Walking to the station: The role of walkability on transit use

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Walk21: Walking and Liveable Communities 2014, Sydney
Outline

• Background and Objective
• Methodology
• The modelling approach
• The results
• Key barriers in the built environment
• Conclusions
Transit for liveable community

- Creating places for community life
- Acting as a catalyst for the renewal and revitalization of neighborhoods and entire downtowns
- Making communities safer and more comfortable
- Making connections between neighborhoods, downtowns, and community destinations more accessible and convenient
- Shaping community growth

Source: Transportation Research Board, TCRP Report 22
The objective of this study

- How does urban design around transit stop/station influence transit use?
Study Locations

Portland

- Large metropolitan area
- 1.8 million population
- 7,214 stops/stations

Lane County

- Medium metropolitan area
- 250,000 population
- 1,400 stops/stations

Rogue Valley

- Small metropolitan area
- 150,000 population
- 350 stops/stations
Transit Performance Measure

- Transit Ridership: total “ons” and total “offs” for each stop location

![Chart showing transit ridership distribution by stop level for TriMet, Lane Transit, and Rogue Valley Transit.]

- TriMet
- Lane Transit
- Rogue Valley Transit

% of stops

Stop-level Ridership

0-30 31-100 101-250 251-1000 Over 1,000
Urban Design Measures
## Urban Design Measures

<table>
<thead>
<tr>
<th>Measure</th>
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</thead>
<tbody>
<tr>
<td>Total Employment</td>
</tr>
<tr>
<td>Total Population</td>
</tr>
<tr>
<td>% of SFR land use</td>
</tr>
<tr>
<td>% of MFR land use</td>
</tr>
<tr>
<td>% of COM land use</td>
</tr>
<tr>
<td>Total parks</td>
</tr>
<tr>
<td>Pedestrian Destinations</td>
</tr>
<tr>
<td>Land use mix index</td>
</tr>
<tr>
<td>Street Connectivity (# of street nodes with 3+ valence)</td>
</tr>
<tr>
<td>Miles of regional multi-use paths</td>
</tr>
<tr>
<td>Miles of bike lanes</td>
</tr>
</tbody>
</table>
### Other Factors considered

<table>
<thead>
<tr>
<th>Socio-Demographic Variables</th>
<th>Transit Service Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of white population</td>
<td>Rail transit or BRT station</td>
</tr>
<tr>
<td>% of population with aged under 17</td>
<td>Transfer Stop</td>
</tr>
<tr>
<td>% of population aged 65 or older</td>
<td>Transit Center</td>
</tr>
<tr>
<td>% of population with college or above degree</td>
<td>Minimum headway</td>
</tr>
<tr>
<td>% of households without vehicle available</td>
<td>Maximum Coverage Time</td>
</tr>
<tr>
<td>% of households with annual HH income below the poverty level</td>
<td>Total bus stops</td>
</tr>
<tr>
<td>Park &amp; Ride</td>
<td>Total light rail stations</td>
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</table>
Statistical Models

- Urban Design
- Socio-Demographics
- Level of Service

Transit Ridership
## Model Results Highlight

<table>
<thead>
<tr>
<th></th>
<th>Portland (TriMet)</th>
<th>Lane County (LTD)</th>
<th>Rogue Valley (RVTD)</th>
</tr>
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<tbody>
<tr>
<td><strong>Adjusted R²</strong></td>
<td>0.69</td>
<td>0.62</td>
<td>0.53</td>
</tr>
<tr>
<td><strong>Socio-Demographic Variables</strong></td>
<td>24%</td>
<td>11%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Transit Service Variables</strong></td>
<td>41%</td>
<td>46%</td>
<td>27%</td>
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<tr>
<td><strong>Land Use Variables</strong></td>
<td>5%</td>
<td>6%</td>
<td>18%</td>
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Pedestrian friendly design encourage transit use

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Combination of having a high level of service and pedestrian friendly design contribute to a proportionally greater effect on ridership.
Key barriers
Key barriers
Key barriers
Key barriers
Key barriers
Conclusions

• Built environment around transit stops/stations affect ridership levels
  ◦ Promotion of pedestrian friendly built environment can increase ridership

• Integration of land use and transport investments is important for ridership levels can increase ridership by focussing on
  ◦ multi-family housing
  ◦ pedestrian-orientated commercial land use

• The built environment around the stop is important as most transit users are pedestrians at origin, destination or both
• Thank You!

• Comments and Suggestions?

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