

NCHRP 20-7 Guide to Benchmarking Operations Performance Measures Customer Satisfaction - Pilot Test Results

4.1 Customer Satisfaction Surveys

Volunteer organizations were requested to submit the results of customer satisfaction surveys in order to compare and contrast the performance measure definition with actual field experience. Due to the cycle length needed to program, design, and administer a survey, the pilot tests include results from surveys administered over the past three years, from 2005 through 2007. Some were specifically dedicated to obtain customer satisfaction rating for highway operations services and applications, where others were broader in scope but contained significant emphasis on highway operations and ITS topics.

Five organizations submitted results. Two were from state DOTs (Florida and Virginia), two from metropolitan planning organizations (Baltimore Metropolitan Council and MetroPlan Orlando) and one from a city (Overland Park, Kansas). The results represent a good sampling of types of organizations and purposes of survey. Tables 4.x.1 and 4.x.2 summarize key characteristics of the five surveys, including the purpose, the sample size, cost, and the nature of the survey questions.

The objective and scope of each customer satisfaction survey studied are highlighted below in more detail.

Baltimore Metropolitan Council (BMC)

The BMC survey was conducted to obtain a baseline measure of user perceptions on the management and operations of the transportation system in the Baltimore region. The intent of the BMC was to identify regional interests in order to develop collaborative strategies through plans and programs that will improve the quality of life and economic vitality of the Baltimore region. A unique aspect of the BMC survey is that it was multi-modal, assessing customer satisfaction of transit offerings as well as the roadway system. Also of note, the BMC survey was influenced by the original work by NTOC identifying Customer Satisfaction as a key performance measure.

Florida DOT – District 4

The results submitted by Florida DOT, District 4 were part of a larger statewide survey to explore usage of, attitudes toward, and perceptions of Florida Department of Transportation's (FDOT) intelligent transportation system (ITS) services. The FDOT survey focused specifically on ITS services including customer awareness and satisfaction with their Road Ranger service, 511, and other methods and conduits of traveler information.

MetroPlan Orlando

The 2005 MetroPlan Orlando customer satisfaction survey was one of a series administered in recent years to monitor the state of public thinking about transportation issues in the Orlando metropolitan area. Previous surveys in 2001 and 2003 allow for trend analysis with respect to the results of the 2005 survey. The Orlando survey covers not only aspects of operation, but, similar to BMC, it touches on a wider array of transportation infrastructure issues including transit alternatives as well as preferred methods of financing.

Overland Park, Kansas

The customer satisfaction survey conducted by Overland Park (OP) was the most focused and application specific survey of those studied. OP surveyed residents from the area concerning the use of dynamic message signs (DMS) on the city's local arterial streets. At the time of the survey multiple DMS were installed and functional on various approaches at two major arterial intersections adjacent to a major freeway. The DMS were used to warn drivers of congestion on the major freeway as well as problems on the local arterials. The OP survey was a one-time survey to gauge the overall effectiveness of DMS, elicit feedback on specific aspects of the DMS (i.e., aesthetics, message content, route diversion, etc.), and determine if expanded deployment of DMS was viewed as a worthwhile investment.

Virginia DOT (VDOT)

VDOT has conducted customer satisfaction surveys for a number of years; however, there has never been a schedule or consistent focus on specific items. Recently, VDOT developed a plan to conduct surveys on a regular basis that will focus on specific functional and operational areas including: communications, traffic and incident management, responsiveness to citizen's needs, planning, maintenance and construction of roads, and management of public funds. The first such survey was conducted in spring 2007.

Although the five sample surveys reflect a broad array of objectives, the methodologies employed by the five organizations contained many similarities. Common to all is the engagement of professional resources, either private businesses or university resources, to assist in the design of the survey, establish an appropriate sampling framework, and to perform all aspects of survey administration and data analysis. These findings reinforced the workshop recommendation that organizations should utilize professional services when conducting customer satisfaction surveys. Involvement of the transportation, ITS, or planning professional was limited primarily to defining the objective and sample population of the survey, selection of question topics, and providing technical assistance in terms of transportation expertise in formulating survey questions.

Surveys from all five organizations used various question types. The majority of questions were constructed to rate user response on an ordinal scale. Some of these used numerical values, for example "On a scale of 1 to 5, with one being strongly agree and five being strongly disagree ...". In the majority of questions, the ordinal scale was with descriptive phases such as "Strongly agree, somewhat agree, neutral, disagree, strongly disagree". The majority of question were limited to 4 or 5 possible response categories.

Table 4.x.1 Summary of Customer Satisfaction Surveys

Customer Satisfaction Survey											
	Purpose of Survey	Survey Mechanism	Type of Operations and IT Services Surveyed	Engaged Professional Assistance	Number of Total Questions	Sample Size	Confidence Level / Error	Cost	Geographic Extents	Date	Survey Frequency
Baltimore Metropolitan Council	Identify regional mobility interests and develop collaborative strategies to improve the quality of transportation and economic vitality throughout the Baltimore region.	Telephone	Extent of Congestion Traffic Signal Operations Transportation Information	Yes	30	1003	95% / 3.1%	-	Five counties & Baltimore City	May - June 2006	-
Florida DOT - District 4	Explore usage of, attitudes toward, and perceptions of Florida DOT's intelligent transportation system (ITS) services.	Telephone	DMS 511 Road Rangers Radio Traffic Reports TV Traffic Reports Web Site	Yes	31	400	3.90%	-	Florida District 4	March 2006	-
MetroPlan Orlando	Monitor the state of public thinking about transportation issues in the Orlando metropolitan area.	Telephone	Congestion Management Incident Management DMS Signal Coordination Travel Time Travel Time Reliability	Yes	76	840	-	-	Orlando metro area, 3 counties	Feb - Mar 2005	Previous surveys in 2001 & 2003
Overland Park, KS	The intent of the survey was to see if additional DMS on arterial streets would be seen as a positive feature by residents..	Mail and Telephone	DMS	Yes	22	527	95% / 4.5%	\$7500 + 40 hours of staff time	City of Overland Park, KS	Jan - Feb 2007	One time survey
Virginia DOT	Develop and report regularly key measures of resident satisfaction for VDOT's functional and operational areas	Telephone	Traffic Management Incident Response 511 Phone and Web CMS	Yes	44	1800	-	\$ 51,200	Statewide	May 2007	Periodic (Every 2-3 Years)

Table 4.x.2 Types of Questions Used in Customer Satisfaction Surveys

Customer Satisfaction Questions						
Nature of Questions				Question Structure		Sample Questions
Type of Service	Assessment of			Ordinal Scale « OS Yes or No « YN	Typical number of values for ordinal scale	
	Frequency of Use	Satisfaction and/or Importance	Behavior Modification			
Baltimore Metropolitan Council	Extent of Congestion Traffic Signal Operations Transportation Information	✓ • •	✓ ✓ ✓	✓ • •	OS / YN OS OS	5 Q18. How often have you experienced congestion on your way to or from work/school? Would you say ... ? [Always Sometimes Rarely Never Don't Know or Refused] Q20. Do you change your commute to work/school in any way as a result of congestion? [
Florida DOT « District 4	DMS 511 Road Rangers Radio Traffic Reports TV Traffic Reports Web Site	✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓	✓ • • • • •	YN / OS YN / OS YN / OS OS OS YN / OS	3 or 4 How often do you use the 511 service? [Frequently Occasionally Seldom Never] Have you every been assisted by a Road Ranger unit? [P No]
MetroPlan Orlando	Congestion Management Incident Management DMS Signal Coordination Travel Time Travel Time Reliability	✓ • • • • •	✓ ✓ ✓ ✓ ✓ ✓	✓ • • • • •	YN / OS OS OS OS OS OS	4 For the following statements, please tell me how important that issues is as a priority to you « very important, somewhat important, not too important, or not important at all. Clear highway accidents more quickly. Provide traffic information through hig
Overland Park, KS	DMS	✓	✓	✓	YN / OS	4 or 5 Q8. What do you think of the messages on these signs? Do you think they are: [Very easy to understand Easy to understand Neutral Hard to understand Very hard to understand Don't know] Q10. Have you changed your route as a result of a messag
Virginia DOT	Traffic Management Incident Response 511 Phone and Web DMS	• • ✓ •	✓ ✓ ✓ ✓	• • ✓ •	OS OS YN / OS YN	5 Q21: Prior to this interview, had you ever heard of or read about 511, 511 Virginia, or 511 Virginia.org? [P No] Q25b: What prompted you to use 511? [Traffic Word of Mouth Highway Sign Advertisement Weather Trip Planning Web Link Don't

Updated Performance Measure Definition:

Performance Measure: Customer Satisfaction

Definition: A quantitative measure of customers' satisfaction with roadway management and operations services provided in a specified region. (See Notes 1 & 2) A set of guidelines is provided as a resource for customer satisfaction surveys related to management and operations. Agencies should use these guidelines to prepare surveys customized to local conditions and concerns.

- Determine survey objective and information needs:
 - What is the purpose of conducting the survey?
 - What information is needed?
 - How will the results be used?
- Define the targeted study population:
 - Will you sample residents of a geographic area or specific system or service users (e.g., Commuters, recreational, specific users of a route or intersection)?
- Types of services (See Note 3):
 - 511 – telephone access
 - Websites for traffic management resources (Web 511 and other)
 - Changeable message signs (also known as Variable Message Signs and Dynamic Message Signs)
 - Incident management
 - Highway advisory radio
 - Traffic signal operations
 - Variance of travel time
 - Radio traffic alerts
 - Motorist assist
- Types of questions
 - Frequency of access
 - “How many times did you traverse a certain roadway?”
 - “How often did you access the website?” etc.
 - Satisfaction rating for the service, and various aspects of the service
 - Importance of providing the service

- Effect of the information or service on traveler choice or behavior (Did you choose an alternate route as a result of the information?)
- Feedback on improvements or enhancements to the service
- Socio-demographic characteristics
- Methodology
 - Use professional resources (such as business consultants, customer feedback specialists, or university personnel) to insure robust and rigorous methodology. A robust methodology insures appropriate:
 - Sample Size
 - Response Rate
 - Sample Method (phone, online, mail, etc.)
 - Question structure and balance
- Question Structure
 - Questions requiring a rating scale should be balanced, providing equal number of positive and negative responses (i.e. Very Satisfied, Somewhat satisfied, Not very satisfied, Not at all satisfied)
 - Satisfaction ratings are often on a 5 point scale; however, 7-point or 11-point scales may be appropriate. In general, it is recommended that these scales include a neutral point.

Includes: Customer satisfaction with operations on freeways, arterials, corridors and regions.

Excludes: Many agencies regularly conduct customer satisfaction surveys asking questions about the entire range of services they offer; the questions in this operations performance survey are specific to traveler information, highway management and operations.

Units of Measurement:

Utilize rating scales, including Likert scales or other ordinal scales. In general, ratings should include a “Don’t Know” response category, and a “Not Applicable” response category, as appropriate..

Processing (or how to measure): It is recommended that responses be processed to provide the distribution of responses.. In cases where Likert scales are used, it may be appropriate to provide the mean response. Survey results should also be analyzed by travel location, trip types (commute, school, vacation, freight movement, etc.) and type of customer.

Survey report should contain a full description of the methodology, response rate, and a copy of the survey itself.

Typical Applications: Agency management and evaluation of the quality of service being provided to its customers. This measure can also be used for outreach to senior agency management and government officials.

Example: Given the inability of financial and personnel resources to accomplish all of the various operations tasks desired by the public, the agency wants to know the relative levels of satisfaction that exist with each of their programs (e.g. traffic incident response, dynamic sign messages, traffic signal operations, etc.)

Notes:

- (1) Customers may include all transportation system stakeholders (motorists and commercial vehicle operators as well as members of the public affected by transportation services (shippers, fleet operators, first responders, etc.)) The definition of the study population may narrow this specific to the objective of the survey.
- (2) In instances where the population is limited, funds are limited, or the nature of the effort is the discovery of issues, selected interviews or focus groups with a sub-population may be appropriate. Unlike surveys, these methods provide qualitative data (rather than quantitative) to identify and rate aspects of transportation operations issues (the results can provide valuable insights but are not representative).
- (3) Note that customers do not separate roads or services by jurisdiction, nor traffic information by provider. Survey should delineate as appropriate.