

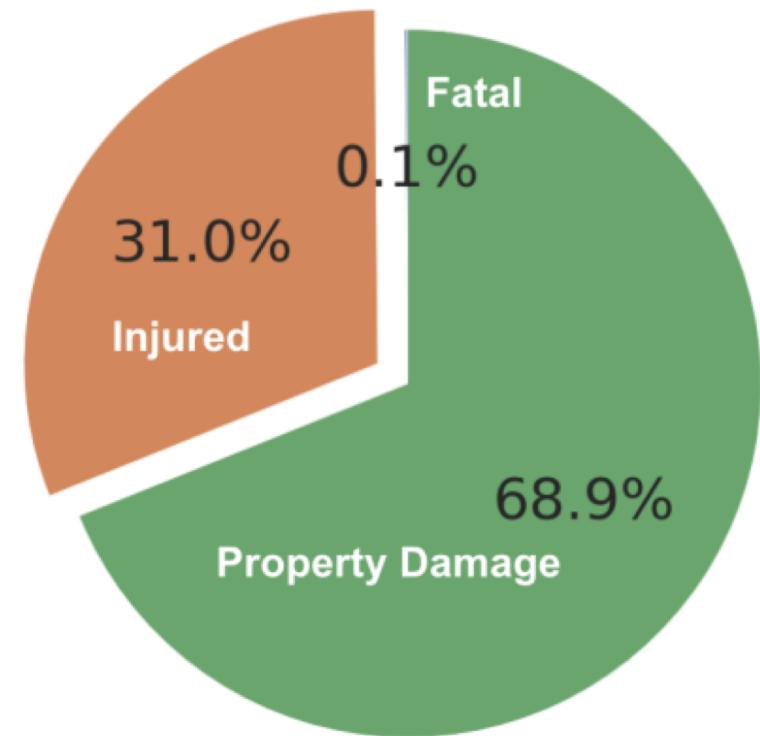
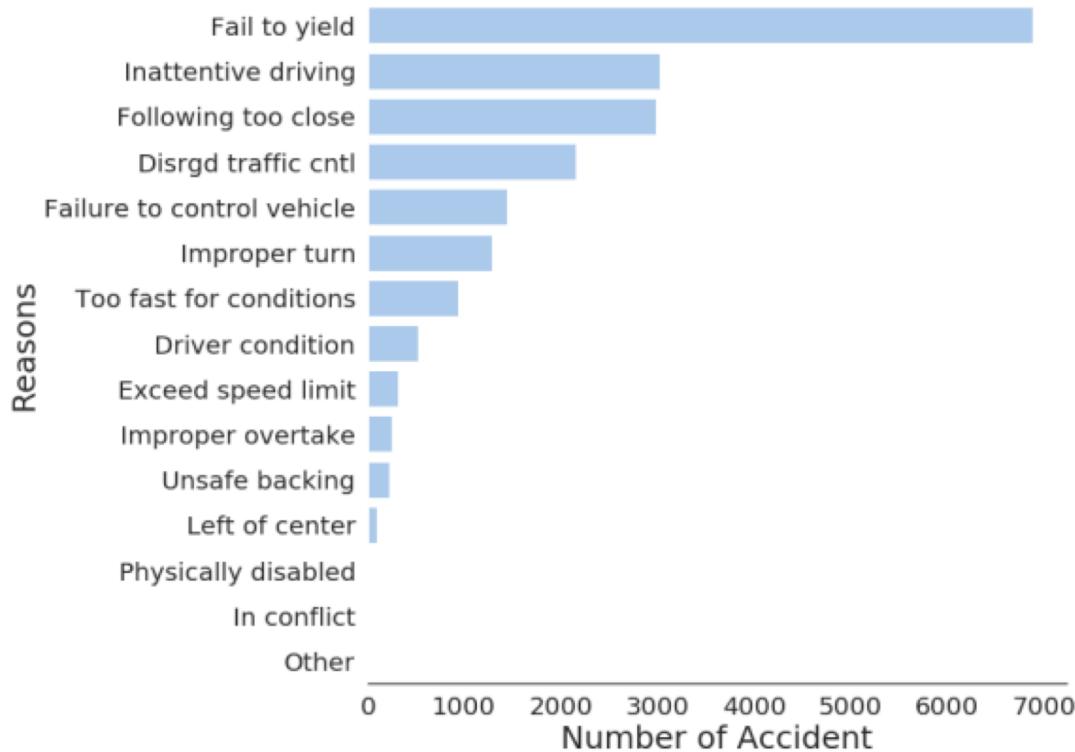
Vision Zero Madison

Tongkai Yang, Siyuan Ji, Clarence Kuo

3 Main Part:

- Intersection Crash
- Car to Truck Crash
- Bike Crash Analysis

Intersection Crash



The Most Dangerous Intersections

City Street: Mineral Point Rd & Pleasant View Rd

2009 - 2018

Total: **272**

Fail To Yield: **65%**

2015 - 2018

Enter Loop vs. On Loop: **35%**



Highway: E Washington Ave. & S Stoughton Rd.

2009 - 2018

Total: **346**

Inattentive Driving: **26%**

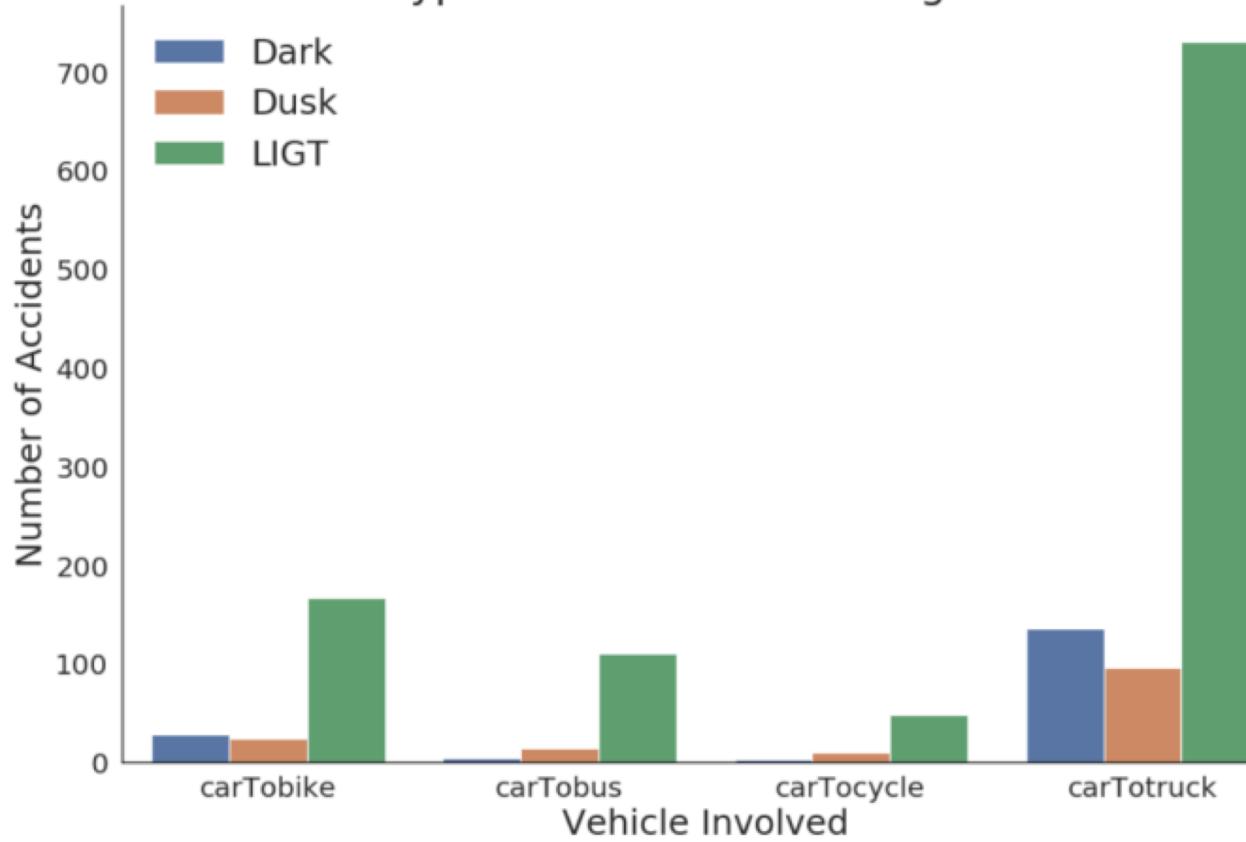
2015 - 2018

Go Straight vs. Left Turn: **20%**

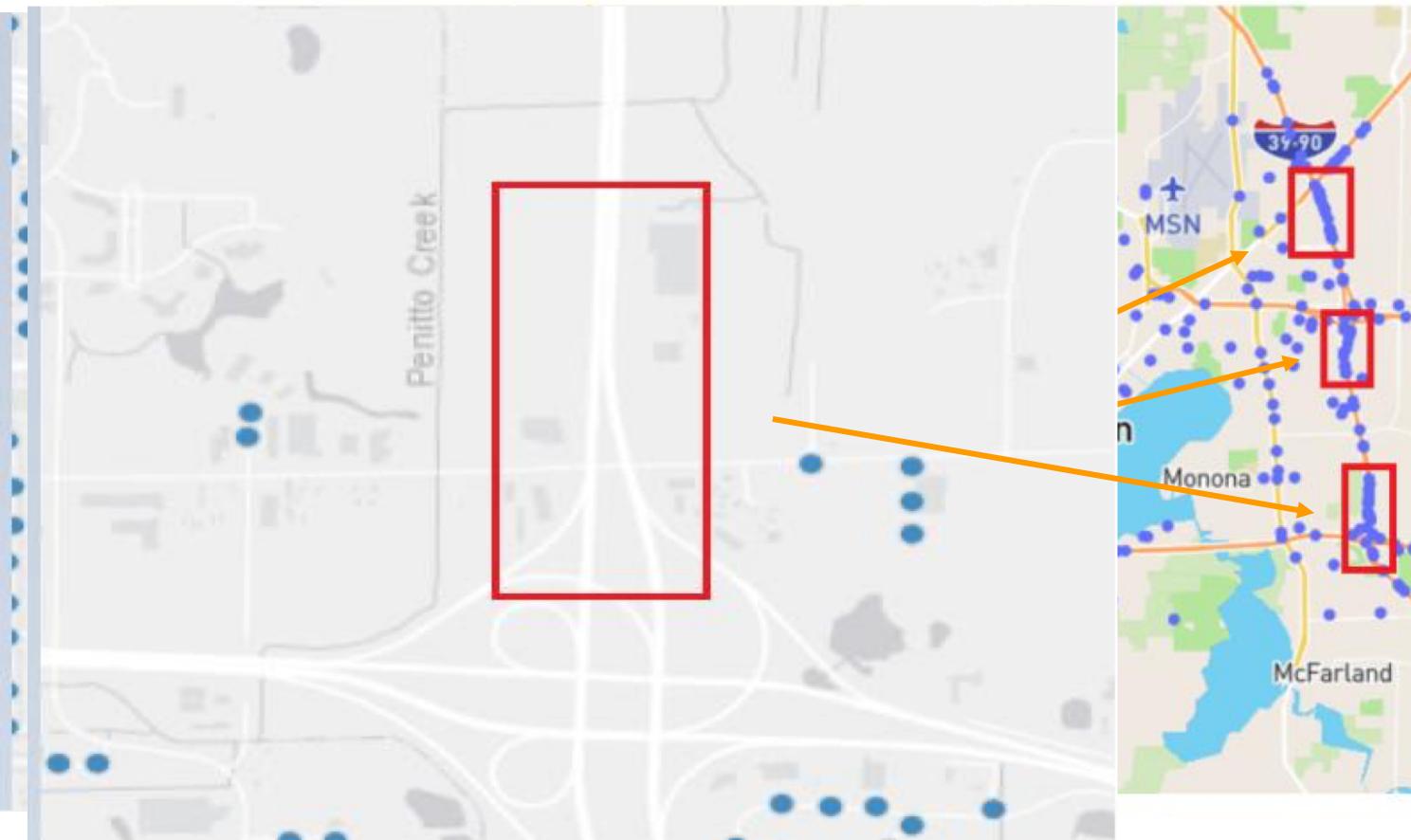


Car to Truck Crash

Different Types of Accidents and Light Conditions



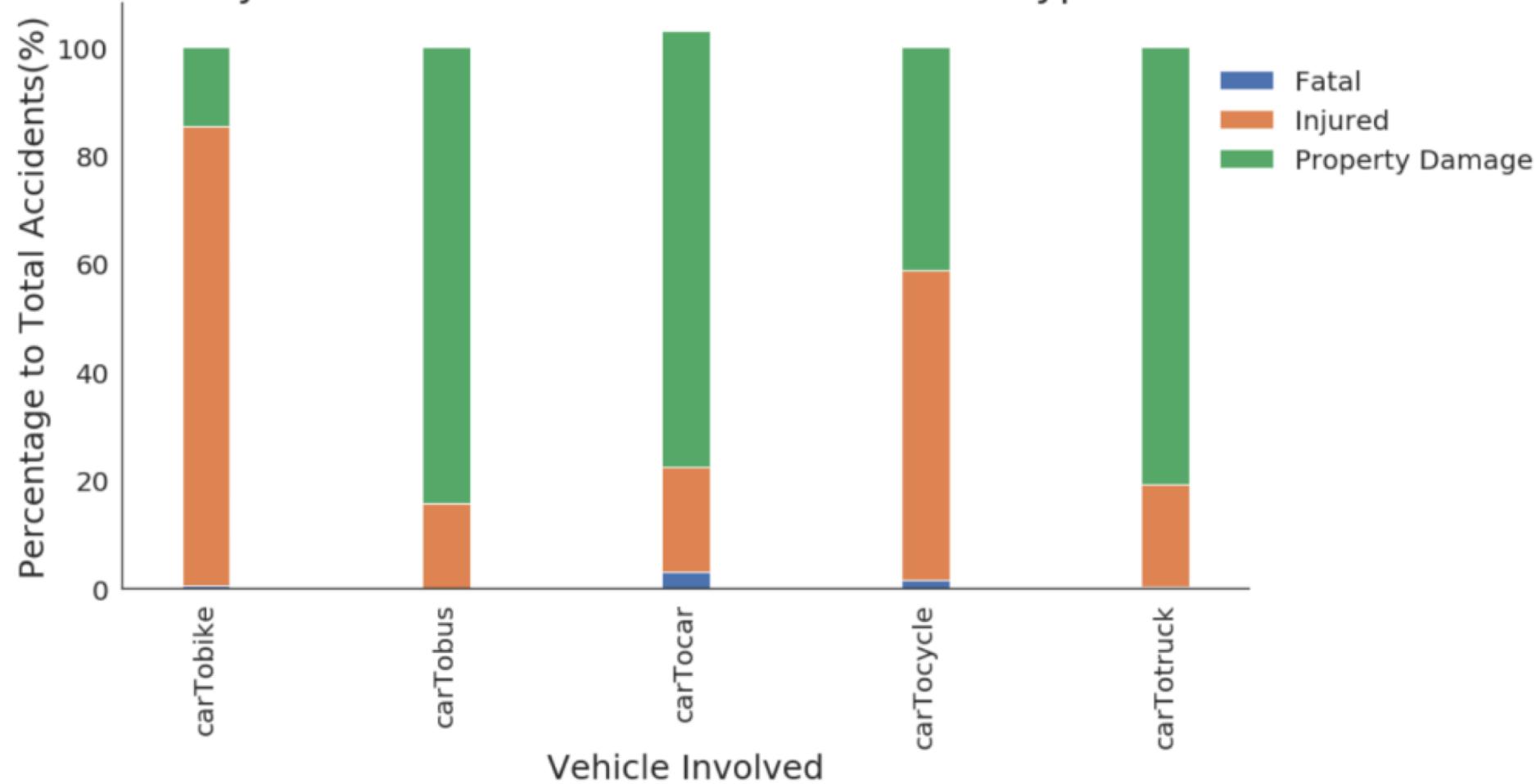
Data for CarToTruck Accidents Happended in Dark Time



I-90

I-39

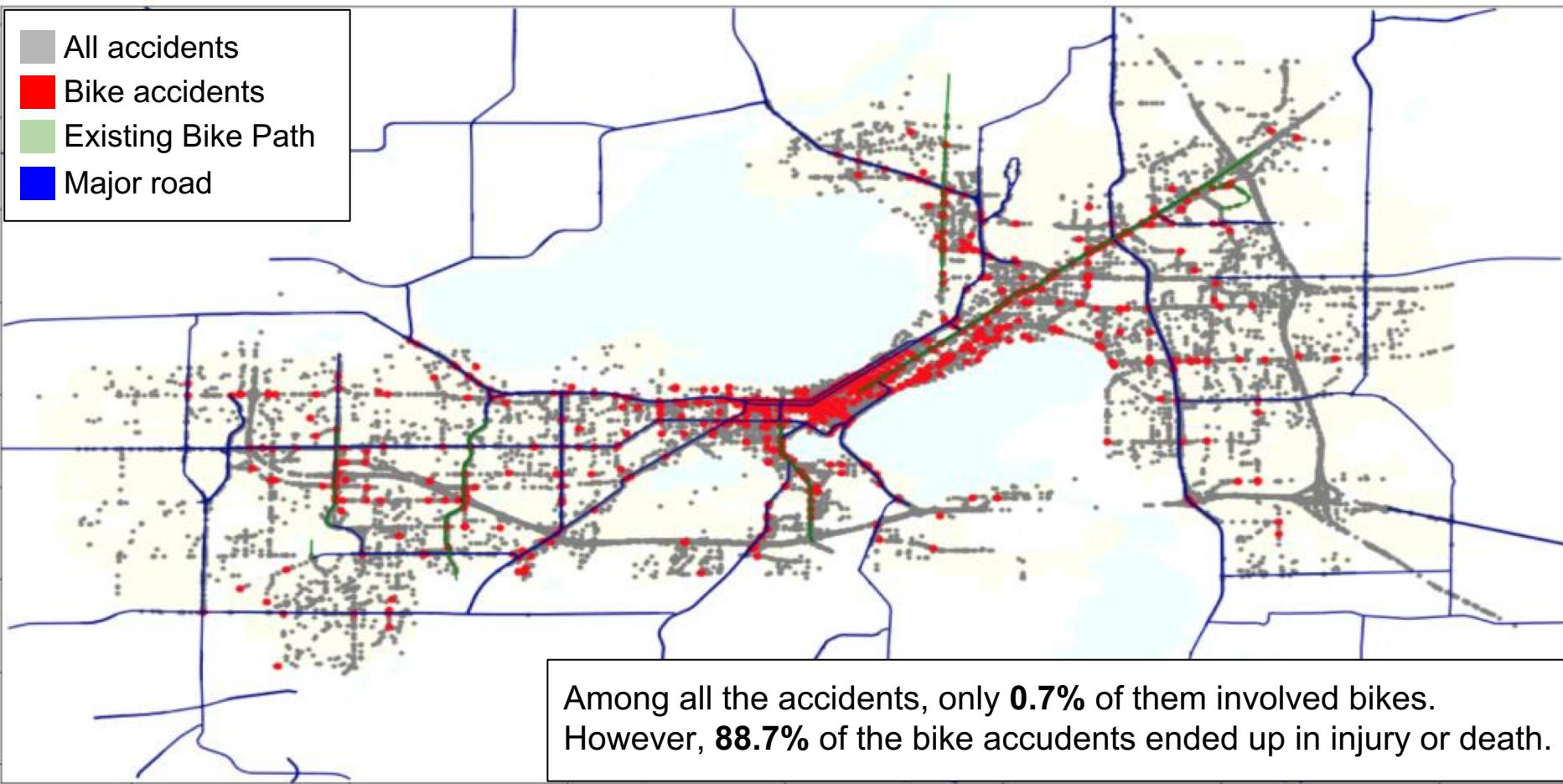
The Severity of Accidents Involved with Different Types of Vehicles



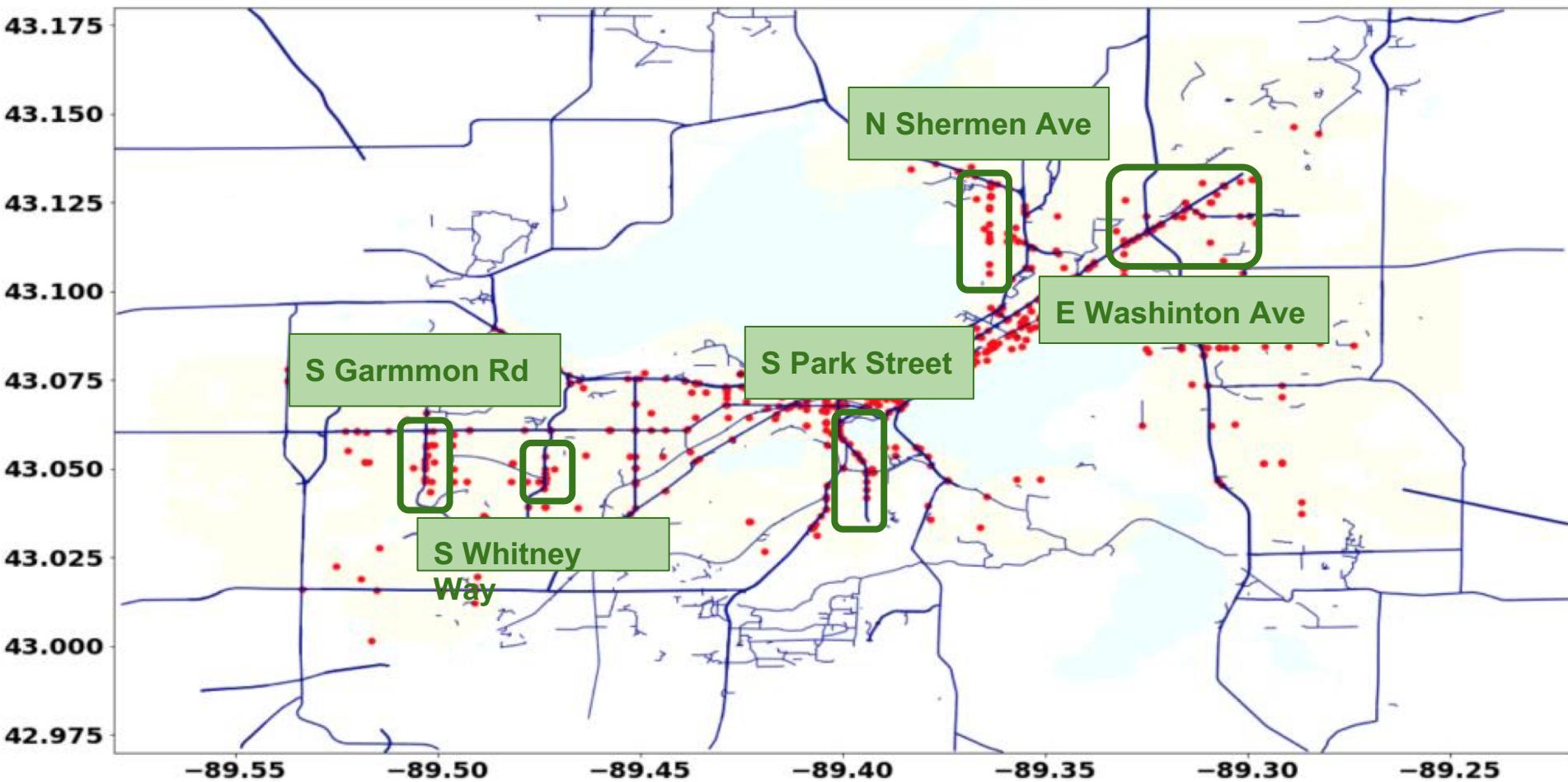
Bike Crash Analysis

Clarence

Why Bikes?



Dangerous sections



Analysis and Ranking

1. Check current status of the target

- Google maps
- Dane County Bike Map

1. Is there enough room for new bike facilities?

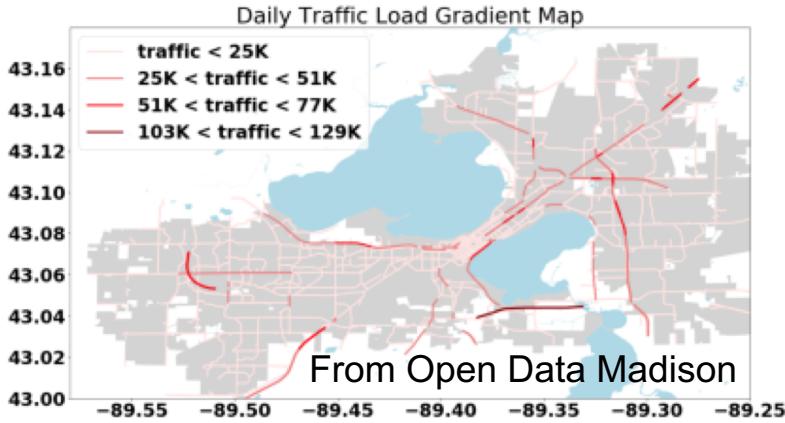
- Check traffic load/ lane for availability:
 - The average theoretical maximum saturation flow rate per lane is **1800** vehicles/ hour
 - Assume **70%** of the daily traffic load occurred within **3** hours of peak time.

$$Loading = \frac{0.7 * \text{daily loading}}{3 \text{ hours} * \text{num of Lanes}}$$

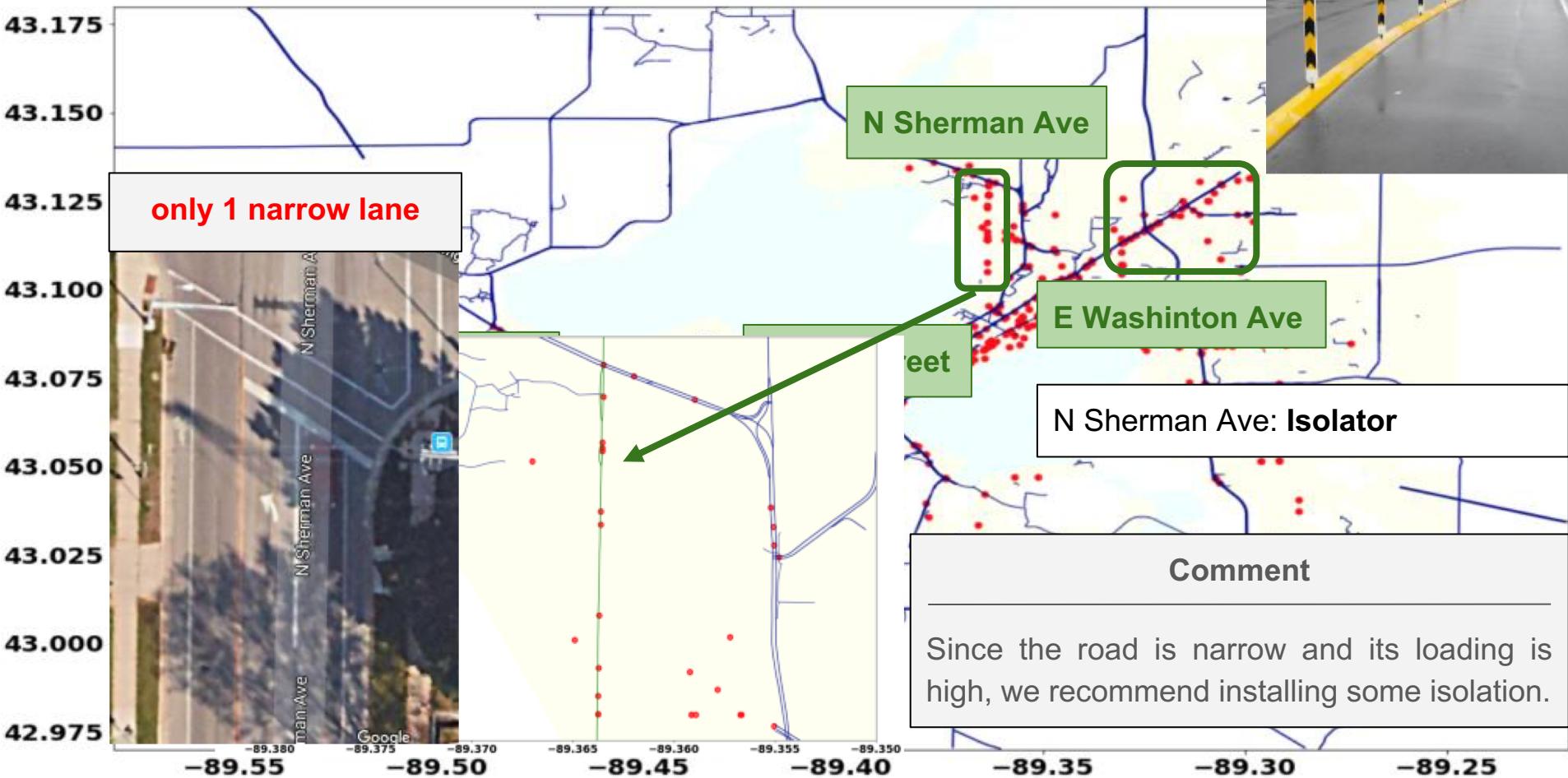
- Calculate score:

$$Score = \frac{\text{Average accident count}}{\text{Length}}$$

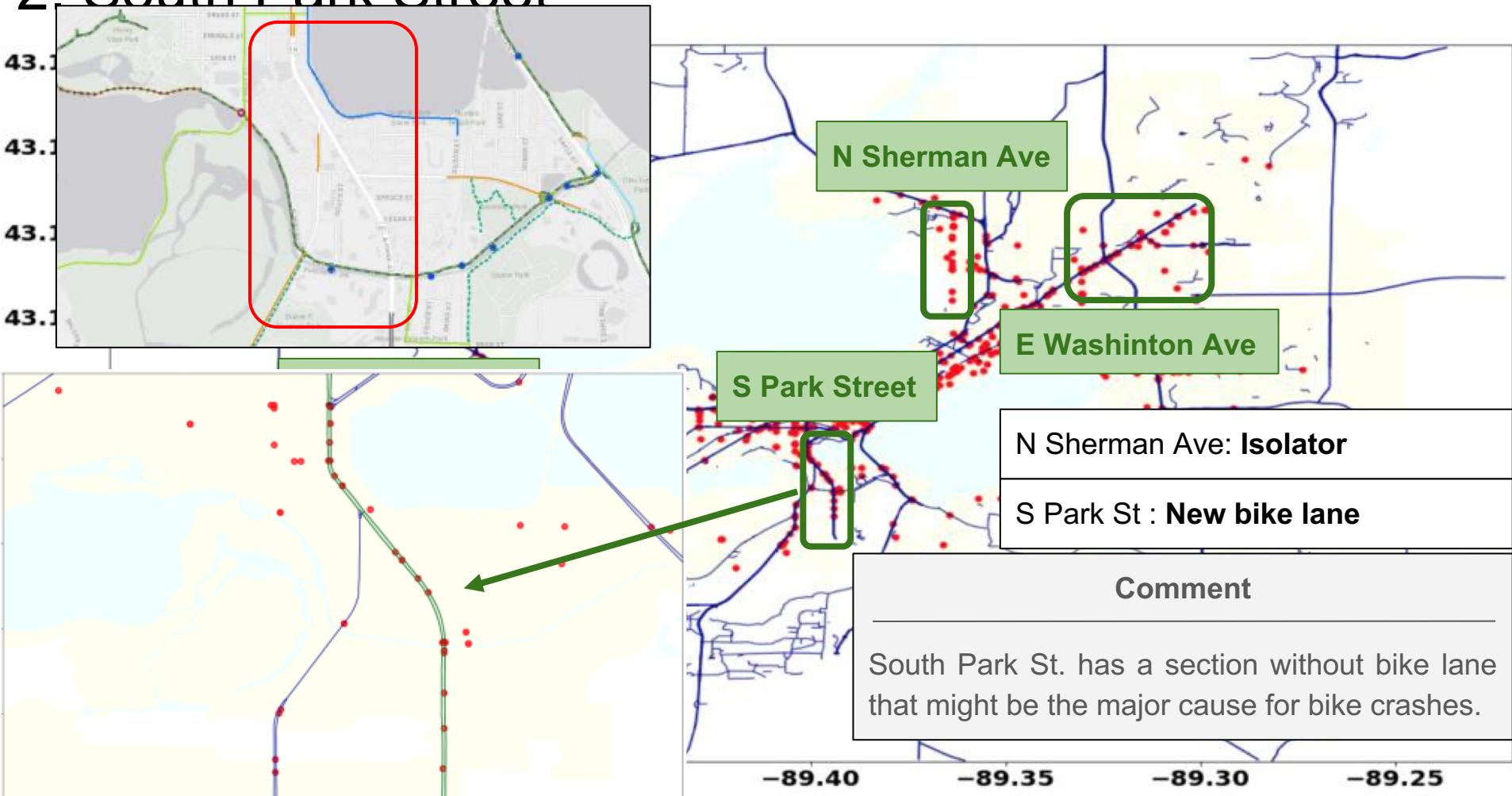
The higher the score, the higher the priority.



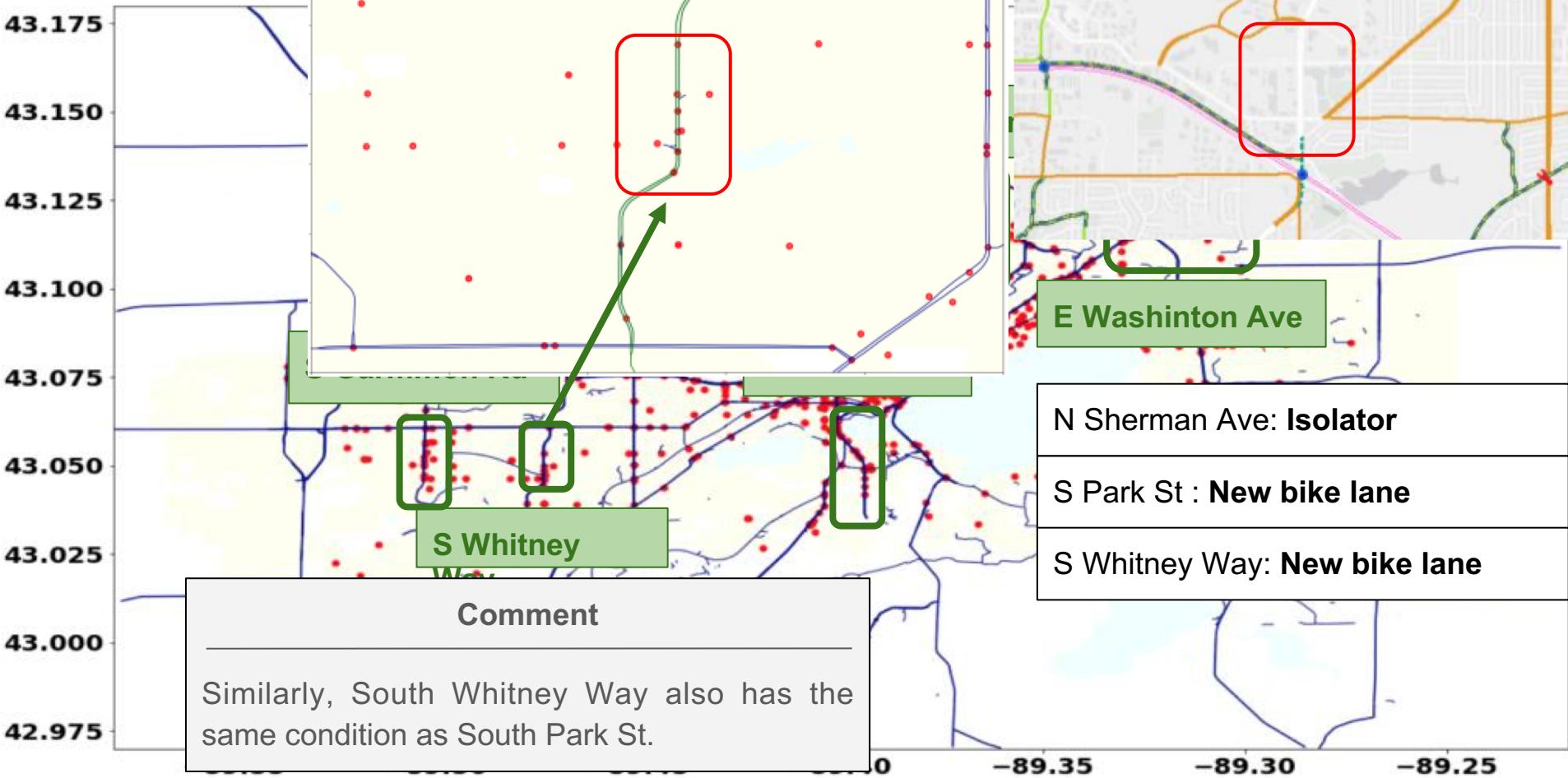
1. North Sherman Avenue



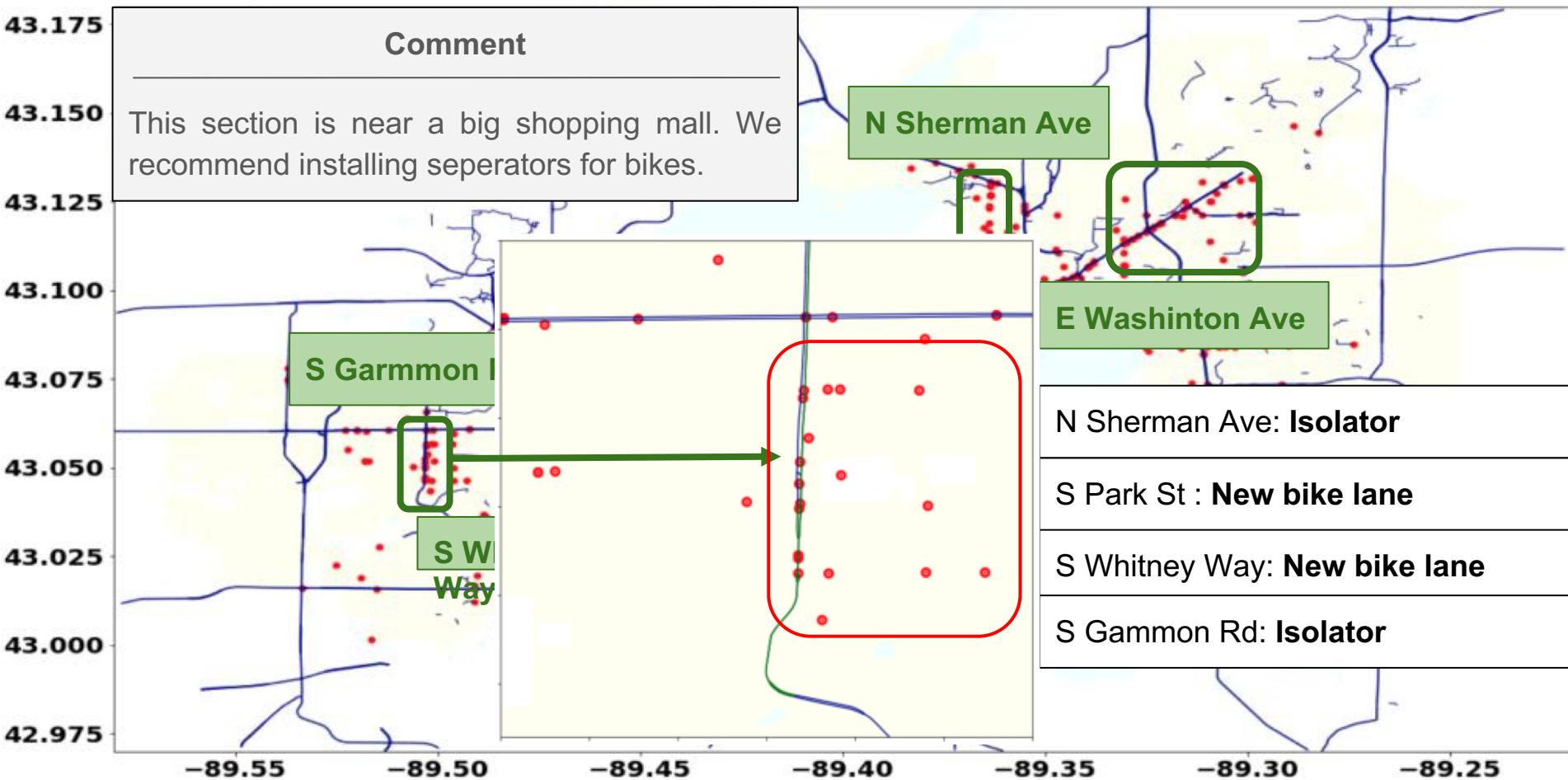
2 South Park Street



3. South W

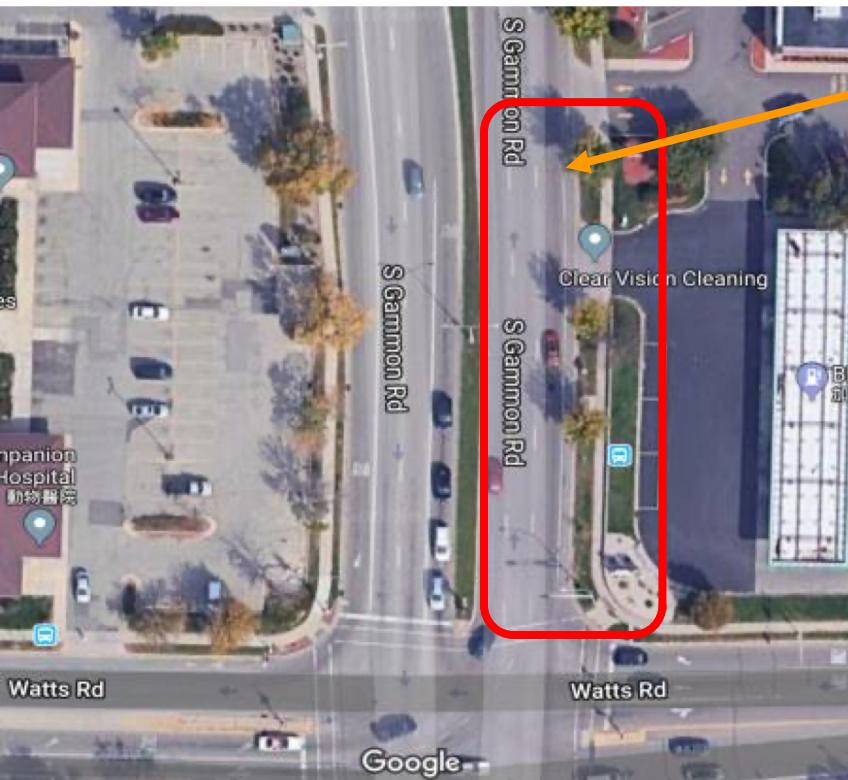


4. South Gammon Road



4. South Gammon Road

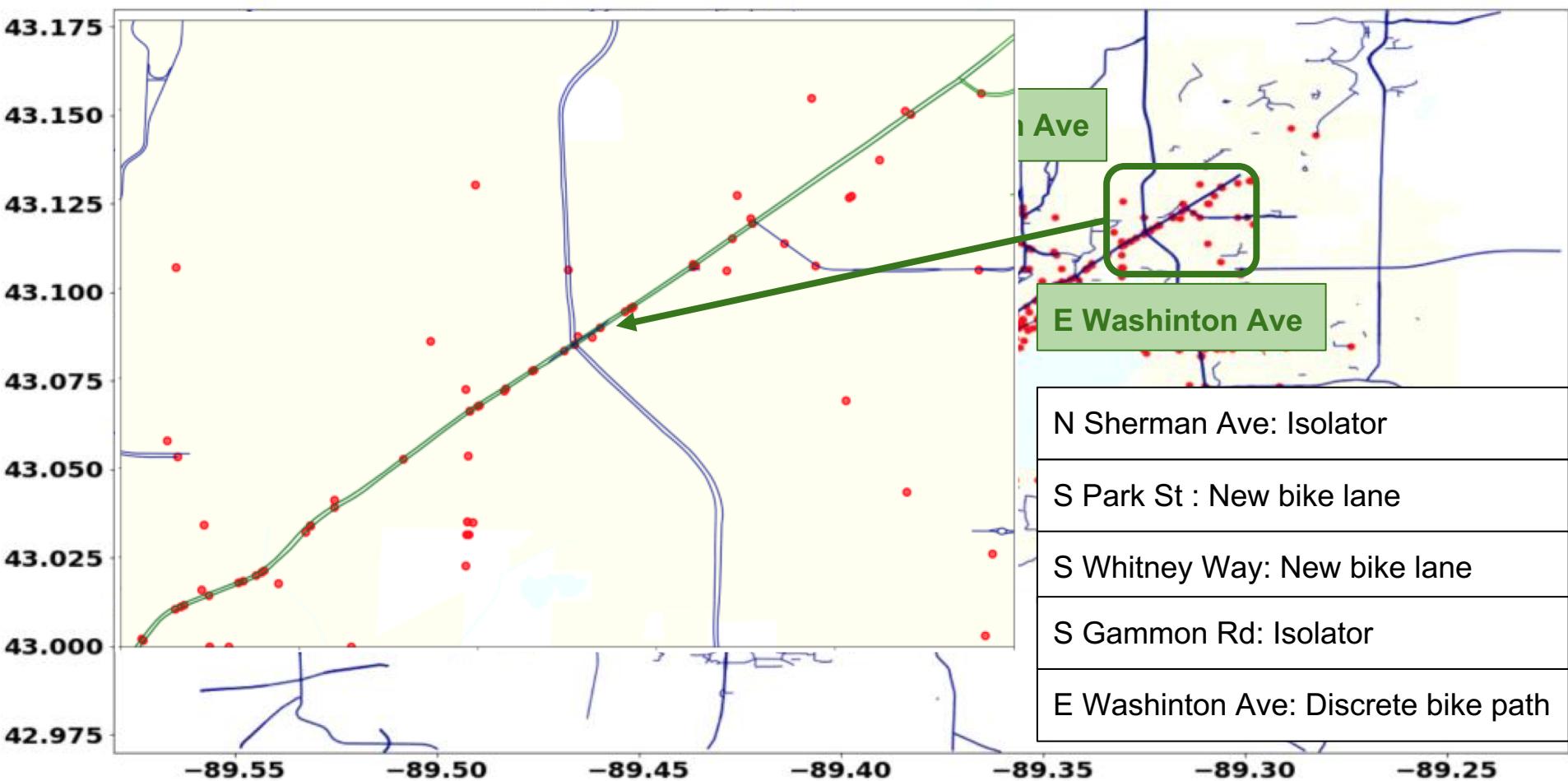
Extra Bike Lane



Additional Comment

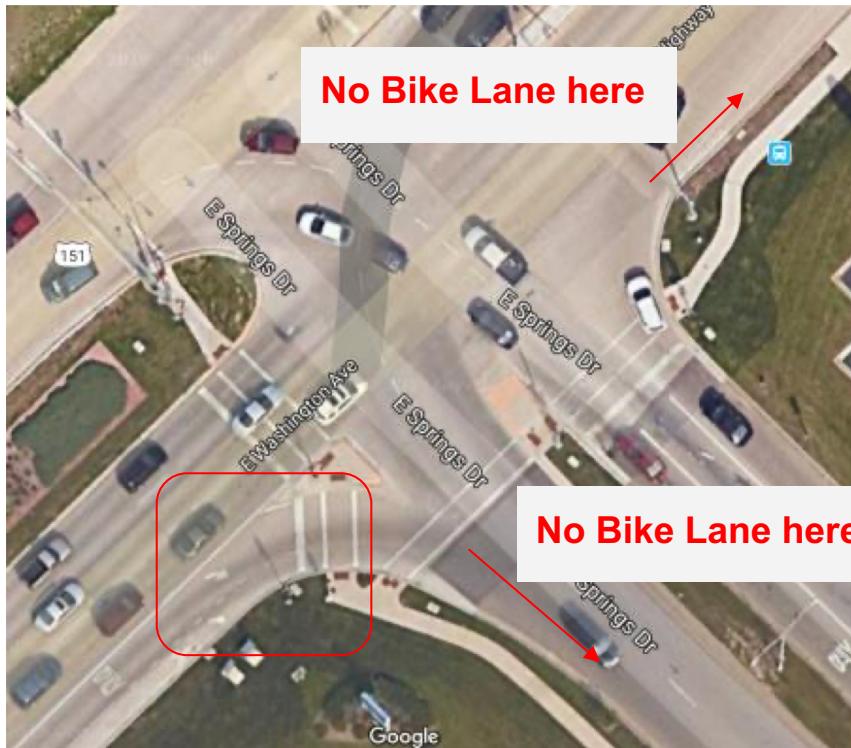
Crossing Watts Rd, the bike lane continued for a short distance and disappeared. It might be better to remove it.

5. East Washington Avenue



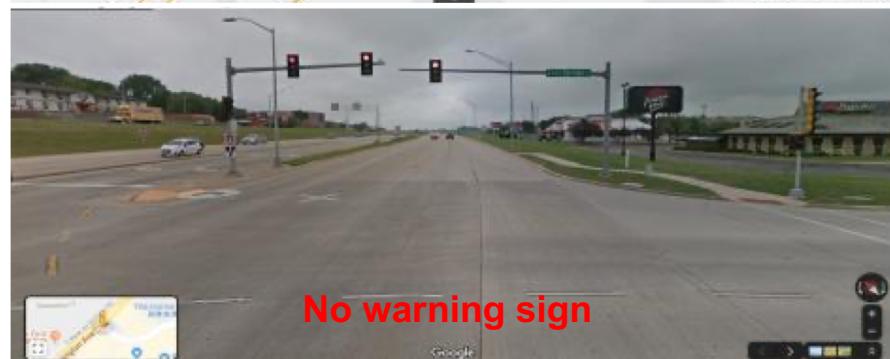
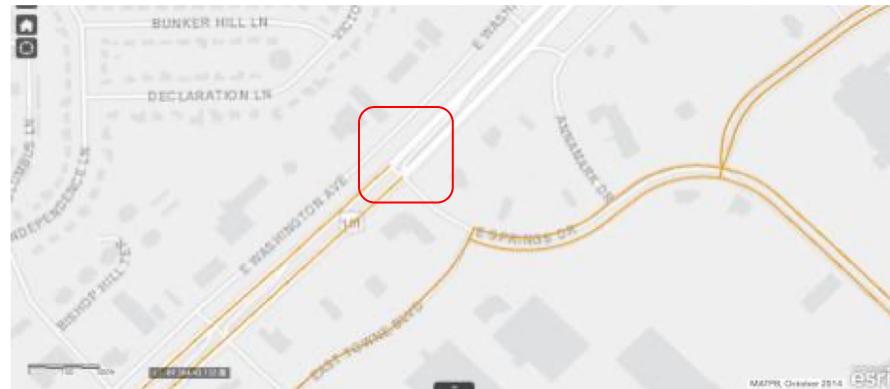
5. East Washington Avenue

- Disconnected Bike Lane



Additional Comment

The bike lane comes to a sudden stop at the cross of E Springs Drive. We suggest connecting it with adjacent bike lanes.



No warning sign

Conclusion

$$\text{Loading} = \frac{0.7 * \text{daily loading}}{3 \text{ hours} * \text{num of Lanes}}$$

Loading/lane: 🚗🔥
Accident rate: 🔥🔥
Rank: 2

Load/lane: 🚗🚗🚗🚗
Accident rate: 🔥
Rank: 5

Load/lane: 🚗🚗🚗🚗
Accident rate: 🔥🔥🔥🔥
Rank: 1

S Garmon Rd

S Park Street

E Washinton Ave

S Whitney Way

Loading/lane: 🚗🔥
Accident rate: 🔥🔥
Rank: 3

Load/lane: 🚗🚗🚗
Accident rate: 🔥🔥
Rank: 4

N Sherman Ave: Isolator

S Park St : New bike lane

S Whitney Way: New bike lane

S Gammon Rd: Isolator

E Washinton Ave: Discrete bike path

Refferences

- Dane County Bike Map

<https://cityofmadison.maps.arcgis.com/apps/webappviewer/index.html?id=5d9b5793e6404b8c89872c06bd5f26c2>

- Open Data Madison

<https://data-cityofmadison.opendata.arcgis.com/>

- Google Maps

<https://www.google.com/maps>

- Distance calculator

<https://www.movable-type.co.uk/scripts/latlong.html>

Thank you!