

Meeting Minutes January 9-10, 2008 Household Travel Survey

A workshop for NYMTC member agencies and on best practices in household travel survey design and management was held at NYMTC on January 9-10, 2008. The following are the minutes for that meeting.

- NYMTC Executive Director, Joel Ettinger, gave an introduction and spoke about the importance of the workshop. He discussed about the expected growth in the region in the next 25 years. He mentioned that the age of the current survey data has been questioned in recent studies. On March 13th the NYMTC principals will meet to define the vision for the region.
- The Technical Group Director, Kuo-Ann Chiao discussed congestion pricing, the aging population and the reasons for the workshop. He also mentioned that proposals for NYMTC's Regional Household Travel Survey were due on 1/10/2008.

Wednesday January 9, 2008

Session 1 – Matching Goals with Design, Methods, and Sample Size

Moderator: *Todd Goldman, UTRC*

Presenters:

Dr. Laxmi Ramasubramanian, Hunter College/CUNY- Key Issues in Survey Design

Dr. Ramasubramanian discussed goals of survey research, types of surveys, basics of survey design, sampling, measurement concepts and technologies. She also discussed special populations (social isolation), response rates due to barriers of language, face to face interviews and sample size.

Guy Rousseau, Atlanta Regional Commission – Household Travel Survey Methods

Mr. Rousseau spoke regarding the National Household Travel Survey, survey examples from other cities, recent survey experience, designing surveys, the future of survey design, and key issues in travel survey design. He mentioned that it costs between \$175 to \$200 for a complete and useable survey. He mentioned several types of surveys such as establishment, airport, tourist and work place and that at a minimum sampling should be 1/200 households. He also said that short trips were under reported. Also discussed was stated vs. revealed preferences.

Session 2 – Survey Planning and implementation at U.S. MPOs

Moderator: *Kuo-Ann Chiao, NYMTC Technical Group Director*

Presenters:

Robert Griffiths, Metropolitan Washington Council of Governments – MWCOG 2007 Household Travel Survey

Mr. Griffiths spoke on the MWCOG 2007 Household Travel survey. Topics included: household travel survey basics, survey challenges, survey design elements, sampling plan, schedule, GPS vehicle data collection and non-respondent follow-up.

Neil Kilgren, Puget Sound Regional Council – PSRC 2006 Household Activity Survey

Mr. Kilgren discussed the survey study area (4-county Puget Sound Region), survey intercept locations, GPS tracking, transit choice experiments, transit market analysis, study goals, public relations, sample design, pretest analysis and stated preference survey.

Kyung-Hwa Kim, Portland Metro – Household and Travel Behavior Survey 2010
Ms. Kim discussed issues such as, survey history, reason for the survey, survey geography (Portland/Vancouver, Salem, Eugene, Medford, Corvallis, Bend), survey strategy, types of data collected, survey costs, choice based sample survey, funding and research partners.

Guy Rousseau, Atlanta Regional Commission (ARC) – Household Travel Survey SMARTRAQ at the Atlanta Regional Commission
Mr. Rousseau discussed travel modeling at ARC, why ARC needs SMARTRAQ, short term trip based modeling, long term trip based modeling, address GEO-coding outcomes and trip generation model.

Thursday January 10, 2008

Prior to the first session, NYMTC staff and workshop presenters held a round table to discuss modeling and data collection issues.

Session 3 – Applications of GPS Technologies in Household Travel Surveys

Moderator: *Kyung-Hwa Kim, Portland Metro*

Presenters:

Dr. Cynthia Chen, City College of New York/CUNY – GPS Pilot Project

Dr. Chen discussed statewide surveys that used GPS technology, analysis of 1997-1998 survey data, types of GPS and the role of proxy.

Session 4 – Best Practices in Sampling

Moderator: *Todd Goldman, UTRC*

Presenters:

Elaine Murakami FHWA (by phone) – Hard to Reach Populations

Ms. Murakami discussed why collecting data for New York City is unique, hard to reach populations, survey methods for hard to reach populations and choice base samples. She also discussed the importance of the legitimacy of the survey. Since some of these groups of populations are distrustful of the government.

A participant stated that a formal letter to make a survey legitimate can improve response rate.

Session 5 – Stated Preference Add-ons and Panel Surveys

Moderator: *Dr. Cynthia Chen, City College of New York/CUNY*

Presenters:

Dr. Jose Holguin-Veras, Rensselaer Polytechnic Institute – A Primer on Stated Preference and Panel Surveys

Dr. Veras discussed stated vs. revealed data, disaggregate data, potential sources of bias, hybrid panel design and comparison of revealed preference vs. stated preference data.

Additional Highlights and Issues

What follows are the highlights and issues that were discussed at the different workshop sessions.

Dr. Laxmi Ramasubramanian, Hunter College/CUNY- Key Issues in Survey Design

- During the discussion of telephone interviews it was noted that not everyone has a land line phone. In 1997, 97% of households had a land line phone; that is not the case now.
- Some advantages of F2F interviews include:
 1. Reach special populations
 2. Can probe for more information
- Disadvantages include high possibility of interviewer bias.
- Advantages of telephone interview include:
 1. As valid as mail survey or F2F (USA)
 2. Combines features of F2F and mail surveys
 3. Relatively inexpensive
- When you design the questionnaire you need to:
 1. Pay attention to words/phrases
 2. Design mutually exclusive responses
 3. Avoid loaded questions
- Also discussed were innovative uses of technologies such as:
 1. *GIS*:
 - Preliminary spatial analysis to assist in sampling.
 - Identifying pilot test sites.
 2. *Mobile Devices*: To gather time use data
 3. *Robust Websites*:
 - To disseminate information.
 - To manage continuous survey participation.
- In-house internet penetration – about 75%. Internet survey participants are mostly white, educated and with high incomes.

Guy Rousseau, Atlanta Regional Commission – Household Travel Survey Methods

- Modern household travel surveys are facing many challenges, such as declining telephone response rates, cell phone only households, answering systems, caller identification, etc.
- It appears more and more common to randomly select household by postal carrier routes, instead of random digit dialing, as has been the case in the past, due to no call listings.
- NHTS is mostly suited for small to mid-size MPO's, as well as State DOT's.
- Large MPO's, such as NYMTC, are usually better served by a through household travel survey, administered and conducted separately from NHTS.
- Comparison of household response rates among other metropolitan areas range from 30% to 34%.

- Some pitfalls to avoid in a survey are:
 1. Missing/ miscoded locations
 2. Underreporting of short non-mandatory activities
 3. Missing preschool children (ARC)
- When designing surveys to support activity based and tour based models:
 1. Need full and consistent diary-days for all household members
 2. Perform checks of frequency distributions, ARC found out that age distribution indicates missing children under age 5.
 3. Activity starts and end times: Day should start at home at 3AM and end at 2:59 (1,439 minutes). Duration of all activities and travel should add to 24 hours (valid range of 1:00 to 24:59).
- Sample size and degree of precision
 1. At a minimum, 1 household out of every 200 households should be surveyed
 2. 0.5% sampling of the total households is desired but may not be economically feasible in large metropolitan areas.
 3. Pre-test sample size is usually between 100-1,000 households.
- Other key questions for model development
 1. Oversampling of environmental justice areas, and “difficult to reach” population.
- The future of survey design
 1. NYMTC could implement continuous data collection programs rather than large scale episodic survey programs as are commonly done for household travel surveys every 10 years.
 2. A mixture of revealed and stated preference survey techniques could also be used to elicit information on all aspects of the transportation system.

Robert Griffiths, Metropolitan Washington Council of Governments - 2007 Household Travel Survey

- Background on Survey
 1. About once every decade
 2. Used to update travel models
 3. Trend analysis
- Challenges for MWCOG 2007 HTS
 1. Declining telephone response rates
 2. “cell phone only” households
 3. Obtaining the participation of lower income, minority, younger and no-vehicle households
 4. Identifying “travel substituting” activities (e.g. teleworking, teleshopping, etc.)
 5. Incomplete reporting of auto travel
 6. Measuring non-response
- Design elements for 2007 Metropolitan Washington Council of Governments HTS
 1. Address list-based sampling frame
 2. Address-telephone matching
 3. Website for scheduling recruitment interviews

4. Special focus group incentives
 5. GPS Vehicle data collection to supplement travel diary data collection
 6. Non-respondent follow-up survey
- Address-telephone matching for households not having a listed phone number
 1. Advance letter w/household questionnaire
 2. Up to 3 reminder post cards
 3. \$50 participation incentive
 4. Household provides phone number via mail, telephone, or website
 - GPS vehicle data collection sub-sample
 1. Randomly selected GPS household sub-sample
 2. 2-3 days of GPS data collection
 3. Obtain independent estimates of vehicle trip rates and VMT
 - Non-respondent follow-up survey conducted to measure size and likely impacts of survey non-response.

Neil Kilgren, Puget Sound Regional Council – PSRC 2006 Household Activity Survey

- Regarding public relations; you should respond to every phone call/email. Also share with project team feedback/complaints.
- Pilot survey results
 1. Awkward or confusing wording identified
 2. Interviews longer than average; mail-back option to reduce respondent burden
 3. Substantial changes to diary
 4. Differential incentives of \$15 for rare population households.
- GPS subsample
 1. Conducted over 12-week period concurrent with main survey
 2. 150 GPS devices to 285 households with 518 different vehicles
 3. Mail-out/mail-back GPS logger, easily installed by respondent.
 4. 27% overall under-reporting of auto stops
 5. Highest under-reporting on 2nd day, and on short home-home trips.
- Stated preference survey
 1. Stated-preference and attitudinal portion of the survey carried out as a follow-up to the main activity survey
 2. Four stated-preference choice tasks between car and transit options
 3. Four stated-preference choice tasks between car tolled and non-tolled options.
- Attitudinal data used to segment the market along subjective dimensions.
- Transit market segmentation factor analysis
 1. Factor analysis searches for patterns within the responses
 - A. Instead of selecting a known variable for analysis
 - B. “How did households making over \$80K/year respond to question #23?”
 2. Factor analysis looks for correlation among the responses
 - A. “Did people who agree strongly with question #23 respond in a similar fashion to question #5? #17? #9?”
- Final analysis looks for previously undefined “factors” that help explain these relationships.

Kyung-Hwa Kim, Portland Metro – Household and Travel Behavior Survey 2010

- Value of cross-sectional data
 1. Provides regional “snapshot”
 2. Provides information for model building
- Value of Longitudinal data (original)
 1. Measures transitional effects
 - A. Captures traveler response to
 - Household changes (new HH member, income changes, retirement, new driver, etc.).
 - Infrastructure changes (new transit service / park-ride lot, roadway widening, road pricing, etc.).
 - Environment changes (new close-by shopping opportunities, new home, new job site, etc.)
- Caution list on questions related to:
 1. Transit path (whether B-L-B, L-B-L ...)
 2. What they consider their mode (bus or LRT)
 3. Where they parked
 4. Parking cost
 5. Bike path
- Careful with the number of questions on a survey.
- Panel survey – problems analyzing data. In their experience not much has been getting done with the panel survey data in terms of practical applications.

Guy Rousseau, Atlanta Regional Commission – Household Travel Survey SMARTRAQ at the Atlanta Regional Commission.

- This work supports decades of prior research that have shown that household income is an extremely important determinant of household trip making.
- Income provides the resources both for consumption of goods and services and for trip making, so it should logically be a strong influence on travel.
- Total number of persons is not a key variable. For adult trip-makers, total size has largely been replaced with the “number of other adults” and the “presence of any children”.
- This suggests that the number of children in a household is not a strong determinant of travel – it doesn’t matter much whether there is one child or four. But the presence of even one child makes a huge difference over the presence of none, as every new parent will readily attest.
- Number of cars, and the relationship between cars and workers, was important for many of the “discretionary” trip models. This influence is over and above that of income.
- This may suggest that the effect of “induced travel” comes indirectly from households locating in areas where transit and walking are not viable options, thus causing greater car ownership, and thus creating more trips.
- The density and accessibility variables were not very important. Researchers had theorized that high density or accessibility might relate to less trip making, since car ownership could be less and more trips could be combined. This did not prove to be the case, however. The accessibility variables were statistically too weak. In

some cases, the propensity was for slightly more travel in high density areas and slightly less travel in low density areas.

Dr. Cynthia Chen, City College of New York/CUNY – GPS Pilot Project

- GPS technology is being accepted by more and more people.
- There are lots of issues:
 1. Technical feasibility
 2. Practical feasibility
 3. The added benefit and burden of having a GPS component in the Household travel survey
- Data accuracy and reliability
 1. Accuracy: the newest technology can detect a point within 10-15 meters of a location and report data every second for several hours; the most advanced has a battery life of 12-16 hours, or 466,000 points of recording.
 2. Reliability: urban-canyon effect; being underground; cold-start issues
- From the scan of regional/statewide surveys that used GPS technologies
 1. Weight: 100-500 grams for the most recent ones
 2. Ease of use/respondent burden: although most suggest a pure passive data collection, 80% of the surveys reviewed required respondents fill out a traditional diary as well.
 3. Cost: \$1,000 per household.
 4. Public acceptance: most are willing to participate in a GPS survey. Those unwilling are very different from those willing. Those unwilling are often lower-income, non-English, without driver license, couples with older children or household heads 30 or younger.
- Advantages of implementing GPS technologies in travel surveys:
 1. Gather more accurate data
 2. Determine detailed route information
 3. Capture trips that are often missed in traditional surveys
 4. Travel Mode information may be inferred

Elaine Murakami FHWA (by phone) – Hard to Reach Populations

- Start with difficult populations.
- You don't need many households with 2+ vehicles and 2 workers who live in the suburbs. They all travel about the same.
- Work with the survey research organization to start recruiting difficult populations at the beginning. If you wait until the end you will run out of money and not have sufficient samples.
- Hard to reach populations
 1. African American
 2. Non-English speaking
 - A. Hispanic, fear of INS
 - B. Distrust of government
 3. Young males, who are often very mobile

- Hard to reach populations and difference in travel behavior
 1. African American
 - a. Lower income
 - b. Different vehicle availability
 - c. More likely to be “cell phone only”
 2. Non-English speaking
 - a. Lower income
 - b. Different driver licensing (especially women)
 3. Young males, who are often very mobile
 - a. May be intrigued by new technology
- Survey methods for hard-to-reach populations
- Special targeted time periods of specific populations
- Work with neighborhood schools
- Work with University to add legitimacy
- Adding legitimacy by local knowledge and jargon
- Differential incentives
- Easy to read materials (6th or 7or 7th grade).
- Use graphics to translate message and purpose
- Use choice-based samples.
- Survey methods to try
 - a. Establish a CALENDAR period focused on specific target populations
 - b. Pre-survey meetings with community leaders
 - c. Special and different media campaign: - Radio, television, print, bus and subway signs
 - d. How to avoid scam artists
 - e. Work with selected neighborhood schools
- Develop a homework assignment related to travel behavior and transportation planning. Suggestions:
 - a. Work with the UTRC to develop and implement this?
 - b. Add legitimacy with link to university. In Chile, South America, response rates to travel behavior surveys are much better when part of university research not government.
 - c. Add legitimacy with local knowledge and local jargon. CMAP (Chicago) survey. Used local African American survey firm for sample recruitment and had good recruitment. But, then, travel data retrieval was conducted by firm in Texas and retrieval rates fell off considerably.
- Choice samples vs. “random” samples:
 - a. Samples today are non-random. We are kidding random ourselves if we pretend they are random.
 - b. Typically, much lower response rates from both lower and upper income ranges, and Hispanic populations.
 - c. WHY NOT try choice-based sample and weight them by known characteristics, like Vehicle Ownership, Household Income, Household size, Education
- Choice-based samples:

- a. Men between 16 and 25. How about trying a driver's license file and a web-based survey with cash incentive? Obtaining license data in NYS is difficult.
 - b. Regular bicycle riders (e.g. more than once a week)
- Some ideas, not solutions:
 - a. Do a couple of small tests.
 - b. Conduct a couple of focus groups with populations you think will be particularly problematic.
 - c. Outreach: Start working with community leaders for special populations.

Jose Holguin-Veras, Rensselaer Polytechnic Institute – A Primer on Stated Preference and Panel Surveys

- Repeated Cross Sections: Pros and Cons:
 1. Causality cannot be studied in depth as the individuals are not the same from sample to sample.
- Panels: Pros and Cons
 1. In panels, the “same” sets of individuals participate in different waves of data collection.
 2. This enables to track the impact of policies on specific individuals, and unravel cause-effect relations.
 3. If the panel is refreshed to make sure each wave is representative of the population, it could also be used as a cross-section.
 4. Panels suffer from attrition bias, require statistical compensation.
 5. Panel stagnation, panel fatigue may be an issue.
- Hybrid panel designs
 1. Rotating panel surveys (RPS):
 - a. Individuals are rotated off fairly soon, and panel is refreshed to ensure it represents the population.
 - b. Rapid rotation may limit the ability to identify longitudinal effects.
 2. Split panel surveys (SPS):
 - a. It includes a longitudinal panel (with same participants in multiple waves) and a non-overlapping cross-sectional sample).
 - b. Require a large effort and cost though it may be worth it.