

TMIP Webinar: April 19, 2012

PTV NuStats, Sandra Rodriguez srodriguez@ptvnustats.com

Q. does the PaceLogger tell the trip maker is to fill out a trip log for each portion of a "total" trip? In other words, will the data be able to be used to estimate an ABM model?

A. Similar to traditional survey diaries, each respondent is given instructions on how to report their trips and whether each leg of a trip should be reported independently or not.

Q. Does PaceLogger or RouteScout apps work in the background such that the smartphones are still operational while it is recording a trip?

A. Yes, these apps run in the background.

Q. If someone forgets to end a trip, how is the trip edited/modified? Do you use the accelerometer to identify stops?

A: All the resulting data is post-processed by PTV NuStats to look for anomalies. For example, if a person stays in the same location for a long time, the trip is edited to end.

Q. Do you have data on "item non-response" (missing trips) with RouteScout. I.e. users forget to log a trip. Do you impute trips, if the start of one trip is not at the end of the last trip?

A: We keep track of missing data. We have very advanced, network-aware trip imputation algorithms.

Q. How much data is this app going to take? What if I recruit respondents who have a limited data plan?

A. The Portland project provided a \$10 incentive, but cash incentives toward cellphone bills could be a good way to assure that any overage in data usage would be covered by the survey sponsor. For "RouteScout," the average log file for a single day is ~1meg. This should not be an issue even for very limited data plans. We can also use WIFI to transmit data which does not require using a data plan.

Q. Does using a smartphone do a better job of collecting information compared to traditional methods?

A. In past studies using passive GPS tracking, nearly 1 additional trip per person per day has been captured compared to traditional diary reporting using Computer-Assisted Telephone Interviews (CATI).

Q. Did you have an "urban canyon" problem in downtown Portland?

A. We did very minimal cleaning before delivering the file and did not analyze the data to see if this problem existed.

Q: What format is the collected data in? Is it compatible with major GIS softwares, such as ArcMap?

A: "Pacelogger" collected lat/long coordinates, therefore the data are compatible with ArcMap or other GIS packages. Similarly, "RouteScout" data are compatible with major GIS packages.

UC Berkeley, Joan Walker joanwalker@berkeley.edu and Andre Carrel acarrel@berkeley.edu

Q. Prior to the study, did you compare the location captured from the tower triangulation or WIFI, to GPS?

A. **Waiting for response from UC Berkeley.** At the January TRB meeting, Kate Deutch from UC Santa Barbara said she was conducting a test.

Q. What kind of server infrastructure is needed to receive the data?

A. **Waiting for response from UC Berkeley.**

Q: Did any respondents turn WIFI or GPS off to save battery life?

A: Participants were instructed not to turn them off, and the app alerts them if one of these sensors is off. We did not track this during the experiment, but it appears that almost everybody followed the instructions.

Q: What is the distribution of locations from GPS vs cellphone tower vs wifi.

A: Approximately 80% WiFi, 20% GPS.

AIRSAGE Cy Smith, Founder and CEO csmith@airsage.com

Q: Has anyone worked with AirSage to ask for volunteers to opt-in to a regional survey? Then, after permissions, to ask respondents to provide trip purpose to augment the O/D information.

A: No; however, since we know the home locations and work locations, we do classify trips as Home-Work, Work Home, Home-Other, Work-Other, etc...

Q: Are the spider graphs weighted by population?

A: Yes, AirSage results use proprietary algorithms to extrapolate the mobile movements into full population movements. The extrapolation algorithms are unique for every mobile device based on the Census Tract where the mobile device lives. Given the fact that we typically see the movements for 5% to 30% of the population, our sample sets are orders of magnitude larger than any other available source. We also have demographic information for each mobile device to ensure that we have a broad cross section of people. Data is synthesized using Census and American Community Survey (ACS) demographic results to account for differences between the mobile population and the overall population.

Q: Is AirSage allowed to say what carriers they use?

A: AirSage does not disclose which carriers they use, but we have 2 of the 3 largest carriers in the US and total over 100 million mobile devices.

Q: Has AirSage OD data been used for an External Station Survey?

A: Yes, we did a project in Chattanooga, TN and project in Mobile, AL is currently in progress.

Q: Since AirSage is relying solely on cellphone signals, is there a minimum critical density for cellphone towers to ensure reasonable location accuracy? How well will this work in a rural area?

A: Since we use signaling characteristics to determine the location of mobile devices in addition to the tower location data, we are able to generate useful information in rural as well as urban/suburban areas. In some cases, however, we may not be as geographically granular in determining the origins and destinations.

Q: Does AirSage plan to provide an API to enable others to use the data you have collected and processed into the ½ mile grid cells?

A: Yes, we are working on this now.

Q: What is the geographic level of precision for AirSage data using the cell signaling technology?

A: AirSage typically uses approximately 1/2 square mile grids to analyze movements. These grids may be grouped into larger geographic areas such as block groups or census tracts or customer specific TAZ's to generate O-D matrices.

DATA TRANSMISSION

Q: How often are the location data saved? How frequently are data sent to a server?

PTVNuStats: The data are transmitted "immediately" when the respondents says they have completed a trip.

AirSage: We typically see a device about 100 times per day. The data is extracted from the network in real-time as the phones connect with the network. This data is used for both real-time and historical analysis. We have data from January 2009 and archive indefinitely. Traffic Counts are estimated hourly; O-D Matrices are summarized by daypart (Morning (6-9), Mid-day (9-3), Afternoon (3-6), and Evening / Night (6-6)); Other time intervals are available for these and more data sets (e.g. select link, external station, etc.).

SAMPLE BIAS

Q. how you would deal with the sample bias created by using the smartphone population rather than the whole population ?

A. PTV NuStats: one alternative is to continue to provide persons/households without smartphones with a GPS data logger, or to provide them with a smartphone for the duration of the project.

Announcement:

NCHRP 08-89 project, with GeoStats is the contractor had kick-off meeting this week. Please share your innovative GPS/travel behavior projects with the GeoStats. Please contact Jean Wolf at jwolf@geostats.com