

Guide to Social Assessment of Transit User Needs in Sustainable Transportation Projects

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1. Overview

Sustainable transportation is vital to creating greener cities. However, recent years have seen growing user discontent with local sustainable transport systems in Latin America. In Mexico City, Bogotá, Santiago, and cities across Brazil, users have taken to the streets and busways - sometimes repeatedly - to demand higher quality service. These protests disrupt service and sometimes cause costly damage to infrastructure. Fare evasion is also an increasing problem in some cities.

Additionally, automobile and motorcycle ownership is rising all around the world (Haworth 2012, Zegras and Hannan 2012, Rodriguez and Palacios 2012, Ingram and Liu 1999). Many transit users who are dissatisfied with service increasingly have the ability to opt out of the transit system entirely. This trend threatens the financial sustainability of public transit.

Why Measure Transit User Needs?

Public transit can only thrive if it provides transit users with what they want and need. Public transit can only thrive if planners *know* what users want and need. Our knowledge should be based on hard data. This can only be accomplished by bringing the perspectives of users, particularly the most vulnerable groups, into the planning process (Wekerle 2005, Hook 2011, Kash and Hidalgo 2014).

All too often, we neglect to include adequate social assessment in planning major transit reforms (ibid, Vasconcellos 2001, Basset 2013). As a result, planner's understandings of transit users' needs are not grounded in the experience of users themselves. Without effective two-way communication, we lose the opportunity to identify conflicting priorities before they become crises (Corburn 2005, Kash and Hidalgo 2014, Irwin 1995).

Studies of participation in transit reform have typically focused on the needs and participation of transit operators, particularly the needs of informal operators in formalization processes (see for examples Muñoz et al 2009, Ardila 2007, Gakenheimer 2011, Wright 2011). While these stakeholders are important actors within transit reform, focusing disproportionately on them often results in policy where transit users shoulder a large share of the cost and receive a smaller portion of benefits (Ardila 2004). To help correct this imbalance, this guide will focus specifically on social assessment of the needs of transit *users* and potential users.

Social assessment is method of "gathering, analyzing, and incorporating social information and participation into the design and delivery" of a project (Rietbergen-McCracken and Narayan 1998). It entails collecting data about user needs by directly involving current or potential users in data collection. User participation may be as simple as responding to a well-designed survey, or as comprehensive as becoming involved in an advisory board. The key factor in all cases is that conclusions about what users want and need are drawn directly from the experiences and opinions of users themselves.

In addition to minimizing the type of user opposition that can spill over into public protests, social assessment of transit user needs can have a number of benefits.

- Improve the fit between service offered and local users' needs

- Increase user satisfaction
- Advance social inclusion by focusing attention on the needs of vulnerable groups such as the poor, women, and the disabled
- Secure public support and allies to overcome obstacles such as opposition by informal transit operators.

Social assessment is most effective early in a planning process, when it can be incorporated into project goals and design (Rietbergen-McCracken and Narayan 1998). Conducting social assessment early and often can help prevent or minimize user dissatisfaction. This does not mean social assessment is only good for new systems. The critical point is to use the data to *inform* decisions rather than *justify* them. Whether planners are designing a new transit system, expanding an existing one, or identifying strategies to combat declining satisfaction or ridership, social assessment can help ensure decisions are based on data about user needs rather than guesses.

The Building Blocks of Social Assessment

When evaluating a proposed transportation project or transit system, we typically begin by evaluating what we expect the project to do. However, we also need to ask ourselves how well the project fits with what transit users want and need from their transit system. To evaluate the fit between project and user needs, we must identify users' self-identified needs by talking with them directly. This guide will present and discuss methods of doing so in a systematic, rigorous way.

The social assessment methods presented here provide an array of options for identifying what transit users need and how well the existing transit is meeting those needs. We discuss tools which have been underutilized by transport planners, such as extended and in-transit interviews and focus groups. We offer tools to improve the power and usefulness of surveys and public meetings. Finally, we discuss how to use this menu of options to design a social assessment strategy that is appropriate to any situation.

Combining users' local knowledge with the expertise of transportation planners and policymakers helps us build a comprehensive understanding of the problems facing transit users, and to envision effective ways of addressing those problems. The guide is written specifically about public transit reforms, but could be adapted to other types of projects such as bike sharing, pedestrian infrastructure, housing reform, and projects from other sectors.

Understanding what transit users need should and can be a part of every transit planning process. This guide provides planners, policymakers, and researchers with the information needed to improve sustainable transportation planning now. It is often recognized that local needs and realities can vary substantially. The social assessment methods presented here are at once universal and specific: they represent a transferable way to identify an appropriate course of action is for *this* time in *this* place.

How to Use this Guide

This guide is for practitioners who want to improve sustainable transport, whether they work on behalf of a city government, nonprofit, consulting agency, university, or a private transit provider. It can be used at any stage of the planning process, from before the project goals have been selected through assessing the functioning of a fully operational transit system.

The tools presented here are not only powerful, but relatively straightforward. Anyone with a genuine interest in listening to transit users and the dedication to educate himself or herself about research techniques can learn to apply these social assessment strategies. The information needed to get started can be found in the pages that follow.

This chapter has provided an overview of the need for social assessment. Chapters 2 and 3 describe the various tools available for social assessment, their best uses, and how to build a social assessment strategy that is both powerful and practical. Together, these chapters contain the information necessary to design a strategy to measure the needs of transit users in relation to the project you are working on.

To help put this strategy in action, the guide also includes an in-depth methodological appendix. This section is designed for researchers planning to collect data for their social assessment, and contains practical guidance about how to design specific research instruments, choose who to talk to, and collect and analyze high-quality data. It discusses interviews, surveys, and focus groups. In some cases, the methods appendix provides the information needed to begin data collection. In all cases, it includes recommendations of additional resources.

The recommendations presented here are based both on best-practice guidelines and the author's research experience conducting case studies in Colombia and Bolivia, presented in Appendix B.

2. The Toolbox for Social Assessment of Transit User Needs

How can we assess the needs of thousands (or millions) of diverse transit users? This chapter provides an overview of available techniques for incorporating community perspectives in a systematic way. Once planners and researchers are familiar with the menu of options, they can use it to craft a strategy to construct a comprehensive portrait of the challenges and opportunities of any specific sustainable transport project.

Surveys

Surveys are an indispensable tool for collecting statistically representative data about transit users. Surveys are commonly used to measure residents' trip patterns, demographics, and economic characteristics. However, they are capable of providing more in-depth information about users' preferences, behaviors, and day-to-day experiences that can improve the planning and management of public transport systems. Survey can be particularly valuable when trying to identify which of several potential improvements to prioritize or when attempting to understand the current functioning of an informal transit system, where the on-the-ground reality may differ substantially from the formal rules that regulate the system.

However, a survey is only as good as the questions it contains. In particular, the need to script questions and answer choices before talking to transit users leaves surveys vulnerable to developing “blind spots;” where community concerns that researchers did not pre-identify are never included in the social needs assessment. One solution is to combine surveys with the other assessment tools described here. Another important strategy is to ask questions that better address users' concerns and day-to-day experiences. The methods appendix covers two underused tools for doing this. Including open-ended questions helps reduce blind spots by providing users with an opportunity to raise the issues they themselves view as most relevant. Questions focused on critical incidents (specific pleasant or unpleasant experiences users may have had with the transit system) provide a detailed portrait of the daily functioning of the transit system. Critical incidents questions diagnose specific problems and generate immediately actionable data.

Individual Interviews

An interview is a one-on-one conversation between a researcher and transit user or potential user. Unlike with a survey, an interview is mainly composed of open-ended questions, allowing the researcher to understand the transit system from the point of view of transit users (Weiss 1994). Interviews excel at helping researchers understand the nuances of the issues surrounding sustainable

transportation. Because more time is required for each interview, the sample is typically much smaller than the sample of a survey. While interviews (and focus groups) do not yield statistically generalizable data, they have an unparalleled power to generate detailed information, illuminating the relationships between multiple problems and the complex social components of the transit system. The social assessment toolbox contains two types of individual interviews: In-transit interviews conducted in the field and more traditional sit-down interviews.

In-Transit Interviews

An in-transit interview is a relatively brief interview (typically 5-15 minutes) conducted with a transit user as they interact with the transit system, either waiting for a vehicle to arrive or on board the vehicle itself. In-transit interviews excel at identifying problems of which planning staff may be unaware. They capture the daily experience of taking transit (Buscher and Urry 2009). Users often illustrate their points by drawing the interviewer's attention to conditions around them. For this reason, and because mobile interviews require traveling to a variety of locations throughout a city or town, in-transit interviews combine very naturally with direct field observation of the transit system. In this way, they provide researchers with a comprehensive education about users' experiences taking transit.

Box 2.1: Example Exchange from In-Transit Interview

Interviewer: In your view, what are the main problems with public transport?

Transit user: Look at what we're seeing!

Interviewer: Why don't you tell me about what we're seeing.

Transit user: Huge crowds and very few buses. It's a lot of people for so few buses! Here, if you're traveling with a child, you have to protect him so he doesn't get stepped on or crushed.

Interviewer: I see you're covering your son with your arm.

Transit user: Yes, because otherwise they'll crush him!

An additional benefit of in-transit interviews is that they facilitate access to difficult-to-reach populations. For example, many low-income people work very long hours and may find it difficult to schedule time for a more extended interview. Street interviews ensure this population is not excluded. In-transit interviews do not capture the perspectives of non-users of public transport. These perspectives may be important if project goals include attracting more choice riders or improving access for excluded groups such as the disabled. However, with a bit of creativity, mobile interviews can be adapted to reach some of these populations (Kash and McCoy 2015).

If conducted before a survey, in-transit interviews significantly improve the survey design process by raising questions researchers might not have thought to ask and helping with question wording. However, interviews are also a valuable source of data in their own right. Excerpts from the interviews can be used to illustrate survey findings. If a survey result appears counterintuitive to the research team, the qualitative interviews may help explain the result. Finally, when done with a careful sampling design and a large enough sample, the interviews themselves can also be analyzed

quantitatively, as a small-sample survey. In this way, mobile interviews balance the depth of qualitative research methods with the breadth of a quantitative survey.

Sit-Down Interviews

Sit-down interviews, which are typically 45-60 minutes in length, allow for greater depth than their mobile cousins (or indeed any of the other methods discussed here). They may be conducted at an office, café, community center, or the home of a respondent. This also makes sit-down interviews one of the best tools for reaching non-users with severe travel difficulties and users with schedule constraints or family obligations.

The questions can be similar to those used for mobile interviews, but devoting greater time and more follow-up questions to each topic. Because sit-down interview participants become more comfortable over the course of the conversation, they are likely to offer more detailed responses and sometimes deeply personal experiences. As a result, sit-down interviews work well for examining sensitive social topics.

Box 2.2: Example Exchange from Sit-down Interview

Interviewer: Can you tell me what happened?

Transit user: A man was standing behind me, and I began to feel him getting closer and closer to my bottom. I was very uncomfortable, very very uncomfortable, and I didn't know what to do. I just kept moving further away from him until I was practically on top of the people sitting in front of me. I lacked the determination to say something. Fortunately, the man next to me yelled at the man, "stop rubbing up against the girl." He defended me, saying "stop fondling her. Step back."

Interviewer: You told me earlier that this had happened to you before, but this time was the most traumatizing.

Transit user: This was the first time I knew explicitly what was happening, because the other times, you wonder if you're imagining it. 'Maybe it's the movement of the bus. Maybe I'm imagining that he's groping me. Maybe it's not happening and I'm crazy,' because nobody ever defended me. But this time was the first time I definitely knew what was happening, that I wasn't imagining it... but it was great that someone else was able to stop this type of thing when you don't know how to react. We need more people like that, who stop to defend people.

Sit-down interviews can also be particularly valuable in cities that are implementing a new transit system, where residents may not have experienced anything similar to the project being considered. The researcher has the ability to explain the new transit system, using images of the plans and similar systems that have been implemented in other cities. Once the interviewee has had their questions about the new system answered, they are more equipped to offer opinions on it than would a participant in a mobile interview or survey. Sit-down interviews are also useful for examining questions raised by data collection from other methods.

Focus Groups

A focus group is a group interview in which a researcher facilitates a conversation between participants. In many respects, it is similar to a small-group public meeting. However, a focus group with an outside facilitator, focused on learning rather than deciding on policy, may create a less politically charged discussion in situations where transit policy is a subject of controversy. Focus groups are useful for providing deeper investigation of topics and questions raised by survey results, discussing potential policy interventions, assessing public education materials and campaigns, and understanding public debate around a proposed policy (Morgan 1996, Short 2006).

Focus groups can also be helpful for reaching non-user populations whose needs are not adequately assessed by other methods such as survey data. This is particularly true with subpopulations who share a common burden not faced by other participants, such as victims of sexual assault, vendors in informal markets, and people with disabilities. However, if the transportation burden is too severe for respondents to travel to a meeting location, individual interviews may be more appropriate.

A focus group is not a shortcut for individual interviews; participants influence each other's responses (Short 2006), and the range of responses will be more narrow (Morgan 1996). Groups are also more logistically complicated than individual interviews. Multiple focus groups should be conducted with each population of interest, particularly if the groups are the only social assessment method being used (ibid).

Homogenous Focus Groups: A traditional focus group is homogenous, containing only a single type of participant. This helps to create an atmosphere where all group members feel confident enough to participate.

Heterogenous Focus Groups: An alternative method is to include local planners in the discussion. When a focus group is framed as a learning opportunity for all participants, it provides planners with a safe space to directly learn from transit users and ask their own questions. This may make the results more impactful than if planners and policymakers simply read a report of the results. Heterogenous focus groups can also be useful in situations where previous interactions between planners and the public have been conflictual. One challenge of organizing heterogenous focus groups is that they need to be held outside of normal working hours to accommodate the schedules of transit users.

In either type of focus group, participants may respond to a series of questions or engage in an exercise such as a workshop, or visioning session (Reitbergen-McCracken and Narayan 1998, Da Silva et al 2008). Focus groups can also be a good venue to solicit community feedback about preliminary findings or proposed plans of action (Marshall and Rossman 2011, Reitbergen-McCracken and Narayan 1998). They can be helpful sources to identify participants in long-term collaboration, if desired.

Public Meetings

A public meeting is a gathering where members of the public are invited to attend, will be given an opportunity to speak, and will be allowed to divulge what is said at the meeting to their friends and neighbors. The ability of public meetings to provide data for social assessment depends strongly on the meeting format. Like focus groups, small-group meetings can be a good venue to learn from transit users and generate and evaluate potential solutions. Large-format public hearings are useful for giving information *to* many members of the public, but are very limited in their capacity to solicit information *from* the public in a meaningful way (Forester 1999, Arnstein 1969). However, large-scale public hearings can be useful ways of identifying interested participants for subsequent components of the social assessment.

Small-Group Meetings

The main difference between a focus group and a small-group meeting is whether the event is conducted as a learning exercise or as part of a planning process. Typically, a public meeting will be officially affiliated with the local planning organization (whereas a focus group may be under the auspices of a separate organization or academic study). This can be an advantage in that no outside staff is required, and the process of hosting meetings will build the capacity of the planning team. Small public meetings are important for fostering two-way communication between planners and community members. Public meetings have often been used to address the needs of a neighborhood or section of a city through vehicles such as design charrettes. Planners in a number of cities, including Bogotá and La Paz, have used neighborhood-level meetings to make design decisions about local transit routes and the most effective locations for bus stops. Most exercises that can be conducted as part of a focus group can also be conducted in a small-group meeting, facilitated by planners.

Ongoing Collaboration

Ongoing collaboration results from multiple meetings with the same (or similar) group of people. In some cases, a planning organization will create a committee composed of community stakeholders. In other cases, collaboration may be between the planning organization and a pre-existing outside organization that represents the needs of a group of users, such as a neighborhood council or grassroots NGO. Collaboration can provide planners with ongoing information about changing community needs. It may also be helpful for building alliances to overcome challenges such as opposition from informal transit operators. Designed and executed well, public meetings and ongoing collaboration are one of the most effective strategies for assuring accountability to meeting the needs of transit users. However, ongoing collaboration is time-intensive, and participants may grow frustrated if their suggestions are not incorporated into planning (Arnstein 1969).

Ensuring Accountability

Social Assessment is only valuable to the degree that it is used to inform planning, policy, and operational decisions (Reitbergen-McCracken and Narayan 1998, Arnstein 1969). When designing a social assessment strategy, it is important to make sure the results will be 1) usable, and

2) used to benefit of transit users, particularly members of vulnerable subpopulations. It is important that the information not simply be a vehicle for justifying or promoting pre-made decisions.

To be usable, information needs to be understandable to decision makers, and it needs to be available early enough to incorporate it into decision-making. This may be before the design of a new system is completed or, in an already-operating system, in preparation for plans to expand or reform the system. Investigators should also make sure to avoid “blind spots,” providing space for research participants to raise issues that were not initially priorities for the transit agency (Kash and Hidalgo 2014, Marshall and Rossman 2011).

A plan for how the results of the social assessment of transit user needs will be used should be in place before data is collected (Rietbergen-McCracken and Narayan 1998). Follow-through can be encouraged by building in mechanisms to encourage accountability. Public meetings and ongoing collaboration with groups of transit users can both increase accountability (ibid, Arnstein 1969). User priorities can be included in the criteria for evaluating policy options in a formal decision-making process. TRANSMILENIO S.A. has experimented with tying operator compensation to user satisfaction. Due to the many obstacles facing TransMilenio, this has not been enough to achieve satisfactory service, but the idea may be worth exploring.

Summary of Options for Social Assessment of Transit User Needs

TABLE 2.1 Summary of Methods for Social Assessment of Transit User Needs

| Method | Advantages and Best Uses | Limitations and Drawbacks |
|--------------------------------|--|---|
| In-Transit (Mobile) Interviews | <ul style="list-style-type: none"> • Measure transit users' uninfluenced perspectives • Identify unknown and new problems • Researchers directly observe field conditions • Access hard-to-reach transit user populations • Can be analyzed both qualitatively and statistically • Help design surveys and explain results | <ul style="list-style-type: none"> • Sample size is limited by the time needed for analysis • Does not reach non-users, unless public places outside of the transit system are also used • May underemphasize problems that are less visible or occur sporadically (such as crime) |

| Method | Advantages and Best Uses | Limitations and Drawbacks |
|--------------------------------------|--|--|
| Transit User Surveys | <ul style="list-style-type: none"> • Statistically representative data • Can provide both qualitative and quantitative information • Measure behavior, preferences, and perceptions • Identify most frequent and severe problems • Turnaround time for initial analysis is short • Track changes over time | <ul style="list-style-type: none"> • Breadth of information at the expense of depth • Danger of asking the wrong questions • Requires largest staff • Does not reach non-users; may not reach off-peak users • Insufficient data on small subpopulations (e.g. disabled) |
| Extended (Sit-Down) Interviews | <ul style="list-style-type: none"> • Most in-depth information of any method • Reach both users and non-users • Capture nuances of problems identified from other forms of data collection • Facilitates discussion of planned (but not yet implemented) systems | <ul style="list-style-type: none"> • Depth of information at expense of breadth • Sample may be non-representative; sampling strategy is very important. • Large volume of data generated can be overwhelming; data reduction strategies are needed |
| Homogenous Focus Groups (Users Only) | <ul style="list-style-type: none"> • Capture needs of specialized populations • Brainstorming of and feedback about potential solutions • Facilitates discussion of planned (but not yet implemented) systems • Examine how a policy change might be perceived publicly • If desired, identify potential participants for follow-up or future collaboration | <ul style="list-style-type: none"> • Same as in-depth interviews • Logistically more complicated to organize than interviews • Because respondents influence each other, groups are <u>not</u> a shortcut for individual interviews • Lack of involvement from planners may reduce impact of results |

| Method | Advantages and Best Uses | Limitations and Drawbacks |
|--|--|--|
| Heterogenous Focus Groups (Users and Planners) | <ul style="list-style-type: none"> • Same as homogenous focus groups • Opportunity for planning team to learn directly from users • Ability to speak with planning team helps recruit participants • Useful in situations where previous public involvement has been conflictual or difficult | <ul style="list-style-type: none"> • Same as homogenous groups (except for planner involvement) • Planners must be willing to attend groups outside of normal working hours. |
| Small Public Meetings | <ul style="list-style-type: none"> • Similar to focus groups • Good for identifying ideas and solutions, and small-scale design decisions • Can be executed without an outside researcher or consultant • May help secure allies and support | <ul style="list-style-type: none"> • Important to foster two-way communication • Participants may be frustrated if suggestions are not incorporated into planning/policy • High time commitment |
| Large Public Meetings | <ul style="list-style-type: none"> • Inform many people at once • Identify people interested in participating in other portions of social assessment plan | <ul style="list-style-type: none"> • Least effective method for learning <i>from</i> users. • Large number of respondents impedes two-way dialog. • Large format can lead to conflict |
| Ongoing Collaboration | <ul style="list-style-type: none"> • Time for discussion of community-generated solutions and technical problems they might face • Solutions generated are more likely to have stakeholder approval • Participants can be a resource for helping implement policies or confront opposition • Greater accountability for incorporating findings | <ul style="list-style-type: none"> • Highest time commitment over a long period • Participants may become frustrated if suggestions are not incorporated into planning/policy • Need to ensure participants in collaboration reflect the perspectives of the target groups • |

Any of these tools can be used for both planning new projects and expanding or reforming existing transit systems. However, seeking public input on systems that are dramatically different from existing options poses a few additional challenges. Users are readily able to describe their experience and problems with the existing transit system, but do not automatically have the knowledge needed to evaluate some aspects of the new system. There are two strategies to address this.

The first is to apply data about existing problems to the future system. For example, a change in transit mode will not dramatically change users' *ability* to pay (though for those with any disposable income, it may affect *willingness*). Users know what destinations they need to reach at what times, whether they feel safe walking near transit stops, how often they travel with children, and all sorts of other information that is directly applicable to any new system. Users also know how much they are currently paying, which is particularly important in informal transit systems.

The second strategy for assessing user needs in a not-yet-existing transit system is to build time into encounters with each research participant to describe possibilities or plans for the new system and answer questions. If users are presented with balanced information (not a public relations campaign), this equips them to better anticipate both the advantages and potential pitfalls of the new system. This is most doable with assessment methods that involve a longer contact with each user such as sit-down interviews, focus groups, and small public meetings.

Mixing Methods

Each of these social assessment tools provides valuable data, but they are even stronger when combined. First, the strengths of one method can balance the weaknesses of the other method and vice versa (Axinn and Pearce 2006, Small 2011). For example, an assessment that combines survey and interview data would have to sacrifice neither detail nor statistical representativeness. Second, multiple datasources can corroborate each other, increasing confidence in our conclusions.

In the case of social assessment of transit user needs, a third benefit is also critical: combining multiple methods can help ensure all relevant stakeholders are consulted. For example, imagine a planning team was interested both in the needs of current transit users and enticing former users to start using transit again. An appropriate social assessment strategy might combine in-transit interviews with current users and stationary interviews or focus groups with non-users, ensuring that both groups' perspectives are adequately included in the research.

3. Designing a Social Assessment Strategy

When creating a plan to conduct a social assessment, several questions need to be addressed.

- **What questions do we need to ask?** What are the data needs for the project being studied? What are the community's main concerns outside of these pre-identified needs?
- **What groups of people do we need to reach?** Who do we hope will benefit from the project? Who else might be affected? Are there any stakeholders who are socially or economically vulnerable?
- **What assessment tool or combination of tools will best answer these questions and reach these populations?** Researchers should consider both the characteristics of the tools themselves and begin creating a sampling strategy (Who will we interview? How will we recruit people for our survey? Where will we publicize upcoming meetings?).
- **What resources, including time, are needed to enact the strategy?** If we lack the resources to carry out our ideal plan, how can we best approximate it?
- **How will the results be used?** In order to ensure accountability (see Ch. 2), it is best to consider how the results fit into the planning process before beginning to collect data.

Asking the Right Questions

Every city is unique. Therefore, we should start an assessment assuming there may be issues we do not yet know about. Rather than just asking what transit users think about issues X, Y, and Z, researchers should begin with a broader question: What issues are important to transit users? Once the major issues have been identified, researchers can focus in greater depth on more specific topics.

Note that *the only way for respondents to raise issues that have not been pre-identified by the researchers is to include at least one qualitative assessment method.* This does not necessarily rule out choosing a survey as

the sole social assessment method; as described in the methodological appendix, surveys can produce qualitative data through the use of well-designed open questions. However, qualitative data from surveys tends not to be as detailed as that from other methods.

Reaching the Right People

Not all transit users are the same. When designing a social assessment strategy, it is important to clarify which groups of people you would like to learn from. The main groups of interest are generally current transit users, potential users (or current non-users), and groups that face extra barriers to mobility such as the elderly, disabled, very poor, or vendors who use transit to bring their goods to market. If it is desirable to reach multiple groups, a combination of methods may be needed. It is also important to consider divisions within the population of current transit users such as class, gender, ethnicity, and age; different subpopulations may have dramatically different needs.

Surveys and in-transit interviews both tend to reach rush-hour transit users. If a potential expansion to a formal system is being studied, potential users of the new line may be interviewed at existing informal transit stops in the area. Please note that neither surveys nor in-transit interviews are ideal tools for consulting disabled users and potential users, and surveys may not provide enough information to meaningfully analyze the needs of groups that represent a small percentage of the population. However, the in-transit interview method can be adapted to reach other populations by choosing places and times where other populations of interest may be found.

With a well-designed sampling and recruitment strategy, sit-down interviews and focus groups can be used to consult virtually any type of transit user or non-user. For this reason, they are a good supplement to surveys and in-transit interviews. Public meetings also have flexibility to reach different populations. Those who attend are often knowledgeable advocates for their communities, but may not always be representative of their neighbors' concerns.

Synergy and Sequencing

When designing a single-method social assessment of transit user needs, the proposed strategy can be evaluated based on the strengths and weaknesses mentioned in Table 2.1. However, when multiple methods are used, it can be valuable to look at areas of synergy, where the combination of assessment tools produces more or better information than the sum of each individual tool. For example, one particularly strong design is to combine surveys with some form of interview. This provides the data needed to know *what* the problems are, understand them in detail, and also know how *common* they are among transit users in general. Reaching the same conclusion from multiple methods also makes the results more credible.

Researchers must also decide in what order the different modules will be conducted. Different modules may be conducted simultaneously or sequentially. If data collection is sequential, one module may be used to improve the questions asked or instruments used in subsequent modules. For example, one common practice is to use interviews or focus groups to aid in survey

design, though the data can also be used for independent analysis. Interviews or focus groups conducted *after* a survey can be used to examine surprising findings or focus in greater depth on the main problems identified by the survey.

Using multiple methods can also result in a stronger report. A statistic from a survey, for instance, may help provide context for an interview excerpt by demonstrating how common the transit user's experience is. Including interview quotes in a presentation of survey data makes the findings less abstract.

Resources Needed

Table 3.1 summarizes the resources needed to execute various social assessment methods. Social assessment need not be prohibitively expensive. Many of these tools can be accomplished by a small group of staff members, or even an individual. Staff can build expertise in these research methods through the methodological appendix to this guide and the additional resources mentioned there. This has the added advantage of developing the organization's internal capacity, making it easier to reassess user needs and preferences periodically. Creative use of existing staff (such as temporarily reassigning student interns or traffic guards to survey collection) has also been successfully employed (see the case studies included in this guide).

Time for analysis should also be considered. Sit-down interviews, which provide the most detailed data, tend to be slower to analyze than the other methods (Rietbergen-McCracken and Narayan 1998). If fast information is needed, it may be helpful to combine interviews with other methods.

TABLE 3.1 Resources Needed to Execute Social Assessment Methods

| Method | Resources Needed |
|--------------------------------|--|
| In-Transit (Mobile) Interviews | <ul style="list-style-type: none"> • 1-3 interviewers • audio recorders or smartphones • Transit fares for interviewers • Staff or budget to transcribe or take notes on interviews • Recommended sample size: 40-200 interviews • Word processor • Optional: qualitative analysis software |

| Method | Resources Needed |
|--|--|
| Transit User Surveys | <ul style="list-style-type: none"> • Survey team of 10-15 people fulfilling the functions of designer, managers and field supervisors, enumerators, and data entry staff. • Photocopies • Analysis software (excel and/or statistical analysis package such as R, Stata, or SAS) |
| Extended (Sit-Down) Interviews | <ul style="list-style-type: none"> • 1 or more interviewers • Audio-recorder or smart phone • Staff or budget for transcription/ note-taking • Travel stipends, small gift, and/or honorarium for user participants • qualitative analysis software (optional) |
| Homogenous Focus Groups (Users Only) | <ul style="list-style-type: none"> • 1-2 Focus group facilitator(s) from outside the planning organization • Staff to recruit and confirm participants • Quiet meeting space • Audio Recorder (optional but helpful) • Travel stipends, small gift, and/or honorarium for user participants |
| Heterogenous Focus Groups (Users and Planners) | <ul style="list-style-type: none"> • Same as homogenous focus groups • 2-4 planning/policy staff members to attend |
| Small Public Meetings | <ul style="list-style-type: none"> • 1-2 facilitators from inside or outside the planning organization • Multiple meetings for different geographic sections of the city or subpopulations |
| Large Public Meetings | <ul style="list-style-type: none"> • Meeting facilitators • Meeting space |
| Ongoing Collaboration | <ul style="list-style-type: none"> • Staff <i>within the planning organization</i> with responsibility for ensuring the process continues • Meeting space |

Appendix A:

Methodological Appendix

The following chapters provide guidance on how to use the methods mentioned in the previous section. Many of the techniques described were used in studies conducted by the author in the metropolitan areas of La Paz and El Alto, Bolivia and Bogotá and Soacha, Colombia from 2014-2016. The two projects combined entailed two surveys with a combined sample size of 1,685 transit users, more than 250 interviews (both in-transit and sitdown), and four focus groups.

The recommendations that follow are drawn from both academic literature and practical lessons learned through these case studies. Examples drawn from the cases will be interwoven throughout the more detailed guides on implementing individual social assessment methods.

The cases were chosen for their contrast. Bogotá's TransMilenio is a pioneer in BRT, and has been operating for 15 years. La Paz and El Alto, in contrast, have begun their transit reform processes recently, and illustrate the challenges of attempting to implement something totally dissimilar from existing informal transit service. More details of the cases are described in Appendix B.

A1. Interview Techniques

A researcher who chooses to conduct interviews will be gaining an in-depth, detailed understanding of the perspectives of transit users. The job of an interviewer is to guide the interviewee (also known as the participant) through a conversation that is structured to address the research questions. This guide will discuss the steps of conducting an interview project: (1) Designing the guide and sample strategy, (2) Recruiting participants, (3) Conducting interviews, (4) taking field notes, and (5) analyzing and using data.

I will discuss two types of interviews: traditional sit-down interviews, conducted in an office or home, and mobile in-transit interviews. In-transit interviews (generally 5-15 minutes) are one of the simplest tools for getting immediate, relatively detailed data about transit users' perspectives. Sit-down interviews, which typically last 45 minutes or longer, allow a deeper examination of each topic. Because the interviewer has some time to build a trust relationship with the interviewee, sit-down interviews are also a better venue for asking questions that may be perceived as personal or intimate, or about illegal behavior (such as fare evasion).

Sit-down interviews are also an excellent method to reach stakeholders that will be undersampled or excluded from other data collection tools. For example, rush hour interviews and surveys will exclude non rush-hour commuters, and a sampling design based on work commuting patterns may under sample women (Peters 1998). People with mobility impairments may be unable to use the current system either at all or during peak periods, if crowding is an issue. And, of course, interviews can be used to reach former or potential users who do not currently take transit.

Both types of interviews rely on the same set of skills, though I will be addressing differences between the two techniques. This guide is intended to provide enough information to allow a researcher to include interviews in a social assessment. For those who are interested in more-detailed guidance, I highly recommend *Learning from Strangers*, by Robert Weiss.

Designing an Interview Guide

Interviews should be used to collect participants' uninfluenced attitudes about public transport. They may also be used to get more data on specific problems that have been identified in advance or, if conducted later in the assessment process, questions that arise from early findings.

An interview guide differs from a survey questionnaire in that the questions are open-ended, aimed at soliciting details rather than a discrete answer. While some interviewers prefer a fully-scripted list of questions, many researchers prefer a guide that more closely resembles a checklist of topics to cover or take a non-traditional form such as an A-Scheme diagram (Aspers 2009). In either case, the guide should be considered flexible. The interviewer should ask follow-up questions customized to each participant's responses. If an interviewee appears not to understand a question as worded or interpret it differently than intended, the interviewer should rephrase.

Interview guides move from the general to the specific. The conversation begins by soliciting a respondent's uninfluenced views on transportation, and then fills in the gaps by asking specifically about topics of interest that did not arise organically. It is important to begin with general questions *before* prompting respondents about specific issues to avoid unduly influencing their initial responses.

The In-Transit Interview Guide

Box A1.1 is adapted from the in-transit interview guide used in the two case studies included in the appendix. The first question is the most important for establishing users' baseline concerns. The guide is also front-loaded with the most important questions, as it is expected that a portion of interviews will be interrupted when a participant's bus or train arrives. The guide is designed to be flexible and to adapt to the researchers' increasing knowledge about local conditions. For example, the list of issues in Part B of Box A1.1 should evolve as interviewers learn more.

BOX A1.1 Example In-Transit Interview Guide

PART A: Open Questions

- What are the main problems with [public transport system] in [city] today?
- What is the worst/best thing that has happened to you using [transport] here?
 - Is that common?
 - What made it an unpleasant/pleasant experience?
- How often do you use [transport system]? *You may ask about multiple modes if applicable.*

PART B: Prompted Issues

I am going to mention some issues that have come up in other conversations. I'd like to hear your opinion about them. For example, do you think they are a problem here, how much, are they something you have experienced, things like that.

[note: at each interview, only ask about the topics they haven't already discussed in part A. This list should be customized to local conditions]

- The cost of transport
- The safety of transport (crime, road safety)
- Travel times, or how long your trips last (may specify waiting times and travel times)
- How transit staff treat users
- How users treat each other
- Pollution from public transport

PART C: Demographic information

Ask about key demographic variables, such as age, gender, ethnicity or race, income/poverty, gender, disabilities, education, employment, etc.

The Sit-Down Interview Guide

At its simplest, the sit-down interview guide can be nearly identical to the suggested in-transit guide, with questioning conducted at a slower pace and more detailed follow-up questions. If some questions are expected to be emotionally difficult for the participant (such as discussion of having been a victim of a crime), these should also be asked later in the interview. If the interview sample contains respondents who were *not* included in other assessment methods used, the sit-down interview should be used to solicit an overall portrait of the participant's concerns. Otherwise, the guide may focus in greater depth on a smaller number of specific topics.

In addition to the types of interview guides already mentioned, one tool that proved very valuable for the cases reported here was the use of physical “show cards” (see box A1.2) These were pieces of information such as photos and excerpts from other interviews printed out on card stock and used to facilitate discussion. In-keeping with the principal of moving from the general to the specific, these cards were used after participants responded to more general questions.

Using Photographs

Participants were shown photos taken at field interview sites and other sections of the city showing common conditions of the transit system. Reitbergen-McCracken and Narayan refer to this method of inciting discussion as a "photo parade," and the technique can also be used in focus groups or meetings (1998, 278). Using photographs in sit-down interview interviews of transit users incorporated some of the advantage of in-transit interviews into the sit-down interviews by giving participants more material to reference. The photographs were also helpful for examining users' beliefs about the causes of the conditions shown in the photos. This was particularly true of images showing user (mis)behavior such as hanging out of the station doors at a crowded station, jaywalking, and fare evasion.

Complex Social Issues

Show cards were particularly valuable for examining sexual assault, a problem with physical and cultural dimensions, and contributing factors emanating from both within and outside the transit system. Participants in both Colombia and Bolivia were shown a series of comments (primarily from other interviews) about sexual assault on transit. These included the experiences of assault victims and the opinions of non-victims, and, where available, statistical information on the frequency of assault. In a group dialog, some participants would be afraid to express disagreement, while others might become angry at someone expressing an opinion they strongly oppose. The use of the cards allowed all participants to engage with the perspectives of other transit users in a safe space, eliciting detailed, thoughtful responses.

Box A1.2 Sample Prompt Cards from Sexual Assault Module (Colombia)

38% of female TransMilenio users between the ages of 18 and 50 say they have been sexually assaulted on public transit.

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“Six years ago, I was waiting for TransMilenio, and **this guy came up behind me and started rubbing his genitals against me.** There were so many people on the platform, I thought it was because of the crowding. But when I got on the bus, the guy stayed behind, **looking at the other women** on the platform, surely to do the same to them. You have to **live your whole life on the defensive.**”

-Public Transit User

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When there are a lot of people, **there’s always going to be groping.** But women, just like men, have sexual desires, so **15-20% of women like that this happens to them.** But since the feminist movement appeared, **women complain about everything.**

-Public Transit Planner

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New Systems

A sit-down interview can also be a chance to learn users' perspectives on a system with which they have no analogous experience, such as the first BRT line in a region. The interviewer can explain the major features of a system and some of the expected effects. Care should be taken that this description is as close to neutral as possible; otherwise, the interviews may simply identify users' reactions to a publicity strategy rather than the system itself. These conversations may also serve as a bridge to connect users' concerns with existing, often informal service to the ways that a new, formal system might be able to address users' underlying needs.

Sampling Strategy

Because a small random sample can end up being very unbalanced, rigorous qualitative studies rely on purposive (rather than random) sampling (Weiss 1994, Marshall and Rossman 2011). The intent is to seek out a range of perspectives that represents the diversity of transit users. Users of different ages, genders, and incomes should be interviewed. Populations that face more severe transport barriers, such as people with disabilities, should be specifically sought out. In general, The goal is to understand a complex set of issues rather than to extrapolate statistically; this is one reason interviews can pair well with survey research.

Ideally, interviews should continue until new interviews are not revealing anything surprising; this is the point at which *data saturation* has been reached (Guest et al 2006). In practice, 40-60 interviews is suggested as a baseline sample size for in-transit interviews. Larger samples have the additional benefit of allowing some preliminary quantitative analysis. Recommendations for sit-down interviews vary, but a sample of 15-20 interviews should be enough to achieve data saturation for a single group of respondents (Guest et al 2006).

For in-transit interviews, Interviews should be conducted in different parts of the city and at different times of day. Approximately ten transit stops should be chosen as interview sites. In an informal system, local planners can assist with identifying points of high demand. The sites should include transit that serves central and peripheral neighborhoods, rich and poor areas, and different geographic sectors. It may be desirable to include a station near a local university, or a manufacturing area. Transfer points can be particularly valuable interview sites as they serve an array of users, and because users are more disposed to be interviewed when they are waiting. Stations can be selected using a stratified random sampling strategy; when the number of potential sites exceeds the number needed, the researchers can select from among them randomly.

To attain a diverse sample for *Sit-down Interviews*, it may be helpful to think of the population under study in terms of cells. To take a simple example, a case with two cities using the same transit system. It might be desirable to interview both men and women in each city. To achieve this, the researcher could set a goal of interviewing 3-5 men and 3-5 women in each city and a final sample size of 15-20 transit users.

While it is ideal not to rely exclusively on a convenience sample of the easiest-to-reach participants, some degree of pragmatism is needed when identifying interview subjects. *Chain sampling*, sometimes known as snowball sampling, can be helpful in this regard. In chain sampling,

one interview subject is used to identify subsequent participants. This greatly facilitates the process of identifying potential respondents, but at the potential cost of variation within the sample. One way to capitalize on the pragmatic utility of chain sampling while decreasing this disadvantage is to employ chain sampling with multiple points of entry. Interview participants may be identified through in-transit interviews, community leaders, community organizations (whether or not they work on transportation issues), religious institutions, and social connections. Each initial respondent may be the start of an independent sampling chain.

When sampling community members, it is important to remember that community leaders and organizations may or may not be a good representation of the people they purportedly represent. These groups can nevertheless be an important part of an interview study for several reasons. First, the community group's perspective may be important for transport policy, and interviews with leaders can be used to compare the leaders' perspectives to those of unaffiliated transit users. Secondly, in some neighborhoods where crime or suspicion of outsiders are major factors, working with a local community organization may be the only way to gain access to residents of the neighborhood.

Recruitment for Sit-Down Interviews

Appointments for sit-down interviews are typically made in advance, though some researchers have partnered with community organizations to have “interview days” working out of a neighborhood site. It is important to remember that not every person who makes an appointment will keep it. Working through chain sampling and with organizations can make potential interviewees more likely to follow through by creating a personal connection. Small stipends are also commonly used as incentives (Weiss 1994). The less inconvenient going to an interview is, the more likely the participant is to keep an appointment. This means that, whenever safety allows, it is very helpful to have the interviewer go to a location convenient to the respondent, whether that be a café in their neighborhood or even the respondent's home. Even taking these measures, there will still be some unannounced cancellations. The researcher should allow extra time for this and try not to take it personally.

Recruitment for In-Transit Interviews

With in-transit interviews, recruitment happens in the field, immediately before interviewing a participant. For many people new to field interviewing, recruiting participants is the most intimidating step. It may feel uncomfortable to approach a stranger, or improbable that they would want to give their time for an interview. It is helpful to remember that being interviewed provides several benefits to participants. They are given an opportunity to express their concerns and a sympathetic ear for doing so. Users are also very supportive of efforts to make transit better, and so may be particularly interested when told that their responses are being shared with local transit planners to help improve service.

Recruiting participants is facilitated by using a script like the following:

"Hello! I am [name], and I'm from [organization]. We're talking with transit users about their experiences to look for ways to improve service. Is it ok if I ask you a few questions? It usually takes 5-10 minutes, but please feel free to leave earlier if your bus comes."

It is important not to become discouraged if a potential respondent declines; this happens even to experienced interviewers. However, it is sometimes worth restating the benefits of the study and asking a second time. For example, the interviewer might say, "I understand that you are busy, but your perspective would really help us understand the problems with transit better, and we're sharing them directly with [municipal planning organization]. May I ask you some questions?" It is not recommended to ask a third time.

It is significantly easier to recruit transit users who are waiting for transit service as compared to those arriving at their destination. Therefore, while in most cases it is easiest to conduct interviews during evening rush hour, it may be more fruitful to visit bedroom communities in the morning.

Conducting Interviews

An in-transit interview is a brief, structured conversation. It differs from a survey in that the interviewer should treat the guide as flexible. The guide can serve as a reminder to help ensure all topics are covered, but the interviewer should feel free to rephrase questions if a respondent does not understand, to ask follow-up questions, pursue relevant topics not included on the original interview guide, and to solicit greater detail. While it is important that general questions precede more specific ones (the "funnel" method), section B of the guide should be viewed more as a checklist than a list of questions.

The interviewer must fulfill two major functions.

1) gently steer the conversation through the desired topics without influencing the content of responses

Box A1.3 shows some example neutral probes that can be used for this purpose. It is also important to pay attention to transitions between topics.

2) Build an interview partnership

The quality of data in an interview is strongly related to how comfortable a participant feels sharing his or her experiences and perceptions with the interviewer. It is therefore important to build establish trust and establish the interview as a partnership (Weiss 1994). This can be accomplished by listening actively, demonstrating interest in what the participant is saying, asking intelligent follow-up questions, and not repeating questions that the participant has already answered. In mobile interviews, successfully establishing a partnership may result in longer interviews, as an invested participant may be willing to let their bus pass by and wait for the next one. Box A1.4 contains more guidance on building a research partnership.

3) Solicit detailed, "rich" responses

Interviewers should look for opportunities to capitalize on users' detailed knowledge of the daily experience of using local transit. The interviewer should be attentive to "leads" indicating that a participant has more information to offer on a topic (Weiss 1994). For example, if a transit user mentions briefly that they were injured attempting to board a jitney, the interviewer may wish to get the full story before moving on to the next topic.

BOX A1.3 Sample Neutral Probes for Interviewers

Adapted from Weiss (1994)

Seeking Details

"Can you say more about that?"

"Can you tell me about a time that illustrates that?"

"Can you tell me, step by step, what happened?"

"Was that typical?"

"What were you thinking/feeling when that was happening?"

Guiding the Conversation

"Thank you for sharing that with me."

"If I understand, what you're saying is [...]. Is that exactly right?"

"Thank you. Now there is another issue I wanted to ask you about. It is..."

For a talkative respondent: "This is very interesting! I'd like to be respectful of your time, and there are a few other topics I'd like to cover. Would it be ok if we move on?"

Box A1.4 Building an Interview Partnership

Adapted from Weiss (1994)

- Actively listen without judging: this is the most important skill for any interviewer. The participant needs to feel that they are being heard by someone who respects their experience. Even when the participant is saying something with which the interviewer disagrees, it is important to be appreciative that they are candidly sharing their perspective. If evaluation happens, it should happen during analysis, not interviewing.
- Keeping the Conversation Flowing: The interviewer is also responsible for making the conversation flow in a way that feels natural to the respondent by organizing questions in a logical order and providing logical verbal transitions between lines of questioning.
- Continuously build trust: The strength of the interviewing partnership grows over the course of an interview as the interviewer listens respectfully. It is therefore a good idea to reserve questions that are expected to be difficult for the interviewee for later in the interview, when trust is stronger.
- Be a person without making it personal: Interview participants are naturally curious about the person with whom they are conversing. A participant might ask how the interviewer became interested in the study, or whether they share an interest in some topic other than transportation. It can be appropriate to answer these questions briefly. Respondents will also sometimes ask how the interviewer would respond to the question she has just posed. An easy way to deflect these questions is to say "I'd be happy to tell you after we finish the interview. Right now, I'm interested in what *you* think."

Tape Recording and Beginning Interviews

It is recommended that interviews be tape recorded for several reasons. Recording helps an interviewer make the most of the interview by capturing the data in its original format, rather than summarizing the information in the field and potentially missing details. Second, if the interviews will be followed by a survey, a recording or transcript can be a good source of nuanced quotations to help illustrate and explain survey findings.

In-transit interviews are recorded in locations with a lot of background noise. It is therefore important to ensure the recording device used can effectively filter most of this noise out, focusing on the primary conversation. For this reason, a dedicated recording device may be preferable to a smart phone. The author uses a Zoom H1 Portable Digital Recorder. External microphones are available that are compatible with some smart phones, providing another option for improving sound quality. Any recording device or system should be tested in comparably noisy surroundings to ensure it produces understandable audio. A wind screen may also be necessary in outdoor environments (though a baby sock can be used as a budget alternative).

It is necessary to ask permission from all interviewees before recording. This may make some participants nervous. It helps to act as though the recorder is a natural part of the conversation, and explain the benefits. The author usually says "Is it ok if I record? It helps me focus on listening to you instead of writing."

Ending the interview

Always close by thanking the respondent for their participation. If additional interviews, focus groups, or meetings are planned, this is also an opportunity to ask if the respondent might be interested in participating in subsequent stages of the project. Interviewees may also have acquaintances who would be valuable contacts. An interview can potentially serve as an entry point for a cluster of interviews within a neighborhood or social group.

Taking Field Notes

Field notes are those taken while out conducting interviews, either before, during, or after the conversation. At a minimum, the notes should include basic logistical information (who was interviewed, spelling of names and job titles, date, location) to make labeling the dozens of audio files produced by an interview study easier. Notes are also often used to record information that might not show up on an audio-recording or interview transcript, such as where you met a participant, that they travel with a cane, and any pertinent remarks they made after the recorder was turned off (with permission, of course).

It can also be useful to write 1-2 sentences identifying the main issues discussed and any information the researcher found surprising. This process can help guide continued data collection and also provide an early reference of preliminary interview findings before full analysis can be completed.

It is very difficult to give full attention to an interview subject while taking notes. It is therefore recommended to take very brief notes during the interview, and expand on them immediately after the interview when recall is at its best (Weiss 1994). This is also the strategy employed by researchers using qualitative methods such as participant observation, where most research interactions and interviews are not audio-recorded (Marshall and Rossman 2011). Alternately or in addition, a second researcher may observe the interview and take notes.

Field Notes for In-Transit Interviews

In addition to the functions listed above, conducting interviews in the field is a valuable opportunity to observe the functioning of the transit system at points that were strategically chosen in the sampling process for the interviews. Field observations may corroborate what is being said in interviews, allowing triangulation (providing better support for a conclusion by supporting it with multiple types of data) (Marshall and Rossman 2011). Researchers may also observe practices about which they may want to ask questions. Field notes may also discuss any difficulties with data collection, and the interviews themselves

Field notes about the transit system might cover the physical layout of the transit stop, the condition of vehicles, how many passengers are waiting, whether passengers wait in a queue or a crowd, and other relevant details. In some cases, it may also help to draw a diagram or map of the transit stop or station. The notes should be descriptive rather than placing value judgements. For example, instead of saying an intersection is badly designed, a researcher might want to note that there is no crosswalk and that there are conflicts between vehicles and pedestrians. The descriptive field notes provide more information and allow later analysis based on a fuller picture of field conditions.

Photographs of the interview sites can also be very valuable as additional evidence, for use in subsequent interviews and focus groups, or simply for presenting findings. Depending on the conditions at the stops and the risk of theft, it may be preferable to devote a day to taking photographs at many different sites rather than carrying a camera every day.

Analyzing and Using Data

In-Transit Interviews for Survey Design

In-transit interviews are very useful for designing instruments for subsequent data collection instruments, such as survey questionnaires. Even before formal analysis begins, the researcher(s) conducting in-transit interviews will have cultivated in-depth knowledge of transit users' views of the problems with local transit. For example, the interviewer will be able to identify the most common issues raised in interviews, even if he or she cannot rank these common issues against each other. The interviewer will also know common phrases used to discuss these issues. For this reason, it is helpful to have at least some members of the survey design team participate directly in the in-transit interviews. However, using in-transit interviews only as tools for survey design fails to capitalize on much of their potential to help with identifying and understanding transit users' needs. For example,

interviews can help explain or illustrate survey findings, and can be used to assess validity of categories used in the survey (Axinn and Pearce 2006).

Analysis of the interview data can also produce valuable results independent of other assessment methods. Interviews allow investigation of variation within users' views of broad problems, including perspectives on root causes. For example, while many TransMilenio users were concerned with user (mis)behavior such as pushing, failing to respect queues, and failing to yield to the elderly and people with disabilities, in-transit interview data revealed a divide between those who attributed the problem to civic culture and those who viewed these behaviors as inevitable results of the system's extreme rush-hour crowding. An effort to improve user behavior through educational campaigns alone would risk alienating this latter group.

In the case of problems that have multiple negative consequences, in-transit interviews can reveal which underlying concerns are most salient to users. For example, *trameaje* in Bolivia increases the cost of transport, travel time and uncertainty, walking distances, and the risk of crime. *Trameaje* was almost universally identified as the main problem with public transport; the in-transit interviews helped establish that for most users, the primary underlying concern was cost.

Interviews can also be used to assess to what extent users trust planning agencies' intentions and ability to improve transit and to seek details on uncommon experiences when victims are encountered. They are also useful when users are ambivalent, as with the commonly-expressed sentiment that TransMilenio was the best option, but only because other available options were viewed as even more unacceptable. Finally, in-transit interviews can help planners put educational and publicity materials in terms that match users' vocabularies.

In-Depth Interview Analysis

Interview analysis can be facilitated by two major tools: coding and writing research memos. The aim of both tools is to help identify patterns and reduce a large amount of information into the most valuable data. Coding and memoing can be used together, or memoing can be used on its own.

Coding involves identifying key themes within the data and tagging them where they appear. In the context of in-transit interviews, the codes will likely be the problems identified by users, though space should be left for adding codes not originally accounted for in the coding scheme to avoid missing important issues. Coding may be as simple as highlighting sections of text in different colors, which can be accomplished with a simple word processor, but it is generally assisted with qualitative analysis software such as MAXQDA, atlas.ti, NVivo, or the online platform Dedoose. Each program has its advantages and disadvantages. The author uses MAXQDA, but for researchers not affiliated with a university, it is worth noting that Dedoose offers a monthly subscription. For short-term projects, this is the most affordable non-academic qualitative software license available.

Coding is not, in and of itself, data analysis; it is a way of analyzing and sorting information (Maietta 2006). Data may be fully coded, where every instance of every theme is tagged, or the researcher may use highlight-coding, tagging only sections of an interview that are of particular interest. Full coding allows quasi-statistical analysis, but is time consuming, especially for a large sample of interviews. Highlight coding is most useful as part of a well-structured process of

memoing, with most of the analysis actually occurring as the researcher writes about the interview contents. One option is to full-code a subset of interviews and highlight code the remainder, balancing depth and breadth.

For the case studies discussed, a blend of these strategies was used. User responses to the first question, on the principal problems with public transport, were full-coded. This allowed a count of how many users mentioned each problem, providing data in a similar format to that which resulted from the analogous survey question.

The remainder of each interview, where participants were discussing issues specifically brought up by the researcher, was highlight coded. For example, every instance of the code for fare evasion on TransMilenio was marked in the responses to the open question. However, if a participant responded to a question about whether fare evasion specifically is a problem with a simple yes or no answer, this would not have been coded in highlight coding. Rather, the codes would have been applied to more in-depth responses such as "I think it's unfair because we make a sacrifice to pay the fare and others take advantage" or "my friends evade the fare to avoid the long queues and also because they don't want to pay for such bad service." More in-depth responses such as these help capture consensus or heterogeneity in users' perspectives on each individual problem.

After highlight coding was completed, the researcher examined each problem with transport one at a time, using the qualitative software to retrieve all interview segments marked as pertaining to that topic. These quotations were compared to each other. For example, this analysis revealed that TransMilenio users shared a consensus about the problem of crowding, but there were disagreements on the subject of ambulatory vendors; some viewed vendors as individuals who are just "looking for a way to support their family" in difficult circumstances, while others viewed the vendors' presence as a contributor to crime within the system. This type of information can be useful when deciding how highly to prioritize removing vendors from the system and which communications strategy to choose when doing so.

Some studies have multiple people code each interview to check for inter-coder reliability. This strategy can be valuable when quasi-statistical analysis is desired, but it is important to consider the cost of having multiple coders in relation to the benefits. Having each interview double-coded more than doubles the amount of time and money required for analysis. Many, but by no means all academic studies use multiple coders. Alternate methods of ensuring reliability can be used, such as having the interview analyst confer with other people involved in data collection or conduct member checks such as conversations with transit users who have been interviewed (Marshall and Rossman 2011).

A2. Surveys

Surveys are a common method of consulting transit users. While surveys are a valuable tool, it is important to ensure that they address the issues that are relevant to users, and provide data that is concrete enough to be actionable. This section will discuss general strategies for ensuring a survey questionnaire is appropriate to local context and then two specific types of survey items: open questions and critical incidents.

Ensuring a Good Local Fit

To accurately capture transit users' perspectives, a survey must ask questions and provide response options that match a respondent's true opinion reasonably well. To take a simplistic example, suppose we wanted to find out about users' priorities for service improvements. We might ask them to select the most important from a list of options, say "Improve the speed of public transit," "Control vendors in the system," and "Combat fare evasion." This list may leave off the true priority of many transit users; some obvious examples would be users whose primary concern is with the cost, comfort, or coverage of the transport system.

Even if their true priority is not reflected in the response options, most users will choose from the options given (Tourangeau et al 2000). This could give the false view that support for controlling vendors, for example, is stronger than it is. Please note that including an "other" option does not solve this problem, as a very small percentage of respondents tend to choose "other," even when available (Schuman and Presser 1979). For this reason, it is important to ensure that the full array of issues important to users is included in the survey. This is best achieved by speaking directly with transit users before designing the survey through interviews or focus groups.

It is also important to make sure the survey matches the local vocabulary, especially if it is being adapted from an instrument used in another country. This is true even if the main language of the two locations is the same; transportation vocabulary tends to be idiosyncratic. A *minibus* refers to a medium-sized bus in Colombia and a 14-passenger van in Bolivia. The Colombian minibuses are instead known as *microbuses*, a word that is used to refer to medium and large vehicles alike. If interviews are being used for survey design, pay attention not only to the ideas expressed but to the vocabulary used.

As with all surveys, pre-testing is important. Resources often do not allow for a large-scale pre-test, but even a few days of pretesting can identify critical issues. For example, the TransMilenio survey originally asked both male and female users about experience with sexual assault, but pre-testing revealed that many male respondents were interpreting inappropriate contact to mean having been pushed by another passenger. The survey was revised to only ask the question of female users.

Survey enumerators can also be a good resource, especially if they are encouraged to pay attention to questions users have difficulty answering or interpreting and report these observations to the investigators.

Using Open Questions

Including one or more open questions in a survey is a good way to preserve flexibility and make sure the survey does not develop a “blind spot.” This corrects for the accidental exclusion of relevant issues of which the survey team was not aware. Open questions can also help a survey instrument maintain its relevance over time as the conditions of the transit system itself change (Schuman and Presser 1979).

The most basic and most useful open question is to simply begin the survey interview by asking “what are two main problems with public transportation in [city]?” It is critical that this question *precede* closed questions on the same topic because users will otherwise incorporate previous questions into their responses (Tourangeau et al 2000, Kash 2013). Asking for two problems signals to users that they can offer multiple issues and may encourage them to think beyond the problems they have experienced most recently, reducing bias induced by the tendency to answer relying on the first idea that comes to mind (ibid). In the Colombia and Bolivia cases, interviewers were instructed to record excerpts of respondents' exact words and also to code the responses in the field from a list included on the questionnaire (see Box A2.1 for one example). The responses were blind recoded by data entry staff, and discrepancies were addressed.

A cautionary note: the list of available codes can influence what survey enumerators focus on as the main points of a transit user's response or the vocabulary used to summarize. This happened in the Colombia survey, where the code list included “lack of citizenship culture”, which refers to undesirable behavior by users such as pushing. However, when the survey data was compared to the responses during in-transit interviews, which were fully transcribed from audio recordings, it was revealed that a substantial proportion of users concerned about undesirable behaviors actually attribute them to the crowding in the system rather than culture. It is therefore important that the list of codes be as closely matched as possible to actual likely responses, and that codes refer to problems rather than value judgments about problems. Users' own value judgments can be captured in their exact comments.

Box A2.1: Example Open Question from TransMilenio User Survey

In your own words, what are two problems you see with public transportation in Bogotá and Soacha today?

Instruction for interviewer: if including the interviewee's exact words, put them "in quotes" to distinguish them from a summary.

Code List

1. Accessibility (people with disabilities)
2. Cost
3. Citizenship Culture
4. Crime
5. Physical State of Stations/Vehicles
6. Not enough buses
7. Queues to enter station
- 8a. Waiting time
- 8b. Travel Time
9. Crowding in Stations
10. Crowding on Buses
11. Bad Planning/Chaos
12. Congestion
13. Vendors
99. Other

So if I understand correctly, what you said to me is... *[read your notes, and make corrections if necessary.]*

In an interviewer-administered questionnaire, the success of this open question hinges on proper training of the survey staff. Staff must be trained to accurately record a respondent's exact words, to paraphrase when appropriate, and to differentiate between exact quotes and the interviewer's summary. This distinction needed to be emphasized repeatedly in training field staff in both countries. They must also practice identifying the appropriate codes quickly and efficiently.

One successful training technique was to read aloud excerpts from in-transit interviews and have all survey staff practice transcribing and coding the response. Divergent codings can then be discussed among the entire group, helping all staff clarify definitions. If interview excerpts are not available, staff can practice by transcribing and coding each other's responses.

A second area in which open questions were used concerned expectations for new transit reforms. In Bolivia, residents of El Alto were asked what they had heard about Bus Sariri to assess their pre-existing knowledge. After a discussion of some of the potential benefits, they were also asked, "In spite of these benefits, what disadvantages do you think Sariri could have?" This question revealed transit users' concerns that Sariri would not improve travel times or have routes that met user needs. The information about route concerns proved particularly prescient – public disagreements about Sariri's routes later led to a chaotic implementation process.

Critical Incidents

Critical incidents survey questions assess users' overall experience of the transit system by measuring the specific experiences that influence how users view the system (Friman et al 2001, Bitner et al 1990). Each critical incident is a short description of a negative service incident that a user might encounter on his or her commute. For example, an interviewer might ask, "In the past seven days, on how many days have you had to make a queue to enter the transit station? How much would you say this type of experience bothers you?"

Generating Critical Incidents

Critical incident questions must be based on some type of interviews with transit users. This is because the method is most effective when all the relevant incidents have been identified in advance, and when they are phrased in a way that matches how transit users narrate their own experiences. In-transit interviews work well for designing critical incidents questions because of their relatively large sample and the ability to process the data quickly.

To generate the specific critical incidents, begin by making a list of the negative experiences most commonly mentioned. Next, make a list of the problems with transport mentioned, and categorize the experiences mentioned. Then, brainstorm additional experiences that reflect problems that are underrepresented among the incidents already generated. For example, if one of the problems identified is mistreatment by operators, the critical incidents questions might ask about being yelled at, pushed, given incorrect change, or other behaviors that were mentioned in interviews. It may also be valuable to include questions about experiences that only some users will view as a problem, such as seeing vendors and musicians in the system. Box 6.2 shows example critical incidents items.

From Incidents to Questions

One design consideration when writing Critical Incidents questions is the reference period, or length of time about which respondents will be asked. For day-to-day incidents, seven or thirty days can both be appropriate reference periods. The shorter period is useful because it allows respondents to answer more quickly and easily (Tourangeau et al 2000). However, for incidents that might occur only a few times each month, limiting the reference period to the past seven days may exclude people who have experienced the problem recently. The short reference period is helpful for diagnosing the behavior of the transit *system*, but the longer reference period is better suited to measuring the experiences of individual *users* (ibid).

For some incidents, such as being a victim of a crime, it is valuable to ask about whether the respondent has *ever* experienced the incident, without time limit. If a diagnostic of the current crime rate is desired, a follow-up question can be added about whether the crime occurred within the past 365 days. Asking about crime victimization can be particularly useful in the common situation where both robbery and sexual assault are underreported to the police or other authorities.

The second decision to be made is what scale to use when asking about how strongly respondents dislike the incidents being described. Both the Colombia and Bolivia surveys used a

three category scale (a lot, a little, not at all). Box A2.2 shows example questions from the Colombia survey.

| BOX A2.2 Example Critical Incidents Survey Items | | |
|--|----------------------------|--|
| <i>INSTRUCTIONS:</i> A. Read each incident. Ask, “In the last seven days, on how many days has this happened to you?.” B. Ask any relevant follow-up questions (indented). C. Ask: “How much does/would this type of incident bother you? Would you say it doesn’t bother you, it bothers you a little, or it bothers you a lot?” | How Many Days (0-7) | How Bothered 1 = no 2 = a little 3 = a lot |
| You traveled on foot the entire trip | | |
| Someone pushed you | | |
| There was a vendor in the station or on the bus | | |
| The bus was excessively crowded | | |
| You had to make a queue to enter the station The last time this happened, how many minutes did you have to wait? _____ | | |
| You let two or more buses that served your destination pass because there wasn’t room to enter | | |
| You waited more than 15 minutes for the bus. The last time this happened, how many minutes did you have to wait? _____ | | |
| You saw someone evading the fare | | |

Analyzing Critical Incidents Results

Critical Incidents can be analyzed using descriptive statistics, determining which incidents are the most common and which are the most disliked. The concrete nature of critical incidents makes for actionable results - strongly disliked problems may be good targets for policy interventions designed to increase user satisfaction.

The data can also be used to examine the correlations between experience and strength of dislike. For example, in Colombia, we found that experiencing quality of service problems more frequently was associated with increased dislike of encountering these incidents. In contrast, there was no correlation between witnessing fare evasion and viewing it as a problem, meaning that the severity of the problem does not automatically translate to public support for addressing it. In addition to analyzing incidents individually, factor analysis performed using a polychoric correlation matrix can be used to look at aggregated categories of incidents. With either type of analysis, the goal is to build an understanding of user satisfaction from users' experiences and perceptions rather than starting with a more abstract measure.

A3. Focus Groups

Facilitating focus groups require a similar set of skills as conducting individual interviews, with the added layer of managing interactions between multiple group members. To make sure all participants feel comfortable, a facilitator must make sure that participants listen and speak respectfully, and create a safe environment for shy or unconfident participants to contribute. These issues are magnified in mixed groups, where substantial power differentials may exist between the planners and community members participating in a joint dialog. A number of good guides to conducting focus groups in general are available (e.g. Greenbaum 2000, Morgan 1996). Therefore, after a brief discussion of recruiting participants and scheduling, this guide will focus mainly on mixed focus groups.

Getting Participants to the Table

Whether conducting individual interviews or a focus group, as many as half of community members will cancel or fail to attend an appointment. This tendency can be a problem when arranging a focus group. Intensive outreach and follow-up with prospective attendees is required. Researchers should make sure to have at least twice as many participants as desired confirmed, and to contact them with a reminder the day of the event. Strategies that help with recruitment include holding the focus group outside of normal work hours, providing food if it is during a mealtime, and providing childcare.

It is also possible to partner with a community organization to recruit participants. This strategy greatly simplifies the process of getting residents in the room. Researchers will, however, need to consider whether the participants brought by the community organization match the type of people the researchers wish to consult; this will need to be evaluated on a case-by-case basis. An organization may be the only method of reaching some marginalized populations, such as people with disabilities or neighborhoods where distrust of outsiders is strong.

Dialog Between Transit Users and Professionals

Mixed focus groups are a good opportunity for transport professionals to learn directly from transit users. However, the facilitator(s) need to take a few extra measures to promote an atmosphere where all participants feel comfortable sharing their perspectives.

First, to ensure community participants feel comfortable speaking up in front of technical experts, it should be emphasized at the beginning of the group that everyone - both users and professionals - is there to learn. It is also helpful to begin by having community members speak and transportation professionals react, rather than the other way around.

Second, it is important that transportation professionals feel safe asking questions and making comments, especially if transportation policy is a major political issue. One option is to have an asymmetrical confidentiality policy, where professionals are encouraged to share what they learned from the group with their colleagues but transit users are asked not to talk about the discussion outside of the group.

A4. Further Resources by Method

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APPENDIX B

Example Cases: Measuring User Needs in Colombia and Bolivia

Case One: Formalizing Informal Transport in Bolivia

This case is an example of a low-income municipality attempting to provide an alternative to an informal transit system plagued by problems. The case illustrates that it is possible to collect high-quality data with limited resources, but also highlights the importance of incorporating results of a social needs assessment into planning decisions.

Context

El Alto is the second largest city in Bolivia and the highest city in the world with an altitude of 4,000 m. El Alto is perched on Bolivia's altiplano, or high plains, overlooking La Paz, Bolivia's de facto capital. The two cities are linked geographically and economically, with a large number of *alteños* commuting to La Paz each day. At the time of the study, public transport in the metropolitan area was dominated by informal transport, predominantly vans known locally as *minibuses*. The region's transport system is one of the most atomized in Latin America (Pando Solares 2012).

However, three transit formalization projects were underway. Pumakatari, a municipally operated bus service, opened its first line in early 2014. The Mi Teleférico cablecar system, operated by the national government, began offering service connecting El Alto and La Paz a few months later. Pumakatari in particular was conceived of as a demonstration project with the plan to increase public support and enable the construction of more lines, eventually including BRT service.

El Alto was in the planning stages of launching its own municipal bus service, Bus Sariri (traveler in the indigenous Aymara language). At the same time, El Alto's municipal transit agency, SMMUS (Municipal Secretary of Sustainable Urban Mobility) had to contend with attempting to regulate widespread abuse by providers of the informal transit on which most *alteños* relied for their mobility needs.

Objectives

The investigator worked with SMMUS to identify *alteños'* needs regarding the existing transport system and the most important potential benefits of BusSariri. SMMUS was data poor; the survey conducted as part of this investigation was the first user survey from which the municipality had data. Therefore, attention was placed both on identifying the experiences and views of transit users in aggregate and on identifying the particular needs of vulnerable groups such as residents of outlying, informal neighborhoods, residents with disabilities, and small-scale vendors in the area's many markets.

Methods

The project began with 105 in-transit interviews with users in El Alto and La Paz. They were conducted in collaboration with Raleigh McCoy, an undergraduate research assistant who was trained by the investigator. The research assistant also conducted an independent investigation of the specific needs of disabled residents using interviews. The investigator met with the leadership of SMMUS and arranged for a collaboration to conduct a survey of transit users. Survey staff and resources such as photocopies were provided by SMMUS. The investigator was responsible for survey design with some input from SMMUS staff, and for training and supervising survey staff. The survey enumerators were a combination of student interns and employees usually assigned to traffic control. Due to the collaboration between the municipality and an academic investigator and use of existing resources, the total monetary expenditure for the survey was only 73 USD. The sample size of the survey was 929 complete observations. Preliminary survey results were presented to SMMUS before the close of fieldwork. The investigator also began sit-down interviews with transit users.

In between the end of the first fieldwork visit and the beginning of the second, seven months later, SMMUS announced the final plans for Bus Sariri and launched the service. The launch date was driven by the mayor's desire to implement Bus Sariri as soon as possible, and the system opened while missing vital components such as bus stops and maintenance facilities. The system was troubled but at least partially operational. During the second fieldwork visit, the investigator continued sit-down user interviews and worked with the staff of SMMUS to have a focus group with elderly and disabled potential users of Bus Sariri. A second focus group, with market vendors, failed to occur because the respondents were recruited by a single community leader, who cancelled at the last minute.

Results

Problems with Informal Transport

All social assessment tools identified the same primary issue with public transit: a local driver practice known as *trameaje*. *Trameaje*, from the Spanish word for section, consists of drivers illegally segmenting routes, allowing them to spend more time on the profitable sections of the route or collect multiple fares for what should legally be a single passage. *Trameaje* disproportionately affects users who live in low-income peripheral neighborhoods, who commonly pay double or triple fares. By forcing users to make additional transfers, *trameaje* also increases travel time and uncertainty of wait times. Further, it causes less profitable neighborhoods to receive inadequate service. In outlying areas, many users are forced to walk long distances along sometimes dangerous streets.

Aside from congestion, the other principal problems were also related to operator behavior. Operators drove unsafely, fare collectors yelled at or physically pushed passengers as they boarded, and discrimination against the elderly, disabled, and indigenous women was rampant. Even problems with security were viewed as partially related to driver behavior; several women who had

been sexually assaulted reported that the driver refused requests to remove the perpetrator from the vehicle.

Hopes and fears for Bus Sariri

The survey revealed that users of the existing informal transport were most excited about Sariri's potential to improve safety and security, as well as accessibility for disabled users. The benefit that resonated least with users was the service's potential to improve connectivity between bus and Teleférico service.

The most common fears were that Sariri would be slow due to congestion, and that the routes would not meet the mobility needs of *alteños*. A number of users worried that Sariri might not serve low-income neighborhoods on the periphery of the city, which were perceived as having the greatest transportation need. It should be noted that at the time, SMMUS's plans for the Sariri routes had not been publicized.

Outcomes and Limitations

Data collection encountered some limitations. In a country where most residents have a flexible view of time, getting all focus group participants to meet at a similar time was consistently difficult. One group had to be cancelled, and a second rescheduled. While most *alteños* either speak Spanish as a native or second language, many of the small market vendors, especially elderly women, spoke only Aymara; a translator was not available to help reach this vulnerable group. Finally, because the survey was conducted in collaboration with the municipality of El Alto, it did not include data about residents of La Paz, despite the interconnection of the two cities' economies and transport systems.

However, most of the limitations concerned how the data was incorporated into the planning process. SMMUS used the data in press releases to justify pre-made decisions, but was not open to using the results of the study to inform policy. Despite the lack of public enthusiasm for improving connectivity to the Teleférico and concern for connecting the residents of peripheral neighborhoods to the center of the city, SMMUS continued to pursue a route that skirted the city center, connected to the Teleférico, and deliberately avoided connecting to the informal transit most *alteños* used to travel to La Paz.

When this route was finally publicized just a few weeks before the planned launch, it immediately provoked public controversy and opposition from FEJUVE, a powerful citizens group that was otherwise very supportive of transit reform. This deprived SMMUS of an important ally a few weeks later when the informal transit operators paralyzed the city with repeated strikes. Under pressure from the strikes, SMMUS agreed to change Sariri's routes. FEJUVE then immediately assisted with breaking the strikes, sending members out into the street to physically confront the informal transit providers. While this cleared the way for Sariri in the short term, the chaos and difficulty adapting to the sudden change was a major factor in the virtually complete collapse of Bus Sariri over the next several months. This failed reform illustrates that simply collecting data is not enough; it must be incorporated into planning in a meaningful way (Arnstein 1969, Reitbergen-McCracken and Narayan 1998).

Case Two: Addressing a Crisis in BRT Service in Colombia

This case is an example of incorporating a social assessment of user needs into a mature system facing a crisis from declining quality of service and rising user dissatisfaction. It illustrates a successful use of survey and interview data to analyze a wider range of issues in greater depth than would be possible from using either method in isolation.

Context

TransMilenio, which began operating in Bogotá in 2000, is a leader in the BRT movement. While TransMilenio is the winner of a number of international awards and often considered the "gold standard of BRT" (Suzuki et al 2013), in recent years, quality of service and user satisfaction have declined precipitously. The demand for transport has outgrown TransMilenio's capacity to supply service. The system was strongly criticized by local political leaders. This included the mayor at the time this study began, Gustavo Petro, who publicly declared the system a failure. Petro was expressing a sentiment shared by many users, some of whom expressed their discontent by staging periodic walkouts and protests.

In spite of these challenges, in 2013, TransMilenio was able to expand service into the neighboring municipality of Soacha, a much poorer, quickly expanding city with a large number of commuters to Bogotá. However, because much of construction in Soacha is informal, official population figures underestimate the true population. As a result, the four new TransMilenio stations immediately became home to some of the most intense crowding in the system.

In late 2015, Enrique Peñalosa, the mayor who oversaw the creation of TransMilenio, was elected. When he returned to office in January 2016, he and his staff faced the formidable challenge of restoring the quality of and public trust in TransMilenio.

Objectives

The goals of this study were (1) to identify which problems were of greatest concern to users, (2) to examine user mistrust of TRANSMILENIO S.A. and identify strategies to address it, and (3) document the incidence of robbery and sexual assault, which was known to be a problem, but of unknown magnitude.

Methods

Data collection project began in 2015 with 51 in-transit interviews. These were used to design a user survey, administered to 756 TransMilenio users in Bogotá and Soacha. Survey enumerators were trained directly by the investigator and a consulting company managed the data collection. Preliminary results of the survey were presented to the staff of TRANSMILENIO S.A. and the office of the Secretary of Mobility in Soacha. The investigator began sit-down interviews with transit users, and a focus group fostering discussion between staff of the Secretary of Mobility and residents of an informal neighborhood in Soacha was conducted.

The second fieldwork visit in 2016 occurred after Dr. Peñalosa re-entered office, and the new staff of TRANSMILENIO S.A. requested a second presentation of survey findings. This resulted in a collaboration to host a focus group with women who had been sexually assaulted on TransMilenio. This visit was also used to finish sit-down user interviews.

Results

User-identified service problems

On-street interviews and survey data pointed to the same conclusion: the main problems, according to transit users, were travel times and crowding. Many users attributed both these problems to the inadequate number of buses for the number of riders. One of the most common incidents mentioned was waiting as multiple full buses passed because there was no room to enter. The next most common complaint was user behavior such as shoving and failing to yield to the elderly and disabled. While some respondents viewed this as a symptom of a lack of citizenship culture, others felt that the intense crowding made such behaviors inevitable.

While all users experienced similarly crowded conditions, the negative effects of the crowding were unequally distributed. Many users with disabilities found fighting rush hour crowds impossible, restricting their mobility at these times of day. Users traveling with children, elderly relatives, or shopping bags were also adversely affected. Both groups reported that the accessible infrastructure and preferential doors and seats were of limited utility when the system was operating past capacity. The crowding also affected physically small users (primarily women) more strongly. As one interview respondent explained, "I'm short, so sometimes I can't breathe well." As will be discussed below, the crowding was particularly unpleasant for victims of sexual assault.

Fare evasion and vendors in the system, both of which had become common, were notably absent from the list of problems users identified, despite the fact that more than 95% of users reported witnessing each phenomenon within the past week. One quarter of respondents reported having personally evaded the fare at some point. No correlation was found between witnessing fare evasion and considering it a problem. When asked directly about the issue, many interview

respondents did express that they felt fair evaders were treating other users unfairly, but others expressed sympathy for the presumed low-income fare evaders.

Mistrust of TRANSMILENIO S.A.

Interviews with users revealed that many did not trust either the intentions or the ability of TRANSMILENIO S.A. to fix the problems with TransMilenio service. The clash of views over fare evasion was one source tension. At the time, a number of highly visible and publicized efforts to curb fare evasion were underway; users questioned why fare evasion should be a priority while the quality of service remained so low. Many expressed concern that TRANSMILENIO staff were trying to make money at the expense of the quality of service. Other users felt that TRANSMILENIO staff must not understand how bad the experience of using TransMilenio had become. This mistrust had the potential to pose a significant obstacle to securing user collaboration with efforts to improve TransMilenio service, particularly those efforts that focus on low user priorities such as fare evasion.

An Epidemic of Transit Crime

Both robbery and sexual assault were at epidemic levels. More than half of TransMilenio users reported being robbed, and 38% of female users reported having been sexually assaulted. Have been a victim of robbery did not appear to have a strong effect on users' sense of safety, though this may have been because even those users who had not been robbed personally had heard family and friends talk about being victimized. Sexual assault did have a lasting impact on many victims' sense of safety and comfort using TransMilenio. Two-thirds of assault victims reported having had an experience where a fellow passenger touched them in a way that made them feel uncomfortable, but they were uncertain as to whether or not it was intentional (as compared to one third of women who had not been victimized). Interviews and a focus group with victims revealed barriers to denouncing attackers. While some women were relatively unaffected, others reported trauma symptoms such as hypervigilance of their surroundings and emotional distress upon entering crowded vehicles. The continued exposure to crowded TransMilenio vehicles was enough to motivate some victims to avoid TransMilenio where possible.

Benefits and User Ambivalence

Many TransMilenio users recognized that TransMilenio provides some benefits, notably in greatly reduced travel time compared to previous and existing alternatives (however, it should be noted that in response to a question about the most important benefits of TransMilenio, 18% of users spontaneously replied that there were no positive aspects). As one survey respondent summarized this conflict, "In spite of the bad service and everything else, in order to arrive early, one prefers to go in the pile-up that is TransMilenio."

However, a small percentage of users viewed TransMilenio service as good or very good. In interviews, satisfied users tended to be those for whom TransMilenio was an improvement over

their recent past experience. Many of these users were in Soacha, to which TransMilenio service had been extended recently. Some users of the new Soacha extension were saving more than an hour each way, producing tangible benefits in their lives. For example, a nurse who had suffered headaches from chronic sleep deprivation was now able to get enough sleep, and a student attributed his recent improvement in grades to the availability of more time to study. The mother of a disabled son, while noting all the difficulties of navigating the system with him, also noted that until recently, her only option had been to take an expensive taxi.

Outcomes and Limitations

The project documented some of the difficulties of directly measuring user satisfaction; there was no correlation between what users experienced and how satisfied with the system they reported being. There was, however, a correlation between the strength of their *dislike* for negative experiences and their satisfaction, indicating that in the case of TransMilenio, satisfaction may be determined more by exogenous factors than the quality of service of the system itself. It is possible this is because overall quality is viewed as unacceptable by virtually all users, or because many users have difficulty translating their ambivalence into a simple numeric description of their satisfaction.

Study results and a memo of findings and recommendations about sexual assault were presented to TRANSMILENIO S.A. during their process of planning for the next several years; that process is still ongoing.

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