STATION PARKING ISSUES

• Preferred mode of station access at suburban sites
• Inadequate supply can limit rail ridership
• Typically consumes the greatest portion of site area
• Costly to provide
• Not visually appealing
• Risk of spillover impacts if inadequate supply
• Attracts non neighborhood traffic
TYPICAL PARKING AND TOD CONFLICTS

1. Desire to expand parking supply
2. Desire to convert station parking to TOD uses
3. Desire to Redevelop private station parking lots for TOD
BART PARKING AND TOD
TOD DEVELOPMENT ON STATION PARKING LOT
COMMON STATION PARKING QUESTIONS

• What might the rail ridership be for alternative uses of station site areas – parking, residential, office and retail?
• How intense would TOD development need to be to provide the equivalent rail ridership of surface parking?
• What is the full cost of providing surface and structured parking?
• At what land value does structured parking become economical?
• Affordable housing in TOD– what is true parking demand? And why housing types work best for TOD projects?
FOCUS OF PRESENTATION

• Outline a framework for addressing these issues, rather than a universal answer – ridership and costs are local influenced and local values should be used where available.

• It is recognized that many factors influence decisions for highest and best use of station sites with rail ridership being just one of them.

• Parking Demand and Affordable Housing recent data from San Diego
RAIL RIDERSHIP ESTIMATING SPREADSHEET

• Park and ride use
• Residential use
• Office use
• Retail use
RAIL TRANSIT PATRONAGE METHODOLOGY

1. Estimate buildout for 10,000 gsf site unit
2. Estimate Vehicle Trip Generation ITE
3. Translate into person trips
4. Estimate rail capture rate
5. Daily Rail patronage
PARK AND RIDE RAIL RIDERSHIP

- One space per 350 gsf of site area
- At capacity 100% occupancy – one car per space
- 1.2 persons per vehicle
- Rail Roundtrip = 2.4 transit trips per space
- 69 daily transit trips per 10,000 gsf
RESIDENTIAL RAIL TRANSIT RIDERSHIP

- 1,200 gsf average dwelling unit
- One off-street space per dwelling unit (350 gsf)
- 6.5 dwelling units per 10,000 gsf site
- ITE rate of 6 vehicle trips per du = 39 vehicle trips
- 1.2 persons per vehicle = 46.5 person trips
- Low transit capture 25% = 12 rail transit trips
- High transit capture 35% = 16 rail transit trips
OFFICE USE RAIL TRANSIT TRIPS

- 2.0 off-street parking spaces per 1,000 gsf (600 gsf)
- Net office 6,600 gsf for 10,000 gsf site
- ITE 10 vehicle trips per 1,000 gsf = 66 vehicle trips
- 1.1 persons per vehicle = 72 person trips
- Low capture (5%) = 3.6 transit trips
- High capture (10%) = 7.2 transit trips
RETAIL RAIL RIDERSHIP

- 3.5 parking spaces per 1,000 gsf (1,050 gsf)
- Net retail area 4,900 gsf of 10,000 gsf site
- ITE 40 vehicle trips per 1,000 gsf = 195 veh trips
- 1.3 persons per vehicle = 254 person trips
- Low capture (3%) = 7.6 trips
- High capture (5%) = 12.7 trips
# RAIL RIDERSHIP FOR 10,000 SF PARCEL

## TABLE 2 Linehaul Ridership for 10,000 Square Foot Station Parcel

<table>
<thead>
<tr>
<th>Ridership Factors</th>
<th>Parking</th>
<th>Residential</th>
<th>Office</th>
<th>Retail</th>
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<tbody>
<tr>
<td>Site Area (sq. ft.)</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
<td>10,000</td>
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<tr>
<td>Unit Area (Sq. Ft.)</td>
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<td>1,200</td>
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<tr>
<td>Adjustment for Parking</td>
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<td>300</td>
<td>525</td>
<td>1,050</td>
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<tr>
<td>Units/10,000 sq. ft.</td>
<td>28.6</td>
<td>6.7</td>
<td>6.6</td>
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<td>Person Trip Rate</td>
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<td>7.2</td>
<td>11.0</td>
<td>52.0</td>
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<tr>
<td>Daily Person Trips</td>
<td>68.6</td>
<td>46.5</td>
<td>72.1</td>
<td>253.7</td>
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<tr>
<td>Rail Transit Capture %</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Low</td>
<td>100</td>
<td>25</td>
<td>5</td>
<td>3</td>
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<tr>
<td>High</td>
<td>100</td>
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<td>10</td>
<td>5</td>
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<tr>
<td>Daily Rail Patrons</td>
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<td></td>
</tr>
<tr>
<td>Low</td>
<td>68.6</td>
<td>11.6</td>
<td>3.6</td>
<td>7.6</td>
</tr>
<tr>
<td>High</td>
<td>68.6</td>
<td>16.3</td>
<td>7.2</td>
<td>12.7</td>
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</table>
DEVELOPMENT LEVELS NEED FOR EQUIVALENT RAIL RIDERSHIP

Station Parking and Transit Oriented Development

<table>
<thead>
<tr>
<th>Development Levels</th>
<th>Residential</th>
<th>Office</th>
<th>Retail</th>
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</thead>
<tbody>
<tr>
<td>High Capture</td>
<td>4.2</td>
<td>9.5</td>
<td>5.4</td>
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<tr>
<td>Low Capture</td>
<td>6</td>
<td>19</td>
<td>9</td>
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</tbody>
</table>

Station Parking and Transit Oriented Development
RAIL RIDERSHIP IS ONE OF MANY FACTORS FOR STATION SITE PLANNING

• Mobility
• Livability
• Economic vibrancy
• Revenue
• Passive security
WHY RAIL RIDERSHIP IS IMPORTANT

- FTA funding
- Quality of sustainable service
- Symbiotic benefit to property values
PARKING COST SPREADSHEET

1. Construction costs
2. Annual Operation & maintenance costs
3. Land costs (modeled from $250,000 to $10,000,000/acre)
## COST PER SPACE – NEW CONSTRUCTION

<table>
<thead>
<tr>
<th>Parking Type</th>
<th>Spaces</th>
<th>Construction Cost Per Space</th>
<th>Total Cost</th>
<th>Total Cost per Space Including Land</th>
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</thead>
<tbody>
<tr>
<td><strong>Surface</strong></td>
<td>125</td>
<td>$5,000</td>
<td>$25,000</td>
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<tr>
<td><strong>Deck</strong></td>
<td>250</td>
<td>$2,000</td>
<td>$3,000,000</td>
<td>$13,000</td>
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<tr>
<td>3 levels</td>
<td>375</td>
<td>$21,900</td>
<td>$8,212,500</td>
<td>$22,567</td>
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<tr>
<td>4 levels</td>
<td>500</td>
<td>$23,400</td>
<td>$1,700,000</td>
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<td>5 levels</td>
<td>625</td>
<td>$24,900</td>
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<td>$25,300</td>
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<td>6 levels</td>
<td>750</td>
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<td>$9,800,000</td>
<td>$26,733</td>
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<td>7 levels</td>
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<td>$27,900</td>
<td>$4,412,500</td>
<td>$28,471</td>
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<tr>
<td>8 levels</td>
<td>1000</td>
<td>$29,400</td>
<td>$29,400,000</td>
<td>$29,900</td>
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<tr>
<td><strong>Underground</strong></td>
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<td></td>
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</tr>
<tr>
<td>1 level</td>
<td>125</td>
<td>$26,250</td>
<td>$3,281,250</td>
<td>$28,250</td>
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<tr>
<td>2 levels</td>
<td>250</td>
<td>$36,500</td>
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</tr>
<tr>
<td>3 levels</td>
<td>375</td>
<td>$38,000</td>
<td>$4,250,000</td>
<td>$38,667</td>
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<tr>
<td>4 levels</td>
<td>500</td>
<td>$39,500</td>
<td>$9,750,000</td>
<td>$40,000</td>
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</tbody>
</table>
ESTIMATED COST RECOVERY PER SPACE

- Surface lot - $0.25 daily
- Structured garage
  - Platform - $5 daily
  - Multilevel - $6-7 daily
- Underground garage
  - One level - $6 daily
  - Multilevel - $6-8 daily

Footnote: Assumes no weekend revenue and 95% occupancy of parking
COST PER PARKING SPACE

Station Parking and Transit Oriented Development

Land Value ($000 per acre)

Surface Lot
3 Levels Above
6 Levels Above
3 Levels Below
Parking and Affordable Housing (San Diego)

- Surveyed 2700+ Households living in Affordable housing developments
- Affordable Households 50% less likely than avg. rental population to own a vehicle
- Significant parking demand factors:
  - Housing type, unit size, income and household age (correlated factors)
    - Senior, SRO and some special needs housing had lowest demand
  - Land use and transportation
    - Urban/core sites had very low parking demand and high walking and transit scores
- Code adjustments by housing type are under review
SUMMARY

• Station parking is expensive to provide and parkers should be expected to pay for its use
• Transit oriented developments require multiple floors to generate equivalent rail ridership to park and ride
• TOD uses are likely to generate more vehicle trips than surface parking
• At land values less than $2 million per acre, surface parking is the most economical strategy
• Convenient station access is critically important for viable rail transit investments
• Many factors in addition to rail patronage are important in deciding highest and best use of station sites
• Affordable housing can be a good fit for TOD