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## TOD BEATS TAD IN AFFORDABILITY SHOWDOWN

*A research project compares transportation affordability between transit-oriented development (TOD) and transit-adjacent development (TAD).*

### The Issue

Transit-oriented development, or TOD, is gaining popularity as a form of sustainable urban development. It concentrates land uses, including commercial and multi-family housing, near transit stations so as to reduce car dependency and increase ridership. The benefits are manifold; increased community health, positive economic impacts, less harm to the environment and potentially greater social equity.

Existing travel behavior studies in the context of TOD, however, are limited in terms of small sample size, inconsistent TOD classification methods, and failure to control for residential self-selection. Researchers Brenda Scheer, Reid Ewing, Keunhyun Park and Shabnam Sifat Ara Khan of the University of Utah sought to overcome these difficulties and to investigate travel behavior and transportation affordability in different contexts. They compared TOD with transit-adjacent development, also known as TAD; another form of urban growth that is sometimes almost-affectionately referred to as TOD's evil twin. Where TOD is mixed-use and walkable, TAD is the opposite.

### The Research

The study posed three research questions. First, how can we distinguish between TOD and TAD? Second, how do travel behaviors vary between TODs and TADs? Third, how does transportation affordability vary between TODs and TADs? To address the first, they analyzed three built-environment criteria—density, diversity, and walkability—in a half-mile buffer. This allowed them to categorize existing station areas as TOD, TAD or hybrid types.

### THE ISSUE

Transportation affordability has been under-studied, especially in the context of TOD. As a result, transit officials don't have empirical evidence of transportation affordability in different urban contexts.

### THE RESEARCH

The research distinguished between TOD and TAD using three criteria:

- Development density;
- Diversity of land uses;
- Walkability, or road network connectivity.

### IMPLICATIONS

This study shows that a TOD household is likely to save enough money on vehicle ownership to have a significantly lower financial burden from transportation.

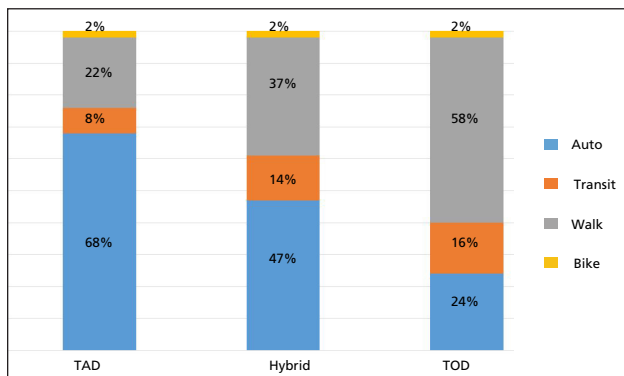
*Photo: Temple Square Station in Salt Lake City, Utah: a hybrid type of station with elements of both TOD and TAD*

To ensure a large enough sample size, the research team looked at transit stations in eight regions: Atlanta, Georgia; Boston, Massachusetts; Denver, Colorado; Miami, Florida; Minneapolis-St. Paul, Minnesota; Portland, Oregon; Salt Lake City, Utah; and Seattle, Washington. Of the 549 stations they studied, 11 percent of them were labeled as TOD: dense, diverse and walkable. One-fifth were named TAD, having the opposite urban form. The remaining 70 percent of the stations could be classified as hybrids.

With respect to travel behavior, one challenge was how to find the true impact of the built environment. Households living in TADs tend to be more affluent, have more cars and be more auto-oriented than their counterparts in TODs. However, residential-self selection theory points out that those people might live there because they are auto-oriented, not the other way around. To get around this difficulty, the research team used propensity score matching to make sample households comparable in order to control for residential self-selection. TODs were shown to be more affordable, too, in terms of transportation costs: average TAD households spend 15.6 percent of their total income on transportation, while average TOD households spend less than half of that—7.5 percent. The hybrid type was found to be the least affordable, as it has lowest average household income.

### Implications

This study offers practical policy implications, particularly for planners dealing with the in-between hybrid type, which represents the majority of station areas. If a local government or transit authority converts a sprawled, single-use and unwalkable station area from a TAD into a Hybrid type—by, for instance, adding different land uses—they could expect small increases in transit and walk trips. A hybrid type of station area could be changed into a TOD by adding density and decreasing block sizes, resulting in more walking.



#### Mode Share by Station Area Type

This graph shows the percentage of trips taken by each mode, for each station area type. Personal vehicle travel accounts for two-thirds of trips in TADs but only a quarter of total trips in TODs.

The cumulative change from TAD to TOD could encourage residents to drive less, walk more, and take more trips on transit; all of which can have positive impacts on the city’s environment, society and economy.

The study also offers new contributions to research. The eight regions studied—Atlanta, Georgia; Boston, Massachusetts; Denver, Colorado; Miami, Florida; Minneapolis-St. Paul, Minnesota; Portland, Oregon; Salt Lake City, Utah; and Seattle, Washington—represent a larger sample than the one or two regions studied in most of the existing literature. Additionally, the use of cluster analysis to classify the types of station areas offers a more objective and measurable approach than previous work.

### PROJECT INFORMATION

**TITLE:** How does transportation affordability vary between TODs, TADs, and other areas

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**MORE INFORMATION** <http://nitc.trec.pdx.edu/research/project/859>