



# Peer Exchanges

Planning for a Better Tomorrow

FHWA/FTA  
Transportation Planning Capacity Building

*Transportation Planning Capacity Building Program*

– Peer Exchange Report –

## “Performance-based Planning and Performance Measures”

### TRB Summer Meeting

- Location:** Minneapolis, Minnesota
- Date:** July 13, 2010
- Organizers:** FHWA Office of Planning and TRB Statewide Multimodal Planning Committee
- Exchange Participants:** Members of TRB Statewide Multimodal Planning Committee
- Adjo Amekudzi
  - Patricia Hendren
  - Charlie Howard
  - Sandi Kohrs
  - Reena Mathews
  - Ron McCready
  - Amanda Pietz
  - Steven Pickrell
  - Peggy Reichert
  - Suzanne Rhodes
  - Kyle Schneewis
  - Joan Sollenberger
  - Jack Stickel
  - Montie Wade
  - David Wasserman
  - Rhonda Young

## I. Introduction

This report documents the proceedings of the FHWA/FTA TPCB sponsored Performance-based Planning Peer Exchange as well as two sessions on the use of performance measures (PM) in transportation planning that took place as part of the [Transportation Research Board's](#) (TRB) 2010 Summer Meetings in Minneapolis, Minnesota on July 13, 2010. The peer exchange was sponsored by the [Transportation Planning Capacity Building \(TPCB\) Peer Program](#), which is jointly funded by the [Federal Highway Administration \(FHWA\)](#) and [Federal Transit Administration \(FTA\)](#). The two TRB sessions were sponsored by various Transportation Research Board Committees and Groups.

The TPCB Peer Program advances the state of the practice in multimodal transportation planning nationwide by organizing, facilitating and documenting peer events to share noteworthy practices among State Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPOs), transit agencies, and local and tribal transportation planning agencies. During peer events, transportation planners interact with one another to share information, accomplishments, and lessons learned from the field and help one another overcome shared transportation problems.

The peer exchange, "Performance-based Planning and Performance Measures: Moving from Theory to Implementation," discussed the use, challenges, and potential of performance-based planning.

The first of the two TRB sessions, "Performance-Based Planning and Investment: Current Practice and Emerging Concepts" featured three presentations that provided perspectives on the current use of performance-based transportation planning by State DOTs and MPOs, and their partners. The second TRB session, "In an Ideal World – Performance Measures and Data to Inform the Planning Process" provided an open forum for participants to share ideas about how performance measures can and should be used to inform the planning process.

This report documents the proceedings of the peer exchange highlighting key findings, and includes a summary of the two TRB sessions in the appendix. The report is organized in the following sections:

- I. Introduction**
- II. About the Peer Exchange**
- III. Performance-based Planning and Performance Measures: Moving from Theory to Implementation**
  - A. Snapshot View
  - B. Performance Targets
  - C. Overcoming Barriers
  - D. What is on the Horizon
- IV. Lessons Learned**
- V. Conclusion**
- VI. Next Steps: Research Priorities**
- VII. Appendix**
  - A. Performance-Based Planning and Investment: Current Practice and Emerging Concepts**
  - B. In an Ideal World -- Performance Measures and Data to Inform the Planning Process**

- C. Agenda
- D. Participant List
- E. Agency Website and Resources

## II. About the Peer Exchange

The FHWA Office of Planning and the TRB Statewide Multimodal Transportation Planning Committee organized a peer exchange on “Performance Measures: Moving from Theory to Implementation” in conjunction with the TRB Summer meeting in Minneapolis on July 13, 2010. The peer exchange was facilitated by William Lyons of the U.S. DOT/Volpe Center; participation was limited to members of the TRB Statewide Multimodal Planning Committee. Committee members discussed how each of their agencies apply performance measures to transportation planning and programming processes with a focus on implementation, challenges, innovation, and evolution.

The goals of the peer exchange were to:

- Exchange agency experiences using performance measures in transportation planning and programming, highlighting notable practices and lessons learned.
- Provide input into the Federal discussion about a performance-based Federal-aid program.
- Identify research needs, potential annual conference sessions, calls for papers, etc.

## III. Performance-based Planning and Performance Measures: Moving from Theory to Implementation

### **Performance-Based Transportation Planning – *Concepts and Terms***

Prior to the peer event, the Volpe Center developed and distributed to each of the peers a common set of terms for the peer exchange and the following conceptual framework for performance-based transportation planning. This background information allowed the discussion to focus on experiences using performance management, challenges, and lessons learned.

#### *Framework*

Performance-based planning provides processes and tools to identify and prioritize alternative transportation policies, programs, projects, and strategies based on the ability to meet goals and objectives. This can be a challenging task, given the great diversity of goals set for transportation, the range of measurable elements of the transportation system, and the complex interdependencies and results of transportation decisions on issues, such as land use, economic development, and environmental sustainability.

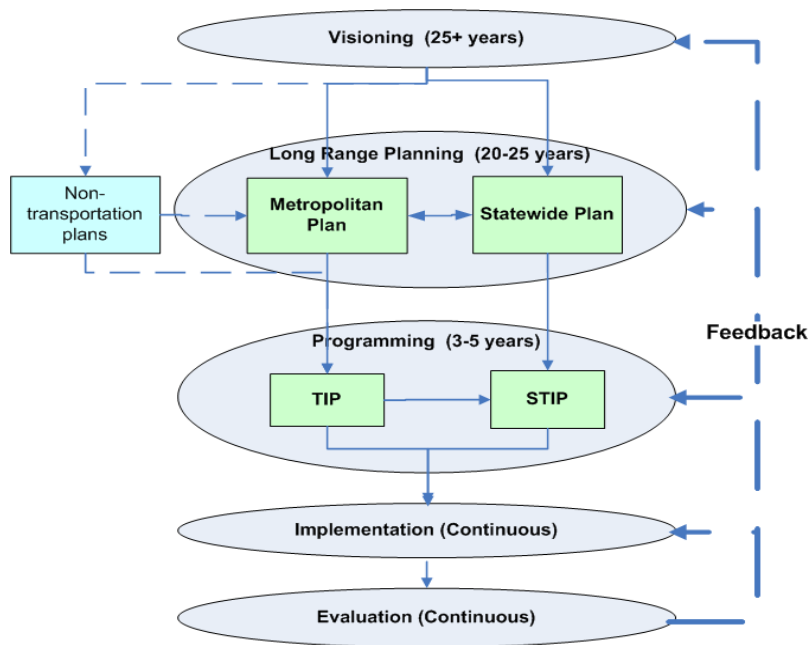
To develop an effective approach to performance-based transportation planning and programming, planners must focus on how best to:

- Identify broadly based long range goals and associated objectives, set locally, regionally, by States, or nationally;
- Define and adopt measures of transportation performance appropriate to these goals and objectives;

- Forecast, collect, monitor, and analyze meaningful and accurate performance data for the alternatives considered; and
- Apply the adopted measures to transportation decision-making throughout the planning and programming process to guide decisions and program investments;
- Use measures to monitor and evaluate results; and
- Use evaluation results to inform and adjust the on-going planning process.

Aligned performance measures should be applied throughout the transportation planning process to ensure that the goals and measures articulated in transportation plans guide the prioritization of projects and the allocation of resources, and that the implementation and impact of these projects and strategies are monitored to provide feedback for future plans (see Figure 1).

**Figure 1. Holistic Performance-based Planning Framework**



*Definitions*

Performance measures can be defined in diverse ways and may be applied across a wide range of contexts by transportation planning agencies. Given the myriad approaches currently in use, the following common concepts and terms were used as a foundation for the “Performance Measures: Moving from Theory to Implementation” peer exchange.

**Goal** – a broad, forward looking statement of what a planning agency intends to accomplish; articulates long-term priorities, intended achievements, or desired results. Transportation agencies typically develop goals during a long-range visioning, scenario planning, or other strategic planning process, and adopt several goals as guiding principles around which to organize a long-range plan. Goals can be directly related to the performance or quality of the transportation system itself (e.g., mobility, state of good repair, or safety) or reflect broader societal priorities (e.g., air quality, economic development, energy conservation, public health, or sustainability).

**Objective** – a discrete intermediate step that an agency can take towards achieving a longer-term goal or performance outcome. Typically, agencies articulate several objectives in support of each goal in a long-range plan. Ideally, objectives should be “SMART” – Specific, Measurable, Achievable, Realistic and Time-limited.

**Performance Measures** – an indicator that objectively evaluates how well something is performing, using quantitative or sometimes qualitative data. Measures can describe performance at one point in time; track progress over time; or identify gaps between desired and actual performance. A comprehensive approach to performance-based transportation planning requires that agencies develop multiple types of performance measures to reflect diverse goals and applications at different stages of planning and programming. Types of measures used by transportation planning agencies include:

- **Output Measures** - measure the level of activity or outputs that result from a plan, program, or project. Examples include tons of salt applied per mile of roadway, dollars allocated to transit projects, hours or miles of transit service, or lanes of striped bike paths. Output measures are typically quantitative and can be used to track implementation towards completion of a plan, program, or other transportation strategy.
- **Outcome Measures** - measure how effectively policies, plans, or projects accomplish goals and objectives, and achieve desired results. Measures are typically quantitative, and often rely on ratios (e.g., injuries per million miles, carbon emissions per vehicle mile, transit load factor, walking access to transit, traffic delay per capita, or access to jobs, schools or health services, sometimes by target populations). As a measure of the effectiveness of the transportation planning process or a specific plan, outcome measures can be used to determine the extent to which strategic goals are achieved. Note that a direct connection between cause and effect can be extremely difficult to demonstrate.
- **Indirect Outcome Measures** – measure the broader impacts of transportation policies and projects on society and the environment. While some outcomes of transportation investments may be the direct result of transportation investments (e.g., asset conditions), other outcomes (e.g., economic development, improved public health, community livability, etc.) are an indirect result of transportation investments in combination with other policies, investment decisions, and behaviors (e.g., land use, energy prices, employment, and economic development policy). Indirect outcome measures can be used to assess transportation’s contribution to broader societal goals and objectives, but causality can be difficult.
- **Process Measures** – measure whether, or how well, the activities or processes used to develop transportation plans and programs reflect regulatory requirements (e.g., Federal planning regulations or the Clean Air Act Amendments) or best practices. These indicators are typically qualitative in nature because they involve subjective determination of how well processes reflect goals and objectives (e.g., how effectively the public participation was reflected in the planning process, institutional coordination, or collaboration, etc.), although some could be quantitative (e.g., comparing revenues to expenses to ensure that fiscal constraint is met).

**Target** – translates goals and objectives into quantifiable, specific, measurable and realistic terms, expressed using performance measures. It allows an agency or community to commit to accomplishment of a specific result, often with a time horizon (e.g., reduce pedestrian fatalities by 10 percent in five years, reduce transportation related carbon emissions by 20% of 2005 level by 2020, reduce per capita delay by 10 minutes per day, increase transit or non-motorized mode share by 10%, etc.).

## *FHWA and FTA Perspectives*

FHWA and FTA presented an overview of the Federal perspective on performance-based planning. FHWA and FTA have traditionally applied regulation and oversight to the State and MPO planning processes. The FHWA and FTA are exploring the potential of transitioning to a Federal oversight role that places less emphasis on regulating planning processes and more emphasis on the outcomes of the planning process and overall system performance. One possibility of reauthorization is that there may be a set of national goal areas and specific measures (see Figure 2) that will be identified to support those goal areas. Those national goals and measures may be associated with performance targets that specify levels of performance to be achieved over a time period ranging from 4 to 20 years. States and MPOs may be requested to develop systematic data collection for nationally designated performance measures, forecast future system performance, identify and evaluate alternative strategies, and provide periodic reporting of progress towards those goals. State and MPO performance on these measures may be tied to incentives such as: the opportunity for less oversight over the planning process, the waiving of match requirements, or eligibility for discretionary funding.

**Figure 2. Potential National Goal Areas and Measures**

<b>Potential National Goal Area</b>	<b>Potential Performance Measures</b>
<b>Safety</b>	Fatalities and injuries
<b>State of Good Repair</b>	Pavement roughness, remaining surface life, bridge sufficiency rating
<b>Freight</b>	Reliability
<b>Environment</b>	Greenhouse gas emissions
<b>Mobility and Congestion</b>	Annual hours of delay and reliability
<b>Livability</b>	Access to work, travel time, and availability of mode choices

### ***Four Topics of Discussion***

Discussion focused on the use of performance measures in the participants' respective agencies rather than the role of Federal agencies or legislation. The goal was not to reach consensus but rather to share experiences and identify lessons learned and research needs. The discussion was structured around four topics:

1. Snapshot View
2. Performance Targets
3. Overcoming Barriers
4. What is on the Horizon

### ***Topic 1: Snapshot View -- one minute snapshot from Committee members***

Each of the peer participants provided a brief snapshot that focused on identifying the major themes related to performance management in the future. Participants raised some recurring themes:

- The use of performance measures is evolving; many States and MPOs are using performance measures more frequently and across a broader range of functions than in the past. Maryland DOT, for example, has expanded its use of performance measures beyond traditional asset management measures, to account for connectivity, quality of service and environmental stewardship. In California, statewide standards for reductions of greenhouse gas emissions have prompted the development of climate change performance measures at a regional level.
- Many organizations face difficulties in using performance measures to guide decisions. While performance measures are used to develop transportation plans and to monitor system performance, many organizations are struggling with the extent that performance is guiding, or should guide, decisions about investments. To address this specific issue, North Carolina DOT has developed a project prioritization process that aligns planning and capital programming with performance measures and goals.
- Many organizations are applying performance measures to asset management and safety. Several participants noted that their organizations are working to develop and apply measures for other goals, such as sustainability and livability, but these areas have proven to be more challenging to define and measure effectively. Minnesota DOT is conducting research to determine what “quality of life” means to Minnesotans.
- In some cases, the use of performance measures has forced greater transparency about the difficult decisions and tradeoffs that DOTs, MPOs, and their partners must make in programming funds. This can generate controversy. Some State DOTs have found that the application of performance-based planning has improved their ability to communicate their needs, but it has also generated controversy when a performance-based approach does not support politically popular projects or strategies.
- Many organizations have made significant progress in data collection processes, but they face challenges in deciding how best to use data to make decisions, incentivize performance and communicate with the public.

Participants were asked how their agencies are using performance measures at the different stages of the planning and programming process. Their responses are compiled in Figure 3. Figure 3 is not intended to be a complete summary of applications made by all State DOTs or MPOs, nor of those represented in the peer exchange.

**Figure 3. Participant Agency Use of Performance Measures**

<b>Transportation Planning/Programming Stage or Document</b>	<b>Participant Agencies Using Performance Measures at this Stage</b>
<b>Planning</b>	
Develop Vision Plan or Conduct Scenario Planning	NC, CO, CA,
Long-Range Plan	WY, KS, Puget Sound Regional Council (PSRC), CO, MD, MN, Washington Metropolitan Area Transit Authority (WMATA), CA, OR,
Forecast future condition/performance of system	KS, NC, CO, TX, CA, OR, MN
Set long-term targets based on goals	NC, CO, CA, OR, MN
<b>Programming</b>	
Define investment needs “systematically”	TX, MN, NC
Select and program projects in the STIP/TIP	PSRC, NC
Develop criteria for TIP project selection/screening	PSRC, NC
Allocate financial resources within investment categories	KS, NC, CO, OR, MN, NC

<b>Transportation Planning/Programming Stage or Document</b>	<b>Participant Agencies Using Performance Measures at this Stage</b>
Set short-term targets based on goals	KS, CO, TX, MD, MN, CA, OR, NC
<b>Monitoring</b>	
Evaluate post-project implementation	WY, MD, CA, OR
Report on condition of the system	KS, NC, CO, MD, MN, WMATA, CA, OR, AK
<b>Other</b>	
Congestion Management Process	PSRC, TX, MN, CA
Strategic Highway Safety Plan	NC, CO, CA, AK, OR
Outreach for Public Involvement	CO, MN, OR
Annual Execution Plans for Departments	WMATA
Highway Safety Improvement Plan	AK
Data Business Plan	AK

### **Topic 2: Performance Targets**

Committee members were asked whether they supported the use of performance targets. While almost all the members supported the use of performance targets, many suggested caution was necessary in developing and setting targets. Several participant organizations currently use performance targets:

- Oregon – The statewide multimodal planning process focuses on goal-based approaches, but performance targets are identified as well. For example, greenhouse gas (GHG) planning includes objective-driven targets. Oregon DOT also sets performance targets for transportation safety planning, and measures results annually.
- Maryland – Financial performance data for capital projects are linked to specific program outcome objectives. Once overall funding levels for these programs are established, program activities are reviewed based on quarterly performance results and adjusted as necessary to optimize performance. Examples of this include highway safety, pavement, bridge, maintenance activities, environmental compliance, and ITS.
- Minnesota – The statewide Multimodal Plan established key policies (goals) in ten areas. Each policy is supported by key strategies (objectives or actions to be taken). Numerous targets and indicators are established under each policy area to track progress on the goal and strategies the indicators support.

Committee members expressed a range of views on the value and application of performance targets. Several members asserted that setting targets with time horizons can create greater rigor and accountability than the use of measures without time horizons. Advocates of targets asserted that setting aspirational targets can push an organization towards excellence and bring to light gaps between goals and means. One member noted that targets may be more appropriate for short term (3-5 years) operational objectives rather than for long term aspirational goals. Some suggested that targets are only useful for areas that an organization controls and that MPOs face difficulties because they have limited control over many of the system outcomes that they measure. Setting targets may also be difficult when performance on some measures is trending downward due to a lack of funding.

Several Committee members cautioned that performance measures should not be linked to incentives or disincentives. They feared that disincentives could lead to gaming results to hide underperformance. Punishment for failure can be a disincentive to take risks. Incentives, on the other hand, could lead to an excessive focus on the measure to the exclusion of other important aspects of performance. They believed targets could motivate performance without being tied to incentives or disincentives. Rather



than tie performance to incentives or disincentives, performance targets, they stated, should be part of a self assessment process that enables a discussion about what levels of performance can be achieved or why certain levels of performance were not achieved.

As potential ways to address the risks associated with setting performance targets, the group proposed several solutions:

- Associating a family of measures to a specific goal rather than one specific measure;
- Setting targets only for aspects of performance that can be controlled;
- Setting targets over appropriate time frames; and
- Using partnerships to develop more holistic approaches to achieve outcomes.

### **Topic 3: Overcoming Barriers**

Committee Members highlighted several critical challenges in implementing performance-based planning.

#### *Governance challenges*

- Stakeholder input into performance driven decisions can contradict the recommendations of performance-based systems.
- It is difficult for stakeholders to agree on realistic performance outcomes given funding challenges.
- Changes in leadership and policy direction can often impact performance management staffing levels.
- MPOs have limited control over the aspects of system performance that they measure.
- It can be difficult to get agency boards to agree to use PMs defined to steer financial and management decisions – it is easier to get their support to do the data gathering/analysis, set performance targets, or assess performance.
- Decisions have been made without PMs for so long that integrating them into that process has proven difficult.
- It is difficult to systematically integrate measurable, quantitative data with qualitative, normative or political considerations, such as equity, into decisionmaking processes.
- Reporting requirements at the State and Federal level can differ, causing measures to proliferate across the enterprise.
- The State Transportation Commission may be the one entity that could set targets for all funds allocated at the State level, but it may not have the authority to require them.
- Goals can be incompatible, for example livability and mobility goals may call for actions and outcomes that inherently conflict.
- Establishing equitable measurements with targets across a large State with many jurisdictions can be a significant challenge.

#### *Performance measure selection and target setting challenges*

- Establishing measures with agreement by all local, regional and State decision makers.
- Reaching agreement on measures for non-traditional goals such as economic competitiveness, sustainability and livability.
- Not being able to accurately project the future condition of the highway system, future expected conditions, and cost to meet performance targets.

- Developing measures which are broad enough to be statewide, but specific enough to apply across different geographies and contexts. For example, some PMs are more appropriate for highly congested areas and others for rural areas so they cannot be used uniformly.
- Developing effective PMs for goals that are difficult to quantify or may be subjective (e.g., for livability or sustainability).
- Developing better methods for estimating local vehicle miles traveled (VMT), especially as related to air quality and transportation considerations.
- Identifying meaningful customer-oriented performance measures. In related activities, States like Kansas and Minnesota are using surveys and focus groups to understand what matters to the public.
- Applying system-wide performance measures for projects that arise in response to an unforeseen opportunity (e.g., projects to support economic development or to take advantage of special funding such as TIGER grants).

#### *Data challenges*

- Finding and developing credible and consistent data sources.
- Getting decision-makers to make long-term implementation commitments to such things as public surveys.
- Lacking data to support many of the measures. With limited resources, no one wants to reduce requirements for certain kinds of measures to start collecting and monitoring others.
- Translating data into information through analysis. It is easy to be “data rich but information poor.” It is important and challenging to ensure that different data streams are producing consistent results of value for decision making.
- Collecting, verifying, and reporting consistent, comparable, quality data in a timely way can be time consuming and expensive, but organizations do not want to report bad data.
- Measuring and monitoring outcomes of performance.

#### *Communicating Results*

- When lack of funding cannot explain subpar performance, staff may be hesitant to report performance.
- Concern over consequences of reporting poor performance.
- Developing effective visualization techniques (e.g., dashboards) to communicate system performance to legislatures, public, and internal stakeholders.

#### *Topic 4: What is on the Horizon*

Peer participants directed the discussion toward efforts to measure aspects of performance that have not been traditionally measured. One participant noted that some measures, like livability, are not easy to measure. Many outcomes, including congestion, accessibility, environmental quality, and quality of life, are influenced by non-transportation policies and measuring them can create jurisdictional issues. Some agencies are developing partnerships to address and report on outcomes associated with livability and climate change.

Several peer participants asserted that some aspects of livability that are directly impacted by transportation policy should be measured. However, others argued that more work is needed to define and understand livability before related measures are used to guide decisions.

Several agencies are using tools to allocate resources on the basis of performance goals and measures. For example, North Carolina DOT (NCDOT) is using a tool to make strategic investment decisions based on goals and level of service standards. The tool allows NCDOT to closely link goals and funding and present forecasted results graphically. WMATA used its strategic goals and objectives to select projects for the American Recovery and Reinvestment Act funds and to prioritize its FY2011 – FY2020 \$11 billion in capital needs. Other agencies have also developed processes to rank and prioritize investments based on performance measures.

## 4. Lesson Learned

Participants listed a number of lessons learned, based on experiences implementing performance-based planning and application of measures across a range of agencies (e.g., State DOTs, MPOs, transit agency). Participating agencies were at different stages of using performance measures; nonetheless, several key lessons emerged from the peer exchange discussion:

### *Measures and Targets Should Evolve Over Time*

- The focus of operations agencies is taking care of day-to-day service issues as they arise. This makes it challenging to focus on longer-term strategies and measures.
- Setting the correct targets is difficult and often takes time to get correct.
- Establishing the right performance indicator is an iterative process; the first ones may not be ones that are best suited. One should be ready to make changes to performance measures, targets and measurement processes as additional knowledge is gained.

### *Limit the Number of Performance Measures*

- System level performance measurement should be limited to the fewest number of measures that can adequately describe system performance at a level that policy makers find useful. If an agency is using too many measures planning can quickly become too complex, making it difficult for policy makers to focus on, track, and understand performance.
- Less can sometimes be better than more. For the public, more than 25 measures may not be useful. Additional internal indicators can inform managers, but do not merit public reporting.
- Setting targets can sometimes cause lead to focus and resources being allocated to meeting or improving in one area at the expense of other areas.

### *Performance Measures Should Reflect Agency Goals and Customer Concerns*

- Goals should be articulated before adopting performance measures. Some performance measures have been adopted simply because the data are available.
- Ideally a given performance measure is an accurate indicator of the performance being measured, but often a second best measure needs to be used until better data become available.
- Defining performance measures that are meaningful to customers is important (e.g., average travel time from point A to B rather than duration and extent of congestion).
- Asset conditions are often easier to evaluate than actions and outcomes in other areas. Targets and goals need to be flexible in response to priorities and resources.

### *Communicating Results*

- Including explanations about why performance changed can help clarify performance results and lower resistance to publically sharing information.

- Increasing visibility of performance information can have mixed results and requires anticipation by management if there is the possibility of negative press.

#### *Data*

- A data business plan is helpful in determining what the key transportation business areas are that need to be supported and what performance indicators should be measured.
- Automating data collection and reporting is critical to ensuring consistent tracking of performance measures (e.g., collect the data, display the metrics, and communicate the results). Manual efforts can fade over time without continual oversight.
- With the advent of integrated land use, transportation and economic modeling, performance projections and the ability to monitor outcomes at the system and regional level will become more feasible.

#### *Implementation*

- It can be useful to assign responsibility for performance measures to a specific person or office; however, many measures require partnerships within and outside the organization. If responsibilities are spread out results may be sporadic, making it difficult to integrate measures into an agency's business practices.
- It can be a challenge to get performance measures to guide decision-making. Political considerations can often play stronger roles than performance measures in the highest level strategic decisions.
- To overcome resistance to change there is a need to have advocates at all levels of planning and decision-making, with regular education about the benefits of strategic decision-making.
- An agency should monitor for unintended consequences. Is the measurement of one aspect of the system having negative consequences on other aspects' capacity or performance?
- An annual performance measures validation process is just as important as the annual review of targets. The needs of the organization/work unit may and often change over the year.
- Performance measures may only illustrate a limited aspect of performance and therefore should serve as a starting point for assessing performance.

## **IV. Conclusions**

As the discussion of the Committee members suggests, the use of performance-based planning is expanding and evolving. As the performance-based planning processes of State DOTs and MPOs evolve, so too do the challenges they face. While the technical challenges of collecting and reporting accurate, timely and consistent data persist, the ability of transportation agencies to manage performance data appears to be rapidly improving. But those agencies committed to performance-based planning may face another set of challenges in applying performance data to actual decisions. Institutional and political challenges often push transportation agencies to find ways to accommodate a broader range of public concerns beyond management, maintenance and operation of the transportation system itself. As transportation agencies look to develop meaningful measures for broader or more subjective outcomes that matter to their stakeholders, such as livability and sustainability, they are increasingly reaching across sectors to form institutional partnerships to collect data and implement policies. The higher levels of transparency and accountability encouraged by performance-based planning is improving communication with the public and politicians and helping to shift the focus of transportation investments from specific projects and operational outcomes to system performance and customer service.

## V. Next Steps: Research Topics

Based on the current challenges affecting the use of performance measures in transportation planning processes, peer participants proposed various research topics:

- Best practices in the use of market research surveys to identify customer-oriented performance measures for the planning process;
- The use of visualization tools to portray performance measures;
- Measuring return on investment using performance outcomes;
- Developing public and private partnerships for the expanded collection and use of holistic performance measures (e.g., land use, greenhouse gas emissions, health indicators) through long range multimodal planning;
- Best practices in the use of measures and models for assessing sustainability and livability;
- Building capacity on performance management (connecting performance to decisions) through distance learning applications (e.g., webinars, self-paced learning modules); and
- Development of more sophisticated data models to incorporate information from across sectors that address holistic concerns and measures, such as land use, accessibility, and climate change. This requires investments in data collection, analysis and maintenance.

## VI. Appendices

### Appendix A. Peer Exchange Agenda

**Peer Exchange Agenda**  
**Performance-based Planning and Performance Measures:**  
**Moving from Theory to Implementation**  
TRB Summer Meeting, Minneapolis  
Marriott City Center, Excelsior/Lafayette Rooms  
July 13, 2010, 1:30 – 6:00 pm

Organizers: FHWA Office of Planning and TRB Statewide Multimodal Planning Committee

Focus: Statewide Planning and Programming

Purpose:

- Peer exchange on experiences, good practices, and lessons learned.
- Exchange of ideas on how FHWA can encourage performance-based planning through federal programs, including under reauthorization.

Participants: Members of TRB Statewide Planning Committee; other invitees as observers.

Facilitator and summary proceedings: USDOT/Volpe National Transportation Systems Center

1:30-1:45

Welcome, introductions, expectations for exchange

Harlan Miller, FHWA  
James Garland, FTA  
Patricia Hendren, TRB Statewide  
Planning Committee

- FHWA and FTA perspectives on topic

1:45-2:00

Overview of agenda and structure for peer exchange

William Lyons, USDOT/Volpe Center

- Review of Volpe summary framework (reviewed by participants in advance)
  - Key concepts: foundation for discussion
  - Synthesis of participants' responses to discussion questions
- Key points from Tuesday morning Performance Measure (PM) sessions

2:00-2:30 Topic 1: The Big Picture -- one minute snapshot from Committee members

- How does your agency use performance measures?
- E.g., for strategic planning, programming, communications, accountability, monitoring, etc.

2:30-3:00 Topic 2: Performance Targets

- What is your agency's experience with performance targets?
- What are the pros and cons of using performance targets?
- Are targets more appropriate for some uses vs. others? Why?

3:00-3:40 Topic 3: Overcoming Barriers

- Group summarizes key barriers, expanding on those identified in responses.
- How has your agency overcome these challenges?

3:40-3:50 Break

3:50-4:35 Topic 4: What is on the horizon?

- *Non-traditional measures*: how are agencies dealing with the push to use non-traditional measures in planning and to track performance?
  - E.g.: greenhouse gas emissions, energy consumption, social equity, affordability, public health, livability, sustainability, etc.
- *Programming*: linking resource allocation decisions to PMs or targets:
  - How is this working and not working?
- Other related concerns?

4:35-5:25 Topic 5: lessons learned related to performance-based planning and PMs -- successes and failures. For example:

- What are the best points in the planning process to use PMs?
- How many measures?
- Data availability and accuracy.
- Measures vs. indicators.
- Role of flexibility vs. consistency? Regional differences.
- Long vs. short-term uses.
- Overcoming resistance.

5:25-6:00 Conclusion

- How can the federal government encourage more successful performance-based planning, with performance measures, within statewide and metropolitan transportation planning processes?  
For example, through:
  - Technical assistance, research, regulations, program and funding structure, etc.
  - Research needs for TRB.
  - Next steps.

## Appendix B. TRB Session: Performance-Based Planning and Investment: Current Practice and Emerging Concepts

This TRB session was sponsored by the following TRB committees: Planning and Environment Group; Transportation System Policy, Planning and Process Section; statewide Multimodal Transportation Planning Committee; Metropolitan Policy, Planning, and Processes Committee; and Transportation Programming, Planning, and Systems Evaluation Committee. Presenters included

- William Lyons, U.S. DOT's Volpe National Transportation Systems Center,
- Sandi Kohrs, Colorado DOT,
- Kyle Schneweis, Highstreet Consulting.

### *Emerging Approaches to Performance-Based Planning: Insights from Recent State and Metropolitan Plan Case Studies*

Mr. Lyons presented the initial findings of three research projects funded by FHWA's Office of Planning. Each project sheds some light on performance-based transportation planning practices.

The first project is a review of all 52 statewide transportation plans. The Volpe Center is developing a database of statewide plans for public access that categorizes the plans by various elements and a synthesis report on how the plans approach major aspects of planning including core planning topics such as financial planning and public involvement, and emerging topics such as climate change, livability, and sustainability. This project is an update of [earlier projects](#) for FHWA. Mr. Lyons presented the results of analysis of priority topics, including approach to performance-based planning. An analysis of all statewide plans shows that 75 percent of all statewide plans contain performance measures or state the intention to develop performance measures. An important result of the research so far is the development of a typology of statewide plans that distinguishes different types of plans by the distinct purpose they serve, for example, whether the plans are policy or needs based, involved vision or scenario planning, or have a performance focus.

A second research project examines best practice by seven smaller MPOs in developing metropolitan area long range plans. In general, the MPOs reviewed are: expanding their use of performance measures, working to incorporate sustainability or livability measures, and challenged by data availability and limited technical tools. There is reluctance to define too many measures in the plans and an interest in technical assistance to support further progress.

The final project is a review of best practices in performance-based planning that examines practices in four States and four MPOs and develops a framework for evaluating performance-based planning practices. Performance-based planning practices were evaluated using a conceptual framework for a holistic performance-based planning "life cycle" that applies performance measures throughout the planning process from visioning to programming to implementation and reporting. The study has found significant progress and some common challenges in the use of performance-based planning by States and MPOs. Each State and MPO reviewed emphasizes the use of performance measure in certain stages of the planning process, but no State or MPO has a comprehensive holistic process for applying aligned measure throughout all of the stages of the planning process. Furthermore, none of the States or MPOs reviewed for this report formally and explicitly use formal performance measures to assess the outcomes of the planning process itself. The study has found that there is often a disconnect between the planning and programming process. Audience members suggested in the following discussions that

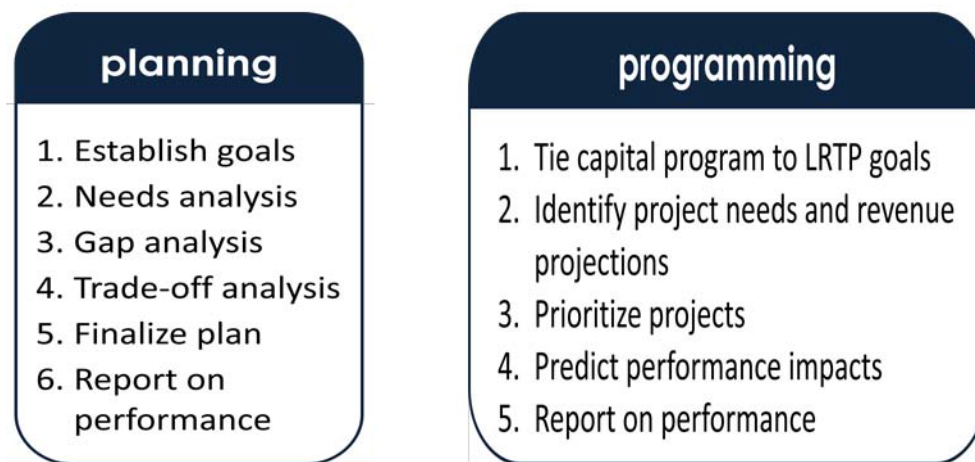


other planning documents, such as strategic plans, freight plans, modal plans or safety plans may be key components of performance-based planning, and may be where the disconnect with programming is addressed.

### *DOT Consensus on Performance-Based Planning and Programming: Results of the 2009 AASHTO Roundtable*

Mr. Schneweis reported on the outcomes of a [2009 AASHTO Roundtable discussion](#) supported by FHWA. The participants at the roundtable recognized that a performance-based approach to planning is appropriate and may be mandated or incentivized by the Federal government in the near future. To support the Roundtable discussion, AASHTO developed a framework that described a performance-based approach to both planning and programming (see Figure 4).

**Figure 4. Performance-based Approach to both Planning and Programming**



The Roundtable participants agreed that States should have a role in setting performance targets and that local condition and politics must be accommodated. Roundtable participants suggested that there should be a balance between data-driven and qualitative decisions. They agreed that States should be able to report progress toward national goals, but they cautioned that definitions of measures and data collection methodologies vary across States and that the trend line may be more important than the measure itself.

Several participants noted that the ARRA program is an example of what works and what does not work about reporting. State DOTs do not want to become big reporting agencies. The Roundtable participants suggested that FHWA should participate as a stakeholder in the statewide planning process to represent Federal interests rather than requiring specific measures or targets. They further suggested that FHWA should approve the performance-based planning process; not the targets themselves. It may take several authorization cycles before a truly performance-based planning process is in place.

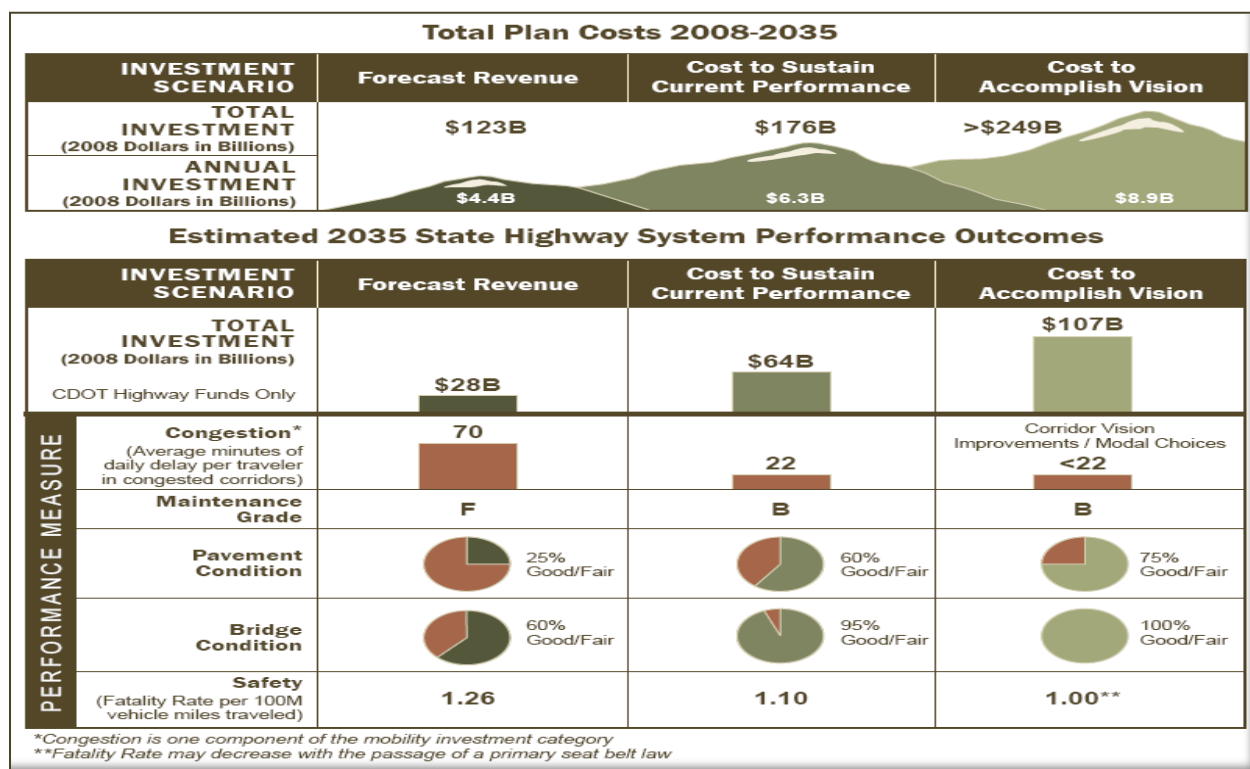
### *Tough Choices: Planning to Performance*

Ms. Kohrs described how Colorado DOT uses performance measures to make tough choices about priorities in the planning process. Colorado planners recognized that in its recent planning cycle the State was short of needed revenues and that tradeoffs would be required. Colorado is a fast growing

State with an aging population. In urban areas the concern is for congestion relief; in rural areas the concern is for maintenance of the system.

The Colorado Statewide Transportation Plan is developed by CDOT's Division of Transportation Development. The State's bi-partisan Governor-appointed Transportation Commission is responsible for developing visions and goals in conjunction with long range planning. The Transportation Commission is responsible for adopting annual program budgets and setting annual performance targets. The Statewide Transportation Plan integrates the policy priorities of the Transportation Commission with input from a variety of stakeholders and sets a long range vision for the transportation system. The Statewide Plan divided funding into investment categories and linked those investment categories to goals and performance measures. Based on the vision CDOT assessed total transportation funding needs of \$249 billion over the next 25 years. Total projected spending on transportation over the same time period was less than half of the projected needs, which will be insufficient to sustain performance – let alone achieve the vision.

Using performance measures enabled Colorado transportation planners to analyze and communicate tradeoffs between the competing goals. To analyze some funding tradeoffs, the Transportation Commission reviews performance outcomes for pavement, bridge and maintenance at projected funding levels. The staff has begun to analyze funding tradeoffs using a spreadsheet based tool to show the impact of funding decisions on system performance.



CDOT faces challenges in implementing performance-based planning. It is sometimes difficult to gather credible and consistent data over a substantial period of time to compare trends. Goal categories such as livability, sustainability, and economic development are difficult to define and measure. Some stakeholders can be more concerned with the health of the State's economy, but CDOT is better equipped with data to discuss asset condition measures than the State's economic condition. One must recognize that data about tradeoffs and prioritizing funding based on needs must also fit within a political

environment. There is sometimes reluctance on the part of staff to report poor performance for fear of consequences for things that may be beyond their control. Also, given the current fiscal environment, Colorado DOT may in a position where they are managing declining performance for some assets.

In spite of the constraints, CDOT believes that the use of performance measures has yielded significant benefits. Colorado DOT transportation planners are now able to portray a credible projection of future system conditions. Measures also help staff communicate their needs and successes to the public. Finally, the use of performance measures to demonstrate the limitations of current funding levels to affect performance has helped policy makers discuss tough options. Policy makers are now exploring more system operations options for addressing capacity and ways to assess which needs can be met.

During the question and answer period participants discussed the challenge of measuring performance in a fiscal climate where there is insufficient support to improve performance. Participants reported gaps between long term goals and targets set in vision statements and trends in performance. As a result, some States are adjusting their goals to lower levels of performance or to support more cost effective strategies. For example, MnDOT realizes it will never eliminate congestion in the Twin Cities, so it is now aiming to make transportation more reliable by developing a system of managed lanes.

## Appendix C. In an Ideal World – Performance Measures and Data to Inform the Planning Process

This TRB session was sponsored by the following committees: Planning and Environment Group; Transportation System Policy, Planning and Process Section; Statewide Multimodal Transportation Planning Committee; Metropolitan Policy, Planning, and Processes Committee; and Transportation Programming, Planning and System Evaluation Committee.

Ms. Thera Black, Thurston Regional Planning Council in Olympia, Washington, facilitated a conversation among participants regarding their vision for the use of performance measures and performance-based planning. The following questions were posed:

- In an ideal world what would we measure?
- How could we create an integrated concept of performance measurement and planning?
- How can we shift from a ‘mechanistic’ way of thinking about performance measures to a more ‘holistic’ and ‘systemic’ approach?

### *Reporting Performance*

Participants noted that it is important both that measures make sense to the public and that they also are the “right measures.” What is the difference between publicly perceived measures, pavement smoothness for example, and measures used by professionals, such as subsurface conditions? To better understand public expectations, Kansas DOT works with customer focus groups to see how they rated aspects of Kansas DOT performance, such as ride quality. Kansas DOT also set up a working group to better understand how transportation investments support the economy of the State and how those concepts can be communicated. Finally, the Kansas DOT understands that the public is not a monolithic entity. The Kansas DOT has looked at the responses of different stakeholder types and regions to better understand their concerns and communicate more strategically.

Several participants noted that while it is important to have simple measures that the public can understand, it is also important to preserve the use of more sophisticated measures by professionals. It was suggested that it may be helpful to distinguish between different types of performance measures: those that focus on how transportation contributes to broad societal outcomes, those that are used to communicate with customers; and those that are used to operate the system.

There was some debate over what measures should be made available to the public. Some participants argued that all measures should be made public in the spirit of transparency. Other participants argued that too many measures can be detrimental to the dialogue. Participants eventually agreed that while all measures should be available to the public, there is a need to be strategic about which measures are put forth. Measures need to be translated into information that is useful for different audiences. One participant stressed the importance of developing data business plans and aligning data collection to core business programs to support decision-making.

### *Data-Driven Resource Allocation*

One participant suggested that using data-driven processes to determine the most effective strategies could lead to unintended consequences, such as fewer multi-modal investments. For example, transit is relatively safe compared to highway driving. Does that mean that money invested in transit safety would be better invested in highway safety? Another participant countered that investments that promoted

alternatives to driving could improve safety by reducing traveler exposure to safety risks. A third participant suggested that truly data-driven safety investments probably should not go to infrastructure or maintenance at all, but rather to behavioral or enforcement programs.

### *Livability*

Some participants were troubled by Federal attempts to define livability. Participants noted the tension between “top-down” definitions of desired outcomes and “bottom-up” definitions. They suggested that livability values can vary from community to community and livability outcomes may be best defined locally. Others suggested that more information was needed about what the public considers livability or quality of life to entail. One participant suggested that the transportation community should play a role in identifying how transportation can impact various aspects of quality of life, but transportation planners should let the public define the desired outcomes. Livability indicators could include: household transportation costs, accessibility to jobs, proximity to transit stations, or even school quality. Another participant noted that “conceptual definitions” of goals such as economic development may be the same everywhere, but that “operational definitions” can vary by region or over time.

### *Modeling Non-Traditional Performance Measures*

One participant gave her perspective on work being conducted in California by the Department of Transportation and associated researchers. In California, research is being conducted into what performance measures can serve as indicators about how the transportation system fits into the larger society. Researchers are building models that look at non-traditional performance indicators such as greenhouse gas emissions, household transportation costs, land use, accessibility, and statewide economic growth. In California, major regions are required to reduce greenhouse gas emissions. This has fostered a great deal of innovative thinking about transportation strategies to reduce greenhouse gas emissions. Better information is needed about the impact of various transportation strategies on larger society.

Another participant commented that outcome measures often presume control over cause and effect and the absence of externalities. Performance measures should be founded in a good understanding of cause and effect. He suggested that transportation modelers and measurers of performance are not capturing some of the major elements that motivate decisions about where people choose to live or work.

### *Partnerships*

Several participants suggested that a holistic view of transportation goals will require broader policies involving partnerships across many entities. For example, transportation planning can only have a marginal impact on reducing greenhouse gas emissions; big picture policies such as pricing to reduce dependence on petroleum can have a broader impact. The HUD-DOT sustainability challenge grants are an example of how transportation and non-transportation agencies can work together to address broader outcomes.

### *Research Priorities*

Participants suggested various avenues of further research. One participant suggested working to identify data needed and to develop “fused” data sets. Another participant suggested working with major polling organizations to find out what is important to people. Another suggested researching best practices in the use of measures in the planning process and the testing of various potential capabilities and processes. Others suggested examining practices in risk assessment, and developing processes that ensure that plans are actually implemented.

## Appendix D. Participant List

Adjo Amekudzi	Georgia Tech
<i>James Cheatham*</i>	<i>FHWA</i>
<i>Kim Fisher*</i>	<i>TRB</i>
<i>James Garland*</i>	<i>FTA</i>
<i>Charles Goodman*</i>	<i>FTA</i>
Patricia Hendren	WMATA
Charlie Howard	PSRC
<i>Aaron Jette*</i>	<i>USDOT/Volpe Center</i>
Ashby Johnson	H-GAC
Sandi Kohrs	Colorado DOT
<i>William Lyons*</i>	<i>USDOT/Volpe Center</i>
Reena Mathews	Maryland SHA
Ron McCready	Consultant
<i>Harlan Miller*</i>	<i>FHWA</i>
<i>Ken Petty*</i>	<i>FHWA</i>
Amanda Pietz	Oregon DOT
Steven Pickrell	Cambridge Systematics
Peggy Reichert	Minnesota DOT
Suzann Rhodes	Wilbur Smith
Kyle Schneweis	High Street Consulting
Joan Sollenberger	UC Davis
Jack Stickel	Alaska DOT&PF
Montie Wade	Texas A&M
David Wasserman	North Carolina DOT
Rhonda Young	University of Wyoming

\*Participant listed in italics were observers, facilitators, organizers and note takers. They were not active participants in the discussions.

Appendix E. Agency Website and Resources

TRB Statewide Multimodal Transportation Planning Committee, [www.uwyo.edu/statewideplanning/](http://www.uwyo.edu/statewideplanning/)

TRB Performance Measurement Committee, [www.trb-performancemeasurement.org/](http://www.trb-performancemeasurement.org/)

FHWA Performance Measurement Exchange, <http://knowledge.fhwa.dot.gov/cops/pm.nsf/home>