

Evaluation of cost effectiveness and feasibility of face-to-face surveys as an augment to regional travel surveys: a case study in the Toronto area

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Abstract

The methods employed for carrying out the Transportation Tomorrow Survey (or TTS), one of the largest household travel surveys in the world, are currently under revision. After conducting the survey for much the same way every five years since 1986, using a landline-based sampling frame and telephone interview method, a research and development project named TTS 2.0 has been launched to investigate alternative approaches to collecting data on travel demand in the region.

The motivation for this project is simple to understand for anyone who works in the field: declining rates of landline penetration and increasing reticence to participate among households who do still have a landline at home. The solutions, however, are far less obvious. To address this problem, a next-generation core-satellite framework for data collection is being designed. Where the TTS has historically been carried out as one monolithic effort, a retrospective telephone survey aimed at obtaining responses from 5% of the households in the study area (over 160,000 households in 2016), inquiring about the travel made by household members 'the day before', the next generation TTS is likely to include a variety of data collection tools, ranging from smartphones apps to web surveys. Passive data, multiple sampling frames and data fusion will all also likely be components of future TTS efforts.

One method of data collection which has not been given much consideration in the region of late, is the possibility of making use of the oldest form of travel survey: in-person, or face-to-face interviews. While carrying out a household travel survey for a region as large as Toronto using *exclusively* in-person interviews would be a very complex and costly task, there may well be value in using targeted cluster sampling to augment other methods of data collection in parts of the region where other methods of respondent recruitment have proven to perform poorly. The cost-effectiveness and data quality implications of such an approach are what we set out to assess.

Seven census tracts within the region where response rates were deemed problematic for certain demographic groups in past TTS efforts were selected for our study. Invitation letters were delivered approximately 5 days beforehand to advise residents that interviewers would be coming by to collect travel information. Interviewers with internet-connected tablets

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were then dispatched to these tracts to conduct computer assisted personal interviews (CAPI), going door to door on selected streets. Three different questionnaires were tested, with roughly equivalent levels of respondent burden.

One survey was essentially a copy of the TTS, with demographic and mobility tool ownership data, as well as travel diaries collected for all household members above the age of 11. The second was very similar, but collected considerably more general information and only one travel diary per household. Finally, a third survey collected similar demographic and mobility tool information, but instead of a travel diary collected data on resident perspectives regarding the transportation and land use planning process.

While the travel data are not yet fully analyzed, the effort seems to have been a success. Without having an official government seal on invitations to increase the credibility of the effort, over 950 completed surveys were obtained from just over 6,000 listed addresses – an overall completed response rate of 15.7%. Including materials, incentives, transportation and labour (interviewers), but excluding the time put in by the lead research assistant, the cost per completed survey came in just under \$14. The method may not be generalizable to the entire region, but for certain areas, CAPI may be an effective means by which to reach prospective respondents.

Travel behaviour of those who filled out the survey with one of our interviewers would appear to be markedly different than the travel behaviour of residents who were not directly interviewed – respondents who did not open the door when interviewers visited, but rather used the survey code left behind and answered online. Those who answered the survey on their own reported a higher daily trip rate (3.7 to 2.85 trips per day), which could indicate a number of things. It would be reasonable to interpret this higher reported trip rate as a sign of greater dedication to providing accurate data, given that these respondents chose to answer the survey not because of pressure felt by having an interviewer in front of them, but because they have an interest in the topic, or more free time. It could also indicate, however, that unlike the respondents who were interviewed directly, they ignored the instructions and reported a ‘typical’ day instead of reporting the travel episodes of the day prior. This will be further explored, but 2.85 trips per day is very near the 2011 TTS rate of 3 for non-proxy respondents, and is promising considering the survey was carried out during the summer instead of the fall.

One of the survey lessons learned was that counting on household members to pass along an email invitation to answer a travel diary was not an effective approach. Only 29 travel diaries being collected in this manner. The most interesting finding, however, may well be that there were only a handful of incompletes when residents spoke with the interviewers face-to-face. Whether respondents were asked to answer a long survey about the planning process or provide travel diaries for multiple members of a given household, in only a few instances did the respondent ask to end the survey – less than 0.5% of cases. Considering how long and detailed the surveys were, this is an important finding that indicates surveys with high burden may be best suited to door-to-door CAPI.

Issues of language barriers and physical access to residents (e.g. condo and apartment buildings) still need to be explored, but we believe even preliminary analysis of this data shows there is potential for including CAPI in the TTS core and satellite framework. Given that sunset plays an important role in ensuring safety of interviewers, this may be a reason to also explore the impacts of collecting data in the spring instead of fall - daylight savings time making March to May a better option than September to November.

It is not yet clear if segments of the population that were reticent to participate in previous iterations of the TTS were better represented, nor whether the method employed (personal interaction with assistance in responding to questions) led to higher quality (fewer ‘forgotten’ trips, as well as higher precision in location information). To better answer the latter question, comparisons of CAPI and CATI data, collected by colleagues during the same time frame, will need to be carried out.

Keywords: Regional travel surveys; in-person interviews; transportation planning
