State
Smart Transportation
Initiative

Practical Solutions to Move America Forward

Metropolitan sustainability and the Interstate System: A new professional paradigm

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Future of the Interstate Study

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Starting point

- Interstates imagined as inter-city facilities but greatly affect metro accessibility (for good and ill)
  - Siting and design for inter-city travel
  - Non-Interstate networks poorly connected
- Financing model serves rural needs but not metro needs
- Metro governance initially ignored and still underdeveloped
- Professional practice around construction

-- Adapted from Boarnet, 2014

Some more recent responses

- Anti-freeway movements
- Handful of freeway removals
- Undergrounding/capping, CSS
- Congestion pricing and other operational strategies
- Greater multimodalism

Still no new paradigm in practice

Opportunities for the future

Two tools to guide practice

- Accessibility = Ease of reaching destinations
- Trip-making = Actual use of the system to reach destinations

Both measures are empirical, multimodal and scalable

Why measure accessibility?

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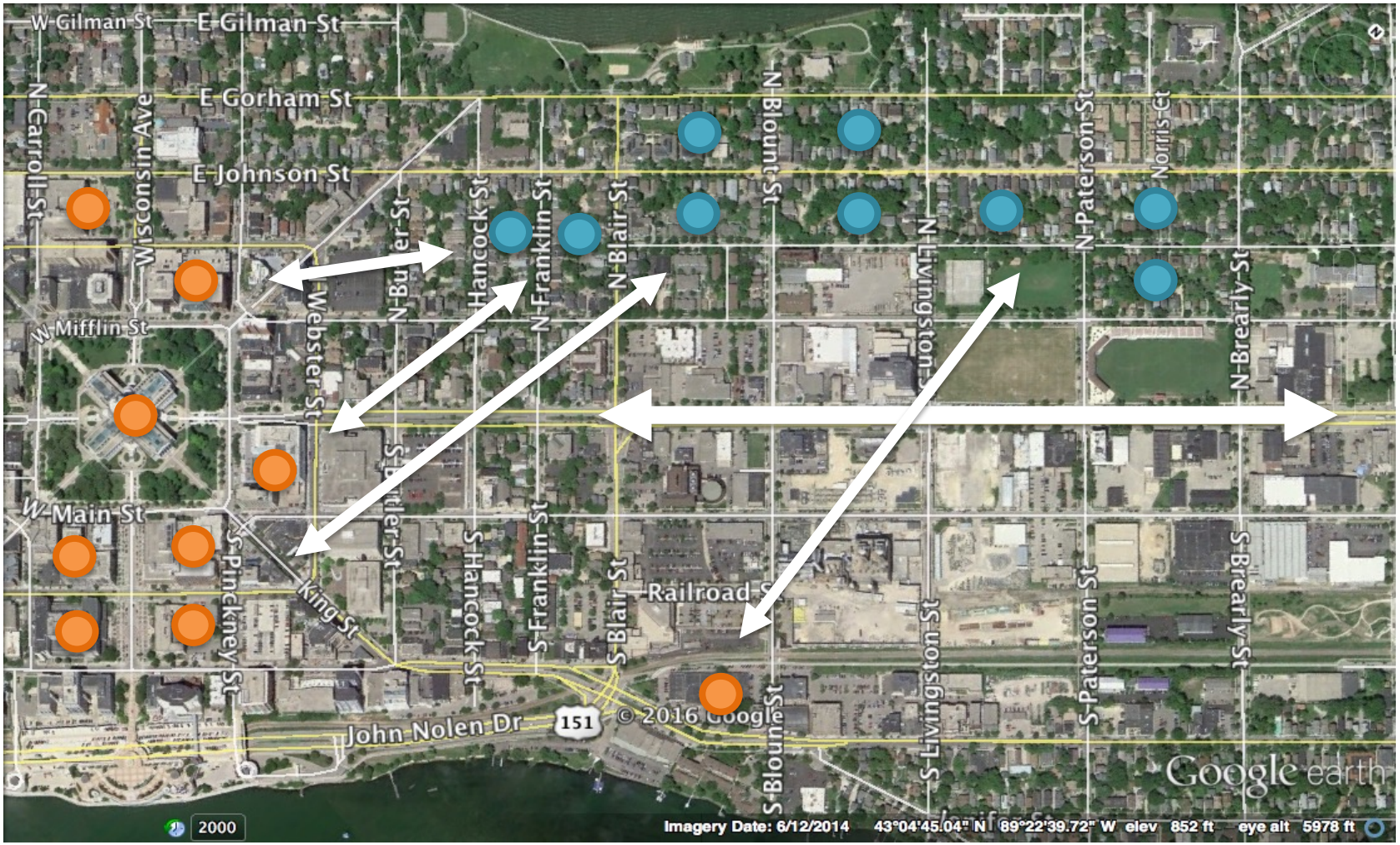
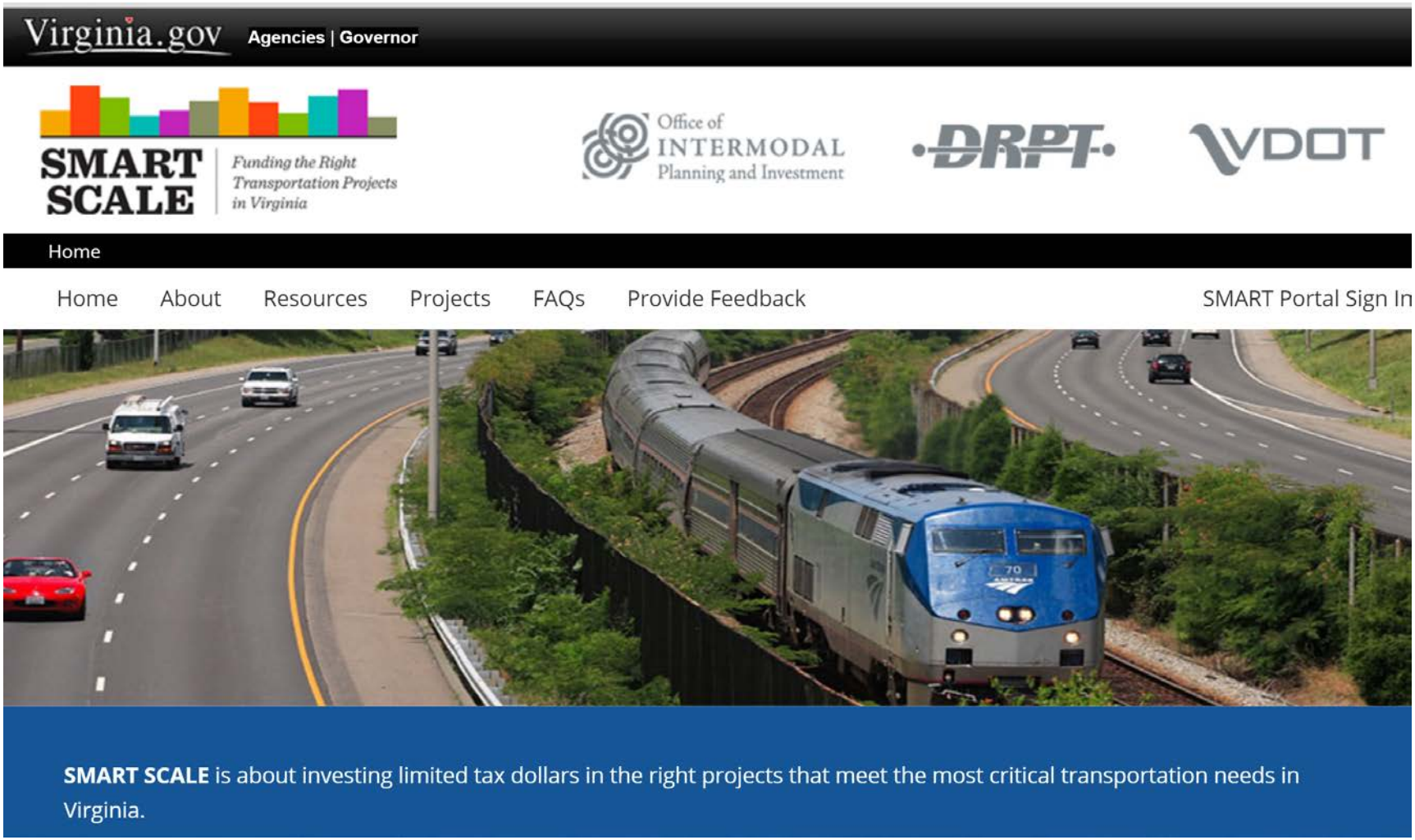


Not just for plans, but also for projects



Multiple modes with one metric

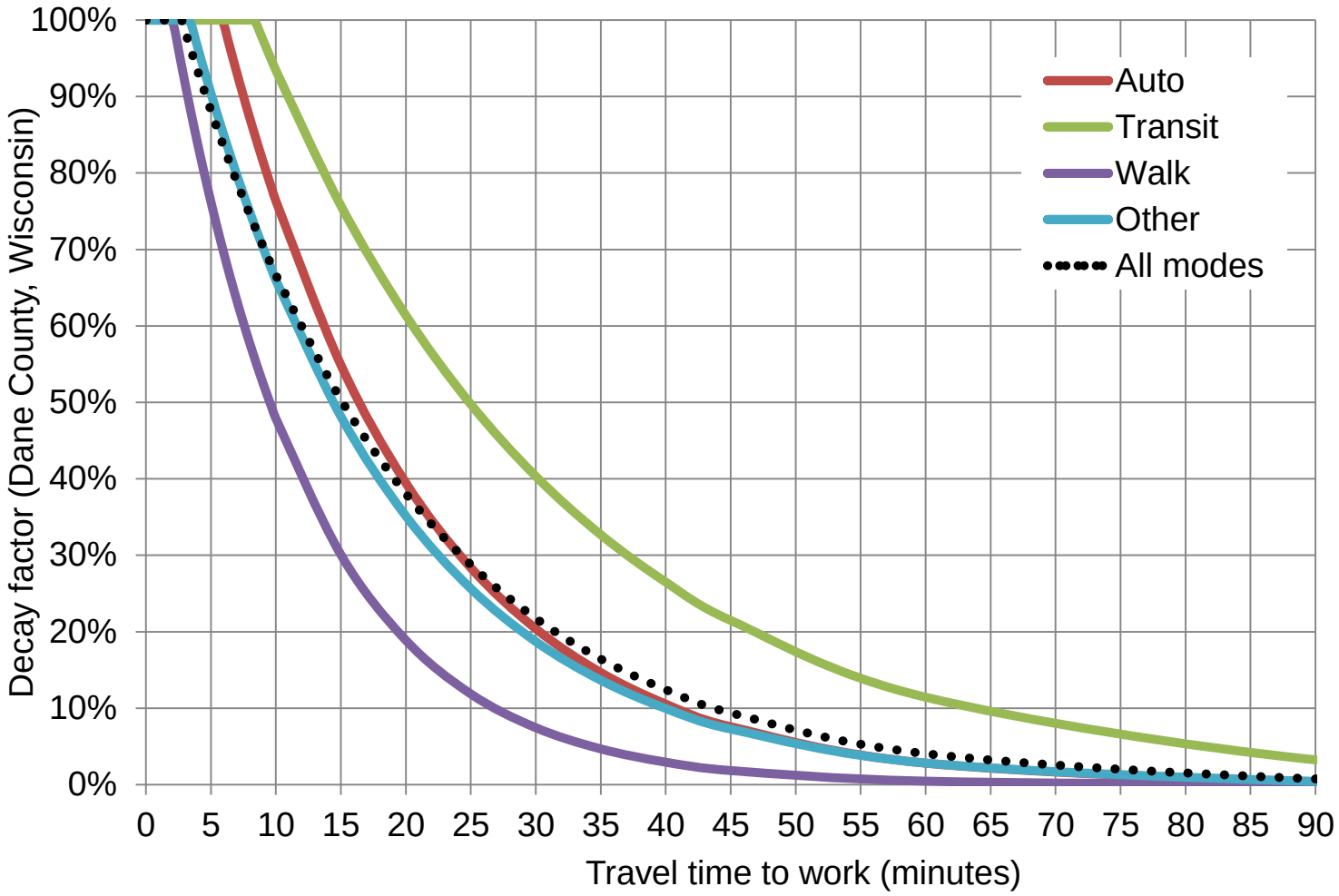
- Predict mode share
- Estimate VMT, transit ridership, bike-ped usage
- Estimate HH transportation costs

HBW Auto Mode Share =
.083 + 1.38E-07(AccAuto) - 1.45E-06(AccTransit) - 6.71E-06(AccWalk)

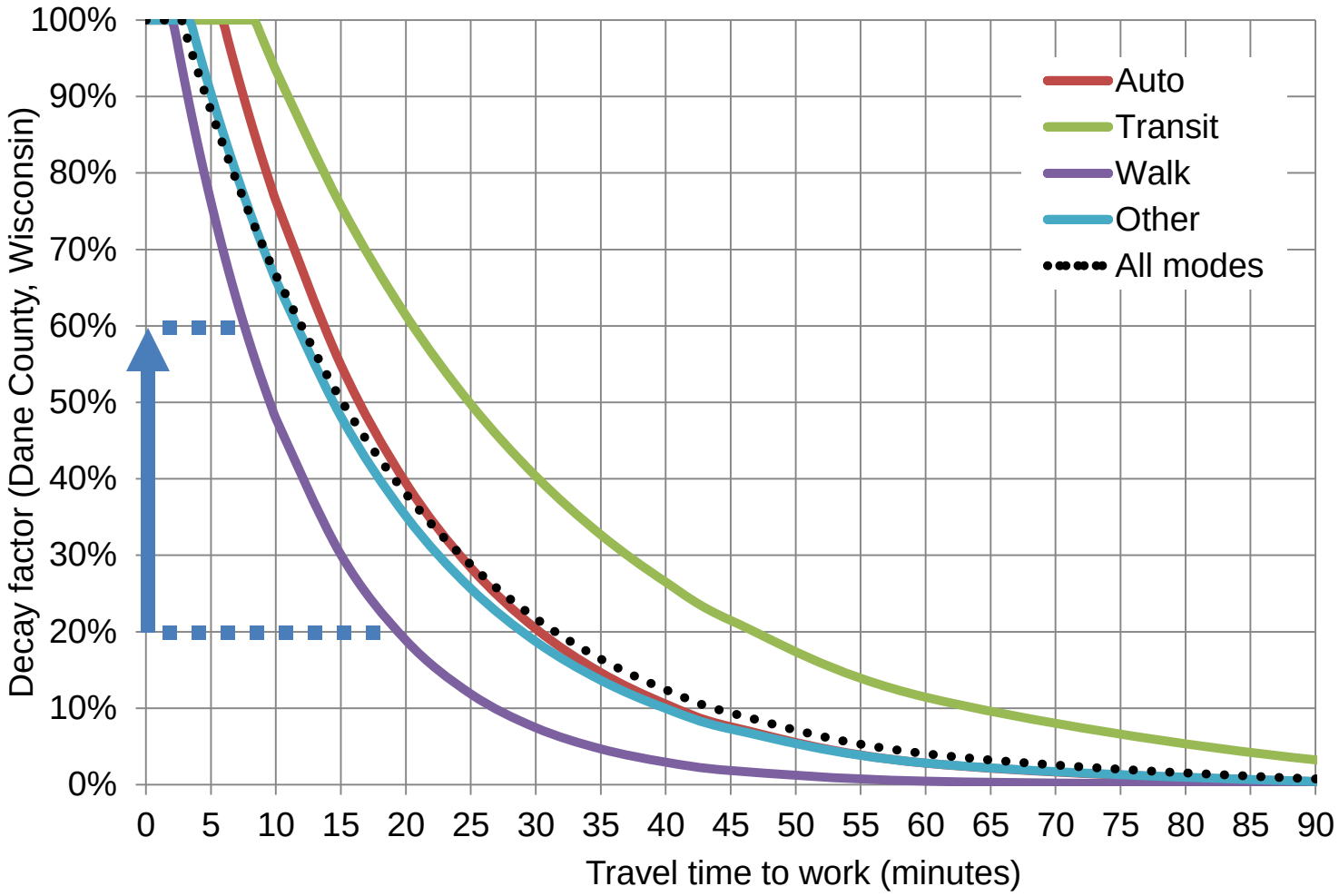
Calculating accessibility

- Network
- Land uses
- Method to calculate times

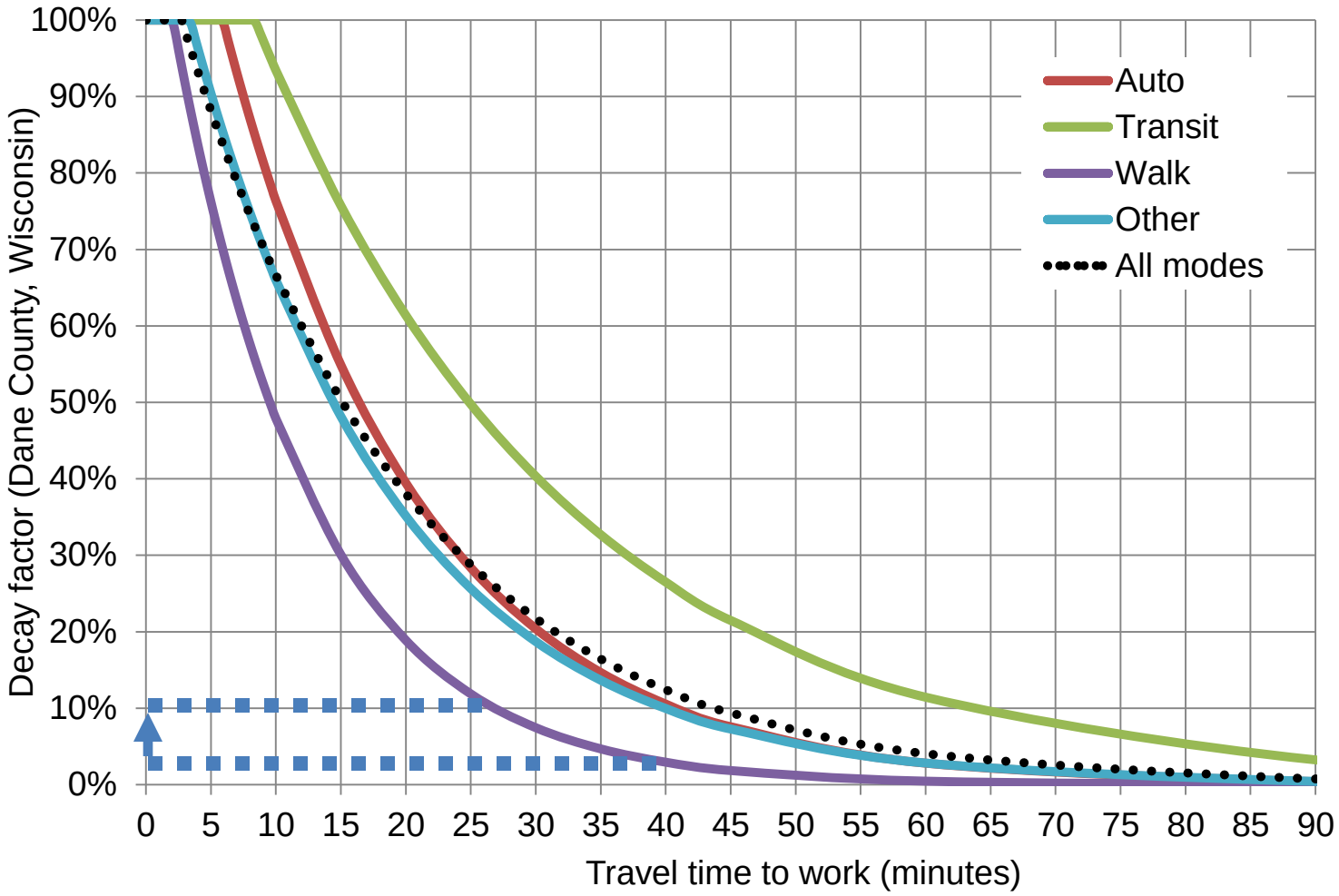
Calculating accessibility



13 minute improvement (20 to 7)



13-minute improvement (40 to 27)

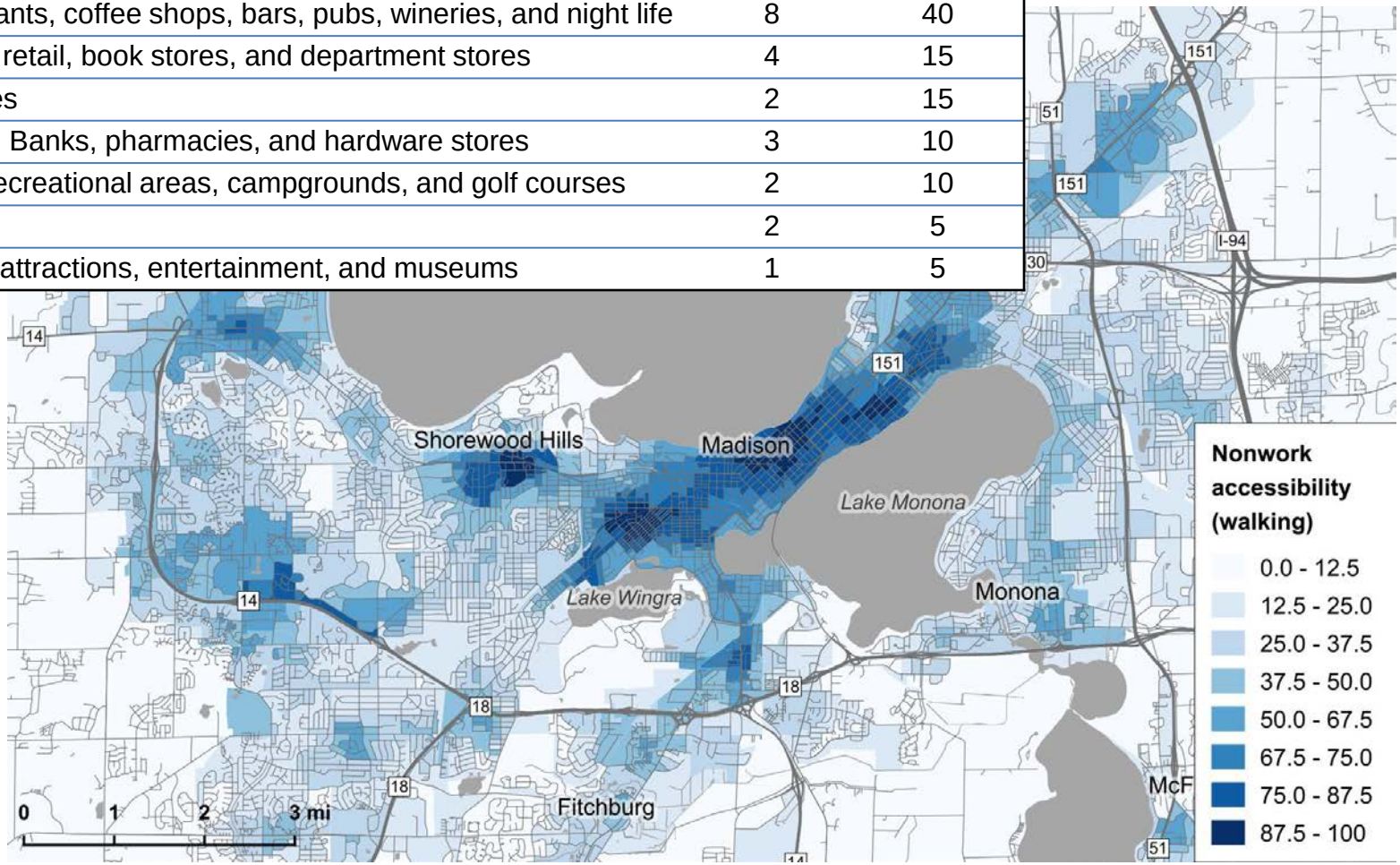


Two primary metrics

- Work: access to jobs or a subset of jobs
  - 20 percent of trips, 30 percent of VMT
  - Unit is jobs
- Non-work: access to groceries, parks, banks, restaurants and other non-work destinations
  - 80 percent of trips, 70 percent of VMT
  - Unit is a score up to 100

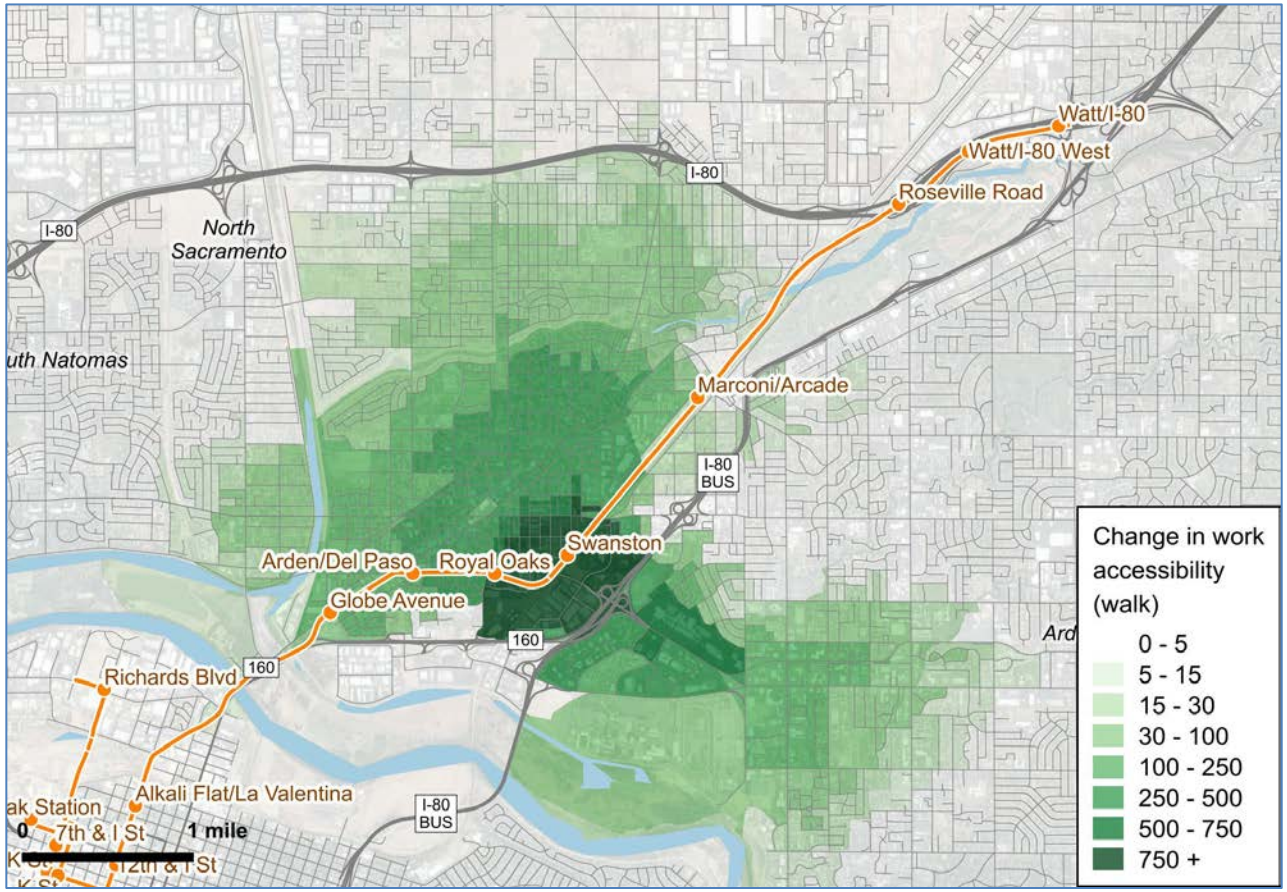
Madison: Nonwork accessibility (walk)

Destination Types	Target	Weight
Restaurants, coffee shops, bars, pubs, wineries, and night life	8	40
General retail, book stores, and department stores	4	15
Groceries	2	15
Errands: Banks, pharmacies, and hardware stores	3	10
Parks, recreational areas, campgrounds, and golf courses	2	10
Schools	2	5
Cultural attractions, entertainment, and museums	1	5



Sacto: RR overpass + I-80B crossing

Walk accessibility (work): RR overpass + I-80B crossing



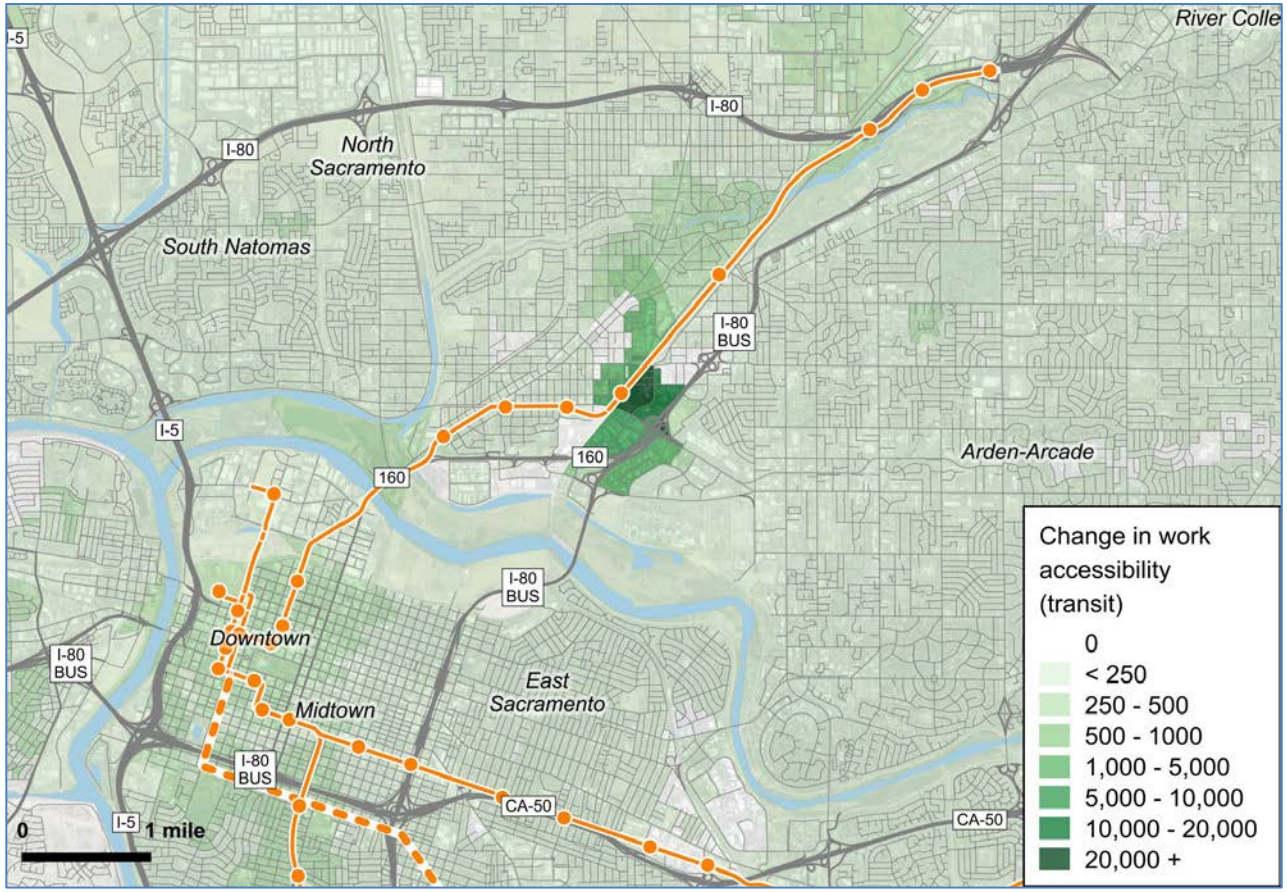
Total impact (3-mile radius)

- 2,688,457 household-jobs

Average

- Before: 4,785 jobs
- After: 4,832 jobs
- Change: 47 jobs

Transit accessibility (work, a.m.): RR overpass + I-80B crossing



Total impact

- 29,229,479 household-jobs

Average

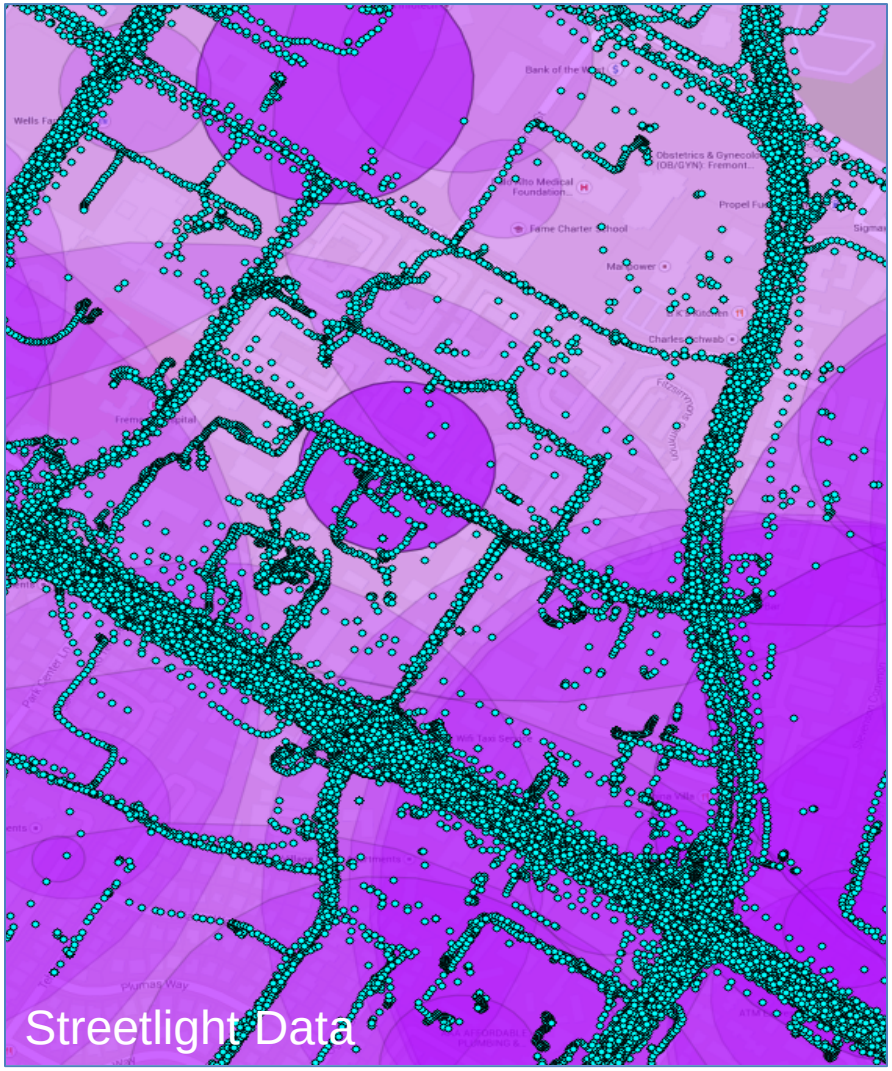
- Before: 85,179 jobs
- After: 85,229 jobs
- Change: 50 jobs

Measuring trip-making

- Anonymous GPS data
- Precise information not in travel demand models or traffic counts

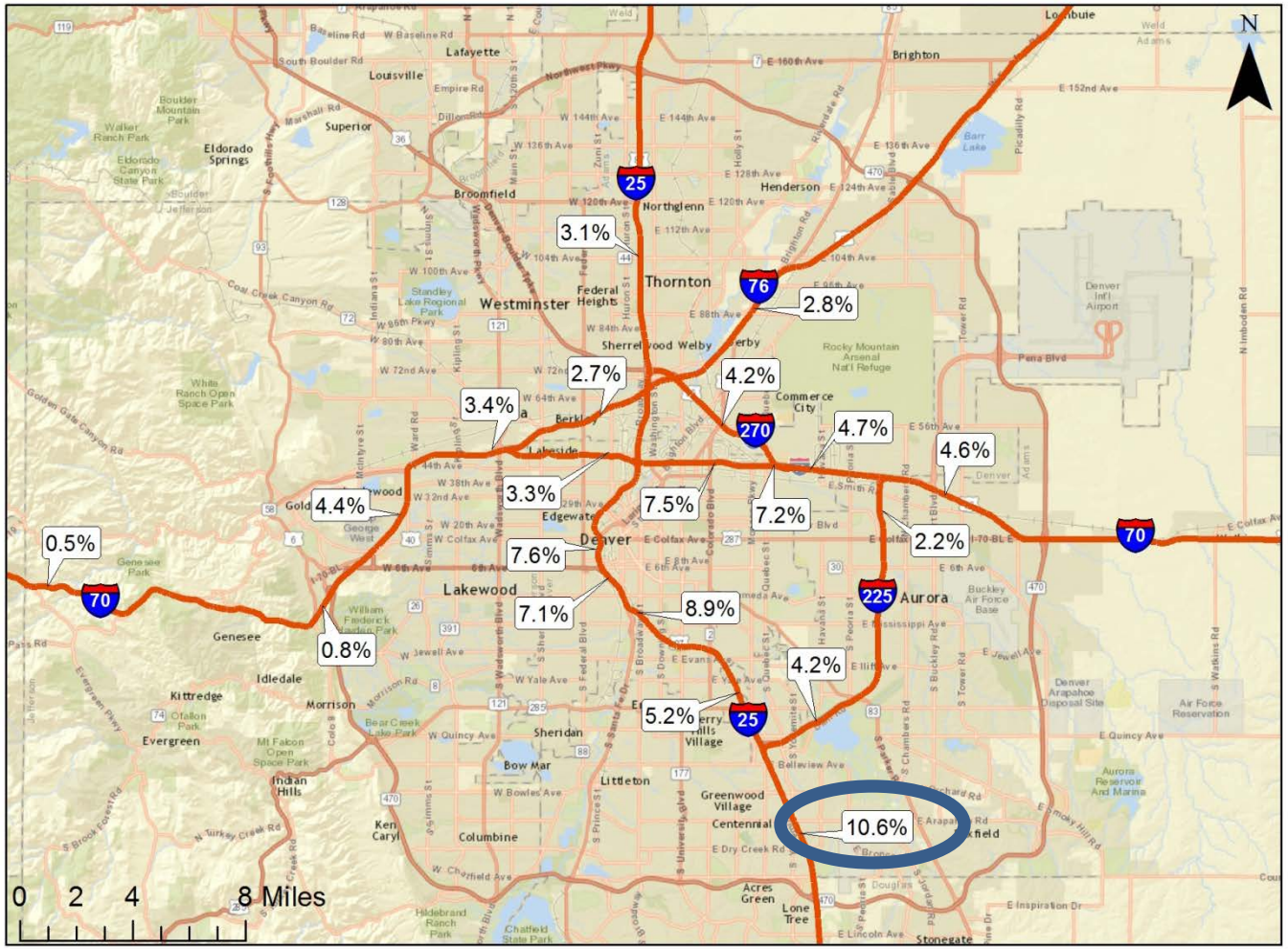
Summary

- More than 3 million trips per day in NOVA
  - 51% < 5 miles
  - 24% < 2 miles
  - 8% < 1 mile
- 44% of short trips are during peak periods

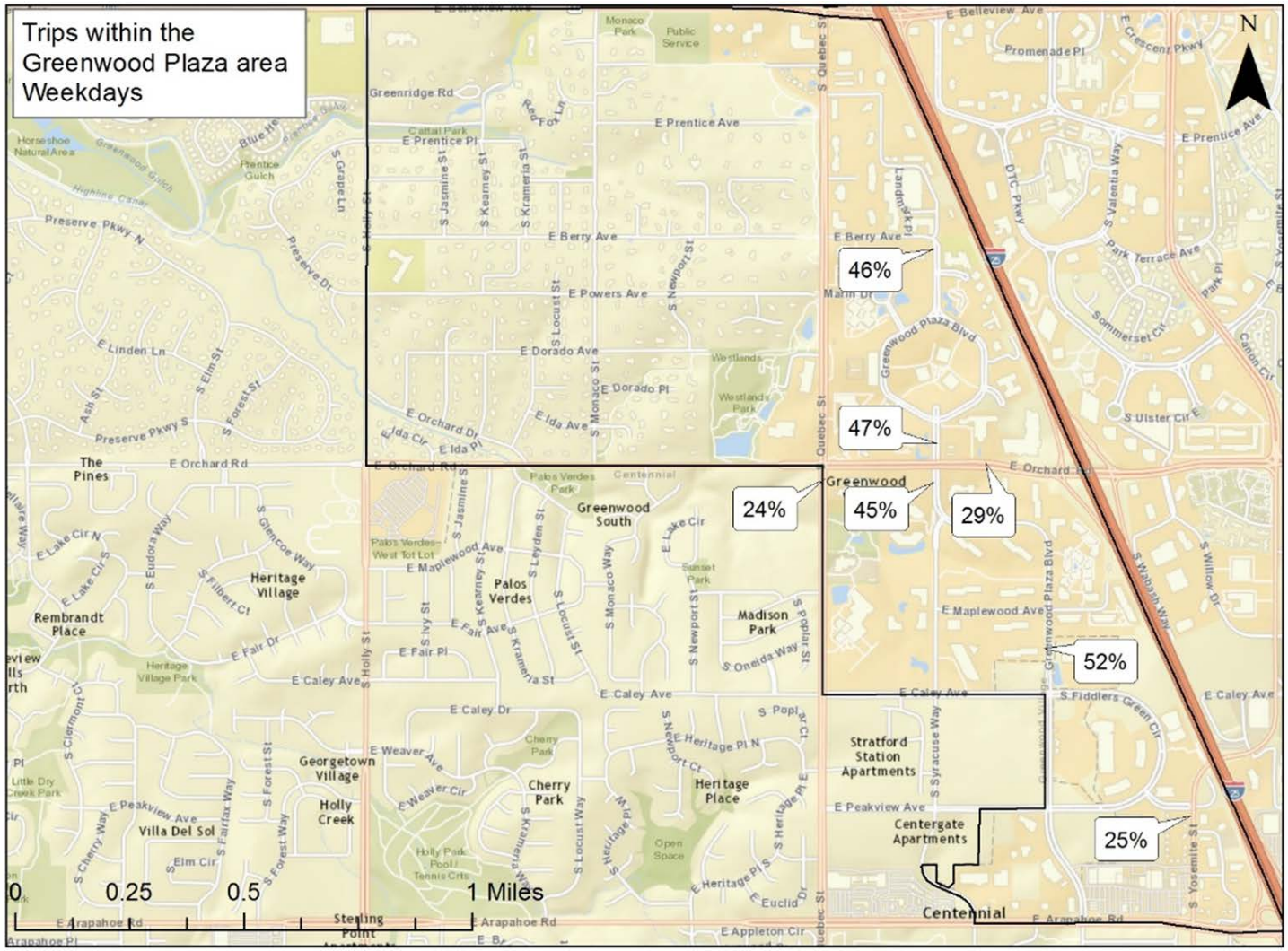


Denver: Short trips on freeways

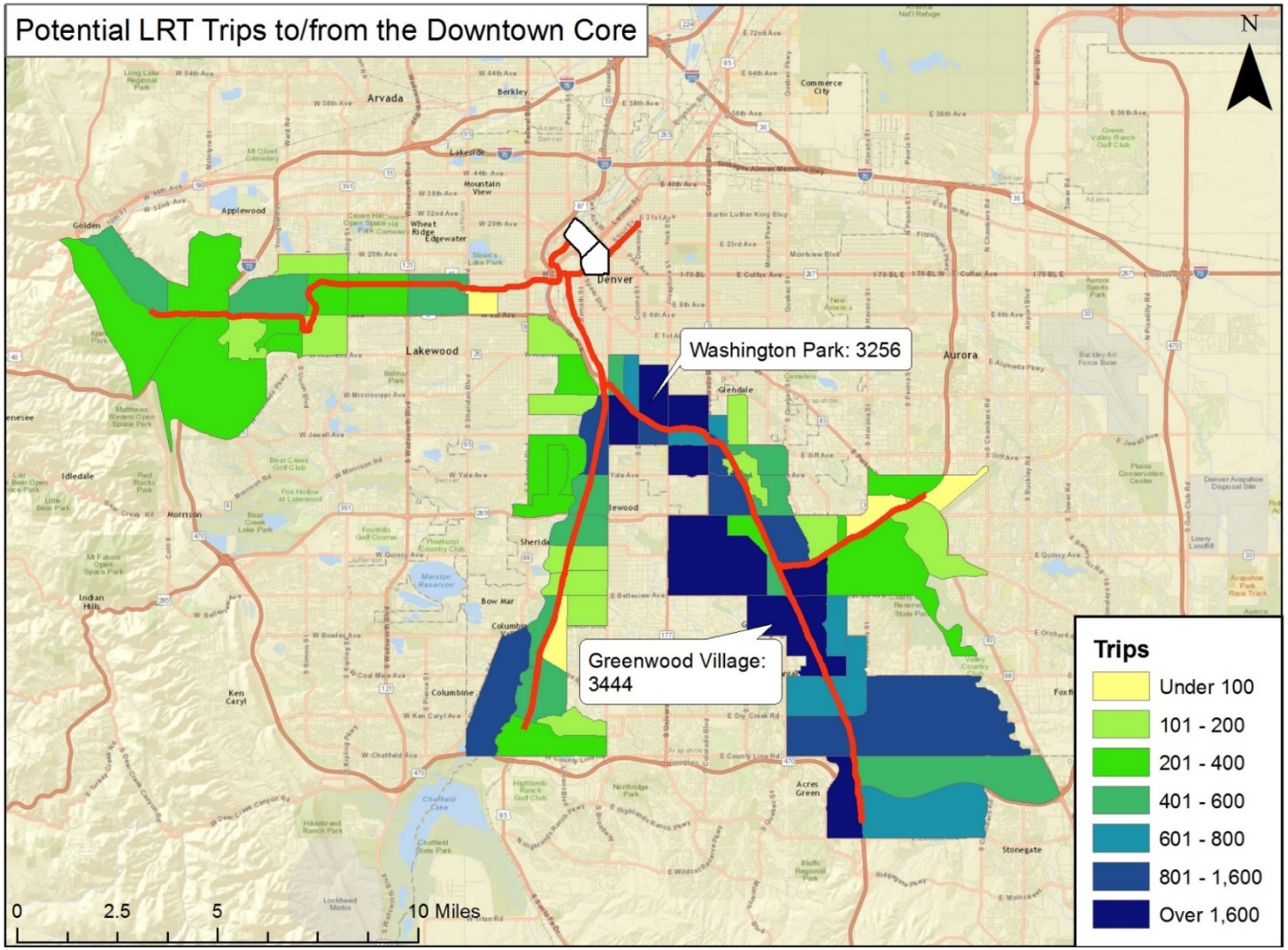
Interstate trips under 5 miles as a percentage of PM peak period (3-7pm) weekday traffic



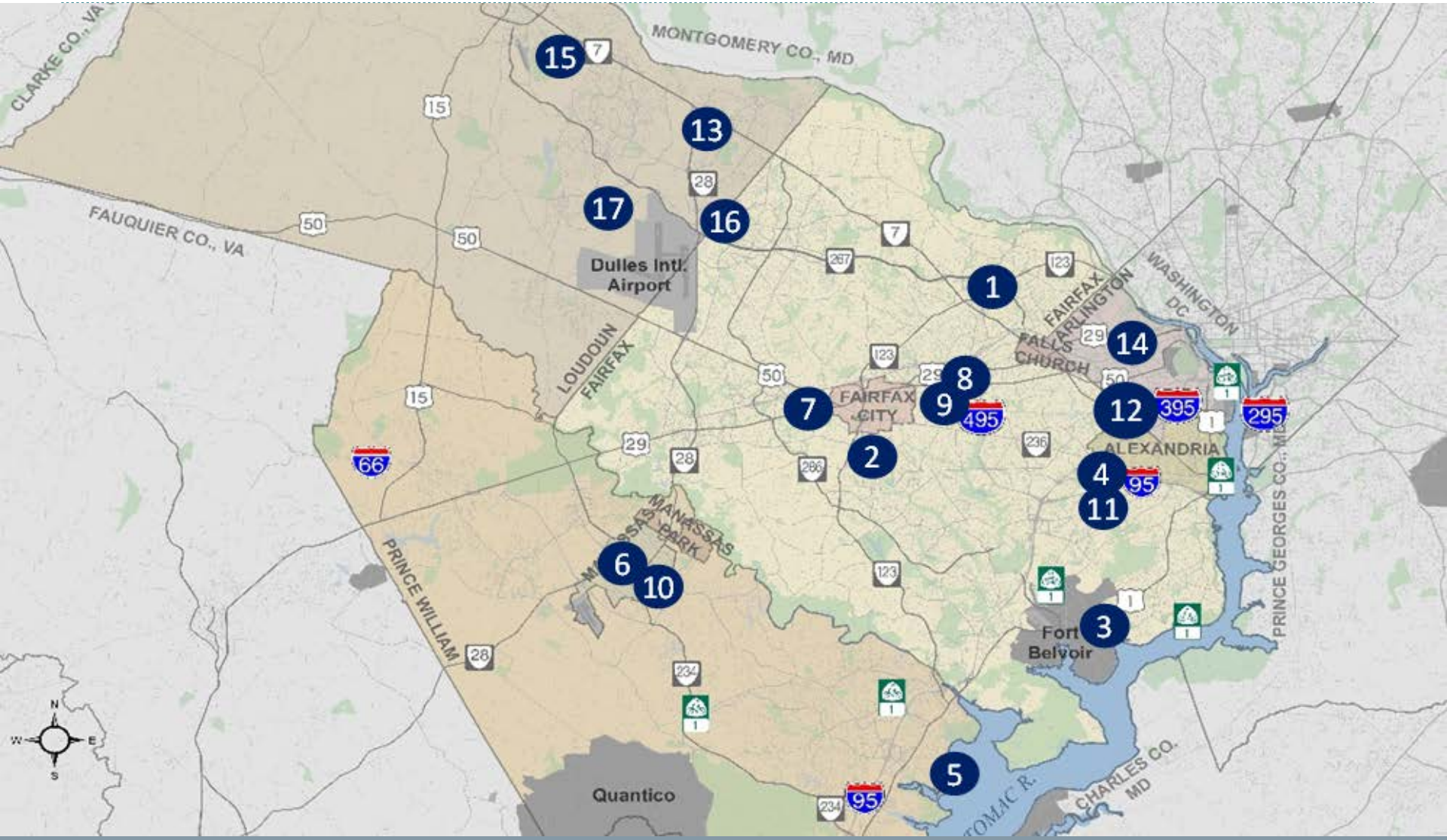
Denver: Short internal trips



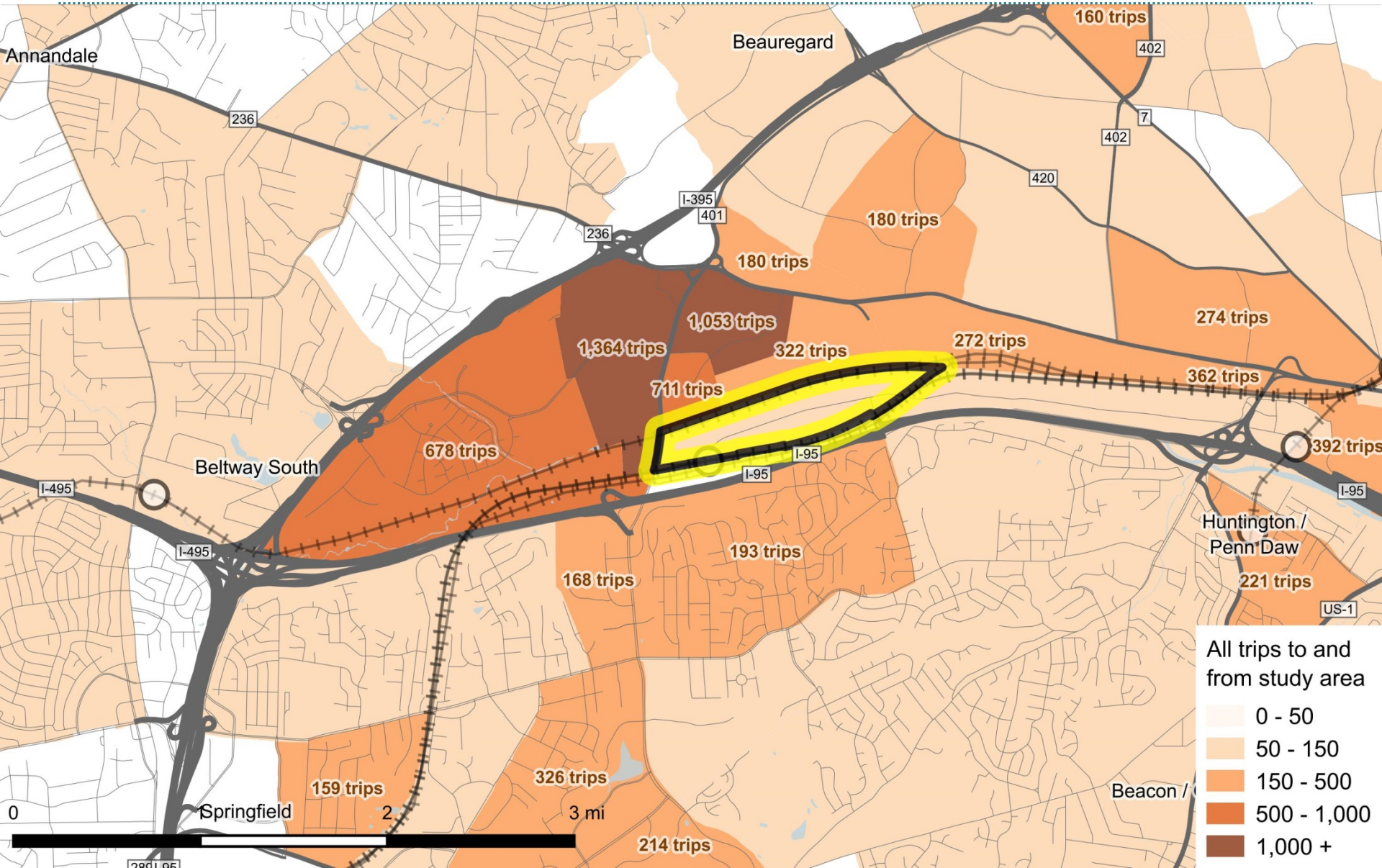
Denver: Potential Light Rail Trips



Northern Virginia: Case studies



Northern Virginia: Van Dorn Street Metro



Van Dorn Street Metro

Northern Virginia: Van Dorn Street Metro

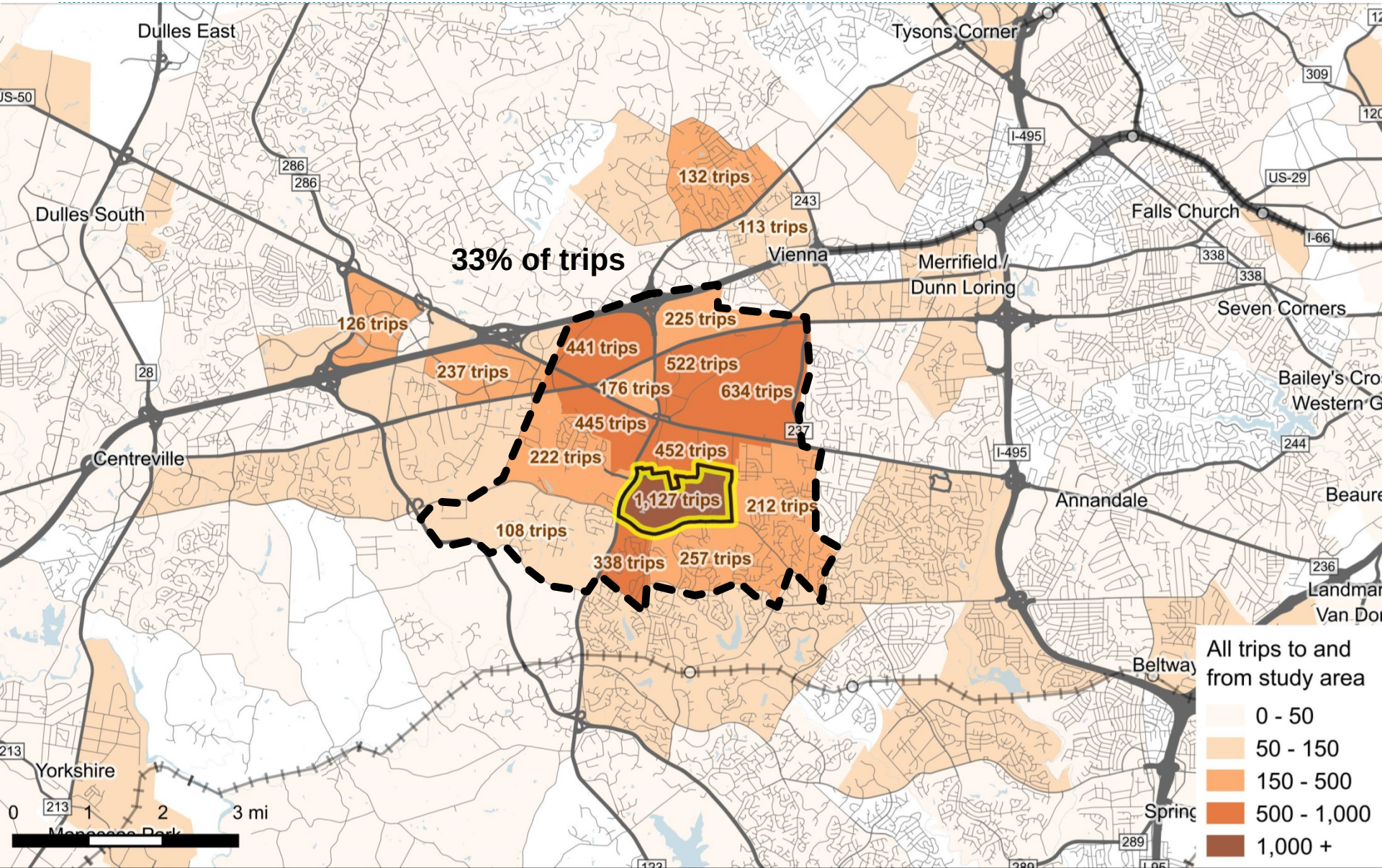
Benefits

- Improve multimodal access to station
- Remove 152,000 vehicle trips per year (24,500 hours)
- Save $155,000 in traveler costs per year
- Eliminate 113 tons of carbon emissions per year

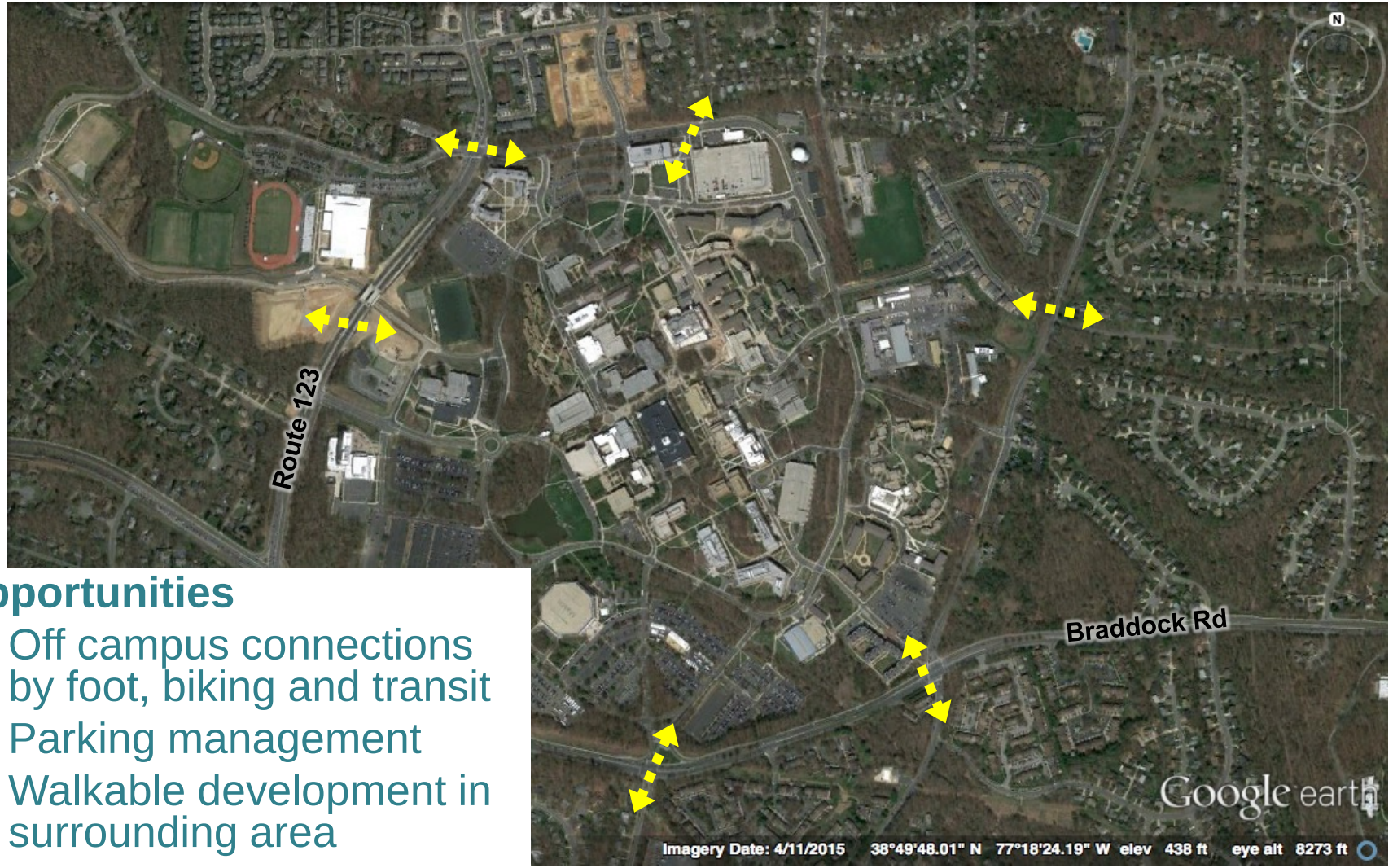
Costs

- $0.5 to 0.6 million (annualized)
  - New infrastructure
  - Modest increase in TDM

Northern Virginia: George Mason University



George Mason University



Opportunities

- Off campus connections by foot, biking and transit
- Parking management
- Walkable development in surrounding area

Northern Virginia: George Mason University

Benefits

- Improve multimodal access to campus
- Remove 460,000 vehicle trips per year (82,000 hours)
- Save $500,000 in traveler costs per year
- Eliminate 390 tons of carbon emissions per year

Costs

- $0.9 to 1.0 million (annualized)
  - Bike and pedestrian improvements
  - Local shuttle/transit service
  - TDM and parking management

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