Planning Suburban Bike Networks

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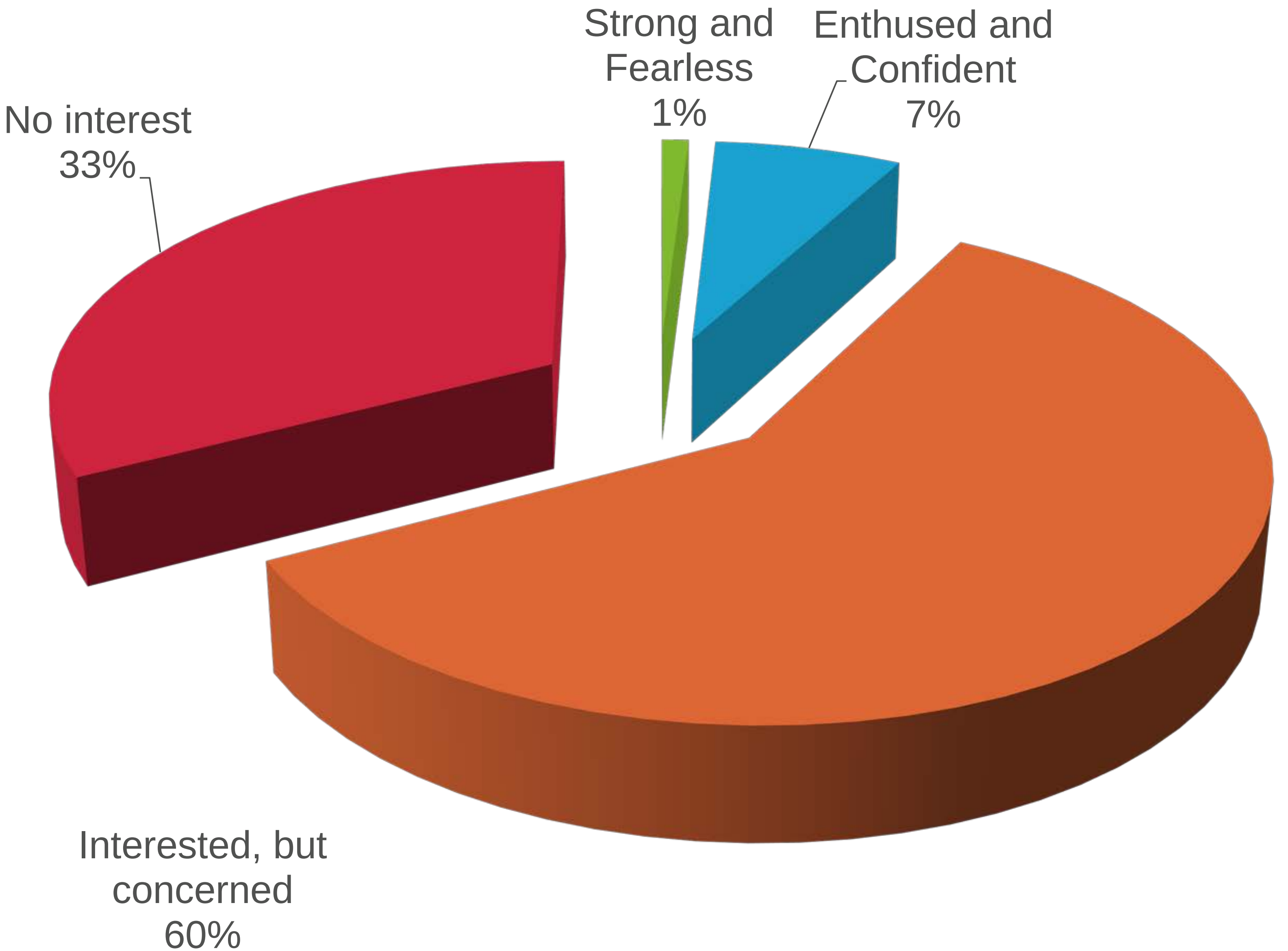
Bikeway design guidance

Different Cyclists Have Different Needs



Sam Schwartz Engineering D.P.C.

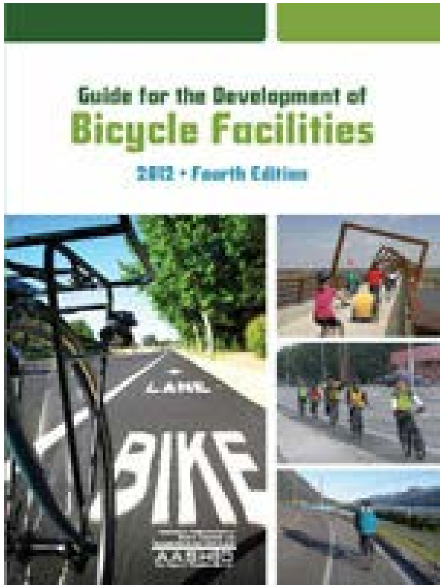
Design Guidelines:

IDOT Bicycle Facility Selection for Urban Roadways

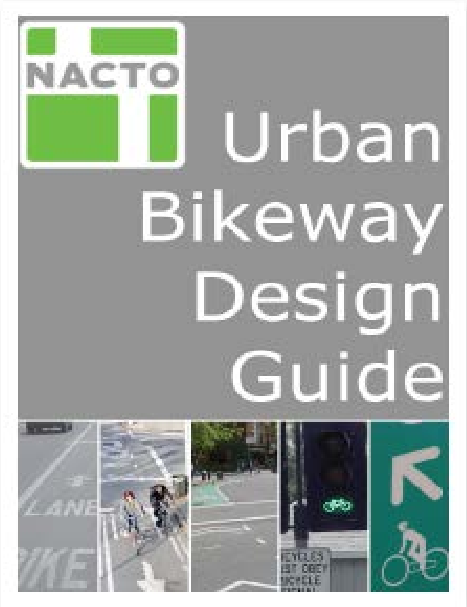
ADT	< 2,000	2,000-8,000	8,000 – 15,000	> 15,000
< 30 mph	None	13-14' outside lane	5' bike lane	6' bike lane *or* 10-12' sidepath*
30-35 mph	5' bike lane	5' bike lane	6' bike lane	6' bike lane *or* 10-12' sidepath
36-44 mph	5' bike lane	6' bike lane	10-12' sidepath	10-12' sidepath
45+ mph	6' bike lane	6' bike lane	10-12' sidepath	10-12' sidepath

* Sidepaths are often not appropriate in urban environments

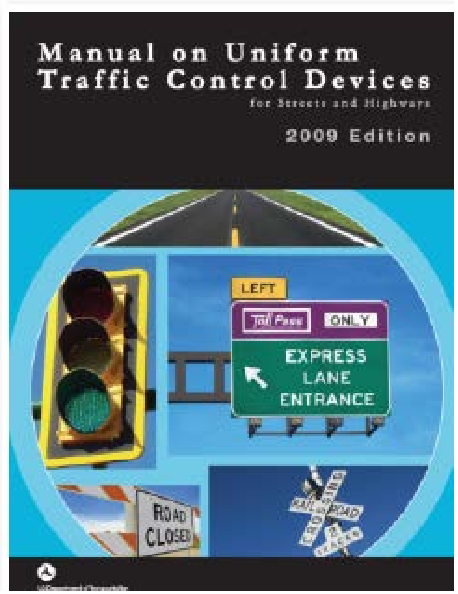
National Design Guidelines



AASHTO Bike Guide, 4th Edition (2012)



NACTO Urban Bikeway Design Guide



MUTCD, 2009 Edition

Facility types

1. What is your design vehicle?

2. What are your roadway characteristics?

Neighborhood Greenway (Bicycle Boulevard)

Photo: James Mayer, The Oregonian

- Creates a bike priority street; restricted to local traffic only
- Enhances neighborhood street through traffic calming
- Traffic calming can be controversial

Sharrows/Shared Lane Markings (SLMs)

- Minimally affect traffic patterns
- Simple to implement
- Improve motorists awareness of cyclists
- Of limited appeal to many cyclists

Advisory Bike Lanes

- Separates bike from vehicle traffic
- Applicable on very low volume streets (up to 6,000 vpd)
- Gives priority to bicyclists

Standard Bike Lanes

- Separates bike from vehicle traffic
- More comfortable on higher speed (> 25 mph), higher volume roads (> 3,000 ADT)
- Greater visibility than standard SLMs
- Appealing to more cyclists than standard SLMs

Buffered Bike Lanes

- May require using an existing travel or parking lane
- Appropriate for higher volume/higher speed streets (>35 mph)
- Gives the rider a “buffer” from traffic and a place to ride when people are accessing parked cars
- Appealing to a range of cyclists. The cyclist’s path is clearly delineated and riders are away from car traffic

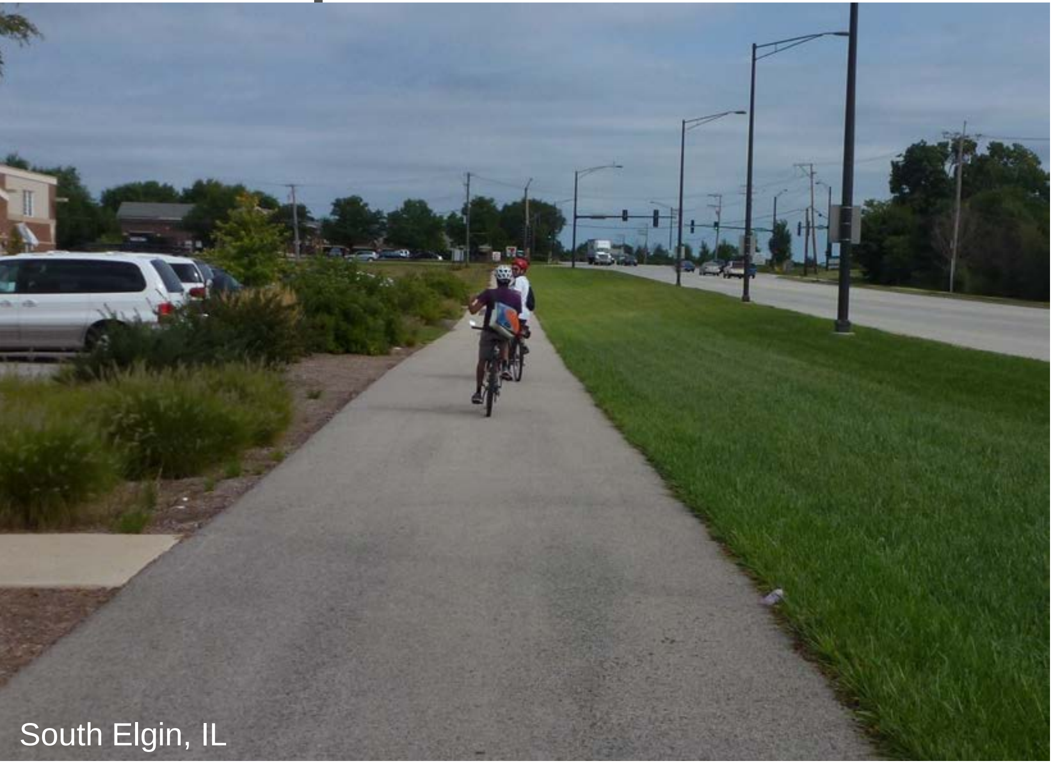
Physically Protected Bike Lanes

New York, NY

Portland, OR

- Provides a physical separation between travel lane and bike lane
- Appropriate for higher traffic volumes and speeds
- Appealing to a wide range of cyclists
- Bigger change and requires more space

Sidepaths


South Elgin, IL


Elgin, IL

- Separated from roadway; often at sidewalk grade
- Shared use
- Follows roadway corridor

Shared Use Trails

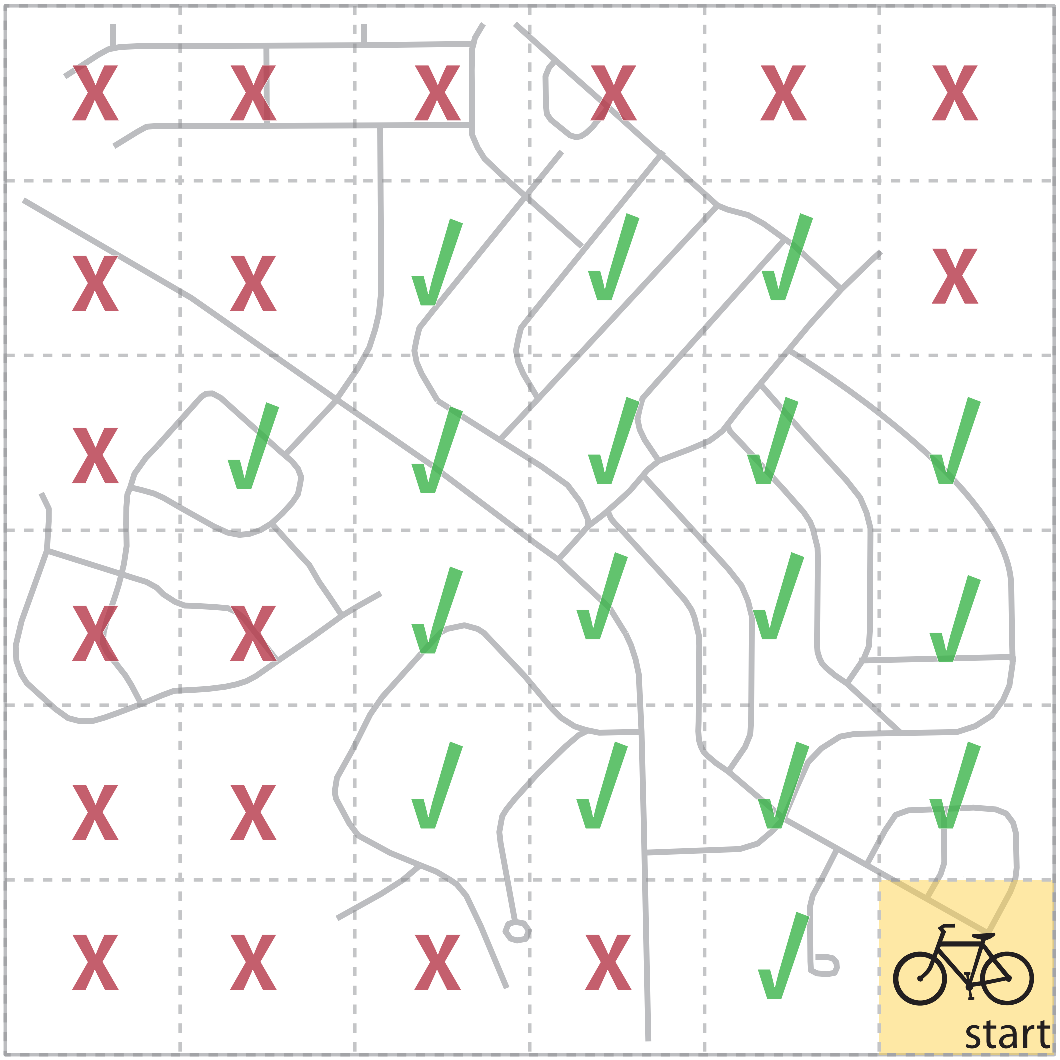
Barrington Hills, IL

- Completely separate from roadway
- Through open space or along RR ROW

Network Planning:

Assessing bikability & evaluating network completeness

Measuring Accessibility

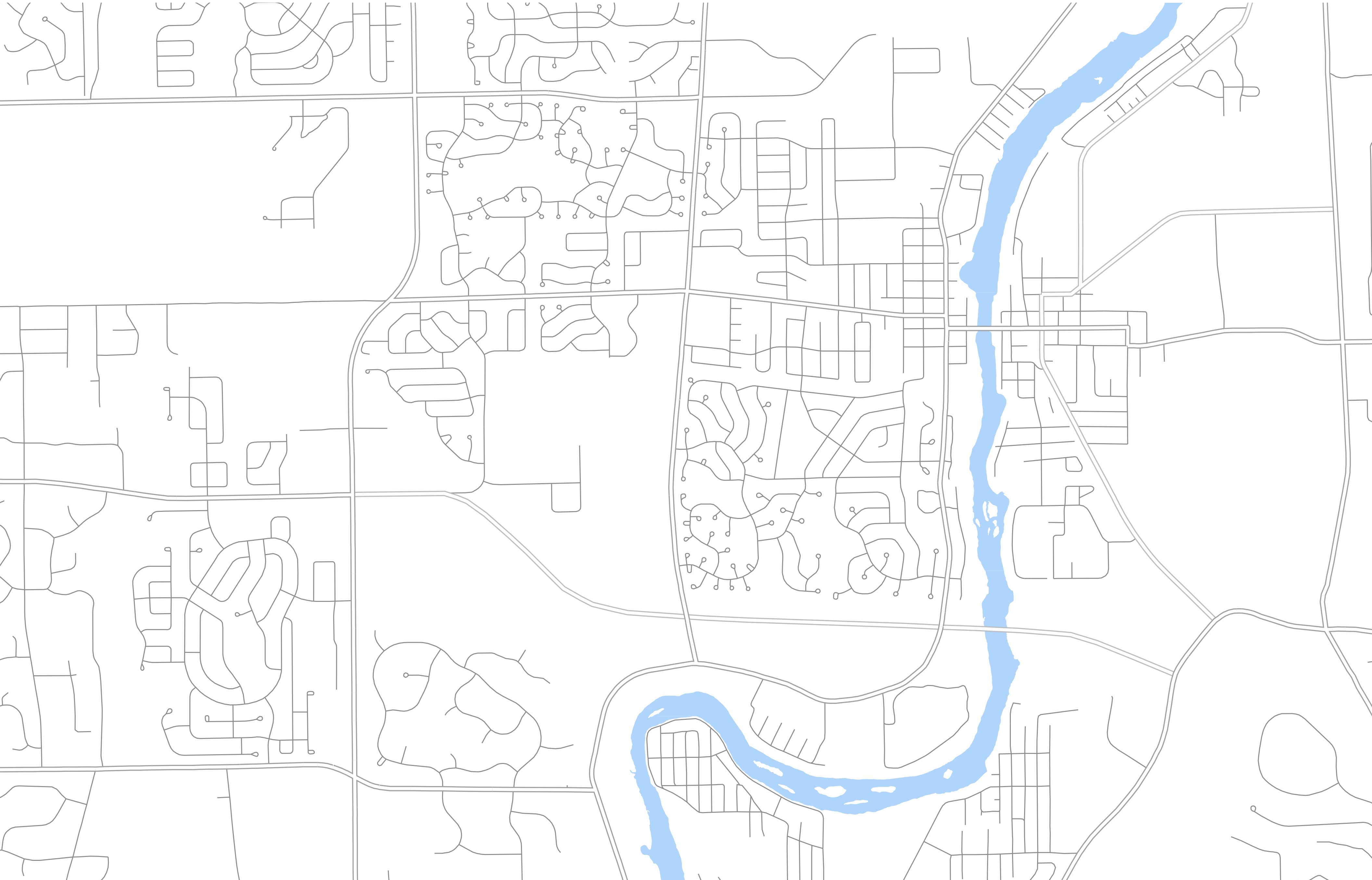


X *more than 4 miles bike*

√ *less than 4 miles bike*

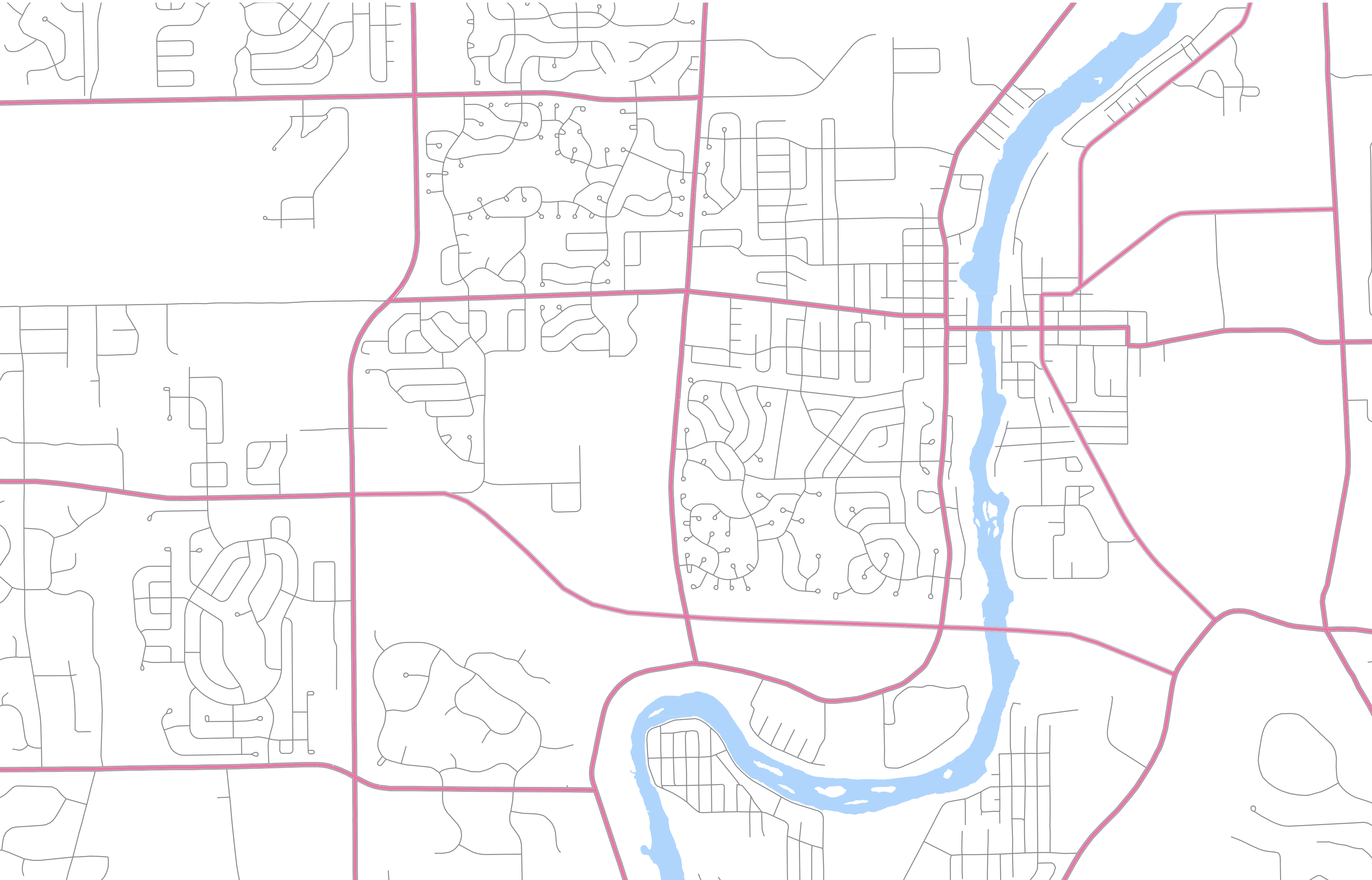
Measuring Accessibility

defining the network



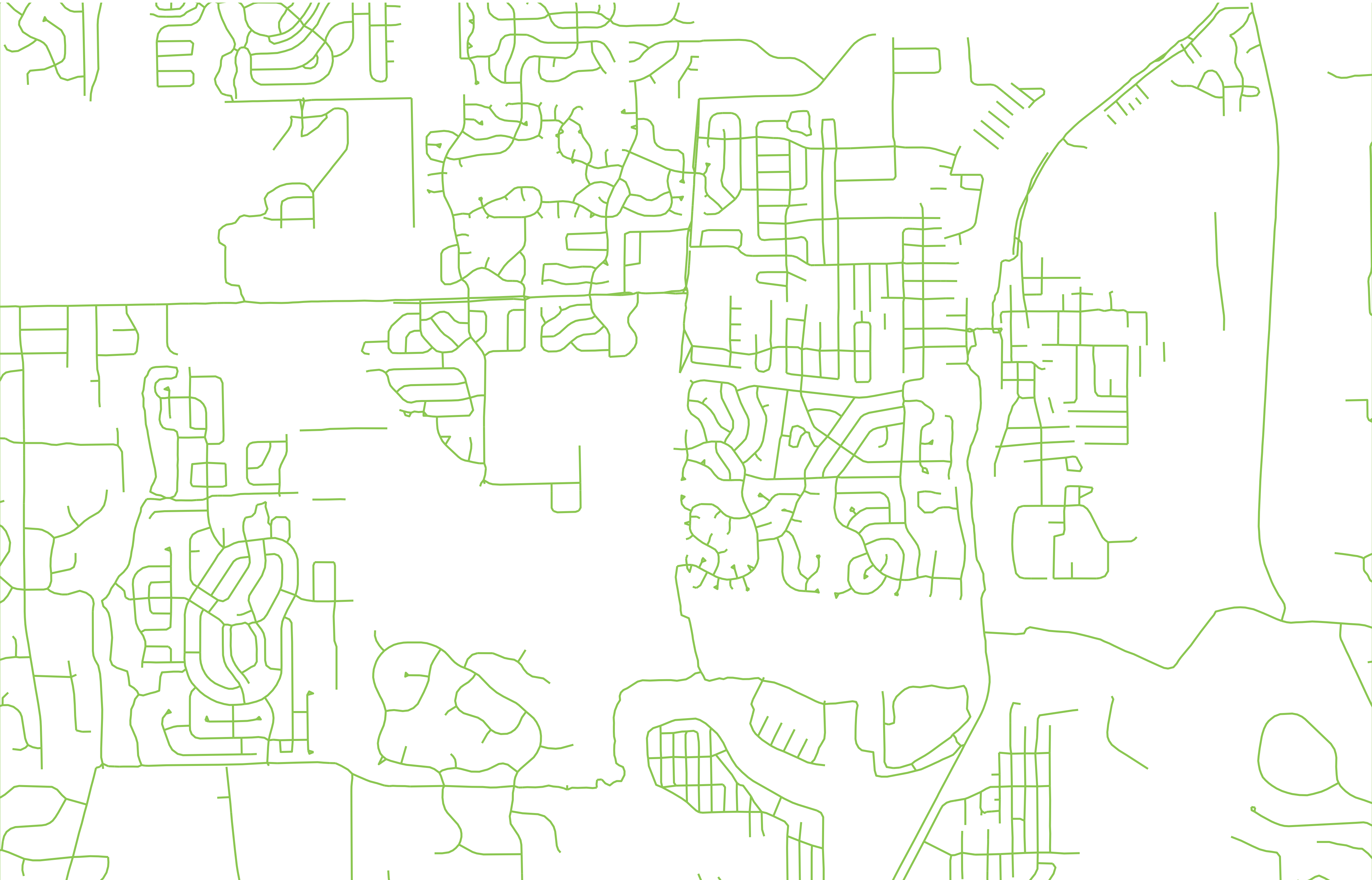
Measuring Accessibility

defining the network



Measuring Accessibility

defining the network



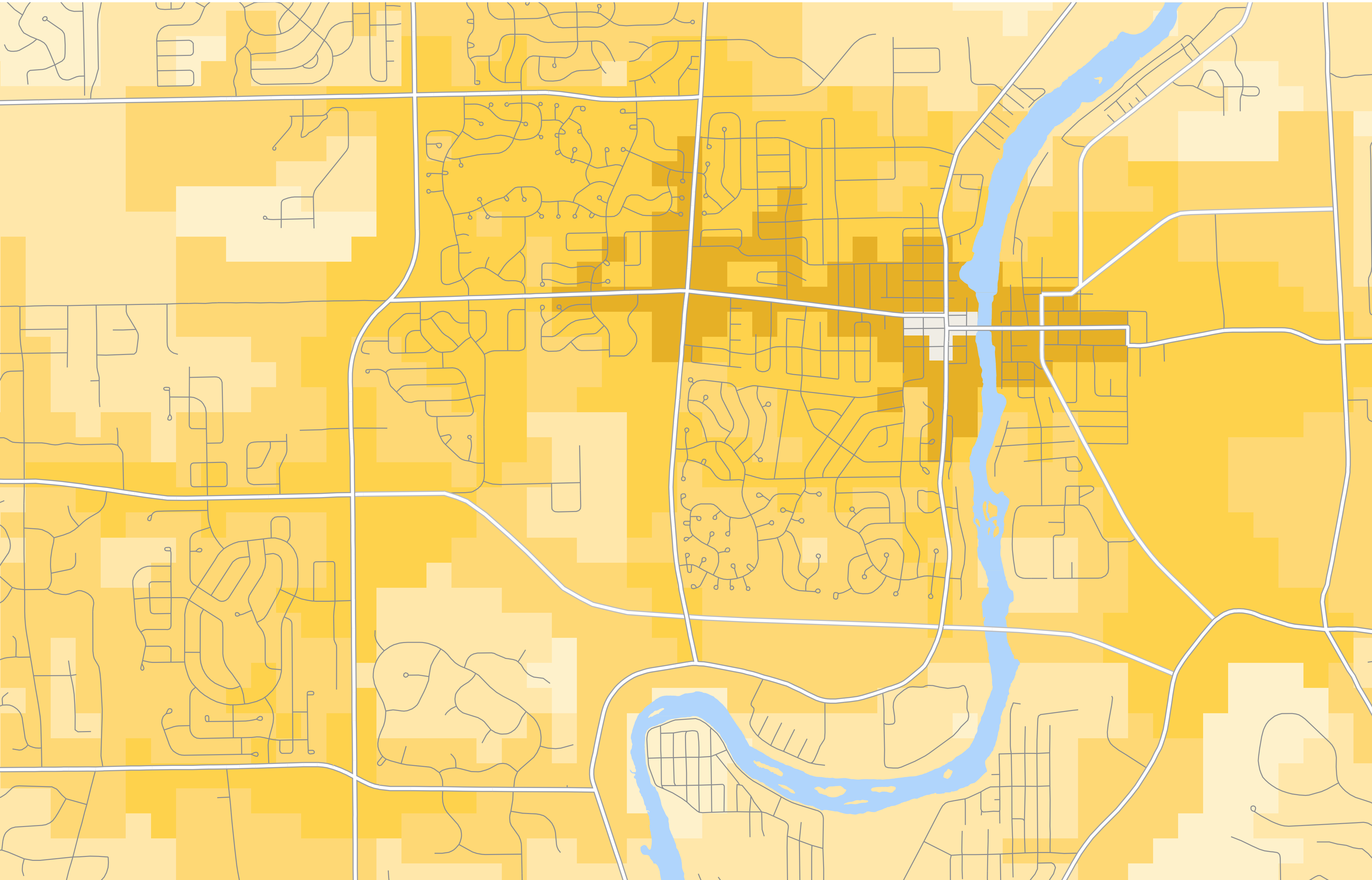
Measuring Accessibility

creating nodes

Measuring Accessibility

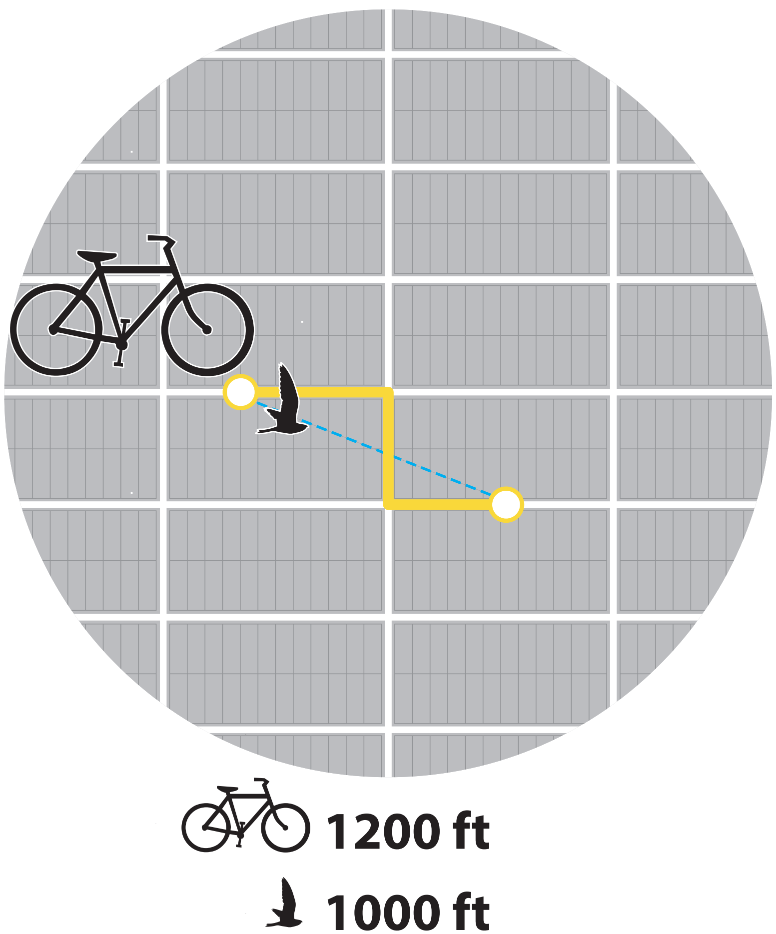
results

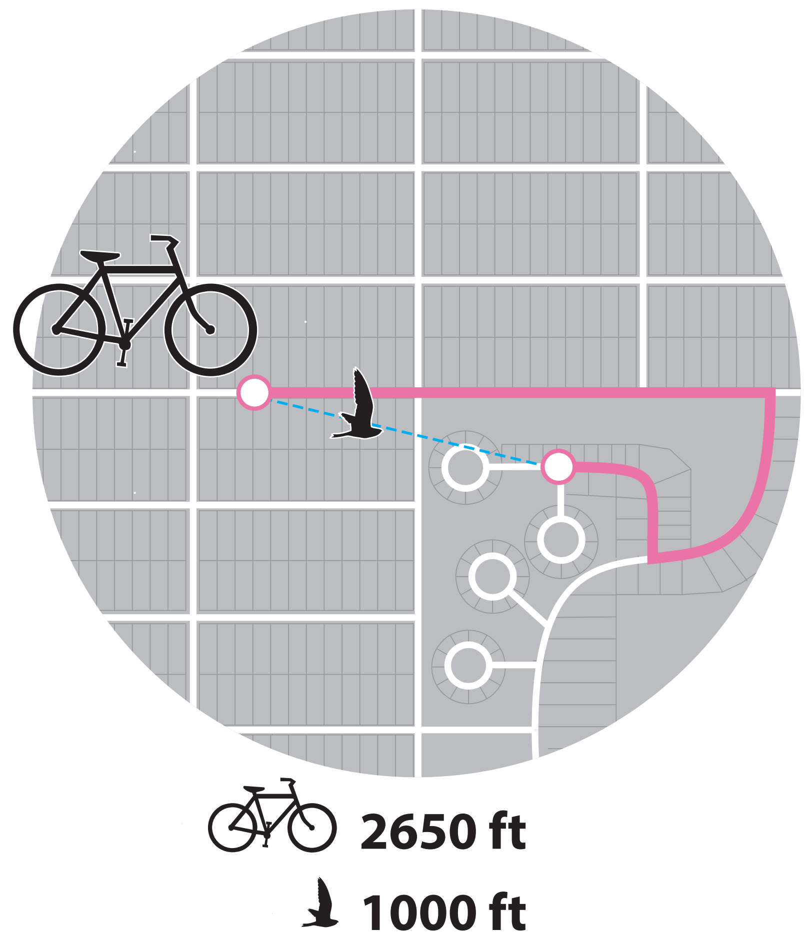
more accessible



Measuring Accessibility

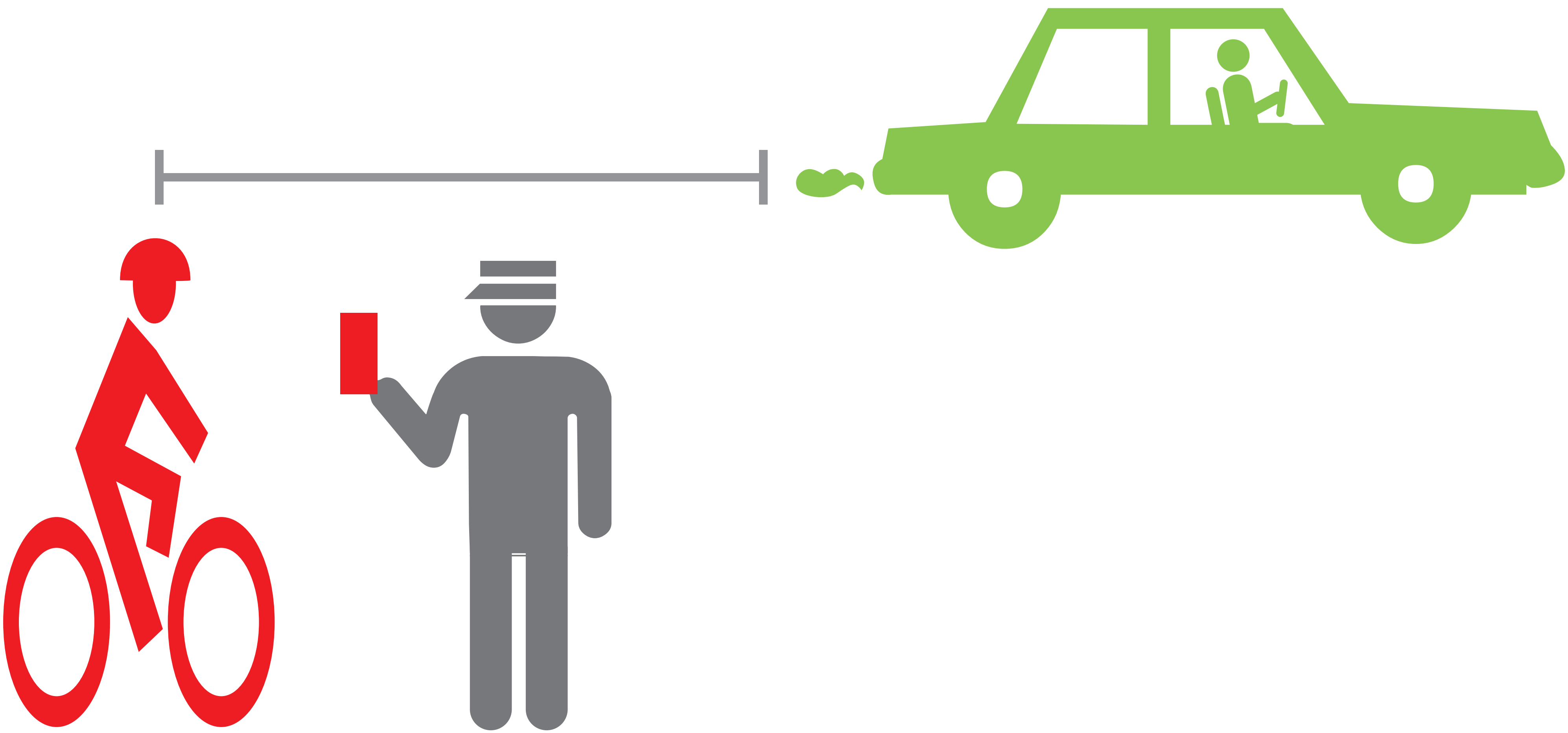
network structure impacts results





Defining a "Bike Penalty"

(accessibility by car - accessibility by bike) ÷ accessibility by car



Calculating “Bike Penalty”

accessibility by car vs. **accessibility by bike**

35 other squares reached by car

17 other squares reached by bike

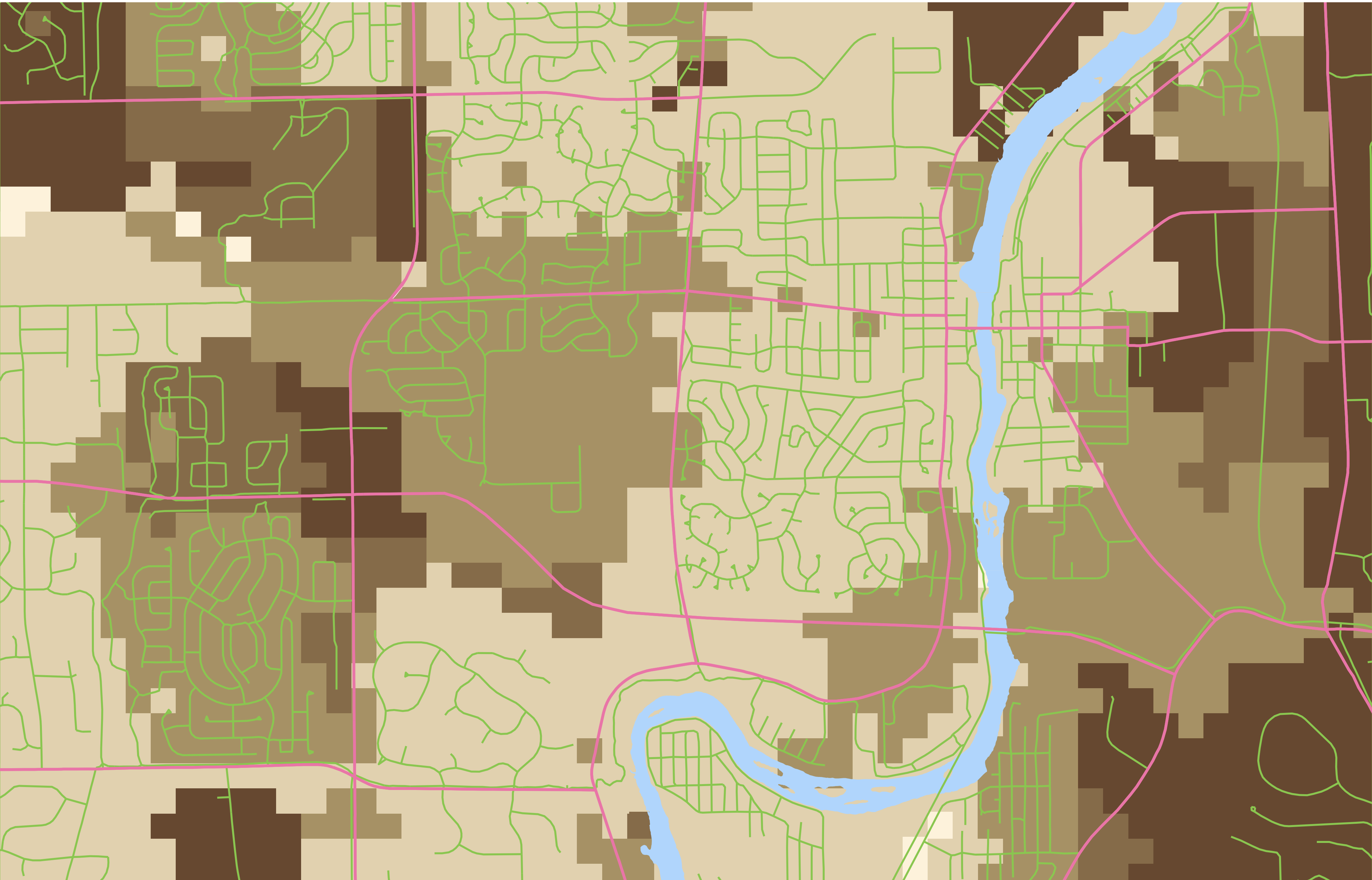
(35 -17) = 18 fewer squares

= 50% bike penalty

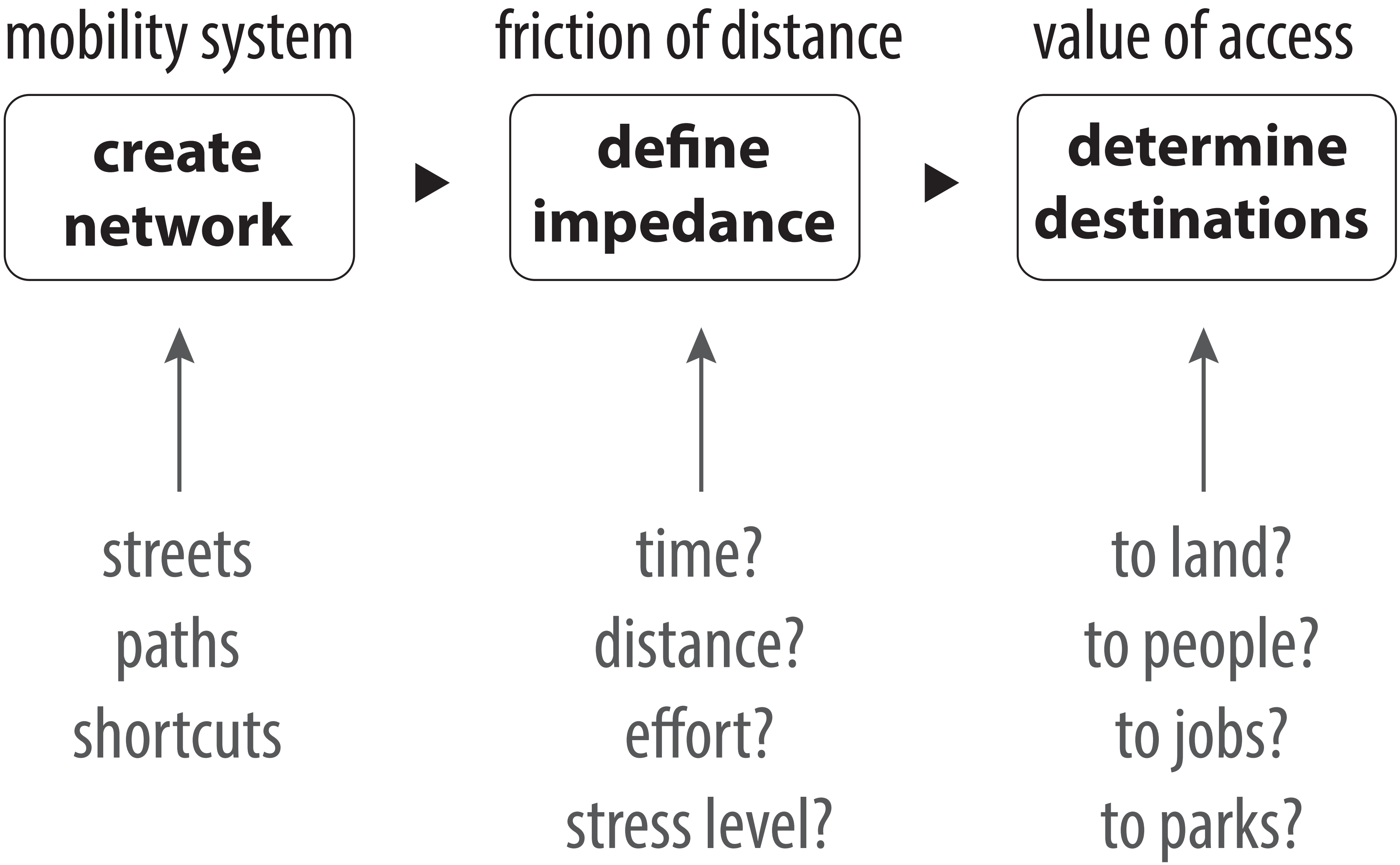
Visualizing "Bike Penalty"

final result

80-100%
60-80%
40-60%
20-40%



Building an Accessibility Model



Limitations/Challenges

- Does not account for challenging nodes
- Software needs
- Finer grain analysis require more computing power

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