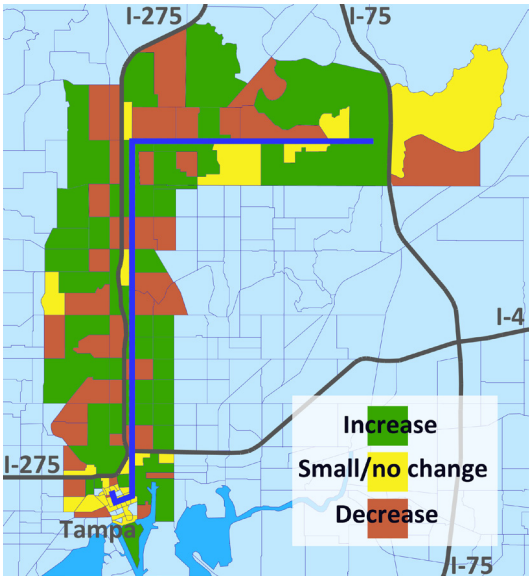
Florida Department of Transportation Research

Assessing the Impact of Proposed Transit Investments and Public Policy Choices on Land Use Patterns (A Simulation Approach with UrbanSim)
BDK85 977-26

Public transit systems and routes are designed to serve current patterns of development, but implementation of new transit services may induce residents to change travel modes and use transit, rather than autos; this, in turn, alters traffic patterns and how properties near transit lines develop over time. Public transit like bus rapid transit (BRT) or light rail may also require significant, multiyear infrastructure investments. A useful tool to aid such important decisions would predict the impacts of transit investments on land use patterns, based on local data, and assist in choosing designs that support a community's desired goals.



This map shows population shifts caused by introduction of a BRT line (blue line) in Hillsborough County, assuming a 5% adoption rate. The route is 15 miles long.

In this project, researchers from the University of South Florida tackled this problem using UrbanSim, open-source software which simulates land use changes by considering population shifts, demographics, local economy, the real estate market, land use and growth policies, etc. By interacting land use and travel demand models, UrbanSim can evaluate impacts of proposed transit investments on population, employment, housing prices and other socioeconomic indicators within walking distance of a premium transit system.

To develop this application of UrbanSim, the researchers tested a proposed BRT service in Hillsborough County, Florida. UrbanSim was ideally suited to this scenario because it works on small geographic scales, such as parcel, allowing simulation of travel and land use decisions made by individuals and businesses. However, this geographic specificity and level of detail demand substantial data about the area being modeled. Researchers collected data on geography, buildings, households, employment, and real estate. Data were retrieved from county appraisers, InfoUSA, the Census Summary, the American Community Survey, and the Hillsborough Planning Commission Future Land Use Element. The Tampa Bay Regional Planning model was used to produce travel patterns. Data were linked and imported into the UrbanSim model to create a 2010 base scenario.

The basic plan of the project was to compare land use patterns with and without implementing the BRT route. Researchers tested four scenarios, examining two-year versus ten-year impact and two levels of travel mode change.

The researchers determined that UrbanSim was a powerful tool for simulating land use changes. UrbanSim predictions were reasonable compared to the other long-range transportation projections. Importantly, the proposed BRT service was found to produce significant impacts on land use patterns over ten years, primarily attracting population and increasing home prices. The researchers noted the importance of data preparation for successful and more locally specific use of UrbanSim.

As the needs of cities press the development of more public transit infrastructure, the methods developed in this project can provide valuable guidance for planners and decision makers.

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For more information, visit http://www.dot.state.fl.us/research-center