

Pedestrian Oriented Transit: A New Criteria for Pedestrian Network Building

RES2014-23

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Purpose of the Project: Though public transit systems are often operated by agencies that also have direct jurisdiction over pedestrian infrastructure planning and investment (e.g., cities) there is often a disconnection between pedestrian network investment plans and transit service provision. The metro-areas in Tennessee spend tens of millions each year on transit, yet many of the potential transit destinations are not connected to the stop by adequate pedestrian infrastructure. This creates safety challenges for those who rely on transit to access destinations and diminishes demand for those whose other transportation options are more appealing (choice riders); those with door-to-door personal transportation modes.

In the past several years, transit ridership has been increasing in Tennessee and service improvements have generally been in improved rolling stock and changes in operations of the routes and schedules. Indeed, often the most onerous part of the transit journey is the out-of-vehicle time, connecting origins and destinations.

Additionally, improved pedestrian infrastructure that follows Universal Design principals could reduce the need for very costly paratransit service (8.5% of national operating costs for <1% of trips) to the disabled. Several state and regional DOTs have identified pedestrian infrastructure as a key element to increasing transit demand. Following the Safe Routes to School principle, some have developed Safe Routes to Transit plans, focusing on safety, equity, and travel demand management.

Scope and significance of the project: This research develops a framework to evaluate pedestrian improvements as they relate to the transit system such that the transit system can be supported by the pedestrian infrastructure in a way that can boost transit ridership and improve safety and access of riders.

The research has three main spatial data inputs available in most cities; transit bus stop location, pedestrian infrastructure configuration, and parcel-level land use and socioeconomic data (population density, income, commercial properties etc.). Using these data, one can optimize investment in pedestrian infrastructure that likely has the greatest impact on transit using network connectivity metrics, weighted to account for the influence of existing and potential demand (socioeconomic and land use data).

The result is a method to optimize investment in pedestrian infrastructure with a focus on accessing transit, which has compounding benefits (e.g., increasing ridership and fare revenue etc.). Indeed, pedestrian infrastructure improvements could be more cost effective than transit service improvements or other ridership strategies in some cases. Improved pedestrian connectivity could ultimately result in more direct transit routing

along corridors, increasing overall efficiency. It is possible that these investments also have better long-term effectiveness at improving air quality by providing even marginal increases in walk access to transit.

Expected outcomes: The outcome of this research will be to develop a method to assess pedestrian improvements in order to rank and prioritize infrastructure investment that may have the largest impact on ridership (focusing on both commercial destinations and residential origins). The method will be described in an implementation guide that will lay out the data needs and software methods to conduct the analysis. It will also include an illustration of Knoxville that can be replicated in any city. We also expect to provide a short video tutorial, illustrating the method. The project will also produce a full written report documenting the process.

Time periods and status of the project: The project start date was August 1, 2013, with an expected duration of 24 months. The main products of project have been completed, including drafts of a final report and implementation guide.

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