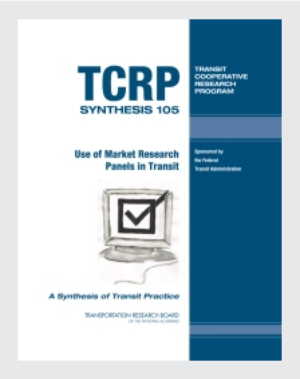


# Use of Market Research Panels in Transit

**DETAILS**

62 pages | 8.5 x 11 | PAPERBACK
ISBN 978-0-309-22393-5 | DOI 10.17226/22563



**AUTHORS**

Coffel, Kathryn

TRANSIT COOPERATIVE RESEARCH PROGRAM

# TCRP SYNTHESIS 105

# Use of Market Research Panels in Transit

## *A Synthesis of Transit Practice*

**CONSULTANT**
Kathryn Coffel
Kathryn Coffel Consulting, LLC
Portland, Oregon

**SUBSCRIBER CATEGORIES**
Public Transportation • Planning and Forecasting

Research Sponsored by the Federal Transit Administration in Cooperation with
the Transit Development Corporation

**TRANSPORTATION RESEARCH BOARD**

WASHINGTON, D.C.
2013
www.TRB.org

## TRANSIT COOPERATIVE RESEARCH PROGRAM

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## TCRP SYNTHESIS 105

Project J-7, Topic SB-22
ISSN 1073-4880
ISBN 978-0-309-22393-5
Library of Congress Control Number 2013936322



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Transportation Research Board
Business Office
500 Fifth Street, NW
Washington, DC 20001

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Printed in the United States of America

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## FOREWORD

Transit administrators, engineers, and researchers often face problems for which information already exists, either in documented form or as undocumented experience and practice. This information may be fragmented, scattered, and unevaluated. As a consequence, full knowledge of what has been learned about a problem may not be brought to bear on its solution. Costly research findings may go unused, valuable experience may be overlooked, and due consideration may not be given to recommended practices for solving or alleviating the problem.

There is information on nearly every subject of concern to the transit industry. Much of it derives from research or from the work of practitioners faced with problems in their day-to-day work. To provide a systematic means for assembling and evaluating such useful information and to make it available to the entire transit community, the Transit Cooperative Research Program Oversight and Project Selection (TOPS) Committee authorized the Transportation Research Board to undertake a continuing study. This study, TCRP Project J-7, "Synthesis of Information Related to Transit Problems," searches out and synthesizes useful knowledge from all available sources and prepares concise, documented reports on specific topics. Reports from this endeavor constitute a TCRP report series, *Synthesis of Transit Practice*.

This synthesis series reports on current knowledge and practice, in a compact format, without the detailed directions usually found in handbooks or design manuals. Each report in the series provides a compendium of the best knowledge available on those measures found to be the most successful in resolving specific problems.

## PREFACE

*By Donna L. Vlasak*
*Senior Program Officer*
*Transportation Research Board*

This synthesis describes the various types of market research panels, identifies critical issues that researchers might be aware of when engaging in market research and panel surveys, and provides examples of successful market research panel programs. It provides information about common pitfalls to be avoided and successful techniques to apply that maximize research dollars without jeopardizing the quality of the data or validity of the results.

The synthesis was conducted using a literature review of market research and market research panels, an industry survey of transportation agencies on the use of market research and panels, three agency panel survey profiles, and four full case examples. A selected survey of 29 respondents out of 38 transit and transportation agencies known to conduct market research yielded a 76% response rate from transit agencies, one metropolitan planning organization, and one state department of transportation. The four case example agencies are the Regional Transportation District (Denver), Minnesota Department of Transportation, Metropolitan Transportation Authority New York City, and Washington State Transportation Commission/Washington State Ferries and demonstrate the wide variety of ways in which panels have been implemented in the transportation field.

Kathryn Coffel, Kathryn Coffel Consulting LLC, Portland, Oregon, collected and synthesized the information and wrote the report, under the guidance of a panel of experts in the subject area. The members of the topic panel are acknowledged on the preceding page. This synthesis is an immediately useful document that records the practices that were acceptable within the limitations of the knowledge available at the time of its preparation. As progress in research and practice continues, new knowledge will be added to that now at hand.

# CONTENTS

Note: Many of the photographs, figures, and tables in this report have been converted from color to grayscale for printing. The electronic version of the report (posted on the Web at www.trb.org) retains the color versions.

# USE OF MARKET RESEARCH PANELS IN TRANSIT


## SUMMARY

Market research panels offer the potential of fast, inexpensive market research, but if not designed correctly, their benefits can come at the expense of quality results. This synthesis defines the various types of market research panels, identifies critical issues that a researcher needs to consider when engaging in market research and panel surveys, and provides examples of successful market research panel programs. The transit market researcher will understand common pitfalls to be avoided and learn successful techniques that will maximize research dollars without jeopardizing the quality of the data or the validity of the results. Four themes emerged from the review.

- **Flexibility—**Market research panels are a flexible tool that can be successfully applied to a wide variety of transit research needs, including focused discussions, in-depth travel behavior studies, satisfaction tracking, and brief, short-turnaround "hot topic" surveys.
- **Benefits—**Once developed, a panel provides a mechanism for collecting survey results quickly and inexpensively to support daily decision making. Agency panels also boost public relations by demonstrating that agencies are listening to their customers.
- **Limitations—**Panel surveys are often low-cost because they rely on online recruitment and surveying. Online surveys are not representative of the general population or of transit riders, and should not be used when precision is required in the research results.
- **Paradigm shift—**The evolution in communications modes, such as smart phones and social media, combined with a dramatic reduction in the number of households with land-line telephones, has created a paradigm shift in market research methods. The industry is grappling with these changes, and it is in the best interests of the transit industry to closely monitor this sector's activities.

The synthesis was conducted using a literature review of market research and market research panels; an industry survey of transportation agencies on use of market research and panels; three agency panel survey profiles; and four full case examples. Market research, including the use of panels, is an established practice with an extensive body of literature. The literature review takes advantage of this depth, examining market research and panel techniques through industry publications, websites of market research trade organizations, and articles on panels, survey sampling, and online research. An industry survey was sent to 38 transit and transportation agencies known to conduct market research to solicit insights on the use of market research panels. The respondents included 29 transit agencies, one metropolitan planning organization, and one state department of transportation, a response rate of 76%. The survey was used to identify the seven case examples agencies.

The market research process has four basic steps: (1) planning (identifying goals of the project); (2) designing the research (selecting a sampling plan, data collection method, and questionnaire development); (3) implementing the research; and (4) analyzing data and reporting results. A market research panel is a group of persons selected for the purpose of providing data related to the analysis of some aspect of a group or area; as such, panel research is a sampling technique, and falls within step 2, designing the research. The sampling technique used to develop the panel is critical to obtaining quality results and determines when the data can be used with confidence.

Conventional surveys implicitly assume that respondents are selected through random sampling techniques and that survey results are representative of the population with a certain range of precision. Random digit-dial telephone sampling has been the go-to technique for more than 50 years. However, the number of households in the United States without landline telephones continues to decline—more than 30% in 2011. Consequently, market researchers must make more calls in an attempt to find a sample that represents the general population. Random representative sampling is cited as a prime factor in the increasing cost of and time needed for conducting traditional market research, leading more researchers to use non-random or convenience sampling techniques, where the sampling plan and survey respondents do not adhere to the underlying requirements for a random sample. The most commonly used convenience sampling technique is Internet recruiting. Although adjustments can be made for some of the error and bias associated with convenience sampling, online recruitment, and online surveying, limitations on the data dictate that results should be used for concept formation rather than for estimates of the population.

The traditional definition of a true panel is a group of respondents measured repeatedly over time with respect to the same variables. An omnibus panel is defined as a group of respondents who are measured repeatedly over time but on variables that change each time. True panels are not used very frequently in transit market research because of the high cost of developing and maintaining them. Most panels are omnibus panels, designed to speed up the market research process while reducing costs. Market research vendors have developed on-going online access panels that an agency can buy into for a specific project on an as-needed basis. Omnibus panels developed by an organization solely for its own use are called client or in-house panels. The most recent adaptation of market research panels is to create an online research community using a social media format (e.g., Facebook or LinkedIn), where panel members complete surveys, share ideas, and interact as they would on a public social media website but around topics provided by the transportation agency.

An industry survey of transit and transportation agencies was conducted into current market research practices and experiences with panel surveys. Although panel survey research is not used extensively in the transit industry, interest in the methodology is increasing. Of the 31 agencies completing the survey, 10 had experience implementing a research panel and nine more were either considering or in the process of implementing a panel study. The 19 agencies that had either implemented or were considering a research panel provided perspective on:

- **Panel survey topics—**The most common topics were rider attitudes, customer satisfaction, marketing and message development, awareness of transit issues, public input on planning projects, and evaluating the effects of agency actions.
- **Benefits of panels—**The primary benefits were the agency's ability to conduct research at a moment's notice and to target specific markets.
- **Concerns with panels—**The primary concern was that the panel may not be representative of the target population.
- **Use of vendors—**Responses ran the full range, from having conducted the panel research completely in-house to having contracted out all tasks to a vendor. Only one agency used an existing vendor's online access panel; the other nine agencies developed an in-house panel recruited to meet specific agency goals.

The industry survey was used to identify four case example agencies: Regional Transportation District (Denver); Minnesota Department of Transportation; Metropolitan Transportation Authority, New York City; and Washington State Transportation Commission/ Washington State Ferries. An overview of the structure of each case example is provided, demonstrating the wide variety of ways in which panels have been implemented in the transportation field.

- **Regional Transportation District (Denver)** recruits 16 volunteer panel members annually through the agency website. The panel meets four times over the course of the year

in focus-group style meetings, providing qualitative input on issues ranging from ticket vending machines to agency image and branding. The program is implemented completely in-house.
- **Minnesota** recruits 600 panel members online paralleling the demographics of state, 300 from the Minneapolis–St. Paul urbanized area and 300 from the rest of the state. Panel members belong to a closed online research community, with a variety of online activities and weekly surveys. The community is run by an outside vendor in partnership with Minnesota Department of Transportation staff.
- **Metropolitan Transportation Authority's** panel was made up of 1,500 members recruited through random-digit-dial telephoning to represent the population based on demographics and location. Between 12 and 15 panel members were surveyed by telephone every day of the year, except on six major holidays, providing continuous feedback from the customer. The program was implemented using both in-house and consultant resources. The 15-year panel research program was recently ended for budgetary reasons.
- **Washington State Ferries** currently has approximately 6,500 online panel members recruited through on-board surveys and recruiting posters with a web address. Surveys are conducted online every one or two months. The panel is open to anyone who wishes to register on the website. The program is managed almost entirely by a consultant team.

The case examples and literature review provided insights into implementing successful panel research, from the perspective of an implementing agency and from a general market research perspective. Following are insights drawn from the perspective of agencies implementing panel research.

- **Flexibility—**Panels can be used to collect information on any topic, using any type of research, including telephone surveys, on-line surveys, and discussion and focus groups.
- **Speed—**Panels provide a readily accessible sample of respondents, allowing for faster, cheaper implementation of research studies.
- **Cost—**Panels can reduce the cost of implementing individual studies, but building and maintaining an in-house panel can be expensive. Although one agency had no vendor costs and limited staff time investment, most programs reported initial start-up and annual costs of more than $100,000 annually, in addition to 0.25 to 0.5 full-time equivalent employees to administer the program.
- **Non-random sampling—**Panels that were recruited without adhering to principles of sampling theory are not to be used when an estimate of the population is expected or needed.
- **Panel members with an agenda—**Open membership panels are especially prone to attracting a high percentage of participants with a vested interest in the outcome of the research. Increasing the panel size dilutes the impact of these members, but at the cost of additional recruitment and retention.
- **Communication reduces attrition—**Researchers have an expectation that frequent communication will cause panel members to drop out of the program. Agencies discovered that on-going engagement with panel members keeps them motivated and reduces attrition.
- **Public relations value—**Whether a panel has a specifically recruited closed membership program or allows anyone to join, agencies cited a public relations benefit from the public's knowing that the agency was actively seeking and listening to its customers. A second set of insights related to the state of the practice of market research.
- **Paradigm shift—**The electronic age has produced profound changes in how society communicates. Landlines have given way to smart phones, and the Internet is becoming the center of business and communication. Traditional survey sampling is becoming increasingly difficult and costly, especially in comparison to online survey techniques. Sampling theory has not yet been developed to address issues with online panel recruitment and surveying. Until a theoretical basis is established so that online research

accurately represents the population, the market research industry advises using online panel research only when the results are for testing ideas and concepts, not for precise estimates of the population.
- **Industry guidance—**Developing and implementing a panel research program to provide appropriate and reliable results requires a current and in-depth understanding of market research principles. The market research industry has created resources and guidelines to assist researchers in purchasing and developing quality panel research programs.

Most of the advances in panel research have come from professional survey research organizations in the United States and Europe. That research need not be repeated by the transit industry; however, four gaps in information specific to the transit industry are identified here:

- **Monitoring market research industry activities—**The market research industry has established an extensive "research-on-research" program related to online panel survey techniques. Transit professionals would benefit from the development of a communication tool for disseminating the results of advances in panel and online research techniques.
- **Special populations—**The transit industry has both a requirement and an obligation to hear from existing and potential riders. Research is needed on ways to include the elderly, persons with disabilities, minorities, low-income households, and persons with limited English proficiency or low reading and writing comprehension in agency panel and customer research.
- **Multi-frame sampling—**Survey researchers have been moving away from single source sampling (e.g., online surveys only) to dual-frame or multi-frame sampling (online surveys supplemented with on-vehicle surveys). Additional research is needed to understand how transit agencies can use multi-frame sampling to improve customer surveying.
- **Legal and ethical issues—**Human subjects laws, privacy acts, and freedom of information acts all have implications for market research in the public sector, especially online panel research. Transit agencies need guidance to ensure that all legal and ethical requirements are met when establishing market research panels.

CHAPTER ONE

# INTRODUCTION

This synthesis defines the various types of market research panels, identifies critical issues that the researcher needs to be aware of when engaging in market research and panel surveys, and provides examples of successful market research panel programs. Understanding common pitfalls and successful techniques will allow transit market researchers to make the best use of funds without jeopardizing the quality of the data or the validity of the results.

## MARKET RESEARCH PROCESS

Market research is the gathering and evaluation of data regarding consumers' preferences for products and services. It is as valuable for the provision of public services as it is in the development and sales of private sector products. In the transit industry, market research supports decision making for all aspects of planning and operations, including service routing and scheduling, fare policy and implementation, advertising and promotion of transit services, vehicle and customer amenities, customer information, and long-term financing and planning. The private sector has used market research extensively for more than 50 years and has developed a wide variety of tools to collect and analyze customer information. These tools have assisted transit agencies in understanding customer needs, resulting in improved transit services and effective use of public funds.

Information collected through market research is used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor performance; and improve understanding of marketing as a process. Marketing research specifies the information required to address these issues, designs the method for collecting information, manages and implements the data collection process, analyzes the results, and communicates the findings and their implications.

Market research requires a four-step process: (1) planning; (2) designing the research; (3) conducting the research; and (4) analyzing data and reporting results (Elmore-Yalch 1998). Although there are variations in this process, it remains essentially the same for all market research studies. The activities associated with each of these steps are summarized here:

Step 1—Planning. This step includes the preliminary tasks of defining the research problem; determining resource requirements and cost of the research; hiring a consultant team, if any; and working with the consultant team to develop a final research plan.

Step 2—Designing the research. This step includes determining the data collection technique, developing the sampling plan, and designing the questionnaire. The data collection technique will be influenced by the goals of the research and resources available, as established in Step 1. Data collection techniques include qualitative techniques (e.g., focus groups) and quantitative techniques (e.g., surveys). The sampling plan outlines the population of who is to be surveyed (the respondents), the sample design (for example, stratified random sample), the sample size (number of respondents required) and the procedure for contacting the individual respondents from the population. The questionnaire is developed and tested to ensure it is obtaining the desired results and that the cost of implementing the survey is in line with the estimates. An analysis plan is developed at this point of the process to ensure that the sampling and data collection meet the goals of the project.

Step 3—Conducting the research. This step includes training the field supervisors and interviewers, data collection, data coding, data entry, and quality checking of data.

Step 4—Analyzing data and reporting results. This step includes developing the analysis programs, establishing data weighting plans if needed, running the statistical analysis routines, analyzing the results, and writing the final reports and presentations.

There are two types of market research panels, as defined by the American Marketing Association (AMA):

- True panel: A sample of respondents who are measured repeatedly over time with respect to the same variables;
- Omnibus panel: A sample of respondents who are measured repeatedly over time but on variables that change from measurement to measurement [http://www.marketingpower.com/_layouts/Dictionary.aspx?dLetter=P (accessed Mar. 11, 2012)].

The shared element is that a sample of respondents is surveyed repeatedly over time, regardless of the content of the questionnaire. Thus, the key concepts for panels are in Step 2 of the market research process, designing the research.

### Random Survey Sampling

A traditional random sample is designed to provide results that can be projected to a target population with a specified level of accuracy, whether the population is all transit riders, the general population, or some other target population. Collecting data using a traditional random sample will often take longer, driving up implementation time and cost of the research.

A non-probabilistic sample is not designed to tap into a representative population, and therefore the results cannot be projected to a target population. This simplifies data collection, leading to faster completion times. Online surveys (e.g., links from agency websites) and omnibus panels typically have a non-probabilistic sample that can provide fast, inexpensive survey results.

The Internet, smart phones, and social media have dramatically changed how society communicates. This has had a significant impact on sampling and the underlying assumptions of a random and representative sample. This synthesis will touch on the critical issues in sampling as they relate to panel surveys.

### Limitations of the Research

Market research is a broad subject and while most issues related specifically to panel surveys will be covered, other topics will not be covered or may only be touched upon in the synthesis. It should be noted that:

This synthesis is not intended as a guidebook for creating a transit market research program. There are many reference books and resources available on market research and transportation-specific research which provide information beyond the scope of this synthesis.

There are many areas of study in market research that relate to all types of surveys, not specifically to panels; and therefore are only touched on in this synthesis. These topics include types of error in sampling and surveying, the use of interviewer versus self-administered surveys, and the emergence of dual or multi-frame sampling.

Specifically excluded are non-research activities such as public outreach and public involvement, although they may use some of the same online and panel techniques.

Further reading is advisable for those wanting an in-depth understanding of market research methods and the full breadth of transportation research methods.

## PROJECT PURPOSE

This synthesis provides a literature review of the science and standards of market research panels, results of a survey of transit and transportation agencies, and case examples of selected transportation agencies currently using market research panels. Areas explored include:

- Which transit agencies are currently using market research panels and how these are defined;
- When and why agencies choose to use this methodology;
- Qualitative and quantitative uses of panel research;
- Statistical and analytical techniques and tools utilized;
- Advantages and limitations of panel research compared with other market research methods;
- Range of costs associated with panel research compared with other market research methods;
- Demonstrated usefulness of data;
- Sampling, recruitment, maintenance, and incentives used to build and maintain the panels;
- Ethical and legal issues;
- Lessons learned; and
- Gaps in information.

The results of the survey and the case examples point out that larger agencies, which typically have more resources, are more likely to experiment with new research techniques. The experiences gained from the larger agencies provide valuable instruction for smaller agencies and those without the resources to risk experimenting with new techniques.

## TECHNICAL APPROACH TO THE PROJECT

This synthesis includes a literature review, an industry survey of transit and transportation agencies, and case examples demonstrating the range of applications of market research panels.

The literature review includes documents on panel surveys within the broader context of market research techniques. Sources included market research reference books, TCRP and FHWA reports, and documents available through market research industry trade organizations, such as the AMA, American Association for Public Opinion Research (AAPOR) and the European Association for Opinion and Market Research (ESOMAR).

A web-based survey was developed to determine the extent that technology-based communication tools were used, current market research activities by transportation agencies, and their use of and experience with panel research techniques. Agencies invited to participate in the survey were known to have conducted panel survey research, have an active market research program, or be a leader in the field in other areas. The survey provided an opportunity for respondents to suggest other agencies that may have conducted panel survey research. The sample was designed to provide insights into use of market research panels, and is not indicative of the transit industry as a whole. Respondents included 29 transit agencies, one metropolitan planning organization (MPO), and one state department of transportation. The response rate was 76%. Appendix A provides the industry survey questionnaire. Appendix B lists the agencies who responded to the industry survey.

Three agencies were singled out for a brief profile of their panel experience, which had specific elements of interest but did not warrant a full case example. They are provided along with the results of the industry survey. Based on the information provided on the surveys, the consultant's knowledge of the industry, and input from this topic's advisory panel, four agencies were identified for full case examples: Regional Transportation District (RTD), Denver, Colorado; Minneapolis DOT (MnDOT); Metropolitan Transportation Authority (MTA) (New York City); and Washington State Ferries (WSF). The agencies were selected to demonstrate the broad range of ways in which panel survey research is being implemented. The case examples highlight the following elements:

- Overview of the panel survey;
- Panel sampling, recruitment, and maintenance;
- Implementation, analysis, and reporting;
- Benefits, cost, and concerns;
- Legal, ethical, and privacy issues; and
- Lessons learned/elements for success.

Case example interviews were conducted by telephone, and case example write-ups were reviewed, edited, and approved by the individual case example respondents.

## REPORT ORGANIZATION

The synthesis is organized into five chapters. This introduction is followed by the literature review in chapter two, survey results in chapter three, and case examples in chapter four. Chapter five provides conclusions and identifies potential further research topics.

CHAPTER TWO

# LITERATURE REVIEW

This literature review consists of four sections:

- The first section provides a brief history of survey sampling and the theoretical basis for market research analysis, providing context for what became the standard procedures and expectations of market research. This is followed by an overview of some of the issues facing market research today, and how they are impacting the statistical underpinning of market analysis.
- The second section introduces traditional panel surveys and panel survey techniques. A summary of a typical traditional case example, the Puget Sound Transportation Panel Survey, is provided in Appendix A.
- The third section introduces relatively newer concepts of online panel research, with definitions particular to online panel surveys and techniques, issues with online panel research, and the special concerns of market research in the public sector.
- The fourth section circles back to the concerns raised in the first section, and looks at what lies ahead for the market research industry on these issues.

## MARKET RESEARCH CONTEXT

### A Brief History of Survey Sampling

In a 2011 special edition of the *Public Opinion Quarterly,* Brick provides an article on the future of survey sampling (Brick 2011). For the purposes of the article, survey sampling is defined as the methodology for identifying a set of observations from a population and making inferences about the population from those observations. Prior to 1934, full enumeration was considered necessary to understanding characteristics of a population; everyone needed to be contacted. Neyman, in his 1934 article "On the Two Different Aspects of the Representative Method: The Method of Stratified Sample and the Method of Purposive Selection," planted the seeds that resulted in the overthrow of full enumeration and established the paradigm of survey sampling. The move to telephone surveying in the mid-20th century was another significant change in survey sampling methods. The pressures for timely and cost-efficient estimates were stimulants for change then, and are even more relevant today.

The article by Brick draws from a 1987 article by Frankel and Frankel, "Fifty Years of Survey Sampling in the United States." In the 1987 article, sampling is described as having two phases: (1) the establishment of the basic methods of probability sampling; and (2) innovations in the basic methods to accommodate new technologies, such as telephone sampling and computerization. Since Frankel and Frankel wrote their article in 1987, the Internet has become another technological advance, requiring innovations in sampling to accommodate the technology. The Brick article notes that 10 years ago, no generally accepted method of sampling from the Internet had been established, and that as of the writing of the article in 2011, it was still the case.

As developed by Neyman in 1934, probability survey sampling became the basis for virtually all sampling theory, with a very specific framework for making inferences. The framework assumes that all units in the population can be identified, that every unit has a probability of being selected, and that the probability can be computed for each unit. Once the population is selected, the framework assumes that all characteristics can be accurately measured. Non-response factors and the inability to include portions of the population (coverage error) violate the pure assumptions of probability sampling. A variety of techniques has been developed to adjust for non-response and coverage error, such as model-based and design-based sampling methods.

Technological advances that have changed sampling methods include: the introduction of telephone surveying, which eventually replaced face-to-face interviews as the primary mode of household surveying; the shift from landline telephones to cell phones; and the advent of the Internet. Each of these not only affected methods of sampling, it is intertwined with the others, with changes in one leading to new developments in the others.

### New Concerns with Traditional Quantitative Research

The science of traditional quantitative market research rests on two fundamental assumptions: (1) the people who are surveyed approximate a random probability sample; and (2) the people who are surveyed are able and willing to answer the questions they are asked (Poynter 2010). In addition to these concerns with the theoretical underpinnings of market research, operational concerns are also putting pressure on traditional methodologies.

#### *Random Probability Sample*

The random probability sample is an essential ingredient of traditional market research. Without it, quantitative market

research studies and analysis cannot be conducted. It is this underpinning of sampling theory that allows the calculation of sampling and expressing confidence in the results, such as results being ±3% with a confidence interval of 95%. As telephones became standard in every household, random-digit-dial techniques for landline telephones became the foundation of probabilistic sampling, with a solid theoretical basis.

Results for a survey conducted between January and June 2011 by the National Center for Health Statistics found that 31.6% of American homes had only cell phones, and that an additional 16.4% of homes received all or almost all calls on wireless telephones despite also having a landline telephone (Blumbery 2011). Expert disagree, but it has been suggested that if more than 30% of the population has a 0% chance of being selected, then a random probabilistic sample cannot be selected (Brick 2011).

The implication is profound—that with the incidence of landline phones declining, random-digit-dial telephone surveying, the mainstay of traditional quantitative market research, no longer provides a probabilistic sample. Cell phones are considered unsuitable for random-digit-dialing, for a variety of reasons, including the possibility of respondents having more than one cell phone resulting in duplication within the sample; respondent resistance; and legislation that prohibits the practice. Online recruitment is fast and economical, but does not provide a probabilistic sample, as is discussed later in this chapter.

#### *Willingness and Ability to Answer Research Questions*

Market researchers started out assuming that people could answer direct questions about their attitudes and behavior. Early on, it became clear that these questions were difficult to answer, so psychometrics and marketing science methodologies were developed to facilitate responses and analysis of results. More recently even these techniques have been challenged, as the industry realizes that respondents are unreliable witnesses about themselves.

#### *Operational Issues*

Other problems with the traditional market research process are operational. It is perceived as slow and costly, and increasingly, organizations are relying on techniques that may be providing quick results at the expense of quality. The cost of traditional survey research often is driven up by the decline in use of landline telephones, making it more difficult to obtain a traditional random probabilistic sample. In addition, more people have answering machines to screen calls or otherwise refuse to participate, again making it difficult to achieve a sufficient sample without additional time and expense.

If cost is arguably the single most important factor in the search for new survey techniques, the Internet offers a potential solution, even though it doesn't provide a probabilistic sample. This shift from probability sampling to non-probability sampling is a paradigm change of the magnitude of the shift from enumeration to probability sampling theory in 1934—which, Brick notes in his article, was spurred by the cost of enumeration. Today researchers find themselves in a similar situation, driven by rising costs away from probabilistic sampling toward non-probabilistic sampling.

The issues raised here may fundamentally change the way all market research is conducted. How the market research industry is responding and what may lie ahead is discussed in the last section of this chapter, "The Future of Market Research."

## TRADITIONAL MARKET RESEARCH PANELS

Panel surveys have been conducted for many years, and have been used in the transportation industry for topics such as travel behavior changes and tracking customer satisfaction. The concepts discussed in this section are applicable to both traditional and online panel research.

### Definition of a Traditional Panel

The meaning of a market research panel depends on the context, industry, and time period in which the term is being used. The AMA acknowledges this with the following distinctions:

- True panel: A sample of respondents who are measured repeatedly over time with respect to the same variables.
- Omnibus panel: A sample of respondents who are measured repeatedly over time but on variables that change from measurement to measurement [http://www.marketingpower.com/_layouts/Dictionary.aspx?dLetter=P (accessed Mar. 11, 2012)].

### Traditional Panel Survey Techniques

Traditional panel members were recruited through probabilistic sampling techniques so that survey results could be extrapolated to the general population. Developing and maintaining a panel was an expensive proposition, made more difficult by the challenge of keeping track of people and households as they moved and changed phone numbers. Panel survey research was typically used to determine individual travel behavior changes over time, such as to understand the relationship between changes in household characteristics and choice of travel mode. Another use was for "before and after" studies to measure impacts of a change in policy or service; for example, adding a new light rail line or carpool lanes. These studies were often conducted by a MPO for the purpose of developing regional travel demand and forecasting models. Panels were rarely set up and maintained for the purpose of ad hoc, on-call market research (omnibus panels).

Panel data collection is described as "a survey of a group of preselected respondents who agree to be panel members on a continuous basis for a given period of time and provide demographic data, allowing selection of special groups and

permitting the use of surveys to monitor responses over time" (Elmore-Yalch 1998). This maximizes the use of a sample in that the sampling need be done only once, after which the panel is accessible for future research efforts. Panel member attrition and replacement is an element of maintaining the panel, and is discussed elsewhere in this chapter.

The remainder of this section is a summary of *An Introduction to Panel Surveys in Transportation Studies* (Tourangeau et al. 1997), which provides a solid overview of the basics of traditional panel survey research, especially as applied to travel behavior studies.

The report has a four-fold purpose for the development and implementation of travel behavior studies: (1) to highlight the differences between cross-sectional and panel surveys; (2) to discuss the limitations of both cross-sectional and panel surveys; (3) to identify situations where panel surveys are the preferred method; and (4) to provide guidelines for designing a panel survey and maintaining the panel. A panel survey approach is recommended when the purpose of the survey is to develop travel demand models and forecast future demand; to measure and understand trends in behavior; to assess the impact of a change in transportation policies or services; or to collect timely information on emerging travel issues.

### *Definition of Cross-Sectional and Panel Designs*

There are two broad types of surveys, cross-sectional and panel surveys. A cross-sectional survey uses a fresh sample each time, whereas a panel survey samples the same persons (or households) over time. In addition, the questions may be the same or change with each survey. This creates four basic approaches to travel behavior surveys.

One-time cross-sectional surveys provide a "snapshot" of travel behavior at a particular point in time, and show how behavior differs among members of the population, but provide no direct information on how it changes over time. This type of survey makes no attempt to replicate conditions or questions from previous studies, and as a result is not well suited for assessing trends in population behavior.

Repeated cross-sectional surveys measure travel behavior by repeating the same survey on two or more occasions. In addition to repeating the questions, the sampling is conducted in a similar manner to allow comparisons between or among separate survey efforts. Repeated cross-sectional surveys are sometimes referred to as a "longitudinal survey design" because they measure variations in the population over time. A more restrictive definition of a longitudinal survey design is where survey questions are repeated with the same sample over time.

Longitudinal panel designs collect information on the same set of variables from the same sample members at two or more points in time. Each time the panel is surveyed, it provides what is called a "wave" of data collection. Typically, each wave consists of the same core questions along with some new questions. In a travel behavior survey, the panel provides information on how the travel behavior of each participant evolves in response to changes in the travel environment, household background, or other factors.

Rotating or revolving panel surveys are a combination of repeated and cross-sectional designs, in that they collect panel data on the same sample for a specified number of waves, after which portions of the panel are dropped and replaced with comparable members. The strength of this design is its ability to allow for both short-term panel member analysis and long-term analysis of population and subgroup change. Like repeated cross-sectional designs, rotating panels periodically draw new members from the current population, obtaining similar measurements on them.

### *Benefits of Panel Designs*

The most important benefit of a panel survey is that it directly measures changes at the individual level and can provide repeated measurements over time. This rich source of information on personal and household behavior is essential for determining causal relationships between travel behavior and the factors that influence personal travel decisions and developing predictive models for personal travel behavior. This same benefit applies to the ability to measure and understand trends in population behavior.

Panel studies can be especially useful for before-and-after surveys that measure the impacts of transportation policy and service changes on travel behavior, rider attitudes, and safety. For example, a before-and-after study of the implementation of a new rail line (replacing existing bus service) shows that a shift in mode split occurred after the implementation of the new line. Results using a cross-sectional survey showed a shift from auto to train after opening of the rail line suggesting overall growth in transit use shifting car drivers to rail riders. A panel study measuring individual specific changes captured a shift from bus to car in addition to the shift from car to rail. This finding fundamentally changed the implications of the cross-sectional study: the new service attracted former car drivers, but also shifted former bus riders into cars.

Additional benefits of the panel approach include statistical efficiency (it requires a smaller sample size); lower cost (it requires fewer surveys); and speed (easy access to the panel allows faster survey implementation than when a fresh sample must be obtained).

### *Limitations with Panel Designs*

Three primary limitations of panel surveys are identified: panel attrition, time-in-sample effects, and seam effects.

1. Panel attrition refers to panel member non-response in later waves of data collection. The Puget Sound Transportation Panel conducted its first wave of surveys in

1989. The fourth round of surveying in 1993 had a participation rate from the original panel member of about 55%, meaning 45% of the panel had left and needed to be replaced.
2. The time-in-sample effect refers to reporting errors or bias as a result of participants remaining in the panel over time. This is also called condition, rotation bias, or panel fatigue; and generally refers to respondents reporting fewer trips or fewer purchases in later rounds of a panel survey than in earlier ones.
3. Seam effects are another type of reporting error and refer to reporting changes at the beginning or ending of the interval between rounds rather than in other times covered by the interview.

*Design Issues in Conducting a Panel Survey*

There are four design issues that need to be considered in conducting a panel survey: definition of the sample unit; the number and spacing of rounds; method of data collection; and sample size.

1. Most traditional travel surveys conducted by MPOs use households as the sampling unit; however, sampling individuals is another option. When a household is the sampling unit, the panel survey sample can become complicated as household members are born, die, divorce, or mature and move out. For travel surveys, the report suggests using the household as the sampling unit, following initial respondents to new households, and adding any additional household members to the panel.
2. The number and spacing of survey rounds depends on factors such as the rate of changes in travel behavior and the need for up-to-date information. If changes in travel behavior are the result of external factors, such as rapidly increasing gas prices, or if administrative reporting requires monthly or quarterly updates, this may shorten the intervals between survey waves. Panel travel surveys are collected at six-month or annual intervals, balancing the potential for respondent burden with the desire for regular data collection. The report recommends annual data collection for travel behavior studies.
3. Data collection methods differ in terms of cost, coverage of the population, response rates, and data quality (inconsistent or missing data). In-person data collection is typically the most expensive, but produces the highest percentage of coverage, highest response rates, and potentially most accurate data, as the interviewer can assist the respondent. Telephone data collection tends to be the next most expensive methodology, and eliminates the population without a telephone. This used to be limited since almost all households had a landline phone, but since the report was written the percentage of mobile phone-only households has grown significantly. Data collection by mail is the cheapest of the three traditional modes, but has the lowest response rates and poorest data quality. [Since the report was written, Internet surveying has become another inexpensive alternative method of data collection. Online surveying is covered in other portions of the literature review.] The report recommends using the telephone for data collection in the first wave of a travel behavior panel study and considering less expensive methods for successive waves, if necessary.
4. Selecting the sample size requires specifying the desired level of precision for the survey estimates. The precision level is determined by the requirements for analyzing the goals and objectives of the survey, typically rates of change in travel behavior at the household or sub-regional level. After the level of precision is determined, traditional statistical formulas can be applied to determine the sample size, which is then adjusted for anticipated non-response, attrition, and eligibility rates.

*Issues with Maintaining the Panel*

The report points up three issues that need to be considered in terms of maintaining a panel: freshening the sample, maintaining high response rates across waves, and modifying the questionnaires across rounds.

1. "Freshening the sample" is the process of adding new panel members over time to ensure that the sample accurately reflects changes in the population from newly formed households or those who have recently moved to the study area. The longer the panel is continued, the less likely it is to represent the study area. The report suggests that, if a panel continues for more than five years or there is significant in-migration to the study area, a supplemental sample be implemented.

   Another reason for freshening the sample is to offset attrition, recruiting new panel members comparable to those who drop out and thereby maintaining the panel make-up and sample size for the duration of the panel effort. The report suggests that the initial sample size be large enough to accommodate anticipated attrition in later waves, and that steps are taken to minimize attrition. Replacement of panel members should only be done as a last resort.
2. There are three techniques for maintaining high response rates: tracing people or households who move; maintaining contact with panel members between rounds; and providing incentives for participation. Methods of tracing panel members who move include mailing a letter several months in advance of the next wave requesting updated contact information; and asking the post office to provide new addresses rather than forwarding the mail, to ensure that the contact files get updated. If new contact information is not provided, researchers may attempt a manual search through existing databases. The report suggests that a protocol be developed at the outset of the survey effort to track respondents between waves and reduce attrition.

   Another way of reducing attrition is to maintain respondent interest and contact information between

waves by sending postcards, holiday greetings, and survey results. Incentives such as small amounts of cash can also be helpful. Cross-sectional surveys have shown that a small prepaid incentive (for example, a $2 bill) is effective in increasing participation rates and reducing attrition. Unfortunately, there was limited research at the time as to the effect of incentives on panel surveys over time. It is noted that non-respondents in one wave may still participate in the next, so that only those who refuse to respond to more than one round of the study would be dropped from the panel.

3. A defining element of a traditional panel survey is the ability to administer the same questions to panel members over time, which is what provides the direct measurement of change that is so valuable to travel behavior studies. Two situations arise that may make it necessary to modify the questionnaire across waves. First, a new issue may arise that can be advantageously posed to the panel. This then becomes a cross-sectional survey, where the data are collected once. If the question is repeated in later waves, it becomes part of the panel effort. Although this is easy, fast, and less expensive than conducting a separate study, it can add to respondent fatigue by making the questionnaire longer. For this reason, it is suggested that new questions be kept to a minimum. The second reason for changing a question that there is a problem with the question itself (e.g., it is poorly worded, yields unreliable results, or becomes irrelevant). In this instance, it is important to revise the question as soon as possible. The report recommends that a calibration study be done to determine the effect of any core changes.

*Weighting the Panel Data*

The final section of the report deals with how to weight panel survey data. Weighting is done to account for differences in the probability of being selected, to compensate for differences in response rates across subgroups, and to adjust for random or systematic departures from the composition of the population. Weighting is done at two points: after the initial wave, following the procedures for standard cross-sectional surveys; and then after each wave to account for changes in the panel membership. Although weighting is fairly straightforward for the first wave, subsequent waves can be complicated if the sampling unit is a household, as is typical of travel behavior panel studies. Elements that must be taken into account are how to treat households who add or lose members over the course of the panel; and how to define a "responding" or "non-responding" household, for example, whether all survey waves are completed by all household members or only certain household members. It is sometimes necessary to generate different weights for different survey analyses. Detailed guidelines for developing panel survey weights are provided in the report appendices.

## ONLINE MARKET RESEARCH PANELS

This section will discuss the types of online panels, sampling strategies, and issues and concerns with using the Internet for market research purposes. The current literature reviewed in this synthesis discusses sampling and recruitment for online panels using the Internet, e-mail, or other new technologies, such as quick response (QR) codes scanned by a smart phone. Multi-frame sampling, where a mix of sampling techniques is used for developing the panel, poses additional issues which are only now being explored and disseminated within the market research industry. Because this is an emerging area of research, this literature review does not include multi-frame sampling.

### Types of Online Panels

Three types of panels are discussed by Poynter in his 2010 book, *The Handbook of Online and Social Media Research: Tools and Techniques for Market Researchers.* The first is a traditional panel, typically called a client panel or in-house panel, developed to meet specific criteria and recruited either in-house by the agency or through the assistance of a vendor. The panel can be recruited through a variety of techniques, including telephone; in-person intercepts (on a vehicle, or on the street); through existing agency customer databases; or online, through the agency website or pop-up invitations to join the panel. The critical elements of this type of panel are the definition and control that is exercised by the agency, and the intention for the agency to maintain the panel over time.

An online access panel, also referred to as an access panel or online panel, is developed by independent market research firms and can provide samples for most markets that have a significant volume of research activity. The researcher provides the panel company with the desired sample specification, and then either the researcher provides a link to the online survey, or the panel company scripts and hosts the online survey.

The third type of panel survey is an online research community, also known as a market research online community or MROC, which combines attributes of panel research with elements of a social media community. Although it is sometimes grouped with social media techniques, the online research community has been included here because it meets the definition of "a group of persons selected for the purpose of collecting data for the analysis of some aspect of the group or area."

*In-House Panels*

As the name implies, in-house panels are owned by the research department of the agency, and are not purchased from a vendor's existing panel. The in-house panel is used

for market research, not public relations, marketing or sales; and panel members are aware that they will be contacted for research, insight, and advice.

The primary advantages of in-house panels are cost savings, speed of feedback, and control over the panel. Disadvantages include the workload required to manage a panel and that the possibility that panel members may become sensitized to the research approaches.

In-house panels can be conducted simply from a list of people and an off-the-shelf survey program using e-mail and a way to unsubscribe from the panel. For small-budget projects or a low-key exploratory concept, a simple approach may be the most appropriate. More sophisticated panel management may require methods to prevent people from signing up multiple times, the ability to draw sub-samples, protocols for handling and managing incentives, panel member replacement strategies, quotas on survey responses, online focus groups or bulletin board groups, and rules for creating an online panel community.

The more sophisticated the approach, the more advantageous it is to contract with a vendor to run the panel. Using internal staff may make the research more responsive to management needs while saving in consultant fees. A vendor, however, can handle more work without overburdening agency staff, using employees familiar with the latest thinking and best practices. These different strengths often lead to a strong partnership between the vendor and staff.

Traditionally, panel research was done with standard questionnaires, implemented by means of mail or telephone. New developments in technology and the Internet have made it easy to expand the activities of a panel even further, creating online focus groups, photo projects where panel members take pictures with their cell phones and upload them to an agency website, brainstorming through collaborative systems such as "wiki" sites, and quick "fun polls" that encourage participation, generate panel engagement, and provide almost instant answers to questions of the moment.

Tips for using an in-house panel include:

1. Manage the expectations of panel members by letting them know at the outset how many surveys/activities they should expect.
2. Let panel members know you value their participation and that they are making a difference.
3. Recognize that panels will usually be skewed toward members who are knowledgeable about the product or service, and that they may not represent the opinion of the general public.
4. Complement conventional incentives (such as cash) with intrinsic rewards, such as information about upcoming events or new products before it hits the general market.

*Online Access Panels*

Online access panels have fundamentally changed how market research is conducted. An online access panel "is a collection of potential respondents who have signed up with a vendor which provides people for market research surveys." These respondents are aware that they are joining a market research panel, and that they will be receiving invitations to online surveys. The vendor keeps some information on the panel members so that it can draw samples, if requested, but does not share this information with the client. Panel maintenance, including the provision of incentives, is the vendor's responsibility.

In selecting a panel vendor, six factors need to be considered:

1. Does the vendor provide only the sample, or will it also host surveys? If so, can the brand image on the survey maintain the agency's brand, or does it become folded into the vendor's survey branding?
2. What is the quality of the panel? Not all panels are created equal, and the results can vary based on the panel used. ESOMAR formulated "26 Questions" (later, "28 Questions") for agencies to ask vendors in order to understand their procedures and the potential quality of the survey results. The questions can be found at: http://www.esomar.org/index.php/26-questions.html.
3. In looking at vendor costs, caution must be exercised to ensure that price quotes are on similar services so they can be correctly compared.
4. Make sure that the vendor has the capacity to complete the study, including any potential future waves of the study. It is common practice for panel survey vendors to outsource a portion of or even the entire project to another firm if they do not have the resources to complete it as scheduled. Outsourcing to another panel survey firm can result in double-sampling people who are members of both panels. More importantly, because different panels often have varying results, this can lead to confusion as to whether an apparent change is real or a reflection of the panel used.
5. The more data a vendor has on its panel members, the more closely a survey can be targeted to the appropriate respondents. This results in fewer respondents being screened out and a shorter survey with fewer necessary questions.
6. As with any service, it is helpful to have a supportive vendor who is willing to stay late if needed, help clean up errors, and respond quickly to issues and concerns.

After selecting a vendor, it is essential to ensure a good working relationship. This can be facilitated by:

- Clarifying the quote for the project to make sure it includes all work needed;

- Booking the fielding time for the job as soon as the vendor is selected so there is flexibility if dates need to be changed for holidays, computer maintenance, etc.; and
- Developing and agreeing on the timeline, including finalizing the sample specification, scripting the survey or sending the link to the survey, having a soft launch to test the survey, agreeing on the full implementation and end date, and specifying the frequency of communication with the panel company, especially regarding problems that may occur.

Once the survey is in the field, it is important to monitor progress and report any issues immediately to the panel vendor, including problems reaching the target quotas for completed surveys. The sooner action is taken, the easier it will be to rectify the issue. It is advisable to work closely with the vendor supplying the panel to take advantage of its experience with data issues with long surveys and improving the survey experience.

*Online Research Communities*

Using social media to create online research communities or MROCs for research purposes is a relatively new field. Research communities have been offered by third-party vendors since about 2000, but did not become widely used until about 2006. Online research communities typically have a few hundred members, and straddle the divide between quantitative and qualitative research. The communities can be short-term, developed for one research question and then dissolved; or can be a long-term resource, allowing research on a wide variety of topics over a period of six months or more.

The benefits of online research communities are that they provide access to the authentic voice of the customer; go beyond the numbers to provide qualitative discussion; provide quick turnaround at a low marginal cost because the sampling and recruitment is complete; and create an active dialogue with the customers, letting them feel they "make a difference." These communities can either be open to anyone who wishes to join (within the requirements of screening criteria, such as age or geographic location), or closed, in which case panel members are invited to participate. It is important to note that open communities tend to be more about involvement, advocacy, and transparency rather than insight and research.

Incentives are important to maintaining a high level of participation for all types of research panels; however, several issues are to be considered when structuring an incentive program. (It should be noted that it is illegal for some public agencies to use incentives.)

The argument for using incentives is that they represent a small payment for the time and contributions of the panel members, and may be necessary to obtain the level of engagement needed to make the community succeed. The type of incentive (cash versus intrinsic rewards) must also be considered. A chance to win a transit pass or seeing the results immediately upon completing an instant poll are examples of incentives. Finally, the agency must decide how to allocate the incentives. Options include giving all members an incentive regardless of participation levels; giving members who participate in a specified time frame the incentive; offering a chance to win a prize; and awarding a prize to the "best" contribution in a specified time frame. Agencies should avoid starting with a high-value incentive, because lowering the incentive later will seem to panel members that the agency is taking away a benefit, resulting in a loss of participation.

As with all research techniques, the online community can be developed and maintained either in-house or through a vendor. Online research communities require significant and continuous management. Even if the community is maintained by a vendor, significant input by staff is needed to ensure that the community is addressing issues of concern to the agency. The advantages of a having a research-only community are that it can be much smaller than broader-topic communities, and members may be more open if they know they will not be "sold to" another interest. Opening the community up to other department managers may result in too many surveys and e-mails being sent to members, with research being pushed aside in favor of other topics. Likewise, it is important not to allow community members to usurp the purpose of the research community for their own agendas. Part of managing the community is monitoring and ending any member activity that begins to create an agenda separate from that of the agency, even removing a panel member if necessary.

The steps to and guidelines for setting up an online community include determining:

- What type of community is best (short versus long term, open versus closed, and the number of members);
- The "look and feel" (i.e., makeup) of the community;
- Community tools;
- Methods of recruiting members;
- Terms and conditions (including intellectual property, member expectations, restricted activities, anti-community behavior, privacy and safety, incentive rules, eligibility, data protection and privacy), and the ability to change terms and conditions;
- Methods of moderating and managing communities (moderator function, community plan, dealing with negativity, creating member engagement); and
- Requirements for finding and delivering insights.

The rapid pace of change among social media makes it difficult to project how this type of research activity will be conducted in the future. Four considerations are identified in Poynton's book:

1. Market research organizations typically do not allow activities that would influence the outcome of the

research. Because interaction and relationships built between community members and the sponsoring community agency may sensitize panel members to organizational issues, MROCs may be declared "not research."
2. Currently, online research communities are used for more qualitative work rather than large-scale quantitative work. The ability to expand online research to larger projects (e.g., international research) will increase this as a mainstream research tool.
3. Respondent fatigue may set in, resulting in a less engaged community. This may be especially true if panel members belong to more than one community.
4. Alternative (not research-based) methods may be more successful, such as having a very large community that can serve both marketing and research functions, or tapping into other existing communities to conduct research rather than establishing one specific to the organization.

One of the primary concerns with online research communities has been that the relationship with the organization may cause heightened brand awareness and affinity, and that this will lead to a positive bias in research results. However, Austin notes in an article in *Quirk's Marketing Research Media* (Austin 2012) that while engagement builds a relationship with the company, community members remain candid and critical despite their relationship with the brand. If anything, members became slightly more critical as their tenure lengthened, not less. The article recommends that in moving to a new research paradigm, organizations make two changes from the traditional research approach to take advantage of this finding: trade anonymity for transparency because transparency builds engagement; and trade distance for relationship because relationship creates candor. Together, the community members "work harder, they share more and they stay engaged in the research longer."

#### Online Panel Sampling Techniques

A few online panels employ traditional random sampling techniques, such as random-digit-dialing, and then conduct the research online; but the majority of panels are recruited using a non-probability approach online, such as pop-up or web banner ads. The AAPOR Report on Online Panels (Baker 2010) covers both types of panels. This review will cover probability and non-probability sampling techniques as they relate to panels; it also discusses "river sampling," although it is not a panel sampling technique, per se. Lastly, it provides an overview of strategies for adjusting non-probability samples to represent a population.

Probability sampling techniques for online survey research have been slow to be adopted, despite being around for more than 20 years. The recruitment is similar to voluntary, non-probabilistic samples, except that the initial contact is based on probabilistic sampling techniques such as random-digit-dialing, or other techniques for which the population is known. Computers may sometimes be provided to persons with no online access to remove bias that might exist from only including persons or households with Internet access. Once the sample is determined, panels are built and maintained in the same way, regardless of whether they are probability- or non-probability-based. A probability-based sample is more expensive to develop than a non-probabilistic sample. Consequently, systematic replacement or the replacement of panel members lost through attrition is also more costly. The benefit is that a panel can be built that represents the general population and allows analysis of results based on probability theory.

Non-probability and volunteer online panel members are recruited through a variety of techniques, all of which involve self-selection. The invitations to join a panel can be delivered online (through pop-up or banner advertisements), in magazines, on television, or through any other medium where the target population is likely to see the advertisement. The recruitment entices respondents by offering an incentive, talking about the fun of taking surveys, or other proven techniques.

A common practice in the industry for developing online panels is through co-registration agreements. An organization will compile e-mail lists of its website visitors and ask if they would like to receive offers from partner agencies. The e-mail list is then sold to a research panel company. Off-line recruitment strategies include purchasing an organization's customer contact database and asking participants in a telephone survey if they would like to become part of an online panel for future surveys. A technique used for both online and off-line recruitment is to ask existing panel members to refer their friends and relatives, sometimes offering a reward for each new panel member recruited. No two panels are recruited the same way, and the panel research companies carefully guard their methodologies for recruiting panel members.

River sampling is an online technique that uses pop-up surveys, banner ads, or other methods to attract survey respondents when they are needed. In river sampling, the ad presents a survey invitation to site visitors and then directs or "downstreams" them to another, unrelated website to complete the survey. (Using this analogy, a panel would be a pond or reservoir sample.) Knowing on which websites to place the ads is critical to the success of river sampling. This technique is not related to developing a panel, although sometimes the respondent is invited to join a panel at the completion of the survey. There is generally a reward of some kind for completing the survey, such as cash, online merchant gift cards, frequent flyer miles, etc. This type of sampling may be on the rise as researchers seek larger and more diverse sample pools, and to get respondents who are less frequently surveyed than those provided through online access panels.

The AAPOR report provides an overview of strategies for adjusting self-selected (non-probability-based) online panels, and reviews complex weighting, quotas, benchmarking, and modeling methodologies for creating a more representative

sample. Complex weighting uses detailed information about the population to balance respondents so that they mirror the population. Quotas, which match key demographics of the respondents with the demographics of the target population, are the most common technique. Benchmarking keeps the sample specifications the same over multiple waves, under the assumption that any changes are the result of changes in the element being measured, regardless of whether the sample is representative of the population. Modeling refers to linking the benchmark results to the real world to model what a survey score of X means in terms of actual outcomes.

When applying statistical significance testing to the panel sample, it is important to recognize that the significance is not how representative it is of the population, but of the panel. "The error statistics indicate how likely it is that another sample from the same panel will be different, which is a valid and relevant measure of reliability" (Poynter, p. 74). It is not, however, an estimate of the population sampling error, as is commonly understood with traditional random (probabilistic) sampling. Response rates for online access panels have little impact on how representative the research is, but do provide a measure of the quality of the panel.

### Issues and Concerns with Online Panel Surveys: AAPOR Report on Online Panels

Online surveys have grown rapidly because of the lower cost, faster turnaround time, and greater reliability in building targeted samples, at the same time that traditional survey research methods are plagued by increasing costs, higher non-response rates, and coverage concerns. The quality of online access panel survey data came into focus in 2006 when the VP of Proctor and Gamble's Global Consumer Market Knowledge gave a presentation on the range of problems P&G had faced with online access panel reliability. It fielded a survey twice with the same panel, two weeks apart, with results that pointed to two different business conclusions. This focused the market research industry's attention on the need to provide understanding, guidance, and research on the topic of online research.

The traditional probabilistic sample, such as random-digit-dialing, is the underpinning of market research. Probabilistic samples are based on the probability of being selected out of a specified population (such as households within the city limits). Based on probability theory, the results can be projected to the population with a statistical level of certainty. Online panel surveys typically use non-probability samples, which are a significant departure from traditional methods.

The AAPOR *Report on Online Panels,* produced by the AAPOR task force on opt-in online panels, is a seminal work on concerns and issues with online panel (i.e., non-probability sample) survey research. The scope was to "provide key information and recommendations about whether and when opt-in panels might be best utilized and how best to judge their quality" (Baker 2010).

#### *Sampling Error, Coverage Error, and Non-Response Bias*

A sample is, by definition, a subset of a population. All surveys, regardless of sampling method, have some level of imprecision owing to variation in the sample. This is known as sampling error. A probabilistic sample is one where sampling theory provides the probability by which the member of the sample is selected from the total population. In traditional sampling methods, such as random-digit-dialing of households within a geographic area, the total population of home telephone numbers is known. With address-based sampling, the total number of addresses in a specific area is known. Thus the total population is known and the probability of selecting any one phone number (or address) is known. This allows the data to be projected to the population as a whole.

The difficulty with online sampling is that the population is unknown. Typically an e-mail address is used as the sampling unit (rather than a home telephone, as in the earlier example). The issues with e-mail addresses include duplication problems, in that one person may have more than one e-mail address; and clustering problems, where an e-mail address represents more than one person. As a result, online sampling differs from traditional sampling in three significant ways: (1) the concept of a sampling frame is discarded and the focus is shifted to recruiting as large and diverse a group as possible; (2) instead of a representative sample of all households, a diverse group of persons with the attributes of interest for the panel is recruited; (3) the panel membership is rarely rotated, with panel members being retained as long as they keep completing surveys. Over time, this can lead to a very different panel membership than the initial profile of the panel.

Coverage error occurs when persons, or groups of persons, have zero chance of being selected to participate in the survey. Lack of access to the Internet creates significant coverage bias. The AAPOR report includes data from 2008 stating that although 85% of the households in the continental United States have some level of Internet service, those without Internet access differ significantly from those who do. Those without access are more than twice as likely to be over the age of 65 as the general population. They are also more likely to be members of a minority group, to have incomes less than $25,000, to have a high school education (or less), to be unemployed, not to own a home, and to live in rural counties or the South Census Region. It can also be noted that having access to the Internet does not necessarily make for active users of the Internet. In 1970, household telephone coverage estimates of 88% led to the acceptability of using telephone surveys in place of in person interviewing. Coverage estimates of Internet usage are currently lower than 88%, indicating that it has not yet reached a level where it can be used to represent the general population.

Commercial online access panels are even more problematic, in that a person has to have Internet access, receive an invitation to become a panel member, sign up for the panel,

and then participate in the surveys. Current estimates are that less than 5% of the population has signed up for an online panel, meaning that more than 95% of the population has a 0% chance of being selected.

Non-response bias is when some of the persons in the sample choose not to respond to the survey, or some of the questions within the survey. Four stages of panel development are discussed, and how online panel survey development is affected by non-response bias:

Stage 1: Recruitment of panel members. The previous discussion on coverage error points out issues with Internet access. In addition, there is bias regarding which Internet users are likely to join a panel. The report cites several studies that found online panels are more likely to be comprised of white, active Internet users with high education levels who are considerably more involved in civic and political activities; and who place less importance on religion and traditional gender roles and more importance on environmental issues.

Stage 2: Joining and profiling the respondents. Most panels require a respondent to click through from the online ad to the company's website to register for the panel and complete some profile information, including an e-mail address. An e-mail is sent to the prospective panel member, who must respond in order to join the panel. A study by Alvarez et al. (2003) reported that just over 6% of those who clicked on the banner ad completed all of the steps to become a panel member.

Stage 3: Completing the questionnaire. This is similar to random-digit dialing when a person refuses to participate in the survey or does not meet the eligibility requirements. Online surveys have an additional non-response bias from technical problems that can prevent delivery of the e-mail invitation or completion of the survey itself. Some panels will oversample groups that are known to have low response rates in order to have a representative sample after data collection is complete. Although this may result in a balanced sample on that particular dimension, it does not ensure that the sample is representative on other points.

Stage 4: Panel maintenance. Attrition can be "normal," when people opt out for whatever reasons; or can be forced, when panel members are automatically dropped from the panel after a set period of time to keep the panel fresh. Many strategies are used to reduce panel attrition, but little research exists on reducing or determining the most "desirable" attrition rate to balance the costs of adding panel members with the potential concerns of long-term membership, such as panel conditioning.

*Measurement Error*

Measurement error is defined as the difference between an observed response and the underlying true response. This can be random error, as when a respondent picks an answer other than the true response, without any systematic direction in the choice made. Systematic measurement error, or bias, occurs when the responses are more often skewed in one direction. Much of the literature regarding measurement error is related to the benefits and potential biases of personal interviewers and self-administered surveys, including paper and online surveys. Because this is an issue that is related to data collection methodology for any survey, not specific to panel surveys, it is beyond the scope of this project and will not be covered in this literature review. However, this is an important issue for all survey efforts, and researchers are encouraged to look at the issues related to both interviewers and self-administered surveys.

One measurement issue directly related to panel surveys is that of panel conditioning. Repeatedly taking surveys on a particular topic is known to make respondents more aware of that topic, pay more attention to it in their daily lives, and therefore have different responses on future surveys than if they had not been on the panel. The research on panel conditioning with online panels has mixed findings. Some studies have shown a marked bias towards an increased likelihood to purchase; other studies show that this effect can be mitigated by varying topics from survey to survey. Other research studies have shown no difference in attitudinal responses between infrequent and very experienced panel survey members. There are two theories on the effects of taking large numbers of surveys: Experienced survey-takers may be more likely to answer in a way that they believe is best for themselves (e.g., it will earn them more incentives, or get more surveys to complete; alternatively, experienced survey takers will understand the process better, resulting in more accurate and complete responses. So far, there is no definitive research on the effects of panel members completing large numbers of surveys regarding the accuracy of the survey results.

*Sample Adjustments to Reduce Error and Bias*

It is agreed by most researchers that online panels are not representative of the general population, and that techniques are needed to correct for this if the results are used. Four techniques have been used to attempt to correct for the known biases with a goal of making the sample representative of the population: sampling to represent a population; modeling; post-survey adjustment; and propensity weighting.

1. The most common form of sampling to represent a certain population is quota sampling, with the quotas often being demographics to match the census. Other elements can be factored in by, for example, balancing members by political affiliation. There does not appear to be any research on the reliability or validity of this type of sampling applied to panel surveys.
2. Models are frequently used in the physical sciences and in epidemiological studies to reduce error and bias. Online panels are much more complex than epidemiological studies, however, making it more difficult to apply model-based techniques.

3. The most common post-survey adjustment is the weighting of survey data. The difference between the sample and sampling frame with probability samples is handled through probability theory principles. Because there is rarely a sampling frame in an online sample, the census and other sources are typically used to adjust the results for under-representation of certain groups of respondents. Work conducted by Dever et al. (2008) found that inclusion of enough variables could eliminate coverage bias, but did not address problems associated with being a non-probability sample.
4. To apply propensity weighting, a second "reference" survey with a probability-based sample is conducted at the same time as the online panel survey, using the same questions. A model is built that can be used to weight future online surveys to better represent the target population. Although this technique can be used successfully, it can also increase other types of error, leading to erroneous conclusions from the resulting data.

The AAPOR report (Baker 2010) provides an extensive discussion of and guidance on applying these techniques. The reader is encouraged to review the report before applying a sampling adjustment technique.

*Panel Data Quality*

Panel data cleaning is an important step in delivering results from respondents who are real, unique, and engaged in the survey. Three areas of cleaning panel data are discussed: eliminating fraudulent respondents, identifying duplicate respondents, and measuring engagement. Fraudulent respondents are those who sign up for a panel multiple times under false names and lie on the qualifying questionnaire to maximize their chances of participation. Duplicate responses occur when respondents answer the questionnaire more than once from the same invitation or when they are invited to complete the survey more than once because they belong to more than one panel.

Measuring engagement is the most controversial technique. Four basic cleaning strategies are used to weed out respondents who may not be engaged with completing the survey, but are simply answering to earn the incentives: recognizing respondents with very short survey times (compared with all surveys); identifying respondents who answer all questions in a matrix format (usually scaled questions) the same way; recording an excessive selection of non-substantive answers, such as "don't know"; and noting nonsense answers or identical answers provided for all open-ended questions.

Although there was no research at the time that demonstrated the effects of using cleaned data on the sample or final results, it is generally accepted that negative respondent behavior is detrimental to data quality.

*Industry Focus on Quality*

The market research industry has been focused on panel data quality, with virtually every national and international association incorporating principles and guidelines for conducting online and panel research. Four key efforts are highlighted in the report:

1. The Council of American Survey Research Organization (CASRO) revised its Code of Standards and Ethics for Survey Research in 2007 to include specific clauses related to online panels.
2. ESOMAR developed comprehensive guidelines titled "Conducting Market and Opinion Research Using the Internet." This was supplemented by its "26 Questions to Help Research Buyers of Online Samples."
3. The International Organization for Standardization technical committee that developed ISO 20252—Market, Opinion and Social Research also developed ISO 26362—Access Panels in Market, Opinion and Social Research. The standard defines key terms and concepts in an attempt to create a common vocabulary for online panels, and details the specific kinds of information that a research panel is expected to make available to a client at the conclusion of every project.
4. The Advertising Research Foundation established the Online Research Quality Council, which in turn designed and executed the Foundations of Quality project. Work was in progress as of the writing of the AAPOR report, and as of the writing of this synthesis, results of the effort were just being made public.

*Recommendations*

The AAPOR *Report on Online Panels* makes the following recommendations to market researchers who are considering using online access panels:

- A non-probability online panel is appropriate when precise estimates of population values are not required, such as when testing the receptivity to product concepts and features.
- Avoid using non-probability online access panels when the research is to be used to estimate population values. There is no theoretical basis for making projections or estimates from this type of sample.
- The accuracy of self-administered computer surveys is undermined because it is a non-probability sample. A random-digit-dial telephone survey is more accurate than an online survey because it is a probability sample, despite the coverage error arising from households without a landline phone.
- It has not yet been demonstrated that weighting the results from online access panel surveys is consistently effective and can be used to adjust for panel bias.

- There are significant differences in the composition and practices of various online access panels, which can affect survey results. Different panels may yield significantly different results on the same questionnaire.

### Market Research by the Public Sector

Poynter's book devotes a section to issues specific to public sector research. Although most of the marketing research principles apply equally to the private and public sectors, there are a few areas where the public sector researcher needs to be particularly attentive, because public funds are being used to conduct the research and the results may determine how public funds are expended. Areas for particular attention are identified as: operating in the public eye, "representativity," geographical limitations, social media and the public sector, and ethics.

#### *In the Public Eye*

Public sector research is subject to audit, inspection, and reporting in the media. Freedom of information laws ensure that the public has a right to see how public funds are being spent. Poorly conducted research could be brought to light in a public forum, creating public relations problems for a perceived waste of taxpayer money and jeopardizing the ability to conduct future research. As a result, care must be taken to ensure public sector research is conducted to the highest quality and ethical standards.

#### *Representativity*

Having a representative sample is always important, but is of special concern for public agencies. Many public services, such as public transportation, target specific groups which may have multiple challenges. Much of the target population may not have Internet access, and those that do may not be typical of the market segment they are expected to represent. For each study, the researcher must carefully assess whether an online survey is appropriate for that market and research purpose, and whether the sampling and recruitment strategies provide survey results that can be defended in public.

#### *Geographical Limitations*

Public agencies have strict geographic boundaries from which a sample population can be drawn. Face-to-face or telephone surveys are often simplified by these restrictions. Surveys using an online access panel, however, can be problematic, as there may not be an adequate sample of persons from the target area. This is further exacerbated when the sample is also required to be representative of the population within a specified geographical area.

#### *Social Media and the Public Sector*

There are several ways in which social media are being used for research in the public sector. Online communities engage in a range of activities, including information-sharing, research, community-building, and engagement. Online research communities are typically closed communities, operated by a vendor, with membership by invitation only as part of an overall sampling plan (see the MnDOT case example of an online research community).

Twitter, blogs, and public discussions are resources for passive research, using data mining tools to monitor trends in what people are saying about the agency. Although useful information can be elicited from these sources, it should be noted that they do not provide a representative sample, and should be considered public comment rather than research.

Social media is often used to reach out to groups that are otherwise hard to reach, such as young adults. It should be noted that using a variety of social media techniques, such as Facebook, YouTube, and Twitter, is likely to reach the same people multiple times. If multiple social media channels are used to recruit online survey participants, for example, the researcher must be prepared for the potential duplication of survey responses.

#### *Ethics*

There is an expectation that research will be reliable, and can be used by a decision-making body in a public forum. First and foremost, the researcher must provide unbiased market research. Often a vendor is used to conduct the research so as to provide a wall between the agency and the research and avoid the appearance of leading the respondents, or "spinning" the results. The second concern is that quantitative research based on random probability sampling has been the standard method for achieving that level of reliability expected of a public agency. Since online research is typically not from a probabilistic sample, the researcher should recognize the potential lack of statistical reliability inherent in the research design and ensure that decision makers understand the limitations of the data.

## FUTURE OF MARKET RESEARCH

Technology has fundamentally changed how society communicates and how it does business. Whereas people used to communicate by means of the telephone at home, cell phones make communication possible virtually anywhere. Cell phone numbers do not represent a physical address; they have become a moving, real-time "personal" address. The Internet provides instant access to information and communication through e-mail, websites and social media. The smart phone combines mobile communication with the Internet, creating

a completely new, technology-based world. Panels can now be developed online, quickly and easily. Household and personal contact information is no longer tied to a home address, but exists outside of the person's geographic location.

This technology has led to a revolution in market research. Recruiting survey respondents is easier; developing a panel is faster; and surveys are online, resulting in automation of survey tabulation and reporting. As a result, recruiting and maintaining research panels is simpler, less expensive, and very attractive to decision makers who want results "now." But these changes have created a myriad of concerns, primarily related to using non-probabilistic sampling practices.

The history of sampling theory provides some insights into what may occur in the future. In 1934, although sampling theory had not yet been developed, Anders Kaier convinced an international audience that representative samples could be used to represent a population. Morris Hansen of the U.S. Census Bureau greatly expanded the theory and practice of sampling and helped convince the bureau to accept sampling and quality control methods in the 1940 Census. Through the leadership of these two important individuals, the practice was adopted. From there, sampling theory was developed—it followed the practice, rather than the theory creating the practice.

Brick states that data collection costs will continue to put pressure on agencies to use non-probability samples from online recruitment. If this cannot be done within design-based probability sampling theory, he suggests two potential outcomes: A new paradigm that accommodates online surveys is introduced, which replaces or supplements traditional probability sampling; or online surveys using non-probabilistic sampling are restricted to specific applications as a result of the weak theoretical basis.

One potential solution is the use of multiple-frame sampling to reduce coverage error, a fundamental concern with online panel research. For example, to reach transit riders, an online survey could be placed on the agency website and be supplemented with paper surveys on board vehicles. Statisticians are working on establishing a theoretical basis for conducting sampling using the multiple-frame technique (Brick 2011).

In addition to the changes in survey practice that led to the historical development of sampling theory, two additional factors are cited as creating the paradigm shift from population surveying to representative sampling in 1934. The first was the wealth of scientific development and statistical ideas, not necessarily related to survey sampling, which nevertheless supported the growth and change in methods. The second factor was society's demand for information on a wide range of topics that made population sampling cumbersome and expensive. This desire for faster, cheaper research drove the development of probability sampling and our current market research paradigm. These characteristics are in place today, almost 80 years after probabilistic sampling made its debut. With the rapid changes in technology and society's insatiable thirst for more information, more quickly, and for less cost, a new research paradigm with a theoretical foundation to support non-probabilistic online surveying may be on the horizon.

CHAPTER THREE

# SURVEY RESULTS—USE OF PANELS

## METHODOLOGY

An online survey of selected transit and transportation agencies was conducted to determine the extent of market research activities and the use of panel surveys in transit. The sample of agencies surveyed was not randomly generated, but rather was selected because: (1) They were known to have experience with panel surveys; (2) they were known to conduct market research and were most likely to have experience with panel survey techniques; or (3) they helped provide representation of all sizes of agencies. As such, the responses reflect the experience and views of the participating agencies, and are not necessarily representative of the industry as a whole.

The e-mail invitation to participate in the survey and the questionnaire are provided in Appendix B. The participating agencies are listed in Appendix C. It can be noted that there is limited participation in the survey from smaller transit agencies. Small and rural agencies have limited budgets and are much less likely to have a market research function; through this synthesis, smaller firms will be able to learn from the experiences from the larger firms and better understand the elements of successful panel research.

## FINDINGS

The survey covered four primary topics: modes operated; methods of gathering customer feedback; use of market research; and experience with panel surveys.

### Agency Description

Agencies were asked what types of transit service(s) they operate (see Figure 1). Of the 31 respondents, 28 were transit operating agencies, one was a regional transit authority, one was a MPO, and one was a state DOT that does not operate transit services.

### Customer Feedback Methods

Feedback can be gathered informally from customers and the general public through a variety of methods. Social media is becoming a more common way of communicating with customers and the general public. The survey listed nine traditional and social media communication techniques. The respondents were asked if they used each method, and if so, to rate its usefulness for gathering feedback from their customers and general public. Results are shown in Table 1.

A call center/live operator was the most widely used method for gathering feedback, and rated the most useful of all techniques (63% described it as very useful and 30% as somewhat useful). The second most useful method was the agency website (50% called it very useful and 40% somewhat useful).

Twitter was the third most used communication medium, with 25 of the 31 agencies having a Twitter feed; among those 25, 16% rated it as very useful and 68% as somewhat useful. Facebook and YouTube were being used by 21 of the 31 agencies; however, Facebook was rated as more useful, with 24% giving it a neutral rating and only 5% rating it not very useful. Nearly one-quarter of the respondents with a Facebook page gave it a neutral rating (14% described it as very useful, 57% as somewhat useful). YouTube was rated neutral by 38% of the agencies and by another 24% as not useful (19% called it not very useful, 5% not at all useful).

Although only 17 of the 31 agencies had a blog, 24% of those that did rated it as very useful for gathering feedback. LinkedIn, Flickr, and third-party sites (e.g., ICanMakeIt Better.com or SeeClickFix.com) were used by fewer than half of the agencies, and were generally rated as being less useful than other methods for gathering feedback from their customers or the general public.

In addition to the question shown in Table 1, agencies were asked the open-ended question, "What other platforms do you use to obtain feedback from your customers and the general public?" Responses included:

- Customer surveys/panels (22 agencies)
- Public meetings/hearings/open houses/workshops (8 agencies)
- Telephone hotlines/e-mail (3 agencies)
- Comment cards/feedback forms (3 agencies)
- Community Committees (3 agencies)
- Frontline personnel (2 agencies)
- Third party provider: ICanMakeItBetter.com (1 agency).

### Use of Market Research

All agencies responding to the survey conduct market research. Phone interviews with several of the agencies that did not respond to the survey indicated that they do not conduct market

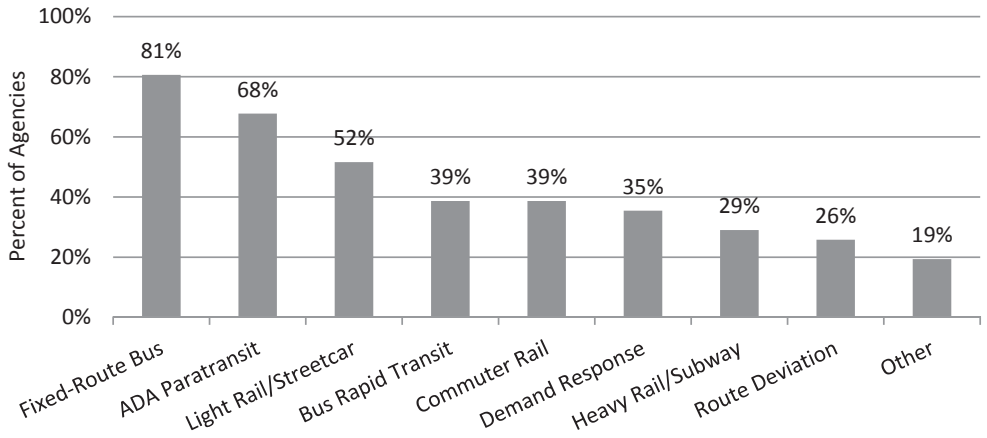


FIGURE 1 Which modes does your agency either directly operate or operate using a contractor ($n = 31$)? Other: ferry system (1), high-occupancy vehicle lanes (1), vanpools (1), not a transit service operator (3).

research. Paper surveys distributed on board vehicles were the most common technique, used by all but one agency. Focus groups, telephone surveys, and online surveys from the company website were also common, with about 80% of the agencies reporting using those techniques. It is interesting to note that among these agencies conducting market research, online surveys are now as prevalent a research method as telephone surveys. In-person interviews are used by about two-thirds of respondents. Only 42% used paper surveys distributed through the mail, and 29% had employed panel surveys (see Figure 2). No agencies reported e-mailing the survey or survey link using an agency e-mail list, or linking to a survey from a social media broadcast (e.g., Facebook, Twitter).

When asked what barriers the agency faced in conducting market research, 48% of the agencies cited lack of funds for consultants, with 26% citing lack of staff resources. Other barriers to conducting market research reported included lack of management support (13%), lack of overall funding (6%), and lack of technical staff to conduct the research (3%). Of this select sample of 31 agencies, 39% stated that they did not face any barriers to conducting research. No agency responded that it did not have a need for market research (see Table 2).

Respondents were asked how much their agency spent annually on all market research, for in-house staff as well as consultants. Combined staff and consultant budgets ranged from under $10,000 annually to $1 million at the larger agencies or for special projects. One agency had not conducted market research over the past three years, but had budget allocated to conduct research in the current year.

The primary topics of research over the past three years were rider demographics and rider attitudes/satisfaction (90%). Next were trip characteristics (84%) and marketing/message development (77%). Federal requirements, such as the National Transit Database and Title VI, were the topics of market research over the past three years for 13 agencies (see Table 3).

TABLE 1
HOW WOULD YOU RATE THE USEFULNESS OF EACH OF THESE METHODS FOR GATHERING FEEDBACK FROM YOUR CUSTOMERS AND THE GENERAL PUBLIC?

| Method | Not Used (No.) | Used (No.) | Very Useful (%) | Somewhat Useful (%) | Neutral (%) | Not Very Useful (%) | Not At All Useful (%) |
|---|---|---|---|---|---|---|---|
| Call Center/Live Operator | 1 | 30 | 63 | 30 | 7 | 0 | 0 |
| Agency Website | 1 | 30 | 50 | 40 | 7 | 3 | 0 |
| Twitter | 6 | 25 | 16 | 68 | 12 | 4 | 0 |
| Facebook | 10 | 21 | 14 | 57 | 24 | 5 | 0 |
| YouTube | 10 | 21 | 10 | 29 | 38 | 19 | 5 |
| Agency Blog | 14 | 17 | 24 | 47 | 18 | 12 | 0 |
| Flickr | 16 | 15 | 0 | 27 | 47 | 20 | 7 |
| LinkedIn | 18 | 13 | 0 | 23 | 54 | 23 | 0 |
| Third Party (e.g., SeeClickFix.com) | 21 | 10 | 20 | 10 | 50 | 20 | 0 |

$n = 31$.

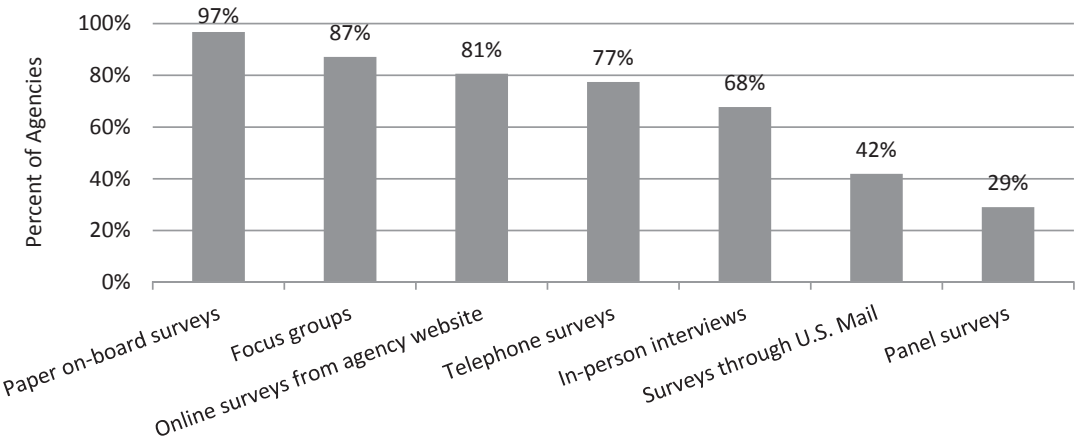


FIGURE 2 What are the market research techniques you use to collect information from your customers and the general public ($n = 31$)?

### Panel Surveys

Respondents were asked if they had experience with panel surveys. Ten agencies had conducted panel research, nine had considered but not conducted panel research at that time, and 12 had neither considered nor conducted panel research (see Figure 3).

Those agencies that had considered or conducted panel research were asked what they saw as the primary benefits of panel research. More than half responded that they are able to conduct research in-house at a moment's notice; that they can target specific market segments; that it is faster and cheaper than traditional survey methods; and that they are able to track changes in attitudes or behaviors from the

TABLE 2
WHAT ARE THE BARRIERS TO CONDUCTING MARKET RESEARCH AT YOUR AGENCY (check all that apply)?

| Barriers | Percent |
|---|---|
| Lack of funding to pay for research consultants | 48 |
| Lack of staff to conduct or oversee market research activities | 26 |
| Lack of support from management for market research activities | 13 |
| Lack of overall funding | 6 |
| Lack of technical skill to conduct market research | 3 |
| We do not have any barriers to conducting needed market research | 39 |
| We do not have a need for market research | 0 |

$n = 31$.

TABLE 3
OVER THE PAST THREE YEARS, WHAT HAS BEEN THE PURPOSE OF YOUR MARKET RESEARCH (check all that apply)

| Purpose of market research | Percent |
|---|---|
| Rider demographics | 90 |
| Rider attitudes/customer satisfaction | 90 |
| Rider trip characteristics (origin, destination, trip purpose, mode of access, etc.) | 84 |
| Marketing and message development | 77 |
| General public attitudes and awareness of transit/transit issues | 71 |
| Public input on transit planning, transit projects | 65 |
| Evaluating the effects of an agency action | 55 |
| Federal reporting requirements (Title VI, limited English proficiency, etc.) | 42 |
| General public support for funding initiatives | 35 |
| Other | 3 |
| Not applicable | 6 |

$n = 31$.

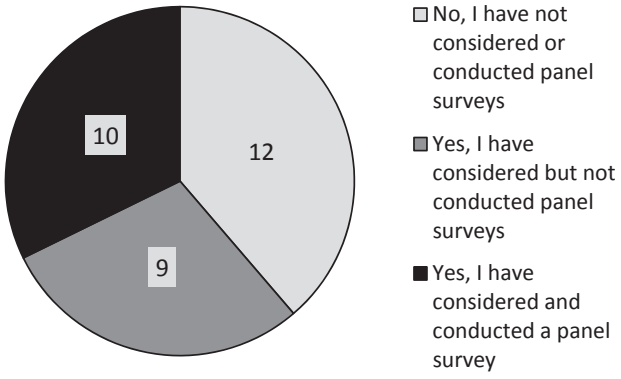


FIGURE 3 Have you considered or conducted panel surveys for market research purposes ($n = 31$)?

same person over time. Other benefits cited include a public relations benefit with riders and non-riders, and tracking changes in attitudes or behavior over time (not by individual). One agency reported using a panel approach for smaller annual surveys, which could more easily be accommodated in the budget using revenues, rather than conducting an infrequent large-scale survey that could require special funding (see Table 4).

The number one concern with panel surveys was that the panel might not be representative of the target population (cited by 70% of the respondents). At least half of the 19 respondents cited concerns with panel attrition and lack of funding or staff to maintain the panel. Seven agencies (35%) cited concerns with panel members becoming sensitized to transit issues. Ethical concerns and public relations concerns were only cited as an issue by one agency each. No one cited legal concerns with panel surveys. Four agencies (21%) had no concerns at all with panel surveys (see Table 5).

Panel surveys were most likely to be used for rider and general public attitudes and awareness of transit, and marketing and message development. They were least likely to be used to research rider demographics and trip characteristics, which are typically tracked using on-board paper surveys (see Table 6).

The nine agencies that had considered a panel survey but not conducted one at that time were asked why they had not

TABLE 4
WHAT ARE THE PRIMARY BENEFITS THAT LED YOU TO CONSIDER A PANEL SURVEY (check all that apply)?

| Primary Benefits | Percent |
|---|---|
| Able conduct the research in-house on a moment's notice | 63 |
| Can do research with specific market segments | 63 |
| Faster than traditional survey methods | 58 |
| Ability to track changes in attitudes or behaviors from the same person, over time | 58 |
| Cheaper than traditional survey methods | 53 |
| Provides a public relations benefit with our riders | 37 |
| Other | 21 |
| • Allows non-rider community stakeholders to feel they are involved in transit planning | |
| • An experiment with new methods to conduct tracking research | |
| • Specific reactions to changes made over time | |
| • Saw the panels survey as a way to smooth out our survey research budgets over a number of years. Typically, our large-scale cross-sectional surveys cost approximately $2ñ3 million dollars, which is a big bite out of our total MPO budget; thus, very hard to fund in a single year. Can only afford these large-scale surveys about once a decade. The original thought was to use a smaller continuing annual panel survey and to budget about $250,000/per year instead of $2,500,000 once every 10 years. | |

$n = 19$.

TABLE 5
WHAT ARE YOUR PRIMARY CONCERNS WITH PANEL SURVEYS?

| Primary Concern | Percent |
|---|---|
| Panel may not be representative of my target population | 70 |
| Panel respondents "dropping out" (panel attrition) | 55 |
| Lack of funding/staffing to maintain the panel | 50 |
| Panel members were becoming sensitized to transit issues | 35 |
| Providing incentives to engage and keep panel members participating | 20 |
| Public relations concerns | 5 |
| Ethical concerns raised regarding panels | 5 |
| Other: Costs outweigh benefits | 5 |
| Legal concerns | 0 |
| I do not have any concerns with panel surveys | 20 |

$n = 19$.

TABLE 6
WHAT WAS THE PURPOSE FOR WHICH YOU CONSIDERED OR CONDUCTED A PANEL SURVEY (check all that apply)?

| Purpose | Percent |
|---|---|
| Rider attitudes/customer satisfaction | 68 |
| Marketing and message development | 58 |
| General public attitudes and awareness of transit/transit issues | 53 |
| Public input on transit planning, transit projects | 42 |
| Evaluating the effects of an agency action | 42 |
| Rider trip characteristics (origin, destination, trip purpose, mode of access, etc.) | 26 |
| Rider demographics | 21 |
| General public support for funding initiatives | 11 |
| Federal reporting requirements (Title VI, limited English proficiency, etc.) | 5 |
| Other: | 11 |
| Website evaluation, mobile website evaluation, parking payment system evaluation | |
| All—but we don't just focus on transit | |

*n* = 19.

conducted panel research. The following open-ended responses were received:

- Short staff, not a priority for last year
- Still deciding whether or not to do it. Top management leaning towards allowing it
- Time constraints
- Haven't decided
- Start-up was complicated. New product development could be leaked to general public with negative reactions to beta test.
- Primarily concerns about attrition and replacing panel members as we were considering it for a survey that would be conducted annually or every couple of years.
- The first regional customer satisfaction study is being conducted that could provide a basis for panels implementation in the future.
- We plan to implement panels in 2012. We are currently conducting customer satisfaction survey that will provide us with a pool to recruit customer panels.

### Panel Survey Experience

A series of questions was asked of those agencies that had implemented panel survey research. The survey included the following definition of a panel survey:

> A panel survey is a community of people who have agreed to participate in research projects periodically. Panel members can be recruited and surveyed using traditional techniques (for example, random-digit-dial with a phone survey) or more recently, using on-line recruitment and surveying. Market research companies develop and maintain general panels and also have the ability to create custom panels. Alternately, a panel can be developed and maintained in-house.

*Number of Panel Surveys Conducted*

Based on the definition provided, 10 of the agencies participating in the survey had implemented panel surveys. Two agencies had extensive experience with panel surveys, stretching over 15 years or more. Following are the responses to the question: "How many panel surveys have you conducted over all survey efforts?"

- One survey (3 agencies)
- Two surveys (2 agencies)
- Three surveys (1 agency)
- 4 or 8 per year for 20+ years (1 agency)
- 20—periodic surveys over 3 years (1 agency)
- 200—1 or more weekly surveys for 3 years (1 agency)
- Continuous daily surveying for 15 years (1 agency).

*Benefits of Panel Research*

The most commonly cited benefit of panel surveys, reported by seven of the 10 respondents that had conducted them, is that it was cheaper than traditional survey methods. Six remarked that the research could be targeted to specific markets, while five agencies believed that panels were faster than traditional survey methods, and could be conducted in-house at a moment's notice (see Table 7).

The Metro Washington Council of Governments (COG), District of Columbia, saw the panel as a way to smooth out its survey research budget over a number of years by conducting a continuous panel survey. See the Metro Washington Council of Governments Panel Survey Experience profile for details of their panel effort.

**Metro Washington Council of Governments Panel Survey Experience**

The Metro Washington (D.C.) Council of Governments (COG) conducts a large household travel survey approximately every ten years to update the regional transportation planning model. Data needed are origin/

TABLE 7
WHAT ARE THE PRIMARY BENEFITS THAT LED YOU TO CONSIDER A PANEL SURVEY (check all that apply)?

| Primary Benefits | Considered Panel Surveys $n = 9$ | Conducted Panel Surveys $n = 10$ | Total $n = 19$ |
|---|---|---|---|
| Able conduct the research in-house on a moment's notice | 6 | 5 | 12 |
| Can do research with specific market segments | 5 | 6 | 12 |
| Faster than traditional survey methods | 5 | 5 | 11 |
| Ability to track changes in attitudes or behaviors from the same person, over time | 7 | 4 | 11 |
| Cheaper than traditional survey methods | 2 | 7 | 10 |
| Provides a public relations benefit with our riders | 4 | 3 | 7 |
| Other | 1 | 3 | 4 |

destination, mode of travel, trip purpose, time of travel, etc., for all daily travel. Typically, the large-scale cross-sectional household travel diary study costs $2–$3 million, which is a significant portion of the COG's budget and difficult to fund in a single year. The plan was to create a panel which would have fewer members than are typically surveyed in the telephone survey, but that would be surveyed annually. The budget would be about $250,000 annually and cost the same over the ten-year period.

The panel was recruited and the survey was fielded for six years, from 1998 to 2003. The panel was disbanded before the proposed ten years for several reasons: High turnover of panel members resulted in the study becoming more of a repeated cross-sectional survey with limited travel behavior tracking at the individual level; the sample was determined to be too small to get the origin/destination data needed to support the regional travel model; there was little, and inconsistent, year-to-year change in the measures of regional travel behavior; proper weighting and statistical analysis of the survey results was exceedingly complex; and panel maintenance costs were high.

*Concerns with Panel Research*

When asked about concerns they had with panel surveys, two of the ten agencies did not cite any. The main concerns of six of the eight remaining agencies were that the panel might not be representative of their target population, panel attrition, and adequate resources to maintain the panel. Other concerns cited by three or fewer agencies included the panel becoming sensitized to transit issues, the necessity of providing incentives to keep panel members engaged and participating in the panel, and ethical concerns (see Table 8).

NJ TRANSIT planned to implement an online customer satisfaction and travel behavior study, but was concerned that the panel might not be representative of the riding population. It instituted several practices to ensure participation by all of their riders. See the NJ TRANSIT Panel Survey Experience profile for a discussion of its efforts.

**NJ TRANSIT Panel Survey Experience**

In April 2011, NJ TRANSIT initiated a quarterly on-line survey with 41 service attributes designed to track customer satisfaction. An initial panel was developed

TABLE 8
WHAT ARE YOUR PRIMARY CONCERNS WITH PANEL SURVEYS?

| Primary Concerns | Considered Panel Surveys $n = 9$ | Conducted Panel Surveys $n = 10$ | Total $n = 19$ |
|---|---|---|---|
| Panel may not be representative of my target population | 7 | 6 | 14 |
| Panel respondents may "drop out" (panel attrition) | 5 | 5 | 11 |
| Lack of funding/staffing to maintain the panel | 5 | 4 | 10 |
| Panel members were becoming sensitized to transit issues | 3 | 3 | 7 |
| Providing incentives to engage and keep panel members participating | 2 | 2 | 4 |
| Public relations concerns | 1 | 0 | 1 |
| Ethical concerns raised regarding panels | 2 | 1 | 1 |
| Legal concerns | 0 | 0 | 0 |
| Other | 0 | 1 | 1 |
| I do not have any concerns with panel surveys | 0 | 2 | 4 |

using customer e-mail lists from all departments in the agency. Recognizing that existing e-mail lists may not be representative of the actual customer base, the agency developed a wide variety of methods to encourage customers to visit the website, take the survey, and become part of the panel. Panel membership is open to all customers of NJ TRANSIT bus, rail, and light rail service, and Access Link, NJ TRANSIT's ADA paratransit service.

For each wave of the survey, existing panel members are sent an e-mail asking them to complete that quarter's customer satisfaction survey. In addition, the following techniques are used to encourage customers to visit the website, complete the survey, and become part of the panel: A public relations campaign publicizes the survey in media; the agency website features the survey link; posters are placed on buses; flyers are placed on the seats of trains; Access Link places announcements on the telephone reservation system; business cards are handed out at stations and on board vehicles with the survey invitation; and those without Internet access are encouraged to go a free public access resource, such as the local library in their community, to complete the survey and become part of the panel. Even with these efforts, NJ TRANSIT recognizes that the panel will not represent all customers. The panel survey data are supplemented with data collected in the field by NJ TRANSIT employees, who survey customers using tablet computers.

There are approximately 16,000 customers taking the survey each quarter. Detailed origin and destination survey data are used to weight the customer satisfaction data, based on ridership counts by mode and geographic market. The final sample is slightly skewed toward the peak period commuter, but is sufficiently representative to be used as quantitative findings rather than being limited to qualitative analysis.

*Use of Vendors*

The primary tasks of conducting a panel survey are panel recruitment; maintaining the panel; developing the questionnaire; implementing the survey; and conducting the analysis and reporting. Those who had conducted panel research were asked how the responsibilities were assigned for each of these tasks: to in-house staff, an outside consultant, or both working together (see Table 9). Overall, there was no clear-cut division of responsibilities. It is clear that each agency develops its methodology and use of vendors based on its own situation, needs, and resources.

The 10 agencies that had implemented panel surveys were asked if they used a custom panel developed for their specific needs or purchased an existing panel from a vendor. Nine agencies developed a custom panel, while only one had used an existing panel from a vendor (see Figure 4).

The Tri-County Metropolitan Transportation District of Oregon (TriMet) used a vendor-provided panel representing the Portland metropolitan area to determine if a panel survey could be used instead of the annual telephone tracking study. See the TriMet Panel Survey Experience profile for details on TriMet's experience with using an existing vendor panel.

**TriMet Panel Survey Experience**

Every year, TriMet conducts a 20-minute telephone survey of the general population in the Portland, Oregon, metropolitan area to track attitudes and awareness of TriMet services, customer satisfaction, and other agency tracking measures. Telephone surveying has become increasingly expensive, and with the increase in cell phone usage and corresponding decrease in households with landlines, some demographic populations are difficult to reach. Online panel surveys were looked at as a lower-cost research technique that could replace the telephone survey.

TABLE 9
WHO COMPLETED EACH OF THE FOLLOWING TASKS ON YOUR MOST RECENT PANEL SURVEY?

| Tasks | In-House No. | Consultant No. | Both No. | Not Applicable No. |
|---|---|---|---|---|
| Recruited the panel | 3 | 5 | 2 | 0 |
| Maintained the panel | 5 | 3 | 2 | 0 |
| Developed the questionnaire | 6 | 1 | 2 | 1 |
| Implemented the survey | 4 | 4 | 1 | 1 |
| Conducted the analysis and reporting | 5 | 1 | 4 | 0 |

$n = 10$.

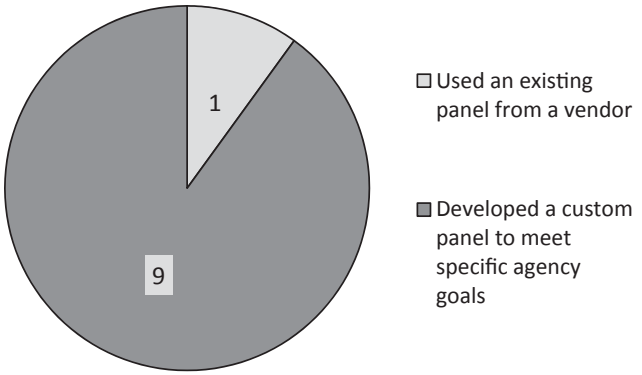


FIGURE 4 For your most recent panel survey, did you use a vendor's existing panel or develop a custom panel ($n = 10$)?

TriMet contracted with its telephone vendor to conduct an online panel survey in parallel with the household telephone survey. The panel was an existing group recruited by the vendor to mirror the population within the TriMet service district. The telephone questionnaire was used for online surveying, with minor modifications to adapt to the online format.

Results of the online survey were disappointing. Although the target sample was the general population if the Portland metropolitan area, the respondents were highly skewed toward a specific demographic. Weighting the data to remove the bias would have been expensive and time-consuming, and without the weighting, the data were clearly erroneous. As a result, it was determined that the best use of the methodology would be to contact specific target markets. Once the methodology becomes more reliable, further use of an online panel would be considered.

*Satisfaction with Panel Survey Effort*

Half of the agencies (five) reported being very satisfied with their panel survey research, with one other being satisfied. One agency was neutral on its experience. One agency was dissatisfied, whereas two were very dissatisfied. The survey did not ask the respondents for details as to why they gave that satisfaction rating (see Figure 5).

## SUMMARY OF SURVEY RESULTS

Survey results and conversations with transit agencies indicated that the use of market research panels is in its infancy in the transit industry. Every effort was made to contact all transit agencies that were conducting panel survey research to invite them to participate. However, survey results show that very few transit agencies have used panel survey techniques, and only ten agencies have completed a panel survey. At the same time, nine agencies are considering or in the process of developing a panel survey, indicating that this technique is of increasing interest to the transit industry.

Among agencies that have considered or conducted panel research, the primary benefits cited were the ability to conduct research on short notice and the ability to target specific markets. Other key benefits were the ability to track changes in attitudes or behaviors of the same persons over time, and that it is faster and cheaper than traditional research. The primary concern with panel research was ensuring representation of the target population. Other key concerns were panel attrition and lack of funding/staffing to maintain the panel. Almost all agencies had collected rider information through their panel surveys. Other topics addressed marketing, attitudes of the general public, rider input on transit planning issues, and effects of agency action.

Five major tasks for conducting panel research were identified (panel recruitment, panel maintenance, questionnaire

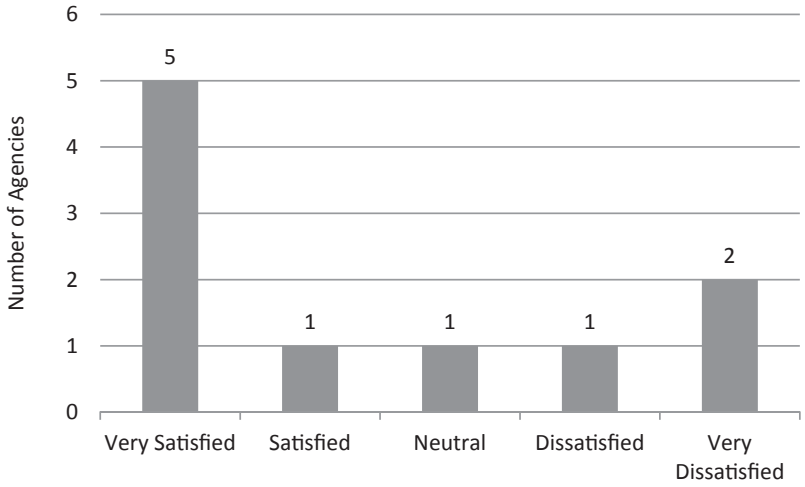


FIGURE 5 How satisfied has your agency been with its panel survey efforts ($n = 10$)?

development, data collection, and analysis and reporting). The survey also investigated the split of responsibilities between agencies and vendors. There was no consistency on the how vendors were used—in some cases, vendors were used for all tasks of the panel study, and in others, not used at all. Only one agency used an existing commercial online panel; the other nine agencies developed in-house panels to meet specific agency goals.

Agencies with several years' experience were more satisfied with panel research than those who had limited, recent experience. This indicates that there may be a learning curve for agencies to become familiar with the technique, understand when and why to use a panel, and ensure the panel is set up properly to achieve the maximum benefit.

The results of the survey were used to identify case examples. Three agencies, Metro Washington COG, NJ TRANSIT, and TriMet were developed into agency profiles, shown in this chapter. Four additional agencies were used as detailed case examples, which are provided in chapter four.

CHAPTER FOUR

# CASE EXAMPLES—A VARIETY OF PANEL SURVEY APPLICATIONS

Four agencies were selected for full case examples to illustrate the broad range of ways in which panel survey research is being implemented. The case examples highlight the following aspects of panel research and agencies' different techniques for recruiting panel members:

- RTD recruits panel members using a link on the agency website, a non-probabilistic sampling technique.
- MnDOT hired a consultant to recruit panel members online using pop-up messages to join a research panel, a non-probabilistic sampling technique, but recruited respondents to represent the population.
- MTA used a consultant to recruit panel members by random-digit-dial telephoning, a probabilistic sampling technique.
- WSF has posters on board vehicles and at terminals with the web address, encouraging passengers to sign up for the panel. They also have experimented with QR codes to have passengers vote on the value of service and then be linked to the website to join the panel. Both are non-probabilistic sampling methods.

The size of the panels:

- RTD recruits 16 panel members, who are replaced every year.
- MnDOT recruits 600 panel members, 300 from the Minneapolis region and 300 from the rest of the state.
- MTA recruited 1,500 panel members by zip code and borough to represent the general population.
- WSF does not limit panel members. There are currently approximately 6,500 panel members; the agency's goal is 18,000.

Varying levels of in-house versus consultant use:

- RTD conducts the panel research completely in-house.
- MnDOT and MTA use a mix of staff and consultants.
- WSF contracts out all panel research activities.

Different methods of surveying the panel members, and frequency of interaction:

- RTD has a qualitative panel, with focus group-style panel meetings every three months but no interaction between meetings.
- MnDOT conducts online surveys weekly through an interactive online research community, a mix of qualitative and quantitative studies.
- MTA conducted quantitative surveys of 12–15 panel members by telephone each day of the week, year-round, with the exception of major holidays.
- WSF conducts quantitative surveys with panelists online, notifying them by means of e-mail when a new survey is available.

Each of the case examples covers six topic areas: (1) research purpose; (2) panel sampling, recruitment, and maintenance; (3) implementation, analysis, and reporting; (4) benefits, cost, and concerns; (5) legal, ethical, and privacy issues; and (6) lessons learned/elements of success.

## REGIONAL TRANSPORTATION DISTRICT CASE EXAMPLE

### Overview

RTD (Denver) has conducted rider panel research involving its bus and light rail passengers for more than 20 years. The fixed-route service panel of 16 members is recruited annually through a link on the agency website, and meets quarterly for one year, after which a new panel is recruited. Although most panel research is survey-based, RTD's panel meets in a tightly structured focus group setting, where topics are covered in depth. The panel meetings are not appropriate when statistical accuracy is required, but are used to test and refine concepts and ideas before they are applied to larger, statistically accurate rider surveys. The market research staff works with the requesting departments to match the research technique to the research question and ensure that the panel is appropriate for the topic. Examples of research topics include testing parking payment systems, RTD existing and potential branding and marketing efforts, mobile applications for the RTD website, and long-range planning activities. All panel members are riders; therefore the panel does not provide perspectives from the nonriding population.

In 2012, a second rider panel was added to address issues of the disabled community on both fixed-route and ADA demand-responsive services. The program is conducted entirely in-house, from the online panel recruitment through final analysis and reporting, making it a very cost-effective research program.

**Panel Sampling, Recruitment, and Maintenance**

*Panel Sampling and Recruitment*

At the inception of the panel research program, more than 20 years ago, two fixed-route panels were recruited, one for bus riders and one for light rail riders. Today, most riders have regular experience with both bus and light rail, eliminating the need for separate panels. Currently, there is one fixed-route customer panel representing all of the non-ADA service modes operated by the agency.

Panel members were initially recruited through RTD's "Read and Ride" customer newsletter available on-board vehicles. The penetration of the Internet into everyday life has changed the recruitment strategy, which is now exclusively online and conducted during a four-week period each November. This is publicized through the news and an online alert on the agency website that invites riders to "Please apply for customer panel" (see textbox) and includes a link to an online screening application. The application gathers information on RTD services used, frequency of usage, availability of a car, usual park and ride lot (if any), previous service on an RTD panel, and demographics; and poses two open-ended questions: "Why do you want to be on the panel?" and "What general area or topic most interests or most concerns you about RTD?" These questions are used to gauge the respondents' communication skills. It is not necessary to be fluent in English, but the respondent does need to demonstrate a willingness to participate and ability to share their thoughts and ideas with the agency.

Share your ideas on the RTD customer panel:

We are looking for enthusiastic, interested RTD customers who are team players and want to make their ideas and opinions heard by actively participating on the RTD customer panel! If you ride RTD buses or light rail and want to share your ideas to help improve RTD, please complete our panel application.

The RTD customer panel is a year-long discussion group on RTD policies, procedures, products, and services. The 15-member panel meets four times a year for two hours on Wednesday evenings starting at 5:15 p.m. at the RTD Administration Building at 1600 Blake Street in Downtown Denver. In return for their participation, panel members receive a FREE buffet dinner at each meeting and a FREE Regional monthly pass for each month they attend a meeting. Panel members who attend all four meetings receive a FREE annual Eco Pass for the following year.

You can apply to become a member of the RTD Customer Panel by completing this short online application by December 17, 2010. RTD employees and their family members cannot be considered for this panel. If you are selected as a candidate, a copy of the Panel Meeting Guidelines will be sent to you by January 5, 2011, to review before you make a final decision to become a panel member.

There are typically 200–300 applications received each year. The high value incentive of a monthly pass after each meeting and a regional annual pass if all meetings are attended is seen as a critical element for attracting quality applicants. The applications are reviewed by RTD research staff. The 16 panel members selected (15 plus an alternate in case of attrition) represent each of the 15 RTD service districts; they are also selected to represent a cross-section of RTD customers based on age, race, gender, and transit dependence (availability of an automobile). Because of the college campus population served by RTD, it attempts to recruit at least one college student each year. The customer profile is obtained separately through a regular on-board customer satisfaction survey handed out by bus drivers and distributed at rail stations according to a sampling plan designed to achieve representative sample of RTD riders.

Although panel members are selected to reflect the riding population, they differ from the customer profile in one area: The selection methodology requires that all panelists have at least some college education. Experience has shown that those who have been in a college classroom understand the process of group discussion: listening, speaking, and the give-and-take of ideas. Those without the college classroom experience are less likely to understand the research and discovery process and hinder the panel discussions.

After the potential panelists are selected, they receive an e-mail outlining the program, schedule, what to expect at the panel meetings, what is expected of them as panelists, and the rules to earn their incentives. Exact dates in February, May, August, and November are set in advance, so that potential panelists can plan accordingly. On rare occasions, potential panel members have indicated that they would be unable to attend all of the meetings or meet the requirements of the program, and were immediately replaced. (One person was getting married on a meeting day; another was scheduled to be traveling for business.) Those who are not selected or decline to participate receive two free one-way tickets in appreciation for their applying. There have been some riders who clearly applied only to get the free tickets, but the number is few, and doesn't cause a problem for the agency or the research program.

In addition to the regular service customer panel, a second panel was added in 2012 to focus on issues relevant to persons with disabilities. The panel will consist of about eight persons who use fixed-route service and eight who use ADA demand-responsive service. Recruitment is being conducted by RTD market research staff through contacts at the Colorado Federation of the Blind and other agencies that serve persons with neurological, visual, hearing, and physical impairments. Recruiting for the panel for persons with disabilities is occurring at the same time as the regular service panel, and panel meeting focus groups are scheduled for one week after the regular service panel. The initial topic is how the agency can move riders from ADA service to fixed-route service, reducing reliance on the demand response service and increasing riders' options through improvements that would allow use of the more flexible fixed-route service.

*Panel Maintenance*

Panel members are informed of the incentives for participation as part of the information packet when they are invited to join the panel. The incentives include a buffet dinner the night of the meetings, a regional bus pass for the month following each panel meeting they attend, and an annual regional bus pass for the following year if they attend all four panel meetings. However, no panel member can be more than 15 minutes late to the meeting, or leave early.

If a panelist misses the first meeting in February, he or she is immediately replaced with a new panelist; however, after that, no new panel members are added for the remainder of the year. Because any new member would not have attended all four panel meetings, he/she would not be eligible for the annual pass, substantially reducing the incentive to participate in the remaining sessions.

There is no contact with panel members between the quarterly meetings. Attrition is not an issue because the panel is notified of meeting dates at the outset of the program, and because the regional transit pass is a valuable incentive.

**Implementation, Analysis, and Reporting**

*Implementation*

The research work is developed and implemented entirely in-house. The panel research program is administered by the market research department, which recruits and manages the panel, determines the research topics, establishes the meeting agenda and research questions, oversees the development of the materials to be used at the meeting, and writes and presents the final results. The panel meetings occur four times a year, so there can be competition for research topics to be conducted on a specific date. The research staff determines if the time can be split between two topics, or if a topic needs to be moved to another meeting or addressed through another format, such as an online survey on the agency website.

Panel members are sent reminder notices of the meetings. All meetings are held from 5:00 p.m. to 7:30 p.m., usually at the RTD administrative offices, although they are sometimes held at another RTD location (the light rail transit maintenance facility, computer lab, etc), and moderated by RTD research staff. The topic of the meeting is not made known to members in advance.

Agency employees who have requested the research or have an interest in the outcome are invited to attend the meetings as observers and, if needed, technical experts. Typically at least 14 panel members attend any one meeting. The meeting starts with a buffet dinner and social conversation. The remainder of the meeting is highly structured to ensure that the participants stay busy and engaged. At the end of the meeting, staff is available to answer any concerns raised by any panel member or to set up a time to contact him/her.

Any testing of tool or materials is done on-site. For testing a prototype mobile website, participants were given smart phones to use at the meeting. When the topic was a new method of paying a parking fee, a parking ticket vending machine was brought into the meeting for panel members to use along with laptop computers so they could evaluate the online information (see the following parking pavement example project text box).

Customer panel members were supplied with a packet containing survey materials to be filled out during the course of the session. Panel members were also given two parking payment scenarios which contained a valid license plate number, a length of stay, and identification as either "in-district" or "out-of-district" to be used during the website evaluation portion of the activity.

Panel members were asked to "act out" several activities during the course of the session:

- Pre-test: Used to determine RTD parking payment use and knowledge.
- Payment attempt #1: Following an initial attempt at paying for parking, panel members were asked to evaluate their experience.
- Payment attempt #2: Following another attempt to pay for parking using a different scenario card, panel members were again asked to evaluate their experience.
- Website evaluation: Panel members were asked to obtain several pieces of parking information using the RTD website and evaluate their experiences.
- Evaluation of payment alternatives: Panel members were provided descriptions of payment alternatives

and asked to compare the likelihood of their use of each of the potential solutions.
- Demographics: Panel members were asked to provide several pieces of demographic information.
- Observations: Time to completion and other observations from RTD staff members were recorded to provide additional details on panel member performance.

*Analysis and Reporting*

The research question is clearly identified as the panel meeting discussion guide is developed. The research staff summarizes the findings of the meeting into a PowerPoint presentation, and if requested, an executive summary. All stakeholders who participate in the panel meeting receive a copy of the presentation and executive summary, and market research staff will make a presentation of the results to staff, board members, or management, if requested. The requesting department distributes the findings to its stakeholders, and those staffers who attended the meeting can address specific questions about the proceedings.

Panel members do not routinely receive the final report. On rare occasions the final report is requested by a panel member, which is provided as a matter of open-records law.

### Benefits, Cost, and Concerns

*Benefits*

The benefits of the panel survey mirror those of a traditional focus group. There is an opportunity to gain an in-depth understanding of the research topic, and to understand how the rider perceives and processes information regarding the transit system. Panel members become familiar with the process after the first meeting and are then able to focus more quickly on the tasks required, because they know the routine. The group discussion produces data and insights that would be less accessible without the interaction of a group setting. Listening to others' experiences stimulates thoughts and ideas in each of the panel members that might otherwise not have been brought to light.

Often research is conducted by telephone or in a format where the client has little participation until a final report is produced. The panel meetings allow the stakeholders to be at the meeting, so they see and hear findings directly from the customer. This first-hand experience helps each staff member gain a better appreciation of customer needs, creating a customer orientation throughout the agency.

Since the panels are replaced annually, recruitment costs are reduced, and members are less likely to become too sensitized to transit issues; similarly, the creation of a new panel every year ensures that fresh perspectives are brought to the table.

*Cost*

This focus-group style panel research provides a rich source of information, and because everything is done internally, the program is very affordable. The cost is mostly limited to the buffet dinners provided at the meetings, along with the foregone revenue from the monthly and annual transit passes. Online recruiting reduces the staff time needed to establish the panel, estimated to be approximately one week. Developing the meeting materials, setting up the meetings, and reporting afterward require one to two weeks of staff time per meeting, for a total of 0.1 to 0.15 FTE needed to administer the program.

*Concerns*

A drawback to the panel approach is its small sample size, which doesn't provide the statistical accuracy needed for some research topics. Additional research techniques are needed to address all of the various questions posed by agency staff.

A second concern is that the panel is made up of engaged transit riders who do not necessarily reflect the views of those unfamiliar with RTD services. The panel members can be too focused on a specific issue, or too knowledgeable about the transit services, and thus not open to certain approaches, ideas, or topics.

### Legal, Ethical, and Privacy Issues

RTD has not had any legal, ethical, or privacy issue concerns related to its panel research program. Panel members use only their first names, and the meetings are structured so that they do not encourage personal interaction between panel members. Personal information is collected on a secure server and is only available to market research staff. The information is not shared with any other departments or entities outside of RTD.

### Lessons Learned/Elements for Success

Experience has shown that persons who regularly call the RTD complaint line tend to come to meetings with a specific agenda in mind and distract from the meeting topics without adding to the discussion. All potential panel members are screened against the RTD complaint database to identify any who are habitual callers to the system and would not make good participants.

Meetings need to be tightly structured around the research question, with a full schedule of both discussion and interactive exercises. This keeps panel members engaged and

moving forward so there is less likelihood of their straying off topic. If the discussion does stray, the moderator steps in immediately to re-focus the discussion. Off-topic comments can be acknowledged but noted as something to bring up with RTD staff after the meeting.

RTD management and staff have been pleasantly surprised over the years at the quality of the panel members, their involvement in RTD issues, and the thoughtful, considered input that they provide. It is enjoyable for everyone, with very positive feedback from all involved, panel members and RTD staff.

## MINNESOTA DEPARTMENT OF TRANSPORTATION CASE EXAMPLE

### Overview

The MnDOT research department uses a variety of techniques to understand the needs of its customers (the taxpayers of Minnesota). Extensive ad-hoc telephone and annual tracking surveys have been supplemented with focus groups that address the qualitative "why?" questions that are sometimes difficult to capture through quantitative studies (see Figure 6).

The dramatic decline in the number of households that have and use a landline telephone, and the rise of social media as a communication tool not only between individuals but also between individuals and organizations, has made telephone surveying more difficult and has resulted in survey samples that do not mirror the general population.. These changes have led the MnDOT to introduce a new research strategy building on the use of the Internet and social media communities to supplement its existing research program.

The online panel community approach provides an opportunity to combine the sample sizes of quantitative methods with the depth of discussion provided by focus groups through on-going and iterative surveying and discussions. The results of one test might spark changes to the program, which could be re-tested with the community, allowing experimentation and refinement of ideas and improvements to the final product. A vendor with extensive experience in establishing online communities was selected to manage the program. To preserve the integrity of this program, the community is not used for public outreach or public relations.

### Panel Sampling, Recruitment, and Maintenance

*Panel Sampling and Recruitment*

Several recruitment strategies were used by the vendor to determine what would be the best method of obtaining a representative sample. In the end, online recruitment was the easiest and least expensive method for obtaining a valid sample of the general population with Internet access.

The panel consists of 600 panel members, approximately 300 members from the Minneapolis/St. Paul urban and surrounding suburbs and 300 panel members from the remainder of the state. The membership is designed to mirror the population based on geography, gender, age, income, and education. There is a known bias in that the panel is an online community, so that members must have Internet access to participate.

A transportation profile is captured at the time of panel recruitment. This includes whether members commute during peak period and their mode of travel (for example, single occupant vehicle, carpool, transit, bike, train, or pedestrian).

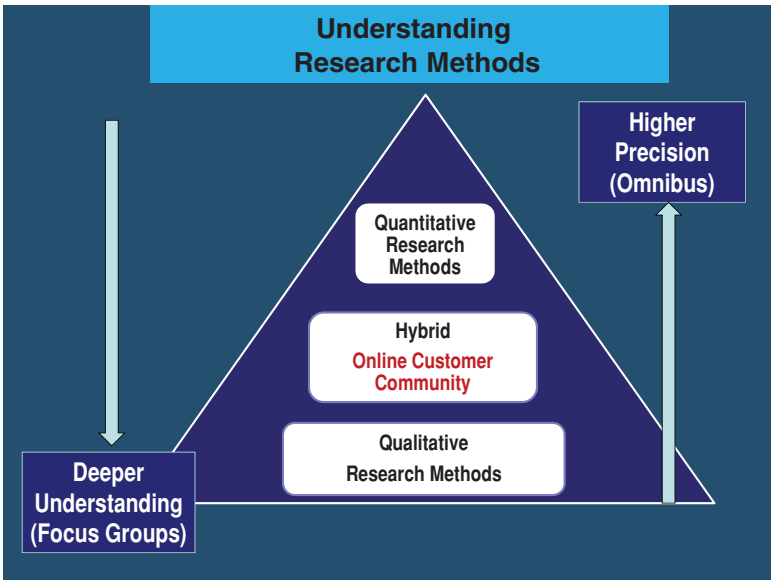


FIGURE 6 Market research techniques employed at MnDOT.

In addition, panel members are asked to provide a personal profile that includes self-reporting on whether or not they describe themselves as having a disability.

MnDOT was specific in wanting to develop an online panel community for the purpose of research, not public relations. The community is not marketed or publicized. Persons who hear about the online community and volunteer to participate are politely refused.

*Panel Maintenance*

A key element of panel maintenance is ongoing engagement among panel members. The community is not just surveys—it is also a community discussion opportunity. High activity generates high engagement and response. Every week, there is something new posed to the community. Some weeks it is a strategic survey to inform program development; other weeks there are broader topics that invite open discussion. Both are important and add value to transportation planning while keeping the panel engaged and reducing attrition.

Panel members receive a $10 gift card each month that they fully participate. This was vetted by members, who indicated that they believed it was the right amount of incentive: They deserved a small token of appreciation for weekly feedback over an extended period, but any greater amount would be perceived as too much of a taxpayer expense.

The panel is refreshed once a year to keep members engaged and avoid their becoming too sensitized to MnDOT issues. If needed, the option exists to refresh twice a year. Approximately 30% of the panel is replaced each year, based on the level of member involvement. Those who have not participated regularly are thanked for their past input, then removed from the panel and replaced with new members recruited to maintain the target demographic profile of the community.

**Implementation, Analysis, and Reporting**

*Implementation*

The online community is open only to research panel members. The community is intended to be useful for MnDOT while being interesting to participants. There are a variety of online tools with which researchers interact with the panel members, including surveys, brainstorms, discussions, live chats, image galleries, video clips and attachments. The community's home page, Mn/DOT Talk, features the week's survey, discussion questions, and an informational section on the homepage that describes what is happening with the online community that week. The home page and sign-in screen is shown in Figure 7.

To earn their monthly incentives, panel members need to sign in each week and participate in all surveys and community interactions. MnDOT staff identifies the weekly issue to be addressed: For example, if there was a major snow storm, panelists might be asked if they traveled to work during the snow and how MnDOT performed on snow removal.

The research topics are gathered from MnDOT leadership, district/regional offices, and other transportation stakeholders, and agency staff meets with the vendor each week to coordinate on survey objectives and topics for that week, and to draft the survey questions. Although the weekly content is typically developed by MnDOT, the vendor is available to assist with developing community engagement activities and other tasks as needed.

MnDOT came into the process with the belief that monthly surveys would be better than weekly activities, which MnDOT feared could burn out the panel members. However, the experience of the private sector has been that frequent communication on a variety of levels actually increases response rates and quality of participation by the community; and the vendor recommended hosting weekly activities. Response rates are good, panel members are interested and engaged, and the content of the feedback is of high value.

MnDOT panel members may send comments to MnDOT staff at any time through this community. MnDOT also encourages informal exchanges among members addressing transportation-related issues, and community members can even create their own transportation discussions and surveys to distribute to all members. It is believed that through these three-way interactions (MnDOT to members, members to MnDOT, and members to members) that new learning occurs. One example is the use of roundabouts, a traffic control device used in Minnesota. A panel member raised questions about how to safely navigate a roundabout. This generated an active discussion among members, signaling to MnDOT that there might be misperceptions about roundabouts and a need for more education. Surveys on the topic of roundabouts were conducted and information was added to the online community site. The information was also made available to the general public through other MnDOT communication channels.

*Analysis and Reporting*

The goal was to obtain close to 300 responses (out of 600 members) per week. The outgoing sample yields a close representation of the state's population, but the returning data are not weighted to adjust for non-response. The online community results are not expected to have the highest level of precision; other research tools provide that information to the agency. A comparison of the unweighted results to the statewide profile has shown that the results, although not be perfect, are adequate for the agency's needs and intended use of results.

The results provided are usually simple cross-tabulations of the data results, for example, comparing commuters to non-commuters; or Metro area residents vs. outer-state


FIGURE 7 Home page for the "Mn/DOT Talk" online customer community.

Minnesotans. MnDOT recognizes the limitations of the online community and is careful when interpreting and projecting results from surveys and discussions.

Results of surveys are not directly provided to the panel on the community site. Instead, the community is shown how the data were used and is provided advance notice of any campaign or changes to the system as a result of its input. MnDOT has also created a video in which State Transportation Commissioner Tom Sorel expresses his appreciation for the work of the community, its value to the agency, and how, specifically, its feedback has been used. The video demonstrates top management's support and appreciation of the participants, and puts a public face on a large state agency.

Key to the internal success of this program is closing the loop with the rest of the agency. A website was created on the MnDOT intranet dedicated to the information collected from the online community (see Figure 8). This site is intended to be directly accessible, providing regular summaries of the survey and discussions that offer insight into MnDOT's customer base. As a result, overall understanding of customer needs has increased and is regularly discussed in decision-making circles.

### Benefits, Cost, and Concerns

*Benefits*

The online community is a nimble, cost-effective resource. Previously, the agency relied primarily on large telephone studies to provide quantitative data. That type of study is still used for annual tracking, but is not helpful in responding to the agency's immediate and dynamic needs for customer input. Focus groups also have drawbacks. Organizing groups of 10 to 12 persons to explore a topic through in-depth study is


FIGURE 8 MnDOT's internal webpage "iHub" for the online customer community.

labor-intensive, and yields limited information from residents of only one geographic area. The online panel community approach has the ability to respond quickly to statewide questions with a larger, more representative sample, while at the same time offering an iterative, interactive learning venue without additional cost.

An example of how the community works addressed the topic of a "zipper merge," where cars entering a freeway needed to merge into one lane of traffic (see Figure 9 for an example of a zipper merge). Rather than use the entire length of the merge lane and merge near the end of the zone, drivers would typically attempt to merge as soon as possible, thereby significantly extending backups. Initially, MnDOT staff thought the lack of proper zipper merging was the result of ineffective signage. However, after posing survey questions, testing new signs with several hundred panel members, and instituting online discussions, the agency realized that the problem was not direction, but a "Minnesota nice" issue. In Minnesota, merging late was perceived as being rude, and no amount of signage would change that perception. Few people wanted to risk being viewed by other drivers as "that guy," meaning the one who is "budging in line." As a result, an information campaign was launched to educate drivers on how the zipper merge is intended to work (see Figure 10). Without the repeated testing and conversations with the online community, it is unlikely that staff would have realized that they were dealing with a cultural issue.

This ability of the community to provide a quick response to emerging needs has resulted in staff from all over the agency bringing forward new topics to engage the customers. After two years of continuous research, and with the iHUB internal site making customer research accessible to all staff, employees are developing a deeper understanding and appreciation of customer feedback in decision-making. Another advantage

FIGURE 9 Example of a zipper merge.


FIGURE 10 Signage developed from the online community discussion.

that became clear after the community was established was the value of using the customers' own language. The online community provides a rich source of words and terminology that can be used in to create clear communications to the public.

*Cost*

The online community program at MnDOT is entering its third year. One full-time employee is needed to maintain the program, coordinate the research questions, develop the questionnaires, report on results, and work closely with the full-service vendor. The vendor implements the program, recruits and maintains the panel, runs the community site, assists with the panel engagement activities, collects and summarizes survey data, and performs other tasks as needed. Total cost for the vendor services in 2012 was $260,000, including respondent incentives. The panel size is being reduced to 400 members, 200 from Minneapolis–St. Paul and 200 from the remainder of the state, in an effort to contain costs while still keeping the community active.

*Concerns*

There was initial concern that some panel members might use inappropriate language or otherwise be disrespectful during online discussions, because all comments are accessible to the community; so a strategy to handle inappropriate activity was developed even before the community was launched. Panel members are warned that communication is open and that all postings must be respectful. Some panel members have used some strong language and had to be reminded of the rules of engagement; but this has not been a serious problem; In the first two years of the program, only one person had to be removed for continuing inappropriate communication after receiving a warning.

**Legal, Ethical, and Privacy Issues**

Before proceeding with the online community, MnDOT research staff conferred with general counsel to discuss risks and limitations of the program. Minnesota has legislation referred to as the Tennessen warning: Whenever a government entity collects private or confidential data from an individual about that individual, the agency must give him/her a Tennessen warning notice (see Minnesota Statutes, section 13.04, subdivision 2). The purpose of the notice is to enable an individual to make an informed decision about whether to provide the government entity with that data. A government agency may not collect data on individuals unless the collection is necessary for the agency to carry out its duties under a program that is authorized by law (see Minnesota Statutes, section 13.05, subdivision 3).

Following is an example of how this warning is used in MnDOT market research, including the online community:

> Hello, this is [YOUR NAME] from [Market Research Supplier Name] and we are calling ON BEHALF OF the Minnesota Department of Transportation. Mn/DOT (pronounced "mindot") is interested in your opinions about your driving experiences on Minnesota's freeways and state highways. We are not selling anything; this is for research purposes only. You are not obligated to do this survey but your responses will help to inform Mn/DOT of public attitudes when making decisions. All your responses will be combined with others in the study and your name is never made known to Mn/DOT or the rest of the public.

The information provided to potential panel members in the screening questionnaire includes the Tennessen warning that any information members provide is strictly voluntary, and that they can refuse to participate or opt out of the program at any time.

The individual's name and contact information is collected and maintained by the vendor, providing a wall between the panel members and the state. Identification on the community website is only by first name and last initial; however, the community is a social media-style interactive website, and panel members are able to include a photo with their online information, if they so choose.

**Lessons Learned/Elements for Success**

MnDOT recognized the value of the online research community approach and did not want its foray into this new research strategy to fail. The agency selected a vendor based on a number of factors: cost of services, depth of experience in developing online communities, and the agency's desire for three-way communications (MnDOT to the customer, customer to customer, and customer to MnDOT). The vendor provided significant experience and counsel as the agency was charting this new ground; consequently, MnDOT was able to avoid possible challenges and problems as a result of the partnership.

Weekly discussions and activities designed to interest panel members have proven to be the key to continued engagement. Response rates are good and exchanges are substantive, which result in high quality information from the online community.

Market researchers are used to developing formal questions to be used in telephone, in-person intercept, and written surveys. An online community needs a more conversational style of questions. The depth of experience provided by the vendor helped MnDOT staff transition from the traditional research and question format methods to the world of social media.

Even as a research tool, the community has public relations value. Panel members are fascinated and impressed that MnDOT is using this technique and asking for feedback from the public. Occasional videos of the transportation commissioner addressing the community provide a "face" for what might be an impersonal public agency. Panel members "expect it from government, but are surprised it actually happens!"

## METROPOLITAN TRANSPORTATION AUTHORITY CASE EXAMPLE

### Overview

The MTA in New York City initiated its panel research program in 1995 to monitor operation of the system through the perspective of the average New Yorker. The study was designed as a "transportation" survey and did not specifically identify itself as an MTA project. This helped keep the focus on New York and travel within the city, and reduced the potential for the panel to become a forum about public transit.

The panel consisted of 1,500 members recruited by telephone to mirror the general population of New York City. Every day, the vendor surveyed 12 to 15 panel members by telephone, providing a continuous stream of data that could be used at a moment's notice to answer operational questions. Typical uses of the data included tracking ratings of satisfaction with safety and security in the days immediately following any incident, and adding questions to the survey for a period of time to gauge reaction to a new advertising campaign. The panel survey was utilized by staff from all over the agency to identify issues of concern to the public; results were, in effect, used as a report card for customer service and attitudes about MTA service measured over time. The panel research program ended in 2010 after 15 years.

### Panel Sampling, Recruitment, and Maintenance

*Panel Sampling and Recruitment*

MTA employed an outside vendor to recruit and maintain the panel, and to administer the surveys. The panel was recruited through random-digit-dial calls to match census data based on location (zip code of residence and borough) and demographics (age, income, ethnicity/race, etc.). MTA staff had no direct contact with the panelists and no access to panel names or contact information.

*Panel Maintenance*

To sustain panel interest, MTA offered three levels of incentives: (1) Every time the vendor successfully contacted a panel member, the panel member received a $10 incentive, even if the survey was not completed; (2) all panelists were mailed a professionally produced quarterly newsletter from the vendor that focused on life in New York City; and (3) every quarter, there were raffles for savings bonds in various denominations up to $1,000. All incentives were managed and distributed by the vendor.

The vendor completed 400 surveys each month, a total of 4,800 each year. With a pool of 1,500 members, the vendor only needed to contact each panel member about every four months. Panel members who were successfully contacted three times within 18 months were replaced to keep the panel fresh. Panel members were also replaced if they could not be reached after multiple attempts. Replacements were also recruited by telephone, to match the demographics of the person being replaced, maintaining the overall demographic and geographic profile of the region.

Replacing panel members avoided concerns with creating "professional" respondents and ensured that a wide variety of viewpoints were being obtained. For example, New York City has a large immigrant population, with many more arriving every year. The study recruitment would naturally reach both new immigrants and newly arrived residents. As they adjusted to life in the city, however, their perceptions changed. Continuous refreshment of panel members new to New York maintained the "newcomer" perspective.

### Implementation, Analysis, and Reporting

The survey was developed by MTA staff in coordination with the vendor. It collected travel behavior data, attitudes about travel in New York, satisfaction with service attributes, specifically focused questions (for example, tracking advertising or promotional campaigns), and demographics. The telephone call typically lasted 22–23 minutes, including the time required to connect with the correct person in the household and update contact information; the heart of the questionnaire took approximately 16 minutes.

Surveying was conducted seven days a week, with the exception of major holidays. Four hundred interviews were conducted each month (12–15 per day), providing a continuous stream of data. This allowed the surveys to be modified at very short notice. For example, when there was a need to understand what the public believed about cellular service in

the subway, questions could be inserted and left in the panel survey for a specified period of time or until the desired sample size was reached (a sample size of 100 could be obtained in about a week). Questions related to advertising and promotional activities were typically fielded for six months to ensure that a sufficient portion of the population had seen the advertising.

The vendor provided data to MTA staff on a monthly basis. The data were weighted to mirror the population of the New York City both demographically and geographically. (Weights were applied based on the profile of the entire panel, not the profile of the respondents from that particular quarter's surveys.) Use of public transportation was not a weighting criterion.

MTA staff prepared the ad-hoc and quarterly reports using Statistical Package for the Social Sciences (SPSS) software. Quarterly reports on public satisfaction with surface or subway service gave the operational departments a checklist on what areas were improving and which needed more attention. Ad hoc reports using monthly data provided an early warning system for new or growing problems in the system, such as concerns with station personnel or smells in the subway. Daily survey results, combined with the monthly data, provided a measurement of public response to specific issues. For example, if there was a significant security incident, public satisfaction measures with service attributes in the days before and immediately following the event could be tracked to better understand how the public perceptions changed in response to the incident.

#### Benefits, Cost, and Concerns

*Benefits*

The primary benefit of the panel was the daily surveying, which provided a nimble, dynamic research tool. Because it was daily, information on public reactions was captured real-time, not by asking people to "think back to when . . . " and then report on what they thought they believed at that time. Operations managers for both the subway and bus systems also relied on this continuous approach and systematic feedback to alert them to developing issues and areas needing immediate attention.

The fluidity of this technique also allowed the addition of new questions as they arose from operations and management. A question could be crafted and implemented within days, and the quick turnaround of results helped inform management decision making.

Over the 15 years of the panel survey, a vast and in-depth database of information was developed, providing an in-depth understanding of the MTA customer and the image of MTA in the minds of the typical New Yorker. These longitudinal data could be mined for years after it had been collected.

*Cost*

The main drawback to the study was the cost. By 2010, when the program was ended, the average vendor cost was $250,000–300,000 per year to maintain the panel (including incentives and refreshment of the panel) and to field the surveys. The MTA project manager had daily contact with the vendor, managed the questionnaire, analyzed the data, and wrote the ad hoc and quarterly reports. Staff time needed was approximately 0.5 FTE.

*Concerns*

There were no concerns with this panel survey program other than the on-going cost.

#### Legal, Ethical, and Privacy Issues

MTA did not have any legal, ethical, or privacy issues with its panel. The panel was developed and maintained by the vendor, with all contact funneled through the vendor. On occasion, a call from the public would be forwarded internally through MTA to the project manager. He would then pass the contact to the vendor, who would respond to the public inquiry. This provided a wall between the agency and the panel, protecting the integrity of the research and assuring anonymity for the panel members. In addition, this eliminated the concern that panel identities could be released through public records laws.

#### Lessons Learned/Elements for Success

MTA had 15 years of experience with on-going panel research. The key element of success was replenishing the panel to keep it dynamic and fresh. Rules were put in place and strictly adhered to throughout the life of the panel effort. This kept participants from becoming "professional survey takers" and ensured a rotating panel with fresh ideas.

A second element that was deemed critical for the long-term success of the panel was having it address broad travel patterns and travel modes, not New York City public transit, to avoid sensitizing participants to subway and bus issues. For example, the survey would ask if the panel member traveled to the airport and, if so, what mode of travel he/she used to get there. The popular quarterly newsletter focused on travel and life in New York City, reinforcing that the survey was about urban culture, not public transportation.

To manage costs, MTA recommends a long-term contract with the vendor. The initial cost is in the set-up of the project. Agreeing on a long-term contract allows the agency to budget for a consistent expected expense, and the vendor may offer a better price in exchange for having a steady revenue stream for several years at a time.

## WASHINGTON STATE TRANSPORTATION COMMISSION CASE EXAMPLE

### Overview

In 2006, the Washington state legislature passed a law requiring the WSTC to conduct surveys of ferry riders every two years to help inform level of service, operational, pricing, planning, and investment decisions. (See Appendix D for relevant sections of the code.) WSTC conducted comprehensive, on-board surveys of ferry riders' attitudes and opinions regarding ferry service. However, while they provided excellent information from the riding public, it was recognized that these paper surveys did not allow researchers an opportunity to follow up with the same riders over time to track trends, or to conduct additional research such as conjoint studies to support fare elasticity models. In addition, it was realized that passengers were eager to share their opinions about the Washington State Ferries (WSF) system, incentive-free. As a result, WSTC decided to create and maintain a panel of riders to communicate regarding service, fares, planning, and investments in the ferry system. The online panel, called the Ferry Riders' Opinion Group (FROG), provides a mechanism to conduct the required ferry rider surveys and other topical surveys with quick turnaround times and timely feedback on issues of importance to the WSTC, the state legislature, and the WSF.

The program was developed by a market research consultant who reports directly to the WSTC. Together, they hired a team of market research vendors to implement the program, providing the software backbone of the project, panel management, survey invitations, and questionnaire programming software. The FROG online panel had more than 6,500 participants in 2012, and is open to anyone who wishes to join, providing both market research and public relations benefits for the state ferry system.

### Panel Sampling, Recruitment, and Maintenance

*Panel Sampling and Recruitment*

Initial recruitment for the panel was conducted in the winter of 2010 using in-person intercepts to distribute a paper recruitment form. Passengers were approached either while waiting on the dock or while travelling on board the ferry and asked if they would be interested in being a part of panel of riders that could give the state feedback on ferry fares, service quality, and system operation issues. Those who were interested were asked to provide their names and e-mail addresses, which were entered into a database and were then used to send invitations to join the panel. A secondary recruitment process was conducted the following summer to attract the more casual and recreational riders of WSF to the survey panel.

In subsequent years, riders were recruited to the FROG panel using a variety of traditional methods, including mailers, press releases in the print and TV media, and WSTC and WSDOT/WSF web postings. The WSTC has also experimented with recruiting panelists using smart phone-based QR codes, which are provided on posters on the ferries and terminals. Passengers scan the QR code with a smart phone to vote on whether ferry service is a good or poor value for the fare paid, and then are connected to the FROG website where they can join the panel (see Figure 11). About 120 new panel members have joined as a result of following up on the QR link. The posters also provide the FROG website address so passengers can sign up directly without using the QR codes (an unknown number did so).

Although the number of new sign-ups is relatively small in this case, the promotion also provides a visual reminder that the WSTC & WSF are interested in customer feedback, and was used in conjunction with the start of a system-wide survey on fare media utilizing the FROG panel members.

Gathering input from the occasional and/or recreational ferry riders, who are much less likely to become FROG panel members, is more difficult, yet their input is required under Washington state law. The WSTC's primary survey efforts have been done two times over the two-year budget biennium: once in the winter and once in the summer. Summer is the prime time to gather input from the recreational riders in


FIGURE 11 Poster to recruit membership in the FROG panel.

particular, but because they are unlikely to be panel members, the WSTC has had to rely more on traditional on-board surveying of this customer segment. However, the plans for the summer 2012 surveying shifted towards a more technology-driven platform: Instead of handing out paper surveys, surveyors were to use notepad technology to conduct on-board surveys and input the data directly into the notepad device. Passengers were to be asked whether they are FROG members or not.

Current FROG members will be encouraged to take the survey by means of the link in the e-mail sent to them. Non-FROG members will be asked if they would be interested in joining the FROG panel, and if so, their e-mail addresses will be collected and they will receive an e-mail invitation to take the survey online. Passengers not interested in being part of the panel will be asked an abbreviated set of service quality questions. One of the main purposes for this process is to capture the casual and recreational riders who might be making their only trips on WSF, but who collectively make up a significant segment of WSF's customers.

The move to technology-based data collection was done for three reasons: (1) collecting data on board the ferries in a fast and efficient paperless manner increases the probability of gathering input from more riders who otherwise may not have participated in the survey; (2) having the notepad device means on-board interviewers won't be approaching passengers with a clipboard, so riders are less likely to try to avoid the surveyor; and (3) the technology and QR codes may appeal to younger riders less likely to participate in a traditional paper-based survey. The move to technology has the added benefit of demonstrating that the WSTC is innovative and open to the input of riders in a variety of forms, thus raising public trust and interest in critical issues.

One of the benefits of a survey panel is that information collected on static questions can be saved in FROG members' individual profiles and reused on future surveys. This reduces the burden on the respondent because subsequent surveys can omit redundant questions, thus making the survey shorter and more issue-focused without losing the static demographic information for data analysis. This information can also be appended to future surveys to provide a longitudinal view of to the data; registrants are asked to establish a unique password to allow them to modify their panel profile submissions at a later point.

When registering to participate in the FROG panel, riders are required to provide contact information (e-mail address, phone number, home address, zip code, etc.), demographic information (gender, birth year, family size, education, household income, etc.), and baseline attitudinal information (ferry usage, trip purpose, perceptions of value, etc.). Individuals under the age of 18 are barred from registering based upon their birth date, but their contact information is retained, and future surveys are sent once they reach 18. The profile data are designed both to meet legislative requirements and to ensure specific rider segments—casual, vacation, and commuter—are correctly captured.

Membership in the panel is open to anyone who wishes to join, and they remain members until they remove themselves from the e-mail list. The current pool of more than 6,500 ferry riders can provide reliable data at the system-wide, ferry route, county, and legislative district levels. The value of FROG research has been acknowledged by both the WSF management and legislature, resulting in greater utilization of survey findings and results. The WSTC's goal is to continue to expand the panel so that it can provide reliable data at even more specific levels, such as sailing time or ferry terminal. It is anticipated that FROG will need to grow to about 18,000 members to provide data at that level of detail. This will require additional advertising through posters, announcements, and on-board surveys as the agency looks at new recruitment enticements.

### *Panel Maintenance*

Panel membership has grown with the announcement of every study since its inception in 2010. Since members are only removed at their own request, attrition has been limited. Maintaining the panel's viability requires measuring the personal information of new members against those who drop out so that recruitment efforts are scaled and implemented effectively.

Frequent interaction is essential to keeping panel members engaged. In a given two-year biennial state budget cycle, two large (35–50 questions) surveys are conducted, along with two to four smaller (15–25 questions) studies. To keep the panel members engaged between the larger surveys, simple "quick poll" surveys of one to three questions are conducted. The larger surveys are used to gather ongoing customer service-related data and test a variety of issues and ideas. In contrast, the smaller studies are typically focused on a given operational matter, such as riders' ability to shift modes of transportation, capital funding approaches, ferry fares, strategies, and approaches, as well as other key issues. The quick-poll surveys, while limited in nature, do keep the panel members interested and provide valuable data for the WSTC and WSF to consider. One of the benefits of the "quick polls" is that when panel members complete one, they are instantly shown how their responses compare to all other respondents. This feedback provides a non-monetary incentive to participate, allowing members to see how they line up with other ferry riders and how the system as a whole is responding to a given question.

No financial incentives for completing a survey have been provided to panel members up to this point. This is a state-funded effort and the project manager believes that using taxpayer funds to benefit FROG participants is questionable

and controversial. In a separate study, the WSTC conducted a survey on statewide transportation funding and issues. Participation rates were a bit low in certain parts of the state. After careful review, the agency decided to offer the opportunity to win airline tickets as an incentive to stimulate participation in target markets that were under-represented. To date, the agency has received no complaints regarding the use of this incentive, opening the door to exploring future incentives as a last resort.

Another incentive concept that may be explored is the idea of creating a game for participants on the FROG panel, or what is called "gamification." The more participation a member has, the more points she/he earns to advance in the game at play—similar to a simplified "Farmville" type concept.

#### Implementation, Analysis, and Reporting

*Implementation*

The WSTC hired an expert market research professional to act as the commission's project manager and oversee its survey efforts. The WSTC Executive Director and the contracted project manager together hired a market research company to handle questionnaire design, analysis, reporting, and presentations to legislative bodies and decision makers.

Surveys are deployed to the panel members by e-mail. Panel members can also log onto the FROG website at any time to see if new surveys are available or to review reports on past surveys. While surveys are being conducted, the online program checks the IP address of each computer being used to fill out a survey, so that it cannot be used to submit duplicate surveys should panel members attempt to sway the results.

The panel is used to gather information regarding possible operational changes, pricing, and investment/funding approaches. Recent survey topics include capital funding, fare policies and fare levels, mode shift opportunities, elasticity of demand, options for reservations, etc. The completion rate from FROG panel members has typically been 20%–30%, regardless of the length or topic of the survey.

The required customer satisfaction studies are conducted each biennium in winter (to capture input from commuters) and summer (to capture input from recreational riders). On-board intercept surveys are still conducted in the summer because many recreational riders are visitors to the area and unlikely to be FROG members.

*Analysis and Reporting*

Because panel membership is open, it is not representative of the ferry ridership unless panel data are adjusted against actual rider data. To ensure each survey is statistically reliable and projectable, results are weighted to match total ridership by ferry route and time of day during the period of the survey. Spot checks are conducted to make sure that responses by mode (vehicle driver, vehicle passenger, pedestrian, etc.) are also in line. As the total number of panel members grows, the ability to weight by mode within a route is enhanced.

The ferry survey research is typically analyzed at two levels: (1) at the personal or rider level (one ferry rider = one vote); or (2) the trip level (one ferry ride = one vote). Some analyses are more appropriate at the rider level, such as opinions on how ferry improvements can be funded; whereas other analyses are more appropriate at the trip level, such as the percentage of ferry trips taken for recreation purposes. Using information on the frequency of ferry ridership, individual rider responses are weighted to represent trip level data. Reports are typically presented from both the rider total trips perspectives.

The "quick polls" are designed to keep the panel engaged and provide data for future surveys. Results of all research conducted each biennium are provided to the legislature and posted on the WSTC website. As a new feature of the panel program, PowerPoint presentations and full reports given to the legislature are being posted on the FROG website so that panel members can easily access the information and see how their opinions were presented to representatives.

#### Benefits, Costs, and Concerns

*Benefits*

Panel surveys provide valuable longitudinal data that make it easier to understand and track what is happening with ferry riders and how those changes may be impacting ferry ridership.

The panel has proven to be a good way to establish an ongoing dialogue between decision makers and the riding public. It would appear that most people do not join the panel to complain but rather to be a part of the conversation and help shape the future of the ferry system. This results in a win/win outcome—decision makers hear from a vast number of riders and the riders play an active role in setting policies that impact their lives directly.

FROG'S success has reaped many direct benefits for the state legislature. Regulations have been drafted based on the results of a given survey and enacted after legislators saw how their constituents felt on the subject. This is because the surveys are conducted by an independent body—the WSTC, which has no political party connection—and the WSTC's contracted market research firms, who serve as technical experts and also have no political affiliation. As a result, the data are highly credible and both sides of the legislative aisles are able to use the data to identify solutions that have bipartisan support. As an example, one FROG survey tested support for paying a per-ticket fee of varying amounts if the revenues were dedicated to a capital fund for future ferry system improvements. The overwhelmingly positive response resulted in the

legislature adopting a 25¢ per ticket fee and citing the FROG survey. An active conversation has begun in which the legislature has requested questions be asked of the panel to shape future ferry-related legislation.

The success of the FROG panel has resulted in the expansion of the panel technique to other statewide transportation issues. A recent statewide survey on transportation needs and sources of funding for new projects resulted in the development of a statewide citizen's panel called VOWS (Voice of Washington Survey). The results from an initial survey in Fall 2011 helped shape the passage of an electric vehicle tax with overwhelming support of the public and legislators.

*Cost*

The Washington legislature appropriated $350,000 per biennium for the FROG program. The funding paid for the project manager, various market research firms, and the vendor who provides the software platform. The WSTC and WSF have limited staff allocated to the program.

*Concerns*

There is a concern that the FROG panel could become skewed toward persons who have a high vested interest in the ferries. This has resulted in a desire to recruit more general and casual riders, not just the "enthusiastic" commuters. At present, the agency hopes that increasing the total panel membership will provide a broader representation across all markets. This will require more public relations and advertising efforts to alert riders to the panel and help them understand the value of participating.

The value and viability of the panel data are directly tied to the size of the panel. The smaller it gets, the less the WSTC can do in terms of drilling down into detailed subsets of the data, such as slicing the data by time of day, sailing direction, etc. Again, keeping the overall panel size stable and growing will require advertising and public relation campaigns to elicit interest and participation.

#### Legal, Ethical, and Privacy Issues

There have been no overriding legal or ethical concerns regarding the implementation of the FROG panel. The only concern is with the protection of panel participants' privacy and information that might be obtained from the WSF's using freedom of information petitions. There are state safeguards in place to protect individuals' privacy, but it is unclear as to the amount and type of information that would need to be provided, if requested. This is an issue that would need to be resolved by the Washington State Attorney General's office.

The FROG website has a very detailed privacy policy informing panel members of the legal aspects of joining the FROG panel as a state government hosted activity. The legal information is provided on the Privacy Policy link at http://www.ferryridersopiniongroup.com.

In addition to the privacy policy, the screening questionnaire for joining the panel states:

> Participation in the research is voluntary. Individual survey responses will be kept confidential and will only be used for statistical purposes. The Commission would like to encourage all customers to join the group and play a role in WSF's future.

#### Lessons Learned/Elements for Success

Electronic data collection is more effective and efficient than using paper surveys. Communicating with survey panel members and gathering data through the online FROG website can be done very quickly, as compared with traditional approaches.

There was an initial expectation that ferry riders would not want to participate in the FROG panel and complete surveys online; however, WSTC's experience with FROG demonstrates that an agency should not be reluctant to create online panels and solicit customer feedback actively and electronically. People are very willing to participate in the decisions that will be made regarding their services and how the government is spending their money. The WSTC has received very few complaints out of all its interactions with customers.

Initially, research results were not shared directly with the panel members, but there appears to be greater interest and value in sharing them. Survey results sent to the legislature have been posted on the WSTC website. More recently, the WSTC started posting the resulting survey reports on the FROG website so panel members can easily access them by going to the "My Reports" page on their FROG member account. The results may not always be rosy from the agency's point, but publishing them on the panel website adds credibility to the process and demonstrates that the agency is listening to the customer. This builds trust and respect from the panel members, provides transparency to the process, and creates a public relations value beyond the results of the survey.

CHAPTER FIVE

# CONCLUSIONS

From the late 1950s through the 1990s, market research was conducted primarily through random-digit-dial telephone surveys, personal intercept surveys, and the U.S. Postal Service. Transit studies typically employed on-board surveys, telephone surveys, and focus groups. However, evolving modes of communication, most notably cell phones, the Internet, and social media, have created a fundamental change in market research. At the same time, transit agencies face increasingly constrained research budgets and shortened timelines, and need alternative market research approaches that provide quality data more quickly and less expensively.

Market research panels provide an option for affordable customer research to support transit management decision-making. This synthesis examines the various types of panels, how they can be tailored to address a variety of transit agency needs, and areas of concern that the researcher should be aware of to ensure appropriate use of panel survey data.

## MARKET RESEARCH CONTEXT

Market research is the gathering and evaluation of data regarding consumers' preferences for products and services. In the transit industry, market research supports decision-making in all aspects of planning and operations, including service routing and scheduling, fare policy and implementation, advertising and promotion of transit services, vehicle and customer amenities, customer information, and long-term financing and planning. The private sector has applied market research extensively for more than 50 years and has developed a wide variety of techniques that can be used by the transit industry to collect and analyze customer information.

### Market Research Process

Market research is used to identify and define marketing opportunities and problems; to generate, refine, and evaluate marketing actions; to monitor performance; and to clarify the market research process itself.

Market research has four steps: (1) planning the study (specifying the data necessary to address the issue); (2) designing the research methodology; (3) conducting the research survey(s); and (4) analyzing and reporting the findings and their implications. Although there are variations in this process, it remains essentially the same for all market research studies. A market research panel is a sampling technique, and therefore falls within Step 2. Sampling is a critical issue in developing a panel and the appropriate application of panel survey results.

### Sampling

Traditional survey sampling is based on the concept of a random sample. A random sample is designed to provide results that can be projected to a particular target population with a specified level of accuracy. Collecting data using a traditional random sample can be a lengthy process, increasing costs and delaying completion of the research; but yields results with a known level of accuracy.

A non-probabilistic sample (of which one type is called a "convenience sample") is not random, which simplifies and shortens the data collection process; however, because the sample is not random, the results cannot be projected to a target population. The Internet, smart phones, and social media are rapidly supplanting traditional modes of communications. Many surveys are now conducted over the Internet; but as online panel recruitment and surveying provides a non-probabilistic sample, those survey results should be used for concepts and idea formation, not for estimates of the population.

### Sources of Error and Bias in Market Research

There are many potential sources of error and bias in market research. This synthesis highlights three categories of error as they relate to market research panels. Coverage error is perhaps the most significant issue for studies that use online recruitment and surveying, because certain segments of the population do not have access to, or do not use, the Internet, and therefore cannot participate. Non-response bias occurs when individuals selected as part of a sample either do not respond to the request to complete the survey or decline to answer some or all of the questions. This can be exacerbated in panel surveys, since members must continue to participate from the recruitment stage through multiple surveys. Measurement error is the difference between an observed response and the true response, and has been shown to occur when researchers shift from interview surveys (e.g., intercept or telephone) surveys to self-administered (e.g., paper or online) surveys. A second source of measurement error in panel surveys is called "panel conditioning," which refers

to members' becoming more attuned to the issue and therefore responding differently than if they had not been on the panel.

#### Adjustments to Reduce Error and Bias

Sampling strategies and data weighting are among techniques that can be used to reduce the effects of sampling error in surveys. Online panel surveys may require additional strategies to weed out respondents who are not truly engaged or are only completing the questionnaire to receive an incentive. Adjusting a non-probabilistic sample to make it representative of a target population can be time-consuming and expensive, offsetting two of the primary benefits of panel research. As a result, market researchers are experimenting with dual-frame or multi-frame sampling to increase survey coverage and create a more representative sample.

## MARKET RESEARCH PANELS

A survey panel is selected to provide data for the analysis of some specific aspect of a target population. Panel surveys have been used in transportation for many years, but new technologies are changing the definitions and applications of market research panels, expanding them to address a variety of research needs.

#### Types of Market Research Panels

The traditional definition of a panel—what the American Marketing Association considers to be a "true panel"—includes the respondents' being measured over multiple surveys with respect to the same variables. Market researchers also employ "omnibus panels," in which respondents are measured over multiple surveys but on variables that change each time. Omnibus panels developed by an organization solely for its own use are called "client panels." In addition, market research vendors have developed online access panels that an agency can "buy into" for a specific project. Recently, social media techniques have been combined with client panels to create "online research communities" in which panel members log in to a closed website to participate in surveys and discussions and to interact with other panel members and/or the sponsoring agency.

#### Conducting Panel Research

There are four stages in panel research. Stage 1 involves the recruitment of panel members, either through traditional means, such as telephone or in-person solicitation; through agency contact lists; or through online methods, such as pop-up advertisements or a link on the agency website. Stage 2 refers to the profiling and assembling of panel members. With telephone or in-person recruitment, profiling the respondents and having them join the panel is done when the potential panel members are first contacted. Agency contact lists require contacting potential panel members to collect basic information and screening to determine if the person will make a good addition. With online recruitment, there is typically a screening questionnaire, as part of which the respondent agrees to become a member of the panel. Stage 3 covers implementation of the panel survey. This can be done through traditional methods, such as telephone surveys, paper surveys, or focus groups; or online. Stage 4 pertains to panel maintenance. Maintaining panel membership is important to ensure the integrity of the sample and to limit costs. Attrition from any panel is to be expected, but steps can be taken to reduce it, including frequent communication, engaging survey topics, and incentives such as free transit passes or savings bonds.

## HOW TRANSIT AGENCIES ARE USING PANEL SURVEYS

A survey of 31 industry agencies showed that only 10 transit agencies had completed a project using a market research panel. However, interest in the method is growing, with nine other agencies having considered or reporting being in the process of developing a market research panel.

#### Survey Topics for Panel Research

Transit agencies have used panel surveys to address a wide variety of topics: rider attitudes and satisfaction, marketing and message development, public awareness of transit issues and input on planning projects, and evaluating the effects of agency actions. Although less frequently cited, other information gathered includes basic travel behavior characteristics and demographics. One agency that uses a panel for focus group-style research has used it to test products, such as parking payment equipment and the agency website interface for mobile devices; to develop a brand image and messaging; and for long-range transit planning.

#### Benefits of Panel Surveys

Those agencies that have considered or conducted panel surveys cited as primary benefits of panel surveys the ability to conduct research at a moment's notice and the ability to do research with specific target markets (both at 63% of respondents). Other key benefits, cited by 53% to 58% of respondents, were the ability to track changes in attitudes or behaviors from the same person over time, and that panel surveys are faster and cheaper than traditional research.

#### Concerns with Panel Surveys

The primary concern with panel research was that the panel may not be representative of the target population (70% of respondents). The other key concerns, cited by about half

of the respondents, were panel attrition and lack of funding/staffing to maintain the panel.

#### Use of Vendors

Agencies were asked what role vendors had in developing and implementing their panel research programs. Five general tasks were provided: recruiting the panel, maintaining the panel, developing the questionnaire, implementing the survey, conducting the analysis and reporting. Responses ran the full range, from the agency's having conducted the panel research completely in-house to having contracted out all tasks to a vendor.

The survey also asked if the agency used a vendor online access panel or developed their own client panel. Only one agency used an existing commercial online access panel; the other nine agencies developed an in-house panel to meet specific agency goals.

## LESSONS LEARNED

The literature review, industry survey, and case examples provided a wealth of information on the issues surrounding market research panels and their successful application in transportation. Key lessons learned are provided here.

#### Paradigm Shift

The issues and concerns with online access panel market research include the lack of grounding in sampling theory. In 1970, 88% of the households in the United States were estimated to have a landline telephone. This level of coverage led to the acceptability of using random-digit-dial telephone surveys in place of in-person interviewing. The past 10 years has seen a dramatic shift to cell phones and online technologies as daily methods of communication for many households and individuals. Current estimates are that fewer than 70% of U.S. households now have a landline telephone, raising the issue of whether random-digit-dial telephone surveys can adequately represent the population.

The implication is profound: random-digit-dial telephone surveying, the mainstay of current market research, no longer provides a probabilistic sample. This shift from probability sampling to non-probability sampling is a paradigm shift of the magnitude that led to the development of sampling theory in 1934. Sampling theory, specifically non-probabilistic sampling, has not caught up with the "wireless" age.

As of the writing of this report, no generally accepted method of sampling by means of the Internet has been established, nor is Internet access pervasive enough that it can replace telephone surveys. Given the current state of the practice, online access panel research can be used successfully when care is taken in selecting the panel members are and when the research question involves concepts and features, not precise estimates of the population. If precise estimates are needed, a survey using random sampling techniques is necessary to provide reliable results, and research has shown that telephone surveying is still superior to online panels in providing a random and representative sample.

#### Step 1, Recruitment

*People Want to Participate!*

There was an initial expectation that riders would not want to participate in a panel or complete surveys online. The experience of the participating agencies demonstrates that an agency need not be timid about creating online panels and actively soliciting customer feedback. Although the panel may not be statistically representative of the riding population, many people are eager to sign up and participate in the decisions that will be made regarding their service and how the government is spending their money. The online panel format makes that participation easy and efficient.

*Methods of Recruitment*

A variety of methods has been used to recruit panels. The method selected depends on the type of research panel being assembled, the type of data that will needed, and whether and how much vendors will be used to support the panel research effort. Typical methods include random-digit-dial telephoning, using existing agency e-mail lists, recruiting and asking for e-mail addresses from other agency surveys (by telephone or on-vehicle), posting a link on the agency website, and hiring a vendor to provide recruiting services. Advertising and promotion of the panel was a key element of open membership research panels at New Jersey Transit and Washington State Ferries (WSF). Means of encouraging participation and promoting the web address include posters at terminals and on vehicles, press releases to engage the media, a message on the agency phone lines for callers on hold, and handing out business cards with the information at high activity transit stops. WSF experimented with using Quick Response codes on their posters to take people directly to the website on their smart phone.

*Probability-based Sampling Has Benefits*

A probability-based sample is more expensive to develop than a non-probabilistic sample; consequently, replacing panel members who leave through attrition or systematic replacement is also more costly. The benefit is that a panel can be built that represents the general population and survey results can be fully analyzed using market research techniques. New York's Metropolitan Transportation Authority successfully used probability sampling for their panel.

### Step 2, Assembling and Profiling the Respondents

*Open Panel Membership*

Panel membership can be closed, where members must be selected to join the panel; or open, where anyone can join. WSF's Ferry Riders' Opinion Group panel is an example of an open membership panel, with on-going recruitment to solicit new members. Open panels can become over-heavy with members who have a high vested interest in the transit system, whether to complain about services or advocate for a certain planning decision. This creates a need to recruit more general and casual riders, not just the "enthusiastic" regular customer, requiring ongoing advertising and promotion of the panel.

*Screening for a Good Fit*

Denver's Regional Transportation District (RTD) recruits just 16 riders each year for its focus group-style panel, making it important to select members who are engaged and able to communicate effectively in the group format. The potential panelists complete an online questionnaire with open-ended questions about the transit system. These questions allow staff to determine which candidates are thoughtful and engaged, while weeding out those who may have a personal agenda and may not be constructive members. The list of potential panelists is also screened against a list of persons who have filed an excessive number of complaints against the agency, reducing the likelihood of including "chronic complainers" unlikely to provide useful input or feedback to the agency.

### Step 3, Conducting the Research

*Target Samples versus Completed Surveys*

In Portland, Oregon, TriMet contracted with a vendor to use the vendor's existing online access panel. The panel members *invited* to complete the survey were demographically representative of the transit service district population; however, there was significant demographic bias in who *completed* the survey. As a result, the data did not reliably represent the population, and could not be used for the intended purpose. At the Minnesota Department of Transportation (MnDOT), the panel participants were recruited to represent the population of the metropolitan area, and the remainder of the state. A comparison of the unweighted results to the statewide profile has shown that the results may not be perfect, but they are adequate for the agency information needs and intended use of results.

In both cases, weighting the data would add time and cost to the survey, thereby eliminating the benefit of using the panel approach. This underscores the need for the researcher to understand the goals of the survey at the project planning stage and to tailor the sampling technique to the requirements, understanding the strengths and limitations of online access panels vis-à-vis traditional survey techniques.

### Step 4, Panel Maintenance

*More Communication Is Better*

Researchers have an expectation that frequent contact with panel members will lead to burn-out among participants, and that they will drop out of the panel as a result. MnDOT's experience with its online research community demonstrated that regular weekly discussions and activities are the key to continued panelist engagement, high response rates, and quality information.

*Incentives Are Welcome*

Not all public agencies are permitted to provide incentives for panel participants, but if allowed, they are very effective. RTD has quarterly panel meetings. To encourage all 16 panel members to show up every time, the agency offers them a monthly pass at each meeting; and participants who attend all four meetings receive an annual pass for the following year. Incentives used by other agencies include $10 cash cards; drawings for U.S. savings bonds of various denominations; and publications about the city created specifically for the panel. WSF provides a noncash incentive: immediate gratification. When respondents complete a quick survey, they immediately get the results-to-date so they can compare their response with other panel members.

### Variety of Successful Applications

Panel surveys have been successfully applied to a variety of research needs. At RTD, a panel is used for quarterly focus groups. The WSF created an open membership panel to gather input from as many ferry customers as possible, and create a public relations benefit. MnDOT created a closed online community that engages in topical discussions as well as surveys, thereby providing quantitative and qualitative feedback. Metropolitan Transportation Authority created a telephone survey panel with daily input that provided a fluid, dynamic research tool—real-time customer response instead of recollected experience.

### Agency Costs

One of the primary benefits cited for using market research panels is that surveys can be conducted more quickly and economically than with traditional methods. The case examples illustrate that in-house client panels typically require a combination of staff and vendor resources. RTD's program has the lowest total cost, in part because it is conducted completely in-house. Staff resources across all departments were not directly measured; however, the program is streamlined to the point that it requires about 0.15 FTE. (It is important to recognize that the program has been in existence for many years, so this does not include start-up costs.) An on-going

panel research program typically has approximately 0.5 FTE assigned to the program and an annual budget of $100,000–$300,000. It is recommended that, if a vendor is used, a long-term contract be negotiated to smooth out initial start-up costs and possibly lower the vendor's overall charges in return for several years of guaranteed work.

### Guidance on the Use of Online Panels

The American Association for Public Opinion Research Report on Online Panels provides the following guidance to market researchers who are considering online access panels:

- A non-probability online panel is appropriate when precise estimates of population values are not required, such as when testing the receptivity to product concepts and features.
- Avoid using non-probability online access panels when the research is to be used to estimate population values. There is no theoretical basis for making projections or estimates from this type of sample.
- The accuracy of self-administered computer surveys is undermined because it is a non-probability sample. A random-digit-dial telephone survey is more accurate than an online survey because it is a probability sample.
- Weighting the results from online access panel surveys has not yet been demonstrated to be consistently effective and can be used to adjust for panel bias.
- There are significant differences in the composition and practices of various online access panels, which can affect survey results. Different online access panels may yield significantly different results on the same questionnaire.
- The market research industry has developed guidance for organizations to assist with obtaining quality survey research and understanding the limitations of online research panels (see the Bibliography).

## TOPICS FOR FUTURE STUDY

The transit industry is increasingly involved in market panel research, and as such needs to stay abreast of new research techniques, as well as contribute to the field of research. Topics for participation and additional research are summarized here.

### Monitor Market Research Industry Activities

The market research industry has established a "research-on-research" program related to online panel survey techniques. The program includes research on sampling, data collection, self-administered versus surveyor-administered questionnaires; measuring and adjusting for different types of bias and error, and adapting to new technologies. At the same time, the industry is publishing guidelines and standards to help users of market research understand how successfully to adapt to new market research techniques. These research programs are underway in the United States and Europe. Transit professionals will benefit from having access to the guidelines and standards resulting from this market research industry work.

### Special Populations on Market Research Panels

The transit industry has both a requirement and an obligation to hear from all of its existing and potential riders. This includes transit-disadvantaged populations, such as the elderly, persons with disabilities, minorities, low-income households, and persons with limited English proficiency. In addition, persons with low reading and writing comprehension are likely to have difficulty completing self-administered online surveys. These groups tend to be under-represented because they are less likely to have Internet access or have physical or language barriers that preclude them from participating in the panels. Research into how to include these individuals in panel research is important to providing reliable and representative survey results.

### Multi-frame Sampling

This synthesis provides a discussion of the issues and concerns surrounding non-probabilistic sampling, especially as it relates to online panels. Survey researchers have been moving away from single-source sampling (such as using only random-digit-dial telephoning) to dual-frame or multi-frame sampling. Both the New Jersey Transit customer satisfaction survey and the Washington State Transportation Commission case example illustrate dual-frame sampling, where online surveys are supplemented with in-person or paper surveys. Additional research is needed to understand how transit agencies can use multi-frame sampling to create efficiencies in customer surveying.

### Legal and Ethical Issues

Agencies participating in this synthesis did not cite any concerns with legal or ethical issues, because most already conduct market research and this is an extension of that activity. However, human subjects laws, privacy acts, and freedom of information acts all have implications for market research in the public sector, especially in an age of readily available and shared electronic information. The implications of conducting online and panel research need to be explored, particularly when it is implemented in-house, and guidance provided to agencies to ensure all legal and ethical requirements are met.

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# APPENDIX A

## Case Example of a Traditional Panel Survey: Puget Sound Transportation Panel

*Purpose:* The Puget Sound Council of Governments (now the Puget Sound Regional Council) initiated the Puget Sound Transportation Panel in 1989 to track changes in household travel behavior over time (Kilgren n.d.). This was the first general purpose travel panel survey of an urban area in the United States. The information gained from the panel survey effort has been used to develop and refine the regional transportation model used for forecasting and analysis for transportation decision-making.

A total of 12 telephone surveys were conducted between 1989 and 2002, with gaps ranging from six to 18 months between waves. The surveys varied, sometimes covering only demographics and travel behavior (with travel diaries), and at other times including attitudes and values.

*Panel recruitment and maintenance:* The panel was composed of approximately 1,700 households in King, Kitsap, Pierce, and Snohomish counties. Panel membership was recruited to include households with at least one regular bus rider, households with at least one regular carpooler, and households whose members drove alone for most of their trips (Kitamura 1989).

During each wave, new households were recruited to replace households that were unable or unwilling to participate in that wave, or that could not be contacted. The replacements households were selected to mirror those who dropped out of the panel as closely as possible in order to maintain the same overall demographic makeup of the panel. Additional attention was paid to the balance of people dropping out of the sample, representing out-migration from the region; and households that were new to the area, representing in-migration.

The attrition rate for the panel was typically about 20%, but was as high as 39% when there was a gap of 18 months between waves. Documentation of the project available from the Puget Sound Council of Governments does not indicate that incentives were provided between waves. Lack of contact for periods of a year or more makes it more difficult to follow households who have moved between survey waves, adding to attrition rates.

*Implementation, analysis, and reporting:* All members of the household 15 years and older were asked to complete a two-day travel diary, with some members also asked to complete a questionnaire on perceptions of and attitudes towards different modes of transportation.

*Benefits and disadvantages:* Several advantages and disadvantages of a panel approach were cited by the study. The advantages of panel surveys are: (1) direct measurement of individual changes; (2) ability to analyze causality about changes in place of residence, place of work, and commute mode; (3) smaller sample requirements for the same statistical reliability; and (4) lower on-going costs. The disadvantages of panel surveys are: (1) higher initial costs at empanelment; (2) possible higher non-participation rate; (3) attrition and replacement of panel member households; and (4) locating in-migrants to the region for recruitment.

The first two advantages, taken together, are the greatest, because they permit causal inferences about the effects of changes in variables influencing behavior. When survey measurement is cross-sectional, using a different sample of survey households each time, the dynamics that affect travel mode are missed.

*Result:* The panel survey program provided a rich and detailed source of mode choice and travel behavior data, including responses to changes in the transportation system. Information gained from the panel survey has aided in long-range transportation forecasting and analysis used to inform decisions regarding highway and road construction and transit development, as well as carpooling and parking policies. The data has also supported special studies, including an analysis of the travel behavior of baby boomers. The project not only provided transportation planning data, it also provided detailed tracking of response rates, attrition rates, and other information that facilitates research about traditional panel research. The data is made available to the general public through an online custom survey data request form.

# APPENDIX B

## E-Mail Invitation to Participate in the Industry Survey

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The National Academies
Advisors to the Nation on Science, Engineering and Medicine
Transportation Research Board

MEMORANDUM

DATE: December 16, 2011

TO: Selected Transit Agencies

FROM: Donna L. Vlasak, Senior Program Officer
Synthesis Studies

SUBJECT: Transit Cooperative Research Program (TCRP), Synthesis Topic SB-22, Use of Market Research Panels in Transit

The American Public Transit Association (APTA), through its nonprofit research organization, the Transit Development Corporation, Inc. (TDC), is cooperating in a research project to prepare a synthesis of current practice on the Use of Market Research Panel Surveys in Transit. This is part of the Transit Cooperative Research Program (TCRP) which was authorized in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), to be managed by the Transportation Research Board (TRB) in cooperation with the Federal Transit Administration (FTA) and TDC.

The synthesis will explore when and where a panel approach is appropriate in the context of the full range of market research methods, and will provide practical information and guidance for transit agencies of all sizes in profiling innovative and successful practices, lessons learned, and gaps in information. The final report will be published by the Transportation Research Board (TRB) and available for free at www.TCRPonline.org.

Kathryn Coffel Consulting, LLC, is preparing this synthesis report under contract to TRB. In order for the synthesis to reflect the best current information, it is important that responses be obtained from selected transit agencies of various sizes and geographic locations.

Please complete this survey even if you do not currently conduct market research or use panel surveys. It will help us have a clearer understanding of current market research activities. It should take no more than about 15 minutes to complete. If you are not the appropriate person at your agency to complete this survey, or if your market research and surveying are conducted by a different agency (e.g. the city or MPO), please forward this to the correct person.

The online questionnaire is accessible via the following web-link:
http://appv3.sgizmo.com/testsurvey/survey?id=735956&crc=f9c2a0b30bcd2781d80c3f2ef4129a1e

Please complete and submit this survey questionnaire by January 13, 2012. If you have any questions, please do not hesitate to contact our principal investigator Kathryn Coffel at Kathryn@KathrynCoffelConsulting.com or 503-914-9217.

Thank you for participating in this survey!

# Industry Survey

## TCRP Synthesis SB-22
## Use of Market Research Panels in Transit
## Welcome

Dear Transit Professional,

The American Public Transit Association (APTA), through its nonprofit research organization, the Transit Development Corporation, Inc. (TDC), is cooperating in a research project to prepare a synthesis of current practice on the Use of Market Research Panel Surveys in Transit. This is part of the Transit Cooperative Research Program (TCRP) which was authorized in the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), to be managed by the Transportation Research Board (TRB) in cooperation with the Federal Transit Administration (FTA) and TDC.

The synthesis will explore when and where a panel approach is appropriate in the context of the full range of market research methods, and will provide practical information and guidance for transit agencies of all sizes in profiling innovative and successful practices, lessons learned, and gaps in information. The final report will be published by the Transportation Research Board (TRB) and available for free at www.TCRPonline.org.

This survey questionnaire is being distributed to transit agency marketing and market research professionals. Please complete this survey even if you do not currently conduct market research or use panel surveys. It will help us have a clearer understanding of current market research activities. It should take no more than about 15 minutes to complete. If you are not the appropriate person at your agency to complete this survey, or if your market research and surveying are conducted by a different agency (e.g. the city or MPO), please forward this to the correct person.

Please complete and submit this survey questionnaire by ***January 13, 2012.*** If you have any questions, please do not hesitate to contact our principal investigator Kathryn Coffel at Kathryn@KathrynCoffelConsulting.com or 503-914-9217.

Thank you very much for participating in this survey!

**QUESTIONNAIRE INSTRUCTIONS**

To view and print the entire questionnaire, Click on the following link and print using "control p":
//surveygizmolibrary.s3.amazonaws.com/library/64484/TCRP_Synthesis_SB22_Panel_Surveys.pdf

To save your partial answers, or to forward a partially completed questionnaire to another party, click on the "Save and Continue Later" link in the upper right hand corner of your screen. A link to the partially completed questionnaire will be emailed to you from SurveyGizmo. To return to the questionnaire later, open the email from SurveyGizmo and click on the link. To invite a colleague to complete part of the survey, simply click on the “Save and Continue” link and enter your colleague's email address. Please note that the questionnaire can be saved and passed around multiple times, but respondents must use the link emailed from SurveyGizmo.

To view and print your answers before submitting the survey, click forward to the page following question 21. Print using “control p”.

To submit the survey, click on "Submit" on the last page.

[Note: Items marked with an “*” are required fields]

## Respondent Information

Please enter the date (MM/DD/YYYY).*

_____

Please enter your contact information.

First Name*: _____

Last Name*: _____

Title*: _____

Agency/Organization*: _____

Street Address: _____

Suite: _____

City*: _____

State*: _____

Zip Code*: _____

Country: _____

Email Address*: _____

Phone Number*: _____

Fax Number: _____

Mobile Phone: _____

URL: _____

## Transit System Information

1) Which modes does your agency either directly operate or operate using a contractor? (Check all that apply)*

- ☐ Fixed-route bus
- ☐ Fixed-route with route deviation
- ☐ Demand response paratransit (non-ADA)
- ☐ ADA paratransit
- ☐ Bus rapid transit (BRT)
- ☐ Light rail/streetcar
- ☐ Heavy rail/subway
- ☐ Commuter rail
- ☐ Other: _____

2) What is your system's annual ridership (unlinked trips)?*

_____

## Customer Feedback

3) How would you rate the usefulness of each of these methods for gathering feedback from your customers and the general public? Please check "N/A" for Not Applicable if you do not use that platform.

| | Very Useful | Somewhat Useful | Neutral | Not Very Useful | Not At All Useful | Not Applicable |
|---|---|---|---|---|---|---|
| Call center/live operator | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Agency website | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Agency blog | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Facebook | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Twitter | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| LinkedIn | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| YouTube | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Flickr | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |
| Third party (e.g. SeeClickFix.com) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ |

4) What other platforms do you use to obtain feedback from your customers and the general public?

_____

## Market Research Experience

5) What are the market research techniques you use to collect information from your customers and the general public? (Check all that apply)*

☐ Paper on-board surveys
☐ Paper surveys through U.S. Mail
☐ Telephone surveys
☐ Panel surveys
☐ Focus groups
☐ In-person interviews on the street or on-board the vehicle
☐ Online surveys
☐ We do not conduct market research surveys
☐ Other _____

IF QUESTION 5 = “We do not conduct market research surveys,” SKIP TO “Other transit agencies”

6) What are the barriers to conducting market research at your agency? (Check all that apply)

- ☐ Lack of support from management for market research activities
- ☐ Lack of funding to pay for research consultants
- ☐ Lack of funding for staff to conduct or oversee market research activities
- ☐ Lack of technical skill to conduct market research
- ☐ We do not have any barriers to conducting needed market research
- ☐ We do not have a need for market research
- ☐ Other: _____

7) About how much did your agency spend on market research last fiscal year?

In-house costs include staff salaries+fringe benefits, and materials & services that support in-house research (printing, survey software, etc.)

In-house: _____
Consultant: _____

8) About how much does your agency expect to spend on market research this fiscal year?

In-house costs include staff salaries+fringe benefits, and materials & services that support in-house research (printing, survey software, etc.)

In-house: _____
Consultant: _____

## Market Research Techniques

9) Over the past three years, what has been the purpose of your market research? (Check all that apply)*

- ☐ Rider trip characteristics (origin, destination, trip purpose, mode of access, etc.)
- ☐ Rider demographics
- ☐ Rider attitudes/customer satisfaction
- ☐ General public attitudes and awareness of transit/transit issues
- ☐ General public support for funding initiatives
- ☐ Public input on transit planning, transit projects
- ☐ Marketing and message development
- ☐ Evaluating the effects of an agency action
- ☐ Federal reporting requirements (Title VI, limited English proficiency, etc.)
- ☐ Other: _____

## Use of Panel Surveys

A panel survey is a community of people who have agreed to participate in research projects periodically. Panel members can be recruited and surveyed using traditional techniques (for example, random-digit-dial with a phone survey) or more recently, using on-line recruitment and surveying. Market research companies develop and maintain general panels and also have the ability to create custom panels. Alternately, a panel can be developed and maintained in-house.

10) Have you considered or conducted panel surveys for market research purposes?*

- ❍ No, I have not considered or conducted panel surveys => **SKIP** TO "Other transit agencies"
- ❍ Yes, I have considered but not conducted panel surveys
- ❍ Yes, I have considered and conducted a panel survey

IF QUESTION 10 = "Yes, I have considered but not conducted panel surveys," SKIP TO Question 14
IF QUESTIONS 10 = "Yes I have considered and conducted a panel survey," SKIP TO Question 15

## Purpose and Benefits of Panel Surveys

11) What was the purpose of the survey for which you considered or conducted a panel survey? (Check all that apply)

- ☐ Rider trip characteristics (origin, destination, trip purpose, mode of access, etc.)
- ☐ Rider demographics
- ☐ Rider attitudes/customer satisfaction
- ☐ General public attitudes and awareness of transit/transit issues
- ☐ General public support for funding initiatives
- ☐ Public input on transit planning, transit projects
- ☐ Marketing and message development
- ☐ Evaluating the effects of an agency action
- ☐ Federal reporting requirements (Title VI, limited English proficiency, etc.)
- ☐ Other: _____

12) What are the primary benefits that led you to consider a panel survey? (Check all that apply)

- ☐ Faster than traditional survey methods
- ☐ Cheaper than traditional survey methods
- ☐ Able to conduct the research in-house on a moment's notice
- ☐ Can do research with specific market segments
- ☐ Provides a public relations benefit with our riders
- ☐ Ability to track changes in attitudes or behaviors from the same person, over time
- ☐ Other: _____

13) What are your primary concerns with panel surveys?

- ☐ Panel may not be representative of my target population
- ☐ Panel respondents "dropping out" (panel attrition)
- ☐ Lack of funding/staffing to maintain the panel
- ☐ Panel members becoming sensitized to transit issues
- ☐ Providing incentives to engage and keep panel members participating
- ☐ Legal concerns
- ☐ Public relations concerns
- ☐ Ethical concerns raised regarding panels
- ☐ Other: _____
- ☐ I do not have any concerns with panel surveys

## Did Not Implement a Panel Survey

14) Why did you decide not to implement a panel survey?

_____

=> SKIP TO "OTHER TRANSIT AGENCIES"

## Panel Survey Experience

15) How many panel surveys have you conducted, across all panel efforts?*

_____

16) For your most recent panel survey, did you use a vendor's existing panel, or develop a custom panel?*

- ❍ Used an existing panel from a vendor
- ❍ Developed a custom panel to meet specific agency needs

17) Who completed each of the following tasks on your most recent panel survey?*

| | In-house | Consultant | Both | Not Applicable |
|---|---|---|---|---|
| Recruited the panel | ❍ | ❍ | ❍ | ❍ |
| Maintained the panel | ❍ | ❍ | ❍ | ❍ |
| Developed the questionnaire | ❍ | ❍ | ❍ | ❍ |
| Implemented the survey | ❍ | ❍ | ❍ | ❍ |
| Conducted the analysis and reporting | ❍ | ❍ | ❍ | ❍ |

## Satisfaction with Panel Surveys

18) How satisfied has your agency been with its panel survey efforts?

- ❍ Very Satisfied
- ❍ Satisfied
- ❍ Neutral
- ❍ Dissatisfied
- ❍ Very Dissatisfied
- ❍ Not Applicable

19) Please describe any "lessons learned" that would benefit other transit agencies that are considering using panel surveys for market research.

_____

20) Would you be willing to participate further as a case study? If selected by the TCRP panel for the case study, you would be interviewed by phone on the details of your panel survey experience.

- ❍ Yes
- ❍ No

**“Other transit agencies”**

Thank you for taking our survey. Is there another transit system that you suggest we contact for this synthesis project on market research and panel surveys?

_____

**Response Review**

[Opportunity to review and edit completed questionnaire before submitting]

**Thank You!**

Thank you for taking our survey. Your response is very important to us. If you have any questions or comments, please feel free to contact Kathryn Coffel at:

E-mail: Kathryn@KathrynCoffelConsulting.com
Phone: 503-914-9217
Mailing Address: 1752 SE Poplar Ave., Portland, Oregon 97214

# APPENDIX C

## List of Respondents

| | |
|---|---|
| Capital Area Transportation Authority (CATA) | Lansing, MI |
| Capital Metropolitan Transportation Authority (CMTA) | Austin, TX |
| Charlotte Area Transit System (CATS) | Charlotte, NC |
| Santa Monica's Big Blue Bus (Big Blue Bus) | Santa Monica, CA |
| Dallas Area Rapid Transit (DART) | Dallas, TX |
| Greater Cleveland Regional Transit Authority (GCRTA) | Cleveland, OH |
| King County DOT—Metro Transit Division (King County Metro) | Seattle, WA |
| Los Angeles County Metropolitan Transit Authority (LACMTA) | Los Angeles, CA |
| Metropolitan Area Rapid Transit Authority (MARTA) | Atlanta, GA |
| Maryland Transit Administration (MTA) | Baltimore, MD |
| Massachusetts Bay Transportation Authority (MBTA) | Boston, MA |
| Metro Transit | Minneapolis, MN |
| Metropolitan Washington Council of Governments | Washington, DC |
| Metropolitan Transit System of San Diego (MTS) | San Diego, CA |
| Minnesota DOT (MnDOT) | St. Paul, MN |
| MTA Metro-North Railroad (MTA–MNCR) | New York, NY |
| MTA New York City Transit (NYCT) | New York, NY |
| New Jersey Transit Corporation (NJ TRANSIT) | Newark, NJ |
| Pace–Suburban Bus Division (PACE) | Arlington Heights, IL |
| Regional Transportation Commission of Washoe County (RTC) | Reno, NV |
| Regional Transportation District (RTD) | Denver, CO |
| Regional Transportation Authority (RTA) | Chicago, IL |
| San Francisco Bay Area Rapid Transit (BART) | Oakland, CA |
| Southeastern Pennsylvania Transportation Authority (SEPTA) | Philadelphia, PA |
| Central Puget Sound Regional Transit Authority (Sound Transit) | Seattle, WA |
| Southwest Ohio Regional Transit Authority (SORTA) | Cincinnati, OH |
| Tri-County Metropolitan Transportation District of Oregon (TriMet) | Portland, OR |
| Utah Transit Authority (UTA) | Salt Lake City, UT |
| Regional Public Transportation Authority (Valley Metro, RPTA) | Phoenix, AZ |
| Washington State Transportation Commission (WSTC) | Olympia, WA |
| Washington Metropolitan Area Transit Authority (WMATA) | Washington, DC |

# APPENDIX D

## Revised Code of Washington Related to Ferry User Surveys

The Washington State Transportation Commission (WSTC) is a Governor-appointed body with a variety of responsibilities related to state transportation fiscal and policy matters, including setting rates and polices for toll roads/bridges and ferries. Washington State Ferries (WSF) serves eight counties within Washington State and the Province of British Columbia in Canada. The system has 10 routes and 20 terminals that are served by 22 vessels, with annual ridership of almost 23 million passengers.

In 2006, the Washington state legislature passed a law requiring the WSTC to conduct surveys of ferry riders every two years to help inform level of service, operational, pricing, planning, and investment decisions. Following is the relevant excerpt from the Revised Code of Washington (RCW):

**RCW 47.60.286**
**Ferry user data survey.**

(1) The commission shall, with the involvement of the department, conduct a survey to gather data on ferry users to help inform level of service, operational, pricing, planning, and investment decisions. The survey must include, but is not limited to:
   (a) Recreational use;
   (b) Walk-on customer use;
   (c) Vehicle customer use;
   (d) Freight and goods movement demand; and
   (e) Reactions to potential operational strategies and pricing policies described under RCW 47.60.327 and 47.60.290.

(2) The commission shall develop the survey after providing an opportunity for ferry advisory committees to offer input.

(3) The survey must be updated at least every two years and maintained to support the development and implementation of adaptive management of ferry services.

During the 2011-2012 legislative session, a new section was added to the Revised Code of Washington (RCW) 47.64.355 relating to performance measures for the ferries, specifically passenger satisfaction measures to be collected through the ferry riders' opinion group (FROG) survey panel. It states in part:

> The committee may also develop performance measures in addition to the following:
>
> (2) Service effectiveness measures including but not limited to passenger satisfaction of interactions with ferry employees, cleanliness and comfort of vessels and terminals, and satisfactory response to requests for assistance. Passenger satisfaction must be measured by an evaluation that is created by a contracted market research company and conducted by the Washington state transportation commission as a part of the ferry riders' opinion group survey. The Washington state transportation commission shall, to the extent possible, integrate the passenger satisfaction evaluation into the ferry user data survey described in RCW 47.60.286.

Abbreviations used without definitions in TRB publications:

| | |
|---|---|
| A4A | Airlines for America |
| AAAE | American Association of Airport Executives |
| AASHO | American Association of State Highway Officials |
| AASHTO | American Association of State Highway and Transportation Officials |
| ACI–NA | Airports Council International–North America |
| ACRP | Airport Cooperative Research Program |
| ADA | Americans with Disabilities Act |
| APTA | American Public Transportation Association |
| ASCE | American Society of Civil Engineers |
| ASME | American Society of Mechanical Engineers |
| ASTM | American Society for Testing and Materials |
| ATA | American Trucking Associations |
| CTAA | Community Transportation Association of America |
| CTBSSP | Commercial Truck and Bus Safety Synthesis Program |
| DHS | Department of Homeland Security |
| DOE | Department of Energy |
| EPA | Environmental Protection Agency |
| FAA | Federal Aviation Administration |
| FHWA | Federal Highway Administration |
| FMCSA | Federal Motor Carrier Safety Administration |
| FRA | Federal Railroad Administration |
| FTA | Federal Transit Administration |
| HMCRP | Hazardous Materials Cooperative Research Program |
| IEEE | Institute of Electrical and Electronics Engineers |
| ISTEA | Intermodal Surface Transportation Efficiency Act of 1991 |
| ITE | Institute of Transportation Engineers |
| MAP-21 | Moving Ahead for Progress in the 21st Century Act (2012) |
| NASA | National Aeronautics and Space Administration |
| NASAO | National Association of State Aviation Officials |
| NCFRP | National Cooperative Freight Research Program |
| NCHRP | National Cooperative Highway Research Program |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| PHMSA | Pipeline and Hazardous Materials Safety Administration |
| RITA | Research and Innovative Technology Administration |
| SAE | Society of Automotive Engineers |
| SAFETEA-LU | Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005) |
| TCRP | Transit Cooperative Research Program |
| TEA-21 | Transportation Equity Act for the 21st Century (1998) |
| TRB | Transportation Research Board |
| TSA | Transportation Security Administration |
| U.S.DOT | United States Department of Transportation |