Trip and Parking Generation at TODs

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Impediments to MXDs and TODs

- Traffic professionals overestimate mixed-use development impacts by 35%

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

Research Question

- Vehicle trips
- Transit trips
- Walk trips
- Internal trips
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.

Dense
Mixed use
Pedestrian-friendly
Adjacent to transit
Built after transit
Fully developed or nearly so
Self-contained parking
TOD Selection

Mixed use developments (MXDs) near transit

Regional transit agencies and MPOs

Google Satellite Imagery

Site visit
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?
TOD residential parking supply (spaces per unit)

TOD residential peak parking demand (occupied spaces per unit)

- Redmond
- Rhode Island Row
- Fruitvale
- Englewood
- Wilshire/Vermont
- Average

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Peak parking demand as % of ITE supply guideline

- Redmond TOD: [45%]
- Rhode Island Row: [35%]
- Fruitvale Village: [20%]
- Englewood: [45%]
- Wilshire/Vermont: [35%]
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)
  3. 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

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

Research Paper

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

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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.

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ABSTRACT

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.

One sample of TODs is small, which limits our ability to generalize. However, the five case selected...