



Project Summary

Texas Department of Transportation

0-4713: Development of Sources and Methods for Securing Truck Travel Data in Texas

Background

State departments of transportation (DOTs) require disaggregated truck flow data to determine the impact of truck movements on the state's road infrastructure—bridges and pavements—and the implications in terms of funding. In addition, robust truck data enable state transportation planners to (a) evaluate strategies for improving freight mobility, (b) forecast system performance, (c) mitigate the impacts of truck traffic, (d) determine the impacts on air quality, and (e) improve the safety and security performance of the road network. Informed decisions, however, are critically contingent upon the availability of accurate data and sound models. The objective of this research was to recommend a robust methodology to obtain and maintain truck travel data in a format that can be used in the Texas Statewide Analysis Model (SAM).

What the Researchers Did

The research team:

- Surveyed state DOTs to identify the freight data sources used and to determine how DOTs conduct statewide freight modeling. In addition, the researchers reviewed more than fifty private and public freight data sources as part of an extensive literature review to determine which of the relevant variables are captured by publicly available data sources.
- Interviewed Texas Department of Transportation (TxDOT) and metropolitan planning organization (MPO) transportation planners to discuss the freight data used and needed in travel demand forecasting models in Texas. In addition, various shipper associations, trade associations, trucking interest groups, and other stakeholders were interviewed to understand any potential objections to sharing (possibly proprietary) truck travel information with TxDOT.
- Developed a truck travel database structure that facilitates the storage and analysis of truck travel data for the SAM.
- Reviewed the robust regression and gravity models that other U.S. states have used to estimate county-level truck flows from available commodity flow and socioeconomic data. The research team subsequently proposed a multinomial logit (MNL) approach to estimate county-level truck travel data from the publicly available commodity flow survey (CFS) and IMPLAN data.
- Reviewed available primary freight data collection methods and discussed two data collection approaches—i.e., truck intercept surveys and truck carrier participation—that showed the most promise of providing TxDOT with the data needed for the SAM over the medium term. In addition, the research team listed a number of national initiatives for collecting freight data that might result in more robust truck data becoming available to state DOTs over the intermediate long term (i.e., 5 to 10 years).

Research Performed by:

Center for Transportation Research (CTR),
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- Provided an overview of the various freight-forecasting techniques available, ranging from simple growth factors for short-term forecasts to more complex models for long-term freight forecasts. Finally, the research team highlighted two approaches for forecasting truck data for the SAM.

What They Found

The research team found that state departments of transportation rely (a) predominantly on traffic and classification counts conducted, (b) on the data compiled and published by federal agencies, (c) on the Reebie TRANSEARCH freight database, or (d) to a lesser extent on the collection of original data for use in their freight planning models and studies. A few states (e.g., Mississippi) have developed procedures to disaggregate truck flows from publicly available freight data sources, such as the CFS, and available county socioeconomic data gathered by the U.S. Census Bureau.

What This Means

This research culminated in the recommendation of various approaches available to TxDOT planners for obtaining and maintaining county-level truck travel data in the format required for the SAM. In the short term (i.e., the next 1 to 3 years), TxDOT can either continue to purchase the Reebie TRANSEARCH database or use the calibrated MNL models developed in this research project to estimate county-level truck data. The Reebie TRANSEARCH database is a relatively inexpensive source of detailed freight data. Alternatively, TxDOT can use the MNL models developed to estimate county-level truck data from the 2002 CFS database. For about half of the commodity groups, no statistically significant difference existed between the model results and the Reebie TRANSEARCH data.

Over the medium term (i.e., the next 3 to 5 years), reliable truck data for Texas can be collected through an extensive program of truck intercept surveys or a data-sharing initiative with trucking companies. Collecting primary data through one of these two approaches would provide TxDOT with the most robust truck travel data, but it would also be far more costly as compared with the short-term options. Because it is foreseen that a data-sharing approach will be more cost-effective over the longer term than a program of truck intercept surveys, it is recommended that TxDOT evaluate the feasibility and costs of recruiting a statistically significant sample of trucking companies to subsequently share a sample of their operational data with the agency.

In the intermediate long term (i.e., the next 5 to 10 years), a number of national trade and ITS initiatives could potentially result in more robust freight data for transportation planning. Of these initiatives, the Federal Highway Administration's development of a universal electronic freight manifest, the proposed U.S. Customs and Border Protection's trade systems, and the foreseen Dedicated Short Range Communication devices hold the most promise of providing states with more robust freight data. At a minimum, TxDOT should stay abreast of these initiatives. Ideally, however, the agency should participate in any workshops that are hosted to ensure that robust truck travel data are collected and made available for state transportation planning.

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