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## Improving Trip Data for Livable Communities

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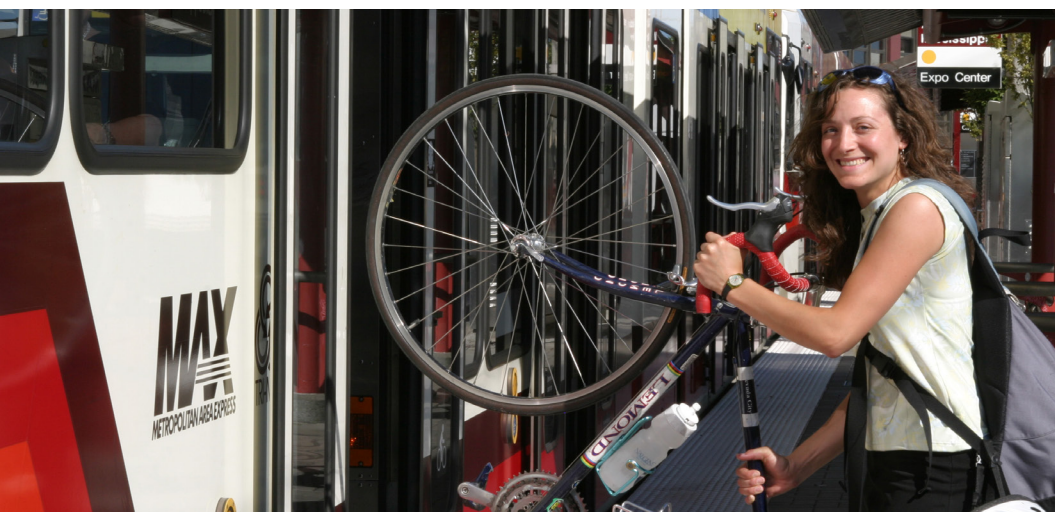
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# IMPROVING TRIP DATA FOR LIVABLE COMMUNITIES

*NITC researchers work to refine a framework for trip generation that includes people walking, biking and riding transit.*

## The Issue

Trip generation is the first step in the transportation forecasting process. For transportation impact analysis, practitioners need to know how to accommodate not just the cars but also the people who will be interacting with the neighborhood on a human scale. Current trip generation methods used by engineers across the country focus on motorized modes without much consideration for cyclist and pedestrian trips. Particularly in dense urban areas with a greater mix of land uses, the trip generation rates used by the Institute of Transportation Engineers (ITE) tend to overestimate the number of vehicle trips while failing to adequately address non-vehicular modes.

In a previous study (see project 407), NITC researcher Kelly Clifton of Portland State University developed a model to adjust ITE's trip generation rates for urban contexts using local data from Portland, Oregon. Building upon that earlier work, Clifton now leads a project which pools data from Oregon and California to create a combined sample of over 180 sites in a variety of urban contexts. This latest effort involves several faculty from across the country, including co-investigator Nico Larco of the University of Oregon. The research further refines trip generation methods by expanding the number of land use types considered, adding mixed-use developments, and estimating the number of person trips including those made by non-automobile modes.

## The Research

The aim of the study was to determine the site-level and urban design characteristics that help to shape multimodal trip generation. To isolate these characteristics, researchers zeroed in on two types of locations: places

## THE ISSUE

To forecast travel demand, practitioners need reliable trip generation rates for all modes, not just auto trips.

## THE RESEARCH

Researchers analyzed sites in a variety of urban settings to find:

- The number and type of non-motorized trips;
- Sociodemographic and other factors determining travel behavior;
- Site-level and urban design characteristics that shape travel behavior.

## IMPLICATIONS

The resulting framework provides a way to forecast non-motorized travel demand for more accurate transportation impact analysis.

*Photo: A cyclist loads her bicycle onto the light rail in Portland, Oregon.*

where the non-automobile mode shares were high despite a less supportive environment (for example, businesses with a lot of foot traffic despite a dearth of pedestrian routes), and locations where the non-automobile mode shares were low even though the surrounding environment was supportive of non-automobile travel. The research team examined survey data collected from the previous studies and compared them with satellite images and site visits to try to understand why the sites were under- or over-performing in attracting non-automobile trips.

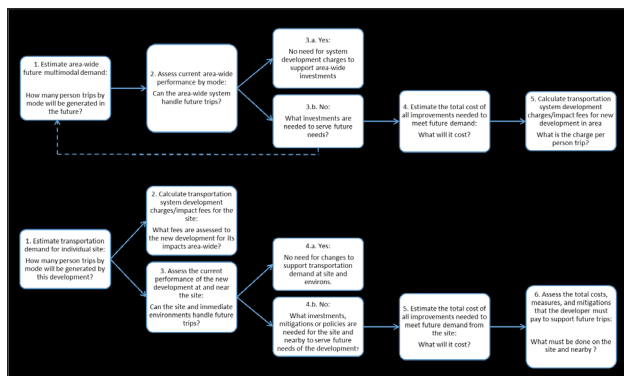
The research team considered the proximity of nearby residential, commercial and other land uses, and how those land uses were connected to the study site. They also considered how the majority of people were interacting with the establishment at the study site (for example, did the majority of customers eat in a restaurant or take food to go?). They visited the sites over several days during morning and evening hours, and discussed how all of the elements combined for each study area to produce the observed multimodal behavior. Based upon this qualitative assessment, combined with the quantitative information collected previously, the team was able to identify certain trends in the built environment, traffic operations, transportation movements and site visitors that are influential to trip generation.

## Implications

The most important outcome of this research is a framework for sustainable multimodal planning, which includes an approach for site-level and area-wide analysis. This work is slowly finding its way into the trip generation practices of cities nationwide, and the methodology used in the original study has been added to the ITE handbook. The flexible, transparent approach to data collection and analysis is helping to create a system where land use planning and transportation impact analysis are inextricably linked -- thus giving

agencies more autonomy to decide what the character of a place should be based on the needs of the people who live there.

One important finding to arise from this framework is that sociodemographic factors shape travel behavior. This is commonly accepted to influence travel choices at the household level, yet often overlooked at the site level. A failure to account for the characteristics of site visitors or the potential market for businesses can lead to large errors in the estimation of the numbers of trips, the mode shares and the trip length. It is also important to consider how visitors are using the site, and why. Travel choices are complex and there is increasing recognition that perceptions, attitudes, motivations, social norms and other psychosocial characteristics play an important role.



## Proposed Framework for Evaluating Transportation Impacts of New Development

This approach includes an intermediate step that links urban transportation and land use planning and transportation impact analysis done during development review.

## PROJECT INFORMATION

**TITLE:** Improving Trip Generation Methods for Livable Communities

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

**PROJECT NUMBER:** 2017-757

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**MORE INFORMATION** <http://nitc.trec.pdx.edu/research/project/757>