

0-6760: Improved Trip Generation Data for Texas Using Workplace and Special Generator Surveys

Background

Trip generation rates play an important role in transportation planning, which can help in making informed decisions about future transportation investment and design. However, sometimes the rates are derived from small sample sizes or may not be reflective of the size of the location under consideration. While using local data in the planning process is desirable, it is often difficult to obtain a sufficient, useful sample size. From a modeling standpoint, rates have historically been focused on productions rather than attractions—principally due to larger, more reliable production rate samples being available.

The Texas Department of Transportation (TxDOT) has a robust source of over a decade's worth of workplace and special generator (WSG) survey data collected as part of the Texas Travel Survey Program. The use of this master data set allowed for limitations from both a land use and modeling perspective to be addressed. This research used this rich data source to develop a *Texas Trip Generation Manual and User Guide* for use in small- and medium-size areas to aid in the land development process. In the development of the manual, efforts were taken to follow the same formatting as the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, to allow for easier comparison.

In addition to the manual created for land development purposes, a set of generic attraction rates was created for different

metropolitan planning organization (MPO) size categories for use in modeling. Given the large set of WSG data that was available, the focus was on attractions, rather than the more commonly used production rates. An extensive analysis to develop disaggregate trip attraction models was also performed. This analysis identified numerous explanatory variables that can be used to help explain attraction rates.

What the Researchers Did

This research project consisted of nine major tasks, summarized as follows:

- **Task 1:** Literature Review and Review of Previous Work.
- **Task 2:** Review Work Place/Special Generator Survey Design and Methods.
- **Task 3:** Compile and Analyze Data to Develop Trip Attraction Rates for Modeling.

Research Performed by:

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- **Task 4:** Conduct Analysis to Develop Trip Generation Rates for Land Development.
- **Task 5:** Evaluate Models and Potential Explanatory Variables.
- **Task 6:** Establish Criteria for Texas Trip Generation Manual.
- **Task 7:** Prepare Draft Texas Trip Generation Manual and User Guide.
- **Task 8:** Conduct Workshop to Present Manual and User Guide.
- **Task 9:** Prepare Research and Summary Reports.

Tasks 4, 6, and 7 were geared toward land development, while Tasks 3 and 5 were focused on modeling. The findings were presented in a workshop, and a paper detailing the research efforts of each task was generated.

What They Found

In comparing rates calculated from Texas WSG survey data to the national data contained within the *ITE Trip Generation Manual*, there were several instances of statistically and practically significant differences being observed. Generally, the Texas rates were lower than the national rates. This finding was not surprising, given that data from small- to medium-sized MPO areas were used in the Texas manual.

From a modeling perspective, trip attraction rates were found to vary across employment sectors and vehicle types. Likewise, parking availability, MPO area size, employment density, traffic analysis zone area type, and establishment type have a significant effect on the trip attraction rate. Distance to major throughway was considered as a potential explanatory variable and may be of use in future trip attraction models.

What This Means

The *Texas Trip Generation Manual* produced through this research effort will be useful for land use planning in the future, in particular for small- and medium-sized cities in Texas. Additional data from WSG surveys, as well as other outside sources, will be added to future versions of the manual. This may result in not only larger sample sizes for the existing plots, but also the inclusion of more land uses—thereby increasing the useful scope of the manual. The TxDOT WSG survey specifications are being adjusted to ensure that the information needed to include the WSG data in the manual is ascertained. Future modeling endeavors undertaken in Texas may find the use of the generic trip attraction rates, disaggregate attraction models, and explanatory variables developed in this research effort very useful.

For More Information

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