

Sharing Knowledge, Improving Decisions, and Establishing Accountability

Comparative Performance Measurement Demonstrates Benefits

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The successful implementation of performance management during the past decade has improved accountability in the transportation industry and has identified effective practices. Establishing consistent, comparative performance measures for key areas of national interest—while retaining flexibility for agencies to customize the measures—has accelerated the implementation of performance management across the states.

Problem

Comparing the performance of the transportation system and of state agencies at a national level is a daunting challenge. Some of the underlying issues include the following:

- ◆ The national data infrastructure is inadequate for providing direct and accurate comparisons among states;
- ◆ Data measured by every state cannot be com-

pared directly for a variety of reasons, such as inconsistencies in definitions or in sample sizes or the use of collection techniques that introduce biases;

- ◆ Measures are interpreted differently in varying contexts—for example, congestion indicates economic activity for some, but deficiencies in the infrastructure for others;

- ◆ Substantial narrative information is needed to tell the national, as well as an individual state agency's, performance story properly; and

- ◆ Agencies have concerns about invalid conclusions drawn from comparisons.

Despite these complications, several members of what became the American Association of State Highway and Transportation Officials' (AASHTO's) Standing Committee on Performance Management recognized the need for states to work together to provide “apples to apples” comparisons on performance indicators relevant to transportation.



PHOTO: STEVEN VANCE FLICKR

As a performance measure, traffic congestion is hard to classify—it can be considered a sign of economic activity or of poor infrastructure.

TABLE 1 Comparative Performance Measure Summary

NCHRP Project ^a	Study Contribution	Published
Project Delivery, 20-24(37)A	Compared performance and established effective practices by state DOTs for delivering transportation construction projects on time and on budget.	2007
Pavement Condition, 20-24(37)B	Compared performance and established effective practices by state DOTs for pavement smoothness, a feature highly valued by all travelers and shippers.	2008
Bridge Conditions, 20-24(37)E	Compared performance and established effective practices by state DOTs for addressing bridge conditions.	2010
Traffic Safety, 20-24(37)C	Compared performance and established effective practices by state DOTs for traffic safety, specifically in reducing highway fatality rates.	2009
Traffic Operations: Incident Response, 20-24(37)D	Compared performance and established effective practices by state DOTs for traffic incident management, specifically in reducing roadway and incident clearance time.	2011

^a All of the NCHRP comparative performance measure reports are available at: <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=543>.

Comparative Research Initiative

The first pilot project began in 2006 by testing the value of comparative performance measurement among seven volunteer states. The pilot yielded insightful findings and led to the first of a series of AASHTO-sponsored projects, funded through the National Cooperative Highway Research Program (NCHRP), exploring comparative performance measurement in several subject areas (Table 1, above).

For each measurement area, the research compiled detailed performance data from state DOTs, calculated performance measures for each agency, developed peer groups for comparative analysis, identified the top tier of agencies for the selected measures, scrubbed and normalized the data, and conducted interviews to determine the practices related to high performance.

These efforts covered an array of subject areas and demonstrated the viability of national-level performance measures. Each project can be regarded as trailblazing, because each provided insights and effective practices in a particular subject area. The collective success has led to the identification of new opportunities and support for exploring additional performance topics for a national, comparative analysis.

Results

Information from one of the comparative performance measurement research efforts—on pavement smoothness—is detailed in the sidebar on page 44. The full series of efforts demonstrated that state DOTs working together can develop acceptable measures and compare performance in areas critical to the mission of every state DOT.

The participating state DOTs reported that the projects helped in addressing many of the functions and processes that drive internal performance measurement programs, such as identifying benchmarks, responding to stakeholder demands for more accountability, exploring solutions for emerging business challenges, making continuous improvements, and increasing the focus on customer expectations.

In addition, this applied research demonstrated the following:

1. Rigorous methodologies for comparative measurement are achievable;
2. Comparative data can be collected; and
3. Identifying effective, ready-to-adopt practices can overcome resistance by agencies suspicious that national comparative performance measurements may devolve into winner-and-loser rankings.

Alaska Department of Transportation and Public Facilities (DOT&PF) implemented safety measures such as signage.



PHOTO: ALASKA DOT&PF



PHOTO: ALASKA DOT&PF

Rumble strips and other engineering improvements on Alaska's roads were examined in NCHRP comparative performance measurement project.

Benefits

By identifying and developing a common terminology, thresholds, and standards for national performance measures, agencies were able to review not only their own performance but to glean ideas that could be adopted or expanded from high-performing agencies.

The knowledge gained from this series of comparative performance measurement research projects has been invaluable and has proved a critical, foundational step as state DOTs and metropolitan planning organizations prepare to implement the performance measurement requirements of the Moving Ahead for Progress in the 21st Century Act. The comparative performance measurement projects have validated the vision and possibility of a performance-based transportation program that focuses on key areas of national interest and enables effective

practices tailored to individual states' needs.

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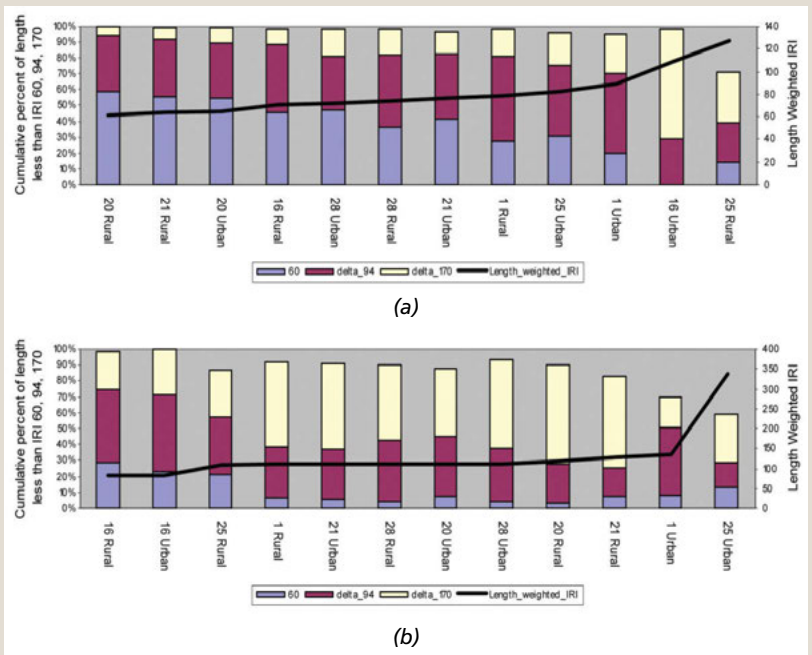
Suggestions for Research Pays Off topics are welcome. Contact G. P. Jayaprakash, Transportation Research Board, Keck 488, 500 Fifth Street, NW, Washington, DC 20001 (202-334-2956; gjayaprakash@nas.edu).

Pavement Smoothness Eases the Way

National Cooperative Highway Research Program (NCHRP) Project 20-24(37)B, Measuring Performance Among State Departments of Transportation: Sharing Good Practices Based on the International Roughness Index, produced the second report on comparative performance measures. The project identified states that have achieved exemplary performance, analyzed the practices that have contributed to success, and documented the practices for other states.^a

Pavement smoothness is an important performance measure for all states—travelers and shippers value the feature highly, and several studies have found that smooth pavement reduces vehicle operating costs. The Federal Highway Administration's Highway Performance Monitoring System requires all states to collect and report International Roughness Index (IRI) data for roads in the National Highway System. The importance of this measure to states and the availability of relatively consistent data across agencies made pavement smoothness a good candidate for comparative performance measurement. After agreeing to the data requirements and definitions, 32 states collected data for rigid and flexible pavements, climate conditions, and other relevant categories; the categories identified peer states and enabled more accurate comparisons.

The accompanying figures show the comparative results for flexible and rigid pavements in the peer group of states with a dry-freeze climate. Each bar represents the rural and urban Interstate pavements in a particular state, identified by a ran-



International Roughness Index performance comparisons in dry-freeze climate: (a) flexible pavement; (b) rigid pavement. [Source: NCHRP Project 20-24 (37)B, Measuring Performance Among State DOTs: Sharing Good Practices Based on the International Roughness Index.]

dom number, not by name, to protect against misuse of the results to generate rankings. The left y-axis indicates the percentage of highway miles that fell below the IRI cutoff values of 60, 94, and 170 in./mi. The space above the bar indicates pavement sections with an IRI above 170 in./mi. The right y-axis shows the average IRI, length-weighted by centerline mile, traced by the graph line superimposed on the bars.

^a All of the NCHRP comparative performance measure reports are available at <http://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=543>.