

Linking Transportation Performance and Accountability

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16. Abstract It is becoming essential in the United States for transportation agencies to demonstrate credibility with elected officials and the public. The Federal Highway Administration, American Association of State Highway and Transportation Officials, and National Cooperative Highway Research Program sponsored a scanning study of how transportation agencies in other countries apply performance management programs. The scan team found that the nations it studied articulate a limited number of national transportation policy goals, negotiate intergovernmental agreements on how state, regional, and local agencies will achieve the goals, and evaluate performance by tracking the measures and reporting them in clear language appropriate to the audience. The team developed an implementation plan that includes outreach efforts to disseminate scan findings and put international best practices into use in the United States and research efforts to translate some aspects of the best practices into useful American context.			
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International Technology Scanning Program

The International Technology Scanning Program, sponsored by the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the National Cooperative Highway Research Program (NCHRP), evaluates innovative foreign technologies and practices that could significantly benefit U.S. highway transportation systems. This approach allows advanced technology to be adapted and put into practice much more efficiently without spending scarce research funds to re-create advances already developed by other countries.

FHWA and AASHTO, with recommendations from NCHRP, jointly determine priority topics for teams of U.S. experts to study. Teams in the specific areas being investigated are formed and sent to countries where significant advances and innovations have been made in technology, management practices, organizational structure, program delivery, and financing. Scan teams usually include representatives from FHWA, State departments of transportation, local governments, transportation trade and research groups, the private sector, and academia.

After a scan is completed, team members evaluate findings and develop comprehensive reports, including recommendations for further research and pilot projects to verify the value of adapting innovations for U.S. use. Scan reports, as well as the results of pilot programs and research, are circulated throughout the country to State and local transportation officials and the private sector. Since 1990, more than 80 international scans have been organized on topics such as pavements, bridge construction and maintenance, contracting, intermodal transport, organizational management, winter road maintenance, safety, intelligent transportation systems, planning, and policy.

The International Technology Scanning Program has resulted in significant improvements and savings in road program technologies and practices throughout the United States. In some cases, scan studies have facilitated joint research and

technology-sharing projects with international counterparts, further conserving resources and advancing the state of the art. Scan studies have also exposed transportation professionals to remarkable advancements and inspired implementation of hundreds of innovations. The result: large savings of research dollars and time, as well as significant improvements in the Nation's transportation system.

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Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials	NCHRP	National Cooperative Highway Research Program
AMPO	Association of Metropolitan Planning Organizations	NPI	National Performance Indicators
APTA	American Public Transit Association	NLTP	National Land Transport Programme
AUD	Australian dollar	NZTA	New Zealand Transport Agency
CEO	chief executive officer	PMDU	Prime Minister's Delivery Unit
CPM	comprehensive performance management	RAMS	Road Asset Management System
COAG	Council of Australian Governments	RLTS	Regional Land Transport Strategy
EU	European Union	RSP	Results and Services Plan
FHWA	Federal Highway Administration	RTA	New South Wales Roads and Traffic Authority
GAO	U.S. Government Accountability Office	SEK	Swedish krona
GASB	Government Accounting Standards Board	SRA	Swedish Road Administration
GBP	British pound	SCATS	Sydney Coordinated Adaptive Traffic System
GPS	Global Positioning System	TIP	Transportation Improvement Program
HA	Highways Agency	U.K.	United Kingdom
LAA	Local Area Agreements	USD	U.S. dollar
LTCCP	Long-Term Council Community Plan	U.S. DOT	U.S. Department of Transportation
MPO	metropolitan planning organization		
NACE	National Association of County Engineers		



Executive Summary

At a time when the United States is working to define a Federal-State-regional-local framework for transportation performance management, the international examples examined in this scan hold many lessons. The performance management systems of the studied agencies demonstrated clear linkage between government expenditures and transportation agency results. Long-term government goals were incorporated into transportation agency actions—and the results of those actions could be clearly documented to show what the public received for its transportation investment.

The officials visited offered the scan team invaluable advice from their past decade—in some cases more—of performance management. The systems they developed applied to diverse settings, from the complex and densely populated Great Britain to the rural and isolated New Zealand islands. Despite the diversity of their applications, the performance management systems had five universal components, or steps. From Sweden to New Zealand, the officials interviewed recommended similar processes:

1. Articulate a limited number of high-level national transportation policy goals that are linked to a clear set of measures and targets.
2. Negotiate intergovernmental agreements on how state, regional, and local agencies will achieve the national goals while translating them into local context and priorities.
3. Evaluate performance by tracking the measures and reporting them in clear language appropriate for the audience.
4. Collaborate with state, regional, and local agencies to achieve the targets by emphasizing incentives, training, and support—instead of penalties—as the preferred way to advance performance.
5. Perpetuate long-term improvement by understanding that the real value of performance management is an improved decisionmaking and investment process, not the achievement of many arbitrary, short-term targets.

Key Scan Findings

The federal-state relationships found abroad were more akin to coach-player relationships than to umpire-player relationships. It was common to find different levels of government jointly setting a target, then collaborating on ways to achieve it. It was not common to find one level of government setting a target, then penalizing another for missing it.

The scan team found that the true value of performance management was in achieving steady long-term progress. Many officials stressed that another important benefit of their performance management systems was the transparency they created. The transparency improved understanding about transportation issues and led to greater degrees of trust. Striving for long-term accomplishment created collaboration among levels of government, not contention.

Broad Policy Goals and Collaboration

Despite the greater linkage of national goals to agency activities found in the visited countries, the central governments set few explicit and quantitative national transportation targets for the transportation agencies. The two exceptions found were in the areas of safety and climate change in the two European countries. The central government articulated broad policy goals, and the transportation agency translated those goals into specific performance measures or targets in collaboration with the federal or state government. This collaborative target-setting practice appeared to exist between both national and state governments and state and regional/local governments.

The scan team seldom found that one level of government mandated the performance of another. Rather, service-level agreements or other negotiated documents between the central government and the transportation agency were used to define performance measures and targets for which the transportation agency was held accountable. The service-level agreements communicated priorities and clarified outcomes

while allowing each state or region to negotiate measures and priorities important to its unique circumstances. These negotiations were supported by extensive data collection that showed trends in systemwide performance. Negotiations between the agencies and their central governments were fluid and continuous. Flexibility was particularly evident with major cities, where unique transportation needs and solutions were recognized.

The combination of national goals cascading into state or regional performance measures appeared to create a strong focus on outcomes instead of process. Not evident abroad were the highly detailed and procedural, fiscally constrained, long-range plans and short-term Transportation Improvement Programs (TIPs) found in the United States. Instead, the negotiated service agreements served to clarify desired outcomes over the next 1- to 5-year period.

Performance-Driven Funding Allocations: A Difficult Goal

The agencies the scan team visited clearly documented system and organizational performance, often in detailed trends over a number of years. The richness of reporting was usually quite sophisticated. The agencies demonstrated improved customer satisfaction, higher reliability in transit and highway travel times, reduced environmental impacts, and greater efficiencies. Their performance management systems naturally dovetailed with asset management systems. The agencies demonstrated a keen knowledge of system conditions and trends and a finely calibrated understanding of system investment needs, often by asset type and region. Clearly, the agencies benefited from managing their performance to maximize resources, optimize assets, and earn credibility from legislators and budgeting agencies.

Despite those benefits to both legislatures and agencies, budget appropriations were for the most part not driven by the resources required to achieve the performance targets. In short, performance management appeared to be less of an influence on budgeting than other factors. Performance management demonstrated how funds were spent and to what end, but the systems did not appear to include a feedback loop that triggered legislative appropriation decisions. The team saw little evidence that legislatures or executive branch financial agencies establish asset investment levels based on data from performance management systems. One British official noted there was no easy linkage between transportation program goals and the budget set by legislators or Treasury officials.

Performance results, however, were considered important in budget discussions. The performance results demonstrated how effectively the agency spent its budget, but the performance targets did not strongly influence the budget level. Discussions indicated that this was because of overall funding constraints in competing public sectors, such as education and health care. It was not because of an ineffective performance management program or agency performance. Most agencies did not have a dedicated road user fund; agencies competed for funding with all other government programs. One agency stated that while its performance management did not garner a budget increase, elected officials viewed it as so effective that it was able to sustain its budget when others were cut.

In three of the six cases, agencies reported discouragement that they could not convince legislators to invest more in system preservation despite their sophisticated documentation. Further discussion noted that identifying large maintenance funding gaps was a longstanding concern. Similar to the United States, the countries had difficulty expressing the impact of changes in pavement and bridge condition at the political level.

Queensland developed a sophisticated means of demonstrating long-term financial risk by calculating the unfunded liabilities caused by underinvestment in maintenance. It uses asset inventories, management systems, and overall asset management approaches to convert asset maintenance needs into a balance-sheet calculation. The process was similar to the Government Accounting Standards Board 34 (GASB 34) process required in the United States. Sweden, the United Kingdom, and New Zealand used variations of this approach to summarize all asset management financial needs in one comprehensive calculation that documented the future infrastructure liability the government faces.

Central government decisions on agency operating budgets tend to remain incremental. System preservation increases were modest and based on increases from past budgets. Budget increases depended on whether the government had any residual revenue left once other priorities were met.

Ambitious Goals and Visions Drive Investment

The host countries provided examples of recent budget increases to expand the transportation system or carry out new economic stimulus programs:

- ▶ Ambitious new national visions and broad goals, as opposed to a need to meet specific performance targets, tended to generate new investments in transportation.
- ▶ When the governments articulated a new transportation vision, adopted new transportation goals, or sought to use transportation investment to achieve other ends (e.g., economic stimulus), the likelihood of new investment increased. The Australian Nation Building Program was planned as a record AUD26.7 billion road and rail construction program over 6 years, with an AUD2.3 billion program in 2009.
- ▶ Sweden has been undertaking significant investments for nationally important corridors and bridges. A cordon pricing system will be used to pay for a new outer belt for Stockholm.
- ▶ In 2009, the New Zealand government announced a major investment in seven of its most important routes, called the Roads of National Significance. These routes are critical to ensure users have access to significant markets, areas of employment, and economic growth. The system is similar to the U.S. National Highway System.
- ▶ Great Britain has been using tolling and long-term design-build-finance-and-operate contracts for a USD10.2 billion upgrade and long-term maintenance of the M25 highway.

Demonstrating Return on Investment: Value for Money

“Value for money” was a common theme observed during the scan. The agencies frequently used benefit-cost analysis to evaluate projects and programs and demonstrate the effectiveness of their investments.

- ▶ In several of the agencies visited, every project received a benefit-cost analysis. The benefit-cost ratio was a common measure for discussing project selection in the agency and with the public, other ministries, and legislatures.
- ▶ The use of benefit-cost analysis and a value-for-money approach appeared to give the agencies a common language to demonstrate the value of their projects and programs.
- ▶ Many major projects were selected based on political and broader policy priorities, not just benefit-cost ratios.
- ▶ One agency official cautioned that the use of a benefit-cost analysis may erroneously exclude an investment that may yield a greater unexpected benefit in the future.
- ▶ Some agencies indicated that they evaluate impacts of some major projects after they are completed (e.g., before-and-after analysis) to assess whether benefits included in

the original benefit-cost analysis were actually realized. This type of post-construction evaluation is not done routinely in the United States.

- ▶ Another way to demonstrate value for money was by using risk management. Several agencies appeared to make tradeoffs based on formal risk management. Risk was used to differentiate between types of bridge investments, set appropriate speed limits, and support safety improvements.

Accountability is Transparent

The agencies visited clearly embraced performance management as the system for delivering results and documenting accountability.

- ▶ The agencies produced detailed, ongoing measures illustrating their achievement of agency goals and management of public resources.
- ▶ It was common for the agencies to regularly review performance with agency managers and to produce monthly, quarterly, and annual performance summaries.
- ▶ Continual two-way dialogue occurred at the ministerial and executive levels, as well as with the parliamentary committees in most of the agencies visited.
- ▶ Polished, high-level annual reports detailing goals, outcomes, and expenditures were common, and at least one was also used also for recruiting purposes.
- ▶ Dashboards and extensive reporting, mostly internal and between governments, clearly expressed what the agencies achieved, at what cost, and for whom.
- ▶ Regular reporting was viewed as a key mechanism for achieving accountability.
- ▶ In general, performance measures were used to support budget requests and demonstrate the agencies’ use of resources.

Limited Number of High-Level Measures

The scan team found that in general, national governments have steadily reduced the number of measures and targets required of transportation agencies and moved toward fewer, broader, more policy-oriented goals.

- ▶ The most dramatic example was in Great Britain. Since 1998, the number of central government-imposed measures across all government departments has shrunk from 600 to 30. These 30 Public Service Agreements reflect the high-level outcomes the government is committed to secure.
- ▶ Likewise in 1998, local governments in England were required to report more than 2,000 performance measures

covering all aspects of local governance, including transportation. That large number was rescinded in the face of broad criticism and replaced with 198 measures, with a greater focus on higher level outcomes to achieve. Of those 198 measures, local governments must set up to 35 targets, which they negotiate with the central government based on local priorities. In addition, 18 mandatory targets must be reached for education and children. The remaining measures are reported as long-term indicators for trend line analysis.

- ▶ The agreed-on local performance targets are articulated through Local Area Agreements. The targets sometimes differ in form from those applied to the Highways Agency, but in principle the local government contribution, together with delivery by central government agencies, is designed to secure delivery of the 30 overall Public Service Agreements.

“Do It With People, Not To Them”

“Do it with people, not to them” was both a direct quote and a common sentiment heard from transportation officials during the scan. From Sweden to New Zealand, transportation officials advised that carrots versus sticks, incentives versus penalties, and dialogue versus dictates were preferred in the intergovernmental management of performance.

- ▶ In most of the agencies examined, officials at one level of government required performance reporting of lower levels of government.
- ▶ Universally, state and national officials said they did not impose penalties on local or state agencies that failed to meet performance targets. In fact, few actual targets had to be achieved.
- ▶ Goals and measures were used to track performance and identify areas for improvement. When improvement was needed, it was achieved through training, benchmarking, peer exchanges, and local agency staff development.

Typical was the Swedish example, in which the central government expressed several broad goals for the transportation department. From those, the Swedish Road Administration negotiated a comprehensive set of about 300 performance measures it developed for both internal and external reporting. Hard targets for those measures were negotiated between the agency and the ministry. For instance, its target to reduce traffic fatalities by another 20 in 2009 was a short-term milestone toward a national vision of zero fatalities. It also targeted a department reduction in greenhouse gas emissions of 70,000 tons in 2009 as a short-term

milestone toward reducing national carbon emissions. Both targets were negotiated with the central government. If the agency fails to achieve the targets, the performance is noted and a determination is made on what different tactics are needed to achieve the goal.

In short, the measures are benchmarks for continuous improvement and dialogue, rather than milestones for penalties.

Outcomes Relate to the Public in Personal Terms

The transportation agencies tended to speak to the public in broad, outcome-based terms, such as “the journey home” or “support for the journey,” instead of technical terms.

- ▶ Transportation was translated into the topics important to people, instead of technical engineering, financial, or operational terms.
- ▶ The agencies produced voluminous technical support data, but they were often summarized in general categories important to stakeholders.
- ▶ Concern about moving people rather than vehicles was a significant manifestation of this focus on person-centric outcomes. The agencies appeared to focus on reducing personal travel time and vehicle delay and offering more choice in transportation modes.
- ▶ The personal focus appeared to increase the emphasis on bicycling, walking, and other forms of active travel.
- ▶ The Swedish Road Administration spoke of its mission as evolving from being highway builders to community builders.

In many cases, the data are packaged for a lay reader. Rather than extensive technical and financial data, public reporting focused more on outcomes of more immediate relevance and clarity to the typical user.

Performance Management Takes Time and Resources

Many officials noted that successful performance management systems are long-term, iterative processes that require a commitment of funding and staff resources. All of the agencies had dedicated staff to collect and report performance data. All reported that measures evolve and often take significant effort to develop. The British spent 4 years refining their reliability measure and already are exploring a next generation of measure that is more understandable to the public.

Outcomes Are Difficult to Measure

Important outcomes that are difficult to measure in the United States were equally elusive in the agencies studied. Such measures as transportation's effect on the economy, travel time reliability, and transportation's effect on the environment were not easily captured by the visited agencies. All of the agencies expressed a desire for continued evaluation of ways to measure transportation's effects in these areas, particularly the economy.

Short-Term Results Can Be Overemphasized

All of the agencies officials support performance management, but they also spoke of a tendency of elected officials to emphasize short-term accomplishments in lieu of long-term goals. Several agency officials cautioned that while frequent budget reporting of results achieved short-term transparency, they feared that emphasis on "bean counting" skewed performance toward easily measured, short-term accomplishments. They advised that a better system was one that tracked accomplishment of long-term goals, which may be more ambiguous to measure but more important overall. Important issues such as the public's satisfaction with the journey, transportation's support of economic development, and transportation's link to environmental sustainability may be vitally important but difficult to measure in monthly increments.

Candid, Confidential Reporting Has Its Place

Several agencies cited examples in which their performance reporting was used to criticize the agency, either in the media or in political debates. Several acknowledged that such criticism creates a desire to set easily achievable targets, hide or downplay problems, or play "metric games," which undermine the transparency and accountability of performance management.

While they had public reporting processes, all of the agencies had some form of candid, confidential reporting of results to central ministries. Great Britain used the Prime Minister's Delivery Unit (PMDU) delivery assessment, an uncompromising, truthful assessment conducted every 6 months as a confidential tool. It was conducted as an evidenced self-assessment and action-setting exercise by government departments that was challenged and moderated by the PMDU. It drove the agency's actions for the next 6 months. These confidential reporting processes allowed for candid discussions with central governments about agency

performance, steps that may be needed to improve performance, and best practices.

Reorganization and Refocus: From Building Highways to Moving People

The six agencies visited were in a state of transition—in terms of both their organization and their basic mission.

Three were in the process of reorganizing to merge the highway with state or regional transit agencies. The merger was driven by a national government desire to move away from a traditional highway-centric focus to a broader, more inclusive approach to surface transportation planning in highly congested urban areas.

"We are moving people, we are serving business, and we are moving freight. We are no longer in the business of just moving cars," said a New South Wales official. "We are no longer in the business of counting cars. It is about allocating road space."

"We are a travel agency. That is what we are involved with. It is not just the road," said a Swedish Road Administration official. "We are community builders."

"(We) had to do a cultural realignment to recognize that we are part of the solution for public transport," said a New South Wales highway official.

"The most important message was that we are the road authority, but we manage the transport network as one network that includes roads, buses, and trains. More and more, we are doing integration," said a VicRoads official in Melbourne. "From a road authority perspective, we can't build enough roads. If we did, it would not be a city anyone wants to live in. We need to manage the demand in travel."

The cause and effect of the agencies' performance management systems and their shift to holistic transportation agencies were not entirely clear. It appeared that the agencies' forecast of continuing degradation in travel time reliability pushed them beyond strategies of only expanding highways. The examined agencies placed a great emphasis on transit service, rail passenger service, land use integration, and moving people and freight as well as vehicles.

Highway Corridors Remain Important

While the agencies displayed a strong commitment to transit, passenger rail, and urban land use integration, they also had ambitious highway corridor programs. All of the agencies

retained a strong commitment to rural connectivity that relied heavily on highways. The Swedish and New Zealand governments emphasized their environmental commitments, but they also had programs to improve national highway corridors. The Australian states all maintained rural connectivity as a basic goal of their transportation programs. Although the urban systems emphasized ambitious transit and rail programs, the agencies also retained a strong highway component, particularly as it relates to national corridors and rural access.

Sustainability With Mobility

The agencies visited displayed a strong commitment to addressing climate change and sustainability. However, none had adopted, nor had imposed on them, requirements to reduce vehicle-miles of travel.

- ▶ Their transportation-related climate change strategies relied on other tactics, such as improving vehicular fuel efficiency, reducing the use of electricity in lighting and buildings, and encouraging nonautomobile passenger travel.
- ▶ The agencies were developing refined methods for calculating their greenhouse gas emissions.
- ▶ All of the agencies acknowledged that they lack the strategies to achieve the ambitious long-term carbon-reduction goals their nations have established.
- ▶ As governments adopted goals related to new environmental issues, agencies were exploring how to reflect these emerging priorities in their programs and in the measures and targets in their performance management systems.
- ▶ Transportation agencies appeared to work more frequently with other cabinet agencies on cross-cutting issues, such as economic development, public health, and climate change. In part, this appeared to be the result of multiple agencies sharing responsibility for cross-cutting policy goals, such as climate change or economic development.

Safety Focus is Emphatic

The agencies were particularly emphatic about documenting safety results.

- ▶ The agencies achieved significant safety reductions by applying performance management tactics to reduce the number of crashes.
- ▶ In addition to targeting black spot, or high-crash, locations, they applied programmatic treatments, such as extensive cable barriers and skid-resistant pavements.
- ▶ They also relied heavily on increased police surveillance, using automated speed enforcement and random alcohol breath tests to reduce speed and crashes.

- ▶ The New Zealand Transport Agency conducted a periodic baseline review of the benefits of enforcement services that could lead to increased investment. An additional 337,000 road-policing hours were added when the benefit-cost analysis showed an 8:1 return (with no diminishing returns). Benefit-cost analysis of targeted onroad enforcement, speed cameras, and safety advertising has shown benefits of up to 28:1.
- ▶ The New South Wales Roads and Traffic Authority and the New Zealand Transport Agency broke their high-crash, or black spot, areas, into great detail. In the process, they learned that roadway departure crashes were most common on curves where the radius was sufficiently tight to cause handling maneuvering difficulty, but not tight enough to cause drivers to slow down appreciably. By honing in on curves with these specific problem radii, they targeted limited safety funds and effectively reduced roadway departure crashes in New South Wales and New Zealand.

Measures Drive Operations Innovation

Several agencies displayed a progressive attitude toward highway operations, spurred by their efforts to meet reliability goals. The British, in particular, had invested considerable effort in measuring reliability on high-volume national routes. All of the agencies reported that their reliability measures were still evolving and they were not entirely satisfied with their measurement tools. However, it was clear that the more urbanized agencies in the United Kingdom, Australia, and Sweden were investing considerable effort in measuring real-time highway, transit, and rail operations to improve travel time reliability, enhance transportation choices, and reduce greenhouse gas emissions.

- ▶ In Great Britain, Department for Transport officials said they changed their entire approach to relieving congestion on major national routes when tight revenues and increasing public resistance to land takings for roads prevented the widening of highways. However, the nation's performance goals required improvement in travel reliability. The department had been downsizing for three decades, but reversed that policy by hiring 1,500 additional traffic officers as a strategy to prevent crashes and clear them quickly to improve highway operations. The department fundamentally shifted to operations-based strategies that significantly increased the number of traffic cameras, speed-monitored automated enforcement, incident response efforts, and use of hard-shoulder running. Regions were allocated funds specifically for intelligent transportation systems deployment and operation, in addition to preservation and maintenance funds. After years of

steady decreases, they documented small increases in travel time reliability, although this is partly a result of a drop in traffic growth caused by the economic recession.

- ▶ In Melbourne, Australia, the Victorian Department of Transport fundamentally altered its approach to integrating land use and transportation when its forecasts showed it could not meet its long-term reliability goals in the face of rising population growth. It identified five regional central business districts in which land use development will be encouraged to capitalize on excess transportation capacity.
- ▶ In Sydney, Melbourne, and Brisbane, the states integrated management of local traffic signals and provided signal priority for bus fleets, which have Global Positioning System and geographic information system real-time monitoring. In addition, transport officials targeted efforts to increase low-cost walking and cycling in highly congested urban corridors.

A consistent finding throughout the study was that although hard-and-fast performance targets were waning, the steady, long-term practice of benchmarking to broad government goals tended to spur innovative solutions to major transportation challenges, such as improving operations and travel time reliability.

Key Lessons Learned

The scan provided considerable insight into the evolution of performance management among nations that have practiced it for at least a decade. Their systems have matured and evolved in ways that provide lessons for the United States. The scan also validated the use of performance management as an effective means to translate broad government goals into meaningful agency practice. The performance management systems observed abroad provided transparency and accountability to transportation programs, while also allowing flexibility to meet local needs.

The officials offered the scan team advice in several key areas of performance management. The following outlines their advice and the scan team's conclusions:

1. Articulate a limited number of high-level national transportation policy goals that are linked to a clear set of measures and targets.
2. Negotiate intergovernmental agreements on how state, regional, and local agencies will achieve the national goals while translating them into state, regional, or local context and priorities.
3. Evaluate performance by tracking the measures and

reporting them in clear language appropriate for the audience.

4. Collaborate with state, regional, and local agencies to achieve the targets by emphasizing incentives, training, and support—instead of penalties—as the preferred way to advance performance.
5. Perpetuate long-term improvement by understanding that the real value of performance management is an improved decisionmaking and investment process, not the achievement of many arbitrary, short-term targets.
6. Improve the use of benefit-cost analysis and risk management practices to demonstrate value for money. Consider major project postconstruction evaluations to assess whether benefits included in the original benefit-cost assessments were realized.
7. Recognize that major national visions, not achievement of narrow targets, tend to generate new investment.
8. Convert long-term deferred maintenance needs into a long-term future liability calculation. This would clearly link the budget to long-term system sustainability.
9. Demonstrate accountability by producing annual performance reports on agency achievements.
10. Instead of using technical jargon, report results with language meaningful to the public, such as “the journey home” or “support for the journey.” Detailed technical terms should be used for internal reporting, but should be translated into understandable language for the public.
11. Collaborate frequently with other cabinet agencies, including conducting periodic meetings with top leadership on cross-cutting issues such as economic development, public health, highway safety, and climate change.
12. Have a strong safety focus and document the results of safety measures, in addition to the usual measures of infrastructure condition, internal operations, transit, and rail ontime performance.
13. Focus on desired outcomes for travel time reliability that lead to expanded strategies for highway operations.
14. Learn from international examples of addressing climate change that rely on improving vehicles, fuels, and modal choice, but do not mandate reductions in travel or mobility.
15. Provide resources to enable high-quality data tracking, analysis, and reporting capabilities that allow for the use of performance data in decisionmaking.
16. Recognize that performance management is not a black box or simplistic solution. It is a culture to grow in the agency as an important consideration in the decision-making and investment process.

Introduction

For 2 weeks in July and August 2009, a scan team from the United States visited international transportation agencies with mature performance management systems to study how these organizations demonstrate accountability to elected officials and the public. In addition, the team examined how these transportation agencies use goal setting and performance measures to manage, explain, deliver, and adjust their transportation budgets and internal activities. The following were the specific elements the scan sought to examine:

- ▶ Examples in which national, state, or provincial strategic goals are translated into meaningful performance measures for the transportation agency
- ▶ Ways to establish effective and achievable performance levels based on input from the public, elected officials, and the business community
- ▶ Examples of tying performance and transparency to national, state, regional, and metropolitan plans and budgets
- ▶ Ways transportation agencies can demonstrate good governance and accountability in meeting or exceeding performance expectations
- ▶ Advice on what works and what does not when performance measures are applied to federal or multiregion transportation programs

The scan team visited the following agencies:

- ▶ Swedish Road Administration (SRA) in Stockholm, Sweden
- ▶ United Kingdom (U.K.) Department for Transport and Highways Agency (HA) in London, England
- ▶ New South Wales Roads and Traffic Authority (RTA) and Austroads in Sydney, Australia
- ▶ Victoria Department of Transport and VicRoads in Melbourne, Australia
- ▶ Queensland Department of Transport and Main Roads in Brisbane, Australia
- ▶ New Zealand Transport Agency (NZTA) in Wellington, New Zealand

Scan Team

The scan team was cochaired by Carlos Braceras, deputy director of the Utah Department of Transportation (DOT), and Robert Tally, Indiana Division administrator for the Federal Highway Administration (FHWA). They were accompanied by a diverse and multidisciplinary scan team:

- ▶ **Daniela Bremmer**, director of strategic assessment, Washington State DOT
- ▶ **Leon E. Hank**, chief administrative officer, Michigan DOT
- ▶ **Jane Hayse**, chief, Transportation Planning Division, Atlanta Regional Commission
- ▶ **Dr. Anthony (Tony) R. Kane**, director of engineering and technical services, American Association of State Highway and Transportation Officials (AASHTO)
- ▶ **Dr. Kristine L. Leiphart**, deputy associate administrator for budget and policy, Federal Transit Administration
- ▶ **James (Jim) March**, team leader, Office of Policy and Governmental Affairs, FHWA
- ▶ **Steven M. Pickrell**, senior vice president, Cambridge Systematics, Inc.
- ▶ **Dr. J. Woody Stanley**, team leader, Strategic Initiatives Team, Office of Policy and Governmental Affairs, FHWA
- ▶ **Jenne van der Velde**, strategic advisor, Dutch Ministry of Transport, Public Works, and Water Management (Rijks-waterstaat)
- ▶ **Connie P. Yew**, team leader, Stewardship/Oversight Team, Office of Infrastructure, FHWA
- ▶ **Gordon Proctor**, Gordon Proctor & Associates, Inc., report facilitator

The scanning study was conducted against a backdrop of three major U.S. transportation needs:

- ▶ Reauthorizing Federal legislation for transportation programs
- ▶ Stabilizing the financially drained Highway Trust Fund that supports highway and transit programs

- ▶ Ensuring greater accountability from State, regional, and local recipients of Federal transportation aid

Those issues made the scan particularly timely and important.

Agencies Visited

The countries and transportation agencies were chosen because they have mature performance management systems that they use to manage large, complex, industrialized transportation networks. All were parliamentary democracies, which may influence the degree to which their governments can rapidly change policy for the central transportation agencies. Otherwise, the agencies visited had many similarities to U.S. transportation agencies. One strong similarity was that many of the agencies not only needed to carry out direct goals set by the central government, but they also needed to cascade those goals to many local agencies. As in the United States, many transportation services were provided by local government or private contractors.

The scan team visited the following agencies:

Swedish Road Administration—SRA is the highway agency for the Swedish national government. Sweden has the world's 15th-largest highway network. Of that, SRA is responsible for 98,400 kilometers (km) (61,000 miles (mi)) of state roads. Municipalities manage 41,000 km (25,500 mi) of local routes and streets. Private persons and companies manage about 290,000 km (180,000 mi) of private roads, mainly logging routes, of which 76,100 km (47,000 mi) get state grants and are open to general traffic. The highway network spans a nation the size of California, but Sweden has only 9 million people compared to California's 36 million. Sweden stretches from the Baltic Sea to the south to well above the Arctic Circle to the north. In addition to managing highways, SRA interacts frequently with bus and rail passenger services offered in major cities such as Stockholm.

British Department for Transport and Highways Agency—The main British transportation agency is the Department for Transport, which oversees HA and monitors the private contractors that operate the nation's rail passenger system. The agency improves, operates, and maintains strategic roads for 51 million people in England, who live in a 50,000-square-mi (129,499-square-km) country about the size of Alabama. The Department for Transport manages policy and funding for a transportation system that includes 80,000 buses, 17 train operators, and

about 4,500 mi (7,242 km) of the nation's 245,000 mi (394,289 km) of roads.

New South Wales Roads and Traffic Authority—The Australian state of New South Wales has a sprawling landscape 15 percent larger geographically than Texas. Its major city is Sydney, with its iconic bridge and opera house and a rapidly growing population. The Australian state has a population of 7 million, of which 4.4 million live in Sydney. RTA manages 17,932 km (11,142 mi) of roads and provides financial assistance to local councils to manage 18,257 km (11,344 mi) of regional roads. The agency also manages another 2,946 km (1,818 mi) of regional and local roads in unincorporated areas of New South Wales with no local councils.

Victoria Department of Transport and VicRoads—Victoria is Australia's smallest state geographically, but it is the most densely populated with 5.2 million people. Despite its size in relation to other Australian states, it is nearly as large as Montana and includes the city of Melbourne with 3.4 million people. VicRoads manages 22,250 km (13,734 mi) of public roads, or about 14 percent of the state's total, but those routes carry 82 percent of the state's highway travel. The Department of Transport is a policy and funding agency that not only manages VicRoads, but also sets policy, planning, and funding direction for the privately provided transit and rail services.

Queensland Department of Transport and Main Roads—This newly consolidated agency combined the former Queensland Transport and Department of Main Roads. Both the former agencies and the combined new one display a well-articulated strategic management framework. Queensland is Australia's fastest growing state, with a population of 4.2 million spread across a huge landmass twice the size of Texas. Queensland is a diverse state that includes the upscale Miami Beach-like Gold Coast, the Great Barrier Reef, and thousands of square miles of sparsely populated interior. The agency has 34,000 km (21,000 mi) of highways under its control out of 188,000 km (116,000 mi) in the state. It also coordinates, sets policy for, and funds several transit agencies.

New Zealand Ministry of Transport and New Zealand Transport Agency—New Zealand is a nation of only 4.2 million spread over two major islands that combined are the size of Great Britain. With its diverse terrain and relatively small population, New Zealand faces significant transportation challenges, both in sustaining its internal transportation network and shipping exports to international markets. NZTA, the main transportation agency, was created in

August 2008 by merging Transit New Zealand (the highway agency) and Land Transport New Zealand (the funding and planning agency). Despite its small size, the country has been cited frequently in international studies of best practices in asset management and safety. It has 93,576 km (57,762 mi) of roads, of which NZTA manages 10,895 km (6,725 mil).

Definitions

For the purpose of the scan, the following definitions were used:

Performance measurement—The U.S. Government Accountability Office (GAO) definition of performance measurement is “the ongoing monitoring and reporting of program accomplishments, particularly progress toward preestablished goals.” The GAO defines a program as “any activity, project, function, or policy that has an identifiable purpose or set of objectives.” FHWA defines a performance measure as “a qualitative or quantitative measure of outcomes, outputs, efficiency, or cost-effectiveness. In general, measures should be related to an organization’s mission and programs, and should not merely measure one-time or short-term activities.”

Performance management—AASHTO defines performance management as an ongoing process that translates strategic goals into relevant and detailed measures and targets that, along with resources, are continuously monitored to ensure achievement of published institutional goals. Comprehensive performance management (CPM) uses that definition in all key functions of a transport agency, including policy development and long-range planning; programming and budgeting; program, project, and service delivery; system operation; and monitoring and reporting of results in a variety of forms to a variety of audiences.

Linking Transportation Programs With Government Goals

A key report for the New South Wales RTA is called *Blueprint: 2008–2012 RTA Corporate Plan*. It links the Australian state’s aspirations with the day-to-day activities of its transportation agency.

Such reporting, which clearly demonstrates how transportation fits into larger societal goals, was evident in the scan of selected transportation agencies conducted in summer 2009. The scan on linking transportation performance and accountability provided substantial insight into how transportation agencies can incorporate broad national or state goals into their transportation performance management systems. This linkage of national and state goals to agency performance allows the agencies to illustrate how transportation serves larger societal goals and document accountability, performance, and need. The examples appear to hold clear lessons as the United States considers a national performance management system for its transportation programs. In this chapter, the underlying philosophy and strategy of the agencies’ performance management systems are discussed.

Transportation Performance is Linked to Government Goals

A direct linkage between what society expects from its transportation agencies and what they achieve was strongly evident in the case study agencies for four reasons.

First, the national or state government articulated clear goals for the transportation system. Policy goals or expectations, such as economic development, safety, environmental sustainability, or best value for the money, were set as broad national or state transportation goals.

Second, the agencies negotiated service agreements that translated these broad goals into clearly articulated performance measures and targets. Third, the agencies’ performance management systems reported their accomplishments in

achieving the measures and targets. Fourth, the agencies continually refined their processes during more than a decade of performance management. Their officials cautioned that years of effort are needed to fully develop the performance management process.

The performance management systems set clear performance expectations and created transparency, not only on how the agencies perform but also on how their efforts contribute to broad national policy goals. In the agencies visited, it was apparent that transportation was considered a means to important societal ends. It also was apparent how effectively the agencies achieved those ends.

Despite the strong linkage between central government strategy and transportation agency execution, the scanning study did not find requirements that transportation agencies or regional planning organizations have long-term plans with specific projects lists, or fiscal constraint and air quality conformity requirements. The long-term plans the team saw tended to focus on policies, strategies, corridors, and general approaches to providing transportation, not on detailed long-term project plans. Plans that included specific, fiscally constrained lists of projects tended to be of shorter terms, such as 5 years. The team did not find analogies to the U.S. model, which requires fiscally constrained, 30-year, project-specific plans.

New South Wales Performance Strategy

The Australian state of New South Wales has more than 7 million people in a sprawling landscape 15 percent larger geographically than Texas. Its major city is Sydney, with its iconic bridge and opera house and a rapidly growing population.

At the time of the scanning study, the New South Wales State Plan included 34 priorities developed after an extensive public involvement process that began in 2006. The State Plan had several priorities that directly linked to the Business Plan and subsequent performance management system for the state

highway agency, the New South Wales RTA. The strategic priorities for RTA were enumerated clearly in the State Plan and were included among other critical social objectives. The plan includes a goal-priority-target framework with the elements in table 1.

Building on the State Plan, RTA developed its own strategic document and framework, *Blueprint: 2008–2012 RTA Corporate Plan*. It noted, “The NSW State Plan is the key focus for the RTA’s activities. . . . The State Plan provides the vision for NSW for the next ten years.” It notes that of the 34 priorities in the State Plan, RTA is the lead agency on the safer roads priority and is a partner agency for five others. “The Blueprint directs our organization in achieving these priorities,” it stated.

Further specifying the agency’s focus is the annual Results and Services Plan (RSP), a contract-like document negotiated between RTA and the central government ministry. The RSP is a confidential document that provides specifics on how the agency will spend its resources and direct its activities during the year to achieve the larger objectives

set out in the State Plan and Blueprint. The RSP is a candid assessment that the central government can use to monitor agency progress. For public accountability, RTA produces its (annual report) corporate plan and budget papers, which lay out its short-term expenditures and expected accomplishments. The result of these documents is a comprehensive performance management approach to managing the agency. The framework started with the State Plan and cascaded throughout the organization down to the level of individual employees. New South Wales officials noted that within 6 months of being hired, an employee needs a personal performance plan that documents how he or she links to the agency’s strategic priorities.

RTA officials noted that the evolution of the performance management framework created a direct link between what the public stated as its priorities and the activities carried out by the agency. They noted that in the original drafts of the state plan, transportation was not a prominent issue. However, during the extensive public involvement process, issues of congestion and infrastructure rose to prominence.

Table 1. New South Wales strategic framework.

New South Wales Strategic Framework			
State Focus		Transportation Agency Focus	
Activity Area	Goal	Priorities	Targets
Delivering better service	An effective transport system	Increasing share of peak-hour journeys on a safe and reliable public transport system	Increase public transport share of trips made to and from Sydney’s central business district to 75%. Increase the journeys to work in the Sydney metropolitan region by public transport to 25% by 2016.
		Safer roads	Road fatalities continue to fall relative to distance traveled.
Growing prosperity across New South Wales	New South Wales: open for business	Maintain and invest in infrastructure	Maintain average growth of 4.6% in capital expenditure.
Environment for living	Practical environmental solutions	Cleaner air and progress on greenhouse gas emissions	Meet national air quality goals in New South Wales.
			Cut greenhouse gas emissions by 60% by 2050.
	Improved urban environments	Jobs closer to home	Increase the number of people who live within 30 minutes of a city or major center of public transport in metropolitan Sydney.
		Improve the efficiency of the road network	Maintain current travel speeds on Sydney’s major road corridors despite increase in travel volumes.

“Congestion and maintenance were not on the government radar because they didn’t think they were on the public radar. It came up from the bottom and became state priorities (during the public involvement process). People were concerned about congestion and wanted roads maintained. They did not want a lot of new highways, but they did want congestion and maintenance addressed,” said an RTA official. As a result, the priorities in the RTA Blueprint and Results and Services Plan can be directly traced to the priorities expressed by the state’s taxpayers.

Swedish Performance Strategy

The central government of Sweden and its main transportation agency, SRA, also demonstrate clear linkages between the nation’s overarching goals and how those goals are incorporated into the agency’s transportation performance management system. SRA manages the road network for the nation of 9 million people spread across a landmass the size of California.

SRA demonstrates a robust performance management system that cascades national transportation performance goals throughout the agency and down to local governments. SRA receives few mandates or prescriptive performance requirements from its ministry, yet it still manages to translate the general guidance into detailed performance measures that direct the agency to achieve broad national goals. SRA expressed six broad goals to enable the transportation department to achieve the overall national objectives for transportation:

- ▶ An accessible transportation system
- ▶ High transportation quality
- ▶ Safe traffic
- ▶ Good environment
- ▶ Gender equality
- ▶ Efficient operations

From those, SRA negotiated a comprehensive set of 18 objectives supported by more than 300 individual performance measures it developed for both internal and external reporting. Hard targets for those measures were negotiated between the agency and the ministry. For instance, its target was to reduce traffic fatalities by another 20 in 2009 as a short-term milestone toward a national vision of zero fatalities. It also targeted a department reduction in greenhouse gas emissions of 70,000 tons in 2009 as a short-term milestone toward reducing national carbon emissions. Both targets were negotiated with the central government. If SRA fails to

achieve them, the performance is noted and a determination is made on what tactics are needed to achieve the goal in following years.

Even without prescriptive mandates, SRA has set clear goals on which it has achieved considerable progress in core business areas, including the following:

- ▶ Fatalities in the past 10 years have trended downward with fewer than 400 deaths on the state highway system in 2009, a per capita number well below U.S. and European averages.
- ▶ The number of short trips taken by foot, bicycle, or bus have increased 14 percent since 1999.
- ▶ The miles of road treated with center median guardrail or center rumble strips quadrupled in 10 years.
- ▶ Pavement conditions have steadily increased on formerly unimproved rural roads, while paved state routes have sustained a high condition of smoothness.
- ▶ Transit and rail passenger service has expanded significantly.

Victoria Strategic Approach

The Australian state of Victoria has a long-established performance management framework (figure 1) that has articulated goals for its transportation agencies.



Figure 1. The Victorian planning and accountability cycle.

The performance management framework has evolved through several iterations of state plans in the southeastern Australian state of 5.2 million people. The state's highway agency, known as VicRoads, and its transit agency, known as the Department of Transport, have long been recognized for their highly developed performance management systems.

The state's central government articulated a recent Victorian Transport Plan, which was developed by two state ministries, the Ministry for Public Transport and the Ministry for Roads and Ports. It significantly expanded the performance objectives for transportation beyond traditional highway condition performance measures. It specified six action priorities for the transportation agencies, including the following:

- ▶ Shaping Victoria, or linking jobs, services, and homes
- ▶ Linking rural, regional, and metropolitan Victoria so all parts of the state share in prosperity
- ▶ Creating a metro system, or increasing the frequency, reliability, and safety of trains and trams
- ▶ Moving around Melbourne, or closing transportation gaps and improving safety on the crowded Melbourne road and transit network
- ▶ Taking practical steps for a sustainable future, or moving toward a sustainable and lower emission transportation network
- ▶ Strengthening Victoria's economy by linking jobs, economic growth, and prosperity through transportation

The strategic priorities of reshaping the transportation network in the face of overwhelming population growth created a profound impact on the agency's strategic goals. Its officials expressed an overriding focus on integrating land use and transportation, improving personal mobility, deemphasizing vehicle movement in lieu of moving people, and reducing transport's greenhouse gas emissions. As a result, the goals and performance metrics of the transportation agencies have evolved to include these priorities as well as traditional measures of highway condition and performance and organizational efficiency.

Victoria's transportation performance management system could be described as an advanced "posthighway era" or "sustainability era" transportation performance management system. Although its performance report retains its state-of-the-art reporting on highway conditions, it has advanced into additional areas of measuring sustainability and land use integration. In fact, the Department of Transport's secretary said he has concluded that land use planning and transportation planning are virtually the same. If his agency

is to achieve the state's economic development and sustainability goals, it will need to measure its success by how well it links land use and transportation. The agency's performance management system is evolving to ensure the agency's transportation outcomes link to these evolving societal objectives.

New Zealand Transport Agency Strategic Approach

The lightly populated but geographically diverse island nation of New Zealand is known in transportation circles for its advanced asset management and performance management processes. Those processes remain in place, but are undergoing a shift in priorities as a new government implements a new direction in national transport policy. The new government is strongly promoting improvements to national highway corridors as a component of a national economic development strategy. As a result, the transportation agency's performance management system is shifting rapidly to respond to and incorporate the new government objectives. The New Zealand experience in 2009 provided an example of how a longstanding performance management system shifts priorities to respond to changing social objectives.

New Zealand is a nation of only 4.2 million spread over two major islands that combined are the size of Great Britain. With its diverse terrain and relatively small population, the nation faces significant transportation challenges, both in sustaining its internal transportation network and shipping exports to international markets. NZTA was created in 2008 by merging Transit New Zealand, the highway agency, and Land Transport New Zealand, the funding and planning agency. Despite the country's small size, it has been cited frequently in international studies of best practices in asset management and safety.

NZTA is a crown entity administered by a board of up to eight apolitical professionals appointed by the minister of transport guided by State Services Commission guidelines. NZTA is headed by a chief executive, who reports to the board and has a team of 11 senior managers. This creates a dynamic in which the political priorities of the majority party set policy direction for the transportation agency, which is run on a day-to-day basis by longtime professional staff. One senior ministry official described the arrangement in sports terms. "The government gets to make the rules. But we have our players on the field and we can influence them so they know the game plan and are well coached. We in ministry have to help the government be a good coach."

activities they will develop. The NLTP also describes the significant issues facing land transport and includes a 10-year forecast of anticipated revenues and expenditures. From the funding provided by NZTA and the money raised by local authorities through rates, the regions develop transport programs, which include projects and maintenance activities sponsored by the local governments. Local authorities develop 10-year plans called Long-Term Council Community Plans, which must be updated every 3 years. These set the levels of service for funding. Projects for financial assistance must be assessed as part of the Regional Land Transport Programme, which is guided by the Regional Land Transport Strategy (RLTS.) The RLTS is often guided by regional growth management, economic development, and spatial strategies. Substantial input on local programs and local asset management practices come in the form of legally required asset management practices, which NZTA evaluates.

NZTA and its predecessor agencies conclude their performance management cycle with annual reports. The new merged agency, NZTA, produced its first annual report for the financial year 2008, ending June 30, 2009. The report had extensive metrics to document agency performance in achieving the Statement of Intent and illustrate how that performance linked to larger governmental goals.

British Transportation Performance Management Strategy

For the past decade, the British have evolved a performance management system in which the central government's approach shifted from setting many precise performance targets for its transportation agencies to setting broader, more general goals. National, regional, and local transportation agencies develop their own metrics and business plans to carry out the national goals. Regular reporting of results provides feedback to the central government on how effectively its priorities are being achieved by the complex network of central, regional, and local transportation agencies, as well as by the many private contractors who operate in the highly privatized British transportation system.

The performance management framework applies to the transportation network in England, with separate governance structures in Scotland, Wales, and Northern Ireland.

The main British transportation agency is the Department for Transport, which oversees both HA and monitors the private contractors who operate the nation's rail passenger system. HA improves, operates, and maintains strategic roads for the

51 million people in England, who live in a 50,000-square-mi (129,499-square-km) nation about the size of Alabama.

The British governance structure is substantially different from that in the United States. This may reflect the Next Step movement in the 1980s and privatization initiatives in the transportation sector in the 1980s and 1990s.

The day-to-day responsibility for strategic roads lies with HA, a semiautonomous arm of the Department for Transport with its own board and chief executive. The relationship between HA and the Department for Transport is formalized. The department approves and sets HA's budget and agrees to its business plan and targets. HA is responsible for delivery. In delivering some of its functions, HA relies on contracts with external organizations and commercial companies. For example, routine maintenance is provided by private companies under contracts let by competitive tender.

As a result of privatization, passenger rail services are also provided by private companies, in this case operating franchises and contracting directly with the Department for Transport. Service levels and certain types of fares are controlled by the Department for Transport, with companies either paying a premium or receiving a subsidy (contracts are let after a competition). In this case remedial action, including financial penalties, may be taken against rail operators that fail to provide acceptable services.

The Department for Transport operates under five broad strategic goals that it negotiates with the central government:

- ▶ Support national economic competitiveness and growth by delivering reliable and efficient transport networks.
- ▶ Reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change.
- ▶ Contribute to better safety, security, health, and longer life expectancy by reducing the risk of death, injury, or illness arising from transportation and promoting travel modes beneficial to health.
- ▶ Promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society.
- ▶ Improve the quality of life for transport users and nontransport users and promote a healthy natural environment.

From those five flow an extensive performance management structure that measures dozens of aspects of British transportation performance. Most individual targets are not set by the

central government, but are developed by the transportation agencies for measuring success on achieving the national goals. Top-level targets are approved by ministers. The implementing agencies include HA and various regional and local agencies that receive government transportation funds.

From the Department for Transport strategic goals flow the objectives for HA, which has an aim of “safe roads, reliable journeys, informed travelers.” HA’s objectives are the following:

- ▶ Reduce delay and congestion on the strategic road network by delivering sustainable capacity improvements, making journey time more reliable.
- ▶ Influence customers’ travel behavior and decisions by making network information more readily available.
- ▶ Improve road safety by maintaining the network in a safe and serviceable condition.
- ▶ Enhance the environment by mitigating the potentially adverse impact of the strategic road network and supporting the department’s environment and climate change objectives.
- ▶ Provide an effective Traffic Officer Service (figure 3).
- ▶ Seek and respond to feedback from customers.
- ▶ Deliver efficiency and value-for-money savings and improvements.



Figure 3. Great Britain’s performance management approach spurred increased efforts to manage congestion.

Queensland Performance Management

The Queensland Department of Transport and Main Roads displays another well-articulated strategic management framework in which broad, catalytic state goals flow through

a performance management process in the transportation agency down to the individual project and activity level. Queensland is Australia’s most rapidly growing state, with a population of 4.2 million spread across a huge landmass twice the size of Texas. Queensland is a diverse state that includes the upscale Miami Beach-like Gold Coast, the Great Barrier Reef, and thousands of square miles of sparsely populated interior.

The state and municipal governments have been coping with significant urban population growth and have invested heavily in an integrated, multimodal transportation network. The emphasis on integration extended to a recent merger of Queensland Transport, the former transit agency, with the Queensland Department of Main Roads to form the Department of Transport and Main Roads.

For more than a decade, the two agencies operated under a state strategic transportation plan. In 2008, the Queensland minister for transport, trade, employment, and industrial relations and the minister for main roads and local government jointly developed the updated state transportation plan known as the Transport Coordination Plan for Queensland (figure 4, see next page). This plan set the strategic direction for both the highway and transit agencies before and after their merger. It expressed the strategic context and challenges facing the state. The state is coping with rapid growth, high congestion, automobile dependency, environmental changes, high community expectations, a threatened quality of life, and diverse regions with differing transportation needs. The Transport Coordination Plan laid out 10 strategic objectives for the transportation agencies:

- ▶ Make the most of the existing transportation network by balancing demand and supply of infrastructure and services to maximize efficiency.
- ▶ Invest in Queensland’s transport system by targeting investment to achieve the best value for industry and the community.
- ▶ Keep the system working well by ensuring the transport system performs well and accommodates the changing travel patterns and requirements of society and industry.
- ▶ Get people walking, cycling, and using public transport by increasing the share of trips made by public transport, walking, and cycling and providing alternatives to private car use.
- ▶ Support regional and remote communities by connecting them to essential services to support economic development and social cohesion.

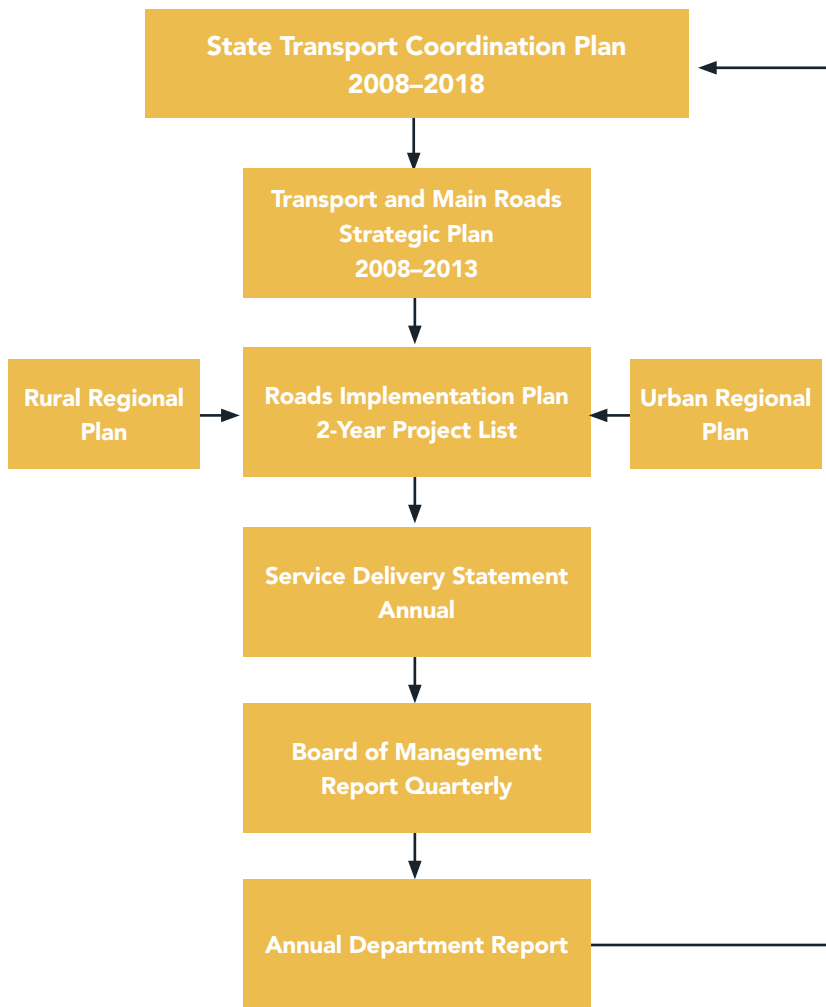


Figure 4. The Queensland transportation agencies have a well-articulated performance management system.

- ▶ Move freight efficiently by contributing to a strong and diverse trading environment.
- ▶ Make transport safer by reducing transport-related incidents, fatalities, and injuries.
- ▶ Make transport more secure by protecting personal security and the integrity of the transport network.
- ▶ Care for the natural and built environment by contributing to a cleaner, healthier, and more livable environment for all Queenslanders.
- ▶ Integrate transport planning and land use by matching transport and land use patterns to enhance livability and trade.

The Department of Transport and Main Roads converts these broad goals into an increasingly specific set of reports and metrics by which it can assess—and be

measured—on how well it is implementing the state government’s overall transportation aspirations, including the following:

- ▶ It adopts a 5-year strategic plan derived directly from the 10-year state plan.
- ▶ It adopts a specific list of projects, called the Roads Implementation Plan, which has a detailed 2-year list of projects to be delivered and a rolling 3-year list of projects under development. The Roads Implementation Plan appeared to be similar to a Transportation Improvement Program in a U.S. metropolitan region.
- ▶ Annually, the department produces a highly detailed and quantified Service Delivery Statement, a public report on what it plans to achieve in the upcoming budget year.
- ▶ Every quarter it produces a Board of Management Report to the cabinet agency on its progress on the Service Delivery Statement.
- ▶ It develops an annual report that specifies what it accomplished in the Service Delivery Statement and through overall efforts in the past fiscal year.

The scan team’s overall impression after reviewing the Queensland process and interviewing its officials was that the state has created strong linkages between its strategic goals and the day-to-day activities of its transportation agencies.

Broad Goals, Negotiated Targets, Ongoing Collaboration

Despite the greater linkage of national goals to agency activities, the central governments mandated few explicit and quantitative national transportation targets for the transportation agencies. It appeared that as the agencies’ performance management systems matured, the central government shifted from insisting on precise performance targets to monitoring long-term system trends.

The scan team seldom found one level of government mandating the performance of another. Rather, the service-level agreements or other negotiated documents between the central government and the transportation agency were used

to define performance measures and targets for which the transportation agency was held accountable. The service-level agreements communicated priorities and clarified outcomes while allowing each state or region to negotiate measures and priorities important to its unique circumstances. These negotiations were supported by extensive data collection that showed trends in systemwide performance. Negotiations between the agencies and their central governments were fluid and continuous. Flexibility in adopting strategies and targets was key, particularly in major cities with unique transportation needs and solutions.

The combination of national goals cascading into state or regional performance measures appeared to create a greater emphasis on outcomes than on process. Results, not process, appeared to be what was closely monitored.

New Zealand Government Policy Statement

The New Zealand system was typical of what the scan team found in its study. A Government Policy Statement spells out broad objectives for transportation. The transportation agency produces a Revenue Investment Strategy and a Statement of Intent to articulate how it intends to invest in transport and achieve the central government's broad transportation goals.

"This structure requires the government to say, 'This is what we want you to achieve,'" said a New Zealand official. "One of the critical points is a mechanism for government to articulate its policies and for the agency to have a dialog about those priorities."

The 2009 New Zealand Government Policy Statement for transportation includes no hard, numeric targets. The only numbers in the document are for budget appropriations—minimum and maximum investment ranges for each investment category. However, it provides clear strategic direction on what it wants from NZTA.

"The government's priority for its investment in land transport is to increase economic productivity and growth in New Zealand," said the Government Policy Statement. "Quality land transport infrastructure and services are an essential part of a robust economy. They enable people and businesses to access employment and markets throughout the country and link them to international markets through the nation's ports and airports. Investing in high-quality infrastructure projects that support the efficient movement of freight and people is critical."

The Government Policy Statement lists seven national corridors as part of a Roads of National Significance network. It directs NZTA to focus resources on these routes to achieve economic growth and productivity. It designates the routes as the nation's most important and says they require significant investment to reduce congestion, improve safety, and support economic growth.

Two important exceptions to the rule that the central government did not set hard targets were in safety and greenhouse gas emission reductions.

"In pursuing economic growth and productivity, the government also expects to see progress on other objectives. The Land Transport Management Act 2003 requires the Government Policy Statement to contribute to achieving an affordable, integrated, safe, responsive and sustainable land transport system, and also to each of the following:

- ▶ Assisting economic development
- ▶ Assisting safety and personal security
- ▶ Improving access and mobility
- ▶ Protecting and promoting public health
- ▶ Ensuring environmental sustainability"

The following are other impacts the Government Policy Statement sets for the agency:

- ▶ Improvements in journey time reliability
- ▶ Easing of severe congestion
- ▶ More efficient freight supply chains
- ▶ Better use of existing transport capacity
- ▶ Better access to markets, employment, and areas that contribute to economic growth
- ▶ A secure and resilient transport network
- ▶ Reductions in deaths and serious injuries as a result of road crashes
- ▶ More transport choices, particularly for those with limited access to a car, where appropriate
- ▶ Reductions in adverse environmental effects from land transport
- ▶ Contributions to positive health outcomes

After the Government Policy Statement is published, the agency develops its Revenue and Investment Strategy and negotiates its Statement of Intent with the government,

setting out what it will achieve during the next 3 financial years. The Statement of Intent explains how it will spend the government’s resources to achieve its desired ends.

“The government has provided clear expectations for service delivery for the financial year 2009–2010 and out-years,” stated NZTA’s Statement of Intent. “This clarity has enabled the organization to focus on what matters most, and to develop five business priorities to ensure organizational resources, behaviours and decisions give effect to the government’s intent. Over the coming three financial years there will be a particular focus on improving road safety, improving the effectiveness of public transport, improving the efficiency of freight movements, planning for and delivering roads of national significance, and improving customer service and reducing compliance costs.”

The Statement of Intent sets comprehensive targets, such as achieving 90 percent of all project development milestones on the Roads of National Significance, achieving specific travel time goals on major routes, and receiving a 75 percent satisfaction rating in surveys of road users. The Statement of Intent includes 64 such comprehensive performance measures. Most are cumulative, programmatic measures, such as achieving a certain level of pavement condition across the entire network. Listed with each group of measures is the accompanying budget expenditures. This pairing allows the agency to link its budget inputs with its desired outputs and illustrate how those outputs achieve the government’s objectives.

As a result, the New Zealand system produces clear measures of expenditure and accomplishment, but without a set of rigid, centrally mandated targets. Instead, the targets are negotiated between the political minister and the professional staff of the transportation agency.

British Public Service Agreements

Similar to the Statements of Intent in New Zealand are the Public Service Agreements in Great Britain. The Public Service Agreement is a widely used device to set goals between units of government (figure 5). The Department for Transport has a Public Service Agreement with Treasury to specify the department’s performance goals for a budget cycle. Likewise, the department has developed agreements with local governments for 10 major urban areas with accompanying measures that underpin the indicators in its own Public Service Agreement.

The British experience over the past 12 years has been movement toward negotiated agreements and away from a large number of mandated targets. The number of measures, targets, and mandates has steadily fallen and the process has evolved from a hierarchical, mandate-driven one to a more collaborative one. The British experience provides a cautionary tale on the use of centralized performance metrics. In the initial stages of British performance management in the 1990s, the number of metrics proliferated to a cumbersome level. Central government imposed an estimated 2,000 metrics on local government and about 600 across national departments. From 2000 to 2009, those metrics were steadily consolidated to 188 for local government and 30 across national departments. The Department for Transport now primarily operates under one Public Service Agreement with underlying indicators.

Not only have the measures on local governments fallen from 2,000 to 198, but local governments only have to set targets for up to 35 of those measures, along with 18 mandatory targets for education and children’s services. The local governments agree on up to 35 targets, based on which improvements are most important to the local community. Local governments report the values of the other measures,

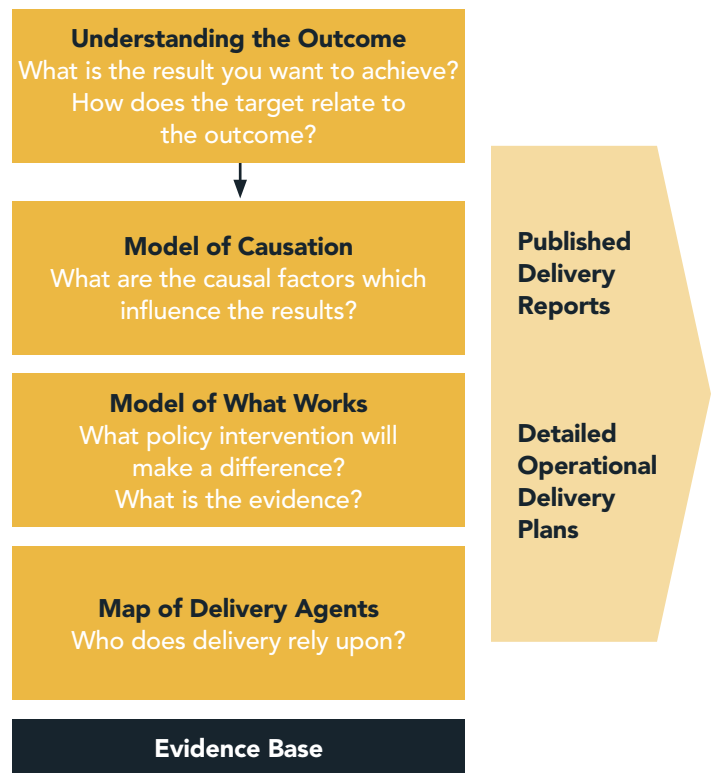


Figure 5. The British rely on service agreements to implement government goals.

but they are used only as indicators of condition or trends, not specific targets that have to be met.

British transportation officials emphasized that the dialogue between the various levels of government in negotiating and monitoring the Public Service Agreements was as important—or perhaps more important—than the setting of the hard performance targets. The setting of targets and the continuous dialogue on how to best achieve them resulted in increased consensus, alignment, and understanding between the central government and the transportation agencies it funds.

British officials said the current system began in 1998 when a process called the Comprehensive Spending Review was initiated. In that process, the central parliamentary government prepared 3-year spending plans and developed Public Service Agreements with each national department on its expenditures for the priorities it would pursue. They cited the following as strengths of their system:

- ▶ The government makes a clear statement on its priorities.
- ▶ It creates an outcome-oriented approach to budgeting and governing.
- ▶ It sharpens accountability to the electorate, U.K. Parliament, and European Union.
- ▶ It forces government and the agencies to balance priorities with revenue.
- ▶ It promotes value-for-money considerations.
- ▶ It provides agencies with a medium-term framework for planning, but with maximum flexibility on how to achieve the government’s desired outcomes.

An example of a key Public Service Agreement is Delivery Agreement 5: “Deliver reliable and efficient transport networks that support economic growth.” The Treasury is the government entity that works on behalf of the prime minister to negotiate the Public Service Agreement with the Department for Transport. It set a broad government goal of having “reliable and efficient transport networks that support economic growth.” From that goal, the government and the Department for Transport negotiated the following indicators (not hard targets):

- ▶ **Journey time on main roads into urban areas**—This indicator relates to journey

times on key routes into the 10 largest urban areas during the morning rush hour.

- ▶ **Journey time reliability on the strategic road network**, as measured by the average delay experienced in the worst 10 percent of journeys for each monitored route— This indicator focuses on the delay experienced in the worst 10 percent of journeys.
- ▶ **Level of capacity and crowding on the rail network**— The target is linked to the government’s high-level output specification for the rail network, which details the passenger numbers to be accommodated and the load factors to be achieved.
- ▶ **Average benefit-cost ratio of investments approved**— The indicator relates to the expected level of benefits to be obtained from investments approved in the period.

Sweden’s Operational Plan and Reports

SRA operates under a similar framework in which Parliament issues broad, qualitative goals to the transportation agency in its annual budget process (figure 6). These directives contain few metrics and the entire document may be less than 10 pages of general discussion on what Parliament wants SRA to focus on.

SRA incorporates this periodic guidance into two key documents. One is SRA’s Strategic Plan, which includes an intermediate horizon of 10 years and key priorities articulated by the government. On a short-term basis, SRA produces a

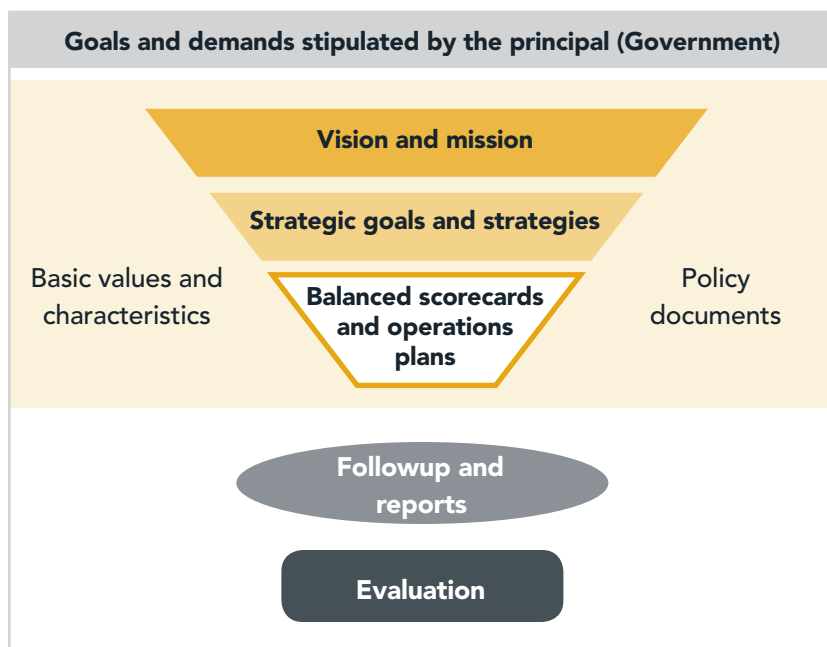


Figure 6. The Swedish system translates broad government goals into agency action plans.

much more detailed Operational Plan and a short-range document that focuses on activities in the upcoming budget cycle. The Operational Plan is influenced by government priorities, parliamentary direction, and the extensive public outreach process Sweden deploys. In a nation of 9 million people, 9,000 are annually surveyed on their satisfaction with a number of basic issues. These include traditional issues, such as pavement smoothness, winter snow and ice control, and how promptly they received a driver’s license from the licensing bureau. But other measures are much more personal. SRA found that 66 percent of parents report their children have a safe route to school, while up to 10 percent believe their child’s route is very unsafe. The results of these surveys, as well as a customer satisfaction index and input from Customer Councils, are combined with parliamentary direction to influence the Operational Plan.

Directly from the Operational Plan flows a Balanced Scorecard reporting process. The Balanced Scorecard reporting is scalable throughout the agency. A summary report rolls up agency performance. However, the performance of individual units or districts also can be reported. All results are on an agency Web network and are shared with the government ministries.

SRA officials said, however, that the most valuable part of their reporting process—at least in communicating with the

central government—are the frequent update meetings they hold with budget officials in the ministries. SRA must provide four mandatory update reports on its Operational Plan and Balanced Scorecard accomplishments. However, much more frequent and informal communication occurs, providing continuous opportunities for budget officials to understand the progress, challenges, and issues confronting SRA.

New South Wales Agreements

Similar to the U.K. Public Service Agreements, the New South Wales RTA generates a Results and Services Plan and a Budget Paper that specify how it will spend its budget, what priorities it has, what targets it expects to meet, and what activities it seeks to accomplish during the budget period. Senior agency officials described the Results and Services Plan as a contract-like document that specifies how they will invest AUD4.4 billion in state and federal funds.

While the Results and Services Plan is a private document given to the state government, the two annual Budget Papers are public documents that explain spending to achieve government transport priorities (figure 7). One is a 30-page document that lists major budget expenditures, general accomplishments, areas of policy emphasis, the status of major projects, and key indicators of performance proposed by the agency. The other is a much longer Infrastructure

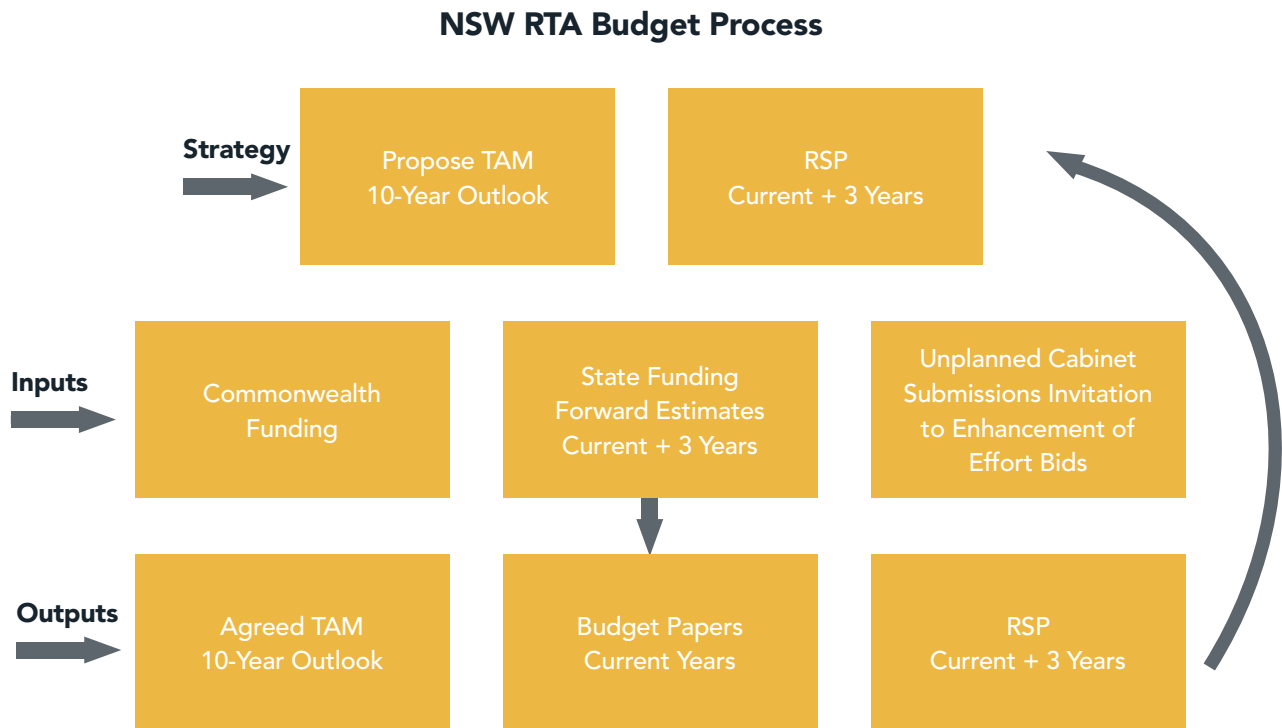


Figure 7. New South Wales translates government strategy into measureable outputs.

Statement that addresses investments in sustaining and improving all forms of the state infrastructure, including transportation. These two documents reflect the parallel nature of the New South Wales budgeting process and accountability process. One aspect focuses on shorter term operations, while the other focuses on longer term total asset management priorities.

Among the operational performance indicators it reports are the following:

- ▶ The benefit of the development program, with a target of AUD4.6 billion
- ▶ The estimated travel speed on major urban routes during morning peak travel times, with a target of 30 kilometers per hour (km/h) (18 miles per hour (mi/h))
- ▶ Ride quality, or smoothness of state roads (percent good versus percent poor), with a target of 89
- ▶ Fatalities per 100,000 population
- ▶ Total greenhouse gas emissions

Agency officials said the targets in the Results and Services Plan, Budget Papers, and total asset management plan are realistic ones they set after negotiating with state government officials. “Imposing targets is likely to be ineffective and we prefer the carrot to the stick. If you set an imposed target, you will get resistance constantly. We say, ‘you give us the target and we will work with you on whether it is the right target,’” is how one agency executive described the target-setting process.

Although setting reasonable targets involves negotiation, once targets are set clear processes are in place to ensure progress toward achieving them. A monthly performance meeting between agency managers and the chief executive officer focuses on progress on accomplishing the agency goals, targets, and business plan. They use an internal dashboard for each measure and only spend time talking about areas in red, which are out of tolerance. They limit agency executives to a two-sentence explanation during the fast-paced meeting to explain how they will get performance back on target.

Periodic oversight from what are called the Central Agencies further enhances accountability. The New South Wales Treasury and the Auditor General conduct periodic performance audits and oversight functions to ensure achievement of agency performance goals.

Agency officials described the budgeting process as a “results budget” that compels the agency to think about important societal outcomes and decide what the public wants from

government services. Instead of merely processing driver’s licenses, officials think about producing more competent drivers. Instead of building highways, they consider whether they provide reliable journeys or high-performing highway assets. They described the results budgeting process as an ever-progressing evolution to link changing societal needs with the agency’s performance. An official said the agency wants metrics that contribute to a performance culture.

The New South Wales budget and performance management processes are closely linked to a long-term total asset management approach that is legislatively mandated throughout the state. The New South Wales Treasury oversees a statewide total asset management approach that applies to all state assets, including highways, state buildings, information technology networks, water systems, and other public assets. The New South Wales RTA manages an extensive *Total Asset Management Manual* that covers all phases of an asset’s life cycle, from planning through retirement. This manual drives a total asset management plan, which is closely linked to the budgeting and performance process.

The agency plans a 10-year transportation asset management strategy operated in parallel with the 3-year Results and Services Plan. The intention is to keep the shorter term political budgeting process linked to long-term highway asset management needs. As described later in this report, the syncing of the budget and asset management processes has not resulted in the total amount of investment that the agency identified. However, the linkage has clearly illustrated long-term asset needs as part of the short-term budgeting cycle.

As in other agencies, New South Wales transportation officials said the dialogue and increased understanding that comes from the negotiation and reporting process is an important benefit of the integrated performance management budgeting approach.

Victoria Department of Transport Focus Reports

Similar to the New South Wales RTA, the Victoria Department of Transport produces voluminous accountability documents that set out detailed aspirations based on state and regional goals. Its short-term priorities are strongly influenced by the state’s focus on coping with rising congestion and environmental impacts caused by the substantial growth the region is experiencing. The short-term objectives the Department of Transport pursues stem directly from the long-term state goals to further integrate transportation with

land use, offer more transportation choices, reduce emissions, and improve the overall sustainability of the region. Because of the many similarities to the process used in New South Wales, the Victoria process of setting short-term targets will not be described in detail. One difference is that it appeared the focus on land use and transportation integration is even more pronounced in Victoria.

Victoria officials describe how their outcome-driven approach has influenced even their accounting process. They said the state moved from cash-based accounting to accrual-based accounting as part of an effort to clearly link expenditures with outcomes. They said the historical approach to public sector financial management in Victoria and other jurisdictions was to apply cash budgeting and reporting. Management of services was based on programs with a focus on inputs to

the government instead of outcomes for the public. Department assets and liabilities were not financially recognized in annual reports, and the overhead costs of leave and pensions were reported by the central Department of Taxation and Finance, not the transportation agencies. By moving to accrual-based accounting, the future liability of accumulated pensions, leave, and infrastructure needs can be recognized on the transportation department's books.

As a result, departmental services could not be fully costed on a competitive and neutral basis with other agencies or the private sector. Further, the input focus did not promote achievement of actual service delivery outputs. A reform process in the 1990s instituted a much more outcome-focused budgeting process that fully accounted for all agency costs to provide services, including all department overhead.

Table 2. Victoria priorities and strategies.

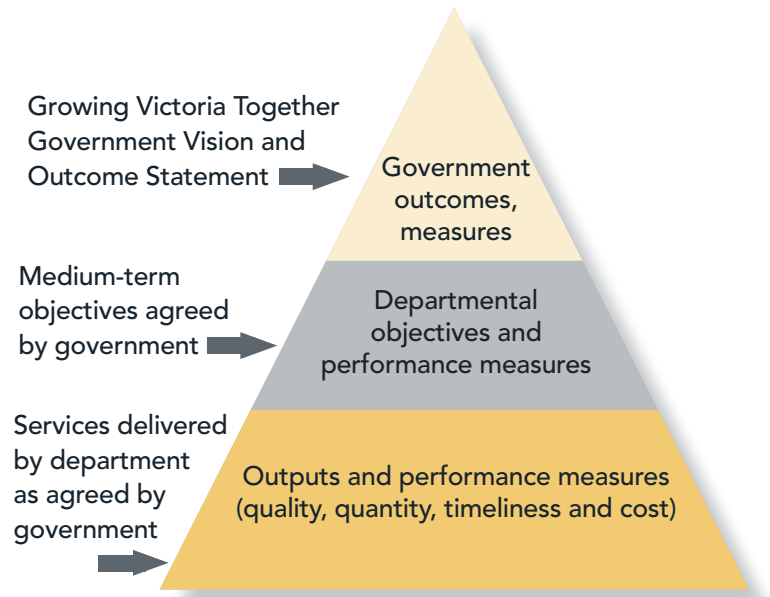
Victoria DOT 3-Year Priorities	
Priorities	Strategies
Integrate transport and land use planning	• Shape Melbourne and regional Victoria to reduce the amount and distance of travel.
	• Ensure legislative and governance arrangements support emerging transport challenges.
	• Improve long-term planning and secure strategic reservations.
Support the Victorian economy with an effective and resilient transport system	• Increase the capacity of the transport system.
	• Maximize the operation and use of the existing transport system.
	• Improve the accessibility and service quality of the transport system and address transport disadvantage.
Ensure safety for all transport users	• Ensure safer roads, roadsides, vehicles, and users.
	• Ensure safer public transport services and create personal safety of public transport users.
	• Ensure safety and security of freight transport.
	• Ensure safer waterways.
Improve the sustainability of Victorian transport	• Support mode shift to more sustainable travel modes.
	• Improve the environmental efficiency of transport activity and the transport fleet.
	• Mitigate the impact of transport activities and adapt to the effects of climate change.
Build a collaborative and effective organization	• Transform the culture of the department to maximize performance on behalf of the community.
	• Improve program development and delivery and risk management.
	• Communicate effectively with the community, industry, and other government agencies.

As a result of the budget and programming reforms, the Victoria Department of Transport now expresses more of its programs in terms of outcomes to the public and alignment to long-term goals.

As emphasized in the other agency examples, the state government has not imposed hard targets on the Victoria Department of Transport. However, its performance management and performance budgeting processes have evolved consistently so that they now link their programs to outcomes that support broader government objectives (figure 8). Agency officials said their plan aligns performance measures for each priority in the state plan and state budget priorities.

Its 3-year and annual reports include achievements, such as the opening of a new section of highway. It includes outputs, such as the miles of road that meet pavement smoothness goals. It also reports outcomes, such as an improvement in travel time as a result of the new projects.

Figure 8. Victoria's performance pyramid illustrates linkages between broad government goals and agency services.



Linking Budgets and Accomplishments

Performance-Driven Funding Allocations: A Difficult Goal

The agencies visited clearly documented system and organizational performance, often in detailed trends over a number of years. The richness of reporting and actions was usually quite sophisticated. The agencies demonstrated improved customer satisfaction, higher reliability in transit and highway travel times, reduced environmental impacts, and greater efficiencies. Their performance management systems naturally dovetailed with asset management systems. The agencies demonstrated a keen knowledge of system conditions, system trends, and finely calibrated system need estimates, often by asset type and region. Clearly, the agencies benefited from managing their performance to maximize resources, optimize assets, and earn credibility from legislators and budgeting agencies.

Despite those benefits to both legislatures and agencies, budget appropriations were for the most part not driven by the resources required to achieve specific performance targets. Generally, appropriations were not calibrated to the condition of specific asset classes. Performance management demonstrated how funds were spent and to what end, but the systems did not appear to include a feedback loop that triggered legislative appropriation decisions to sustain assets at an agreed-on level.

The scan team found no widespread evidence that legislatures or executive branch financial agencies establish asset investment levels based on data from performance management systems. Discussions indicated that this was because of overall funding constraints in competing public sectors, such as education and health care. It was not attributable to an ineffective performance management program or agency performance. Only New Zealand had a dedicated transport fund statutorily protected for transportation uses. All fuel excise duty is dedicated to transport. Excise duty is collected from gasoline sales, and light diesel vehicles and heavy vehicles

pay road user charges based on vehicle weight and distance traveled. Other departments tended to compete with other government agencies for appropriations.

In three of the six cases, agencies reported discouragement that they could not convince legislators to invest more in system preservation, despite their sophisticated documentation of need. Further discussion noted that identifying large maintenance funding gaps was a longstanding concern. Similar to the United States, agencies had difficulty expressing the impact of changes in pavement and bridge condition at the political level.

Central government decisions on agency operating budgets tend to remain incremental. System preservation increases were modest and based on incremental increases from past budgets. Budget decisionmaking depended on whether the government had any residual revenue left once other priorities were met.

In Sweden, SRA officials presented three budget scenarios for long-term basic system preservation needs as part of a 10-year government budget forecasting effort. They presented a low, medium, and high scenario for the 10 years from 2010 to 2021. They presented a low scenario of SEK117 billion (USD16.7 billion) over 10 years, which would make it possible to sustain maintenance standards at a functional level. Investments would be limited to funding projects in the current plan and meeting immediate needs. In the medium scenario, they would meet 75 percent of backlogged maintenance needs. In the high scenario, a 31 percent increase, they would meet all maintenance backlogs. They received in the long-term budget forecast an estimated appropriation for maintenance of SEK110 billion for 10 years, or slightly less than their lowest estimated need to sustain conditions (figure 9, see next page).

“For a long time we have talked about the maintenance mountain, but the problem . . . is they can’t translate that down to ‘What does that mean?’ We did get more maintenance money, but it came from politicians picking up the sentiment in their districts that there was discontent in the

field. It became a political topic, more so than a technical debate” about how to fund maintenance, said an SRA official.

In New South Wales, officials said the national government has held maintenance expenditures level for several years at an amount that does not provide long-term sustainable funding. They said they rely heavily on state revenues to maintain their system at an acceptable condition level.

Queensland officials produce a sophisticated asset deterioration analysis that monetizes the value of all assets and forecasts their deterioration curves based on current expenditures. Their analysis indicates that only about 50 percent of needed

long-term investment in system preservation is occurring. Despite their sophisticated analysis, they have not been able to convince Treasury officials to support a larger investment in system maintenance.

Victoria highway officials manage their assets under the requirements of a Road Management Act that requires sophisticated reporting and forecasting of the effort level needed to sustain conditions at an acceptable level (figure 10). Even with the legislative foundation for identifying their maintenance needs, they said they struggle to convince central budget authorities to invest adequately in system maintenance.

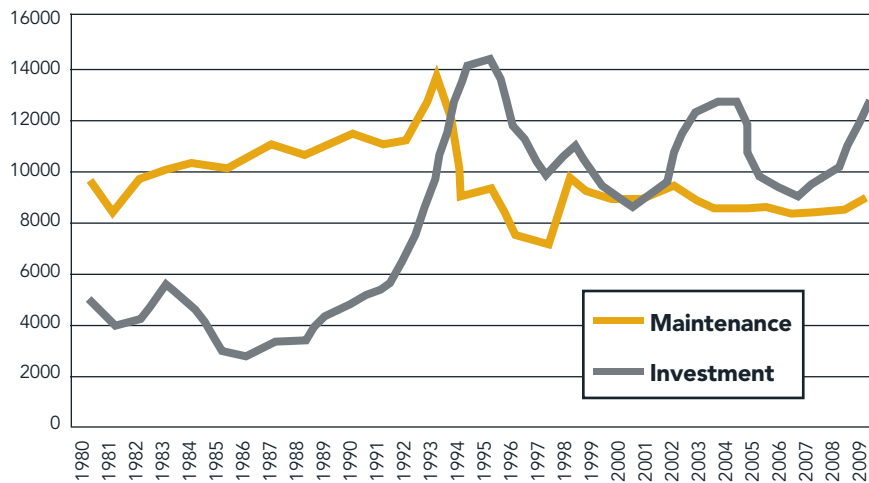


Figure 9. Swedish maintenance expenditures are below those for new investment.

Although there appeared to be little direct linkage between system conditions and appropriations, the performance management systems were widely credited with documenting the agency’s efficiency and helping to defend transportation appropriations during the budgeting process.

“Anything that focuses you on what you are actually achieving for your constituencies is worthwhile,” said one Victorian official in describing how the agency uses its road condition data to defend budget requests.

One British official noted that while there is no mechanistic linkage between transporta-

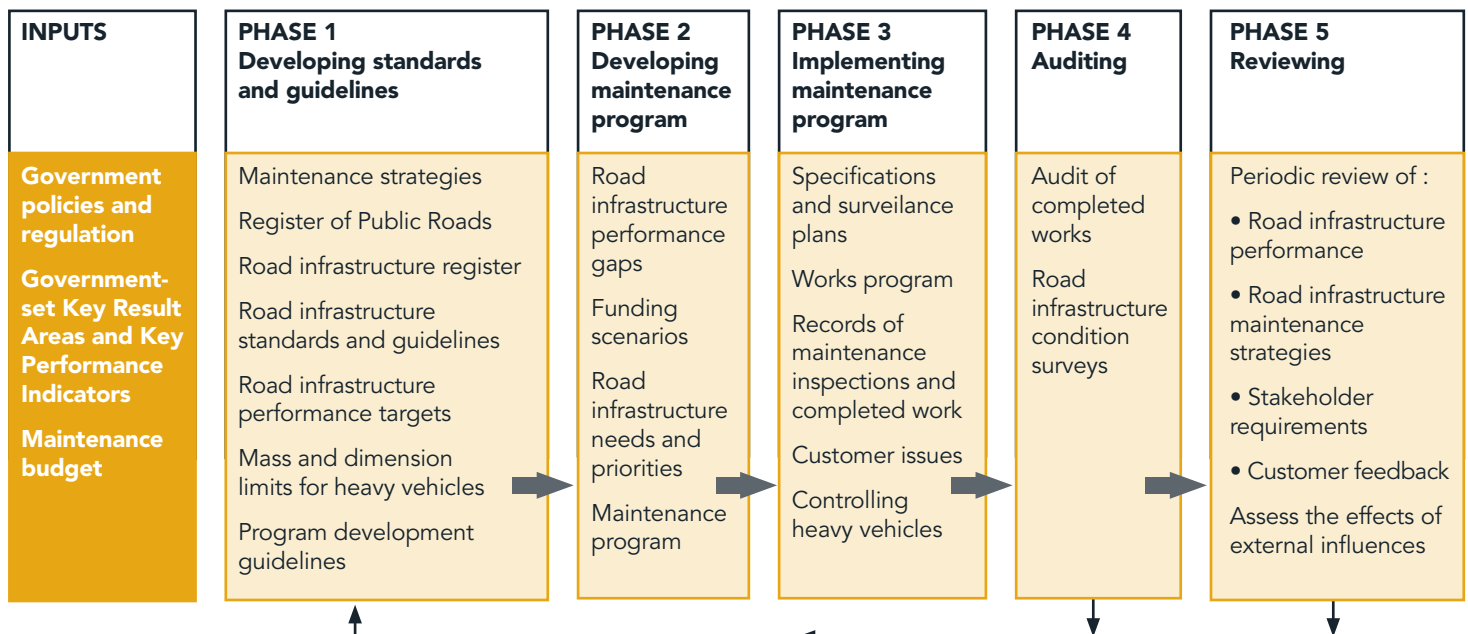


Figure 10. The Victoria Road Management Act requires a systematic and methodical asset management approach.

tion condition targets and the budget set by legislators or Treasury officials, the performance results were considered important in budget discussions.

One agency stated that while its performance management did not garner a budget increase, elected officials viewed it as so effective that the agency was able to sustain its budget when others were cut.

Depreciating Value of Transportation Assets

Another economic analysis common in the international agencies was the use of depreciation in networkwide assets to demonstrate financially whether the investment level is adequate to sustain the assets over time. The evaluation puts the issue of deferred maintenance into a quantifiable number that can be displayed as a liability on the organization's books. The value of this type of analysis is to demonstrate in financial terms whether states or nations are accumulating future costs that will have to be incurred to return the transportation network assets to a serviceable condition.

As a Swedish official said, it demonstrates to the central government the long-term costs of deferring maintenance. "We try to communicate that it is very expensive to be poor." A Queensland official said the depreciation forecasts compel Treasury officials to confront the fact that not investing adequately in infrastructure maintenance increases the amount of annual depreciation the government faces. "When investment decisions reduce funding to rehabilitation and resurfacing, there is still a cost to government."

Queensland Department of Transport and Main Roads displayed a sophisticated depreciation process, Roads Asset Valuation, that relies on four inputs:

- ▶ Unit prices for construction of various assets
- ▶ Remaining useful life of assets already in service
- ▶ Highway assets' rate of depreciation or deterioration
- ▶ Their residual value when exhausted

From these four variables, the agency computes whether current investment levels are adequate to offset the continual

depreciation or deterioration consuming the remaining useful life of the highway assets in service.

The agency derives the conditions of the assets from bridge, pavement, and other asset inventories. From the base case of conditions, the management systems are used to calculate the deterioration rate for each asset and the network as a whole. In an optimally funded program, the amount of improvement created by the capital and maintenance programs would offset the rate of deterioration across the network. However, Queensland officials were able to document that only about 50 percent of the level of maintenance investment was occurring to sustain the assets over time without significant depreciation in the value of the state's highway infrastructure. The extent of the problem was further exacerbated when construction prices soared between 2005 and 2008. That caused the future replacement value of the depreciated assets to increase significantly, widening the investment deficit the state faces in future years. Queensland officials said the analysis did not result in immediate increases in investment from Treasury officials, but it certainly "got their attention" that the state has a serious long-term infrastructure liability it needs to monitor carefully (figure 11).

The road network infrastructure asset valuation brings together two areas of professional practice, financial management and road network asset management. The officials said the resulting closer communication has strengthened links between financial planning and asset planning, as required by the state's *Financial and Performance Management Standard*, published by the Queensland Treasury.

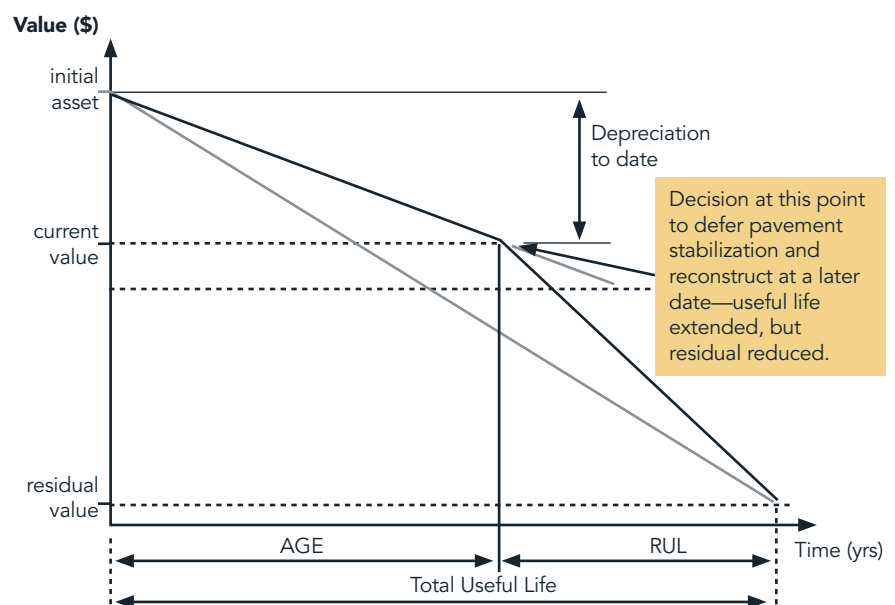


Figure 11. Queensland captures the long-term cost of deferred maintenance.

Queensland officials said the main purpose for valuing infrastructure assets is to generate information that will help them decide on the conduct of their core business. The department has articulated its vision for road network asset management as maximizing performance in a whole-of-life context in terms of safety, road user costs, community benefits, and government outlays.

Queensland officials have refined their depreciation process down to an individual element basis for many assets. It uses unit prices from its project-estimating system to value the replacement cost of individual assets, with variations captured for different regions. Both direct and overhead costs to replace assets are captured.

Similar depreciation models were cited in New Zealand, Victoria, and New South Wales. New South Wales officials called the product of their depreciation analysis a Capital Sustainability Index. It translates the needed maintenance investment versus the actual maintenance expenditures into a ratio. The index did not convince the central government to increase maintenance budgets, but the New South Wales RTA used it to redirect its resources to sustain maintenance conditions.

Ambitious Goals and Visions Drive Investment

Although the performance management processes did not lead directly to consistent budget increases for highway preservation, the scan team found many instances of governments investing significant new sums to expand the transportation system. These investments were driven by broad national visions, such as creating livable cities, spurring economic investment, or linking regions by improving corridors. In short, striving for ambitious new visions rather than achieving narrow performance targets tended to motivate societies to substantially increase investment in their transportation networks.

All four nations the scan team visited had some form of major transportation investment initiative underway. Some were directly influenced by the economic downturn, such as Australia's Nation Building Program. New Zealand's government focused on investing in seven national corridors to create an enhanced network of Roads of National Significance. Great Britain recently committed GBP6.3 billion (USD10.2 billion) to rehabilitate and expand its busiest highway, the M25, and it is considering a high-speed rail network. Sweden used revenue from an urban pricing

cordon to finance a new USD3.7 billion outer belt around its capital, Stockholm. The Queensland government was building a comprehensive network of busways to alleviate congestion. In Sydney, a gleaming new freeway tunnel completed a key missing link in the urban freeway network.

The relationship between the agencies' performance management credibility and the government's decision to entrust these agencies to manage massive new investments is unclear. It appeared to the scan team members, however, that the credibility earned by the transportation agencies for efficiency and competency had at least an indirect bearing on the government's decision to invest massively in new transportation infrastructure.

Nation Building in Australia

Australia's Infrastructure Act 2008 was intended to enhance the federal role in transportation by increasing federal coordination, planning, and financing for nationally important transportation projects. It created an agency called Infrastructure Australia in the national Department of Infrastructure, Transport, Regional Development, and Local Government. The primary function of Infrastructure Australia is to advise the minister, commonwealth, states, territories, local governments, investors, and owners of infrastructure on transportation needs, prioritization of projects, regulatory and price issues, options for reforms, infrastructure user needs, and mechanisms for infrastructure financing. In addition, it has authority to perform audits of the adequacy, capacity, and condition of the nation's infrastructure.

Infrastructure Australia is intended to develop a strategic blueprint for the commonwealth's future infrastructure needs. Its enabling act calls for it to work in partnership with states, territories, local governments, and the private sector while it develops advice to the governments about infrastructure gaps and bottlenecks that hinder economic growth. It also is charged with advising the commonwealth on investment priorities and regulatory reforms necessary for the timely delivery of infrastructure projects.

The central government also developed a concurrent financing program called the Nation Building Program. It is intended to be an AUD26.7 billion (USD21.2 billion) highway and rail development program for 2009 to 2014. It calls the program the largest land transport program in the nation's history. To put that amount of investment into perspective, a U.S. highway and rail program of the same size on a per capita basis would total USD316 billion. The fiscal

year 2009 authorization under U.S. transportation legislation was just under USD40 billion for highways.

The government also appointed an infrastructure coordinator to lead an Office of Infrastructure Coordination, which will identify needs, advise the commonwealth on projects to select, and coordinate the efforts of states, territories, regions, and cities to develop an integrated transportation network.

Infrastructure Australia also was tasked with conducting studies of the adequacy, capacity, and condition of nationally significant infrastructure. Its assignment is to anticipate levels of growth and the adequacy of the national network to accommodate it and, from its analysis, develop a national infrastructure priority list for the Council of Australian Governments (COAG) to consider. COAG is a statutorily created council of the prime minister, state premiers (governors), territorial chief ministers, and the president of the Australian Local Government Administration.

The following are other duties of the coordinator:

- ▶ Evaluate the business case for new infrastructure, when commissioned to do so.
- ▶ Review and provide advice on measures to improve coordination of policy and regulatory regimes that facilitate infrastructure development and investment.
- ▶ Identify barriers, or disincentives, to invest in nationally significant infrastructure.

Infrastructure Australia will also be asked to review the extent to which the government can facilitate infrastructure investment, including improving guidelines for public-private partnerships, project appraisal techniques, and planning and approval processes.

New Zealand Roads of National Significance

In its Government Policy Statement, the New Zealand national government clearly emphasized enhanced transportation investment as a key strategy for improving the economy and increasing the nation's economic competitiveness:

“The government's priority for its investment in land transport is to increase economic productivity and growth in New Zealand. Quality land transport infrastructure and services are an essential part of a robust economy. They enable people and businesses to access employment and markets throughout the country and link them to international markets

through the nation's ports and airports. Investing in high quality infrastructure projects that support the efficient movement of freight and people is critical.”

The government, elected in 2008, created a new office, or portfolio, for infrastructure to develop a 20-year plan for the nation's total public infrastructure system, including transportation, schools, prisons, hospitals, and housing. The Treasury established an Infrastructure Unit to carry out the government's infrastructure goals. An Infrastructure Advisory Board, which includes stakeholder representatives from industry, local government, and the public sector, will provide independent advice to the Infrastructure Unit and the minister of infrastructure. It will also help coordinate the development of the National Infrastructure Plan and monitor progress on the objectives of the plan after it is released.

The government listed seven initial Roads of National Significance for priority in investment. Its emphasis is to focus investment to achieve economic growth and productivity on the roads:

- ▶ Puhoi to Wellsford—State Highway 1
- ▶ Completion of the Auckland Western Ring Route—State Highway 20/16/18
- ▶ Auckland Victoria Park bottleneck—State Highway 1
- ▶ Waikato Expressway—State Highway 1
- ▶ Tauranga Eastern Corridor—State Highway 2
- ▶ Wellington Northern Corridor (Levin to Wellington)—State Highway 1
- ▶ Christchurch motorway projects

Its Government Policy Statement emphasizes its intention to focus investment on these major corridors on the national network:

“These are seven of New Zealand's most essential routes that require significant development to reduce congestion, improve safety and support economic growth. The purpose of listing roads as nationally significant is to ensure these priority roading developments are taken fully into account when the NZTA develops the National Land Transport Programme. Planning for the future development of the land transport network should reflect the importance of these roads from a national perspective and the need to advance them quickly. The National Land Transport Fund can be used for the future development of the Roads of National Significance. Roads of National Significance will be part of the National Infrastructure

Plan. Further Roads of National Significance may be added over time.”

The government specifies that expansion and improvement of the state highway system should receive 33 to 34 percent of the total transport budget. To help increase investment in the state highway network, the government moved about NZD130 million (USD96 million) in nonhighway expenses from the dedicated land transport fund, which is paid for primarily through fuel taxes and road user charges, to the state’s general fund, increasing overall transportation investment. Therefore, the New Zealand government made highway investment a priority and achieved this by the following:

- ▶ Reprioritized other funding in the National Land Transport Fund
- ▶ Injected additional crown funding
- ▶ Authorized the agency to raise debt
- ▶ Encouraged exploring of alternative funding sources, including debt tolling

British System Expansion Plans

Great Britain is pursuing a massive rebuilding of its most important highway, the M25, while also exploring the development of a high-speed rail network, improvements to conventional rail service, and the upgrade of other priority highway routes across the country.

The largest active project is the GBP6.2 billion (USD10.2 billion) design-build-operate-finance widening and operation of the M25. It is one of the world’s most heavily traveled highways with volumes of up to 200,000 vehicles a day. It is a ring road around London and forms the hub of England’s motorway network. The majority of the contract value is in maintaining and operating the road over 30 years, but the project also includes widening nearly 100 km (60 mi) of the beltway.

In August 2009, British rail operator Network Rail released a study recommending a GBP34 billion (USD54 billion) high-speed rail line from London to Scotland with branches to the Midlands and Northwest. It promotes the line as a high-speed, low-carbon solution that will promote economic growth, environmental sustainability, and social inclusion.

Network Rail said the intercity service will save 300,000 tons of carbon emissions and 50 million hours of travel time in the nation. It said a detailed study concluded that a new 200 km/h

(124 mi/h) high-speed line to the Midlands, Northwest, and Scotland would cut travel time to Scotland from London by half to just over 2 hours. The rail operator said its study concluded that the line will pay for itself and provide additional societal benefits, such as travel time savings, emission reductions, and the ability to use current intercity lines for local commuter traffic.

Victorian Transport Plans

The Australian state of Victoria has embraced an ambitious AUD38 billion (USD35 billion) plan to reshape its urbanized areas around Melbourne by coordinating development in five urban and suburban hubs across the region. The plan also strengthens the connections among regional, rural, and metropolitan Victoria so all parts of the state share in prosperity. The Victorian Transport Plan is the government’s statewide action plan for expanding the reach and capacity of Victoria’s transport system over a 12-year period. Melbourne’s population was about 3.6 million people in 2009 and is forecast to grow to 5 million by 2030. Transportation officials said 1,600 people a week move into the city.

Recently the city secured more than AUD3 billion (USD2.7 billion) from the central government for transit expansion (regional rail link) because the state demonstrated that it had an ambitious land use and transportation plan in place. State transportation officials said they and local officials

Victorian Transport Plan

In announcing the Victorian Transport Plan in 2008, the premier said the following:

“Our Government will deliver key transport projects over the short, medium and long term that will transform our State. . . . For the first time in the State’s history, the Victorian Transport Plan is fully integrated with future land use planning—so that these investments will help shape sustainable, resilient and livable communities for the future.”

The plan included the following:

- ▶ More than AUD5.4 billion for new rolling stock
- ▶ AUD1.9 billion to expand suburban roads
- ▶ AUD2.4 billion to expand the metro rail system
- ▶ AUD4 billion for a regional expansion
- ▶ AUD4.5 billion Metro rail tunnel
- ▶ AUD2.5 billion road tunnel
- ▶ AUD6 billion road to complete Melbourne’s orbital network

share a vision to reshape the urban region into one that is sustainable and more compact and that has distinct hubs that efficiently integrate business, residences, and transportation. Victorian Department of Transport officials said they developed a shared vision to integrate the highway, transit, and rail systems into a network that accommodates the growth of the region without creating auto-dependent sprawl that could reduce the region's high quality of life. They said the main driver for the vision and investment is less a response to climate change and more a desire to develop a functioning transportation system to accommodate economic growth and quality of life.

"We can't shape our city if we don't have a transportation plan first," said a Victoria official.

He said the government is in favor of higher density development, but realizes that such development cannot be located only in the Melbourne central business district. He said the region desires five natural clusters of development, including the Melbourne central business district and four suburban hubs. The plan calls for developing infrastructure to support these five hubs without further stress on the transportation systems. Officials know they have to plan for another 600,000 suburban residents by 2030, as well as plan for growth in the central business district. "The challenge for us is to put transport in early ahead of the growth."

The Melbourne region already has one of the most integrated and diverse transportation networks in the world. It has more than 240 km (144 mi) of trams, extensive rail passenger service, and active cycling and walking programs and plans to expand those services. Officials recently announced the biggest rail project since the 19th century, which will include expansion of two new tracks to provide rail passenger service in the suburbs.

The state and Department of Transport also developed *Freight Futures: Victorian Freight Network Strategy*, which plans for an ambitious expansion of the freight network to accommodate growth in water, shipping, rail, and highway freight traffic. The plan says containerized shipments from its port are expected to grow from 2 million containers in 2009 to 8 million by 2036. It says that highway freight-kilometers of travel are expected to increase 70 percent and the number of trucks on the roads by 60 percent. The large majority of freight now moves by truck, but the freight plan calls for significant efforts to expand rail service. The plan also calls for 20 distinct freight strategies, including the following:

- ▶ Identify a freight network.
- ▶ Develop freight activity centers.
- ▶ Protect future corridors.
- ▶ Plan for freight growth.
- ▶ Improve the "last kilometer."
- ▶ Invest in both roads and rail.
- ▶ Manage where trucks travel on the network.
- ▶ Improve freight data collection.

Demonstrating Return on Investment: Value for Money

"Value for money" was a common theme the scan team heard during its study. The agencies continuously used benefit-cost analyses to evaluate projects and communicate their benefits to the public, stakeholders, and government. The use of benefit-cost analysis appeared to occur at both the project level to evaluate individual projects and the program level to consider overall investment levels. Reliance on benefit-cost analysis and the value-for-money concept appeared to be ingrained in the agencies, ministries, parliaments, and local government project sponsors. The smallest nation visited, New Zealand, had a 956-page *Economic Evaluation Manual* for highway projects.

British Benefit-Cost and Risk Analysis

The British Treasury published and updated a *Green Book: Appraisal and Evaluation in Central Government*, which requires five stages of evaluation of benefits and costs, not only for the selection of individual projects but also for the funding of government programs.

As the document states, "The purpose of the *Green Book* is to ensure that no policy, programme or project is adopted without first having the answer to these questions:

- ▶ Are there better ways to achieve this objective?
- ▶ Are there better uses for these resources?"

The *Green Book* describes the types of analysis that need to occur during policy or program development, when new or replacement capital projects are considered, when assets are considered for disposal, when new regulations are considered, and when major procurement decisions are made.

The British Department for Transport has developed a comprehensive approach to evaluating projects and documenting their value for money based on the underlying government approach described in the *Green Book*. The principal aim is to ensure that value for money is achieved and that the department's chief

accounting officer can document projects' justification when required by Parliament. Department for Transport officials said they use their benefit-cost program to advise ministers on the expected impacts of proposals, support planning staff decisions, and explain to the public about the benefits and impacts of projects and programs.

The Department for Transport evaluates projects on a cost-benefit basis rather than a cost-effectiveness basis. The cost-benefit process quantifies in monetary terms as many of the costs and benefits of a proposal as possible, including items for which the market does not provide prices. These include the cost of a ton of carbon emissions or the value of time. In a cost-effectiveness evaluation, an analysis includes only the costs of alternative ways to provide the project or service. The value of many externalities is not included.

The British transport benefit-cost system compares projects or programs to a no-build or no-action scenario (figure 12). Its analysis assumes that in an increasingly populated world that congestion and its associated costs of delay, emissions, and crashes would increase in the no-build case. Therefore, the costs and benefits of a project are compared not just to the current base case of conditions, but also to a future no-build case in which congestion and its impacts are higher. The British analysis seeks to evaluate if net social welfare would be greater with the investment than without it. The Department for Transport evaluates projects on a 60-year horizon with a 3.5 percent discount rate.

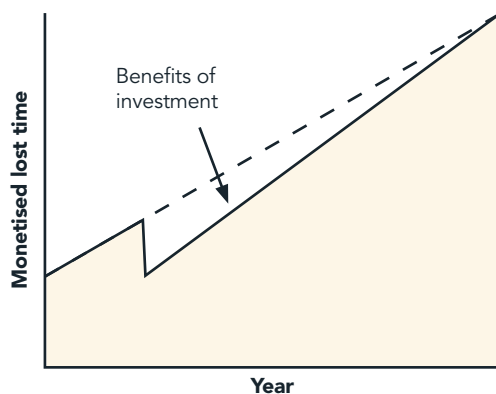


Figure 12. A project's congestion benefits are compared to a no-build scenario.

Among the values that are monetized when evaluating projects are risk of death and injury, noise, carbon emissions, physical fitness of residents if they increase their amount of walking, travel time savings, operating costs of the facility, private sector impacts, and the costs to government. Other

factors for which a qualitative value is applied include the effects of visual intrusion on a community, aquatic impacts, social inclusion, biodiversity, and effects on historical facilities or geographic context. With the other nonmonetized values, Department for Transport officials create an adjusted benefit-cost ratio, which is not as economically robust but captures a wider array of impacts and considerations.

Department for Transport officials use the findings to make value-for-money reports that can assess a project or program by the following:

- ▶ Economic benefit-cost ratio
- ▶ Adjusted benefit-cost ratio, which includes assumptions about the value of the intangible costs and benefits
- ▶ A description of nonmonetized impacts, such as the quality of effects on a community
- ▶ A description of how sensitive the benefit-cost analysis is to intangible benefits, such as the project's effect on the community's landscape
- ▶ A final value-for-money recommendation

Projects are grouped by their relative merits, with projects with benefit-cost ratios of 1.0 or less rated as poor, above 2 as high, and above 4 as very high. With such rankings, officials can document that up to 95 percent of projects the department selected were in the high or very high value-for-money category.

Other Benefit-Cost Applications

Queensland Department of Transport and Main Roads officials demonstrated how they use benefit-cost rankings to prioritize arrays of strategies. They rank ordered a large number of safety countermeasures by their benefit-cost ratios. Strategies as diverse as increased speed enforcement, increased driver education, and engineering improvements were evaluated based on international studies of their effectiveness. A Pareto analysis was conducted to determine which small percentage of roadway conditions create a disproportionate percentage of crashes. From those two analyses, the most effective strategies to address the crashes were estimated by rank order of cost-effectiveness. The most cost-effective was an increase in police presence combined with speed cameras, which produced a 65:1 benefit-cost ratio.

NZTA conducted a periodic baseline review of the benefits of enforcement services that could lead to increased investment. An additional 337,000 road-policing hours were added when the benefit-cost analysis showed it would provide an 8:1 return (with no diminishing returns.) The benefit-cost ratio

of targeted onroad enforcement, speed cameras, and safety advertising has shown benefits of up to 28:1.

Officials in these agencies said they use such analyses to explain their decisions to the public, media, and legislators. “We get tremendous scrutiny on what we are investing in. The dollar we spent could be spent on some other public good. So we find ourselves being more thorough on analyzing and explaining how we spend that dollar,” said a Queensland official.

Exceptions to Benefit Costs

Despite the widespread use of benefit-cost analysis, the benefit-cost ratio was often not the only criterion used in project selection. Officials said policy considerations, social objectives, and environmental considerations often were key factors in decisionmaking. For instance, New Zealand officials said that if their passenger rail investments were made solely on benefit-cost ratios, the level of passenger rail spending might be reduced. However, society expects an adequate level of transit service, which the government desires to meet. In addition, the seven Roads of National Significance were not selected as a result of a benefit-cost analysis, but as a result of a policy-driven initiative to improve the economy and make the country more competitive. The New Zealand Investment and Revenue Strategy assigns a profile to every transport product, giving a high, medium, or low rating for each of the three criteria: strategic fit, effectiveness, and efficiency.

The amount to be spent on the massive Nation Building Program in Australia was not calibrated based on an economic analysis of benefits and costs. However, the benefit-cost ratios of individual projects will be a factor in selecting and ranking the projects proposed for funding.

Although the officials interviewed were adherents of benefit-cost analysis for projects, all acknowledged that it may not capture all considerations of a project and that their governments often considered noneconomic factors in their final decisions.

Risk Management

The concept of risk appeared to be emerging rapidly among the agencies that sought to demonstrate the financial prudence of their actions. By managing risk, they could more intelligently invest scarce resources among many competing investment needs.

For example, the concept of risk management permeated the New South Wales RTA. Risk was discussed in virtually every

decision area of the organization, from how it tests and licenses young, at-risk drivers to how it selects locations for guardrails, performs maintenance on steep slopes, and measures the risks of reusing treated timber pilings. A perusal of the agency’s financial statements, annual reports, and oversight documents revealed that managing risks and making rational tradeoffs between the degree of risk and the subsequent level of investment were widespread across many disciplines.

The New South Wales *Total Asset Management Manual* describes risk management as a systematic process to identify risks that may impact the organization’s objectives, analyze their consequences, and develop ongoing measures to treat them. It says risk management is essential at any stage of the asset life cycle when a significant decision must be made. The risks associated with the decision and their implications should be weighed with other factors when determining a course of action. It requires that risk management be formally applied throughout the total asset management process when setting strategic directions, developing or evaluating projects and programs, and entering into contracts with the private sector.

The New South Wales RTA annual report acknowledged that it faces considerable challenges and risks in managing its large bridge and road networks. The number and cost of high-volume, aging pavements with undetermined remaining service lives was one form of risk mentioned in the report. A key challenge in managing these pavements is to accurately forecast the structural conditions and their subsequent remaining useful life. To reduce risk, the department captures the results of research projects to more accurately predict the structural integrity of the pavement and better identify which high-volume pavements are at high risk of eventual failure. Those pavements are scheduled for rehabilitation or replacement.

On lower volume pavements, another aspect of risk management and pavement decisionmaking was to give priority treatment to weaker and more water-sensitive rural granular pavements over urban arterial asphalt roads, which are more resilient to rainfall. The urban arterial roads are typically lower speed roads and represent less risk to road safety caused by surface roughness than the higher speed rural routes. The risk-mitigation approach has resulted in acceptable levels of service on both the rural and urban network and reduced risk on the crash-prone, higher speed rural routes.

The department’s infrastructure maintenance program establishes priorities on a risk basis to protect assets and

safeguard motorists. A strategic risk-based approach is taken to maintenance to determine minimum levels of service and ensure consistent requirements for identifying and rectifying defects. The bridge management approach prioritizes investments by historical failure rates for specific elements of bridges based on bridge age and bridge design (figure 13). The department realized that pre-1948 bridges lack sufficient live load safety factors, so it prioritized those bridges for corrective treatment. Likewise, it identified a list of high-risk slopes on the state network for inspection and treatment.

In driver licensing and vehicle inspection, the consideration of risk was highly evident. A Novice Driver Pilot Program was begun as an AUD10 million education program to reduce the number of young driver deaths on state roads. The trial was a joint effort by RTA, the Australian and Victorian governments, and the Federal Chamber of Automotive Industries. The training will provide young, provisional drivers with an understanding of their limitations and how they can reduce the risks they face on the road.

A vehicle selection matrix is used as a risk-based procedure for identifying and inspecting heavy vehicles. It improves the intercept rate of high-risk vehicles through a screening process to identify vehicles with historically poor compliance rates. It has been deployed at checking stations to reduce the intercepts of low-risk vehicles and to focus inspection activities on higher risk vehicles and operators.

In 2006, the department began an environmental risk assessment of the reuse of treated bridge timbers. The timbers had not been reused because of concerns about surface treatment chemicals. Depending on the outcome of the risk assessment, the department will conduct a trial timber reuse program. Also, in the environmental area it adopted a risk assessment process for identifying construction projects with a propensity for significant sedimentation runoff.

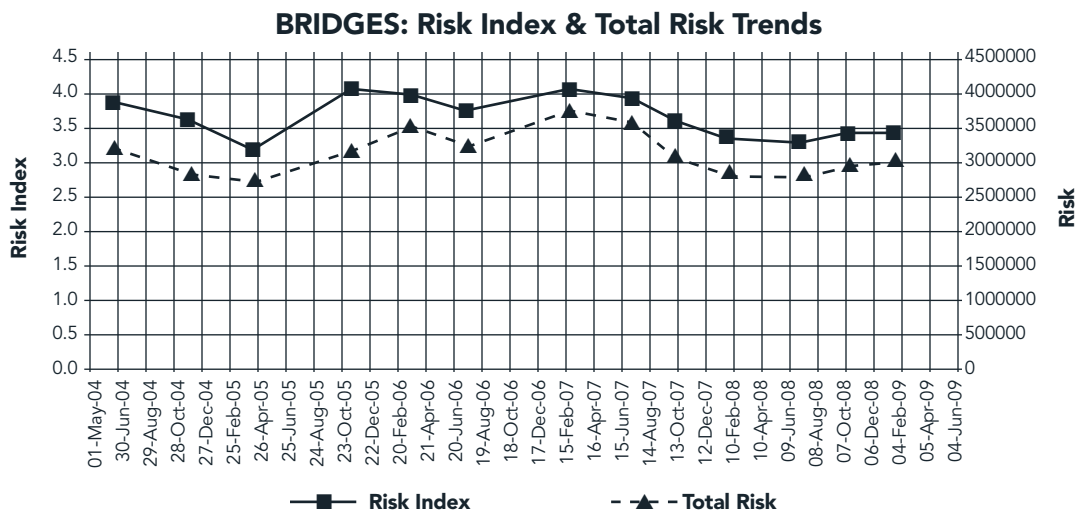


Figure 13. Queensland officials track the overall risk to their bridge inventory as an ongoing metric in their reporting processes.

Transparency, Accountability, and Emerging Issues

Noticeable throughout the scanning study were the large amounts of performance data the agencies produced. Their annual reports, service agreements with the central government, and midyear progress reports all were voluminous in the depth, scope, and scale of their performance reporting.

It was apparent that legislative and budget officials could evaluate the agencies' performance across a wide range of activities. They could produce results showing their accomplishments on highway asset conditions, highway and transit performance, environmental impacts, operating efficiencies, and public satisfaction with their agencies. The performance information was highly detailed and tended to track results over time (figure 14). It was clear the agencies had fully embraced performance management as the framework for running their organizations.

Reporting Documents Were Professionally Produced

The use of professionally produced reports for public information was common. The agencies produced annual reports, strategic plans, strategy reports, and other documents printed on magazine-grade paper stock, with full-color photography and advertising-quality graphics. While such high-cost reports may be criticized in the United States, they were commonly accepted in the countries the scan team visited as an appropriate means for conveying complex and important information to the public. All of the agencies produced a significant number of such publications each year.

One agency staff member said the agency uses the reports as a recruiting tool with young professional job candidates. The high quality of the publications, which depict the importance

Annual Road Fatalities in Victoria, 1970-2004

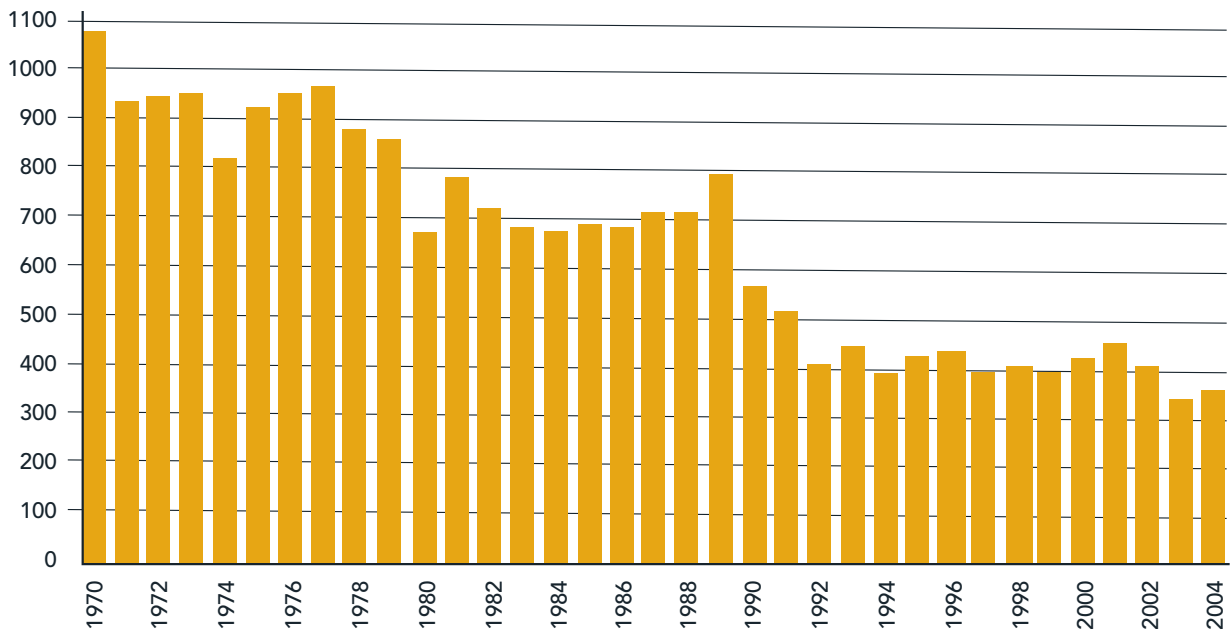


Figure 14. Highway fatalities in Victoria have fallen significantly.

of the agency's work, illustrates the personal and professional rewards that can come from working for the organization, the staff member said.

Performance Reviews

Reviews of the agencies' performance were common. These reviews were often required through statute or regulation, such as the quarterly progress reports SRA provides to central government budget officials in Sweden. The Results and Service Plans in New South Wales and the Statements of Intent in New Zealand also were followed with regular progress reports to central officials throughout the year.

Agency officials said that the updates keep the agency focused on results, but that they also have other important benefits. They said regular reporting to central agencies tends to increase the central officials' understanding of the issues confronting the agency.

"We rely on dialogue, dialogue, dialogue," said an SRA official in explaining the strategy for communicating needs, results, and constraints to central budget officials. SRA officials meet with budget officials monthly. Formal quarterly reports are required on their progress toward the annual operational plan. However, the reporting sessions tend to involve more informal dialogue than formal review of detailed performance metrics, SRA officials said. They said they and their agency benefit from the continuous interaction with budget officials because it enhances the central government's understanding of the agency's needs and what it realistically can accomplish within the constraints it faces. Instead of penalties for failing to meet a specific target, the discussion usually focuses on factors that influenced actual performance.

A New Zealand transportation official made similar observations about the importance of regular reporting to ministry officials. "Many of these communications are formal and many are informal. In reality, organizations are people. Much of this is how people interact. Our interaction is heavily dependent upon the trust and dialogue between people. It takes trust for government to say, 'We'll leave these decisions up to you.' Letting agencies have large budgets and influence does require a high level of trust in making these decisions."

The agencies commonly hold regular internal update meetings in which agency managers report on progress on agency goals.

SRA uses a Balanced Scorecard tracking process at all levels of the organization. Each manager has his or her unit's own

Balanced Scorecard report that feeds into the organizational scorecard. Regular updates on progress are held with the senior staff, often monthly. All major aspects of the agency's Balanced Scorecard reporting are also tracked on the agency intranet, which includes voluminous reports on agency performance. SRA also has invested in intense leadership training with small groups of managers to ensure they understand the performance management framework of the organization.

In all of the agencies visited, performance audits were common and were usually required by law. The countries or states had Treasury officials or auditors general charged with the performance audit function. The auditors published reports and recommendations, which were incorporated into the management priorities for subsequent years.

Incentive-Based Management

"Do It With People, Not To Them"

"Do it with people, not to them" was both a direct quote and a common sentiment heard from transportation officials during the scan. From Sweden to New Zealand, transportation officials advised that carrots versus sticks, incentives versus penalties, and dialogue versus dictates were preferred in the intergovernmental management of performance.

Experienced agency managers urged cooperation when the central government sets measures for transportation agencies to achieve or transportation agencies set targets for local agencies. They universally advised that collaborative processes to assess strategies and set goals were preferable to performance mandates. The scan team found few cases in which one level of government penalized another for poor performance. The performance measures found were benchmarks for continuous improvement and dialogue, rather than milestones for penalty.

British Cooperative Performance Process

As mentioned previously, the British performance management process has evolved from a prescriptive process to a cooperative and collaborative one. The national performance management process began in 1998 with a long list of performance measures that the central agencies, regional governments, and local governments were required to report on. Web sites and news reports revealed that regional and local governments had significant difficulty with the time and expense the reporting requirements involved. The number of required measures steadily declined, culminating in 2007 in a significant change in

the government's approach. In that 2007 update, four key changes were made:

- ▶ Clear national priorities were set. A new set of corporate Public Service Agreements that reflect genuine choices about priorities were adopted.
- ▶ Accountability for delivery was strengthened. Published Delivery Agreements clearly set out the level of ambition, strategy for delivery, and role of all stakeholders.
- ▶ Responsiveness in public services was incentivized. Public Service Agreements underpinned by a small basket of indicators were adopted; targets were used only where appropriate.
- ▶ Communities and citizens were empowered.
- ▶ More performance data were provided to citizens and local governments to improve their decisionmaking.

Department for Transport officials said that the decade of trial and error in performance management taught the government that performance measures are a key component of improving government services, but they are best used in a collaborative, cooperative process. Performance measures work best when departments and agencies being measured have a sense of ownership of the measures and believe they reflect a shared priority.

“We also work with them to set the target, because we want them to own it,” said a Department for Transport official who works with local governments to reduce congestion in their communities. “We very much went through a process to try to get them to own it. . . . One of the benefits is they now say, ‘We much better understand our network and we much better understand how we can manage it.’ . . . The big lesson is this has to be worked out over a number of years. There is a lot of learning on both sides. The fact that we have persuaded the local authorities to do this illustrates that we came up with evidence to overcome their skepticism. . . . The locals said the money was good but the real value was, ‘we felt important, we got to interact with the DfT, which we don’t normally get to do. You shined a light on us and we got to interact on strategies with the DfT to improve.’”

The British experience demonstrated a repeated pattern of officials setting several narrow measures as surrogates for achieving a larger social goal. Over time, they lessened reliance on many measures of output for fewer measures of outcome. “Be absolutely ruthless about what you measure, how you measure, and what you mean,” advised one British veteran of the performance measure evolution.

The British also advised that performance measures combined with financial incentives and penalties are only a very small part of improving local or regional government performance. They said they use a broad range of other strategies to convince regional and local governments to want to improve their performance, rather than forcing them to improve their performance. These strategies include the following:

- ▶ Central government officials providing peer data to illustrate to local governments how their performance may lag behind their peers on important public services or asset conditions
- ▶ Specific training to enhance existing teams in local authorities and improve, in particular, specialist skills
- ▶ Enlisting of local government officials in peer exchange groups so they learn and benchmark from one another
- ▶ Active management against trajectory, which is the joint tracking of performance compared to a target to anticipate and correct performance before a goal is missed (figure 15, see next page)
- ▶ Publicity and praise of high performers
- ▶ Giving agencies greater autonomy to achieve outcomes

The Department for Transport does not use the measures and targets in a punitive fashion to demand performance from local government, officials said. “Targets are not the only lever. We’ve moved away from looking only at measures (of whether local government accomplished desired results). We’ve expanded our evaluation to look at overall, ‘What did it do? What does it want for itself? Is it achieving those goals?’ The measures form the basis for the discussion, but are not the only focus of the discussion.”

“You’d better be very clear about what you want to do and what you want to get. Also don’t do it to people; do it with people.”

Officials said the lesson from their experience is that improving performance of local governments involves constructive engagement in the form of workshops, benchmarking, newsletters, peer reviews, and consulting assistance. The semiannual review of budgets and performance is only one part of the process to set and achieve goals. “You cannot do it only in the context of a spending review,” one said. “Understand your delivery method. This is absolutely key.”

“Have indicators but not targets. Think hard at the beginning to have broad indicators and categories but not targets. You want to be focused without having specific targets.”

Policy Delivery: Trajectories

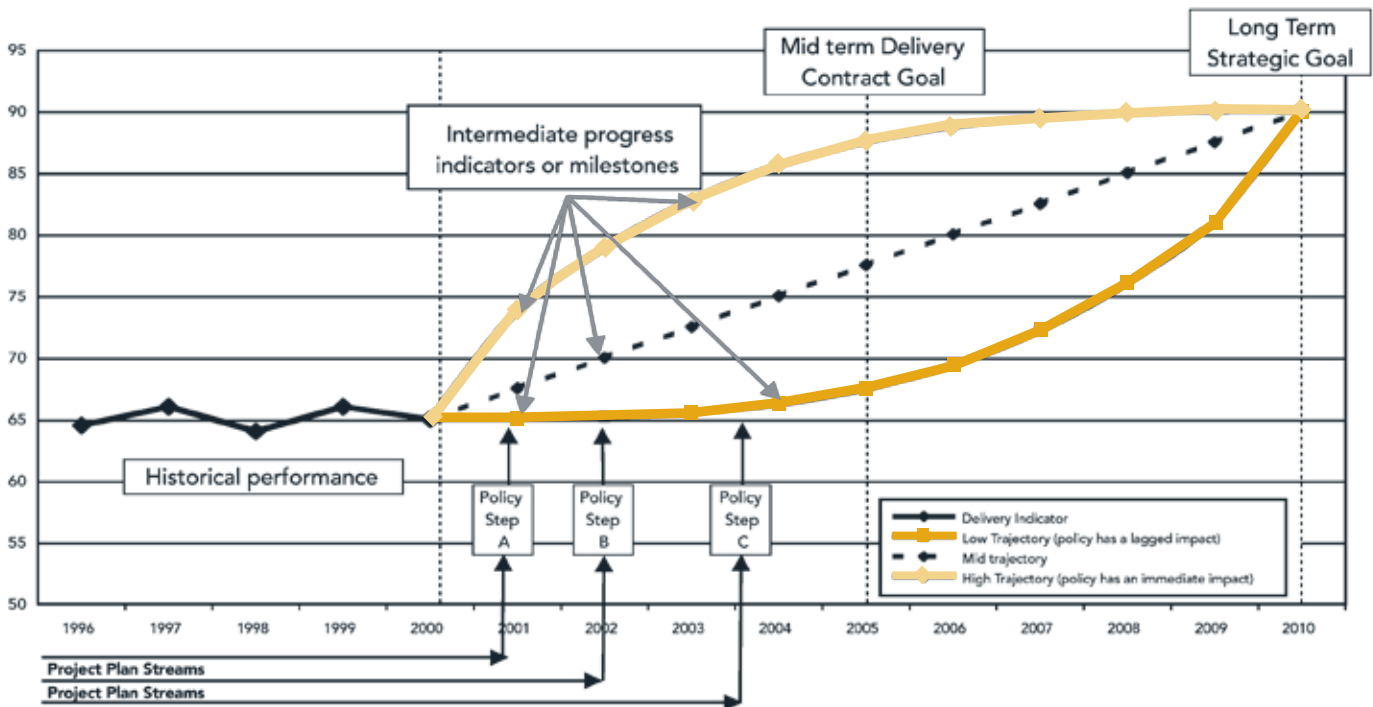


Figure 15. Tracking trajectory against target is a British strategy to achieve performance.

The United States and British transportation governance structures have significant parallels. In both countries, the central government works with a large number of regional and local partners to carry out government transport policies. Although HA provides more direct management of central roads than does FHWA, the British agency still relies on regional and local authorities to manage 97 percent of the country's road-miles. HA manages 2 percent of the network, but that includes high-volume routes that carry 31 percent of all British motorway traffic. The remaining 69 percent is under local jurisdiction.

When the government sets goals to reduce crashes, reduce emissions from transportation, or get best value for the money from transportation investment, it must rely on the performance of the regional and local governments that control most of the highway network. The central government in England works with 34 counties, 238 regional district governments, 83 unified districts that include both counties and cities, 33 London boroughs, the seven largest cities (which have significant autonomy), and six integrated transport authorities. In short, central government officials must work through a wide array of broadly distributed and individualist local, regional, county, and city agencies to achieve national performance goals, such as congestion reduction.

“The delivery of this becomes quite a bit interesting because we don't have control over this,” said a Department for Transport congestion official. “It is a matter of ‘what are our levers to deal with this?’”

Despite the complexities of the governance structure, the Department for Transport has engaged in performance improvement in a broad number of highly complex, highly distributed areas, such as congestion reduction in the 10 largest urban areas. Because the Department for Transport and HA do not control the cities' routes, traffic signals, transit operators, or rail operators, their approach has been one of education, consensus, and incentives. One of the few programs the scan team found that actually included financial incentives or penalties was the English urban congestion program. This program sets goals for modest reductions in congestion levels in urban areas. Despite the modest level of congestion reduction sought, the result would be a significant improvement in the growth rate of congestion, which had been steadily increasing for a number of years.

The program provides GBP60 million (USD96 million) in supplementary funding over 4 years for projects, operational improvements, and other strategies in the 10 urban areas. Payments to the cities are based on their performance and are staggered to incentivize them to exceed their agreed-on

targets. If an area fails to achieve its target, the Department for Transport makes a qualitative decision on how the area has been performing, with up to 25 percent of its original allocated funding available. If the Department for Transport decides that the local government is not making a sufficient effort to meet its congestion target, no reward funding is provided. To date, no area has lost all funding, but two areas were deemed as making insufficient progress. They were subject to increased assessment to improve their strategies and received 25 percent funding that year.

New Zealand Local Government Engagement Strategies

New Zealand also has a negotiated target-setting process in which it works with local governments to set transportation performance expectations. Although a small country of 4 million people, it works with 85 local councils to set targets.

The New Zealand structure has some parallels to the United States in that it has regional councils that function somewhat like metropolitan planning organizations (MPOs) in collaborating with the central government to select projects. In fact, NZTA officials said that the agency proposes few projects that do not come from regional and local officials. NZTA's own state highway projects must be included for funding consideration in regional programs. In project selection, much of the emphasis flows upward from local officials to the central government. In two other important ways, the emphasis flows downward from the central government to regional and local officials. Local officials are required to develop Long-Term Council Community Plans (LTCCP), asset management plans, and financial management plans, which NZTA must audit and approve. NZTA is interested in two components of the LTCCPs, the asset management plan and ensuring that the community was consulted on projects for which financial assistance is requested. The effect of these processes is local input on project selection and programmatic or statutory requirements for local officials to demonstrate basic competency in areas such as asset management, local planning, and long-term financial management.

Regional land transport strategies must take account of local priorities while also demonstrating that national objectives have been considered. In addition to land transport strategies, local governments must adopt a community plan and an asset management plan. The asset management plan is a derivative of national financial sustainability requirements that local governments must demonstrate. The long-term sustainability of NZTA-owned assets is considered one component of the

long-term fiscal solvency of the local government. The asset management plan includes targets for different levels of service for different types of assets. The necessary levels of investments needed to achieve those targets also must be identified. The asset management plans and their accompanying fiscal plans are subject to review by the Office of the Auditor General.

When asset management plans were first required in 1996, many communities hired consultants to develop their plans. NZTA officials said some viewed the plans as stand-alone requirements necessary to satisfy the central government. Over time, continuing consultation among NZTA officials, the auditor general, and local officials led the local officials to understand that asset management is an ongoing approach of implementing good practices, not a stand-alone report or information system. Although NZTA sets performance expectations, the agency does not audit local governments or their LTCCPs. Asset management now is widely accepted by the local governments because the nation has developed a wide cohort of local officials with a strong understanding of asset management principles and strategies.

The central government through NZTA has supported the local asset management evolution by providing data through the national Road Asset Management System (RAMS.) RAMS includes not only an inventory of all pavements, but also a history of all their treatments and a forecast of their deterioration, section by section. "You can actually tell in front of every house in New Zealand how many potholes they have and how many cracks," said one official.

Local and regional governments are also required to develop their own targets for crash reduction, transit operations, and walking and cycling goals. NZTA officials called the safety goals "tremendously useful" in encouraging local governments to focus on crash-reduction efforts over the long term. Although there are no national targets for transit use, regional targets are set that include factors such as total overall patronage, percent of income from the fare box, passenger-kilometers traveled, and service provision to the elderly.

Queensland Roads Alliances

The Queensland Department of Transport and Main Roads took coordination with local governments to a new level by leading the formation of regional Roads Alliances. These alliances are formal, collaborative groups of local governments that form asset management and safety management plans for the entire network of roads in their regions. These alliances and their networks cut across local boundaries and include all

local and state routes in a region. To date, 32,000 km (19,883 mi) of local and state routes have been brought under the jurisdiction of Local Roads of Regional Significance.

The department proposed Roads Alliances as a regional and collaborative approach to provide seamless decisionmaking across the state on local, primarily rural, roads. Because the public expects consistent conditions across the entire network, the alliances offered a way to pool resources, knowledge, and decisionmaking for more consistent roadway performance across the regions.

Through Roads Alliances, members develop an asset management and a safety management plan for the road network in their region. A Roads Alliance board oversees the overall process, while Regional Roads Groups select projects and make local decisions. Each Regional Roads Group is supported by a technical committee of experts from the Department of Main Roads and Transport and local engineering experts.

Queensland officials said the Roads Alliances have led to regional approaches to transport planning and road works delivery, increased local government influence on state decisionmaking, and increased the availability of technical expertise to local governments.

Money is available for alliances to improve their capabilities in five performance areas:

- ▶ Operational effectiveness
- ▶ Program development
- ▶ Road safety
- ▶ Asset management
- ▶ Joint purchasing and resource-sharing agreements

A Transport Infrastructure Development Scheme provides funding to local governments of about AUD63 million (USD46 million) annually. To access funds, alliances must demonstrate road stewardship capability and that most of the money will be managed through the Regional Roads Groups and their cooperative prioritization process.

The Roads Alliances are pursuing three new capacity-building products. One is called NetRisk, interactive software that allows the user to identify high-risk areas of the local road network and evaluate countermeasures. The alliances are also developing a statewide approach to asset management and road safety, including the use of the NetRisk tool.

Swedish Local Cooperation

The Swedish model illustrates that an institutional culture of consensus can be used to cascade broad national goals into local performance. Two hundred and ninety Swedish municipalities govern all cities, towns, and undeveloped areas between the towns. No counties or unincorporated areas exist in Sweden. Using outreach, promotion of best practices, benchmarking, small grants to encourage behavior, and continuous dialogue, SRA has extended national government objectives into the practices, processes, and projects of the local municipalities. SRA's ability to direct municipal agencies is nonexistent, yet the Ministry of Transport and Parliament expect SRA to use persuasion, education, and benchmarking between municipalities to instill central government policies into local governmental actions. SRA officials acknowledged that local performance is not uniform, but they reported continuous improvement among local governments, despite a lack of control over them.

"It is a very cooperative process," said a Swedish official in describing SRA interaction with local governments. "It doesn't have to be. We could use our power to be road builders, but we don't do that. We think we reach our goals much better if we cooperate."

SRA's example illustrates the success of a transport agency reaching beyond its normal stakeholders to create alliances in other sectors to address cross-cutting issues such as vehicular safety and emission reduction. It regularly collaborates with automobile manufacturers on vehicle emission reduction and safety improvement. It also works with trucking firms to help them identify ways to increase vehicle efficiency, reduce emissions, and earn accreditation as "green" businesses. Such accreditation can be an important marketing tool in environmentally conscious Sweden. It has worked with automotive manufacturers to adopt advanced skid-protection technology (electronic stability program) in cars, which is estimated to reduce the risk of fatalities by 15 percent. SRA campaigns on behalf of vehicular safety and regularly works with the media to promote vehicular safety as an important automotive feature. As a result, it is difficult to sell an automobile with less than a five-star safety rating to the informed public, SRA officials said.

Cooperative Goal, Target Setting

It was common in almost every agency visited to find a cooperative forum through which the central government and transportation stakeholders collaborate to establish transportation goals and targets.

In England, local authorities and development agencies advise the Department for Transport on goals, targets, projects, and priorities. In New Zealand, regional councils play a similar role. New Zealand also has a National Road Safety Council and an Asset Management Steering Committee that influence government policies in those areas. In Australia, the Council of Australian Governments represents state and local governments in ongoing consultation with the central commonwealth government. In each state, regional councils work with the state governments. Sweden and other European nations work with the European Union and the Organisation for Economic Cooperation and Development to set common goals in areas such as automobile safety, emissions, and benchmarking.

The Swedish experience also demonstrates the influence of benchmarking with other transport agencies to identify best practices. SRA has regular benchmarking efforts with Poland, Lithuania, Latvia, and the Nordic Association, which includes Norway, Denmark, Iceland, Finland, and the Minnesota DOT.

One of the most continuous transportation benchmarking and peer review processes is that run by Austroads, the association of road authorities in Australia and New Zealand. Since 1993, it has coordinated the publication of National Performance Indicators for New Zealand, as well as the states and territories in Australia.

Current measures include several categories of crash data and costs, pavement smoothness, a general measure of the benefit-cost ratios of projects, travel speeds, congestion, and a user satisfaction index. Under development are measures for the following:

- ▶ Greenhouse gas emissions
- ▶ Citizens' exposure to noise
- ▶ The effectiveness of regulatory strategies, such as size and weight enforcement, speed limits, hours of service, and vehicle roadworthiness standards
- ▶ The efficiency of transactions, such as vehicle registration and licensing

The publication of performance information enables the eight state and territorial transportation agencies in Australia and the national authority in New Zealand to benchmark themselves at both a national and international level. The voluntary effort helps the authorities improve their effectiveness and efficiency as part of the overall Austroads goal to identify and implement international best practice in the management of roads.

Outcomes Relate to the Public in Personal Terms

The transportation agencies the scan team visited all were impressive in the depth and breadth of technical performance data they presented. At the same time, they consolidated the highly technical data into categories of performance that were understandable and relevant to the public. Rather than extensive technical and financial data, public reporting focused more on outcomes of relevance and clarity to the typical user.

"We make the good journey possible" is the Swedish Road Administration's motto. Its entire budget is categorized in four broad areas: "Capture customer needs, improve transport conditions, offer travel opportunities, and provide support during the journey."

The British Highways Agency spoke of three overriding objectives: "Safe Roads, reliable journeys, and informed travelers."

The Victoria Department of Transport's annual report has broad goals for environmental sustainability with calculations of energy consumption and greenhouse gas emissions down to the number of reams of paper the department uses.

It appeared that the departments made consistent efforts to translate their goals and strategies into meaningful examples relevant to the public.

Austroads officials reported that the effort began in an era when the Australian and New Zealand governments were focused on improving corporate governance. The agencies involved decided they should adopt common performance metrics and benchmark their performance before the central government mandated it. They believe that the widespread availability of such robust data may also have played a role in the Australian central government not establishing its own set of performance measures for states and territories.

Performance Management Takes Time and Resources

The experience of the international agencies was that performance management is a very effective way to demonstrate results and accountability, but agency officials also warned that it can take many years. The conditions on large systems such as transportation networks do not change quickly, but only after years of sustained efforts. Gathering accurate data, achieving consensus on goals with other

partners, and constructing projects that actually improve conditions can take a decade or more.

Many noted that developing successful performance management systems is a long-term, iterative process that requires a commitment of funding and staff resources. The measures and targets evolve over time to meet changing fiscal and policy needs. While short-term, quickly implemented dashboards are helpful tools, the ultimate benefit of performance management is the continuous improvement of transportation programs to reach long-term societal goals.

“Evolution is my favorite word,” said a New South Wales official. “It’s about biting off what you can chew.”

The British case study illustrates that successful transportation performance management systems require time, consensus, and clarity, said one British official. “You can’t invent this kind of scheme overnight. It has taken us 10 years.” The British spent 4 years developing their reliability measure, and they already plan to revise it to be more understandable to the public.

Outcomes are Difficult to Measure

Important outcomes that are difficult to measure in the United States were equally elusive in the agencies studied. Such measures as transportation’s effect on the economy, travel time reliability, and transportation’s effect on the environment were not easily captured by the international agencies. All of the agencies expressed a desire for continued evaluation of ways to measure transportation’s effects in these areas, particularly on the economy.

“Our lips are not necessarily connected to our checkbooks,” said one official, who meant that despite a desire to fund broad outcomes such as economic development they were still limited to traditional funding categories. “The money pots still influence decisions. We don’t fund quality of life; we fund transport.”

A Swedish official said they struggle for and have never settled on a good metric for measuring mobility. “For a long time it has been hard to set a target for mobility. What is it really? Reliability? Travel time? What is it?” he asked.

A British official who works with hundreds of local governments said the more they parse measures such as “sound maintenance” or “accessibility” or “air quality,” the harder it is for them to define good performance. Therefore, they use performance metrics as one, but not the only, indicator of performance.

Short-Term Results Can Be Overemphasized

All of the agencies support performance management, but they also spoke of a tendency for elected officials to emphasize short-term accomplishments over long-term trends. Several agency officials cautioned that while frequent budget reporting of results achieved short-term transparency, they feared that emphasis on “bean counting” skewed performance toward easily measured, short-term accomplishments. They advised that a better system was one that tracked accomplishment on long-term goals, which may be more ambiguous to measure but more important overall. Important issues such as the public’s satisfaction with the journey, transportation’s support of economic development, and transportation’s link to environmental sustainability may be vitally important but difficult to measure in monthly increments.

One senior transportation official had worked in the national auditor’s office, where he was involved for many years in measuring agency performance. As an auditor he was an advocate for strict measurement, but now as an agency executive he sees how strict focus on achieving specific targets can divert an agency’s focus from more important but difficult-to-measure objectives.

“One of the dangers of performance management . . . for people like me in my former role at the auditor’s was that performance management was an accountability tool. What it has generated is a dislocation between what is reported and what organizations actually use to manage performance. Focusing on accountability as a way to think about performance management forces us to focus on the things that are easily measured and which can be measured over a shorter time period. That has forced us to measure on short-term things we can count. Also, it leads to risk aversion to the type of targets you set. Accountability is not as helpful as it could be to drive performance. Speaking from my old perspective, I have strong feeling for the need for accountability. In a parliamentary system it is about how the Parliament is a check on the executive branch. But ultimately the Parliament and public are concerned about getting the best value for money. If we get perverse results, that is not the best value of money. The issue is how do we get performance management and targets that actually are going to drive our performance? One of the issues is there is a need for a longer time period. We may need more than a 12-month cycle. We need to look long term rather than ‘what did we do in the last 12 months just so I don’t get beat up.’”

Two other officials expressed frustration over the large number of measures and the frequent audit processes they

experience. “We feel we are submerged in the audit process. By evaluating short-term auditing and accountability measures we often get distracted by whether we’ve made incremental gains rather than the end game. . . . It becomes paralysis by analysis. You spend more time reporting what you are doing than you spend time doing.”

“You are better off to have a few (measures) that everyone understands than this broad suite. You start thinking you need a wide array, but that becomes almost impossible to measure.”

“We’ve been running 8 years on performance reports, and we find that everyone is so exhausted from dreaming up the measure and populating the measure that the consequences of failing to meet the measure is zero.”

Candid, Confidential Reporting Has Its Place

Several agencies cited examples in which their performance reporting was used to criticize the agency, either in the media or in political debates. Several acknowledged that such criticism creates a desire to set easily achievable targets, hide or downplay problems, or play “metric games,” which undermine the transparency and accountability of performance management.

All of the agencies had some form of candid, confidential reporting of results to central ministries. Great Britain used the Prime Minister’s Delivery Unit (PMDU) delivery assessment, an uncompromising, truthful assessment conducted every 6 months as a confidential tool. It was conducted as an evidenced self-assessment and action-setting exercise by government departments that was challenged and moderated by the PMDU. It drove the agency’s actions for the next 6 months. It allowed for candid discussions with central governments about agency performance, steps that may be needed to improve performance, improvement ideas, and best practices.

The Australian Results and Services Plans were confidential, as were the monthly Swedish reports to the central budget authorities. While it is unlikely that U.S. transportation agencies would be able to produce documents that are exempt from public record laws, all of the officials said that a forum for candid discussion with central agencies about the realities of performance and why it may be lagging is an essential component of their performance management systems. The candid forums allowed realistic discussions about what hinders performance or the reasonableness of targets.

Reorganization and Refocus

From Building Highways to Moving People

The six agencies visited were in a state of transition—in terms of both their organization and their basic mission.

Three of the six agencies the scan team visited were in the process of reorganizing to merge the highway division with the state or regional transit agency. The mergers were driven by a central government desire to move from a traditional highway-centric approach to a broader, more inclusive strategy of surface transportation planning.

“We are moving people, we are serving business, and we are moving freight. We are no longer in the business of just moving cars,” said a New South Wales official. “We are no longer in the business of counting cars. It is about allocating road space.”

“We are a travel agency. That is what we are involved with. It is not just the road,” said an SRA official. “We are community builders.”

“The most important message was that we are the road authority, but we manage the transport network as one network that includes roads, buses, and trains. More and more, we are doing integration,” said a VicRoads official in Melbourne. “From a road authority perspective, we can’t build enough roads. If we did, it would not be a city anyone wants to live in. We need to manage the demand in travel.”

The cause and effect of the agencies’ performance management systems and their shift to holistic transportation agencies were not entirely clear. It appeared that the agencies’ forecast of continuing degradation in travel time pushed them beyond strategies of only expanding highways. The agencies placed great emphasis on transit service, rail passenger service, land use integration, and moving people and freight as well as vehicles.

In Stockholm, Sydney, Brisbane, Melbourne, and Auckland, significant population growth and increases in traffic congestion were forecast to overwhelm the already-congested highway network. Sydney has a population of 4.4 million and is projected to grow by another 1.2 million. Melbourne is at 3.6 million, but officials believe the city will grow to 5 million by 2030. Brisbane is at 1.7 million today, but is expected to grow to as much as 2.9 million by 2026.

The agencies’ refocus from just highways to a more diverse, integrated transportation network appeared to be driven by several factors. Public complaints about highway congestion combined with public reluctance for new highway capacity have driven some to emphasize transit options. The agencies’ forecast on travel time reliability caused them to question whether they can add sufficient highway capacity to accommodate such growth. Concern about climate change appeared to be a much greater issue among the populace than in the United States. Finally, the cities in all of the countries appeared to have a greater willingness to influence land use development than is common in many U.S. regions. In metropolitan Sydney, the regional plan calls for 70 percent of the future growth to be in the central city area by infilling existing brownfields. Melbourne is emphasizing growth in five business districts across its region.

In Queensland, transportation executives said their major challenges are congestion, population growth, environmental sustainability, infrastructure development, and safety. In nearly all five categories, the challenges influenced them to support an integrated transportation system.

- ▶ Their minister recently announced the formation of an Office of Sustainable Transport to increase focus on an environmentally compatible transportation system.
- ▶ The region has invested heavily in busways and has one of the largest busway networks in the world, with more than AUD1 billion (USD1.1 billion) in busways under development or in place.
- ▶ Avoidance and mitigation of environmental impacts are

now a high-priority concern for the agency, as are its contributions to greenhouse gas emission reductions.

- ▶ The merger of the transit and highway agencies was intended to further break down barriers to integrating the network efficiently, without regard for funding sources.
- ▶ The state government took over management of the transit agencies to increase their coordination and efficiency of routes. It also subsidizes them significantly to increase ridership.
- ▶ The state government coordinated fares between transit providers to increase the ease of transfer and is considering embedding a transit fare chip into drivers' licenses.

Through these comprehensive strategies, Queensland is looking to address growth, environmental goals, and congestion strategies through increased transportation system integration.

Victoria officials said the growth the region is experiencing is unmatched since the 1850s gold rush boom. Their long-range planning compels them to confront land use challenges as they plan how to sustain mobility across the network in the rapidly growing metropolitan region. They said it is difficult to overestimate the degree to which their plans call for integrating a rail, tram, bus, bicycling, and highway network into the development of the expanding region. To them, the integration of transportation and land use planning is an overriding consideration.

Social, Environmental Goals Are Evident

Closely related to the integrated transportation planning and delivery approach is the agencies' focus on environmental issues. All of the agencies visited had greenhouse gas emission reduction strategies as part of the performance measures focused on environmental concerns. Officials in all of the visited agencies said that climate change concerns were so important to the public that they were a driving factor in government policy, including transportation policy.

All of the agencies examined demonstrated a strong commitment to addressing climate change, even if they acknowledged they lack the strategies to achieve the ambitious long-term carbon-reduction goals their nations have established. Despite their nations' and agencies' strong commitment to addressing climate change, none of the agencies faced mandates to reduce miles or kilometers traveled. Their transportation-related climate change strategies relied on other tactics, such as improving vehicular fuel efficiency, reducing use of electricity

in lighting and buildings, and encouraging nonautomobile passenger travel.

"Building a greener future means that low-carbon travel must be a genuine, viable, and attractive option for businesses and ordinary citizens," said the British secretary of state for transport in the Department for Transport's report, *Low Carbon Transport: A Greener Future*. "It does not mean government dictating which particular mode of travel people should use. Instead, what I want is to widen the options so that it is easier and a natural part of life for people—and businesses—to go for a low-carbon option."

British Low-Carbon Transport Strategies

The British government is a signatory to the Kyoto and European Union climate change agreements. It also has a national Climate Change Act. Collectively, those agreements resulted in a national goal to reduce carbon emissions by 80 percent from 1990 levels by 2050, with an intermediate goal of 34 percent by 2020.

The British government displayed a comprehensive set of strategies for reducing carbon emissions from transportation (figure 16). Its strategies fall into three areas:

- ▶ Low-carbon technologies and cleaner fuels for vehicles
- ▶ Promoting choice for personal travel, business travel, and freight
- ▶ Using market mechanisms to send the right signals by incorporating the cost of carbon into transport decisions

Its strategies did not include targets for reducing kilometers traveled. Instead, it relied on a complete life-cycle approach to transportation carbon reduction that addresses fuels, vehicles, increased provision of transit and rail services, land use integration with transit, international cap-and-trade agreements for carbon, increased movement of freight by rail and water, and expanded research on transportation technology.

The British also promote "active travel," such as walking and cycling. Their reports indicate that in England, 60 percent of the population lives within a 15-minute bicycle ride of a railway station, but only 2 percent of the trips to stations are made by bike. They have announced a GBP5 million (USD8 million) program to install cycling storage facilities at rail stations nationwide.

"If we get this right," their major report said of their carbon approach, "by 2050 we can expect to see a fundamentally

Sending the Right Signals

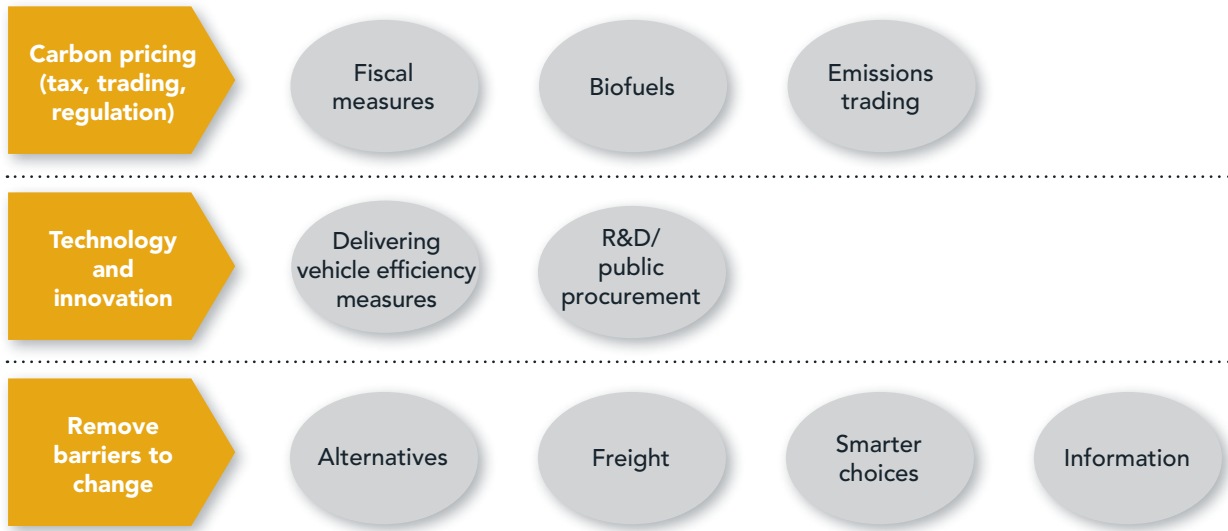


Figure 16. British officials are implementing strategies to meet their carbon targets.

different transport system in this country. Road and rail transport will be largely decarbonized. The technical challenges are greater for aviation and shipping, but these modes too will have seen a transformative improvement in efficiency.”

The British carbon-reduction performance goals for transportation rely heavily on decreasing emissions from the fleet, including cars, vans, large trucks, buses, trains, ships, and aircraft. For cars, the British have agreed to an EU strategy to produce significantly cleaner vehicles. The Department for Transport has funded a demonstration project for electric cars and, through the Technology Strategy Board, research and development funding is available to encourage further technical innovation in cars. The British also are supporting and testing cleaner vans. They are still exploring incentives for trucking, including examining regulation, investment, and best practices. They are incentivizing bus contractors to invest in cleaner vehicles. They are examining ambitious rail electrification and exploring further high-speed rail lines. They said the technological challenges for aviation and shipping are more difficult, but they support increased regulation and research to address those sectors.

Both England and Sweden promote “eco-driving,” which involves training drivers to slow their rate of acceleration and stopping to increase vehicle efficiency. The Safe and Fuel Efficient Driving program includes eco-driving training for van and large truck drivers.

The government has invested GBP17 million (USD28 million) in promoting intermodal facilities to increase a shift from truck to rail or water shipping. It also has pledged to work with the freight industry to develop a common method for estimating carbon emissions from various types of freight operations. This accounting will be a first step toward a standardized estimation of carbon reduction from freight strategies.

Of the nation’s 34 percent carbon reduction goal between 2008 and 2020, the transportation sector has a goal to contribute a 14 percent reduction in carbon emissions. The various strategies the Department for Transport has proposed would enable it to achieve its 2020 goal, largely through the use of cleaner vehicles and fuels across all modes, but primarily in the automotive, van, bus, and truck sectors. Achieving the goals beyond 2020 appears more difficult and less certain, officials said. Those larger reductions cannot be achieved with available technology. Unless significantly different technology comes into the market, additional reductions will have to come from reductions in automotive travel, something that is more challenging to accomplish and that has a potentially higher economic cost. They noted that the Department for Transport has responsibility over only 20 percent of the vehicle-kilometers traveled, while the remaining network is managed by local and regional governments.

“Providing choices is better than forcing people to change. . . . You can only go where your people are willing to be led,” said one HA official.

The agency has produced a carbon-tracking tool so it can measure reduction strategies consistently. The Microsoft® Excel-based tool estimates carbon production from five main areas of HA transport operations:

- ▶ Energy consumption in buildings and highways
- ▶ Amount of carbon generated by all business travel from cars, air, public transport, and agency staff commuting
- ▶ Materials used in construction
- ▶ Waste generated by agency business operations and highway construction

The categories of carbon use are estimated for internal operations, highway operations, major construction projects, contractors who manage regional maintenance, privatized construction contracts, and tolling stations. The tool estimated that HA's carbon footprint for 2008–2009 was about 550,000 tons.

HA is exploring many strategies to reduce the agency's carbon footprint. It is conducting research on turning off highway lighting after midnight, a trial program that has saved 400 tons of carbon, but has not appeared to increase crashes. It is seeking renewable energy sources for its operations, increasing the use of recycled materials, and trying to emphasize lean construction strategies to use less energy during construction. Traffic operational strategies are a major component of its approach to reducing its carbon footprint as well.

Victoria's Triple Bottom Line

The Victoria Department of Transport and VicRoads have long relied on triple bottom line performance measurement reporting to fully capture their effects on the environment. Triple bottom line reporting involves reporting performance on social, economic, and environmental factors in addition to business operations factors.

For many years, VicRoads has reported on environmental measures, such as the number of environmental citations it has received for violations on construction projects or maintenance activities. It has tracked a measure to reduce the amount of potable water used on construction sites and it measures a host of impacts from daily operations. Both it and the Department of Transport measure office energy use, paper generation, water use, fleet mileage, and overall waste generation.

Despite Victoria's impressive multimodal transportation system with its massive investment in trams, trains, and buses, its primary driver for those investments has been congestion

relief and overall quality of life in the city. Those measures have not been linked to a specific greenhouse gas emission reduction goal. The state government has a long-term goal of reducing greenhouse gas emissions by 60 percent between 2000 and 2050. That goal, however, does not include a specific target for transport emissions.

"There is no simple, single solution to reducing transport emissions," said the government's policy paper on climate change. "This conclusion is echoed by a wide range of studies from Australia to overseas, which indicate that there are three broad options for reducing emissions from the transport sector:"

- ▶ Reducing the number of trips
- ▶ Encouraging mode shift
- ▶ Promoting low-emission vehicles and transport

The state government noted that the massive investment it is making in the Victorian Transport Plan is its best effort to address transport emissions.

Swedish Road Administration Sustainability Measures

SRA officials said that environmental sustainability is a priority issue in their nation and that their transportation performance measurement system has embraced the reporting of environmental measures as another way to demonstrate the agency's responsiveness to public concerns.

SRA reports performance metrics for greenhouse gas emissions, other emissions such as hydrocarbons and nitrous oxides, the number of persons exposed to excessive highway noise, and the impacts of highway runoff in water catchment areas. SRA officials said that with their environmentally conscious population, environmental issues are very important, on par with economic concerns.

SRA reported that to reduce greenhouse gas emissions, it has adopted strategies promoting eco-driving, urging people to buy more efficient vehicles, promoting the use of transit, and reducing speed limits on many sections of road to reduce emissions and improve safety. It estimated that eco-driving has reduced carbon emissions by 29,000 tons, the campaign to influence motorist choice by 21,000 tons, speed limit changes by 6,000 tons, lighting changes by 4,000 tons, and various other measures by 6,000 tons (table 3). In all, it estimated its efforts reduced carbon emissions by 72,000 tons in 2008.

Cross-Cutting Coordination

A related finding from the agencies was that they appeared to work more frequently with other cabinet agencies on cross-cutting issues, such as economic development, public health, and climate change. In part, this appeared to be the result of multiple agencies sharing responsibility for cross-cutting policy goals.

In Sweden, the strong SRA focus on environmental sustainability, reduction in greenhouse emissions, and gender equality is influenced by a cabinet form of government in which government decisions are formed by consensus among all cabinet ministers. As a result, the concerns of the Ministry of the Environment and Ministry for Enterprise have significant influence on SRA policies.

The British Department for Transport shares responsibility for climate change with the Department of Health; Department for Children, Schools, and Families; and Department of Energy and Climate Change. The Public Service Agreements

in Great Britain specify a lead agency, but also specify supporting agencies that are required to coordinate their efforts to achieve the goals.

In New South Wales, RTA is clustered in the state cabinet in the Employment and Economic Development portfolio, which includes the agencies of Planning, Transport, and Industry and Investment. In its State Plan, responsibility for cross-cutting issues such as environmental sustainability and economic development is parsed among different cabinet agencies, which are expected to cooperate on joint initiatives.

Safety Focus is Emphatic

The performance management systems in the visited agencies were attuned particularly to focus on highway safety. The agencies not only had safety as a primary strategic goal, but their performance management systems included detailed reporting of strategies to reduce crashes. All of the agencies had crash rates noticeably lower than those in the United States (figure 17).

Table 3. Swedish emission reduction trends.

Swedish Transport Carbon Emission Trends (Millions of tons)											
	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008
CO2 Tons	17.2	17.0	18.0	18.2	18.3	19.1	19.4	19.7	19.6	19.8	19.4
Cars %	72	71	69	69	70	67	66	65	64	64	63
Trucks %	18	19	20	20	19	21	22	22	22	22	23
Buses %	4	4	4	3	3	3	3	3	3	3	3

International comparison: Deaths per 100,000 population

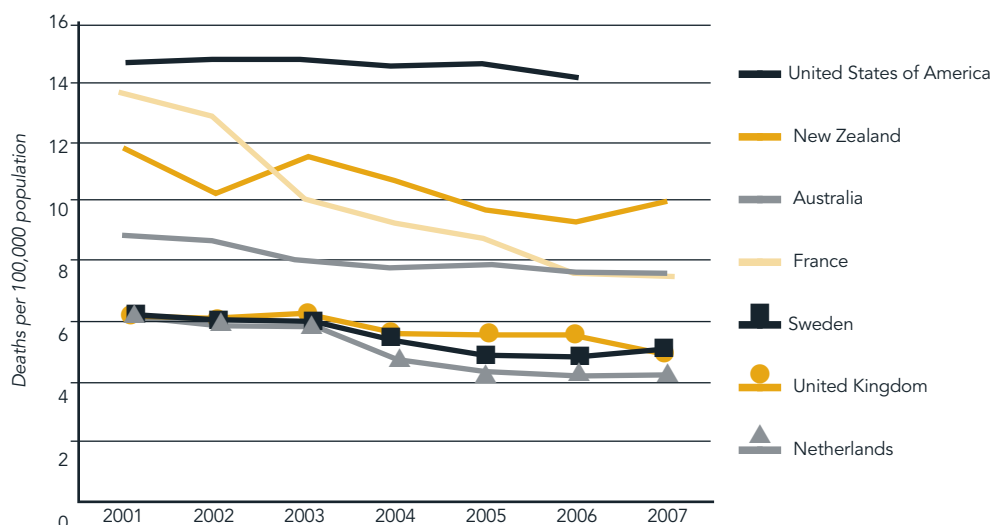


Figure 17. All of the agencies examined had fatality rates significantly below the U.S. average.

The Swedish and Australian agencies, in particular, achieved significant safety reductions by applying performance management tactics to reduce the number of crashes. They targeted not only black spot, or high-crash, locations, but they also applied programmatic treatments such as extensive cable barriers and skid-resistant pavements. In addition, they rely heavily on increased police surveillance, automated speed enforcement, and random alcohol breath tests to reduce speed and crashes.

Swedish Safety Performance Management

Sweden's rate of highway traffic fatalities per 100,000 persons is less than half the U.S. rate. Despite starting from a relatively low number of crashes, the Swedish safety performance management system continues to achieve reductions in both fatal and injury crashes on its highway network. Fatalities fell from more than 500 in the early 1990s to 397 in 2008, the lowest number since 1945. Sweden has used a multifaceted and holistic approach to crash reduction that includes the following efforts:

- ▶ **Calibrating speed limits**—In 2008, SRA introduced a new speed limit scheme based on a 10-stage system. Speed was reduced on 2,400 km of roads and increased on 910 km. The limits are based on how safe the road is in terms of alignment and roadside obstructions.
- ▶ **Speed cameras**—An additional 100 fixed and 15 mobile speed cameras were introduced in 2008 alone for a total 6,700 km of national roads with automated traffic cameras.
- ▶ **Traffic separation**—A total 230 km of roads had traffic separated with cable median barriers, median barriers, guardrail, or medians added in 2008. Now 53 percent of total kilometers traveled are on roads with median separation, and the goal is to achieve 75 percent of all travel on separated roads by 2020.
- ▶ **Centerline rumble strips**—More than 800 km of centerline rumble strips were added in 2008.
- ▶ **Seatbelt use**—Use has risen to 95 percent.

New South Wales Safety Focus

The New South Wales RTA created a Centre for Road Safety to focus on vehicle improvements, behavioral changes, safer roadways, and technology improvements. The center is developing a business plan with specific goals and targets in each area.

The safety approach displayed in New South Wales was quite impressive, with an analytic and granular series of

countermeasures and targets intended to address different types of crashes. The strategies include not only reducing crash risks on highways, but also making highways more forgiving so that when a crash does occur the roadway features limit the forces and energy to which motorists are exposed.

The center reported that the most important behavioral factor it will focus on is speeding. It reported that up to 45 percent of all road deaths are attributable to excessive speed. The center and RTA will address speeding the following ways:

- ▶ Developing speed zoning, similar to Sweden's, that is more sensitive to localized road conditions and road crash history
- ▶ Starting antispeeding public campaigns aimed at changing driver behavior
- ▶ Working with the New South Wales Police Force to increase speed enforcement during holiday periods
- ▶ Operating point-to-point technology on heavy vehicles at key locations
- ▶ Conducting research on recidivist speeders
- ▶ Conducting safety reviews of crash-prone highways
- ▶ Seeking out and correcting areas with low skid resistance, poor alignment, inadequate clear zones, and roadside hazards
- ▶ Conducting analysis of the safety impacts of all projects built to ensure they include positive safety features

The center is developing a series of key performance indicators for safety. Existing ones include fatalities per 100,000 population, fatalities per 100 million km traveled, and the number of fatalities involving young drivers.

It also is developing indicators to measure the effect of behavioral strategies, such as the reduction in the number of fatalities in which speed was a factor, the percentage of heavy vehicles exceeding the speed limit, and fatalities in which seatbelts were not used. For outputs, it will measure the number of miles of highways on which speed cameras have been installed, the percentage of high speed-prone areas identified for enforcement, and the number of reduced-speed limits instituted in high-pedestrian areas.

RTA and the Road Safety Centre broke down high-crash, or black spot, areas into great detail. In the process, they learned that roadway departure crashes were most common on curves where the radius was sufficiently tight to cause handling maneuvering difficulty, but not tight enough to cause drivers to slow down appreciably. Tighter curves caused drivers to slow down sufficiently to avoid roadway departures, while

larger radii curves could safely accommodate the roadway speed. By honing in on curves with these specific problem radii, they targeted limited safety funds and effectively reduced roadway departure crashes. NZTA pursued similar radii analysis to identify crash-prone curves for additional treatment.

Victoria's Renowned Safety Improvements

VicRoads in Victoria, Australia, has been cited frequently for its significant improvement in highway safety in the past decade. The scan team found continued emphasis on the state's safety performance management system during the 2009 scan as well. The government has a goal of a another 30 percent reduction in highway fatalities by 2017.

The Victoria government became aggressive in the early 2000s by implementing strategies such as installation of speed cameras, increased enforcement, stepped-up behavioral campaigns, and increased engineering treatments on highways. The current effort builds on earlier successes by deploying additional strategies and treatments based on an effectiveness analysis of the original safety programs. The agency worked with university researchers to model past successes so that the benefits of additional treatments could be forecast.

It began a 10-year Arrive Alive! strategy with 3-year action plans, with each component of the plan tracked to an individual manager to ensure accountability. The results are summarized and reported quarterly to the minister for transport (figure 18).

The agency also engaged the community to test the degree of public support for aggressive interventions and found substantial support for strategies such as stepped-up enforcement. The public support led to innovative funding programs, such as an additional fee when motorists buy car insurance. The proceeds are used to fund additional safety treatments. A levy of AUD84.70 was imposed on motorcycle registrations, and the proceeds are devoted to motorcycle safety improvement projects. A Victorian Motorcycle Advisory Council advises the minister on use of the funds, which have been prioritized for education and training, engineering and technology, enforcement, and enhanced data collection. To date, 51 motorcycle black spot projects have been completed, with a 38 percent crash reduction rate at those locations. Motorcycle fatalities in Victoria have fallen 20 percent since 2002, despite a 15 percent increase for the rest of Australia. Projects selected by the two funds have an average benefit-cost ratio of at least 3:1.

Another popular program is the "grey spot" program. It targets locations that have a propensity for crashes even if they

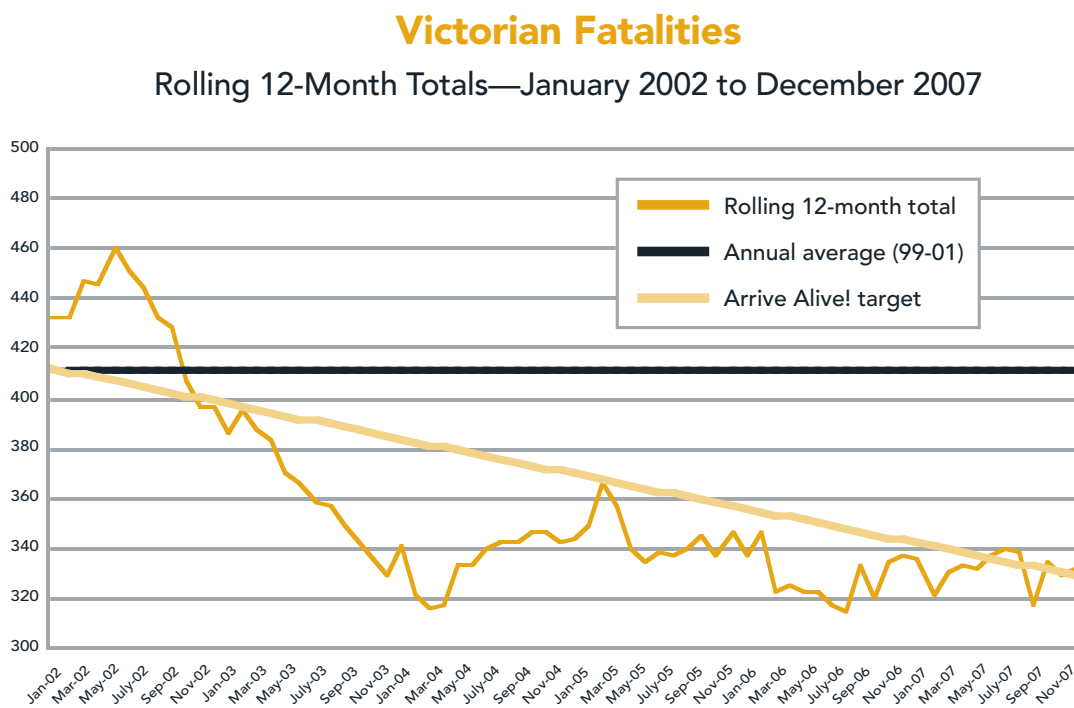


Figure 18. Victoria tracks its fatalities throughout the year against its yearly target for continuing reductions.



Figure 19. Traffic on Great Britain's M25 illustrates the congestion challenges facing the nation.

have not had enough crashes to qualify for the black spot program. It has invested AUD31 million over 3 years on locations based on a crash risk calculation. Almost half of the spending has been to reduce run-off-the-road crashes, with the most common treatment being cable barriers.

Innovation in Reliability

Several agencies displayed a very progressive attitude toward highway operations, spurred by their efforts to meet reliability goals. The British, in particular, have invested considerable effort in measuring reliability on high-volume national routes. All of the agencies reported that their reliability measures were evolving and they were not entirely satisfied with their measurement tools. However, it was clear that the more urbanized agencies in the United Kingdom, Australia, and Sweden have invested considerable effort in measuring

real-time highway, transit, and rail operations to improve travel time reliability, enhance transportation choices, and reduce greenhouse gas emissions.

Great Britain's Highway Reliability Efforts

In Great Britain, Department for Transport officials said they changed their entire approach to relieving congestion on major national routes when tight revenues and increasing public resistance to land takings prevented the widening of highways (figure 19). However, the nation's performance goals required improvement in travel reliability. As a result, the department adopted a "sweating-the-asset" approach to use advanced operations strategies to squeeze more capacity out of the existing freeway network.

British officials said that beginning in 2002 the agency changed its mindset from being a network builder to a network operator. The public demanded improvement in travel time reliability, but had little acceptance for projects that increased the footprint of existing motorways. The motorway system in England is only 2 percent of the total network, but it carries one-third of all traffic and two-thirds of all freight. Travel time data showed steady increases in congestion, and the agency's forecasts predicted that reliability would continue to suffer. The agency also was under pressure to reduce crashes. Its performance measures for crash reduction spurred action, as did the secondary benefit of preventing delay on the motorways when crashes occurred.

The first major change to bring about new capability as a network operator was the introduction of the Traffic Officer Service to assume responsibility for routine traffic management from the police on motorways. The U.K. Department for Transport had been downsizing for three decades, but it made an exception to that policy by hiring 1,500 traffic officers to assist with the program. The officers do not have enforcement powers, but they are equipped with uniforms, vehicles, flashing lights, and other tools to instruct motorists and assist them when they are involved in crashes. Traffic officers were operating across England by 2007. This program has offered more incremental benefits than new or widened roads, but it has tackled nonrecurrent delays, which are the most difficult for motorists to plan their journeys around, and has provided benefits much more immediately than traditional road-building solutions.

The second major change was the introduction of managed motorways, where the focus has been on opening the shoulders during congested periods (figure 20) and making

a substantially more intensive use of intelligent transportation systems technology to manage traffic.

An expensive, contentious highway-widening project would take years to plan, approve, design, and construct. Such projects “future proof” congestion, while operational strategies provide nearly immediate relief, officials said.

The strategies work in the existing right-of-way and involve adding dynamic signage, closed-circuit cameras, response crews, and operational strategies to manage incidents. A key aspect of the British approach is the hard-shoulder running strategy, or the opening of shoulders as travel lanes in peak times or during incidents. The program was so successful that the department minister recently announced that HA would add 520 additional lane-miles, 340 of which are managed shoulders.

Division officials said the programmatic use of hard shoulders combined with real-time operations led to a profound shift in agency culture on managing motorways. Now, managing lanes is viewed as a core, ongoing business function that combines teams of multidisciplinary traffic engineers, information technicians, and on-the-road officers and maintenance crews to respond immediately to incidents. The program led to the development of a suite of strategies and skills, such as improved equipment for quick crash analysis. Emergency response trucks are dispatched to assist with crash scenes and set up temporary signage. Best practices and manuals are produced to teach responders how to manage scenes safely. Predetermined detour routes are planned for when serious incidents close lanes. Driver location signs were installed so motorists calling from the roadway can identify their location easily.

British officials said the program requires four elements:

- ▶ A process to open the shoulder
- ▶ An incident management regime
- ▶ A maintenance strategy
- ▶ A compliance and enforcement regime

British officials said the conventional wisdom at first was that closing the shoulders would decrease safety, but that has not been the case. Instead, the driving environment created by combining hard-shoulder use with traffic management technology has substantially improved safety. They constructed turnout

areas along the routes and observed them by closed-circuit television to monitor if unsafe conditions occurred because disabled vehicles had trouble accessing the turnouts. They said the observation revealed few problems and indicated that most stopped motorists who used the turnouts did so for an emergency restroom break.

“What did we lose in use of the shoulder? The question is what were we gaining from these things in the first place or were they just a safety blanket?” the official asked.

British officials were effusive about the success of the program. The HA divisional director said it provided meaningful congestion relief, fewer crashes, and greater reliability for the motorway network in his region. He predicted that such operations strategies will be viewed as the natural transition to making better use of scarce motorway capacity.

Reliability Measure

The underlying performance measure that spurred HA’s approach was the reliability performance measure the agency had negotiated with the Treasury in 2004. Several years of tracking the measure combined with the inability to afford and get approval for major widenings led to the operational strategy adoption.



Figure 20. The use of shoulders during peak periods has become a common British congestion strategy.

The agency believes it is one of the few, if not the only agency, to actively track reliability performance on a daily basis across an entire national network. The agency identified a Strategic Road Network of 2,700 km (1,678 mi) of motorways and 4,350 km (2,703 mi) of other trunk routes. It divided those routes into 103 sections with 2,500 total links.

The HA Traffic Information System database holds the average journey time traffic flow of every link of that network for every 15-minute time period. The travel speed and reliability data come from several sources, including inductive loops, traffic plate cameras, and Global Positioning System (GPS) tracking systems. The data are compiled into ongoing travel speed data and compared to a 2004 baseline.

From the data, officials measure the amount of delay on the 10 percent most congested sections of the network. Reliability is measured as average vehicle delay on the slowest 10 percent of the journeys. The slowest 10 percent of journeys are selected for each 15-minute departure time between 6 a.m. and 8 p.m. for each day of the week on 95 of the 103 routes on the Strategic Road Network.

A dashboard is produced that illustrates rolling averages of travel time at locations across the network. Observation of the data over time led to a greater appreciation for the following:

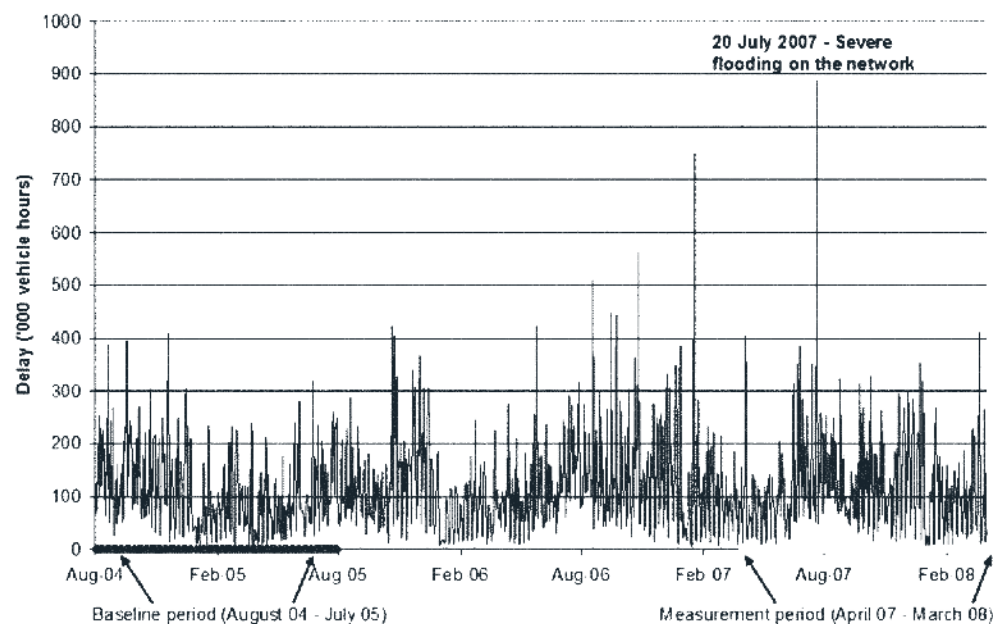


Figure 21. Great Britain’s reliability indices allow the nation’s transportation officials to track delay and how it is affected by events such as weather.

- ▶ Effect of incidents and crashes blocking lanes
- ▶ Effect of construction projects in contributing to delay
- ▶ Ability to locate areas of recurring congestion
- ▶ Effect of weather (figure 21)
- ▶ Effect of major events, such as festivals, on network traffic

The analysis led to many types of interventions and significant increases in accountability. The focus of measurement in the 10 urban areas is “person journey times.” Officials estimated that the total reliability measurement program and its associated interventions produced a 3:1 benefit-cost ratio.

British officials said their network reliability program has improved their understanding of system performance and led to increased evaluation of intervention strategies. But they acknowledged they are not completely satisfied with their program and want to improve it. They noted that measuring reliability is difficult because of shortcomings in data, definitions of what reliability is, and the lack of sensitivity to intervention strategies. The results of their interventions and measurement revealed that for a 10-mi (16-km) journey, a motorist undertaking one of the 10 percent slowest journeys would be subject to 3.4 minutes of delay, compared to 3.9 minutes before the interventions. Such metrics are difficult to explain to the public, they said. Such small differences in average travel time could be attributed partially to the economic downturn, which depressed overall travel. They are pleased that their system responded to the Treasury requirement that they uniformly measure and improve

travel time on the major highway network. But they also acknowledged that explaining the results of the reliability measure to the public and decisionmakers is difficult, and this is the focus for improvement.

New South Wales Reliability Innovations

The Sydney region has been a world leader in highway management since it developed the Sydney Coordinated Adaptive Traffic System (SCATS) in the 1970s. The ever-evolving computerized control system links the region’s traffic signals to optimize signal timing and traffic flow across the entire region. The RTA-developed software is widely used across

Australia and has been exported to more than 130 cities in 30 countries. New South Wales officials said it is a very adaptive system that continually responds to changes in traffic.

A Public Transportation Information System tracks buses in real time and alerts the bus if it is more than 2 minutes late. It also can coordinate with SCATS to provide signal preemption to keep buses on schedule and moving efficiently.

The New South Wales RTA measures reliability by monitoring morning and evening average travel times on its seven most important urban routes. It has invested considerably in both operational and capital improvements to sustain travel times as the population grows.

Queensland Reliability Emphasis

In addition to making large investments in busways around Brisbane, the Queensland Department of Transport and Main Roads is combining various city and suburban traffic operations units into regional traffic management centers. The department will coordinate and manage all of the region's urban traffic signals with one system. It will coordinate the operations of the various local transit bus providers as well.

Similar to New South Wales, Queensland tracks travel reliability by measuring morning and evening travel speeds on a representative section of the urban network.

Victoria Traffic Monitoring

Victoria produces an annual report on the performance and management of its freeway and arterial network. It has monitored travel performance on its network since 1994. It reports travel speeds, travel volumes, tram speeds and reliability, journey trends by bicycling, and traffic volumes. The report feeds into its travel time reliability measures, which influence investment in projects and programs to improve reliability.

Swedish Reliability Measures

SRA produces a large and highly granular series of measures on accessibility to transportation, travel time, and travel reliability. It measures the travel times to major towns for rural residents and reports changes over time. Because of the large number of unpaved rural roads subject to seasonal weather damage, travel times to larger population centers for rural residents can change seasonally. The average travel time for

rural residents and by area are tracked and reported as part of the agency's travel time reliability measure. In its 2008 summary, it reported degradation in overall rural travel times to population centers, with 813,000 people having improved travel times and 1,133,000 having lengthened travel times.

SRA tracks travel speeds on major routes in its three major cities, Stockholm, Malmo, and Goteberg. It reported in 2008 that travel speeds had generally increased in Stockholm and Goteberg and declined slightly in Malmo. It reported on the steps taken in each area to improve traffic flow and reliability and reported on planned improvement strategies for the next year.

Key Lessons Learned

At a time when the United States works to define a Federal-State-regional-local framework for transportation performance management, the international examples hold many clear lessons. The performance management systems of the studied agencies showed clear linkage between government expenditures and transportation agency results. The agencies demonstrated cost-effectiveness and continued improvement. They displayed responsiveness to emerging social concerns, such as climate change and urban sprawl. They clearly established the condition of their assets and the future consequences of current investments. The overall impression the scan team gathered from meetings with six leading performance management agencies is that similar performance practices could be implemented effectively in the United States.

Throughout the interviews, international transportation officials offered similar advice based on more than a decade of performance management experience. As a result, many had a long-term perspective to share on how attempts at performance management tend to begin, why they succeed, how they fail, and how they evolve. The following four major strategies summarize the strategies deployed abroad. The broad strategies are followed by 16 specific tactics that the scan team recommends for consideration in the United States.

Strategies for Implementation

“Do It With People, Not To Them”

None of the officials the scan team met with recommended mandating performance targets and imposing penalties if agencies fail to meet them. The officials had years of experience meeting performance goals set by central governments and ensuring that local governments achieve performance goals set by state and national governments. The agencies had the perspective of being the receiver of performance expectations from higher levels of government and the evaluators of performance by local or regional governments. Officials from Sweden, Great Britain, Australia, and New Zealand all

described a similar approach. They urged a collaborative goal- and target-setting process. Many relied on negotiated service agreements in which different levels of government negotiate goals and targets. Negotiation allowed implementing agencies to help select targets and priorities that make sense in their local contexts.

Great Britain’s evolution in national performance management was particularly enlightening. The central government initially developed a broad range of more than 2,000 metrics in its desire to ensure performance by its national agencies, regional organizations, and local governments. For more than a decade, national, regional, and local governments struggled with the burden of reporting. Gradually, the measures were reduced. Now local and regional governments report on a much smaller number of measures, and they decide what targets to meet for each measure. The new approach is intended to provide uniform national reporting for trend monitoring, but it also allows local governments to pick the focus areas important to their communities.

Instead of a regulatory and punitive approach to measuring performance, the agencies described a supportive and collaborative one. Clearly, expectations were set by the central government for the state transportation agency or by the state agency for local agencies. However, the expectations were negotiated and failure to meet targets brought collaboration, not penalization. The relationships between levels of government were much more like a coach-and-player relationship than an umpire-player relationship. The joint setting of targets and tracking of trajectory to target was intended to create a shared sense of purpose and collaboration between levels of government. Metrics were used to track performance over time, not as short-term means to penalize a lack of a performance.

When performance targets were not met, the central agency was more likely to resort to engagement, training, peer review, and root-cause analysis with the agency that failed to meet a target. In only limited cases did one level of government

sanction another for failure to meet an imposed transportation performance target.

The lack of sanctions in their performance management systems should not be construed as a lack of substance. To the contrary, the long-term focus on process improvement, performance reporting, and accountability in all of the agencies visited led to continual improvement in performance. What drove that performance was seldom fear of a penalty and more often a desire to achieve a higher level of service.

Focus on Long-Term Improvement, Not Short-Term Targets

As long ago as 1991 in their book *Reinventing Government*, Osborne and Gaebler warned about common shortcomings with performance measurement. When agencies are rewarded or penalized based on narrow performance targets, it is possible to skew logical behavior so that the agencies achieve the targets, even if the achievement creates other inefficiencies or costs. Agencies may be tempted to “cream” or skim off the top easy accomplishments to achieve numeric targets while avoiding more difficult, but possibly more important, activities. Measures must evolve, because they seldom are perfect. Qualitative analysis must be conducted along with quantitative analysis, because numbers alone seldom capture all aspects of performance, Osborne and Gaebler wrote.

The advice to not focus only on short-term metrics was confirmed in the scan, even if the agencies visited used different language to express it. All of them emphasized that the advantage of performance management was the tracking of long-term trends and the seeking of continuous improvement. Short-term targets are suspect, was the advice of many. Specific, short-term targets are suspect because data are often unreliable. Outside circumstances such as weather and economic crisis can influence short-term performance and cause targets to be missed through no fault of the agency. Most important outcomes can be achieved only over a number of years, not in a month or quarter. Major accomplishments, such as improving systemwide pavement conditions, reducing congestion, lowering crash rates, and integrating transportation and land use, cannot be achieved in uniform quarterly increments. However, they can be achieved over many years of steady focus, collaboration, and effort. During those years, progress will ebb and flow and targets will occasionally be missed. However, the most important objective is to achieve long-term improvement. Tracking long-term performance serves two important ends, which cannot be

addressed through measuring only short-term metrics. First, focusing on long-term trends tends to minimize disruptive overreaction to fluctuations in performance caused by poor data or outside circumstances. Second, it encourages investments that provide the greatest long-term payoff, even if they do not produce the greatest short-term metrics. This focus on the best long-term investment is particularly important to managing infrastructure assets over their entire life cycle.

At all of the agencies visited, officials emphasized that the advantage of performance management was that it led to long-term, continuous improvement. The iterative setting of goals, measuring of performance, analysis of results, and readjustment of effort were the major benefits they emphasized. A focus on short-term targets can lead to “metric games,” which result in the apparent achievement of short-term targets without regard for whether long-term performance has actually improved. Only after measuring for a number of years can agencies truly understand if they improved transportation system performance. “You can’t invent this kind of scheme overnight. It has taken us 10 years,” advised one British transportation official.

Focus on Outcomes, Not Process

The agencies the scan team visited appeared to focus more on outcomes than processes. In Great Britain, the focus on reliability led to innovative operations strategies that caused HA and police departments to reappraise their normal approach to alleviating congestion and reducing crashes. In Sweden, the highway agency collaborated with the postal service to have postal workers plow snow between rural mailboxes in the far north. In Queensland, the road authorities intentionally blurred funding sources and jurisdictional boundaries to encourage collaboration among state and local governments on maintenance of rural roads. In New South Wales, producing safer young drivers was valued more than quickly processing new drivers’ licenses. In three agencies, barriers between the highway and transit organizations were broken down to reduce traditional transportation silos. These examples illustrate what appeared to be a significant focus on achieving important outcomes. It was not common to hear the agencies speak about adherence to process.

Related to the focus on outcomes was the expression of government goals for transportation. In the agencies visited, the outcomes they sought to achieve derived from clearly articulated central government goals for transportation. The states and nations had a statutory process in which the central government was required to express the broad goals

and outcomes it desired from the transportation agencies—national and state agencies as well as local and regional agencies. These government outcomes did not include narrow performance targets. Rather, they expressed broad policy aspirations. The agencies, in turn, translated those policy aspirations into clear goals, measures, and targets, which they then reported. The systems observed abroad did result in transportation agency activities driven largely by a need to achieve the central government’s desired outcomes. However, the central government did not appear to require a detailed or prescriptive planning process to achieve those outcomes. Instead, the transportation agency negotiated the process, measures, and targets to meet the government objectives. Continuous negotiation, dialogue, and regular reporting of results assured the central government that the transportation agencies achieved the outcomes it desired. It appeared that achieving outcomes was more important than adhering to process.

Don’t Expect Clear Linkage of Performance and Budgets

Explicit linkages between agency performance and agency budget levels were not found. As one British official said, there was no mechanistic linkage between how well an agency performed—or failed to perform—and the amount of funding it received. Funding increases tended to be incremental and based on how much money the government had once other services were funded. Transportation funding increases or decreases were not observed to be tied to the agencies’ ability or inability to achieve a performance target.

Most of the agencies visited abroad displayed sophisticated asset management systems that were linked to their performance management systems. As a result, the agencies could clearly demonstrate needed funding levels to sustain system conditions for bridges, pavements, and maintenance needs. However, the agencies repeatedly reported that demonstrated maintenance needs—and demonstrated agency performance—did not trigger funding increases commensurate with those needs.

These statements on the lack of linkage between budgets and performance should not be construed to mean that performance data were inconsequential in the budget process. Performance data clearly were important. Performance data were used to measure agency accomplishments, track trends, and hold the agency accountable. However, the data on system conditions and system performance did not appear—to by themselves—to trigger higher levels of government

expenditures to achieve specific performance targets, nor were penalties and rewards for performance common.

Where the scan team found a substantial increase in transportation investment was in relation to the achievement of broad, new national visions. The team found major funding programs in several instances. They were spurred by national objectives to stimulate the economy, improve important corridors, transform urban landscapes, and achieve ambitious national visions.

Potential U.S. Tactics for Implementation

As the United States considers a national performance management system for its transportation programs, the following tactics appear to hold great promise. They result from the best practices documented abroad and from the observations of the scanning team.

1. Articulate a limited number of high-level national transportation policy goals that are linked to a clear set of measures and targets.
2. Negotiate intergovernmental agreements on how State, regional, and local agencies will achieve national goals while translating them into State, regional, and local context and priorities.
3. Evaluate performance by tracking the measures and reporting them in clear language appropriate for the audience.
4. Collaborate with State, regional, and local agencies to achieve the targets by emphasizing incentives, training, and support—instead of penalties—as the preferred way to advance performance.
5. Perpetuate long-term improvement by understanding that the real value of performance management is the development of an improved decisionmaking and investment process, not the achievement of many arbitrary, short-term targets.
6. Improve the use of benefit-cost analysis and risk management to demonstrate value for money. Consider major project postconstruction evaluations to assess whether benefits included in the original benefit-cost assessments were realized.
7. Recognize that major national visions, not achievement of narrow targets, tend to generate new investment.
8. Convert long-term deferred maintenance needs into a long-term future liability calculation. This clearly links the budget to long-term system sustainability.
9. Demonstrate accountability for fund expenditures by producing annual performance reports on agency achievements.

10. Instead of using technical jargon, report results with language meaningful to the public, such as “the journey home” or “support for the journey.” Detailed, technical terms should be used for internal reporting, but should be translated into understandable language for the public.
11. Collaborate with other cabinet agencies, including conducting periodic meetings with top leadership on cross-cutting issues such as economic development, public health, highway safety, and climate change.
12. Have a strong safety focus and document the results of safety measures, in addition to the usual measures of infrastructure condition, internal operations, transit, and ontime rail performance.
13. Focus on desired outcomes for travel time reliability that lead to expanded strategies for highway operations.
14. Learn from international examples of addressing climate change that rely on improving vehicles, fuels, and modal choice, but do not mandate reductions in travel or mobility.
15. Provide resources to enable high-quality data tracking, analysis, and reporting capabilities that allow for the use of performance data in decisionmaking.
16. Recognize that performance management is not a black box or simplistic solution. It is a culture to grow in the agency as an important consideration in the decisionmaking and investment process.

Implementation Plan

For 2 weeks in July and August 2009, a scan team from the United States visited international transportation agencies with mature performance management systems to study how these organizations demonstrate accountability to elected officials and the public. In addition, the team examined how the agencies use goal-setting and performance measures to manage, explain, deliver, and adjust their transportation budgets and internal activities. The specific elements that the scan sought to examine in detail were the following:

- ▶ Examples of how national, state, or provincial strategic goals are translated into meaningful performance measures for the transportation agency
- ▶ Ways to establish effective and achievable performance levels based on input from the public, elected officials, and business community
- ▶ Examples of tying performance and transparency to national, state, regional, and metropolitan plans and budgets
- ▶ Ways transportation agencies can demonstrate good governance and accountability in meeting or exceeding performance expectations
- ▶ Advice on what works and what does not when performance measures are applied to Federal, State, or metropolitan transportation programs in the United States

The scan team members identified a large number of important implementation items that they recommend be pursued in the United States. These efforts fall into two general categories of outreach and research. Outreach efforts will disseminate the scan findings and help put the identified best practices into use in the United States. Research efforts will translate some aspects of the international best practices into useful American context.

Outreach Efforts

1. Brief Congressional Staff on Findings from the Performance Management Scan

U.S. congressional committee staff and their counterparts in State legislatures will play key roles in advising elected officials on performance management. It is important that they understand requirements for effective implementation of performance management, lessons learned by lead States and other countries, potential ways to phase in implementation of performance-based programs, and benefits that can be realized from performance management. One briefing was conducted for the House Transportation and Infrastructure Committee staff. One was scheduled for the Senate Environment and Public Works Committee, and a larger briefing will be scheduled after the report is published. Briefings will also be made to key members of Congress as requested.

AASHTO and FHWA will conduct these briefings as needed.

BENEFIT: Congressional staff will have the latest information and experience from the scan as they make legislative decisions during the next reauthorization of funding for transportation programs.

2. Conduct CEO Workshop

The team conducted a State DOT chief executive officers workshop at the 2009 AASHTO annual meeting to build consensus for the need for performance management and discuss characteristics of good performance management systems, how they can be used throughout the organization, and how organizations can get started in performance management. Material developed for this workshop will be used to conduct additional workshops geared to managers in charge of implementing and using performance management systems in different parts of the organization. A workshop was conducted at the February 2010 AASHTO Washington legislative briefing. Presentations were posted on the Web site of the AASHTO Standing Committee on Performance Management.

Providing information to both State DOT chief executives and those directly implementing performance management systems will be beneficial in promoting the concepts and ideas learned from the scan. AASHTO members will conduct the CEO workshop at no cost. Costs for additional workshops will vary according to scope and audience.

BENEFIT: DOT leaders in charge of developing and implementing performance measures will have the latest information and be able to share practical experiences.

3. Present Scan Findings, Recommendations, and Next Steps to Key Stakeholder Groups

There is widespread interest in the scan findings. Scan team members will make presentations at events across the country where performance management is on the agenda. Examples include meetings of TRB, AASHTO, U.S. DOT, and organizations such as the Association of Metropolitan Planning Organizations (AMPO), American Public Transportation Association, American Public Works Association (APWA), and National Association of County Engineers.

Scan team members presented the scan findings at the Asset Management Conference in Portland, OR, in October 2009 and the TRB annual meeting in Washington, DC, in January 2010 and are scheduled to speak at the APWA annual meeting in August 2010.

BENEFIT: Stakeholders will have the latest information and experience from the scan as they consider adopting or expanding their performance management efforts.

4. Develop Illustrative Ways to Present Performance Information

The AASHTO Standing Committee on Performance Management has a Comparative Performance Measures Task Force that is working with States to identify and report performance metrics in key areas such as safety and pavement condition that would allow comparisons across States. FHWA and AASHTO are working to identify ways to map performance data to allow senior officials to quickly see patterns of performance across the country.

There is significant variation in how States and MPOs measure asset condition, congestion, reliability of operations, safety, greenhouse gases, freight, the economy, and other aspects of transportation system performance. Some

research is underway to synthesize current practice, but further research will be needed as the United States moves to greater use of performance management and States increasingly want to compare their performance with that of other States using common metrics. Comparative measurement efforts have been completed for project time and cost, pavement smoothness, and roadway fatalities. Work to assess common measures for bridge condition, reliability, and freight and economic growth remains to be done. AASHTO will work with the Standing Committee on Performance Management to consider pursuing a project to provide best practices on mapping performance information. Recently approved NCHRP Projects 20-24(37)F and G will support this effort.

BENEFIT: DOT leaders in charge of developing and implementing performance measures will have the latest information and be able to share practical experiences.

5. Develop a Performance Management Web Site

Develop, pilot test, and maintain a performance management Web site (or system) to collect key performance data, using data from the comparative performance measures effort described in the fourth implementation item as a starting point. Several existing Web sites contain information and data on performance measurement, but no single site (or system) has the ability to collect and share performance measures and data from States and MPOs across key performance areas.

Recently approved NCHRP Project 20-24(37)F provides funding for development of the specifications for a performance management Web site.

BENEFIT: Key findings from the scan will be integrated into the Web site to reach the widest possible audience. Additional links will be posted to sites such as the TRB Performance Measurement Committee Web site.

6. Conduct Peer Reviews on Performance Management

Develop and conduct peer reviews (informal consultations) to help States examine their existing performance management programs and identify gaps, best practices, and opportunities for enhancements. These would be conducted either by a management consultant in partnership with other agencies or on a peer-to-peer basis. The focus would be to facilitate a noncompetitive and nonthreatening forum

that allows for frank discussions and sharing of expertise and best practices.

FHWA, AASHTO, and AMPO should collaborate to offer these peer exchanges. They could be pursued voluntarily among States and MPOs or through a federally supported peer exchange program.

BENEFIT: States will gain valuable experience by sharing among themselves the lessons learned from various performance measurement programs.

Research Efforts

7. Evaluate Comparative Safety, Greenhouse Gas Emissions Efforts

Fund a study of how safety and greenhouse gas emission performance metrics are developed in European and Nordic countries and by Austroads. All three groups use international associations to help them develop performance metrics. In Europe, the Organisation for Economic Cooperation and Development conducts research and benchmarking among European countries in a variety of transportation areas, and the European Conference of Ministers of Transport (now the International Transport Forum) set broad goals for safety and greenhouse gas emissions. These European efforts are through a Brussels-based European governance body, the European Union Road Federation, and through individual country highway agencies, monitored by the Conference of European Directors of Roads in Paris. Similar comparative analysis efforts are underway among Scandinavian countries that participate in the Nordic Road Association. Likewise, Australian states and territories and New Zealand all cooperate with their AASHTO-like transportation association, Austroads, to develop a set of comparative performance measures. The study would focus on how these three cooperative organizations approach comparative measures on safety and greenhouse gas emissions, two high-profile emerging areas of measurement.

An online data repository is needed to store performance data that States can use to benchmark their performance against other States. Austroads has done considerable work in this area that could be used as a model. The AASHTO Standing Committee on Performance Management has compiled an inventory of performance measures collected in each State. Any insights that Australia might share will be part of this followup study.

BENEFIT: The United States will gain from the experience

of other countries on this important topic and use that knowledge in setting expected U.S. performance measures. Governance in the United States under a Federal system is comparable to the models used in the European Union and Australia.

8. Synthesize Best Practices in Benefit-Cost Analysis

The United Kingdom uses benefit-cost analysis and the value-for-money concept not only for project appraisal, but also at the program level to assess appropriate targets in different performance areas to assure that those targets are consistent with value for money. Benefit-cost analysis is also used in Sweden, Australia, and New Zealand. For benefit-cost analysis to complement performance-based management in improving transportation decisionmaking, guidance on its use should be updated to reflect applicable best practices from around the world, including quantification of such social costs as noise, air, and congestion. If appropriate, this guidance should also include value-for-money concepts used in the United Kingdom and other countries. Consideration should be given to updating the AASHTO user benefit-cost guide for evaluating multimodal projects. Most major MPOs conduct benefit-cost analyses for project prioritization for long-range plans and the Transportation Improvement Program. Guidance must be offered to MPOs for project and program evaluation also. The Austroads guides may be relevant to this effort.

AASHTO, U.S. DOT, and NCHRP should cooperate, using existing and new contract resources, to produce a synthesis of best practices in benefit-cost and value-for-money analysis, especially as they apply to performance management and multimodal surface transportation tradeoffs. The synthesis also should update existing guidance on benefit-cost analysis.

BENEFIT: FHWA and States will be able to establish protocols for determining cost-benefit of various initiatives.

9. Develop Case Study Report on the Use of British Public Service Agreements

In many areas of negotiated performance, service agreements are commonly used. In a service agreement, two or more parties can negotiate the cost, level of service, division of responsibilities, and monitoring processes desired for ongoing transactions. In Great Britain, Public Service Agreements are used to define roles and responsibilities for activities in support of 30 broad national goals. The Department for

Transport has the lead in a Public Service Agreement to “deliver reliable and efficient transport networks that support economic growth,” but it also has specific responsibilities in several other Public Service Agreements related to community development, access to health and educational services, and climate change. The Public Service Agreement concept has potential in the United States. It could formalize roles and responsibilities of different Federal agencies for broad goals such as public safety, livable communities, and environmental sustainability. Public Service Agreements also could allow different levels of governments—such as FHWA and State DOTs—to negotiate performance targets and strategies necessary to satisfy a Federal performance management system. FHWA now uses Stewardship Agreements with States, but they lack the performance target detail common in the British Public Service Agreements.

AASHTO and FHWA could collaborate to produce a brief case study of how Public Service Agreements are used in Great Britain and their applicability in the U.S. transportation sector.

BENEFIT: Federal, State, and local officials can consider whether the model used in the United Kingdom has applicability to their agencies.

10. Develop Research and Development Performance Management Roadmap

NCHRP has approved a project, NCHRP 20-24-(75), to lay out a multiyear research agenda. The roadmap could include projects such as the following:

Document Australian risk management practices. The use of risk management as another tool for making investment tradeoffs and demonstrating value for money appeared to be highly refined in Australia, particularly in New South Wales. It would be useful and informative to produce a short paper that better describes the use of risk management techniques for project-level alternatives analyses and cross-asset prioritization to better understand its applicability for the United States. AASHTO bridge management software is now being enhanced to include a risk module.

AASHTO, FHWA, and NCHRP could cooperate to fund a brief paper on the use and applicability of risk management.

BENEFIT: FHWA, DOT, and other transportation decisionmakers will better understand risk management methodologies.

Develop guidance for measuring sustainability and livability. The pursuit of sustainable and livable communities is a high public priority. How to define, measure, and achieve the goals of sustainability and livability are open to debate. These areas are less mature in the transportation planning and development process than are more traditional issues such as infrastructure condition or congestion levels.

It would be important for FHWA, AASHTO, and NCHRP to collaborate to develop guidance and technical assistance in defining metrics and possible targets in these nontraditional and/or difficult-to-measure areas. Best practices in communicating performance information to key stakeholders should be examined, as well. This includes process techniques such as town hall meetings, the Web, and mass media, as well as content and format approaches.

BENEFIT: States and FHWA will have a common methodology to define, measure, and achieve sustainability and livability performance measures.

Create a performance management leadership module.

The scan team found many examples of management strategies that used performance measures to achieve improved performance. The team found that successful practitioners did not merely publish performance metrics, but used those metrics to track ongoing performance, hold managers accountable, and alter organizational performance to achieve higher results. Some strategies, tactics, and techniques international practitioners used included the following:

- ▶ Developed performance agreements with managers that were tied to the accomplishment of organizational performance targets.
- ▶ Conducted regular team meetings in which managers reviewed the organizational performance metrics and reported on efforts to achieve them.
- ▶ Developed Balanced Scorecards, not only for the entire organization but for every unit and manager in the organization. These scorecards were based on the organization’s performance metrics and cascaded throughout the organization.
- ▶ Briefed central authorities on organizational performance to ensure that they were aware of the agency’s performance and challenges.
- ▶ Published regular reports, both internally and publicly, that track the achievement of key measures and explained steps to improve performance when targets were not achieved.

AASHTO, FHWA, and NCHRP could collaborate to produce a brief study on the management tactics that complement and enhance the utility of performance metrics.

BENEFIT: State, Federal, and local officials can benefit from the performance management tactics used by their overseas counterparts.

Amplifying Questions

It is becoming increasingly essential in the United States for transportation agencies at all levels of government to demonstrate credibility with elected officials and the public. The U.S. Congress is considering a performance-based transportation financing program that may require States and metropolitan planning organizations to document their accomplishments and results on a set of nationally and/or regionally established goals. Although many transportation agencies use performance management (PM) programs, the programs and approaches can differ significantly. Also, in many cases, PM programs are not explicitly tied to national and State budgets or national strategic goals.

The purpose of this scan is to conduct indepth reviews of how transportation agencies in other countries apply transparent and accountable PM programs to budgets and budget requests at the national, state, provincial, metropolitan, or local levels. The scan also seeks to identify examples of how transportation budgets and programs directly link to accomplishment of national, provincial, and local strategic goals.

Performance measurement. For this study, the scan team used the U.S. Government Accountability Office (GAO) definition of performance measurement as “the ongoing monitoring and reporting of program accomplishments, particularly progress toward preestablished goals.” The GAO defines a program as “any activity, project, function, or policy that has an identifiable purpose or set of objectives.” A “performance measure” is defined by the Federal Highway Administration as “a qualitative or quantitative measure of outcomes, outputs, efficiency, or cost-effectiveness. In general, measures should be related to an organization’s mission and programs, and should not merely measure one-time or short-term activities.”

Performance management. The American Association of State Highway and Transportation Officials defines PM as an ongoing process that translates strategic goals into relevant and detailed measures and targets that, along with resources,

are continuously monitored to ensure achievement of published institutional goals. Comprehensive performance management uses the definition just described in all key functions of a transport agency, including policy development and long-range planning; programming and budgeting; program, project, and service delivery; system operation; and monitoring and reporting of results in a variety of forms to a variety of audiences.

Strategic Approach

A major objective of this study is to examine examples in which national, state, or provincial strategic goals are translated into meaningful performance measures for the transportation agency. We want to examine practices in which the transportation agency uses those measures to document its achievement of society’s transportation goals.

1. What were the strategic influences or specific catalyst that caused you to adopt performance management?
2. Is there alignment of strategic goals at the national, state, or provincial level down to the local level? If so, how does that work and how did your PM process help you?
3. At what level or multiple levels of government do transportation performance measurement and, more broadly, performance management occur: national, provincial, state, or local levels?
4. Has the process resulted in an improved connection between long-range transportation plans and the selection of individual projects?
5. Are there any performance measures in use that are based on national policies to affect growth in travel, such as reductions in vehicle-kilometers traveled, or achieve certain outcomes, such as reductions in greenhouse gas emissions or economic development?
6. How has the process affected the investment in different modes or in making tradeoffs between modes?

Setting Performance Goals, Measures, and Targets

Another important objective of this scan is to identify ways to establish effective and achievable performance levels based on input from the public, elected officials, and the business community. We seek examples of how to set performance goals at the proper level—not just easily achievable goals.

7. How are goals, performance measures, and targets set by your agency? What role do key stakeholders play in setting targets? Who are they?
8. How are measures influenced by the availability of data?
9. What considerations of scale—national, state, local, and project level—go into the choice of any particular performance metric?
10. Were the costs to achieve performance targets considered as part of the process to set targets? If so, how do you make financial tradeoffs between competing goals?
11. What timeframes do the performance targets typically cover? Are both long-term goals and short-term targets established?
12. How do you address significant differences between the conditions across the country or province, and how are these differences addressed in your performance measures and performance goals?
13. Do you emphasize outcomes, outputs, productivity, or satisfaction? Has this changed over time?
14. What organizational resources were required to implement your performance management process? Did you need to reorganize your organization or make other significant changes to accommodate performance management programs?
15. What types of functions are best suited to the use of performance measures and which are not? How did you decide?

Linking Performance, Budgets, and Results

Another important purpose of this scan is to find examples of tying performance and transparency to national and state, provincial, and metropolitan budgets. Many transportation officials in the United States believe it has become essential for their transportation agencies to demonstrate credibility with elected officials and the public, which may lead to sustained or increased funding for transportation. We also

want to understand if budget or investment decisions between programs or geographic areas have been affected by the use of performance measures.

16. How have you used performance measures to explain financial needs to legislatures, administrators, the general public, and others to allow for the consideration of funding alternatives, etc.?
17. How are performance targets communicated to elected officials, the public, and the business community?
18. Have you used performance management in marketing campaigns to increase funding or investment in transportation? Were these successful?
19. What are the links between your agency's performance management system and your agency's budget?
20. Are measures and targets used to balance funding decisions for system preservation versus other important needs, such as system expansion or systems operations?
21. Are decisions to invest in one mode of transport versus another based on performance metrics or policy?
22. Do you approach decisions about system preservation with the same decisionmaking process you use for making decisions about system operation, expansion, or enhancement?
23. Has the use of performance measures changed the geographical or program distribution of funds?

Demonstrating Accountability

We are seeking ways transportation agencies can demonstrate good governance and accountability in meeting or exceeding performance expectations. We also want to understand how accountability is achieved.

24. Do your performance measures convince legislators of your efficiency and effectiveness?
25. What tools have you found work best with your constituents and stakeholders to describe results?
26. What happens when goals are not met?
27. Have programs, projects, or activities been dropped as a result of indicators of poor performance or a lack of public need?
28. Are employees or organizations held accountable for meeting performance? If so, in what way?
29. When two or more transportation or other public agencies have a role in meeting performance targets, how is accountability established for each agency?

30. When grants are made from one level of government to another, are grant recipients held accountable for achieving performance targets? How is this accomplished?
31. How well has your performance management process worked across different units and levels of government? For instance, between different state or provincial governments or between state or provincial governments and local governments?
32. Do any governmental oversight agencies or third-party organizations review the transport agencies' management independently? How do they use your performance measures information?

Lessons Learned

As the United States considers a national performance management program for transportation, we are very interested in your advice about what works and what does not when performance measures are applied to federal or multiregion transportation programs.

33. In what important ways has your performance management system evolved and why?
34. What are the most important lessons we should learn from your experience?
35. What was the biggest hurdle to overcome in linking performance measures and targets to resource allocation and funding decisions?
36. Were there unintended or negative consequences of using performance measurement? If so, what were they?
37. What are you most proud of in your performance management process?



Appendix B

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Biographic Sketches

CARLOS M. BRACERAS (AASHTO cochair) is the deputy director and chief engineer for the Utah Department of Transportation (DOT) in Salt Lake City, UT. Braceras is responsible for an agency of 1,800 employees with responsibility for planning, design, construction, operation, and maintenance of the 6,000-mile (9,656-kilometer) State system of roads and bridges. He is responsible for the department budget of about \$1.5 billion per year. Using performance measures and targets to demonstrate accountability, Braceras works closely with State legislators to advance legislation and budgets to fulfill the department mission. Braceras leads a small team to develop the department's strategic plan, which uses performance measures to communicate the department's goals and results for the preceding year. Braceras has served with the Utah DOT for more than 22 years. He has a bachelor's degree in geology from the University of Vermont and a bachelor's degree in civil engineering from the University of Utah. He is a licensed professional engineer in Utah. He serves as the secretary-treasurer for the American Association of State Highway and Transportation Officials (AASHTO) and on several technical committees for AASHTO and the Transportation Research Board (TRB).

ROBERT F. TALLY, JR. (FHWA cochair) is the division administrator for the Federal Highway Administration (FHWA) Indiana Division in Indianapolis, IN. Tally leads a multidisciplinary staff that delivers a \$900 million federally funded transportation program in Indiana. He works with State, local, and private sector representatives to ensure that Federal funds are used effectively and efficiently to meet a set of performance expectations. He was instrumental in helping Indiana position itself to be able to lease the Indiana Toll Road for \$3.85 billion in 2006. Before his current position, Tally served as the assistant division administrator in the FHWA Texas Division. In this capacity, he managed significant transportation projects, including public-private partnerships in Austin, Houston, and Dallas, that linked performance and accountability to revenue generation. He also served as a district engineer in the FHWA California Division, where he managed complex highway projects such as the San Francisco Bay Bridge project, which was funded through toll increases. Tally has bachelor's and master's degrees from the University of Louisville in Kentucky. He is a licensed professional engineer in South Carolina. He serves on a number of FHWA leadership advisory groups, chairs the FHWA Division Administrators' Council, and is a member of the FHWA Senior Leadership Team.

GORDON D. PROCTOR (report facilitator) is the president of Gordon Proctor & Associates, Inc. His firm has conducted research on performance measures for the National Cooperative Freight Research Program, Strategic Highway Research Program, and National Cooperative Highway Research Program (NCHRP). In addition, he regularly lectures on performance management at the National Transportation Leadership Institute, the premier management training program for senior transportation officials in the United States. For 8 years, he was director of the Ohio Department of Transportation, where he led development of a comprehensive performance management system. The Ohio DOT's use of performance measures has served as a case study for several national research efforts. He holds a master's degree in public administration from Ohio State University and a bachelor's degree in journalism from Ohio University. He has been active in AASHTO and TRB and serves as an oncall task order consultant for FHWA.

DANIELA BREMMER is the director of strategic assessment at the Washington State Department of Transportation (WSDOT). She is responsible for the agency's strategic planning, performance management, and system performance analysis functions and develops WSDOT's performance reports, such as the *Gray Notebook*. She is a nationally recognized expert on performance measurement and a frequent conference speaker, lecturer, and published author on the topic. Bremmer has a bachelor's degree in business and computer science and a master's degree in public administration from Evergreen State College in Washington. Bremmer chairs the TRB Performance Measurement Committee, leads the AASHTO Standing Committee on Highway Operations Measurement Task Force, and serves on AASHTO's Standing Committee on Performance Management and other TRB committees and research panels.

LEON E. HANK is the Michigan Department of Transportation's (MDOT) chief administrative officer, overseeing the Bureaus of Finance and Administration, Transportation Planning, and Aeronautics and Freight Services and the operations of the International Bridge. He is also responsible for development and oversight of MDOT's \$3.4 billion budget. Before his appointment in 2002, Hank directed the Office of Financial Management for the Michigan State Budget Office. He served as the State's financial controller, responsible for publishing the State's financial statements and processing payroll for 64,000 employees. A licensed certified public accountant, Hank's career spans 33 years, including various finance and technology positions in five State departments. He earned a master's degree in business

administration from Michigan State University and a finance degree from Central Michigan University. Hank chaired the National Association of State Controllers Committee on Accounting and Financial Reporting for 3 years. As a member of the United Nations Conference on Trade and Development Team, he made four trips to Asia and Africa to teach economic development and government regulation classes to the governments of 25 developing nations.

JANE D. HAYSE is the chief of transportation planning for the Atlanta Regional Commission, the multidisciplinary planning agency for metropolitan Atlanta. Since 1998, she has led all transportation planning functions, which include development of the region's long-range transportation plan, short-range programming, travel demand modeling, air quality analysis, and public outreach. In the most recent plan update, an extensive project prioritization methodology was developed to address congestion mitigation, environmental concerns, safety, and regional development goals for highway and transit projects. Hayse also initiated a corridor management program, local government comprehensive transportation plan program, and freight mobility program, all of which include transportation and land use linkages. She spearheaded creation of a regional thoroughfare plan and assisted in the creation of a regional Transit Implementation Board in her agency to coordinate various transit operators' needs. She has a bachelor's degree in economics and political science from the University of North Carolina and a master's degree in urban and regional planning from Florida State University. She is involved in several national efforts, such as NCHRP Report 594, *Guidebook for Integrating Freight into Transportation Planning and Project Selection Processes*, and NCHRP Project Panel 20-24, *Implications for Transportation of a Conformity-Style Approach to Reduce Greenhouse Gases*. Hayse is also a member of the Association of Metropolitan Planning Organizations' policy committee.

DR. ANTHONY (TONY) R. KANE is the director of Engineering and Technical Services for AASHTO. Kane oversees all highway-related technical activities of AASHTO and is the staff liaison to the State department of transportation chief executive officers and the new Standing Committee on Performance Management. In the past, he was the executive director of FHWA, where he championed performance accountability through corporate and program outcome measurements. Kane has a doctorate in business administration from George Washington University, a master's degree in transportation from Northwestern University, and a bachelor's degree in civil engineering from Rensselaer Polytechnic Institute. He serves on many boards,

including two universities, the International Road Federation and World Road Association (PIARC), and three TRB committees related to the scan topic.

DR. KRISTINE L. LEIPHART is the deputy associate administrator and deputy chief financial Officer (CFO) for the Federal Transit Administration (FTA). Serving as an advisor to the administrator on CFO issues, she manages a staff of 54 people who work for the Offices of Performance Management, Strategic Planning, Policy, Budget, Financial Management, and Financial Systems. Her office is responsible for producing FTA's Annual Performance Plan and a quarterly performance report for the agency called *Transit Trends*. She is responsible for the transit-related information reported in the U.S. Department of Transportation's *Performance and Accountability Report* and FHWA's *Conditions and Performance Report*. Before joining FTA in 2006, Leiphart worked for the U.S. DOT's Office of the Secretary, where she was the principal for the *Performance and Accountability Report*, which ranked first among 24 Federal agencies for several years. She was the author of the "Safety" chapter of the *Conditions and Performance Report* when she worked for FHWA's Office of Safety in 2002 and 2003. Leiphart has bachelor's and master's degrees from Northwestern University and a doctorate degree from the School of Urban Planning at the University of Illinois. She is a member of the TRB Committee on Performance Measurement.

JAMES (JIM) MARCH is acting director of the Office of Transportation Policy Studies in the FHWA Office of Policy and Governmental Affairs. March leads FHWA efforts to develop a framework for a performance-based Federal-aid highway program. Throughout his career, March has worked on or directed studies to examine various aspects of transportation system performance, including the biennial report to the U.S. Congress on the conditions and performance of U.S. highway and transit systems. March has a bachelor's degree in economics from the University of Virginia and completed course work for a master's degree in transportation engineering from Virginia Polytechnic Institute and State University. He has served on several committees of TRB, the Institute of Transportation Engineers, and AASHTO and is the liaison to AASHTO's new Standing Committee on Performance Management.

STEVEN M. PICKRELL is a senior vice president of Cambridge Systematics and national manager of the firm's transportation planning and management business line. He has more than 25 years of transportation consulting experience with emphasis on performance measurement

for planning and programming at the State and regional levels. He was principal investigator for NCHRP Project 8-32(2) and primary author of resulting NCHRP Report 446, *A Guidebook for Performance-Based Transportation Planning* (2000), and principal investigator for NCHRP Project 7-15 and primary author of resulting NCHRP Report 618, *Cost-Effective Performance Measures for Travel Time Delay, Variation, and Reliability* (2008). He was project manager or consultant lead for several multimodal statewide transportation plans incorporating performance measures into project evaluation and prioritization, including *MoveAZ* (Arizona Department of Transportation) and the 2006 Oregon Transportation Plan. He helped develop performance-based programming and management systems for the Oregon Department of Transportation Highway Division, Montana Department of Transportation, Colorado Department of Transportation, and others. He contributed to and did peer evaluations of performance-based project prioritization methods for regional transportation planning agencies, including the Southern California Association of Governments, Santa Clara County Congestion Management Agency, and East-West Gateway Council of Governments. He coauthored *Use of Performance Measures in Transportation Decisionmaking* (TRB, 2000) and *Linking Performance-Based Program Development and Delivery* (TRB, 2004).

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CONNIE P. YEW is the team leader for the Stewardship and Oversight Team in the FHWA Office of Infrastructure and has been with FHWA for 25 years. Yew directs the development and implementation of FHWA stewardship and oversight initiatives. Yew's team helps guide FHWA so that Federal investment, particularly in infrastructure, is well managed and performing. In 2004, Yew cochaired an international scan on transportation performance measures. She participated in several national reviews, such as *Strategies for Reducing Highway Project Delivery Time and Cost* and *Comparing State DOTs' Construction Project Cost and Schedule Performance: 28 Best Practices from Nine States*. Yew holds a bachelor's degree in civil engineering from the University of Maryland and a master's degree in public administration from George Washington University. Yew is a licensed professional engineer in Maryland. She serves on several technical committees, including the TRB Committee on Performance Measurement, TRB Committee on Management and Productivity, and PIARC Committee on Managing Operational Risks in Road Operations.



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