Accessibility Evaluation in a National Context

Andrew Owen — University of Minnesota

1. Overview of National Accessibility Evaluation project

2. Considerations in accessibility evaluation

National Accessibility Evaluation

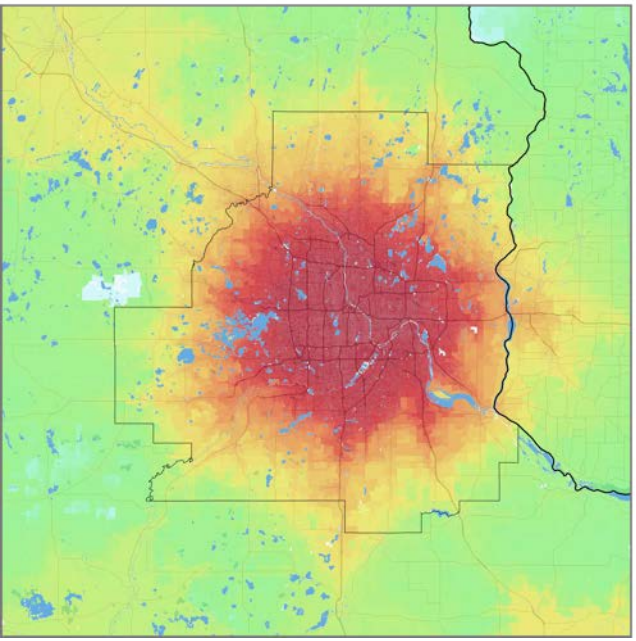
Motivation

- 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 Council



Jobs within 30 minutes
(Driving, AM peak)

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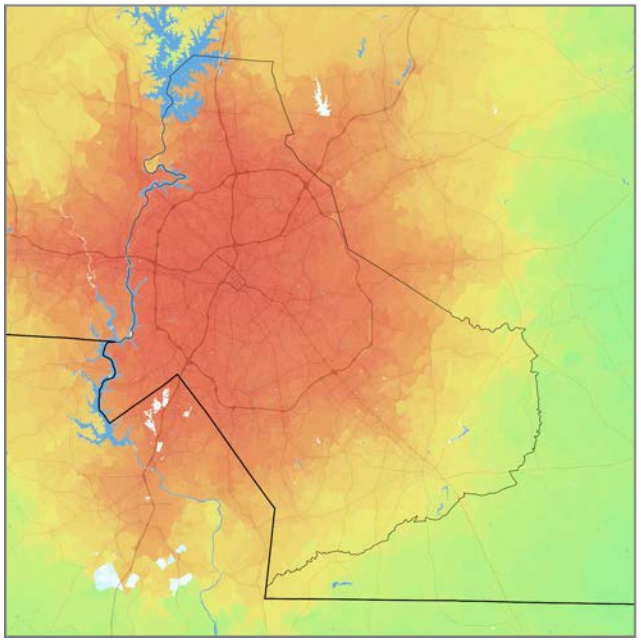
State border
MPO boundary

Charlotte Regional Transportation Planning Organization



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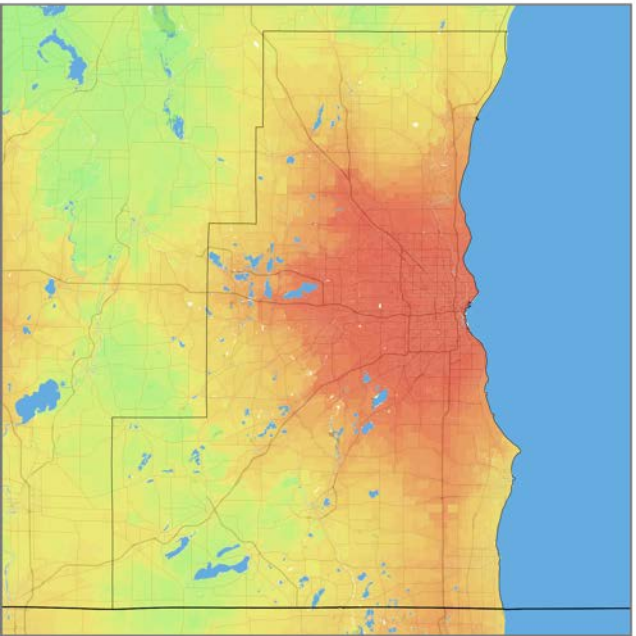
Southeastern Wisconsin Regional Planning Commission



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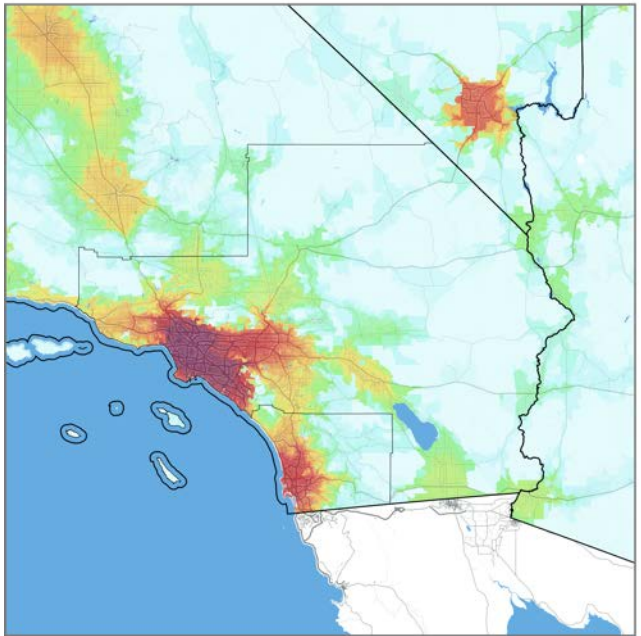
Southern California Association of Governments



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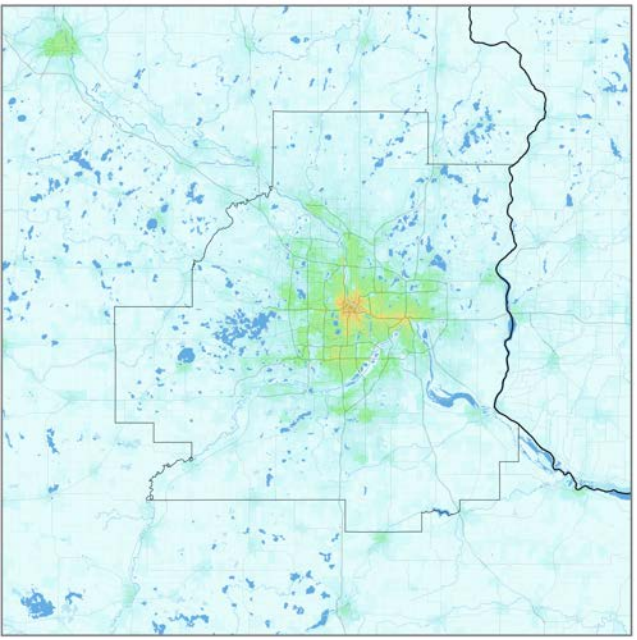

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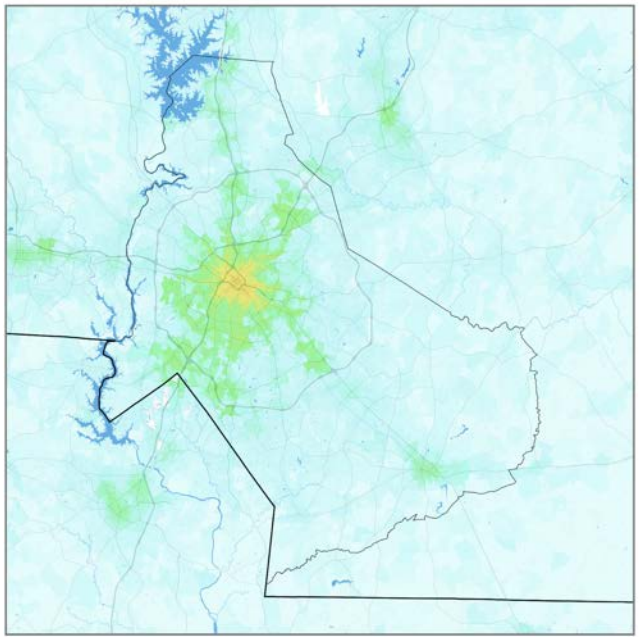

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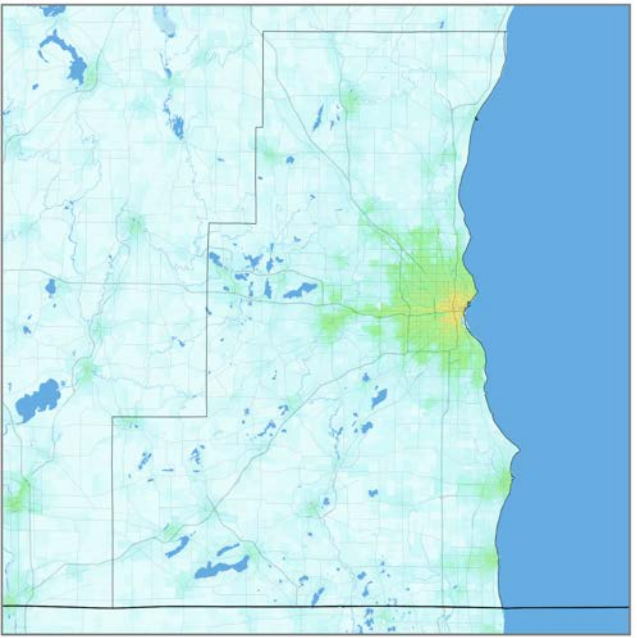

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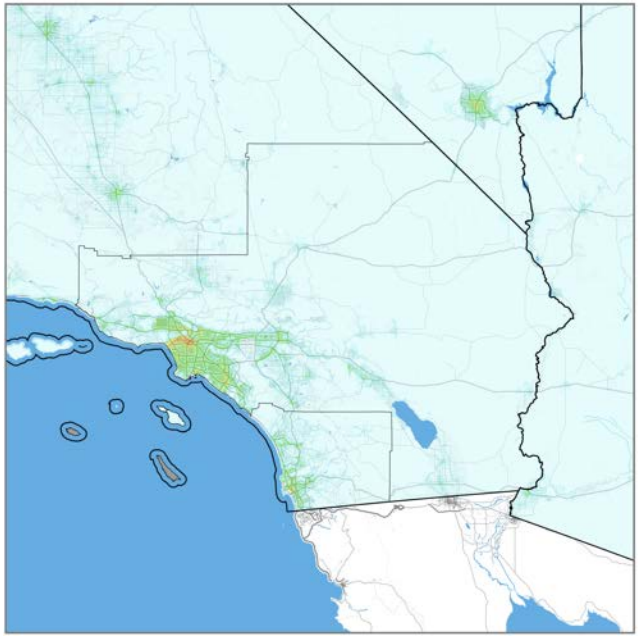

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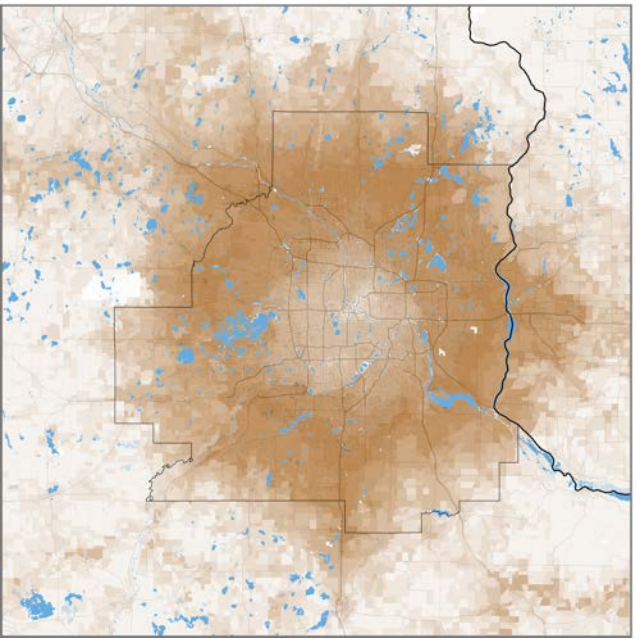

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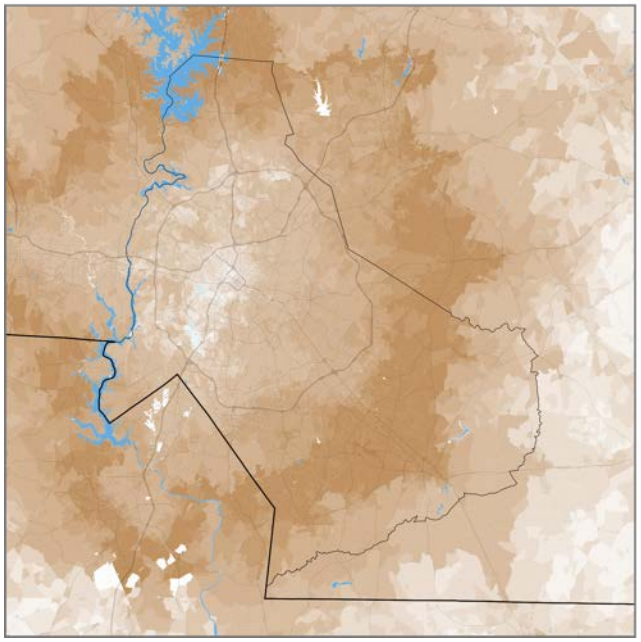

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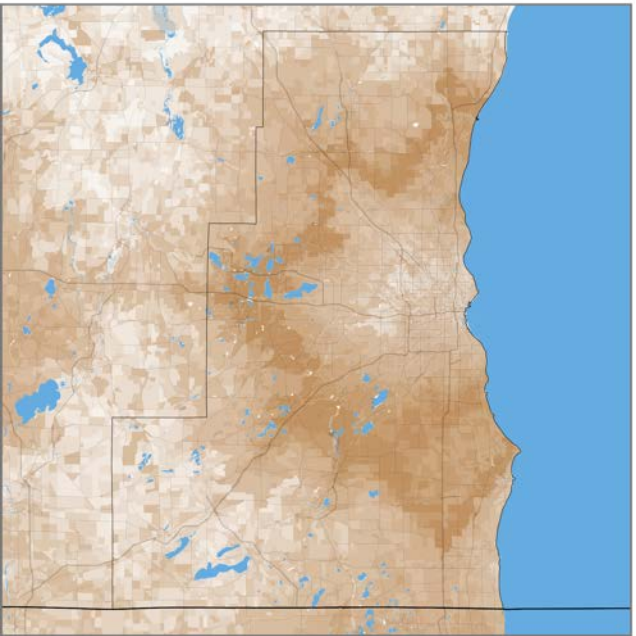

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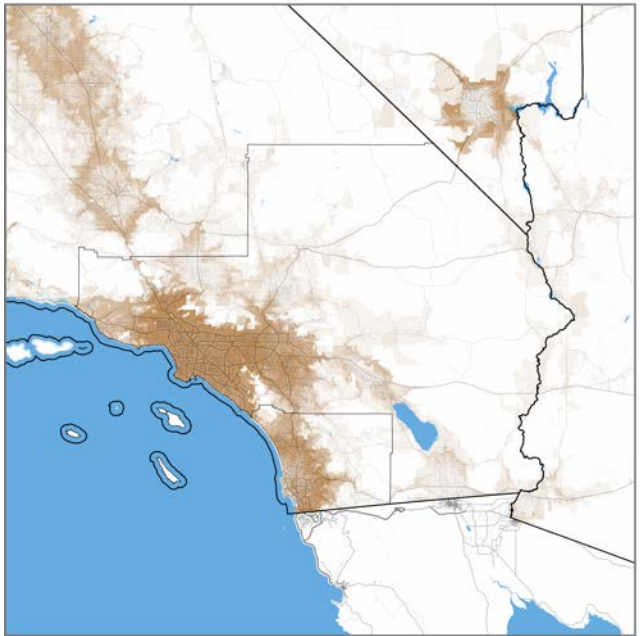

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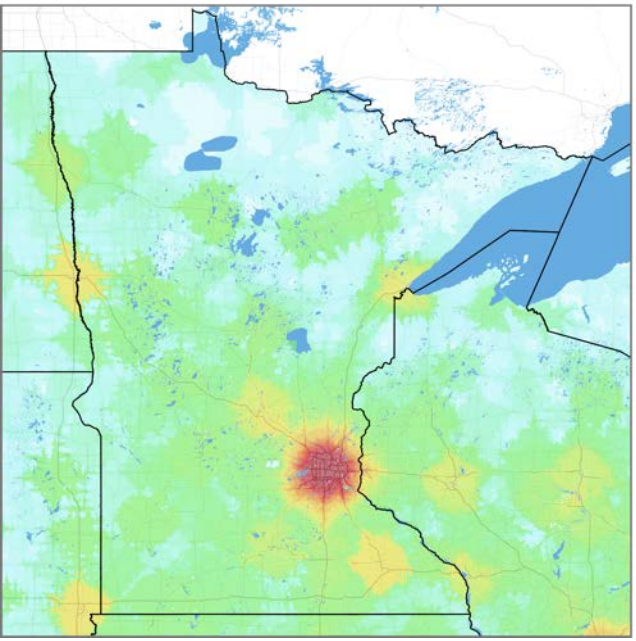
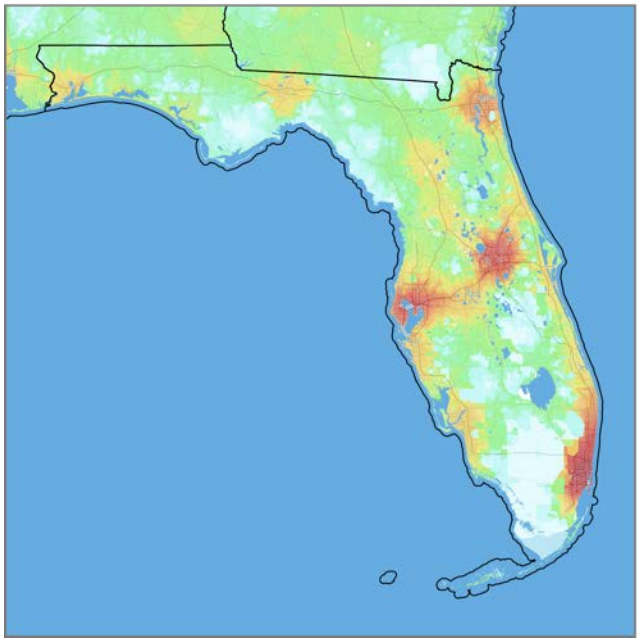
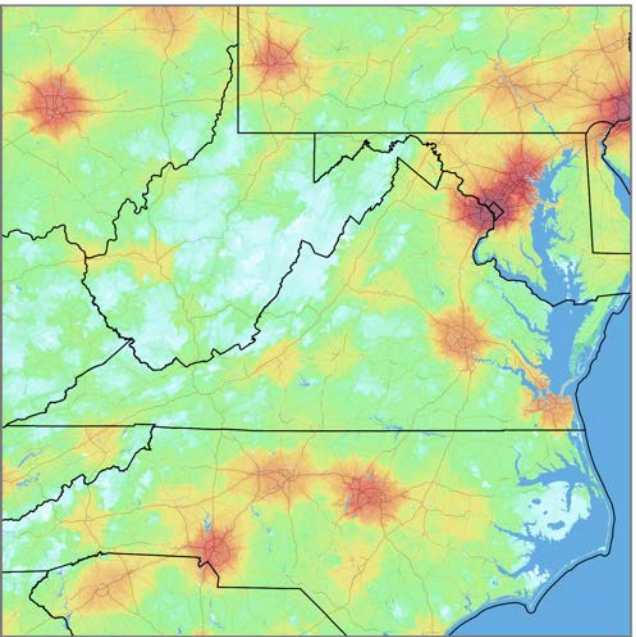


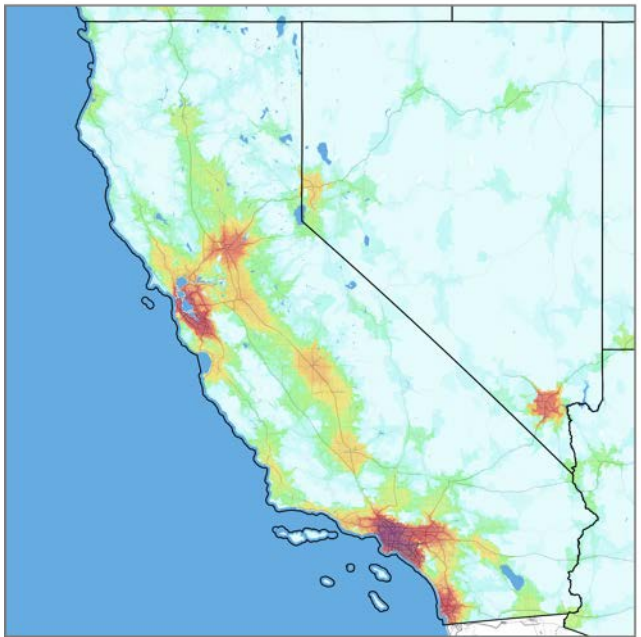
Florida



Virginia



California



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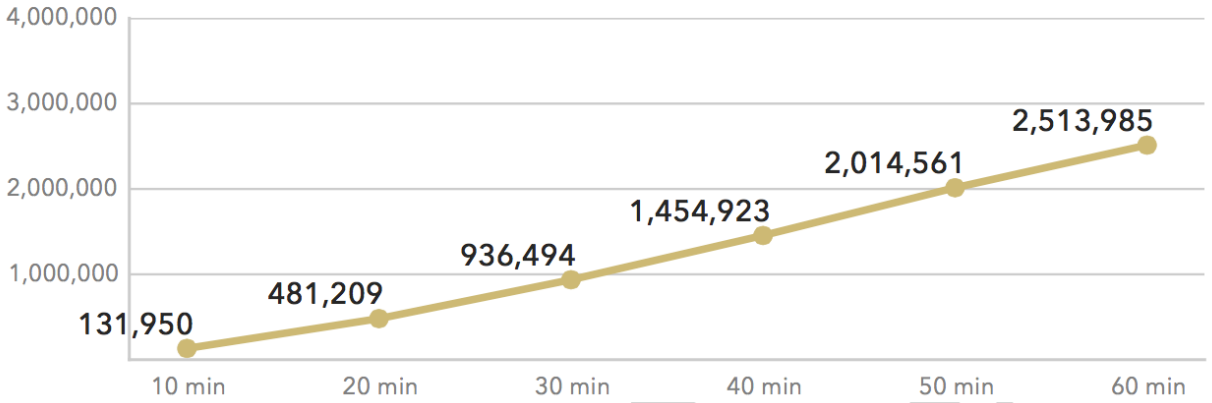
Metropolitan Transportation Commission

Job Accessibility Results – Auto, 2015

Total Jobs	**3,445,338**
Average Job Density (per mi^2)	**1,192**
Total Workers	**3,266,752**
Average Worker Density (per mi^2)	**1,130**

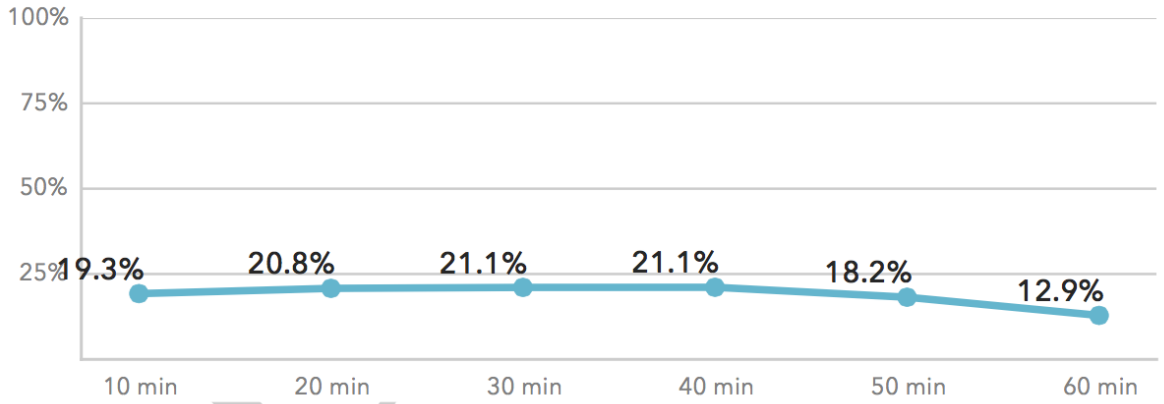
Job and worker totals are based on LEHD estimates and may not match other sources.

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

Measuring Access to…

… Destinations

- How many jobs can be reached within 30 minutes?
- End-to-end travel
- Reflects transportation + land use
- Complex

… Transportation

- How many people live within ¼ mile of a bus stop?
- Reflects only transportation, though not all stops are equal
- Simple

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

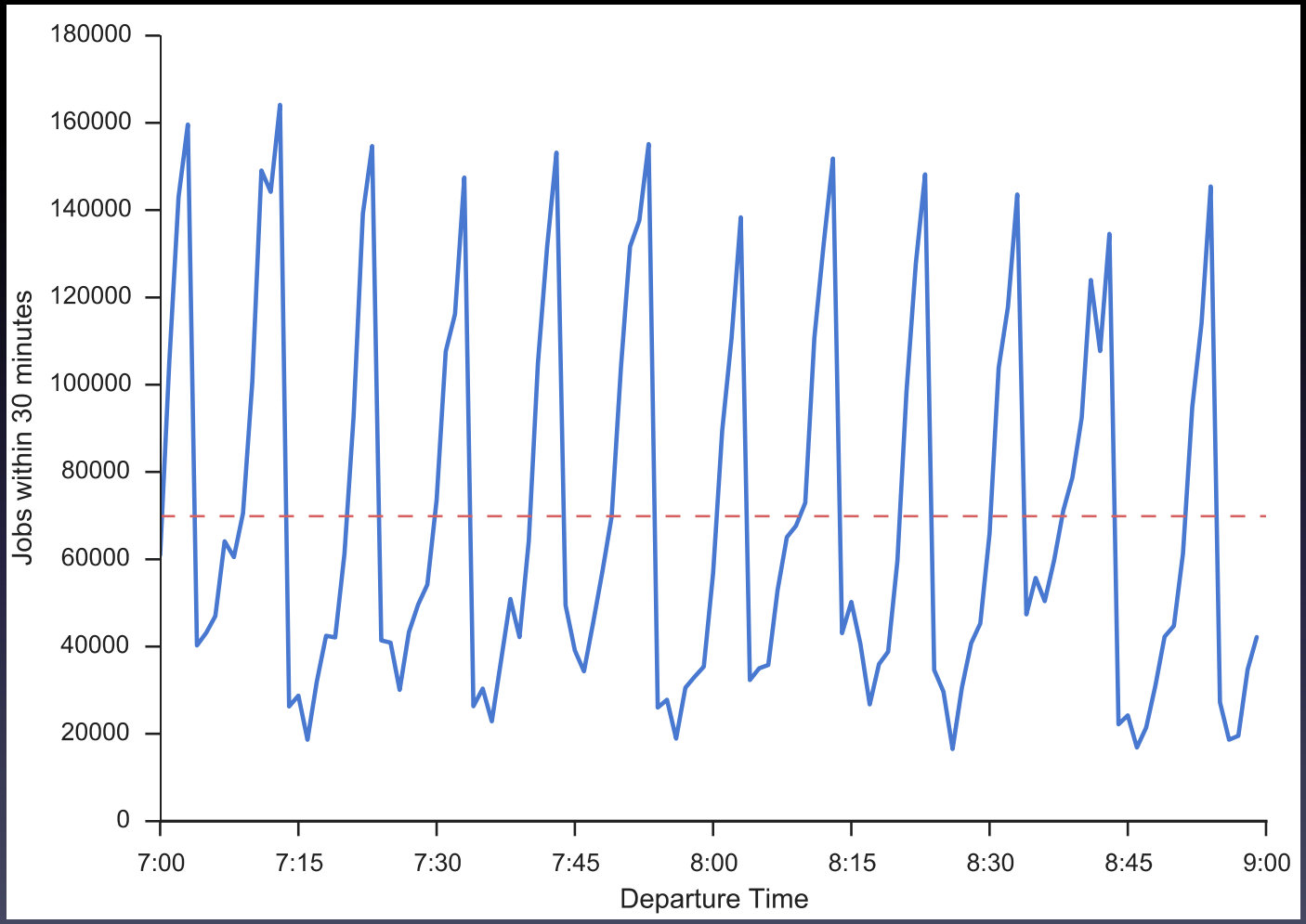
Consistent & Comparable Accessibility

- 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!

ACCESSIBILITY OBSERVATORY

UNIVERSITY OF MINNESOTA

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