



THE TRB PERFORMANCE MEASUREMENT COMMITTEE

NEWSLETTER

DECEMBER 2006

MESSAGE FROM THE CHAIR

BY LANCE NEUMANN ineumann@camsys.com - CAMBRIDGE SYSTEMATICS

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PMC Newsletter Information

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Disclaimer:

The PMC Newsletter is sponsored by contributors submitting Performance Measurement related articles to the editor and do not reflect the views of the Performance Measurement Committee

Our Committee was very active at the summer meeting in La Jolla. A number of committee members participated in a performance measures/data workshop held in conjunction with the meeting and a number of excellent NCHRP problem statements were produced and submitted as a result of this session. Our committee is co-sponsoring a session at the TRB annual meeting in January that will report on the results of this workshop and the data issues that continue to challenge the performance measurement community. Our summer committee meeting was well attended by members and friends and topics for both annual meeting sessions and potential NCHRP projects were identified. As a result, a number of NCHRP problem statements have been submitted and our committee will sponsor or co-sponsor a range of sessions at the annual meeting. Finally, Connie Yew and Joe Zietsman reported on the dramatic increase in the activity on the FHWA performance measures community of practice web site, co-sponsored by our committee. This increase in activity was the result of the significant efforts by our communications and research subcommittees to encourage more active participation and management. Congratulations to all involved in this effort since the site now represents a real resource. RFPs for two new research projects related to performance measurement were released over the summer. NCHRP Project 8-62 Transportation Performance Management Programs – Insight from Practitioners and SHRP II Project CO2 Systems Based Performance Measurement Framework both should begin sometime during 2007.

In October, the first meeting of the planning committee for our 3rd National/1st International Conference on Performance Measurement occurred and we are off to a great start in organizing what should be a very exciting conference. A call for

white papers to support some of the plenary sessions at this conference has been issued and a subcommittee including several international representatives is focusing on encouraging international participation. More information about the conference is provided elsewhere in this newsletter and we will provide an update at our committee meeting in January.

At the TRB annual meeting in January, there will be a variety of sessions of interest to the performance measurement community. The sessions sponsored or co-sponsored by our committee are identified on page 5 of this newsletter. The workshop on accountability and reporting of performance results to be held on Sunday, January 21st may be of particular interest. At our committee meeting we hope to have updates from a variety of ongoing performance measurement activities including the AASHTO Standing Committee on Quality's work on comparative measures, the National Transportation Operations Coalition's work on performance measures for operations and the I-95 Corridor Coalition's performance measurement efforts.

I will look forward to seeing you all in January.



Save the Dates!



TRB's 3rd National/1st International Performance Measurement Conference

"Better Decisions, Better Communication"

Conference Locations

Beckman Conference Center
100 Academy
Irvine, CA 92617
Tel: 949-721-2200 Fax: 949-721-2288
<http://www7.nationalacademies.org/beckman/>
Hyatt Regency Newport Beach Hotel
1107 Jamboree Road
Newport Beach, CA 92660
Tel: 949-729-1234 Fax: 949-644-1552
<http://newportbeach.hyatt.com>

WYDOT LAYS THE FOUNDATION FOR AN ASSET MANAGEMENT SYSTEM

BY JANET FARRAR JANET.FARRAR@DOT.STATE.WY.US

This article is the fourth in a series featuring WYDOT successes and challenges implementing Performance Measures into their transportation program.

CHEYENNE – The Wyoming Department of Transportation continues to move towards a fully-integrated asset management system. The first step was to get the enterprise resource program (ERP) up and functioning. WYDOT went live with ERP in July, and although employees are still learning the system, the undertaking has been, for the most part, successful.

WYDOT's previous accounting system was focused on core financial statements. Although core financial statements are important, their use is limited, and many users became frustrated trying to use the information as a decision-making tool.

The new system takes the focus off financial reporting and puts it on asset management. It is user-friendly, and will enable many users to become better decision-makers.

It will also be able to:

- Perform data queries including:
- repair/replace trade-offs,



This bridge, carrying northbound traffic on Interstate 25 through Casper, was reconstructed during the summer. Future bridge projects will be influenced by WYDOT's new asset management system, ERP.

- scenario analysis, and
- system-wide optimization based on key performance indicators and life-cycle cost;
- Prioritize projects for fund allocation;
- Precisely record and capture asset data and provide the ability to share this information; and
- Provide better tools to prepare budgets and work plans.

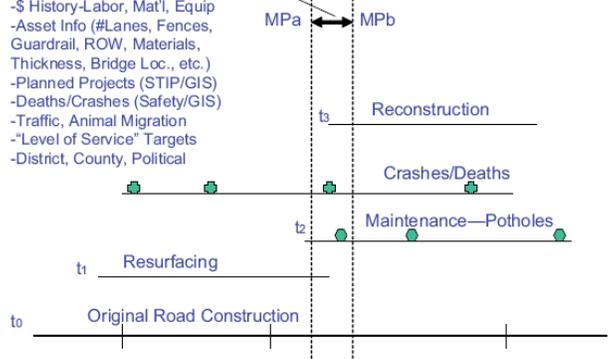
The asset management system reports accurate locations of construction and maintenance activities, shows information on a linear "road view," interface with the pavement management system (PMS) and links with Global Positioning Systems

(GPS) for asset locations, work accomplishments and time recording. ERP has many capabilities that WYDOT plans to use in the future, including integrating ERP with WYDOT's Geographic Information System (GIS).

Asset Information Layers

Dynamic Info Query:

- Road Condition (PMS)
- Maintenance Activities/Locations
- \$ History-Labor, Mat'l, Equip
- Asset Info (#Lanes, Fences, Guardrail, ROW, Materials, Thickness, Bridge Loc., etc.)
- Planned Projects (STIP/GIS)
- Deaths/Crashes (Safety/GIS)
- Traffic, Animal Migration
- "Level of Service" Targets
- District, County, Political



In the future the ERP system will contain many information layers and be GIS-enabled.

(Continued on page 3)

WYDOT CONTINUED...

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The ERP system collects data on reported road conditions; maintenance activities and locations; funding history, including labor, materials and equipment; asset information including number of lanes, guardrail, right of way, materials, pavement thickness, bridge locations and conditions; planned projects; crashes and fatalities; traffic volumes; animal migration; level of service targets; and district, county, and political segments.

WYDOT is currently in the process of updating and populating its management systems for pavement, bridge, maintenance, safety and capacity. These databases will be used as one of the main components in the asset management process flow, along with pavement analysis, budget profile and the balanced scorecard (WYDOT's performance measurement tool) to make informed decisions.

ERP will record maintenance accomplishments by activity into the PMS file table and create a work plan using WYDOT's level of service framework. The level of service framework will be tested in preparation for fiscal year 2008 budget.

The ERP maintenance man-

agement system is currently up and running and gives more visibility to work accomplished and locations of work concentration. Linking maintenance work orders to a GIS system is proving to be a benefit to decision-makers. The next step includes loading level of service data into the system to begin capturing the achievements into the budget cycle.

The bridge management system is currently being updated to migrate more to a uniform health index with predictive features to track bridge conditions. The deterioration rate calculations for the bridge element will greatly enhance WYDOT's ability to evaluate future funding strategies to ensure that bridges remain at the serviceability goals.

The safety management system is being developed and will greatly increase WYDOT's ability to evaluate crashes against a wider range of causal effects, helping safety professionals quickly zero in to factors that contribute to the unacceptable level of fatalities and serious injuries on our highways. Comparing safety features, ranging from guardrail locations to pavement widths, against a history of accidents will allow WYDOT to construct effectiveness models for the most

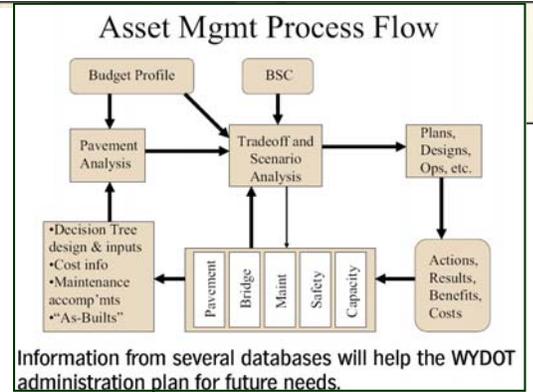
effective tools in reducing accidents.

All of WYDOT's roads are seeing an increase in traffic volumes, and in some areas, the amount of

the increase is staggering.

Some of these roads and bridges cannot be maintained to the same capacity as exists now. The ERP congestion management system will help WYDOT analyze the proper timeframes for facility reconstruction to meet the growing demand. Overbuilding infrastructure too early can create a ripple effect within the rest of the system as funds are diverted from other needed projects.

This is an exciting time for WYDOT as it continues to create a comprehensive system that will serve its customers well for years to come. The ultimate goal, providing a program that can look across the different silos of management systems to ensure that the transportation system is maintained at the desired levels of service, is becoming a reality.



"The bridge management system is currently being updated..."



Story by Janet Farrar, Strategic Performance Improvement Program manager. Martin Kidner, David Stearns, Larry Redd and Gary Schneider contributed to this story.

WSDOT TIES TRANS DEMAND MANAGEMENT EFFORTS TO SYSTEM PERFORMANCE —

BY KEITH COTTON, COTTONK@WSDOT.WA.GOV, BRIAN LAGERBERG, LAGERBB@WSDOT.WA.GOV AND JOHN RESHA, RESHAJ@WSDOT.WA.GOV

The Washington State Department of Transportation implements transportation demand management (TDM) to maximize the efficient use of the transportation system. Consequentially, WSDOT is beginning to tie TDM investment decisions and strategy development to overall system performance.

For example, WSDOT is linking system performance measures to program decision-making in two TDM programs:

- Targeting the state's Commute Trip Reduction (CTR) program on congested highway corridors
- Implementing a Construction Mitigation program to offer travel solutions focused on keeping people moving during major corridor construction

CTR Program

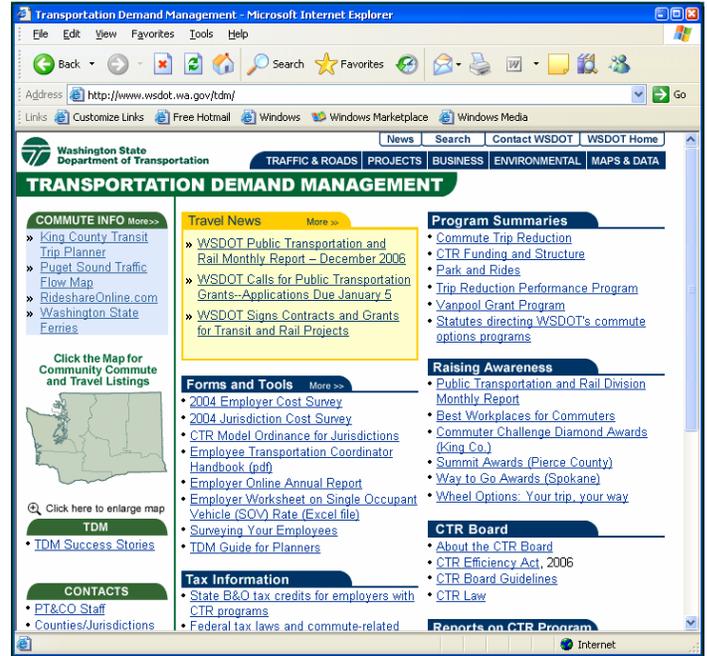
Washington's CTR program works with major employers in the state's ten most populous counties to encourage employees to commute without driving alone. About 500,000 employees at nearly 1,100 worksites in the state have access to CTR programs.

The drive-alone rate at worksites participating in CTR

decreased seven percent from 1993 to 2005, helping to reduce travel delay by an estimated 11.6 percent in the greater Seattle metropolitan area on an average peak morning commute.

During the 2006 legislative session, WSDOT and the CTR Task Force, a governor-appointed policy oversight body, proposed changes to the CTR program to make it more effective and efficient. The most significant performance-related changes include:

- Shifting the program from the ten most populous counties to those urban growth areas that contain the most congested state highways. This change focuses the program on the areas of the state that will deliver a high return on state and private investment.
- Establishing program goals that are projected to improve the mobility of people and goods by increasing the efficiency of the state highway system. The original goals for the program were arbitrary and independent of system needs. WSDOT is proposing two minimum targets:



a 10 percent reduction in the proportion of drive-alone commute trips by CTR commuters by 2011, and a 13 percent reduction in commute vehicle miles traveled per CTR commuter by 2011. Each city and county in the program must establish program targets at or above the state minimum. Local jurisdictions will have the flexibility to set higher targets for their urban growth area, or to establish variable targets for their employer worksites based on the transportation and land use characteris-

(Continued on page 5)

“During the 2006 legislative session, WSDOT and the CTR Task Force.....”



WSDOT TIES TRANS DEMAND MANAGEMENT EFFORTS TO SYSTEM... ..

(Continued from page 4)

tics of the site.

Construction Mitigation

Over the next 10 years, the I-405 corridor on the eastside of the Seattle metropolitan area will experience the highest level of construction activity since it was first built over 40 years ago. To offset the impacts of construction, WSDOT has teamed up with communities and transit agencies to offer travel solutions focused on keeping people moving during the I-405 construction.

The I-405 TDM construction mitigation work plan relies on four main integrated elements:

- Maintain roadway capacity with increased

bus service, maximized HOV (vanpool and carpool) use, and enhanced incident response

- Shift trips to transit and HOV with park and ride lot enhancements, as well as through efforts targeting when and where travel occurs
- Engage and inform the public through expanded real-time travel information
- Target outreach to specific geographic and trip markets to ensure that the most people have relevant knowledge.

As mitigation is targeted, each phase of the construc-

tion will present varied needs and objectives. In the case of the first phase of the I-405 work, the objective is to maintain the pre-construction 33 mph traffic flow while under construction conditions. This translates to affecting approximately 1,500 vehicle trips daily by turning drive alone commute peak hour traffic into transit, carpool, and vanpool trips as well as shifting trips out of the peak period.

As WSDOT continues to implement these and other programs, it will continue to measure the effectiveness of TDM strategies in enhancing system performance. For more information about WSDOT's TDM strategies, visit www.wsdot.wa.gov/tdm/.

“The I-405 TDM construction mitigation work plan relies on four main integrated elements:.....”

2007 86 th TRB Annual Meeting ABC30 Performance Measurement Committee Sponsored & Co-Sponsored Sessions				
Session	Function Title	Location	Day	Time
115*	Accountability and Performance: How Some State Departments of Transportation Are Reporting on Performance and Results	Hilton	Sunday-Jan. 21, 2007	8:30am - 12:00pm
231*	Safety Management and Asset Management	Hilton	Monday-Jan. 22, 2007	8:00am - 9:45am
	Performance Measurement Committee	Hilton	Sunday-Jan. 21, 2007	8:00am - 12:00pm
328*	Successful Asset Management and the Role of Organizational Culture	Hilton	Monday-Jan. 22, 2007	1:30pm- 3:15pm
343*	Planning Mega Session	Hilton	Monday-Jan. 22, 2007	2:30pm-5:00pm
370*	Asset Management: Lessons from the Domestic Scan, Executive Session, and Best Practices	Hilton	Monday-Jan. 22, 2007	3:45pm- 5:30pm
371	Challenges of Data for Performance Measurement	Hilton	Monday-Jan. 22, 2007	3:45pm- 5:30pm
	Performance Measures Conference Planning Subcommittee, ABC30(1)	Hilton	Monday-Jan. 22, 2007	5:45pm-7:15pm
403	Performance Based Contracting	Hilton	Monday-Jan. 22, 2007	7:30pm- 9:30pm
715	Performance Measurement Tools and Practice	Hilton	Wednesday-Jan. 24, 2007	7:30pm - 9:30pm

*Co-sponsored by ABC30

RECENT I-95 CORRIDOR COALITION INITIATIVES IN PERFORMANCE MEASUREMENT

BY DANNY JIJI DJJI@PANYNJ.GOV

The I-95 Corridor Coalition's Performance Measures Task Force sponsored an October 2006 webcast to familiarize members and others with recent developments in performance measurement in transportation. The Coalition is an alliance of transportation agencies, toll authorities, and related organizations, including law enforcement, from Maine to Florida, with affiliate members in Canada.

Over 40 people participated in the webcast. The goals of the webcast were to familiarize participants with applications, recent developments, and best practices in performance measurement; respond to questions and comments; and identify how the Coalition can best assist members as they carry out performance measurement in their organizations. Anita Vandervalk, Cambridge Systematics, presented a summary of research she conducted for the Coalition in 2005. That project provided a framework for performance measurement for the Coalition, showing the relationship between the Coalition's major strategic goals, activities, and organizational structure and how these fit with performance measurement. The project also featured a snapshot of the state-of-practice in performance measure-

ment for transportation, along with a survey of best practices among Coalition member agencies.

Task Force Chair, Dan Jiji, Port Authority of New York and New Jersey, led the webcast. Zoe Neaderland, Delaware Regional Planning Commission; Jeff Price, Virginia DOT; and Gordon Morgan, Florida DOT, described recent and current initiatives of their agencies in performance measurement. The Task Force was also eager to hear of efforts of other associations that would be of interest and assistance to Coalition members. These presenters included Rich Taylor, FHWA, who described activities of his agency and of the National Transportation Operations Coalition; and Lance Neumann, Cambridge Systematics, who described committee activities and research being carried out under the auspices of the Transportation Research Board.

The Coalition



maintains an informative website that includes a Performance Measures Document Library and all of the materials from the webcast.

To view all these materials, along with other information about and by the Coalition, go to www.i95coalition.org.

The Task Force welcomes additional participants, so if you are interested, please email Coalition staff Marygrace Parker at i95mgp@ttlc.net or Patty Reich at

Patty.Reich@telvent.abengoa.com.

"Over 40 people participated in the webcast."

TRB & FHWA Performance Measurement Web Boards!

Both the TRB Performance Measurement Committee and the FHWA have coordinated the development of their websites to support the needs of the TRB Performance Measurement Committee as well as the needs of other performance measurement related Work Groups. The TRB board (www.trb-performancemeasurement.org) has been completed in featuring the PMC Newsletter, Scope, & Strategic Plan, Discussion boards, auto mailing of site changes and Chat for members on the mailing list. The FHWA board (Performance Measurement Exchange) features direct links to other performance measurement related communities in addition to auto mailing of site changes and discussion boards for all users. Please feel free to contact [Mike Tierney](mailto:Mike.Tierney) for questions regarding these sites.

The TRB Performance Measurement Exchange:



The TRB Performance Measurement Committee Home Site:



WINTER MAINTENANCE BY THE NUMBERS

— BY RICHARD L. HANNEMAN DICK@SALTINSTITUTE.ORG

Winter has arrived in the Northern Hemisphere snow-belt and drivers look forward to that first snowfall when they'll tap their brakes to find out just how slippery that roadway is. We've known, intuitively, that friction measurement is what counts when it comes to determining whether winter roadways have been properly maintained. But for a century, that intuition received little reinforcement in metrics of use to the driving public.

That's changing.

For years, airports have used friction measurement to determine whether or not runways could land planes safely. Roadway maintainers dreamed of the day when they could adapt these systems for use on snowplows in winter conditions. Alas, public roadways are "mean streets" in terms of the punishment they dish out to delicate electronic systems that may work in the controlled airport environment. Plus, the airport devices sprayed water onto the runway in order to measure skid resistance – hardly a practical solution for public roads.

Engineering advances in North America and Europe raise new hopes for friction measurement that can be used by roadway agencies to determine if they are reach-

ing their goals in preserving winter roadway safety and mobility. Until a decade ago, friction was measured by putting the test vehicle into a controlled (they hoped) skid and measuring the coefficient of friction. Throwing the brakes on a spreader truck on an urban arterial is not the ideal solution. The newer technologies employ continuous measurement of surface friction by installing an "extra" wheel mounted at a fixed angle to the line of travel, creating friction resistance which can be measured and results transmitted to the cab or back to a snow fighting command center. The U.S. device was based on technology developed for Indy 500 racecars whose drivers wanted to push them to the limit without losing traction and spinning out. In Europe, Norway is notable for its advances in roadway friction measurement. Some of the more sophisticated European models come with friction-triggered cameras (e.g. VitaPhoto by Vitasoft AS, Kongsberg, Norway) that automatically record the roadway surface conditions when the coefficient of friction declines

beyond the safe range.

In the U.S., Ohio DOT has the most experience with these friction devices which were developed by Halliday Technologies, Powell, OH (www.hallidaytech.com).

More information is available from Dr. Wilfrid Nixon, former chair of the TRB Winter Maintenance Committee and a professor at the University of Iowa (also President of Asset Insight Technologies in Iowa City that markets this technology). Baard Nonstad of the Norwegian Public Roads Administration can provide further information about the C- μ trip and ELTRIP decelerometers and the later generation continuous friction testing devices produced Swedish manufacturer ASFT (such as its T2Go unit) and



"For years, airports have used friction measurement .."



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WINTER MAINTENANCE BY THE NUMBERS

— BY RICHARD L. HANNEMAN DICK@SALTINSTITUTE.ORG

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his agency's experience with the Road Analyzer and Recorder (RoAR) Mark III by Norsemeter AS, Traction Watcher One (TWO) and the Optimum Surface Contamination Analyzer and Recorder, (OSCAR) by Norsemeter AS, the agency's current instrument of choice. Vertec AS manufacturers an instrument similar to OSCAR, the Friction Inspector of Norway (FION).

Roadway maintainers – agency personnel or contractors – are usually required to maintain at least a coefficient of friction of at least 0.3. Continuous friction measurement devices can stream the data into the cab so operators can adjust their salt application rates and also beam it to operations headquarters

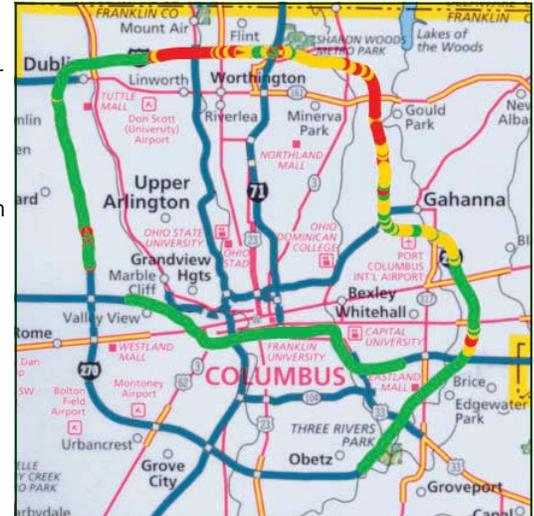
where color-coded highway maps can be used internally by dispatchers and could be Web-posted for drivers seeing the latest and best road weather information.

Friction measuring devices create accountability for outcomes for the first time. In years past, snow fighters have been asked only to demonstrate that they responded quickly, dispatched resources (equipment, labor and salt) efficiently and returned the roads to dry and bare conditions within an acceptable amount of time. During the storm, all bets were off; the heroic crews worked around the clock doing the best they could – and roadway users were either impressed or frustrated with the result (as some former mayors found out on

election day). Now, the possibility of in-storm tactical adjustments should result in roads with more consistent safe driving conditions. As a result, Ohio DOT has gained valuable insights allowing it to

improve its application timing to reflect the interaction of salt applications and traffic to ensure safer roads.

The next frontier will be to transmit actual roadway friction readings to drivers in real-time so they can know what's really going on where the rubber meets the road. Stay tuned.



“Friction measuring devices create accountability”

TRB
Performance Measurement
Exchange
Federal Highway Administration

TRB Booth for Performance Measurement Exchange Community of Practice Website

The website has been in operation for quite some time and has shown a considerable increase in usage over the past year. The site allows people interested in performance measurement to share their experiences and knowledge, collaborate on work, identify and exchange best practices, and advance the state-of-the-art.

We are excited to announce that the website will be showcased at a booth at the Annual TRB Meeting in January, 2007. It will be booth number 1300 and will be located in the Exhibit area of the Marriott Wardman Park Hotel from Monday, January 22 until Wednesday, January 24. If you are planning to be at TRB, please make every effort to stop by the booth!

In the meantime, please visit the website and share your knowledge and experience:
<http://knowledge.fhwa.dot.gov/cops/pm.nsf/home>

TRB POLICY AND ORGANIZATION AWARD— THE CHARLEY V. WOOTAN AWARD

TRB continues to recognize the importance of performance management to good governance and organizational efficiency. A paper presented at a TRB Performance Measurement Committee sponsored session at the 2006 conference, "Selecting Indicators for Strategic Performance Management" has won the Charley V. Wootan Award

for best paper in the area of transportation policy and organization. The paper reports work done on how to select performance indicators to monitor transport plans. In particular, the paper developed an approach to overcome many of the negative side effects that performance management can be accused of generating. The paper, au-

thored by Dr Greg Marsden and Charlotte Kelly (Institute for Transport Studies, University of Leeds) and Dr Carolyn Snell (SEI – York) is part of the DISTILLATE project (www.distillate.c.uk).

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

"There are currently 14 measures"

TRACKING TRANSPORTATION PERFORMANCE IN METROPOLITAN ATLANTA WITH A TRANSPORTATION MAP

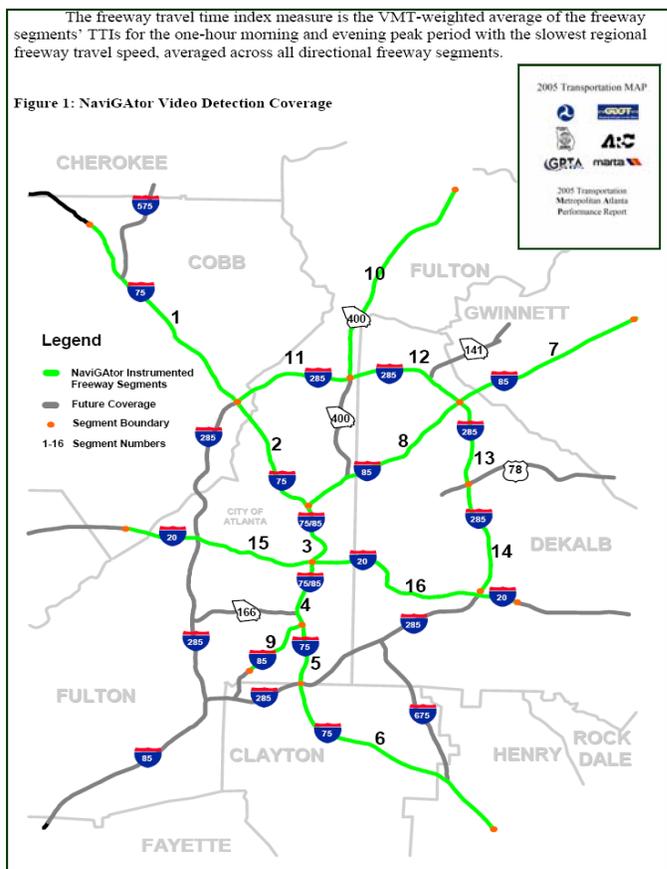
— BY VALENTIN VULOV VALVULOV@GRTA.ORG

Metropolitan Atlanta will invest significant resources in its transportation system over the next 25 years. In order to assess the current state of the system and the effectiveness of transportation investments, a group of agencies developed a set of measures and targets for tracking the performance of those investments in 2003. The annual Transportation MAP (Metropolitan Atlanta Performance) Report summarizes those measures and targets. **There are currently 14 measures** grouped in four areas: Mobility, Transit Accessibility, Air Quality, and Safety. These measures are obtained for the Metropolitan Atlanta area consisting of Cherokee, Clayton, Cobb,

Coweta, DeKalb, Douglas, Fayette, Forsyth, Fulton, Gwinnett, Henry, Paulding, and Rockdale counties.

The agencies tracking the performance measures are the U.S. Department of Transportation, the Georgia Department of Transportation (GDOT), the Environmental Protection Division of the Georgia Department of Natural Resources, the Atlanta Regional Commission, GRTA, and MARTA.

Baseline and target years have been set for the measures, typically 2000 or 2001 for the baseline year and 2006 for the target year. Specific targets for each measure were established based on review and discus-



TRACKING TRANSPORTATION PERFORMANCE IN METROPOLITAN ATLANTA WITH A TRANSPORTATION MAP.....

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sion by professionals from the participating agencies. **Each year, after the data is collected and certified, a task force consisting of** representatives of the participating agencies reviews the existing and proposed new measures and targets. Selected recommendations and ideas are then incorporated into the annual edition of the Transportation MAP Report. The final report, representing a snapshot of the region's progress in meeting the targets, is disseminated to the regional policy makers and the general public.

New measures and targets are developed and added to the report as they become necessary. For example, the 2005 report introduced the travel time index as a measure for congestion on the Atlanta region's freeways. For this measure, data were generated using GDOT's NaviGator video detection cameras. Two travel time reliability measures—the planning time index and the buffer time index—are under development and will be included in the 2006 report. For more information, contact Valentin Vulov, AICP, Senior Project Manager, at 404-463-2434.

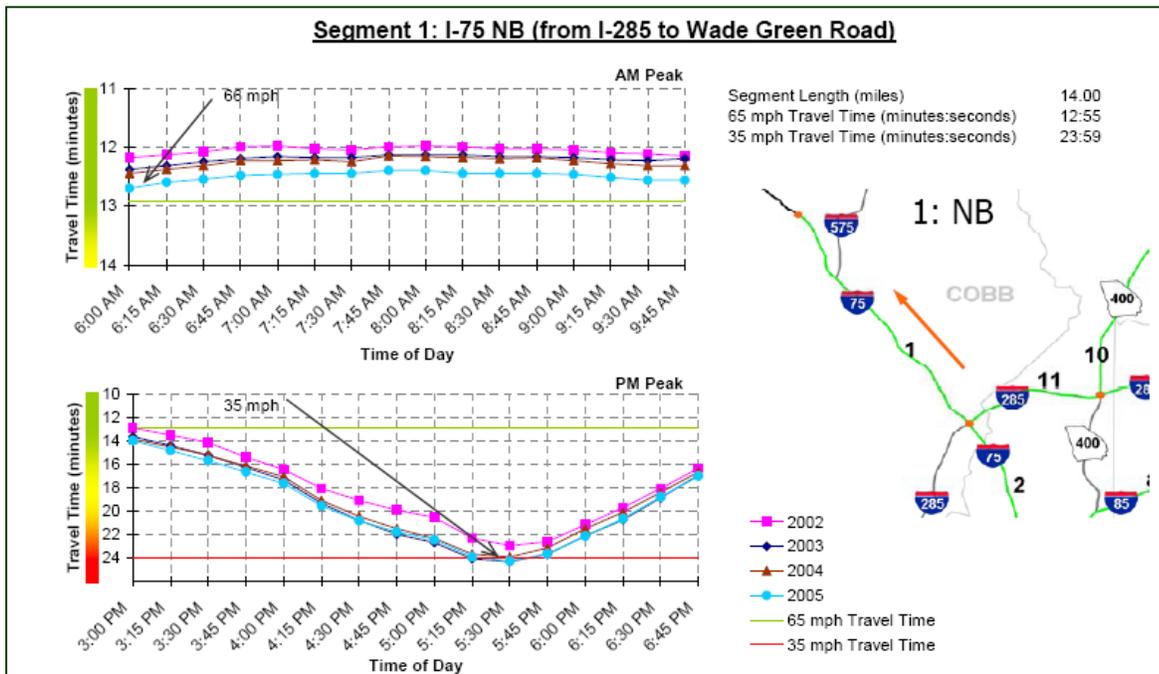
To view the 2005 Transportation MAP Report online, visit http://www.grta.org/news_section/2005_publications/2005%20Transportation%20MAP%20Report%20Final%20Body.pdf



The historical travel times by Atlanta freeway corridor (the Appendix to the 2005 report) can be accessed at

http://www.grta.org/news_section/2005_publications/2005%20Transportation%20MAP%20Report%20Final%20Appendix.pdf

“Each year, after the data is collected and certified, a task force consisting of”



FEATURED STUDIES & SELECTED PERFORMANCE MEASUREMENT RESEARCH & UPDATED RESEARCH ARCHIVE MATRIX

REPORT **NCHRP 551**, FY2006 - PERFORMANCE MEASURES AND TARGETS FOR TRANSPORTATION ASSET MANAGEMENT

Introduction

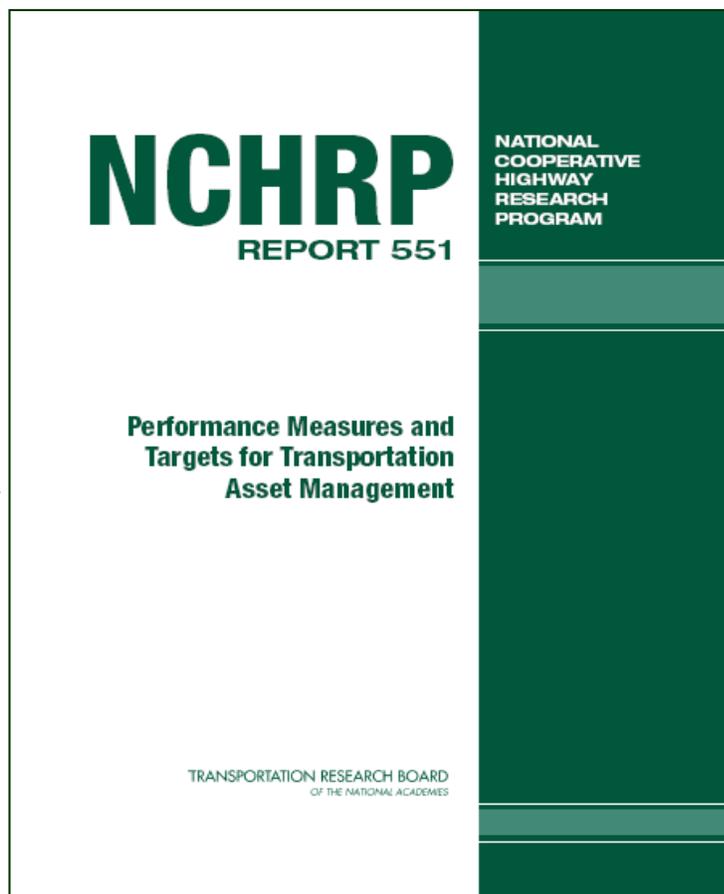
Asset management and performance measurement are topics of strong interest in the transportation community today. NCHRP Project 20-60 looks to the strengths of both of these concepts in considering what performance measures are best to apply within an asset management context. In doing this the study considers implications of several relevant trends now influencing U.S. transportation industry practice:

- Increased use of performance measurement in transportation policy making, planning, programming, and system monitoring;
- Formal development of asset management principles through a collaborative effort among TRB, AASHTO, and the FHWA, culminating in the production of AASHTO's Transportation Asset Management Guide through NCHRP Project 20-24(11);
- Development and application of maintenance quality assurance programs, which base maintenance management on explicit levels of service that, like performance measures, can serve as indicators of both current condition/performance as well as target values for improvement; and
- A renewed focus on analytic tools and other information technology resources that are needed for performance-based management and, more generally, good asset management.

The objectives of this project were to develop an understanding of what set of performance measures can best serve the principles of good asset management and to recommend procedures that help an agency apply this understanding. This study has developed a practical methodology that enables a transportation agency:

- To identify measures of transportation system performance that are best suited to good asset manage-

Featured Research	
<p>Project <u>NCHRP 551</u>, FY 2006 Performance Measures and Targets for Transportation Asset Management</p>	<p>Project <u>NCHRP 8-32(2)A</u>, FY 2000 A Guidebook for Performance-Based Transportation Planning</p>
<p>Project <u>TCRP E-03A</u>, FY 2006 Applications for Improved Inventory Management for Public Transit Systems</p>	<p>Project <u>TCRP G-06</u>, FY 2006 A Guidebook for Performance-Based Transportation Planning</p>



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REPORT 511.....

(Continued from page 11)

ment, covering a range of investments for system preservation, operations, and capacity expansion; and

- To select specific performance measures and set targets for these measures that are consistent with the needs of the agency and with good asset management practice.

This report is Volume I of a two-volume set presenting the results of research conducted for Project 20-60. It includes:

- Results of a literature review and interviews with 15 transportation agencies, describing the range of performance measures now used or proposed for use by domestic and international agencies, the criteria that now govern performance measure selection, and how performance measures are applied in different agencies.
- Criteria for selecting performance measures that are useful to asset management, based on the requirements for this study set by the panel in the scope of work and the principles articulated in the Transportation Asset Management Guide.
- An in-depth treatment of key considerations in defining and using performance measures within an asset management context.
- A description of the framework that has been developed for agencies to use in identifying performance measures that are most useful to asset management and to select target values for these measures.

Volume II of this report is a guide to the framework for performance measure identification and target setting.

PROJECT 8-32(2)A FY 2000 - A GUIDEBOOK FOR PERFORMANCE-BASED TRANSPORTATION PLANNING

National Cooperative Highway Research Program - Completed Project

Res. Agency: Cambridge Systematics, Inc.

Principal Invest: Steven M. Pickrell

Effective Date: April 1, 1997

Completion Date: April 30, 1999

Funds: \$299,990

The results of this project are summarized in NCHRP Report 446, A Guidebook for Performance-Based Transportation Planning. The research delved into the development of a framework for performance-based transportation planning. The report is intended to provide transportation organizations, planning practitioners, and transportation decision makers with practical tools and guidance for considering system performance in the multimodal transportation planning and decision-making process. It is also expected to support transportation investment

(Continued on page 13)



“This report is Volume I of a two-volume set presenting the results of research conducted for Project 20-60. It includes:.....”

TRB NEWSLETTER CONTACT INFORMATION

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PROJECT 8-32(2)A.....

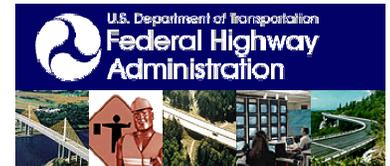
(Continued from page 12)

decisions tailored to the specific conditions and performance needs of major transportation systems. Presented as a guidebook, it brings together lessons learned from different regions of the country and establishes a rationale for performance-based transportation planning and provides guidance for a wide range of applications having different scopes and levels of complexity. 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 guidebook should be especially valuable** to planning practitioners in state departments of transportation (DOTs), metropolitan planning organizations (MPOs), and local transportation agencies, as well as other practitioners concerned with planning, programming, and implementing multimodal transportation projects. It should also be a useful educational resource on the concepts, tools, and procedures currently employed for establishing system performance as a basis for transportation planning and decision making.

Federal transportation policy, as embodied in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA-21), places a high priority on transportation decision making that is based on transportation system performance and reflects the specific needs of the area and public served. This new emphasis represents a shift from predetermined modal decisions toward a broader consideration of tailored multimodal solutions within the context of transportation performance expectations and investment commitments. As such, this emphasis is intended to result in transportation plans, programs, and decisions driven by the needs of the specific area, rather than by the modal restrictions on funding sources or support programs.

NCHRP Report 446 presents guidance for use by planning practitioners and other decision makers to design, manage, and carry out multimodal transportation planning that reflects performance objectives. Although this guidebook addresses many of the fundamental activities included in effective performance-based planning studies, the emphasis is not solely on the process. Rather, the emphasis is on how to organize and employ systematic, effective performance measures to support planning analyses and decisions. The principles and procedures are intended as guidance to practitioners, to be applied in a way that is tailored to the decisions being made. Although this guidebook focuses on the planning-level decisions, it emphasizes the importance of integrating planning and project development so that decision making is, in effect, seamless and objective. In addition, this guidebook includes a comprehensive catalog of performance measures in use in the United States today. This catalog is provided in Appendix B.

The project also resulted in a research project final report, published as **NCHRP Web Document 26**, Multimodal Transportation: Development of a Performance-Based Planning Process. This web document presents, in detail, the results of the entire project, including more detailed documentation of the case studies that serve as the foundation for the project results.



“This guidebook should be especially valuable”



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PROJECT TCRP E-03A FY 2006 - APPLICATIONS FOR IMPROVED INVENTORY MANAGEMENT FOR PUBLIC TRANSIT SYSTEMS

Transit Cooperative Research Program - Completed Project

Project E-03A

Applications for Improved Inventory Management for Public Transit Systems

Res. Agency: Draycott Consulting, Inc.

Principal Invest: Susan Thomas and Michael Kilpatrick

Effective Date: October 1, 1997

Completion Date: July 31, 2000

Funds: \$150,000

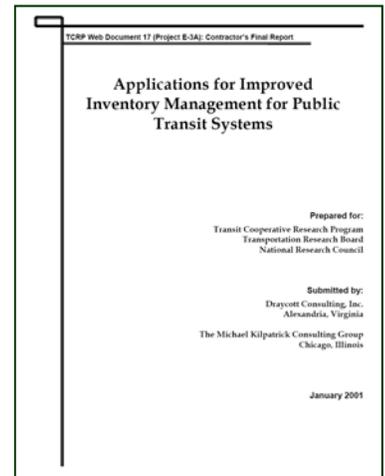
As a part of TCRP Project E-3, *Inventory Management for Bus and Rail Public Transit Systems*, U.S. transit agencies were surveyed for information on current inventory management practices, benchmarking the values of performance measurement indices use, and analyzing the impact of organization and policy decisions on inventory performance.

The survey process used during the research phase yielded valuable information regarding the interrelationships between inventory management and organizational decision factors. However, the conclusions based on the information are preliminary at best. Therefore, the conclusions should be developed into hypotheses for more detailed testing in a more controlled environment, where individual effects can be more effectively isolated and quantified.

The objectives of TCRP Project E-3A were (1) to further isolate and the test results in a real environment considering demographics, fleet size, and composition, organization, inventory management practices, performance and technology, and information systems; and (2) using a controlled environment test, to demonstrate that the conclusions reached from the research phase were valid or to identify adjustments required to implement the conclusions in "real world" conditions.

Status: The final report has been published as *TCRP Research Results Digest 40*, "Revised Inventory Management Desk Guide." The digest summarizes the results from five case studies conducted and analyzed to determine the relationship between inventory control and management, the conditions under which inventory management techniques are best applied, and the solutions to potential problems when applying the inventory control techniques. The final report describes the research approach and the analyses performed during the course of the TCRP E-3A Project. The report is available as *TCRP Web Document 17* in portable document format (PDF). (A free copy of Adobe Acrobat Reader is available at <http://www.adobe.com>.) Click on the link below to access the report. NOTE: Because of the very large size of this file, it will take some time to download. We regret the inconvenience.

http://gulliver.trb.org/publications/tcrp/tcrp_webdoc_17.pdf



"The objectives of TCRP Project E-3A were (1) to further isolate and the test results"

PROJECT TCRP G-06, FY 2006 - GUIDEBOOK FOR PERFORMANCE BASED TRANSPORTATION PLANNING

Transit Cooperative Research Program - Completed Project

Project G-06

A Guidebook for Developing a Transit Performance-Measurement System

Res. Agency: Kittelson & Associates, Inc.

Principal Invest: Paul Ryus

Effective Date: June 28, 2001

Completion Date: November 28, 2002

Funds: \$300,000

Much has been written about performance measurement in the transit industry. Many performance indicators and measures have been developed and used in a variety of ways in response to differing transit-system goals and objectives.

What has been lacking in the transit industry is a rigorous process for determining the most appropriate performance measures and indicators that should be used by a transit organization. In addition, traditional service efficiency indicators (e.g., operating expense per vehicle revenue mile and/or hour) and cost-effectiveness indicators (e.g., operating expense per passenger mile and/or passenger trip) are sometimes not linked to customer-oriented and community issues.

Research is needed to develop a process that can be used by transit systems to prepare a performance-measurement system that is sensitive to customer-oriented and community issues. This process should provide a context, or framework, to select and apply appropriate performance indicators and measures that are integral to transit-system decision making. The research should analyze the different dimensions along which agency performance can be defined, measured, and interpreted based on an operator's goals and objectives.

The objective of this research was to produce a practical, user-friendly guidebook that assists transit system managers in developing a performance-measurement system that uses traditional and nontraditional performance indicators and measures to address customer-oriented and community issues. The guidebook provides a menu of performance indicators and measures, describes how to select and implement the most appropriate performance indicators and measures, and explains how to incorporate the indicators and measures in the decision-making process to monitor and improve service.

Status: The final guidebook for the project has been published as **TCRP Report 88**. In addition, a summary of the guidebook has been published as **TCRP Research Results Digest 56**.



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“Research is needed to develop a process”

TCRP REPORT 88
A Guidebook for Developing a Transit Performance-Measurement System

GUIDEBOOK - The electronic version of TCRP Report 88.

SUMMARY - A synopsis of the Guidebook.

BACKGROUND - Additional project information, including an annotated bibliography of nearly 200 documents.

FTIS - The Florida Transit Information System (first version), providing access to a complete set of National Transit Database data for the years 1984-2000. (Create the Florida DOT and the Urban Core for Transportation Research at Florida International University)

LIBRARY - Other TCRP and NCHRP publications relating to performance measurement.

- TCRP Report 456, Guidebook for Assessing the Social and Economic Impacts of Transportation Projects
- TCRP Report 54, Management Book for Rural and Small Urban Transportation Systems
- TCRP Report 79, Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners
- TCRP Synthesis 5, Management Information Systems
- TCRP Synthesis 10, Bus Route Evaluation Standards
- TCRP Report 26, Operational Analysis of Bus Lanes on Arterials
- TCRP Report 47, A Handbook for Measuring Customer Satisfaction and Service Quality
- TCRP Report 54, Management Book for Rural and Small Urban Transportation Systems
- TCRP Report 79, Estimating the Benefits and Costs of Public Transit Projects: A Guidebook for Practitioners
- TCRP Synthesis 5, Management Information Systems
- TCRP Synthesis 10, Bus Route Evaluation Standards
- TCRP Report 26, Operational Analysis of Bus Lanes on Arterials
- TCRP Synthesis 17, Customer Information at Bus Stops
- TCRP Synthesis 29, Passenger Counting Technologies and Procedures
- TCRP Synthesis 31, Transit Contracting and Service Delivery Methods
- TCRP Synthesis 34, Data Analysis for Bus Monitoring and Planning
- TCRP Web Document 12, Traveler Response to Transportation System Changes, Interim Handbook
- TCRP Web Document 18, Developing Useful Transit Related Crime and Incident Data

PM Research Archive Matrix

Project <u>20-7 (Task 202)</u>, FY 2004 Guide to Benchmarking Operations Performance Measures	Project <u>8-36</u>, Task 47 Effective Organization of Performance Measurement	Project <u>7-15</u>, FY 2004 Cost-Effective Measures and Planning Procedures for Travel Time, Delay and Reliability	Project <u>20-63</u>, FY 2004 Performance Measurement Tool Box and Reporting System for Research Programs and Projects
PROJECT <u>20-24 (20)</u>, FY 2003 USING PERFORMANCE MEASURES TO MANAGE CHANGE IN STATE DEPARTMENTS OF TRANSPORTATION	Project <u>3-68</u>, FY 2003 Guide to Effective Freeway Performance Measurement	Project <u>17-26</u>, FY 2003 Methodology to Predict the Safety Performance of Urban and Suburban Arterials	Project <u>20-24 (30)</u>, FY 2003 Performance Measurement in Context Sensitive Design
PROJECT <u>20-60</u>, FY 2003 Performance Measures and Targets for Transportation Asset Management	Project <u>8-43</u>, FY 2002 Methods for Forecasting Statewide Freight Movements and Related Performance Measures	PROJECT <u>20-57</u>, FY 2002 Analytic Tools to Support Transportation Asset Management	PROJECT <u>20-24 (14)</u>, FY 2001 Managing Change in State Departments of Transportation
Project <u>6-14</u>, FY 2000 Feasibility of Using Friction Indicators to Improve Winter Maintenance Operations and Mobility	Project <u>8-32 (2)A</u>, FY 2000 A guidebook for Performance-Based Transportation Planning	Project <u>2-22</u>, FY 1999 Case Studies on Communicating the Economic Benefits of Transportation Investments	Project <u>2-19</u>, FY 1997 Guidance on Using Existing Analytic Tools for Evaluating Transportation Investments
Project <u>2-22</u>, FY 1997 Needs in Communicating the Economic Impacts of Transportation Investment	Project <u>1-33</u>, FY 1995 Methodology to Improve Pavement-Investment Decisions	Project <u>3-55</u>, FY 1995 Performance Measures and Levels of Service in the Year 2000 Highway Capacity Manual	Project <u>8-32 (2)</u>, FY 1994 Multimodal Transportation: Development of a Performance-Based Planning Process
Project <u>20-24</u>, FY 1994 Customer Based Quality in Transportation	Project <u>2-17</u>, FY 1991 Measuring the Relationship Between Freight Transportation Services and Industry Productivity	Project <u>20-24 (06)</u>, FY 1991 Performance Measures for State Highway and Transportation Agencies	Project <u>2-17(3)</u>, FY 1993 Macroeconomic Analysis of the Linkages Between Transportation Investments and Economic Performance
Project <u>3-55 (4)</u>, FY 1995 Performance Measures and Levels of Service in the Year 2000 Highway Capacity Manual	Project <u>2-17(3)A</u>, FY 1994 Update and Enhancement of Dataset for Macroeconomic Analysis of Transportation Investments and Economic Performance	Project <u>TCRP E-03A</u>, FY 1997 Applications for Improved Inventory Management for Public Transit Systems	Project <u>TCRP G-06</u>, FY 2003 A Guidebook for Developing a Transit Performance-System
Project <u>TCRP B-11</u>, FY 1998 Customer Defined Transit Service Quality	Project <u>TCRP F-03</u>, FY 1992 Total Quality Management in Public Transportation	Project <u>NCHRP 311</u>, FY 2003 Performance Measures of Operational Effectiveness for Highway Segments and Systems	Project <u>NCHRP 300</u>, FY 2001 Performance Measures for Research, Development and Technology Programs
Project <u>TCRP SG-10</u>, FY 003 Use of Performance-Based Measures in Allocating Transit Funding	Project <u>TCRP 40</u>, FY 2001 A Challenged Employment System: Hiring, Training, Performance Evaluation, and Retention of Bus Operators	Project <u>TCRP 22</u>, FY 2001 Monitoring Bus Maintenance Performance	Project <u>TCRP 7</u>, FY 2001 The Role of Performance Based Measures in Allocating Funding for Transit Operations
Project <u>8-32</u>, FY1995 Multimodal Transportation: Development of a Performance-Based Planning Process	Project <u>20-60</u>, FY 2003 Performance Measures and Targets for Transportation Asset Management	Project <u>3-79</u> FY 2004 Measuring and Predicting the Performance of Automobile Traffic on Urban Streets	Project <u>6-17</u>, FY 2005 Performance Measures for Snow and Ice Control Operations
Project <u>TCRP E-03A</u>, FY 2006 Applications for Improved Inventory Management for Public Transit Systems	Project <u>NCHRP 20-5</u>, FY 1967 Synthesis of Information Related to Highway Problems	Project <u>TCRP 88</u>, FY 2006 A Guidebook for Performance-Based Transportation Planning	Project <u>NCHRP 8-32(2)A</u>, FY 2000 A Guidebook for Performance-Based Transportation Planning
Project <u>NCHRP 551</u>, FY 2006 Performance Measures and Targets for Transportation Asset Management	Project <u>8-36</u>, Task 61 Monetary Valuation Per Dollar of Investment in Different Performance Measures		Project <u>14-13</u>, FY 1999 Customer-Driven Benchmarking for Highway Maintenance Activities

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	Committee Name	Liaison
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ABJ20	Statewide Transportation Data & Information Systems	Anita Vandervalk
ADD40T	Sustainability	Josias Zietsman
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ANB10	Transportation Safety Management	Angshuman Guin
ANB20	Safety Data Analysis & Evaluation	Ramkumar Venkatanarayana
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