Accessibility Evaluation in a National Context

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1. Overview of National Accessibility Evaluation project

2. Considerations in accessibility evaluation
National Accessibility Evaluation
Motivation

• Transportation exists to connect people to destinations that matter
• We should measure how well we meet this goal
• Calculate access to jobs by transit and auto for each Census block
• Pooled fund approach provides consistency, avoids redundancy
Goals and Deliverables

1. Accessibility datasets
   - Tabular and shapefile data at Census block level

2. Accessibility reports
   - National report series: Access Across America
   - Local reports for each partner

3. Annual updates and improvements
   - Review data, methodology, and deliverables
   - Identify opportunities for improvement and expansion
   - Guided by input from TAP
Metropolitan Transportation Commission
Job Accessibility Results – Auto, 2015

Total Jobs: 3,445,338
Average Job Density (per mi²): 1,192
Total Workers: 3,266,752
Average Worker Density (per mi²): 1,130

*Job and worker totals are based on LEHD estimates and may not match other sources.*

**Average Job Accessibility by Travel Time Threshold (worker-weighted)**

**Average Congestion Impact by Travel Time Threshold (worker-weighted)**

*Higher numbers indicate greater job access loss due to congestion*
Implementation

• Employment (destinations): Census LEHD

• Transit:
  – Schedules from transit operators
  – Pedestrian network for end-to-end, block-level trips

• Auto:
  – National network & speed data licensed from TomTom
  – Reflects varying congestion at 5-minute intervals

• Travel time calculations:
  – OpenTripPlanner
  – Custom tools for parallelization and aggregation
Benefits & Uses

• “Observatory” approach
  – Annual monitoring
  – Builds trend line for long-term performance management & reporting
  – Data available universally, can be analyzed & combined to meet multiple needs
  – Provides baseline data for project/scenario evaluation
  – Reveals project impact after implementation
Considerations in Accessibility Evaluation
<table>
<thead>
<tr>
<th>Measuring Access to...</th>
<th>... Destinations</th>
<th>... Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many jobs can be reached within 30 minutes?</td>
<td>End-to-end travel</td>
<td>How many people live within ¼ mile of a bus stop?</td>
</tr>
<tr>
<td>Reflects transportation + land use</td>
<td>Complex</td>
<td>Reflects only transportation, though not all stops are equal</td>
</tr>
<tr>
<td>Simple</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Weighting Destinations

Cumulative

• Sum of destinations within given travel time
• Simple
• Sensitive to boundary effects

Decayed

• All reachable destinations weighted by calibrated decay function
• Complex
• High correlation with simpler measures
Consistent & Comparable Accessibility

• How important is comparability across modes?
• How important is comparability across locations?
Departure Time

• Travel times vary by day/hour
  – Auto: speeds vary due to congestion
  – Transit: variation in speeds plus service frequency

• What departure time(s) should be reflected in accessibility metrics?
Departure Time
Thanks!