

Evaluating How the Quality of Pedestrian Infrastructure Affects the Choice to Walk



Understanding how the design of residential streets and their pedestrian infrastructure affects the choice to walk for pleasure and transportation

Sidewalks are an important part of a multimodal transportation system. They enable walking in high traffic environments where walking in the street would be impractical or dangerous and may encourage walking in other locations by providing a safer and more comfortable walking environment. While the benefits of walking are well understood, the physical design of sidewalks and their maintenance needs generally receive much less attention in both research and practice than the infrastructure used by other modes of transportation. As a result, we know comparatively little about how the design of sidewalks and quality of the overall pedestrian environment affect the decision to walk. This research aims to understand the effect of sidewalks and related pedestrian environment quality on the likelihood that a person chooses to make a trip by walking. This question will be evaluated through both an observational analysis and one that asks individuals about their perceptions of sidewalk quality and its relation to their travel preferences. Both analysis methods will use data collected from a questionnaire sent to individual respondents in the Albuquerque, New Mexico metropolitan area.

Background

Increasing the share of trips made using active modes of transportation such as walking can provide many benefits. Walking provides physical activity which provides health benefits; walking is relatively inexpensive; walking does not (directly) emit toxic or greenhouse gas emissions or consume non-renewable energy; walking requires less infrastructure than motorized transportation; and walking can increase community interactions that build stronger neighborhoods and local economies. Despite these and other benefits, there appears to be a wide gap between the provision and quality of pedestrian infrastructure such as sidewalks and that for motorized travel.

In many communities, pedestrian infrastructure is discontinuous, inaccessible to those with physical disabilities, and poorly maintained. Correcting these problems would be a first step in providing

infrastructure to achieve the active travel and related transportation goals of many communities. In many places, achieving these goals also requires providing higher quality infrastructure that goes beyond the bare minimum standards such as compliance with the Americans with Disabilities Act. To increase the amount of walking, which is necessary for realizing this mode's benefits, pedestrian infrastructure should also provide a safe and enjoyable travel experience.

While there are many reasons for the varying provision and quality of pedestrian infrastructure within and among different communities, one nearly universal challenge is an adequate, sustainable and equitable source of funding for pedestrian infrastructure maintenance and reconstruction.

Project Summary

The overall aim of this project is evaluating how the quality of pedestrian infrastructure and the overall pedestrian environment affect a person's choice to walk. The three main objectives of our research are:

Objective 1: Evaluate how the quality of pedestrian infrastructure affects the decision to walk

We will evaluate how the quality of pedestrian infrastructure affects the decision to walk. Quality, in this case, means the physical design of the sidewalk, including its geometric design, placement within the roadway right of way, the materials it is constructed of, and its condition (i.e., is it well maintained). For example, does a wider sidewalk or physical separation from traffic encourage more walking? The focus is on micro-scale sidewalk attributes rather than the more commonly assessed macro-scale street designs, transportation networks, and urban form.

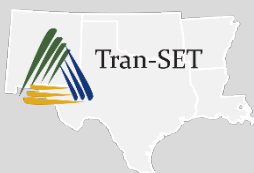
Objective 2: Evaluate how the quality of the pedestrian environment affects the decision to walk

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PI: Dr. Gregory Rowangould (UNM)

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We evaluate how other factors affecting pedestrians as they use sidewalks affect the decision to walk. Prior studies have given this topic relatively more consideration. In this project we will investigate several factors important to understanding walking decisions in Albuquerque that have been evaluated in prior national studies at a relatively macro level. For example, street lighting is important; however, poorly implemented street lighting may not be.

Objective 3: Develop guidance for cost effective sidewalk design

Based on a literature review and the outcome of objectives 1 and 2 above we will develop guidance for cost effective sidewalk design. While there are many sidewalk design guidelines available, our guidance will focus on micro-scale design factors that have not been comprehensively covered in prior studies or where designs have been based on relatively weak evidence.

Status Update

The main research tasks for this project are developing a neighborhood travel survey, administering the survey in several Albuquerque neighborhoods and then evaluating the survey data. We have developed the survey instruments and identified study neighborhoods. We are currently waiting for UNM institutional review board (IRB) approval to distribute our travel survey and begin collecting data. We anticipate data collection in late January or February.

Impacts

Understanding how the design of sidewalks and the quality of the pedestrian environment affect walking is an important research gap that the proposed research aims to fill. It is important for several reasons. First, many municipal and state design guidelines, if they exist at all, largely reflect the Americans with Disability Act's (ADA) minimum standards for accessible sidewalks. The standards set minimum widths, maximum grades and cross slopes, criteria for the design of curb ramps, describe prohibitions on the placement of obstructions, and requires a durable surface that is generally smooth and free of holes and large vertical displacements. The aim of the ADA standards are to ensure that sidewalks are accessible to most people; the standards are not designed to maximize the potential of walking. This latter aim requires broader considerations, such as how the infrastructure affects the quality of a person's walking trip. Of course, sidewalk infrastructure while not as expensive as other types of infrastructure, is still very expensive to provide and maintain. Therefore, it is also

important to know what types of improvements to pedestrian infrastructure and the pedestrian environment will result in how much gain in walking to enable at least a rough cost benefit analysis. If sidewalk quality is only weakly correlated with increased walking than perhaps the bare minimum ADA standards are optimal from a social welfare perspective. Therefore, spending more on this infrastructure would not be the best use of public funds, they would be better spent elsewhere or not at all. However, if infrastructure quality is important for walking than its important to know how much improvement is appropriate and in what circumstances. This knowledge can help municipalities develop more effective and efficient sidewalk and pedestrian environment design standards for new projects and also create more effective and efficient strategies for maintaining and replacing existing infrastructure.

Tran-SET

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