Assessing Transit Accessibility with GPS/GIS
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Background
As a result of the demographic transition, many cities around the globe are pledging to become more “age friendly.” This includes making public transportation more accessible for people of all ages and abilities.

This project uses GPS and GIS to assess geographic features (bus stops, sidewalks, intersections) and to evaluate their attributes in a demographic context.

Study Area & Features
The following features and their accessibility-related attributes were collected in the St. Johns and Cathedral Park neighborhoods (North Portland peninsula):

1. Bus stops: Presence of shelter and/or seating
2. Ramps: Presence of tactile warning devices
3. Obstacles: Missing or damaged sidewalk; curb
4. Aided pedestrian crossing: Presence of crosswalk with or without pedestrian-activated light and/or sound signal

Methods
GPS data were collected on three days in May 2017 using a Trimble Juno 3B recorder. Thirty points were saved for each feature as it occurred along four major bus lines (4, 16, 44, 75) in the study area. For line 11, no features except bus stop enhancement were collected as this rush-hour-only line mostly serves North Portland’s industrial region. Before export, all .ssf files were differentially corrected using the ORGN-Portland Airport base station.

For a choropleth overlay, demographic data were retrieved from the U.S. Bureau of Census’ website. Census tables were edited and linked with shapefiles on census block level.

Findings

<table>
<thead>
<tr>
<th>Bus stop enhancement</th>
<th>Street Furniture</th>
<th>Parking</th>
<th>Pedestrian Bus</th>
<th>Smartphone Bus</th>
<th>Bus Stop Light</th>
<th>Pedestrian Presence</th>
<th>Pedestrian Crossings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelters</td>
<td>Benched</td>
<td>Pole seat</td>
<td>Bench</td>
<td>Bench</td>
<td>Crosswalk</td>
<td>Marked</td>
<td>“Safe intersections”</td>
</tr>
<tr>
<td>Presence of tactile warning device on ramps</td>
<td>Truncated domes: 124 corners</td>
<td>Serrated ramps: 57 corners</td>
<td>Corners without tactile warning: 98</td>
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<tr>
<td>Obstacles on sidewalks</td>
<td>Sidewalk damage or curb: 60</td>
<td>Missing sidewalk: 5 instances</td>
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<tr>
<td>Marked pedestrian crossings</td>
<td>Marked crossings total: 48</td>
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</tbody>
</table>

Data Sources:
U.S. Census Bureau (Census 2010), Metro (RLIS), The City of Portland

Conclusion
The presence of (in)accessibility features seems to be tied to areas of commercial activity rather than reflecting residents’ needs. Improvements are necessary in residential areas with higher numbers of potential transit users and higher numbers of individuals who would benefit from shelters etc.

Some discrepancies were found between collected data and RLIS/City of Portland files (e.g., bus stops, ramps). Some publicly available data seem outdated.