Trick or Treat(ment)? : Impact of Route-level Features on Walk and Bike Decisions

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Trick or Treat(ment)?

Impact of Route-Level Features on Walk and Bike Decisions

Joe Broach
PhD Candidate, Urban Studies and Planning
Presented at the CTS Friday Transportation Seminar Series
October 31, 2014 in Portland, OR
A little backstory

2007: BikeGPS study
Over 150 Volunteers with bike-mounted PDAs

2009-2011: Bike Model 1.0
Route choice model

2010-2013: Family Activity Study (FAS)
Over 1,000 adults and children, wearable GPS

2012-2015: Bike Model 2.0, Ped Model 1.0
Route and Mode Choice
Why a new study?

1. Replication
2. Pedestrians
3. Sample
4. Network
5. Mode Choice
New data

Family Activity Study Sites

Portland, Oregon
- City Boundary
- City Center

Major Roads
- Freeways
- Highways
- Other Major Roads

Study Sites
- Treatment
- Control
<table>
<thead>
<tr>
<th></th>
<th>Study Participants</th>
<th>Multnomah County Families w/ Children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median Annual Household Income</strong></td>
<td>$50,000-$75,000</td>
<td>$57,143</td>
</tr>
<tr>
<td><strong>%Female Adults</strong></td>
<td>62.4%</td>
<td>58.7%</td>
</tr>
<tr>
<td><strong>%Female Children</strong></td>
<td>47.9%</td>
<td>49.0%</td>
</tr>
<tr>
<td><strong>%Married Couple Families</strong></td>
<td>58.5%</td>
<td>64.6%</td>
</tr>
<tr>
<td><strong>%White, Non-Hispanic Adults</strong></td>
<td>84.9%</td>
<td>68.7%</td>
</tr>
<tr>
<td><strong>%Four-year college degree or higher</strong></td>
<td>59.8%</td>
<td>37.5% (age 25+)</td>
</tr>
<tr>
<td><strong>%Renters</strong></td>
<td>19.2%</td>
<td>37.8%</td>
</tr>
<tr>
<td><strong>Vehicles per licensed driver</strong></td>
<td>0.98</td>
<td>-</td>
</tr>
<tr>
<td><strong>Interested but Concerned Cyclists</strong></td>
<td>32%</td>
<td>-</td>
</tr>
</tbody>
</table>
Bike route choice

1. “Label” alternatives
2. Calibrate detours
3. Terrain (LiDAR)
4. Traffic
5. Intersections
6. Facilities
To compensate for listed feature, cyclist willing to ride...
Surprisingly consistent results

- Non-commute trips
- Female cyclists
- Facilities
- Slope
- Traffic
- Buffered lanes?
- Cycle tracks?
- Burnside Bridge?
Some differences

- Commuting
- Traffic
- Bike lanes
- Delay
- Alleyways & Unpaved streets
Ped route choice

• Alternatives: random walks around the shortest path
• Complex crossings
• Blockface land-use and design
• Walking to destination or transit
• 0.25 miles and up
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Distance Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per additional…</td>
<td></td>
</tr>
<tr>
<td>turn</td>
<td>+54 m</td>
</tr>
<tr>
<td>unsignalized arterial crossing</td>
<td>+73 m</td>
</tr>
<tr>
<td>collector crossing w/o marked crosswalk</td>
<td>+28 m</td>
</tr>
<tr>
<td>Change in perceived distance along…</td>
<td></td>
</tr>
<tr>
<td>ten percent upslope</td>
<td>+99 %</td>
</tr>
<tr>
<td>unpaved or alley</td>
<td>+51 %</td>
</tr>
<tr>
<td>busy street (collector or larger)</td>
<td>+14 %</td>
</tr>
<tr>
<td>neighborhood commercial</td>
<td>−28 %</td>
</tr>
<tr>
<td>Increase in detour cost…</td>
<td></td>
</tr>
<tr>
<td>traveling with another family member</td>
<td>+85 %</td>
</tr>
</tbody>
</table>
Compared with cyclists

- Facilities
- Intersections
- Wayfinding/Inertia
- Traffic
- Adjacent Land Use
- Detours
- And...traveling with others?
Stay tuned this Winter...
Application: crosswalk location

Model suggests this crosswalk may be too much of a detour for peds.
Biking the new bridge:

Tilikum Crossing’s cycling potential may be limited by its steep grade (>4%).
Some thanks are in order

- Jennifer Dill, John Gliebe, dissertation committee
- (O)TREC & Robert Wood Johnson
- Metro & PBOT
- Geostats (Westat)
- Grad students
Questions?

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