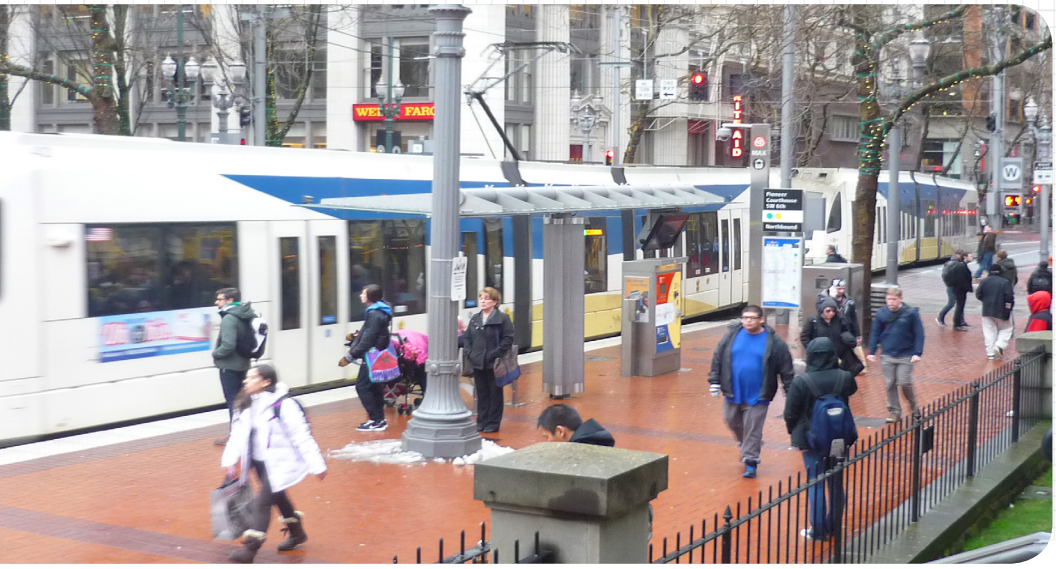

OTREC
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MORE URBAN FORM, FEWER AUTO TRIPS

An OTREC project explores contextual influences on trip generation.

The Issue

Trip generation refers to the number of vehicle trips that are predicted to originate in a given zone. The Institute of Transportation Engineers (ITE) publishes standard trip generation rates for various land use types, but these rates are primarily measured in low-density suburban areas. There is national interest in building data that expands upon the existing ITE trip generation rates to include sites located in a multi-modal context.

In areas that have a more compact urban form, better access to transit and a greater mix of land uses, fewer vehicle trips may be generated there than ITE rates indicate. However, there is a strong industry bias toward using ITE-published rates, so that when local governments are evaluating transportation impacts and calculating transportation system development charges, they are often compelled to use ITE rates instead of local data, especially in the absence of an empirically tested methodology for adjusting the ITE standard rates.

An OTREC project headed by Kelly Clifton, of Portland State University, examines the ways in which urban context affects vehicle trip-generation rates across a variety of land uses. In the study, Clifton developed a model to adjust ITE's trip generation rates for urban contexts.

The Research

From June to October 2011, researchers collected data to develop an adjustment method for ITE vehicle-trip rates. They conducted visitor intercept surveys, gathered site information, and counted people coming and going at selected sites. Land uses chosen for the study included high-turnover restaurants, convenience markets without gas stations, and drinking establishments. These land-use types were chosen because they are found throughout the region in all area types, and are common in areas where vehicle-trip overestimation is most problematic: urban infill, mixed-use and transit-oriented development.

The sites were chosen to represent the entire spectrum of the urban landscape found in the Portland, Ore., metropolitan region, and included central business district neighborhoods,

THE ISSUE

Trip generation rates published by the Institute of Transportation Engineers (ITE) are based on low-density suburban areas. In more urban contexts, vehicle trip generation rates may actually be lower, but there is no standard method for adjusting the ITE rates to reflect contextual influences.

THE RESEARCH

Researchers developed a model to adjust ITE's trip generation rates using the Urban Living Infrastructure score developed for the Portland, Ore., metropolitan area. The model:

- Is easy to use in evaluation of new development;
- Is based on extensive data collected at 78 establishments in the Portland region;
- Should be replicated to extend the application of this research to other cities.

THE IMPLICATIONS

The model developed in this study will allow planners to use the published ITE trip generation rates, modified to make them more relevant to multi-modal contexts.

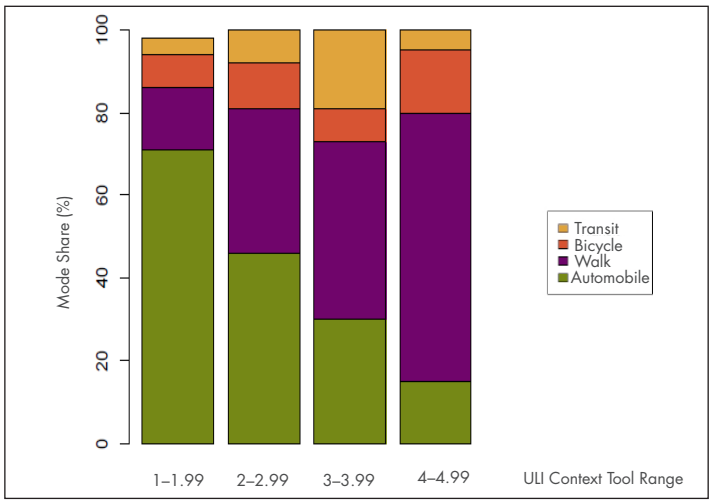
Photo: MAX Light Rail at Pioneer Courthouse Square in downtown Portland, Ore.

urban core neighborhoods further from the city center, neighborhood and regional centers, and suburban town centers and corridors. Individual establishments from each of the five different area types were recruited to participate in the study. Establishments were included in the study based on characteristics of their surrounding built environment.

The key measure representing urban context in this study was the average Urban Living Infrastructure (ULI) score from the Metro Context Tool, developed for the Portland metropolitan area. ULI serves as a measure of the density and diversity of retail and service destinations. The highest ULI values are in places like downtown Portland, where many different retail and service establishments exist in close proximity. While the ULI measure used here can be replicated, it is not a measure that is readily available outside of the Portland region. However, this study represents a first step in advancing national standards.

Implications

Results from this study reveal a trend: For all land uses tested, vehicle-trip rates decrease as neighborhood types become more urban. Without this methodology, in order to accurately predict trip generation for urban neighborhoods, transportation professionals would have had to collect local data specific to each city. The model developed in this study allows planners to modify ITE rates to better reflect the characteristics of urban neighborhoods without the expense of gathering local data.



Average Mode Share by Urban Living Infrastructure Range

This graph shows observed mode shares within average ULI ranges. Clearly, non-automobile travel is associated with density and diversity of retail and service destinations, or a more compact urban form.

Researchers also validated the method with 34 other similar types of establishments. They found that, in general, the urban context adjustment method reduces the overall error in vehicle trip generation estimation compared with ITE's method, particularly for convenience markets and drinking places.

Clifton's research provides a means to adjust ITE's Trip Generation Handbook for urban context. The methodology developed in this study allows trip generation rates to better reflect the relationship between land use, transportation and travel demand for specific land-use types located in various urban settings.

PROJECT INFORMATION

TITLE: Contextual Influences on Trip Generation

LEAD INVESTIGATOR: Kelly Clifton, Ph.D., Portland State University

PROJECT NUMBER: 2011-407

PARTNERS: City of Hillsboro, City of Lake Oswego, City of Milwaukie, City of Tigard, Oregon Department of Transportation, Metro, Portland State University

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