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Doing More with Limited Data Collection Budgets

BIG DATA AND ADVANCED MODELS ON A MID-SIZED CITY'S BUDGET: THE CHATTANOOGA EXPERIENCE

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The Chattanooga TPO faces similar challenges as other mid-sized cities including limited funding and staff resources for planning and analysis. In response to these challenges, the TPO has made a concerted effort to evaluate the opportunities provided by new data and technologies and to take advantage of these where they can provide added value within their budget.

After adopting their most recent plan, before diving into a new round of data collection and model updates to support the next plan, the TPO stepped back to evaluate their options in terms of new data sources and models. First, they developed a process and schedule for data development and then a model design to capitalize on new opportunities available while respecting their planning budget.

The TPO identified critical data sources to support their planning efforts including both traditional, tried and true data such as traffic counts and floating car GPS travel time runs as well as some exciting new sources of "Big Data" such as cell-phone based data from AirSage and HERE and truck GPS data from ATRI. Ultimately, the TPO purchased additional classification counts and travel time runs from a local engineering firm, some limited travel time data from HERE, general origin-destination data from AirSage, and obtained ATRI truck origin-destination data from the state DOT.

The TPO also evaluated their options for the design of their new travel model, including trip-based, hybrid, and full activity-based designs and ultimately chose to develop a new Daysim activity-based model since it cost only slightly more than a new trip-based or hybrid model and would support additional planning features, particularly for bicycle and pedestrian planning. The new travel model incorporates and takes full advantage of the TPO's data investments. HERE data was used to review new free-flow speeds. ATRI data was used to develop new truck models, and the AirSage data was used to calibrate constants for Daysim's destination choice models. This last accomplishment actually represents the first such incorporation of big data in an activity-based model in the world, by agencies big or small.

Both the data and models still have their limitations. Chattanooga made efforts to validate their new data against traditional data sources. For instance, comparing new HERE data to floating car GPS travel time runs, and AirSage data to both traffic counts and their previous travel survey. In both cases, these investigations identified key issues and limitations of the data, but none that could not be accounted for and corrected. The TPO also chose a basic Daysim model design, without explicit intra-household interactions or advanced bicycle and pedestrian path finding and route choice modeling, so that the current investment moved them forward while still respecting their budget, and positioned them to make further enhancements in the future.

Although initially the TPO doubted that it could afford much new data or an advanced model, by carefully researching their options and making careful and prudent decisions about where to limit their investments, Chattanooga has found ways to take advantage of new data and technologies within their budget. Their next plan update will be supported by more and better data and analysis than ever before, allowing them to analyze improvements for active modes and generally produce forecasts with greater confidence.