CTS Research Brief

Access Across America: Transit 2014

"This project provides the most detailed evaluation to date of access to jobs by transit. We directly compare the transit accessibility performance of America's largest metropolitan areas."

—Andrew Owen

Top 10 metro areas: job accessibility by transit (January 2014)

1. New York
2. San Francisco
3. Los Angeles
4. Washington
5. Chicago
6. Boston
7. Philadelphia
8. Seattle
9. Denver
10. San Jose

Overview

Accessibility is the ease of reaching valued destinations. It can be measured for various transportation modes, to different types of destinations, and at different times of day. There are a variety of ways to define accessibility, but the number of destinations reachable within a given travel time is the most comprehensible and transparent, as well as the most directly comparable across cities.

In a report from the University of Minnesota's Accessibility Observatory—*Access Across America: Transit 2014*—researchers examine the accessibility to jobs by transit in 46 of the 50 largest (by population) metropolitan areas in the United States. Transit is used for an estimated 5 percent of commuting trips in the United States, making it the second most widely used commute mode after driving.

The new report is part of the Access Across America study begun last year. It complements *Access Across America: Auto 2013*, which ranked job accessibility by auto in 51 metropolitan areas.

Methodology and Data Sources

Rankings were determined by a weighted average of accessibility, giving a higher weight to closer jobs. Jobs reachable within 10 minutes were weighted most heavily; jobs were given decreasing weight as travel time increased up to 60 minutes.

Travel times by transit were calculated using detailed pedestrian networks and full transit schedules for the 7:00

to 9:00 a.m. period. The calculations include all components of a transit journey, including "last mile" access and egress walking segments and transfers, and account for minute-by-minute variations in service frequency.

Four metropolitan areas were excluded due to a lack of available employment and/or transit schedule data: Memphis, Jacksonville, Oklahoma City, and Richmond.

All calculations and results were based on geographies defined by the U.S. Census Bureau. Census blocks are the fundamental unit for travel time calculation; block-level accessibility results are aggregated across core-based statistical areas for metropolitan-level analysis.
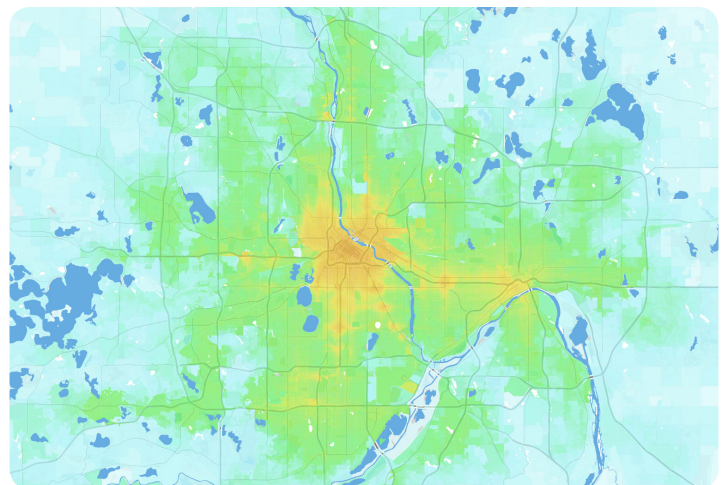
Accessiblity to jobs by transit in the Minneapolis–St. Paul area

Data describing the distribution of labor and employment were drawn from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics program. Data describing the pedestrian network in each metropolitan area were obtained from OpenStreetMap, an open-access online database of transportation network structures and other spatial information. Travel time calculations are based on schedules valid for January 29, 2014.

Results

The report presents detailed accessibility values for each metropolitan area, as well as detailed, block-level color maps that illustrate the spatial patterns of accessibility within each area. A separate publication—*Access Across America: Transit 2014 Methodology*—describes the data and methodology.

In addition, time-lapse map videos for each area are forthcoming, and new analysis of the data will be published periodically. Upcoming reports in the Access Across America series will explore more detailed aspects of transit accessibility to jobs, including accessibility to jobs of different wage levels and a comparison with accessibility by car.

Policy Implications

By tracking accessibility over time, state departments of transportation, metropolitan planning organizations, and transit agencies can better understand how well their transportation networks support the goal of accessibility. Accessibility evaluation can be applied to performance goals related to congestion, reliability, and sustainability.

Transportation planning organizations can use accessibility evaluation to help select between project alternatives and to prioritize investments. Because they incorporate land-use information, accessibility metrics can provide a more comprehensive picture of how investments will change users' ability to reach destinations.

Detailed accessibility evaluation can also help reveal how the costs and benefits of transportation investments are distributed over space and society. Understanding the accessibility characteristics of different origins and destinations can help agencies make equitable decisions in transportation planning.

Case Study: Minneapolis–St. Paul

The Minneapolis–St. Paul metropolitan area ranked 13th in the study, which used data obtained before the launch of Green Line light-rail operations between St. Paul and Minneapolis. In an upcoming report, Observatory researchers will analyze the changes in job accessibility associated with the new rail line and supporting adjustments to connecting bus services.

"When light rail replaced bus service along the corridor, travel times by transit became more reliable," explains Andrew Owen, Observatory director. "Bus service in a large portion of St. Paul north and south of the corridor was rescheduled or realigned to link with the Green Line. We expect to find that the entire Green Line project has created job accessibility benefits throughout the region, not just along the light-rail corridor."

Photo: Michelle Riedel

"Accessibility is the single most important measure in explaining the effectiveness of the urban transportation system," says David Levinson, principal investigator on the project.