

INNOVATIVE ANALYSIS METHODS OF MOBILE PHONE DATA IN THE BEST TRAVEL DEMAND MODELING PRACTICE IN KENTUCKY

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Mobile phone data has been increasingly used in travel demand modeling in recent years. The Kentucky Transportation Cabinet (KYTC) has achieved a state-of-the-practice modeling procedure of utilizing AirSage data in development of regional models. This paper highlights the KYTC's innovative analysis methods of AirSage data by integrating available data sources, statistical analysis and calibration approaches, which are based on recent modeling activities in non-metropolitan areas of Kentucky.

The raw AirSage data is pre-processed by time-of-day and trip purpose, then assessed in terms of data coverage and reasonableness of intrazonal trips. AirSage data is not directly used for trip rates estimation. Instead, area type factors are developed using AirSage trip tables and land use data, which improves trip production modeling in rural and non-rural areas. Depending on project needs and data availability, the raw AirSage trip tables are refined by trip purpose to meet NCHRP estimations by a Fratar model, or calibrated to traffic counts through an origin-destination matrix estimation (ODME) process. The ODME process was followed by a sub-model to disaggregate trips by purpose. The refined or calibrated AirSage trip tables are successfully used to develop friction factors which significantly improves trip distribution results and minimizes modeling time. The development of traffic time-of-day and directional factors heavily rely on AirSage data.

The paper finds AirSage is a useful resource for travel demand modeling in non-metropolitan areas. Assessment of AirSage data is necessary to understand how the data fits the regional modeling needs. Refinement or calibration is recommended as needed to achieve better modeling results, particularly for trip generation and distribution (e.g., possibly large share of non-work intrazonal trips). AirSage data is a good starting point to be used for developing customized parameters (e.g., area type) to enhance trip generation, and can effectively facilitate trip distribution, time-of-day modeling and model calibration.