Tour-based and Supply Chain Modeling for Freight: An Integrated Model Demonstration in Chicago (Maren Outwater, Colin Smith, Bhargava Sana, Jason Chen - Resource Systems Group; Kermit Weis - Chicago Metropolitan Agency for Planning; Supin Yoder - Federal Highway Administration)

Despite recent advances in freight and commercial vehicle modeling, the current state-of-the-practice methods are not adequate to address the increasingly complex issues related to freight demand. Current models are mostly based on methods that were developed for personal passenger travel and are not adequate for freight forecasting. The project includes research that has combined tour-based truck models and logistics supply chain models for urban commercial vehicle movements and that has demonstrated a functional model framework that has the potential to address the limitations of current freight demand forecasting models. The research was performed by Resource Systems Group Inc. (RSG), in partnership with the Chicago Metropolitan Agency for Planning (CMAP) and the University of Illinois at Chicago (UIC).

The project introduced a model framework and focused on the estimation of each of the model components (discrete choice models estimated using existing data sources from several urban areas in North America), described the approach to linking the models together in the model application, and presented initial results from applying the model in the Chicago region. The models were estimated for demonstration purposes from several sources, since there were no datasets that could support all aspects of the new framework. To make the demonstration more practical, two commodities were chosen to model from the data available (food products and manufactured products). The models developed for the project were applied using software developed in R, open source platform which is freely available from the Comprehensive R Archive Network.