

Trip and Parking Generation at TODs

- Reid Ewing, Guang Tian, and Torrey Lyons Department of City and Metropolitan Planning University of Utah
 - Preston Stinger Fehr & Peers

Rachel Weinberger, Ben Kaufman, and Kevin Shivley Nelson\Nygaard Consulting Associates

Impediments to MXDs and TODs

- Traffic professionals overestimate mixed-use development impacts by <u>35%</u>
- Overestimates reduce project viability:
 - Escalate development costs
 - Heighten community resistance
 - Favor isolated single-use development
- New research:
 - Improves accuracy
 - Provides substantial evidence
 - Eliminates overestimate



Absent Hard Numbers

Officials usually assume that TODs require the same number of parking spaces as conventional development and that transit stations require the same number of park-and-ride spaces as non-TOD stations.





Not Applicable to TODs

- "Data were primarily at suburban locations having little or no transit services, nearby pedestrian amenities, or travel demand management (TDM) programs." ITE Trip Generation Manual
- "Primarily isolated, suburban sites" ITE Parking Generation

• • • • • • • • •

Are Suburban TODs Over-Parked?

Robert Cervero, Arlie Adkins, and Cathleen Sullivan University of California, Berkeley

Abstract

A survey of 31 multi-family housing complexes near rail stations in the San Francisco Bay Area and Portland, Oregon, show peak parking demand is 25-30 percent below supplies and, for most projects, falls below national standards. Peak parking demand is generally less for less expansive projects with short walking distances to rail stations that enjoy frequent peak-period services. Case study experiences suggest that welldesigned, short and direct walking paths to rail stops lessen peak parking. A national survey of 80 U.S. cities with rail stations revealed that 75 percent have minimum TOD parking requirements that mandate more parking than suburban design standards and 39 percent grant variances for housing projects near rail stops.

Parking and Transit in the U.S.

Excessive parking could explain why transit-oriented development (TOD) in the United States often has failed to yield hoped-for benefits, such as big ridership gains and less traffic congestion. Critics charge that many large-scale housing projects near urban rail stations are "over-parked"—more parking is provided than is needed (Daisa 2004; Dunphy et al. 2004). This can drive up the cost of housing, consume valuable land near transit, and impose such environmental costs as increased impervious surface area.

Part of the blame for the surfeit of parking in TODs could be the reliance on parking generation figures from the Institute of Transportation Engineers (ITE). Implicitly, ITE standards assume that car ownership levels are no different in rail-served and non-rail-served areas. Outdated parking standards have a way of perpetuating

In Literature

The average trip generation rate in areas with TOD is well below the trip generation rate from the ITE report (*Arrington & Cervero 2008; Cervero & Arrington 2008; Cervero et al. 2004*).

There are a few studies of vehicle trip generation (*Arrington & Cervero, 2008; Cervero & Arrington, 2008; Zamir et al. 2014*) at multifamily developments near transit. There is only one study of vehicle trip generation at TODs (defined as mixed-use developments – Handy et al. 2013). The question of how much vehicle trip reduction occurs with TOD is largely unexplored in the literature.

By comparing parking generation rates for housing projects near rail stops with parking supplies and with ITE's parking generation rates, (*Cervero et al. 2010*) found there is an **oversupply** of parking at TODs, sometimes by as much as 25-30 percent.

Research Question

Much of the travel demand is captured internally or satisfied by alternate modes



TOD Definition

TODs are widely defined as compact, mixed-use developments with high-quality walking environments near transit facilities (*ITE 2004, pp. 5-7; Jacobson & Forsyth 2008; Renne 2009*).

For our purposes, TODs are developed by a single developer under a master development plan, and can also include a clustering of development projects near transit facilities that are developed by one or more developers pursuant to a master development plan.



TOD Selection



Lindbergh City Center Atlanta



Englewood Denver







Seattle

City Creek Center Salt Lake City



City College San Diego



Del Mar os Angeles

Boston

Orenco Station Portland







Rhode Island Row Washington, D.C.



Redmond TOD,

Rhode Island Row Washington D.C

Wilshire/Vermont, Los Angeles





Fruitvale Village, San Francisco





Englewood TOD, Denver



Department of City & Metropolitan Planning, University of Utah

Data Collection





 A count of all persons entering and exiting the buildings – 7:30am to 9:00pm on a weekday in spring or fall 2015

 Parking Occupancy Counts – bi-hourly, total of 10 collections

- A brief intercept survey of a sample of individuals entering and exiting the building
 - "How did you get here?" (e.g., by what mode of travel?), and
 - What is the purpose of your trip?









Vehicle trip rates as percentage of ITE rates

Department of City & Metropolitan Planning, University of Utah

TOD residential parking supply (spaces per unit)

TOD residential peak parking demand (occupied spaces per unit)







Peak parking demand as % of ITE supply guideline

Department of City & Metropolitan Planning, University of Utah

• • • • • •

Parking Policies

• •

- Lowest Parking Demand at Fruitvale Village, Rhode Island Row, and Wilshire/Vermont
 - 1. Shared Parking (FV, RIR)
 - 2. Unbundled Residential Parking (FV, RIR)
 - Paid Commercial Parking (FV, RIR, W/V)

• • • • • • • •

Structured Parking Costs

- Shoup's estimate -\$22k per space back in 2005 (Don Shoup, High Cost of Free Parking, 2005)
- San Francisco study \$45k to \$75k per space (Tudela-Rivadeneyra, M. S., Aldo, E. D., Shirgoakar, M., Deakin, E. A., & Riggs, W. W., The cost versus price for parking spaces at major employment centers, 2015).
- consultant's estimate \$18,599 per space (Carl Walker (2016), Mean Construction Costs, Carl Walker Consulting (www.carlwalker.com)

Cost of Parking at Redmond TOD

- \$8.0 million as built
- \$2.0 million unused

• \$14 million if built to ITE standards

• • • • • • •

\$8 million unused



Figure 2.4. Parking Space Occupancy Rate for Different Uses at Redmond TOD



Figure 6.6. Parking Space Occupancy Rate for Different Uses at Wilshire/Vermont TOD



Trip and parking generation at transit-oriented developments: a case study of Redmond TOD, Seattle region

Guang Tian¹ · Reid Ewing¹ · Rachel Weinberger² · Kevin Shively² · Preston Stinger³ · Shima Hamidi⁴

© Springer Science+Business Media New York 2016

Abstract The decision on how best to allocate land around transit topic, with transit officials often opting for park-and-ride lots over multifamily housing, office, and retail organized into transit-o (TODs). In this study, we identify the ten best self-contained TODs United States based on seven criteria: dense, mixed-use, pedestrian transit, built after transit, fully developed, and with self contained.





Research Paper

Trip and parking generation at transit-oriented developments: Five US case studies



Reid Ewing*, Guang Tian, Torrey Lyons, Kathryn Terzano

College of Architecture+Planning, 220 AAC, University of Utah, 375S 1530 E, Salt Lake City, UT 84112, United States

HIGHLIGHTS

- Parking demand at the five TODs is generally less than half the US guideline.
- Trip generation at the five TODs is generally less than half the US guideline.
- Automobile mode shares at the five US TODs are as low as one quarter of all trips.
- Results suggest the potential for significant savings in TOD developments.
- Guidelines are provided for using study results in TOD planning.

ARTICLE INFO

ABSTRACT

Article history: Received 14 August 2016 Received in revised form 14 November 2016 Accepted 10 December 2016 Guidelines for trip and parking generation in the United States come mainly from the Institute of Transportation Engineers (ITE). However, their trip and parking manuals focus on suburban locations with limited transit and pedestrian access. This study aims to determine how many fewer vehicle trips are generated at transit-oriented developments (TODs), and how much less parking is required at TODs, than ITE guidelines would suggest.

Our comple of TODs is small which limits our ability to constalize Howaver the five acces calested













