



January 9, 2012

**MEMORANDUM**

**TO:** TRAC Members

**FROM:** Bob Felsburg  
Steven Marfitano  
Holly Buck

**SUBJECT:** Meeting Minutes and Materials for 01/13/2012 TRAC Meeting  
FHU Reference No. 11-158-01

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We have attached several documents for your review.

- Meeting Minutes from December 9, 2011 TRAC Meeting
- Literature Review
- Framework Example from December 9, 2011 TRAC Meeting
- Candidate Performance Measures
  - Accessibility
  - Mobility
  - Safety
  - Economic Development
- Characteristics of Good Performance Measures

In anticipation of the upcoming TRAC Meeting January 13, 2012, we have prepared Candidate Performance Measures worksheets for four of the Performance Measures Categories: Accessibility, Mobility, Safety, and Economic Development. Please review these worksheets and be prepared to provide comments and suggestions during a discussion we will have at this week's meeting. As an aide, we have once again provided the Characteristics of Good Performance Measures as you think about additional candidate performance measures to include in the performance measures framework.

January 3, 2012

**MEMORANDUM**

To: TRAC Members

From: Bob Felsburg and Steven Marfitano

Subject: Transit and Rail Advisory Committee  
Summary of Discussion on Performance Measures  
TRAC Meeting – December 9, 2011

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One topic of discussion at the December 9, 2011 meeting of the Transit and Rail Advisory Committee (TRAC) focused on a review of the Performance Measures literature review completed by CDOT staff. Additionally, the discussion began with a short review of the previous meeting minutes and the session ended with a presentation of the Performance Measures framework proposed for use at future meetings.

*Meeting Minutes Review*

This discussion focused on a review of the changes to categories and vision values discussed at the November 10, 2011 meeting. The TRAC generally agreed with the changes. Some discussion of the proposed changes to the TRAC Vision Statement resulted in further refinement to the below version (changes in bold):

“To preserve and enhance, in an environmentally and economically sensitive manner, the efficient mobility of people and goods throughout and beyond Colorado through the development of safe, reliable, and **customer-responsive** transit and rail networks.”

*Literature Review*

David Averill of the CDOT Division of Transit and Rail (DTR) presented the literature review completed for the Performance Measures framework. The complete literature review was presented to the TRAC along with a summary of the major findings from the process (see attached).

Ten documents were reviewed as part of the literature review focusing on national publications discussing the state of the art in performance measures. Each reference was evaluated based on the document’s purpose, applicability to the CDOT DTR Performance Measures process, report methodology, and findings/outcomes. Overall, the literature review found that a majority of state DOTs are currently using performance measures to some degree to track the transportation operations.

One document in particular was identified for its applicability and insight into the Performance Measures process (*NCHRP Research Result Digest 361. State DOT Public Transportation Performance Measures: State of the Practice and Future Needs*). This document identified characteristics of good performance measures and asserts that performance measures should be trackable over time, have

storytelling potential, be meaningful for types of service measured, be relatable to statewide public transportation goals, and have available data.

The literature review process confirmed that the eight performance measure categories which have previously been identified and to which the vision values have been classified in previous TRAC meetings are representative of state of the art transportation performance measures and are acceptable for use in the framework.

#### *Framework for Future Meetings*

The meeting ended with presentation of a sample performance measures framework using Accessibility as an example and defining the values and sample candidate performance measures for the category (see attached). This discussion outlined the framework that is being proposed and identified the distinction between different modes (i.e., freight and passenger) that will be necessary as the framework is built.

Discussion with the group at this meeting identified the first three categories which will be addressed at the upcoming January 13, 2012 meeting.

- Accessibility
- Mobility
- Safety

The goal for the next meeting will be to work through as many of these categories as time permits, focusing on determining the values and associated candidate performance measures.

## Establishing a Framework for Transit Performance Measures

### Task 3: Data Collection - Literature Review

It is understood that the purpose of this literature review is twofold. First, there is a need to ascertain what performance measures are used elsewhere and how they may address the eight proposed categories of Accessibility, Mobility, Economic Development, Quality of Life, Environmental and Resource Conservation, Safety, Operational Efficiency, and System Preservation. Second, there is a need to identify performance data requirements and what resources are available.

This literature review was undertaken primarily by using resources available on the World Wide Web. The National Transportation Library's *Transportation Research Information Services Online* (TRIS Online) was utilized to find relevant resources. This search resulted in the identification of dozens of National Cooperative Highway Research Program (NCHRP) and Transit Cooperative Research Program (TCRP) Reports, Research Results Digests, and Syntheses, all of which are loosely relevant to the questions posed above. From the results of this initial search, DTR staff selected ten documents that appeared to hold the most promise for furthering the TRAC's discussions pertaining to the development of a performance measurement framework for the Division of Transit and Rail.

All of these documents are available for download or in the CDOT library if TRAC members would like to look further into the sources reviewed.

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Summary of sources reviewed:

#### **1). "Development and Application of Performance Measures for Rural Public Transportation Operators" TCRP Report No. 1338 (1992)**

Purpose: Despite the increased interest in performance indicators for large transit systems, there has been no equivalent effort at establishing similar techniques for small and rural systems. This project developed a methodology to evaluate the relative performance of operators of rural transit service.

Applicability: This research and resulting methodology of measuring performance focused on rural providers in Texas. Although dated, it is applicable to the current effort, particularly as we move forward in developing discrete performance measures. The appeal of this paper lies in the fact that it is geared towards measuring performance at rural agencies. It also serves a role in setting the context for the history and evolution of this type of research, which is important to understand.

Methodology: The researchers undertook a literature review and conducted agency interviews.

Findings/Outcomes: It was found that agencies could be compared using measures of cost efficiency, cost-effectiveness, service utilization, vehicle utilization, quality of service, labor productivity, and accessibility. However, the findings indicate that more review of the statistics provided by the operators and greater communication between the operators and DOT staff would increase the usefulness of the performance measures. Most importantly, this early work identifies that QA/QC of agency submitted data is paramount when comparing performance among grantee agencies.

Source: A hardcopy of this document is available for review in the CDOT library.

#### **2). TCRP Synthesis No. 6 "The Role of Performance-Based Measures in Allotting Funding For Transit Operations" (1994)**

Purpose: This report of the Transportation Research Board examines the role of performance measurement in financing transit service. Specifically, the role of state government in assisting local transit service is discussed, as well as the challenges in the use of performance measurement.

Applicability: While dated, this synthesis is of particular interest to policy and planning personnel, and others concerned with the economic and budget aspects of providing transit service, as well as funding officials and policymakers in organizations such as departments of transportation (DOTs) and metropolitan planning organizations (MPOs). This synthesis explores current (1994) practice and trends regarding the linkages between financial assistance, service provision, and performance measurement. It also provides an overview of selected transit agency funding programs, as well as some information from state DOTs.

Methodology: This synthesis is largely based on a survey of selected state departments of transportation. A literature search was also conducted, as well as detailed follow-up discussions with a number of those responding to the survey. An expert panel was established to guide the researchers in organizing and evaluating the collected data, and to review the final synthesis report. In addition to this work, case studies were undertaken in order to explore the funding allocation systems used by three states -- Pennsylvania, Indiana, and Texas. These states were selected primarily because of the diversity of their approaches.

Findings/Outcomes: Key conclusions of this synthesis that may still be true in 2011 are as follows:

- There is often a lack of clear-cut goals established for public transportation in many states.
- Some funding organizations find themselves struggling with conflicts between their concerns for quality and quantity of transit service provided and the need to respond to legislative and taxpayer demands to constrain expenditures.
- There is widespread agreement among state departments of transportation and regional funding bodies like metropolitan planning organizations (MPOs) that local transit system performance should be tracked. Fewer agree that the results should guide financial subsidy decisions, and even fewer are doing it. Some of the related findings, candidly expressed by professionals in funding and recipient agencies, include the following:
  - It is difficult to reach consensus on what constitutes good performance, especially in light of the broad-based goals for transit funding assistance.
  - It is difficult to determine whether performance-based financial assistance should go to the good performers or the poor performers who may have greater financial needs.
  - Funding agency decision makers remain skeptical of the reliability of data provided by many local authorities and there is concern that information can be skewed deliberately or inadvertently to meet benchmarks.
  - There is doubt as to whether performance measurement systems can truly be sensitive to the differences among transit systems (for instance, small urban vs. rural); at the same time, external factors beyond the control of transit managers can also unbalance the playing field.
  - The influence of politics at state and local levels remains formidable, sometimes driving funding or operational decisions regardless of performance results.
  - Funding agency staff are reluctant to apply the financial penalties to local transit systems that might be dictated by performance-based decisions.
  - Performance-based funding may not respond appropriately to the competing pressures on public transit systems to take a hard-nosed business approach to service while also fulfilling their social mission.
- When performance components are used in subsidy allocation formulas, they tend to be combined with nonperformance factors or factors not traditionally viewed as performance characteristics, such as local financial contribution levels.
- Some state departments of transportation and MPOs have considered performance measurement and performance based allocation of financial aid. But they recognize that developing appropriate measures and allocation mechanisms that are responsive is no small task. At a minimum, it requires the active participation of transit systems and local and state legislative bodies.
- Almost all funding agencies maintain performance data on transit systems and use the information for program management and planning purposes exclusively or in connection with grant activities, as indicated above.

However, there is widespread feeling that allocations based strictly on performance measures result in inherent inequities.

Source: This document can be found online at: <http://onlinepubs.trb.org/onlinepubs/tcrp/tsyn06.pdf>

### **3). TCRP Report No. 6 “Users' Manual for Assessing Service-Delivery for Rural Passenger Transportation” (1995)**

Purpose: This manual is meant to assist in designing public transportation services in communities where no systems now exist or in restructuring and improving existing rural transportation. The manual provides detailed methods that allow local planners and operators to identify and analyze transportation services in rural communities.

Applicability: This manual has limited applicability to the task at hand. However, it does include a good discussion on broad benchmarks that rural agencies can strive for as a relative measure of performance to their peers, and may be more helpful when the DTR performance measurement program is implemented.

Methodology: To achieve the project objective, the researchers conducted a comprehensive literature review of current practices. A survey of nearly 200 randomly selected rural public transportation operators, representing all rural public transportation systems in the country, was conducted. The survey collected detailed information on services consumed, services provided, operating and capital costs, sources of funds, and other relevant information.

Findings/Outcomes: A manual of recommended methods was developed using the research. The manual includes methods to decide which types and what levels of service to provide and highlights case studies of a variety of successful rural transit operations.

Source: This document can be found online at: [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_06-a.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_06-a.pdf)

### **4). NCHRP Report Publication No. 446 “A Guidebook for Performance-Based Transportation Planning” (April, 1999)**

Purpose: The purpose of this guidebook is to help organizations improve the development, implementation, and management of their transportation plans and programs. It is also anticipated to support transportation investment decisions tailored to the specific conditions and performance needs of major transportation systems.

Applicability: The research for this project was undertaken with an eye on identifying specific methods and practices that would be useful to a broad range of agencies and organizations undertaking performance based planning. This guidebook provides a structured approach to monitoring, evaluating, and considering transportation system performance in various components of the planning process. It also includes a "Performance Measures Library" (Appendix B) that catalogs measures currently being applied throughout the country. This report is relevant to DTR current effort, and has proven useful in “kick-starting” the development of the performance measures framework.

Methodology: The research undertaken for this report was based on a literature review and detailed case studies.

Findings/Outcomes: The general findings of this study were:

- Above all, integration of performance-based methods into the planning process remains a desirable and important objective.
- Implementation of performance-based planning methodology in the transportation planning context is an evolutionary process.
- In many instances, programs that started out comprehensive in nature have been refined to provide a smaller, more focused method of measuring system condition and performance.
- Performance measures are being applied in a variety of contexts

- The research findings do not warrant any endorsement for using performance measures as a way of replacing the current transportation project prioritization and selection processes with purely analytical, quantitative methods
- In most transportation agency applications, performance-based approaches have not yet had a significant impact on the ultimate outcome of decisions

There were several issues regarding implementation identified in this research, and two may be particularly valuable for the TRAC/DTR to keep in mind as we develop the framework for performance measures. They are:

- A performance-based planning process should include both performance measures which are broad enough to guide statewide system planning, and more specific measures that improve the ability of the agency to select and prioritize specific projects or programs at the regional or local level;
- While the use of more focused measures does lend itself to better informed planning decisions at the project and program level, it calls into question the importance of user-specific issues to those who are responsible for the entire transportation system.

Source: This document can be found online at: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_446.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_446.pdf)

**5). TCRP Report Publication No. 88: A Guidebook for Developing A Transit Performance-Measurement System (January, 2003)**

Purpose: This guidebook was prepared with an eye on assisting transit system managers in the development of a performance-measurement system or program that uses traditional and nontraditional performance measures to address customer and community issues.

Applicability: This guidebook is oriented to transit agency's that operate fixed route and demand-response services, and not State DOT's. However, it provides a recommended set of core performance measures that can be tailored to different-sized agencies and some of these will be applicable to the TRAC's effort.

Methodology: The development of the guide book was undertaken through agency interviews. A total of 32 organizations were interviewed for the project about their performance measurement programs. These organizations included 22 transit agencies of various sizes (including two international agencies), a metropolitan planning organization (MPO), a regional transit authority providing financial oversight and planning for three transit agencies, a city, a private transit contractor, and six companies in the private sector.

Findings/Outcomes: The authors of this report recognize the differences between Fixed Route and Demand Response services, and recommend core performance measures, or categories of performance, specific to each. Recommended performance categories for Fixed Route systems are service availability, service delivery, safety and security, community impact, maintenance, financial performance, and agency administration. Recommended performance categories for Demand Response services are service coverage, span of service, service hours, revenue hours, and service denials. This research also suggests an important point - that transit agency's undertake the implementation of performance measurement systems for varying reasons (gauging customer satisfaction, internal reporting, etc.). Most importantly, it provides several good examples of how specific metrics might be tied back to the 8 proposed categories that the TRAC is currently exploring.

Source: This document can be found online at:  
[http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_report\\_88/Guidebook.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_report_88/Guidebook.pdf)

**6). NCHRP Project No. 20-24(20) – “Strategic Performance Measures for State Departments of Transportation: A Handbook for CEO's and Executives” (June, 2003)**

Purpose: This project report is a guide for CEOs and senior managers in state DOTs on how to develop strategic performance measures.

Applicability: Since the target audiences are State DOT CEO's and senior executives, the report is relevant to the current effort to develop a framework for performance measurement.

Methodology: The research was undertaken through interviews of key personnel at State DOT's which have a proven track record in strategic performance measurement.

Findings/Outcomes: Strategic performance measures link together strategic planning and performance measurement to translate organizational vision into a small group of measurable, meaningful, and accurate performance measures. Only a handful of DOTs, however, fully integrate performance measurement with their strategic management efforts. They offer compelling evidence that performance measures are more than merely a way to track progress. Indeed, strategic performance measurement can be the catalyst for energizing strategic management efforts, maintaining focus, and enabling organizational change. The four key building blocks for establishing a strategic performance measurement program and reaping these benefits are: basic principles, criteria for measure selection, the choice of individual measures, and an implementation framework.

Source: This document can be found online at: <http://downloads.transportation.org/Quality-CEOHandbook.pdf>

**7). TCRP (International Transit Studies Program) "Research Results Digest No. 95: Performance Measurement and Outcomes – a Report on the Spring 2009 Mission" (April, 2010)**

Purpose: This study was undertaken with an eye on exploring how performance measurements are used to achieve organizational goals and enhance quality of service at public transport planning, funding, and operating agencies in Hong Kong, Special Administrative Region of the People's Republic of China; in the city-state of Singapore; in Kuala Lumpur, Malaysia; and in Taipei, Taiwan.

Applicability: One might ask why international research is relevant to an effort to develop performance measures at DTR. The answer is that transit systems, regardless of what country they are located in, have much in common with each other and with U.S. transit agencies. Quality of service, maintaining efficiency, safety, and accessibility, for example, are always challenges no matter the locale. Furthermore, and perhaps more importantly for this effort, it is recognized that funding agencies (such as CDOT) around the world are evaluating public transport agencies' or grantee performance when determining where to allocate public funds. This later point is where the rationale for reviewing this document resides.

Methodology: This paper is based on individual reports by the research team members who asked standard questions of the various agencies they studied.

Findings/Outcomes: The agency's that were surveyed had a clear difference in motivation than their American counterparts primarily because they are largely privatized and focus on business strategies that improve profitability. This report summarizes *how* performance measures are used, *why* they used or implemented, and *what* measures are being used at the subject agencies. All of the agencies surveyed identify broad "core" categories of performance (similar to what have been proposed for DTR) and then develop detailed performance measures that feed into one or more of the core categories.

Source: This document can be found online at: [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rrd\\_95.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rrd_95.pdf)

**8). TCRP Report Publication No. 141 "A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry" (2010)**

Purpose: This research developed and tested a methodology for performance measurement and peer comparison for (a) all fixed-route components of a public transit system, (b) the motorbus mode specifically, and (c) major rail modes specifically (i.e., light rail, heavy rail, and commuter rail). This report complements *TCRP Report 88: A Guidebook for Developing a Transit Performance- Measurement System*, which describes how to implement and use performance measurement on an ongoing basis at a transit agency.

**Applicability:** TCRP Report No. 141 is an applicable resource in that it examines performance measurement and benchmarking as tools to (1) identify the strengths and weaknesses of an organization, (2) set goals or performance targets, and (3) identify best practices to improve performance. It is geared towards fixed route transit providers and has limited applicability to this phase of creating a framework for performance measurement at DTR. However, once the framework is finalized and the TRAC and DTR staff begin to identify specific performance metrics to be applied to the proposed performance categories, it will be quite useful as this document contains an Appendix that catalogs over 300 discrete performance measures.

**Methodology:** The research team undertook a literature review and selected agency interviews in an effort to identify comparison factors, performance measures, and applications. From this information an initial methodology was developed. Next, an interim report was prepared and presented to an expert panel for feedback and course correction. Once the methodology was modified, the team conducted small- and large-scale applications, and then interpreted the results, which are included in the final report.

**Findings/Outcomes:** As mentioned previously, this report is mainly geared toward agency's that operate fixed route public transit services. However, there are some findings that are applicable to State and Regional Transportation and Funding Agencies such as DTR. These are summarized below:

- **Issues with Reliability in Local transit agency and NTD data.** State and Regional Transportation and Funding Agencies should be familiar with local transit agencies and should know whether a change in a performance trend is due to something that has changed locally or whether it is a sign of a possible data problem. Some states, such as Texas and Florida, contract with universities to check NTD data and provide training in areas where data problems occur. In addition, for those state DOTs that incorporate performance results into grant-allocation formulas, having a data-checking process will help in obtaining transit agency acceptance that the data used by the distribution process are reliable.
- **Training efforts.** If the state DOT's review of its transit agencies finds that many are lagging their out-of-state peers in particular areas, the state can use this information to develop training activities in those areas that will benefit a large number of agencies.
- **Transit agency benchmarking programs.** The North Carolina DOT, for example, has developed a benchmarking guidebook for use by its state's transit agencies. This activity helps support the regional or state funder's goal of having its transit agencies serve riders efficiently and effectively and helps ensure that public money directly provided by the state is used responsibly. Funding agencies could consider providing incentives each year to local transit agencies that have developed and use such programs.
- **DOT annual reports on transit performance.** These reports can highlight performance-improvement success stories and the need for action in certain areas (such as dealing with aging infrastructure). These reports can also incorporate non-NTD measures that are of interest at a regional or state level, providing an additional information source that benefits all. The Washington State DOT's annual public transportation report is a good model.
- **Service area population and size values.** This research has shown the value of using per-capita performance measures and the desire of practitioners for reliable service area data. However, tracking regional population is not a normal transit agency function, and as a result the service area population and size values are not reported consistently to the NTD. MPOs, on the other hand, have the data and tools to readily perform these calculations.

**Source:** This document is available online at: [http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\\_rpt\\_141.pdf](http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_141.pdf)

**9). NCHRP Report Publication 708 – “A Guidebook for Sustainability Performance Measurement for Transportation Agencies” (July, 2011)**

**Purpose:** The objective of this project was to develop a guide for state departments of transportation and other transportation agencies to use to measure the sustainability of their networks, systems, facilities, projects, and activities, at the appropriate scales, stages (long-range planning, programming, project development, design, construction, maintenance, operations), and time frames. The guide intended to (1) support agency decision-

making processes at various management levels; (2) enable agencies to develop appropriate sustainability goals, objectives and associated performance measures, and methods for conducting performance measurement and monitoring; and (3) describe computation methods for these measures and possible data sources.

Applicability: This guidebook is applicable to the TRAC and DTR's effort to develop a framework for performance measurement.

Methodology: Literature review, agency interviews, and expert panel review.

Findings/Outcomes: The report describes the underlying principles of sustainability as it relates to transportation, possible goals that can be used to address those principles, and performance measures that can be used to address those goals. It acknowledges that working with performance measures can be a daunting task due to the large number of possible measures, extensive data that might be required, and computational complexity—hence the need for identifying useful and easy-to-use performance measures. The report does contain a performance measures compendium, which is organized by sustainability objectives and applicable performance measures for each goal and focus area.

Source: This document can be found online at: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_708.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_708.pdf)

#### **10). NCHRP Research Results Digest No. 361 "State DOT Public Transportation Performance Measures: State of the Practice" (September, 2011)**

Purpose: This Research Results Digest is intended to provide more information on performance measures and performance management approaches that can be used by state DOTs in relation to public transportation programs.

Applicability: This document is highly applicable to DTR's effort to create a framework for performance measures.

Methodology: The findings in this report are drawn from the three lines of research – 1) a literature review of state DOT performance management and public transportation performance measures, 2) a web survey of state DOT public transportation performance measures, and 3) interviews with selected state DOTs (Florida, Kansas, Minnesota, New Mexico, Virginia, and Washington) that serve as examples of the current practice in the use of public transportation performance measures at the state DOT level.

The research team conducted interviews by phone in October 2010. A copy of the questions is available, and information from the interviews is summarized in the report.

Findings/Outcomes: Through the survey, it was discovered that approximately two-thirds of all state DOTs indicated that they have some public transportation performance measures in place (30 out of 43 respondents). A number of motivations led these DOTs to the use of public transportation performance measures. These include providing accountability to stakeholders, responding to a legislative mandate, a desire for enhanced decision making, and as a way for agency leaders to communicate organizational priorities to their staff.

Common categories of measures include those that assess ridership, availability of services, internal cost and efficiency at the agency level, quality of service, asset management, and community impact. Findings indicate that ridership and internal cost and efficiency measures are much more widespread than measures of availability, service quality, asset management, or community impacts.

Use of performance measures by State DOT public transportation divisions is driven by the business functions these divisions perform, including compliance with data reporting requirements and supporting statewide public transportation planning decisions and funding allocation. Within the survey, 17 state DOTs indicated they are using public transportation performance measures to support allocation of or formulas for public transportation

operating funding, and 11 indicated they are using performance measures to support allocation of or formulas for capital funding. Several also identified that they were using performance measures to measure progress toward statewide goals (15 state DOTs) or for measuring progress toward agency targets or comparing agency services (15 state DOTs).

The research reveals that over half the states without public transportation performance measures indicated that data availability and lack of technical resources were challenges that have prevented the agency from using performance measures.

Among the best practices and lessons learned, several state DOTs emphasized the importance of picking measures that could be consistently used over many years – that is, they should be track-able over time. Others emphasized the importance of selecting measures that are meaningful to the storyline surrounding public transportation performance in the state. It was found that the type of service being measured affects what is considered meaningful. For example, rural public transportation systems must often look beyond traditional cost-efficiency measures to those that gauge social value and quality of life. Performance measures can also be used to track progress toward an agency’s stated goals and objectives. Thirty state DOTs responding to the survey indicated that they have statewide public transportation goals in place, and 15 indicated they are using performance measures to track progress toward those goals. In developing measures, DOTs rely on various resources including their peer DOTs, their transit partners, and national-level documentation. Some DOTs are also developing partnerships with public transportation associations and universities to support data collection.

A number of challenges remain, however, for advancing public transportation performance measures at state DOTs. Collecting data and connecting performance to funding decisions are two key challenges. Many state DOTs pointed to a need to find ways to compare disparate public transportation systems and to collect accurate and relevant data from their public transportation providers. Moreover, developing appropriate performance measures is often challenging, given the disparate nature of different types of public transportation services, particularly in rural areas.

Source: [http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rrd\\_361.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rrd_361.pdf)

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## Conclusions and Major Findings

There are a few broad points that can be taken away from this literature review that will be helpful as TRAC and DTR move through the process of developing the framework for public transit performance measures at CDOT:

- A key consideration is that since CDOT does not directly operate transit services, cooperation and coordination with public transportation providers will be critical to creating a useful statewide performance measurement program for public transportation.
- The research finds that many state DOTs are tracking public transportation performance measures for a variety of reasons, and it is important to understand the underpinning motivations when developing a performance measurement framework.
- Most performance measures in use focus on ridership and internal factors (e.g., cost, efficiency), though those that address service quality and asset management are becoming more widespread.
- Advanced public transportation performance measurement programs are notable for the linkages they make between organizational goals or strategy, performance measures used and funding decisions.
- Advanced public transportation performance measurement programs display characteristics such as accurate data collection processes, strong collaboration with public transportation providers, strong QA/QC practices, and sound reporting methods.
- Performance measures are most meaningful (and useful) when they are track-able over time, have storytelling potential, are meaningful for the different types of services being assessed, relate to Statewide goals, and utilize reliable and accurate data.

The research also indicates that there are potential challenges to be overcome during the process of creating a performance measurement program for public transportation at the DOT level. Challenges to be aware of include:

- Data updates, recording, and reporting. These tasks take time at the agency and DOT levels. We should strive to align these updates and reports with other update and reporting requirements – for instance when NTD data is “due” to be reported to the FTA.
- A lack of resources may exist at the local agency or DOT level. At the local level, this may be a lack of technical expertise or simply a lack of time to undertake the data collection efforts required by a performance measurement program. Depending on the ultimate magnitude of the performance measurement program, staff resources could become an issue at the DTR level.
- A diversity of providers/grantees can create challenges in selecting appropriate performance measures. These challenges often relate to differences in transit agency structure, funding, and governance that often exist between our rural and small urban systems.
- Change to a more performance oriented resource allocation method can often be difficult and face resistance.
- It can be difficult to link performance and expected outcomes to investment, particularly in the context of assessing “system wide” investment choices across all of a state DOT’s programs. A public transit performance measurement system for DTR should “fit” with other performance programs at CDOT.

**ACCESSIBILITY**

Coverage

Freight

Passenger

Serve All Populations

Freight

Passenger

Connectivity

Freight

Passenger

Percent of Areas Within X Miles of Rail Access

Performance Measure

Percent of Population Within 1/4 Mile of Bus Transit

Percent of Population Within 4 Miles of Commuter Rail

Percent of Population Within X Miles of Intercity Rail

Performance Measure

Performance Measure

Percent of Rural Population With Transit Service Available

Percent of Transit-Dependent Population With Transit Service Available

Number of Connections Between Short Lines and Class 1 Railroads

Performance Measure

Number of Intercity Bus Stops Statewide

Number of Intercity Rail Stops

**CATEGORY**

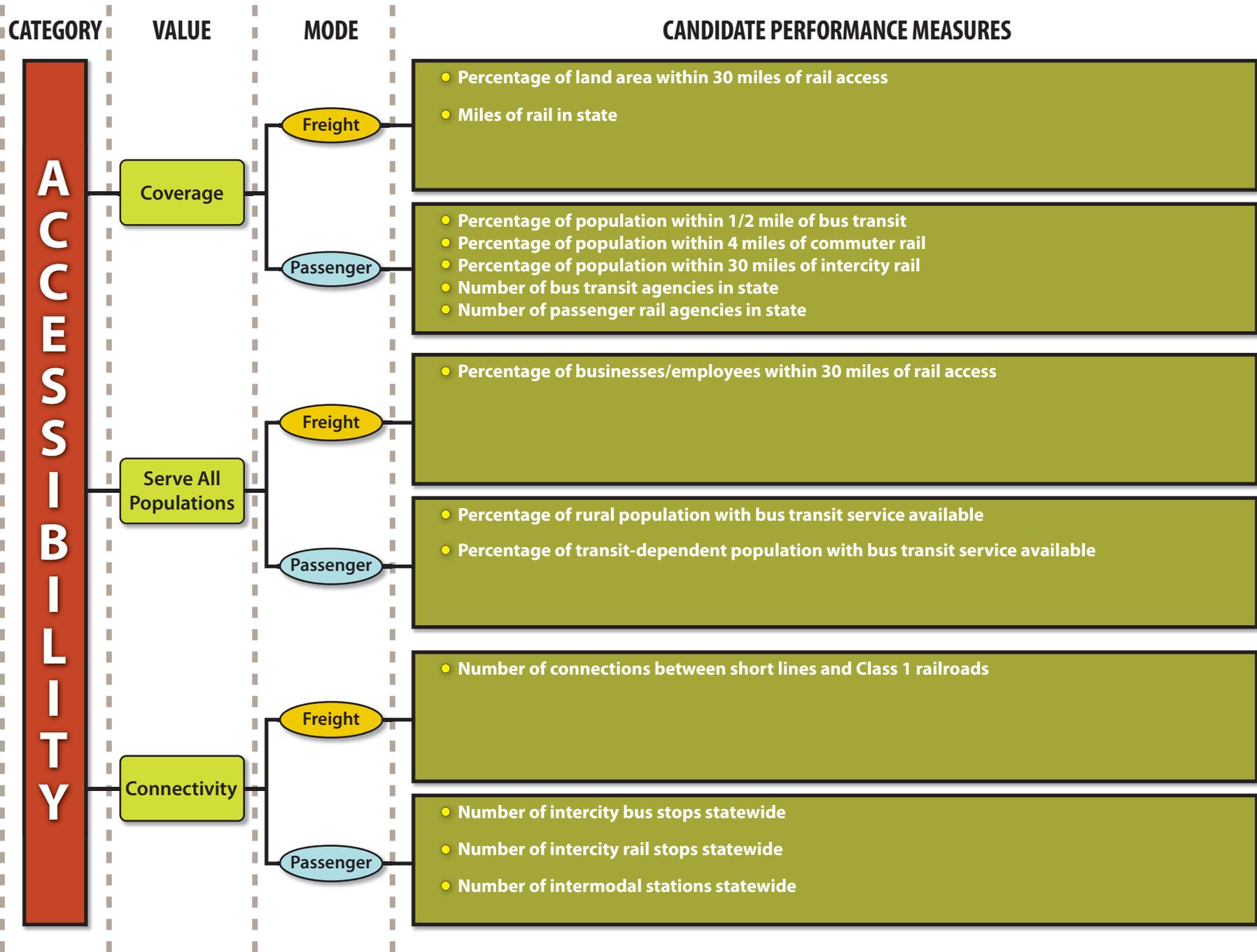
**VALUE**

**MODE**

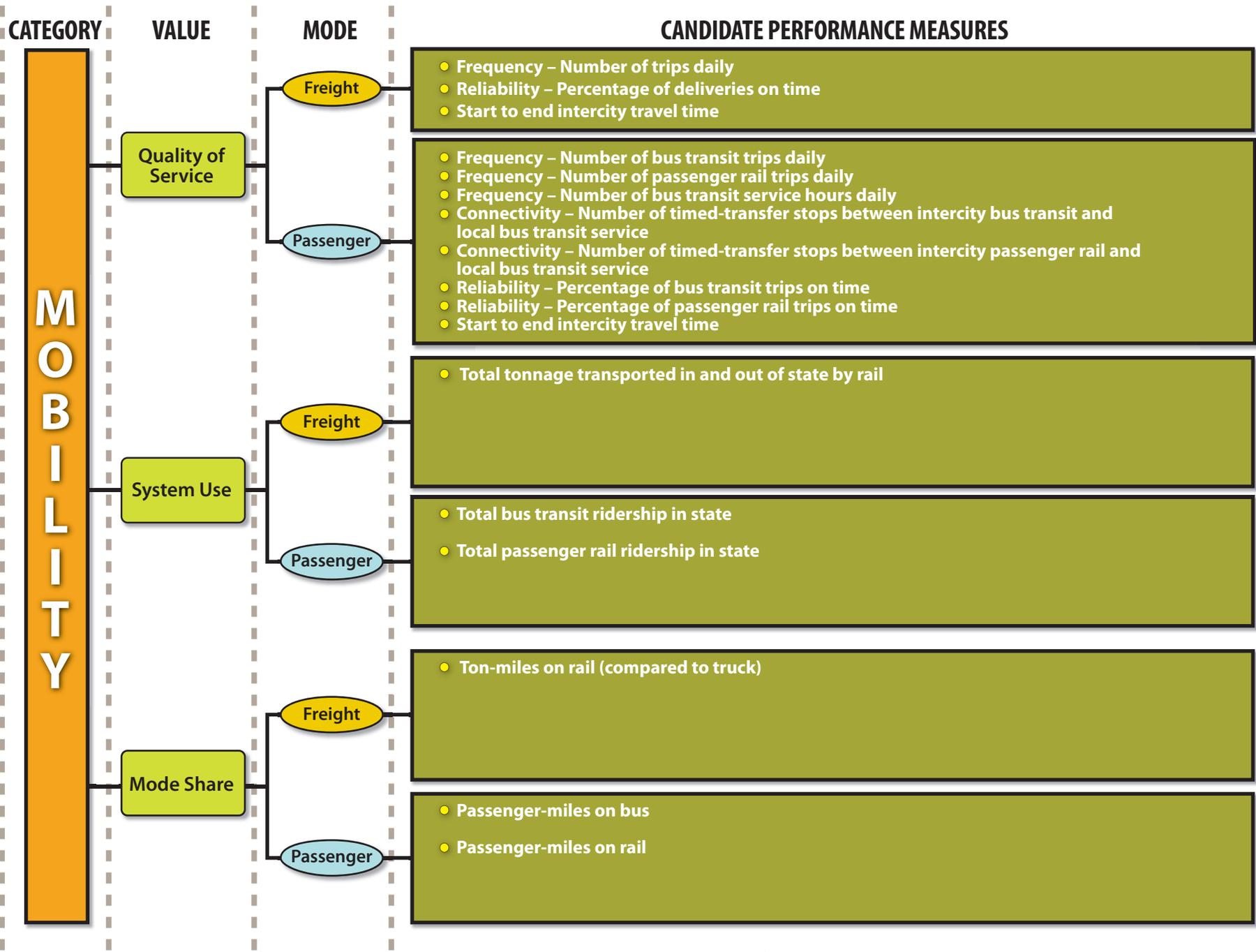
**PERFORMANCE MEASURES**

**FRAMEWORK EXAMPLE**





DRAFT



DRAFT

**CATEGORY**

**VALUE**

**MODE**

**CANDIDATE PERFORMANCE MEASURES**

**S  
A  
F  
E  
T  
Y**

Incidents

Freight

- Number of incidents (per VMT, Year, Trip, ton-miles traveled)
- Incident (rate, deaths, injury, property loss)
- Incidents at at-grade rail crossings
- Number of incidents involving hazardous waste

Passenger

- Number of incidents (per VMT, Year, Trip)
- Incident (rate, deaths, injury, property loss)
- Incidents per 1000 passengers
- Incidents at at-grade rail crossings

Facility

Freight

- Number of railroad/highway at-grade crossings
- Number of railroad/pedestrian at-grade crossings
- Percentage of at-grade crossings with active warning protection

Passenger

- Percentage of transit stops that are ADA compliant
- Percentage of transit stops with shelters

Security

Freight

- Percentage of rail yards with (lighting, security staff, CCTV)
- Customer perception of safety for goods in transit

Passenger

- Percentage of transit bus stops with (lighting, security staff, CCTV)
- Percentage of passenger rail stops with (lighting, security staff, CCTV)
- Customer perception of safety while using transit system

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**CATEGORY**

**VALUE**

**MODE**

**CANDIDATE PERFORMANCE MEASURES**

**E  
C  
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Land Use

Freight

- Number/Percentage of jobs/businesses/shippers served by rail
- Number/Percentage of manufacturers who have relocated for transportation purposes

Passenger

- Number/Percentage of dwelling units/jobs/businesses directly served by bus transit
- Number/Percentage of dwelling units/jobs/businesses directly served by passenger rail

Employment

Freight

- Direct jobs supported (i.e. BNSF/UP/Shortline employees)

Passenger

- Direct jobs supported by bus transit
- Direct jobs supported by passenger rail
- Percentage of employers that cite difficulty in accessing desired labor supply due to transportation
- Percentage of region's unemployed or poor who cite transportation access as a principal barrier to seeking employment

Tourism

Freight

- Percentage of visitors who arrive/depart by bus transit
- Percentage of visitors who arrive/depart by passenger rail

Passenger

- Percentage of visitors who arrive/depart by bus transit
- Percentage of visitors who arrive/depart by passenger rail

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## Transit Performance Measures Framework – Characteristics of Good Performance Measures

<b>Trackable Over Time</b>
Measures should be picked that can be consistently used over many years. The process for changing officially adopted performance measures can take significant time and effort to complete; consequently, consistency in measures is highly desired from an administrative perspective. DOTs also cite the value of consistently tracked data for making predictions and looking at impacts.
<b>Storytelling Potential</b>
A related consideration for DOTs is selecting performance measures that are meaningful and can help weave a storyline around performance in the state. Performance measures can be an effective communication tool for the DOT overall and for reporting to the transportation commission and the state legislature.
<b>Meaningful for Types of Service Measured</b>
Performance measures should be defined based on their ability to convey information about individual methods of transportation. Measures that are helpful when discussing transit may be different from freight rail, but still may have the same ultimate goal for describing the performance category and value. For example, safety is a category useful for all transportation types, but must be measured using unique performance measures (e.g. transit may be measured in injuries per million miles of service and freight rail may be measured in crashes per year at rail crossings statewide).
<b>Relation to Statewide Public Transportation Goals</b>
In performance-based planning, performance measures should track progress toward an agency's stated goals and objectives. The Transit and Rail Advisory Committee has already defined a vision statement and values and assigned each to individual categories. Performance measures identified for each category should be chosen based on their cohesion with these stated goals and objectives.
<b>Available Data</b>
In many cases, the measures selected are heavily influenced by the availability of data. As most states do not directly operate transit and rail services, they rely on the data available from local public transportation providers and freight rail companies. The available data will vary depending on the transportation type and performance measures should be oriented to available data or data that can reasonably be expected to be available as the performance measures framework is implemented.