NCHRP

REPORT 487

Using Customer Needs to Drive Transportation Decisions

TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

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TRANSPORTATION RESEARCH BOARD

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NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM

Systematic, well-designed research provides the most effective approach to the solution of many problems facing highway administrators and engineers. Often, highway problems are of local interest and can best be studied by highway departments individually or in cooperation with their state universities and others. However, the accelerating growth of highway transportation develops increasingly complex problems of wide interest to highway authorities. These problems are best studied through a coordinated program of cooperative research.

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The Transportation Research Board of the National Academies was requested by the Association to administer the research program because of the Board's recognized objectivity and understanding of modern research practices. The Board is uniquely suited for this purpose as it maintains an extensive committee structure from which authorities on any highway transportation subject may be drawn; it possesses avenues of communications and cooperation with federal, state and local governmental agencies, universities, and industry; its relationship to the National Research Council is an insurance of objectivity; it maintains a full-time research correlation staff of specialists in highway transportation matters to bring the findings of research directly to those who are in a position to use them.

The program is developed on the basis of research needs identified by chief administrators of the highway and transportation departments and by committees of AASHTO. Each year, specific areas of research needs to be included in the program are proposed to the National Research Council and the Board by the American Association of State Highway and Transportation Officials. Research projects to fulfill these needs are defined by the Board, and qualified research agencies are selected from those that have submitted proposals. Administration and surveillance of research contracts are the responsibilities of the National Research Council and the Transportation Research Board.

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FOREWORD

By Christopher Hedges
Staff Officer
Transportation Research
Board

This report provides guidance for public-sector transportation agencies on how best to address the needs of the customers they serve. Based on a review of current innovative and effective practices, the report presents a series of guidelines on how to categorize customers into different market segments, how to identify and prioritize customer needs and service expectations, and how to use that information to guide transportation policy and investment decisions. The guidelines should be particularly valuable to transportation planners and decision makers who are committed to ensuring that their programs and policies respond to the needs of those who depend on the transportation system.

Customers increasingly demand that businesses create more value in the products and services that the businesses deliver. Customers are also becoming more diverse in how they define value in terms of meeting their specific needs. Public-sector organizations are now evolving toward a more proactive development of services that save time, reduce costs, and improve quality.

Under NCHRP Project 20-53, "Using Customer Needs to Drive Transportation Decisions," a research team led by Howard/Stein-Hudson Associates, Inc., began by examining the rationale for customer needs analysis. The research team looked at alternative definitions of customers and stakeholders and outlined the reasons that customer needs are important to transportation agencies. The research team then reviewed current practices used to gather customer data, recent trends in customer grouping and segmentation, and examples of how transportation agencies have incorporated customer needs into the decision-making process. Case studies are used to illustrate best practices and implementation strategies, both within and outside the transportation sector. An analysis of lessons learned from the case studies led to development of principles and criteria to maximize an agency's effectiveness at improving customer relationships. The report concludes with concise guidelines for practitioners in four topic areas: preparing to deal effectively with customers, getting customer input, applying customer needs to decision making, and keeping customers informed.

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USING CUSTOMER NEEDS TO DRIVE TRANSPORTATION DECISIONS

SUMMARY   The overall goal of this project is to enable public-sector transportation agencies to understand and use the needs, wants, and values of their existing and potential customers to make better decisions. The report focuses on the development of guidelines that agency personnel can use to expand understanding of customers and the ways in which this understanding can be used to drive decisions. The guidelines are based on a compendium of many newly fielded approaches that have been analyzed by the methods used and arrayed in outline form to show approaches that are likely to be most useful to agencies and most advanced in terms of technique or innovation, while remaining statistically valid, replicable, and cost-effective. The guidelines are followed by suggestions for agencies to use in sharing information about their customers and about how improved information has helped the agency meet its overall goals for service.

To begin a discussion of customer needs and their potential use in driving transportation decisions, practitioners need to agree on definitions. For purposes of this report, customers are identified as individuals who use an agency's facilities or seek services from an agency. Transportation agencies, among others, are providers of facilities and services made available to customers. Either private or public partners and suppliers assist transportation agencies in supplying a web of transportation facilities and services. Customers, providers, partners, and suppliers are all stakeholders in the process of serving public transportation needs.

WORKING WITH CUSTOMER NEEDS

To determine customer needs, transportation agencies work with formal or informal sources of data to find two kinds of information: (1) objective data (behavior-based information, such as traffic volumes) or (2) subjective data (information that focuses on opinions, attitudes, positions, and explanations of why customers make particular choices or have specific preferences). Both objective and subjective research have roles to play. Customer needs can be gleaned from combinations of objective data and statements of preferences about upcoming policy directions or resource programming. Customer responses can come in the form of input to efforts of agencies or feedback or reactions to actions that agencies have taken. Since the users of facilities encompass all

types of people, customer segmentation is frequently used to discern differences between the needs of, for example, commercial truck drivers and elderly vehicle operators. Agencies have distinctive reasons for collecting information they want, whether the basis is geographic, demographic, socioeconomic, or behavioral.

Applying customer needs to decisions is the heart of the research in this report. Whether data on customer needs will be usable depends in part on the way the information is collected, and techniques for researching customer needs vary with the agencies' proposed use of the research. In all research activities, specific data gathering techniques will need to be formulated and adapted to deal with the number of customers identified as the target population for surveying, usually a representative sample of the agency's customers. Traditional and well-established techniques can be used in analyzing the data and reporting on results. The data collection approach must be soundly conceived to provide information that the agency can integrate into its decision-making processes. A process of collecting data not just once but over time may become the best way an agency can track changing behavior and attitudes from its customers. Under the best circumstances, data will be collected, analyzed, and used to disseminate customer information inside the agency. But using customer information does not come naturally to all people, and agencies may need to train staff to use customer information in daily tasks, such as tracking customer reactions to agency proposals to look for common threads of consensus. The agency's use of customer data will go unnoted unless there is a process to document the use of customer data in decisions. Finally, it seems apparent that agencies will be most successful when they make data available for public use and for understanding agency plans and actions. Methods that agencies use in communications with customers can help in swapping information: customers can tell agencies what they think and would like to see improved, and agencies can tell customers what is planned or programmed to incorporate customer needs into transportation planning and operations, and the expectations that the agency has from its efforts.

The next steps of the research focused on finding specific examples of the exploration and use of customer information and looking for underlying principles to use in formulating guidelines for transportation agencies to follow. This research effort included two additional aspects. The first was the examination and evaluation of current techniques to outline best practices in using customer information in both transportation and nontransportation settings. Because the best practices did not often portray a comprehensive approach to investigating and analyzing customer information, a series of eight case studies were also undertaken. In these analyses, it became apparent that certain principles concerning information on customer needs were emerging. These include the following:

- State and local transportation agencies are using customer needs to drive decision making.
- Agencies can demonstrate links between what customers want and what can be delivered.
- Awareness of customer needs brings more positive customer relationships.
- Research techniques are increasingly matching those of private-sector marketing organizations.
- Working with customers can start at any time.
- Agencies rely on both quantitative and qualitative surveys of customer behavior and opinion.
- Agencies are innovating in their use of customer segmentation practices.
- An agency's customer initiatives can be very cost-effective.

- Customer surveys that are statistically reliable have credibility.
- Effective agency communication with customers is essential.
- Agencies need to be aware of the internal climate of the organization.
- Continuity of customer research is essential and brings long-term political advantage.
- Case studies show a direct relationship between customer surveys and policy development.
- Results are evident quickly after implementation.

GUIDELINES FOR AGENCIES

From examples found throughout the country, criteria were developed for use in setting forth guidelines for agencies to use in incorporating customer needs into their work. These criteria were the following:

- Guidelines must have specific applicability to transportation agencies.
- Guidelines must be used in actual practice.
- Guidelines must be used in program planning and resource allocation, not individual projects.
- Guidelines must provide an integrated approach for agencies to follow.
- Guidelines demonstrate the need for interviewing both the end-user customers and agency employees.
- Guidelines must be designed to be implementable and result in measurable improvements.
- Guidelines must be designed to offer a range of available applications.

Using these criteria, as well as the principles derived from existing practices and the research into specific examples, guidelines for practitioners in transportation agencies were developed to aid transportation agencies in exploring and using customer needs in making decisions. The following is an outline of the topics that these guidelines touch upon.

Guideline I: Preparing to Deal Effectively with Customers

Guideline IA: Establishing the Agency's Customers and Partners

The principal goal is to ensure that all agency staff and partners agree on basic terms.

- Step 1. Determine who the agency's stakeholders are.
- Step 2. Determine who the agency's customers are.
- Step 3. Determine who the agency's partners are.

Guideline IB: Setting a Context within the Agency for Working with and for Customers

The principal goal is to ensure that the agency executive leadership and staff work together.

- Step 1. Assure top-level support from the outset of the work.
- Step 2. Find a champion to lead the work of improving customer service.
- Step 3. Form a working group of employees.

- Step 4. Solicit view on customer issues.
- Step 5. Establish tasks for the working group.

Guideline IC: Organizing the Agency Staff to Understand Customer Needs

The principal goal is to guide staff throughout the agency to use customer input efficiently.

- Step 1. Make customer service an executive priority.
- Step 2. Assign time for staff work to adequately consider ongoing customer service issues.
- Step 3. Consider the addition of staff resources to guide the work.
- Step 4. Determine what customer service issues confront the agency.
- Step 5. Organize tasks to improve the agency's understanding of its customers.
- Step 6. Organize a time period for action.
- Step 7. Communicate what is determined.

Guideline II: Getting Customer Input

Guideline IIA: Creating a System for Inventorying Available Data on Customers

The principal goal is to collect and array customer information that is easily available.

- Step 1. Find and preserve the data.
- Step 2. Integrate data about customers.
- Step 3. Develop a format for displaying data.

Guideline IIB: Analyzing the Utility of Available Data

The principal goal is to find ways of maximizing potential uses of available data.

- Step 1. Create a framework for examining data.
- Step 2. Identify data needed for strategic or business planning.
- Step 3. Determine gaps in information.
- Step 4. Focus on filling gaps in information on customer groups.

Guideline IIC: Differentiating Types of Data Needs

The principal goal is to determine uses for both quantitative and qualitative data.

- Step 1. Explore the varieties of data types.
- Step 2. Find ways to use both qualitative and quantitative data.

Guideline IID: Collecting New Information

The principal goal is to determine ways of obtaining new data about customers.

- Step 1. Determine what new information is needed or wanted.
- Step 2. Determine possible approaches to obtaining new information.
- Step 3. Collect the new information.
- Step 4. Establish a continuous data collection process.

Guideline III: Applying Customer Needs to Decision Making

Guideline IIIA: Organizing to Disseminate Customer Information Inside the Agency

The principal goal is to ensure access for all agency staff to information about customers.

- Step 1. Create a structure to disseminate customer information within the agency.
- Step 2. Establish close links between agency staff members who deal with customer information.
- Step 3. Find ways to share customer information.
- Step 4. Designate a functional unit to incorporate customer data into long-range policies and programs.
- Step 5. Implement strategies for getting customer evaluations.

Guideline IIIB: Training Agency Staff to Use Customer Data in Daily Tasks

The principal goal is to integrate customer information into the everyday tasks of agency personnel.

- Step 1. Define the front line staff who interact with customers.
- Step 2. Help staff find and use information about customers in their daily tasks.
- Step 3. Set up a training program to focus on direct customer contacts and data collection.
- Step 4. Set up feedback mechanisms to work toward best uses of customer data.
- Step 5. Document how customers are served in day-to-day actions and decisions.

Guideline IIIC: Using Customer Data to Make Decisions

The principal goal is to use customer information to guide long-range programs.

- Step 1. Establish goals for a continuous process of data collection.
- Step 2. Set up a process for continuous data collection.
- Step 3. Set up a process for analyzing the data collected.
- Step 4. Set up a continuing process to document agency analysis of customer needs.
- Step 5. Document use of customer data in decision making.
- Step 6. Determine ways to make data available for public use.

Guideline IV: Keeping Customers Informed

Guideline IVA: Communicating with Customers

The principal goal is to maintain a continuing link between the agency and its customers.

- Step 1. Develop and implement a policy to make agency information accessible to customers.
- Step 2. Develop and implement an array of customer-based communications techniques.
- Step 3. Develop and implement standards for agency communications.

Guideline IVB: Demonstrating an Understanding of Customer Needs

The principal goal is to show agency progress in using customer contacts.

- Step 1. Develop methods of ensuring that the agency hears its customers.
- Step 2. Develop methods to communicate agency practices.
- Step 3. Ask customers for opinions about the adequacy of agency communications.

Guideline IVC: Monitoring Agency Performance in Communicating with
Customers

The principal goal is to determine the quality of agency interaction with customers.

- Step 1. Evaluate responses to customer input or inquiries.
- Step 2. Find ways to portray customer input or feedback.
- Step 3. Establish links between data collection, needs analysis, and problem solving.
- Step 4. Establish links with strategic planning, key agency goals, and initiatives.
- Step 5. Use state-of-the-art methods to assess communications abilities.

SHARING CUSTOMER INFORMATION

Transportation and nontransportation agencies in this country and abroad have developed effective actions in customer identification and segmentation, in data gathering about customers, and in application of the information to decision making within the agency. Processes for sharing information about customer needs are not yet widespread in the transportation agencies of this country. In part, this circumstance may have resulted because there are insufficient ways in which agencies can share information. Sharing customer information is desirable and can provide substantial benefits. Agency information may be useful across modes and geographic regions to a wide range of transportation agencies. Information can be easily shared by either print or electronic forms of interagency contacts.

The principal reason for sharing information among agencies is to do the following:

- Learn how to serve customers better.
- Use customer contacts effectively.
- Provide transparency to customers.
- Learn from other's experiences.
- Work with peer agencies.

The kinds of information that can be shared include the following:

- Obtaining data and communicating with customers:
  - Enhancing two-way information flow between customers and agencies.
  - Encouraging customer input, opinions, suggestions, and comments.
  - Discovering best practices, goals, and visions derived from customer interactions.
  - Communicating agency practices and policies to customers.
  - Discussing new practices in obtaining or working with customer information.
  - Establishing a transparent path for agency use of customer information.
  - Reporting on positive results of integrating customer information.
  - Communicating agency performance levels to customers.
  - Planning specific forms of information gathering.

    – Evaluating the applicability of customer responses.
    – Looking for both customer input and feedback for ongoing work.
- Integrating customer data:
    – Working directly with customers in problem solving.
    – Gathering and analyzing new data.
    – Explaining distinctive, perhaps unexpected, results.
    – Articulating agency goals in light of customer information.
    – Establishing a vision based on customer input.
    – Using customer information as a factor in decision making.
    – Gaining a democratic consensus in problem areas.
    – Developing communities of interest for dealing with specific problems.
    – Promoting better understanding of agency actions.
    – Using customer information to influence agency management procedures.
    – Finding pitfalls experienced by other agencies in customer interactions.
    – Looking for cost-effective, effective practices.
    – Maintaining positive customer contacts and the results of those contacts.

Transportation agencies should be encouraged to collect and share information with their own customers and with peer agencies throughout the country. Here are several basic steps to follow.

Step 1: Obtain Information to Share

- Compile available customer information.
- Collect details about customers.
- Integrate customer information in agency activities.

**Step 2: Set Preliminary Goals or Standards
for Sharing Customer Information**

- Track changes over time.
- Update dated material.
- Report in a timely fashion on new findings from customer studies.
- Set communications processes for dealing with customers.
- Set goals and agency vision for collecting and using customer contacts in its work.
- Establish a website format that can be used by each transportation agency.

Step 3: Share Information Obtained from Customers

- Designate a staff contact person to assemble and report on customer information.
- Allow a customer expert or resource staff person to share the assembled information.
- Set up an e-mail network among designated customer contacts in each transportation agency.
- Place customer information on agency websites.
- Conduct periodic regional seminars for information sharing and staff training.
- Use federal training programs to develop methods of information sharing.

Step 4: Identify a National Clearinghouse of Information

- Send periodic reports to umbrella organizations.
- Set up a new national website to report on customer-agency interactions.
- Establish responsibility for updating information obtained from multiple sources.

INTRODUCTION

Today, more than ever, transportation agencies are challenged to do more with less—to provide additional capacity for mobility within a transportation infrastructure that is growing slowly, if at all. Yet the customer base is growing, both in terms of numbers and diversity, posing new challenges to the agencies. More people are going more places than at any time in history, and more travelers are multimodal, non-English-speaking, elderly, and with disabilities. The market for transportation services is segmented in new ways that result from socioeconomic and demographic changes, while traditional markets are still operating—whether they are based on mode choice, income, educational attainment, or purchasing power. As a result, agencies face new challenges that require them to seek to understand and address the varied needs suggested by the churning markets for transportation services.

Transportation agencies, like all public agencies, are subject to a great deal of scrutiny from elected officials, private companies, and not-for-profit organizations that claim to offer similar services at lower costs, as well as citizens who want to feel they are getting value for their tax dollars. The demand for customer input and customer satisfaction affects employees at all levels of transportation agencies and in many different departments. Policy makers look for information to make decisions about program, service allocation, and capital investments. Planners and system designers use information as input from consumers to modify and expand routes. Public information departments often encourage feedback from riders to be used by operations staff to upgrade schedules, variable message signs, websites, and more. Facility staff must respond to customer comment forms about the cleanliness of their restrooms, the adequacy of their signage, and a host of other areas of agency responsibility the public and the agencies once took for granted.

With a growing customer base, agencies must be sensitive to understanding and meeting the needs of existing customers while, at the same time, recognizing that others may be potential customers with quite different but valid needs and expectations. For example, the growing desire of travelers to be able to communicate and use laptop computers while en route has led airlines to allow passengers' use of cell phones and laptops during time spent on airplanes, although not during takeoff and landing. This was not a concern of intercity rail service providers until recently. Today, with growing competition between air and rail modes for business passengers, especially in the northeast, long-distance rail services are equipped to provide for cellular telephone and computer laptop use.

In order to meet the challenges of mobility in the twenty-first century, transportation agencies seek new information to know much more about who their customers are (or might be), what they need, and what they expect by way of transportation services. To do so, agencies need guidelines for looking at their customer base, collecting and analyzing data about markets for their services, and using the information collected to guide policy decisions on programs, operations, capital investments, and customer relations.

The research in this document is focused on experiences of traditional public agencies, such as state departments of transportation, and is aimed primarily at audiences in similar types of agencies. This research also includes other quasi-public entities and private transportation companies operating to a large extent under public regulation; for example, airlines and bus companies (both public and private) have similar characteristics with regard to collecting and using customer-based information.

GOALS OF THIS REPORT

The overall goal of this report is to provide guidelines for public-sector transportation agencies to understand and use the needs, wants, and values of their customers and their potential customers. This report has been prepared with several purposes, all designed to assist transportation agencies in examining their customers and their needs. The principal goals of the report are to

- Examine the rationale of customer needs analysis;
- Report on the methods that agencies use to look into the needs of customers and customer subgroups;
- Report on the results of agency analysis and application of techniques designed to meet their customers' needs;
- Recommend best practices for communications with the general public and with distinctly identified customer groups;
- Illustrate by example the methods that agencies may want to examine for possible applicability and use;

- Formulate suggested guidelines that agencies may use in working with and for customers (present guidelines in categories similar to those in earlier chapters, and emphasize the benefits and purposes of gathering data about customer needs);
- Gear entire report to
  - Many different users within transportation agencies, from CEOs to frontline staff and
  - A variety of management purposes (decision making, strategic planning, agency performance review, budgeting, marketing, and communications); and
- Prepare guidelines for agencies to use in sharing information about customer needs.

CHAPTER GUIDE

The organization of this report reflects the presentation of guidelines for practitioners who are interested in using customer needs to guide agency decision making. Introductory chapters show research and examples that support the guidelines.

Chapter 1 provides an explanation of and context for the use of customer needs in transportation decision making. Titled "A Rationale for Customer Needs Analysis," it provides definitions of terms and relationships to set the stage for subsequent information.

Chapters 2, 3, and 4 describe a compendium of options that transportation agencies have examined to improve service. In Chapter 2, customer segments are shown to be the basis of much of the work of data collection carried on by transportation agencies, using a wide variety of methods to identify the needs of customers and customer segments to give guidance on individual issues. Chapter 3 lists some of the methods that transportation agencies have chosen to gather customer data. In Chapter 4, examples drawn from transportation agency practices demonstrate ways to apply knowledge about customers in making decisions.

Chapters 5 and 6 report on best practices in both transportation and nontransportation agencies. Chapter 5 lists practices from agencies that are not principally transportation based, and Chapter 6 lists practices solely from transportation agencies. Chapter 7 contains case studies of several agencies that use customer analysis successfully.

Chapter 8 is the focus of the report—the guidelines for practitioners. These guidelines have also been provided in the summary. Chapter 9 illustrates ways in which agencies can share information about both their customers and their methods of analysis of customer needs and wants.

CHAPTER 1

A RATIONALE FOR CUSTOMER NEEDS ANALYSIS

Customer needs are the focus of this report. Agencies can and do make decisions about customers and their needs every day and in a variety of ways. The methods agencies use in assessing needs and using them in day-to-day situations provide the richest sources of current practice. These methods form the basis of this report.

In theory, customer needs have long been a focus of transportation agencies, and customer needs have as a matter of course driven many of the decisions that agencies make on behalf of their customers. But it is not necessarily true that all transportation agency decisions are made with customers in mind. Perhaps it is a matter of definition of terms: transportation agencies do not always agree on how or whether they should use the term "customer," who their customers are, or which groups of customers could or should be given priority in allocating resources.

In this chapter, definitions of terms are provided, along with their derivations and the relationships between the terms that can be defined. New terms are used to describe the kinds of customer research: *objective* research, which is based on the observable behavior of customers, and *subjective* research, which is based on their stated views, opinions, values, attitudes, positions, and explanations. Decision making also may be based with some success on a combination of both objective and subjective methods.

As a preliminary step, alternative definitions of customers and their needs are examined, as well as steps taken by agencies to provide for customers' needs. Throughout the research, there have been opportunities to test those definitions against specific policy, planning, and operational decisions of transportation agencies.

CUSTOMERS: A WORKING DEFINITION

Transportation agencies find and define their customers in varying ways. During this research, three distinct definitions of "customer" have been identified:

- Agencies may decide that their customers are individuals or businesses that constitute the greater public to which the agency offers services. Actual contact with customers is not essential to this definition.
- Agencies may decide that any and all existing or potential contacts outside the agency determine customers,

whether the customer contact is with an individual, a corporate entity, a business, or another governmental agency.
- Agencies may decide that both the greater public and those in direct contact with the agency constitute customers.

The three definitions are found in the work of many of the agencies explored in this research. However, the research indicates that confusion may exist as to exactly what is meant by a "customer" of a transportation agency. The variety of definitions and application of those definitions frequently adds layers of complication that neither positively nor substantively aid in laying out research findings. Thus, the research has set rather narrow limits around the "customer" definition to facilitate a discussion that has meaning for most departments of transportation (DOTs) and transportation agencies.

Customers are individuals who use an agency's facilities or seek services from an agency. With this definition,

- *Customers are "users" of an agency's facilities or services;*
- *Customers are external to the agency;*
- *Customers do not necessarily have direct contact with an agency;*
- *Customers are not a monolithic group (they might align according to groupings such as defined by Minnesota DOT: commuters, personal travelers, farmers, emergency vehicle operators, common carriers, shippers by truck only, and intermodal shippers); and*
- *Customers may also include those who are collaterally affected by transportation impacts, such as noise or construction acquisitions (these people have needs that may be solved in part by construction projects).*

Present customers, defined as users of transportation facilities and services, are a source of traveling habits and practices that help agencies determine customer wants and actions to be taken to provide improved facilities or better services. Customers can also offer direct feedback for agencies in the form of opinions, preferences, priorities, or expectations. This information about customer wants and needs should be used by providers to develop transportation facilities and services.

Providers of facilities and services are those who help bring about the web of facilities and services operated by transportation agencies. They include

- *Transportation agencies and their internal staff members;*
- *Policy makers who guide transportation agencies in their duties (these include the policy-making and political leadership of governmental units, usually the executive branch, and also the legislative branch, both of which are frequently involved in funding and direction for transportation agencies);*
- *Agency provider partners who join agencies on projects or programs that involve the use of some of their own resources (provider partners include federal, state, and local government transportation, law enforcement, and public safety agencies); and*
- *Suppliers, including contractors and vendors, hired by the agency to develop facilities and to provide services (firms under contract to the transportation agency undertake construction, operations, or research or other projects desired by the agency—for example, facility or service contractors, or planning and research contractors).*

Figure 1 shows the basic relationships between policy makers and agencies, provider partners, suppliers, and customers. It shows the separation between providers and customers and indicates the two-way relationship that exists between many of the providers and between the agencies and customers. Customers are served when providers perform their functions; the system of interrelationships is devised as a method of organizing facilities and services for customers. The use of

these definitions of actors has been central to the formulation and preparation of this report.

Florida Department of Transportation (FDOT) provides an example of a hierarchy of relationships between customers, the agency, provider partners, and suppliers. FDOT regards customers as the users of the transportation system, including

- Motorists;
- Public transportation riders (buses and rail systems);
- Airline passengers;
- Ship passengers;
- Cyclists;
- Pedestrians; and
- Movers of goods such as truckers, cargo ships, air freight, and railroads.

In contrast to its customer base, FDOT notes that it has three major types of suppliers:

- Contractors, who construct and maintain transportation facilities. The agency has prequalified 450 contractors.
- Consultants, who contract for engineering, architecture, surveying, special grant projects, mapping, planning, appraising, and design projects. FDOT has 588 prequalified consultants.
- Vendors, who provide other goods or services. The agency deals with 10,500 firms in this category.

Suppliers at FDOT include firms involved in privatization of the planning effort, design work, construction, and maintenance activities. In addition, FDOT works with several
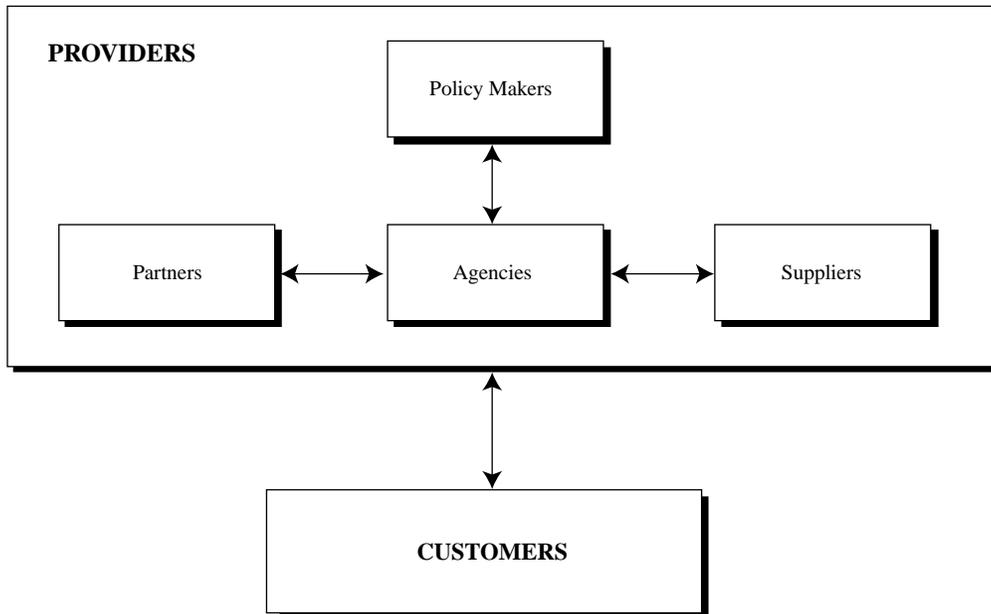
Figure 1.   Relationships between customers and providers.

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cross-functional teams (its supplier consultants and contractors) in order to improve working relationships and the quality of products and services. For example, FDOT's provider partners include a number of unique relationships and partnerships with local governments, federal agencies, and other state agencies.

RELATIONSHIPS BETWEEN STAKEHOLDERS

When it comes to travel, nearly everyone could be called a "stakeholder." All travelers are stakeholders, since travel is usually required for access to work, school, shopping, and a myriad of other reasons. Stakeholders find and use something of value in transportation facilities and services and, in some cases, are themselves the providers of facilities and services.

Stakeholders include not only customers, but also providers of transportation facilities and services.

The outline of the relationships between stakeholders in Figure 2 shows links between providers and customers. Figure 2 is based on a definition of stakeholders as follows: Stakeholders include customers who use transportation facilities and services, along with providers—the policy makers and transportation agencies, their partners, and their contractors. Figure 2 also shows the relationships between stakeholders according to roles each actor plays, and it is apparent that all stakeholders work together in direct or indirect ways.

A close relationship between policy makers and the state transportation agencies exists, in which policy makers develop a future vision based on presumed customer needs, guide the development of programs and projects, allocate funds, and direct procedures for expenditure of funds. Agency staff work with decisionmakers by gathering appropriate data, synthesizing available information, determining customer needs, and analyzing and recommending appropriate actions to meet those needs.

Agencies and partners may work together on funding facilities and services, developing process and performance stan-
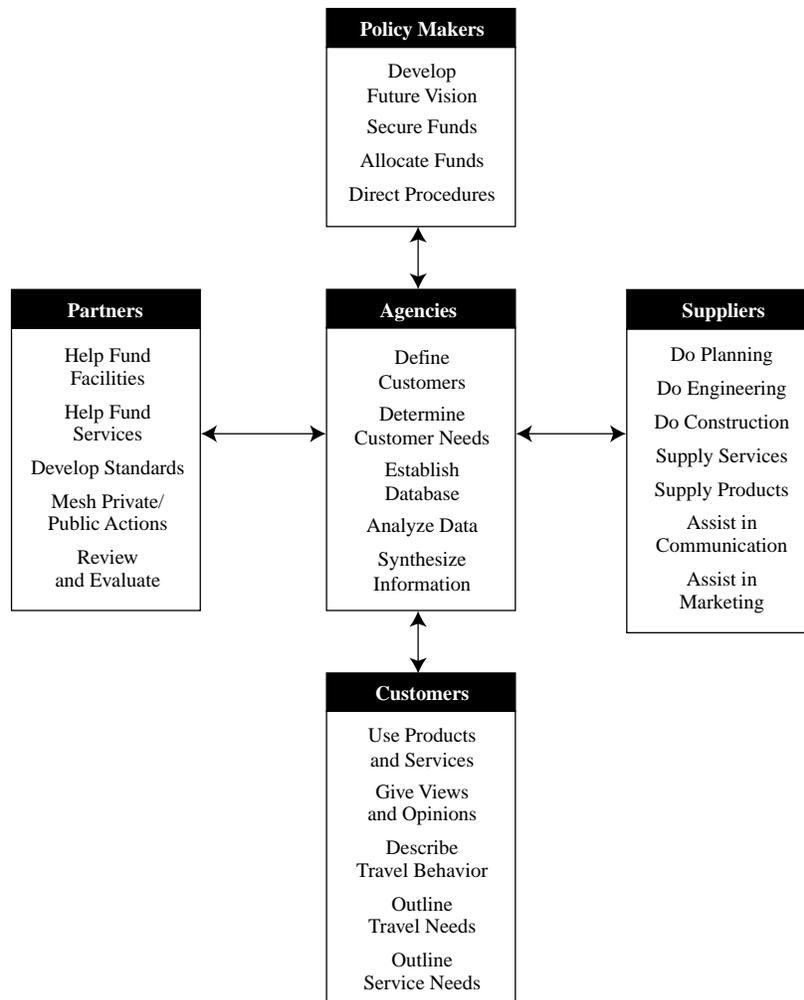
Figure 2.   Potential roles of stakeholders.

dards, meshing business and industry initiatives with projects and programs, or offering peer review and evaluation. Suppliers—such as engineering and planning firms, construction firms, product suppliers, and communications and marketing experts—work with agencies on research studies, information delivery, programs, outsourced work, and design. And, of course, all the efforts are directed toward providing facilities and services for the traveling public—individuals who may work directly to make opinions and preferences known to other stakeholders, principally to the agencies.

WHY CUSTOMER NEEDS ARE IMPORTANT TO TRANSPORTATION AGENCIES

Agencies are ultimately responsible for determining and articulating customer needs and meeting those needs. Policy makers rely on the agencies to do this work, and customers expect the work to be done by agencies in ways that satisfy their needs. Provider partners and suppliers do not directly determine customer needs but may be helpful in the assistance they can give to agencies in performing this role. One of the principal roles of an agency is to carry out programs or projects or to provide services that meet customer needs. Accomplishing this means, among other things, that agencies facilitate relationships between policy makers, agency staff, and customers, thus serving as a central place for interpreting policy, with the assistance of internal staff working with a variety of provider partners and suppliers.

If customer needs form the basis for the work of transportation agencies, how does a transportation agency determine needs without input of some kind from customers? The answer is that agencies routinely use objectively observed information obtained by direct or indirect contacts with customers, by observation of the ways customers use facilities or services, or by some combination of the two. As most agencies are aware, customer needs may also be derived from more subjective, qualitative information through surveys. Customer needs are identified by transportation agencies in two ways, objectively or subjectively, and the two methods are used by transportation agencies to varying degrees and for differing purposes. Both methods provide opportunities for agencies to discover and document customer needs, but both methods have limits that suggest they should be used in an integrated fashion.

MEASURING CUSTOMER NEEDS: OBJECTIVE DATA

Objective data are behavior-based—the kinds of data representing the behavior that customers demonstrate in traveling. Objective data include readily observable information: which transportation modes customers use, their choices of routes, the volumes of traffic they generate, and so forth.

Various forms of objective data are used by virtually all transportation agencies to keep track of their customers and the ways they use agency facilities and services. Nearly all observed data are contained in records that are measures of customer behavior. Traffic counts, for example, are one method transportation agencies use in routine record keeping of how their customers use roads. Traffic counts can be derived from personal observations or by mechanical record keeping machines that transcribe the volume of traffic by time of day and by direction. These traffic counts are conducted by the agency to establish and continually update baseline data for further analysis.

Behavior-based records also transcribe information about crashes, including their effects on users' lives in terms of fatalities or injuries, and their causes (customers' failures to observe traffic laws, inattention to vehicle control, driving while drunk, or other crash-related behavior). Records are kept of the types of crashes, whether they involve customers, and whether they result in bodily injury. Other record keeping related to customer behavior includes rest stop usage, sign visibility and repair, and striping visibility and durability.

Customer behavior can lead agencies to make improvements based on staff perceptions of customer needs. For example, state DOT staff members, looking at construction work zones, see two interrelated problems: the delays to customers passing through a construction zone versus the safety required to protect construction workers and customers. DOT staff members instinctively know they are responsible for both the customers' delays and the workers' and customers' safety. Staff people use principally objective information to determine the best ways to minimize delays and maximize safety in planning the construction work.

With the goal of reducing delay and improving safety for both workers and motorists in work zones, the Ohio Department of Transportation prepared a compendium of strategies and options for designers to consider in maximizing capacity and minimizing delays while maintaining traffic through work zones. Since traffic throughput can be predicted based on the usual volumes of traffic on the roadway and the anticipated periods of shutdowns or interruptions of traffic flow, agencies ordinarily determine measures for construction zone safety on the basis of objective data—past records of workers' injuries in construction zones or records of crashes caused by customers traversing construction zones.

Similarly, Arizona Department of Transportation (ADOT) in 1999 worked with the city of Phoenix to develop and implement an alternative solution to a traffic problem at Happy Valley Road and Interstate 17 off-ramps. The city of Phoenix suggested an alternative—a roundabout—to the solution proposed by ADOT that many thought would not adequately solve the congestion problems in the short or long term on the two-lane bridge over Interstate 17. The city used video and objective data to demonstrate that in Vail, Colorado, a roundabout actually moved higher volumes of vehicles than signalized intersections, reduced the number of injuries, and

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cost a fraction of what would have been required to widen the bridge. ADOT representatives, recognizing that the number of interchanges requiring capacity improvements was growing and traditional solutions would be costlier and more difficult to implement, adopted the roundabout at Happy Valley Road. The roundabout opened in December 2000.

Kansas Department of Transportation (KDOT) used objective data to establish a program of data collection and analysis and to set a basis for setting future goals for performance. Working with local communities, KDOT determined that youthful drivers incur the largest number of motor vehicle crashes by county. This information was used to establish a performance goal of reducing the incidence of crashes involving drivers under 21 years of age by 15 percent. The same information led to establishment of a Safe Communities Coalition to help communities identify traffic safety issues, a Kansas Drunk Driving Prevention Project, with an annual student survey to gather information on the behavior, attitudes, and beliefs of student participants about key traffic safety issues. The information led to initiation of the Wichita Teen Court Project to hold youthful offenders accountable, using peer pressure and influence to encourage positive choices, and to Take-A-Stand, a program of driving under the influence (DUI) prevention for teens and intervention to keep other teens from drinking and driving.

Oregon Department of Transportation (ODOT) reports annually on traffic safety through its performance plan, using data sources that are reliable, readily available, and reasonable as representing outcomes of the program. For example, ODOT uses statewide traffic crash data and measures of exposure for a 5-year period to establish sets of performance measures designed to curb fatality and injury rates. Data in Oregon show that teens are twice as likely as other drivers to be involved in fatal and injury crashes. Based on this information, the Oregon legislation directed the department of motor vehicles (DMV) to institute more stringent licensing procedures for individuals under the age of 18 applying for a driver's license.

Practices based on objective measurements have become routine, undertaken for reasons of safety and traffic throughput. The agencies have made the rational decision that all customers want the highest possible levels of safety and traffic movement. Objective data allow the agency to determine the extent to which these customer goals have been met.

MEASURING CUSTOMER NEEDS: SUBJECTIVE DATA

Subjective data come from statements by the agency's customers, who express opinions, attitudes, positions, and explanations of why they make particular choices. Subjective data can be behavior based, as described by customers in origin-destination studies, for example, or in explorations of modal preferences, trip purposes, and resources for travel in the form of income or automobile availability.

Subjective data can come in the form of feedback and input to agencies, as well as expressions of a customer's degree of satisfaction with agency proposals or work. These expressions can be made at any time and in a variety of ways, but generally follow a pattern closely related to agency actions. For example, Virginia Department of Transportation (VDOT) used customer survey results to work with contractors to improve construction techniques to reduce the impact on the traveling public. Over 3,500 customers statewide were surveyed by telephone and were asked questions about their satisfaction with, among other things, construction impacts. Using a rating scale of 1–5, with 1 being very dissatisfied and 5 being very satisfied, customers said construction, although a welcome activity, was too disruptive. VDOT initiated programs to get contractors to use different techniques and approaches to doing the work and has begun increasing nighttime construction to alleviate construction delays during the busier daytime hours.

Along with objectively observed behavior patterns, subjective data can become the basis for research and analysis. Responses by customers to surveys are tabulated, analyzed, and reported for further use by agencies or their customers. Along with field observations by agencies, the information can become input to nearly all of the actions that agencies undertake in providing products and services for their customers. For example, when agencies try to understand traffic patterns as a basis for further improvement to the transportation system, both objective and subjective data are used.

Subjective customer input is desirable at various stages in the agency's planning processes. Agencies actively solicit customer input in planning and implementing improvement projects or service enhancements. This input can take the form of comments, opinions, suggestions, and viewpoints expressed by customers as the planning process moves forward. Customer expressions can also be gathered in an organized way, as when the agency conducts a customer survey or holds public meetings or workshops to elicit customer viewpoints. This information is melded with the agency's internal processes to ensure the implementation of a quality product or service. For example, planning and implementing projects or services are seldom undertaken without internal agency staff observations, analysis, and recommendations.

An outline of potential uses of objective and subjective forms of transportation research is found in Figure 3. As shown in this figure, the two types of research are carried on parallel with one another, yet are used in different ways. As an example, both types of research have inputs into understanding traffic patterns—objective research deals with such factors as traffic volumes, delays, and mode choices, and subjective research deals with such factors as origins and destinations, trip purposes, and resources used for travel. This information provides input to planning and engineering studies and can lead to new service provision and to projects that help meet the customer needs suggested by the observed customer behavior or stated customer views.

DEFINITION AND EXAMPLES

Objective Research

Observed Customer Behavior
- Traffic Volumes
- Mode Choices
- Delays
- Crashes

Combined Research

Subjective Research

Stated Customer Behavior
- Origins and Destinations
- Mode Preference
- Trip Purpose
- Resources for Travel

POTENTIAL USE IN AGENCY DECISIONS AND ACTIONS

Operational Actions by Agency
- Maintenance
- Repairs
- Guard Rails
- Striping
- Signage
- Construction Zone Safety

Understanding Traffic Patterns
- Input to Planning
- Input to Engineering
- Input to Service Providers

Research to Gain Customer Input
- Surveys
- Tabulations
- Analyses
- Reports

Monitoring Results
- Further Observations
- Staff Analysis
- Staff Recommendations

Planning and Implementing Improvements
- Projects
- Services

EVALUATION AND FEEDBACK

Understanding Results of Improvements

Research to Gain Customer Feedback
- Comments
- Opinions
- Suggestions
- Attitudes
- Reactions

Further Operational Actions

Further Planning

Figure 3. Potential types of travel research.

Another result of the process may be actions taken by the agency, which may yield an improved understanding of traffic and an ability to improve transportation operations through maintenance or upgrading of facilities. If doubt exists as to customer needs, it may be appropriate to secure further viewpoints from customers to improve the agency's understanding of needs that have been articulated in the subjective research or discovered in objective measurements.

For understanding the effects of improvements, agencies rely on both objective and subjective feedback. Objective feedback comes from observations of the effectiveness of the product or service in actual operation in the field. Subjective feedback comes from customer reactions, suggestions, and opinions regarding satisfaction levels that the improvement has brought to them. These forms of feedback lead to additional planning and actions that are implemented to improve situations noted by agency staff or address issues brought up by customers.

SUMMARY

Customer needs are formally or informally identified by transportation agencies in the normal course of work. Customers themselves are identified as individuals who use an

agency's facilities or seek services from an agency. Facilities and services are made available to customers by providers—those who help bring about the web of facilities and services operated by transportation agencies, including provider partners and suppliers. Customers and providers are all stakeholders in the process of serving public transportation needs.

Transportation agencies can identify customer needs by working directly from data to find objective, behavior-based information, or by working with customers for subjective information, which can be behavior based but can add opinions, attitudes, positions, and explanations of why customers make particular choices or have specific preferences.

CHAPTER **2**

CUSTOMER GROUPING AND SEGMENTATION

Identifying customers of a transportation agency is an everyday task for most transportation agencies throughout the country. A simple example is the agency differentiation that singles out commercial vehicles as a subclass of all the vehicles using a transportation network. This differentiation may be done for registration purposes or for the purpose of studying commercial vehicles' special needs. Commercial vehicles in this example become a segment of the customers that the agency is serving. Similarly, people living in a geographic region such as a transportation corridor represent a segment of the population of the region.

Each customer grouping and segment within the broad customer base of an organization usually has common needs and desires. For example, truckers and fleet operators use facilities and services in special ways that in most cases must be managed by the organization's core and ancillary services. Commercial vehicle operators have divergent experiences that do not necessarily reflect the needs and wants of individual drivers and passengers who are regular or occasional users of transportation facilities and services. In terms of statewide transportation services, the needs of commercial vehicle operators differ substantially from the needs of transit service commuters and the needs of people with disabilities and people who are otherwise transportation-disadvantaged.

Customers are classified into groups that help agencies to identify customers' needs, to develop products and services for the groups, and to allocate resources and effort in serving the groups. The question of how groups are formed or organized, how they express their wants and needs, and how best to serve them has become a major component of market research.

TYPES OF SEGMENTATION

Contemporary market research focuses on differences between people classified in different ways, but always in groups. Customer segments may be based on prior judgments that define groups without detailed market research, such as users versus nonusers, men versus women, younger versus older users, etc. Many agencies that develop groupings or market segments have used primary market research to collect information on members of the community. Groups are developed that exhibit differences in needs and wants. These groupings are frequently based on combinations of the following variables:

- **Geographic**—cities and towns, villages, communities, neighborhoods, zip codes, census tracts, etc. Using geography, the Arkansas State Highway and Transportation Department conducted a 1997 survey of customers, breaking the state down into 16 geographic areas, with a sample of opinions from each area. The purpose of the survey was to determine customer opinions on necessary highway improvements in each area. Customers were self-selected by attendance at the meetings, although supplementary survey forms were circulated with the help of the state's chambers of commerce and newspapers. The result of the survey was a total of 1,500 contacts, distributed throughout the state.
- **Demographics**—age, gender, family size and life-cycle, occupation, income, length of residence, type of residence, auto ownership, and nonresidents' other factors that may be useful to understand customer segments.
- **Behavioral**—awareness and usage patterns in relation to products or services and attitudes or responses resulting from contact with the products or services.

  South Dakota Department of Transportation (SDDOT) surveyed residents to determine levels of customer awareness of agency functions, adding this information to prior information available from other sources, such as the governor, legislators, commission members, special interest groups, news media, public meetings, and citizens' correspondence.

  VDOT's 1997 customer satisfaction survey grouped respondents into drivers who use major highways and those who use secondary roads. The purpose was to understand how people rate safety, pavement conditions, roadside maintenance, and other factors for both types of roadways.
- **Socioeconomic**—indicators that demonstrate lifestyle (e.g., work-oriented, family-oriented, or leisure-seeking) or behavior patterns (e.g., segmentation around trip purposes or dependence on particular modes of transportation).

  In surveys, New Jersey Transit classifies riders according to both the transit line they used and the time they boarded—behavioral characteristics of significance in an origin-destination survey of commuter rail passengers. Those surveyed were categorized by age (over 18 only), employment status (employed only), and those who also traveled to certain areas for recreation.

POTENTIAL COMBINATIONS

Combinations of factors may, of course, be explored. The Chicago Transit Authority (CTA) biennial customer satisfaction surveys, which include 2,500 respondents, initially group customers by rail and bus users. Customers are then segmented into seven groups by geographic area of residence and by additional segments such as income level and dependent or choice riders. CTA also surveys nonriders to make comparative assessments of auto, bus, and rail services. The survey addresses 50 service quality measures for each customer segment.

The city of Phoenix, Arizona, segments city customers by geographic and demographic characteristics when it conducts surveys of customer groupings every 2 years. These groupings may be changed or rearranged for the surveys, depending on the questions to be asked. Demographic characteristics may include broad age categories, minorities, etc. Geographic segmentation began with city council districts in early surveys where the sample size of 2,400 individuals was sufficient to be representative of each segment of the customers in the city. Now, geographic areas are generally defined as a quadrant of the city, because the survey sample size has been reduced to some 700 individual participants. At this sample size, the use of city council districts may have too few surveys to have statistically valid results.

ENSURING VALID RESULTS FROM CUSTOMER SEGMENTATION

Customer segmentation does not end with the groupings above. In addition to these likely markings of customer groups, there are characteristics that define whether they can be used in a statistically valid analysis of customer needs. Classic marketing definitions of customer segments insist that groups demonstrate the following characteristics:

- **Homogeneous**—groups of customers should share a common set of characteristics or needs relative to the product or service being offered.

  For example, using customer segmentation for comparison between groups and geographic regions, researchers at the University of Missouri-Columbia conducted a constituent service quality survey for the Missouri Department of Transportation (MoDOT). MoDOT customers were grouped according to geography—the St. Louis Metropolitan area, the Kansas City Metropolitan area, and the rest of the state—followed by gender, age (18–36, 40–59, and 60+), educational attainment (high school diploma or less, some college), income (household annual income of less than $20,000, $20,000 to $49,999, and $50,000 or more), annual miles driven (less than 10,000, 10,000 to 19,000, and 20,000 or more), reasons for travel, special needs due to disabilities, and whether or not respondents had a commercial driver's license.

- **Distinguishable**—common characteristics or needs of groups should be different from those exhibited by other customers, and the differences must be measurable.

  The New York State Department of Transportation (NYSDOT) used surveys to document truck driver safety needs. Working with the Institute for Traffic Safety Management and Research at SUNY-Albany, NYSDOT conducted a survey of long-distance truck drivers in 1997 to examine fatigue-related driving issues.

- **Substantial**—groups should be big enough to warrant the development of a specific research program.

- **Reachable**—groups should be capable of being identified, reached, and served cost-effectively.

  The Intelligent Transportation Society of America (ITS America) has begun a nationwide research study to understand consumers' attitudes and preferences regarding the 511 national traveler information phone system. Potential customers of this service have been stratified for customers who are commuters, through-travelers and commercial vehicle operators. Within these categories, the research will address geography (both urban and rural needs); gather information on the distinctions between transit travelers' needs and highway travelers' needs; and explore the differences attributable to age, gender, income, employment, and race. For each customer segment, questions will focus on desired content of 511 phone system services and consistency of delivery, with additional focus on issues such as information quality and willingness to pay.

- **Interested in specific benefits**—groups should exhibit differences based on expectations of benefits sought from a product or service.

- **Stable**—groups should be secure, relatively unchanging over time.

  Groups identified in customer segmentation for the survey administered by the San Francisco Bay Area's metropolitan planning organization (MPO), the Metropolitan Transportation Commission (MTC), were required to be registered voters, chosen for the sample because the nature of the survey subject matter was electoral. Questions focused on voter reactions to specific transportation preferences. The agency used a stratified sample from the voter file to obtain a higher degree of accuracy of potential voter reactions than would be supplied by a random digit dial sample drawn from the phone directory. The survey was divided into three segments: a base sample of 1,250 interviews within the MTC jurisdiction, a 175-member subsample of high-probability "ethnic" zip code areas, and a 175-member subsample of high-probability "lower-income" zip code areas. Of the 1,600 interviewees, 75 were members of an ethnic or minority group, including people with disabilities.

Members of all such groups are usually chosen by predetermined selection processes, which are discussed in the chapter on data gathering techniques.

TRENDS IN CUSTOMER SEGMENTATION

Customer segmentation using professional market research techniques is a new application for most transportation agencies. Use of currently known and usable marketing techniques may provide new insights for agencies in serving their customers. For example, the Minnesota Department of Transportation (MnDOT) conducted a market segmentation and service value study through its own professional market research unit. Seven customer segments were identified: commuters, personal travelers, farmers, emergency vehicle operators, common carriers, shippers by truck only, and intermodal shippers. Segments formed the basis of telephone interviews with individuals in each of the groups conducted to explore the importance of MnDOT services to each, customer satisfaction levels with agency services, and the opinions of resource commitments to agency programs. Summaries of customer priorities and satisfaction in all segments except for farmers showed substantial agreement among the segments on the value of MnDOT services.

In another example, FDOT established six customer segments as part of its process of seeking customer input. These customer segments flowed from the extensive outreach program that was part of the update of the long-range transportation plan. Work on the update began with meetings to determine what the public viewed as important. A training program for obtaining public input was established; its focus was an on-line training program in public involvement. Using feedback from public input, the FDOT executive board (comprising the secretary of transportation, the assistant secretaries, and the district secretaries) established the six customer segments. These segments included residential travelers, commercial customers, government officials, visitors, special needs, and property owners impacted by transportation construction. The segments provided the basis for approaching groups for inquiries: focus groups were held in 1999 in each of the segments and in north, central, and south parts of the state in urban, rural, and transitioning areas. Interview surveys of individuals in each of the segments were undertaken in 2000, including about 5,000 surveys in all. Segment interviews revealed issues that affected nearly all groups: night visibility of pavement markings, timeliness of completing construction, access to businesses during construction, and lack of opportunity to have input on design plans. Tourists rated FDOT services higher than residents did.

The California Department of Transportation (Caltrans) completed a telephone survey of residents in July 2001. The survey consisted of 3,220 completed questionnaires of people who were 16 years old or older, randomly selected from throughout the state. Respondents were selected on a geographic basis and stratified after being surveyed by mode of travel, type of traveling (work, school, pleasure), professional drivers, and agricultural drivers.

The Pennsylvania Department of Transportation (PennDOT) employs a program called the Voice of the Customer to identify and survey customer segments. The first step identifies customer segments based on the purpose of the survey. The second step is interviewing representatives of customer segments to explore their unique needs and requirements. In the third step, analysis is undertaken to fully understand what the customer has identified, and lastly, an action plan is devised to implement the customer requirements. Using this process, PennDOT has developed customer standards for the Driver License Centers. Communication processes within PennDOT and between PennDOT and external customers have been improved.

Surveys of air travelers can also lead to detailed segmentation for specific purposes. The Rhode Island Economic Development Corporation surveyed more than 2,200 air passengers at the T.F. Green International Airport to help determine the economic impacts of the airport on the local community and statewide. Surveyed air passengers were selected by segments that represent a cross-section of travelers in the airport at different times of day and on different days of the week. Passengers were subsequently segmented by residency status (resident or nonresident), trip purpose (business or recreational), and the amount of money they spent or were expected to spend in the area.

In a more extensive marketing effort, core market segments of the international airline travel market are surveyed monthly by Tourism Industries, an office of the International Trade Administration of the U.S. Department of Commerce. Surveys have been undertaken monthly since 1983 through distribution of questionnaires to passengers on flights, with annual totals of 900 to 4,200 flights. The year 2000 in-flight survey received 26,000 completed questionnaires. Basic market segments for most survey years include

- Direction of travel (inbound or outbound), destination information (country, state, or city visited; attractions; activities; accommodations; etc.);
- Trip planning information (purpose of trip by primary and other purposes, type of ticket, method of booking, etc.);
- Ratings information (factors involved in choosing the airline and a recommendation rating for upcoming trips); and
- Demographic information on residence and citizenship, gender, age, occupation, income, expenditures in destination, etc.).

Information can be reported in up to 48 subgroups provided by the survey information.

As a guide to comparing the segmentation efforts described in this chapter, Table 1 summarizes these public-sector transportation agency experiences in grouping customers into market segments. Differentiation is shown in terms of the distinctive aspects of each effort. The table shows some of the differentiation between agency experiences, resources, and staff capabilities to derive the techniques that are most promising for use in this study effort.

TABLE 1   Techniques used to survey customer needs—targeted customer segments

Agency/Service	Date	Survey Title	Customer Segment
Chicago Transit Auth.	Biennial	Biennial Customer Satisfaction Survey	Rail, bus users, nonusers, level of use, dependence on transit, or choice riders
Colorado DOT	2001	Improving Public Involvement in the Statewide Plan	Transit riders
Florida DOT	2000	Survey for Long-Range Transportation Plan	Residential and commercial travelers, elected officials, visitors, special needs
Florida DOT	2000	FDOT Customer Opinion Survey	Resident drivers, tourists, commercial drivers, elderly
Florida DOT	2000	Senior Citizen Transportation Survey	Older residents able to drive
ITS America	2001	511 National Traveler Information Survey	Commuters, through-travelers, commercial vehicle operators, truck and intermodal shippers
Lowell, MA, Ctr. for Family/Work/Community	1999	Youth Transportation Survey	City high and middle school (in-school) students
Minnesota DOT	2000	MDOT Customer Segmentation Study	Commuters, personal travelers, farmers, emergency medical technicians, truck and intermodal shippers
Missouri DOT	2000	Constituent Service Quality Survey	MO residents by geography, demographics, annual miles driven
NCHRP	1997	SR 91 Corridor Resident Survey	Residents along SR 91 corridor
NJ Transit	1999	NJ Transit Customer First Program	Transit riders by line used and time they boarded
New York State DOT	1997	Survey of Long-Distance Truck Drivers	Long-distance truck drivers
Rhode Island EDC	1998	Economic Impact Study	Air passengers in RI airports
San Francisco BART	1997	Customer Satisfaction Survey	Customers onboard BART vehicles
U.S. Dept of Commerce	Monthly	Survey of International Air Travelers	In-flight survey of international travel populations of U.S. residents and nonresidents
Virginia DOT	1997	Virginia Quality Index Survey	Licensed VA drivers by geography, vehicle type, demographics

SUMMARY

In this chapter, certain aspects of the practice of customer segmentation have been laid out within the marketing context that many now use as a framework for surveying customers. Examples of the experiences of several transportation agencies show practical ways segmentation can be used. Agencies have distinctive reasons for collecting information on the bases they choose, whether the basis is geographic, demographic, socioeconomic, or behavioral. Valid reasoning can readily back up why each agency has chosen the segmentation methods it used in surveying customers.

CHAPTER **3**

CHOICE OF DATA GATHERING TECHNIQUES

Customer research is used by public-sector transportation agencies to obtain reliable, quantifiable, and usable data. This chapter includes an itemization and detailing of available techniques to gather data for use in assessing user needs and wants, along with examples of transportation agencies that have used the techniques in obtaining customer data to be used in agency decision making. Techniques are identified and categorized as used by transportation agencies to produce reliable and quantifiable data on the needs and expectations of various user segments. These techniques include methods to assess customer input that is provided as planning or preparation for improvement projects or new services is underway, as well as feedback from customers that is gleaned from reactions and observations of the effectiveness of the product or service.

Each technique used to obtain information about customers should be

- Sufficiently detailed to form the basis for agency decision making;
- Statistically reliable, illustrating the range of techniques from least reliable to most reliable;
- Fully inclusive and representative of all potential customers served by the agencies;
- Economically supportable, in terms of research costs that can be readily justified;
- Replicable and understandable, with methodologies and procedures that can readily be used by transportation agencies; and
- Usable in context with other techniques to form a basis for agency decision making.

Agencies will need to determine the best ways of finding and using data that meet these goals.

SOURCES AND METHODS OF USING DATA

Data for transportation agencies can be derived from a variety of sources. The objective forms of data that are used to help define customer needs are usually measures taken by agencies in the regular course of business. These forms include traffic counts, route or modal choices, and instances of delays or crashes. Methods for recording these kinds of data are reasonably well established and consistently improving.

This report is concerned primarily with the somewhat lesser-known forms of gathering data to establish customer needs. These forms are generally the more subjective forms of data—information gleaned directly from customer responses, opinions, attitudes, preferences, comments, and suggestions. Data from these sources can also provide input for decision making by agencies, as they enlarge upon concerns and needs that are expressed in the more objective forms of information. They also help in establishing baseline conditions for transportation agencies to deal with in suggesting proposed changes in products or services.

For subjective data gathering, several forms of contacting customers and obtaining responses are well established. These include

- Customer surveys and interviews,
- Focus groups,
- Customer panels and advisory committees,
- Internet and website applications,
- Kiosks and exhibits, and
- Response cards.

Methods of using the different forms of data gathering from customers is of central concern. Furthermore, the types of data that are gathered are also high-level concerns. The use of differing methods of data gathering will help to show customers that the agency is generally open to customer comments and opinions. The choice of the types of data gathered can demonstrate that the agency is open to knowing all the facts surrounding customer needs. Without openness, an agency may be seen as protective and narrow in its concern for customers' views.

In customer surveying, data should be selected to enrich the agency understanding of customer needs. Agencies should not rush into data gathering efforts solely for purposes of getting it over and done with. There is too much at stake for the agency and its customers. Because data can be useful to an agency's ongoing efforts in planning, engineering, construction, or operations, data gathering should not be handled lightly or without due attention.

Customers should be aware that they are free at any time to contact an agency with comments, suggestions, or complaints. Yet they may not know where or how to register their views and where the views should be directed. Agencies can

encourage this type of spontaneous input or feedback from customers by providing contact information in many ways: in telephone directories, on websites, in media announcements, in annual events such as transportation fairs or exhibits, in traveling exhibits at malls, in downtowns and elsewhere, and in other ways that may elicit customer interests and responses.

In Minneapolis/St. Paul, the Minnesota Forum allows open e-mail discussion of city issues for local residents with participation by city officials. E-mail subscribers to these discussions say they find the information exchange more substantive and detailed than people usually manage at meetings. The nature of the electronic conversations—on topics such as airport noise, downtown development, and local politics—allows many people to weigh in on the discussion. The list of subscribers at one e-mail address is moderated by a local resident who gets input from policy makers such as city council members. At another, more activist e-mail site, the focus is on neighborhood issues, such as opposition to the location of a proposed transit station.

PURPOSES OF SURVEYS

A wide variety of surveys are taken each year for many diverse purposes. The following is a sampling of recent surveys arrayed to demonstrate the disparate purposes that surveys can serve.

Colorado Department of Transportation (CDOT) used detailed survey questions to gauge residents' perceptions about transportation issues. Working with the Transit Alliance and the regional transit district, CDOT sponsored a survey of the transportation needs in the Denver metro area. The survey was designed to measure citizen preferences for various transportation and funding options.

Washington State Department of Transportation (WSDOT) used surveys to determine satisfaction with services provided by its ombudsman's office. This office has a goal of ensuring that people are heard by those within WSDOT who have decision-making authority and that they receive thoughtful, appropriate, and timely responses to their inquiries.

The Port Authority of New York and New Jersey used surveys to pinpoint problems in airport use. The agency conducted a survey of airport users at Kennedy, La Guardia, and Newark Airports to determine issues faced by travelers at the airports. The survey found that getting lost because of confusing directions at the airports was second only to unclean restrooms as the most difficult problem cited.

Pinpointing specific problems was the goal of the Lowell, Massachusetts, Regional Transportation Authority and the University of Massachusetts Lowell in conducting a survey of young people to determine attitudes and usage of public transportation by young people. Following the survey, three focus groups were held on issues identified in the surveys, with local social and ethnic club members.

In Alaska, the Department of Transportation and Facilities conducted a customer survey to determine familiarity and public satisfaction with Alaska's transportation and other facilities and awareness of planning efforts concerning those facilities. After respondents gave opinions about their satisfaction with these facilities, they were asked if they were aware of various state transportation planning efforts and whether they had participated in any of the planning efforts. Only 15 percent of the respondents were aware of the state's efforts to develop a new transportation plan, and, of those, only 16 percent had ever personally participated in preparing this or other planning efforts.

Surveys can be used to have citizens rate traffic problems. The city of Ames, Iowa, conducted a survey in preparing its transportation master plan to determine potential directions for improvements based on customer opinions. The city developed methods of asking about travel habits by inquiring whether respondents walked, jogged, rode bicycles, or used public transportation and how frequently. Participants were asked to rate (1) the traffic flow from very poor to very good within major traffic corridors and (2) the adequacy of public transportation by route. Participants were then asked whether new facilities were much needed or not needed and were asked for a ranking on each item in a list of potential improvements that would cost over $1,000,000 each.

Surveys are used to assess customer attitudes toward a new product. ITS America has hired the Gallup Organization to conduct a nationwide research study to understand consumers' attitudes and preferences regarding the 511 national traveler information phone system. The findings will be used to assemble a national consumer perspective on how to design and use 511 services. Guidelines for content and consistency in 511 phone service are being developed by a coalition of the American Association of State Highway and Transportation Officials (AASHTO), the American Public Transportation Association (APTA), and ITS America. The guidelines are sponsored by the U.S. Department of Transportation. Results of the nationwide survey will be used in the development of marketing materials, business models, and local services, in addition to the national content. The survey will be supplemented by four focus groups held in Los Angeles, California; Philadelphia, Pennsylvania; Minneapolis/St. Paul, Minnesota; and Lincoln, Nebraska.

Utah Department of Transportation (UDOT), surveying for potential barriers to travel, commissioned a market research company to conduct qualitative research among Salt Lake area residents who commute to work and among residents who drive primarily for pleasure. The principal objective was to identify barriers to travel in Utah and determine whether the proposed 511 telephone service would mitigate those barriers. Surveys, conducted in four focus groups, found the following potential barriers to travel:

- Out-of-date, inaccurate information from traffic reports and electronic signs;
- Unexpected road closures; and
- Too much information on electronic signs that are difficult to read.

The survey found that travelers want

- Information on traffic delays, closures, construction, weather-related delays, and accidents;
- Real-time information germane to their area;
- Accurate, up-to-date information;
- Alternate routes; and
- Delay time in minutes.

Utah participants in the survey were asked which information they would actually use. Responses were that the most important information (in rank order) concerned traffic delays, winter driving conditions, and traffic during major sporting and cultural events. Respondents considered information about public transit and concierge services moderately important.

Agencies frequently use different forms of qualitative information gathering in one process to produce more reliable results. For example, a number of agencies use a mix of focus groups and public gatherings to determine quality-of-service measures and then conduct random surveys to gather more representative data on customers' assessments of service quality. Surveys of individuals, focus groups, public workshops, and small community meetings helped the St. Louis East-West Gateway Coordinating Council to determine community attitudes and opinions regarding transit proposals in three corridors. Both telephone and other personal interviews with community residents were used to help design survey questions and questionnaires for a survey of a statistically valid sample of the population in the three corridors. These surveys were conducted and repeated later, in order to show longitudinal (over a period of time) changes in opinions on the transportation issues and choices.

BUILDING A SURVEY PROCESS

Setting up a survey process may involve establishing formal task definitions to guide the process. In 1999, the South Dakota Department of Transportation (SDDOT) decided to revisit the statewide survey it had undertaken in 1997. It established a specific path to follow to undertake the survey with the following steps:

- Meet with project technical panel to review scope and work plan;
- Interview selected SDDOT staff to identify important issues related to customer service and to identify actions taken in response to the 1997 customer survey;
- Conduct focus groups with members of the public to identify significant issues that should be assessed;
- Summarize interview and focus group findings and present the findings to the technical panel and SDDOT's 10-member Executive Team;
- Using feedback, develop a survey instrument to be used in a statewide survey and get approval of the technical panel;

- Conduct a statewide survey to determine public opinions concerning the importance and quality of SDDOT's products and services;
- Analyze and summarize survey results to identify significant issues among the general population and among distinct customer groups;
- Conduct a workshop with the Executive Team to develop a plan of action for responding to the survey findings;
- Prepare a final report summarizing methodology, findings, conclusions, and recommendations; and
- Make presentations to SDDOT's Research Review Board and Executive Team.

Caltrans used focus groups to help establish questions for its survey in April 2001. Focus groups helped establish the questions to be asked during a large-sample telephone survey. The focus groups were asked to evaluate several aspects of transportation in California according to a scale of 1 to 5, with 5 being the top grade. The evaluation considered the following points: appearance, comfort, affordability, safety, speed, and easy connections.

Surveys can be structured to give a maximum of information. A concern raised by focus groups during the process of setting up a Caltrans survey was that survey questions should be, so far as possible, open-ended and not simple "yes-no" questions. Caltrans responded with an "unaided" awareness and perceptions study. Questions were framed to avoid prompting specific responses, accepting what respondents said, and noting comments carefully on survey forms. A second portion of the survey form investigated respondents' priorities for spending transportation funds. Questions included thought-provoking issues, such as "Would it be better to improve highways or improve how people drive on the highway?" and "When road construction is being done, would it be better to close the road for one week or do the construction at night and on weekends for 10 weeks?" A third portion of the survey asked for ratings of specific Caltrans attributes or principles—such as communications with the public, quality of service, and innovations—and of highway and transit system performance.

To derive the maximum of information from a hard-to-contact group, a 1997 NYSDOT survey of long-distance truck drivers consisted of interviews with truck drivers at private truck stops, public rest areas, and roadside commercial vehicle safety inspection sites in New York State. Respondents to the survey were screened to ensure responses from experienced drivers; each had driven a tractor-trailer for at least 6 months, made overnight trips, and drove at least 50,000 miles per year for work. Truck stops, rest areas, and inspection stations appeared as the most likely locations for contacting drivers and conducting interviews. Drivers were approached randomly at these locations, and, to encourage participation, drivers were offered a $5 voucher to purchase food or a beverage.

Surveys can be used to establish a database for input to models. In the SR 91 corridor in southern California, researchers

used surveys to examine the values that drivers place on predictability and travel-time savings on congested highways. The results were analyzed as part of *NCHRP Report 431: Valuation of Travel-Time Savings and Predictability in Congested Conditions for Highway User-Cost Estimation.* A two-step survey process was developed and conducted. The first step was a general survey sent out randomly to 2,500 residents along the SR 91 corridor—200 to test the survey, and then 2,300 as the main survey. Residents were given an incentive of participation in a lottery for $400 on return of the forms. Follow-up consisted of reminder postcards, personalized cover letters, and, if necessary, duplicate survey forms. A second survey was then sent to respondents, using the same follow-up techniques. This survey asked for choices among situations in which respondents trade off total travel time, the fraction of travel time in congested conditions, and trip costs. Other questions asked for choices among situations with different travel times, costs, and degrees of travel-time predictability (hypothetical arrival times that might occur on different days). Survey results provided input to separate models for calculating the effect of congestion on the values of travel time and travel-time predictability.

Surveys may result in disparate findings about customer perceptions. At the same time that a large survey of customer preferences in regard to the proposed E-ZPass program was being undertaken, the New York State Thruway Authority (NYSTA) conducted four focus groups near major bridges in New York State. The focus groups differed significantly from the findings of the larger survey. Reacting to simple questions about the proposed system as described, focus group participants were dubious about the system's cost, reliability, and procedures. Specifically, consumers were concerned that the system would cost more and would not save time, the scanning process would not be reliable, prepayments would not be processed in a timely manner, people would misuse the system, tags would be stolen, discounted tolls are more important than a complicated technological change, and commutation ticket discounts could be lost with the new system. The perceived benefit of the system was that it might save NYSTA money by reducing the number of people collecting tolls, although NYSTA would not pass savings on to users.

The needs of agencies may result in the use of different forms of surveys for different customer segments. Florida DOT looked for customer opinions on the ways issues were being addressed by its districts. These issues included night visibility of pavement markings, timeliness of completing construction, access to businesses during construction, and—from local government officials—the ability to have input on design plans. Randomly selected residents, tourists, commercial drivers, and older residents were interviewed by telephone and mail surveys. Residents were identified using a database that uses random digit dialing methods for choosing participants within the counties in FDOT's seven districts. Commercial drivers were identified from a list of individuals with valid commercial driver's licenses from the

Department of Highway Safety and Motor Vehicles. FDOT hired Visit Florida to administer a survey of visitors to the state. FDOT developed a survey for older residents or "well-elders" (e.g., still able to drive or use transit) that was chosen from the state's Elder Affairs mailing list of 75,000 addresses for survey mail-out. All local government officials were surveyed on FDOT services in their counties. They included individuals such as mayors and city managers; state legislators; county commission chairs and administrators; MPO chairs and staff directors; and directors of school bus, fire rescue, police, sheriff, and emergency medical service units. Few issues were found in the tourist segment, which ranked FDOT services higher than residents did. Because FDOT districts vary widely in terms of facilities and services, districts are being asked to pick the highest rated issues in their areas to focus on through improvement plans.

The findings of the Florida survey were reported by customer segment: Florida residents, elders, commercial drivers, and visitors. The single largest problem identified in the survey appears to be the visibility of roadway striping and markings at night.

OBTAINING CUSTOMER INPUT AND FEEDBACK

It is noteworthy that the terms "input" and "feedback" are used somewhat interchangeably by many transportation agencies. For purposes of this report, the terms pose more of a timing issue—when the customers' views are sought and used—rather than a question of how customers' views are gathered and transformed into information for use by the agency.

Customer input is customarily sought as an agency project, program, or service is being planned or programmed for implementation. It is usually expressed in statements of

- *Customers' wants to meet their travel needs,*
- *Customers' expectations for improvement or visions for the future,*
- *Suggestions for the work underway,*
- *Suggestions for other new or modified products and services, and*
- *Opinions of relative worth of current transportation products and services.*

In the San Francisco Bay area, the Metropolitan Transportation Commission (MTC) (the regional MPO) conducted workshops in 2001, supplemented by a web survey based on the workshop questions. To round out its outreach, MTC conducted a telephone opinion poll in April and May 2001 to determine opinions about issue importance and priorities for dealing with transportation system improvements. Customer surveys taken in early 2001 by MTC focused on questions

about the relative importance of transportation in relation to other issues, such as education and energy delivery. It continued with questions about relative priorities (high, medium, and low) on

- Widening freeways,
- Expanding local bus services,
- Expanding rail and BART services,
- Adding carpool lanes,
- Expanding commuter express bus services,
- Adding bicycle lanes,
- Expanding ferry service,
- Synchronizing traffic signals,
- Increasing tow truck service,
- Expanding traveler information,
- Expanding ramp metering,
- Implementing a single-ticket or fare card for transit systems, and
- Maintaining streets and filling potholes.

The survey included questions about preferences on methods for payment for needed improvements: increases in sales taxes, gas tax, bridge tolls, property taxes, vehicle registration, transit fares, and bond authorizations. The survey continued by asking opinions about Bay Area quality of life, transportation issues, managing commercial truck deliveries, improving public transportation, bicycle travel, and respondents' demographic profiles.

Utah Department of Transportation (UDOT) collected customers' opinions to assist in developing a specific public policy by commissioning a survey concerning billboards in Salt Lake County. The survey included 400 residential drivers and 37 billboard advertisers. Questions were asked about general attitudes toward billboards and specifically about billboards along the recently reconstructed I–15 highway that would have to be raised to a more visible level if they were to remain beside the highway. When asked if the billboards should be removed, 56 percent of those surveyed said "yes"; when confronted with the issue of potential loss of federal highway funds if the billboards were raised, 80 percent said "yes" to the same question. Significantly, the billboard advertisers agree, by 73 percent, that the billboards should be removed if the state were to lose some of its federal highway funds.

Envision Utah used a variety of media to obtain information about customer wants in regional planning and development, first distributing 363,500 questionnaires about issues concerning the Wasatch Front area centering on Salt Lake City. Using four potential growth scenarios explained in a full-page newspaper ad and on a website, Envision Utah asked for transportation choices. Responses, including 5,075 by mail and 970 via the website, led to specific conclusions about growth management in Utah:

- 20 percent of respondents agreed that transportation was one of the first or second "worst things about Utah";

- 61 percent supported gasoline tax revenue funding of public transportation;
- 81 percent supported bikeways and trailways for recreation, and 40 percent supported them for access to work; and
- Overall, highest funding priorities on a scale of 1 (highest) to 5 (lowest) showed a rank of 2.7 for highways and 2.9 for public transportation.

Based on its exploratory work, Envision Utah has established growth planning principles to guide development in the region. As communities work with these principles, Envision Utah, in partnership with the governor's office, gives an annual set of awards for exemplary development projects and creative communities for the best achievements in

- Planning vision;
- Development of a regionwide transportation center;
- Large- and small-scale infill and reuse development;
- Planning for transit-oriented development;
- Preservation of critical lands and trails for recreation and commuting; and
- Pedestrian-friendly, walkable development.

Input can also be used in formulating a survey. For its most recent statewide survey process, Caltrans worked with focus groups to establish the questions to be asked. The focus group evaluation considered transportation facility appearance, comfort, affordability, safety, speed, and easy connections. The follow-up step was a telephone survey of people randomly selected on a geographic basis and stratified by mode of travel, with subcategories of mode use, type of traveling (work, school, or pleasure), professional drivers, and agricultural drivers. The survey focused on awareness questions about Caltrans's responsibilities, its performance levels, what it does well or not well, and what it should do in the future—all without prompting specific responses but accepting what the respondent said and noting it carefully on the survey form. The survey also investigated respondents' priorities on spending transportation funds and asked for ratings of specific Caltrans attributes or principles—such as communications with the public, quality of service, and innovations—and of highway and transit system performance. The results of the survey led to identification of four tentative policy directions:

- Celebrate what Caltrans does well (60 percent of respondents have a favorable opinion of Caltrans),
- Focus on unexpected delays in both highway and transit travel,
- Improve public perception of ongoing road construction and repairs, and
- Provide improved choices in public transportation.

Outside surveys can give input to the process of providing transportation facilities and services. The Gastonia, North

Carolina, *Gazette*, in undertaking a citizen survey in its community, discovered that participants wanted no toll roads. In the survey, citizens reported that they wanted less congestion and generally supported widening highways or building connector roads to interstate highways. When asked if they would vote for bonds to pay for improvements and if they were in favor of adding toll roads, 68 percent were decidedly against toll roads, even if it meant that the construction process could be speeded up.

> ***Feedback usually comes as a reaction to the completion of an agency project, program, or service.*** *It is usually expressed in the following ways:*
>
> • *Customer reactions to improvements and their use of them;*
> • *Customer evaluations of services or programs;*
> • *Customer opinions regarding the satisfaction levels that the improvement may have brought to them;*
> • *Customer complaints or suggestions;*
> • *Customer comments or statements in surveys; and*
> • *Unmet needs that the agency has not yet addressed.*

Feedback can work hand in hand with other findings by agencies and lead to additional planning and actions for implementation. For example, the Bay Area Rapid Transit District (BART) in San Francisco conducts periodic customer satisfaction surveys to gauge how well it meets the needs of its riders. The surveys provide information on 43 service characteristics, ranging from on-time performance to station cleanliness. BART uses these specific service characteristic ratings to help set priorities for new initiatives. In the 1998 survey of more than 5,000 customers selected at random aboard trains, 74 percent said they were satisfied with the services provided by BART, and another 13 percent were neutral. These results spanned all demographic groups, including customers of all ages, ethnicities, income levels, genders, and disability statuses. However, declines were present in the "very satisfied" category and in customers' perceptions of whether BART constituted good value for the money. Results also serve as an early warning system regarding important customer service issues, including

- Out-of-service escalators and elevators,
- Problems with ticket vending machines and fare gates,
- Train cleanliness and appearance,
- Availability and responsiveness of personnel, and
- On-time performance of trains.

Detailed information on the survey results was made widely available to the public, including posting on the BART website.

In contrast to the direct use of customer surveys, British Airways has established a marketplace performance unit as a surrogate for its customers, using customer representatives assessing the airline's performance.

Customer feedback information can also be used to identify and determine how user needs, expectations and perceptions may be changing over time. A timeline of opinions over several years can illustrate how customer attitudes and expectations toward transportation services have altered over those years. One example of time-line exploration of customer attitudes and expectations is found in the large-sample surveys conducted by the New York Metropolitan Transportation Authority before, during, and after the institution of the E-ZPass electronic toll collection system in the New York City metropolitan area. Maryland Department of Transportation (MDOT) tracks changes in key issues that are identified through its customer surveys conducted every 2 years.

Tracking customer viewpoints over time, the South Dakota Department of Transportation (SDDOT) initiated a time-based series of interviews when it revisited its 1997 statewide survey in 1999. SDDOT proposed to review the public's perception of its response to issues raised in the earlier survey, and whether perceptions differed significantly over the intervening 2 years. The survey discovered that most residents were satisfied with SDDOT performance, as they had been in the earlier survey. Respondents once more agreed that maintaining the highway surface was SDDOT's most important function. Residents were more satisfied with snow and ice removal than with general maintenance of state roadways. However, most respondents agreed that SDDOT could provide more information about future highway projects, with mass media such as radio, newspapers, and television as preferred sources of information. Two-thirds of respondents felt that highway work sites were encountered regularly, with no visible signs of work being done. Participants from two urban regions felt that the agency was not fair in its funding priorities. Although increased highway work was started, it did not cause additional problems for residents, but only half of the respondents thought that the level of highway construction had been increased.

The Kentucky Transportation Cabinet tracks customer opinions by distributing comment cards to customers for feedback and evaluation at rest areas and truck stops on interstate highways. The comment cards allow respondents to comment directly on the positive and negative features of Kentucky's roadway facilities and to compare Kentucky with other states. Approximately 4,000 to 5,000 cards are received each month. Cards are collected at rest areas or by postage-prepaid mail. Requests for improvements or new services are transmitted to staff members within the cabinet offices. Comment card responses have led the Kentucky Transportation Cabinet to distribute free maps by machine to travelers and to report directly on the quality of rest areas and the condition of roadways. Comment cards also assist the cabinet and its partner, the Department of the Blind, in vending issues at roadside stops.

Feedback can also provide a transportation agency with detailed customer needs information from operational tests. In the fall of 2000, Minnesota Department of Transportation (MnDOT) conducted a test of the effectiveness of freeway ramp metering in the Minneapolis/St. Paul region. The test involved turning off ramp meters for several months, then assessing several indicators, including whether the benefits of metering outweigh the impacts and associated costs and public attitudes toward metering.

Measurements of ramp metering impacts took place in September and October with ramp meters working, and then in the remainder of the fall without ramp meters in effect. Evaluation measures included traffic volumes and throughput, travel time, reliability, safety, emissions, fuel consumption, and benefit-cost analysis. All categories except fuel consumption were improved by activation of ramp meters. (Fuel consumption is greater when vehicles wait on ramps to enter freeways.)

To test public attitudes, MnDOT conducted traveler surveys and focus groups to elicit perceptions of ramp meter operations and the impact of shutting down ramp meters on travel patterns. Surveys included a random sample of area travelers, with four corridor-specific samples related to other data gathering efforts. Samples were split equally between experiences "with meters" and "without meters." Although the results of the surveys and focus groups supported the general findings that benefits of ramp metering outweighed impacts and costs, customers were not completely happy with the ramps. Customer preferences included specific changes that users would like to see, and, based on these expressed customer preferences, these changes were made:

- Reducing the operating time frame of ramp meters;
- Allowing meters to change more quickly from red to green; and
- Keeping several meters at flashing yellow.

In addition, the study recommended that MnDOT develop a policy for (1) optimizing ramp meter operation, monitoring ramp wait times, freeway travel time and its reliability, and crashes, as well as (2) undertaking market research to identify changing traveler perceptions. More generally, the study recommended that MnDOT respond to the public's need for information on traffic management strategies.

RANDOM SAMPLING OF CUSTOMERS

Nearly all of the sample surveys undertaken by state transportation agencies and MPOs were based on random selection of customers. For example, in Colorado, a survey of Denver area transportation needs was conducted in May and June 2001, using telephone interviews with 800 randomly selected area residents who are active voters. The Alaska Department of Transportation and Facilities' survey was completed by telephone interviews based on random selection of telephone subscribers listed in the most current directory for each community. The Washington State Department of Transportation (WSDOT) Ombudsman's Office contacted a random sample of 150 customers based on the way it receives citizen inquiries: by letter; by electronic mail (e-mail); and by telephone calls.

The purpose of random selection of respondents is to ensure validity and representative results of the survey. In general, the results of random selection are useful to agencies because they may be used to demonstrate opinions and reactions of the entire population served by the agency. Without random selection of respondents, surveys seldom have the validity they need to withstand questions of how well they represent the population. An example of what happened when a survey was not administered in a random way follows.

As part of its cooperative planning agreement with a state DOT, an MPO gathered public input about transportation needs, using a survey of a broad range of subjects from a diverse group of citizens. As a basis for distributing the survey, the MPO decided against a random mail-out survey. According to website information, "It was believed that the results of a random mail-out survey would be biased in favor of the retirees who traditionally take the time to fill out mailed surveys." MPO members decided to distribute the survey selectively, with a goal of 50 surveys returned per county. Surveys were distributed at various public events and through MPO members' own contacts. Survey forms were distributed to attendees at airport public meetings, to public school bus drivers, county commissioners and courthouse employees, community health assessment teams, construction company employees, and history museum employees and volunteers. Nearly half of the survey forms were distributed by MPO members or volunteers. Results were disappointing. The goal of distributing surveys in MPO counties was not reached in all of the counties. There was substantial participation from persons who lived outside the 10 counties, although the survey form indicated that it was intended only for residents of the MPO area, with the MPO counties listed at the top of the form.

A graphic summary of the variety of techniques in use in surveying customers is portrayed in Table 2. This table has been devised to illustrate the widespread use of random and nonrandom sampling in examples found during this research.

SUMMARY

Techniques for researching customer needs vary with the need for the research. Both objective and subjective research have roles to play. Customer needs can be gleaned through establishment of an overall process for agency investigation and analysis. Customer responses can come in the form of input to efforts of agencies or feedback from actions that agencies have taken.

TABLE 2   Techniques used to survey customer needs—randomly selected customers

Agency/Service	Date	Survey Title	Randomly Sampled Participants
Alaska DTF	1998	Customer Satisfaction Survey	Random sample of state residents
Arkansas SHTD	1997	Statewide Customer Survey	Random sample from 16 geographic areas, self-selected by meeting attendance
Arizona DOT	2001	Feedback About Service	Web responses from self-selected AZ residents
Arizona Transp. Quality Initiative	2000	Survey of Highway Users	Random sample of AZ residents, 18+ years
California DOT (Caltrans)	2001	Caltrans Customer Survey	Random sample of residents from throughout the state
Cities of Portland and Gresham, OR	2000	Citizen Survey	Random sample of addresses from both cities
City of Ames, IA	2000	Transportation Master Plan Survey	Random sample of city residents chosen from utility bill list
City of Boulder Transp. Division	1999	The Boulder Resident Transportation Survey	Random sample of city households
City of Calgary, ALB	2000	Customer Satisfaction Survey	Random sample of city residents
City of Minneapolis, MN	2000	Open Discussion of City Issues	Random sample of local residents using e-mail
City of Phoenix, AZ	Biennial	City Survey	Random sample of city residents
Florida DOT	1998	Sterling Quality Challenge	Random sample of state residents
Gastonia, NC, *Gazette*	2000	The Gaston Issues Survey	Random sample of city residents
Kentucky Transportation Cabinet	1996	Interstate Rest Area Visitor Survey	Self-selected visitors to interstate rest areas (cards made available by state)
Maryland SHA	Biennial	Customer Satisfaction Survey	Random sample of licensed drivers
Pennsylvania DOT	2001	Customer Satisfaction Survey	Random sample of 1,000 drivers from each of 67 counties
Port Auth of NY & NJ	1998	Airport User Survey	Random sample of airport users
San Francisco MTC	1997	Customer Survey	Random sample of regional voters
South Dakota DOT	2000	SDDOT's 2000 Statewide Customer Survey	Random sample of citizens and all current legislators
St. Louis E-W Gateway	2000	St. Louis Public Survey	Random sample of participants at community hearings
Texas DOT	2000	External Customer Satisfaction	Random sample of magazine subscribers, info center visitors, permit holders, materials suppliers
Utah DOT	2000	Envision Utah	Random sample of state residents
Utah DOT	1999	Survey on Billboards in Salt Lake City	Random sample of resident drivers
Utah DOT	2001	511 Services Survey	Random sample of state residents
Washington State DOT	1998	Customer Satisfaction Survey	Random sample of city residents from past contacts by mail, e-mail, phone

CHAPTER 4

APPLYING CUSTOMER NEEDS TO DECISION MAKING

A review of current efforts to identify and use information about customer needs reveals a rich experience from transportation agencies located in all parts of the country. Agencies have undertaken research of all kinds to gain insights into what customers truly need in transportation services. Much of the research is objective in nature—concerning the observed behavior of customers. Of considerable interest are the forms of research that attempt to study need by asking customers questions and attempting to tabulate and deal with their subjective responses. Where agencies actually talk with customers may provide the best and most interesting leads into the future of an agency's products and services.

Examples of what has been derived from direct customer contact have governed the structure of this chapter.

SOLICITING CUSTOMER VIEWS AND OPINIONS

Obtaining Input on Programs or Services

For an agency to fully understand its customers, it must hear the customers' comments and suggestions. Customer views and opinions may come from a wide range of sources, and the agency may choose which are most likely to produce useful results. Input from customers can come as agencies seek out potential customers for new products or services. One of the best-known surveys of potential customers was undertaken in 1993 by five transportation agencies anticipating the introduction of E-ZPass in New York and New Jersey. The study, administered to more than 3,300 commuters, included a videotape mailed out to each participant before the survey to explain the complexities of the proposed system. Following up the video explanation of the system, the survey found that potential customers preferred dedicated E-ZPass lanes, payment through the mail by check, large discounts on tolls, low deposits and annual fees, transferability of the tag to other vehicles owned by the commuter, one account that covers tolls for travel on any facility accepting E-ZPass, and the ability to use E-ZPass for parking charges.

Details of expectations for proposed service delivery can also be investigated through surveys. UDOT commissioned a market research company to survey Salt Lake City commuters and pleasure drivers. The principal objective of the

research was to identify barriers to travel in Utah and determine whether the proposed 511 telephone service would mitigate those barriers. Focus groups cited inaccurate or out-of-date information from traffic reports and electronic signs, unexpected road closures, and too much information on electronic signs that are difficult to read. The groups wanted accurate, real-time information from 511 services on traffic delays, closures, construction, weather-related delays, and accidents. They also wanted delay time in minutes and suggestions for alternate routes during congested periods.

Surveys have been used to find out what customers think of road maintenance activities. The Montana DOT (MDT) surveyed randomly selected residents to obtain perceptions about the maintenance of highways in 2000 and to compare the results with the 1998 survey results. Respondents were asked to rank each of eight maintenance activities in terms of current adequacy, importance over time, and allocation of MDT resources. Comparisons with the 1998 survey indicated some slight changes to the relative priorities that respondents placed on each maintenance activity. Comparisons were also made between opinions and demographic/travel variables.

Transportation operations were also evaluated by UDOT customers. After preparing its own evaluation of priorities for road improvements, UDOT decided to test its internal preferences with what customers would like to see. Hypothetical questions were posed to customers to aid in prioritizing scarce public funding. Respondents were asked, "How would you spend $100 on transportation needs?" Options for responses included snowplowing, litter cleanup, fencing, bridge repairs, asphalt and concrete repair, vegetation control, painting, sweeping and sign repair, and rest areas. As the top categories for improvement, the survey population preferred painting/sweeping/sign repair and rest areas. A more durable paint specification is now being developed. The information about priorities is passed on from UDOT to decentralized administrative district offices throughout the state.

Customers' expectations of agency service performance can also be investigated through survey techniques. SDDOT conducted a statewide customer survey of public expectations for service, along with perceptions of its delivery of services. Research was undertaken to determine whether needs for the department's key products and services are being acceptably met and to identify opportunities for cost-effective improvements to the DOT's operations. Results showed awareness

that SDDOT checks on and maintains roads and bridges, handles snow removal and winter maintenance, makes sure highway signs are readable, and repairs highways and bridges. Expectations were identified through asking participants to prioritize SDDOT services: maintenance of highways was by far the preferred option. Over half the respondents stated they would support a permanent increase in the gasoline tax in order to maintain highways and bridges, and that two-thirds of the budget should be spent on repairing and maintaining existing highways as opposed to building new highways.

Customer segment interviews in Florida revealed issues that are now being addressed by FDOT districts. These issues include night visibility of pavement markings, timeliness of completing construction, access to businesses during construction, and, from local government officials, the ability to have input on design plans. Few issues were found in the tourist segment, which ranks FDOT services higher than residents do. Because FDOT districts vary widely in terms of facilities and services, districts are being asked to pick at least three of these areas to focus on and to implement improvement plans designed to address the issues. Findings of the Florida survey were reported by customer segment: Florida residents, elders, commercial drivers, and visitors. The single largest problem identified in the survey appears to be the visibility of roadway striping and markings at night.

Obtaining Input on Policy and Planning

Soliciting input on policy development may involve very detailed questioning about choices. UDOT commissioned a survey concerning billboards in Salt Lake County. Questions were asked about general attitudes toward billboards and specifically about billboards along the recently reconstructed I–15 highway. A majority of respondents agreed that the billboards should be removed, but a far larger majority agreed they should be removed rather than losing federal highway funds. Billboard advertisers, interviewed separately, agreed that the billboards should be removed if the state were to lose some of its federal highway funds.

The Maryland Mass Transit Administration (MTA) interviewed its stakeholders—those who work for the MTA and those who benefit from its services—to determine vested interests in the agency's future strategic direction. Prior to drafting the strategic plan, MTA conducted interviews with more than 150 external and 50 internal stakeholders to determine its key strengths, weaknesses, opportunities, and threats. Stakeholder perceptions, as the basis for the strategic plan, were further tested in 30 town meetings held throughout the organization. Meetings were held with external stakeholders and three citizen advisory committees. The significant findings of these meetings addressed the need to

- Improve communications,
- Strengthen working relationships,

- Invest in additional employee training,
- Improve service scheduling,
- Ensure safety and security, and
- Develop accountability measures.

Soliciting customer input on policy and planning can also help agencies in ranking issues and their importance. Measuring customers' preferences is a time-honored technique that remains a valid method for transportation agencies to consider. Citizen preferences for various transportation and funding options were measured by the Colorado Department of Transportation (CDOT), working with the Transit Alliance and the regional transit district. A telephone survey of the transportation needs in the Denver metro area asked respondents to rank items of needed transportation spending and which transportation improvements were "essential," "very important," or "somewhat important."

Survey participants ranked transportation issues according to their views of relative importance by the Southwest Missouri Advisory Council of Governments, an MPO working with Missouri DOT. Safety and maintenance items were at the top of the rankings, involving four of the five top issues. These issues included safety improvements at high-accident locations, repairing and replacing narrow bridges, maintaining existing roads, shoulder improvement on roads, and adding lanes to major highways. Other responses in the top 10 ranks supported the safety theme: improving road striping, widening lanes, and regulating signs and billboards.

Customer input in determining future directions in transportation planning can also be accomplished by survey. In the Salt Lake City metropolitan area, Envision Utah surveyed customer attitudes toward four potential growth scenarios explained in a full-page newspaper ad and on a website. A majority of respondents supported gasoline tax revenue funding of public transportation and the use of bikeways and trailways for recreation. Overall, highest funding priorities on a scale of 1 (highest) to 5 (lowest) showed a rank of 2.7 for highways and 2.9 for public transportation. Based on survey analysis, Envision Utah has established growth planning principles to guide development in the region. As communities work with these principles, Envision Utah, in partnership with the governor's office, gives an annual set of awards for exemplary development projects and creative communities.

Obtaining Input on Program Development

Customers can help in determining future directions in agency performance goals. The Missouri DOT (MoDOT) conducted a constituent service quality survey of satisfaction and future attention for 41 performance areas of MoDOT work. The survey included sources of information about transportation used by respondents, and the nature and extent of contact with MoDOT personnel. The telephone survey found general satisfaction with MoDOT performance but a desire

for greater attention to all performance areas, such as maintenance and preservation of bridges and existing roads (particularly pavement surfaces), use and distribution of funds, timeliness and speed of project planning, and multimodal options. Some differences between customer segments were found through geographic and demographic cross-references.

Rankings by customers in the San Francisco Bay Area MPO followed workshops and a web survey based on workshop proceedings. A telephone poll asked for opinions about issue importance and priorities for dealing with transportation system improvements. The survey asked for rankings of transportation and other issues, such as education and energy delivery. It continued with questions about relative priorities of potential transportation improvements to all modes, via projects or upgraded service and preferred methods for payment for needed improvements. The survey concluded with questions on respondents' demographic profiles.

The city of Ames, Iowa, used its customers' ranking in a survey for input to its transportation master plan. After noting travel habits by mode and frequency of use, participants rated the traffic flow in major traffic corridors from very poor to very good and evaluated the adequacy of public transportation by route. Participants were then asked to choose, from an attached list, which new facilities were needed and to rank all potential improvements costing more than $1,000,000 each. The results were used in preparation of the city's transportation master plan to guide investments over the next 20 years.

USING ANALYSIS OF CUSTOMER NEEDS

Building on Customer Feedback

Customer feedback can be obtained from multiple sources. For example, the Arkansas State Highway and Transportation Department (ASHTD) held a transportation summit in 1998, building on the wide range of ideas and suggestions from the public gleaned from a series of regional meetings. Comments from the audience at the regional meetings were accepted in both oral and written forms. From this input, data indicated that 86 percent of attendees were not satisfied with existing progress, and 85 percent would support a new program. Suggested means of paying for the new program indicated a range of opinion about which sources would be supported. Similar surveys were conducted at the Arkansas Motor Carriers Association, the state chambers of commerce, and other sources, such as letters and Internet comments. In the later step of the process, ASHTD invited the leadership of agencies and organizations with a major interest in transportation to a summit meeting. Assigned to investigate issues via focus groups, the meeting reached consensus on the need for additional funding to meet the needs of the highway system via a relatively short-term (4 to 6 years) program accompanied by a long-range plan to be updated periodically. Combinations of revenue sources were recommended, including increases to motor fuel taxes, additional fees on heavy trucks,

tolls where possible, and bonds to accelerate specific projects. As a result of the summit, ASHTD implemented a public education campaign to explain progress and how commitments are being met and to provide information on the need for additional funding and the program it would support.

Testing the effectiveness of a new program is based on soliciting customer feedback. In 2000, New Jersey Department of Transportation (NJDOT) surveyed residents for feedback on the state's new motor vehicle registration system, which allows renewals on-line or by phone. New Jersey began the AccessDMV program on a pilot basis, instituting service to the general public in April 2000. During the preliminary and pilot months, more than 14,000 people renewed their vehicle registrations over the Internet or by phone. With 8,000 users surveyed on-line after completing their transaction with the DMV, 99 percent gave the system a favorable rating.

Agencies can simply ask customers for feedback on what should be improved. FDOT conducted a survey to ask residents, commercial drivers, local government officials, and visitors for opinions on what it could do better in providing transportation products and services. With responses from more than 5,000 individuals, FDOT found specific areas that required attention:

- Visibility of roadway striping and markings at night,
- Timeliness of completing construction projects,
- Traffic congestion, and
- Pursuit of local government input on construction project priorities and design.

Actions on the striping visibility question and local government input have already been taken by FDOT.

An agency can take a lead on prioritizing specific actions and getting feedback from customers. The Port Authority of New York and New Jersey conducted a survey of 2000 riders of the Trans-Hudson rail service to determine rider satisfaction with service and to pinpoint areas for change. Over 68 percent of respondents rated the agency's overall service as excellent or above average. Respondents agreed on areas targeted for improvement, such as on-time performance. Results also showed that the agency needed especially to work on the reliability and sound quality of public address equipment as well as the timeliness and helpfulness of train announcements, especially during delays and other service disruptions. Customer feedback can be useful in evaluating, over time, the progressive improvement of new services. In 1997 and again in 1998, MTA Bridges and Tunnels in New York City surveyed its customers to determine satisfaction levels with operations at its 10 toll facilities. The survey was administered randomly by mail to 27,000 E-ZPass subscribers, and by handout to 40,000 cash customers at each facility. Survey findings showed that customer satisfaction rose between the two surveys and that E-ZPass customers were more satisfied with service than cash customers were. Recommendations

based on the survey included targeting high-use cash customers to increase E-ZPass membership, improving E-ZPass operations through more E-ZPass toll lanes, and better marking of E-ZPass lanes. Results for individual facilities varied, but included general satisfaction with appearance, cleanliness, and lighting and dissatisfaction with efficiency and safety.

Responding to customer feedback can become a major staff effort. NJDOT has established a Customer Advocacy Office to respond directly to customers who call, e-mail, or fax the agency for information. The NJDOT policy goal is that all customer contacts will receive a same-day response to all questions. Approximately 20,000 outgoing letters each month address consumer concerns, and NJDOT keeps a running record of the name and phone number of the individual contact. For answers that cannot be provided by the Customer Advocacy Office, comments and queries are forwarded to appropriate DOT offices or to outside organizations such as E-ZPass and Motor Vehicle Services. For project inquiries, a toll-free telephone number is also published. Mail and other contacts are tabulated to compare or to group with other similar comments. To manage a volume of some 4,000 to 5,000 e-mails and 1,000 to 2,000 telephone calls each month, the office is staffed by 30 people.

In 2000, the Bureau of Aeronautics of Michigan Department of Transportation (MDOT) conducted a follow-up to its 1998 air passenger survey to determine customers' views of local air service and airport facilities. Random personal interviews of 779 air passengers scheduled to use 17 state air carrier airports outside Detroit were conducted in a 2-week period. One of the key findings was that 65 percent of those surveyed reported using their local airport, and convenience was cited most frequently as the reason for other airports. As a result of the survey, MDOT launched initiatives to improve and strengthen local air service. MDOT is working with airline, airport, and other agencies to address problems regarding higher fares, reliability, and on-time performance. In Washington, the state is working on legislation affecting the competitiveness of smaller airports. A follow-up survey in 2002 will be conducted to compare to 1998 and 2000 results.

Evaluating Temporary Experiments and Tests of Equipment

A composite of subjective and objective evaluations can guide an agency toward further actions. For example, in the fall of 2000, MnDOT conducted a test of the effectiveness of freeway ramp metering in the Minneapolis/St. Paul region. The test involved turning ramp meters off for several months, then assessing several indicators, including whether the benefits of metering outweigh the impacts and associated costs and public attitudes toward metering. The objective evaluation measures included traffic volumes and throughput, travel time, reliability, safety, emissions, fuel consumption, and benefit-cost analysis. All categories except fuel consumption were improved by activation of ramp meters. (Fuel consumption is greater when vehicles wait on ramps to enter freeways.) To test public attitudes, MnDOT conducted random samples of travelers in four freeway corridors, supplemented by focus groups, on the impact of shutting ramp meters down on travel patterns. Samples were split equally between experiences "with meters" and experiences "without meters." Although the results of the surveys and focus groups supported the general findings that benefits of ramp metering outweighed impacts and costs, customers were not completely happy with the ramps. Customer preferences included specific changes that users would like to see, and, based on these expressed customer preferences, the following changes were made:

- Reducing the operating time frame of ramp meters,
- Allowing meters to change more quickly from red to green, and
- Keeping several meters at flashing yellow.

In addition, the study recommended that MnDOT develop a policy for optimizing ramp meter operation, monitoring ramp wait times, optimizing freeway travel time and its reliability, reducing crashes, and undertaking market research to identify changing traveler perceptions.

Surveys can be used to identify problems and then to assess experimental improvements through customer feedback. The Metropolitan Transportation Authority of Los Angeles surveyed residents using bilingual (English and Spanish) questionnaires to identify problem areas that affect safety at grade crossings along the Metro Blue Line train tracks. Customers identified these problems:

- Lack of understanding that trains get to the intersection within 20 seconds after lights start flashing,
- Drivers' attempts to "beat the train" by driving around lowered crossing gates,
- Lack of understanding that two trains can go through an intersection at the same time, and
- Not enough barriers to keep pedestrians and children off the tracks.

Along the Blue Line, the Metropolitan Transportation Authority set up several test programs in response:

- Photo-enforcement was expanded to all crossings on the line because of the of 92-percent decrease in violations at three sites on the Blue Line.
- Wayside horns were installed at intersections to provide a final warning to motorists and pedestrians. The horns were evaluated by focus groups.
- Warning signs were evaluated by focus groups to evaluate words and graphics for signs and for evaluation of risky crossing behavior.
- New pedestrian gates were installed and evaluated by interview surveys with pedestrians.

The city of Ames, Iowa, investigated the concept of installing directional automatic horns at railroad crossings in preference to the train-mounted horns that caused considerably more noise impact on city residents. A survey of residents was conducted to determine the "before" and "after" effects of installing the directional horns. Of the respondents, 74 percent believed that the new horn installations helped in alerting people crossing the tracks, and 89 percent (primarily those within 500 feet of the rail crossing) said the new horns led to an improved quality of life. During the night, 80 percent found the noise disturbing or "very disturbing" prior to the installation, and only 6 percent found it a problem afterward. The overall impact was that 87 percent of residents believed that noise from train horns was a problem before the installation, and 13 percent believed noise to be a problem after installation.

Customer surveys can give feedback during experiments with new equipment. For example, the need for improved information from customers experiencing crashes on rural roads led MnDOT to explore a system to provide a direct voice and data link from a disabled vehicle to emergency dispatchers. The system combined cellular telephone technology with global positioning systems. Participants in an operational test were surveyed before and after the test. The participants included emergency dispatchers, American Automobile Association (AAA) dispatchers, rural metro dispatchers, scheduled test volunteers, and general public volunteers. Survey results showed that the Mayday concept was easy to operate and would provide a faster response from emergency service providers, as well as making traveling in rural Minnesota safer and easier.

Evaluating public comments can result in agency initiatives for improvement. The Massachusetts Registry of Motor Vehicles (RMV), frequently the brunt of complaints about waiting times, lack of professionalism, staff shortages, confusing directions, and more, listened to the recommendations of a legislative committee, the general public at public hearings run by the legislature, and thousands of customer comment cards. Then RMV implemented many of the suggestions in 2000. With a new registrar, the RMV was able to make dramatic improvements in customer service, particularly in the area of wait times. After 18 months, wait times were reduced from as long as an hour for most patrons to less than one-half hour for 95 percent of patrons. The registrar tackled customer satisfaction issues on a number of fronts:

- Management, including frontline staff;
- Branch facilities, with an emphasis on cleanliness and user-friendly design;
- Improving customer service by emphasizing expanding hours, service delivery, and staff directed to customer service;
- New "greeters" who answer questions and provide a triage service for customer needs;
- Better signage; and
- A more pleasant wait.

The registrar himself personally visited each of the 16 branches to talk with customers and employees about what they wanted to see changed. The responses were used in part to develop creative and effective ways to meet customer needs. Programs to shorten wait times included eliminating the need to return cancelled plates in person and expanding on-line registrations and other services, resulting in thousands of fewer people in line. Emphasis has been put on making the time spent in the registry pleasant and productive in one way or another. For example, the greeter's job involves going to the waiting customers and providing paperwork, pens, and clipboards and answering questions. The registry also provides diversions to pass waiting time, such as books for kids to read while waiting and electronic information boards with news and headlines. In addition to the issues tackled above, the registry dealt with somewhat more difficult issues, such as carelessness among employees or letters written in legalese or with a rude tone. Customer comment cards over a 2-month period after the institution of new services generated 1,667 responses and showed an average ranking (1–10 scale) of 7.5. The results were distributed to managers and posted in branches for the public.

COMMUNICATING WITH CUSTOMERS

Delivering Information Customers Want

Agencies can give customers reports on attempts to provide high-quality service and ask customers for feedback. FDOT developed a report card based on its process of measuring performance successes in its operations. FDOT provided a self-assessment of its work in terms of leadership, strategic planning, customer and market knowledge, information and analysis, human resource development and management, process management, and business results, including customer satisfaction and financial and market results. The media responded to the report card, especially when combined with asking people's opinions about the agency's self-evaluation efforts. The report card was also discussed through presentations to MPOs and other organizations. Results were presented on the FDOT website, along with methodology, district breakdowns, and comparisons among customer groups within each area. FDOT is working to show staff members the links between their jobs, the performance ratings of the agency, and what customers think.

Real-time information on arriving trains has been made available to customers on an experimental basis by the San Francisco Municipal Railway (Muni). Using global positioning system (GPS) receivers on each train, coupled with a tracking system, Muni is able to calculate when a vehicle will arrive at a particular stop. Muni then transmits arrival time predictions for each stop to the stop and to Muni's website, where users can discover when their train will arrive. Figure 4 shows an example of information delivery for a single stop on the rail system. Information for each train stop is provided
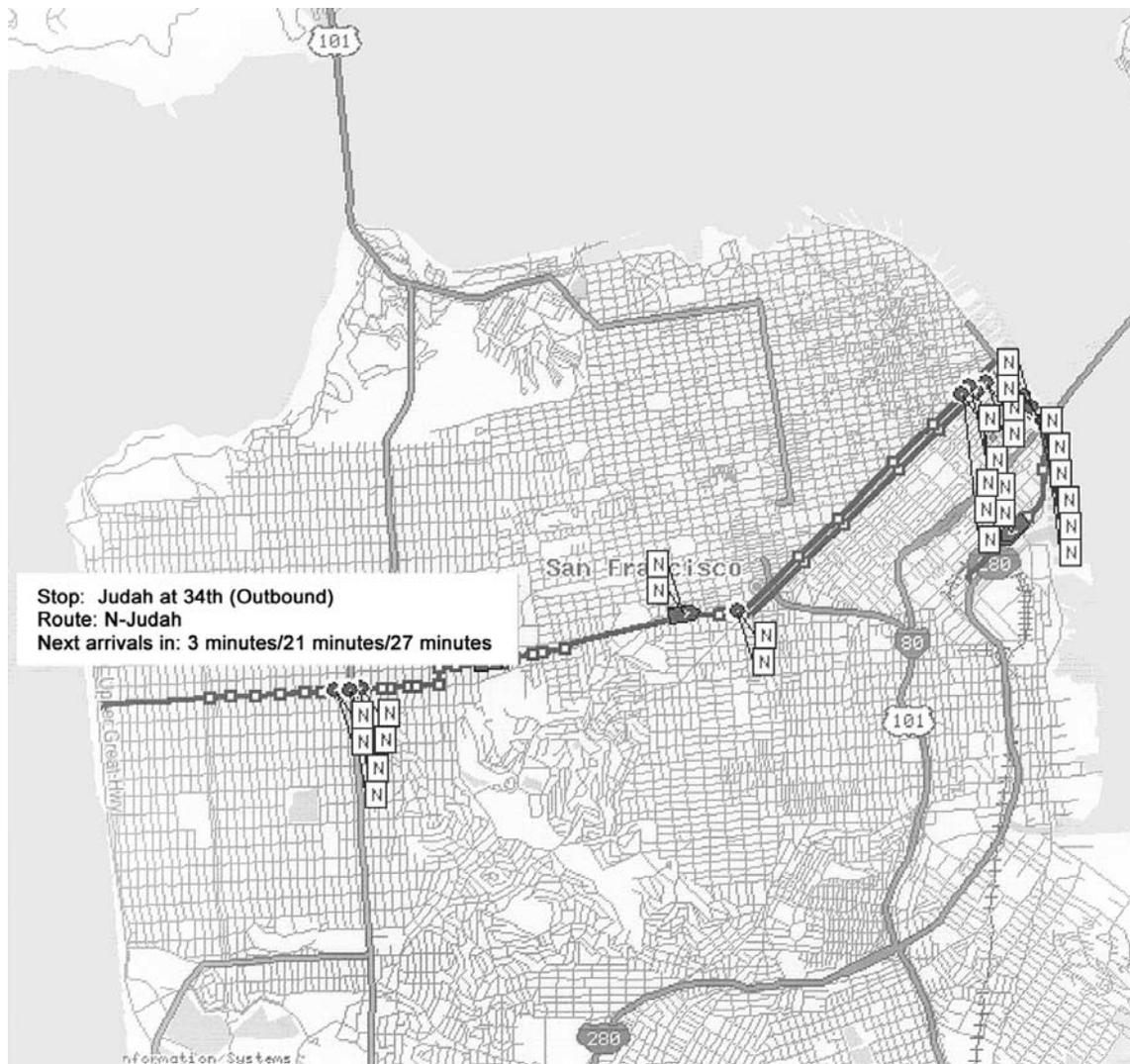
Figure 4.   Real-time information for customers—San Francisco Municipal Railway website.

for the next arriving train and for the two subsequent arrivals, as well. Use of real-time information helps Muni build trust among customers about system reliability and increase ridership. Muni managers are also able to sort out light rail vehicles that have become bunched together along their routes. If necessary, managers can contact the drivers and instruct them to turn around and proceed in the other direction. In case of emergency, the information can be transmitted to individual stops along the line, telling customers what has caused the problem and how long it will take to resolve it.

BART revised its website based on customer input. BART staff used customer feedback to initiate change. First, BART categorized thousands of e-mails it had received over the last few years. Server logs were examined to identify trends and the most frequently visited pages on the site. Proposals for change were presented to focus groups for additional feedback. Implementation of the changes resulted in an award in October 2001 by the American Public Transportation Asso-

ciation, which designated BART's website as the best public transit website in the country.

Agencies can test whether they are successfully delivering information to customers. Surveys can be used to see if customers are aware of an agency's programs and whether customers are registering their opinions through participatory actions. In Alaska, the Department of Transportation and Facilities conducted a customer survey to determine familiarity and public satisfaction with Alaska's transportation facilities, along with customer awareness and participation in planning efforts concerning those facilities. After respondents gave opinions regarding their satisfaction with these facilities, they were asked whether they were aware of various state transportation planning efforts and whether they had participated in any of the planning efforts. Only 15 percent of respondents were aware of the state's efforts to develop a new transportation plan; of those, only 16 percent had ever personally participated in preparation of this or other planning efforts.

In 1999, the New Hampshire Bureau of Rail and Transit hired a team of consultants to develop a marketing campaign to improve delivery of information, raise public awareness of transit in New Hampshire, establish a strong image for transit, and educate middle school kids about the benefits of public transportation. Following the model of private marketing campaigns, the agency's consultant researched customer awareness and needs through a combination of methods: a workshop with stakeholders and transit providers; surveys mailed to stakeholders; and focus groups with middle school students. Results showed the need for developing effective marketing materials and an effective statewide campaign to promote the image of transit. Both the workshop and the mail survey indicated that seniors and people with disabilities considered quality of service to be an issue. A more comprehensive survey was sent to 110 people at 64 agencies representing seniors and people with disabilities to assess transportation needs. Results of the survey were communicated directly to the providers and were incorporated into the marketing plan for New Hampshire Transit.

Information can be delivered after instituting high-profile safety projects. Following the institution of a program of photo-enforcement of red light violations, the city of San Francisco, California, issued a press release on results, noting that 10,000 traffic citations had been issued, that running of red lights had decreased by 40 percent, and that the number of collisions caused by red light running had decreased by nearly 10 percent citywide. Charlotte, North Carolina, established a website for detailed information on its photo-enforcement efforts, including the exact location of the cameras. In San Jose, California, neighborhood organizations can request signs noticing photo-enforcement of red light violations to be located on streets as warnings to motorists that the new speed enforcement program is in place. San Jose then reports on speed limit violations by neighborhood.

The delivery of information can be very detailed; customers can take what they want from agency reports that trumpet agency workloads and accomplishments. When provided on a regular basis, the information is impressive. Oregon Department of Transportation (ODOT) distributes to its customers, the Oregon taxpayers, a Quarterly Report to Stockholders. The report is made available on the ODOT website and distributed in newsletters. Routine quarterly reports include the following:

- The DMV Customer Service Recap—the volume of work the agency processed during the quarter (nearly 1 million external customer contacts);
- ODOT Motor Carrier Staff—contacts in trucks inspected, registered, or weighed (nearly three-quarters of a million customer contacts);
- ODOT maintenance crews—lane miles of highways striped, lengths of guardrail installed, etc.;
- ODOT construction projects—dollar value, number, payments to contractors;

- ODOT rail division—rail cars, locomotives, and miles of track inspected;
- Money savings—travel time saved by trucks in the weigh station pre-clearance program, recycling by employees;
- Public inquiries and assistance—calls and data provided; and
- Delay reduction—assistance to disabled vehicles, crash incidents, debris removed, and vehicles tagged or towed.

The delivery of information can be based on quick turnaround. In the Ministry of Transportation for Ontario, Canada, customer comment cards are received in one central location. Upon receipt, comments are entered into a customer feedback tracking system. Acknowledgement letters are generated within 2 days in English or French. E-mail notifications are sent to regional staff people for comment response and for complaint resolution. The agency is dedicated to resolving customer complaints within 15 days. Reports are produced on levels of satisfaction achieved by the office, with measures of length of wait time, prompt or efficient service, and staff courtesy and politeness. Reports also document turnaround time averages by region in handling customer comment cards. In Boulder, Colorado, the city council made specific, well-promoted service changes in public transportation and tested the altered public image of transit. The "GO Boulder" project, called "Hop, Skip and Jump," served the most popular destinations, improved the design and comfort of the buses (small, brightly colored shuttles), made service more direct and frequent (every 6 minutes), and created an unlimited-access pass (ECO Pass).

Evaluating Satisfaction

Many states solicit customer opinions on how well the state is doing. Satisfaction surveys are most useful if they lead beyond a ratification of what is already underway. Opinions are of the greatest use if they are sought to help the agency find its course or directions for further actions. Thus, a satisfaction survey that simply asks, "How are we doing?" without asking for any kind of guidance from customers is likely not to bring useful information to the sponsoring agency.

Agencies can conduct periodic customer satisfaction surveys to evaluate present performance and to help set priorities for new initiatives. Customer surveys by BART gauge how well BART meets the needs of its riders, using 43 service characteristics, ranging from on-time performance to station cleanliness. The 1998 survey of 5,000 customers selected at random aboard trains spanned all demographic groups—customers of all ages, ethnicities, income levels, genders, and disability statuses. Although 74 percent said they were satisfied with BART services, declines from prior surveys were present in the "very satisfied" category and in customers' perceptions of whether BART constituted good value for the money. Other results highlighted important customer service issues, including

- Out-of-service escalators and elevators;
- Problems with ticket vending machines and fare gates;
- Train cleanliness and appearance;
- Availability and responsiveness of personnel;.
- On-time performance of trains; and
- Public availability of detailed information on the survey results, including posting on the BART website.

The Michigan Department of Transportation (MDOT) 1998 customer survey sought priority rankings from Michigan residents contacted by telephone. The sample was adjusted to allow regional analysis, and the respondents were geographically grouped into the seven MDOT regions for analysis. Overall, respondents felt that the quality of state and local roads and the maintenance of road surfaces needed improvement and should be a priority for MDOT. In response to the customer survey, MDOT shifted its priorities and suspended construction of noise barriers on existing highways and is focusing on road and bridge repair instead.

To be truly useful to the agency, an evaluation or satisfaction survey should focus on potential improvements. For example, Washington State Department of Transportation (WSDOT) conducted a survey of customer satisfaction with a small but important internal department, its ombudsman's office, to ensure that people are being heard by decision-makers and that they receive thoughtful, appropriate, and timely responses. A random survey of the ombudsman's office was conducted of citizen inquiries from letters, e-mail, and telephone calls. Based on the survey, the office learned that people did not fully understand the office's functions and did not call back to clarify information obtained and that referrals made outside WSDOT were overlooked and not followed up on. Actions taken included (1) setting up databases to track all correspondence and calls to WSDOT to identify overdue responses and send timely reminders and (2) partnering with other agencies to reinforce the sense of urgency for responses to inquiries.

Satisfaction surveys can be used to test agency presumptions about customers' needs. After attempts to obtain funding for a highway program failed in 1997, the Arkansas State Highway and Transportation Department conducted customer surveys to determine next steps, asking customers' opinions of what the department should improve. Survey forms were distributed at 16 regional meetings, assisted by the state's chambers of commerce and supplemented by newspaper distribution. Results showed public support for funding the original proposal—interstate highway rehabilitation—but showed that customer priorities included additional improvements on non-interstates, and that they would support new taxes and other funding mechanisms to pay for the improvements. With the results of the survey, the department was successful in getting a bond issue for interstate improvements (the first for the department in 50 years) and gasoline tax increases for repaying the bonds and for non-interstate highway improvements.

Tracking Vision and Perceptions

Customer surveys can be used to test agency long-range goals and present services. In Norway, the Oslo Transit (AS Oslo Sporveier) receives requests, comments, and complaints via its customer service center and through distribution of on-board surveys on metro cars, trams, and buses and at staffed metro stations. Oslo Sporveier's 2001 goal has been to handle the entire growth in the regional passenger transportation market for the next 15 years (a growth of 60 percent) by public transportation services. The agency has also set goals of constantly improving services and obtaining the best customer satisfaction among public transportation providers. To accomplish this, Sporveier works jointly in regional transportation packaging, including road pricing combined with market-oriented public transportation fares. Sporveier also gives a guarantee of on-time performance, including methods of accommodating travelers, informing them about schedules and operations, and giving methods of customer input. Among its guarantees is a promise that replies to letters will be written within 2 weeks of receipt.

To demonstrate a high level of agency performance, FDOT established a process of measuring its success in its operations, including assessing customer needs and opinions. Using the Sterling Quality Challenge—a variation of the traditional Baldrige Quality approach unique to Florida—FDOT provided a self-assessment of its work in terms of several categories:

- Leadership—leadership system and organizational responsibility and citizenship;
- Strategic planning, including a development process and organizational strategy;
- Customer and market knowledge—satisfaction and relationship enhancement;
- Information and analysis—selection and use of data and comparative information, performance review;
- Human resource development and management—work systems, employee education and satisfaction;
- Process management—products and services, suppliers and partners; and
- Business results—customer satisfaction, financial and market results, human resources.

The FDOT self-assessment is reviewed and critiqued by the Florida Sterling Council Board of Examiners.

Media audits can be used to portray the extent and character of information distributed to customers through detailed review of newspaper articles and radio or television presentations. Caltrans uses this method to assess media comments on its activities in the Los Angeles region. A media audit featuring an analysis of newspaper articles during a single year was undertaken to explore the relationship between news articles and public opinion, as part of *TCRP Report 63: Enhancing the Visibility and Image of Transit in the United States and*

Canada. Reviewing more than 375 articles from newspapers across the country and in Canada, researchers found twice as many positive mentions regarding public transportation as negative mentions, contrary to what had been expected on the basis of pre-existing nationwide opinion surveys. Positive mentions of public transportation most often included congestion reduction, benefits to the environment, benefits to the community, need for the service, convenience, and better value than driving. The most frequent negative comments were the inconvenience, poor value, cuts in funding, inefficiency, time, and unreliability. Information from the media audit was compared with results of eight focus groups in diverse areas with public transportation and with a telephone survey of random individuals in each of the nine U.S. census districts. Results of these interviews suggested composite messages and a proposed policy direction that would capitalize on these findings under an approach called "Community Benefit Built on Personal Opportunity." Target audiences for this approach were selected: swing supporters (those unfamiliar with public transit services but who have positive things to say about transit) and influentials (community and neighborhood opinion leaders who do not work for governmental agencies).

SUMMARY

Agencies use specific methods to incorporate customers' views and opinions for use in understanding their transportation needs. These methods include practices of soliciting and analyzing customer needs as found in the agency's research. Communications with customers provide methods to swap information, with customers telling agencies what they think and with agencies telling customers what is planned or programmed to incorporate customer needs into transportation planning and operations.

This chapter contains many examples of practices used by transportation agencies in approaching research and use of information about customer needs. The chapter is meant to be read in conjunction with Chapter 2, which covers customer segmentation, and Chapter 3, which covers techniques of data gathering. Taken together, Chapters 2, 3, and 4 provide a review of the state of the practice of transportation agencies' approaches to using customer needs in transportation decision making. Methods from nontransportation sources have not been included in the review of the state of the practice; they form the basis for Chapter 5.

CHAPTER **5**

NONTRANSPORTATION BEST PRACTICES

Practices that examine and work to serve customer needs are widely used in business and nontransportation settings. Here the examples are limited to public agencies that do not primarily serve transportation needs. Private firms have not been included, because their practices are not usually analogs that public agencies find applicable. Practices in agencies that do not principally serve transportation needs are, nonetheless, related to transportation practices and may in fact illustrate practices that transportation agencies may want to more closely examine. Although some of the agencies are city government entities, their practices may be adaptable to efforts of a similar scale in transportation agencies.

This chapter outlines criteria that structure a process of identifying and applying customer needs, highlighting particularly effective practices of agencies. For purposes of this report, these practices are called "best practices."

Best practices are effective methods that organizations use to obtain an improvement in performance of services to customers. Best practices have been chosen to assist in identifying customers and customer segments, using objective or subjective data collection methods, understanding customer needs through solicitation of customer input, communicating with customers in a two-way flow, and applying customer views through feedback and evaluation.

SELECTING EXAMPLES OF BEST PRACTICES

The list below is used as a structure for best practice examples in nontransportation fields. This list is comparable to the list used in Chapter 6 to describe transportation agency best practices, and the structure of this list is closely related to the criteria used in examining, describing, and structuring the best practices in Chapter 6 for the transportation field.

Examples of nontransportation best practices have been chosen as effective illustrations of what organizations can do to improve service to customers. The examples have been arrayed in outline form according to what they have most effectively accomplished. They are positioned within categories of practices in terms of what the practice illustrates. There are, of course, examples that cover more than one category of practice, and these are not separately

described. Instead, the category of practice is given the context within which it has been put to work for the agency.

BEST PRACTICES IN CUSTOMER IDENTIFICATION AND SERVICE

Using Objective Data about Customer Segments to Establish Legislation

Oregon DMV

According to projections, by the year 2025 one out of every four persons will be over 60 years of age, including a growing number of the very old. Based on this projection, the Oregon legislature formed an Older Driver Advisory Committee to report to ODOT on the effects of aging upon driving ability. The Older Driver Advisory Committee met during 2000, receiving written and verbal testimony from members of the public and recognized experts on the issues. Concurrently, the Oregon DMV hosted eight town hall meetings around the state to explain the study and to solicit public input.

From its study, the committee concluded that licensing restrictions should not be based upon age alone. Rather, the committee determined that fitness to drive should be assessed through appropriate screening for visual, cognitive, and functional abilities to perform tasks necessary to driving safely. Accordingly, the committee recommended the following to ODOT:

- Identification of drivers at risk for being involved in a motor vehicle accident because of age through the driver license renewal process and its renewal cycle, screening techniques reporting capacity to drive, simplification of reporting, revision of the list of medical conditions affecting driving ability that must be reported, and a driver re-examination program;
- Remedial measures to assist drivers in maintaining ability to perform tasks necessary to driving safely;
- Public education for seniors, family members, health care providers, and the public in general; and
- Alternative forms of transportation, including volunteer-based services and increased funding for accessible transportation modes.

Using Objective and Subjective Data to Meet the Welfare-to-Work Challenge

Several States

Transportation plays a key role throughout the country as welfare-to-work programs begin to find jobs for former welfare recipients. Customer needs are clear: less than 10 percent of public assistance recipients own an automobile, yet they need to get to areas where job opportunities abound, frequently in suburban areas that are difficult to reach by conventional transit services.

To document the need for transportation to work, researchers at the New England University Transportation Center at the Massachusetts Institute of Technology (MIT) explored entry-level jobs advertised in Sunday newspapers, residences of welfare recipients, sites for support services such as day care and welfare training centers, and availability of transportation in the metropolitan area. Using geographic information systems (GIS), researchers mapped available jobs, residence patterns, and transportation to efficiently demonstrate the difficulties welfare recipients have in accessing suburban jobs. Research in both Atlanta and Boston showed that shuttle services, heightened security, and pedestrian enhancements were essential to meet the need.

To help welfare recipients gain and retain employment, the Michigan Department of Transportation (MDOT), through its Bureau of Urban and Public Transportation, worked closely with the Family Independence Agency (FIA), formerly the Department of Social Services, and the Michigan Jobs Commission to eliminate transportation as a barrier for participants. The MDOT program included

- Providing more than $1 million in state money to extend transit service hours and areas of operation,
- Providing transportation service to day care centers,
- Allowing children on MichiVan (statewide carpooling) vehicles,
- Allowing lease of MichiVan vehicles for purposes other than vanpooling,
- Providing transportation to job interviews, and
- Providing vehicles to an FIA office where there is no general public transportation.

In Connecticut, the Capitol Region Council of Governments (CRCOG), the MPO for the Hartford area, formed a welfare-to-work task force that included the Connecticut Department of Transportation (ConnDOT), CT Transit (Hartford's fixed-route transit service), the Greater Hartford Transit District, the Rideshare Company of Greater Hartford, and others to find transportation for welfare recipients. Coordination resulted in

- Relatively slight and inexpensive adjustments to the present fixed-route bus system (e.g., rescheduling the last buses leaving major shopping malls to depart after the stores closed);

- New fixed-route service to rapidly developing districts both north and south of Hartford;
- Flexibility in serving small clusters of workers whose destinations or shift times could not be accommodated by fixed-route buses (e.g., subsidized vanpools, subscription bus service, and use of paratransit vehicles); and
- A toll-free phone number publicized among job developers, employers, and welfare clients, connecting to CT Transit and the Rideshare Company, with other inquiries directed to a service review committee to consider other possible service options.

In Lowell, Massachusetts, the Regional Transit Authority, in conjunction with the University of Massachusetts, Lowell, conducted an in-depth survey of more than 350 businesses. The survey concluded that the lack of public transit was a major barrier to finding new employees. A public-private partnership was developed to provide alternatives, with help from the private sector and from initial grants from the Massachusetts Executive Office of Transportation and Construction (EOTC). A second EOTC grant furnished two new buses to create a flexible shuttle service for area employees. A one-stop Jobs Access Center will provide job training; job placement; childcare services; and a focus on public transportation, vanpools, and carpools.

Using Surveys to Evaluate Readiness for Decision Making in Elections

Westminster, Colorado

The city of Westminster, Colorado, uses its biennial survey of 1,040 citizens to evaluate its performance in a number of service areas, including recreation facilities, building permits and inspections, and street repair. The city has conducted this survey since 1992 and compares the service ratings to past evaluations as well as to national norms. It also uses the survey to gauge the public's awareness of policy issues, including changes to a complex proposed term-limits law. Results of the citizen survey showed that the complexities of the term-limits law were not clear to most respondents. Although the city was considering a ballot initiative for the upcoming election that would have clarified the law, it decided to defer the ballot initiative until the public had a greater understanding of the issues and opportunities involved.

Lawrence, Kansas

In Lawrence, Kansas, a survey was directed toward an initiative in support of establishing a citywide public transportation system. Surveyors selected a random sample of citizens to determine levels of support for the proposed bus system and the willingness of supporters to pay for the services in increased taxes. Demographics of interviewees were recorded, especially home ownership, commuting patterns,

attitudes toward urban and traffic growth and change, and general attitudes toward taxation. Segments of customers included renters and homeowners, men and women, groups of varying lengths of residency in Lawrence, age groups, and income groups. Results showed that 60 percent of respondents supported a property tax increase for a city bus system. Positive responses were found in all segments of customers, with few differences attributable to demographic characteristics. Differences were apparent on the exact amount of increase in property taxes: renters and women were willing to increase their taxes more than property owners and men. Residents who think public transportation is a top priority for the city were willing to increase property taxes more than those who did not give it a top priority were. Most respondents were willing to increase taxes by approximately 1 percent. Results of the election led to installation of eight citywide fixed routes and paratransit services.

Incorporating Segmentation Questions into a Broader Survey

Prince William County, Virginia

The 2000 Prince William County survey was the eighth in an annual series conducted by the Center for Survey Research at the University of Virginia. Among other research items, the survey was designed to analyze which subgroups among the county's residents might be more or less satisfied than others with the services they receive. This segmentation analysis was viewed as an important goal of the survey. Other goals of the survey included

- Assess citizen satisfaction with existing county services,
- Compare satisfaction levels with previous surveys by replicating the wording of key satisfaction and service use questions included in previous surveys,
- Determine citizens' needs and preferences regarding the way the county is growing and developing,
- Continue annual measurement of perception of quality of life in the county, and
- Examine the demographic and employment characteristics of workers who commute out of the county for their primary job.

Data compiled by the survey were examined for statistically significant differences among these customer segments: employment, presence of children under 18 in the household, education level, marital status, household income, race or ethnicity, age, gender, and geographic area. Results included indications that residents who had lived in the county 5 years or less were more satisfied than long-time residents were. Blacks and residents with military experience were less satisfied than other groups. Households with children used public facilities—parks, libraries, and recreation services—more than households without children did.

BEST PRACTICES IN SOLICITING CUSTOMER VIEWS

Using Surveys in Budget Preparations and Bonding Propositions

Phoenix, Arizona

The city of Phoenix surveyed customer views regarding city services prior to establishing propositions for a special bond election scheduled for March 2001. In a survey conducted in 2000, Phoenix residents were asked about attitudes toward city services, using questions similar to those in surveys in 1996 and 1998. Participants were asked to rate city services on a scale of 1 to 10. Using these ratings, the city was able to show which services were viewed as good or excellent and which ones citizens were willing to pay more for to improve. Information from the survey was used to set up 12 propositions for the 2001 election. In part because of prior knowledge of customer wants and needs, the city was able to pass all 12 of the bonding propositions.

Surveys of customers in Phoenix are conducted in advance of city council budget hearings to find out what people think the city needs to spend money on. Random sample surveys, held every 2 years, provide information that can be directly connected to budget items. For example, recent surveys indicated a desire for more low-income housing and for historic preservation funding for homeowners. Funding of $47 million was allocated to low-income housing, and grants have been provided to homeowners for historic preservation. Recent bond issues to support funding efforts were passed in part because of the results of the survey.

Using Annual Resident Satisfaction Surveys to Guide Municipal Actions

Ames, Iowa

The city of Ames completed its 18th Annual Resident Satisfaction Survey in 2000. The survey is taken to determine citizens' views on citywide priorities for ongoing services, for soliciting capital improvement budget priorities, and for opinions on the effectiveness of present city services. Survey questions include personal and social characteristics of respondents and preferences on service budget items—whether the respondent would like the city to spend more, the same, or less on each item. Then the survey solicits opinions about the relative importance of specific capital improvement budget items (very important, somewhat important, somewhat unimportant, or very unimportant). The effectiveness of services is determined in a satisfaction survey, in which respondents are asked if they are very satisfied, somewhat satisfied, somewhat unsatisfied, or very unsatisfied with specific municipal

activities. Satisfaction levels are sought about the following services:

- Law enforcement, safety and security: police department, fire department;
- Utilities and physical environment: electric, water, sewer, nuisances;
- Transportation: street system, traffic control, parking facilities, CyRide (bus system); and
- Community enrichment: parks and recreation opportunities, library, public information.

Comments from citizens on each of the areas are also compiled and reported annually.

The wide-ranging information collected is compared for accuracy, where possible, with census data. Results of each year's survey may be contrasted with the prior year's survey results or with the returns of a series of years.

Scottsdale, Arizona

The city of Scottsdale conducts an annual citizen satisfaction survey to assess service delivery. The telephone survey involves approximately 400 citizens through a random digit dialing approach. The sample procedures are so standardized and the survey so routine that the resulting information is used to guide the city's budgetary process.

Using Visioning Exercises to Guide Neighborhood Development

Atlanta, Georgia

The city of Atlanta has conducted visioning exercises with its residents for more than 10 years, working to determine redevelopment objectives. City or consultant staff members show examples of types of development that neighborhoods might want, in photos or on slides. Neighbors talk about the kinds of community they want; the kinds of development; streets and street cross-sections; and neighborhood commerce for children's needs, food, or other retail needs. Participants in visioning exercises discuss kinds of development they want and locate a place for that development on a map of their neighborhood. From these discussions, the city produces a redevelopment plan for the neighborhood, solicits input from the neighbors on details, and begins a rezoning process that is in keeping with the plan. Guidelines for neighborhood development are produced, and the city puts the plan into action by working with the redevelopment corporation or other private development groups. The city monitors implementation of neighborhood plans in terms of economic development. After 10 years of experience with the process, the city is revising two development plans with neighbors' assistance.

Using Surveys and Public Comment Letters to Gauge Planning Values

U.S. National Park Service

The U.S. National Park Service (NPS) relied on several techniques to get input and comment from the public in connection with its work in developing Winter Use Plans and accompanying Environmental Impact Statements for Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller Memorial Parkway. The NPS was mandated to involve the public in the planning process. To estimate the impact that alternative park management policies would have on winter visitation, the NPS conducted a survey of winter users to Yellowstone National Park and Grand Teton National Park, asking about visitors' activities, demographic information, total spent per trip, which entrance was used, and other questions. Additional surveys conducted by state agencies in various nearby states provided data about what trail-related needs users said they had (better trail maintenance, trail maps, separate paths for skiers and snowmobile riders, etc.) and the values and expectations visitors bring when visiting the parks. In 1998–99, the NPS did three more surveys in the winter and summer relating to socioeconomic impacts; the results were used to draw conclusions about visitor experiences and levels of satisfaction.

During the comment period on the Final Environmental Impact Statement (FEIS) for the proposed Winter Use Plans, the NPS sought and received more input from users and others. To ensure accuracy, the NPS made certain adjustments to clarify the estimated percentage change in trips by excluding a small number of responses from people from distant states (New Jersey, Pennsylvania, or Alaska) who showed an "implausibly high number" of trips to the study areas. The NPS divided the comments into two types: short statements and those with more detail and reasoning. There were 10,880 comments of the first type, 6,717 of which were form letters, and only 55 of the second type. E-mails from the Internet polling site, VOTE.com, were not included, because they were not specifically related to the draft Winter Use Plans under review. Of all the public comments on the FEIS, the majority supported eliminating snowmobile use or preferred an alternative that would result in gradual restrictions on snowmobile use over time.

Using Surveys to Identify Funding Priorities

San Diego, California

The city of San Diego conducts customer surveys as part of its performance measurement process and the *Service Efforts and Accomplishments* report. The annual Citizen Satisfaction Survey, initiated in 1995, contacts more than 600 residents to determine satisfaction with 35 specific city services, attitudes

about the quality of life in San Diego, and use of selected city-provided services and facilities.

A new survey conducted every 3 years asks residents to identify funding priorities. For the Service Priority Ranking Survey, the city manager's office conducted in-depth surveys of more than 3,200 residents from a representative cross-section of San Diego residents. The interviewers asked participants what they think is the most important city service improvement to be funded. Police and fire services are excluded from the questions. Surveyed residents were then asked to rate 40 services in terms of priorities for funding. A comprehensive list of service improvements and spending priorities was generated, and the next budget submitted for city council approval reflected the choices.

Using Surveys to Obtain Information about Customer Preferences for Future Directions

Envision Utah

Envision Utah distributed 363,500 questionnaires about issues concerning the Wasatch Front area centering on Salt Lake City. Using four potential growth scenarios explained in a full-page newspaper ad and on a website, Envision Utah asked for transportation choices. Responses, including 5,075 returned through the mail and 970 via the website, led to specific conclusions about growth management in Utah:

- 20 percent of respondents agreed that transportation was one of the first or second most important "worst things about Utah";
- 61 percent supported gasoline tax revenue funding of public transportation;
- 81 percent supported bikeways and trailways for recreation, and 40 percent supported them for access to work; and
- Overall, highest funding priorities on a scale of 1 (highest) to 5 (lowest) showed a rank of 2.7 for highways and 2.9 for public transportation.

Using its exploratory work, Envision Utah has established growth planning principles to guide development in the region. As communities work with these principles, Envision Utah, in partnership with the governor's office, gives an annual set of awards for exemplary development projects and creative communities for the best achievements in

- Planning vision;
- Development of a regionwide transportation center;
- Large- and small-scale infill and reuse development;
- Planning for transit-oriented development;
- Preservation of critical lands and trails for recreation and commuting; and
- Pedestrian-friendly, walkable development.

BEST PRACTICES IN APPLYING CUSTOMER VIEWS

Making Customer Service the Principal Goal

Ritz-Carlton Hotels

Ritz-Carlton Hotels received two National Baldrige Awards during the 1990s for the excellence of its performance in giving service. The company is aware of its customer segments (meeting and event planners, independent business and leisure travelers) and knows that 85 percent of its employees are frontline workers who deal with the public. To work toward a defect-free experience for each guest, the company has measurement systems to chart progress toward eliminating all customer problems, no matter how minor. To prepare its employees for customer contact, the company set employee standards that are embodied in its *Greenbook* manual of quality processes and tools, distributed to all employees for reference. In addition, the company provides extensive training for all employees.

The company, determined to work toward continuous improvement and to direct actions toward customer service at all business and operational levels, developed a pyramid concept to illustrate its approach. At the top is the company's mission; the next two levels are the missions for 10 years and 5 years, broken into 14 "vital few objectives," which are tactics for improving key processes and strategies for sharpening customer and marker focus. Underlying these tiers is the company's total quality management system and methods. Finally, the base of the pyramid is the company's values and philosophy—the foundation for all improvement efforts. The company distributes wallet-sized copies of its philosophy and values to each employee covering the "Gold Standards"—the company's Motto, Credo, Employee Promise, Three Steps of Service, and the Basics (employee performance expectations and company protocol for interacting with customers and responding to their needs).

A new pyramid is developed each year as part of strategic planning, which encompasses analysis leading to "vital few objectives" for the upcoming 3 years. These vital few objectives are divided by strategic objectives (such as 100-percent retention of customers) for organizational units. Performance measures are developed for each objective, and manager-level responsibilities are assigned for quality control and for tracking progress.

Preparing Employees to Value Customers

Southwest Airlines

The customer comes second, a motto used at Southwest Airlines, demonstrates to employees that they are the most important asset of the company. Employees come first, for Southwest feels that the way it treats employees will be the

way employees treat customers. Southwest's mission statement calls for "customer service delivered with a sense of warmth, friendliness, individual pride, and company spirit. . . . Employees will be provided the same concern, respect, and caring attitude within the Organization that they are expected to share externally with every Southwest customer." This mission statement was distributed as a prize in a box of Crackerjacks given to each employee to draw attention and to motivate discussion among employees.

Southwest Airlines estimates that good customer service has immediate returns: reports of good service reach other people by word of mouth. If customers experience bad service, they may tell up to 12 of their friends about it. Based on Southwest's daily customer volume, reports of unpleasant customer experiences may reach millions of potential customers. The company wrote a *Book on Service* to illustrate what the company calls Positively Outrageous Service. The book reminds employees that the service they give is a matter of choice and responsibility, one that involves giving time and talent when performing a job. The book is full of service legends—often-repeated examples of the high levels of service employees may attain. The book includes principles and examples of what works best in certain situations: "reading" the customer, identifying with his or her needs, and caring that the needs are met. Caring can involve intellectual exercises (explaining what regulations are) and emotional responses (sympathizing with the customer's feelings about the regulations).

Southwest believes strongly in working with employees to develop the company culture—the beliefs, expectations, norms, rituals, communication patterns, symbols, heroes, and reward structures of the company. The company culture guides organizational memory and behavior and provides a sense of identity, stability, loyalty, and organizational boundaries without forgetting past challenges, successes, mistakes, and lessons learned. A "milestones" report details the company's accomplishments to develop employee pride and enthusiasm and profiles role models—for example, a story on how the CEO of the company spends his working hours and what he is accomplishing for the common good.

Using Customer Surveys to Focus Specific Services

Boston, Massachusetts, Police Department

Since 1995, the Boston Police Department has conducted three surveys of city residents. In 1999, 5,706 residents were telephoned, and 2,056 valid surveys were completed. Stratified random sampling was done to ensure that the subsets were representative of the populations within each city neighborhood. The survey results show that, since 1995, the fear of crime has been reduced by more than half. The survey asked what issues Boston residents were most concerned about, and the majority dealt with quality-of-life issues, not criminal victimization. The issue that was considered the biggest problem was car break-ins.

The results of the survey reflect objective data collected by the police department. During the 1980s, when crime rates increased dramatically, the fear of crime also rose. Since 1990, however, both reported crimes and resident fear fell dramatically. Yet there were differences by neighborhood. The survey was used to identify specific neighborhoods and issues to focus on so the police department could maintain an appropriate response to both crime prevention and the fear of crime. Survey results were also used by the city to promote Boston as a safe place where most residents experience a high quality of life. The city also wanted to draw attention to its neighborhood policing program and to show that it is an effective tool in improving the quality of life in Boston.

Using Customer Data to Increase Expectations

Riverside, California

The city of Riverside uses customers as outside parties to help motivate city departments and employees with extra, public leverage. For 3 years, the city manager's budget department has used its annual citizen survey results to draw attention to deficiencies and the needs for corrective action and to include both in an overall report on agency performance. In 2000, the third annual survey became part of the city's participation in the International City/County Management Association's Performance Measurement Project. The survey, mailed to 3,000 randomly selected single-family home residents and 300 apartment residents, asked about a number of the city's primary service areas, including police and fire service, libraries, street maintenance, and cleanliness.

The city manager's office summarized the results, transmitted them to all city departments, and requested that department heads respond with action items to address the concerns. The Riverside City Council pays close attention to the survey results, identifying areas where additional data collection or analysis is needed and areas where follow-up is warranted. Individual departments initiated a number of corrective actions to address survey concerns, and selected actions were highlighted by the city council in its report on the survey. An action item initiated on the basis of the survey, "Operation Safe Parks," is a program to address citizen opinions that city parks were unsafe. The program brings together police, park personnel, public works staff, and others to work on engaging the community and addressing their concerns about park safety, vandalism, and quality of life.

Using Surveys to Make Service Adjustments

Phoenix, Arizona

The city of Phoenix conducts random sample surveys to find out customer reactions to city services. In a recent survey, many people said that city water was unsafe to drink. The city, using this information, undertook detailed follow-up surveys

and discovered that the water tasted bad. Research into water quality revealed that the cause was extra chlorine in the water and that the water was not unsafe to drink. Because of these findings, the city launched an education program to inform people that the city made changes in chlorination that led to an upgrade in taste, emphasizing that the water was in fact safe to drink.

Seeking a Customer Response to Service Delivery Events

Various Firms

Private firms have devised individualized methods of obtaining customer reactions to services they provide. The new technology of interactive voice response (IVR) has been used to take voice-automated surveys of customers when they phone in to offer comments or complaints. Firms frequently mail out questionnaires after a contact with a customer to find out if the service level was adequate or needs improvement. Many questionnaires include prepaid postage to encourage returns. Retail firms may include a customer evaluation form with each purchase, a relatively simple method of gathering opinions and reactions to the firm's services. A firm may mail out an annual survey to its repeat customers to get ratings each year of customer satisfaction with the service levels it provides. Many firms offer website methods to customers for commenting, suggesting, or complaining. Others send out an individual e-mail after contact with a customer to ascertain if their service was delivered in a timely, efficient, and accurate way. Website surveys ascertain whether customers find online methods to be easy or difficult.

Using Surveys to Rank Agency Performance

San Jose, California

The city of San Jose DOT surveys the customers of each of its operational services. The survey results are used to rate customer satisfaction, which is one of four performance measures developed for each of its operational services. The ratings are obtained through telephone and mail-in surveys. For each operational service, the various measures of performance (including customer satisfaction, quality, timeliness, and cost) are weighted to reflect relative importance. The list of operational services is as follows:

- Plan transportation system,
- Analyze and advocate policy,
- Manage capital improvement program,
- Coordinate regional transportation projects,
- Optimize arterial traffic conditions,
- Enhance neighborhood traffic conditions,
- Maintain street pavement,

- Maintain storm sewer system,
- Provide street sanitation,
- Maintain fire hydrants,
- Manage street landscaping,
- Manage care of city street trees,
- Maintain undeveloped right-of-way,
- Inspect and repair sidewalks,
- Maintain traffic devices,
- Maintain street lights,
- Manage off-street parking,
- Manage on-street parking,
- Manage financial and budget services,
- Manage personnel services,
- Manage safety, and
- Manage information technology.

U.S. Postal Service

As part of its *CustomerPerfect!* management program, the U.S. Postal Service (USPS) has conducted annual surveys since 1990 of its first-class mail delivery using volunteer mail reporters around the country. The *CustomerPerfect!* program focuses on performance goals in three areas: Voice of the Customer, Voice of the Employee, and Voice of the Business. The annual survey, called the External First-Class Study, is a major component of the Voice of the Customer performance goal. The External First-Class Measurement study, managed by a USPS consultant, is funded through postage-stamp revenue and employs between 13,000 and 14,000 volunteers annually.

Designed to represent the real-time mail flow between 463 three-digit ZIP code areas across the country, the External First-Class Study sends test mail to volunteers, who then call in or report via a special website the day that the mail is received. Special studies are conducted periodically, such as special post-card mailings and 2-week periods of reporting the precise time of delivery and whether any pieces were damaged.

The USPS sets specific performance targets each year and measures progress by using the results from the External First-Class Study. Using the data from volunteers, the USPS reports that local mail delivery has improved from 83 percent on-time delivery in 1992 to 94 percent in 1999. Study data are available to USPS field personnel on a daily basis for use in gauging performance. Performance scores are also posted for the public on a quarterly basis.

Combining Objective and Subjective Data to Evaluate Public Services

Portland, Oregon

The year 2000 marked the 10th annual Portland Citizen Survey, an integral component of the city's annual report on

government performance. For 10 years, the city of Portland has issued a comprehensive report with information on spending, workload, and the results of nine major public services. The survey was undertaken to obtain citizen evaluations of city services through 9,250 mailings to residents in each of the eight Portland neighborhoods. A follow-up of 400 non-respondents was conducted to address possible bias in the results caused by major attitude differences between those who returned the survey and those who did not. Analysis showed no major differences between the sample and those who did not respond.

Results of the survey are distributed as part of the city's annual report. Objective performance measures are printed side by side with subjective measures of how citizens perceive the city's performance in these major areas:

- Quality of services in personal safety—police, fire, emergency services;
- Quality of water and sewer services, garbage and recycling;
- Street smoothness, cleanliness, traffic speed, safety of pedestrians and bicyclists;
- Traffic congestion;
- Quality of parks and recreation programs; and
- Quality of new development and neighborhood conditions and livability.

All ratings were compared with the same ratings from the prior 9 years, and demographics of respondents were compared with those of prior years as well.

The combining of objective data with subjective data gathered through the citizen surveys provides Portland elected officials with a well-developed picture of government performance that includes perceptions in addition to hard data. The city council recently responded to objective measures of inadequate street maintenance, supported by subjective citizen evaluation of poor maintenance documented in the *Service Efforts and Accomplishment* report, by voting to fund additional street paving improvements.

BEST PRACTICES IN COMMUNICATIONS WITH CUSTOMERS

Improving Customer Information Delivery

Phoenix, Arizona

Guided by a Visions and Values program implemented in 1996, employees of the city of Phoenix continuously examine innovative ways to improve service delivery without increasing costs. Staff assigned to the city manager's Seamless Service Task Force are charged with developing simple methods for city employees to respond efficiently and effectively to customer requests. Telephone requests alone have reached a daily average of 72,500 calls. Employees developed a phased set of recommendations on telephone answering techniques and face-to-face interactions between staff and customers. The first phase of activities, now being implemented with respect to staff telephone contact practices, includes staff training to handle customer telephone requests more effectively, a citywide standardized approach for transferring customer calls (giving customers the option of reaching a person rather than leaving a voicemail message), continuing and improving access to Spanish-speaking contacts, and providing support for hearing impaired customers. The second part of the research, dealing with face-to-face contacts, will involve working directly with customers and their opinions to improve service.

Using Surveys to Learn about the Customer Service Experience

Calgary, Alberta, Canada

The city of Calgary's annual survey of citizen satisfaction with city services reaches more than 1,000 randomly selected residents and has been conducted since 1997. The results of the satisfaction portion of the survey are reported to the Corporate Effectiveness Committee, established in 1997 and charged with monitoring and recommending initiatives to "optimize customer and taxpayer satisfaction." The report is then transmitted to the city council and city departments. Individual departments review the data and develop plans to improve operations and establish budget priorities, taking the survey results into account.

Calgary's survey includes significant detail about the customer service experience itself, looking at the quality of the customer's contacts with city employees. When the 2000 survey showed a decline in satisfaction with the customer service experience, Calgary redoubled its efforts to consolidate customer access points so that a resident does not need to understand the "corporate" structure to get to the department he or she needs to reach. The city also is taking steps to increase opportunities for direct personal contact with a city employee and to avoid customers being sent to voicemail or experiencing a busy signal.

Medicare Division of the U.S. Health Care Financing Agency

In managing the Medicare program, the U.S. Health Care Financing Agency (HCFA) participated in a survey of a random sample of Medicare beneficiaries who enrolled and had a Part A (inpatient) experience during 1999. The survey asked how easy it was to enroll in Medicare, how easy it is to get information about Medicare and Medicare benefits, how easy it is to get answers to questions about bills, how useful the information from Medicare is, and how courteous and professional the Medicare staff are.

The survey was part of a larger program to develop a national baseline against which to measure and improve customer satisfaction, as well as to validate the result of ongoing customer information improvements. This larger program—the American Customer Satisfaction Index (ACSI)—involves 30 high-impact agencies. Results comparing the agencies showed that HCFA scored well above the national index in enrollment and customer services and slightly above the national index in the area of benefit information. Improvements are targeted in the areas of answering questions about billing and ensuring that beneficiaries' complaints are handled in a satisfactory manner.

Emphasizing Timely Responses

E*Trade and SBC Ameritech

Private firms are intent on improving telephone-answering skills, responding to concerns of a potentially growing disconnect between investment in call center technology and customer satisfaction. ("Almost an inverse relationship," according to an article in the *New York Times,* March 2002). Levels of customer satisfaction are alleged to drop because call centers are being adopted as a cost saving rather than an improvement in customer service. Firms aggressively dealing with the problem include E*Trade and SBC Ameritech.

E*Trade, an electronic brokerage firm, delegates 400 customer service representatives to answer phones. At E*Trade, as a call comes in, a representative's software displays customer data as well as prior contacts with the company. Details include information on the customer's time in the queue—the time spent waiting to reach a real person rather than a recorded message.

Call center wait time for customers is the focus of activity at SBC Ameritech, the telecommunications firm that includes both Southwestern Bell and Pacific Bell. Call wait time for customers calling into repair service centers was 6.67 seconds in the third quarter of 2001, compared with a nearly 74 second average during the third quarter of 2000. Call wait time for business offices was 63.18 seconds during the third quarter of 2001 and more than 4 minutes during the same time period in 2000.

Using Surveys Consecutively to Track Progress

Phoenix, Arizona

The city of Phoenix has conducted surveys over a number of years, tracking similar questions each time to ascertain whether progress was being made. In surveys made since 1991, the city has tracked perceptions of the quality of life of its citizens. Results show that respondents view the quality of life in Phoenix as generally improving over the years. The proportion of residents who feel that the quality of life

in Phoenix is excellent or good has increased significantly from 1996, when 61 percent rated the city highly, to the 74 percent of respondents who viewed the city positively in 2000. An even higher proportion of Phoenix citizens have a positive view of the performance of the city's agencies in providing services. Fully 89 percent of the citizens of Phoenix said they were satisfied or very satisfied with the city's performance.

Austin, Texas

The city of Austin conducts surveys of randomly selected households every 2 years. Survey questions cover a range of issues, asking respondents for opinions and rankings of satisfaction levels on individual city services. These include emergency medical services (EMS) response times, fire and police protection services, street sweeping, and garbage pickup. Overall rating of city service delivery is queried in terms of the following:

- City service delivery
  - Courtesy with which city employees treat customers;
  - How well city employees seem to know their jobs; and
  - The city's ethics in conducting business.
- Customer communications and responsiveness
  - The city seeks to know customers' needs;
  - The city responds to customers' needs; and
  - The city keeps its citizens informed about matters that affect them.

Changes in the overall ratings of citywide services are shown in Figure 5.

Evaluating and Rewarding Communications Performance

The Teleperformance Group

Since 1988, the Teleperformance Group, a telemarketing company, has announced an annual Grand Prix award based on the quality of service delivered by businesses over the telephone. The award raises awareness of the impact good communications have on company image. The survey also provides benchmarking data against which individual performance can be measured, highlighting specific areas of strength and weakness in relation to the performance of other businesses.

Teleperformance conducts nearly 55,000 "mystery telephone calls" to businesses in 30 countries, using the following criteria to evaluate the levels of quality of call-handling:

- The speed with which each call is answered,
- The quality of the greeting,
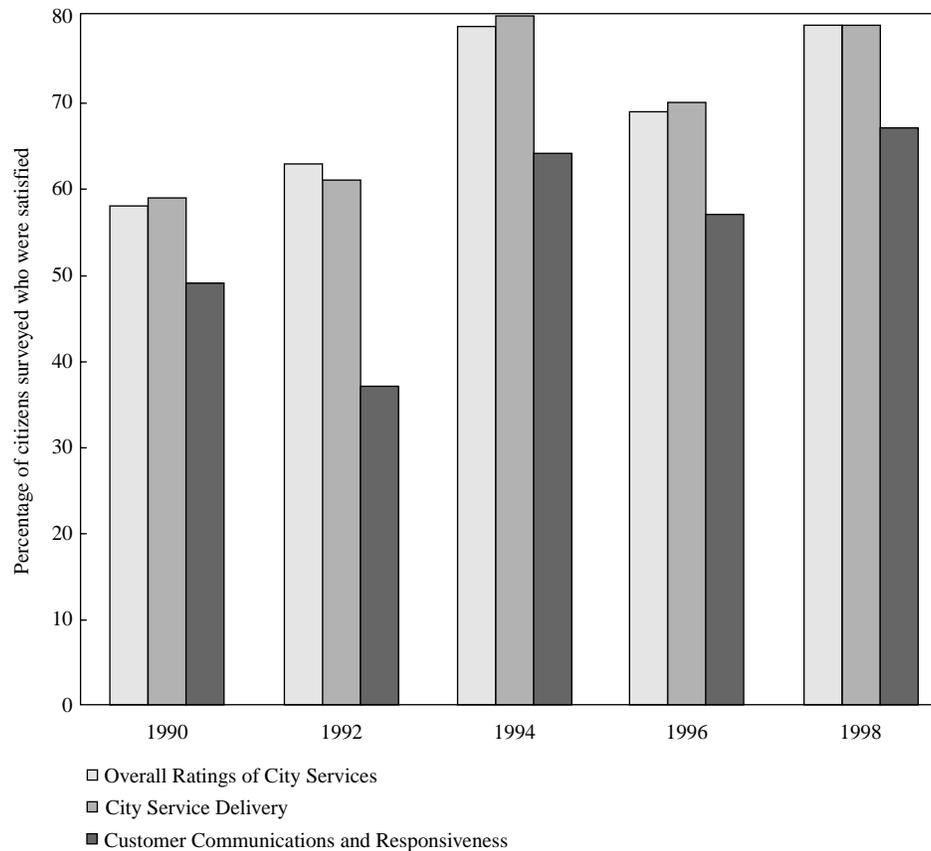
Source: *Community Scorecard,* City of Austin, Texas, Public Information Office.

Figure 5.   Consecutive surveys of citizen ratings—Austin, Texas.

- The level of product knowledge displayed,
- The ability to listen effectively, and
- The overall warmth of welcome during the call.

The survey has recently added an evaluation of the efficiency of companies in handling e-mail inquiries.

In 2001, the Teleperformance Grand Prix award for best overall international performance on telephone and e-mail went to DHL Worldwide Express, the world's largest air express company, linking 120,000 destinations in more than 230 countries. Seven thousand DHL staff members handle more than 4,000,000 inbound calls per month. To monitor the performance of its customer service representatives, DHL carries out internal mystery caller campaigns similar to the Grand Prix assessments. A similar award within the United States has been carried out for 13 years by NSDI Teleperformance. The 2001 U.S. CRM (Customer Relationship Management) Grand Prix Customer Service Award went to U.S. Airways for consistently high levels of telephone support for its customers.

CHAPTER **6**

TRANSPORTATION BEST PRACTICES AND IMPLEMENTATION STRATEGIES

The identification of customer needs is a transportation agency's opportunity to provide better service. Transportation agencies surveyed for this report have been involved in exemplary practices that have been implemented to observe and listen to their customers. In this chapter, criteria are outlined and applied to examples of agency practices to identify criteria that represent the best current thinking about how to implement strategies to serve agency customers better. The examples have been selected to illustrate practices that transportation agencies may want to examine more closely for applicability or potential use.

This chapter outlines criteria that structure a process of identifying and applying customer needs, highlighting particularly effective practices of agencies. For purposes of this report, these practices are called "best practices."

> *Best practices are effective methods that agencies use to obtain an improvement in performance of services to their customers. The following best practices have been chosen to assist in identifying customers and customer segments: using objective or subjective data collection methods, understanding customer needs through solicitation of customer input, communicating with customers in a two-way flow, and applying customer views through feedback and evaluation.*

SELECTING EXAMPLES OF BEST PRACTICES

Accomplishment of an effective action to use customer needs in decision making is the principal criterion used to demonstrate best practices in transportation agency actions. Other choices of best practice examples have been based on examination of the state of the practice in customer identification and segmentation, in data gathering about customers, and in application of the information to decision making within the agency. Choices have been based, in part, on initiatives undertaken in the last 5 years that are likely to be most useful to agencies, most advanced in terms of techniques, innovative or newly fielded as new approaches, statistically valid, replicable, and cost-effective.

Examples illustrating what agencies can do to improve service to customers have been arrayed in outline form according to what the practices have most effectively accomplished.

Certain examples cover more than one category of practice, and these examples include the context within which the practice has been put to work for the agency. Each example is discussed briefly below to provide a relatively complete picture of what was done and the reasoning behind the action.

BEST PRACTICES IN CUSTOMER IDENTIFICATION AND SEGMENTATION

Using Objective Data about Customer Segments to Establish Programs: Kansas DOT

The Bureau of Traffic Safety (BTS) of the Kansas DOT has established a program of data collection and analysis as a basis for setting future goals for performance. In the Sedgwick County/Wichita area, the BTS obtained data with the assistance of local communities. The information helped BTS do the following:

- Determine, from data linkage between communities, that 15- to 20-year-old drivers incur the largest number of motor vehicle crashes in the county. This information was used to establish a performance goal of reducing the incidence of crashes involving drivers under 21 years of age by 15 percent.
- Establish a Safe Communities Coalition to help communities identify traffic safety issues. With BTS help, the coalition can collect, merge, link, and analyze injury data; access existing injury prevention activities for consideration; and develop and introduce new interventions based on the data analysis.

To implement the performance measure of reducing crashes for youthful drivers, KDOT did the following:

- Worked with other agencies to establish a Kansas Drunk Driving Prevention Project. An annual student survey was initiated to gather information on the behavior, attitudes, and beliefs of student participants about key traffic safety issues.
- Initiated the Wichita Teen Court Project to hold youthful offenders accountable, using peer pressure and influence to encourage positive choices. Participating high

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school students defended, prosecuted, and adjudicated their peers, gaining valuable knowledge of the legal system, with help from the local American Bar Association and juvenile court system. In the eight participating high schools, 385 cases were heard in 2000.

- Established Take-A-Stand, a program of DUI prevention for teens and intervention to keep other teens from drinking and driving. The Take-a-Stand website offers alternative events for teens and prizes to participants.
- Held a Workshop on Fake IDs for local police.
- Created a program to establish Drug Recognition Experts among police officers.
- Distributed 20,000 ID holders with a "don't drink and drive" message to college students during enrollment.
- Worked with driver education students.

Using Objective Data about Customer Segments to Set Performance Levels: Oregon DOT

ODOT reports annually on traffic safety through its performance plan, using data sources that are reliable, readily available, and reasonable as representing outcomes of the program. For example, ODOT uses statewide traffic crash data and measures of exposure for a 5-year period to establish sets of performance measures designed to curb fatality and injury rates. For fiscal year 2000, these performance measures were to

- Reduce the traffic fatality rate from 1.70 per million vehicle miles traveled, the 1988 level, to 1.60 per million vehicle miles traveled by September 2000 and
- Reduce the traffic injury rate from 101.62 per million vehicle miles traveled, the 1998 level, to 100.00 per million vehicle miles traveled by September 30, 2000.

Strategies devised to accomplish these measures included

- A comprehensive traffic safety public information and education program,
- An annual traffic safety conference with 250 citizens,
- Development and implementation of the Oregon Safety Management System,
- Training and technical assistance in traffic safety engineering practices to individuals and local agencies, and
- Training for emergency medical service providers to ensure adequate response to motor vehicle crashes.

As a final part of the report, ODOT explored funding dedicated to specific services to implement each of these strategies. Other sets of strategies focus on bicycle safety, community traffic safety programs, employer safety, impaired driving, motorcycle safety, occupant protection, pedestrian safety, police traffic services, roadway safety, speed, work zone safety, and youthful drivers.

In the fall of 2000, ODOT conducted a survey about safety topics. Three out of five respondents evaluated the performance of ODOT as good to excellent in its efforts to reduce crashes, injuries, and deaths. Those surveyed also reported that speeding and running red lights were the two top categories in unsafe driving behavior they observed. Most knew about the changes to the state's teen driving law, and more than 90 percent believe that motor vehicle crashes are due to driver error. Many agreed that over-the-counter drugs impair driving ability.

Using Objective Data about Customer Segments to Write Legislation: Oregon DMV

Data in Oregon show that teens are twice as likely as other drivers to be involved in fatal and injury crashes. Because of this information, Oregon legislation directed the DMV to institute more stringent licensing procedures for individuals under the age of 18 applying for a driver's license. The new requirements for these individuals are as follows:

- Must have held an Oregon instruction permit for at least 6 months;
- Must certify with parental verification that the teen has at least 50 hours of supervised driving experience;
- Must complete an ODOT-approved traffic safety education course through private or public driving schools, or certify an additional 50 hours of driving experience as described above; and
- Must show proof of school attendance, completion of school, or exemption from attendance before DMV will issue them a permit or a driver's license.

In addition, provisional licenses restrict the age and number of passengers that a driver under the age of 18 may have in a vehicle, and the nighttime hours during which a teenager may drive are restricted.

Surveying Customer Segments for Fatigue-Related Driving Issues: New York State DOT

For NYSDOT, the Institute for Traffic Management Safety Management and Research at SUNY-Albany conducted a survey of long-distance truck drivers in 1997 to examine fatigue-related driving issues. Fall-asleep and drowsy incidents and crashes were examined, along with fatigue factors associated with trucking. Interviews with truck drivers were conducted at private truck stops, public rest areas, and roadside commercial vehicle safety inspection sites in New York State. Respondents to the survey were screened to ensure responses from experienced drivers; each driver had driven a tractor-trailer for at least 6 months, made overnight trips, and drove at least 50,000 miles per year for work. Results were compared with data on sleepiness-related truck crashes

in New York State as reported by NYSDOT to the Federal Highway Administration.

Researchers decided to use on-site surveys rather than telephone surveys or mailed surveys to ensure practicality for reaching long-distance truck drivers, who are a small portion of the population and are often on the road. In addition, there is no current and complete census of drivers that could be used to prepare a representative sample. Thus, private or public truck stops, rest areas, and inspection stations appeared to be the most likely locations for contacting drivers and conducting interviews. Drivers were approached randomly at these locations, and, to encourage participation, were offered a $5 voucher to purchase food or a beverage. With these methods, the survey achieved a driver participation rate of 74.9 percent.

Results showed that nearly half of the truckers interviewed fell asleep at some point in their career, and that one-quarter had fallen asleep one or more times during the past year. In the month prior to the survey, 65 percent were drowsy at least occasionally while driving their truck. Of the respondents, 77 percent indicated that rumble strips are very effective in preventing run-off-the-road crashes due to drowsiness or falling asleep, and 55 percent said that driving over rumble strips had alerted them that they were driving off the road because of drowsiness.

Using Surveys of Customer Segments to Pinpoint Orientation Issues: Port Authority of New York and New Jersey

In 1998, the Port Authority conducted a survey of airport users at Kennedy, La Guardia, and Newark Airports to determine issues faced by travelers at the airports. Getting lost because of confusing directions at the airports was second only to unclean restrooms as the most difficult problem. At Kennedy Airport, for example, there was no sign telling newcomers how to get to Manhattan. The 17 separate terminal buildings had some 300 directional signs each, including signs for garages, airport roads, and parking lots. Most terminals are leased to individual airlines with competing graphics. The old signs, dating from the 1970s and 1980s, were indistinguishable from one another: most had white letters on dark backgrounds and were placed randomly along passengers' paths to and through the airport buildings.

New signs were designed with contrasting colors to differentiate between the flying mode, the waiting mode, and the exiting mode. Signs were simplified: "long-term" and "short-term" were replaced with "daily" and "hourly." Difficult abbreviations such as "W/B BQE closed" were eliminated to help newcomers to the city (this abbreviation was replaced with "Westbound Brooklyn-Queens Expressway closed"). New signs were installed perpendicular to the major paths taken by passengers, within an expected line of sight and not too high, as hurrying passengers tend to look downward. Before full installation, the Port Authority tested the

new signs against the old ones at La Guardia. Findings of a survey of 400 passengers showed appreciation of the new signs, which scored 4.19 points out of a top rating of 5. The signs are now in place at all three airports and are being adapted for use at the Port Authority Trans-Hudson commuter lines.

Surveying Customer Segments to Find Preferences: Lowell, Massachusetts, Regional Transportation Authority

The Lowell Regional Transportation Authority, in conjunction with the University of Massachusetts Lowell, conducted a survey of young people in 1999 to determine their attitudes toward and usage of public transportation. The survey was administered by University of Massachusetts graduate students, assisted by students at Lowell High School and Bartlett Middle School. Three focus groups with local social and ethnic club members were held on issues identified in the surveys. Relatively simple suggestions were made:

- Make the agency's *Riders' Guide* less difficult to use,
- Clarify where the downtown transit center is located, where bus stops are, and where people can wave to be picked up,
- Make the bus routes understandable,
- Increase awareness of how to get the most from public transportation, and
- Find "cool" themes (e.g., sponsors, decorations, or ads) to make buses more attractive.

More difficult suggestions were also made:

- Make public transportation the primary method of travel for young people,
- Change bus drivers' perceptions of young people and vice versa,
- Reduce bus pass costs,
- Reduce individual fares,
- Install change machines at the downtown transit center,
- Add new routes to malls and other recreation sites,
- Make the city safer through better policing, and
- Run buses later hours in evenings.

Obtaining Information about Customer Segment Needs

San Francisco Bay Area Metropolitan Transportation Commission

Groups identified in customer segmentation for the survey administered by the San Francisco Bay Area's MPO, the Metropolitan Transportation Commission (MTC), were required to be registered voters, chosen for the sample because the nature of the survey subject matter was electoral. Questions focused

on voter reactions to specific transportation preferences. The agency used a stratified sample from the voter file to obtain a higher degree of accuracy of potential voter reactions than would be supplied by a random digit dial sample drawn from the phone directory. The survey was divided into three segments: a base sample of 1,250 interviews within the MTC jurisdiction, a 175-member subsample of high-probability "ethnic" zip code areas, and a 175-member subsample of high-probability "lower-income" zip code areas. Of the 1,600 interviewees, 75 were members of an ethnic or other minority group, including people with disabilities.

Minnesota DOT

MnDOT conducted a market segmentation and service value study through its own professional market research unit. Seven customer segments were identified: commuters, personal travelers, farmers, emergency vehicle operators, common carriers, shippers by truck only, and intermodal shippers. Segments formed the basis of telephone interviews with individuals in each of the groups. The interviews explored the importance of MnDOT services, customer satisfaction levels with agency services, and the opinions about resource commitments to MnDOT programs. Summaries of customer priorities and satisfaction in all segments except for farmers showed substantial agreement among the segments on the value of MnDOT services.

Among the surveys and studies that MnDOT has undertaken with its customers are the following:

- Focus groups were used to evaluate weather and road condition information available to Minnesota motorists. Discussions focused on accessibility, ease of use, and reliability of each system.
- A telephone survey was conducted to identify attitudes about the use of public transportation. Clusters of potential customers were identified and then profiled by awareness of transit, use of transit, and demographics, leading to best new candidates for a marketing campaign to promote public transit.
- Mail-back questionnaires were distributed to motorists exiting parking garages in downtown St. Paul, project partners, and parking operators to solicit views about advanced information for parking displayed on electronic signs showing parking availability.
- In-person interviews with drivers were conducted to obtain views, experiences, issues, and potential improvements to the use of gates for directing traffic off interstates and prohibiting access during unsafe driving conditions, such as severe snowstorms or major incidents.
- A limited survey of commercial vehicle operators was conducted to determine the economic impact due to snow. Personal interviews and focus groups were conducted with snowplow operators 5 months after technology for snowplows was introduced.

- On-site surveys of motorists and commercial drivers at rest stops were conducted to determine opinions, attitudes, and behavior, followed by a telephone survey of nonusers throughout the state to determine customer segments and the reasons for which these segments do or do not use the rest areas.

Chicago Transit Authority

The Chicago Transit Authority (CTA) conducts biennial customer satisfaction surveys, which include 2,500 respondents, and initially categorizes customers by rail and bus users. Customers are then segmented into seven groups based on geographic area of residence, and into additional segments such as income level, and into dependent or choice riders. CTA also surveys nonriders to make comparative assessments of auto, bus, and rail services. The survey addresses 50 service quality measures for each customer segment.

Special surveys have been conducted of customer segments. In 2000, CTA surveyed students and their use of the U-Pass program, a discount fare system that provides full-time college and university students with unlimited rides on all CTA vehicles during an academic year. The U-Pass is included as part of regular tuition and fees assessed by the participating institutions. The survey showed that the student customer segment of 32,000 people holding U-Passes used the system at a higher rate than other segments. Net new rides totaled 25 to 38 percent of rides, and these new, induced, or discretionary rides by students represent about one-sixth of CTA's ridership growth over a 3-year period.

Florida DOT

FDOT established six customer segments as a part of its process of seeking customer input. The customer segments that FDOT established flowed from the extensive outreach program that was part of the update of the long-range transportation plan. Work on the update began with meetings to determine what the public viewed as important. A training program for obtaining public input was established; its focus was an on-line training program in public involvement. Using feedback from public input, the FDOT executive board, comprising the secretary of transportation, the assistant secretaries, and the district representatives, established the six customer segments. These segments included residential travelers, commercial customers, government officials, visitors, special needs customers, and property owners impacted by transportation construction. The segments provided the basis for approaching groups for inquiries: focus groups were held in 1999 in each of the segments and in north, central, and south parts of the state in urban, rural, and transitioning areas. Interview surveys of individuals in each of the segments were undertaken in 2000, including about 5,000 surveys in all. Segment interviews revealed issues that affected nearly all

groups: night visibility of pavement markings, timeliness of completing construction, and access to businesses during construction. Segment interviews also revealed that government officials were unsatisfied with their ability to have input on design plans. Tourists rated FDOT services higher than residents did.

BEST PRACTICES IN SOLICITING CUSTOMER NEEDS

Surveying to Identify Barriers to Travel: Utah DOT

UDOT commissioned a market research company to conduct qualitative research among Salt Lake area residents who commute to work and among residents who drive primarily for pleasure. The principal objective of the research was to identify barriers to travel in Utah and determine whether the proposed 511 telephone service would mitigate those barriers. Surveys, conducted in four focus groups, found the following barriers to travel:

- Out of-date, inaccurate information from traffic reports and electronic signs;
- Unexpected road closures; and
- Too much information on electronic signs that are difficult to read.

The survey found that travelers want

- Information on traffic delays, closures, construction, weather-related delays, and accidents;
- Real-time information germane to the area;
- Accurate, up-to-date information;
- Alternate routes; and
- Delay time in minutes.

Utah participants in the survey were asked which information they would actually use. Responses were that the most important information (in rank order) concerned traffic delays, winter driving conditions, and traffic during major sporting and cultural events. Respondents considered information about public transit and concierge services moderately important.

Using Surveys to Determine Customer Expectations: South Dakota DOT

In 1997, the SDDOT conducted a statewide customer survey. Before that year, SDDOT had not directly ascertained the public's expectations for service or the public's perception of its performance of the services offered. Lacking the results of public opinion surveys, SDDOT relied on information available from other sources, such as the governor, legislators, commission members, special interest groups,

news media, public meetings, and citizen correspondence. Research was undertaken to determine whether needs for the department's key products and services are being acceptably met and to identify opportunities for cost-effective improvements to SDDOT's operations.

Survey results showed that the large majority of respondents were aware that SDDOT (1) checks on and maintains roads and bridges, (2) handles snow removal and other winter maintenance, (3) makes sure highway signs are readable, and (4) repairs highways and bridges. Of respondents, 63 percent gave SDDOT a grade of "A," citing its servicing of roads or giving encouraging comments such as "good job," "satisfied," "they do the best they can."

Expectations were identified through asking participants to prioritize where SDDOT money and services should be focused. Respondents were asked to rank six items using a fictional $100 to determine importance. The average of $36 to be spent on maintaining the highway surface was almost double the next most important item, planning and building. Secondary attributes noted by respondents under the category of maintaining the highway surface were snow and ice removal and keeping the pavement smooth.

When asked for opinions, more than half of the respondents stated that they would support a permanent increase in the gasoline tax in order to maintain highways and bridges and that two-thirds of the budget should be spent on repairing and maintaining existing highways as opposed to building new highways. Two out of three respondents said there was not enough information about budget issues and spending plans, plans for new highways, and upcoming construction and maintenance projects. Respondents overwhelmingly noted that they would rather drive through a project construction site than follow a detour.

Using Customer Expectations as a Guide to Programs: Florida DOT

FDOT looks for customer expectations through a composite program and a variety of sources, including

- Metropolitan planning organizations and their advisory councils,
- Local government representatives,
- Public workshops and hearings,
- Neighborhood meetings,
- Focus groups,
- Direct mailings,
- Surveys of customers, and
- Community traffic safety teams (local agency representatives, such as traffic engineers, safety officials, education officials, local media, enforcement agencies, emergency medical providers, and community volunteers).

FDOT also has internal management systems based on data collection, field surveys, established criteria, and statu-

tory requirements to determine anticipated customer needs and expectations.

Surveying Customers for Assistance in Developing Policy: Utah DOT

UDOT commissioned a survey concerning billboards in Salt Lake County. The survey included 400 residential drivers and 37 billboard advertisers. Questions were asked about general attitudes toward billboards and specifically about billboards along the recently reconstructed I-15 highway. These billboards would have to be raised to a more visible level if they were to remain beside the highway. When asked if the billboards should be removed, 56 percent of those surveyed said "yes"; when confronted with the issue of potential loss of federal highway funds if the billboards were raised, 80 percent said "yes" to the same question. Significantly, 73 percent of the billboard advertisers agreed that the billboards should be removed if the state were to lose some of its federal highway funds.

Using Surveys to Rank Customer Perceptions about Transportation Issues: Colorado DOT

CDOT, along with the Transit Alliance and the regional transit district, sponsored a survey of the transportation needs in the Denver metro area. The survey was conducted in May and June in 2001, using telephone interviews with 800 area residents who were active voters. The survey was designed to measure citizen preferences for various transportation and funding options. Questions were asked about whether more or less transportation spending was needed and about which transportation improvements were "essential," "very important," or "somewhat important." One question gauged support for a package of planned transportation improvements, including both transit and highway improvements, in six major corridors in the region. The question and results from respondents are shown in Figure 6.

Surveying Citizens to Rank Traffic Problems: Ames, Iowa

The Ames Public Works Department conducted a survey in preparing its transportation master plan to determine potential directions for improvements based on customer opinions. The city developed methods of asking about travel habits by inquiring whether respondents walked, jogged, rode bicycles, or used public transportation, offering the following responses: never, infrequently, weekly, 3 to 4 times per week, or daily. Participants were asked to rate the traffic flow, from very poor to very good, within major traffic corridors and the adequacy of public transportation by route. Participants were then asked whether new facilities were much needed or not needed and were asked for a ranking on each item in a list of potential improvements that would cost more than $1,000,000 each. The results were used in preparation of the city's transportation master plan, completed in 2002 to guide investments over the next 20 years. Participants using the information in the planning process included local citizens, planners, elected officials, business leaders, and the city.

Using Surveys to Determine Issue Importance: Metropolitan Transportation Commission (MTC)

In the San Francisco Bay area, the MTC—the regional MPO—conducted workshops in 2001, supplemented by a web

Transportation agencies have worked with local groups to define transportation improvements for each of these six corridors. This plan includes rail service in each corridor, additional highway lanes in most corridors, and special lanes for express buses and carpools on US 36 and North I-25. It also includes additional trains and parking for the light rail on Southeast I-25 and I-225 and on the existing Southwest light rail line, and extending light rail to Highlands Ranch. With additional funding these projects would be completed within the next 10 to 15 years, which would not be possible without additional funding. Would you support or oppose such a transportation package, which could include new taxes or bonding?

Need More Information 2%
Don't Know 7%
Strongly Support 40%
Strongly Oppose 6%
Somewhat Oppose 7%
Somewhat Support 38%
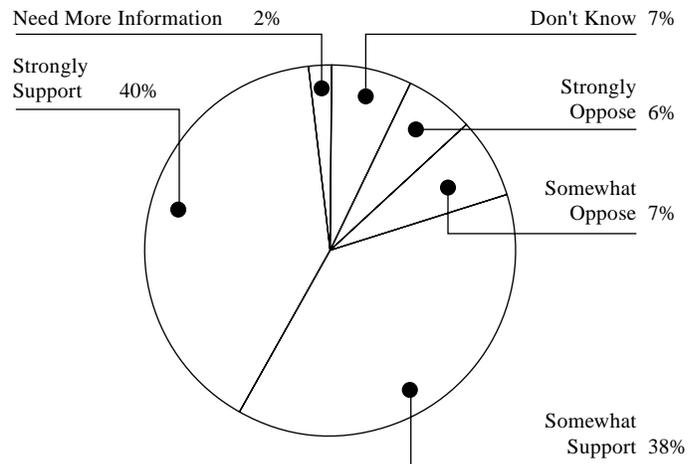
Source: *Transportation Needs in the Denver-Metro Area: Report of Survey Results,* Transit Alliance, 2001.

Figure 6.   Report of survey results—Denver, Colorado.

survey based on the workshop questions. To round out its outreach, MTC conducted a telephone opinion poll in April and May 2001 to determine opinions about issue importance and priorities for dealing with transportation system improvements. The survey began with questions about the relative importance of transportation in relation to other issues, such as education and energy delivery. It continued with questions about relative priorities (high, medium, or low) on

- Widening freeways,
- Expanding local bus services,
- Expanding rail and BART services,
- Adding carpool lanes,
- Expanding commuter express bus services,
- Adding bicycle lanes,
- Expanding ferry service,
- Synchronizing traffic signals,
- Increasing tow truck service,
- Expanding traveler information,
- Expanding ramp metering,
- Implementing a single-ticket or fare card for transit systems, and
- Maintaining streets and filling potholes.

The survey included questions about preferences on the following ways to finance needed improvements: increases in sales taxes, gas tax, bridge tolls, property taxes, vehicle registration, transit fares, and bond authorizations. The survey continued by asking opinions about Bay Area quality of life and transportation issues, managing commercial truck deliveries, improving public transportation, bicycle travel, and respondents' demographic profiles.

Using Surveys to Determine Future Directions

Missouri DOT

For MoDOT, researchers at the University of Missouri-Columbia conducted a constituent service quality survey. The survey consisted of four sections:

- Ratings of satisfaction and future attention for 41 performance areas of MoDOT work,
- Demographics of respondents,
- General questions regarding MoDOT's overall performance and constituents' preferences for future resource allocation, and
- Sources of information about transportation used by respondents and the nature and extent of contact with MoDOT personnel.

A telephone survey using a random digit dialing system was undertaken, resulting in 1,581 usable surveys. The central findings were as follows:

- Missourians are generally satisfied with MoDOT performance, but want greater attention to all performance areas.
- Areas needing most improvement are maintenance and preservation of bridges and existing roads (particularly pavement surfaces), use and distribution of funds, timeliness and speed of project planning, and multimodal options.
- Few differences separate groups based on region, gender, or annual miles driven; however, middle-aged persons, as well as those with higher income and education, tended to express lower levels of satisfaction.
- Missourians depend primarily on mass media outlets for information about the department.

Caltrans

Caltrans initiated a survey in April 2001 by working with focus groups to establish the questions to be asked during an upcoming, large-sample telephone survey. The focus groups were asked to evaluate several aspects of transportation in California according to a scale of 1 to 5, with 5 being the top grade. The evaluation considered the following points: appearance, comfort, affordability, safety, speed, and easy connections. A concern raised by the focus groups was that survey questions should be, so far as possible, open-ended and not simple "yes-no" questions.

Caltrans followed up with a statewide telephone survey of residents in July 2001. The survey consisted of 3,220 completed questionnaires of people who were 16 years old or older, randomly selected throughout the state. Respondents were selected on a geographic basis and stratified after being surveyed by mode of travel, with subcategories of mode use, type of traveling (work, school, or pleasure), professional drivers, and agricultural drivers.

Using information from focus groups that were held to establish survey questions, the survey form included awareness questions about Caltrans versus other state agencies. Questions included, for example, "Who is responsible for the highway system in California?" followed by "Overall, would you say the job they are doing is excellent, good, fair or poor?" Possible answers to the questions were not provided to the respondents. The survey proceeded to ask questions about Caltrans's responsibilities, its performance levels, what it does well or not well, and what it should do in the future—all without prompting specific responses, but accepting what the respondent said and noting it carefully on the survey form.

A second portion of the survey form investigated respondents' priorities on spending transportation funds. Questions included issues such as "Would it be better to improve highways or improve how people drive on the highway?" and "When road construction is being done, would it be better to close the road for one week or do the construction at night and on weekends for 10 weeks?" A third portion of the sur-

vey asked for ratings of specific Caltrans attributes or principles—such as communications with the public, quality of service, and innovations—and a series of questions on personal ratings of highway and transit system performance.

The results of the survey have led to guidance for Caltrans's future activities. Four major policy directions have been identified: celebrate what Caltrans does well (60 percent of respondents have a favorable opinion of Caltrans), focus on unexpected delays in both highway and transit travel, improve public perception of ongoing road construction and repairs, and provide improved choices in public transportation.

Using Customer Surveys to Determine Operations Priorities: Montana DOT

For MDT, researchers at Montana State University in Billings completed 1,005 interviews with randomly selected Montana residents to obtain perceptions about the maintenance of highways in 2000 and to compare the results with the 1998 survey results. The survey divided highway maintenance into eight categories:

- Winter maintenance,
- Maintaining a smooth highway surface,
- Maintenance of roadsides,
- Maintenance of signs,
- Debris removal,
- Rest stop maintenance,
- Striping maintenance, and
- Winter road conditions reports.

Respondents were asked to rank the current state of each of these activities on a 1–4 scale where 1 equals poor and 4 equals excellent. In this ranking, signage was highest, followed by winter roadway information, winter maintenance, roadside maintenance, striping, debris removal, rest stop maintenance, and smoothness of surfaces.

Questions turned to importance of each of the maintenance operations, with the scale of 1 to 4 where 1 equals not important and 4 equals very important. In this ranking, respondents ranked winter maintenance most important, followed by striping, debris removal, surface smoothness, signage, winter roadway information, rest stop maintenance, and roadside maintenance.

The third set of questions asked about allocation of MDT resources with a ranking of 1 to 4, where 1 equals low and 4 equals very high. In this ranking, winter maintenance got the highest resource rating, followed by striping, winter roadway information, surface smoothness, debris removal, rest stop maintenance, signage, and roadside maintenance.

All ratings were combined into a composite variable for each of the maintenance activities. The composite variable provides an indication of the level of attention and resources that the respondents believed each maintenance activity should receive from MDT. Comparisons with the 1998 sur-

vey indicated some slight changes to the relative priorities respondents placed on each maintenance activity. Comparisons were also made between opinions and demographic variables.

Using Customer Preferences as a Guide to Operational Programs: Utah DOT

UDOT prepares its own evaluation of priorities for road improvements, but decided to test its preferences with what customers would like to see. The agency decided to ask its customers hypothetical questions to aid in prioritizing scarce public funding. Questions that were posed in 1,500 survey forms included ratings of current services and concluded with "How would you spend $100 on transportation needs?" Several options were provided as potential answers: snowplowing, litter cleanup, fencing, bridge repairs, asphalt and concrete repair, vegetation control, painting, sweeping and sign repair, rest areas, and so forth. Respondents were asked to evaluate each possibility on a scale of 1 to 5. The survey population preferred painting, sweeping, sign repair, and rest areas as the top categories for improvement. A more durable paint specification is now being developed. The information about priorities is passed on from UDOT to decentralized administrative district offices throughout the state. Surveys are tracked through comment cards at yearly inspections.

BEST PRACTICES IN APPLYING CUSTOMER VIEWS AND OPINIONS

Managing Comments and Queries from Customers and Local Officials: New Jersey DOT

NJDOT has established the Customer Advocacy Office to respond directly to customers who call, e-mail, or fax the agency for information. NJDOT has established a policy that all customer contacts will receive a same-day response to all questions. Staff contacts with customers average 4,000 to 5,000 Internet e-mails and 1,000 to 2,000 telephone calls each month. All mail and other contacts are tabulated to compare or to group with other similar comments. The office sends out approximately 20,000 letters each month to address consumer concerns, keeping a running record of the name and phone number of the individual making the call or contact. For answers that cannot be provided by the NJDOT Customer Advocacy Office, comments and queries are forwarded to the appropriate NJDOT offices where questions can be addressed or to outside organizations such as E-ZPass and Motor Vehicle Services that can directly respond. For project inquiries, a toll-free telephone number is also published. This office is managed by the assistant commissioner for customer outreach, who provides a direct connection to the NJDOT commissioner to facilitate rapid response to customer needs. To manage this volume of contacts from customers with

concerns, comments, and questions, the office is staffed by 30 people.

NJDOT responds to a stated need by local officials for information delivered in a timely way and conducts an outreach program of regular meetings. NJDOT meets with mayors and other local officials, as well as heads of local transportation agencies, to determine concerns and issues that need to be addressed. The visits are a major program for building improved support for NJDOT programs and projects and rapport between officials and NJDOT.

Following Up Regional Meetings with Customer Surveys: Arkansas State Highway and Transportation Department (ASHTD)

ASHTD held a transportation summit in 1998, building on the wide range of ideas and suggestions from the public gleaned from a series of 16 regional meetings. The 16 meetings were held around the state and consisted of brief presentations on the current conditions and future needs of the state highway system. Comments from the audience were accepted in both oral and written forms. More than 1,500 people attended the meetings, and more than 600 written survey forms were received. From this input, data indicated that 86 percent of the attendees were not satisfied with existing progress, and 85 percent would support a new program. Survey participants were also asked about the means of paying for the new program. Responses indicated a range of potential sources of funding, as well as a range of opinion about which sources would be supported. Similar surveys were conducted at the Arkansas Motor Carriers Association and the State Chambers of Commerce and came from other sources such as letters and Internet comments.

Based on this information, ASHTD invited the leadership of organizations with a major interest in transportation to participate. Each organization was assigned to one of six focus groups, and each focus group was charged with discussion of three questions:

- What level of needs do we address?
- How long a program do we develop?
- What sources of revenue do we use?

The focus groups reached consensus on several points:

- Additional funding is needed to meet the needs of the highway system; most groups recommended an additional $400–500 million per year.
- The program should be relatively short-term (4–6 years), accompanied by a long-range plan, and updated periodically.
- Combinations of revenue sources should be considered, including increases to motor fuel taxes, additional fees on heavy trucks, tolls where possible, and bonds to accelerate specific projects.

It was agreed that ASHTD would implement a public education campaign to explain progress on the Highway Improvement Program and how commitments were being fulfilled and to provide information on the need for additional funding and the program such funding would support.

Using a Customer Survey to Prioritize Specific Actions

Florida DOT

FDOT conducted a survey to ask residents, visitors, and businesses what was being done right and what could be done better in providing transportation products and services. FDOT asked more than 5,000 residents, commercial drivers, local government officials, and visitors to complete the survey and found the specific areas that required attention:

- Visibility of roadway striping and markings at night,
- Timeliness of completing construction projects,
- Traffic congestion, and
- Lack of local government input on construction project priorities and design.

Port Authority of New York and New Jersey

The Port Authority conducted a survey of 2000 riders of the Trans-Hudson rail service to determine rider satisfaction with service and to pinpoint areas for change. Over 68 percent of respondents rated the agency's overall service as excellent or above average. Areas targeted for improvement, such as on-time performance, received high scores (62 percent rated it excellent or above average). Results also showed that the agency needed especially to work on the reliability and sound quality of public address equipment as well as the timeliness and helpfulness of train announcements, especially during delays and other service disruptions.

Using a Customer Survey to Test Program Effectiveness: New Jersey DOT

In 2000, NJDOT surveyed its residents for feedback on the state's new motor vehicle registration system, which allows renewals on-line or by phone. New Jersey began the Access-DMV program on a pilot basis, instituting service to the general public in April 2000. No additional costs are required for on-line or phone renewals, and credit cards are accepted for payment. Confidential information, including credit card numbers, is protected by advanced security technologies and by unannounced audits at checkpoints throughout the year.

For the pilot months and April, more than 14,000 people renewed their vehicle registrations over the Internet or by phone. With 8,000 users surveyed on-line after completing

their transaction with the DMV, 99 percent gave the system a favorable rating.

Measuring Transportation Service against Other Services: The Underground, London, England

Measurements of customer satisfaction among transportation providers do not often include comparisons with other service providers, such as banks and supermarkets. The London Underground, however, does benchmark its performance against other nontransportation providers. The agency has initiated a series of actions to measure satisfaction, make necessary improvements and changes to meet customer needs and expectations, and let the public know what is being done.

Despite dramatic improvements in customer satisfaction between 1990 and 1995, the Underground has struggled to maintain high levels of customer satisfaction as demands on the system increased and the technology gap has widened in some areas. To find out about customer needs, the agency interviews and meets with the London Transport Users' Committee, the statutory watchdog group representing users, environmental interest groups, and business groups and associations. In addition to these structured meetings, London Underground uses "mystery shoppers," or field workers trained in observation conducting independent audits. In secret, they observe and score detailed aspects of London Underground's non-time-related service. "Help point" stations located on the platform provide riders with an opportunity to talk to a staff member for routine information, to comment on service, or to report an emergency. "Reputation audits" are surveys that measure the corporate reputation of London Underground, conducted through quantitative interviews with customers, London-based nonriders, members of Parliament, trade union leaders, and others. Polls and Internet-based customer comment cards are also being used to get customers' views on new and potential service developments. Finally, London Underground publishes the results of its customer satisfaction ratings and how it ranks compared with other rail transport service, banking, and supermarkets on its website and in print.

Integrating Sources of Data: Pennsylvania DOT

PennDOT used a combination of telephone surveys, on-site traveler interviews, focus groups, and face-to-face interviews to prepare its 25-year strategic plan. This combination was chosen to reach out beyond the relatively small number of people affected by transportation projects, to reach the larger public that needs and uses transportation services every day.

PennDOT surveys customers annually to measure agency performance levels in every county. Surveys are mailed to 100 individuals in each of the state's 67 counties. This sample size is considerably larger than prior surveys to give the agency a better idea of what its customers want and to provide direction for specific improvements in each county. The sample size was based on focus groups. PennDOT conducted a survey to detail the survey form.

Annual survey questions cover 24 issues, and customers are asked to rank PennDOT services on interstates, numbered routes, and secondary roadways. Overall grades are solicited for ride quality, traffic flow and safety, levels of maintenance in each county, and PennDOT's performance as a service agency.

Results of the annual surveys between 1995 and 2000 led to improvements based in part on what customers have told the agency. These improvements include

- Smoother rides because of revised concrete specifications,
- Incentives to contractors who provide long-lasting asphalt,
- The toll-free customer hotline, and
- Roadway weather information system stations.

Supplementing the annual survey, every other year PennDOT undertakes a Quality Use Importance Knowledge (QUIK) telephone survey, which assesses the perceptions of a representative sample of customers regarding

- Quality of transportation services,
- Use of transportation services,
- Importance of various transportation services, and
- Knowledge about available services.

Integrating Sources of Data: California DOT

Caltrans set up a process guided by in-house staff to undertake integrated surveys and to base its goals for the future on the results of surveys from a combination of sources. Caltrans established an external survey committee to guide and nurture a comprehensive survey of state residents. The committee developed a three-pronged approach to gathering data about customers, including multiple focus groups around the state, a series of statewide external customer surveys, and a set of internal employee surveys. Information from these surveys was drawn together in mid-2002 as a basis for Caltrans's long-range goals and to incorporate customers' preferences as a basis for the agency's general mission to improve mobility across California. Based on this information, Caltrans set the following crosscutting goals to guide future actions:

- Safety—achieve the best safety record in the nation.
- Reliability—reduce traveler delays due to roadwork and incidents.
- Performance—deliver record levels of transportation system improvements.
- Flexibility—make transit a more practical travel option.
- Productivity—improve the efficiency of transportation.

Caltrans anticipates using the goals to inspire and focus action toward accomplishment of its mission. The goals will be backed by specific action plans that will be updated annually.

Surveying Customer Reactions to Changes in Ramp Metering: Minnesota DOT

In the fall of 2000, MnDOT conducted a test of the effectiveness of freeway ramp metering in the Minneapolis/St. Paul region. The test involved turning ramp meters off for several months, then assessing several indicators, including whether the benefits of metering outweigh the impacts and associated costs and public attitudes toward metering. Measurements of ramp metering impacts took place in September and October with ramp meters working and then in the remainder of the fall without ramp meters in effect. Evaluation measures included traffic volumes and throughput, travel time, reliability, safety, emissions, fuel consumption, and benefit-cost analysis. All categories except fuel consumption were improved by activation of ramp meters. (Fuel consumption is greater when vehicles wait on ramps to enter freeways.)

To test public attitudes, MnDOT conducted traveler surveys and focus groups to elicit perceptions of ramp meter operations and the impact of shutting down ramp meters on travel patterns. Surveys included a random sample of area travelers, with four corridor-specific samples related to other data-gathering efforts. Samples were split equally between experiences "with meters" and "without meters." Although the results of the surveys and focus groups supported the general findings that benefits of ramp metering outweighed impacts and costs, customers were not completely happy with the ramps. Customer preferences included specific changes that users would like to see, and, based on these expressed customer preferences, the following changes were made:

- The operating time frame of ramp meters was reduced,
- Meters were allowed to change more quickly from red to green, and
- Several meters were kept at flashing yellow.

In addition, the study recommended that MnDOT develop a policy for optimizing ramp meter operation, monitoring ramp wait times, optimizing freeway travel time and its reliability, reducing crashes, and undertaking market research to identify changing traveler perceptions. More generally, the study recommended that MnDOT respond to the public's need for information on traffic management strategies.

Using Surveys to Elicit Perceptions of Equipment Performance: Minnesota DOT

Recognizing the need for improved information from customers experiencing crashes on rural roads, MnDOT explored a Mayday Plus system to provide a direct voice and data link from a disabled vehicle to emergency dispatchers in southeastern Minnesota. The system combined cellular telephone technology with global positioning systems. Six detailed test plans were used to evaluate the system, including one on perceptions of Mayday Plus. The perceptions of participants in an operational test were surveyed before and after the test. Participants included emergency dispatchers, AAA dispatchers, rural metro dispatchers, scheduled test volunteers, and general public volunteers.

Survey results, both before and after the operational test, were tabulated by type of respondent. For example, volunteers using the test equipment were asked several questions regarding the Mayday Plus system and equipment before and after the operational test. The majority of volunteers responded that the Mayday concept was easy to operate and would provide a faster response from emergency service providers. Volunteers reported that Mayday Plus would make traveling in rural Minnesota safer and easier, as shown in Figure 7.

Using Customer Surveys to Identify Problems and Test Solutions

Los Angeles, California, Metropolitan Transportation Authority

The Los Angeles MTA surveyed residents using bilingual (English and Spanish) questionnaires to identify problem areas that affect safety at grade crossings along the Metro Blue Line train tracks. Customers identified the following problems:
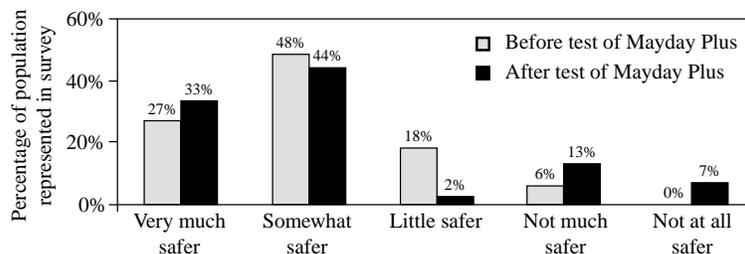
Source: *Mayday Plus Operational Test: Evaluation Report,* MnDOT, 2000.

Figure 7.   Perception of safety on road with and without Mayday Plus.

- Drivers and pedestrians do not understand that trains get to the intersection within 20 seconds after lights start flashing.
- Drivers try to "beat the train" by driving around lowered crossing gates.
- Drivers and pedestrians do not understand that two trains can go through an intersection at the same time.
- There are not enough barriers to keep pedestrians and children off the tracks.

Along the Blue Line, the MTA set up several test programs in response:

- Since photo-enforcement of violations of railroad grade crossings showed a 92-percent decrease in violations at three sites on the Blue Line, the program was expanded to all crossings on the line.
- Wayside horns at the intersections provide a final warning to clear motorists and pedestrians from the danger area. Noise impact measurements were made, and focus groups evaluated the improvements.
- Train-activated "second train" warning signs were evaluated by focus groups to evaluate words and graphics for signs and for evaluation of risky crossing behavior recorded by videos.
- Pedestrian gates were tested to determine effectiveness. Swing gates, opened by pedestrians and closed by gravity, were installed and evaluated by interview surveys with 255 pedestrians.

Ames, Iowa

The city of Ames investigated the concept of installing directional automatic horns at railroad crossings in preference to the train-mounted horns that caused considerably more noise impact on city residents. The new horns are activated as trains approach and are directed toward the roadway and not broadcast over a wide area. A survey of residents of the city was conducted to determine the "before" and "after" results of installing the directional horns. The results were that 74 percent of respondents believed that the noise impacts of the new horn installations helped in alerting those crossing the rails, and 89 percent (primarily those within 500 feet of the rail crossing) said that the installations have led to an improved quality of life. Similar reactions were reported for changes in the impact of the new automated train horn sounds during the night: 80 percent found the noise disturbing or "very disturbing" prior to the installation, and only 6 percent found it a problem afterward. The overall impact was that 87 percent of residents believed that noise from train horns was a problem before the installation, and 13 percent believed it a problem after installation.

Surveying Customer Perceptions of Service: New York City MTA Bridges and Tunnels

In 1997 and again in 1999, MTA Bridges and Tunnels surveyed its customers to determine satisfaction levels with operations at its 10 toll facilities. The survey was administered randomly by mail to 27,000 E-ZPass subscribers and by handout to 40,000 cash customers at each facility. Survey findings showed that customer satisfaction rose between the two surveys and that E-ZPass customers were more satisfied with service than cash customers were.

Recommendations based on the survey included targeting high-use cash customers to increase E-ZPass membership, improving E-ZPass operations through more E-ZPass toll lanes, and better marking of E-ZPass lanes. For each facility, specific findings varied, but included satisfaction with appearance, cleanliness and lighting, and dissatisfaction with efficiency and safety. Because data were available by facility, specific recommendations for each facility were possible; they included improvements needed in efficiency of crossing, safety, physical conditions, road signing, cost-value perceptions, lighting, toll plaza personnel, and appearance.

BEST PRACTICES IN COMMUNICATIONS WITH CUSTOMERS

Using Surveys to Determine Awareness of Agency Plans and Programs: Alaska Department of Transportation and Facilities (ADTF)

In Alaska, the Department of Transportation and Facilities conducted a customer survey to determine familiarity and public satisfaction with Alaska's transportation and other facilities and awareness of planning efforts concerning those facilities. The survey was completed by telephone interviews based on random selection of telephone subscribers listed in the most current directory for each community. After respondents gave opinions about their satisfaction with these facilities, they were asked if they were aware of various state transportation planning efforts and whether they had participated in any of the planning efforts. Only 15 percent of respondents were aware of the state's efforts to develop a new transportation plan; of those aware, only 16 percent had ever personally participated in preparation of this or other planning efforts.

Reporting Information on Customer Preferences: Florida DOT

FDOT developed and distributed a report card that included performance measurements of its service delivery. FDOT found that the media responded to the report card, especially when the report card was combined with asking people for opinions about the agency and its self-evaluation efforts. Figure 8 shows the format used to present the report card to

Florida DOT Has Completed the First Phase of Customer Satisfaction Survey

The Florida Department of Transportation is responsible for maintaining the State Highway System. This includes major roads, such as interstates and highways with the U.S. or state road numbers. While comprising only 10 percent of the centerline miles in Florida, the system supports 66 percent of the daily vehicle miles traveled (VMT).

From November 2000 to February 2001, over 5,000 Floridians and visitors to our state responded to our Customer Satisfaction Survey. They rated their satisfaction with several aspects of the State Highway System, which included the visibility of roadway signs and markings, construction zones, traffic flow, rest areas, and airports, and overall satisfaction with the system. The survey results helped the department identify areas where it can make improvements to Florida's highways and provide initial benchmarks against which changes can be measured in subsequent surveys.

While the overall results were favorable, the respondents of all groups identified some specific areas that required attention:

- Visibility of roadway striping and markings at night
- Timeliness of completing construction projects
- Traffic congestion
- Seeking government input on construction project priorities and design

Table 1 summarizes the percentage rates of "Satisfied" and "Very Satisfied" on each area. Tables following Table 1 provide detailed information on the areas.

Table 1	Percentage of Respondents Who Were "Satisfied" or "Very Satisfied"				
Area	**Statewide**	**Residents**	**Commercial Drivers**	**Government Officials**	**Visitors**
Road signs, markings	86	83	83	N/A	92
Construction zones	71	65	72	77	N/A
Traffic flow	63	56	54	61	81
Rest areas & airports	87	N/A	N/A	N/A	87
State highways overall	78	73	76	77	85

Table 2	Percent Satisfied with Road Signs and Markings			
Item	**Statewide**	**Residents**	**Commercial Drivers**	**Visitors**
Spacing of exit & crossroad signs	86	87	82	89
Overall visibility of road signs	92	89	89	97
Readability of road signs	92	88	N/A	96
Daytime visibility of roadway striping & markings	92	89	90	96
Night visibility of roadway striping and markings	72	63	71	81

Figure 8. Sample material from FDOT 2000 customer satisfaction survey, Report Card of Agency Performance.

Table 3   Percent Satisfied with Construction Zones

Item	Statewide	Residents	Commercial Drivers	Government Officials
Construction signs	88	80	89	95
Construction zone markings	90	86	90	93
Safety	71	65	69	79
Access to local businesses	51	43	N/A	59
Timeliness of completion	39	32	34	50
Completed construction projects	83	81	80	87

Table 4   Percentage Satisfied with Traffic Flow

Item	Statewide	Residents	Commercial Drivers	Government Officials	Visitors
Time to travel within local cities or towns	65	57	52	68	81
Time to travel between local cities or towns	72	67	68	66	86
Traffic congestion	53	44	43	48	76

Table 5   Percent of Visitors Satisfied with Transportation system

Item	Visitors
Florida highways compared to home state	90
Cleanliness of rest areas	94
Adequate number of rest areas	77
Rest area safety	93
Vending services at rest areas	74
Florida airports compared to home state	87
Access to and from airports	88
Overall experience with airport	94

Table 6   Percentage Satisfied with State Highway System Overall

Item	Statewide	Residents	Commercial Drivers	Government Officials	Visitors
Visual appeal	74	75	N/A	62	84
Overall safety	84	76	82	88	89
Overall road smoothness	77	71	69	77	92
The highway system	76	69	78	80	75

Table 7   Percent of Government Officials Satisfied

Item	Government Officials
Ability to obtain information from FDOT	85
Advance notice on construction projects	83
Construction projects do not disrupt the community	73
Seeking input in establishing priorities	63
Seeking input during design or roadway projects	59

    * N/A = question not asked on this survey.

Figure 8.   *Continued.*

Florida customers. The report card was also discussed through a road show of presentations to MPOs and other organizations. Results were presented on the FDOT website, along with methodology, district breakdowns, and comparisons among customer groups within each area. Media representatives, interested parties, and FDOT staff had full access to the results. FDOT is working to show staff members the links between their jobs, the performance ratings of the agency, and what customers think.

Distribution of Information Directly to Customers

Oregon DOT

ODOT issues a quarterly report to stockholders (Oregon taxpayers) describing its progress through the preceding 3 months. The report is available on the ODOT website and distributed in newsletters. Routine reports include the following:

- MV Customer Service Recap, or "DMV by the Numbers," describes the volume of work the agency processed during the quarter, in terms of
  - Driver's licenses issued or renewed;
  - Skill (on the road) tests administered;
  - Knowledge tests by computer, written, oral, and audio examinations conducted;
  - Vehicle titles issued;
  - Law enforcement records supplied;
  - Customer telephone calls answered;
  - Average DMV field office wait time; and
  - Volume of contacts made: nearly 1 million external customer contacts reported.
- ODOT motor carrier staff describe quarterly activities in terms of
  - Volume of contacts made: nearly three-quarters of a million customer contacts;
  - Trucks inspected, registered, or both;
  - Citations issued; and
  - Trucks weighed in static scales.
- ODOT maintenance crews quarterly activities include
  - Lane miles of highways striped,
  - Lengths of guard rail installed,
  - Tons of asphalt laid,
  - Tons of sand used,
  - Dollar value of emergency maintenance performed,
  - Dollar value of bridge maintenance and repair work,
  - Dollar value of snow plowing, and
  - Number of bridges inspected.
- ODOT construction projects are reports in terms of
  - Dollar value of construction projects completed,
  - Number of active projects underway,
  - Quarterly payments to contractors, and
  - Number of bridges inspected.
- ODOT rail division activities are reported in terms of
  - Number of rail cars inspected,
  - Number of locomotives inspected, and
  - Miles of track inspected.
- Money savings are reported in terms of
  - Travel time savings and
  - Recycling by employees.
- Public inquiries and assistance are reported in terms of
  - Calls on ODOT toll-free citizens' representative line and
  - Data on annual transportation volumes.
- Delay reduction is reported in terms of
  - Assistance to disabled vehicles,
  - Incidents caused by crashes,
  - Debris removed, and
  - Vehicles tagged or towed from principal routes.

Montana DOT

In Montana, MDT reports on program accomplishments and performance measures on a fiscal year basis. Each year, MDT publishes information on the following:

- Winter driving conditions in terms of annual
  - Miles of roadway plowed,
  - Gallons of deicer used,
  - Yards of sand used, and
  - Hours of plowing involved.
- Reactive or preventive maintenance to ensure the safe, efficient movement of goods and services on over 19,500 lane miles of roadways in terms of annual
  - Square feet of potholes filled,
  - Square yards of patching finished,
  - Miles of crackseal put in place,
  - Square yards of chipseal used, and
  - Dollar value of overlay used.
- Pavement striping of approximately 19,500 lane miles of roadway depending on conditions, traffic volumes, and other factors in terms of annual
  - Gallons of paint,
  - Pounds of beads,
  - Number of miles striped,
  - Number of rest area sites maintained (approximately 35),
  - Number of caretaker contracts revised,
  - Amount of additional cleaning equipment purchased, and
  - Amount of training in usage of equipment.

Federal Highway Administration (FHWA)

In 2001, the FHWA distributed the results of three national surveys conducted in 2000 to measure public satisfaction with the nation's highways and with community transportation systems. These surveys were the Operations and Planning/Environment Survey, Infrastructure Survey, and Federal Lands Highway Survey. The Infrastructure Survey repeats many questions from the 1995 National Highway User Survey to allow comparison of results over the 5-year span. Information from the surveys is attractively presented in FHWA's report, *Moving Ahead: The American Public Speaks on Roadways and Transportation in Communities.* An example of the presentation graphics from the report is Figure 9.

Publicizing and Testing Public Transportation Alternatives: Boulder, Colorado

In Boulder, a city council initiative promoted public transportation alternatives and surveyed customers to evaluate the altered public image of transit after making specific, well-promoted service changes. Service was promoted to capitalize on community awareness of the relationship between public transportation, land use, and clean air and water. The "GO Boulder" project was designed to promote public transportation. The revamped service, called "Hop, Skip, and Jump," served the most popular destinations, improved the design and comfort of the buses (small, bright colored shuttles), made service more direct and frequent (every 6 min-
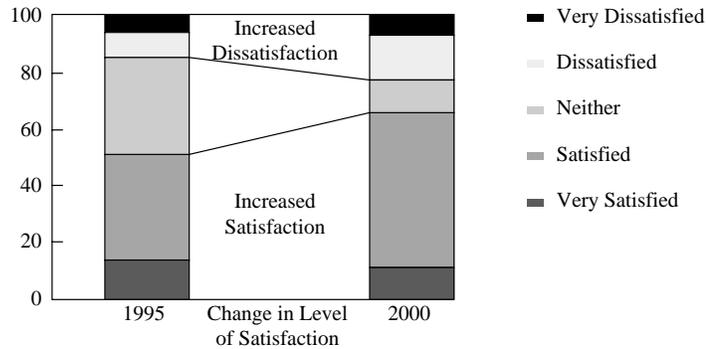
Satisfaction with major highways used most has increased 15 percentage points since 1995, while dissatisfaction has increased 6 percentage points.

Today, fewer travelers have neutral attitudes than five years ago.

Source: Infrastructure Survey (2000)
NQI National Highway User Survey (1995)
as cited in *Moving Ahead: The American Public Speaks on Road Ways and Transportation in Communities, 2001,* FHWA.

Figure 9.   Report of nationwide customer survey—Federal Highway Administration.

utes), and created an unlimited-access pass (ECO Pass). The results of the program include a 300-percent increase in ridership by groups using bus passes and additional financial support for public transportation.

Using Surveys to Determine Satisfaction with Specific Services: Washington State DOT

WSDOT conducted a satisfaction survey in 1998 on services provided by its ombudsman's office. This office has a goal of ensuring that people are heard by those within the DOT who have decision-making authority and that they receive thoughtful, appropriate, and timely responses to their inquiries. The ombudsman's office receives citizen inquiries in three ways: by letter, by e-mail, and by telephone. A random sample of 50 contacts from each category was selected, for a total sample of 150 who were sent a questionnaire by mail or e-mail, or contacted by phone.

From the survey, the office learned that

- Too many people who contacted WSDOT with concerns did not hear back promptly,
- People did not always understand the office and other offices and agencies,
- Referrals made to other agencies may be falling between the cracks,
- People did not understand that they could come back if they remained dissatisfied, and
- People were not always aware of the powers and limitations of the office.

Actions taken to address the findings of the survey include the following:

- Databases are tracking all correspondence and calls to the office to identify overdue responses and send reminders;

- WSDOT is partnering with other agencies to reinforce the sense of urgency for responses to inquiries;
- The office will more closely follow up on inquiries; and
- The office will place more emphasis on clarifying its role, responsibilities, and capabilities.

Evaluating Satisfaction with Information Offered: Virginia DOT

In 2001, VDOT conducted a survey of its customers using a variety of techniques. These included

- 1,500 resident phone interviews statewide,
- 6 focus groups of residents and 6 discussion groups of community advisors in 3 locations,
- 34 transportation executive interviews,
- 90 public officials surveyed,
- 327 new stories analyzed, and
- 92 publications reviewed.

Results of the survey showed that customers have a neutral or positive perception of VDOT and that some know very little about the agency and its operations. Improved flow of information was cited as a major opportunity for VDOT to change perceptions from neutral to positive. Among perceptions that could be changed by improving information were the following:

- Employees are perceived as professional, knowledgeable, and honest, but are frequently slow and technical in giving responses.
- The agency's structure limits internal communication between employees.
- Communicating is a job for everyone at VDOT and not just the public relations staff. All employees communicate VDOT's image and contribute to its reputation.

- Customers want more involvement in decision making and more communication to support participation.
- Customers want information to be available from a variety of sources.

Goals based on the findings of the research include a major effort to restore VDOT's credibility with customers by providing accurate and timely information. This effort includes improving outgoing information and responses to inaccurate media coverage. Goals also include building VDOT's image of "One Virginia, One VDOT, One Voice," by developing and branding its identity, as well as developing consistency in communications with key messages, media relations training, conflict management, public participation techniques, and a communications protocol to clarify roles and responsibilities.

Assessing Customer Satisfaction with Services: San Francisco BART

BART conducts periodic customer satisfaction surveys to gauge how well it meets the needs of its riders. The surveys provide information on 43 service characteristics, ranging from on-time performance to station cleanliness. BART uses these specific service characteristic ratings to help set priorities for new initiatives. In the 1998 survey of more than 5,000 customers selected randomly aboard trains, 74 percent said they were satisfied with the services provided by BART, and another 13 percent were neutral. These results spanned all demographic groups, including customers of all ages, ethnicities, income levels, genders, and disability status. However, declines were present in the "very satisfied" category and in customers' perceptions of whether BART constituted good value for the money. Results also serve as an early warning system regarding important customer service issues, including

- Out-of-service escalators and elevators,
- Problems with ticket vending machines and fare gates,
- Train cleanliness and appearance,
- Availability and responsiveness of personnel, and
- On-time performance of trains.

Detailed information on the survey results was made widely available to the public, including posting on the BART website.

Using Surveys of Customer Needs to Support Agency Programs: Arkansas State Highway and Transportation Department

After attempts to obtain funding for a highway program failed in 1997, ASHTD conducted customer satisfaction sur-

veys to determine next steps. The survey investigated customer satisfaction with the department, asking customers' opinions of what the department should improve. Sixteen regional meetings were held to introduce the issue. Survey forms were distributed at these meetings, assisted by the state's chambers of commerce and supplemented by newspaper distribution. A total of 1,500 survey forms were distributed to representative districts throughout Arkansas late in 1997. The results showed public support for funding the original proposal, interstate highway rehabilitation, but showed that customer priorities included additional improvements on noninterstates and that they would support new taxes or other funding mechanisms to pay for the improvements.

Using the results of the survey, the department was successful in getting a bond issue for interstate improvements (the first for the department in 50 years), and also obtained gasoline tax increases for other improvements. The gasoline tax increases, phased in over 2 to 3 years, totaled 7 cents per gallon, with 4 cents per gallon going to repay bonds, and 3 cents per gallon dedicated for noninterstate highway improvements.

Using Objective and Subjective Research in Evaluation: Minnesota DOT

In 1999, MnDOT conducted a survey of before-and-after effects of new "countdown" pedestrian signals.

In Phase I of the study, the objective research consisted of observations of pedestrians crossing the streets in the intersections prior to the introduction of the new signals. Six intersections were chosen for their historical and current traffic, as well as a desired demographic mix. Phase I repeated the observations after installation of the new signals for an "after" view of pedestrian behavior. Each crossing was classified by the degree of success pedestrians had in crossing the street (successfully crossed with either an appropriate or inappropriate start) within the time allotted to the pedestrian signal phase.

In Phase II of the study, surveys of individuals using the same intersections were conducted after the introduction of the signals and after they had crossed the street. These individuals were surveyed to participate in a brief interview regarding their subjective views on the new countdown pedestrian indications (flashing hand with numeric countdown).

Results of the survey showed that nearly 80 percent of the pedestrians favored the new crossing signals. Seniors (65 years of age or older) were the most reluctant to prefer the new signals, in large part because of the confusion or lack of understanding of the meaning of the new signals' flashing hands and countdown numbers. Yet the objective research showed that in all age groups—seniors, other adults, and teens—the percentage of successfully completed crossings with appropriate starts increases with a pedestrian indication showing a flashing hand with a numeric countdown.

CHAPTER **7**

CASE STUDIES OF CUSTOMER ANALYSIS IN AGENCY WORK

Case studies for this publication have been chosen from a variety of sources. The best practice examples have been mined for further analysis, in both transportation and non-transportation fields. Case studies are essential in the process of developing guidelines for practitioners. They help glean useful approaches, illustrate effective practices, and demonstrate innovative approaches.

Criteria for selecting case studies have been developed as follows:

- Applicable for general transportation agency work;
- Illustrates benefits from focus on customers and market segments;
- Customer-based techniques of research;
- Significant longitudinal history (e.g., not a 1-year project);
- Proven cost-effectiveness;
- Recent dates (work accomplished or underway within the last 5 to 6 years);
- Potential comparisons with private-sector examples; and
- Variety of approaches, including programs that are fully integrated into agency work, use a step-wise progression of activities, and emphasize more than a single activity.

The case studies that follow were chosen because they met nearly all of these criteria. They include examples from Pennsylvania, Minnesota, California, Missouri, New Jersey, Florida, Oregon, and Colorado (Boulder).

CASE STUDY 1: PENNDOT

PennDOT has a long history of addressing consumer needs, customer service and satisfaction, productivity improvements, performance indicators, quality improvement, and employee involvement. PennDOT uses customer information to drive its decision making. For example, with data from customer surveys, PennDOT redirected funding from construction of new highways to rehabilitation of old highways. Using information from another survey, the agency developed customer standards for driver's license centers.

The PennDOT agency approach has evolved over 20 years of experience and attachment to the quality programs promoted by a public-private partnership that includes the American Society for Quality, the National Institute of

Standards and Technology, and the U.S. Department of Commerce. PennDOT follows guidelines of the Malcolm Baldrige National Quality Award, which presents an annual Baldrige Award to practitioners in quality programs. The Baldrige approach stresses these qualities: leadership, strategic planning, customer and market focus, information and analysis, human resource management, process management, and business results. PennDOT has used the framework of Baldrige elements to involve customers and improve internal processes to give better service.

Leadership, the first Baldrige element, is closely related to the success of PennDOT in implementing customer strategies. Beginning in 1978, a reform governor set PennDOT on a course of improvement that has continued without interruption for almost 25 years. Successive governors—Republican and Democrat alike—have supported the actions and approaches of the agency.

Employee involvement in agency improvement was an early key. The agency initiated immediate goals for improving quality of employee performance within the agency and developed performance indicators in the early 1980s based on improved data flow and the use of a report card system of progress in key indicators of PennDOT's work. Internal value systems began to change because of positive improvements in agency productivity. To improve internal work flow and upgrade customer service levels, PennDOT surveyed employee attitudes as a prominent step toward improved productivity. Five elements of successful employee involvement were used: top management commitment, a proactive steering committee, training, recognition, and actions to institutionalize the process.

PennDOT began strategic planning in the 1980s, and the planning effort was updated in 1997 and revised in 2000. The current version, Moving Pennsylvania Forward, is based on responses from focus groups and surveys of customers, suppliers, and partners. The plan documents the agency's basic approach to its work:

- Maintenance first—make the smartest choices to take care of the transportation system.
- Quality of life—transportation matters in people's lives.
- Mobility and access—get there safely and on time.
- Customer focus—if it is important to the customer, it is very important to PennDOT.

- Innovation and technology—make life easier and more enjoyable.
- Safety—enjoy the ride; come back again.
- Leadership at all levels—quality employees are absolutely committed to the customer.
- Relationship building—listen to customers, partners, and suppliers who can take PennDOT to new levels.

The strategic plan provides the broad context for PennDOT's Statewide Long-Range Transportation Plan, which is based on 10 goals to be implemented by 30 objectives for actions where state progress can be measured. The 30 objectives were tested in 2001 with first-year performance measures and targets contrasted with levels of achievement. A report on these achievements was prepared to illustrate advances made by PennDOT in implementing the objectives. Of the 46 targets associated with the 30 objectives, 30 were met or were progressing on schedule. Nine were not met, or were behind schedule. Data for three objectives were not reported by work units responsible, and progress toward four objectives could not be measured until the end of 2001.

Business plans are based on the strategic plan for subunits within PennDOT, such as the 10 engineering districts. For example, the 2001 Business Plan for District 10 outlines strategic focus areas as a structure to demonstrate key business results, high-level goals, a scorecard, and action items and strategies to meet proposed targets. Innovative ideas and best practices are highlighted. A responsible person is designated for each action item and strategy to ensure that the work will be completed. These employees become "owners"

of core business areas, with each having a target performance level to attain. Employee performance reviews reflect degrees of support and attainment of the business plans.

A customer and market focus, along with a database of information for analysis, has been developed by PennDOT using several elements. These elements include customer segmentation procedures; an annual customer survey of road maintenance quality; a biennial customer survey to determine important services and current levels of performance; surveys of municipal governments, utilities, and internal customers; an organizational climate survey of employees; and market research to establish customer service standards in motor vehicle and driver's license sites.

Customer segmentation procedures have been developed with employees in mind. A PennDOT training process and guidebook, *Segmentation . . . A Proactive Process*, helps employees understand and implement segmentation processes. PennDOT has developed the training program to institute basic changes in organizational attitudes toward customer service. The program helps employees pay attention to customer segments and better understand the needs and requirements of the customers in each identified segment. An example used to demonstrate the value of segmentation is the changing of hours of operation that are based on customer needs. PennDOT driver's license centers now have Saturday hours, welcome centers have expanded evening hours, and nighttime construction is performed more than before.

PennDOT administers annual and biennial customer surveys to plot the "Voice of the Customer" (see Figure 10). To evaluate customer satisfaction with its performance in road
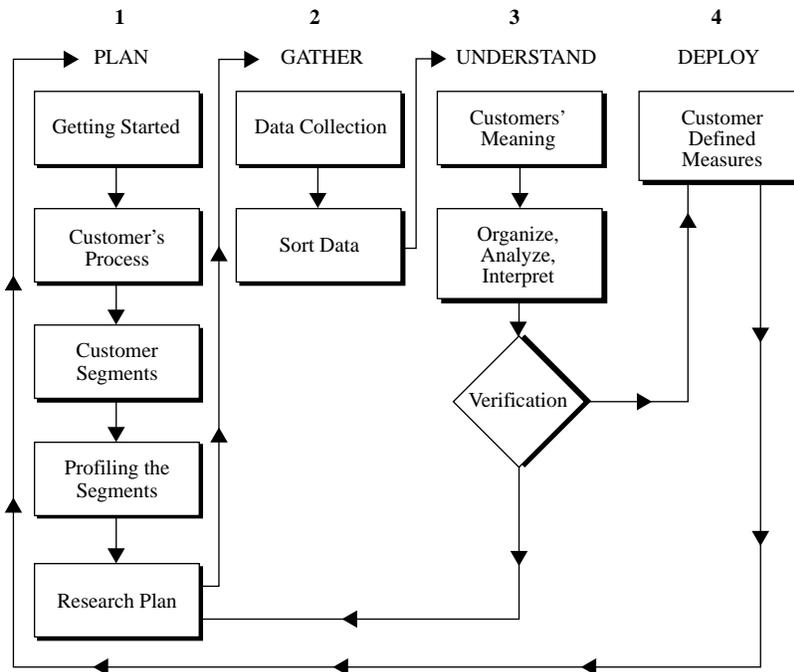

Figure 10.   PennDOT: Voice of the customer process.

maintenance, PennDOT conducts an annual County Maintenance Customer Satisfaction Survey. In 2001, the survey was sent to 1,000 randomly selected licensed drivers in each of Pennsylvania's 67 counties, for a total of 67,000 individuals. The survey format was based on prior results from similar surveys, where customers indicated specific concerns by responding to 24 questions, aggregated by PennDOT under three categories: safety (safer), traffic flow (swifter), and ride quality (smoother). In the customer satisfaction survey, participants are asked to give a grade (A, B, C, D, F) for PennDOT's maintenance performance on three distinct types of road (interstates, traffic routes, and secondary roads) in each county. As an aid to participants, PennDOT identified roadway types using roadway names within the county of residence.

Surveys Drive Policy

One of the results of the PennDOT County Maintenance Customer Satisfaction Survey in 2001 was a renewed emphasis on maintenance. After 17,478 customer survey forms were evaluated, results were clear. Based on low statewide grades for highway maintenance, the agency moved one-third of the funding for new construction projects into rehabilitation of existing roadways.

The maintenance customer satisfaction survey produced the following statewide findings:

- Safety grades were highest for interstate highways (B) and lowest for secondary roads (C); traffic flow grades were the same for each type of roadway (B−).
- Road quality grades were highest for interstates (C+) and lowest for secondary roads (C−); the statewide performance grade is a C+ and very close to a B−. Although nearly 50 percent of respondents gave PennDOT high grades, very low grades were received from about 12 percent of customers.

Differences between customer segments were as follows:

- There was no meaningful difference in customer attitudes by gender of respondents.
- Grades improve with customer age: the highest grades came from those who were 60 years or older.
- Suburban residents may have been less satisfied than those who live elsewhere may have been.

The results of the County Maintenance Customer Satisfaction Survey in 2001 came from 17,478 forms returned to PennDOT by state residents. Survey results were tabulated for attitudes about roadway maintenance in individual counties, in PennDOT districts, and statewide. Customer segments were tabulated to portray differences between respondents by gender, age, and location of residence. PennDOT prepared a final report for the 2001 customer satisfaction survey to show overall performance grades in 29 different maintenance areas, tabulated to show overall grades in safety, traffic flow, and ride quality, and plotted in tables and graphs for each county and

district. Statewide results were based on a summary of district results, supplemented by responses from customer segments based on gender, age, and location of residence.

A supplementary customer survey is the biennial Quality Use Importance Knowledge (QUIK) survey, administered by Pennsylvania State University. Approximately 1,100 customers are contacted by telephone to determine which transportation services are most important to them, along with an opinion of agency performance in those areas. Following the survey, PennDOT staff analyzes customer comments and prepares an action plan to implement customer requirements. Customer performance ratings of PennDOT's services, revealed through customer surveys, are presented in an annual customer service index (CSI). Feedback from the QUIK survey has resulted in new initiatives. For example, customer requests led to a toll-free maintenance hotline to call from anywhere in the state to report maintenance concerns on state roads.

The CSI is a tool for PennDOT staff to monitor and evaluate customer perceptions of the agency's service delivery system. The service delivery system is defined as all the components, physical and procedural, that PennDOT has at its disposal to meet customers' needs. The CSI shows how customers are affected by PennDOT's maintenance and other activities. It also can be used to show how well the support bureaus within the agency provide services to the operational departments. To assist employees in understanding the methodology of finding, analyzing, and using information about customers, PennDOT has prepared a detailed manual, *CSI—Customer Services Index: A Guide to Measuring Customer Satisfaction.*

The Center for Customer Surveys has been established within PennDOT to provide technical expertise to DOT managers and employees in the development and analysis of optically scanned surveys, telephone surveys, written surveys, and focus groups. PennDOT annually trains approximately 50 employees in how to construct, administer, and analyze customer surveys. The training process extends to all counties and PennDOT districts and bureaus.

Internal surveys of PennDOT employee needs help make specific improvements in human resource management, process management, and business results. Investigations focus on an annual employee survey, the Organizational Climate Survey, conducted annually from 1994 to 1998 and biennially since 1998, to measure the working climate within the organization. About half of the agency's employees are surveyed each time, and responses are confidential. Employees at all levels are surveyed, from road crews to executives. The survey measures the climate for participation, safety, stress, teamwork, quality of supervision, and many other factors.

The agency also works to encourage employee involvement in its pursuit of quality work. Since 1990, the agency has maintained an Employee Involvement Steering Committee to work on solving problems encountered by employees. Recognition of employee work is provided through formal

presentations, newsletters, periodic video programs (where employees explain and demonstrate their improvement), special recognition days, and nonmonetary awards for employee and team achievements. Specific processes in use include quality circles, quality breakthrough teams, and less formal approaches, including brown bag lunches to meet and discuss issues and management by walking around.

Training has been a major element in employee involvement. The PennDOT Transportation University has been reorganized to reflect employee needs. Once a small but traditionally structured group of six employees within the Bureau of Personnel, the university is now woven more directly into the PennDOT working structure. The university has eight colleges, with one devoted to customer and partner services. Adjunct faculty members, specialists in functional areas of the department's operations, provide the training, supplemented with highly qualified training consultants who are specialists in related fields. Information about the university is available to all employees via the agency's website. PennDOT employees also use benchmarking procedures, which set out goals for operations to work toward, along with data analysis that demonstrates whether the organization is meeting those goals. Employees are encouraged to attend benchmarking courses to obtain the necessary skills and knowledge to conduct benchmarking projects. PennDOT has also developed a best practices survey tool that assists organizations in tackling business problems using proven models, but without the analysis that benchmarking provides.

In 1997, PennDOT instituted "gap analysis," another program of Baldrige origin. The agency assesses and identifies "gaps" between current PennDOT procedures and those practiced by "world class" organizations that have received the Baldrige Award for Quality. "Gaps" are simply opportunities for improvement that are pointed out by employees using this form of analysis. More than 200 PennDOT employees have been trained as internal Baldrige examiners. Each is asked to annually review organization review packages that each bureau or district prepares every 2 years. Feedback reports give "gap closure" suggestions, and teams from that organization work to close the gaps. Results are posted in an organizational performance index (OPI) available to all staff.

CASE STUDY 2: MNDOT

MnDOT has an extensive program designed to understand the needs of its customers and to integrate information about customer needs and opinions into the everyday activities of the DOT. The DOT has promoted and pioneered market research, customer segmentation, strategic planning to highlight customer service needs, customer surveys and focus groups, objective and customer opinion studies, customer and employee feedback methods, customer involvement in specific programs, and performance monitoring.

The strategic plan developed by MnDOT, called Moving Minnesota, places particular emphasis on customers of the department. The plan points out one of the principal values of MnDOT: be responsive to customer needs and consider what MnDOT does in terms of how it benefits customers. The plan includes the department's vision, mission, and the following strategic objectives:

- Multimodal—to increase travel options for moving people and goods;
- Interregional corridors—to ensure that corridors of statewide significance link the state's regional trade centers;
- Program delivery—to streamline the highway construction and maintenance program delivery process while improving quality and cost-effectiveness; and
- Information—to listen to customers and respond with accurate, timely, and reliable information.

To accomplish the strategic plan, MnDOT has outlined the direction in which MnDOT is heading:

- Safeguard what exists.
- Make the network operate better by
  - Improving access for highway and transit,
  - Removing bottleneck, and
  - Providing corridor connections.
- Make MnDOT work better through continuous improvement and quality service delivery.
- Emphasize strategic management by
  - Knowing the diverse customers and focusing projects and services to meet customers' needs;
  - Managing resources using business planning, quality innovations, and customer-based performance measures;
  - Developing financial management tools;
  - Emphasizing human resource management; and
  - Simplifying and improving access to information.

MnDOT formed its own professional market research unit in the mid-1990s, hiring staff with market research expertise to help implement the strategic plan. MnDOT was interested in (1) introducing private-sector practices into the public sector to get new ideas for analyzing customer needs and (2) having those ideas reported in a manner that would ensure their usefulness. The organization hired three professional researchers directly from the private sector, with the same marketing functions as the private sector would have. Each had information and training that would adapt to public-sector transportation applications; for example, one professional was formerly in the airline industry. The range of experience in the new staff ensured a greater credibility of research techniques and appreciation of real-life examples from the private sector.

Professional market research was new to long-term MnDOT staff. The private-sector viewpoint of the market research team helped bring about change toward recognizing that both stakeholders and customers are important. While customers were defined as end users, stakeholders were defined as partners working alongside MnDOT to serve end

users. Stakeholders remain firmly in place as joint service providers with MnDOT. However, certain end users, such as those appearing at public meetings, may potentially be unrepresentative of the population at large. For example, a representative sample used in a statewide survey showed that end users from around the state had a generally favorable attitude toward MnDOT service delivery.

The private-sector outlook of the marketing staff led MnDOT to conduct a market segmentation and service value study in 2000, identifying seven customer segments: commuters, personal travelers, farmers, emergency vehicle operators, common carriers, shippers by truck only, and intermodal shippers. Telephone interviews and focus groups explored the importance of MnDOT services, customer satisfaction levels with DOT services, and opinions about resource commitments devoted to DOT programs. Summaries showed substantial agreement among the segments on customer priorities and satisfaction and the value of DOT services for all groups but farmers. Through surveys and focus groups, MnDOT targets specific issues and market segments to identify attitudes and opinions about MnDOT services and facilities. The following are some examples of this targeting:

- An annual statewide survey of customers provides a barometer of customer perceptions of MnDOT. The survey uses two or three key questions as an indicator of MnDOT's standing.
- An annual customer survey regarding MnDOT maintenance practices involves some 800 households balanced by county. The study compares Metro Minneapolis/St. Paul with the remainder of the state. The study showed that the agency may be over-delivering services in snow removal, weed control, and other roadside maintenance in certain areas, allowing resources to be diverted into other areas.
- Every 3 years, a tracking study is used to track customer tolerance and attitudes toward congestion.
- A telephone survey was conducted to identify attitudes about the use of public transportation outside the metropolitan area of Minneapolis/St. Paul. Potential market segments or clusters of potential customers were identified and profiled by awareness and use of transit and by demographics, leading to best new candidates for a marketing campaign to promote public transit.
- Focus groups were used to examine the effectiveness of the department's public involvement programs and to suggest how improvements might be made. Participants asked for additional project details in local newspapers and in roadside locations; for personal invitations to meetings; for a forum where listening and responses are central; and for information to help make reasoned decisions.
- Focus groups are useful in the 20-year plan update, where staff are examining ways to get a better understanding of customer needs and ways to get customers involved in long-range planning and policies. Particularly difficult

issues include promoting understanding that long-term policies can affect project priorities. Focus groups are also being used to discuss participation by nontraditional stakeholders (low-income people, ethnic and racial minorities, and people with disabilities).
- On-site observations and interviews were used to evaluate pedestrian countdown indicators at five sites. Intercept interviews reviewed pedestrians' understanding of symbols and reactions to countdown displays both before and after installation of the machines.
- A limited survey of commercial vehicle operators was conducted to determine the economic impact on their operations due to snow. Personal interviews with snowplow operators and focus groups were conducted 5 months after introducing new snowplow technology to assess potential access improvements due to improved snow removal.
- On-site surveys of motorists and commercial drivers at rest stops were conducted to determine patterns of use, opinions, attitudes, and behavior, followed by a telephone survey of nonusers throughout the state to determine customer segments and the reasons they do not use the rest areas.
- MnDOT asked 1,200 drivers if they would want to travel during snow removal, after they viewed six different levels of removal activities on videos. Drivers have also been interviewed to rate pavement smoothness.
- Market research questions were asked of wireless phone customers on their expectations and potential acceptance of the 511 traveler service providing real-time information about traffic, transit, parking, and tourism.

An internal survey was undertaken in 1996 to determine the attitudes of MnDOT staff, their job satisfaction, and their acceptance of market research as a basis for agency priorities. The internal survey included both quantitative measures (a survey of the entire staff) and qualitative measures (discussions in small groups). Internal discussions have been used to explain why market research is desirable, what the essential differences are between public meetings and market research, why both play important roles, and why they are complementary. MnDOT is now updating the survey on a sampling basis to follow up on baseline information and to determine measures to track over time.

Internal staff satisfaction with marketing techniques is growing. Engineers who tended to view marketing as soft and inapplicable are beginning to realize its benefits over time. With their years of experience and their track record, the marketing staff can cite real-life examples of the need for research prior to implementation of unsuccessful projects. The marketing effort has enjoyed support from the very top since it started; this support has been maintained despite changes in state administrations.

Because of the continued levels of internal support for research, MnDOT has established priorities and funding for market research to carry its strategic plan forward. Management

personnel are encouraged to compete for market research as they develop projects that would support the strategic plan. They are asked to determine which upcoming decisions would be helped by a more complete knowledge of customers' needs and how information can be gained through market research studies. They are asked to determine whether these studies will most help short-term or long-term decision planning. Submissions from management staff are evaluated using weighted scores as follows:

- 40 percent—linkage to one or more strategic objective initiatives,
- 30 percent—decision timing (imminence of decision, relation to other projects),
- 20 percent—level of investment (project size and impact), and
- 10 percent—multiple applications (usable in more than one part of MnDOT).

The process of weighting scores, which highlights projects warranting detailed examination through marketing analysis, is repeated every 18 months.

Combined objective and subjective investigations can improve the understanding of transportation facility operations. In the fall of 2000, MnDOT tested the effectiveness of freeway ramp metering in the Minneapolis/St. Paul region, as required by the legislature. MnDOT surveyed a random sample of area travelers to obtain perceptions of ramp meter operations and of the impact that shutting down ramp meters would have on travel patterns. Surveys of four corridors provided information on experiences with and without meters. A general finding showed that benefits of ramp metering outweighed impacts and costs. Customers reminded MnDOT of the general public need for information on traffic management strategies and suggested specific changes that MnDOT made, including

- Reducing the hours of ramp meter operation,
- Allowing meters to change more quickly from red to green, and
- Keeping several meters at flashing yellow.

MnDOT simultaneously conducted an objective analysis of the results of the operational test to determine the likely effects on customer travel. Objective evaluation measures included traffic volumes and throughput, travel time, reliability, safety, emissions, fuel consumption, and benefit-cost analysis. All categories except fuel consumption were improved by ramp meter activation. (Fuel consumption is greater when vehicles wait on ramps to enter freeways.)

Customer and employee feedback can help experiments with new equipment. MnDOT explored a Mayday system to provide a direct voice and data link from a disabled vehicle on rural roads to emergency dispatchers. The system combined cellular telephone technology with GPS. For an operational test of the equipment, MnDOT conducted a before-and-after survey of diverse participants. Respondents to the survey included emergency dispatchers, AAA dispatchers, rural metro dispatchers, scheduled test volunteers, and general public volunteers. Survey results showed that the Mayday concept was easy to operate and would provide a faster response from emergency service providers, as well as make traveling in rural Minnesota safer and easier. In a similar study, customers helped MnDOT understand why overhead electrical signage was ineffective in diversions; focus groups asked for more specific communications to show exactly what is ahead (e.g., a crash or a left or right lane closure) so they could take action based on the information.

Customer information is essential to help MnDOT develop plans and policies that are responsive to transportation user needs. MnDOT uses a variety of methods (1) to tell customers what is being done and why it is important that customers understand current actions and (2) to listen to customer reactions. Public meetings provide an opportunity for customers to learn about and state opinions on the development of programs, policies, or projects. MnDOT relies heavily on the Internet to send out information and obtain feedback. For example, the MnDOT website includes information specifically designed to educate customers and present the range of activities underway within the DOT to meet customer needs. The website includes status information on both future plans and projects or programs that are underway. It also informs viewers about new programs, such as the Interregional Corridor Program, specifically inviting customer opinions on current efforts and future directions, while telling them where and when presenting opinions is most effective. MnDOT website viewers are invited to tell the agency what they think of the goals, the indicators of results, and the targets that the department is attempting to meet.

Customer involvement in MnDOT programs is solicited through appeals to expressed needs and ways in which the department can help meet those needs. For example, the department provides landscape partnerships, which, with community involvement, establish a landscape plan and program for specific stretches of roadway. Then the department makes landscape materials available for use in that area, and community volunteers become the workers and planters. Using this method to respond to customer needs while saving on labor costs, the department estimates that it has saved money while meeting customer expectations for beautifying highways.

MnDOT is part of the state's performance monitoring efforts designed to show customers how the state agencies are working to meet customer-specified goals. This information is presented on the state website as "Minnesota Government at Work." Each state government subdivision highlights its own goals and its progress toward reaching those goals. For example, one of the agency's objectives is to ensure that corridors of statewide significance link the state's regional trade centers. The performance measure chosen to illustrate progress toward that goal is the percentage of interregional corridor traffic that moved at target speed of 60 mph for past

years and for a target year. Another performance measure shows customer satisfaction levels with MnDOT's maintenance work on a scale of 1–10 for past years and for a target year; components of this index were derived from statewide surveys of MnDOT's customers and annual polling of management staff.

MnDOT uses another form of performance measure for its in-house research. When research projects are completed, research determines if results are usable for the client, usually a department within MnDOT. A "closeout memo" is generated after research is completed to indicate which research results are put into practice. If research recommendations are used and implementation has taken place, MnDOT attempts to define the benefits of the research. Measures include a representation of how much implementation occurs, along with the payoff from implementation (see Figure 11).

DIRECTIONS

Integration of Corridor Management Planning into Statewide, Regional, and Local Planning

Local comprehensive plans review land use but few sufficiently address transportation or system issues. What is the best way to coordinate regional, state, and local planning efforts? To learn more about ways to bring together local, regional, and state planning into a successful corridor management system, MnDOT is contributing to a demonstration growth management planning project with the counties of Cass and Crow Wing.

The research involves documenting and evaluating the planning process at all levels and outcomes. The research team will provide an objective evaluation of tools, methods, and strategies that planners use as part of this demonstration project to promote coordinated land use and transportation planning.

The case study offers the potential to guide future planning through development of a model process framework, training and education materials, technical assistance, and incentives. Such a process would help reduce redundant efforts, streamline planning, enhance transportation decisions, and better leverage resources and community support.

Identifying and Communicating the Purpose and Needs of Transportation Projects

Identifying and communicating the purpose and need of transportation projects are important elements of the planning project and regulatory permitting process. This project seeks to develop a deeper understanding of tools, techniques, technologies, and methods for the identification and communication of a project's purpose and need during transportation planning and project development.

Measuring the Impact of Transportation Systems Decisions in Terms that Matter to Decision-Makers and the Public

In this project, researchers will identify the factors that local elected officials value, but currently do not receive as part of the transportation planning process, as well as identify innovative practices that transportation planners use to bring broader community values into the transportation decision-making process. The research focuses on the feasibility and methods for developing data that will aid policy leaders in making well-informed transportation decisions.

Source: *Moving Minnesota,* MnDOT, 2000.

Figure 11.   MnDOT strategic plan: Research project.

CASE STUDY 3: CALTRANS

Caltrans is ambitiously pursuing information for serving customers better. Its efforts include a staff committee to oversee surveys, a series of internal surveys of employees, the use of focus groups to prepare for a larger subjective survey, an extensive external survey of customers, and, based on survey results, a statewide transportation plan and strategic objectives.

Caltrans conducted an "employee climate" survey in 1999. A Caltrans consultant contacted a random sample of 4,700 employees who were invited to participate in the survey. A return rate of 68 percent resulted when 3,196 employees completed the survey. Caltrans compared the results with a national norm, which established a numerical rating system for companies around the country. Among the responses to the survey's 79 questions, employees responded favorably to questions about job responsibilities and satisfaction and employee involvement, but indicated that they felt the general public did not regard the agency highly. About 65 percent of the employees indicated that they received feedback on customer satisfaction with their work, but indicated that additional work should be done on employee feedback, cross-training and promotion procedures.

Data and analyses from the employee survey were intended for use in preparing the Caltrans strategic plan. Caltrans plans to conduct the employee survey annually and use it to monitor the effectiveness of new initiatives. Results of the survey are available to act as a benchmark against which future improvements will be measured. A follow-up internal survey was undertaken in mid-2002 to track the effectiveness of changes that were implemented in response to the 1999 survey. Identical questions were used in both surveys.

Caltrans set up an external survey committee, comprising representatives from several geographic districts and functional areas, to initiate the project and to ensure that survey data would be translated into action within the department. This committee directed and guided the research effort. The prior internal survey had indicated staff uncertainties about how Caltrans services were perceived. As the overall direction of the study, the committee decided to use a two-pronged approach. The first would be a series of focus groups from around the state, allowing the committee to view in advance the types of questions that would produce the most useful input for Caltrans in its efforts to prepare its transportation plan and strategic objectives. The second was a statewide customer survey using questions pretested in the focus groups.

In early 2001, the committee deployed its focus groups to guide selection of questions to be asked during a large-scale, statewide telephone survey. Fifty-four focus groups involving 500 stakeholders and end users were held. The focus groups took place in

- The San Diego area,
- The Los Angeles basin,
- San Joaquin Valley,
- The San Francisco Bay area,
- Sacramento/Stockton,
- Eastern California,
- North Valley, and
- California Coast.

Stakeholders represented the general public, transportation providers, area businesses, community service providers, legislative and regulatory personnel, public opinion makers, and representatives of local and regional planning groups. Focus groups were asked to

- Evaluate aspects of transportation in California, such as appearance, comfort, affordability, safety, speed, and ease of connections, on a scale of 1 to 5, with 5 being the top grade;
- Determine awareness of Caltrans' responsibilities, accomplishments, and its performance levels;
- State preferences for future actions, recognizing trade-offs resulting from either limited funding or difficult procedures (such as temporary road limitations during construction);
- Evaluate Caltrans' performance in its communications with the public, the quality of service that Caltrans delivers, and the innovations that Caltrans works on;
- Rate highway and transit system performance; and
- Discuss methods of presenting questions (a concern of the focus groups was that survey questions should be, where possible, open-ended and not simple "yes-no" questions).

The focus groups identified four potential policy directions:

- Celebrate what Caltrans does well (most respondents have a favorable opinion of Caltrans).
- Focus on unexpected delays in both highway and transit travel.
- Improve public perception of ongoing road construction and repairs.
- Provide improved choices in public transportation.

Focus groups indicated that the public awareness of Caltrans was very strong, but that first impressions were deficient. Discussions suggested that the public, though unaware of the agency's roles beyond maintenance, looks to Caltrans to fix transportation problems.

Recommendations from the groups suggested expanded involvement of Caltrans in multimodal services and in community planning, even though the groups were uncertain precisely what roles Caltrans should play. Focus group respondents felt that Caltrans should speed up project delivery and expand emphasis on driving and roadway safety. Participants felt that Caltrans should communicate better and clearer, using multiple communication strategies.

The External Survey Committee identified four areas for further scrutiny using the results of the focus group information:

- Improving Caltrans's public image and its relationships with external customers;
- Reassessing the role of management as it relates to internal integrity and values;
- Strengthening the long-term "vision" and strategy for Caltrans; and
- Improving quality management, training, and job mobility.

In addition to having focus groups, Caltrans analyzed returns from prior external surveys, including the external customer survey conducted in 1996 and the followup customer survey in 1998. In 1996 and 1998, telephone surveyors asked identical questions of 3,200 randomly selected California drivers in 8 geographic regions of the state. Participants in the survey were asked about maintenance activities: priorities, satisfaction levels, desired levels of service, and understanding of maintenance procedures. The information was intended as customer input to improve internal performance measurement criteria. In 1998, the results were compared with the results of both the 1996 customer survey and the National Highway User Survey conducted in 1995. The 1998 survey indicated that drivers were more satisfied with the job Caltrans was doing in 1998 than in 1996 and more satisfied with transportation generally than respondents to the national survey were.

After this series of analyses, Caltrans conducted a statewide telephone survey of residents in July 2001. The survey consisted of 3,220 interviews of approximately 400 driving-age people in each of the eight geographic areas of the state. Surveys were conducted in English, Spanish, and several Asian languages. Respondents were randomly selected and stratified after the survey to show differences that might result by gender, age, income, ethnicity, and region. To respond to concerns from the focus groups, questions were designed to test awareness and perceptions of the agency in a neutral way. Questions were often open-ended—that is, framed to avoid prompting specific responses, with surveyors accepting what respondents said and noting comments carefully on survey forms. The survey was designed to answer the following questions:

- How do people evaluate the quality of the trips they now make? What components of a trip are most important to them?
- What are Californians' priorities for future transportation improvements? What tradeoffs would they make?
- Do people know what Caltrans is? What do people think Caltrans does now and should do in the future?
- How do people think about measuring Caltrans' performance? What kind of ratings does Caltrans get?
- Does Caltrans communicate well? How can Caltrans better communicate in the future?

The statewide customer survey helped Caltrans discover customers' opinions on the agency's accomplishments, such as communications with the public, quality of service, and innovations in transportation. A series of questions elicited general travel behavior, satisfaction with services, and personal ratings of highway and transit system performance. Responses were reported in graphs reflecting responses by geographic region. Highlights of the survey are as follows:

- Satisfaction responses showed that most customers felt their trips were safe, comfortable, affordable, and esthetically pleasing, with differences based on gender and income level. Many customers cited surprise delays and the inability to reach destinations quickly as problems.
- Priorities focused on reduction in congestion, with public transportation the most frequently cited improvement to solve the problem. Some customers felt that it was important to improve how people drive on highways and to remove truck traffic.
- Tradeoff analysis showed respondents evenly split between investing in improved public transportation and extending services to more places. Some customers preferred building a high-speed train between cities rather than expanding airports.
- Awareness of Caltrans was ascertained in neutral questions that asked for respondents' knowledge. Fifty-five percent knew the name, and most thought the agency maintains and repairs highways.
- Roles desired by the public include a role in public transportation, better connections, encouraging carpooling, and involvement in community planning.
- Performance ratings showed good scores for Caltrans on delivering quality and having integrity, but not as good scores for being innovative or communicating with the public. When asked what Caltrans does best, many respondents said road work.
- Communications efforts were not as positively regarded as other Caltrans efforts were. Results suggested that improvements were needed in providing more immediately useful information to the general public on road conditions, traffic delays, and road work plans. A difficult issue is that perceptions are least favorable among the most highly educated people, who are most well-informed about Caltrans.
- Survey results are intended to be translated into actions.

The report on the external survey, incorporating the focus group findings, indicates the following:

- Relative priorities in terms of transportation convenience, efficiency, safety, affordability, esthetics, and other attributes could assist the agency in setting priorities and making decisions.
- Tradeoff information can also assist in setting priorities (e.g., responses can suggest priorities).

- Survey responses form a benchmark for comparison with future research.
- Caltrans should consider expanding the responsibilities for the agency to encompass more than highways, as respondents suggested.
- Caltrans should evaluate communication messages and mechanisms to ensure that information is comprehensive and directed toward needs that have been expressed. Special effort may be needed to enhance messages already provided.
- Caltrans should recognize questions that result from research and investigate further to see what can be done. For example, additional exploration may be warranted where respondents support expanded public transportation services but say they would not use it if it were available.

Data from customer surveys can aid the evolution of the strategic plan, which guides transportation decision making. The strategic plan prepared as the final report of the Commission on Building for the 21st Century is called Strategic Planning for California's Future Prosperity and Quality of Life. The plan is devoted to solving issues and finding solutions to improve transportation in the state between now and 2020. The strategic plan sets the stage for implementation of a set of criteria and performance measures for evaluating transportation proposals geared toward improving project delivery and maximizing investments. The criteria may be part of the planned California Scorecard report on performance objectives and measurement.

In parallel with Caltrans's efforts, the governor's office has established the Office for Innovation in Government, which is leading the drive for quality improvements in government. This office is empowered to encourage customer involvement and improve customer understanding of state actions in transportation. The office produces the Innovation-Gram, a periodical devoted to assisting customers and government employees in understanding the potential for quality improvements in the delivery of government services. One of the improvements designed to draw attention to quality improvements is the annual award given for improvements aimed at customer understanding of government processes: the Clarity Award, designed to recognize efforts to reduce paperwork and to focus on precision and clarity in stating issues and potential solutions.

CASE STUDY 4: MODOT

MoDOT has a customer-driven process based on outcomes of its planning and implementation processes. MoDOT uses a variety of customer surveys and public involvement techniques to establish goals for long-range planning, strategic planning, and agency performance. The agency used its customer survey information to guide resource allocation in accord with its strategic and general statewide planning efforts and has become an active partner with the Missouri Managing for Results initiative. Collaborating with regional agencies such as MPOs resulted in finding and sharing additional customer information.

In 1998–99, a customer survey was undertaken. MoDOT contracted with the University of Missouri to conduct a telephone survey using a random digit dialing system, resulting in 1,581 usable returns. The survey, called the Constituent Service Quality Survey (CSQS), was designed to establish an information baseline for gauging state resident's perceptions and opinions, including current levels of satisfaction with MoDOT, and anticipated future levels of attention necessary to meet a satisfactory MoDOT performance. Survey personnel contacted randomly selected telephones with a sampling size large enough to ensure small sampling errors. The CSQS consisted of four sections:

- Ratings of satisfaction and the need for future attention to 41 MoDOT performance areas;
- Demographics of respondents (3 major geographic areas, gender, age, education, income, annual miles driven, and holders of commercial driver's licenses);
- Questions on MoDOT's overall performance and preference for future resource allocation; and
- Sources of information about transportation, including nature and extent of contact with MoDOT employees.

The survey indicated that Missourians generally had high levels of satisfaction with MoDOT's work, but the survey also indicated several concerns warranting improved performance in 12 of the performance areas. Issues of pavement surfaces remain a primary performance challenge. Missourians feel that MoDOT should attend to planning and process issues and the allocation and distribution of resources. Finally, responses suggested a need for new emphasis on public education efforts and increased citizen participation. Results of the survey also demonstrated that Missourians demand a safe transportation system as the highest priority, followed by maintenance of existing facilities (preferable to building new roads) and the need to support all modes of transportation, even though the emphasis is on highways and bridges.

As part of the survey, a random sample of customers considered the importance of the different modes of transportation. Groups were asked to allocate a hypothetical $100 among the modes and then were asked to subdivide each mode's share between top priorities for each mode. MoDOT used the information to understand the relative importance of potential transportation investments and to advance the process of educating participants about the challenges of planning and improving transportation services and facilities.

For gap analysis in parallel planning exercises, MoDOT worked to obtain a full picture of all possible transportation needs. A dollar amount was calculated to meet the gap between existing investment levels and what it would take to

fund all the needs. The gap is estimated to be $1 billion a year for 20 years, or nearly $2 billion a year if inflation and growing project costs are factored in. Options were presented to demonstrate the difference in costs between fully meeting desired results through facility expansion and partially meeting stated needs through preservation, rehabilitation, or reconstruction of facilities. In some goal statements, the desired result is stated in terms of the status of pavement serviceability or in lane and shoulder widths, followed by a target of meeting, for example, 75 or 80 percent of needs over 20 years. Working with local communities and regional organizations, MoDOT then established priorities of funding to meet these needs.

MoDOT has joined hands with regional MPOs for further analysis of survey results. The Southwest Missouri Advisory Council of Governments, an MPO working with MoDOT, ranked transportation issues according to the views of customers. Safety and maintenance items—such as safety improvements at high-accident locations, repairing and replacing narrow bridges, maintaining existing roads, shoulder improvement on roads, and adding lanes to major highways—topped the rankings. Other responses in the top ten ranks supported the safety theme: improving road striping, widening lanes, and regulating signs and billboards.

Using customer survey information, MoDOT assembled a long-range planning direction in 2001 to guide policy and program development over a 20-year period, with a mid-range period of 6–10 years and a short-range period of 5 years. The work was guided by involvement of more than 2,400 MoDOT customers, who were asked what they expected of the transportation system. Statewide public surveys were conducted to establish top priorities for all modes of transportation. A series of road rallies were also used, where randomly selected citizens were driven along a predetermined course on state roads and bridges. Along the way, they graded road conditions of pavement smoothness, lane and shoulder width, striping, signage, and other components. MoDOT had already driven these routes and applied engineering standards to assess conditions. With the road rally results, MoDOT could apply scores—based on engineering standards—to what the public found acceptable. These scores became a baseline for measurement of progress in meeting objectives.

For its strategic plan revision in 2000, MoDOT documented issues and prepared goals showing agency intentions to respond to customer needs. Transportation investment goals for the state provided a basis consistent with what state residents said they expect from their transportation system. Major issues included safety, transportation system investments, delivery of the state transportation improvement program, planning, communication, resource management, and an effective workforce. Each of the issues led to goals, a desired outcome, benchmarks that will serve as measures of success in meeting the goal, and strategies to implement the benchmarks. For example, the issue "transportation system investments" led to the following:

- **Statement**—Operate, maintain, rehabilitate, reconstruct, and expand Missouri's transportation investments.
- **Goal** (in what direction does the agency want to head?)—Maintain the highway system to identified standards.
- **Desired outcome** (what is to be achieved?)—Highway system is maintained consistently in accordance with public expectations.
- **Outcome measures** (how will success be achieved?)—Percentage of system that meets standards, percentage of striping that meets reflectivity standards, and percentage of signs that meet reflectivity standards.
- **Strategies** (how will the goal be accomplished?)—Develop standards for maintenance activities; evaluate effectiveness of maintenance activities; begin implementation of Maintenance Vision 2000; and schedule all activities to increase efficiency and reduce customer delays by considering such things as working at night or 24 hours per day, closing the road, etc.

MoDOT has been an active partner in the statewide Managing for Results program. Under this program, MoDOT has been urged to adopt desirable outcomes that reduce costs and provide improved customer service. For example, the agency met with customers in the community through local meetings to determine the best way to reconstruct a highway interchange. In practice, it was a difficult decision because it involved full or partial closing of an interchange of two major interstate roadways. Faced with choices between a short period of major disruption and long period of partial disruption, customers chose the short period. Because of this decision, the agency is able to complete the work more efficiently and at a significant savings in overall costs. As another example, MoDOT worked to reduce administrative costs such as publications and employee travel expenses and cell phone expenses. Savings were transferred into the funding available for projects.

CASE STUDY 5: NJ TRANSIT

Since its organization in 1979, NJ Transit has invested $8.2 billion in state and federal capital funds to improve and expand the state's public transit network. NJ Transit has become the largest statewide public transportation system and the third largest transit system in the country. Bus, rail, and light rail lines serve 380,600 daily commuters to major points in New Jersey, New York, and Philadelphia on 12 commuter rail lines, two light rail lines, and 240 bus routes.

Customers are the focus of NJ Transit's efforts in managing resources and providing service. As expressed in *A Call to Action: Investment for the Future*, the NJ Transit's mission is clear: "to provide safe, reliable, convenient and cost-effective transit service with a skilled team of employees, dedicated to our customers' needs and committed to excellence." The word "customer" is synonymous with "rider" in all of NJ

Transit's planning documents, literature, and website information. "Customer service" is used consistently in NJ Transit publications and announcements, reinforcing the concept as the focus of the agency's work (see Figure 12).

Customer segmentation is the basis of surveys of riders using NJ Transit services. Customers are grouped by the transit lines they use and by boarding times, which are significant behavioral characteristics of origin and destination studies. Subclassifications of customers are made on the basis of age, employment status, and recreation travelers.

The 2001 strategic plan, based on a 5-year schedule, is strongly devoted to protecting NJ Transit's fiscal integrity and the reliability and quality of service in its core system, including the Northeast Corridor rail spine. Individual steps deal with a 5-year relief plan for congestion on both rail and bus lines: parking facilities, additional seats and vehicles for riders, reductions in delays, and working with MPOs and local communities to improve the flow of transit services within the state. While providing these services, NJ Transit hopes to increase its responsiveness to customers through employee recruitment, training, performance reviews, communications, and increased attention to and investments in service quality issues—cleanliness, working public address systems, doors, restrooms, stations, and terminals. The 2001 strategic plan has been modified since the events of September 2001 to reflect the significant impacts on NJ Transit services.

The long-range plan, *Possibilities for the Future*, is a preliminary sketch of transit services in the year 2020, shown on a map with committed and potential new projects for fixed guideways (commuter rail and light rail lines), bus priority facilities, and ferries. Capacity issues with present or possible new service are characterized as "Pressure Points." These future possibilities overlay a map of geographic areas that have been rated with a transit score that indicates the relative potential for transit usage in different geographic areas. Components of the transit score include household density in each community, population and employment density, and the density of zero- and one-car households.
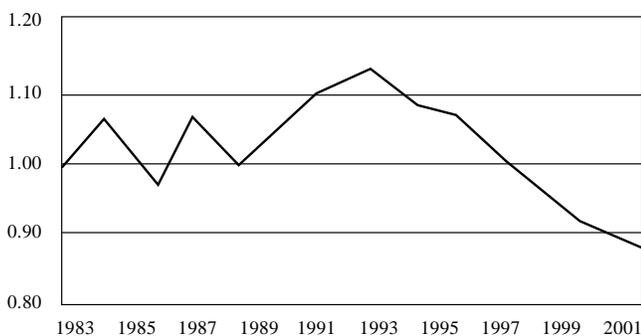
A $1 trip in 1983 now costs $0.88, considering the impact of inflation. Thus, riders pay less today than in 1983.

Source: *Call to Action: An Investment for the Future,* New Jersey Transit, www.state.nj.us/transportation/cpd/tcp/draft/njtACall.htm.

Figure 12. Cost of New Jersey Transit trip from 1983 to 2001 (in dollars).

Information for customers includes redesign of the agency website to position the most-requested information on the home page and to ease navigation to schedules and construction and service advisories. The new website features "My Transit," through which customers can receive e-mails, pager messages, or cellular phone alerts from NJ Transit when the agency experiences peak-period delays in excess of 30 minutes on any rail line or interstate bus. "My Transit" users can respond to NJ Transit with questions or suggestions by filling out quick surveys designed to elicit comments on service improvements. NJ Transit has initiated a children's safety awareness campaign through a costumed figure, "Cool Cat," who makes her way through schools, churches, and day care centers to spread the word about safety through songs, skits, and dance to engage children. This service was opened at the same time as the new Hudson-Bergen light rail system.

By marketing services to customers, NJ Transit has increased awareness of its ability to aid in commuting and pleasure trips. An early step was development of a company logo and slogan, "The Way to Go," integrated into publications, schedules, and the website. NJ Transit seeks to inform both users and nonusers about the importance of transit to the state's environment, economy, and quality of life. Regular seat notices and publications keep riders up to date on issues affecting transit service and give answers to frequently asked questions. NJ Transit has paired with recreational organizations such as Six Flags Great America amusement park, Hurricane Harbor Water Park, and Monmouth Race Track to market joint tickets that include reductions in admission prices at the destination. Reduced prices are the focus of NJ Transit's marketing of linked parking and ticket purchases at specific rail and light rail stations. The linkage is designed to encourage patronage and to engender good will. Parking pricing has been set to aggressively compete with non- NJ Transit park-and-ride facilities by using attractive, lower, combined fare-and-parking packages.

Feedback from customers is solicited in several ways. Onboard surveys are used regularly to test satisfaction levels. Customer comment cards, available at terminals and stations, are postage-paid to encourage customers to evaluate the transit system and NJ Transit services. Customer forums are scheduled periodically to allow riders to meet with agency management to present individual concerns. Customer service offices at heavily traveled rail stations—two in Manhattan and two in New Jersey—assist customers during their travels. These offices are staffed from 7:00 a.m. to 7:00 p.m.

CASE STUDY 6: FDOT

In 2000, FDOT adopted a quality-based management system and business model, including strategic objectives to help drive higher performance levels. The new approach was grounded in the Sterling Quality Challenge—a variation of the traditional Baldrige Quality Approach that is unique

to Florida. Using this method, FDOT provided a self-assessment of its work in terms of several categories, including leadership, strategic planning, customer and market knowledge, information and analysis, human resource development and management, process management, and business results, including customer satisfaction. At its heart are several customer-oriented processes. The FDOT strategic objectives resulting from the quality approach are as follows:

- Customer focus
  - Improve customer satisfaction
  - Reduce external customer complaints
- Work program delivery
  - Improve project delivery performance
- Organizational performance
  - Implement results-based management system
  - Improve employee satisfaction
  - Improve leadership system effectiveness

To demonstrate a high level of agency performance, FDOT established a process of measuring its success in its operations, including assessing customer needs and opinions.

The current 20-year state transportation plan was adopted in 1995 and is based on extensive public involvement effort. A training program for obtaining public input was established, focusing on an on-line training program in public involvement. Update meetings helped determine what the public viewed as important. More than 70 FDOT public events provided information for citizens in community business centers, malls, airports, and hotels. Transportation fairs with displays, videos, and handouts provided open and informal ways for the public to ask questions and raise issues for the planning effort.

Customer segmentation was part of an extensive outreach program to update the long-range transportation plan. Public input helped define six customer segments: residential travelers, commercial customers, government officials, visitors, customers with special needs, and property owners impacted by transportation construction. These segments were reviewed by the FDOT executive board, comprising the secretary of transportation, assistant secretaries, and district secretaries. Customer segments formed groups for further discussion: focus groups were held in 1999 in each of the segments and in north, central, and south parts of the state in urban, rural, and transitioning areas. Individuals in each of the segments were interviewed in 2000 as part of the performance review of FDOT.

FDOT maintains partnerships with three major types of suppliers:

- Contractors, who construct and maintain transportation facilities (450 prequalified contractors);
- Consultants, who contract for engineering, architecture, surveying, special grant projects, mapping, planning, appraising, and design projects (588 prequalified consultants); and

- Vendors, who provide other goods or services (10,500 firms).

The update of the state transportation plan—the Florida Transportation Plan 2020—was completed in 2000. A lengthy public involvement process considered many aspects of the plan before it was finally adopted. Citizen input was solicited in the years leading up to 2000 as a basis for the update. For example, in early 1997, the public transit portion of the plan was begun by seven district advisory committees and one statewide advisory committee. These committees identified public transit issues to be explored by focus groups composed of specific customer segments, including retirement community residents, college students, unemployed persons, social service workers, transit agency employees, major employers, tourists, tourist industry employees, jitney riders, existing and new transit riders, and nontransit users. Input from the focus groups helped prepare a statewide telephone survey of randomly selected households for additional input into the plan. By 1998, a transit strategic plan was ready for use in updating the statewide transportation plan.

FDOT's strategic plan is the short-range component of the 2020 transportation plan, which sets out specific strategies for implementing the plan. The FDOT strategic plan for 1999–2006 includes general goals of safety, system management, economic competitiveness, and quality of life. To demonstrate how the department will accomplish the goals, specific objectives are grouped under four general headings:

- Preserve and manage a safe, efficient transportation system;
- Enhance Florida's economic competitiveness, quality of life, and transportation safety;
- Pursue organizational excellence by improving customer satisfaction; and
- Deliver the work program and strengthen the effectiveness of FDOT.

Each of these headings contains specific objectives. For example, to address the first objective—preserve and manage a safe, efficient transportation system—the DOT plans to ensure that 80 percent of pavement on the state highway system meets standards through 2011.

These strategies set the framework for an annual performance report for FDOT, documenting the agency's progress toward its goals and objectives. Required by state statute, the performance report reviews goals and refines goals over a 5-year period. The results, for example, may show that FDOT is nearing its objective of ensuring that 80 percent of pavement on the state highway system meets standards through 2011 (shown above in the strategic plan). The cost of routine maintenance ($358 million in 1 year) is emphasized to show the continuing need for funding the task.

To test the public perceptions of its performance, FDOT conducted a customer satisfaction survey over a 3-month

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period ending in early 2001. More than 5,000 residents and visitors responded to questions about visibility of roadway signs and markings, construction zones, traffic flow, rest areas, airports, and overall satisfaction with the system. The survey segmented customer groups into residents (1,752 forms returned), commercial drivers (1,767 returns), government officials (794), visitors (402), older Floridians (447), and property owners (not available), indicating statewide totals as well. Results provide a benchmark for measuring progress in subsequent surveys. Respondents had concerns about visibility of roadway markings at night, timeliness of completing construction, traffic congestion, access to businesses during construction, and local government input on construction priorities and design plans. Tourists rated FDOT services higher than residents did. Results were presented in a "report card" format—four pages presenting the goals of the survey and selected initial results. The second phase of the survey will be to revisit the issues and find out how well the agency has responded to respondents' concerns.

FDOT gives reports to customers on efforts to provide high-quality service and asks customers for feedback on these efforts. The agency developed a report card based on its process of measuring performance successes in its operations. The report card represented the results of the agency's outreach to customers through its quality-based business model to get customer responses. The media responded to the report card because the report card amply demonstrated customer's opinions about the agency's efforts. The report card was also discussed through presentations to MPOs and other organizations. Results were presented on the FDOT website, along with methodology, district breakdowns, and comparisons among customer groups within each area. FDOT is using the report card to show staff members the links between their jobs, the performance ratings of the agency, and what customers think.

CASE STUDY 7: OREGON DOT

ODOT has an extensive program of contacting customers and probing transportation needs. The agency wants to show its customers that its work is efficient, cost-effective, and a good investment. It is evolving from a "highway" brand to a "service" brand. Its overall goal statement is "Think ODOT, Think Customer Service."

ODOT conducts periodic customer surveys to assess its responsiveness to customer needs. The high customer satisfaction levels that ODOT receives are transmitted to the legislature to demonstrate positive public support. Customer surveys are also used to report on transportation needs and reactions to individual programs.

ODOT targets its periodic customer satisfaction surveys by topic. In the fall of 2000, ODOT conducted a survey about safety topics. Three out of five respondents evaluated ODOT performance as good to excellent in its efforts to reduce

crashes, injuries, and deaths. Those surveyed also reported that speeding and running red lights were the two top categories in observed unsafe driving behavior. Most respondents knew about the changes to the state's teen driving law, and more than 90 percent believed that motor vehicle crashes are due to driver error. Many agreed that over-the-counter drugs impair driving ability.

Customer segmentation study efforts frequently lead directly to legislation. Data in Oregon show that teens are twice as likely as other drivers to be involved in fatal and injury crashes. Because of this information, the Oregon legislation directed the DMV to institute more stringent licensing procedures for individuals under the age of 18 applying for a driver's license.

Customer segmentation was used in dealing with older drivers. According to projections, by the year 2025, one out of every four Oregon residents will be over 60 years of age. Concern about the effects of aging upon driving ability prompted the Oregon legislature to form the Older Driver Advisory Committee to report to ODOT on the effects of aging upon driving ability. The Older Driver Advisory Committee met during 2000, receiving writing and verbal testimony from members of the public and recognized experts on the issues. Concurrently, the DMV hosted eight town hall meetings around the state to explain the study and to solicit public input.

From this study, the committee concluded that licensing restrictions should not be based upon age alone. Rather, fitness to drive should be assessed through appropriate screening for visual, cognitive, and functional abilities to perform tasks necessary to driving safely. The committee recommendations were

- Identification of drivers who may be at risk for being involved in a motor vehicle accident because of age, through the driver license renewal process and its renewal cycle, screening techniques reporting capacity to drive, simplification of reporting, revision of the list of medical conditions affecting driving ability that must be reported, and a driver re-examination program;
- Remedial measures to assist drivers in maintaining ability to perform tasks necessary to driving safely;
- Public education for seniors, family members, health care providers, and the public in general; and
- Alternative forms of transportation, including volunteer-based services and increased funding for accessible transportation modes.

ODOT issues a quarterly report to stockholders to describe progress in the preceding 3 months. Stockholders are defined as ODOT's customers—the Oregon taxpayers. The detailed report on agency workloads and accomplishments is available on the ODOT website and is distributed as individual, newsletter reports on a quarterly basis. These reports include the following:

- The DMV Customer Service Recap—the volume of work that the agency processed during the quarter (nearly 1 million external customer contacts)
  - Driver's licenses issued or renewed;
  - Skill (on the road) tests administered;
  - Knowledge tests by computer, written, oral and audio examinations conducted;
  - Vehicle titles issued;
  - Law enforcement records supplied;
  - Customer telephone calls answered;
  - Average DMV field office wait time; and
  - Volume of contacts made.
- ODOT Motor Carrier Staff
  - Volume of contacts made: nearly three-quarters of a million customer contacts;
  - Trucks inspected, registered, or both;
  - Citations issued; and
  - Trucks weighed in static scales.
- ODOT maintenance crews
  - Lane miles of highway striped,
  - Lengths of guard rail installed,
  - Tons of asphalt laid,
  - Tons of sand used,
  - Dollar value of emergency maintenance performed,
  - Dollar value of bridge maintenance and repair work,
  - Dollar value of snow plowing, and
  - Number of bridges inspected.
- ODOT construction projects
  - Dollar value of construction projects completed,
  - Number of active projects underway,
  - Quarterly payments to contractors, and
  - Number of bridges inspected.
- ODOT rail division
  - Number of rail cars inspected,
  - Number of locomotives inspected, and
  - Miles of track inspected.
- Money savings
  - Travel time saved by trucks in the weigh station pre-clearance program and
  - Recycling by employees.
- Public inquiries and assistance as reported in terms of
  - Calls on ODOT toll-free citizens' representative line and
  - Data on annual transportation volumes.
- Delay reduction as reported in terms of
  - Assistance to disabled vehicles,
  - Incidents caused by crashes,
  - Debris removed, and
  - Vehicles tagged or towed from principal routes.

ODOT maintains short guidebooks for agency use in dealing with customers. Each guidebook is posted on the ODOT website. The guidebooks cover topics of general interest to staff members who deal with customers on the front line, as well as topics of specific use to transit providers. The list of guidebooks include the following:

- A public involvement guide describing the purpose, objectives, and process of citizen involvement, as well as how to plan for it;
- A customer survey guide describing satisfaction surveys, research techniques, and types of informal research;
- A customer relations guide defining "customer" and giving tips on discovering customer needs;
- A public and media relations guide dealing with news releases, interviews, announcements, and crisis handling;
- A social marketing guide with a case study based on South Florida Commuter Services' surveys of the Hispanic community; and
- A sales promotion and guerrilla marketing guide with promotional ideas.

ODOT uses its performance plan to report annually on traffic safety. The data sources are reliable, readily available, and reasonable in representing outcomes of the program. For example, ODOT uses statewide traffic crash data and measures of exposure for a 5-year period to establish sets of performance measures designed to curb fatality and injury rates. For FY 2000, these performance measures were

- To reduce the traffic fatality rate from 1.70 per million vehicle miles traveled, the 1988 level, to 1.60 per million vehicle miles traveled by September 2000 and
- To reduce the 1998 traffic injury rate of 101.62 per million vehicle miles traveled to 100.00 per million vehicle miles traveled by September 30, 2000.

As a part of the report, ODOT cited funding dedicated to specific services to implement each of these strategies:

- A comprehensive traffic safety public information and education program,
- An annual traffic safety conference with 250 citizens,
- Implementation of the Oregon Safety Management System,
- Training and technical assistance in traffic safety engineering practices to individuals and local agencies, and
- Training for emergency medical service providers to ensure adequate response to motor vehicle crashes.

Other sets of strategies focus on bicycle safety, community traffic safety programs, employer safety, impaired driving, motorcycle safety, occupant protection, pedestrian safety, police traffic services, roadway safety, speed, work zone safety, and youthful drivers.

The Oregon Transportation Plan establishes a report card for its goals for the future. ODOT records trends and sets 2010 goals for the following:

- Percentage of Oregonians commuting less than 30 minutes;
- Percentage of Oregonians commuting to work by means other than a single-occupancy vehicle;

- Percentage of Oregonians living in communities with daily intercity service;
- Percentage of urban state and local highways with bicycle lanes and sidewalks;
- Annual vehicle miles of travel per capita in metropolitan areas;
- Transportation-related fatalities for every 100,000 persons;
- Percentage of state pavements classified as "fair or better" or "sufficient";
- Percentage of bridges rated "good";
- Percentage of public transit vehicles, equipment, and facilities rated fair or better;
- Percentage of public airport runway pavements rated fair or better;
- Percentage of funding received required for plan implementation;
- Auto and truck payments as a percentage of the cost responsibility study; and
- Percentage of Oregonians living in communities where air quality meets standards.

The Oregon Progress Board issues benchmarks based on ODOT report card data to illustrate the state's progress toward a variety of goals (see Figure 13). Under one goal—healthy, sustainable surroundings—the board cites urban highway congestion as a major component of driver stress, lost work time, air pollution, fuel consumption, and the cost of goods and services. The measure of congestion is the percentage of
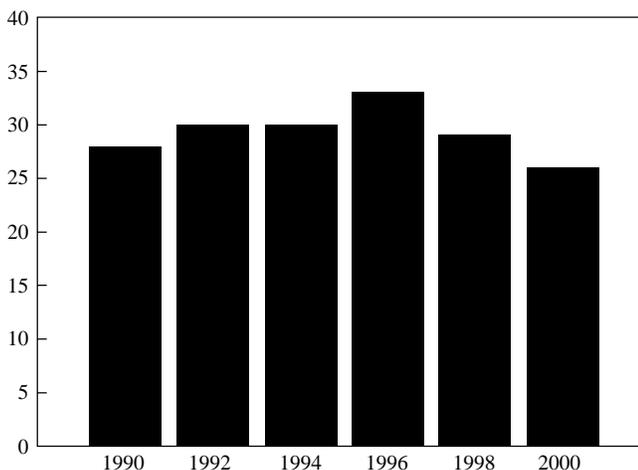
Note: In 1990, ODOT established the goal that by 2000, at least 35 percent of Oregonians would commute by means other than single-occupancy vehicle. By 2000, this goal was not met.

Source: *The 2001 Benchmark Performance Report,* Oregon Progress Board, 2001.

Figure 13. Oregon DOT benchmark reporting: Percentage of Oregonians who commute by means other than a single-occupancy vehicle.

miles of limited-access highways in Oregon urban areas that are congested, as expressed by the hours of travel delay per driver per year in urban areas. Portland metro is separated from all other areas in this analysis. Using this measure, the board established that in 1997, there were 52 hours of delay and, recognizing rising trends, set a goal of not more than 60 hours of delay by 2005.

CASE STUDY 8: BOULDER, COLORADO

The city of Boulder uses customer information and customer teams to design and develop regional transit service. Working with the regional transit agency, the city has developed a transit program that involves its own citizens in designing details of routes and service. The program has doubled the number of bus riders over the past decade in this city with a nighttime population of 100,000 and a daytime population of 145,000. Boulder bus riders are drawn from city residents, downtown businesses, the University of Colorado (26,000 students), and workers at regional job-producing facilities.

Beginning with a program called "Go Boulder" in 1990, the city established its goals for transit services, determining to use its own resources to get the program off the ground. The city gradually expanded its approach to improvements in transit through consultations with both community residents and with the Denver Regional Transit District (RTD), which includes Boulder County and provides local transit service. The city joined with the RTD to test an approach to transit designed to increase ridership. The city uncovered unusual sources of funding to go beyond the limits inherent in local or regional funding practices for transit operations. The combination of community-based design with powerful marketing became a distinguishing feature of the program.

In accord with its transportation master plan, the city turned toward enhanced multimodal services as a principal method for controlling traffic growth within the city. Pedestrian and bicycle routes were established and improved. The city worked with a local transit provider (the firm providing transit service to people with disabilities in Boulder County) to establish an inner-city bus loop connecting downtown, the university, and a major shopping mall. The new service, called HOP, was devised by a citizen advisory committee (CAC) that worked with the city to design all aspects of the service: the exact route, the frequency of services and bus stops, the marketing methods and graphics associated with the bus, and the external look of the bus and its interior layout and design. The CAC also made recommendations for training drivers to approach bus routes and the transit service in a positive way. The HOP route has a distinctive logo, and buses are painted with individual colors and designs (see Figure 14).

The integration of the community-based design elements resulted in a bus service that is very recognizable and intensively used by local residential, business, and university communities. The HOP bus route was initially subsidized by the city. With a demonstration by the city that the HOP route

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Figure 14.   Logo and design for HOP buses.

could successfully attract riders, the RTD took over and now manages the route. The city-RTD relationship has become a strong political partnership intended to help the regional system build ridership, increase revenues, and improve public image.

After its initial success with the HOP route, the city worked with business and neighborhood representatives on other RTD routes using the citizen advisory committee model. For each route, the city formed a committee of 30–40 citizens, drawn primarily from residences, work places, or school sites along the route. The city guaranteed major blocks of time for its staff to work directly with the citizen committees. A schedule of 9–12 months was set aside for each design period leading up to proposed changes. Citizens on the advisory committees were presented with a list of potential items to revise on each route. Certain items such as union operations were not on the agenda. For these examinations, CACs principally reviewed and discussed the list of issues that were raised during the design of the HOP service: routes, frequency, stops, marketing, and design. A neutral facilitator led each meeting. Votes were not taken; consensus was used to make CAC recommendations.

Using these methods, the city identified four additional existing RTD routes to examine. These routes became the following:

- SKIP: a north-south route through the city center;
- JUMP: an east-west route to the city center, with a LONG JUMP from an outlying area and a SHORT JUMP from an area lying closer to the city center;
- LEAP: an east-west route to serve employment sources; and
- BOUND: a north-south route farther from the city center.

Each of the above RTD routes, like the HOP route, has a distinctive logo, with distinctive colors and designs painted on the buses.

Together, these bus routes form a grid network of services for the city. Two further routes are currently being designed for implementation to supplement the grid. All routes provide high-frequency transit service based on a design by the community.

Funding for the revisions to bus routes comes from a unique mixture of sources. Under a new agreement with the city, the RTD agrees to commit the funding required to operate the existing route toward the new, revised route. The city finds the necessary additional funding to build on the RTD basic support for operations. New funding frequently comes from federal transportation grant programs and is often the result of funding applications from the multiple communities served by the newly revised route. The RTD accepts city recommendations for route revisions where minimum ridership and service hour standards are met. Boulder's community-designed routes have exceeded these minimum standards in each route revision.

The new transit services and the improved ridership encouraged the city to move toward new goals. Reviewing its transportation master plan in 1995, the city expanded the scope of the plan and established three basic goals:

- Hold traffic at 1994 levels—2.4 vehicle miles traveled (VMT) per day,
- Develop a multimodal transportation network, and
- Provide a transit grid with a core-area shuttle.

For the multimodal network, the city set priorities for funding improvements to each of the transportation modes in the following order: pedestrians, bicycles, transit, and roadways.

With experience in successfully improving seven bus routes, the city suggests that improvements to transit service consist of five critical interrelated elements:

- Market research,
- Integrity in design,
- Marketing,

- Measurement, and
- Continuous improvement.

Market research helps the city understand potential market segments that would use proposed bus services. The purpose of the surveys is to isolate target markets and to satisfy community needs. Market research includes on-board surveys, communitywide surveys, focus groups, and community meetings. In Boulder, target markets were readily discovered: students, residents, and employees, each with distinct travel needs. For the HOP central area loop route, the city targeted services for daytime activities such as shopping, errands, and lunch. For the SKIP and JUMP routes, the city assumed that riders would need services not only for daytime activities but also for commuter trips. Riders wanted vehicles that were attractive and easy to identify, with pleasant interiors and low emissions performance.

To ensure that there is integrity in design, the city relies heavily on interested citizens in designing bus services. For example, in one exercise, advisors determined that they did not want to rely on schedules to find a bus, leading the city to determine the need for small buses, high frequency, and dependable service. Citizen advisors also did not want to worry about missing the bus after hours; the result was extended service hours in the evenings and ensured rides home for others. Advisors did not want to waste time in travel, guiding discussions toward more direct routings that were easy to understand. Vehicles were designed with comfortable seats, carpeted interiors, music, and clear, large windows (advisors did not want tinted glass hiding bus riders and contents). Service identity was promoted through distinctive paint colors and motifs on bus exteriors; for example, the HOP service line included rabbits, crickets, and frogs as part of the design from the options provided by a graphics design firm.

A marketing plan for each line is based on several integrated elements. First, advisors determined that an overall transit network identity should be developed early. Second, the web provided coordination among all team members. Third, a countdown period of 6–9 months led to new service. Fourth, advertising was placed in print and on local cable. Fifth, new vehicles were shown before service starts to create a buzz in town. Marketing techniques were developed so that provider partners could play a role in promoting the new services. Both the city and the RTD were involved in marketing services; costs of marketing were split between partners. Slide presentations were available for people to take out into their communities. Further marketing efforts include the pass programs described below. Marketing is carried out by a full-time professional on the city staff.

Measurement and reporting of results were determined to be necessities for the feedback that management would need to understand the impact of its services. For example, after a year of new service, on-board surveys were conducted to determine if services were well conceived and if they met the expectations of the advisory committee and the community.

Measurements were intended primarily for decisionmakers and the community to evaluate where services met targets and expectations and where they did not. In the years since the program was initiated, transit providers have increasingly needed to inform the community about what the transit providers have learned through the measurement process: they are interested in historical trends and in what will be provided as improvements to the service.

Continuous improvement is an integral part of the provision of transit services in Boulder. Generally, continuous improvement means that initial designs are useful but may be subject to either gradual or rapid changes in user needs and use patterns. Techniques of measuring transit use can help calibrate changes that may be needed. For example, over time, the city learned that riders wanted bike racks on the circulating city center loop, additional capacity on another route, changes to physical routing on yet another route, and general improvement to pedestrian amenities.

To entice Boulder residents and workers to increase their use of the transit network, a series of pass programs encourage the riders in neighborhoods, businesses, the university, and schools. Pass programs are now an essential part of the transit service and are designed for specific markets. They include the Eco Pass, used by businesses and university students, and the Neighborhood Eco Pass.

The Eco Pass is an annual bus pass purchased by employers for full-time employees and represented by a photo ID card. Using the card, instituted in 1991, employees are entitled to unlimited rides on all regular RTD transit services in and around Denver, including local, express, airport (Skyride) or regional buses, local community transit networks, the light rail network, and Call-'n-Ride. Pass holders are eligible to use the Guaranteed Ride Home program from Ride Arrangers. Eco Pass holders now number 60,000. Of this total, about half are university students or faculty, and half are from businesses or neighborhoods.

The framework for encouraging business and government employees to use alternative transportation modes in downtown Boulder is the general improvement district (GID). The downtown GID has encouraged adoption of employee programs to garner for transit the work trips of 700 downtown businesses in offices or retail establishments (7,500 employees, not counting workers for the city or county of Boulder). After conducting a 1993 survey of downtown transportation patterns, the city council mandated restrictions on the development of parking and increased employee transportation programs. Because of these programs, employees using alternative modes of transportation increased from 35 percent in 1993 to 47 percent in 1997. Transit has increased its share of downtown work trips from less than 11 percent in 1993 to 21 percent in 1997.

Students at the University of Colorado now purchase Eco Passes through their tuition. Students approved by vote a $15-per-semester charge to give them unlimited access on the city's transit lines and much access to and through Den-

ver. The university program is now a major supporter of Boulder's transit program.

The Neighborhood Eco Pass (NECO Pass) is available to parts of the city where residents decide to work collectively to lower their transit costs. The NECO Pass annual cost is $50–$100 per household, depending on locations and levels of transit services available within a one-third-mile walking distance. The pass is valued at $800–$1,000 if purchased outside this program. Cardholders can use all of the same transit lines as in the Eco Pass. Currently, 17 neighborhoods and 3,700 Boulder residents carry this pass. A minimum of 100 households and a minimum contract amount of $5,000 are required to establish a NECO pass program. First-year programs can apply for a 50-percent discount in both of these items in the first year and a 30-percent discount in subsequent years.

In the Forest Glen neighborhood, residents voted to form a GIT to provide transit passes for all neighborhood residents. Passes are paid for by property owners as part of their annual property tax. All residents, owners or renters, can obtain a pass for the transit services. A special rebate from the usual cost of the transit pass is available to seniors, people with disabilities, and students such as those attending the University of Colorado, where passes are part of annual fees.

LESSONS LEARNED FROM THE CASE STUDIES

The case studies included in this chapter were assembled to illustrate a variety of approaches to incorporating customer needs in decision making and everyday agency work. The review of these examples suggests specific results and procedures that can be applied to other transportation agencies. These results and procedures include the following:

- *State and local transportation agencies are using customer needs to drive decision making.* Examples show that customer needs can be used to drive agency work on both the state and local level and in a variety of transportation modes.
- *According to case examples from the past 5 years, work on customer needs is simmering in various locations around the country.*
- *Results from case examples are evident quickly after implementation.* Agencies find positive feedback from customers after no more than a few years' experience in each instance of implementing programs aimed toward uncovering customer needs.
- *Working with customers can start at any time.* Some agencies have begun to integrate customer needs in the past few years, while others have been working at it for a much longer period.
- *Continuity of customer research is essential.* One-shot efforts to investigate customer satisfaction cannot bring

the agency the trust and integrity that come with a long-term commitment to recognize customer needs and build programs that work to meet those needs. Continuous customer research reflects the fact that customers change attitudes and opinions over time.

- *Continuity can bring long-term political advantage.* The longest record of an agency's customer sensitivity—nearly 25 years—may belong to PennDOT, whose early use of quality analysis improved service delivery practices and moved the agency toward incorporating customer opinion research into day-to-day operations.
- *Agencies are innovative in their use of customer segmentation practices.* Virtually all cases identified customers and used customer segmentation techniques to determine who the agency's customers are and the different needs they represent.
- *Awareness of customer needs brings more positive customer relationships.* Agencies can use this heightened awareness to show how they are being attentive to customer needs and show how their plans and programs work toward meeting customer needs. Customer surveys tend to support agency programs focused on stated, documentable customer needs.
- *Case studies show a direct relationship between customer surveys and policy development.* Results of surveys tend to show, for example, that customers place high values on safety and maintenance, and that kind of information can lead to significant public support for increased agency expenditures on maintenance.
- *Surveys that are statistically reliable have credibility.* Educated customers will justifiably ignore small-scale or small-sample surveys that do not include random selection of respondents. Since customers are frequently skeptical of agency practices, it would be better to use other techniques, such as small focus groups of customers, than carry out a survey that cannot be fully supported in terms of contemporary research standards.
- *Agencies rely on both quantitative and qualitative surveys of customer behavior and opinion.* Quantitative research such as traffic counts are essential, but customer attitudes and explanations can deepen understanding of trends and future behavior. A balance of research has aided agency understanding of customer needs.
- *Research techniques are increasingly matching those of private-sector marketing organizations.* Surveys and analyses of customer wants and needs are becoming more methodical and technically proficient in assessing issues that agencies must address in planning, policy, and program development.
- *Effective agency communication with customers is essential.* Agencies work diligently to quickly respond to customer queries and to build good will by training front line personnel to be gracious, informative, and accommodating to customers. As a result, customers

may respond positively, feel better served, and support agency initiatives.

- *Agency customer initiatives can be very cost-effective.* Programs can be more closely attuned to efficient actions in service and information delivery when those needs are well known. Targeting actions to meet specific needs generates public support and minimizes conflict among the agency; its customers; and its partners, suppliers, and consultants.
- *Agencies can demonstrate links between what customers want and what can be delivered.* Rationalizing the process of service delivery can gain public support and confidence in the agency. This process, demonstrated over a period of years, results in the agency's institutionalization of understanding and incorporation of customer needs.
- *Agencies need to be aware of the internal climate of the organization.* Many agencies conduct periodic employee surveys to determine internal attitudes and suggestions for agency performance improvements. Morale can be enhanced by recognizing and integrating employee interest in serving customers better.

CHAPTER **8**

GUIDELINES FOR PRACTITIONERS

INTRODUCTION TO THE GUIDELINES

What can be learned from the examples and case studies presented in this review of methods of incorporating customer needs into transportation practices? How can information from the wide variety of organizations in various parts of the country be coordinated and put into use? What steps can an agency take to proceed toward acknowledgment and use of customer opinions and needs? How can an agency be assured that these steps are integrated with one another? How can an agency be assured that these steps will lead toward actual improvement?

These guidelines have been prepared to address questions confronting transportation agencies that are concerned about dealing effectively with customer needs. Incorporating information from national research, the guidelines take advantage of transportation agency experience in improving customer relations in both qualitative and quantitative ways. Guidelines were assembled by categorizing practices that integrate well into agencies, address customer needs, and use data collection as a core requirement for a successful approach to serving customer needs.

CRITERIA FOR GUIDELINE DEVELOPMENT

A series of criteria has been developed in preparing these guidelines. The criteria help ensure that the guidelines will have maximum potential in improving relationships with customers. The criteria are as follows:

- *Guidelines must have specific applicability to transportation agencies.* Each guideline is based on approaches by agencies over a broad front designed to understand, incorporate, and improve customer reactions and attitudes.
- *Guidelines must derive from actual practice.* Each guideline is based on practices in one or more transportation agencies around the country, as reported in research and analysis in customer service trends. Guidelines reflect the array of practices that exist in agencies around the country. When selected to illustrate guidelines, information from individual sources helps to demonstrate the practicality of the recommended procedure.
- *Guidelines must be used in program planning and resource allocation, not in individual projects.* Project development customarily has a high degree of interac-

tion between agencies and customers. Guidelines are based on examples of practices that frequently use multiple tasks to get results.
- *Guidelines must provide an integrated approach for agencies to follow.* Most of the guidelines are intended to work sequentially. The multiple components fit together to represent a total work effort that uses customer needs to drive decision making.
- *Guidelines demonstrate the need for interviewing both the end-user customers and agency employees in gathering data on attitudes and expectations.*
- *Guidelines must be designed to be implementable and result in measurable improvements.*
- *Guidelines must be designed to offer a range of available applications for transportation agencies, along with options for differing levels of resources, such as staffing, to implement a new practice.* They reflect different agency purposes and goals in seeking customer input. They offer a variety of measures of effectiveness of instituting improvements for incorporating customer input.

The criteria have been used in reviewing practices reported from agencies around the country and reflect the usefulness of specific practices that lead to specific guidelines.

The guidelines are organized into broad practice groupings that reflect typical procedures being used around the country; generally, the practices are in sequential order. They are as follows:

- Guideline I: Preparing to deal effectively with customers
- Guideline II: Getting customer input
- Guideline III: Applying customer needs to decision making
- Guideline IV: Keeping customers informed

Within each of these broad groupings, subheadings provide steps to take in incorporating customer needs into agency procedures.

GUIDELINE I: PREPARING TO DEAL EFFECTIVELY WITH CUSTOMERS

Guideline I describes what a transportation agency can do to assemble information to improve its understanding of its

customers and how that information can be integrated into short- and long-term decision making, administration, operation, planning, and program development. This guideline emphasizes working with agency staff to ensure that the search for a customer basis is undertaken with staff enthusiasm and support. The work is organized into three basic categories:

- Guideline IA: Establishing the agency's customers and partners
- Guideline IB: Setting a context within the agency for working with and for customers
- Guideline IC: Organizing the agency staff to understand customer needs

These steps lay the framework for assessing, understanding, and working effectively with customer needs.

Guideline IA: Establishing the Agency's Customers and Partners

A growing consensus among transportation agencies is that their principal customers are the end users of the transportation facilities and services. Some agencies have suggested other candidates as their customers—suppliers, service providers, contractors, and members of the legislature. While these groups are important to transportation agency business, many agencies think that customers are the most important reason for the agency's existence. Transportation organizations are created to serve end users. Suppliers, service providers, contractors, and members of the legislature are partners of the agency, all acting as servants who provide transportation services and facilities to the end users.

> *Principal goal: to ensure that all agency staff and partners agree on basic terms* in establishing or improving the agency's relationships with customers and in understanding their needs.

Step 1: Determine Who the Agency's Stakeholders Are

Stakeholders are, by definition, all those who have a stake in what the agency does. They include end users, suppliers, partners, and policy makers from all levels of government.

Step 2: Determine Who the Agency's Customers Are

The principal customers of a transportation agency are most likely to be end users of the services and facilities provided by the agency, though neighbors or abutters to an agency's facilities might also be regarded as customers. End users are external to the agency and form a group of stakeholders in agency actions. Unlike other stakeholders, they have no partnership relation with the transportation agency. Breaking down agency customers by types ("segmenting" customer groups) is essential to understanding specific and potentially differing needs. If segmentation has already been accomplished, agency staff can build on the work.

Step 3: Determine Who the Agency's Partners Are

Partners, like end users, are also stakeholders in the overall process. Partners have different roles to play, principally because they actively help the agency provide services and programs. The list of partners includes transportation agencies and their internal staff members, policy makers of various units of government (including municipalities and regional organizations such as MPOs), state or federal agencies, and provider-partners who join agencies on projects or programs that use some of their own resources. All suppliers, contractors, and consultants are partners in the transportation agency's efforts to better serve customers.

Guideline IB: Setting a Context within the Agency for Working with and for Customers

The most important action an agency can take is to provide a context for customer-centered service activities within the agency. In this regard, it is essential that executive levels support the concept and that agency staff members understand and support the concepts of working with and for customers.

> *Principal goal: to ensure that the agency executive leadership and staff work together* in a customer-centered approach to the agency's work.

Step 1: Ensure Top-Level Support from the Outset of the Work

The executive management's ability to support and guide agency staff is essential to an organization's success in adopting customer-based approaches. Staff members must understand that the organization's leadership wants customer service to be a principal basis for agency work. Support for a customer-based philosophy might be embedded in strategic planning efforts or in the agency's business plan.

Step 2: Find a Champion to Lead the Work of Improving Customer Service

Leadership should come from the executive level of management, supported by the agency's top executive. A champion can be found by looking for appropriate executive-level

volunteers or by assigning the task to an interested and committed department head or to another high-profile individual within the organization.

Step 3: Form a Working Group of Employees

The working group will guide the customer information gathering as a basis for agency work. Working group staff members could include representatives of a strategic or business planning team, the program planning staff, marketing or public affairs departments, executive office heads, and operating units. Staff members should work as a team with an agencywide perspective while maintaining an approach that respects distinctive lines of organizational responsibility.

Step 4: Solicit Views on Customer Issues

The working group should find ways to reach out and listen to individuals or organizations that have tried various approaches to improving customer satisfaction with the agency's services and facilities. This process can begin by soliciting and recording the views of the group itself.

Step 5: Establish Tasks for the Working Group

Initial working group tasks should include articulation of the agency's reasons for looking at customer needs and the means necessary to determine and acquire data to help the agency understand those needs.

Step 5A: Articulate convincing reasons for looking at customer needs. The agency's working group should determine and document its desire to do the following:

- Understand customers and their needs.
- Improve the agency's effectiveness in dealing with customers.
- Ensure equitable resource expenditures among customer groups.
- Demonstrate financial implications of dealing with customers' needs.
- Elicit support for the agency's approach and work that will be based on it.
- Improve performance and responsiveness by meeting customers' needs and expectations.

Step 5B: Develop a general understanding of desirable types of data. The agency's working group should be coached on the use and desirability of a variety of data terminologies that may be useful in understanding customer needs:

- Quantitative, objective, behavior-based data that reflect choice of modes and routes, volumes of traffic, delays, crash incidence, and so forth;

- Qualitative, subjective data that come directly from customers and reflect attitudes, opinions, positions, and explanations of choices and trip purposes; and
- Combined quantitative and qualitative efforts that reflect an understanding of traffic patterns, testing impacts of proposed improvements, testing acceptance for proposals, and so forth.

Statistically valid surveys are a basic requirement for all agency data gathering.

Step 5C: Review the specific types of existing data that are available. To begin this process, the agency should first examine potential data sources, then establish what data will be most useful in understanding customers. Examples of data and their sources include the following:

- Quantitative data in agency records of customer actions
  – Traffic counts (corridor, route)
  – Ridership counts (corridor, route)
  – Origin-destination surveys (regional, subregional)
  – Other internal sources of objective data
- Qualitative data in agency records of customer actions
  – Suggestions, complaints, and plaudits
  – Public meeting records
  – Project committee records
  – Customer satisfaction surveys
  – Other sources of subjective data
- Quantitative or qualitative data from nonagency, external sources
  – Demographic indicators: federal, state, or local census records
  – MPO records
  – GIS field work
  – Media contacts
  – Nontransportation state agency data collection
  – Other external sources of data

Guideline IC: Organizing the Agency Staff to Understand Customer Needs

Knowledge is a basis for action. Customer-centered service activities cannot be supported without a solid understanding by agency staff of why customers are important. Working toward meeting customer needs is what many agency employees think they already do, yet they may not have direct input about what customers think of the services being offered. It is important to nurture staff consideration of current practices in a context of how improvements might be made. For example, an employee climate survey can uncover staff concerns and ideas about customer service needs from the agency. In many cases, this work will be supplemental to tasks already underway and will build on past practices to improve the delivery of services that meet customers' needs and wants.

Experimenting with varying approaches may aid agency staff members in understanding and supporting the concepts of working with and for customers while enhancing a sense of teamwork within the agency culture.

Principal goal: to guide staff throughout the agency to use customer input efficiently in sorting priorities, making decisions, assigning tasks, setting overall schedules, and obtaining support from all levels of the organization.

Step 1: Make Customer Service an Executive Priority

Agency management can announce its intent to focus on customer wants and needs within the agency and make customer service a part of short- and long-term strategies. The announcement should be based on a program of incorporating customer needs into agency work, along with constant reminders of the service direction that is implied.

Step 2: Assign Time for Staff Work to Adequately Consider Ongoing Customer Service Issues

As preparatory work within the agency gets underway, employee working group tasks are likely to become numerous and require sorting and ranking. Staff time should be allocated for development of a customer-centered approach. Initially, the head office may arbitrarily assign staff time. Later, the working group will be able to define the amount of time it needs to do its work.

Step 3: Consider the Addition of Staff Resources to Guide the Work

The working group may find itself overwhelmed by the process that will determine what actions are required to reorient the agency. In such instances, it may be appropriate to consider hiring staff with applicable experience or finding temporary consultant assistance to train staff or provide guidance. It is important that the agency "own" the work if outside help is used.

Step 4: Determine Which Customer Service Issues Confront the Agency

The working group should discuss, in a preliminary way, known issues that the agency has encountered regarding customer service, including finding records of complaints or suggestions from customers. It is important to know if the agency has responded appropriately to customers in recent years. Examining approaches used by other agencies may help to inform this process.

Step 5: Organize Tasks to Improve the Agency's Understanding of its Customers

Organizing tasks should lead to an action agenda. The group should outline a process showing how information from objective and subjective research can be used to form agency decisions and actions and make the data central to agency activities. Work should be outlined to be congruent with overall agency goals.

Step 6: Organize a Time Period for Action

The working group will need to determine how its work can be effective in both the long and short term. Some actions may necessarily be experimental and would need to be reviewed after a limited period of time. Methods for assimilating information or for altering current agency practices should be established, along with time implications.

Step 7: Communicate What is Determined

Special efforts to promote internal communications are essential. Contacts, newsletters, or videos can spread the word about the agency's proposed use of customer input. Methods of eliciting agency staff responses should be put into place. The attitudes of other institutions may be helpful. University or other academic programs in data collection may be related to the proposed work. Other state, regional, or local government agencies may be able to help with organizational or other data issues.

GUIDELINE II: GETTING CUSTOMER INPUT

As the public becomes more demanding about the ways in which agencies respond to constituents, customer service is a necessary agency emphasis, and the agency's responsiveness to customer needs to be demonstrated. One result is that agencies must make efforts as part of their ongoing decision-making processes to find out what customers do and what they want.

Guideline II is oriented around the process of finding and assembling information about customer needs and wants. Information can come from objective and subjective sources. The general approach will be to maximize the use of available information and to set in motion a process to determine the need for new information and a design procedure to collect it.

The work is organized into four basic processes:

- Guideline IIA: Creating a system for inventorying available data on customers
- Guideline IIB: Analyzing the utility of available data
- Guideline IIC: Differentiating types of data needs
- Guideline IID: Collecting new information

These steps provide a framework for the agency to improve its understanding of customers by obtaining data on their travel choices or behavior and their preferences, wants, and needs.

Guideline IIA: Creating a System for Inventorying Available Data on Customers

Virtually all transportation agencies collect data about their customers. Over the years, traffic counts and opinion surveys have been used to elicit customer practices and opinions. Yet many organizations have no systematic method for examining or comparing data sources so they can be effectively used by the agency. In many instances, the information is collected but not used in decision-making processes. Systematic thinking about data begins with a look at the agency's available information concerning its customers.

Principal goal: to collect and array customer information that is easily available.

Step 1: Find and Preserve the Data

Data collection efforts are invaluable to a transportation agency. Potential sources of data that are useful to transportation agencies include U.S. Census data and surveys or other enumeration from outside agencies or departmental units within the agency. Special efforts are warranted to collect, preserve, and transcribe data in a form that researchers can use. All customer data should be retained in a permanent form. Where possible, this form should include raw, unprocessed data—counts, survey results, tabular reports—that may be useful in future analysis in the event that any of the collected data were unused.

Step 2: Integrate Data about Customers

Data are useless to an agency unless the data are comprehended and integrated into staff work. To prepare for using data, several basic steps are required:

Step 2A: Catalogue the data. Data should be catalogued following a comprehensive inventory of known and potential sources of information about customers. Methods should be found to coordinate and cross-reference customer data, whether in an objective, behavior-based form or in subjective, opinion-based research. In each case, what is known about the data should include the following:

- What—the subject of the data collection;
- When—the date of data collection;
- Where—the locations of data collection;
- Who—the agency, staff, or participants conducting the collecting process;

- How—the sampling procedures used in collecting the data and methods of recording data; and
- Why—the purpose(s) for collecting the data.

Finally, it is useful to record whether the data were actually used by the agency, how they were integrated into agency decisions and work, and which staff members or departments used them.

Step 2B: Determine comparability of data. Looking at trends in transportation patterns affords a useful way to project future needs and design programs to meet those needs. Trends (sometimes called time series) can be found only where comparable data exist for the same information for more than 1 year or other time span. Traffic or passenger counts at identical locations in more than 1 year will yield information that may be comparable. Data cannot be extrapolated to become a time series if data are not directly comparable.

Step 3: Develop a Format for Displaying Data

Data are only useful if accessible and useable by agency staff and, ultimately, the public. Display techniques can vary as needs may suggest; however, agencies should be aware of the need for consistency to avoid misleading the public about the meaning of data or data displays. Under no circumstances should agencies skew data or present data in ways that may be misunderstood or misinterpreted.

Transportation agencies need to explore ways to present data in a useful form to a variety of potential users. For objective data of customer behavior, charts and graphs are one way to tell the story. Subjective data can also be presented simply; pie charts, for example, are frequently used to portray distinctions between customer segments. In most instances, complementary and explanatory material designed to accompany visuals is essential to ensure that observers comprehend the display of data and what the information may mean to observers or their future.

Guideline IIB: Analyzing the Utility of Available Data

Collecting data can be very expensive and usually will not be warranted without a detailed understanding of how the data can be used effectively and how the data will benefit the agency, its customers, or both. An early step that may be taken prior to obtaining new data is an analysis of data already in hand. In many instances, agencies find that this analysis deepens the understanding of information already collected and provides a basis for subsequent examination. Many methods may be used by agencies to examine existing data and maximize their use. Agencies may want to consider hiring outside expertise for the analytic process. Some of the ways agencies use available data are included below.

Principal goal: to find ways of maximizing potential uses of available data.

Step 1: Create a Framework for Examining Data

The tasks of collecting, reviewing, and analyzing data about customers and the ways in which customers use and view transportation services and facilities should be delegated to agency staff with survey research expertise. The group may become, in effect, staff for the agency's center for survey research. In a time when information and data are highly revered, agencies with research centers may become highly regarded. Group tasks will include finding analytical methods to advance the agency's understanding of its data collection procedures and results. Tasks should include establishing rigorous methods for assembling new ideas about data and applying them to existing information. Training programs may be necessary to ensure staff comprehension and information use. In some instances, data uses will become apparent as information is arrayed in a sequential or other form of relationship and as questions are asked and pursued.

Step 2: Identify Data Needed for Strategic or Business Planning

Information should be collected with consideration of the need to support and enhance strategic or business plans. For example, safety issues will undoubtedly be identified as a major goal of a strategic plan. Improvements in safety might be expressed in terms of potentially desirable outcomes that will result from implementing safety improvements. Methods of measuring success in safety improvements will be essential and may include standards for measuring safety improvements. Data can be designed to demonstrate that improved safety has resulted from systemic improvements.

Step 3: Determine Gaps in Information

Whether data will be useful depends on completeness and on whether the present form of the data will be applicable to current issues in a timely way. Gaps in knowledge may exist where information is too old or confusing or where useful aspects of informative data were never collected. If the data are mostly objective—for example, from traffic or passenger counts—collection of additional objective information may be warranted. If objective data do not tell the full story, there may be a need for opinion-based subjective research to determine directly what customers think they want and need. If information is more than 5 years old, it may be important to update the database, perhaps with additional subjective research to fill gaps or flesh out unknowns.

Step 4: Focus on Filling Gaps in Information on Customer Groups

A major and typical example of a gap in information within transportation agencies is the determining of agency customer segments and subgroups. Portions of this work can be accomplished with existing data, particularly in qualitative surveys that aim to determine what kinds of customers they are and what they expect from the agency. This type of information can become useful in determining an agency's approach to many of its tasks.

Step 4A: Create a method for identifying agency customers and subgroups. In undertaking this task, an agency can document known customer subgroups or segments and look for potential new subgroups or segments. Customer segments can be based on geographic areas, demographic or population data, behavioral patterns, or socioeconomic differences. Each group of customers should be some or all of the following: homogeneous, distinguishable, of significant numbers, reachable, and stable. Throughout this exercise, it is important for the agency to document methods used to determine existing or new customer segments.

Step 4B: Look for methods to analyze differences between customer segments. The results of this task are used to portray distinctive customer needs by segment. In some instances, the agency will find self-defined customer groups who will offer their comments on agency work. Differences between customer segments and their views of the agency will vary depending on

- Views of needed services for customer segments, such as commuters, recreational drivers, commercial truckers, and transit users;
- Differences in expectations from the agency; and
- Degrees of satisfaction with the agency's work.

Step 4C: Determine missing information about subgroups. In all probability, varying amounts of information will exist for specific customer segments. Information that is immediately useful to the agency may not be apparent or may take some degree of effort to uncover. Some of the information to look for includes

- Current demographic information;
- Population distribution patterns and distribution of subgroups within overall patterns;
- Current transportation use patterns and differing needs of subgroups in transportation; and
- Customer awareness of services and facilities, perceptions of and attitudes toward the service provider agency.

**Guideline IIC: Differentiating Types
of Data Needs**

A great variety of customer data can be useful in directing policy development, programmatic plans and objectives, and project work. Objective data can be used to demonstrate customers' behavior and their use of agency services and facilities. Objective data essentially look backward, forming the historical basis on which future conditions will rest. Baseline data, established using objective measurements, can be used in subsequent years for additional measurements of the rate and nature of change.

Subjective data, used to determine customers' opinions and suggestions for improvement, are often forward looking, with future changes and improvements as the focus, based on opinions and experiences drawing from the past. Subjective customer data can be contrasted with objective trends to make decisions on future policies, program development, and the project planning emphasis. Both objective and subjective data can be used to better understand relationships between customers and agencies.

Differentiating types of data may require outside assistance and expertise to be of maximum use to the agency. Alternatively, the expertise of data exploration and application could be added to agency staff; staff with marketing or research background may be most capable of massaging and using customer data. This expertise is important in evaluating existing data and setting the stage for acquiring additional data.

Principal goal: to determine uses for both quantitative and qualitative data.

Step 1: Explore the Varieties of Data Types

Information about customers can be derived from many sources. In recent years, transportation agencies have invented creative ways to find new sources of data and to portray the data imaginatively. The underlying information may be objective or subjective or a combination designed to heighten customer interest in issues and problems faced by agencies. Certain data are highly desirable for an agency to have—for example, information that will help an agency fulfill a mandate that involves customers directly. Long-range planning can include not only public meetings but also information about what customers think about the process and the emerging products or plans.

Step 1A: Examine quantitative data sources. The best example of quantitative data is the traditional traffic or passenger count that many transportation agencies conduct periodically. These counts are usually taken over a period of several days to provide averages that avoid distortions caused by unusual travel patterns. Quantitative data can also be used to demonstrate the agency's annual progress or performance in terms of actions taken. This information is frequently used to demonstrate that the agency is working to meet its long-range strategic goals.

Step 1B: Examine qualitative data sources. The best examples of qualitative data sources are customer surveys and focus groups. Getting customer information in these ways is generally more costly than counting traffic because of the time and effort to prepare, execute, analyze, and report on such customer contact. Customer surveys are generally thought to be an accurate way to obtain opinions or explanations of travel patterns if they are based on statistically valid random selection techniques. In such cases, surveys become statistically valid, unbiased methods of obtaining information; that is, they represent a larger population with traits similar to the sample surveyed. Stratified random selection methods also help agencies reach all customer groups or segments. Focus groups, when contrasted with large-scale surveys, are relatively inexpensive, easy to prepare and implement, and informal. Each source should be explored for the customers' stated opinions, preferences, attitudes, values, expressed and unexpressed needs, and feedback on current practices and suggestions for future performance.

Step 2: Find Ways to Use Both Qualitative and Quantitative Data

Quantitative and qualitative data collection methods can be used together in specific techniques. The best example for transportation agencies is the origin and destination survey, where quantitative and qualitative data complement each other. Traffic and ridership counts are supplemented by a sample survey of customers to determine subjective reasons for travel choices and explanations of patterns of travel. Such surveys are also useful because they tend to be neutral toward the use of modes. Examples of the combined use of objective and subjective data in other ways are given below.

Step 2A: Use quantitative information prior to qualitative surveys. Ridership or traffic counts can be used to give dimensions or scale to a larger survey. Informal quantitative surveys, such as demographic data, can be used prior to larger surveys to identify customer groups that warrant interviews.

Step 2B: Use qualitative information to supplement quantitative surveys. Since quantitative surveys can be expensive, small-scale information sources can be used to give direction and help ensure a comprehensive approach. Agency e-mails, suggestion boxes, or complaint bureaus can lead to numerical surveys. Paid panels, focus groups, or role-playing exercises with customers can give direction to counting efforts. Public hearings or other community meetings can

also provide impetus to counting efforts. Small test groups can help develop questions for quantitative survey forms and pretest the survey instrument.

Step 2C: Use qualitative information to help amplify quantitative surveys. Numbers alone cannot express the whole pattern of travel behavior. Surveys of customers help explain why travel behavior can result in congestion in specific locations by giving reasons why individuals make the travel choices they do.

Step 2D: Use qualitative methods to prepare for quantitative or qualitative surveys. Focus groups have been used as a method of informal testing of approaches to qualitative surveys, in some cases becoming the basis or first test of a questionnaire developed by the agency. Since large-scale qualitative surveys are also expensive, small-scale efforts help to elicit issues to be explored in a larger effort.

Guideline IID: Collecting New Information

Following an inclusive and extensive review process, an agency can determine which new information is essential to its long- or short-range policy or program development. Collecting new information should not be a last resort, but rather a method of updating information and of answering questions about customers and the ways in which they use transportation services and facilities. New information can be used to add significantly to an agency's understanding of its efforts, their effects, and the ways in which customers view the agency's decisions and performance.

In collecting new information, it is essential to have expertise in survey designs, market research, and statistics to ensure that the agency carries out the work efficiently. For example, this expertise can be added to staff capabilities in the form of experienced new hires or can be found in outside firms that specialize in collecting statistically valid information that is useful and readily applied to customer service improvements planned by the agency and decision making that leads to implementation.

Principal goal: to determine ways of obtaining new data about customers.

Step 1: Determine What New Information Is Needed or Wanted

From the analysis of available data, it should be possible to determine if essential and desirable information exists. Gaps in existing information will determine the types of information needed. As an agency prepares a list of needed information, the agency should consider methods of using new information and of coping if the new information is not forthcoming. The distinctive character of each piece of infor-

mation should be underscored and the rationale for obtaining new information outlined. If possible, the agency should solicit representatives of existing customer segments for their views about obtaining new information.

An array of data collection techniques is available for agency use. The selection of one or more techniques will be based on agency needs and to a large extent on the kinds of information already collected. The process should include representatives of agency customers, who are consulted to solicit their views on the usefulness and applications of proposed data collection activities. Many types of information can help the agency perform its duties, including

- Use patterns made by agency customers (used in planning and decision making);
- Volumes of customers using agency facilities (used in planning and decision making);
- Customer opinions (used in developing programs and policies and making decisions);
- Agency direction and management;
- Agency service levels;
- Agency facilities—construction, safety, maintenance levels;
- Agency personnel;
- Overall image of the transportation agency;
- Unmet needs; and
- Employee opinions about agency services, facilities, and management (used in developing responses to customers).

Step 2: Determine Possible Approaches to Obtaining New Information

Information should not be sought for its own sake, but rather as an aid to an agency's decision making on policies and programs. Agencies can seek new information as a method for doing the following:

- **Updating or revisiting existing data.** Updated information is helpful to demonstrate progress, track trends, and supplement other forms of information.
- **Adding information.** By conducting new surveys or other methods of determining travel patterns and needs, new information can be used to expand understanding of the agency's customers and their needs, wants, or opinions.
- **Working toward a time series or longitudinal continuum.** Collecting the same information each time a survey is undertaken can help agencies uncover changes in use patterns and attitudes of users over a period of years.
- **Making greater use of day-to-day contacts with customers.** Telephone or other contacts with customers can become a partial surrogate for the agency to use in keep-

ing a record of how it is doing. Complaints, suggestions, and kudos can give the agency an impression of where it should be making improvements.

Step 3: Collect the New Information

An information collection process should include both objective, behavioral measurements such as traffic counts, and the face-to-face contacts with customers who are the basis of surveys, interviews, focus groups, and public involvement using public meetings or other techniques. The collection process should include the following elements:

- Consulting with agency customers for input before and after data collection to get feedback;
- Determining contacts (detail and record selection processes used, such as random selection methods that are statistically valid);
- Establishing continuously available methods for day-to-day customer contact, such as complaint bureaus, fax lines, hotlines, and agency websites;
- Reaching out to contact individuals for opinions, transportation use patterns, demographic information, etc.;
- Documenting contacts, their types, number, volume, and locations, while respecting the confidentiality of customer contacts;
- Documenting content of contacts (counts, responses, locations, dates, etc.);
- Recording data in a consistent format to aid internal and external comprehension;
- Ensuring availability of data through a permanent repository for information open to the public for both survey data and daily comment collections; and
- Recording examples of how the agency uses data through reports, policy documents, program plans, and project development.

*Step 4: Establish a Continuous Data
Collection Process*

To be most useful, data collection efforts should be ongoing. At an early date, an agency should review the benefits of an ongoing data collection program. Over time, data can show trends in customer activities and opinions and help define directions the agency can take to adapt to changed circumstances. Progress can also be demonstrated with data collected over time, allowing the agency to evaluate its actions and develop new programs. Carefully collected information over time supports business orientation toward customer service. Changes over time can affect customers' attitudes toward agency services and show changes in measures of satisfaction with agency service delivery.

GUIDELINE III: APPLYING CUSTOMER NEEDS TO DECISION MAKING

Guideline III is designed for use by transportation agency staff in preparing for and responding to customer needs. It is intended to train staff to recognize the importance of customer contacts with the agency and of high-quality responses to those contacts. Training should be devoted to using customer data in everything from commonplace daily tasks to major decisions on agency policies and programs with long-range implications.

The work is organized into three basic processes:

- Guideline IIIA: Organizing to disseminate customer information inside the agency
- Guideline IIIB: Training agency staff to use customer data in daily tasks
- Guideline IIIC: Using customer data to make decisions

These three steps provide a beginning framework for training agency staff to recognize the worth of customers and their opinions and to work with customers in fulfilling the responsibilities of the agency.

Guideline IIIA: Organizing to Disseminate Customer Information inside the Agency

Information about customers is of little use unless it is available to staff people who can use it to perform work or make decisions. A transportation organization can use many existing methods of employee communication to provide information about customers to agency staff. In some instances, new methods of communication may become essential for appropriate distribution of customer-based information. For example, an agency might set up a distribution network that targets all staff who may need to know about customer data. It is important to recognize that an integral part of disseminating information is to respect the confidentiality of the customers who provide information.

Principal goal: to ensure access for all agency staff to information about customers.

*Step 1: Create a Structure to Disseminate
Customer Information within the Agency.*

To promote internal access to information about customers, agencies should use the existing hierarchy of staff relationships and contacts, along with newsletters, e-mail, teleconferencing, or videos to inform staff about the proposed agency use of customer input. It is useful to tell people what data are available without circulating an entire book of survey results. As in most efforts by agencies to inform staff, methods of providing feedback from agency staff should be

included. Agency staff members should be designated as responsible agents for data collection and analysis, reports on data findings, transmission of results throughout the agency, and communications with customers regarding aggregate data and data interpretations.

Step 2: Establish Close Links between Agency Staff Members Who Deal with Customer Information

Agency work devoted to using customer information will be enhanced if staff members can share the information and work on it together. To accomplish interchange of information and interactions between staff members, it is essential to determine the agency's framework for sharing data about customers. A process for data collection should be established within the agency and should include representation from agency data users and an agency spokesperson who can clearly articulate the uses of data and the benefits to the agency of correctly interpreting data content.

Step 3: Find Ways to Share Customer Information

Methods of sharing data between staff members are essential and may include printed material such as reports and handouts, or online material as a source of basic materials, perhaps including raw data collected by the agency.

Step 4: Designate a Functional Unit to Incorporate Customer Data into Long-Range Policies and Programs

Agency staff dealing with long-range policies and programs may be dispersed throughout the agency. One method of using customer data is to designate staff groupings—much like the working group mentioned above—to find ways of using the data to best advantage for long-range planning and decision making. Specific staff members with assignments dealing with long-range agency programs and strategies should be included in such a group or develop close links with it. Relationships between staff data collectors and staff concerned with long-range planning may warrant establishing a specially defined team.

Step 5: Implement Strategies for Getting Customer Evaluations

Customer evaluations are one of the principal methods of obtaining feedback to determine whether a transportation agency is aware of customer attitudes toward the agency. For preliminary evaluations of agency responses to customers, it may be appropriate to take steps to research customer attitudes toward the agency and its public image.

Resources to be applied to obtaining customer evaluations need not be costly; one frequently used method is to assemble focus groups from assorted points within the agency's jurisdiction to obtain preliminary information the agency can build on to improve its use of customer information.

Guideline IIIB: Training Agency Staff to Use Customer Data in Daily Tasks

As customer information is disseminated agencywide, staff may need assistance to understand the use of the information. Special training may be necessary for staff to grasp the form and volume of the data, why they were collected, their meaning and potential uses, and how to apply and analyze the information in useful ways. When agency staff members feel comfortable with the use of customer data, the agency will be able to use their insights to provide better service to constituents. For example, customer opinions may significantly assist an agency in developing policies and programs and aid in providing a firm foundation for the agency's decisions.

Principal goal: to integrate customer information into the everyday tasks of agency personnel.

Step 1: Define the Frontline Staff Who Interact with Customers

Staff members who deal with customers are likely to be the most visible and public representatives of the agency—the front line of customer interactions. The list of agency representatives who deal directly with customers is frequently broader than many agencies are aware of or acknowledge. It includes staff involved in executive management and decision making, policy development and direction, department or district office leadership, program management, public relations, public involvement, planning, project engineering, operations and maintenance, licensing and registration functions, research branches, and virtually all personnel who answer telephones. The agency should in some manner reflect its acknowledgement of the critical positions of the agency staff as frontline personnel in dealing with customers. One method would be formally listing people who are the principal contacts with customers.

Step 2: Help Staff Find and Use Information About Customers in Their Daily Tasks

Dealing effectively with customers is not an innate skill; staff may need training and assistance to make the most of data and information about agency customers and to interact constructively with customers. Certain tasks will require training for maximum returns to the agency. Other tasks are already part of everyday agency life but may need fine-tuning to

make the agency more responsive to requests for information. Training programs may be established to deal with the following aspects of agency work:

- **Receiving inquiries from customers.** Agencies typically receive customer requests for information on virtually an hourly basis. Initial contacts with the agency can be frustrating to customers. In an era when cost savings push toward impersonal prerecording information and mail boxes for voice mail messages from customers, it is important to ensure that each inquiry is appropriately registered by the agency and passed along to responsible staff members for a timely response.
- **Responding to inquiries from customers.** Customers form opinions about an agency on the basis of how the agency responds to day-to-day questions—whether the response came from the appropriate person and was responsive to the question, timely, accurate, and delivered in a friendly manner.
- **Receiving and responding to customer comments and suggestions.** A method should be available through which customers can register their opinions about actions that they feel the agency should be undertaking or about how the agency could improve on present practices. Follow-up on comments and suggestions is very important. When an answer is delivered, the agency has an important opportunity to demonstrate to customers that it has carefully considered the opinion or suggestion and has delivered it to the appropriate staff people. If appropriate, the agency could report to the customer on its intended use of the comment or suggestion.

Step 3: Set Up a Training Program to Focus on Direct Customer Contacts and Data Collection

A staff training program should outline the use of customer data in the agency's work: where data originate, where they are processed, and what their likely benefits and results are. Processing customer information should be reviewed in terms of ways to secure satisfying returns for the customers while providing maximum benefits to the agency. Staff training should emphasize the importance of responsible and prompt staff work to ensure a positive relationship with the public. Staff should regard a large part of their job as thinking about customers and their needs. Staff should be trained to know where to look for answers to customer inquiries and to maximize use of pre-established links between staff members who may have additional information. Analysis of current agency practices for dealing with customers, as well as anecdotes of experiences and results, will be illustrative to the staff. Peer agency practices and results may also assist in better understanding of customer-agency relationships. As a final element, it is important to solicit suggestions from staff for additional methods of responding to customer inquiries.

Step 4: Set Up Feedback Mechanisms to Work Toward Best Uses of Customer Data

Staff feedback can be valuable in determining whether the agency is using customer data in the most effective ways. Staff members should be aware if the agency is able to adequately respond to inquiries from customers and whether customers are satisfied with answers that are provided. Suggestions for improving the ways in which the agency obtains customer data are appropriate and will be valued as responses from staff members involved in the process of collecting data or from frontline contacts with customers.

Step 5: Document How Customers Are Served in Day-to-Day Actions and Decisions

Frontline contacts with customers are among the easiest customer data to assemble. Frontline staff should record all contacts with customers by any media—telephone, fax, e-mail, etc.—in a format that allows aggregation of the data for subsequent agency use. Telephone call centers can be programmed to give data on the number of calls for specific bits of information—the frequently asked questions that every agency has. Call centers can also be programmed to document the number of calls received by personnel in specific agencies and the amount of time taken to respond to each call. Staff can note dates, general topics, caller names or organizations, or other information that will help the agency determine customer concerns and ways the agency can respond to those concerns.

Guideline IIIC: Using Customer Data to Make Decisions

Customer data are useful in making decisions, developing policies, instituting programs and objectives, and performing project work. Distinctions between objective and subjective data help the agency determine the thrust of its data collection activities and how they can be used in long-range tasks. The scale of effort expended in data collection will determine the degree to which the data will assist in agency work.

Baseline data for the agency can be determined from customers' behavior and use of agency services and facilities. These objective data form the historical basis for exploring future conditions and policy direction. Virtually all transportation agencies have programs of counting and tabulating their customers' use of facilities and services. Traffic flow data, for example, can be updated on the basis of the original information, giving measurements of the rate and nature of change, and allowing projections of customer behavior into the future.

Qualitative information can provide an agency with customers' opinions about current conditions and suggestions for improvement. These subjective opinions can help drive

decision making. For example, a state transportation agency may find that its customers prefer using limited funds for upgraded maintenance rather than new construction. Customer opinions can be contrasted with historical trends to aid in determining future policy and program development and the emphasis of project planning. Traditionally, information from customers has been used in origin-destination surveys to supplement other measures of travel behavior.

Principal goal: to use customer information to guide long-range programs.

Step 1: Establish Goals for a Continuous Process of Data Collection

Transportation agencies need to understand travel movements in order, at a minimum, to maintain current facilities and to make modest improvements. For longer-range facility and service planning, agencies need to know broader information such as how customers behave during travel, why they make trips, and whether they will continue to travel in current patterns and volumes. Agencies may also want to know what customers think of the services and facilities they offer and what could be done to direct and improve agency performance. For these purposes, a transportation agency may want to have a comprehensive program to assemble data and conduct research related to its long-range policy and program development. Goals for long-range data collection might include the following:

- **Understanding travel patterns**—where people travel and why, as viewed by quantitative measures (to determine traffic volumes and the incidence of delays and crashes) and qualitative measures of point-to-point travel patterns and preferences, trip purposes, and reasons for choice of mode.
- **Undertaking needs-based routine maintenance and repairs**—basic, readily observable needs for physical improvements that are essential to keep travel operating smoothly, based on professional staff analysis.
- **Monitoring objective results of agency actions**—safer conditions, as expressed in reductions in crashes or delays, and greater throughput.
- **Gaining customer input to decision making**—surveys of customers' travel patterns, needs, and wants regarding those facilities.
- **Planning and implementing long-range improvements**—customers' expectations of future levels of transportation service.
- **Programming improvements of all types**—assembling a program of physical improvements to travel facilities, assisted by customer viewpoints and priorities.
- **Understanding results of improvements on customers' travel**—feedback from customers to elicit reactions, attitudes, opinions, and comments.

Step 2: Set Up a Process for Continuous Data Collection

To meet the goals outlined above, both objective and subjective research techniques can be used:

- **Collecting objective data.** Many agencies already have a continuing and comprehensive capacity to collect objective data about customers and how they use the facilities and services the agency provides. Agencies may observe customer behavior in a variety of ways—for example, by counting traffic volumes, determining customer choices between travel modes, tabulating the number of crashes on traveled ways, and quantifying delays encountered in travel.
- **Collecting subjective data.** Agencies can establish continuing methods of testing customers' opinions, explanations, and preferences. Methods can range from small focus group discussions to large-scale regionwide or statewide surveys of residents. Information may be acquired as input into processes of understanding travel patterns or as feedback from customers regarding planning and implementation of improvements. Agency personnel can also be surveyed to determine attitudes toward work and staff views of the work environment. Certain forms of data can be compared with objective data to rationalize observed behavior.
- **Collecting reliable data.** Agencies must assure staff members and all stakeholders, including end users, that the data that have been collected are reliable. Agencies should develop methods that assemble data in the methods most representative of the data types in question. For example, in collecting objective data, agencies may be able to obtain a relatively large sample that helps to ensure that the information is viable and representative. For subjective data, since reaching all customers is impossible, agencies must rely on samples of the overall population. Such customer surveys should always be based on a statistically valid random sample of customers. Since customer opinions can be crucial to the success of an agency's proposals, they should be broadly representative; it is clearly preferable to have a statistically valid sample than to hear only from vocal individuals who may or may not represent large segments of the population.

Step 3: Set Up a Process for Analyzing the Data Collected

The uses of data collected by the transportation agency depend on the goals and priorities of the agency. For example, customer data may be used in evaluating policies for a long-range strategic plan, reviewing available options and discussing potential impacts of the policies. Data from and

about customers can support agency work and decision making and may even offer new insights that help in long-range planning and programming. Another method of analysis might be using data from internal surveys to look at agency proposals from a professional transportation employee's point of view and then compare the agency's position with data generated from surveys of customers' points of view. Analyzing data involves the following tasks:

- **Evaluating the adequacy of proposed products and services in meeting customer needs as seen by the agency.** Agencies typically establish long-range plans based on analysis of travel behavior trends, derived from baseline information and estimates or projections into the future. In many instances, this information is supplemented by customer surveys indicating travel patterns and behavior and perhaps estimates of customers' future needs as well. This information is useful in evaluating the transportation products and services currently provided; adequacy may be expressed in the traditional analysis of levels of service already provided, as compared with anticipated needs for the future. Data analysis frequently includes information about both the general public and subgroups of the public, along with analysis of travel behavior differences and trends.
- **Evaluating the adequacy of products and services to meet customer needs as seen by customers.** Contemporary practice in many transportation agencies is to provide detailed information for customer consumption and to ask periodically for opinions and views that customers may have regarding the agency and its work. Agencies ask customers for their views and input on formulating policies and plans, programs or services, projects, and even techniques used to take surveys and contact customers. Agencies also ask customers for their views, as feedback, on the results produced by the agency's implementation of policies and plans, programs or services, and projects, as well as the needs that are not met by the proposed activities. Much of this information, after tabulation and analysis, can be used to develop tasks or activities to seek further customer input and feedback.
- **Comparing agency and customer viewpoints of customer needs.** A traditional method of using customer data alongside agency data is the origin-destination study. In this methodology, observed travel behavior is compared with stated customer behavior. Both forms of data may be required to fully understand traffic and travel patterns and to provide input to planning, engineering, or other kinds of services. Agency data can also be based on objective measurements of the effects of improvements on the transportation system, and these measurements can be compared with customer feedback in the form of comments, opinions, attitudes, reactions, or suggestions about the improvements once they are in place. Customer surveys in this context are helpful in determining whether the agency has been effective in understanding customer needs and is acting to meet those needs through its programs and plans. Customers are also a good source of evaluative information on whether the agency has prepared for improvements that are applicable to existing or potential future problems or issues. With information from a variety of sources, a transportation agency can determine where gaps in knowledge exist and where additional information may be essential. The agency can also determine a program for monitoring results of its long-range program as it is implemented, getting objective information from its staff and seeking customer feedback from outside.

Step 4: Set Up a Continuing Process to Document Agency Analysis of Customer Needs

Surveys and other forms of data collection involve procedures that transportation agencies can and should document. A documentation process will help the agency recollect what procedures were followed in determining actions, plans, or programs and will provide a basis for reporting how actions can be supported using rational, reportable data. The format for documentation will vary, but could involve assembling an accepted format for data reporting that can be used throughout the agency and meet the variety of documentation requirements that may appear as the agency works toward implementation of programs and projects. The continuing process should review (1) decisions on methods of surveying customer needs; (2) the raw data that are derived from surveys and the appropriate levels of detail; (3) the methods used to analyze the data; and (4) the methods of reporting the data to the general public, including methods using electronic media to allow maximum accessibility by customer groups that are interested in agency products and processes.

Step 5: Document Use of Customer Data in Decision Making

Data collection should be oriented to specific agency goals or tasks. To make the effort most valuable, an agency can develop tools for evaluating how the data were applied in agency decisions and practices. One method is a formal report, requested to demonstrate how research into customer behavior or opinions has helped the agency make decisions. A report is also good for feedback to customers on how their input was used to make improvements. Another method may be an informal exchange of opinions about how data were used, how they could be collected or used in improved ways, and whether data collection experiences were beneficial to the agency.

*Step 6: Determine Ways to Make Data Available
for Public Use*

All data and data sources should be reviewed for availability to the public. In most instances, such information would automatically become part of the public realm and thus open to public scrutiny. User-friendly methods should be established to aid customers who seek access to data.

GUIDELINE IV: KEEPING CUSTOMERS INFORMED

Guideline IV is concerned with direct communication with customers—a need recognized by most transportation agencies. This guideline is derived from the customers' need to know what the agency is doing to work with them as the agency plans for the future, makes decisions, and provides transportation services and facilities. It is also designed to work toward customer satisfaction—when the product or service meets or exceeds a customer's expectations and the customer is well aware of it.

Keeping customers informed is a continuing need, involving skills that should be in tune with customer expectations from the agency. Keeping customers informed involves the practices of reaching out to customers, listening to their concerns, and checking periodically to see how the agency is doing in its communication efforts. This guideline covers the following topics:

- Guideline IVA: Communicating with customers
- Guideline IVB: Demonstrating an understanding of customer needs
- Guideline IVC: Monitoring agency performance in communicating with customers

Guideline IVA: Communicating with Customers

A regularized, continuing stream of communication with customers is essential to transportation agencies for transmitting ideas, concepts, and projects, along with having an overall vision of where the agency intends to move toward in the future and how the agency has used customer input in its decisions. For example, the need for continuing and informative communication is frequently overlooked by agencies, even though the agencies may in fact be progressing rapidly in directions customers would like. Inadequate staff and communication resources are unacceptable as explanations for low levels of communication, since customers are now holding public agencies increasingly more accountable for actions, words, and deeds.

Principal goal: to maintain a continuing link between the agency and its customers.

*Step 1: Develop and Implement a Policy to Make
Agency Information Accessible to Customers*

Customers have a right to know what agencies are doing from day to day. Agencies need to let customers know that the staff works for the public. Agencies need to go beyond the bare outlines of internal procedures, processes, and data collection efforts. By opening up to provide information, an agency can reveal collective staff concerns about what customers think and at the same time make it clear that the agency works for the public, the end-user customers. To undertake a process of opening up, top agency leadership will need to develop policies designed to meet or exceed customer expectations in delivering access to information. Policy discussions should include specific task assignment within specific agency departments or groupings of staff members. Assignments may include determining ways of communicating as a response to requests and as a method of obtaining information, as several transportation marketing and public relations departments now do. Equally important may be development of a policy whereby agency responses to customers have a quick turnaround time.

*Step 2: Develop and Implement an Array
of Customer-Based Communication Techniques*

Access from many platforms is the key for disseminating information to diverse customer segments. Transportation agencies need to inform the public that these access points exist and are intended by the agency for customers to use. Clear pathways for information should be established to facilitate communications using the following types of techniques:

- **External-to-internal (from customers to agency) communication techniques.** The goal should be to maximize the number of ways in which customers can contact the agency and be heard. Many if not all of these techniques are in current use by agencies, through telephone or fax contacts, surveys and focus groups, websites, e-mail and postal addresses, public meetings of all types, and other feedback methods that may be adapted specially to capture customer input. Agencies should respond quickly, accurately, and in a friendly manner.
- **Internal-to-external (from agency to customers) communication techniques.** Agencies can disseminate information in a variety of ways and in many instances by responding to the external-to-internal customer requests. In addition, agencies can provide additional information through public presentations, hearings, or other meetings; printed or on-line reports; newsletters; and stockholders' reports.
- **Internal-to-internal (between agency staff members) communication techniques.** Internal agency informa-

tion sharing between staff members is critical to the success of communication with the public. Staff needs are paramount when searching for accurate responses to give to customers. Available information on policies, programs, and projects, along with the sources of that information, should be provided to all staff to use in responding to customers. Methods can include newsletters, e-mail messages, regional meetings, annual reports, databases, and so forth.

Step 3: Develop and Implement Standards for Agency Communications

Agency policy should include developing the following standards for staff to follow when responding to customer inquiries:

- **Speedy responses.** Providing information from the agency to customers can now be accomplished on a 24/7 basis using website information delivery techniques. For customers looking for information, but unable to use the website for access or detail, additional techniques for communicating (phone, fax, e-mail, and call center) should be in place. During the working day, contact hours may be specified for communication with available on-site staff, and calls may be handled by call chaining that minimizes direct staff involvement. Limits on direct contacts between internal staff and external people can be a continuing source of potential customer confusion and dissatisfaction. Agencies need to alleviate the problem and establish a policy of responding as soon as possible, regardless of the channel of communication used by the customer. A standard of response might be based on turnaround time limits for responses to inquiries, with a guaranteed response to the customer (even if the response is "I don't know") within a specified, limited period of time—a deadline of a day or two after the initial inquiry.
- **Extensive direct contact with agency staff people.** Customers are delighted with direct contact with people who are thoroughly prepared to answer their questions. Direct customer contact can bring substantial benefits to the agency in the form of improved credibility and gratitude from the public. It also brings benefits to customers who feel that the public agency staff is working for them, with a deep sense of obligation and commitment to their jobs. The commitment to accessibility to agency staff members may require a policy determination of how and when this accessibility can be accomplished. Direct contact may also imply specific training requirements for staff to be prompt with responses and answer inquiries graciously, with a goal to provide as much information as needed.
- **Clarity in responding to customers.** Agency staff members should be thoroughly trained to understand cus-

tomer questions and to provide solid information in a clear way. The first customer contact with the agency is an opportunity to provide satisfaction in responses. Staff members may need training in the skills of clear writing and speaking. Efforts should be made to ensure that staff understand the terms that customers use in their queries. For customer satisfaction, all agency information and responses must be easily understood by the customer making the inquiry.
- **Logging of customer communications.** Records should be maintained of customer inquiries and all information and responses that are provided. Intake of customer requests should be recorded in full. For information given out by the agency, simple notes of the staff person and the response provided should be sufficient as records of the contact.
- **Feedback loops.** Communication records are of potentially significant use to agency staff members who should be apprised periodically of customer concerns. Customer comments are frequently an early warning to changing satisfaction levels and may be reviewed and aggregated to obtain an array of concerns about the agency. Customer inquiries can also guide agency communications to ensure the ability of frontline staff to cover topics that are of concern to the public.

Guideline IVB: Demonstrating an Understanding of Customer Needs

Transportation agencies should work to show that they have customers' needs in mind and that they use insights into customers' needs to make better decisions and provide improved facilities and services. Customer inquiries should be passed along internally not only to staff members who are responsible for responding, but also to others who need to be made aware of public interest in agency practices. Records of distribution of customer concerns throughout the agency help to demonstrate that the agency is making efforts to meet customer needs. Agencies can also demonstrate that customer input and feedback actually make a difference in the work that the agency performs. Customer contacts can be summed up and portrayed in aggregate forms; individual's accounts provide examples, and queries demonstrate concerns that agencies should be working with. Activities resulting from customer contacts should certainly be recorded and provided as information of progress.

Principal goal: to show agency progress in using customer contacts.

Step 1: Develop Methods of Ensuring that the Agency Hears Its Customers

Data collected from and about customers and day-to-day customer contacts provide the voice of the customer—a solid

basis for understanding customer behavior and attitudes. For maximum effect, all such customer information and contacts should be recorded and passed along for use within the agency. Staff members on all levels of the agency need customer information to perform their work adequately. The task is to relate the information or inquiry to the way in which individuals work and the ways in which the agency provides services or products. Staff people receiving information or inquiries from the public should have both a procedure for reviewing each customer contact and a network for distributing the information or inquiries to other internal staff members who may be able to use them. Distribution of this information will help the agency demonstrate that it hears customers and uses information that they provide. Some of the ways in which an agency can compile customer information are as follows:

- Inquiries from individuals and the way in which the agency subsequently responds are of use to demonstrate that the agency has an ability to listen and take suggestions.
- An aggregation of customer concerns registered by telephone, fax, and e-mail contacts can list the questions that the agency must face and find ways of dealing with.
- Individual concerns can offer hints to questions that might be used in surveys or other such contacts with the public.
- The results of surveys, interviews, and focus groups afford an opportunity for the agency to sum up concerns and issues that will be the basis for upcoming work.
- Public involvement and contacts from public hearings or other meetings may provide opportunities for discussions among customers that help agencies understand the breadth and depth of issues.
- Feedback from customers regarding specific actions can help the agency devise improved practices in future actions.
- Anecdotes obtained in individual contacts with the agency and the impact the customer has had on the agency can be of use to illustrate larger concepts or issues. Care must be taken to determine if permission or releases from the individuals are required prior to publicizing the anecdotes.

Step 2: Develop Methods to Communicate Agency Practices

Customer contacts and the ways they are used by agencies can give added substance to existing and proposed internal policies and practices. Information about these procedures should be reported back to the public to show that the agency is moving to meet customer needs by using customer input to make more responsive decisions. Experience with customer contact should help the agency summarize its goals for the use of customer input and demonstrate successful (and, if possible, unsuccessful) results from such input. Based on dealings with customers, a transportation agency should be able to establish agency goals and achievements to be communicated and show how customer comments or inquiries affected policy, programs, or projects. All suggestions and comments from the public can provide input for the agency to use in developing future activities. Careful sorting and analyses of customer contacts can help the agency grow and become more responsive.

Step 3: Ask Customers for Opinions about the Adequacy of Agency Communications

One of the best ways to get an evaluation of agency communication abilities is to ask customers what they think. A focus group on agency communications may be useful. A broader survey might give the agency information about what customers generally think about the abilities of the agency to adequately promote its mission, its goals, and the progress it is making.

Guideline IVC: Monitoring Agency Performance in Communicating with Customers

Transportation agencies have a responsibility to ensure an adequate level of communication with customers. The agency may need to review and analyze its practices to determine if it is doing all that is possible to promote customer-agency interaction. Perhaps the simplest method of demonstrating that agencies are interacting with customers is to quantify the number of interactions that take place on a daily, weekly, or monthly basis. The quality of interaction is equally important, however, and may vary depending on whether agency contacts are positive in character and whether customer input or feedback is useful to the agency in its everyday or long-range activities. A more thorough analysis could begin, for example, with an examination of customer contacts, agency responses, methods of response—whether timely and direct—and how the customer inquiry or information finds its way through the agency. Performance measures can be outlined by establishing goals for the agency's communications practice and evaluating whether the agency meets those goals.

Principal goal: to determine the quality of agency interaction with customers.

Step 1: Evaluate Responses to Customer Input or Inquiries

Responding to customer contacts is a routine matter for most transportation agencies—a core competency that many agencies use effectively to demonstrate concern about customer needs. Measurement of whether contacts are success-

ful from the customer viewpoint is more unusual. Basic quality measures include the timeliness with which the staff is able to respond to inquiries, whether the response was delivered at an appropriate level of completeness, and whether the response facilitated improved customer comprehension of agency activities. Obtaining information directly from customers can also facilitate an understanding of agency practices as viewed from the outside. Satisfaction surveys can elicit such information from small or large groups of customers. A transportation agency can also study its public image by contacting customers for their opinions.

Step 2: Find Ways to Portray Customer Input or Feedback

Customer opinions are received in a variety of ways. A challenge is to use data effectively within the agency and to show that the information has an impact on the business and procedures of the agency. Customer input is usually based on prospective agency activities, such as policy development, a long-range plan, or planning for a future project. Feedback comes as customers understand what agencies are planning and as they want their opinions registered. An agency should be able to demonstrate that it understands the quality and content of both input and feedback and how they may impact the agency. Such customer contacts help to illuminate further information that is needed for the agency to fully comprehend what customers are reporting.

Step 3: Establish Links Among Data Collection, Needs Analysis, and Problem Solving

Transportation agencies should make clear that internal progress is being made on using customer contact and interaction to determine courses of action. One way to demonstrate links between contacts and results is to show how information from customers makes its way through the agency, into departments, and onto the desks of appropriate staff members. Following the path of information may also illuminate whether and how the information is used in problem solving.

Step 4: Establish Links with Strategic Planning, Key Agency Goals, and Initiatives

Customer information may be essential to successful long-range planning. Customer information provides opinions about how the agency is performing and the directions in which the public would like to see the agency go. Data on customer needs should drive strategies chosen by the agency to fulfill its mission, purpose, and goals. Customer needs can also become the basis for specific initiatives that the agency plans and implements.

Step 5: Use State-of-the-Art Methods to Assess Communications Abilities

Agencies can make use of methods such as "report cards" to relate what is being done to reach and interact with customers. In addition to annual reports, some transportation agencies use progress or performance reports to demonstrate whether predetermined goals are being reached. Other agencies are using benchmarking techniques to show degrees of success in meeting goals. An unusual approach is the stockholder report, where customers are viewed as stockholders of the public agencies, and the report is focused on the return that customers get for their investment in the agency.

CONCLUSIONS

Customer service is recognized by many transportation agencies as a fundamental basis for developing policies and programs. In recent years, agencies have begun systematic programs to find and use customers' opinions, suggestions, and complaints and apply the collected information to decision making throughout the agency. In most instances, the agencies have approached the tasks of finding customer information on the basis of surveys using statistically valid random samples to obtain the information. Differing kinds of surveys have been found to be helpful, whether based on quantitative data sources (objective customer behavior) or qualitative sources (subjective opinions, reactions, or suggestions). In some instances, both quantitative and qualitative data have been assembled and used in conjunction with one another for maximum impact.

Gathering information from transportation agency customers must be carefully developed to glean useful data for the agency. The data collection approach must be soundly conceived to provide methods that the agency can integrate into its decision-making processes. Appropriately trained personnel or outside firms can help prepare approaches to data collection to embrace principles of confidentiality and direct applicability that will provide the maximum benefits to the agency and its customers. On the basis of data aggregations, agencies can develop policies and programs that integrate customer opinions and suggestions into both long- and short-term policies and programs. The overriding goal is to ensure that customers affect agency decisions, programs, and policies, and that the agency can communicate its responsiveness in using the information obtained from customers.

CHAPTER **9**

THE POTENTIAL FOR INFORMATION SHARING

INTRODUCTION

This chapter illustrates how transportation agencies around the country can share information about attracting and integrating customer information into everyday tasks. The chapter is organized to show why sharing is desirable and what benefits it can provide.

The memorandum also explores the kinds of information to share and the methods and techniques of sharing, ranging from hard copy to electronic media. The memorandum is designed to illustrate potential methods and timing of information sharing and to point out the top methods that merit the most consideration.

The memorandum is intended for transportation agencies to use in contacting peers about working with customers. Its principal value is the extent to which it supports and elicits interactions between agencies. The study team has focused throughout the study on creating a product that is useful across modes and geographic regions to a wide range of transportation agencies. The information can be easily shared using both print and electronic forms of interagency contact.

The objectives of this memorandum are as follows:

- To establish reasons for transportation agencies to share information about customer contacts, emphasizing the benefits of sharing;
- To show the kinds of information that can be shared between agencies; and
- To examine how information can be shared, when it is appropriate, and what methods can be used to facilitate sharing.

Each of these objectives is explored in detail below.

WHY SHARE INFORMATION ABOUT CUSTOMER RELATIONSHIPS?

Transportation agencies generally share information in a variety of ways when peers request them to do so. Traditionally, this sharing took place through informal contacts between friends or acquaintances. Somewhat more formal methods are available through information-sharing organizations such as the Transportation Research Board (TRB), the National Cooperative Highway Research Program (NCHRP), the American

Association of State Highway and Transportation Officials (AASHTO), the American Public Transportation Association (APTA), and others. These organizations exist principally to collect information, conduct research, and explore common problems for their members. The umbrella organizations share information with their constituents—including transportation agencies of all sizes and purposes—through hard-copy publications, websites, e-mail, regular mail, and telephone. Through these means, agencies can do the following:

- **Learn how to serve customers.** Many transportation organizations have an incomplete relationship with their customers. This relationship can have historical, traditional, and even cultural bases. In recent years, however, the lack of direct contact between transportation agencies and end users has come under attack from all sides, with a push to open transportation agencies to direct engagement with the people who directly pay for their facilities and services. Customer concerns are increasingly viewed by transportation agencies as essential ingredients to successful task completion at both the policy and the project level.
- **Use customer contact effectively.** Transportation organizations have begun working more directly with customers for significant reasons. Customer contact is warranted and easily understood when new facilities are being developed; customers are contacted because they are affected by land takings, traffic diversions, and facility operations. These contacts may help the agency uncover problems that otherwise might be overlooked. Customer contact can also be useful in policy development, long-range or strategic planning, establishing project priorities, exploring new ideas, developing and implementing new services, and marketing the results of planning and implementing new services.
- **Provide transparency to customers.** Transportation agencies' perceived lack of direct contact with their customers—the end users of their products—has been well documented and often cited as a major deficiency in agency work. In service planning, the lack of direct contact with end users results in claims that agencies do not understand the needs and wants of their customers. From a political point of view, the lack of understanding of what customers want can be dangerous. It can lead to

embarrassment as agencies are called to account by private organizations or (more frequently) state governors for their apparent lack of customer contact or concern.

- **Learn from others' experiences.** As a result of pressures toward including customers in agency work more frequently, many transportation organizations have begun programs that help define customer wants and needs. These programs give guidance to project and facility development through customer surveys, marketing techniques, service development, explorations of changing needs over time, and other examinations of customer needs using direct contact with customers. As agencies begin to perceive the potential benefits from customer interactions, they look more widely for examples and precedents to follow in establishing new ways to include customers in their work. Fortunately, examples of new techniques and procedures can be found in organizations around the country. Transportation agencies can examine activities and results from their peers to determine if adaptations to their own needs can be made.
- **Work with peer agencies.** Nearly all agencies can improve direct contacts with peers on customer issues. Gains from the exchange might help clarify why such work is beneficial to customers and agencies. Joint efforts in research on customer issues might be explored. Agency results in one state might be a basis for adaptations to be made and used by another state.

WHAT KINDS OF INFORMATION CAN BE SHARED BETWEEN TRANSPORTATION AGENCIES?

While any information about customers can be shared, agencies should try to establish why they want to contact another agency. One of the initial issues of information sharing is the question of whether actual benefits will accrue to participants. Agencies can and should expect beneficial results from exchanging information, and both questioner and responder may work together to establish what is to be exchanged.

Information that can be shared comes from customers and agency practice, including

- Best practices, goals, and visions derived from customer interactions;
- Findings of customer research from around the country;
- Benefits to agencies from customer communications and interactions;
- Effective ways to encourage and obtain customer input, opinions, suggestions, and comments;
- Effective techniques for soliciting customer feedback and reactions to proposals or agency actions;
- Customer contact practices that promote better understanding of agency actions;
- Methods to help gain a democratic consensus in problem areas;

- Methods of public presentations of costs, resources, and time required in pursuing desirable processes;
- Methods of evaluating the applicability and effectiveness of customer responses;
- Methods useful in maintaining positive customer contacts and the results of those contacts;
- Integration of customer input and feedback into ongoing work;
- Evidence of which practices work best over time;
- Evidence of which practices are most cost-effective;
- Notice of pitfalls experienced by other agencies in customer interactions;
- Development of contacts in other agencies; and
- Comparisons of peer groups' activities.

Other kinds of information may be discovered through contacts among agencies and actions to discover customers' needs and wants. Information about the benefits of interacting with customers may be of considerable interest and potential use to individual agencies.

With all the possible information of interest to transportation practitioners, how can agencies tell what other agencies may be able to use? Transportation agencies should share a basic level of information about what they are currently doing in determining and satisfying their customers' needs and wants. In most instances, agency actions can be summarized to reflect how they obtain and use information about customers. Agencies should be interested in and able to use information about customer interactions. Transportation agencies should consider that other agencies would be interested in the following:

- Attracting customer input and feedback by
  - Enhancing two-way information flow between customers and agencies,
  - Communicating agency practices and policies to customers,
  - Discussing new practices in working with customer information,
  - Establishing a transparent path for agency use of customer information,
  - Reporting on positive results of integrating customer information, and
  - Communicating agency performance levels to customers.
- Integrating customer input and feedback by
  - Working directly with customers in problem solving,
  - Articulating agency goals in light of customer information,
  - Establishing a vision based on customer input,
  - Using customer information as a factor in decision making,
  - Developing communities of interest for dealing with specific problems, and
  - Using customer information to influence agency management procedures.

While these categories form a minimum list of basic questions that agencies may find of interest and want to share with each other, the question remains of how best to share this information.

HOW CAN INFORMATION BE SHARED?

Transportation agencies are frequently unaware of what other agencies may be doing that is of potential relevance to them. Certain agency staff members may be current with the literature and reports on other agencies' attempts to interact more effectively with customers, or they may be familiar with periodic information gathered by umbrella organizations, such as AASHTO or TRB, for compilation and distribution to member agencies. Depending on the levels of influence that these individuals hold within the organization, top management may or may not be aware of new or promising practices that other transportation agencies use in dealing with customers.

Overall, agencies do not generally have mechanisms in place to provide timely reports on practices that may be of use to them in improving customer relations. This lack may result from the agency's misunderstanding that information about customers is critically important to the success of the agency's ventures. The lack may also result from a lack of staff available to cull information from a variety of sources. In short, an agency that does not know what information exists may not know what is important and may also lack an ability to search it out. This important problem will be more fully considered below.

The lack of direct interaction and information sharing between most transportation agencies may be the result of several interrelated questions:

- When should agencies share information?
- What methods can transportation agencies use to share information?

To some extent, these questions overlap each other. For example, when to share may be related to material that has become timely to share. Likewise, methods available for sharing may make the timing of the sharing more practical and relatively easy. These questions are considered below.

When Should Agencies Share Information?

Transportation agencies may not understand when it is appropriate to share information about their own procedures with other agencies. Below are some general guidelines that may help the agencies determine when their information should be circulated to other organizations.

Agencies should circulate information on customer interactions on one or more of these occasions:

- When **the agency is planning to undertake information gathering**, to allow others to comment or to offer suggestions that may assist in the effort.
- When **new twists in procedures are to be tested,** while following the general lines of what others have tried.
- When **the practice of gathering information is new to the agency** and possibly unlike practices reported in the literature or in known activities of other agencies.
- When **the information is newly gathered and tabulated,** as when agency reports are produced and distributed in either written or on-line form.
- When **the information has distinctive, perhaps unexpected results** that may trigger important reactions and responses from other agencies.
- When **umbrella organizations are interested in the issue,** as demonstrated by publications, conferences, current investigations, or ongoing processes.

What Methods Can Transportation Agencies Use to Share Information?

Transportation agencies should be encouraged to collect and share information with their own customers and with peer agencies throughout the country. Although there are a variety of methods to accomplish this task, several basic steps may be followed to undertake the work. These steps are as follows.

Step 1: Obtain information to share. Transportation agencies should be encouraged to work in the following areas:

- **Compile available customer information.** All transportation agencies have customer information; even traffic counts are an objective form of customer information. Surveys of individuals may be extremely useful. Information grouped or compiled for use outside the agency may advance the agency's understanding of its customers, both internally and in external organizations that analyze the information. Having external assistance may be a useful means of stretching scarce agency resources.
- **Collect details about customers.** Surveys, focus groups, and public meetings provide details of what customers want and need from transportation agencies and what customers think about the way they are being served.
- **Integrate customer information into agency activities.** The process of establishing goals, visions, and policies can be enriched by customer contacts. Decision-making processes should include customer information where possible to underscore understandings of the needs being served. Customer input and feedback—both positive and negative—are essential to a fuller understanding of how the agency is viewed.

Step 2: Set preliminary goals or standards for sharing customer information. This step includes establishing ways in which the agency plans to do the following:

- **Track changes over time** through periodic studies of customer wants and needs and help to set trends that are useful in guiding future plans and policies. Information in successive studies should be sufficiently similar to allow comparisons between collected data.
- **Update dated material** through planned research into customer needs and wants, including anticipated methods of study.
- **Report in a timely fashion** on new findings from customer studies (surveys, focus groups, public meetings) so that information will be current and representative of customer needs.
- **Set communications processes** for dealing with customers. These standards can include disclosure of, for example, planning or policy initiatives that are underway, thereby providing a way for customers to understand what agencies are doing in specific areas and offer their input.
- **Set goals and agency vision** for collecting and using customer contacts in the agency's work.
- **Establish a website format that can be used by each transportation agency** in reporting on its customer programs and information collection processes.

Step 3: Share information obtained from customers. Agencies should, at minimum, plan to share customer information using one or more of the following methods:

- **Designate a staff contact person** to assemble and report on customer information within each agency. More than one contact person may be appointed per agency. Staff people assembling customer information frequently will become knowledgeable about peers in other transportation organizations and, through them, become knowledgeable about what other groups may be doing.
- **Allow a customer expert or resource staff person to share the information** assembled from the agency's customer contacts. Sharing information helps dispel notions that the agency is not forthcoming about its knowledge of customers' service needs and expectations.
- **Set up an e-mail network** among designated customer contacts in each transportation agency to provide a lively discussion of new approaches and findings in areas touching customer-agency relationships.
- **Place customer information on agency websites.** Data in raw forms, analyzed forms, or both can demonstrate

the intent of the agency to find and incorporate customer needs and wants into the agency's decision-making processes.

- **Conduct periodic regional seminars** either independently or in conjunction with pre-existing forums (e.g., AASHTO or APTA) for information sharing and staff training.
- **Use federal training programs,** such as those provided by the National Highway Institute and National Transit Institute, to develop methods of information sharing.

Step 4: Identify a national clearinghouse of information about customer-agency interactions by working with other transportation organizations. Alternative methods include the following:

- **Send periodic reports to umbrella organizations** and their working committees for informational purposes and for assisting in specific studies. Organizations receiving this information can contact, for example, the AASHTO Standing Committee on Quality, which reports on customer issues on its website. Another such organization is the I-95 Corridor Coalition, which maintains a state-by-state inventory of information, including the status of electronic payment systems in each agency in individual states. Working with umbrella organizations to establish a clearinghouse is a good first step, prior to trying other alternatives.
- **Set up a new national website to report on customer-agency interactions** by working with existing interagency organizations. The website might provide a means for agencies to inform users of available data and findings from all types of customer studies. Feedback might be encouraged if the website incorporates an ability to record input for exploring ideas on an informal basis—perhaps retaining the anonymity of contributors, as required. In setting up the website, there will probably be a role for U.S.DOT or one of the national research organizations.
- **Establish responsibility for updating information obtained from multiple sources.** An alternative method of reporting (in the absence of an interagency organization with coordinating responsibility) may be to work toward charging a single agency or individual with the responsibility of seeking and keeping information current and appropriately posted on an agency website, on a national organization's website, or in print or other media.