



rails·to·trails
conservancy

BikeAble™

Measuring Low-Stress Bicycle Connectivity

*Planning Innovations: Tricks and
Tools
for Implementing Complete Streets*

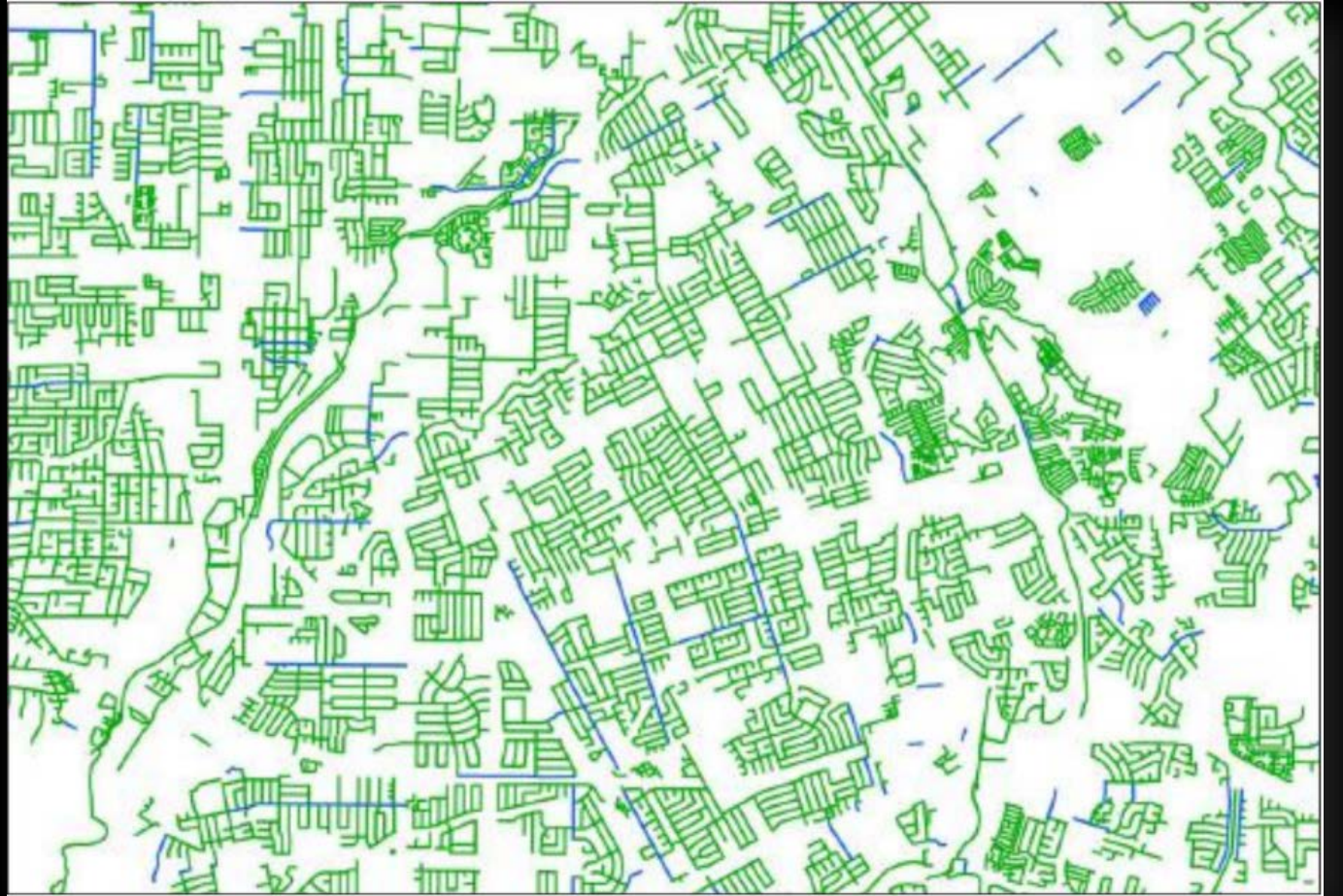
Bay Area Regional Trail Network

- Bay Trail, Ridge Trail, Coastal Trail, paved trail network
- 2700 miles, almost 60% complete

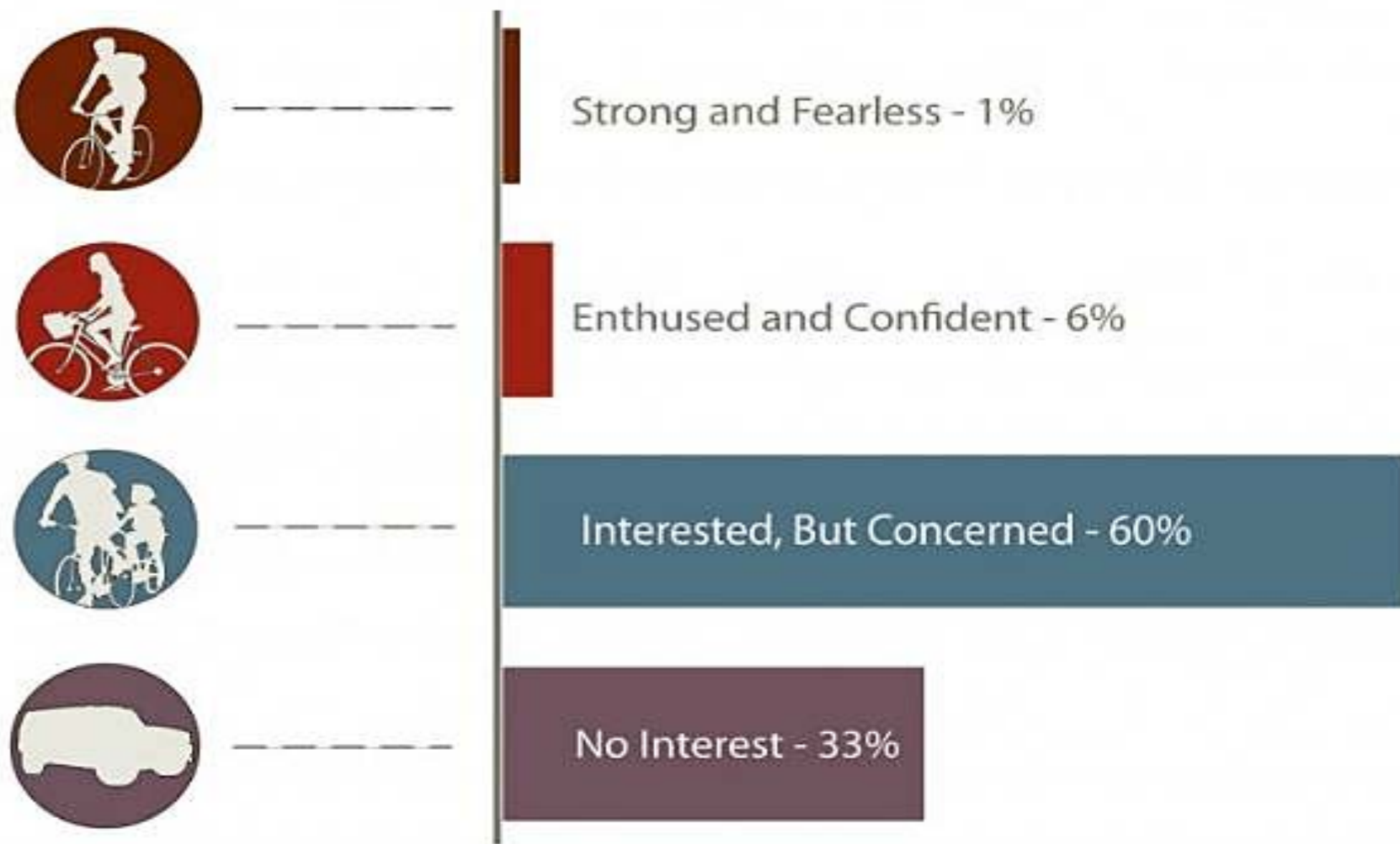
What is BikeAble™?



**A tool for
measuring bicycle
connectivity
between origins
and destinations
via low traffic
stress routes**



The Four Types of Bicyclists



Level of Traffic Stress

**Low
Stress**



**High
Stress**

Speed Limit



Number of Lanes



Stress Reducers



Trail



**Protected
Bike Lane**



**Buffered
Bike Lane**



Bike Lane



Sharro

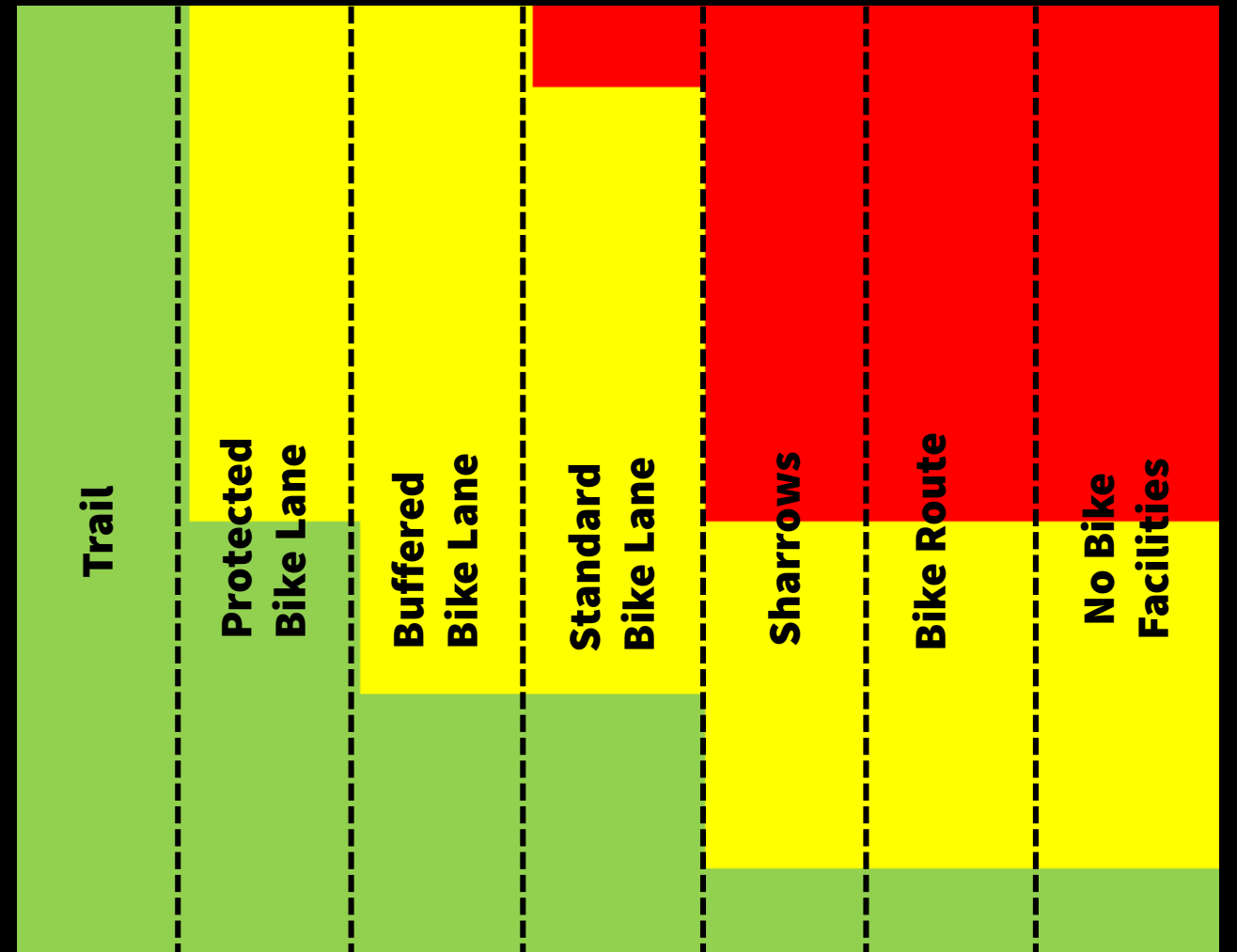
W

Perceived Traffic Stress

(based on vehicle speed & # of lanes)

High Perceived Stress

Low Perceived Stress



High Stress

Moderate Stress

Low Stress

Most Stress Reduction

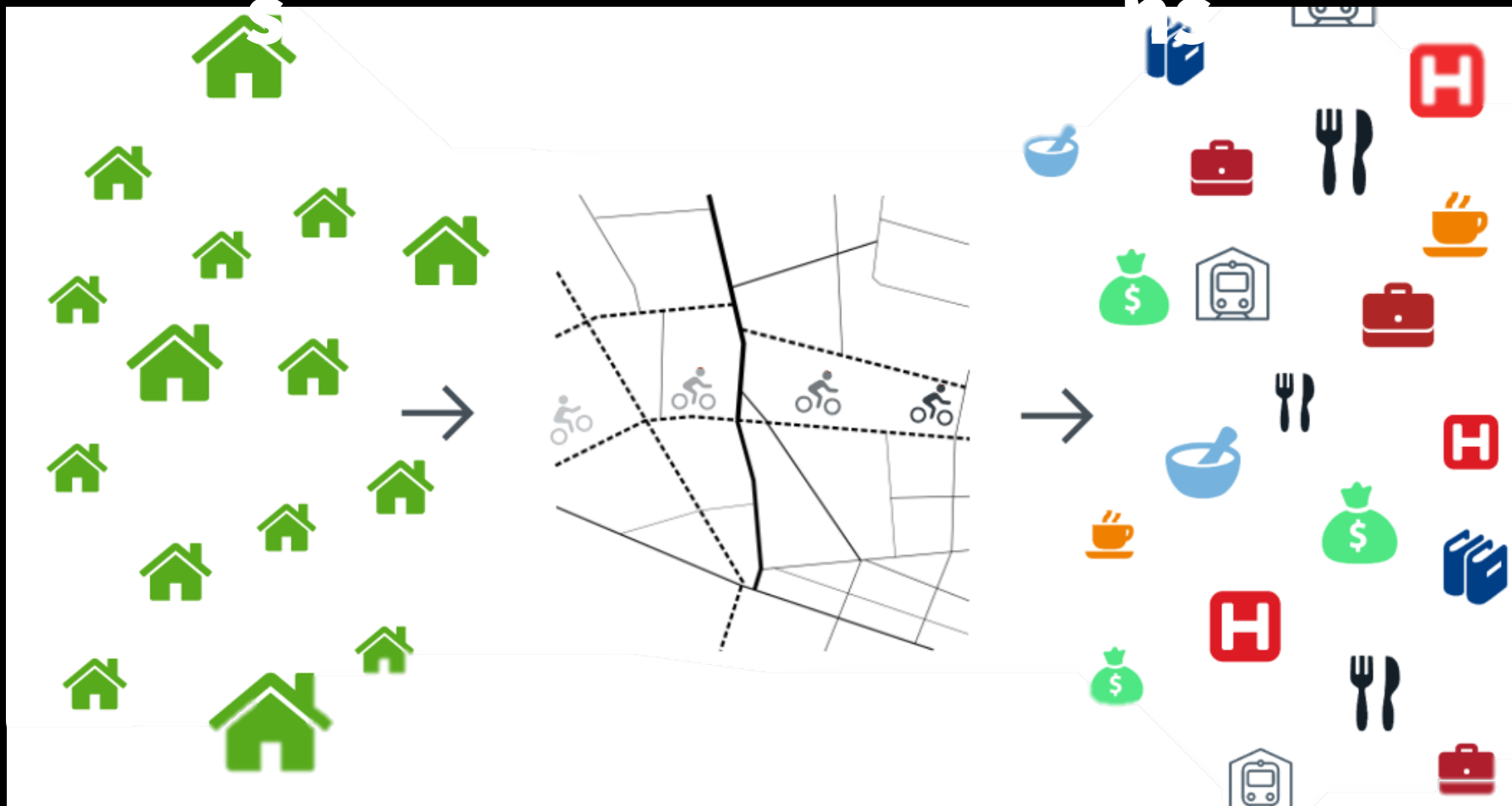
Least Stress Reduction

Bicycle Facility Improvements

Origin

Destinations

Residential parcels



- Restaurants
- Banks
- Grocery stores
- Schools
- Parks
- Transit stations
- Medical facilities
- Etc.

Origin

Level of
Traffic
Stress

Destinations

Residential
parcels

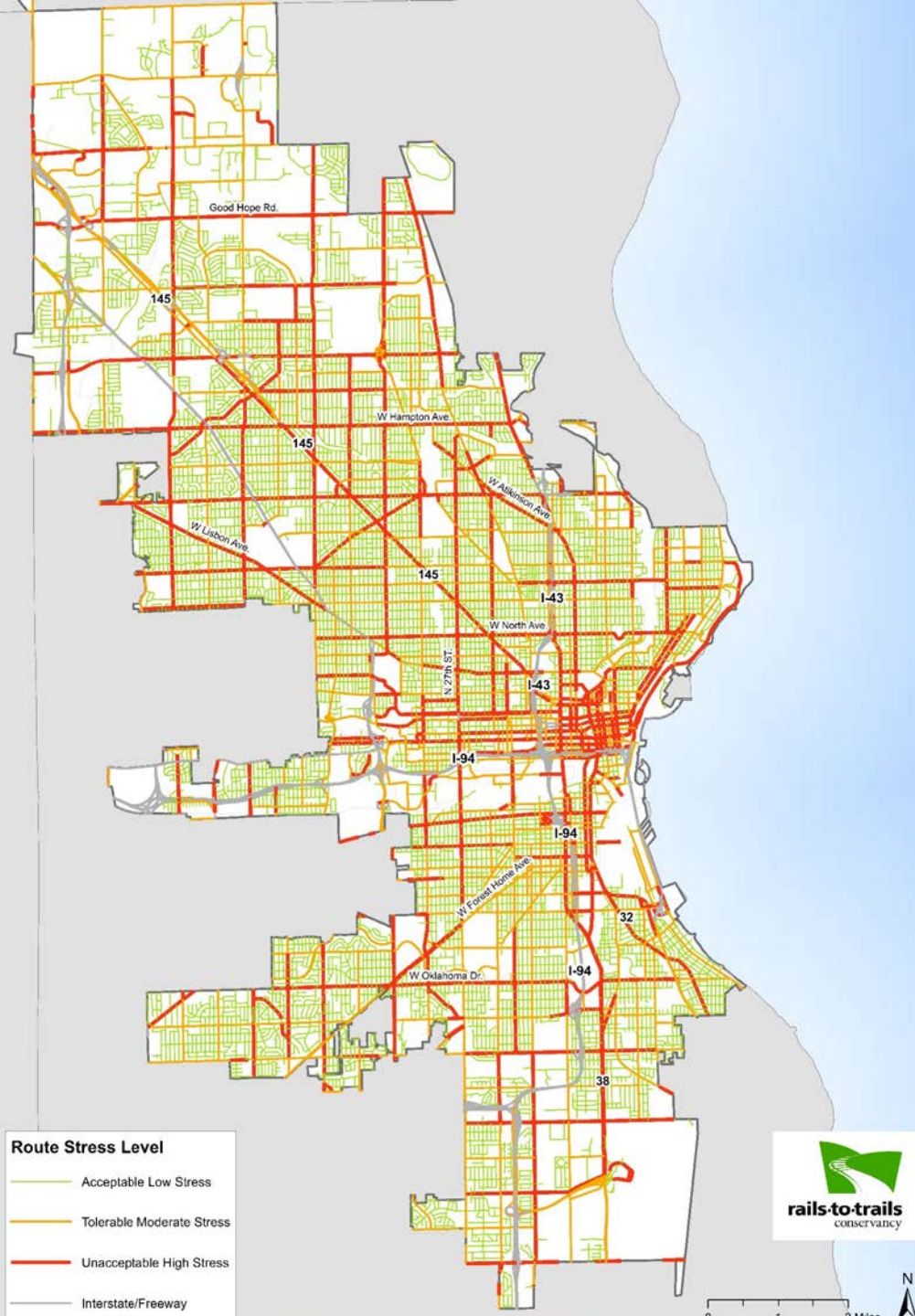


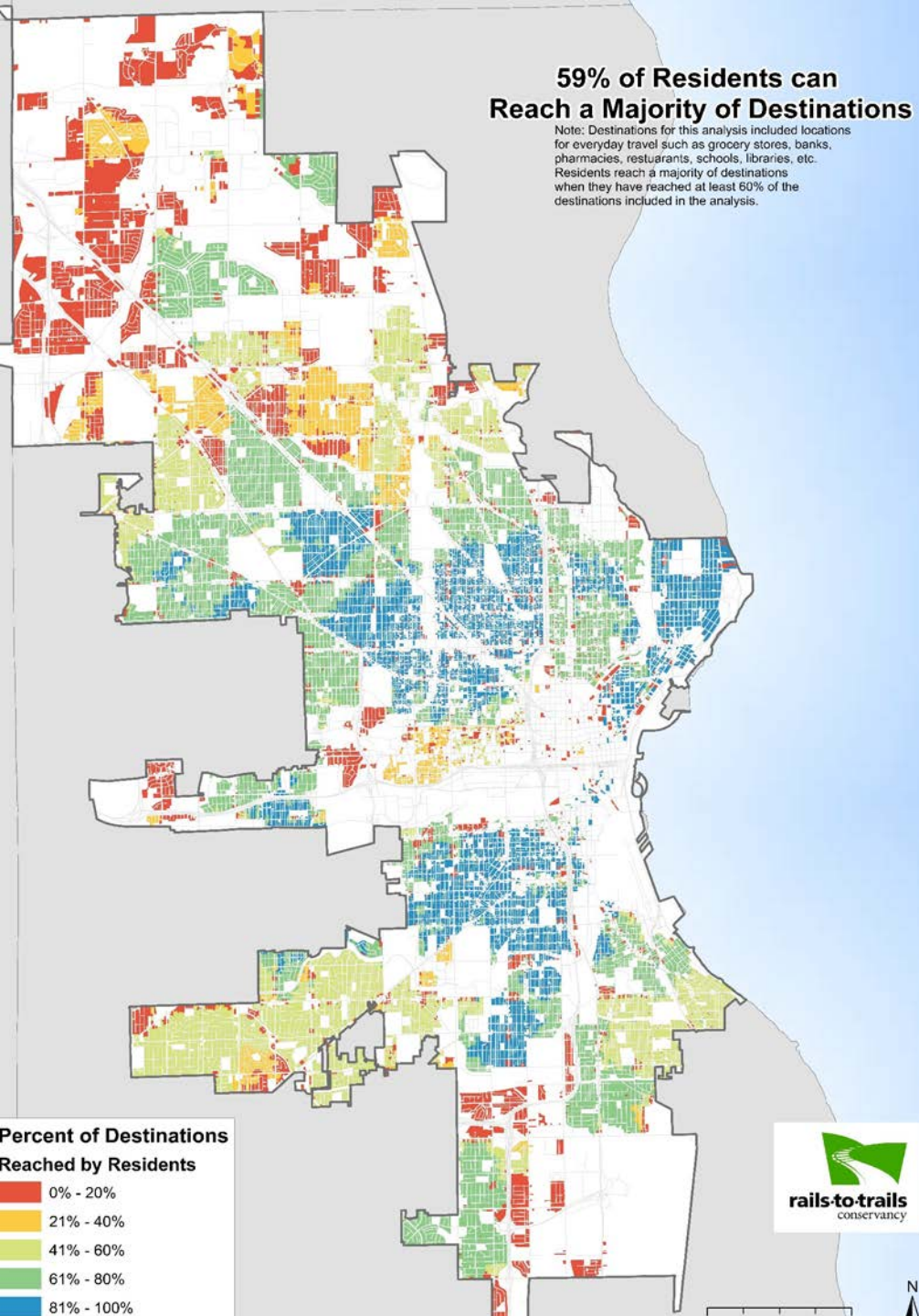
- Restaurants
- Banks
- Grocery stores
- Schools
- Parks
- Transit stations
- Medical facilities
- Etc.

Milwaukee, WI

Assign Level of Traffic Stress

- **Roadways categorized by:**
 - Travel lanes
 - Posted speed
 - Slope
 - Bikeway type
- **Intersection features – traffic controls, bike boxes**
- **Class I bikeways included in network**





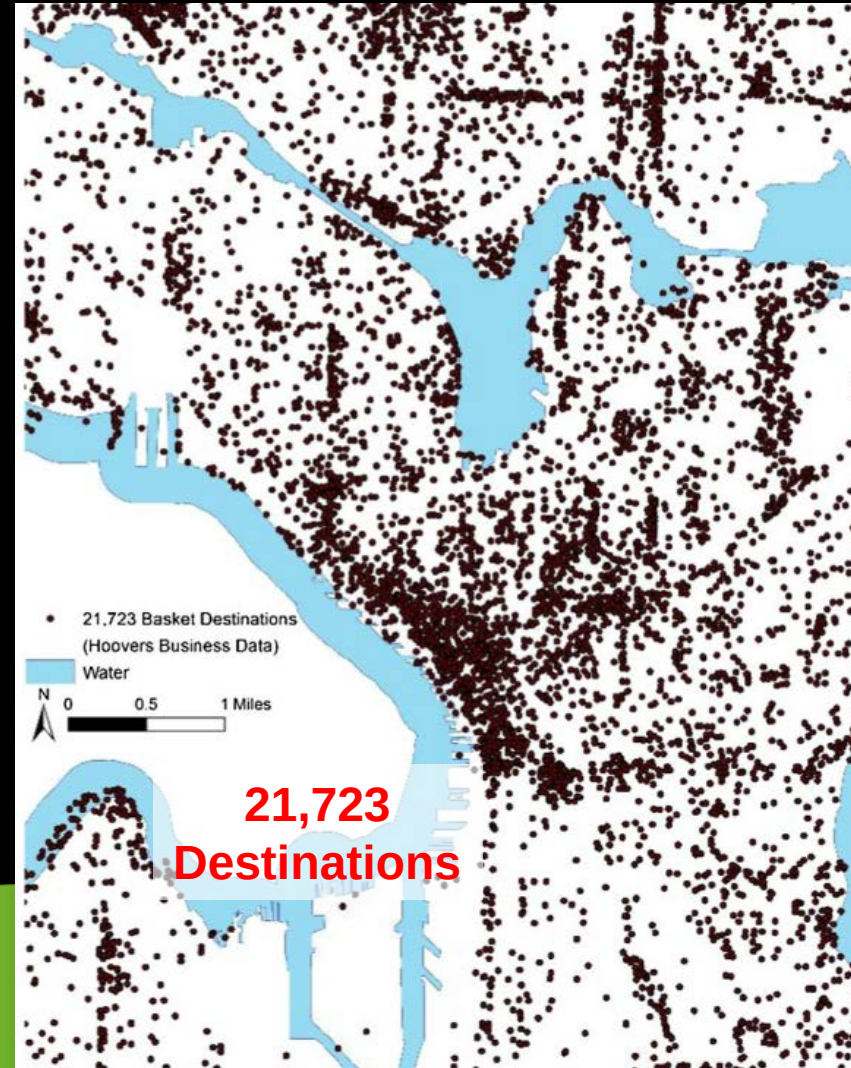
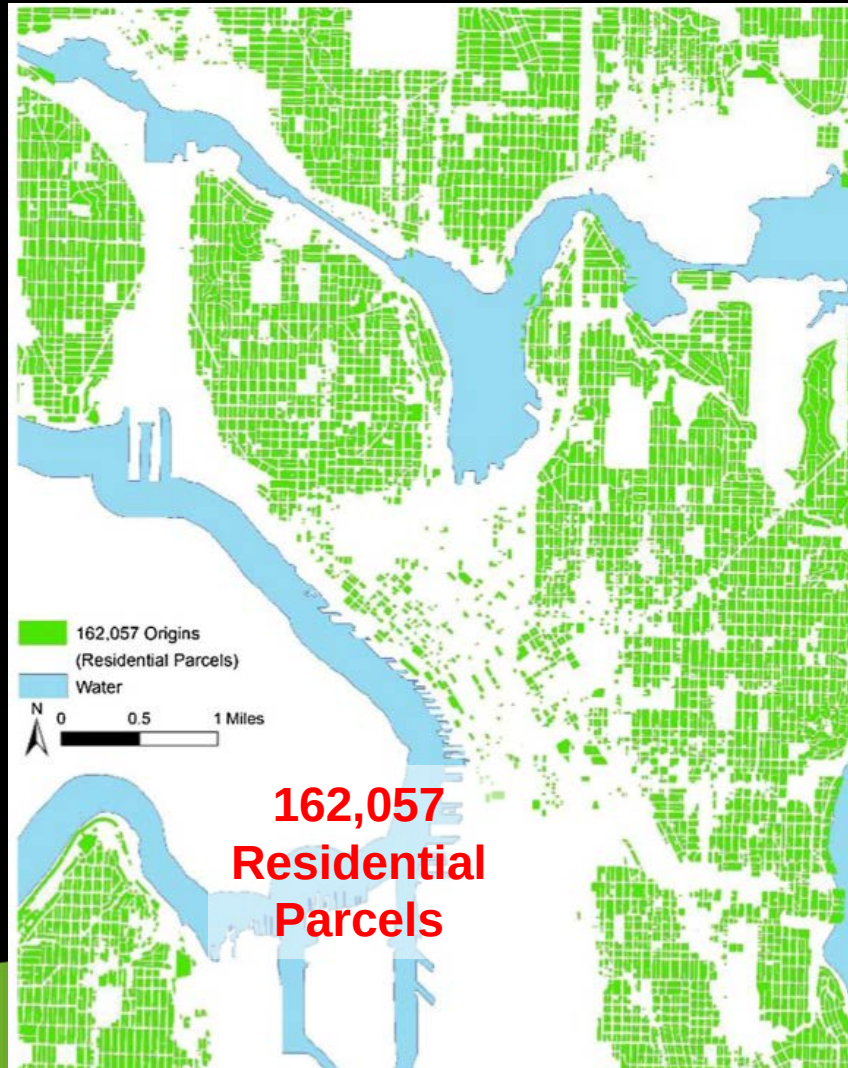
Milwaukee, WI

Assess Network Connectivity

- **Determine % of parcels that can reach each of the selected destinations along low-stress routes**
- **Identify number of each destination type**
- **Assumptions**
 - **Destinations within 2 miles of each parcel**
 - **Bicyclists willing to travel up to 40% further to be on trail**

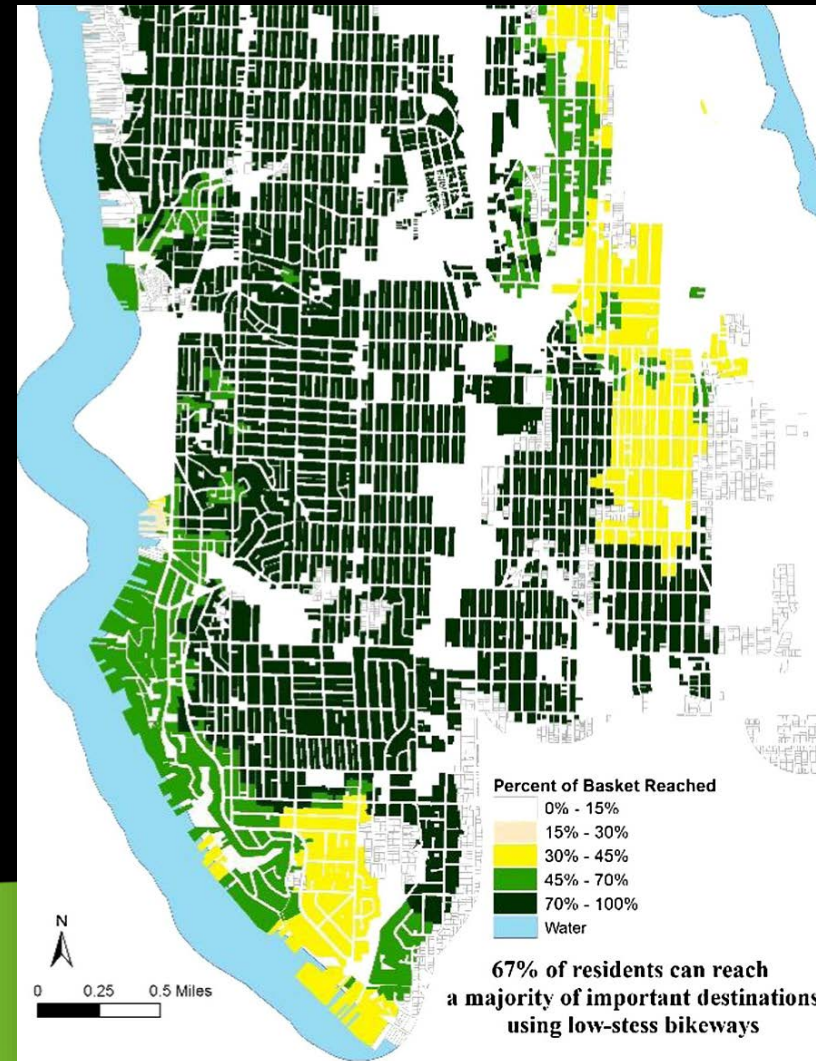
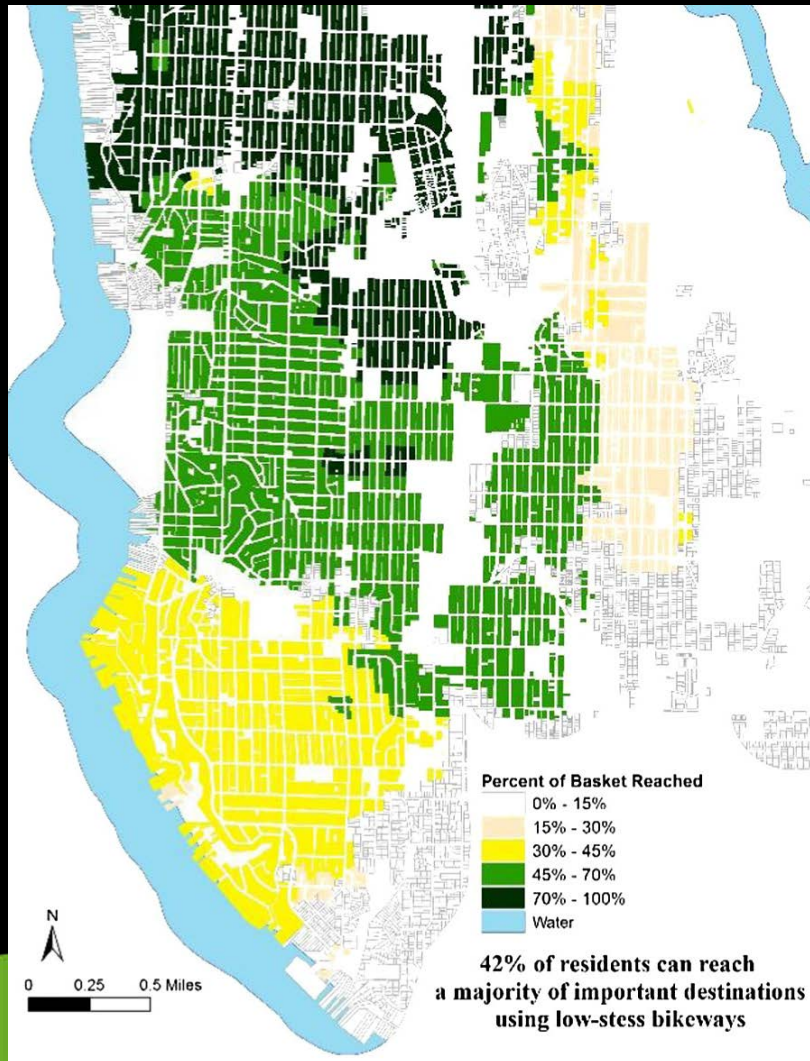
Seattle, WA

Origins and Destinations



Seattle, WA

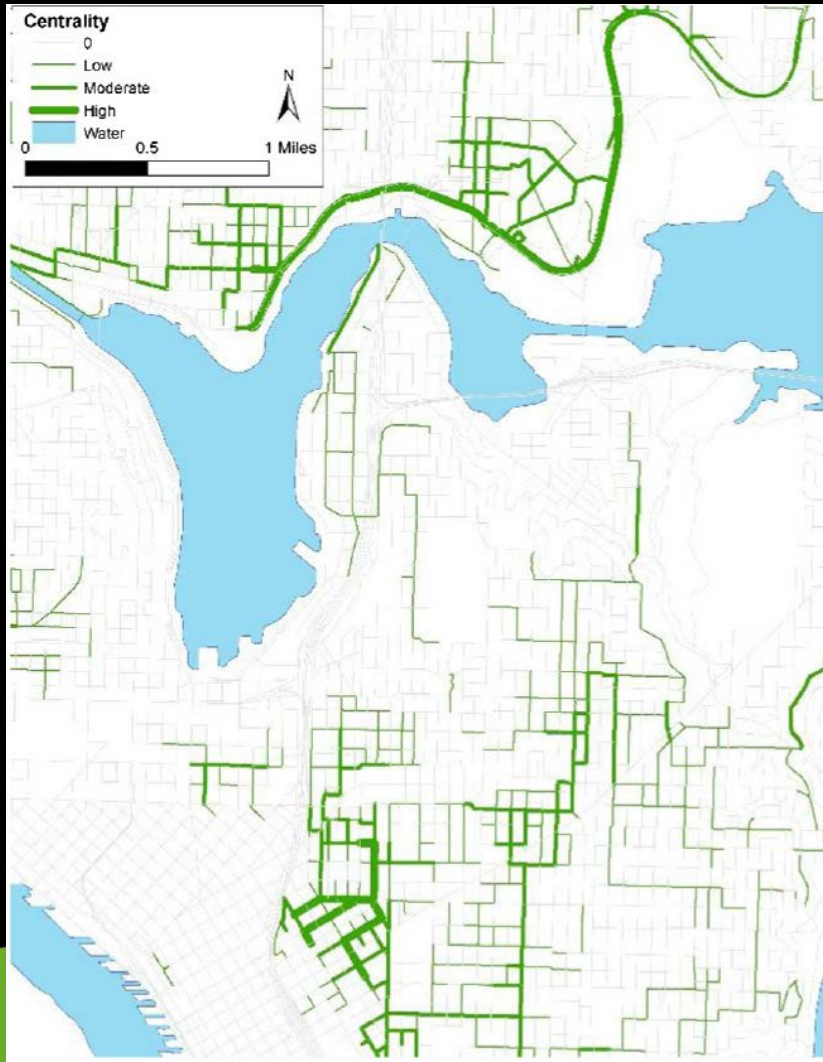
Scenario Testing – Assessing Connectivity



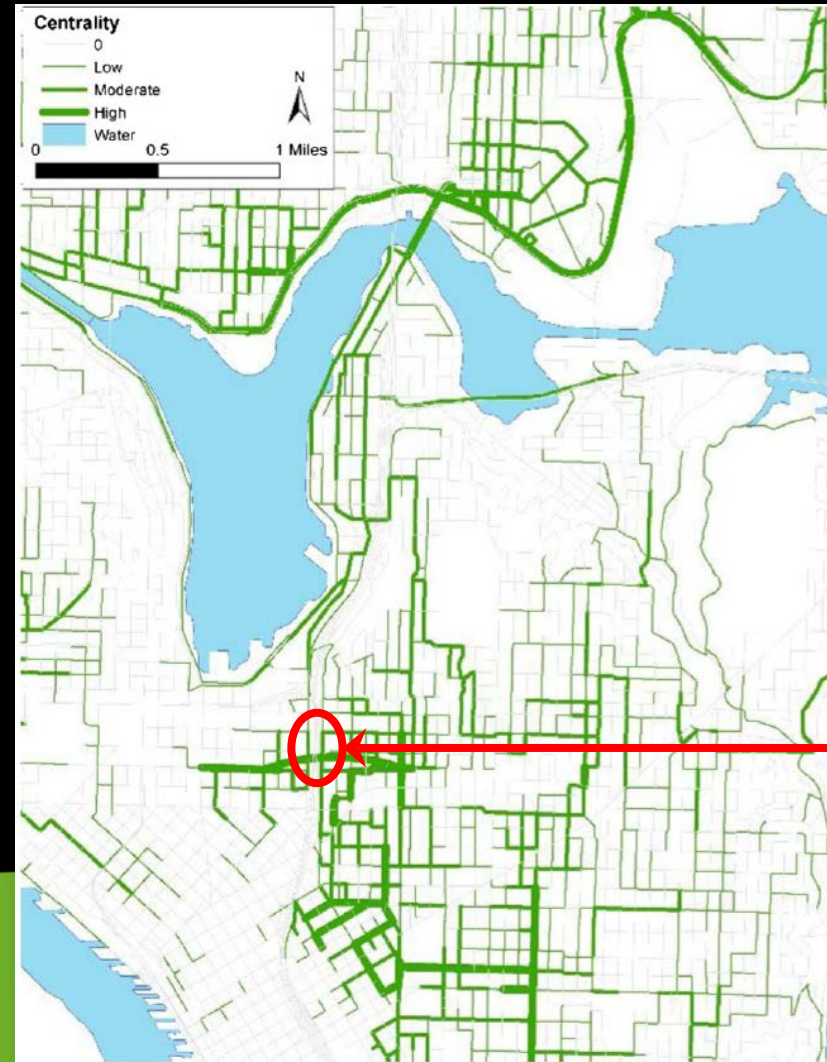
Seattle, WA

Scenario Testing – Changes in Trip Flows

Existing
Conditions



BMP
Buildout



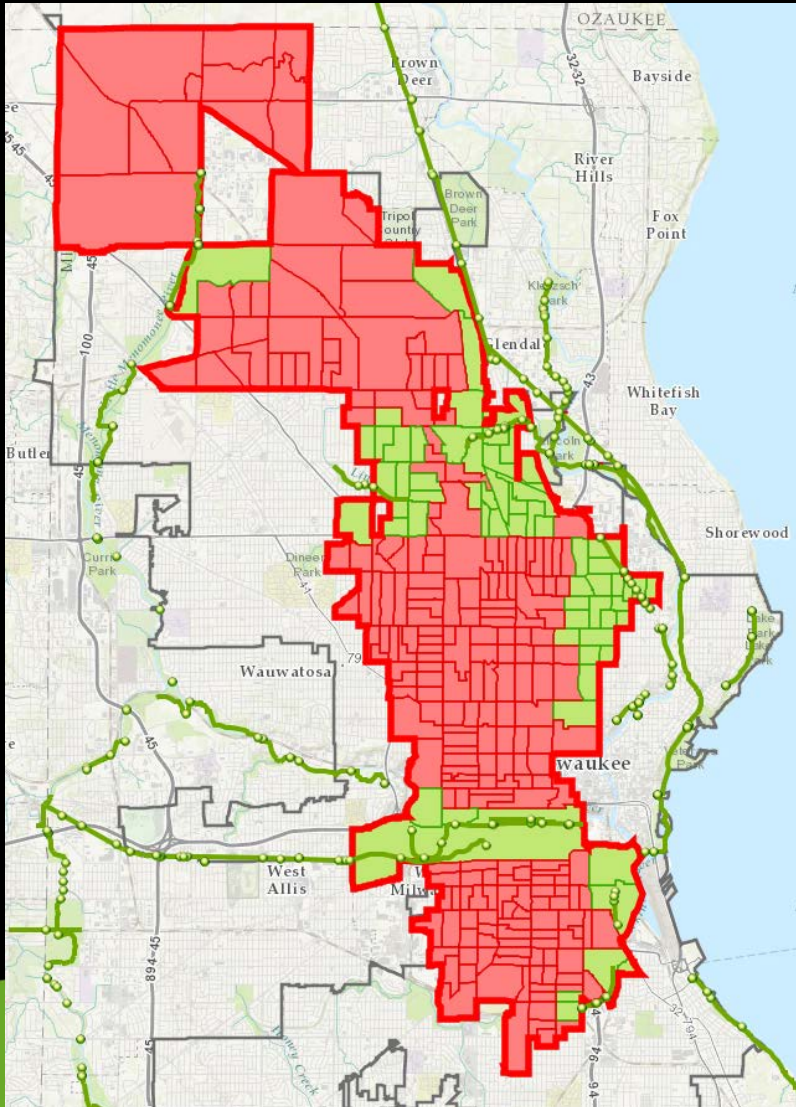
I-5
overpass:
#1 ranked
project

Milwaukee, WI

Trail Access in Disadvantaged Communities

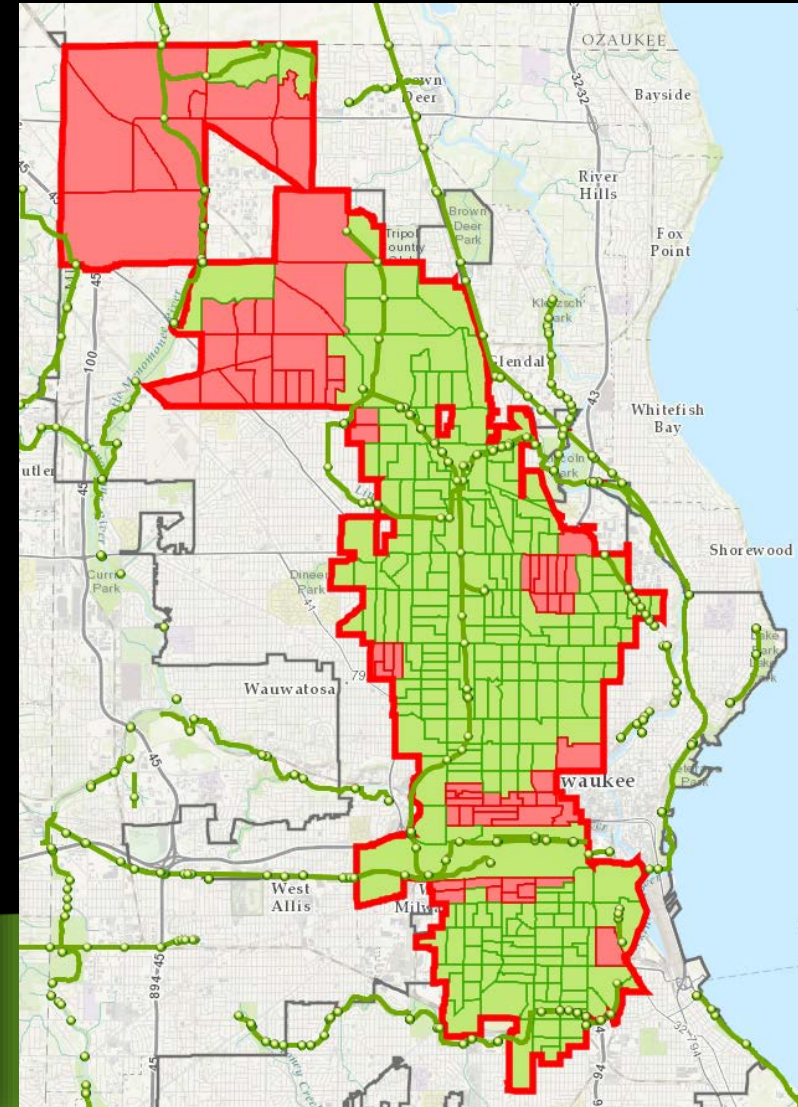
Current:

**8% within 2
miles of trail
access point**



**After Projects
Completed:**

**66% within 2
miles of trail
access point**



Planning for Bikeable Communities

Key features of BikeAble™

- **Level of Traffic Stress – focuses on needs of the 60% “interested but concerned”**
- **Considers entire network**
- **Highly customizable – number and types of destinations, stress tolerance, etc.**

Potential BikeAble™ applications include...

- **Bike plans – scenario testing, prioritizing projects**
- **Evaluating access to employment sites, schools, recreation**
- **Assessing impacts of projects on population groups: Communities of Concern, zero-vehicle households, etc.**

For More Information

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Lowry, M., Furth, P, and Hadden Loh, T. 2016. Prioritizing New Bicycle Facilities to Improve Low-Stress

Network Connectivity. Transportation Research Part A 86, 124-140.

<http://tinyurl.com/y8y3kbh3>