factors. The need for the funding has also increased as the country’s transportation system continues to age and expand.³³⁴ Given Congress’ continued reluctance to increase the gas tax, the constrained analysis assumes that federal funding will not be available for this project in the form of grant funding.

Ideal Scenario

Ideally, there will be federal transit grant funding available for a new crossing alternative. It is possible that this funding comes from a VMT tax rather than a motor fuel tax, which has been piloted in Oregon and California.³³⁵ We expect this to become a more common form of transportation tax revenue and to serve as the primary mechanism of federal funding for public transit.

Federal Loans

Both Scenarios

While grant funds are not a reliable source, the federal government is a unique provider of credit, and this is not likely to change. Both the constrained and ideal scenarios assume the project will be able to access loans through programs such as the Transportation Infrastructure Finance and Innovation Act (TIFIA). While revenues come from the federal highway trust fund, which might be significantly diminished, and TIFIA may not exist in the same form, we assume that a mechanism for federal credit with similar terms will continue.

³³⁰ Santa Clara Valley Transportation Authority, “Introduction to Transportation Funding.”

³³¹ Transbay Transit Center, “Transbay Program Budgets « Transbay Center.”

³³² SFMTA, “Project Funding/Budget.”

³³³ United States Government Accountability Office, “High-Risk Series.”

³³⁴ Wachs, “A Quiet Crisis in Transportation Finance.”

³³⁵ Oregon Department of Transportation, “MyOREGO | A New Way to Fund Roads for All Oregonians”; DeSaulnier, Bill Text - SB-1077 Vehicles: road usage charge pilot program.

TIFIA offers loans, lines of credit, and credit enhancement. TIFIA loan interest rates are typically below market rate and repayment terms are longer and more flexible than typical private loans.³³⁶ Repayment can be amortized over 35 years.³³⁷ Program fees range between \$400,000 and \$700,000.³³⁸ Credit assistance is currently limited to 33% of a project's total cost. Project sponsors can include states, state infrastructure banks, private firms, special authorities, local governments and transportation improvement districts.

Sales taxes, tax increment financing, and special assessment district revenues typically secure TIFIA loans.³³⁹ For example, Denver Union Station secured a TIFIA loan backed by sales tax revenues, and the Transbay Terminal TIFIA loan of \$171 million will be repaid through the Tax Increment district. If a new crossing project includes standard rail, the project could access funding through the federal Railroad Rehabilitation and Improvement Financing (RRIF) program, which has similarly attractive terms. TIFIA projects must significantly support the regional economy, international commerce, and/or the national transportation system. Applications are also judged on the extent to which a TIFIA loan could increase attractiveness for private involvement and how the project would help to maintain or protect the environment.³⁴⁰ A new crossing would score well on all accounts.

Federal & Regional Resilience & Seismic Funding

Both Scenarios

Bay Area infrastructure is vulnerable to seismic and climate change threats, and funding resources often become available as a result of disaster relief appropriations or specific hazard mitigation needs. The Disaster Relief Appropriations Act and the Sandy Recovery Act of 2013, for example, not only authorized federal funding for disaster and emergency spending after Hurricane Sandy, but also mandated the development of a "national strategy for reducing future costs, loss of life, and injuries associated with extreme disaster events in vulnerable areas of the United States."³⁴¹ After Hurricane Sandy, the Federal Transit Administration announced the availability of \$3 billion in funds for states impacted by the damage to fund resilience projects that would "address current and future vulnerabilities."³⁴²

Funding sources that are originally created for specific disaster mitigation projects can also be adapted for other purposes. Assembly Bill 1171 was passed in 2001 to increase Bay Area bridge tolls by \$1 for seismic retrofit projects for the region. MTC's Resolution 3434, adopted in 2005, permits funding from AB1171 Bridge Toll seismic funds to be spent on projects eligible under

³³⁶ Sasha Page, Bill Bishop, and Waiching Wong, "Guide to Value Capture Financing for Public Transportation Projects."

³³⁷ Regional Transportation District, "Fastracks Plan."

³³⁸ U.S. Department of Transportation, "Transportation Infrastructure Finance and Innovation Act (TIFIA)."

³³⁹ Ibid.

³⁴⁰ U.S. Department of Transportation, "Chapter 5: Selection Process."

³⁴¹ 113th Congress, Disaster Relief Appropriations Act.

³⁴² Federal Transit Administration, "Notice of Funding Availability for Resilience Projects in Response to Hurricane Sandy."

MTC's Transit-Oriented Development (TOD) policy for Transit Extension Projects.³⁴³ Projects are eligible if they develop land near transit and establish coordination between transit agencies.

It is our hope that additional funding sources become available to prevent future hazards. Currently, the Federal Emergency Management Agency (FEMA) offers hazard mitigation grants and pre-disaster mitigation funds. The Environmental Protection Agency (EPA) provides grants to support development that will mitigate greenhouse gas impacts through coordination of land use and transportation planning. It is possible that this type of smart growth funding from the EPA will evolve to include funding for projects that increase resiliency and climate change impact adaptation measures. The U.S. Department of Housing and Urban Development (HUD) announced a National Disaster Resilience Competition in 2015 to fund nearly \$1 billion in disaster recovery and long-term resilience efforts. While these funding programs have specific requirements and limitations on funding eligibility and administration, funding programs may continue to support seismic, climate change mitigation and adaptation projects, and resilience efforts.

State Sources

State Assets

Both Scenarios

For projects receiving federal assistance, Title 23 of the United States Code section 323 (Donations and Credits) authorizes state transportation departments to credit the fair market value of state-owned assets incorporated into their projects. If a new crossing contributes to the removal of I-980 in Downtown Oakland, the project could have access to a significant source of proceeds from transferred state assets.

A related precedent is the removal of the Embarcadero freeway after the 1989 Loma Prieta earthquake and the subsequent authorization to transfer right-of-way parcels from Caltrans to the City and County of San Francisco and to dedicate the "excess right-of-way proceeds for local street improvements."³⁴⁴ Senate Bill 181 authorized repair or replacement of Route 101 (1991); Senate Bill 798 (1999) relinquished state highway 101 from Caltrans to City of San Francisco after the public voted to not rebuild the destroyed section of the highway downtown and committed the remaining right-of-way proceeds to local streets.

California Infrastructure and Economic Development Financing Bank

Both Scenarios

The California Infrastructure and Economic Development Financing Bank (IBank) is one of 33 State Revolving Funds nationwide. The IBank was established in 1994 to promote infrastructure and development "that promote[s] a healthy climate for jobs, contribute[s] to a strong economy, and improve[s] the quality of life in California communities." Since its inception, the IBank has financed \$38 billion of infrastructure and development, including \$600 million in low-interest loans and over

³⁴³ Metropolitan Transportation Commission, "MTC Resolution 3434 Transit-Oriented (TOD) Development Policy for Regional Transit Expansion Projects."

³⁴⁴ Burton, SB 798.

\$37 billion in bond issuances. The Infrastructure State Revolving Fund (ISRF) provides direct loans for a variety of infrastructure projects in amounts anywhere from \$50,000 to \$25 million. The ISRF provides below-market interest rates, a non-competitive application process, and no matching requirements. Lastly, the application process would subject the project to a level of scrutiny that aligns with some of the risk-reducing recommendations already discussed.

California's High Speed Rail Bond of 2008

Ideal Scenario

In 2008, voters approved a \$9.95 billion rail bond to construct high-speed rail linking San Francisco and Sacramento with Los Angeles and San Diego. Of that, \$950 million was allocated for local transit systems that would connect to the high-speed rail. It is possible that this amount will increase as the bond money shifts towards statewide transportation modernization projects. For example, Assembly Bill 1889, passed in 2016, authorizes \$1.1 billion of the bond to go towards Caltrain electrification. While the High Speed Rail Authority has committed \$2.6 billion to match already-invested federal funds, the *Sacramento Bee* speculates that the remaining bonding from Proposition 1A may become a slush fund for regional transit operators.³⁴⁵ Our ideal scenario envisions that the third crossing could obtain as much as 40% of this revenue source (\$2.2 billion). We base this estimate on the "40-60" Northern California-Southern California split enshrined in 1997 Senate Bill 45 for state transportation improvements.³⁴⁶ Of course, it is important to recognize that any funding from this source would imply a reduction in funding for the state's High-Speed Rail project.

Local Sources

Bond Mechanisms

Both Scenarios

Local bond authorizations for transportation have experienced recent success at the polls and will be a vital funding component. Bonds are typically backed by value capture mechanisms associated with increased development near stations, or by a dedicated repayment funding stream like sales tax add-ons, property tax increases, or tolls. Although Proposition 13 and subsequent ballot measures have imposed a two-thirds voter approval requirement for any tax increase, these measures have proven to be reasonably popular in recent history.

BART Bond 2016

Both Scenarios

In November BART successfully passed a district-wide general obligation bond measure (Measure RR) authorizing the issue of \$3.5 billion in bonds over 21 years. Bond funds will support state-of-good repair measures (infrastructure is maintained to a level that is safe and reliable) including track replacement and control system upgrades. The bond is backed by an increase in property taxes, up to \$17.49 per \$100,000 of assessed value. One inclusion

³⁴⁵ Dan Walters, "California Bullet Train's Bond Funds Shifting into Local Projects."

³⁴⁶ Caltrans, "2016-2017 California Transportation Financing Package."

in the measure that hasn't garnered much attention is \$200 million allocated for "future projects to relieve crowding, increase system flexibility and responsiveness, and reduce traffic congestion." These funds could contribute to supporting costs associated with the early-stage planning of the third crossing.³⁴⁷

Geographic Fundraising Mechanisms

Both Scenarios

In 2011, the California Legislature authorized legislation effectively ending the state's Redevelopment Agencies (RDAs), a move that was later upheld after a legal challenge from cities. RDAs were first authorized in 1945 and supported with federal funding until 1952, when Proposition 18 enabled the use of tax-increment financing (TIF). With the authority to declare an area blighted (and thus in need of redevelopment), a city or county could dedicate all future increases in property tax revenues to its RDA. The RDAs could issue bonds backed by future TIF revenues and assemble or clean up parcels to attract development.

After the passage of Proposition 13, RDAs were one of the few ways for municipalities to finance redevelopment, as local RDAs captured almost all of the new revenue, compared to the 5 to 20 percent of property tax revenue that cities usually retained. TIF is appealing because there are no revenue losses compared to baseline, but there are obviously opportunity costs associated with ceding future revenues for cities and the state. In the wake of RDAs' dissolution, a new TIF funding mechanism called an enhanced infrastructure financing district (EIFD) has been created.³⁴⁸

Assessment districts, Mello-Roos districts and Enhanced Infrastructure Facilities Districts are three geographic fundraising mechanisms commonly used in California to generate funding for infrastructure and services, as shown in

³⁴⁷ SPUR, "Measure RR."

³⁴⁸ "The Demise of TIF-Funded Redevelopment in California | The Planning Report"; Blount et al., "Redevelopment Agencies in California: History, Benefits, Excesses, and Closure"; "Explainer."

Table 10. The use of these districts has increased since the tax revolt of the 1970s caused severe funding constraints. Geographic fundraising mechanisms are more equitable for transportation infrastructure than sales tax measures because they are paid for by property owners rather than the general public. With the establishment of any geographic fundraising mechanism, we propose that the revenue generated is directed towards not only a new crossing, but a community grant program that would be managed by the aforementioned Community Advisory Board.

Table 10: Differences between types of special assessment districts

	Assessment District	Mello-Roos / CFD	EIFD
What it can pay for	Any improvement or activity that confers benefit to the properties within the boundary	Improvements or infrastructure benefitting the district	Infrastructure of "communitywide significance" called for in an infrastructure financing plan
Formation	Majority of property owners, with votes weighted by benefits accrued OR, two-thirds-voter approval (see Proposition 218 box)	Majority of residents if more than 12 residents live in district boundaries OTHERWISE, Majority of property owners	Local agency or JPA creates an infrastructure financing plan
District size and boundary-setting opportunities	District boundaries need not be contiguous, but benefit to all properties must be demonstrated	Boundaries need not be contiguous; generally limited to smaller geographies.	Boundaries need not be contiguous
Assessment mechanism	The encompassing agency must issue a report proving the benefits and showing the formula by which benefits match assessment for each property.	Each property owner is responsible for a tax lien, based on property use, improvement size, and lot size.	Tax increment financing

Sources: California Tax Data, Fulton & Shigley Guide to California Planning³⁴⁹

Assessment Districts

Assessment districts are a popular method of funding infrastructure improvements, as the concept is easy for voters and elected officials to understand. A district boundary is drawn, and every property owner inside the district contributes to the cost of the improvement through a special assessment. This model could be extended to contribute revenue towards a new transbay crossing.

Assessment districts can fund infrastructure in two ways; the first of which is standard assessments. If the benefits in question can be shown to accrue as value to real property within district boundaries, then the authorizing agency issues a report that analyzes distribution of benefits and proposes commensurate assessment levels. Then, a benefit-weighted vote among property owners must clear a simple majority to approve the district.

³⁴⁹ "California Tax Data"; Fulton and Shigley, *GUIDE TO CALIFORNIA PLANNING*.

The second option is via a generally accepted benefit to the district. In this case, the agency may levy a “special tax” rather than an assessment (see description of *Proposition 218*). Additional evaluation is needed which method is more viable for a new crossing. Such evaluation could draw from past research on the property value impacts of rail and BART stations.³⁵⁰

Proposition 218

California State Proposition 218, the “Right to Vote on Taxes Act,” tightened the rules on benefit assessments and distinguished between assessments and special taxes. When the Santa Clara County Open Space Authority formed an assessment district to preserve open space, the district assessed virtually every parcel in the county uniformly with a benefit assessment. After Proposition 218 passed, a lawsuit and eventual ruling established that the assessment was instead a special tax because it did not confer specific benefits to the broad base of property owners assessed. Subject to this ruling, an agency’s proposed assessment must be accompanied by a technical report that quantifies the benefits to each parcel. A general benefit conferred to the district parcels falls into the category of special tax, which requires two-thirds voter approval.

Mello-Roos/Community Facilities District

The Mello-Roos Community Facilities Act of 1982 enabled the creation of assessment districts for new developments to pay for necessary infrastructure. Two-thirds voter approval is required for the formation of a district. If there are at least 12 people currently living in the district, they are the electorate; otherwise, landowners are the voters, though special restrictions exist on landowner Mello-Roos districts. These landowner Mello-Roos districts, commonly called “dirt bonds,” carry special considerations and risks because there is often only raw land, or dirt, and the uncertain promise of development to back any potential revenues when such a district is drawn. Therefore, while district formation may be easier prior to development, there is also greater risk in relying on assessments of as-yet-undeveloped land.

The district may levy a property tax, either to pay directly for facilities or services, or to service bond debt for the same. The enabling legislation does not specify how to apply the tax, except that it may not be assessed *ad valorem*—that is, applied as a certain percentage of assessed value, the typical mechanism for property tax assessment. The tax is commonly based on a formula involving lot size and improvements but can also be a per-parcel tax. Also, Mello-Roos districts do not need to be contiguous or conform to any jurisdiction’s boundaries. If, for example, Alameda County wanted to draw a Mello-Roos district that extended into neighboring Contra Costa County, the two agencies would form a Joint Powers agreement for the formation of the district.

A Mello-Roos district also contains the advantage of the ability to add new property to the district by a process similar to the initial district formation. The incentive of additional

³⁵⁰ Strategic Economics, “Property Values and Fiscal Benefits of BART.”

density through upzoning may encourage participation in the district; such agreement was the driving force behind San Francisco's Transbay Terminal Mello-Roos District (see description of *Mello-Roos in Transbay Transit Center*).³⁵¹

Mello-Roos in Transbay Transit Center

The first two phases of the \$2.2 billion Transbay Transit Center project have received around \$1.2 billion from the formation of a Mello-Roos district. In 2012, the City of San Francisco authorized upzoning for several parcels in the Transit Center District Plan area. Property owners could opt to join the Mello-Roos district as a trade for additional height allowances. The Mello-Roos district allowed the Transbay Joint Powers Authority to issue bonds and impose special tax on the owners of those parcels. The tax rate calculation set in 2012 equated to 0.55% of the assessed value, or roughly \$3.30 per square foot. However, in 2015, the assessed values of these properties had increased such that the Mello-Roos assessment was around \$5 per square foot.³⁵² After a threat of lawsuit from several private developers owning parcels in the district, the district was approved to provide funding for the project.

Enhanced Infrastructure Facilities Districts

Enhanced infrastructure Facilities Districts (EIFD) have come to the foreground with the extinction of the state redevelopment program. The EIFD model, authorized by Senate Bill 628 (SB 628) in 2014, uses value capture through tax increment financing.

Unlike Mello-Roos districts, EIFDs may capture *ad valorem* property tax from consenting agencies. Participating cities or counties must therefore consent to cede what is an anticipated increase in property tax revenues to the EIFD, whereas a Mello-Roos district simply levies a separate and additional tax. This form of revenue generation is more palatable for taxpayers because it does not generate additional burden. However, its success requires cities and counties to agree to set aside property tax revenues, and in an already built-out area, the increase in property values may not generate as much money as a parcel tax.

The formation of the district does not require a vote, and issuance of tax-increment backed bonds requires only 55% voter approval within the district. Funded projects are not required to be located within the district but must detail their connection to the district in an infrastructure financing plan.

The existing legislation for EIFDs does not adequately protect the provision of affordable housing. SB 628 requires low- or moderate-income housing that is lost through takings or other redevelopment to be replaced within 2 years, and temporary replacement units must

³⁵¹ Bort, "An Introduction to California Mello-Roos Community Facilities Districts."

³⁵² Lombardo, "Memorandum - TTC DTX Major Capital Projects Update.pdf"; Cote and Dineen, "How Transbay Transit Center Deal's Collapse Would Alter S.F.;" Dineen, "Developers Drop Threats over Special Transbay Tax District."

be provided for immediate use at the time of displacement.³⁵³ However, the bill does not set aside additional money for the provision of affordable housing,³⁵⁴ unlike the former Redevelopment Agencies, which had to set aside 20% of tax increment revenues for that purpose. Senate Bill 2280 would have re-established tax-increment financing for community revitalization with a 25% affordable housing set-aside, but it was vetoed in 2014.³⁵⁵

If the above shortcomings can be fully addressed, EIFDs would be well suited for combining multiple revenue sources and coordinating the efforts of many agencies or authorities.

Half-Mile Enhanced Infrastructure Facilities District

One possible use of the EIFD model would be to establish an EIFD for areas located within a half-mile of each proposed station location, as well as existing stations. These “station catchments” represent the areas in which the improvements to the transportation system would capitalize into property values.³⁵⁶ The total size of the value increase is greatly affected by the number of vacant parcels and properties that are not built to maximum zoning potential, as these would generate the greatest changes in property taxes. While the structure of this funding mechanism would not lead to additional displacement pressures compared to other mechanisms, the historically problematic relationship between tax-increment districts and urban renewal projects means that an EIFD should be used with sensitivity to potential conflicts of interest.

Modeling could be used to estimate total potential revenue generation and, if possible, should incorporate the potential for joint development in the half-mile districts, which could increase revenues generated both from land sales and from subsequent property taxes.

Nine-County Land Value Tax

Using the land use model discussed in the Model Methodology section, we have derived rough estimates of revenue potential for one geographic funding mechanism in particular: a parcel tax levied on a special district comprising all property in the nine-county Bay Area (see Table 11). Land values for 2010 were used due to the wide range of possibilities for 2035 scenarios. As such, the total revenue generation listed below represents a lower bound of potential revenue.

This scenario offers more flexibility in where and how the funding is spent, as it is not dependent on value added from a new crossing. It could be structured as a perpetual fund for infrastructure, or it might sunset with the completion of the project. It might also be structured to apply to projects across the nine-county region, or to projects beyond transportation infrastructure. This tax would be more politically challenging to implement,

³⁵³ Beall, SB 628: Enhanced infrastructure financing districts, sec. 53398.50.

³⁵⁴ California Planning and Development Report, “Enhanced Infrastructure Financing Districts Legislation Passes in SB 628 - CP&DR.”

³⁵⁵ Alejo, AB-2280 Community Revitalization and Investment Authorities.

³⁵⁶ “PlaceMaking Strategies at BART.”

requiring two-thirds-voter approval in areas where voters may not feel they are receiving direct benefits.

We draw the conservative (0.004%) land value tax rate from 2016's nine-county Measure AA. The measure, which passed with 70% support, imposes a \$12 annual parcel tax across the nine-county Bay Area through 2037. The funds pay for environmental protection of the San Francisco Bay. Based on our land use model, the roughly \$25 million Measure AA generates per year could have been achieved with a property tax rate of approximately 0.002%. Because the total Bay Area land value is just under half of the total property value, we chose double the rate (0.004%). For the sake of comparison, we also chose a more "aggressive" land value tax rate of 0.025% to see how much money would be generated.

Table 11: Nine-county land value tax (all figures in 000's)

	Land Value, 2010	Property Value (Land + improvements)	Conservative Land Value Tax, 0.004%	Aggressive Land Value Tax, .025%
Residential	\$337,000,000	\$746,000,000	\$13,480	\$84,250
All other non-tax-exempt parcels	\$121,882,386	\$309,599,671	\$4,875	\$30,471
Total	\$458,882,386	\$1,055,599,671	\$18,355	\$114,721

Source: Produced by students in the Fall 2016 Transportation Planning Studio using UrbanSim data.

Community Grant Program

With the establishment of an EIFD and/or land value tax district, a community grant program focused on improving social equity in the region should be created from a dedicated portion of the revenue. The principle is similar to SB 535 (2006), which requires that 25% of cap-and-trade proceeds be spent on projects that benefit disadvantaged communities. The Community Advisory Board discussed in the Social Equity Opportunities and Governance sections would administer the grant program.

Regional Measure 3

Both Scenarios

Regional Measure 2, approved by voters in 2004, increased bridge tolls by \$1 on seven of the region's state-owned bridges. In addition to supporting operations, revenue from this toll increase also supports capital projects across the region, including the Transbay Transit Center, the Oakland Airport Connector, and the Warm Springs BART extension.³⁵⁷ MTC has proposed sponsoring

³⁵⁷ Metropolitan Transportation Commission, "Appendix A-1: Regional Measure 2 - Capital Program Project List."

Regional Measure 3 to raise the tolls on state-owned bridges in order to fund bridge corridor transportation, and it plans to put it on the ballot in 2018.³⁵⁸ The state legislature will determine the amount of the toll increase and where and how the revenues will be spent. Based on past bridge toll increases, a \$1-\$2 boost is most likely, with a percentage dedicated to fund major future capital projects and operations.

Congestion Pricing & Regional Measure 4

Ideal Scenario

We expect the region and state to develop an additional Regional Measure to generate revenue in the transbay corridor between now and project execution. The revenue generated by this toll would go directly towards programs that aim to decrease congestion across the region. We estimate that an additional \$1 toll on the Bay Bridge could generate \$57 million annually. This could be used towards backing a bond, and over 35 years could amount to nearly \$2 billion.

In addition to this \$1 increase, we propose expanding the peak period variable pricing scheme. This recommendation builds on the Bay Area Toll Authority and State's efforts to increase tolls in 2010 to fund seismic safety projects on the bridges and implement a peak period variable pricing scheme along the Bay Bridge.³⁵⁹ As a result of these efforts, the Bay Bridge has a peak period toll of \$6 and an off-peak toll of \$4. The ideal scenario would involve implementing peak pricing along the six other state-owned bridges. These bridges would also ideally experience overall toll increases, with a pricing formula dependent demand increasing with inflation. The automation of toll collection with FasTrak will eliminate concerns of less-than-one-dollar increases. Pricing should also account for the potential need for a toll discount for low-income riders, seniors, veterans and students as well as a discount for carpooling and high-occupancy vehicles.

BART Fare Structure Changes

Ideal Scenario

We recommend a change in BART fare structures to include an increased peak period fare, an additional Bay crossing surcharge, and a subsidized fare program for low-income riders. An increase in peak period fares would help solve capacity concerns by encouraging those with flexibility to travel off-peak. An additional transbay surcharge in addition to the current \$0.94 would likewise address capacity in the tube and provide a nexus between those who cross the Bay and a new crossing.

However, these fare increases would place a greater burden on low-income riders, making a subsidized fare program even more important. Los Angeles Metro's Rider Relief Program offers fare subsidy coupons, and Muni's Lifeline Pass offers a 50% discount on standard adult monthly passes for riders within certain income brackets.³⁶⁰ Income eligibility for the Lifeline Pass can be verified

³⁵⁸ Metropolitan Transportation Commission, "2016 Final Advocacy Program."

³⁵⁹ Deakin et al., "Bay Bridge Toll Evaluation: Final Report."

³⁶⁰ Los Angeles County Metropolitan Transportation Authority, "Rider Relief"; San Francisco Municipal Transportation Agency, "Lifeline (Low Income) Pass."

through tax returns, an award letter for CalWORKS, CAAP, CalFresh, or Medi-Cal, two State Disability of Social Security check stubs, or a Government Housing Assistance Program Contract.³⁶¹ BART currently offers discounts for people with disabilities, veterans, Medicare card holders, seniors, and DMV placard identification holders through the Regional Transit Connection Discount card.³⁶² We propose expanding this to include Medi-Cal card holders, as well as an additional option for people to apply for a subsidized pass that is based not on income but on occupation. This would allow people who are undocumented or wary of sharing personal income information to apply for a discounted pass.

The Federal Transportation Administration (FTA) requires all transportation agencies to adopt a “Disparate Impacts and Disproportionate Burden Policy” under Title VI.³⁶³ This policy applies when there is a change of service or a change in fares and requires separate analysis for minority and low-income populations, and a fare change related to a third crossing would most likely be subject to both fare and service equity analyses. This type of analysis is important but needs improvement to more equitably address the needs of disadvantaged populations. While this basic formula may be necessary for federal approvals, the region should hold itself to higher and stricter standards and impose additional procedural and analytical requirements including vulnerability assessments and a range of impact rather than average threshold.

Accessory Funding: Naming, Advertising, and Fiber Optics

Both Scenarios

Additional funding could come from selling advertising and naming rights and offering fiber optic access to riders. While these funding mechanisms have been utilized in metro areas as diverse as New York City and Dallas,³⁶⁴ there may be significant public concern in the Bay Area regarding the encroachment of the private sector in this area. Furthermore, the controversy surrounding related contracts could increase legal fees and public relations costs. Hospitals and other commercial sites have historically had greater success with selling naming rights, and in 2015, the Transbay Transit Center issued a sponsorship/naming rights offer. However, as of 2016, there has not been any public release of any contract.³⁶⁵

Cost Option Not Included: Cap-and-Trade

Cap-and-trade funding is not included in either scenario despite the fact that it has sponsored transportation projects in the past. California High Speed Rail (HSR) received \$250 million in cap-and-trade auction proceeds in 2015, and a quarter of cap-and-trade revenue is reserved for HSR each year through that project’s Phase 1.³⁶⁶ Additionally, Senate Bill 535 requires a quarter of the

³⁶¹ San Francisco Municipal Transportation Agency, “SFMTA Lifeline Pass Application.”

³⁶² BART, “RTC Frequently Asked Questions | Bart.gov.”

³⁶³ Federal Transit Administration, “Title VI Requirements and Guidelines for Federal Transit Administration Recipients (FTA Circular C 4702.1B).”

³⁶⁴ Metropolitan Transportation Authority, “Mta.info | Station Naming Rights”; North Central Texas Council Of Governments, “Innovative Finance Initiative: Cotton Belt Corridor.”

³⁶⁵ Transbay Transit Center, “Transbay Transit Center Issues Sponsorship/Naming Rights Offering for the Future ‘Grand Central Station of the West.’”

³⁶⁶ California Legislative Analyst’s Office, “Review of High-Speed Rail Draft 2016 Business Plan.”

funds raised to be spent on projects that provide direct benefits to disadvantaged communities. Such projects have included replacement of high-polluting vehicles with low-emission electric vehicles and offering van pool commute options.³⁶⁷ However, the cap-and-trade revenue stream is unpredictable. In May 2016, only 7 million of the offered 68 million allowances were sold,³⁶⁸ due in part to concerns about the legality of cap-and-trade. The court ruling on whether cap-and-trade is an illegal tax is likely to be handed down within the next year. Although auction sales rebounded in November 2016,³⁶⁹ the fundamental uncertainty of the program makes it inappropriate to rely on for funding.

Case Studies

Case Study: São Paulo “Certificates of Additional Potential for Construction”

In 2001, the Brazilian government passed the Statute of the City, federal legislation designed to assist local governments in maximizing the public benefit of land use.³⁷⁰ The statute allows vacant lot owners to be taxed at higher rates for a maximum of five years, at which point the government dedicates the land to a state-managed land bank to provide public services such as housing. The statute also gives local authorities the right to capture property value increases and to sell development rights that go beyond what is permitted by zoning regulations through changing uses, footprints, and floor area ratios.³⁷¹ These rights are sold as “Certificates of Additional Potential for Construction” (CEPACs) on the Brazilian Stock Exchange.³⁷² A version of this system has been in place in São Paulo since the 1980s, with the goal of increasing the overall housing stock and decreasing the use of informal settlements.³⁷³ The CEPAC system has been credited for quickly generating a lot of money with relatively low risk. However, its implementation raises social equity concerns, and a federal investigation committee questioned the extent to which they truly serve as an instrument for the public good.

CEPACs have focused primarily on districts that the City designates for growth and redevelopment, called Urban Operations (UO) areas. The City first makes a determination of how much additional housing stock they wish to add in the UO and how much money would be required to fund the required infrastructure improvements to accommodate that level of growth. The City then puts up for auction enough CEPACs to allow for that additional growth and sets a minimum price that ensures they raise enough money for the required infrastructure, while also factoring in the estimated increase in property values that the increased density will unlock.³⁷⁴ The revenue

³⁶⁷ Alvaro S. Sanchez, “California’s Climate Investments: 10 Case Studies Reducing Poverty & Pollution.”

³⁶⁸ California Air Resources Board, “California Cap-and-Trade Program and Quebec Cap-and-Trade System May 2016 Joint Auction #7.”

³⁶⁹ California Air Resources Board, “California Cap-and-Trade Program and Quebec Cap-and-Trade System November 2016 Joint Auction #9.”

³⁷⁰ Mathur, *Innovation in Public Transport Finance*.

³⁷¹ Sandroni, “A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential.”

³⁷² Mathur, *Innovation in Public Transport Finance*.

³⁷³ Siqueira, “Urban Operations: Public-Private Partnerships Globalizing São Paulo.”

³⁷⁴ Mathur, *Innovation in Public Transport Finance*.

generated from CEPACs must be used within the district and is linked to objectives of the UOs (see description of *CEPACs as a Fundraising Mechanism*).

CEPACs as a Fundraising Mechanism

São Paulo has issued CEPACs for two UOs, Faria Lima and Agua Espraiada, which generated US\$812 million between 2004 and 2009. Annual citywide property tax revenue with \$1.4 billion in 2007, as a point of comparison.³⁷⁵ In 2004, the first 100,000 CEPACs for UO Agua Espraiada's were auctioned for US\$150 million. Each CEPAC represented additional allowable building area of 1-3 square meters depending on land values, and the resulting sales quickly raised US\$15 million for infrastructure projects.³⁷⁶

The money raised from sales of the CEPACs were directed towards transportation infrastructure, compensation for displaced populations, construction of public housing for people living in informal settlements, and overall quality-of-life improvements for local residents. There were three informal settlements in the area, and 10% of the urban operation funding was to be spent on public housing for people that were displaced as a result of the UO.³⁷⁷ The Faria Lima UO CEPAC auction offered 90,000 CEPACs at a minimum of US\$550 each, with a spatial range of 0.8 square meters to 2.8 square meters per stock. However, only 9,091 CEPACs were sold at auction. The poor auction results were in part due to the fact that the price of CEPACs was higher than what developers could obtain on the market for development licenses from São Paolo's pre-CEPAC regime.³⁷⁸ A third public auction in 2007 had more success, as 156,730 CEPACs were auctioned, all sold at higher than the minimum asking price. This success was likely due an improved real estate market and the suspension the trading of the pre-CEPAC licenses.³⁷⁹ The lack of predictability in the market is one major drawback of the CEPACs, and while the stocks are linked to the development of specific public housing and infrastructure projects, there is no obligation for the administration to complete the projects if the associated CEPACs are not all sold.³⁸⁰

Main Benefits & Challenges of CEPACs

CEPACs have the potential to offer quick funding for public projects. However, they lack predictability and come with significant social equity concerns.

Benefits of CEPACs

- CEPACs offer infrastructure funds prior to development without any issuance of public debt. Overall, there is little public risk, as the only cost to the public is planning district objective, calculating CEPAC minimums, and organizing the auction.³⁸¹

³⁷⁵ Sandroni, "A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential."

³⁷⁶ Ibid.

³⁷⁷ Siqueira, "Urban Operations: Public-Private Partnerships Globalizing São Paulo."

³⁷⁸ Sandroni, "A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential."

³⁷⁹ Ibid.

³⁸⁰ Ibid.

³⁸¹ Mathur, *Innovation in Public Transport Finance*.

- The districts can be drawn so as to avoid negative impacts from gentrification. In São Paulo, there are areas designated for affordable housing called Zonas Especiais de Interesse Social / Special Zones of Social Interest.³⁸²
- The competitive process in theory results in the highest bids permissible by the market; if the market bids are higher than anticipated, they generate extra revenue for project spending.³⁸³
- CEPACs can be used at any time, allowing developers to invest in a good market. They can also be used anywhere in the UO; developers are not tied to parcels until they specify.³⁸⁴

Challenges of CEPACs

- Revenue from CEPACs can only be spent in the district from which they are issued, raising the possibility of a geographically inequitable distribution of resources. This issue is exacerbated by the lack of public participation in the district planning process and the reality that the UO designation can be driven by private interests. The Faria Lima district, for instance, is a more affluent area of the city with high-rise office towers, luxury apartment buildings, and some of São Paulo's most expensive shopping malls.³⁸⁵ One way to at least partially address this concern would be to allow CEPAC funds to be applied to neighboring areas that might experience negative externalities due to increased development in the UO.
- The original process did not include any accountability, which led to prioritizing increasing property values in the Faria Lima district over social benefit objectives. While public housing was built, there was not a one-to-one replacement of the housing provided by the informal settlements.³⁸⁶ Issues in execution led to a federal investigation, which found that the 10% dedication of funds to public housing was not occurring and that more was built than approved. The federal government has imposed new legislation since their investigation that requires specific accountability measures and increased documentation.³⁸⁷
- Once rights are sold, CEPAC revenue stops.³⁸⁸ While the administration has the authority to auction more CEPACs, doing so could decrease existing CEPAC prices. As holders of CEPACs not associated with a parcel do not have a right to recover financial damages, this investor uncertainty could undermine the market.³⁸⁹

³⁸² Sandroni, "A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential."

³⁸³ Walls, "A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential: Commentary."

³⁸⁴ Mathur, *Innovation in Public Transport Finance*.

³⁸⁵ Siqueira, "Urban Operations: Public-Private Partnerships Globalizing São Paulo."

³⁸⁶ Ibid.

³⁸⁷ Ibid.

³⁸⁸ Mathur, *Innovation in Public Transport Finance*.

³⁸⁹ Sandroni, "A New Financial Instrument of Value Capture in São Paulo: Certificates of Additional Construction Potential."

- To the extent that zoning helps promote general public welfare, CEPACs subvert that process.
- The fundraising mechanism is still in its infancy, and it will take time for both public and private actors to fully understand its implications. For instance, it is unclear what would happen if there is a default and a developer cannot finish a project that is linked to CEPACs.³⁹⁰

Adoption of CEPAC Mechanism

The CEPAC model has the potential to raise a significant amount of funds quickly and with low public risk, but with significant potential social equity concerns. Any adoption of a similar mechanism would require adaptation to address issues of displacement, process, transparency and accountability.

California has extensive experience with similar fundraising mechanisms. Tax increment financing and special assessment districts such as Mello-Roos are commonly used to repay bonds for infrastructure projects. Development impact fees require developers to pay specific funds to public projects that support the infrastructure needed for the density expected by their development. Transferrable development rights permit developers to build beyond their zoning allocation in exchange for the purchase of rights on another property. Density bonuses permit developers to build increased floors in exchange for the inclusion of affordable housing.

The key distinction between these funding and incentive mechanisms and the CEPAC model is that the government plays a key role in each transaction. Whereas density bonuses and impact fees are limited to a set price, with CEPACs, the government can realize upside if the auction pushes the price above the minimum. With transferrable development rights, while private entities negotiate the price of a transferrable development rights agreement, the subsequent developments are still bounded by zoning restrictions, unlike with CEPACs.³⁹¹ Establishing districts where density is determined more by market demands than by public regulations will likely result in increased housing and jobs near transit. However, it is important to maintain zones dedicated to affordable housing in order to prevent the displacement of low-income populations from these areas.³⁹²

The California legislature has the ability to implement a funding model that associates value to future building stock. Outside of the state's extensive experience with land use regulation, the cap-and-trade for carbon dioxide offers a similar platform. If California were to implement a mechanism similar to CEPACs, however, it is necessary to improve upon the model. There would need to be significant accountability and transparency measures on both the public and private side, and strict requirements for public involvement at every step of the process—from drawing the district lines to determining district objectives and ensuring successful prioritization and implementation.

³⁹⁰ Ibid.

³⁹¹ Walls, “A New Financial Instrument of Value Capture in Sao Paulo: Certificates of Additional Construction Potential: Commentary.”

³⁹² Zuk and Chapple, “Urban Displacement Project.”

Case Study: Denver

The Denver Eagle and Union Station projects provide an example of how complex projects can be delivered with a mix of funding sources and extensive use of financing. Leveraging these tools can help agencies provide public benefit by delivering projects that are otherwise too expensive. Public-private partnerships like the Denver Eagle shift some risk from public agencies, but this transfer comes with financing and transaction costs. This Denver Eagle example benefited from participation as a “demonstration” project and received over \$1 billion in federal funding—a windfall a new crossing would be unlikely to enjoy, possibly amplifying the hazards of private engagement.

Denver Regional Transit District

The Denver area Regional Transit District (RTD) provides transit service for an eight-county region encompassing Denver and a surrounding regional population of 2.8 million people. It is one of only three elected transit boards in the country. In 2001, the district began planning for an overhaul to the regional transit system with large-scale investment in light rail, commuter rail, and bus rapid transit. After a 3-year planning process that included a 96-member advisory committee,³⁹³ RTD released plans for its FasTracks initiative—a 12-year, \$4.7 billion plan.

Table 12: Revenue sources used for Denver Eagle project

Source	Amount (\$ Thousands)	Percent
FTA New Starts	\$1,030,400	51%
Private Activity Bonds	\$396,100	19%
TIFIA loan	\$280,000	14%
Other federal grants	\$57,000	3%
RTD sales tax revenue	\$128,100	6%
Revenue bond proceeds	\$56,800	3%
Local contributions	\$40,300	20%
Equity	\$54,300	3%
Total	\$2,043,000	100%

Source: Comprehensive Financial Annual Report³⁹⁴

³⁹³ Husch Blackwell, “Denver Union Station: \$500M Transportation Infrastructure Financing.”

³⁹⁴ Regional Transportation District - Finance Divisoin, “Comprehensive Annual Financial Report: Fiscal Year Ended December 31, 2014 and 2013.”

Half of the project funding would come from a sales tax measure approved in 2004 that allocated an additional 0.4% on top of RTD's existing 0.6% sales tax revenue. As shown in Table 12, the district's sales tax growth projections predicted approximately 6% sales tax revenue growth through 2025.³⁹⁵

Rising Costs and Falling Revenues Imperil Project

In the ensuing years, two important trends changed the nature of planning for FasTracks. First, the sales tax revenue did not generate the anticipated annual 6% growth. Second, commodity and material price increases drove cost estimates up dramatically.³⁹⁶ With rising costs and falling revenues impacting the project's feasibility, RTD needed another way to fund and deliver the project.

RTD chose to utilize the Federal Transit Administration's public private partnership pilot program (Penta-P), authorized by 2005's federal transportation authorization legislation SAFETEA-LU. In 2007, the FTA chose three FasTracks pilot projects to demonstrate the potential for agencies to use public-private partnerships to finance and deliver projects. These three projects came to be known as the Denver Eagle:

- The East Corridor (a 23-mile commuter rail line from Denver Union Station to the airport)
- The Gold Line (an 11-mile commuter rail line)
- The commuter rail maintenance facility

Denver Eagle: Public-Private Partnerships

The shortage in anticipated revenues and the spike in costs were contributing factors to the project's turning to a public-private partnership. Participation in the Penta-P program came with an approximate \$1 billion grant from FTA, slightly more than 50% of the project's total revenues, with the sales tax revenue providing local match. The use of a bidding process also drove down costs, as the winning bid came in at \$300 million below RTD's internal estimates. The contracting structure established a 34-year design-build-finance-operate-maintain agreement with the Denver Transit Partners (DTP) consortium. A \$3.4 million monthly payment from RTD to DTP for fulfillment of contractual duties ensures quality service even in the event of low ridership, as payment deductions for any poor performance would reduce the consortium's profitability.

The resulting revenue sources put together by the consortium are given below in Table 12. The private bonds and private equity together combine for 22% of project revenue. Private equity investors typically expect a higher return, so their inclusion drives the project's cost up. The private activity bonds are publicly issued (and therefore tax free for investors) but backed by the concessionaire's revenue stream. Some of this repayment revenue comes from fares on the lines the concessionaire has built, and the 2016 FasTracks budget shows a projected increase in farebox revenue of 565%—from \$4.031 million to \$26.797 million.³⁹⁷ This increase is attributable to the opening of new services, but regardless, the ridership forecast risk is with the agency. The \$1 billion

³⁹⁵ Regional Transportation District, "Fastracks Plan."

³⁹⁶ "Eagle P3 Project, Denver, CO | Department of Transportation."

³⁹⁷ Denver Regional Transportation District, "Adopted Budget 2016."

FTA New Starts grant funding helped ensure that this “demonstration project” would be delivered. Short of this grant award, more equity investment would have had to make up the funding balance.

Allocating Risk

The contracting structure has the effect of insulating RTD from fears of material or labor cost increases and passing those costs onto the concessionaire. The monthly performance payments keep the risk of low ridership with the transit district, and financial incentives and poor performance penalties ensure the concessionaire adequately builds, operates, and maintains the transit lines.

RTD has imposed these penalties multiple times, as in one example where the safety gates at at-grade crossings failed to come down. The result has been increased personnel costs to DTP to pay for round-the-clock traffic flaggers and \$1.1 million in performance penalties.³⁹⁸ Until the problem is addressed, RTD will continue to withhold \$250,000 per month, or 7% of the monthly scheduled availability payments. Regarding the penalties, DTP’s project director John Thompson said, “For us to get to 100 percent of our [debt servicing] payment, we have to be north of 95 percent on availability [payments]—and we’re not there.”³⁹⁹

In May 2016, a lightning strike caused the train to stall, forcing the evacuation of approximately 80 passengers. RTD and DTP disagree on the cause of the breakdown, but potential lightning strikes had been a controversial subject during the design phase. DTP has filed a “force majeure” claim, essentially arguing that the incident was an “act of God” and beyond their control. A dispute is currently being worked out, and harsh financial penalties are expected.

In one sense, these penalties are a public-private partnership process at work—presumably a private entity with debt and equity investors has as much or more incentive to rectify such problems than would a public agency, lest they go bankrupt. But a problem with offloading those risks to the concessionaire is if the transit system is not properly maintained or operated, the public suffers. Financial penalties align incentives but do not by themselves create better outcomes. At the same time, the dispute resolution process increases the transaction costs of a P3.

Conclusion: Funding and Financing Key Recommendations

A new crossing project will require a very large amount of funds. We identified possible funding sources available in constrained and an ideal scenarios and highlighted potential opportunities and challenges. A summary of our key recommendations is below.

- 1) Project leaders must go beyond a “do no harm” philosophy of social equity.**
Regional inequality is a persistent and wide-ranging problem, and a new crossing represents a huge opportunity to generate equitable outcomes. Every step in the funding and financing process must ensure that certain populations are not being disproportionately burdened by the project. Furthermore, any project must incorporate specific mechanisms for meaningful community engagement, such as a

³⁹⁸ Aguilar, “A-Line Design Questions That Have Caused Travel Delays Were Brought up as Early as 2013.”

³⁹⁹ Proctor, “Exclusive.”

transparent public involvement process, accurate cost and timeline estimates, and a long-term Community Grant Program.

- 2) **Utilize reference-class forecasting to budget for the unexpected.** This project will necessarily be complicated, and the planning and construction process will span many years. Use some of the methods discussed in this report and avoiding the everything-goes-according-to-plan approach to planning and budgeting.
- 3) **Revenue sources should be broad and stable while minimizing regressivity.** The more stable the funding source, the higher the bond rating and lower the debt risk. Half-mile catchment areas around new stations is the most obvious and politically salient funding mechanism, but a project of this magnitude should not rely on simply what is most politically expedient. Regional, or at least multicounty, support will be necessary. Chosen funding mechanisms must also make sure to limit regressivity.
- 4) **Funding from existing crossings should come primarily from drivers.** The BART system already has relatively high fares and a transbay surcharge in place. While increasing fares adheres to the “user pays” principle, it also makes a service that should be available to all prohibitively expensive for low-income riders. As Bay Bridge drivers also benefit from more people taking transit across the bridge, toll revenue is a sound option.
- 5) **Engagement with the private sector must proceed with caution.** Private equity investment can increase financing costs, and ensuring proper risk transfer in contracting can increase transaction costs. Instead, lean heavily on low-cost public financing mechanisms like TIFIA loans and municipal bonds as much as possible.