

## Access to Destinations

# A New Approach to Understanding and Measuring Transportation and Land Use

### An Access to Destinations Study Research Brief

#### PROJECT BACKGROUND

*Access to Destinations* consists of 11 studies in 3 subject areas. The research takes a new approach to understanding how people use the transportation system and how transportation and land use interact. At the heart of this approach is the concept of accessibility: the ability of people to reach the destinations they need to visit in order to meet their needs. By focusing on accessibility rather than simple congestion measures, the Access to Destinations Study aims to produce a more complete and meaningful picture of transportation and its role in our lives.

#### MEASURING ACCESSIBILITY

Developing and refining methods of measuring accessibility across many modes of transportation paints a clearer picture of how people reach common destinations such as jobs, schools, shopping, and parks.

##### *Automobile*

In the past, automobile travel times focused primarily on freeways. *Access to Destinations* researchers not only refined freeway travel-time estimation—they also improved arterial travel-time models. The result is state-of-the-art travel-time estimates on the signalized arterial road network.

Researchers found accessibility by automobile increased throughout the region from 1995–2005. The greatest increases occurred in the developing edges of the region. While some new roads were built during this period and others were improved, nothing explains these gains except changes in land use and increased employment density in multiple zones of the region.

In 1995, people in only one traffic analysis zone could reach more than one million jobs within 20 minutes; by 2005 there were 20 zones with that claim. Additionally, the overall ratio of jobs to workers is improving (getting closer to 1:1) in most areas of the region.

##### *Walking*

Researchers documented small but measurable decreases in walking travel time due to improved or expanded facilities in the pedestrian infrastructure. Making it easier and safer to walk raises the desirability of walking and lowers the trip time, increasing the likelihood of walking as a selected mode of travel. Researchers found a third of walking trips exceeded a mile, calling into question the long-standing belief that a quarter-mile is the limit of willingness to walk.

#### Project Fast Facts

- While congestion has been worsening, accessibility has improved throughout the Twin Cities region—especially by automobile. Accessibility by walking, biking, and transit has also improved.
- Changes in land use and increased development explain most of the accessibility improvements.
- In 1995, people in only one traffic analysis zone could reach a million jobs within 30 minutes. Today, more than half the region's population can reach a million jobs within 30 minutes.
- High accessibility has a positive effect on home values.
- A third of walking trips exceeded a mile, calling into question the long-standing belief that a quarter-mile is the limit of willingness to walk.
- The addition of the Hiawatha light-rail line and high-frequency bus service is increasing accessibility in the region by transit.



## Bicycling

Outfitting a sample of actual bicyclists with GPS devices gave researchers a first-hand look at how differences in bike facilities affected the range of destinations that could be considered accessible by bicycle. They found that adding new bike networks has a measurable, positive accessibility effect.

## Transit

Measuring travel times on transit is complex, so researchers experimented with ways to mitigate the likely error in measurement. They documented an expected positive impact of adding new capacity. For example, multiple measures showed the positive effects of adding the region's first light-rail line along the Hiawatha corridor.

## ASSESSING THE ROLE OF LAND USE

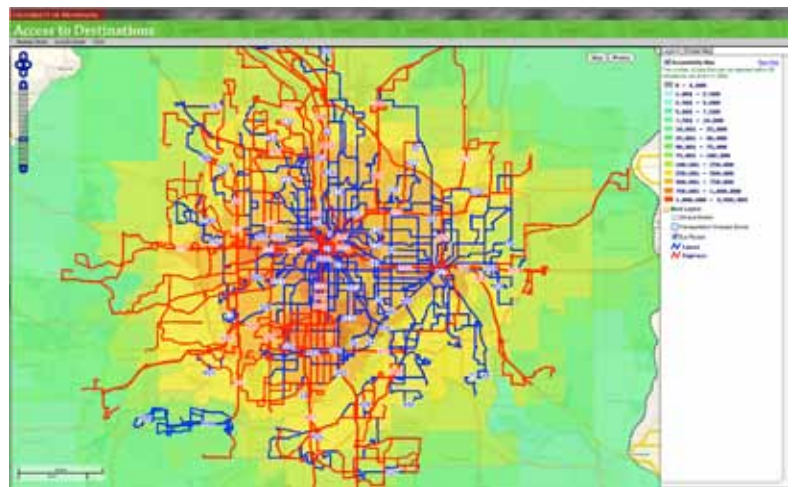
*Access to Destinations* researchers broke new ground in exploring how travel behavior relates to changes in land use. They examined how cities or entire metro areas display the drive for efficiency of location, how public policy affects land-use decisions, and how to best model and forecast future land use. This research makes real gains in mashing up complex transportation and land-use data with simple, transparent models on which future analyses may be built.

## MAPPING ACCESSIBILITY

The ultimate goal of the researchers was a tool that describes and potentially predicts how people access destinations by different modes. Now, transportation and land-use decision makers in the Twin Cities region have this new tool: an online "accessibility matrix" that captures variations in accessibility to different types of destinations for travelers who drive, bike, walk, or use transit.

For each origin area, a user can create a matrix with columns representing types of destinations and rows representing travel modes. Each cell tells how easy it is to reach the specified destination activity using a chosen mode. For example, a resident of one suburb could learn the accessibility of jobs in another by car or transit. The tool has a number of predefined maps and also allows users to create their own maps at the census block level.

The tool is hosted by the Minnesota Traffic Observatory, a transportation laboratory at the University of Minnesota staffed by experts in managing large data sets and creating visual models of complex data. Future researchers will be able to further develop the tool and add new data as they become available.



## POLICY IMPLICATIONS

*Access to Destinations* research shows the power of asking a more relevant question: accessibility versus mobility. It demonstrates that changes in individual and firm market choices—combined with land-use and transportation policies—enable people to reach more destinations in less time, even under conditions of worsening congestion.

Overall, the study opens new frontiers of information for better policy and investment decisions. It also marks the development of a new performance-measurement tool, the Accessibility Matrix, in a time when performance management is of growing focus in transportation circles.

## ABOUT THE RESEARCH

The Access to Destinations Study is an interdisciplinary research and outreach effort coordinated by the University of Minnesota's Center for Transportation Studies with support from sponsors including the Minnesota Department of Transportation, Hennepin County, the Metropolitan Council, and the McKnight Foundation. More information is available at [www.cts.umn.edu/access-study](http://www.cts.umn.edu/access-study).