The California Department of Transportation:
SSTI Assessment and Recommendations

State Smart Transportation Initiative
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Contents

Abbreviations

AASHTO: American Association of Highway and Transportation Officials
APTA: American Public Transit Association
BTH: California Business, Transportation and Housing Agency
CARB: California Air Resources Board
CalSTA: California State Transportation Agency
Caltrans: California Department of Transportation
CEQA: California Environmental Quality Act
CTC: California Transportation Commission
CTIP: California Transportation Infrastructure Priorities work group
CTP: California Transportation Plan
DOT: Department of transportation
FFY: Federal fiscal year
GHG: Greenhouse gas(es) or greenhouse gas emissions
GSP: Gross state product
ICM: Integrated Corridor Management
ITE: Institute of Transportation Engineers
ITIP: Interregional Transportation Improvement Program
ISTEA: Intermodal Surface Transportation Efficiency Act
ITS: Intelligent transportation system
ITS America: Intelligent Transportation Society of America
LTST: Local transportation sales tax
LOS: Level of service
MassDOT: Massachusetts Department of Transportation
MPO: Metropolitan planning organization
MTC: (Bay Area) Metropolitan Transportation Commission
NCDOT: North Carolina Department of Transportation
NEPA: National Environmental Policy Act
OPR: Office of Planning and Research
PennDOT: Pennsylvania Department of Transportation
RTIP: Regional Transportation Improvement Program
RTPA: Regional transportation planning agency
SANDAG: San Diego Association of Governments
SHA: (Maryland) State Highway Administration
SHOPP: State Highway Operation and Protection Program
SOV: Single-occupancy vehicle
SRI: SRI International
SSTI: State Smart Transportation Initiative
STIP: State Highway Improvement Program
TIGER: Transportation Investment Generating Economic Recovery
VMT: Vehicle-miles traveled
WSDOT: Washington State Department of Transportation

The California Department of Transportation: SSTI Assessment and Recommendations

Executive Summary

This report provides an assessment of the performance of the California Department of Transportation (Caltrans) and recommendations for improvement. It is the product of a team assembled by the State Smart Transportation Initiative (Appendix A), which interviewed Caltrans staff and stakeholders (Appendix B) and reviewed a wide range of materials from and about the department (Appendix C).

The report is quite critical of Caltrans' management and operations. However, we note at the outset that almost all the problems we point to are longstanding, so should not be blamed on Caltrans current management. We also note that Caltrans has many strengths that give us rational hope for its reform. Chief among these is the dedication of much of its top leadership and most of its staff to serving the public interest and improving their department's performance. This strength was evident to us in the more than 100 interviews we conducted with current Caltrans employees. In those interviews, repeatedly, Caltrans staffers also openly acknowledged problems, many of the department's own making. We thank our interviewees for their openness, and we acknowledge help from Caltrans administration in providing us with all manner of requested documentation.

The report provides a brief history of Caltrans and of the demands placed on it, a set of findings about Caltrans' current state, and recommendations for improvement. Throughout, it focuses on the need for modernization and culture change at the department.

Caltrans' legacy

Caltrans, like other state DOTs, was organized to build a network of trunk highways linking cities. In metro areas, local traffic began to overwhelm these highways, leading to massive construction. Eventually the highway system was largely built-out, and system operation and maintenance became more critical to Caltrans' job. Yet the department continues to be oriented toward projects—both for new capacity and reconstruction of the existing system.

Two crucial policy changes, unusual if not unique for state DOTs, have reduced Caltrans' power and capacity to act. One is the evolution of "self-help" counties, which allows local government to fund and often dictate the shaping of transportation systems, including the state highway system. The other is the state's practice of sub-allocating state funding by formula to the local level, again empowering stakeholders vis-à-vis Caltrans and reducing funds available at the state level.

Demands and expectations on Caltrans have also changed since the Interstate-building era. As early as 1972, when Caltrans was formed out of the Department of Highways, there were calls for more multimodalism and less reliance on auto-mobility. More recent passage of state planning goals in AB 857 (2002) and transportation greenhouse gas reduction strategies SB 375 (2008), signal a need for Caltrans to support reductions in auto travel via low transportation-

demand land use patterns. These outcomes are precisely the opposite of what Caltrans was set up to do—foster higher auto-mobility—and the department has not adapted to them. At the same time, Californians are driving less, a trend that creates optimism for achieving state planning and policy goals and that should allow for less spending on highway capacity. Other expectations that have developed since the Interstate-building era include concerns for economic and environmental justice, livability, and economic development. New technologies in planning and operations, and expectations of mode choice have all complicated Caltrans' world.

Caltrans often has not had to adapt to these changes. When the state vested more funding decisions at the local level, for example, decision-makers seem not to have thought much about how Caltrans would have to change to be a partner rather than a master builder. Sustainability initiatives frequently have worked around, not through, Caltrans—even when transportation is the topic. SB 375, for example, places the onus of GHG reduction on metro-level planning and the Air Resources Board (CARB). The legislature has required many reports from Caltrans, but these have failed to drive fundamental change in the department, which remains oriented toward projects. Note that the current management undertook a program review in 2012, which has spun off potentially important initiatives, such as a smarter system of managing risk, new relationships with self-help counties, and a streamlined design exception process. Many of the department's program review initiatives overlap with or complement our own recommendations, but the important ones are still works in progress.

Caltrans today

Partly because of its own actions or lack thereof, but also because of how it has been treated by stakeholders, Caltrans today is significantly out of step with best practice in the transportation field and with the state of California's policy expectations. It is in need of modernization—both in the way it sees its job and how it approaches that job—and of a culture change that will foster needed adaptation and innovation.

We focus on three important areas for improvement: 1) how the department expresses its mission; 2) what resources are available to achieve that mission; and 3) how the department manages those resources to greatest effect.

A mission, vision, and goals not well-aligned with current conditions or demands. When this review began, Caltrans was moving toward adopting a new five-year strategic plan that would include a mission, vision, and goals. However the department put that work on hold pending the release of this report and results from the concurrent California Transportation Infrastructure Priorities (CTIP) process. We applaud that move, because the draft plan was very similar to previous iterations, and mostly unresponsive to new conditions and policy direction. Critically, the draft plan avoided the word "sustainability" or any similar concept, when one of Caltrans' most important tasks is to understand what sustainability means to a state DOT and to operationalize it in goals, measures, and actions. For example, the department has not come to grips with the reality of induced traffic and the relationship between transportation and land use.

A portfolio of skills and practices that do not match modern demands. As it remains oriented toward project development, Caltrans has not developed the resources needed in the modern, post-Interstate building era.

Though it produced an important guide to fostering low-travel land use, *Smart Mobility 2010*, the department has almost completely ignored the report and failed to implement its important recommendations for practice. Caltrans' use of automotive level of service (LOS) standards in determining exactions from developers has been a barrier to the compact development sought by state policy and may have induced the opposite—low-density, high travel exurban development. Caltrans' analytic capacity on these issues has fallen behind that of local and regional partners.

Though it now controls a mature system, Caltrans continues to view it on a project-by-project basis. Consequently, systemic and operational issues have not received enough attention. There is no modern asset management system yet in place to guide investments and extend facility lifespans. System planning documents, such as the *California Interregional Blueprint*, may have sound guidance, but these often do not effectively guide investment or policy, as they garner little interest among the project-oriented department. Operational needs, such as maintenance of ITS infrastructure, are not a top priority.

Caltrans, again with a focus on capital projects, has not fully adapted to the multi-stakeholder environment in which it finds itself. It participates in some partner-driven initiatives, such as the nationally significant integrated corridor management (ICM) program in San Diego, but rarely leads on these and tends to view off-system activities as irrelevant. Goods movement, involving a mix of state and local and public and private systems, is a particular challenge.

Important standard operating procedures, such as those in design guides, are too inflexible and do not do enough to mainstream facilities for non-SOV (single-occupancy vehicle) travel into project development. Caltrans' peculiar standards on bicycle facilities even pertain to locally owned streets, precluding some active transportation initiatives. The rigidity of the guidance gives rise to requests for design exceptions, which all stakeholders characterized as a painful and time-consuming process.

Caltrans has not developed sufficient communications skills and procedures to either explain its own decisions well or to take into account important material from communities and partners. It is undertaking an effort to improve reporting on its performance, inspired by the Washington State DOT's *Gray Notebook.* Its website is in need of an overhaul.

Managerial systems and practices that are inadequate to motivate staff and to hold them accountable, and to foster innovation. Modernizing Caltrans' mission and redirecting resources will only pay off if the department can effectively implement these changes. One reason for Caltrans' lack of evolution, however, is that it lacks the systems to manage for change and for performance.

Interviewees told many stories of underperforming employees who stayed on the job. The department lacks a thorough performance management system that would hold everyone

accountable and reward innovators—even though such a system was envisioned in a widely-read report from two decades ago.

One reason for Caltrans' rigidity, both with respect to projects and to its ability to change, is a culture of risk aversion and even fear. It is easier for employees to either follow an established standard slavishly—or not to make a decision at all—than to creatively come to the best solution. Staff frequently cited liability as a concern, but other DOTs have been able to innovate without exposing themselves. Caltrans is working on an enterprise risk management program to address some of these issues.

Salary levels are too low for some important groups of employees, including managers and planners, leading to a brain drain and the inability of Caltrans to reward good work with a meaningful promotion. The department has a management training program, but it has been cut during budget squeezes and lacks follow-up; managers encounter the course only once or twice in their careers.

As with most DOTs, structural boundaries—between headquarters and the districts and between various units within the department—are a serious impediment to creative problem solving and innovation.

Caltrans tomorrow

Our recommendations are aimed at modernizing Caltrans and changing its culture to be able to meet new demands. Our 10 recommendations address the three areas for improvement cited in the previous section: 1) how Caltrans views its job; 2) what resources it devotes to doing that job; and 3) how it manages those resources. The recommendations are:

Mission, vision, and goals

1. Establish a mission, vision, and associated goals that reflect current state law and policy.
    - *Caltrans should use its visioning and strategic planning process to explain to its staff and stakeholders how it will address established state planning and policy goals around sustainability.*
    - *System preservation should be a primary message.*
    - *Caltrans should outline a groundbreaking approach to the delivery of transportation services—an approach that is not adequately expressed in the current "improves mobility" mission.*
    - *Caltrans should have a strong focus on state interconnectivity, in particular as it relates to freight movement and port connectivity.*

2. Better match investments to policy goals expressed in the statements of mission, vision, and goals.
    - *CalSTA should see proposed STIP project lists more than a week before they go to the CTC for approval.*
    - *CalSTA and Caltrans should use the CTC review process to impose a policy review of all proposed investments.*

- *CalSTA should consider proposing legislation to allow the CTC to approve individual projects rather than entire programs.*
- *Caltrans, with CalSTA, should review legislatively mandated reports and propose discontinuing many of them.*

3. Take advantage of the state's new institutional structure to help drive change.
   - *CalSTA and Caltrans should strengthen relationships with other state agencies that can help (or hinder) the achievement of the new vision.*
   - *CalSTA should provide leadership and oversight in implementing the mission and vision, and the recommendations of this study.*
   - *CalSTA should develop a "staff exchange" program.*

Alignment of resources and skills

4. Align resources to desired goals.
   - *Caltrans should strengthen its planning unit.*
   - *Caltrans should improve its ability to operate its highway system.*
   - *Caltrans should modernize its stewardship effort through asset management.*
   - *Caltrans should provide more resources, expertise or simply a real voice in planning and prioritization to the offices dealing with rail and freight.*
   - *Caltrans should develop an enhanced internal capability to identify and pursue innovative finance partnerships.*

5. Reform critical guidance documents and standard operating procedures.
   - *Caltrans should update the design and traffic control device manuals, and other guidance documents as necessary, to implement the new strategic plan and vision.*
   - *As an initial step, Caltrans should relinquish oversight of bike facilities on locally owned streets.*
   - *As a second initial step, Caltrans should give designers the option of using NACTO urban design standards in metro areas.*
   - *Caltrans should generally rethink its approach to facilities in metro areas and town centers.*
   - *Caltrans should build more flexibility into its processes.*
   - *Caltrans should implement Smart Mobility 2010.*
   - *Caltrans and CalSTA should revisit legal guidance on the risk of innovative design and practices.*

6. Strengthen strategic partnerships.
   - *Caltrans should assert leadership in the area of sustainable transportation in its relations with regional partners.*
   - *Caltrans should find ways to transfer local-serving roads to local government.*
   - *Caltrans and CalSTA should negotiate coverage for long-term maintenance, resurfacing, and reconstruction costs when locally controlled STIP and LTST funds are used to add capacity to state highways.*

7. Focus on freight.
   - *CalSTA and Caltrans should create a clear focal point for freight policy and planning within the department.*
   - *California's Freight and Rail Plans should identify the major transport corridors, whether highway, rail, or air, that should receive significant attention from Caltrans in the next decades.*

8. Communicate more effectively.
   - *Caltrans should communicate around the performance metrics that are used to monitor progress against organizational goals*.
   - *To effectively communicate on performance, Caltrans should develop capacity in "performance journalism."*
   - *Caltrans should work to ensure its communications with local stakeholders are genuine and two-way.*

Management systems

9. Manage for performance.
   - *Caltrans should set enterprise-wide and team-specific goals, both short- and long-term.*
   - *Caltrans should devise metrics to track the organizational goals*.
   - *The Caltrans director should assign each of his direct reports responsibility for a subset of the goals, and an associated set of numerical metrics.*
   - *Measures should evolve.*
   - *Caltrans should provide financial incentives for manager performance.*
   - *Caltrans should dedicate resources to push performance-based management throughout the organization.*
   - *To ensure that union contracts are not violated, goals and performance metrics for non-management personnel should be set at the team level, with the union engaged in the goal-setting effort.*
   - *At the same time Caltrans should provide room for innovative actions that further state and department goals.*
   - *Caltrans should re-examine internal relationships and flow of authority to foster accountability and effective collaboration.*

10. Foster innovation and continuing evolution.
   - *Caltrans management and CalSTA should insist on robust implementation of state policies and rely on staff for implementation details.*
   - *Caltrans should benchmark practice against best practices elsewhere.*
   - *Caltrans should work to better integrate its research program with improved practice.*
   - *Caltrans' effort to develop an enterprise risk management system should continue and be viewed as a critically important resource for performance-based decision making*.
   - *Caltrans should improve staff training and workforce development.*
   - *Caltrans should strike the right balance between the cost and benefit of national engagement for Caltrans staff.*

Plan of action.
This is a wide-ranging list of initiatives, not all of which can be accomplished immediately. Over the next six months, to move forward as rapidly as possible, we recommend this plan of action:

1. Caltrans and CalSTA should develop mission, vision, and goal statements that are fully consistent with state planning and policy goals. These statements should explain conceptually what Caltrans' role is in sustainability, livability, and equitable economic development. One source for these statements is the department's own 2040 long-range plan, which is being constructed in parallel to, but separately from, the five-year strategic plan. Another is the recent *Smart Mobility* report, which has largely been ignored. Critically, if the word "mobility" (whether described as smart or not) remains as a central focus in the department's mission, it needs a clear definition in light of new expectations of Caltrans. Whatever the aims of management might be, currently too many in the department understand the word to mean "moving cars faster." To jumpstart this effort, we recommend that the secretary and director accept responsibility for crafting these statements in concert with a set of key senior staff of their choosing. To demonstrate the commitment to collaboration, we suggest that these statements be produced in draft and shared with key transportation and elected officials selected by the secretary before finalization. Once CalSTA and Caltrans have developed the new statements, they must go to the district directors and other key staff to work out the details and implementation. The process we describe is different from the bottom-up approach that has characterized strategic planning in the department, which resulted in the culture endorsing itself. Strategic direction must come from top down and outside in. *Timeframe: Month 1.*

2. Following the release of new mission, vision, and goals, Caltrans and CalSTA should use those statements, as well as the recommendations in this report, to organize teams to develop implementation actions and performance measures. Teams may be organized around work-streams, e.g., project development or system planning, or topic areas from the recommendations, e.g., liability or guidance manuals. Ten to 12 teams of about 10 to 12 members should be able to tackle a wide range of critical issues. Membership should be across silos, e.g., if a design team is formed it should not be limited to engineers doing design, and ideally should be composed of staff members who volunteer to serve and guide implementation of the new strategic direction. Caltrans should designate a leader of this effort with sufficient staffing and enough seniority to have the ear of the secretary and the director. Going forward this staff can take responsibility for tracking and adjusting measures, and recommending strategic corrections. Staff from the agency and its other departments, as well as those from other state and local entities, may be included in the work groups where such expertise and perspectives are helpful. For example, if a group is formed around the big issue of reporting and communications, it might consider reducing or combining some of the many reports required by law, and this discussion might include legislative staff. The majority of staff, however, should be from Caltrans. To focus the effort, this work should supersede or absorb other external and internal initiatives, such as the strategic and long-range planning processes and the 2012 program review follow-ups. While there may be areas where new resources are needed in order for Caltrans to improve performance—we have argued that planning and operations are two—implementation should not assume additional resources for projects unless those resources are clearly forthcoming. *Timeframe: Months 2-6.*

3. Caltrans and CalSTA should work to ensure the success of CEQA reform rulemaking set up by SB 743 (2013). SB 743 could do more to advance state planning goals than anything else Caltrans has done. The statute's assignment of the SB 743 rulemaking to another department, however, is evidence of the general lack of confidence in Caltrans' ability to accomplish this transformative change. And that lack of confidence may be well-founded, as our interviews disclosed substantial resistance to change, with Caltrans staff, for example, arguing to extend the new rules only to the minimum area required, while the statute would permit statewide application. A successful rulemaking, leading to a predictable developer fee based on transportation system use—probably vehicle-miles traveled (VMT)—would put California and Caltrans back at the leading edge of modern transportation practice, and would remove one of the greatest institutional barriers to implementing SB 375. It would begin to make Caltrans a real contributor to the success of modern policy in the state, and it would provide a model for how the staff could help implement a challenging new charge. *Timeframe: Months 1-5.*

4. Caltrans and CalSTA should modernize state transportation design guidance. A complete overhaul involving the content of multiple manuals and changes to the exception process will take longer than a half-year, but the agency and department should move quickly to encourage modern multimodal improvements in metro areas. The agency and department should support, or propose if no bill is forthcoming, legislation to end the archaic practice of imposing state rules on local streets for bicycle facilities. For the many remaining state-owned metropolitan facilities—local streets designed to road standards, or "stroads"—the agency and department should follow the lead of Washington State DOT and quickly adopt modern guidance as laid out in the NACTO Urban Street Design Guide. These actions will not only improve multimodal access and safety in metro areas, but will also provide relief to local entities that have raised money and sought to implement modern design, only to be thwarted by the state and its dated, rigid design policies. These initial steps should be followed by more thorough reform of the department's design guidance as described in the recommendations. One or more of the work groups in recommendation No. 2 should be tasked with creating a process for design reform. *Timeframe: Months 1-4.*

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SSTI Assessment and Recommendations

Introduction

This report, commissioned by the California Business, Transportation and Housing Agency (BTH) in May 2013 and delivered now to the Secretary of the California Transportation Agency (CalSTA), provides an assessment and recommendations for improving the performance of California's Department of Transportation (Caltrans).

The motivation for the project was the imminent dissolution of BTH and establishment of CalSTA, of which Caltrans would remain a continuing and major part. In the view of BTH leadership, this provided a "unique opportunity to take a fresh look at the operations of Caltrans and conduct an objective review, assessment, and analysis of its operations, particularly in the areas of performance, communications, and management [to] help Caltrans provide better services and effectively deliver the transportation needs for California."

The report was compiled by a team assembled by the State Smart Transportation Initiative (SSTI), a foundation- and government-funded effort, managed out of the University of Wisconsin-Madison, which has a mission of improving the productivity, sustainability, and accountability of state transportation policy and practice. This team included academics, SSTI staff, independent transportation experts, a California lawyer and businessman, and former chief executives of state transportation departments in Massachusetts, Pennsylvania, and North Carolina. (For a list of team members, see Appendix A.) The report is based on the prior knowledge team members brought to the task, their review of several thousand pages of documents from or about Caltrans, and, most important, interviews they conducted with more than a hundred Caltrans employees and other stakeholders in the Caltrans operation. (For a list of interviewees, see Appendix B.) To encourage frankness in these interviews, SSTI assured all interviewees that no particular quote, finding, or recommendation in this report would be attributed to them by name.

SSTI was asked, "at a minimum," to answer the following questions about Caltrans:

a) Does the department have the right performance measures to help it achieve the mobility, safety, and environmental stewardship goals that are expected from California's transportation system?
b) Are performance outcomes adequately measured and reported within the department, the Agency, the public, the Legislature, and other key stakeholders?
c) Are performance targets set at the correct levels to properly evaluate the department's performance considering California's current environment?
d) Are performance measures appropriately aggregated or disaggregated—meaning, are measures appropriately set at the employee, location, district, and/or statewide levels?
e) Does the department effectively communicate its goals, objectives, and accomplishments to the Legislature, public, and key transportation stakeholders?
f) Are policies on internal and external communications adequate to ensure important issues are elevated to appropriate management level?
g) Are policies on performance and reporting well understood by staff-level employees and management?

h) Does management communicate effectively with employees when superior or inferior performance is observed?
i) Does the department maintain current and up-to-date manuals that effectively articulate and communicate the safety, mobility, and environmental stewardship goals of the department?
j) Are managers located outside of the Sacramento executive office provided the appropriate level of both discretion and restraint to effectively manage performance?
k) Is the organizational structure conducive to achieving its performance goals?
l) Is the overall size and structure of the department appropriate to achieve the desired goals and performance?
m) Are sufficient tools provided to management to track performance, and, if so, does management use those tools?
n) Are managers appropriately evaluated on performance outcomes?
o) Are non-supervisory employees adequately evaluated on performance outcomes?
p) Do managers effectively use the tools available to them in state government to acknowledge and reward good employee performance and to address underperformance?[1]

Our brief concluding answer to all these questions is "no."

This summary negative answer should not surprise because it is not new. It is roughly the same answer, to similar questions, that has been given by repeated outside and internal assessors of Caltrans' performance going back many years.

Prominent among these assessors was the team assembled by SRI International (SRI) in its report on Caltrans in 1994.[2] Its assessment included "a review of audits conducted in the past 20 years proposing solutions to specific operational issues more-or-less similar to those raised in the present effort (in addition to reviews undertaken by legislative committee and the California Transportation Commission [CTC])." And all, including SRI, came to the same general conclusion:

> Clearly, Caltrans remains "rule-driven" rather than "product-driven" not for lack of good ideas but because of (not unique) bureaucratic culture. The key to achieving any meaningful change in the department's performance will be to change its culture, including its operating rules and work habits.[3]

This culture has proven very hard to change. SRI, for example, made 72 specific recommendations to improve Caltrans' performance. These ranged from relatively minor ones to those it highlighted for strategic attention. SRI went back two years later to check on progress and found some progress on the first but very little on the second, including "very slow progress in the development of integrated performance measures; continued lack of flexibility to contract

[1] Department of Transportation, State of California, *Out of State University (State Funds) Agreement #12B910004*, Exhibit A, p. 1.
[2] Ibid., pp. 3-4.
[3] SRI International, *Evaluation of the Organizational Structure and Management Practices of the California Department of Transportation, Volume I: Summary and Recommendations*, p. I-1.

out; the lack of individual incentives; and the lack of a process to determine and set priorities among maintenance/rehabilitation/capital investments based on a top-down need assessment."[4] In other words, on the things that really counted, Caltrans hadn't fundamentally changed its behavior.

More recently, Caltrans promised a major change of direction via another report, *Smart Mobility 2010: A Call for Action for the New Decade*. Again with the help of outside consultants, it declared itself committed to "smart mobility," defined as transportation policy and practice that "moves people and freight while enhancing California's economic, environmental, and human resources by emphasizing convenient and safe multimodal travel, speed suitability, accessibility, management of the circulation network, and efficient use of land."[5] But such "smart mobility," our interviews revealed, has certainly not been internalized to Caltrans as its basic mission. Many senior managers we talked to could barely recall the existence of this "call for action."

In the meantime, of course, the policy surround for Caltrans operations has changed fundamentally. Through AB 32 and SB 375, California has committed itself to radical reductions in its greenhouse gas (GHG) emissions, the plurality share of which in this state are supplied by transportation. This means, essentially, that Caltrans should be in service to radical reductions in vehicle-miles traveled (VMT). Doing that in a $12.6 billion department—one with ongoing responsibilities for operating a system of 15,000 roadway centerline miles and an intercity rail network of 887 route-miles—is a very hard task. So too is moving a vast bureaucracy, at present some 19,000 employees, schooled in doing something other than reducing travel demand.

Nevertheless, making change is the challenge this report confronts. We think there is a way to meet it, but it will require the cooperation and effort not just of Caltrans, but many other stakeholders in California's mobility future.

Within Caltrans itself there is great interest in this different mission. Both top leadership and staff seem truly committed to serving the public interest and improving their department's performance. Caltrans personnel devoted hundreds of hours to speaking with the SSTI team and to providing a wide variety of requested documents, including some created just for this project. Caltrans staff has openly acknowledged problems, both those of the department's own making and those created by outside entities, and has addressed some of them in its own program review of 2012. The staff's openness to discussing these problems and possible solutions provide real hope that the department can embrace needed reforms. These conversations, and those of other stakeholders, provide much of the source material for this report. To allow for candor, we do not attribute statements to named interviewees. We thank all who had those conversations with us for their frankness.

We wish to note two additional introductory points, particularly regarding the assessment part of what follows:

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[4] SRI International, *Evaluation of the Organizational Structure and Management Practices of the California Department of Transportation: Progress Report on Caltrans' Implementation Efforts*, March 1996, p. 6.
[5] Caltrans, *Smart Mobility 2010: A Call for Action for the New Decade*, p. 8.

First, as we emphasize throughout, many of the important issues we raise are long-standing and not caused by the current management, so this report should not be seen as laying blame for problems on particular individuals, in particular, current Caltrans leadership.

Second, while Caltrans is certainly a key player in California transportation, it is not the only one. We address some activities of other organizations, both public and private, at the state and local levels, that bear on Caltrans. But in no way should this report be taken as a full assessment of the California transportation scene.

Two themes run through our findings and recommendations. One is that Caltrans, once a national leader among state transportation agencies, has fallen out of step with current "best practice" in transportation practice and the express aims of California state policy. The other is that the department's culture not only has not come to grips with new realities, but also frequently runs on process rather than outcomes. In other words, Caltrans is in need of both *modernization* and organizational *culture change.*

Caltrans is in need of both modernization and organizational culture change.

Such problems are not unique to Caltrans, and much can be learned from the experience of other state transportation agencies that have faced them. This we suspect is part of the reason the SSTI team, which includes several former executives of agencies that have made progress on both modernization and culture change, was asked to take a look. With a newly organized CalSTA and a new Caltrans management already embarked on significant reforms out of its own 2012 program review, and with many rank-and-file staff who are eager to move forward, we are optimistic that the months and years ahead will see major positive change.

The body of this report comprises three main sections: 1) "Caltrans' legacy," which provides brief history of the department and its evolving policy surround, up through Calstrans' own program review-based initiatives of 2012; 2) "Caltrans today," which provides the SSTI team's assessment of how Caltrans is performing now; and 3) "Caltrans tomorrow," which provides recommendations and a plan of action.

Caltrans' legacy

In the early 20th century, the department that would evolve into Caltrans, like other state DOTs, set out to establish and operate a network of mainly rural roadways that would link cities, open new land for development and tourism, and provide farm-to-market access. Much of this network was acquired from local governments, rebuilt for higher travel speeds, and assembled into a series of at-grade trunk highways. After World War II, this activity ratcheted up enormously due to two developments: 1) a massive infusion of state and federal funding devoted to the construction of limited-access superhighways, and 2) sharp increases in traffic, with short, local trips swamping the intercity travel for which the network was originally designed.

This period was something of a golden age for state DOTs, and particularly Caltrans, which attracted top engineering talent from around the country to design and build its enormous, generally popular new highway system. But now, with state highway systems largely built-out, the era of epic highway building is over. There is much work to be done to meet California's ever-changing transportation needs, and doing it well requires expertise, judgment, and leadership at least as demanding as in the earlier era. But it also requires different thinking, expertise, and processes than those developed previously.

With state highway systems largely built-out, the era of epic highway building is over.

Unfortunately, Caltrans, despite declarations going back at least 40 years, still has not accepted, adjusted to, or made anywhere near the possible best public-serving use of this new reality. This conclusion, we emphasize, is itself not new. Similar findings have been reached in previous department assessments, from both within and without California government.

This failure to fully evolve has many contributing causes. It certainly owes in part to resistance within Caltrans. But it owes as well to how Caltrans has been treated by its many stakeholders, including the California legislature and executive.[6]

In what follows, we highlight some of the developments since the 1970s, the period after the heyday of the highway-building era, which help explain Caltrans' current situation. Some of these developments, such as the recent inflexion point in VMT trendlines, mirror the rest of the country. Others, such as the empowerment of local units of government to address the state highway system, are nearly unique to California.

[6] This sort of conflict is not unique to California. Around the nation, the activities of a state transportation department, with responsibility for maintaining a state highway system, are often seen in conflict with popular demands for greater environmental sustainability, developer interests in cities, etc. Nor does it help that many states are subject to California's recent financial strains, and all have been subject to cutbacks in federal assistance.

Highway building winds down, local power ratchets up

Throughout the 1970s, highway construction declined precipitously as real revenues fell, construction costs increased, and the department faced greater public opposition to highway construction. SB 215, enacted in 1981, provided the department with additional revenue but ordered the department to shift its priorities toward maintenance and reconstruction and away from the construction of new facilities.[7] As the Interstate-building era wound down, California changed the funding formula for transportation. The result was a Caltrans with growing responsibility for operations and maintenance but lessened power and capacity. Two unusual state policies, a new reliance on local funds to capitalize state highways and formula suballocation of state funds to local entities, are key.

The result was a Caltrans with growing responsibility for operations and maintenance but lessened power and capacity.

The evolution of "self-help" counties. As state fuel-tax revenue declined in real terms during the 1970s and '80s, making Caltrans less able to pursue new transportation projects, local governments began seeking authority to levy their own taxes to fund transportation investments.[8] Sales taxes rose to prominence as a transportation funding mechanism in the mid-1980s as the legislature authorized more county sales taxes for transportation projects. Counties and cities could cooperatively establish "transportation authorities" to administer sales tax proceeds in keeping with voter-approved expenditure programs. Voters in Santa Clara County approved the first of these in 1984. The legislature soon gave all counties the power to adopt such sales taxes, leading to a number of ballot proposals. By 1990, 17 counties had adopted transportation sales taxes.

Proposition 62 in1986 required local transportation sales taxes (LTST) to receive a two-thirds supermajority for passage. Due to legal challenges, its implications were not fully felt until the early 1990s when the state appellate court decision upheld the supermajority requirement. For several years following the decision few counties pursued local transportation sales taxes, believing the requirement unattainable. Since 2000, however, with the success of transportation sales tax ballot measures in Alameda and Santa Clara counties, a number of other counties have been able to meet the two-thirds requirement to pass or reauthorize their local transportation sales taxes. Several factors are generally credited with the ballot successes:

1. Funds raised by the sales taxes are spent where they are gathered, allowing voters to feel the benefits directly.
2. Most of the sales taxes automatically expire, usually after 15 or 20 years.
3. Measures normally contain a list of specific transportation projects, giving voters more control over expenditures.

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[7] Jeffrey Brown, *Statewide Transportation Planning in California: Past Experience and Lessons for the Future* (Institute of Transportation Studies, University of California, Los Angeles, 2000), http://www.uctc.net/papers/658.pdf.

[8] Much of the material in this section comes from Amber E. Crabbe et al., *Local Transportation Sales Taxes: California's Experiment in Transportation Finance* (Institute of Transportation Studies, University of California, Berkeley, 2005), http://www.uctc.net/papers/737.pdf.

4. The broad base of sales tax allows the collection of large amounts of revenue with relatively low rates, making them more appealing to voters than higher fuel tax rates.

Once counties formed transportation authorities to administer their LTSTs, they developed the capacity to plan and deliver transportation projects on their own, allowing them to take over many of the functions that had been performed by Caltrans. The greater county-level decision making power has countered efforts to strengthen the state's MPOs in spite of their increased powers granted by the Intermodal Surface Transportation Efficiency Act (ISTEA), the federal transportation bill of 1991.

The trend toward increasing county decision-making authority has created some problems in intercounty coordination of transportation investments. While counties have been successful in working together to fund transit systems, there is a widespread reluctance to fund improvements to roads that are considered "feeders" to other counties. Problems in intercounty coordination between LTST counties and neighboring non-LTST counties are even more challenging. In addition, the discrepancy between LTST counties and non-LTST counties affects the overall state transportation program because self-help counties may be less interested in raising fuel taxes or taking other steps to improve the state's system of transportation finance.

Shaping transportation decisions in self-help counties has been the need to win support from a supermajority of voters for the LTST. This has led counties to assemble sales tax plans based on public support for potential projects, as indicated by polling data. Projects are selected to appeal to specific interest groups—highway users, transit advocates, environmentalists, etc.—and to meet expectations for geographic equity. Projects that met these standards were not necessarily the most appropriate based on technical analysis or environmental policy concerns. Most LTST measures have been based on lists of projects to be completed over their lifespan, and modifying projects in the out years to adapt to changing conditions can be politically challenging.

Most county transportation authorities have presumed that Caltrans would allocate resources for the operations and maintenance of any projects they build on the state highway system. The expectation that Caltrans would maintain projects constructed by RTPAs using locally generated revenues has put Caltrans in the situation of having to maintain an increasing inventory of state highway system assets without additional maintenance funding.

Prior to the rise of LTSTs as a funding source, counties deferred to Caltrans for highway design and construction projects on the state system. But once counties began adopting LTSTs that allowed them to contribute more than half of project funds, some began to take control of project delivery. As more counties began to adopt LTSTs, state legislation in 1988, 1993, and 1998 authorized Caltrans to enter into cooperative agreements allowing local public entities to handle project delivery on the State Highway System and authorized the use of private contractors.[9, 10] Shortly thereafter, Proposition 35 (2000) amended the State Constitution to eliminate restrictions on the use of private vendors for public works projects.[11]

[9] Cal. Sts. & High. Code § 114.
[10] Cal. Gov. Code §14134.
[11] CA Const. art. XXII.

A change in state funding allocations. California also developed an unusual process for allocating state funding for roads. It formally designated a portion of state dollars for preservation and operations, and suballocated a large share of its other funds to sub-state regions.

Responsibility for preservation and operations were assigned California's State Highway Operation and Protection Program (SHOPP), created in the early 1990s. This recognized the importance of "fix it first" in the post-highway-building era, a commitment registered in its separate funding. SB 1435 (1992), which amended a bill from the previous year and remains in force today, dedicates funds for "capital improvements relative to maintenance, safety, and rehabilitation of state highways and bridges which do not add a new traffic lane to the system."

At the same time, new highway projects continued to be funded out of the State Transportation Improvement Program (STIP). In a move that continued California's evolution toward local and regional control, in 1997 the legislature passed SB 45. This imposed major changes in the levels of transportation planning and programming. Some of the measure's most notable provisions affecting the relationship between Caltrans and regional transportation agencies included:

- Dividing the STIP into a Regional Transportation Improvement Plan (RTIP), a compilation of the five-year programs of projects prepared by RTPAs and county transportation commissions, and an Interregional Transportation Plan (ITIP), a five-year program of projects that promote interregional connectivity prepared by Caltrans
- Assigning 75 percent of STIP funds for RTIP projects and 25 percent for ITIP projects
- Requiring that the California Transportation Commission (CTC) adopt all RTIP projects into the STIP or reject the RTIP entirely, lessening the Commission's control over project selection

Sen. Quentin Kopp, the author of SB 45, maintained that the bill would bring the planning process closer to the voting public and pave the way for the greater use of local tax revenue in transportation.[12] Supporters of the legislation also believed that transportation decision-making would be improved by increasing the role of the local and regional entities that have control over land use.[13]

According to interviewees familiar with Caltrans at the time, Caltrans did not see SB 45 as precipitating a major change in the department's role in project development, design, and construction on the state highway system. While SB 45 transferred substantial decision-making authority to regional entities, Caltrans assumed that it would continue delivering state highway system projects, whether programmed as part of the RTIP or the ITIP, and that its planning responsibilities and processes for long-range highway planning and joint planning would remain largely unchanged. [14] But in fact, SB 45, coupled with funding power from self-help county taxation, has weakened Caltrans' ability to plan and control its own system, given its reliance on local funding, and statutory requirements on how the state-controlled quarter of the STIP must be spent.

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[12] Brown, *Statewide Transportation Planning in California: Past Experience and Lessons for the Future*.
[13] James Chai, *Should California Revisit SB 45?* (Mineta Transportation Institute, College of Business, San Jose State University, 2003), http://transweb.sjsu.edu/MTIportal/education/alumni/capstones/2002chai.pdf.
[14] *Interregional Transportation Strategic Plan* (Caltrans, June 1998), http://www.dot.ca.gov/hq/transprog/ocip/te/itsp.pdf.

The state's allocation of STIP funding separately from its SHOPP funding has had another important outcome. Despite decades-long calls for a pivot toward system preservation, nearly all STIP funding, whether administered by state or local governments, goes to highway-capacity projects, even though state law allows for STIP-funded preservation projects as well. Coupled with self-help county funding and other sources, such as recent bonding, the STIP helps to generate substantial new highway capacity. Lane-miles of non-Interstate freeways, for example, grew by 6 percent in the eight years from 2003 to 2011.[15,16] And in 2011, when the CTC rolled up forecast state and local highway "needs" for the following 10 years, it showed that anticipated costs for capacity projects nearly equaled costs for preservation.[17]

The shifting landscape of transportation policy

As Caltrans' role has shifted due to the rise of local power, so too has the landscape of transportation needs in which it operates. A mission once focused on building highway infrastructure has become far more complex, and more than 40 years ago the state began to make adjustments. Prompted in part by severe smog in the Los Angeles area, California was one of the first states to address downsides to the highway-building boom, and to seek a more balanced policy. AB 69[18] in 1972 transformed the Division of Highways into Caltrans, with the hopes that it would develop a more multimodal system. Funding, however, remained largely directed to highways. The measure also increased local participation in transportation planning and raised the importance of non-highway modes. The measure required regional transportation planning agencies (RTPAs) to develop their own multimodal transportation plans, which would be combined into the statewide California Transportation Plan (CTP).

Caltrans became a statewide purveyor of local transportation infrastructure—a critical shift in its mission.

Changing patterns of travel. In its earlier incarnations, Caltrans' goal had been to provide for intercity and rural travel, while local governments provided their own streets and transit systems for commuting and other short trips. The growing intercity transportation system, however, induced car-oriented development—aka sprawl—and in turn that development generated rapidly growing traffic that swamped the intercity system. Over time, as transit declined and local car-trip distances increased, Caltrans became a statewide purveyor of local transportation infrastructure—a critical shift in its mission. Caltrans has made some efforts to divest itself of at-grade, state-owned roads that serve a mainly

[15] *2003 California Public Road Data Statistical Information Derived from the Highway Performance Monitoring System* (California Department of Transportation, Division of Transportation System Information, August 2004), http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2003PRD.pdf.
[16] *2011 California Public Road Data Statistical Information Derived from the Highway Performance Monitoring System* (California Department of Transportation, Division of Transportation System Information, October 2012), http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/prd/2011prd/2011prd.pdf.
[17] Transportation Finance Executive Working Group, *2011 Statewide Transportation System Needs Assessment: Final Report* (California Transportation Commission, October 2011), http://www.catc.ca.gov/reports/2011Reports/2011_Needs_Assessment_updated.pdf.
[18] Cal. A.B. 69 (1972), Chapter 1253 (Cal. Stat. 1972).

local purpose, but local governments are not always eager to take on new operation and maintenance responsibilities, particularly where roads are in need of rehabilitation. And Caltrans, which built the freeways, has continued to operate them, though in many cases they serve almost entirely local traffic.

In the 21st century, transportation demand has shifted in a new way. Automobile travel, which once grew predictably year by year, now is flat on an aggregate basis and declining on a per-person basis (Figure 1).

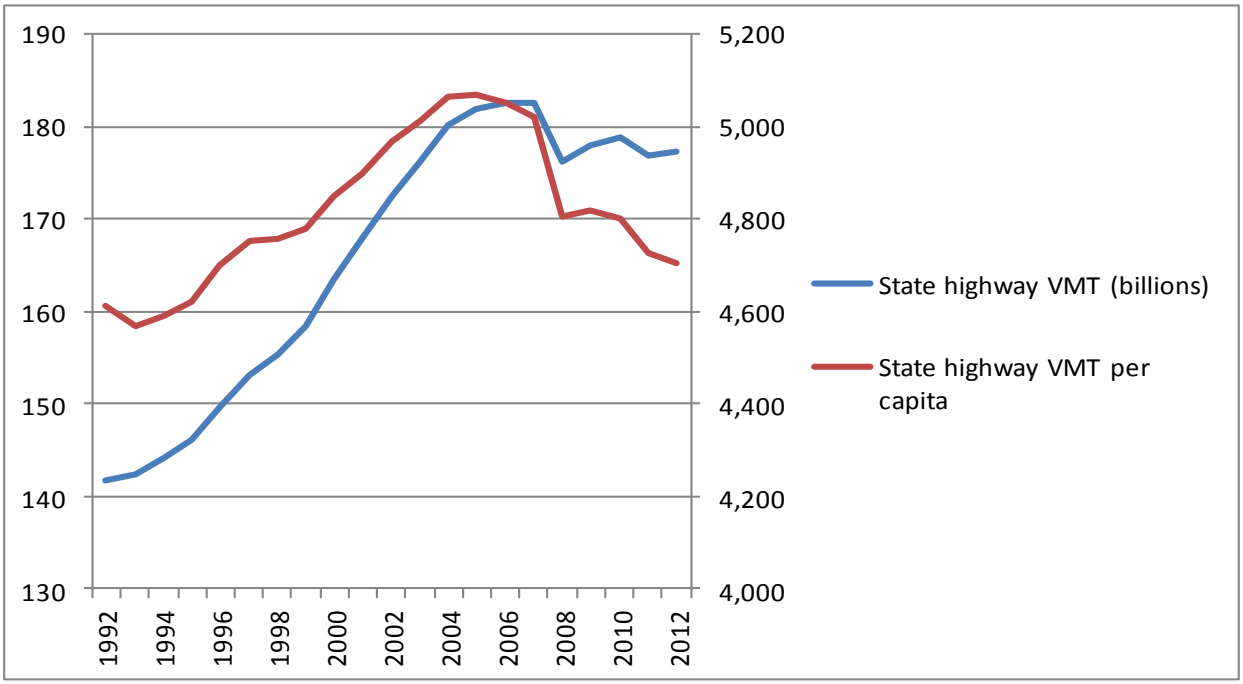

Figure 1, VMT and per capita VMT on California state highways, 1992-2012. Sources: Caltrans (VMT) and Department of Finance (population).

As this inflexion point developed in the 2000s, there was some thought that it only reflected increased fuel prices and a sagging economy. But an SSTI analysis of U.S. fuel prices and VMT shows little correlation over time.[19] And while VMT and economic output did track closely for many years, that relationship has broken down. In California, since the mid-1990s gross state product has significantly outpaced VMT (Figure 2).

[19] State Smart Transportation Initiative, *Motor Vehicle Travel Demand Continues Long-term Downward Trend in 2011*, 2012, http://www.ssti.us/wp/wp-content/uploads/2012/02/VMT-ver-2.pdf.

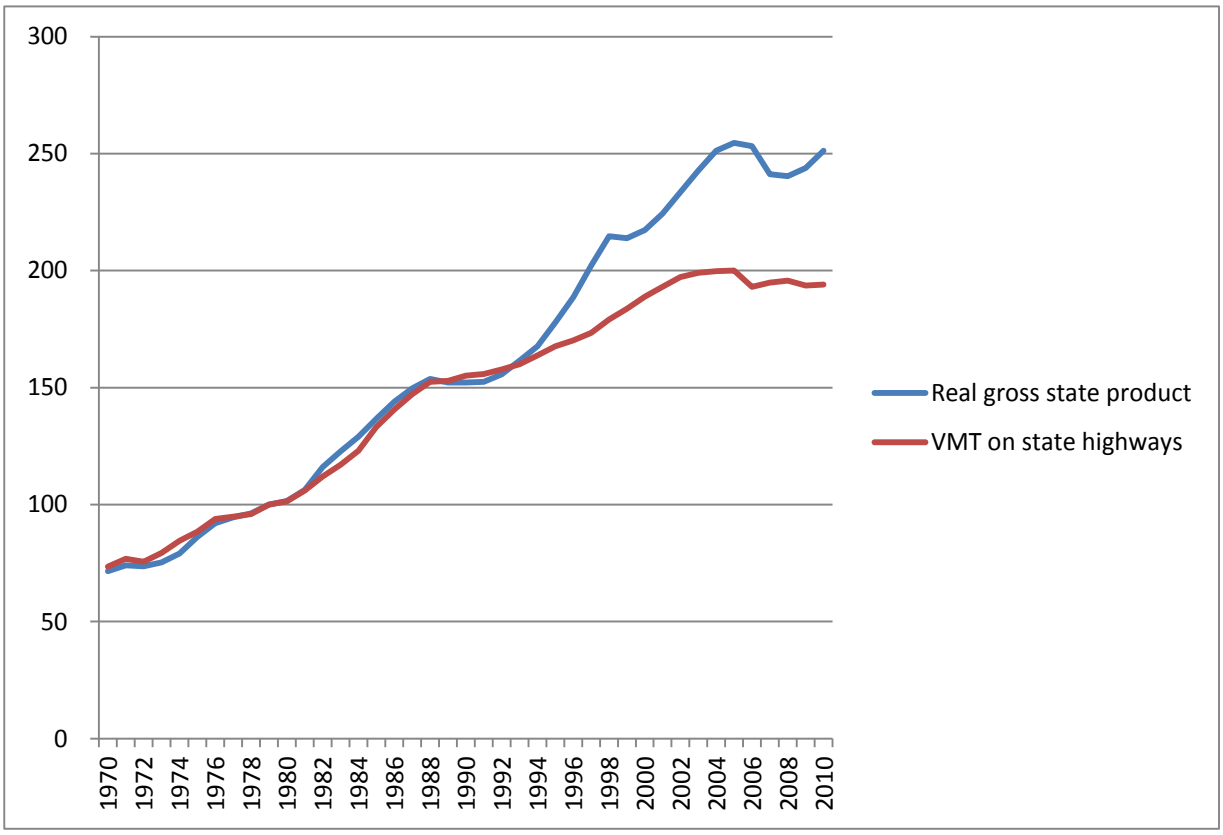

Figure 2. Real (inflation adjusted) California gross state product (GSP) and VMT on state highways, 1970-2012 (1980=100). Sources: Department of Finance (GSP) and Caltrans (VMT).

While some of the reduction in auto travel may be linked to a resurgence in transit ridership, the transit share has not grown enough to account for all of the difference. Cars are still the primary personal mode, but Californians are meeting their needs with fewer and/or shorter trips. The development community has both enabled and responded to preferences for less driving. Where it once built almost exclusively for low-density, segregated uses, it is increasingly oriented to compact, mixed-use development, with its lower infrastructure costs and the "smart growth premium" it commands in the market.

A built environment that reduces VMT is precisely the goal of the state's landmark climate policy. And it is precisely the opposite of what Caltrans was organized to do.

A built environment that reduces VMT is precisely the goal of SB 375[20], the state's landmark climate policy. And it is precisely the opposite of what Caltrans was organized to do — foster higher auto-mobility, without regard to the consequences in land use.

[20] Sustainable Communities and Climate Protection Act of 2008, Cal. S.B. 375 (2008), Chapter 728 (Cal. Stat. 2008), available at http://www.leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf.

The department does not have major responsibilities for implementing SB 375 and might be able to continue increasing auto-mobility were it not for another outcome of modern travel behavior: The trend toward lower driving, coupled with improving vehicle fuel economy, have battered the traditional highway-department business model, which relies heavily on fuel taxes.

Other changes. The reversal of the trend toward more driving is a profound one, but it is hardly the only factor affecting Caltrans. Demands on a modern transportation department go far beyond infrastructure provisions. Some of these include:

- New expectations around economic and environmental justice. During the highway-building era, new roads routinely destroyed low-income neighborhoods, where land was cheap and citizens disempowered. Adding to this insult, the resulting auto-based built environment made it harder for low-income residents to access jobs and other destinations.
- New expectations around livability. Transportation agencies once ignored the noise and unsightly views their projects created, as well as degraded non-auto access. In recent decades a host of initiatives and policies have grown up to mitigate these harms and prevent new ones, including Complete Streets, Context Sensitive Design, Transportation Alternatives (formerly Enhancements), and the Sustainable Communities Initiative.
- New expectations around economic development. Developmental highways once seemed to be obvious wealth generators, though research has shown that they often simply redistributed businesses instead of catalyzing them. Transportation agencies' difficulty in applying for TIGER grants, which required economic justification, demonstrated a general weakness in this field, and transportation economic impact analysis remains an emerging field fraught with questionable claims.
- New expectations around transportation choice. The regions have increasingly chosen to invest in non-auto modes, and the state's signature public works project today is high-speed rail.
- New expectations on managing mature systems. With built-out highway systems around the country, parts of which have reached the end of their useful lives, efforts have turned away from expanding infrastructure and toward system preservation and operational enhancements. In ITS, technology has advanced so rapidly that, with long delivery times typical in highway projects, systems may become obsolete before they are installed.
- New expectations around the sophistication of planning. Technology has provided powerful new planning techniques that address many of the drawbacks of traditional planning tools. Land use and transportation can be modeled together, trip-chains can be accounted for, and "big data" offers opportunities to both better calibrate models and to observe behavior directly, without resorting to models, which have been notoriously bad at adjusting to changes in travel demand seen this century.
- New expectations in partnering. Particularly in the California context, where local partners are critical funders, but around the country as well, state DOTs are acknowledging that their systems are intimately connected with local street and transit networks, and with ports, railways, and other modes that may be privately run. And all of those transportation systems both affect and are affected by land use decisions. Optimizing for access to destinations in that context is a far cry from the earlier state DOT mission, assembling a statewide road network and building the Interstates.

California and Caltrans in a time of change

As early as the 1970s, Caltrans produced policy that began to address stewardship, sustainability, and other issues that motivate our current assessment. In 1974, Caltrans' California Transportation Progress Report identified four primary policy goals to guide the department: energy conservation, improved air quality, reduced auto dependence, and maximization of travel opportunity.[21] Several years later, the California Transportation Plan Task Force produced *Recommended Statewide Transportation Goals, Policies and Objectives*, which stated the need for change at the department, away from the focus on expanding the highway network toward dealing with finance pressures, traffic congestion, environmental concerns, and providing transportation options for non-drivers. The report identified the state's appropriate role in transportation as limited to resolving differences in regional transportation plans around issues of statewide interest. Otherwise, transportation decisions were to be the purview of local and regional government.

A profound transition, such as the move away from state-centered highway building, would be challenging for any organization. Caltrans has had to answer to local entities with their newfound power and funding, and to continue to operate its system, often through earthquakes and other emergencies; it cannot shut down, regroup, and start over. At SSTI's request, Caltrans compiled a list of recent successes, which we included in this report as Appendix D. Below we comment on some of the items on that list. Overall it is impressive and it indicates the enduring desire to do the public's work that we cited in the introduction.

On the other hand, changes in recent decades in some cases have left Caltrans out of step, despite the staff's genuine efforts, and despite policy statements such as those cited above. We deal with some of the problems in the subsequent section. But in terms of the history, it is useful to know how some of the problems have developed.

State-local partnerships. It is not clear that decision makers fully understood the situation they were creating when they disempowered Caltrans vis-à-vis local governments. In some cases, relationships have gone well, but in many others the strong local counties and regions have grown to resent Caltrans' project development presence—some to the point of refusing to employ Caltrans for more than required oversight. At the same time, the balkanized system of funding has left Caltrans with a difficult task in maintaining interregional access. As noted above, Caltrans has also been expected to cover owner-operator costs of new or expanded facilities funded locally, raising its long-term costs. On the other hand, local partners have complained about what they see as Caltrans' excessive and contradictory project oversight, and lack of systematic planning and operations and cooperation with local street and

It is not clear that decision makers fully understood the situation they were creating when they disempowered Caltrans vis-à-vis local governments.

[21] Much of the material in this section comes from Brown, *Statewide Transportation Planning in California: Past Experience and Lessons for the Future*.

transit networks. In some cases Caltrans has developed a strong working relationship with its partners, but many others are characterized by mistrust.

State policy direction. The legislature has actively intervened with Caltrans on funding issues, as previously noted. It has also expressed a host of policy desires, often by requiring reporting on particular issues (Appendix E). Other than taking time to prepare, it is not clear that these reports have had much impact on Caltrans. Often, however, on critical policy issues that would logically involve Caltrans, such as creating a high-speed rail network and reducing transportation climate effects, the legislature has worked around the department. In AB 857 (2002), the state seeks to orient state investments around a set of modern planning goals.[22] Again, the outcomes of Caltrans' work often are at odds with these goals; its system of negotiating developer exactions, for example, discourages the very infill development envisioned in the goals, and prompted the passage of SB 743 (2013).[23] In sum, it is not clear the legislature and the executive have helped Caltrans to adapt to change in a positive way, but rather have directed resources and mandates for change to other stakeholders.

Expertise. Highway building required good design and other project development skills. But modern transportation systems also require new skills around planning, operations, asset management, and multimodal coordination. Unfortunately, for years Caltrans staff was hampered in its ability to keep up with these changing skill sets because of restrictions on travel and access to training and knowledge exchange; other state DOTs noticed Caltrans by its absence. Particularly hard-hit have been non-engineering skills, such as system planning, where pay issues have been acute.

Caltrans, reliant on others for funding, has come to resemble a large engineering firm.

An insular culture based on project development. Caltrans, reliant on others for funding, has come to resemble a large engineering firm, which is

[22] 65041.1. The state planning priorities, which are intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety in the state, including in urban, suburban, and rural communities, shall be as follows:

(a) To promote infill development and equity by rehabilitating, maintaining, and improving existing infrastructure that supports infill development and appropriate reuse and redevelopment of previously developed, underutilized land that is presently served by transit, streets, water, sewer, and other essential services, particularly in underserved areas, and to preserving cultural and historic resources.

(b) To protect environmental and agricultural resources by protecting, preserving, and enhancing the state's most valuable natural resources, including working landscapes such as farm, range, and forest lands, natural lands such as wetlands, watersheds, wildlife habitats, and other wildlands, recreation lands such as parks, trails, greenbelts, and other open space, and landscapes with locally unique features and areas identified by the state as deserving special protection.

(c) To encourage efficient development patterns by ensuring that any infrastructure associated with development that is not infill supports new development that uses land efficiently, is built adjacent to existing developed areas to the extent consistent with the priorities specified pursuant to subdivision (b), is in an area appropriately planned for growth, is served by adequate transportation and other essential utilities and services, and minimizes ongoing costs to taxpayers.

[23] A recent paper commissioned by OPR (Jouganatos, 2013) finds that Caltrans is guided by the planning goals. Our research shows the opposite. For example, the underlying thinking behind one of the key strategies cited in the paper (i.e., Caltrans' GHG reduction effort) is congestion reduction, which has typically meant the sort of expanded highway capacity that makes compact development much more difficult.

something of a mismatch with state policy direction around operations, preservation, multimodalism, and climate mitigation. Despite a major 1994 report calling for such action,[24] Caltrans has not fully implemented the types of performance management processes that might give leaders more ability to make change, and so many of the department's or legislature's policy pronouncements have not significantly affected the culture. In states that contract out more design and planning work, outside entities can bring new perspectives to bear, but California, with its 90-10 rule requiring at least 90 percent of project work to be completed by Caltrans employees, has maintained a large project-development workforce. The rule, attributed to union influence by some but not all interviewees, not only keeps potentially fresh views out of the mix but also makes it hard for Caltrans to ride out ups and downs in workload by outsourcing.[25] At the same time non-engineering professions and managers, including the staff needed for strategic thinking and creative adaptation to change, have seen salary erosion that makes it hard to attract new blood.

Recent initiatives. The SSTI assessment was conducted in the wake of an internal review conducted by new management at Caltrans. Initiatives undertaken after that review respond to some of the problems we cite in our findings below. These include:

- Creation of a risk management office to address excessive risk aversion
- Creation of a committee to manage relationships with self-help counties
- Work to revise the design exception process, vesting more authority in district offices
- Organization of a team that will produce regular performance reports
- Surveys of state-owned roadways to identify those that serve exclusively or mainly local purposes and are good candidates for transfers of ownership
- Convening of stakeholders to develop more efficient freight movement
- Publication of a new *Main Street, California*[26] guide to community friendly design

All of these developments are positive, and Caltrans deserves credit for their undertaking. In all cases, however, these efforts have not yet delivered the ultimate desired outcome; for example, the risk management office has not yet mitigated a culture of risk aversion, the self-help county committee has not yet revamped state-local relationships, and so on. So Caltrans' recent initiatives deserve applause and support, and we acknowledge them where relevant in the remainder of this report, but they have not yet accomplished the major reforms that are needed to modernize and change the culture of the department.

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[24] SRI International, *Evaluation of the Organizational Structure and Management Practices of the California Department of Transportation Volume I: Summary and Recommendations.* February 1994.

[25] It should be noted that there are real downsides, as well as benefits, to outsourcing. For example, when consultants develop new skills in performing work for a department, often those skills vanish when the contract ends. And consultants can become as potent and self-interested political force as employee unions.

[26] *Main Street, California* (Caltrans, 2013), http://www.dot.ca.gov/hq/LandArch/mainstreet/main_street_3rd_edition.pdf.

Caltrans today

Viewed as an organization, Caltrans has not successfully adapted and evolved to match its current environment. Its mission, vision, and goals are not well-aligned with current conditions and demands. Its portfolio of skills, and their own organization in the department, does not match modern demands for integrating transportations solutions with concerns for sustainability and community livability as well as economic growth. And its managerial systems and practices are inadequate to deliver both innovative problem-solving while holding staff accountable for performance.

In part because of the issues just discussed, Caltrans is often viewed critically by partners, legislators, and citizens who see the department as out of step with the times, too often at odds with evolving transportation policy, in need of fundamental change, and incapable of exercising effective leadership among the many transportation and land use stakeholders in the state. And in fact it will be necessary to confront all three issues in order to succeed at modernization and culture change at the department.

Caltrans has not successfully adapted and evolved to match its current environment.

This view from the outside looking in stands in contrast to the perspective of many Caltrans managers and line employees who, as the SSTI team found in dozens of interviews, are proud of the department's accomplishments, frustrated by credit not given for Caltrans' successes, aware that Caltrans needs to change if it is to remain a vital public department, and genuinely struggling with the question of how best to reclaim a leadership role. On the other hand, internal change advocates have run up against an even more persistent institutional culture; despite producing reams of reports and recommendations that purport to address new policy demands, they have not fully succeeded in modernizing the department, as many well-meaning initiatives have simply withered. For this reason, and because even the best managers at Caltrans tend to be a product of that culture—and because significant hurdles to change come from outside the department—it appears that modernizing is unlikely to occur simply through Caltrans' own work, but will require action by CalSTA, the legislature, and other agencies and stakeholders, including local partners, with whom new relationships must be forged. To date, as we have said, those entities have often worked around Caltrans to achieve change in transportation.

A mission, vision, and goals not well-aligned with current conditions or demands
Our interviews with Caltrans and CalSTA focused attention on some of the failings in the department's draft strategic plan, which was being prepared as this review got under way. At the same time, the agency was convening stakeholders for its California Transportation Infrastructure Priorities (CTIP) work group, which was looking at some of the same issues. To their credit, the department and agency decided to put the strategic plan drafting on hold, and they have acknowledged some of the issues we raise below. In fact, as this review was concluding, management shared a potential new vision statement—"A transportation system that is safe, sustainable, integrated, and drives economic vitality and an improved quality of life"—which we see as a great improvement, and one that shows Caltrans is taking constructive criticism into account and working to make change moving forward. If such a statement is ultimately adopted, the critical next step would be to operationalize the concepts and to measure progress against agreed-upon targets. We suggest in our recommendations that, because of discussions already under way, leadership at the department and agency should be able to develop statements of mission, vision, and goals in relatively short order.

Still, in order to understand the importance of this issue, it is worth exploring the current state of affairs.

After World War II, Caltrans and its predecessor agencies created what was widely perceived to be a state-of-the-art highway system. In the process, Caltrans assembled a talented team of design and construction management engineers, together with a capable planning, environmental review, and right-of-way acquisition staff. Caltrans employees became known for their passionate commitment to the state's highway system. In an expression of this commitment and pride that still lives in many Caltrans offices, it was not uncommon to hear Caltrans workers describe themselves as "bleeding orange."

During this era Caltrans became a model of innovation in design and construction management. This tradition of excellence in project delivery resulted in a public department whose employees were fully engaged in their work, stayed on the job for a long time, and exhibited an institutional loyalty that is increasingly rare in both the private and public sectors.

Now new demands and conditions have made Caltrans' job more complex. Today, through new state policies, those of its regions and local governments, and the expectations of its citizens, the state of California is again at the center of a new and groundbreaking approach to the "smart" delivery of transportation services. It's an approach:

- that measures system performance not only in terms of traditional metrics such as lane miles, roadway capacity, and unimodal levels of service, but also in terms of greenhouse gas (GHG) emission reduction, air quality, environmental stewardship, reliability, connectivity, user costs, modal choice, livability, economic justice, public health, and economic development and productivity;
- that takes into consideration the reciprocal cause and effect relationship between land use and transportation; and
- that, with regard to the state's roadway infrastructure, assigns priority to investments in system preservation and system operations while de-emphasizing system expansion.

Unlike the road building achievements of the interstate era, which occurred to a large degree because of Caltrans, the current transition to a more sustainable approach is largely taking place in spite of the department. The adoption of AB 32[27] in 2006 and SB 375 in 2008, in particular, were "game changers." If Caltrans is to keep pace with these statewide policy initiatives, the department will need to make fundamental adjustments in the way it exercises its statutory authority.

Our assessment suggests the department's senior staff acknowledge the transformative forces confronting Caltrans. The department points to the preparation of its emerging five-year strategic management plan (2013-2018). The results of this strategic planning process, however, provide a sense of just how difficult the effort to transform Caltrans will be.

Caltrans' last 5-year (2007-2012) Strategic Plan described the department's "Mission and Vision" as "Caltrans Improves Mobility Across California." It says, "Through strategic and effective partnerships, Caltrans can improve mobility even in the face of the state's aggressive population growth. Inherent in this effort is the need to sustain a high quality of life."[28] According to the 2007-2012 Strategic Plan, this combined mission and vision statement, which was carried over "unchanged" from "previous [strategic planning] efforts," "succinctly reflect[s] who [Caltrans] is and what it want[s] to accomplish as an organization."[29]

In developing its new 2013-2018 Strategic Management Plan, Caltrans has spent hundreds of hours engaging senior staff as well as rank-and-file employees and stakeholders. The result of this process, according to descriptions provided of the current draft, is to once again carry over unchanged the mission statement of the prior strategic plan and to add a separate vision statement: "Caltrans provides leadership to achieve an excellent transportation system for California's future."

Moreover, the five goals of the 2007-2012 Strategic Plan, which are intended to "assert the general direction [Caltrans] wants to take to realize its vision and mission," have also been carried over into the new five-year strategic plan essentially unchanged. Of the five 2007-2012 Strategic Plan goals, three ("Safety," "Stewardship," and "Delivery") have been retained as written. Although the other two goals have been renamed, their substance has remained the same. During the 2013-2018 strategic planning period, the "Service" goal to "promote quality service through an excellent workforce" will go by the name "Professional Workforce," and the "Mobility" goal to "maximize transportation system performance and accessibility" will go by the name "System Performance."

If the purpose of developing a statement of mission, vision, and goals is to succinctly define "why [Caltrans] exists," "[Caltrans'] desired end state," and the strategic direction Caltrans intends to pursue in order to realize that end state, it is telling that, over the course of the last decade, Caltrans' sense of its mission, vision, and goals has remained essentially unchanged even though, during this same period, the transportation policy framework that defines the

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[27] Global Warming Solutions Act of 2006, Cal. A.B. 32 (2006), Chapter 488 (Cal. Stat. 2006), available at http://www.leginfo.ca.gov/cgi-bin/waisgate?WAISdocID=9743481776+379+0+0&WAISaction=retrieve.
[28] Vicki White et al., *Caltrans Strategic Plan 2007-2012* (Caltrans, December 17, 2007).
[29] Ibid.

department's reason for being, desired end state, and strategic direction has undergone a dramatic transformation.

The most obvious example of this change is climate policy. Even though transportation is the source of almost 40 percent of the GHG emissions AB 32 is designed to address, the 2007-2012 strategic plan was written as if the law didn't exist. Moreover, the 2013-2018 draft plan provides little indication that Caltrans intends to give the impact of either AB 32 or SB 375 on Caltrans' mission, vision, or goals any more attention than it gave AB 32 in its previous five-year planning effort.

This is not to say that the 2013-2018 draft plan does not acknowledge, particularly in the briefing notes that are appended to the presentation of the draft plan, the need for change. [30] The briefing notes begin with the recognition that the department "must continually adapt to change." The plan goes on to list "change" as one of the four areas of "focus" and to reference in the related notes "the need for . . . change (reform)." There is also a reference in the parenthetical description of the "Director's Intent" to "Culture Change."

Yet there is almost nothing in Caltrans' draft statement of mission, vision, or goals to suggest the department is taking its own admonition regarding change seriously. According to the briefing notes on the plan, the word "sustainability" was at one point incorporated in a draft of the mission, but it was removed because it was not well understood. This omission suggests Caltrans is settling for an anodyne statement of the status quo, not a clear description of a path forward, nor a rigorous attempt to adjust to current demands on the department. The fact that Caltrans employees are confused "about the use of sustainability and vitality in the vision statement" is all the more reason to use the strategic planning process to clarify this confusion. The role of a strategic plan is to show the way forward. Without an operational plan, performance management, which relates sub-unit and individual goals to the plan, is impossible.

If Caltrans is to build a relationship with the public it serves, it must be able to explain the importance of the work it is doing and the positive difference it will make in terms of both quality of life and a sustainable future.

Caltrans' approach to its mission also leaves the department without a compelling story to tell. While we discuss in greater detail the challenges Caltrans has encountered in devising an effective communications strategy later in this report, effective leadership and successful public outreach almost always begin with a compelling story.

For Caltrans, a compelling story is one that explains why the public should care about the role the department intends to fill, the policy it intends to implement, the goals and objectives it intends to achieve, and the strategic initiatives it intends to undertake. If Caltrans is to build a relationship with the public it serves, and particularly if Caltrans aspires to lead the public "to an

[30] Peter Spaulding, "2013-2018 Strategic Management Plan" (presented at the Meeting of Executive Board, 1120 N St., Room 1245, MS 49, Sacramento, CA 95814, n.d.).

excellent transportation system for California's future," it must be able to explain the importance of the work it is doing and the positive difference it will make in terms of both quality of life and a sustainable future. The department's success in engaging the public will depend, to a large extent, on its ability to describe the end it aspires to achieve in a way that will inspire the public to follow its lead.

A vision that has as its "desired end state" "an excellent transportation system for California's future" is so "succinct" as to be meaningless. A vision that has as its central predicate the provision of "leadership" but fails to provide a description of outcome that inspires others to follow sows the seed of its own demise. And a Caltrans' vision that is not closely aligned with the statutory vision of a more sustainable and smarter approach to transportation, which inspired the adoption of AB 32 and SB 375, lacks coherence and gives rise to a disconnect that is more likely to alienate potential support than to invite allegiance.

The plan as currently written suggests an organization that has not yet embraced the transformational shifts that have taken place in California's transportation policy and has yet to redefine itself and its aspirations to internalize the new systemic order these shifts in policy require. Without a real statement of where the department is going, it will stay focused on building highways rather than managing a system to optimize access to destinations.

The policy focus of the Caltrans mission on improving mobility, in particular, reflects the backward-looking priorities of a much simpler road-building era that was almost exclusively concerned with the movement of people and goods and traditional measures thereof. These measures include segment-based level of service (LOS), which the legislature with SB 743 (2013) rightly has found to be an impediment to modern policy goals when used to justify developer exactions. A more modern statement, and one consistent with the department's 2010 *Smart Mobility* report, might be "improving accessibility," which allows for travelers and shippers to reach destinations through proximity as well as movement. And, in focusing exclusively on mobility, Caltrans' mission fails to recognize the complexities and competing priorities of a more modern view of the role of a transportation system:

- in reducing greenhouse gas emissions that contribute to climate change and related sea level rise;
- in fostering more compact, transit oriented development, optimizing locational efficiencies, maximizing opportunities for active transportation, and otherwise encouraging smart growth and discouraging sprawl;
- in promoting economic development;
- in addressing considerations of economic justice;
- in reducing adverse impacts to air quality;
- in enhancing the livability of our communities;
- in improving the health of our public; and
- in otherwise addressing the sustainability agenda that is at the center of 21st century transportation planning.

We recognize the department's effort to use a bottom-up approach to the formulation of its mission and vision statement as a means of securing buy-in from those who will ultimately be responsible for implementing the mission and vision on the ground. But we are concerned that

the department has achieved relative consensus by casting the mission in terms that even those most resistant to change can embrace and by removing from the discussion of vision the very elements that are most in need of buy-in if they are to effectively guide Caltrans going forward.

The confusion over the word "sustainability" points to a basic issue that Caltrans must address as it charts its future: What does "sustainability" mean to a state DOT? There would be little debate that one aspect of sustainability involves the DOT cleaning up its own act, by using more fuel-efficient vehicles, energy-efficient buildings, and greener highway materials. But as stated above, the state's relevant policies go well beyond those. Highway materials account for well under 10 percent of the facilities lifecycle energy use and emissions; the vast majority of those are related to use of the highway. Caltrans will not be able to meet the policy expectations of the state of California until it comes up with ways (many of them expressed in existing department policy documents such as *Smart Mobility 2010*, which have not been implemented) to provide access to destinations without inducing new travel, as new highway capacity does.

The confusion over the word "sustainability" points to a basic issue that Caltrans must address as it charts its future: What does "sustainability" mean to a state DOT?

One source for such direction, in addition to *Smart Mobility,* is in the evolving long-range transportation plan, drafts of which much more forthrightly address modern policy goals than does the draft strategic plan. Unfortunately, the long-range transportation plan is being produced in Planning, while the strategic plan comes out of the director's office, and the two seem to be on separate tracks. Getting a good long-range plan would be helpful, but long-range plans historically have not guided actual investment decisions, and it is the strategic plan that critically sets the goals for performance management.

A portfolio of skills and practices that do not match modern demands

Caltrans grew up in the highway-building era, and it still resembles a large engineering firm, focusing on construction projects largely funded by others. Excluding administration and legal, we estimate that more than 95 percent of Caltrans' staff works on highways, the majority of them on projects (as opposed to maintenance and operations). On paper, the department has a large planning function, but hundreds of these staff are dedicated to projects as well, e.g., in preparing project initiation documents. For its modern transportation needs that go beyond project delivery, California has worked around the department, for example, by empowering local and regional agencies, creating a new department to handle high-speed rail (even though Caltrans has a rail program), and vesting transportation-climate policy implementation in other entities, such as the Office of Planning and Research (OPR), the

For its modern transportation needs that go beyond project delivery, California has worked around the department.

California Air Resources Board (CARB), and the MPOs. These actions are both a cause and effect of Caltrans being out of step with current needs and skills. Another cause, as previously noted, is the historic lack of access to outside training and knowledge exchange opportunities, and a tendency to maintain project development staff while cutting planners and others who might introduce the multidisciplinary approach to transportation that has taken hold around the nation in recent years. Caltrans has produced potentially helpful policy statements, but too often these have not significantly altered the way the department does business.

Land use and transportation. Transportation agencies have traditionally declaimed any responsibility for land use outcomes. In the traditional four-step demand model, land use is a given, provided to the modeler so that she can decide where transportation facilities should be placed. Such a framework has the virtue of keeping things simple for practitioners. But it is of course an untenable position, and one that modern agencies, including California's MPOs, have abandoned. There is no greater determinant of land use than the transportation system. If Caltrans' roads were designed differently, or placed differently, or not there at all, California's land use would be commensurately different. And these outcomes matter greatly. They determine whether VMT reduction envisioned in SB 375 will succeed, whether cities will be livable, whether highways will continue to be congested, and whether citizens can access destinations at reasonable cost.

So it frustrates stakeholders to hear department staff declare, as many did in our interviews, "we don't control land use" since their department's actions so clearly affect it. Some of those stakeholders decided not to wait on Caltrans to change, and to take action this year, passing legislation to reform Caltrans' sprawl-inducing transportation-impact calculations that are based on highway level of service near proposed developments. Significantly, they handed implementation of SB 743 to OPR rather than Caltrans (but Caltrans' involvement provides a real opportunity for the department to develop expertise in this area and find new ways to improve land use outcomes). Nor is Caltrans (or for that matter the agency or the CTC) a major player in ensuring the regions are moving toward lower VMT development, as envisioned in SB 375, even though much of the work done in the region is funded through state STIP monies. CTC, in its most recent STIP guidance, does require local project sponsors to qualitatively show how projects relate to sustainability goals,[31] but the history is that neither Caltrans nor locally-sponsored projects have undergone much scrutiny for their contribution to, or impedance of, progress toward state goals.

Caltrans has actually written good policy in land use and transportation. In 2005, Caltrans issued a deputy directive on "Local Development—Intergovernmental Review" with a strong smart growth orientation.[32] Also, in a well-conceived 2004 project, Caltrans developed an alternative

[31] Each region with an adopted sustainable communities strategy shall include a discussion of how the RTIP relates to its sustainable communities strategy. This may include a quantitative or qualitative assessment of how the RTIP will facilitate implementation of the policies and projects in the sustainable communities strategy and should identify any challenges the region is facing in implementing its sustainable communities strategy. In a region served by a multi-county transportation planning organization, the report shall address the portion of the sustainable communities strategy relevant to that region.

[32] Randal H. Iwasaki, "Deputy Directive DD-25-R1, Local Development - Intergovernmental Review (LD-IGR)" (Caltrans, June 2005), http://www.dot.ca.gov/hq/tpp/offices/ocp/igr_ceqa_files/DD-25-R1_final.pdf.

for urban and infill projects to the Institute of Transportation Engineers trip generation methodology, which tends to reflect suburban experience and yield inflated motor vehicle trip generation rates for such projects. And it did commission the 2010 *Smart Mobility* report, which took on many issues related to land use, and it has committed to a pilot project intended to "More fully integrate [smart mobility] principles into sub-regional transportation and land use planning processes."[33]

The practical effects of these, however, have been small. Despite the strong evidence that trip generation calculations are inaccurate, Caltrans' *Guide for Preparation of Traffic Impact Studies* has not been updated since its publication in 2002 and still calls for high motor vehicle levels of service in urban and infill settings.[34] Interviews with district directors and stakeholders indicated a failure to consider land use implications in state highway planning and development review. Indeed, interviews confirmed Caltrans' continued adherence to the traffic impact study approach to smart growth development, with at least one high-level Caltrans manager expressing strong disapproval of CEQA's traffic impact assessment exemption for infill projects. Varied stakeholders we spoke with provided anecdotal evidence that Caltrans continues to pursue inappropriate project-specific motor vehicle LOS goals in urban settings.

Smart Mobility 2010 includes a detailed implementation checklist,[35] and Caltrans declares implementation a success story (Appendix D). However, according to interviewees within Caltrans, neither senior management direction nor staffing and funding have been provided for an implementation process. Instead, as the Caltrans smart mobility web page indicates, the smart mobility framework has been kept alive only through a couple of pilot projects within the Office of Community Planning.[36]

Thus the *Smart Mobility* location efficiency guidance is not reflected in any deputy directive, in the Caltrans traffic impact studies guide, nor, despite its recent revision, in the Caltrans *Highway Design Manual.*

According to a consultant who did work for Caltrans and who was interviewed for this project, in a survey of approximately 100 Caltrans managers, only two were familiar with the *Smart Mobility* guide. In our interviews, a very high-level division manager, when asked about it, dismissed it as "just a document someone wrote." An external partner observed that the Caltrans culture and practices reflect a continued failure to embrace location efficiency. The department's own review of MPO activities,[37] supplemented by our interviews, reveals no engagement on smart mobility with the MPOs—this despite an emphasis in *Smart Mobility 2010* on Caltrans's

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[33] Caltrans, "Smart Mobility Framework Implementation Pilot Study Factsheet," April 2013, http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/SMF_Pilot_Study_Fact_Sheet_041613.pdf.
[34] Department of Transportation, *Guide for the Preparation of Traffic Impact Studies* (State of California, December 2002).
[35] Pages x-xi and 108-115.
[36] "Smart Mobility Framework," *California Department of Transportation*, n.d., http://www.dot.ca.gov/hq/tpp/offices/ocp/smf.html.
[37] CTC & Associates LLC, *Sustainability Tools and Practices: An Examination of Selected State Departments of Transportation, California Metropolitan Planning Organizations and National Tools* (Caltrans, March 22, 2013), http://www.dot.ca.gov/hq/tpp/offices/ocp/smf_files/Caltrans_Smart_Mobility_Preliminary_Investigation_3-21-13.pdf#zoom=75.

role as "a leader in adopting a changing approach that all transportation agencies will need to embrace in order to gain Smart Mobility's benefits."[38]

Caltrans is not alone among transportation agencies that still avoid the land use issue, but in California it stands in stark contrast to the MPOs that have made the leap, building both analytic capacity and policy frameworks for handling land use and transportation interactions. This is despite the fact that MPOs also don't "control" land use in the sense of having zoning authority. In short, Caltrans cannot be the leader that it aspires to be, nor achieve the policy outcomes the state expects, without building new capacity to understand its influence on land use, and to use that influence for good.

The state-of-the art demands attention to operations, off-network and multimodal connections and, as just noted, land use/transportation coordination.

Managing systems. For a long time transportation agencies looked at their role as delivering a series of projects. The projects would be prioritized on a list, and the individual projects in the best case might be coordinated in order to address issues on a corridor or area. Today, even developing good project lists is not enough; the state-of-the art demands attention to operations, off-network and multimodal connections and, as just noted, land use/transportation coordination. Project lists are still important, but even here the best practice has advanced.

Outside stakeholders consulted for this project, as well as some internal ones, said systems thinking was an area that has advanced beyond Caltrans' practice. In one area, asset management, the department has acknowledged this issue publicly. With aging freeways and finite SHOPP dollars, Caltrans can no longer address pavement, bridge and culvert upkeep and rehabilitation in traditional ways that rely on incomplete data, individual judgment, or "worst first" rules of thumb. Asset management programs are costly and time-consuming to establish and not particularly exciting to many stakeholders, but states that have made the investments have greatly improved their performance. So Caltrans' will need support to move in this direction.

Asset management, though challenging, is probably a reform at which Caltrans can excel, with its strong infrastructure-oriented thinking. More difficult, perhaps, in terms of mindset are systems involving operations and off-system connections to land use, local networks, and non-auto modes. In the San Diego region, where a local initiative has imposed some capacity to do systematic thinking in the form of corridor managers, a nationally significant integrated corridor management (ICM) project promises to link state and local facilities in productive ways. The project was locally led, but, like SB 743 in the land use arena, San Diego's ICM effort now represents an opportunity for learning, replication, and inspiration throughout Caltrans. Such learning is critical, as many internal interviewees expressed a lack of interest in local networks, particularly those involving non-auto modes; even senior district staff in our interviews expressed the feeling that such considerations were not important to Caltrans.

[38] *Smart Mobility 2010*, p. xi; see also pp. 108-115.

Stakeholders expressed particular concern about Caltrans' ability to lead on interregional travel and goods movement. Both require systems planning and coordination across geographies and modes, with the latter including both publicly- and privately-owned networks. Stakeholders portray Caltrans as a relatively passive facilitator of interests, rather than an organizer or leader in these areas, and internal staff did not greatly dispute this characterization. Caltrans rightly points to its diminished ability to apply STIP funding to interregional issues. But the focus on money for projects again reveals the department's blind spot regarding organizing, leadership, and analytics—services it can provide without more project funding. To this end Caltrans is producing an interregional blueprint. Its *California Interregional Blueprint: Interim Report* (2012) provides a very thoughtful review of regional planning activities and statewide sustainability, with suggestions as to roles that Caltrans might take up. The report serves to document Caltrans' current lack of engagement in the state's key forward-looking regional and interregional plans. If Caltrans uses the report to chart a new course of engagement, it will go a long way toward addressing complaints about its systems thinking and leadership in interregional travel. There are warning signs, however, that such implementation may not occur, as knowledge and interest in the plan seem confined mostly to the planners working on it and some top Sacramento managers.

Coordinating and operating, rather than building. In a time when scarce state and local resources increasingly must go to system preservation, there remains a need to improve personal accessibility and goods movement. Improvements in these areas, without relying on state-funded highway projects, implicate skills and practices that Caltrans tends to marginalize. Even though preservation is the department's highest statutory objective, in the period 1993-2010, as the department grew by 4,000, maintenance positions actually dropped by 1,500, according to data assembled by one stakeholder. While it is difficult to directly compare state staffing levels, it appears Caltrans is an outlier in this area; in most other states, DOT maintenance employees greatly outnumber project development staff, but in California the reverse is true, according to a 2008 AASHTO survey.

Often in our interviews, when we raised issues related to improving some performance aspect, Caltrans staff responded that they did not have funding for relevant projects. This view ignores other strategies. Outside stakeholders, for example, wish that Caltrans had more capacity to organize public-private partnerships, which might alleviate freight bottlenecks that now threaten economic competitiveness. Caltrans does have experience in using consultants to evaluate P3s, but the gap here is in strategically assessing the opportunities and assembling the deals.

Goods movement is particularly relevant in this discussion because it involves multiple parties, both public and private, and multiple modes. The Alameda Corridor and Colton Crossing projects are nationally renowned successes in which Caltrans played a constructive role, helping to separate freight related to the Ports of Los Angeles and Long Beach from local traffic. Yet perhaps because these were primarily about freight rail, the department did not include them in its top recent successes list provided to SSTI. Local partners maintain that Caltrans primarily concerned itself with the freeways in these projects, rather than providing vision and strong facilitation. On the nearby Gerald Desmond Bridge megaproject being built by the Port of Long Beach with Caltrans oversight, they complain that Caltrans' multilayered design review process generated belated design concerns over a "nonstandard" interchange and other issues. This

threatened the project's viability, as they would give the design-build contractor free rein to add costs.

Port-originating and -destined freight is a key issue requiring Caltrans to think beyond its on-network projects, but it is hardly the only one. Most internal and external stakeholders agree that operations has been given less attention at Caltrans—and by legislative budgeting—than traditional infrastructure. They cite high failure rates of changeable message signs and inoperable loop detectors around the state, the value-engineering out of some ITS components in project development, and the relatively long startup period for data generation after projects are complete.

Perhaps more important is the previously cited inclination of Caltrans staff to view off-system networks as unimportant to the department when, in fact, good connectivity and redundancy in these networks can greatly improve reliability and reduce traffic loads on the freeways. In addition to comments we received in interviews to this effect, we note that the Caltrans traffic volume web page only tracks flows on the state highway system.[39] The ability to analyze and plan around all elements of the built environment, including land uses, is critical to achieving the state's sustainability goals. Analysis, organizing, leadership, and operations—none of these plays to Caltrans' strong suit of building projects.

Continued on page 30.

[39] "Welcome to the Traffic Data Branch," *California Department of Transportation*, n.d., http://traffic-counts.dot.ca.gov/.

Sidebar 1: New needs around freight

California has three of the top five U.S. container ports: Los Angeles, Long Beach, and Oakland.[40] Approximately 40 percent of the imports to the United States enter through these ports, destined for points as far as the East Coast. The expansion of the Panama Canal may shift ship traffic from Asia to East Coast ports, but it is not clear that this will reduce volumes moving through California. While more Asian ships will be able to go through the canal directly to the U.S. East Coast, traffic from the East Coast of South America may choose the canal as a shorter route to the big markets on the U.S. West Coast.

This sector creates several hundred thousand jobs, but this activity also comes with problems, including congestion and air emissions. Caltrans has had success and failure over the last 20 years in partnering with local and private interests to improve throughput and reduce air pollution near port locations. For the most part, however, stakeholders involved in the issue say Caltrans has been in a reactive posture on goods movement issues, with a highway-centric focus. One exception is Caltrans' involvement in the improvements at the San Ysidro border crossing. Improvements to that crossing are under way, and Caltrans is playing an active and positive role with other state and federal agencies.

The state's most notable success in freight is probably the Alameda Corridor, a highway/rail separation that allows goods to move quickly and efficiently from the ports of Los Angeles and Long Beach to inland distribution. The corridor idea originated with the railroads and the port but eventually included Caltrans and generated federal financial assistance. (The federal TIFIA loan program was built on the concepts used to provide federal support for the corridor.) The improvements have led to more shipments from the port by rail. Still, short-haul truck movements continue to generate congestion and emissions. Two megaprojects, the Desmond Bridge and I-710 reconfigurations, are directed at this problem. Again, the port has been the driver of these fixes. One source of frustration for the port leadership has been getting Caltrans engineers to understand the need to move quickly on needed design exceptions to an extremely complex project. The department's "by the book" attitude, sometimes invoked even after non-standard design-build contracts have been let, has threatened to drive costs up by giving the contractor free rein to add costs. Port management has had to circumvent Caltrans district staff and enlist central office assistance. This tactic has been successful, though time-consuming, but it indicates problems for Caltrans' solution to design flexibility, coming out of its 2012 program review. That solution is to vest more power in the districts—a fix that will only work if the districts actually use flexibility and stick to decisions once they are made.

Caltrans' role is complicated as well by the lack of a consistent vision of what the state's role is in goods movement. Railroads are privately owned, and there is often public resistance to "helping" them; the railroads themselves are usually reluctant partners and have a well-earned reputation for making things difficult. The California ports are owned and operated by competing authorities. For example, the Port of Oakland is working on major expansion plans that could

[40] American Association of Port Authorities, "North America Container Traffic 2011 Port Rankings by TEUs," April 30, 2012, http://aapa.files.cms-plus.com/PDFs/NORTH%20AMERICA%20PORT%20CONTAINER%20TRAFFIC%20RANKING%202011_1361895265064_1.pdf.

benefit from Caltrans or state assistance. However, there is no methodology to determine the merits or size of an investment from the state perspective. As Oakland moves forward with its plans, the uncertainty surrounding Caltrans' participation and cooperation in managing operations during construction creates significant concern at the port. Similarly, the Port of Hueneme, identified as one of six "top priority global gateways" in the California Goods Movement Action Plan[41], would benefit from more clearly articulated state support with landside issues. Currently, there is no policy or institutional framework that facilitates discussion and resolution of such matters.

Short of having the state take ownership—as Maryland and North Carolina have done—states with multiple ports and similar intrastate competition have sought to improve communication/planning/project delivery by setting up some state funding that can be directed to projects with high benefit-cost ratios. Although it is still in the early stages of implementation, Florida has allocated specific funding, on an annual basis, to assist with local port improvement projects. Similarly, many states have either moved to own freight rail lines (mostly Class 2, but some Class 1 routes) or more commonly have set aside funding for improvements. Though the dollars involved in the latter tend to be modest, these programs at least form the basis for conversations between railroads, shippers, manufacturers, and the state.

Another area of interest is the developing role of the Central Valley as the location for distribution centers. Historically, the valley has seen large volumes of agriculture products moving both within the state and into interstate commerce. Recently, distribution centers for merchandise have sprouted along State Route 99, often as an alternative to moving goods on I-5. Caltrans can continue to be a relatively passive observer of these kinds of developments, or it can engage with developers, shippers, and other stakeholders to take a more active role in helping to guide and facilitate economic growth of this type.

Finally, goods movement issues are also prevalent at the various border crossings with Mexico. Planning and delivering projects is enormously complicated because of the multiple interests, both public and private, involved. Because of the private and public leadership in the San Diego area, good progress has been made on updating the crossings at San Ysidro and Otay Mesa, using creative approaches to contracting and introducing innovative technologies. Similar efforts are anticipated at Calexico, Tecate, and Andrade, the more rural crossings to the west.

As part of MAP-21 implementation, Caltrans has created a State Freight Advisory Committee (SFAC) to develop a statewide freight plan. The group includes a broad cross section of public and private sector participants. It has met several times and is in the process of producing a draft plan.

In summary, the major challenge for Caltrans and CalSTA on goods movement is to create an institutional structure that is forward-looking, nimble, multimodal, and capable of competing effectively for federal resources. The dynamic nature of global goods movement requires the capability to invest in new technologies and facilities wisely and in a timely manner. Without a

[41] *Goods Movement Action Plan* (California Business, Transportation and Housing Agency and California Environmental Protection Agency, January 2007).

clear focus by Caltrans on these issues, the state will not be able to maximize the benefits of its strategic location and its past investments in port, rail, highway, and border infrastructure.

While California has had some success in improving facilities and operations on an ad hoc basis, it has lacked an overall state vision and a methodology for directing state investment and operations in the goods movement arena. Improvements will require a significant refocus of resources at Caltrans, as well as a change in attitude and culture from a central command structure and approach for highway construction to a more partnership-based and collaborative approach to building or improving multimodal connections. This is in addition to adopting, deploying, and maintaining the best operational technologies. It also means working more closely with shippers, particularly those supporting the California economy with state-based industry and agriculture.

Continued from page 26.

Balancing competing priorities. In the section on mission we discussed Caltrans' focus on mobility. In practice, mobility could mean "smart mobility," as in the department's 2010 report, which would involve concern for multimodalism, connectivity, livability, and location efficiency. Yet as noted, when sustainability was considered as part of a mission/vision statement, it was deemed too confusing to the staff. Leaving this out not only misses an opportunity to teach and move the department, but the reason for its omission reveals a gap in capacity. Sustainable transport has been a topic of concern for decades, and Caltrans acknowledged it at least as far back as the 1970s. And while the department has some staff who understand the concept, to most of the staff it is a foreign or even hostile concept in part because sustainable transport depends on local networks, which Caltrans staff tend to regard as an issue for others. In contrast, local partners fund projects on both the state system and on their own networks, and of course maintain the latter; consequently they have a more holistic attitude. Where advances have occurred, as in the San Diego area's ICM project, these have tended to be led by the local partner.

This is not to say that Caltrans has ignored such issues, but its implementation has fallen short of policy pronouncements. In 2008, Caltrans issued a "Deputy Directive" with a complete streets policy.[42] The National Complete Streets Coalition rates it highly, ranking it third among 12 state policy directives. The department recently concluded an implementation process that is documented in detail on its website. One district director cites that process as a model of breaking down silos and coordinating headquarters planning and district implementation. As part of the implementation process, Caltrans updated its Highway Design Manual to incorporate the complete streets policy directive. Despite that ostensibly broad review and updating, however, the manual remains an impediment to a modern approach. For example:

Despite that ostensibly broad review and updating, however, the manual remains an impediment to a modern approach.

- The manual sets "mandatory standards," not guidelines or ranges, for most design elements such as lane and shoulder widths. Even in the 1980s, by contrast, the AASHTO "Green Book" emphasized that figures it provided for such design elements were guidelines, not standards. Deviations from the mandatory standards require a special approval process. The new Main Streets guide carries forward this approach.
- The "mandatory standards" for lane width and shoulder width are high—12-foot minimum lane widths are generally required, with 11-foot lanes allowed in a few limited circumstances. In contrast, off high-speed limited access highways, current best practice nationally calls for lane widths of 10-12 feet, depending on the context.
- The manual does not provide for a design process in which accommodation of all users is mainstreamed, an integrated process that provides flexibility for making trade-offs. Levels of service for pedestrians and bicyclists are still determined in isolation and with

[42] Randal H. Iwasaki, "Deputy Directive DD-64-R1, Complete Streets—Integrating the Transportation System." (Caltrans, October 2008), http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets_files/dd_64_r1_signed.pdf.

dated measures, for example, pedestrian LOS is based heavily on sidewalk width. The manual thus does not incorporate the multimodal LOS framework of TRB's 2010 Highway Capacity Manual and the Caltrans website, where manual updates and related documents are posted, does not mention the 2010 edition or multimodal LOS concept.

- The manual's approach to motor vehicle design speed, which does much to determine the character of a road or street, favors high speeds without regard to their impact on other modes. State routes that are non-limited access urban arterials other than main streets must have design speeds of 40-60 MPH and state route urban arterials that are "main streets in community centers and downtown cores" must have design speeds of 30-40 MPH. Again, the new Main Streets guide carries forward this approach.

Caltrans is to be applauded for recent publication of an updated *Main Street, California* guide, with calls for flexibility to achieve complete streets and multimodalism. However, like many Caltrans publications that deal with modern practices and goals, it is not clear this one will change outcomes. The guide does not change underlying manuals or processes, nor attitudes like that of one senior staff member who told us that bicycle and pedestrian facilities are not part of Caltrans' mission. Local stakeholders, who do care about non-auto travelers, complain that Caltrans continues to make automobility the primary goal in design and redesign of state-owned roads, including streets in pedestrian-dense urban areas. Even more frustrating is Caltrans' control of bicycle facility design, which by statute[43] extends to locally owned streets, where it insists, counter to current practice around the country, that bike lanes be separated from car traffic only by paint unless the separation is 5 feet wide or includes a fence. This rule is not enforced, and some localities have disregarded it in order to put in planters or other separations that are less than 5 feet wide; but in other places fear of a lawsuit resulting from a crash in a non-compliant facility has precluded such action, discouraging cycling.

Communication. The old joke has it that the extroverted engineer is the one who looks down at *your* shoes. While this is a caricature—our interviews found many articulate and outgoing engineers at Caltrans—it does point out that communication is not always a natural skill, and not one stressed in the sorts of technical training typically received by Caltrans staff. A generation ago, when Caltrans was building popular projects and cutting ribbons, such communication might not have been so important. But that time has passed. Local transportation staff, who must face boards and the public, have learned how to improve in this area, and when they are working with Caltrans sometimes they coach their state counterparts on how to communicate to non-technical audiences. Such coaching, however, is the exception, and there is general agreement that Caltrans' ability to communicate is not what it needs to be. This assessment comes both from staff at local partner agencies, and from at least some members of the public, who express frustration about getting information and responses to concerns from the department related to specific projects. For example, in one case, according to stakeholders, Caltrans staff redesigned one of its urban street-roads in San Francisco to better accommodate bikes and pedestrians—a move the stakeholders applauded—but they did little outreach in advance, which resulted in unnecessary complaints. In another case, local stakeholders complain that Caltrans communications staff is less a conduit than a wall, resulting in poor outcomes on a coastal highway project. As a window to the general public, the department's website is in need of a relaunch to improve content, navigation and presentation.

[43] Cal. Sts. & High. Code §§ 890.6 – 891.

To return to a theme, one reason for this problem is likely that the Caltrans story is not clear.. The legislature clearly wants such a story, and it has imposed a myriad of reporting requirements on the department (Appendix E), but these do not add up to a coherent account of progress, nor do they have much impact on Caltrans' work or on the legislature's understanding of that work. Moreover, this reporting is reactive—based on a disjointed collection of legislative requests, and not a proactive effort to tell Caltrans' story and build support for its initiatives—and does not really track performance. Legislative stakeholders contacted for this project would welcome a more proactive, forthright approach that speaks to Caltrans' plans and needs in addressing system preservation, sustainability, and other issues.

With an anodyne mission that might have been written in the 1950s, staff have little way of expressing where Caltrans is going, or how to describe its progress.

Caltrans is now working on one way to fill this void, by producing a version of WSDOT's Gray Notebook, which is a best practice in DOT "performance journalism," providing stakeholders with useful information and reassuring them that WSDOT is competent in tracking and managing its affairs. It is no coincidence that this year's I-5 bridge collapse in Washington did not result in any recriminations for WSDOT, which had listed the bridge as a threatened asset and which moved to explain what had happened very rapidly. This success of Caltrans' effort will rest on whether it can dedicate staff with skills in such journalism and outreach, and on developing new datasets (such as needed for asset management), not on producing template that looks like WSDOT's. A hallmark of the Gray Notebook is that it constantly changes, focusing on data- and performance-related timely issues, which themselves relate to the Moving Washington strategy; it is not a dashboard that can be filled in by rote. Nor is it a panacea, replacing the need to effectively communicate on emerging policy and other matters that may not yet be readily measurable.

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Sidebar 2: La Conchita

While much of this report addresses local- and regional-government complaints about Caltrans' communications troubles and lack of responsiveness, we also heard from citizens about their own similar frustrations. Not all complaints are well-founded, but a story from La Conchita encapsulates some of the issues: Caltrans' delivery of a project that will ultimately produce a better pedestrian facility comes decades after the department created a barrier in the first place; is marred by a project plan that disregarded community concerns about pedestrian access; and gives the impression that communications staff is in place not to address such concerns but to insulate project staff from them.

La Conchita is an unincorporated Ventura County community separated from the beach by U.S. 101. Decades ago, when Caltrans' predecessor widened the highway, residents say it promised to provide pedestrian access to the beach, but this never materialized. Residents resorted to using a 4-foot-high storm drain under the highway.

In early 2012, as it launched a project to widen U.S. 101, Caltrans reconfigured the storm drain, rendering it impassable. It also began to construct a new underpass for pedestrians, to fulfill the decades-old promise.

The underpass was nearly complete by mid-2012 but remained blocked, awaiting relatively minor work such as lighting, handrails, and a ramp on the beach side. Through the summer and fall of 2012 there was a back-and-forth between the community and Caltrans as community members took it upon themselves to remove barriers at the entrance only to have them replaced by sturdier versions, making it increasingly difficult for them to access the beach and eventually blocking access altogether (right).

Unable to use the undercrossing, some residents began using other tunnels north of town. In October 2012, a resident was fatally struck by a train while walking his dogs in a location suggesting he was on his way to or from the beach. This incident added new urgency to the community's calls for a safe beach access route.

At least one member of the community asked Caltrans' contractor for the project what could be done to open the new underpass and was told that a temporary wooden ramp on the beach side could be put in place in two days if Caltrans requested it. However, while community members say they have contacted Caltrans repeatedly to discuss potential short-term solutions such as the

ramp, no one in a position to address their concerns has offered a solution. Instead, their concerns have primarily generated responses from the agency's public relations staff, who seem to the community to function as a barrier to rather than a conduit of communication. Residents were particularly upset when they received a letter from Caltrans in December 2012 requesting that they drive to the beach for the duration of the project; this solution failed to account for children and older residents who do not own cars or are unable to drive.

In the process of our confidential interviews of Caltrans staff, the facts as presented by the community were not contested. One knowledgeable staff member, while rightly pointing out the project will eventually produce better pedestrian beach access, said the lengthy passage closing was simply part of the project.

At this writing, the undercrossing remains blocked, as it has been for nearly two years.

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Managerial systems and practices that are inadequate to motivate staff and to hold them accountable, and to foster innovation

If Caltrans' mission, skill sets, and practice are not well aligned with current conditions, as we have suggested above, it is worth considering what tools the department has to make needed change, and to simply operate efficiently. Technically oriented institutions such as DOTs, with staff oriented toward particular professional practices, can be particularly daunting to change. Consider the challenges involved, for example, of making change at a university with its tenured faculty, or at a medical facility, with similarly entrenched physicians. Technically oriented staff who rise to management often find they have no training or capacity for directing people. Yet the complexities and changing conditions confronting Caltrans requires sound management that fosters innovation and channels energy to meet new demands.

We do not repeat here our remarks above on the department's statement of mission and objectives. Yet these are critical. Not only is Caltrans' strategic plan out of step with current conditions and state policy; but as a management system it does not adequately lead the staff toward desired outcomes, nor does it adequately set organizational norms and expectations. Clear objectives are key to using performance management, which has been urged on Caltrans for many years as a system to motivate and hold staff accountable for success. Other related challenges facing the department include a risk-averse, fearful culture, a compensation system that does not reward performance, inadequate management training, and internal and external relationships in need of revision.

Performance management. We heard repeatedly from internal stakeholders, and some external ones, that while the vast majority of staff at Caltrans are dedicated to their work in serving the public, a too-large minority is not, and worse, not much is done about it. One department head startled us by saying that a substantial subset of his/her staff existed to whom nothing important can be entrusted due to incompetence, but showed no particular interest in doing anything about this.

Clearly, attention to performance and documentation processes for those not living up to expectations, seem inadequate. Again, this is not a new observation. It's almost perfectly in line with the 1994 SRI report[44], which was never fully implemented in the crucial area of establishing a performance management system. The department's strategic plan still does not contain operational goals for various sub-units and individuals; with the exception of time and dollar budgets on project development, then, there is little accountability through the organization for achieving departmental objectives. Even in project development, accountability is tenuous, as staff report they pad project budgets in order to avoid returning to the CTC for changes, and contractors report that when issues frequently arise out of bad surveys and other project documents, staff uses years-long claims processes to avoid paying these costs, essentially shifting construction-design risk to contractors and forcing contractors to bid high on projects or avoid them altogether.

[44] SRI International, *Evaluation of the Organizational Structure and Management Practices of the California Department of Transportation Volume II: Detailed Findings, Options, and Recommendations*, February 1994.

Yet the benefit of performance management is not simply in documenting atrocities and removing poor-performers. In fact, in a culture that is risk- and change-averse, or even fearful, the main benefit might be to inspire appropriate risk-taking and other innovative actions. We've suggested that Caltrans' statement of goals and mission do not yet provide the right marching orders. Assuming that can be addressed, then performance management is a way to get the staff to figure out how to implement. The mission and goals describe desired outputs and outcomes. The staff, with management, sets their goals for achieving them. And performance management tracks progress not only to shine a light on individual poor performers, but to determine which strategies are working and which need to be changed.

Risk-aversion and fear. Caltrans' 2012 program review rightly addressed the department's attitude toward risk—the futile and ultimately damaging effort to reduce it to zero, at least for the personnel involved in decision making. Local partners say Caltrans "starts at no" and must be goaded into making decisions; and once decisions are made at the district level they may be second-guessed by Sacramento, resulting in delay and cost.

If staff are not accountable, why are they afraid?

As the department tries to implement systems for managing risk more rationally, it is worth thinking about some of the roots of the concern. There is a seeming paradox, for example, between the widely expressed feeling that staff are not accountable for performance and the equally widespread notion that staff are afraid to make decisions. If staff are not accountable, why are they afraid? The answer seems to be that staff only feel held to account in the case of some major problem. If things go well, nothing happens, but if something goes wrong—and the press or a watchdog agency seizes on it—things can be uncomfortable. In other words, the motivation is not achievement of some goal, but fear of failure. And the frequent response is to resort to standard answers, or to delay answers altogether.

Caltrans staff acknowledge the risk problem, but also frequently cite liability concerns as a major constraint, particularly on project design. At least some local partners find this to be an excuse for avoiding creative thinking that might at some point involve blame. Other state DOTs have worked out ways, with their lawyers, to document innovative design decision making so as to insulate themselves from liability, but Caltrans instead simply tends to avoid innovation.

The liability rationale for conservative design seems even thinner given comments by some internal stakeholders about the department's attitude toward stiffening environmental rules, including the important ones on stormwater. Here the view is that Caltrans, after settling a protracted citizens suit on stormwater in 2004, is content to wait to be sued again for noncompliance rather than reorienting toward green infrastructure or pursuing other innovative strategies that would address newly tightening federal rules. Such an attitude contradicts the stated concern about liability on design, and gives the impression that its risk-aversion is based on comfort with standard answers, or a fear of changing things.

So, while we applaud Caltrans management in moving toward creating an enterprise risk management program, we note that its success will likely require some basic rewiring of incentives within the department, not simply new guidance from Sacramento.

Compensation. Of course, performance management works best when it is not mainly punitive but also provides rewards for contributing to the success of the enterprise. But here, too, Caltrans has problems meeting such reasonable expectations. Due to the constraints under which it operates, management has significant difficulty in rewarding performance. It can issue awards of a few hundred dollars, but these are insignificant given larger salary issues and, as suggested above, have not succeeded in establishing a culture of innovation.

Moreover, Caltrans salaries have been shaped over the years by union negotiations, and these have resulted in relatively good compensation for engineers. But pay for other categories of the workforce, including managers, has not fared as well, making it hard for Caltrans to recruit and retain top performers. Not only is pay often better in the private sector, but it is also better at local and regional public agencies as well. And salary "compression" within the department means that staff can make as much or even more than their managers. The Caltrans director himself is a prominent case in point. He bears a huge responsibility, but if the salary database is correct, he makes less than some line staff, and certainly far less than peers in other public and private transportation entities. As with travel restrictions, the pay scale for managers may be a result of state decision-makers' fear of bad publicity; but just as the travel restrictions have done, the salary scales are eroding Caltrans' ability to perform. Local partner interviewees for this report often reported having worked at Caltrans, but they jumped to other agencies where pay is better and the opportunity to do interesting, innovative work is more likely.

Additionally, Caltrans' pay scale does not account for geographic differences in the cost of living, so staff recruitment and retention tend to be even more difficult in major metro areas, typically the places where getting partnership, projects, and planning to work together well are the most challenging.

The process for design exceptions disempowers staff that are closest to the project, adds time and cost, and annoys local partners.

Management training. We have remarked several times on the effect of a long-standing, but now eased, policy that discouraged travel and knowledge exchange. Caltrans' technical abilities have suffered as a result. Besides technical knowledge, the department also needs management skills, such as communications, that are not always natural to technically trained staff moving up through the ranks. Caltrans does have a program for such training, with sound curriculum. However, the training has been cut during tough budget times. And when it has been offered, it has been a one- or two-time opportunity without follow-up.

Structure. Caltrans is a large organization with a complex organizational chart that becomes even more complex if the close partners that fund projects on the system and provide complementary networks are included. Sometimes organizational reformers are tempted to go to

the organizational chart first. We mention it last in this assessment, not because it is not important, but because considerations of mission alignment, skill and practice needs, and management tools all inform discussions of organizational relationships, not the other way around. Other states have found they could make good headway on innovations without first making major structural changes

Caltrans' current relationship structure presents some problems that are worth considering. We have alluded to the design-exception issue, which derives from an unusually rigid design manual. Caltrans management is aware of this problem, and lists the negative outcomes that correspond with our own findings: The process for design exceptions disempowers staff that are closest to the project, adds time and cost, and annoys local partners who come to agreement with one part of Caltrans only to be questioned by another. Caltrans management is rightly looking to reform this process, putting more decision-making power in the hands of the districts. This strategy will only work, of course, if districts use their new power; external stakeholders seeking flexibility report that this is often not the case.

In addition to unnecessary headquarters-district conflicts, divisional silos can be an impediment to innovation and efficiency as well. Such issues as stormwater quality, a major impending cost for transportation agencies, require cross-cutting work. Certain pavements, as well as median plantings, may improve water quality, so the environmental staff needs cooperation from staff in other divisions dealing with design and materials and with maintenance. And the need is not just for communication, but for accountability. If a no-mow planting is mowed down, someone in maintenance must own that mistake and put into place a procedure that prevents it from happening again.

Caltrans tomorrow

Given the long list of concerns with Caltrans just noted, and the fact that many of the criticisms we make above have been made before without success, the less hardy might throw up their hands and declare it beyond repair. This, emphatically, is not our view. But it is clear to us that Caltrans needs substantial *modernization* to bring it better in line with, and able to make its desired contribution to, current realities and the public policies of California. And to have any real effect there needs to be a sweeping *culture change* within the department. It needs to feel like and be a different place.

Modernizing Caltrans. As previously noted, in the early Interstate-building era, Caltrans was on the leading edge of the transportation community. Responding to the call to improve auto-mobility, the department conceived, designed, and constructed an incredible network of freeways and major arterials. But the Interstate-building era is over. The state of California has recognized that new reality by, for example, requiring communities to plan for lower VMT and investing in a rejuvenated intrastate passenger rail network. The new policy direction, however, generally has not explicitly involved Caltrans. In the examples just cited, regional and local entities, along with CARB, are responsible for implementing SB 375, and the state's flagship passenger rail effort, the north-south high-speed line, is being run by another entity.[45] Most recently, in passing SB 743 (2013), which directly affects the way Caltrans negotiates exactions from developers, the legislature and governor assigned rulemaking to another state entity, OPR.

Modernization of Caltrans will require a difficult conversation about the conflict between mobility, as conventionally understood, and sustainability, which is not yet well understood by the department at all.

It would be possible for the state and its local governments to continue to work around Caltrans and even demote the department to simply serving empowered regional and local entities by maintaining and repairing highways. However, while some devolution of local-serving state-owned roads would be desirable, California needs a stronger, better aligned Caltrans—not only to provide for interregional travel but also to assist communities as they work toward improving multimodal accessibility, reducing environmental harms, and building regional economies and opportunity for reducing poverty.

Delivering these outcomes is a far different business than simply delivering highway projects (though, of course, delivering projects will always be an important part of the work). Modernization of Caltrans will require a difficult conversation about the conflict between mobility, as conventionally understood, and sustainability, which is not yet well understood by the department at all. Mobility has meant facilitating more and faster travel, particularly by automobile. While sustainability—whether focused on climate and other environmental

[45] We note though in the course of our review in 2013, CalSTA began to push for more thinking about improvements to conventional rail service, for which Caltrans is responsible.

concerns, or livability, or safety from crashes, or shared prosperity, or simply out-of-pocket costs for infrastructure, vehicles, fuel, and so forth—means looking for ways to meet Californians' needs without increasing auto travel and speeds. Working through this conflict will be central to Caltrans' strategic ability to deliver on the state's policy goals. It would be inappropriate for the SSTI team to dictate the specifics of a new mission and vision for the department, but replacing automotive mobility with multimodal accessibility in the department's thinking may be a useful starting point. How can Caltrans and its many partners provide the most efficient access, to meet the needs of travelers and shippers with expensive new highway capacity as a last and infrequent resort? And what is Caltrans' role in providing that access in the many cases when the no-build, or a complete-streets retrofit, option is preferred?

Changing the culture. Beyond the mission, vision, and goals, a modernized Caltrans will require capacities and skills that now are lacking: to understand and manage demand (including demand induced by new transportation facilities), to adapt design guidelines to current needs, to manage assets to get the most out of every facility before rebuilding, to optimize systems with operators of local street and transit networks and private railroads, and to lead the way toward achieving the state's policy goals. The department will need to confront its unrealistic approach to risk—that is, rigidly following a manual and being reluctant to change it (or simply not making decisions at all)—to protect it from liability and bad press.

Too much of Caltrans' culture today is focused on mobility instead of accessibility—on motor vehicles rather than people and goods and communities, and on delivering projects instead of operating a system. Changing this condition will be more daunting than simply reassigning staff, particularly given the lack of a performance management system and an out-of-date incentive structure.

But Caltrans does have strong human resource assets, including many staff members who are eager to deliver transportation services in a new way. And it exists within a refocused new agency, CalSTA, which exists outside the legacy culture and can therefore provide direction that would not necessarily bubble up from within. Caltrans management, along with CalSTA, will need to insist on a new direction and provide training and other resources, but also ask middle managers and rank-and-file staff to figure out how to achieve new goals—and then hold the individuals and the organization accountable for making progress.

Recommendations.

The following recommendations, aimed and modernization and culture change, address the three major areas of concern listed in the previous section: mission and vision, alignment of resources and skills, and management systems. They reflect the thoughts and ideas obtained from more than 100 interviews conducted as part of this study, as well as the knowledge and experience of the study team.

Mission, vision, and goals

1. Establish a mission, vision, and associated goals that reflect current state law and policy. California has produced nationally significant transportation policy innovations in land/use

transportation integration, multimodalism, and climate protection. In many ways, these policies establish the basis for Caltrans' work. However, these concepts have not been integrated well into Caltrans' vision or practice. Caltrans should develop a vision statement and a strategic plan that reflects the directions outlined in both legislative and executive initiatives in the state, with emphasis on accessibility and mobility, sustainability, economic growth, equity, and multimodal system integration. The SSTI team cannot dictate such a vision, which must come from the agency and department, but we recommend the following considerations:

- *Caltrans should use its visioning and strategic planning process to explain to its staff and stakeholders how it will address established state planning and policy goals around sustainability.* Caltrans has focused on mobility in past vision statements and in drafts of its new strategic plan. But the department cannot achieve sustainability goals by devoting itself to increasing auto-mobility, thereby inducing new auto travel and low-density growth. If a new definition of mobility is intended—and there is good language in the 2010 Smart Mobility report and draft 2040 plan—it will require explicit description; interviews found the staff generally equates "mobility" with "auto-mobility."

- *System preservation should be a primary message.* This message should not diminish California's needs for targeted multimodal investments to handle the expected growth in population and employment. However, as is true in every state, preserving the condition and integrity of the existing system is an increasingly important part of a state's funding program. While the majority of Caltrans-controlled state funding goes toward preservation, local contributions, developer exactions, and federal funding continue to expand the department's highway capacity, leading to higher maintenance costs even as household driving rates are decreasing. The CTC's recent needs assessment, which Caltrans staff often referred to in our interviews, contained nearly as much spending for new highway capacity as for preservation.

- *Caltrans should outline a groundbreaking approach to the delivery of transportation services—an approach that is not adequately expressed in the current "improves mobility" mission.* Such an approach should:
    - measure system performance not only in terms of traditional metrics such as safety, reliability, and motor vehicle levels of service, but also in terms of non-traditional metrics such as accessibility and location efficiency, GHG emission reduction, air quality, environmental stewardship, modal choice, livability, economic justice, public health, and economic development and productivity;
    - take into consideration the integral relationship between land use and transportation, and avoid inducing new demand for SOV travel;
    - view the department as an operator of a system that is integrated with local networks, rather than simply a deliverer of projects;
    - emphasize multimodal alternatives and choice; and
    - assign priority to investments in system preservation and system operations rather than system expansion, even when projects come with local funding.

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Sidebar 3: Modernization and culture change at other DOTs

Changing the course of a large governmental organization is a major undertaking. Most of the recommendations above are not simple check-the-box action items, but call for the hard work of collaborating, rethinking, and establishing a new course. Fortunately other DOTs have worked through similar processes, and while their stories cannot simply be copied due to different policy surrounds and other issues, they can provide both information and inspiration as reform efforts proceed in California.

Pennsylvania. Pennsylvania's 2001-04 State Transportation Improvement Program (STIP) devoted 25 percent of its funding to highway capacity expansion and 75 percent to road and bridge repairs. But in 2003, 11,000 miles of state roads out of 40,000 were classified as being in poor condition, and 5,500 state-owned bridges out of 25,000 were rated structurally deficient.

Facing this grim reality, PennDOT's Secretary led an effort to reduce spending on capacity projects and devote more funds to repairing roads and bridges. Updates of the STIP between 2003 and 2011 reduced spending on capacity projects from 25 percent to less than 4 percent.

Focusing more funding on system repair produced steady results, but left questions about how the DOT would continue to provide access to destinations. In 2004, PennDOT began what it termed a *Smart Transportation* journey to approach transportation improvements in a new way. It required a culture change. Eventually, *Smart Transportation* affected virtually every phase of the Department's activity.

PennDOT's Secretary instituted the *Smart Transportation* theme and insisted on the general direction of integrating transportation design with community design, reducing design footprints, and encouraging modal balance. Virtually everything else that followed from 2004 to 2011, in terms of means and methods, was the result of broad collaboration.

Step one was engaging PennDOT's staff. Transforming the purposes and processes of PennDOT's business could only be carried out if its district office leadership and staff, and the staff of all its central office departments, fully understood and embraced the new core operating approach.

PennDOT made full-on efforts to bring *Smart Transportation* to the rank-and-file and secure their interest, understanding, and support.

The most important step PennDOT took in reaching its employees was the oldest method, and yet sometimes today the most radical: PennDOT listened to its employees, fielded and responded to reservations and concerns, and engaged its own workforce in shaping its own change process.

On its *Smart Transportation* website, for example, questions like this reflected the kinds of concerns the rank-and-file were raising:

- Are we the only ones doing this?
- Is *Smart Transportation* here to stay?

- How does *Smart Transportation* address land-use and congestion?
- How do I get communities to understand that *Smart Transportation* goes beyond amenities to projects (aesthetic treatments, street furniture, etc.)?
- How does the bridge initiative fit into this?
- Are there performance measures for *Smart Transportation*?
- Where is FHWA in this effort? Are they supportive of the approach?
- Where can I get technical/design guidance?
- Where in the project development process do I apply *Smart Transportation?*
- What role does *Smart Transportation* play in the Highway Occupancy Permit process?
- How does *Smart Transportation* fit into context sensitive solutions?
- Will *Smart Transportation* increase project delivery time?
- Does *Smart Transportation* apply to projects in suburban and rural areas as well as urban areas?

The list of questions mirrored the concerns the rank-and-file had about how *Smart Transportation* was affecting the daily work of PennDOT. Straightforward and simple answers to all the above concerns were given to the employees, significantly building buy-in to the program.

Eventually PennDOT's staff collaborated to create this statement: *"Smart Transportation is partnering to build great communities for future generations of Pennsylvanians by linking transportation investments and land use planning and decision making."*

Collaboration in the *Smart Transportation* journey spread from PennDOT staff to representatives of MPOs, municipalities, developers, counties, consultants, FHWA, FTA, public transportation agencies, and alternative transportation advocates. Urban, suburban, and rural interests all contributed to maturing processes, practices, and guidance.

The methods used were conventional—training, guidance, and outreach. And extensive publications—both printed and web-based. Collaboration resulted in:

- Creation of 10 *Smart Transportation* themes:
    1. Money counts
    2. Leverage and preserve existing investments
    3. Choose projects with high value/price ratio
    4. Safety always and maybe safety only
    5. Look beyond level-of-service
    6. Accommodate all modes of travel
    7. Enhance local network
    8. Build towns not sprawl
    9. Understand the context; plan and design within the context
    10. Develop local governments as strong land use partners

- Development of a *Smart Transportation Guidebook* that incorporated the 10 themes and provided planning and design guidelines for streets and highways that supported

sustainable and livable communities. The *Guidebook* contained flexible design guidelines tailored to urban, suburban, and rural settings.

- Incorporation of the *Smart Transportation Guidebook* into PennDOT's "Design Manual 2." This very significant action required all PennDOT engineers and consultants to incorporate use of flexible design standards.

- A $60 million Pennsylvania Community Transportation Initiative, which sought projects that demonstrated the 10 *Smart Transportation* themes, attracted hundreds of grant applications. It showed the public—local governments, MPOs, and RPOs—what *Smart Transportation* could mean.

- Issuance of *Developing Regional Long Range Plans*—a resource guide for MPOs and RPOs. This document encourages incorporation of livability principles, asset management, and fiscal reality.

Smart Transportation started from the need to put a constructive face on a wrenching reality of PennDOT's fiscal capacity to build big projects. By 2011, *Smart Transportation* had grown from a set of initiatives and programs and had taken on all the attributes of PennDOT's brand. It carried the core values of PennDOT's approach to its work, its alliances and partnerships, and all its constituencies—including its own employees.

North Carolina. In the late 1990s, NCDOT and the North Carolina General Assembly faced a complex set of problems around project delivery, congestion, and accommodating growth in the Piedmont region of the state. Passage of the Highway Trust Fund in 1989 had created new funding for major construction projects, mainly to four-lane the intrastate system (a politically designated set of corridors across the state) so that 90 percent of the state's population would be within 20 miles of a four-lane divided highway, and creating major highway "urban loops" around 11 North Carolina cities. Both sets of projects were the result of political tradeoffs in the legislature.

By 2000, most of the loops were unfunded and unlikely to be in the foreseeable future. The intrastate system was being built slowly, years behind the projected 20-year program. Projects were being held up in environmental reviews and lawsuits. Moreover, new revenues were piling up in the trust fund because of these project delays.

The General Assembly commissioned a review by an outside consulting firm to figure out a way to effectively spend down the balances in the trust fund and to reform DOT processes to expedite delivery of projects. The review was completed in 2001 and was quickly embraced by the new leadership of NCDOT.

Several actions followed this initial review. NCDOT implemented a modern cash/construction management system to begin to draw down the excessive balances in the trust fund in a rational and cost-effective manner. NCDOT also created an award winning ecosystem enhancement program to identify and secure mitigation lands well in advance of project initiation, which

reduced significantly delays in permitting and delivering projects. These two changes were driven largely by legislative and departmental leadership.

By 2003, it became clear that NCDOT needed to embrace a new vision for itself and for the services it provided to the state and its citizens. Thus began a decade-long process to change the way the department looked at itself and its customers, and to transform the reality of its work and the perception of that work by citizens and taxpayers.

NCDOT's first Long Range, Multimodal Transportation Plan was crafted in 2003 to provide a 40-year vision for the department and the state. The development of this plan involved MPOs, RPOs, and a variety of transportation interests, as well as the largest and most extensive public involvement effort ever undertaken by the department. It represented the first real attempt to look at all modes in North Carolina, including its ferry system and intrastate rail service, and to lay out in real terms, the costs and benefits of future investment scenarios.

The plan envisioned a significant mode shift in investment, anchored by a firm commitment for the state to contribute up to 25 percent of the capital for new transit investments, e.g., the light rail system in Charlotte. It also served as a catalyst for a department-wide focus on "context sensitive" solutions, with several hundred staff attending courses at North Carolina State to learn about and promote this approach.

Second, over $600 million of the excess cash was directed to small-scale transportation improvements focused on spot safety and congestion relief. This program, titled *NC Moving Ahead,* again brought strong involvement from local groups and government leaders to designate projects and improvements that would best support their communities.

In 2005-6, NCDOT engaged in a follow-on effort with a small task force to "think ahead" to plan for the transportation needs for the next decade. This modest attempt never went anywhere because the Governor did not want any discussion of new revenues. So it died a quiet death in late 2006.

In 2007, the department issued an RFP to conduct a detailed evaluation of itself, with a view to continue on the path of transforming itself from a new construction paradigm toward a more multimodal, integrated systems approach, featuring more private participation and a greater focus on maintaining past investments. The result of that RFP was a $3.5 million contract with McKinsey to do a six-month, deep dive into NCDOT operations. At that time, the General Assembly also asked for an update of its earlier study on NCDOT.

The second legislatively sponsored study reinforced the need to move forward on the management initiatives first proposed in 2000-1, e.g., putting in place a stronger project management culture to keep projects within scope and on-time, reducing political influence in project selection, and streamlining, where feasible, the project delivery process.

The McKinsey work led to creation of a 100-person Transformation Team to identify particular "work streams" for analysis and improvement, and to shepherd the process of "changing the culture" of NCDOT.

The Transformation Team coordinated a major effort to realign the department with a new mission ("Connecting people and places safely and efficiently, with accountability and environmental sensitivity, to enhance the economy, health and well-being of North Carolina") and goals ("Safety, Mobility, Infrastructure Health, A Place that Works Well, and A Great Place to Work").

In 2009 the new governor issued an executive order removing project selection and contract approval from the 19-member, highly politicized Board of Transportation, and vested those authorities in the Secretary. This was accompanied by a serious effort to scrub the project lists, to eliminate projects of less merit and urgency, and to create a work program for NCDOT that focused on priorities determined in collaboration with MPOs, RPOs, and local civic leaders.

Prior to this reform, the DOT's practice was to put every request into the "plan" even though the track record for delivery ran about 50 percent on time and probably less than that on budget. The new goal for NCDOT was projects delivered 95 percent on time and 100 percent on budget. One part of that switch was to delete projects of dubious transportation benefit, and to focus resources and energy on actually delivering promised and prioritized projects.

As a result of the project scrub, many of the loop projects were moved out of the immediate horizon for construction, and several regions of the state pushed for renewed emphasis on transit solutions and rehabilitation, rather than new construction.

The reform effort also included a slimmed-down internal design capability, with more design work going to private engineering firms, a renewed emphasis on contracting out some traditional DOT maintenance work, and the termination of most "temporary" (mainly meaning "no benefits") employees. From 2008-12, the total workforce declined by about 20 percent.

In conjunction with the overall reform effort, NCDOT also became much more multimodal in its actions. With American Recovery Act (ARRA) dollars, NCDOT built new transit facilities in Durham, Raleigh, Charlotte, and Boone. The award of $600 million for intrastate rail between Charlotte and Raleigh will boost the frequency of service from two to five daily trains each way by 2017. And the state made a $250 million commitment to the extension of the Blue Line light rail in the Charlotte area.

So far, even with the change in parties in the 2012 election, NCDOT continues to emphasize strongly the commitment to data-driven project selection, to multimodal services, and to strong public input into the department's plans and activities. All of this requires constant and consistent outreach to NCDOT employees by senior and mid-level managers, an openness to public involvement in all types of decisions, and an absolute promise to hold NCDOT accountable for delivering a transportation program adopted through collaboration with local governments and their citizens.

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- *Caltrans should have a strong focus on state interconnectivity, in particular as it relates to freight movement and port connectivity.* One of the most important roles of a state transportation department is to provide for access between urban centers and to state-significant intermodal facilities. For Caltrans, in the past this charge has meant highway capacity. Unfortunately, added capacity can induce new low-density growth and higher demand, clogging highways with local traffic and thwarting interregional access effort. Even if this weren't the case, there is simply not enough money in the system to rely so heavily on highway capacity. New ways of getting long-distance travelers and shippers through congested areas are needed. These may include pricing and demand options, and cooperation with railroads and other non-highway entities. And at the same time, Caltrans should embrace new approaches to urban and suburban travel needs, elevating the importance of non-auto modes.

2. Better match investments to policy goals expressed in the vision and plan. When Caltrans selects its own capacity projects and agrees to take new capacity generated by others, the overriding policy consideration is improving auto-mobility. The department also seeks to fund projects that reduce auto crashes, and it is bound by statute to devote SHOPP funds to preservation. Other policy goals, such as effects on land use and GHG, have traditionally received little attention. Following the intent of AB 857, which tries to connect investment to policy, Caltrans and CalSTA need to revise budgeting processes. A model for such an effort is the recent TIP review performed by the MTC in the Bay Area, which evaluated 1,000 proposed projects both for traditional costs and benefits, and for their contribution to 11 policy goals.

- *CalSTA should see proposed STIP project lists more than a week before they go to the CTC for approval.* The agency must become more engaged in the project selection process, not necessarily to pick or reject projects, but to be an informed arbiter of the policies that could lead to better projects being proposed, selected, and constructed.

- *CalSTA and Caltrans should use the CTC review process to impose a policy review of all proposed investments.* Such a deliberation – again, the MTC TIP process is a model – would be informed by CalSTA and Caltrans staff. It would likely require reforms of the CTC, focusing the body on more strategic questions of performance measurement and policy, rather than the current minutiae of property acquisition and project cost changes. In addition to the qualitative explanation of how projects help meet sustainable communities goals, the CTC and CalSTA should consider requiring specific analysis regarding induced traffic, both short-term (from congestion reduction) and long-term (from land use changes).

- *CalSTA should consider proposing legislation to allow the CTC to approve individual projects rather than entire programs.* If the CTC is to play a more important role in matching investments to policy goals, it might need the ability to address specific parts of programs that may be problematic.

- *Caltrans, with CalSTA, should review legislatively mandated reports and propose discontinuing many of them.* These many reports, listed in Appendix E, may serve useful purposes in some cases, but in others they take time away from more important work, and, given the department's natural inclination to try to please the legislature, they may give the impression that more progress is being made on an issue than actually is.

3. Take advantage of the state's new institutional structure to help drive change. Recently created CalSTA offers a tremendous opportunity for reforming the transportation program. The agency can play an important role in providing policy guidance, insisting on culture change, and coordinating investments. For example, the agency should establish implementation benchmarks for key initiatives, monitor the operational details of their implementation, and establish a system of accountability and transparency for their success.

- *CalSTA and Caltrans should strengthen relationships with other state agencies that can help (or hinder) the achievement of the new vision.* These agencies include, at a minimum, the California Air Resources Board, the Department of Natural Resources, and the State Office of Planning and Research (OPR). Agencies such as OPR can play an important role in implementing state legislative policies and initiatives, and could thus be an important resource in refocusing Caltrans' mission to reflect such priorities. At a minimum, CalSTA and Caltrans should meet with these agencies to present Caltrans' new vision and to lay out the steps that are being taken to achieve this vision.

- *CalSTA should provide leadership and oversight in implementing the mission and vision, and the recommendations of this study.* The Secretary should create an implementation working group with Caltrans, develop a timetable for implementation based on key benchmarks, and establish a system for reporting on the progress being made toward institutionalizing recommended changes. As one of the key immediate recommendations involves redrafting Caltrans' strategic plan, CalSTA should have a representative on the departmental committee charged with that effort.

- *CalSTA should develop a "staff exchange" program.* This effort would assign staff members from Caltrans to the agency for temporary work on particular initiatives, and to help build mutual capacity between the agency and department. The long-term benefits in fostering such understanding and in developing personal relationships can lead to improved collaborative and cooperative efforts over the long haul.

Alignment of resources and skills

4. Align resources to desired goals. The allocation of staff resources is a good benchmark of the emphasis that an organization places on particular functions that ultimately relate to achieving stated goals. Organizational structure is an important precursor to organizational effectiveness. Conducting an organization-wide study of how Caltrans is structured and the degree to which this structure effectively contributes to the mission requires an extensive examination of individual units and how they relate to one another. Such an effort was beyond the scope of this study. However, several issues were raised by those interviewed as well as others identified by the study team that deserve attention by Caltrans management. In general, the department has an

abundance of project development resources—including half or more of the staff members in planning, who work on project initiation documents—but is short of needed capacity in system planning, in operations, in non-highway modes, in asset management, and in strategic partnerships, including innovative finance arrangements. (We address another area, communications, separately below.)

- *Caltrans should strengthen its planning unit.* The planning function within Caltrans, although listed with more than 600 planners, does not seem to do "planning" in the sense of viewing the state's transportation program, its future, and needs from a systems perspective. Recent reviews of the planning function, shared with the SSTI team, have found deficits in basic skills, such as demand projection and analysis of location efficiency. Caltrans needs this capacity to guide its own investment and to help lead wiser decision making at the regional and local levels.

- *Caltrans should improve its ability to operate its highway system.* Caltrans' integrated corridor management (ICM) arrangement in San Diego holds great promise, but it was instigated at the local level and has not been replicated elsewhere in the state. Internal and external stakeholders report that Caltrans tends to value-engineer out loop detectors and other operations-related assets, and many ITS message signs have been inoperable. As with planning, the department's operations unit should be better resourced and play a more prominent role in the department's thinking.

- *Caltrans should modernize its stewardship effort through asset management.* Establishment of an asset management system, which will provide more efficient use of scarce system preservation dollars, is one of the goals of the department's own program review. Other DOTs, such as Michigan, are much further along and can be models. CalSTA and other stakeholders should support Caltrans in its current work to develop the system, which will require significant technology and skills resources.

- *Caltrans should provide more resources, expertise, or simply a real voice in planning and prioritization to the offices dealing with rail and freight.* The state focus on rail modernization would suggest an important staff function in Caltrans for rail planning, and yet the staff size seems quite limited. The same can be said for the number of staff devoted to freight planning. Reallocating resources to these critical, but now marginalized, elements of the organization will be essential.

- *Caltrans should develop an enhanced internal capability to identify and pursue innovative finance partnerships.* It seems likely that the future fiscal picture for California, as for other states, will be one where a range of funding mechanisms will be used, with innovative financing arrangements playing an increasingly more important role. While Caltrans has pursued innovative financing, and has properly relied on outside consulting to assess the details of such deals, it needs enhanced enterprise capacity to identify and pursue potential deals going forward. This is an initiative that should be undertaken jointly with both agency and Caltrans participation.

5. Reform critical guidance documents and standard operating procedures. State departments of transportation rely on standardized approaches to planning, design, construction, maintenance, and other activities. These standards and guidelines both reflect and shape the culture. To be effective and to foster modern practice, such standardized approaches must be frequently updated to reflect different circumstances or new knowledge about safe designs and practices. Though Caltrans has produced some attractive policy statements, including the Smart Mobility report and the freshly minted "Main Streets" guide, the manuals and processes that actually dictate decisions tend to be both overly rigid and dated.

- *Caltrans should update the design and traffic control device manuals, and other guidance documents as necessary, to implement the new strategic plan and vision.* Despite a recent updating of the Highway Design Manual, many of Caltrans' guidance documents are out of step with the times.

- *As an initial step, Caltrans should relinquish oversight of bike facilities on locally owned streets.* The state does not govern auto or pedestrian modes on local facilities, and it is not adding value in its control of bike lanes; in fact, local entities frequently are more sophisticated in addressing active transportation. Caltrans and CalSTA should support or sponsor legislation to end this statutory oddity.

- *As a second initial step, Caltrans should give designers the option of using NACTO urban design standards in metro areas.* One of the worst aspects of treating state-owned facilities with one-size-fits-all standards is that rural cross-sections tend to be imposed on urban and suburban areas and town centers. The NACTO guide provides sound design guidance for surface facilities in metro areas. Washington State recently adopted it by reference in its guidance; California should follow.

- *Caltrans should generally rethink its approach to facilities in metro areas and town centers.* Caltrans grew up with the idea it was moving travelers between cities, but now most of its facilities provide access between local destinations. The department's recent Main Streets guide is a nod to this situation, but it builds upon a foundation of underlying design standards that tend not to provide high-quality conditions for non-motorized users. The policies and standards in metro areas and towns should be very different than those for facilities in low-density rural areas; where the latter may legitimately focus on speed and throughput of motor vehicles (though not to the extent that they induce new travel and low-density development), the former should put pedestrian, bicyclist and livability concerns before auto-mobility. Narrower lanes, slower speeds, and pedestrian amenities should all be the default. An example of another DOT addressing this issue comes from Massachusetts, where the MassDOT design manual, as a former commissioner puts it, reverses historic practice and contemplates designing projects "from the outside [of the right of way] in," and state policy requires all projects to at least maintain existing non-auto levels of service. But the work extends beyond design; as noted in the Plan of Action, developer exactions can impede the type of compact development favored by state policy, and success in the SB 743 rulemaking will help improve Caltrans' work in urban areas.

- *Caltrans should build more flexibility into its processes.* In roadway design, outdated guidance means that staff needs to seek "design exceptions," but these require time and lobbying at headquarters, and often cannot be pursued except on major projects. Design exceptions should rarely be required with updated guidance—the manual should provide ranges for design parameters that ensure high-quality conditions can be provided for all users as standard practice. The current reliance on design exceptions disempowers staff who are closest to the project, adds time and cost, and annoys local partners who come to agreement with one part of Caltrans only to be questioned by another. Caltrans is currently looking to reform this process by putting more decision-making power in the hands of the districts. CalSTA and stakeholders should support Caltrans in this reform.

- *Caltrans should implement Smart Mobility 2010. Smart Mobility* was an excellent effort at incorporating an up-to-date concept of mobility, as well as sustainability and community concerns, into transportation policy, and it included a detailed implementation checklist. Although Caltrans declares implementation a success story, neither senior management direction nor staffing and funding have been provided for implementation. Instead, as the Caltrans smart mobility webpage indicates, the smart mobility framework has been kept alive only through a couple of pilot projects within the Office of Community Planning. Despite an emphasis in *Smart Mobility 2010* on Caltrans's role as "a leader in adopting a changing approach that all transportation agencies will need to embrace in order to gain Smart Mobility's benefits," not much has been accomplished. *Smart Mobility 2010* provides a foundation for reform that is responsive to current state policy.

- *Caltrans and CalSTA should revisit legal guidance on the risk of innovative design and practices.* The assessment found that Caltrans has a very low tolerance for any form of risk associated with project design. Caltrans staff has frequently cited liability concerns as a major constraint, particularly on project design. Other state DOTs have worked out ways, with their lawyers, to document the reasons for design decisions so as to insulate themselves from liability, but Caltrans seems to avoid doing so. Such an attitude gives the impression that Caltrans' risk-aversion is based on comfort with standard answers, or a fear of changing to a more context-sensitive and multimodal approach to project design. In other words, liability concerns can be an excuse for not changing.

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Sidebar 4: Addressing liability

Transportation is an inherently dangerous activity, responsible for some 30,000 deaths every year in the United States. Sometimes transportation providers are sued when deaths and injuries occur. One defense is to point to established manuals and standards, showing that the facility was built and operated by the book. Yet conditions and needs change over time and from place to place, so "by the book" can have negative consequences for budgets, livability, function, safety, and even, in some cases, liability. Caltrans faces two challenges in this area: 1) to update its guidance documents so that "the book" reflects current thinking, particularly on multimodal streets, and 2) streamlining its process for assessing the exceptions to that guidance, which should be much less frequent if design manuals better address all settings and modes. The two challenges overlap; one reform to the guidance documents would be to provide designers with a range of options, as does the national standard AASHTO "green book," and to provide better guidance for how to handle urban and suburban facilities. These actions would reduce the number of exceptions required. Adopting new standards does nothing to harm the "by the book" defense of a lawsuit; the department simply has a newer book to go by.

Still, in our interviews, Caltrans staff frequently invoked the fear of liability as a barrier for either providing more leeway in published guidance or for allowing exceptions. Fortunately, other departments largely solved this problem years ago when "practical design" and "context sensitive solutions" rolled out.

For individual design decisions, the best strategy for defense of personal injury claims is solid documentation of the reason for each decision. In litigation, a department's defense can overcome claims that a flexibly designed facility is unsafe by providing documentation that demonstrates a thorough engineering analysis to determine the best design.

Tort lawsuits may claim that roads designed to meet standards are inherently safe and roads that deviate are inherently less safe. However, court judgments have shown that reasonable engineering judgment and compliance with acceptable best practices are more defensible than blind conformity with design standards—particularly once a flexible design approach has become the norm—along with a method for documenting design decisions. Acceptable affidavits defending design decisions include language such as:

- "Excellent" design
- Compliance with "reasonable engineering principles"
- "Accordance with generally recognized engineering… standard, criteri[on], or design theory"

Arguments deemed insufficient include:

- Plans "fell within the range of reasonable engineering guidelines"
- Properly posted warning signs as required by the Manual on Uniform Traffic Control Devices (MUTCD).[46]

[46] The National Cooperative Highway Research Program Legal Research Digest No. 57. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_lrd_57.pdf.

The AASHTO green book and state design guidelines are considered authoritative, but internal policies should be reviewed to ensure that they conform to known best practices, which today address in a balanced way the safety and convenience of non-motorized users as well as motorists. Policies also should be revised to allow the necessary level of flexibility. For example, if existing internal policies call for maintaining a 30-foot clear zone, but an agency does not own sufficient right-of-way to meet this criterion in all instances, the agency could be liable in the case of an off-road collision. In contrast, policies that call for "engineering judgment" or "flexibility" can serve as the basis for a legal defense,[47] particularly if the department uses alternative strategies, such as reduced design speeds, to mitigate safety issues, and it documents the reasons for its decisions.

DOTs can take particular steps to manage risk when evaluating design options:[48]

- **Consider multiple alternatives.** Thoroughly consider alternatives and document an explanation as to why a design is appropriate to design speed, multimodal user needs, and context.

- **Evaluate and document design decisions**. Include expected operational and safety performance in design reports. Document all stakeholder engagement including the development, evaluation, and discussion of different alternatives. Place all documentation in project files for later reference. Documentation should contain a full description of the reason for a decision, including such considerations as community values, the environment, and any other pertinent factors.

- **Demonstrate a commitment to mitigate safety concerns**. When a design exception is considered, plans should include mitigating features to ensure safety (design for lower motor vehicle travel speeds and use of shoulder rumble strips, guardrails, or other appropriate measures).

- **Monitor design exceptions to improve decision making**. Keep a list of design exceptions by location and review their safety performance over time to build on and improve a knowledge base for future decisions.

[47] Ibid.
[48] Ibid.

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6. Strengthen strategic partnerships. Many of those taking part in the assessment pointed to San Diego as an example of how Caltrans can work collaboratively with its partners in pursuing cost-effective transportation system strategies. San Diego is something of an exception, however, as relations with other partners were described in less-glowing terms. Two types of public agencies are prominent in Caltrans' environment: metropolitan planning organizations and the "self-help" counties (and the corresponding transportation authorities). In addition, Caltrans' system of trunk highways only functions in conjunction with local street and transit networks maintained by all localities. Land use authorities are both affected by and can greatly affect what happens on Caltrans' facilities as well as on freight railroads and ports. Caltrans should rethink its relations, particularly with regional and self-help entities, but with all parties working in transportation and land use.

- *Caltrans should assert leadership in the area of sustainable transportation in its relations with regional partners.* The department has some history in this area, as it ran the blueprint planning grants. Some possible actions include:
    - Develop pilot projects with MPOs on prototype prioritization schemes that reflect state legislation.
    - Review locally funded transportation projects against SB 375 and other state policies, and right-sizing or eliminating those that conflict. Projects funded through past referenda should not be exempt from such a review.
    - Establish Caltrans staff rotational or funded positions in the MPO (similar to San Diego).
    - Aggressively pursue innovative financing agreements with investors, especially for freight projects.
    - Negotiate sales-tax referenda language to cover maintenance and other lifecycle costs of capacity projects on the state highway network and to cover preservation, modernization, and operational infrastructure on the existing system.

- *Caltrans should find ways to transfer local-serving roads to local government.* Caltrans is saddled with many road segments that were once intercity trunk routes but that now serve as local arterials. These "stroads"—street-road hybrids—are problematic, because Caltrans frequently imposes auto-centric standards, e.g., by restricting curb bump outs or refuge islands that would improve pedestrian safety in an urban environment. They also require Caltrans resources for maintenance and rebuilding, even though they serve mostly local travelers. Caltrans is already categorizing such facilities to identify streets (some of which never leave city limits) that are good candidates for transfer. CalSTA and stakeholders should support Caltrans' efforts, which may require funding to induce local governments to take on new responsibilities.

- *Caltrans and CalSTA should negotiate coverage for long-term maintenance, resurfacing, and reconstruction costs when locally controlled STIP and LTST funds are used to add capacity to state highways.* The current system, with locals covering only capital costs, underprices highway capacity as an option for facilitating metropolitan travel. It also

saddles the SHOPP, already stretched too thin, with additional burdens, threatening to degrade the system over time.

7. Focus on freight. Freight mobility has become an increasingly important transportation policy concern at the national level and in many states and regions in the country. California is uniquely positioned given the size of its economy and its role in global logistics to provide targeted state policy attention and resources to improve the state's freight network. Caltrans (or CalSTA) should build upon the *MAP21* requirements for a national freight network and continue to emphasize the need for investments in inter-regional corridors that will benefit freight movements.

- *CalSTA and Caltrans should create a clear focal point for freight policy and planning within the department.* This can be accomplished either in the form of a small staff (reassigned from within the department), or as an ongoing task force of similar size, with clear goals and metrics to monitor its effectiveness. This group can pursue items/projects identified in the State Freight Plan, develop and maintain stakeholder relationships (with ports, shippers, truckers, railroads, and other interested parties) to ensure fulfillment of these projects, establishment of metrics for these activities, and accountability standards for evaluating the effectiveness of this effort.

- *California's Freight and Rail Plans should identify the major transport corridors, whether highway, rail, or air, that should receive significant attention from Caltrans in the next decades.* Because of the state's pivotal position with regard to both imports from Asia by sea, and landside commerce from Mexico, Caltrans needs to be a leader in strengthening goods movement in and through the state. Corridors identified in these plans should receive priority in the STIP, financing options should be prepared to accelerate these investments, and specific timelines for delivery of these improvements should be developed. Critically, improvements should be targeted so as to move freight more efficiently while not inducing additional personal travel. Pricing, dedicated truck lanes, mode shift to rail and barge, and other strategies should be considered.

8. Communicate more effectively. Caltrans' external communications reflect the department's limited vision with respect to the role it intends to play in the state's transportation program, the policies it intends to implement, the goals and objectives it intends to achieve, and the initiatives it intends to undertake. With the notable exception of successful project deliveries, Caltrans often simply lacks a compelling story to tell. Caltrans needs to develop an effective communications strategy that is transparent, promotes accountability and emphasizes the benefits that Caltrans brings to the state—and describes how it is improving its practice over time. This strategy needs to be coordinated closely with the CalSTA and its communications effort.

- *Caltrans should communicate around the performance metrics that are used to monitor progress against organizational goals*. The development of a "manage to performance" approach to Caltrans' activities will be a benefit to the communications program. By measuring its performance using metrics that are consistent with the way it has defined its goals and that can be easily explained and understood, and by tracking performance against these metrics, Caltrans will have a story to tell.

- *To effectively communicate on performance, Caltrans should develop capacity in "performance journalism."* Recent conversations with senior Caltrans management indicate the department may still be in the mindset that providing "dashboards" of targets and measures is sufficient. Dashboards were DOTs' first attempt at providing new transparency, but they are not enough. Caltrans deserves credit for looking at Washington State DOT's Gray Notebook program as a model. The danger is that the Caltrans response is to provide simply a more detailed dashboard. The greatest virtue of the WSDOT model is that the Gray Notebook staff see themselves as performance journalists (their term) identifying important trends and explaining them to internal and external stakeholders. Hosting this information on a more coherent website would help as well.

- *Caltrans should work to ensure its communications with local stakeholders are genuine and two-way.* Local communities complain that their input, even when taken in formal processes, often means little, and that they do not have sufficient access to real decision makers to ask questions and provide information and opinions. Sometimes even projects that the community would embrace are rolled out without enough information exchange, and Caltrans snatches defeat from the jaws of victory. Regrettably, the new Main Streets guide seems to contemplate the continuation of a project development process in which community involvement is not mainstreamed at an early stage, during the identification of objectives and issues. Likewise, regional partners and citizens report that Caltrans staff is not skilled at communicating with either grasstops (local boards, for example) or grassroots (the public). Public outreach should be a core competency of the department, but it is not one typically taught in technical coursework. Communications should be included in the department's new training and SOP regimens, and rank-and-file staff who struggle with this skill should have access to mentoring.

Management systems

9. Manage for performance. Effective management measures goal achievement and establishes a system of accountability within the organization. However, with rapid changes in technology, evolving skill sets of new staff—and, in Caltrans' case, additional opportunities in the policy environment—effective management also requires a commitment to flexibility that will allow the department to adapt to changing circumstances. A "manage to performance" approach leads to continual organizational improvement over time.

- *Caltrans should set enterprise-wide and team-specific goals, both short- and long-term.* The goal-setting process should be coordinated by the director's office, with the engagement of CalSTA. The goals should reflect a new policy/mission and thus, for example, cover location-efficient land use, VMT reduction, and progress toward more and better quality pedestrian, bicycle, and transit mobility. These goals should be clearly communicated to the organization and its stakeholders through an intensive outreach process that begins with internal work on implementation and creates deep buy-in.

- *Caltrans should devise metrics to track the organizational goals*. Targets should be set on an annual basis. Metrics should be tracked on a quarterly basis and compared to targets.

The results should be disseminated throughout the organization and to its stakeholders. Metrics could include financial performance, operations, innovation, and employee performance. The goals and metrics across the organization should be appropriately flexible and be subject to no less than annual review, to allow for changes in an individual and team's responsibility over time and for changes in what work a project requires. The Caltrans performance measurement system should be put to work as a platform for collaboration with MPOs and other partners. Over time, performance measurement should also inform legislative relations, guiding the state's infrastructure funding and development strategies.

- *The Caltrans director should assign each of his direct reports responsibility for a subset of the goals, and an associated set of numerical metrics.* Each of these direct reports should then, in collaboration with their direct reports, assign their own direct reports responsibility for a subset of the goals, and so on down the chain. As a result, each manager should have a clear set of goals that they are responsible for within the organization, which clearly links up to the organization's overall goals. Each manager should have a commensurate set of numerical targets by which their performance in achieving those goals is measured.

- *Measures should evolve.* Performance measurement should neither be frozen in place on the basis of current data capabilities, nor deferred until major investments in data development have borne fruit. The Caltrans performance measurement system should from the outset use metrics that reflect state goals and measures, starting with metrics that current data capabilities can support, and then steadily evolve to reflect better data and ever-stronger departmental alignment with policy goals.

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Sidebar 5: Measuring performance

Performance measurement can tell the public, elected officials, regional partners, and the department itself about the state of the transportation system, use of resources, and progress toward state goals. In California, performance measurement can also document progress in modernizing Caltrans and aligning its activities with state transportation goals. Performance measures must reflect the mobility, livability, and climate goals set out in legislation such as SB 375, AB 857 (state planning priorities), and SB 743 (alternatives to LOS in CEQA), as well as in *Smart Mobility 2010* and other Caltrans policy documents. Performance measures not aligned with state goals— those concerned too exclusively with minimizing traffic congestion—would provide a script for failure in re-positioning the department as a vital and trusted player in building the California of the future.

In *Smart Mobility 2010,* Caltrans has already articulated an excellent framework for performance measurement. That document calls for incorporation of the measures into Caltrans programs and activities, including but not limited to STIP development. The *Smart Mobility* goals and performance measures are as follows:

Goal	**Performance Measure**
Location Efficiency	Support for Sustainable Growth
	Transit Mode Share
	Accessibility and Connectivity
Reliable Mobility	Multi-Modal Travel Mobility
	Multi-Modal Travel Reliability
	Multi-Modal Service Quality (Level of Service: LOS)
Health and Safety	Multi-Modal Safety
	Design and Speed Suitability
	Pedestrian & Bicycle Mode Share
Environmental Stewardship	Climate and Energy Conservation
	Emissions Reduction
Social Equity	Equitable Distribution of Impacts
	Equitable Distribution of Access and Mobility
Robust Economy	Congestion Effects on Productivity
	Efficient Use of System Resources
	Network Performance Optimization
	Return on Investment

To make performance measurement central to the CalSTA-Caltrans relationship and day-to-day Caltrans management, the agency and department will need to put in place additional metrics.

The following are examples of good state sustainable transportation metrics from the Maryland Department of Transportation 2013 Annual Attainment Report[49]:

[49] *2013 Annual Attainment Report on Transportation System Performance* (Maryland Department of Transportation, n.d.), http://www.mdot.maryland.gov/Office_of_Planning_and_Capital_Programming/CTP/CTP_13_18/CTP_Documents/Attainment_Report_2013_FINAL.pdf.

Goals: Quality of Service; Connectivity for Daily Life

- Percentage of the Maryland State Highway Administration (SHA) network in overall preferred maintenance condition
- Percent of roadway miles with acceptable ride quality
- User cost savings for the traveling public due to incident management
- Percentage of State-owned roadway directional miles within urban areas that have sidewalks and percent of sidewalks that meet Americans with Disabilities Act compliance
- Percentage of State-owned roadway centerline miles with a bicycle level of comfort grade "D" or better and directional mileage of SHA-owned highways with marked bike lanes
- Travel demand management and transit service quality

Goal: System Preservation and Performance

- Percentage of the SHA network in overall preferred maintenance condition
- Number of bridges and percent that are structurally deficient

Goal: Safety & Security

- Number of bicycle and pedestrian fatalities and injuries on all Maryland roads
- High-crash locations
- Annual number of traffic fatalities and personal injuries on all roads in Maryland

Goal: Environmental Stewardship (including climate stewardship)

- Transportation-related greenhouse gas emissions

Also worth considering is Maryland's data-driven management tool and process, Maryland's StateStat. Weekly StateStat meetings are chaired by the governor or members of his senior staff. Managers report on and are queried about performance data, and follow-up on previous meetings is reviewed. Rather than being relegated to an episodic administrative exercise, performance measurement is used to structure continuous improvement into operations. The secretary and director should likewise participate in Caltrans performance management meetings.

Finally, MAP-21 has established a limited set of federal performance measures around assets, safety, congestion, and "system performance." While the specific measures (still in rulemaking) may complement those needed to track progress on state goals, they will not be sufficient to do so. They do come with new probe-vehicle data on speed by highway segment. The conventional use of those data will be to identify bottlenecks. Another use, however, will be to identify segments where speeds are over the speed limit, and to track progress—through enforcement, ITS, traffic calming or other means—of reducing speeding.

Continued from page 57.

- *Caltrans should provide financial incentives for manager performance.* Salaries were frozen for a period, and then increased for engineers, but not for other staff. Managers of engineers now make essentially the same salaries as those they supervise. Many capable staff members have left for local government or the private sector where salaries are far higher. Managers should be given financial incentives to meet their goals on an annual and multi-annual basis. This can be done by adopting the following actions:

    - Promotion decisions should be directly related to performance. Those that fail to meet their goals for multiple years should face disciplinary action.

    - All metrics should be tracked in a database, so that the metrics can be easily compared and compiled. Managers' performance should be compared against each other, to identify under-performing units that need additional assistance and over-performing units whose practices should be disseminated.

    - Alongside results-driven performance evaluation, managers should be subject to 360-degree evaluation (managers, subordinates, colleagues, stakeholders, and trainers/coaches) on an annual basis.

    - Key managers should get annual management training in small groups, and monthly sessions with an executive coach.

    - Caltrans should work with CalSTA and other stakeholders to better reward high-performing managers and staff, and to attract top talent in key positions. This means higher pay in many cases. As an example, the Caltrans director's salary is far too low—a fraction of what self-help counties pay their transportation CEOs . If California wants an excellent transportation department, it must be willing to pay competitive salaries and provide incentives for good work. It would be reasonable for stakeholders to insist on meaningful reform and improvement in exchange. Conversely, if there is no willingness to change the salary structure, outside stakeholders bear substantial responsibility for any Caltrans failings going forward.

- *Caltrans should dedicate resources to push performance-based management throughout the organization.* Caltrans has already established a group to develop performance metrics for the department. This group, which should include a CalSTA representative, should be responsible for collecting data and analyzing the performance of difference parts of the organization. In some sense, this group should act as an internal strategic consulting team, working closely with the relevant departments to solve problems quickly and identify and disseminate best practices in performance-based management. In addition, there should be a dedicated individual in each district whose responsibility it is to collect and compile organizational metrics, do outreach to that district's staff regarding the organizational goals and how they can be more proactive and creative in working towards them, and liaise with HQ's strategic consulting team.

- *To ensure that union contracts are not violated, goals and performance metrics for non-management personnel could be set at the team level, with the union engaged in the goal-setting effort.* This approach has occurred in Ohio, Maryland, and at the federal level. It is also possible to link this to better financial rewards. Caltrans management should work with the union over the longer term to allow for individual performance to be evaluated based on outcomes as well as effort, for outstanding performance to be compensated, for performance to be used in determining hiring and promotion, and for repeat poor performers to be terminated.

- *At the same time Caltrans must provide room for innovative actions that further state and department goals.* Performance management as described above can go too far if staff simply chase existing metrics without regard to the goals and mission of the enterprise. Innovation can be motivated through monetary rewards and other proxies such as recognition for employee suggestions, improvements in work processes, improvements in delivery over previous projects, a rate of improvement index, etc. A powerful way to inspire innovation is to acknowledge it and use it to change department-wide procedures.

- *Caltrans should re-examine internal relationships and flow of authority to foster accountability and effective collaboration.* A system of headquarters checks and balances on district staff and local partners, put into place in the early 1980s when the department had many novice staff, now often delays local work, adding cost and time to projects and reducing design flexibility. That such a system remains is evidence of what the department acknowledges is a culture that does not manage risk well. The Caltrans program review of 2012 promises to put more decision making in the hands of the districts, which should be supported as long as accountability flows with new authority. In addition, the department should set up silo-busting efforts to address cross-cutting issues, such as meeting tighter stormwater requirements. Such issues are good candidates for being addressed in ad hoc work groups led by CalSTA.

10. Foster innovation and continuing evolution. At one point, Caltrans was widely acknowledged as the national leader in the development and application of innovative practices, including those related to technology for system management and operations. No longer. Within California, many of the most innovative design and operations strategies are conceived at the regional and local levels. Caltrans' vision statement should recommit to restoring the department as the world's premier location for innovative transportation practices that responds to modern needs and policy, and the department must foster a culture that can live up to that vision.

- *Caltrans management and CalSTA should insist on robust implementation of state policies and rely on staff for implementation details.* Many of the previous recommendations highlight an issue that is a challenge for many organizations—following through with policy initiatives and directives. Implementation entails clear assignment of responsibility and authority for required actions, identification and tracking of performance metrics for monitoring progress, and establishing interim decision points where changes can be made in the implementation strategy to fix those issues that have

proven to be a challenge. In general, management must insist on a new direction, then work with staff to create new guidance, processes, and measures.

- *Caltrans should benchmark practice against best practices elsewhere.* Transportation agencies outside of and inside California offer examples of practices that can be adapted for use by Caltrans, and Caltrans in turn can inform peer agencies when it advances its work as well. A good tool for making such comparison is INVEST (Infrastructure Voluntary Evaluation Sustainability Tool), provided free online by FHWA. Other state DOTs and MPOs have found that, in addition to learning from best practices described in the tool, the internal conversations required to do the scoring in INVEST have created new connections and generated new thinking. Several Caltrans staff members took the initiative recently to hold a webinar on INVEST, and now Caltrans should go further and score its planning, project development, and operations and maintenance practices against those reflected in the tool. Note that INVEST may not address all relevant concerns, and Caltrans may wish to augment it with criteria of its own, as the Illinois DOT is considering.

- *Caltrans should work to better integrate its research program with improved practice.* Caltrans has a robust research program, but those involved report that research projects and findings often do not filter into the department's thinking and decision making. For example, Caltrans-funded research has determined that traffic-mitigation calculations may overestimate the number of trips generated by infill development, imposing additional costs on the very land use projects embraced by state planning goals. Yet it took legislative action (SB 743 of 2013) to reform the exaction practice. In other cases, research conducted outside of the department's own program provides important new information, yet it too rarely penetrates the culture. For example, despite a rich literature on induced demand, internal interviewees frequently dismissed the phenomenon.

- *Caltrans' effort to develop an enterprise risk management system should continue and be viewed as a critically important resource for performance-based decision making*. One of the key findings of Caltrans' 2012 program review was that the department poorly manages risk, with staff often looking for personal zero-risk strategies that get in the way of innovation and decision making. The department's effort to better manage risks in four categories—projects, program, operations, and organizational change—deserves strong support from CalSTA and other stakeholders. Managing risk instead of wishing it away, along with dropping liability as an excuse for fighting change, will go a long way toward providing the nimbleness that Caltrans needs to respond to current and future needs and demands.

- *Caltrans should improve staff training and workforce development.* Caltrans needs to expose its staff to current thinking, ensure younger staff can take over for retirees, and build skills and expertise where departmental capacity is currently limited. In addition, technical staff who are moving into management need to develop new skills. One way to manage human capital is to consider it an asset, and track it just as the department should be doing for bridges and pavements. Caltrans has training programs, particularly in

management, but these are sometimes discontinued, and staff who attend report that there is little follow-up after the training.

- *Caltrans should strike the right balance between the cost and benefit of national engagement for Caltrans staff.* Caltrans at one time was an active participant in national transportation research and professional organizations such as the Transportation Research Board (TRB), American Public Transportation Association (APTA), Intelligent Transportation Society of America (ITS America), and of course the American Association of State Highway and Transportation Officials (AASHTO). From the perspective of staff professional development, continuing or restoring such relationships and participation should be an important Caltrans initiative worth more resources than have been available in recent years.

Plan of action.

In recent decades many reviewers, both inside and outside of Caltrans, have provided recommendations for how the department could better meet the challenges it faces. While some progress has been made—and the current management's program review from 2012 holds promise in several significant areas—on the whole the department remains out of step with current policies and needs, handcuffed by risk aversion and an insular culture based on project delivery and auto-mobility.

So, how to move forward? The answer is to use the recommendations detailed above as the roadmap to modernization and culture change. The keys to progress will be commitment, collaboration, open communication, and probably some humility. Most of all, progress will require leadership and ownership of thorough organizational change. Caltrans staff will need assurance that when well-thought-out innovations fail, as some inevitably will, the boss will have their backs.

With this in mind, we recommend four immediate steps, all of which should be completed in the next six months.

1. Caltrans and CalSTA should develop mission, vision and goal statements that are fully consistent with state planning and policy goals. These statements should explain conceptually what Caltrans' role is in sustainability, livability, and equitable economic development. One source for these statements is the department's own 2040 long-range plan, which is being constructed in parallel to, but separately from, the five-year strategic plan. Another is the recent *Smart Mobility* report, which has largely been ignored. Critically, if the word "mobility" (whether described as smart or not) remains as a central focus in the department's mission, it needs a clear definition in light of new expectations of Caltrans, because whatever the aims of management might be, currently too many in the department understand the word to mean "moving cars faster." To jumpstart this effort, we recommend that the secretary and director accept responsibility for crafting these statements in concert with a set of key senior staff of their choosing. To demonstrate the commitment to collaboration, we suggest that these statements be produced in draft and shared with key transportation and elected officials selected by the secretary before finalization. Once CalSTA and Caltrans have developed the new statements, they must go to the district directors and other key staff to work out the details and

implementation. The process we describe is different from the bottom-up approach that has characterized strategic planning in the department, which resulted in the culture endorsing itself. Strategic direction must come from top down and outside in. *Timeframe: Month 1.*

2. Following the release of new mission, vision and goals, Caltrans and CalSTA should use those statements, as well as the recommendations in this report, to organize teams to develop implementation actions and performance measures. Teams may be organized around work-streams, e.g., project development or system planning, or topic areas from the recommendations, e.g. liability or guidance manuals. Ten to 12 teams of about 10 to 12 members should be able to tackle a wide range of critical issues. Membership should be across silos, e.g., if a design team is formed it should not be limited to engineers doing design, and ideally should be composed of staff members who volunteer to serve and guide implementation of the new strategic direction. Caltrans should designate a leader of this effort with sufficient staffing and enough seniority to have the ear of the secretary and the director. Going forward this staff can take responsibility for tracking and adjusting measures, and recommending strategic corrections. Staff from the agency and its other departments, as well as those from other state and local entities, may be included in the work groups where such expertise and perspectives are helpful. For example, if a group is formed around the big issue of reporting and communications, it might consider reducing or combining some of the many reports required by law, and this discussion might include legislative staff. The majority of staff, however, should be from Caltrans. To focus the effort, this work should supersede or absorb other external and internal initiatives, such as the strategic and long-range planning processes and the 2012 program review follow-ups. While there may be areas where new resources are needed in order for Caltrans to improve performance—we have argued that planning and operations are two—implementation should not assume additional resources for projects unless those resources are clearly forthcoming. *Timeframe: Months 2-6.*

3. Caltrans and CalSTA should work to ensure the success of CEQA reform rulemaking set up by SB 743 (2013). SB 743 could do more to advance state planning goals than anything else Caltrans has done. The statute's assignment of the SB 743 rulemaking to another department, however, is evidence of the general lack of confidence in Caltrans' ability to accomplish this transformative change. And that lack of confidence may be well-founded, as our interviews disclosed substantial resistance to change, with Caltrans staff, for example, arguing to extend the new rules only to the minimum area required, while the statute would permit statewide application. A successful rulemaking, leading to a predictable developer fee based on transportation system use—probably VMT—would put California and Caltrans back at the leading edge of modern transportation practice, and would remove one of the greatest institutional barriers to implementing SB 375. It would begin to make Caltrans a real contributor to the success of modern policy in the state, and it would provide a model for how the staff could help implement a challenging new charge. *Timeframe: Months 1-5.*

4. Caltrans and CalSTA should modernize state transportation design guidance. A complete overhaul involving the content of multiple manuals and changes to the exception process will take longer than a half-year, but the agency and department should move quickly to encourage modern multimodal improvements in metro areas. The agency and department should support, or propose if no bill is forthcoming, legislation to end the archaic practice of imposing state rules on local streets for bicycle facilities. For the many remaining state-owned metropolitan facilities—

streets designed to road standards, or "stroads"—the agency and department should follow the lead of Washington State DOT and quickly adopt modern guidance such as that laid out in the NACTO Urban Street Design Guide. These actions will not only improve multimodal access and safety in metro areas,but will also provide relief to local entities that have raised money and sought to implement modern design, only to be thwarted by the state and its dated, rigid design policies. These initial steps should be followed by more thorough reform of the department's design guidance as described in the recommendations. One or more of the work groups in recommendation No. 2 should be tasked with creating a process for design reform. *Timeframe: Months 1-4.*

SSTI's role going forward

The SSTI team offers its findings and recommendations in hopes that they will catalyze change where many other reports have not. We know, however, that the real work in modernization and culture change is only beginning. Most of that work will have to be done by the department and agency, with support from stakeholders. SSTI remains under contract with the agency to continue to provide advice and other assistance. We will be available to assist with mission, vision, and goal development; creation and facilitation of work-stream groups; rulemaking under SB 743; and adoption of modern urban transportation guidance, as well as other issues that may arise in the implementation of our recommendations.

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Appendix A: SSTI assessment team

The State Smart Transportation Initiative promotes transportation practices that advance environmental sustainability and equitable economic development, while maintaining high standards of governmental efficiency and transparency. SSTI, housed at the University of Wisconsin, operates in three ways:

- As a community of practice, where participating agencies can learn together and share experiences as they implement innovative smart transportation policies;
- As a source of direct technical assistance to the agencies on transformative and replicable smart transportation reform efforts; and
- As a resource to the wider transportation community, including local, state, and federal agencies, in their efforts to reorient practice to changing social and financial demands.

The SSTI team responsible for this report comprises:

Al Biehler — Secretary of the Pennsylvania Department of Transportation from 2003-10, where he pioneered the philosophy of "Smart Transportation." The smart transportation approach streamlined and stabilized the Commonwealth's transit program, accelerated PennDOT's highway project delivery processes, and ensured that highway projects became assets for the surrounding community. Earlier, he was a Vice President with the consulting firm DMJM+Harris, and served as director of planning, engineering, and construction at the Allegheny County Port Authority. Biehler served as president of AASHTO in 2009. Biehler is a Distinguished Service Professor of Transportation Systems and Policy at the H. John Heinz III College at Carnegie Mellon University and Executive Director of CMU's University Transportation Center. He is also an Adjunct Professor in the Civil and Environmental Engineering Department in the Engineering College at Carnegie Mellon University. Biehler is a member of SSTI's Executive Committee and has participated in all of SSTI's agency reviews.

Stephen Burrington, J.D. — In key public and private sector roles, Burrington has won national recognition for leadership in tackling energy, transportation, and sustainable development challenges. As a member of Serrafix, Burrington works with diverse clients to carry out innovative large-scale energy efficiency and clean energy strategies, green urban redevelopment projects, and state land use and transportation policy initiatives. He previously served as commissioner of the Massachusetts Department of Conservation and Recreation, where he led the formation of the nation's sixth-largest and most diverse state parks, infrastructure and natural resources agency, and as undersecretary in the Massachusetts Office for Commonwealth Development. Before entering state government, Burrington was vice president and general counsel for the Conservation Law Foundation, New England's leading environmental protection organization. Burrington assisted with SSTI's review of the Washington State Department of Transportation.

Gene Conti, Ph.D. — Secretary of the North Carolina Department of Transportation (NCDOT) 2009-2013. His career in public service and private business management includes tenures as Secretary of the Maryland Department of Labor, Licensing and Regulation; Assistant Secretary for Transportation Policy at the United States Department of Transportation; and Vice President

of PBS&J (now Atkins), an engineering consulting firm. As Secretary, Conti directed a sweeping reform of the NCDOT, an agency with 12,000 employees and an annual budget of over $5 billion. Under his leadership, NCDOT also underwent an internal transformation that emphasized performance management, transparency, and accountability. Conti participated in SSTI's review of the Pennsylvania Department of Transportation. Dr. Conti is currently engaged in a consulting practice with clients in the transportation, energy, and waste reduction sectors.

Douglas Foy, J.D. — President of Serrafix Corporation. Prior to founding Serrafix, Foy served as the Secretary of Commonwealth Development in Massachusetts under Governor Mitt Romney, overseeing the agencies of Transportation, Housing, Environment and Energy, with combined annual capital budgets of $5 billion, operating budgets of $500 million, and a total workforce of more than 11,000. During Foy's tenure, these agencies developed Massachusetts' first comprehensive transportation plan (with an emphasis on transit and fix-it-first), and the nation's most comprehensive climate action plan. Prior to his public service, Foy served for 25 years as the President of the Conservation Law Foundation, New England's leading environmental advocacy organization. As a member of SSTI's Executive Committee, Foy has participated in most of SSTI's agency reviews.

Bill Holloway — Bill is a Transportation Policy Analyst at SSTI. Before joining SSTI in 2010, he worked on a variety of regional and statewide plans and studies dealing with multimodal freight transportation and associated issues as a transportation analyst in the Austin, Texas, office of Cambridge Systematics Inc.

Nicholas Josefowitz — Nicholas is the Founder of Leadership For A Clean Economy, developing and investing in clean economy political leadership in California. Previously, Nicholas founded RenGen Energy, a solar power plant development company. Under his leadership, RenGen developed, financed, and built approximately $100 million of solar power plants. Nicholas is an active investor in sustainability, social enterprise, and political causes in California and the Bay Area. He sits on the Dean's Council of the Kennedy School of Government at Harvard and is on the Board of the Bay Area Jewish Community Relations Council. He was appointed by San Francisco Mayor Ed Lee to sit on the Environment Commission. He graduated from Harvard College cum laude as a member of Phi Beta Kappa.

J. Cleve Livingston, J.D. — Of Counsel at Briscoe, Ivester & Bazel LLP, Cleve is one of California's leading experts with respect to vested development rights, master planning, environmental quality, green energy, smart growth, and affordable housing. In over 35 years of work, Livingston has built a reputation for fashioning sustainable development strategies and innovative design solutions to growth issues. He has long been an advocate of smart growth planning strategies and sustainable transportation initiatives that mitigate traffic impacts. He is also well versed in addressing compliance issues arising under CEQA, the National Environmental Policy Act (NEPA), and other state and federal environmental regulations.

Michael D. Meyer, Ph.D., P.E. — Former Georgia Tech Professor of Civil and Environmental Engineering, Meyer specializes in transportation systems engineering, multimodal transportation planning and evaluation, transit planning, institutional analysis and project implementation, public works economics and finance, environmental impact analysis, sustainable development;

and transportation policy. He has written more than 200 technical articles and authored or co-authored 26 books or book chapters on transportation planning and policy, and is the recipient of numerous awards (including 2009 Transportation Research Board's W.N. Carey, Jr. Award for Distinguished Service, 2006 Wilbur Smith Distinguished Educator award from the Institute of Transportation Engineers, 2000 Theodore M. Matson Memorial Award for outstanding contributions in the field of transportation engineering, and the1988 Harland Bartholomew Award of the American Society of Civil Engineers for contribution to the enhancement of the role of the civil engineer in urban planning and development). Meyer participated in the SSTI reviews of the Arizona, Massachusetts, Pennsylvania, and Washington Departments of Transportation.

Joel Rogers, Ph.D., J.D. — Director of SSTI, professor of law, political science, public affairs, and sociology at the University of Wisconsin-Madison, and the director of COWS (of which SSTI is one project), he's written widely on American politics and public policy (e.g., *On Democracy*, *Right Turn*, *The Forgotten Majority*, *What Workers Want*, *American Society: How It Really Works*). He's also co-founded and helped run a large number of progressive NGOs (e.g., Center for New Democracy, New Party, Economic Analysis and Research Network, Apollo Alliance, Emerald Cities Collaborative). A MacArthur Foundation Fellow, *Newsweek* identifies him as one of the 100 living Americans most likely to shape U.S. politics and culture in the 21st century.

Eric Sundquist, Ph.D. — Managing Director of SSTI. Before assuming that position in 2010, he was a senior associate and policy analyst focusing on transportation and clean energy at COWS. Sundquist also worked as a transportation researcher at Georgia Tech, as an instructor at Georgia State University, as an editor for the *Journal of the American Planning Association*, and as an editor at the *Atlanta Journal-Constitution* and several other newspapers.

The team thanks Raphael Barcham, University of California-Berkeley Goldman School of Public Policy, for background research, and Lisa MacKinnon for editing.

Appendix B: Subjects interviewed

Dennis Agar	Division Chief, Traffic Operations	Caltrans
Kome Ajise	Deputy Director	Caltrans
Brian Annis	Undersecretary	CalSTA
Richard Backlund	Associate Division Administrator	FHWA
Jean Banker	Deputy Executive Director	Port of Oakland
Ron Beals	Chief Legal Counsel	Caltrans
Mike Bell	Chair	La Conchita Community Organization
Shari Bender-Elhert	District 6 Director	Caltrans
Katie Benouar	Chief, Division of Transportation Planning	Caltrans
Lauri Berman	District 11 Director	Caltrans
Bruce Blanning	Executive Director	Professional Engineers in California Government
Andre Boutros	Executive Director	California Transportation Commission
Carrie Bowan	District 10 Director	Caltrans
Brian Boxer	Senior Vice President	Environmental Science Associates
Susan Bransen	Assistant Deputy Director	California Transportation Commission
Coco Briseno	Chief, Division of Research, Innovation and System Information	Caltrans

William Bronte	Chief, Division of Rail	Caltrans
John Bulinski	District 2 Director	Caltrans
Kianna Buss	Associate Legislative Representative, Housing, Land Use and Transportation	California State Association of Counties
Christopher Calfee	Senior Counsel	Office of Planning and Research
Christina Casgar	Goods Movement Policy Manager	San Diego Association of Governments
Ryan Chamberlain	District 12 Director	Caltrans
Jim Coffman	Executive Vice President	Coffman Speciaties Inc.
Stuart Cohen	Executive Director	TransForm
Timothy Craggs	Division Chief, Design	Caltrans
Bill Davidson	Deputy Secretary, Administration and Finance	CalSTA
James Davis	Division Chief, Project Management	Caltrans
Janet Dawson	Chief Consultant	State Assembly Transportation Committee
Mark DeSaulnier	Senator	State Senate
Malcolm Dougherty	Director	Caltrans
James Dreisbach-Towle	Principal Technology Program Manager	San Diego Association of Governments
Ellen Drell	Board Member	Willits Environmental Center
Keith Dunn	Executive Director	Self Help Counties Coalition

Amanda Eaken	Deputy Director of Sustainable Communities, Energy & Transportation Program	Natural Resources Defense Council
James Earp	Commissioner	California Transportation Commission
J. Alex Estrella	Senior Transportation Planner	San Diego Association of Governments
Doug Failing	Executive Director of Highway Projects	Los Angeles County Metropolitan Transportation Authority
Charlie Fielder	District 1 Director	Caltrans
Gary Gallegos	Executive Director	San Diego Association of Governments
Kimberly Gamble	District 11 Deputy	Caltrans
Chris Ganson	Senior Planner	Office of Planning and Research
Armando Garcia	Construction Manager	Coffman Specialties
James Ghielmetti	Chair	California Transportation Commission
Don Goss	Manager, Product and Technical Services	Valero Refining
Tim Grubbins	District 5 Director	Caltrans
Steve Guenther	Senior Transportation Engineer	Caltrans
Tom Hallenbeck	District 9 Director	Caltrans
Rene Halverson	Assistant Director of Business & Economic Opportunity	Caltrans
Steve Heminger	Executive Director	Metropolitan Transportation Commission
Bill Higgins	Executive Director	California Association of Councils of Government

Justin Horner	Policy Analyst	Natural Resources Defense Council
Gary Hughes	Executive Director	Environmental Protection Information Center
Hasan Ikhrata	Executive Director	Southern California Association of Governments
Darrel Johnson	Chief Executive Officer	Orange County Transportation Authority
Jody Jones	District 3 Director	Caltrans
Kim Kawada	TransNet and Legislative Affairs Coordinator	San Diego Association of Governments
Steven Keck	Chief Budget Officer	Caltrans
Bonnie Kelm	La Conchita Historian / Professor (Retired)	University of California - Santa Barbara
Will Kempton	Executive Director	Transportation California
Barbara Kennedy	Member	Save Richardson Grove Coalition
Pam Korte	Office Chief, Division of Transportation Planning	Caltrans
Ron Kosinski	District 7 Deputy Director for Environmental Planning	Caltrans
Richard Land	Chief Deputy Director	Caltrans
Arthur Leahy	Chief Executive Officer	Los Angeles County Metropolitan Transportation Authority
Bill Lewis	Assistant Director of Audits & Investigations	Caltrans
Sherman Lewis	President	Hayward Area Planning Association
Tony Limas	New Technology Deployment Specialist	Granite Construction
Bonnie Lowenthal	Member	State Assembly

Chris Lytle	Executive Director	Port of Oakland
Vince Mammano	Division Administrator	FHWA
Pascal Mascarenhas	Senior Technical Service Specialist	Vulcan Materials
Anne Mayer	Executive Director	Riverside County Transportation Commission
Mike McCoy	Executive Director	California Strategic Growth Council
Scott McGowan	Chief Environment	Caltrans
Tamie McGowen	Assistant Deputy Director, Public Affairs	Caltrans
Ron Milam	Principal	Fehr & Peers
Mike Miles	District 7 Director	Caltrans
Mark Monroe	Assistant Program Budget Manager	Department of Finance
Jeff Morales	Chief Executive Officer	High Speed Rail Authority
Basem Muallem	District 8 Director	Caltrans
Krishniah Murthy	Executive Director of Transit Project Delivery	Los Angeles County Metropolitan Transportation Authority
José Nuncio	Manager of Financial Planning	San Diego Association of Governments
Norma Ortega	Chief Financial Officer	Caltrans
Tami Podesta	Senior Environmental Planner, District 7	Caltrans
Marnie Primmer	Executive Director	Mobility-21
Chris Ratekin	Senior Transportation Planner	Caltrans

Seleta Reynolds	Section Leader, Livable Streets	San Francisco Municipal Transportation Agency
Cris Rojas	Deputy Director of Administration	Caltrans
Bijan Sartipi	District 4 Director	Caltrans
Patrick Shannon	Land Owner, Humboldt County	Self Employed
Kristin Shelton	Program Budget Manager	Department of Finance
Eric Shen	Director, Transportation Planning	Port of Long Beach
Will Shuck	Deputy Director of External Affairs	Caltrans
Gigi Smith	Chief Information Officer	Caltrans
Russell Snyder	Executive Director	California Asphalt Pavement Association
Pete Spaulding	Division Chief	Caltrans
Jim St Martin	Technical Consultant	California Asphalt Pavement Association
Karla Sutliff	Deputy Director of Project Delivery	Caltrans
Steve Takigawa	Deputy Director of Maintenance and Operations	Caltrans
Alan Telford	President	Fehr & Peers
Eric Thronson	Chief Consultant	State Senate Transportation and Housing Committee
Kirk Trost	General Counsel	Sacramento Area Council of Governments
Marty Tuttle	City Manager	City of West Sacramento
Rachel Vandenberg	Senior Engineer, Port Specialist	AECOM

Jack Van Kirk	Director of Asphalt Technology	Basic Resources
Don Vivant	Quality Control Director	Blue Diamond Materials
Mark Watts	Principal	Smith, Watts & Martinez
John Yang	District 11 Deputy	Caltrans
Allison Yoh	Transportation Policy Specialist	Port of Long Beach
Ali Zaghari	District 11 Deputy	Caltrans

Appendix C: Documents reviewed

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Appendix D: Caltrans' report of recent major achievements

Projects

Carmageddon I

In July 2011, the south side of the Mulholland Bridge was demolished as part of a project that added a carpool lane to a 10-mile stretch of northbound I-405. In November 2012, this project received the Grand Prize at the 5th Annual America's Transportation Awards competition.

Carmageddon II

A stretch of I-405 was shut down while crews dismantled the northern side of the Mulholland Bridge over a weekend. Like Carmegeddon I this project was completed ahead of time.

I-5 Boat Section

That section of I- 5 carries more than 190,000 vehicles each day. The work was completed in a record 38 working days, rather than the projected two years. The project was named one of ten finalists for the national 2009 America's Transportation Award.

Presidio Parkway Project Demolition

Doyle Drive, the critical link between the Golden Gate Bridge and central San Francisco, is a 1.6-mile approach, which opened along with the Golden Gate Bridge in 1937. A crew of 300 workers and 40 excavators demolished 151 bridge spans and 307 columns in just 57 hours.

Devil's Slide

Opened in March 2013, the $439 million project features two 4,200-foot long tunnels
Cable Bridge Upgrades

Carquinez Bridge

The original span was replaced in 2003 by a graceful new suspension bridge. The cost was $240 million.

The San Francisco-Oakland Bay Bridge

Known as the region's workhorse bridge, it carries more than a third of the traffic of all of the state-owned bridges combined. Construction of the skyway portion of the bridge was completed in 2007. The new East Span opened to traffic in 2013.

Benicia-Martinez Bridge

The $1.2-billion project includes a new toll plaza plus reconstruction of the Interstate 680 interchanges at Interstate 780 in Benicia and Marina Vista/Waterfront Road in Martinez.

Programs

Proposition 1B

Approved by the voters in the November 2006 general elections, Proposition 1B enacted the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006. It authorized $19.925 billion of state general obligation bonds for specified purposes. Caltrans' portion was $15.5 billion.

Intercity rail ridership
Total annual ridership for all routes has increased since FFY 2009-2010. In 2011 ridership was at 5.56 million, an increase of 391,000 from the previous year. Passenger miles had increased from 456,296 in 2010 to 496,260 in 2011. Total revenue for 2011 was $105.3 million, an increase of $12.1 million from the year before.

Redistribution of Federal Obligation Funds (August Redistribution)
In the last five years Caltrans has led the nation in the "August Redistribution." In 2012 the amount was $136,596,000.

Redistribution of Certain Federal Authorized Funds (Various Appropriations Acts)
In the last five years Caltrans has led the nation in this redistribution. In 2011 the amount was $16,023,000.

Seismic retrofit program
The current Seismic Retrofit Program has been focused on identifying and retrofitting existing bridges statewide. Phase 1 included 1,039 bridges, costing $1.082 billion, and the second phase of 1,055 bridges is 83.6 percent complete.

California Interregional Blueprint
Once fully developed, the California Interregional Blueprint will become the foundation for the next update to the California Transportation Plan. Known as the CTP 2040, this is a statewide, long-range transportation plan designed to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. Key milestones include development of a statewide model framework, an evaluation model, and reporting schedule.

CALTRANS Smart Mobility 2010, February 2010, Appendix C: Implementation Checklist
State and local agencies developed a framework that would help guide and assess how well plans, programs, and projects meet a definition of "smart mobility". The goal was to ensure applicability of the framework for Caltrans as well as for partner agencies. An implementation checklist is located in Appendix C. All components are either complete or on schedule for development.

Report to the Legislature, CALTRANS' Response to Stanford Research International's Report of February 1994, August 1995
The February 1994 report cited 14 high-priority recommendations. Many of the recommendations, such as performance measures and development of a strategic plan, have been implemented. Other recommendations like changing the culture and a continuous CTP are constantly updated.

Emergencies
Winter of 2011
Caltrans' faced significant challenges in the winter of 2011. In April, following near record storms, Governor Edmund G. Brown Jr. issued an emergency proclamation for 19 counties

following the storms. Caltrans worked tirelessly to clear the hazards and traffic moving. Notable examples can be found in the Emergencies section of this document.

MacArthur Maze

At 3:42 a.m. on Sunday, April 29, 2007, a tank truck carrying 8,600 gallons (32,500 liters) of unleaded gasoline overturned on the connector from Interstate 80 west (from Berkeley) to Interstate 880 south. The deadline to finish the project was beaten by over a month, and it was completed only 26 days after the original accident

Angeles Crest Highway

The Angeles Crest Highway was closed in late August 2009, due to the Station Fire in the Angeles National Forest. Contractors worked around the clock to repair thousands of feet of guardrail, hundreds of road signs, debris/catch basins, culverts and pavement. The highway reopened November 30, 2009.

Appendix E: Caltrans' required reports to the legislature

Title	Description	Authority	Frequency	Due to the Legislature
Anadromous Fish Passageways Report	Requires Caltrans to report its progress in locating, assessing, and remediating barriers to fish passage	SHC § 156.1 (SB 857, Chapter 589, Statutes of 2005)	Annually	Due: 10/31
California State Rail Plan	Requires Caltrans to prepare a ten-year State rail plan on intercity passenger rail operations, marketing, capital improvements, service expansion, and new routes. Additionally, the plan is to address key freight issues including funding, environmental issues, goods movement, and short line freight rail activities. (must be submitted to the CTC by 10/1 for advice and consent)	GOV § 14036 (AB 74, Chapter 373, Statutes of 1999)	Biennial - even years	Due: 03/01
Capital Outlay Support (COS) Budget Report	Requires Caltrans to report supplemental information to substantiate Caltrans' proposed Capital Outlay Support budget	SHC § 167 (h) (SB 1102, Chapter 272, Statutes of 2012)	Annually	Due: 05/01
Clean Renewable Energy Bonds Program	Requires Caltrans to report specified information on bonds issued for acquisition and installation of solar energy systems	SHC § 157.8 - (AB 268, Budget Cmt., Chapter 756, Statutes of 2008)	Annually	Due: 03/01
Cost Report and Project Delivery Report	Requires Caltrans to submit a project delivery report based on the STIP adopted by the CTC (the "Green Book")	GOV § 14524.16 and 14525.5 (SB 140, Chapter 24, Stats. of 1988) (SB 300, Chapter 105, Stats. of 1989)	Annually	Due: 06/01

DOT: Construction Manager / General Contractor project method.	Requires Caltrans to submit a report, as specified, no later than July 1 of each year during which any project using the Construction Manager/General Contractor method is underway and no later than July 1 of the year any project using the Construction Manager/General Contractor method has been completed	PCC § 6701 (d) (1) -(2) (AB 2498, Chapter 752, Statutes of 2012)	Ongoing as needed	Due: 07/01 as needed
High Occupancy Toll (HOT) Lanes	Requires Los Angeles County Metropolitan Transportation Authority and Caltrans to report on the HOT lanes project on the I-10 and 110	SHC § 149.9 (AB 1224, Chapter 441, Statutes of 2010)	One-time	Due: 12/31/14
Highway Maintenance Plan	Requires Caltrans to prepare a five-year maintenance plan for the State highway system	SHC § 164.6 - (SB 1098, Cmt. B&FR, Chapter 212, Statutes of 2004)	Biennially during odd years	Due: 01/31
Highway Rehabilitation Plan	Requires Caltrans to prepare a 10-year rehabilitation plan (must be submitted first to the CTC by 01/31 for review and comments)	SHC § 164.6 - (SB 1098, Cmt. B&FR, Chapter 212, Statutes of 2004)	Biennially during odd years	Due: 05/01
Interagency Agreement Recommendations for the Pacific Surfliner Rail Corridor	If an agreement has not been reached by 6/30/2015 Caltrans must explain why and provide recommendations on how to achieve an Interagency Agreement.	GOV § 14070.2 (b) (SB 1225, Chapter 802, Statutes of 2012)	One-Time	Due: 06/30/16

Interagency Agreement Recommendations for the San Joaquin Rail Corridor	If an agreement has not been reached by 6/30/2015 Caltrans must explain why and provide recommendations on how to achieve an Interagency Agreement.	GOV § 14070.2 (b) (AB 1779, Chapter 801, Statutes of 2012)	One-time	Due: 06/30/16
Local Exceptions to Caltrans Bikeway Design Guidelines	Requires Caltrans to establish, by June 30, 2013, procedures for cities, counties, and local agencies to be granted exceptions from the requirement to use established criteria and specifications for purposes of research, experimentation, testing, evaluation, or verification	SHC § 891.1 (a) - (b) (AB 819, Chapter 716, statutes of 2012)	One-time	Due: 11/01/14
Non-motorized Transportation Facilities	Requires Caltrans to submit a report summarizing programs it has undertaken for the development of non-motorized transportation facilities	SHC § 887.4 - (SB 1095, Chapter 517, Statutes of 1993)	Annual	Due: 12/31
Project Resourcing and Schedule Management (PRSM)	Beginning July 1, 2005, Caltrans shall provide quarterly to the Chairperson of the Joint Legislative Budget Committee copies of the monthly status and oversight PRSM reports submitted to the Department of Finance.	Budget Act of 2005, Item 2660-492, Reappropriation (SB 77, Chapter 38, Statutes of 2005)	Qtrly	Due: 3/15, 6/15, 9/15, 12/15
Report of Reimbursable Projects Implemented Prior to Allocation	Requires Caltrans to report the number of projects for which an agreement exists to transfer funds to local agencies to accelerate projects	GOV § 14529.19(b) - (AB 872, Chapter 572, Statutes of 1999)	Annual	Due: 07/01

Safety Enhancement - Double Fine Zones	Requires Caltrans to submit Safety Enhancement - Double Fine Zones Study findings	SHC § 97.5 (SB 1419, Chapter 121, Statutes of 2008)	One Time	Due: 01/01/13
Solid Waste: Recycled Asphalt	Requires Caltrans to report on the progress toward development and implementation of the specifications for reclaimed asphalt pavement	PRC § 42704 (a) - (c) (AB 812, Chapter 230, Statutes of 2012)	One Time	Due: 03/01/16
State Bond Proceeds Report (PTMISEA)	Requires Caltrans to report on any bond-funded projects annually	GOV §16724.4 (AB 1368, Chapter 770, Statutes of 2003)	Annual	Due: 01/01
State Transportation Improvement Program (STIP)	Requires Caltrans to report the difference between the original allocation made by the CTC and the actual construction capital and support costs at project close	GOV § 14525.6 (SB 1102, Chapter 272, Statutes of 2012)	Annual	Due: 11/15/14 (First Installment)
Surface Transportation Project Delivery Pilot Program	Requires Caltrans to prepare a comparative analysis of the environmental review process under NEPA for the 30 projects categorically excluded from environmental review	SHC § 820.1 (d) (AB 2650, Chapter 248, Statutes of 2008)	One-time	Due: 01/01/16
The American With Disabilities Act (ADA) compliance program report	Requires Caltrans to report on efforts related to the settlement of lawsuits regarding violations to the ADA	Budget Act of 2010, Section 2 Item 2660-001-0042 (SB 870, Chapter 712, Statutes of 2010)	Annually for 3 years (2011, 2012, 2013)	Due: 10/01/13 (Final Installment)

Unfunded Gasoline Tax Used for Off-Highway Agricultural Purposes	Estimates the amount of the unclaimed portion of refundable motor vehicle fuel taxes used for off-highway agricultural purposes to be transferred from the Motor Vehicle Fuel Account to the California Department of Agriculture (CDFA) Fund	RTC § 8352.5 (AB 522, Chapter 1243, Statutes of 1971)	Biennially during even years	Due: 09/30
Vehicles: Length Limitations: Motorsports	Requires Caltrans to conduct field tests on segments of the National Network and transition routes regarding validity of the existing 56-foot trailer length limitations	VEH § 35401.5 (g)(2)(a-b) (SB 1174, Chapter 292, Statutes of 2012)	One Time	Due: 01/01/14