

**APPENDIX E**  
**GUIDE TO BENCHMARKING OPERATIONS PERFORMANCE MEASURES**

**Conference Call Summaries and Minutes**

**Contents**

**July 26, 2007 Conference Call Summary**  
**December 10, 2007 Conference Call Minutes**

**To: Volunteer Organizations Pilot Testing NTOC Performance Measures**  
**Subject: Summary of July 26, 2007 Conference Call**

Thanks to everyone who participated in the conference call on July 26, 2007. Over 15 organizations were represented. I trust the overview and summary provided by Phil Tarnoff and the Q&A session were helpful. A summary of a few discussion points as well as contact information for potential additional resources are included below. The attached document contains a matrix mapping volunteer organizations to the performance measures they intend to test (as of the morning of July 30). If your organization plans to participate, please indicate so by returning the synopsis form the end of this week.

Q&A

**What are the deadlines for submitting information for the project?**

Data should be submitted no later than September 28. Although we will accept data after the 28th and incorporate it into the report, data submitted after the 28th will have minimal impact on the development of implementation guidelines for the performance measures.

**The meeting summary from the February workshop indicated that 'Speed' need not be pilot tested. Should the 'Speed' measure be omitted?**

The technical issues related to gathering spot speed information are well known and documented. No additional technical implementation guidelines will be developed. However, if speed is reported as a performance measure to management, the public, or elected officials as part of a performance management initiative, examples of how the data is formatted and reported are welcome. Also, speed detectors remains the primary method for estimating travel time. Technical data concerning the conversion of speed data into travel time is requested as part of the travel time measures.

**How much staff time will be required to participate in the study?**

Valentin Vulov from the Georgia Regional Transportation Authority (GRTA) has already submitted results on behalf of GRTA. He estimated approximately 6 hours of effort per performance measure to document and report on their experience. This does not include time for data collection or processing. Just additional time for providing the data requested by the study.

**Additional Resources**

Cambridge Systemics is in need of quality travel time data on arterials for evaluation of reliability metrics. They have funding available to assist organizations with data collection using instruments such as toll-tag readers, license plate recognition, or other technology that directly measures travel time on arterials. If interested, please contact Rich Margiotta

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1265 Kensington Drive  
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Jane Lappin from the Volpe National Transportation Systems Center has volunteered assistance to organizations attempting to implement the customer satisfaction (CS) performance measure. Volpe would assist in the development of an adequate survey to capture relevant CS metrics customized to the jurisdiction of the organization. If interested please contact Jane Lappin or Margaret Petrella.

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NCHRP 20-7  
Guide to Benchmarking Operations Performance Measures  
Pilot Test Wrap-up Conference Call  
Minutes  
December 20, 2007

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**Those in attendance included:**

Katherine Boyd	Washington DOT
Daniela Bremmer	Washington DOT
David Crisler	Nevada RTC
Ray Derr	Transportation Research Board
Bill Eisele	Texas Transportation Institute
George Gilhooley	HNTB (formerly Florida DOT)
Jim Helmer	City of San Jose, California
Brian Hoeft	Southern Nevada RTC
Jeff Price	Virginia DOT
David Reeves	Colorado DOT
Robert Rupert	FHWA
Brian Shields	City of Overland Park, Kansas
Jason Sims	Kansas City Scout, Missouri DOT
Ed Spilker	Washington DOT
Phil Tarnoff	University of Maryland
Monique de los Rios-Urban	Maricopa Association of Governments
Valentin Vulov	Georgia Regional Transportation Authority
John Wells	Louisiana DOT
Stan Young	University of Maryland
Mike Zezeski	Maryland SHA

AGENDA

Accuracy Requirements of Performance Measures  
Natural variability in traffic flow as a function of VPHPL  
Pilot Test Results – [see corresponding docs on web site]:  
    Customer Satisfaction - Mature and well established  
    Incident Duration - Mature and well established  
    Traffic Flow Measures:  
        Quality control processes of base data are critical  
        Applications to arterials have special requirements  
        Concept of ‘unconstrained travel time’  
        Need to measure travel time directly with probe methods  
    Travel Time – Facility  
        Primary performance measure reported  
    Speed – Use primarily to color code web maps and as a surrogate to travel time

Travel Time – Reliability

Consistent Implementation

Recurring Delay

Used as indicator of cost of congestion

Extent of Congestion Measures

Concept is widespread, use of NTOC definitions are not

Definition of ‘unconstrained travel time’ varies

Confusion between 30% greater travel time and 30% reduced speed

Varying thresholds for congestion

Widespread use TTI or speed index charted for time and extents

Non-Recurring Delay

No sample submitted

Throughput Measures – Vehicle Mature and well established

Throughput Measures – Vehicle Mature, but not as frequently reported

## DISCUSSION HIGHLIGHTS

### Accuracy Requirements of Performance Measures:

An updated matrix reflecting the required accuracy of the performance measures for various application classes was distributed to participants for comment. The need to understand and document data accuracy requirements is acknowledged, however, such requirements are subjected and based on professional experience. The matrix developed in the this project is based on the collaboration and comments of the steering committee and pilot testing organizations.

### Pilot Test Results

Both Customer Satisfaction and Incident Duration measures are mature and well established. The data from the pilot tests provide a good sampling from which implementation guides were drafted.

The remaining performance measures, referred to collectively as ‘Traffic Flow Measures’, share many common issues related to data collection. The pilot test results for traffic flow measures were summarized from two aspects. The first aspect was data collection issues such as cost, technology, and quality control common to most of the traffic flow measures. The second aspect was the compilation and usefulness of the various flow measures.

Data collection issues dominate the concerns of agencies. The cost of fixed sensor networks and proliferation of new sensor technology and probe methods of data collection are causing organizations to re-evaluate data collection methods. Participants recommended that summary information on various data collection methods (issues, accuracy, and costs) would be of great value in the implementation guide.

The concept of ‘unconstrained travel time’, critical to the definition of delay, extent of congestion, and calculation of travel time indices, is ill-defined on

arterials in which travel times are governed more by signal timing than by traffic demand. Measurement of travel time on arterials is difficult to perform effectively with anything other than probe methods.

The primary and dominant traffic flow performance measure was travel time. Travel time measurements appear to be supplanting more traditional measures based on density or LOS.

The cost of data collection systems contains another component not currently addressed in the summary charts. This component is the data management costs to retrieve, format, archive, and maintain integrity of the data for subsequent use in performance measure calculations. Participants recommended using a three component model in the guidelines: data acquisition cost (cost of sensors, maintenance, or vehicle probe data), data management costs (data bases and servers to maintain the integrity of the data), and data compilation and reporting costs (cost to calculate, format, and report various measures.)