



# Travel-cost-based accessibility in the Twin Cities

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Accessibility and Behavior Impacts of Bus-  
Highway System Interactions  
[http://  
mndot.gov/research/reports/2019/201917.pdf](http://mndot.gov/research/reports/2019/201917.pdf)

  
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## Accessibility Measurement



- Accessibility can be understood through the lens of the individual or through the lens of the place.
- The Accessibility Observatory measures “locational” accessibility — property of place.
- Land use and transportation each play a role in connecting people and goods with jobs, services, and activities.
- The Accessibility Observatory primarily focuses on access to jobs—which is a good proxy for other destination types.

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## Travel Resources



- Accessibility to jobs depends on the impedance between the origin and destination, e.g. distance, travel duration, travel costs.
- If two places are nearby, fewer resources are needed to make a connection between them.
- There are **fixed** costs associated with auto travel (vehicle ownership, parking) and transit travel (transit fare).
- There are **variable** costs (fuel, depreciation, repair, value of time) depending on the mode and route offered by surface roads, transit, and bike/ped infrastructure.

We applied these travel costs to SOV and transit travel to compare accessibility by the dollar across the Twin Cities



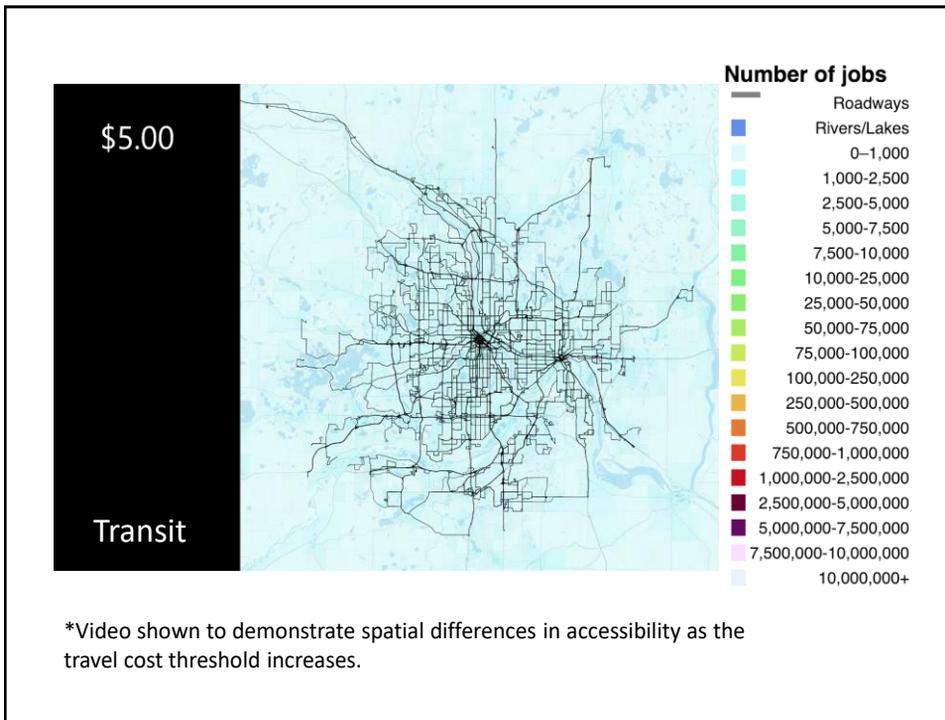
	Auto	Transit	P&R
Fuel (\$2.335/gal)	X		X
Vehicle Repair: highway \$0.017/mi, city \$0.019/mi	X		X
Vehicle Depreciation: highway \$0.025/mi, city \$0.030/mi	X		X
Parking (\$0—\$15)	X		
Transit Fare (\$3.25)		X	X
Wage-Value of Time (\$18.03/hr)	X	X	X



# Transit Travel Costs + Value of Time

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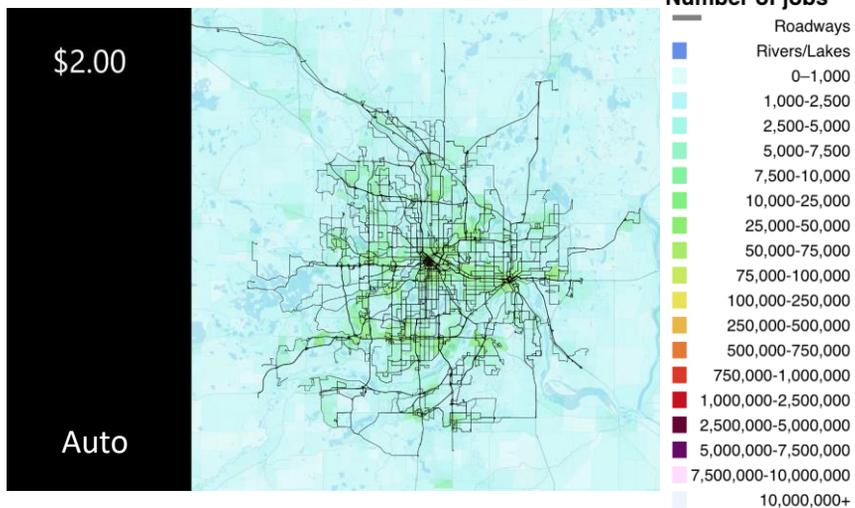




# Automobile Travel Costs + Value of Time

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\*Video shown to demonstrate spatial differences in accessibility as the travel cost threshold increases.

## Takeaways from travel-cost-based accessibility analysis



- The value in this analysis comes from the comparison of travel costs associated with neighborhood levels of accessibility.
- Parameters included in this demonstration are by no means comprehensive, but give baseline understanding of how to interpret cost-based accessibility results.
- Accounting for the negative externalities of driving or the value of commuter freedom on transit are two parameters that may bring their respective cost-based accessibility profiles closer to reality.
- In certain contexts, cost-based measures may be more helpful in communicating accessibility results than time-based measure.
- The full cost of travel is important for modeling traveler behavior.
- Cost-based accessibility measures may be advantageous for equity evaluations.

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## Travel-cost-based accessibility in the Twin Cities

Accessibility Observatory

Kristin Carlson



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# Park-and-Ride Travel Costs + Value of Time

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