Conducting a Successful On-Board Survey of Public Transit Customers

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ABSTRACT

This paper presents a best-practices manual that describes the necessary steps in conducting a successful on-board survey of public transit customers. It was specifically developed for the public transit professional that has at least a rudimentary understanding of the purposes and procedures in survey research and is searching for specific guidance on how to “best” conduct an on-board survey of its customers. This how-to manual will help provide public transit professionals with a much better understanding of the total customer surveying process and its importance in planning and ultimately the highest quality service to the riding public. It describes the various components or steps of the on-board transit customer surveying process from specifying and clearly defined objectives, various methods of data collection, questionnaire construction, sample size, appropriate level(s) of analysis, accurate and truthful reporting of results, data entry, report writing, and data archiving.

Key words: customers—data collection—design manual—on-board survey—public transit—questionnaire—sample size
INTRODUCTION

In recent years, there has been a growing awareness of the need to use public transportation resources more efficiently. As a result, it has become very important for public transit systems to carefully evaluate all services so as to provide the most efficient and desirable transit services to the community that it serves. Public transit customer surveys can play an important role in the evaluation of current and planned public transit services. When a public transit system decides to evaluate current or planned services via the use of a customer survey, there are a number of important issues that need to be addressed to facilitate the data collection process and to ensure that reliable and high quality data are collected, analyzed, and ethically reported. In some cases, however, the collection of important information about customers of public transit and the resulting evaluation has not been supported by comprehensive and methodologically valid surveying techniques.

There are a number of important steps that should be followed in the development and conduct of such surveys. This includes simple statistical procedures such as the sampling frame, questionnaire design, and at what level within the transit system information will be collected about customers, for example.

Despite the time and cost associated with such surveying efforts, the results obtained from surveys of public transit customers can be extremely useful to a public transit system’s planning and operations functions, as well as to governmental boards, commissions, and councils. Therefore, it is in the best interest of public transit systems to conduct annual periodic surveys of its customers and to make sure that its surveying process is appropriate and correct to meet the desired information needs. The archiving of historical databases should be initiated and used for yearly comparisons of changes in customer demographics, travel patterns, and overall satisfaction with services provided, at a minimum.

SURVEY ELEMENTS

In order to fully identify the many aspects of public transit customer surveying, it was important to examine, review, and summarize the various types of survey instruments (questionnaires) and final reports from as many sources as possible. To achieve the project objective of producing a how-to manual for surveying public transit customers, a review of literature related to surveying, in general, and actual surveys of public transit customers was conducted.

In order to gather and summarize as much literature as possible about surveying public transit customers, the American Public Transit Association (APTA) was contacted and solicited to provide its complete transit system membership mailing list. APTA is a membership organization charged with serving and leading its diverse membership through advocacy, innovation, and information sharing to strengthen and expand public transit in North America. APTA graciously agreed to the use of its complete membership mailing list.

A thoughtful letter was crafted that specifically asked public transit systems on APTA’s mailing list for assistance in gathering information about the various types of customer surveys that they have conducted over the past decade or so. The letter asked, if possible, for each of the transit systems to provide a hard copy of all of the on-board or other survey reports that it has or has had completed for the system either internally, by a private consultant, or other entity. The letter stated that it is of particular importance that the research team obtains complete reports that list, in detail, all of the specifics about the customer surveys such as survey design, survey distribution technique(s), and any other relevant methodological issues.
Using APTA’s membership mailing list, the letter was sent to over 400 transit systems in both the US and Canada. This effort resulted in a total of 100 reports and other types of important information being sent for review.

The results from the review of literature illustrated the different techniques, methods, and elements used by various transit systems operating various modes such as buses, heavy and light rail, and paratransit, in both urban and rural environments.

Perhaps the most surprising finding from the literature was the absence of a comprehensive source(s) that specifically addressed the unique aspects of the public transit customer surveying. While there are many sources such as textbooks and the like that cover statistical and other general methodological issues of surveying, none cover the unique aspects surrounding surveying customers of public transit.

The results from the literature review made it clear that there are a number of important issues that must be addressed and logical steps followed in the design and conduct of surveys of public transit customers. As noted previously, many important issues such as the statistics related to sampling and the like, are covered extensively in textbooks and other similar publications. The statistical and other methodological issues related to surveying in public transit will be briefly touched on in this how-to manual for reference and general understanding by the end user.

**What Is a Survey?**

A survey is a system for collecting information to describe the characteristics or attitudes of a particular group of individuals, in this case, public transit customers. Outside of the arena of public transit, surveys are conducted to determine political and consumer preferences and the opinions and beliefs of just about every conceivable issue.

The literature notes that all surveys have the following features in common, regardless of the group or topic being surveyed:

- specific and clearly defined objectives
- method of data collection
- questionnaire construction
- sample size
- appropriate level(s) of analysis
- accurate and truthful reporting of results

From this list of survey basics above, there are many interrelated steps involved in the design, planning, and administration of a survey of public transit customers. Before a survey can be conducted, important and sometimes subtle decisions must be made about the objectives and the purpose of the survey as well as its unique characteristics. A survey of public transit customers usually originates when transit system planning staff are confronted with an information need for real data about existing customers, their preferences, and overall satisfaction with the transit system. It is often the case that information about customers is either insufficient, outdated, or does not exist at all.
Survey Design Steps

Developing, administering, and reporting the results of an on-board survey or other survey of public transit customers includes a number of important steps that should be followed to ensure the highest degree of success with the survey effort. The steps to follow are provided in an outline format. The intent of presenting the steps in this manner is so the end-user of the how-to manual can refer back to previous sections for detailed guidance.

Step 1: Define and Clarify Objectives

- Define expectations
- Define what information needs to be gathered about customers
  - Demographics
  - Travel Patterns
  - Satisfaction
  - Other
- Confirming all related costs
  - Staffing, materials, equipment, travel, etc.
- Establishing a reasonable timeline
- Investigate any previous survey efforts
- Coordinate with persons knowledgeable about surveying including academics, consultants, etc.
- Familiarize with this how-to manual

Step 2: Identify Sample

- Decide sampling method
- Probability or non-probability
  - Simple random sample
  - Stratified random sample
  - Cluster random sample
  - Systematic Sample
- Representative of the whole population
- Degree of accuracy
  - Confidence Level
    - 95 percent or other
- Minimize sampling error
- Minimize sampling bias
- Influenced by available resources
- Randomly selected routes
  - Inbound and outbound

Step 3: Data Collection Methodology

- Data collection methodology
  - Self-administered
    - On-board survey
    - Seat drop
    - Driver assist
    - Surveyor assist
    - Intercept
- Mail
- Telephone
  - CATI
- Personal interview
  - CAPI

**Step 4: Questionnaire Design**

- Develop clearly worded and simple questions
- Keep the questionnaire as short as possible
- Avoid question writing problems
  - Double negatives
  - Probing questions
  - Hypothetical
  - Acronyms
  - Bias
  - Ambiguous wording
  - Double-barreled
  - Cryptic
- Don't assume customers know terminology
- No way to word a question perfectly
- Questions should be relevant to objectives
- Short questions are best
- Avoid slang, jargon, and technical terminology
- Develop consistent response methods (i.e., checks, circles)
- Make questions as impersonal as possible
- Sequence questions from the general to the specific
- Closed-ended questions should use exhaustive and mutually exclusive response choices
- Place questions with similar content together (i.e., demographics and so on)
- Make the questions as easy to answer as possible
- Provide clear and concise directions
- Define unique and unusual terms
- Use an attractive questionnaire format that conveys a professional image
  - Landscape
  - Folded
  - Front-back
  - Paper selection
    - Card stock
    - Copier
    - Color
- Coding of response choices
- Coding schemes
- Numeric or alpha
- Research design
- Consecutive numbering
- Distribution logs

**Step 5: Surveyors**

- Obtain surveyors (if necessary)
- Extensively train surveyors
  - Refer to checklist in how-to manual

**Step 6: Conduct Pre-test of Questionnaire and Survey Methods**

- Conduct a pre-test of draft questionnaire using actual persons who will be surveyors
- Fine tune questions and overall survey methods
- Ensure surveyors are trained properly
- Solicit information from the surveyors that participated in the pre-test
- Conduct focus groups and/or brainstorming sessions with surveyors
- Make appropriate modifications

**Step 7: Conduct the Survey**

- Undertake the survey
  - Operator assistance
  - Surveyor assistance
  - Other assistance
- Collect surveys
  - Operator assistance
  - Surveyor assistance
  - Drop boxes on vehicles
  - Mail return provision

**Step 8: Data Processing and Analysis**

- Data entry type
  - Manual
  - Electronic
- If manual, then data entry staff
- Data weighting
- Template design
- Software
  - Spreadsheet
    - Microsoft Excel™, Lotus 1-2-3™
  - Database
    - Microsoft Access™
  - Other
    - SPSS™, SAS™
- Data cleansing
  - Transcription errors
  - Logic checks

**Step 9: Reporting Results and Other**

- Consider audience
  - General or academic
  - Organize tightly
  - Do not overwhelm reader
  - Consider sensitive topics
• Use simple bar graphs, pie charts, tables
• Accuracy of reported results
• Describe survey design
• Describe sampling methods
• Ethical reporting of results
• Data Archiving
• Historical Comparisons
• Consistency between instruments
• Multi-year comparisons
• Length of time between surveys

OTHER CONSIDERATIONS

In 1991, the Federal Transit Administration began a project to implement a transit performance monitoring system (TPMS). The TPMS was designed to collect data on transit customers through an ongoing, systematic program of on-board surveys. The long-term goal of the TPMS initiative is to standardize the collection of data and, thereby, provide a basic, but comprehensive analysis of the performance and benefits of transit service.

The project has consisted of two rounds of surveys, each involving 14 transit systems. The Round 1 surveys were performed in 1997 and 1998. The Round 2 surveys were conducted in 1999 and 2000.

Twelve core questions were included on the survey questionnaire during rounds one and two. The survey form shows that the 12 core questions are 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, and 15. The rationale for inclusion of these questions is as follows:

• Questions 1, 3, 8, and 15 are used to determine trip purpose, automobile availability, and income. The responses to these questions are used to define the functions or benefits provided to the customer such as congestion management, low cost mobility, and livable communities. These functions or benefits are discussed in the chapter entitled Survey Results.
• Question 5 addresses trip frequency and also is used to estimate the number of people in the community that use transit service. For example, each response of one day a week might be given a weight of 7.0 to estimate the number of people using transit service one day a week.
• Question 6 is used to assess the degree of turnover in transit ridership.
• Questions 7 and 9 help assess the level of added mobility that transit provides to customers.
• Questions 2 and 4 provide information on access and egress modes.
• Questions 10 and 12 are used to examine the survey responses in terms of age and gender.

When conducting an on-board survey of public transit customers, serious consideration should be given to the inclusion of as many of these twelve core questions and exact response choices as possible.

SUMMARY

It has become very important for public transit systems to carefully evaluate both current and planned services in order to provide the most efficient and desirable public transit services to the community that it serves and funds its existence. Surveys of public transit customers can play an important role in the evaluation of current and planned services. When a public transit system decides to evaluate current or planned services through the use of a customer survey, there are a number of important issues that need to be addressed to facilitate the data collection process and to ensure that reliable and high quality data are
collected, analyzed, and ethically reported. In some cases, however, the collection of important information about customers of public transit and the resulting evaluation has not been supported by comprehensive, thorough, and methodologically valid surveying techniques.

This paper presents a how-to manual that describes the steps to follow when conducting an on-board survey of public transit customers. It was specifically developed for the public transit professional that has at least a rudimentary understanding of the purposes and procedures in survey research and is searching for specific guidance on how to “best” conduct such a survey. It is hoped that this how-to manual will help provide public transit professionals with a much better understanding of the total customer surveying process and its importance. This how-to manual describes the various components or steps of the on-board transit customer surveying process