

Appendix I: White Paper

MAJOR PROJECT DELIVERY

KEY TOPICS

- Case studies of large project delivery strategies employed in other jurisdictions
- Summary of project delivery success factors

1 Introduction

Background research for the SFTP identified the need to expand the city's capacity to deliver major infrastructure projects, including through alternative and innovative methods. Funding for large infrastructure projects is limited, and self-help strategies will need to continue to be pursued, including user fees and taxes, value capture mechanisms, and Public-Private Partnership (PPP) strategies, if the city is to meet its ambitious goals and growth plans. This report was developed to investigate strategies to improve project delivery and identify innovative delivery strategies.

San Francisco has had some success in delivering high-profile, complex projects. While some project timelines have been lengthy, many are distinguished by innovative funding, design, or institutional arrangements. Such projects include the Embarcadero Boulevard, Central Freeway/Octavia Boulevard, and Presidio Parkway Project. Other major investments are anticipated in the coming period, such as the Transbay Terminal/Downtown Extension of Caltrain, Van Ness and Geary Bus Rapid Transit projects, the Better Market Street project, Muni Metro M-line west side alignment and grade separation, BART and Muni Metro enhancements, and ultimately blended Caltrain/High-Speed Rail. To meet the city's goals and growth plans, it is likely that another generation of robust light and heavy rail investments will be required. This investment program demands a robust funding and project implementation strategy in order to be realized.

1.1 | Purpose of Analysis

This Major Project Delivery research project involved two fact-sheet style case studies of regional agencies that have mounted major project delivery efforts at the program level in response to local goals or mandates. Cases were selected based on an initial survey of online sources and recommendations from interviews of key informants knowledgeable of successful innovative programs. Of particular interest were the funding, institutional, policy, political, and contractual arrangements that were marshaled for those efforts. Based on existing data available online and in agency reports, the study summarizes already published facts, analyses or opinions about the projects that were or will be delivered and the overall program, in terms of their perceived benefits and impacts; estimated versus actual costs; institutional transparency and accountability; timeliness of delivery and overall public opinion. This work was supplemented by interviews with practitioners or stakeholders who were involved with, or knowledgeable about, these efforts.

The study aims to identify different models for delivering large transportation projects and document, in a limited way, the local situation and context in which it came about, what results were observed, and

the opinions of interviewees knowledgeable about the projects and programs. With this information, the study produces a set of findings.

1.2 | Research Approach

In order to understand the institutional and political context in which various programs were situated, the study began by examining the structure of public entities involved in transportation infrastructure from funding, through delivery, all the way to operations and maintenance. The information gathered is summarized in Table 1.

Subsequently, a close examination of the history and features of sales tax measures in the largest California metropolitan regions was undertaken, recognizing these measures' importance in funding transportation in California and consequently their strong influence on project delivery, selection, and maintenance. The results of this examination are summarized in Tables 2-5. Counties located in large metropolitan regions, regardless of amount of annual revenues, whose most recently passed transportation sales tax measures contain a programmatic fund allocation for transit operations are also described in Table 6 to provide further context. These findings afford a better understanding of transportation funding and delivery in the state and informed the selection process of in-depth case studies.

Following this, a number of experts in the field of transportation funding, finance, and project delivery in the California context were contacted and interviewed. These interviews permitted the development of an understanding of past and present trends in the field, as well as helped to further focus efforts on a small number of metropolitan regions and agencies. Information gathered in these interviews was also ultimately incorporated into the case studies.

As a result of this research and the industry expert interviews, the San Diego and Los Angeles metropolitan areas were selected for closer examination, based on transportation capital program and region size; program nature and types of projects; and apparent presence of innovative practices.

The case studies that follow explore the two areas by concentrating on the sales tax administrators in each. They integrate information from interviews with industry experts external to transportation agencies, interviews with agency staff themselves, and research based on available reports and documents.

2 Observed Strategies

The application of innovative project delivery, funding, and financing practices to major transportation infrastructure projects represents both a response to current political and fiscal environments, as well as the ongoing pursuit of greater efficiency in delivering transportation projects. San Diego and Los Angeles represent a fast-growing, medium-sized metropolitan area and the third-largest metropolitan area in the country, respectively, and both are known for their car-oriented transportation culture.

To address increasing need and demand for new transit infrastructure, creative congestion management solutions, and rehabilitation of existing facilities, both have pursued innovative methods to get projects on the ground more quickly and economically. Four broad strategies were identified in the course of this study: non-traditional contractual arrangements; innovating funding and financing practices; stakeholder coordination methods; and accountability and oversight measures.

3 Case Study: San Diego

MANY RESPONSIBILITIES: Institutionally, SANDAG plays many roles for a medium-sized region: MPO, CMA, sales tax authority and Express Lane operator, as well as toll road operator as of July 29, 2011. It is also tasked with managing and delivering highway and transit projects in the San Diego region, but is neither a highway nor transit operator.

STRONG ON HIGHWAYS: SANDAG has traditionally been successful at expediting and working with Caltrans to deliver highway projects. This is partially a function of their close relationship and amount of institutional overlap with the California Department of Transportation (Caltrans) District 11; the two often act as an integrated project team, and one interviewee reported that many SANDAG staff are former Caltrans District 11 staff. Though SANDAG does not deliver highway projects, they control a large proportion of the funding for the projects in the region and have significant influence over project development and selection; one interviewee suggested that SANDAG functioned as a board that evaluates and influences projects. In the case of the recent I-5 Managed Lanes project, for example, SANDAG made many of the decisions related to the alternatives analysis, despite Caltrans being the lead agency.

NEW TO TRANSIT DELIVERY: SANDAG received the responsibility of delivering transit projects with the passage of SB 1703 (2003); the Metropolitan Transit Development Board and the North San Diego County Transit Development Board were consolidated into SANDAG as a result. This change occurred around the time of the arrival of Gary Gallegos as the Executive Director of SANDAG. One interviewee suggested that this shift was in part owing to stakeholders' confidence in his leadership.

The consolidation was a move to strengthen regional planning as well as better promote transit and land use integration, since SANDAG, as the metropolitan planning organization (MPO) and Congestion Management Agency (CMA), has some influence over the latter. An interviewee cited the weaker link between design of long-term capital projects and needs of daily operations as a result of the separation of project delivery and operating responsibilities as a downside to this institutional arrangement.

SMALL FULL-TIME STAFF: SANDAG has decided upon a practice of retaining long-term on-call consultants and foregoing the maintenance of a large staff; in this arrangement, they limit in-house activities to community outreach and technical coordination. Staff members often play the role of high-level project or program managers. The scale of these contracts can be as large as \$26M spent on a task order to on-call contractors for engineering and planning activities; these contracts may have up to 15 to 20 sub-contractors each.

3.1 | Contractual Arrangements

SANDAG has been intimately involved in a number of projects that have employed non-standard contractual arrangements, though they have not had extensive experience with letting contracts themselves in these situations. Design sequencing, construction-management/general contractor, and design-build arrangements (listed in order of decreasing direct owner control) have all been used on projects at Caltrans District 11 over which SANDAG has had significant input and control. More recently, SANDAG has begun looking to adopt these methods for projects they will lead and deliver directly.

DESIGN SEQUENCING: Design sequencing has been used successfully in the San Diego region, including with the I-15 Express Lanes project. Though SANDAG was intimately involved in the delivery of these projects, the contracts were let by Caltrans; design-sequencing enabling legislation, AB 405 (1999), only permitted Caltrans to pursue such delivery models. This legislation defines design sequencing as “a method of contracting that enables the sequencing of design activities to permit each construction phase to commence when design for that phase is complete, instead of requiring design for the entire project to be completed before commencing construction,” with a minimum initial design requirement of 30%.

Design-sequencing can also be used to begin construction before the finalization of complicated but non-critical elements or the completion of right-of-way acquisition. The same interviewee suggested that this method could save up to 12 months due to the overlapping of the final design process and actual construction activities.

In the case of these projects, said one interviewee, design was completed to an average of 70% before allowing contractors to bid. While Caltrans and SANDAG also hoped that contractors would have input in the final 30% of design, due to contractual structures that rendered the incorporation of a contractor’s design input difficult because of change-order requirements or a cost reduction incentive proposal (CRIP), the desired level of contractor input and resulting innovation or cost savings in the design process was not realized.

DESIGN-BUILD (DB): SANDAG has experimented with Design-Build on a small scale. Under the Design-Build delivery method, the agency contracts with a single designer-builder, often a construction manager, who self-performs or directly contracts for all design and construction work; the purported benefits of the system are both time and cost savings. Cost efficiencies can be realized through the accountability of the designer to the construction contractor: the construction contractor works with the designer in an iterative process to ensure that the final design is affordable and easy to build. Additionally, time savings can be achieved through more holistic project and resource management, as well as the ability to overlap different project phase activities more easily.

Examples of SANDAG’s experimentation with this method are a series of park-and-ride parking garages for bus rapid transit (BRT) facilities as part of the I-15 Corridor Express Lanes project. An interviewee stated that, though the projects did not experience drastic cost escalation or delays, SANDAG did not feel that this approach realized the expected level of time- and cost-savings that would justify further pursuit of DB in the immediate future.

CONSTRUCTION MANAGEMENT/GENERAL CONTRACTOR (CMGC): In 2012, SB 1549 was passed to allow SANDAG to work in CMGC arrangements for transit projects; the same year, AB 2498 (2012) was passed, which established a CMGC pilot program for Caltrans. One interviewee noted that CMGC is perceived as a successor to or augmented version of the design-sequencing technique at SANDAG and Caltrans District 11.

In this method, as defined by the legislation, a contractor is brought into the design process and works with an agency-hired consultant or staff doing the design; the design is completed to at minimum 30% and then the involved contractor has the opportunity to bid on the project. If the agency finds the bid unsatisfactory, the project can then be open to other bidders.

CMGC is similar to Design-Build, but the contractor does not hire the designer or perform the design him or herself. As a result, the contracting agency retains more control over the design process and also maintains ownership of the final plans.

In previous experience with design sequencing, little interaction between designers and builders existed; its principal benefit was achieved by overlapping the two processes temporally to realize time savings. The hope for CMGC is to engage contractors on complex projects (such as I-5 or the Mid-Coast Corridor trolley) early in the process to receive input and benefit from innovative design or engineering methods.

MID-COAST LIGHT RAIL PROJECT: This project, which is partially funded by the federal New Starts Program and will connect University City and UCSD to downtown San Diego, will be SANDAG's first major opportunity to deliver a large-scale transit project. The delivery method chosen will be partly Design-Bid-Build (DBB) for the portion that requires extensive third-party coordination and partly CMGC on the more straightforward portion of the project. The breakdown of contracting types represents a desire of SANDAG's to maintain more control over the project delivery process for more complex project components, which DBB affords.

3.2 | Stakeholder Coordination

Coordination of the various actors in project delivery was cited by more than one interviewee as one of SANDAG's strengths. This fact is in part attributable to their close relationship with Caltrans, but extends beyond the integration of the two agencies. SANDAG has given particular attention to the organization and management of large-scale projects or clusters of projects, which has streamlined processes and partially protected them from delays. Sensitivity to environmental concerns through incorporation of dedicated environmental consultant resources has additionally mitigated the impacts of environmental factors on project delivery.

CORRIDOR PROJECTS: A strong emphasis has been put on corridor projects, in part motivated by the requirements to received funds from the Corridor Mobility Improvement Account (CMIA) established in 2006 by Proposition 1B. One interviewee noted that the project teams, which include members from multiple agencies and consulting firms that result from these corridor projects, allow SANDAG to involve the most knowledgeable and skilled individuals, regardless of affiliation.

I-15 CORRIDOR: This project included managed lanes and bypass ramps to facilitate access for both High-Occupancy Vehicles and planned Bus Rapid Transit. The lanes themselves were constructed in three segments, with the final segment opening January 17, 2012, a year early and under budget. The construction of BRT-related facilities such as transit centers with parking structures is ongoing and projected to finish construction by 2016. This project in particular has provided SANDAG the opportunity to develop and hone approaches to corridor projects which it plans to carry into the future.

NORTH COAST CORRIDOR: SANDAG is also managing a large, \$6.4B programmatic, packaged effort which entails environmental mitigations and upgrading road, rail, and bike-pedestrian facilities along the northern section of I-5. A subproject within this is a bundle of upgrades to the LOSSAN Corridor, which involves 20 different rail projects, including double-tracking and adding stations to commuter rail facilities in the corridor; none of these are major infrastructure projects like the Mid-Coast Light Rail project, however.

According to interviewees, the corridor model has had a positive, synergistic effect on the quality and thoughtfulness of the delivered projects, and has also inspired Caltrans District 11, through its involvement, to consider other projects differently. Through Caltrans District 11's close relationship with SANDAG, the two have been able to build an understanding of one another's goals. Their

relationship has been less adversarial as a result; Caltrans understands and supports SANDAG's vision of projects as regional products designed to enrich the region holistically, rather than as mere highway construction projects. The North Coast Corridor is an example of this: more than one interviewee observed that there has not been significant opposition on the part of Caltrans to include other, non-highway aspects of the program.

In the context of the North Coast Corridor, SANDAG is pursuing a Construction Manager General Contractor (CMGC) project delivery model for many of the projects in order to speed delivery and manage construction costs, while still retaining ownership of final designs.

ENVIRONMENTAL INVOLVEMENT: The North Coast Corridor, I-15 Corridor, and SR-76 projects have all involved the incorporation of the environmental concerns in the delivery process, going as far as having a full-time staff member for the most recent program, the North Coast Corridor. Funding and impetus for this largely comes from the inclusion of an \$850M environmental mitigation program in the new Transnet transportation sales tax ordinance.

This programmatic environmental approach to mitigation spans multiple projects and phases and, according to more than one interviewee, has reduced surprises and increased acceptance of projects, particularly in a region where there are many environmental concerns with regard to development activities. Such an approach has also served to partially transform these transportation projects into environmental enhancement projects, which has further increased engagement.

3.3 | Accountability and Oversight

SANDAG has pursued a number of methods to ensure accountability to the public and its stakeholders. It has additionally established oversight systems for project delivery that attempt to identify and manage potential issues; self-monitoring and provision of information in a transparent way have been the most vital components to reach these goals.

PUBLIC INFORMATION: SANDAG, in conjunction with Caltrans and the help of consulting firms PBS&J and HNTB, launched the Transnet Dashboard in August 2006, which provides interactive information about up-to-date schedule, budget, and expenditure information for Transnet Early Action Program projects. General information is provided in a legible way with graphics, while more specific, specialized project information is also available in text and table formats. This tool is part of a larger website called 'Keep San Diego Moving,' which provides organized, easily accessible information about Early Action Program projects.

EARLY ACTION PROGRAM: This program was established by the second Transnet ordinance, which specified that a bundle of the total projects slated for delivery from the sales tax would be delivered within a 10-year timeframe. These projects include both highway and transit. Every 4 years, the transportation plan is updated; with each update, SANDAG continues to prioritize the Early Action Program projects. Establishment of a bundle of projects with a set timeline has led to greater voter buy-in and has created a manageable package that provides SANDAG with focus, goals, and deadlines for which it is accountable.

OVERSIGHT: Oversight requirements outlined in the Transnet ordinance provide for the creation of an Independent Taxpayers' Oversight Committee (ITOC), as well as a system of three audit or review cycles (annual, triennial, and decennial), the former two being the responsibility of the Transnet ITOC.

The ITOC's stated tasks are to enhance accountability for the Transnet Expenditure Plan; ensure the completion of voter mandates; and develop recommendations for the improvement of financial integrity and performance of SANDAG's project delivery practices. Each of the seven members of the ITOC represents a different area of expertise in the field and is selected by a committee composed of San-Diego-region city mayors and county supervisors. Specific responsibilities of the ITOC include contracting an annual audit of all Transnet-funded activities for requirement compliance and preparing a report for the SANDAG Board of Directors summarizing this; conducting a triennial performance audit of SANDAG and other agencies involved in Transnet-funded programs to review project delivery, cost control, schedule adherence, and related activities complete with recommendations; and providing review and comment for various reports and actions undertaken by SANDAG.

In addition to the two audits performed by the ITOC, a comprehensive ten-year review of all projects and programs implemented under the Expenditure Plan in the previous ten years is mandated in order to evaluate the potential need for revision of the Expenditure Plan to improve performance. The robustness of this oversight and auditing system provides ongoing opportunities for comprehensive evaluation of project success and risk factors.

4 Case Study: Los Angeles

ALL UNDER ONE ROOF: The Los Angeles County Metropolitan Transportation Authority (LACMTA or 'LA Metro') was formed in 1993 by the merger of the Los Angeles County Transportation Commission (LACTC) and the Southern California Rapid Transit District (SCRTD). As such, LA Metro is a number of things for Los Angeles County: Congestion Management Agency (CMA), Regional Transportation Planning Agency (RTPA), sales tax authority, and transit owner/operator.

A STRONG AGENCY: LA Metro is a strong player in the region when compared to other levels of transportation planning and governance, such as the Southern California Association of Governments (SCAG), which is the Metropolitan Planning Organization (MPO) for the greater Los Angeles area. One interviewee stated, for example, that LA Metro selects projects and programs with little input from SCAG, though the individual indicated that this may be slowly changing as a result of a change in leadership at SCAG.

VAST REACH: Los Angeles County, over which LA Metro has jurisdiction, contains 88 incorporated cities and holds about 10 million of the region's 18 million people (55%).

TRANSIT DELIVERY, NOT HIGHWAY DELIVERY: LA Metro delivers most transit projects in the region, but relies on Caltrans or local governments to deliver highway and roads projects. There are key exceptions to this, including the three highway projects planned as public-private partnerships (PPP), toll congestion-priced tolled facilities along the I-10 and I-110, and the improvements to I-405 in the Sepulveda Pass.

4.1 | Contractual Arrangements

DESIGN-BUILD (DB): Metro has extensive experience with DB, particularly on maintenance facility and transit projects, to the extent that DB is their preferred method. According to one interviewee, LA Metro has determined that DB is most successful when individuals involved have previous experience with such a method, as well as with the type of project itself, since part of DB's success is related to a

well-designed and specific contract which measures performance and sets good milestones. An example of LA Metro's recognition of this fact is the project delivery structure of the Eastside Gold Line extension: though most was delivered under a DB model, they chose to construct the tunnel with a more traditional Design-Bid-Build (DBB) method due to a lack of certainty or recent experience with tunneling; the interviewee indicated that LA Metro now feels more comfortable about using design-build to deliver a tunnel project.

While DB is the preferred method due to the time savings realized by overlapping design and construction, which one interviewee estimated to be around 8 to 10 months on average for transit projects, each project is assessed to establish the best project delivery method: an evaluation process is undertaken and the results are taken to the LA Metro Board of Supervisors to make a recommendation. The interviewee also indicated that outside consultants are brought in when such a determination can be difficult for LA Metro to make alone.

I-405 HIGH OCCUPANCY VEHICLE (HOV) LANES AND IMPROVEMENTS: The state was interested in using a DB strategy to deliver this project. As a result, the state legislature passed a law, SB 1026, in 2006 allowing Metro to deliver it; according to one interviewee, this decision was due to LA Metro's experience, and Caltrans' relative inexperience, with DB projects. Caltrans will still be responsible for operations and maintenance of the facility after completion. The project has encountered some major delays, particularly related to issues with utility relocation and a large retaining wall, and the completion date has been advanced from May 2013 to mid-2014. Despite this, official sources claim that the project has been shortened by up to 7 years by the use of Design-Build.

GOLD LINE EASTSIDE EXTENSION: This project, completed in November 2009, was among the first at LA Metro to be delivered under DB. Though most components of the project were bid as DB projects, the construction of the tunnel portion was delivered under the more traditional Design-Bid-Build. The motivation for this mixed method, as explained by one interviewee, was to maintain greater agency control over the tunnel portion, with which LA Metro had little successful experience and which was politically sensitive after safety and construction issues during the construction of the Red Line subway. The project was ultimately delivered on time and budget, thereby providing the impetus to continue pursuing DB for other projects.

4.2 | Funding and Finance

Owing in part to their size and their pursuit of such a large program of projects, as well as the pressing need for reliable transportation and congestion relief, LA Metro has and continues to pilot and advocate for innovative ways to maximize their intake and availability of both funding and financing at many scales: on a project-by-project basis, as well as at the county, state, and federal levels.

PUBLIC-PRIVATE PARTNERSHIPS (PPP): LA Metro is currently examining and experimenting with large-scale PPP projects, which they view as a way of completing projects more quickly and at an earlier date. Following the passage of Measure R, LA Metro initially decided to evaluate three transit and three highway projects for PPP-model application. After consideration, they determined that PPPs would be beneficial to pursue for the three highway projects (a freight corridor along I-710, a tunneling project at the northern terminus of the same corridor, and a new freeway in Northern LA County) but decided that none of the transit projects should move forward as PPPs.

Metro now has a small PPP Program department, consisting of two people. The first application of a PPP strategy will be a bundle of projects called the Accelerated Regional Transportation Improvements, for which a request for proposals will be released in the near future at about \$700M. Notably, however, this bundle of projects is not one of the three projects set out in the initially considered program.

Despite Metro's tendency not to deliver highway projects, it will deliver these PPP highway projects due to their intention to either take the toll-revenue risk, such as for truck routes with low volumes, or will provide an availability payment; almost all of the local money for these projects will come from LA Metro. Nevertheless, Caltrans will ultimately become the owner-operator.

ACCELERATED HIGHWAY PROGRAM: The goal of this program is to accelerate delivery of highway projects specified in Measure R that aren't fully funded through traditional funding sources. It entails pursuing Public-Private Partnership (PPP) models.

30/10 - AMERICA FAST FORWARD: The 30/10 Plan, described as a goal to deliver 30 years' worth of transit projects in 10 years, advanced at the time of the passage of the 2008 Measure R transportation sales tax. The Plan amounted to 12 key transit projects that serve as a program of projects that receive resource and funding priority. The Plan, whose branding is no longer officially being used at LA Metro, represented a best-case scenario for the development of funding and finance programs at a number of levels of government. America Fast Forward, the federal component of this suite of tools, sought to work with the federal government to increase access to financing for transportation projects through an expansion of the Transportation Infrastructure Finance and Innovation Act (TIFIA), which provides loans to transportation agencies to build transportation projects, and the creation of a Qualified Transportation Improvement Bonds (QTIB) program. Due to the inability to fully attain America Fast Forward's goals in addition to the failure of a new sales tax measure, the timeline for projects formerly included in the 30/10 Plan is closer to 15 years, according to one interviewee. Nevertheless, Metro continues to make particular efforts to identify methods of accelerating these projects.

BONDING AGAINST FUTURE REVENUES: Both the transit and highway accelerated delivery programs mentioned above involve issuing bonds against future sales tax revenue, particularly those raised by Measure R, in order to deliver projects faster. PPP highway projects may additionally involve bonding against future toll revenue in situations where the facilities are tolled.

To further take advantage of this tool, LA County attempted to extend the Measure R tax, which is not slated to sunset until 2039, for another 30 years in order to bond against revenue even further into the future. The initiative placed on the November 2012 ballot, called Measure J, failed to reach the necessary two-thirds vote by half a percentage point.

4.3 | Stakeholder Coordination

INTEGRATED PROJECT MANAGEMENT OFFICE (IPMO): Metro has begun to establish integrated project offices for given projects, which bring designers, engineers, staff and others under one roof without creating a legally separate entity, such as a joint powers or construction authority. This strategy was initially used on the Gold Line Eastside extension and has subsequently been viewed as a successful model to pursue; an IPMO has been created for the forthcoming Crenshaw/LAX Corridor project.

4.4 | Accountability and Oversight

HISTORY: LA Metro (and its predecessor SCRTD) experienced past complications with delivery of transit projects, such as the original Blue and Red lines, which created frustration and tension with local elected officials. One interviewer said that early struggles were particularly related to inexperience, while another indicated that this was in part related to a disagreement over the ability to finish projects with available funds that had been lobbied for by these officials.

As a result, two separate pieces of legislation were passed that created the Blue Line extension (now Gold Line) and Expo Line construction authorities in 1998 and 2003, respectively, thereby taking away control of project delivery from LA Metro. These construction agencies proved to be problematic due initially to their incentive structure, which encouraged speed and cost savings without sufficient controls to encourage construction of quality facilities that were easy to maintain and operate. More recently, LA Metro has worked to create more accountability within the existing construction authorities, which has helped ameliorate these issues. The second phase of the Gold Line Foothill Extension, to Azusa, which continues to be delivered by the Gold Line Foothill Extension Authority, is proceeding on time and on budget, while the final phase of the Expo Line has likewise encountered few issues related to project delivery.

Nevertheless, in part due to the challenges with these construction authorities, LA Metro has been able to use the delivery of the Orange Line Bus Rapid Transit line and the Gold Line Eastside Extension, delivered on-time and on-budget, to demonstrate their abilities and regain regional confidence and support. One interviewee stated that the improvements in the ability to deliver projects that enabled these successes were strongly related to a major institutional restructuring.

OVERSIGHT: The first annual audit requirement and oversight committee for LA Metro were established by the Reform and Accountability Act in 1998, approved by the voters of Los Angeles County, with the stated goal of restoring voter confidence and creating higher accountability in the expenditure of Proposition A and Proposition C sales tax revenues. Subsequently, the Measure R ordinance passed in 2008 required a similar annual audit of LA Metro's compliance with the ordinance and formed an Independent Taxpayer Oversight Committee (ITOC) for Measure R.

LA Metro's Measure R ITOC is composed of three retired state or federal judges, with the Los Angeles County Board of Supervisors, the mayor of Los Angeles, and the Los Angeles County Selection Committee each selecting one. These ITOC members consult with an advisory panel that they have selected, composed of six to twelve members, with one to two members each coming from six areas of expertise relevant to project funding and delivery. Specific responsibilities of the ITOC include creating a report summarizing the annual audit of LA Metro's compliance with the Measure R ordinance, for which the agency itself contracts, and reviewing and making findings regarding ordinance amendments and debt financing.

5 Conclusions

5.1 | Project Delivery Success Factors

CONTRACTUAL ARRANGEMENTS: Various alternative delivery methods exist, such as DB, CMGC, and Design Sequencing, which alter the contractual relationships and roles of those involved in project delivery. Based on these two case studies, it appears that no one such arrangement is guaranteed to produce cost or time savings; SANDAG has seen less success with Design-Build and as such has

decided to pursue a different alternative delivery method, while at LA Metro, according to one interviewee, Design-Build is the preferred method for transit project delivery. SANDAG has nevertheless identified a broadly successful alternative delivery method, design sequencing, and continues to pursue what it sees as its successor, CMGC, which shares some, but not all, of the features of DB. Such outcomes suggest that alternative delivery methods are valid options for a broad array of, though not all, projects. An evaluation process like that of LA Metro potentially provides a good model for selecting project delivery systems, incorporating outside knowledge and experience with regard to the types of projects most suited to alternative project delivery.

STAKEHOLDER COORDINATION: Successes as a result of collaboration, and the related strategy of collocation, can be seen in a number of instances in San Diego and Los Angeles: the positive, intimate relationship between SANDAG and Caltrans; the benefits accrued by SANDAG and Caltrans from early engagement of environmental interests; and the Integrated Project Management Office model at LA Metro. In each case, interviewees identified collaboration as a key aspect of the success of the projects also evidenced by plans to replicate such arrangements in the future.

FUNDING AND FINANCE: Innovative or novel ways of funding and financing projects offer the opportunity to deliver within an increasingly constrained transportation budget scenario. LA Metro in particular provides a number of examples worth noting. New funding and financing sources can be identified at multiple levels: at the federal level with improved and expanded bond and loan programs, at the local level with sales tax revenue extensions that can be bonded against the future, and at the intersection of the public and private sector through public-private partnerships.

ACCOUNTABILITY AND OVERSIGHT: Often critical for success of transportation revenue measures, accountability and oversight mechanisms have also been integrated into transportation sales tax measures and project delivery activities at both SANDAG and LA Metro in order to maintain or increase voter confidence and support for both the agencies and the projects themselves. In both regions, Independent Taxpayer Oversight Committees (ITOCs) were established by sales tax measures to perform vital oversight functions and advise the agencies, and they developed programs of projects slated for acceleration through prioritization and bonding that have aided in legibility of agency goals and voters' ability to identify with projects. SANDAG additionally built a website that provides up-to-date funding and delivery information in graphic and text formats to increase transparency and consequently voter confidence.

INSTITUTIONAL KNOWLEDGE AND EXPERIENCE: Prior experience with types of projects and project delivery methods was identified by numerous interviewees, in differing ways, as critical to successful delivery. In the case of LA Metro, one interviewee contended that its current success with Design-Build was largely a result of agency knowledge and previous experience with letting and managing Design-Build contracts. Furthermore, the individual stated that Design-Build was preferred for types of projects with which LA Metro already had experience, likely with a more traditional, Design-Bid-Build model. In cases where uncertainty existed, expert consultants were sought out.

Interviewees expressed similar sentiments about the San Diego region: experience with design sequencing allowed SANDAG and Caltrans to benefit more consistently from its use. Additionally, an interviewee identified both the use of large consultant contracts and the flexibility of the integrated project team model as an opportunity to reap the benefits of experience indirectly.

6 Appendix

6.1 | List of Interviewees

Bates, Toni – Assistant Vice President/Planning Manager at Parsons Brinckerhoff

Failing, Doug – Executive Director of Highway Programs at LA Metro

Kosup, Allan – I-5 and SR-76 Corridor Director at Caltrans District 11

Murthy, K.N. – Executive Director of Transit Project Delivery at LA Metro

Schneider, Michael – Senior Vice President at Infraconsult

Way, Cecily – Senior Transportation Planner at Parsons Brinckerhoff

6.2 | List of Organizational Acronyms

A.C. Transit – Alameda-Contra Costa Transit District

BART – Bay Area Rapid Transit

Caltrans – California Department of Transportation

HNTB – HNTB Corporation

LACMTA (LA Metro or Metro) – Los Angeles County Metropolitan Transportation Agency

LACTC – Los Angeles County Transportation Commission

LAX – Los Angeles International Airport

MTC – Metropolitan Transportation Commission

NCTD – North County Transportation District

OCTA – Orange County Transportation Authority

PBS&J – Currently ‘Atkins’

SACOG – Sacramento Council of Governments

SANDAG – San Diego Association of Governments

SCAG – Southern California Association of Governments

SCRTD – Southern California Regional Transit District

SDMTS – San Diego Metropolitan Transit

SFCTA – San Francisco County Transportation Authority

SFMTA – San Francisco Metropolitan Transportation Agency

SRT – Sacramento Regional Transit District

STA – Sacramento Transportation Authority

Table 1 Key California County and Regional Transportation Agencies

REGION	ORGANIZATION	SALES TAX AUTHORITY	TRANSIT PROJECT DELIVERY	HIGHWAY PROJECT DELIVERY	CONGESTION MANAGEMENT AGENCY	TRANSIT OPERATOR	METROPOLITAN PLANNING ORGANIZATION	REGIONAL TRANSPORTATION PLANNING AGENCY
San Diego	SANDAG	✓	✓	(✓) ¹⁰	✓		✓	✓
	SDMTS					✓		
	NCTD					✓		
Los Angeles	LACMTA	✓	✓	✓ ¹¹	✓	✓		✓
	SCAG						✓	
Orange County	OCTA	✓	✓	(✓) ¹	✓	✓		✓
	SCAG						✓	
Sacramento	SACOG			*	✓		✓	✓
	SRT		✓	*		✓		
	STA	✓		*				
San Francisco	MTC						✓	
	SFCTA	✓	✓ ²	✓ ²	✓			✓
	SFMTA		✓ ²			✓		

Note: Those marked by an * indicate that highway projects are delivered by Caltrans

Sources: Sandag.org, Gonctd.com, SDMTS.com, Metro.net, Dot.ca.gov, OCTA.net, SacTA.org, SacRT.com, SACOG.org, SFCTA.org, SFMTA.com, MTC.ca.gov.

Table 2 Current Sales Tax Measures

ORGANIZATION	NAME	VALUE	APPROVED/TOOK EFFECT	DURATION	PERCENT APPROVAL	PROJECTED REVENUES	REVENUE FUND ¹²	TRANSIT OPERATING AND MAINTENANCE COSTS
LACMTA	Measure R	½ ¢	2008/July 2009	30 yr	68%	\$40 B	Sales Tax Revenue Fund with Subfunds	Yes (Subfund)
OCTA	Measure M2	½ ¢	2006/April 2011 ¹³	30 yr	70%	\$15.5 B	Transportation Special Revenue Fund	No
SANDAG	Transnet	½ ¢	2004/April 2008 ²	40 yr	>67%	\$14 B	No	Yes
STA	Measure A	½ ¢	2004/April 2009 ²	30 yr	>75%	\$4.74 B	No	Yes ¹⁴

Sources: Metro.net, Sandag.org, OCTA.net, Sacta.org.

¹⁰ Delivered by Caltrans with significant input or control from specified agency

¹¹ Delivers a portion of these types of projects, e.g. more recent special projects involve P3s or design-build (by legislative authority)

¹² A special revenue fund is an account whose contents must be used for a specific purpose; this is intended to provide an extra level of accountability and transparency.

¹³ Time gaps between approval and effect date are to avoid overlap with existing transportation sales taxes.

¹⁴ Most transit funding will be allocated to operations and maintenance.

Table 3 Oversight and Review

ORGANIZATION	OVERSIGHT COMMITTEE	ANNUAL AUDIT	COMPREHENSIVE PROGRAM REVIEW
LACMTA	3 retired judges; judge-selected advisory panel from each area of expertise	Yes	No
OCTA	11 geographically distributed members	Yes	10-year cycle
SANDAG	7 members, one from each area of expertise + 2 ex-officio members	Yes, including of local agencies	10-year cycle
STA	3 members, one from each area of expertise + 3 ex-officio members	Yes	No

Sources: Metro.net, Sandag.org, OCTA.net, Sacta.org.

Table 4 Additional Information

ORGANIZATION	NEW EXACTION FEE	PROJECT ACCELERATION PROGRAM	SIGNATURE/HIGH PROFILE PROJECTS
LACMTA	No	30/10 America Fast Forward (Bonding)	Orange Line Extension Subway Extension* Gold Line Extension* Expo Line Extension*
OCTA	No	Early Action Plan (Bonding) M2020 Plan	I-405 Widening*
SANDAG	\$2,000 per new housing unit, increased annually \$1,000 per new single family home, proportional fee for other development based on trip generation rate	Early Action Program (Bonding)	Mid-Coast Trolley*
STA		No	Capital Southeast Connector* Green Line Extension ^(*)

Note: Those marked by an * are in progress or yet to be completed.

Sources: Metro.net, NBC Los Angeles, Sandag.org, OCTA.net, U-T San Diego, Sacta.org, The Transport Politic, Sacramento Bee, Sacramento Business Journal.

Table 5 Previous Transportation Sales Taxes

ORGANIZATION	NAME	VALUE	APPROVED/TOOK EFFECT	DURATION	REVENUES TO DATE	SIGNATURE/HIGH PROFILE PROJECTS
LACMTA	Prop A Prop C	½ ¢ ½ ¢	1980 1990	Permanent Permanent	\$694 M/year \$694 M/year	Metro Blue, Red, and Green Lines; Century Freeway Corridor
OCTA	Measure M1	½ ¢	1991	20 years	\$4 B	I-5/I-405 Interchange (M1)
SANDAG	Transnet	½ ¢	1988	20 years	\$3.3 B	I-15 Express Lanes
STA	Measure A	½ ¢	1989	20 years	Unavailable	N/A

Sources: Metro.net, Sandag.org, Orange County Register.

Table 6 Transit Operating Fund Allocations for Transportation Sales Tax Measures

COUNTY	NAME (YEAR PASSED)	TRANSIT OPERATIONS ALLOCATIONS	NOTES
Los Angeles	Measure R (2008)	20% to Bus Operations 5% to New Rail Operations	Inclusion of Bus Operations Fund related to political context and pressure from the Bus Riders' Union
San Diego	Prop A 'Transnet' (2004)	7.9% of Total to Specified Project Operations 16% of Total to General Transit Operations ¹⁵	Transit operators whose total operating cost per vehicle hour exceeds that of the previous year, adjusted for inflation, are ineligible for general transit operations funds in excess of the previous year's levels
Alameda	Measure B (2000)	21.91% to General Transit Operations	Funds are allocated in percentages to specific operators and, in the case of A.C. Transit, sub-regions within jurisdictions of single operators
Santa Clara	Measure A (2000)	18.5% to Expanded Service Operations (Specified Projects)	Eligible expanded services are specific light rail lines, commuter rail connection to BART, expanded paratransit services, expanded bus fleet of 750 vehicles, and BART extension to San Jose ¹⁶
San Mateo	Measure A (2004)	Included in Capital Project Allocations	The division between capital and operations spending is not specified for projects whose funds are also eligible for operations, with the exception of Caltrain, which has an operations cap of 50% ¹⁷

Sources: Metro.net, TheStrategyCenter.org, Sandag.org, ACTC.org, SMCTA.com, VTA.org.

¹⁵ Less 2.5% for paratransit, 3.25% for senior transportation grant program for non-profits, and funds sufficient to support reduced price passes for youth/seniors

¹⁶ Auditors in 2008 noted that the breakdown of funds and the meaning of 'expanded service'. The VTA does not specify exact projects receiving Measure A Operating Assistance funds in their budget.

¹⁷ Eligibility of Caltrain funding for operations was not part of the original 1988 ordinance