

McDowell EcoLabs

Champaign County Bike Crash



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Outline

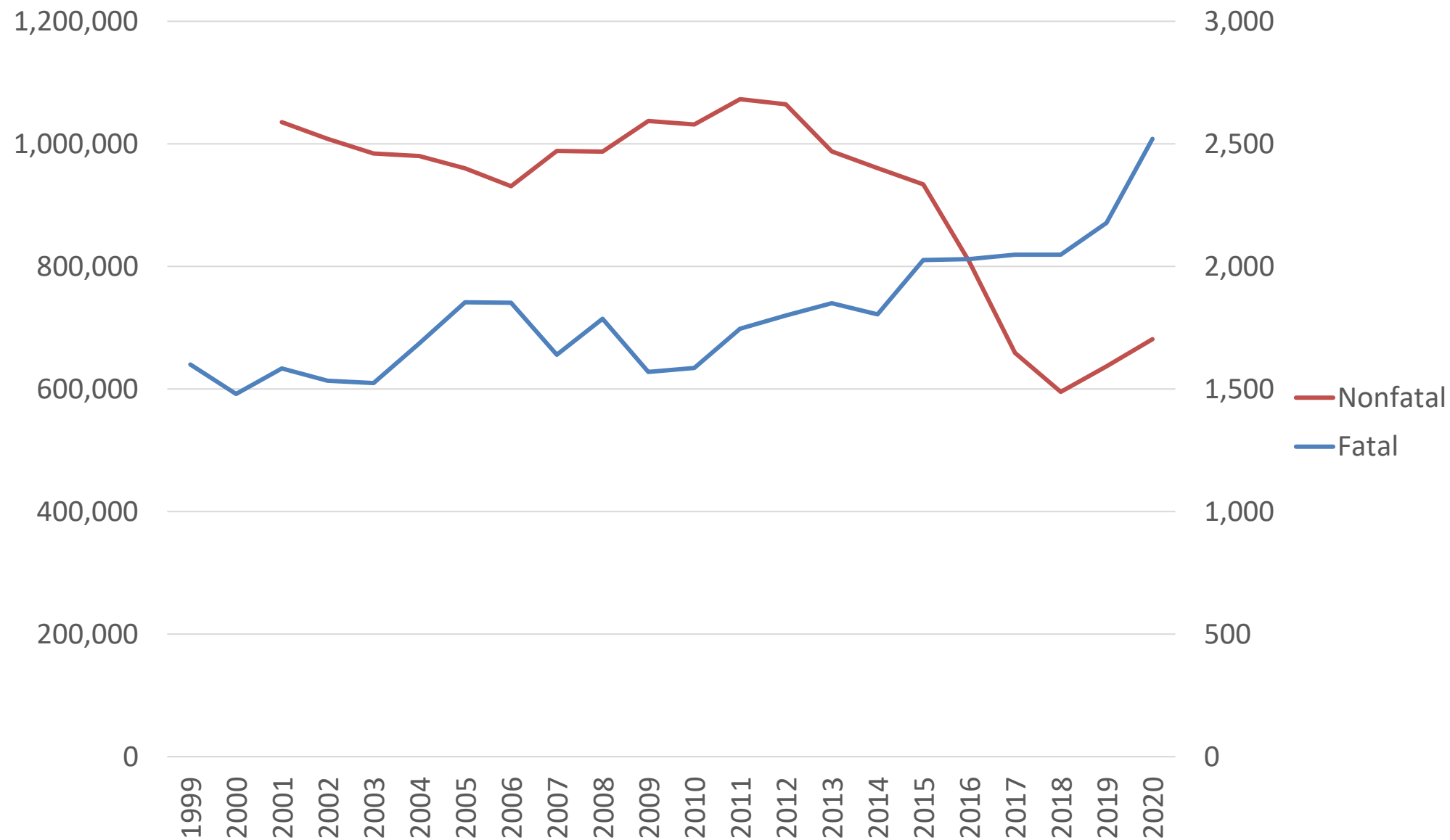


- Motivation & Introduction
- Data Pre-processing
- Data Analysis & Hypothesis Testing
- Conclusion

Motivation



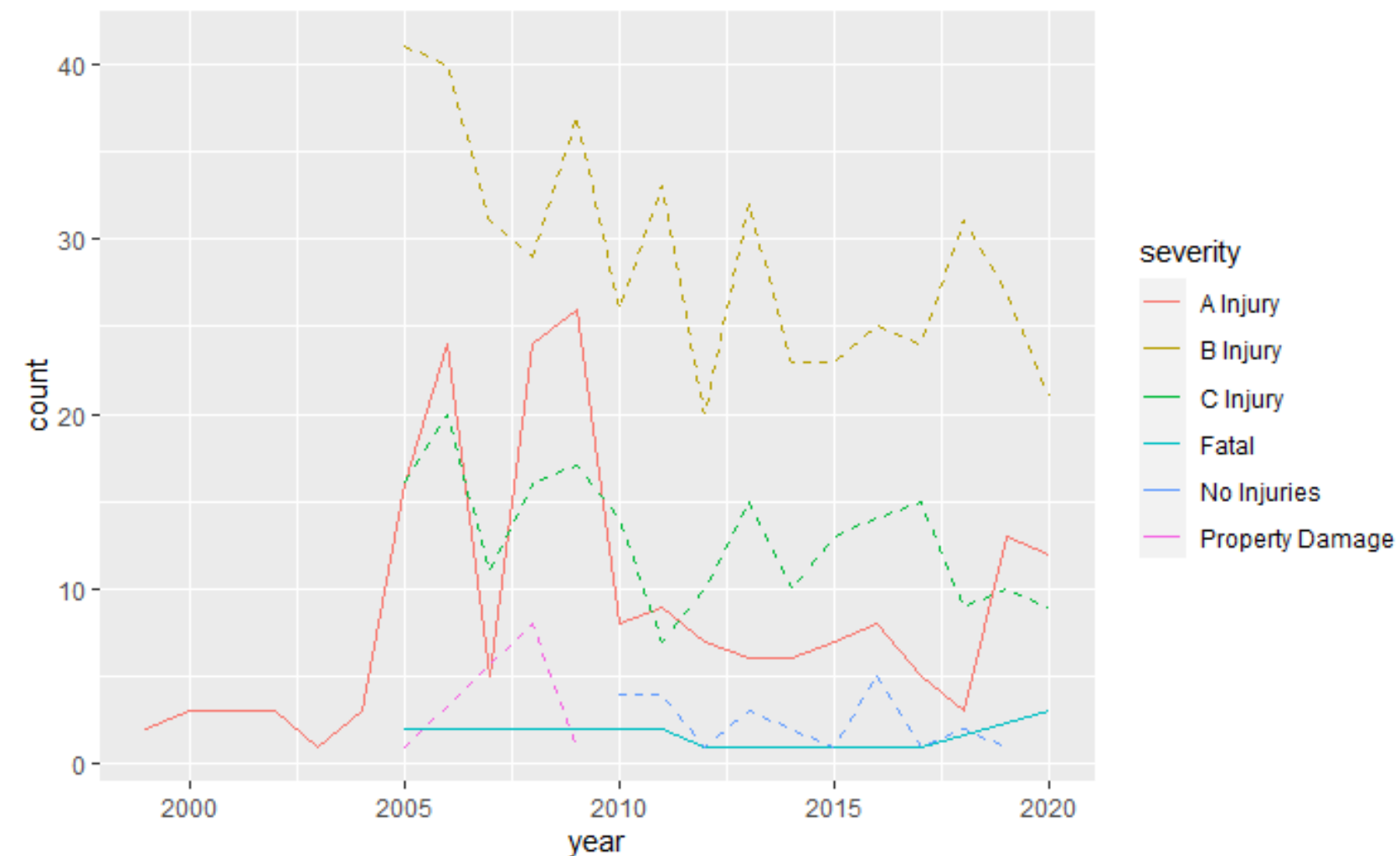
National Bike Crash



- Overall, decline in Bike accident
- Significant increase in Fatal Accident



Champaign Bike Crash



- Severe injure and Fatal likely to increase

What lead to **severe bike crash**?

ILLINOIS	1999 to present		
	K – Fatal	K	A fatal crash is a traffic crash involving a motor vehicle in which at least one person dies within 30 days of the crash.
	A – Incapacitating Injury	A	Any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities he/she was capable of performing before the injury occurred. This includes severe lacerations, broken/distorted limbs, skull injuries, chest injuries, abdominal injuries
	B – Non-incapacitating Injury	B	Any injury, other than a fatal or incapacitating injury, which is evident to observers at the scene of the crash. This includes lumps on the head, abrasions, bruises, minor lacerations.
	C – Reported/Not evident	C	Any injury reported or claimed which is not listed above. This includes momentary unconsciousness, claims of injuries not evident, limping, complaints of pain, nausea, hysteria.
	O – No indication of injury	O	



Data Preprocessing



Bike Data from 1999-2020

911 rows --exclude before 2005 -> 896 rows
-- exclude Unknown -> 833 rows

Pedestrian Data from 1999-2020

825 rows --exclude before 2005 -> 799 rows
-- exclude Unknown -> 743 rows

Highlight Variables

- Severity
- Weather
- Light
- Road Surface
- Traffic Control
- City

Data Grouping



	Severity
Severe	Fatal, A-Injury
Non-Severe	B-Injury, C-Injury, No Injuries, Property Damage

	Weather	Light	Road Surface	Traffic Control	City
Good Condition/ City Area	Clear	Daylight, Lighted Road	Dry	Any Control	Any City
Bad Condition/ Unincorporated Area	Cloudy/Outcast, Fog/Smoke/Haze, Rain, Snow	Dawn, Dusk, Darkness	Ice, Sand/Mud/Dirt, Snow or Slush, Wet, Other	No Control	Unincorporated

Bike Contingency Table & Odds Ratio



Weather	Severe	Non-Severe
Bad	21	67
Good	165	580
Odds Ratio/ 95% CI	1.10	[0.62, 1.87]

Traffic Control	Severe	Non-Severe
Bad	80	250
Good	106	397
Odds Ratio/ 95% CI	1.20	[0.84, 1.69]

Light	Severe	Non-Severe
Bad	20	52
Good	166	595
Odds Ratio/ 95% CI	1.38	[0.76, 2.43]

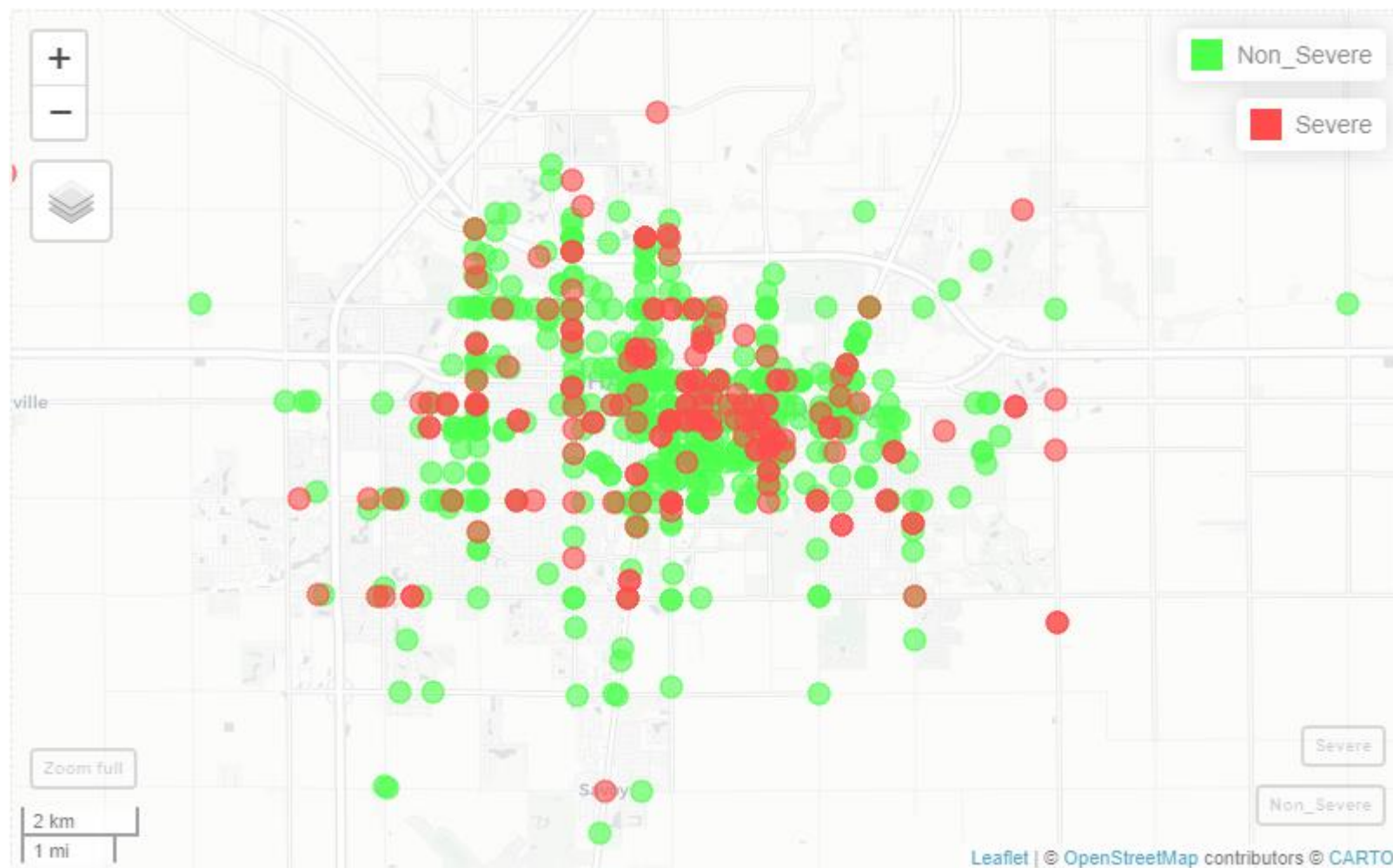
City	Severe	Non-Severe
Unincorporated	21	35
City Area	165	612
Odds Ratio/ 95% CI	2.22	[1.19, 4.05]

Road Surface	Severe	Non-Severe
Bad	23	69
Good	163	578
Odds Ratio/ 95% CI	1.18	[0.68, 1.99]

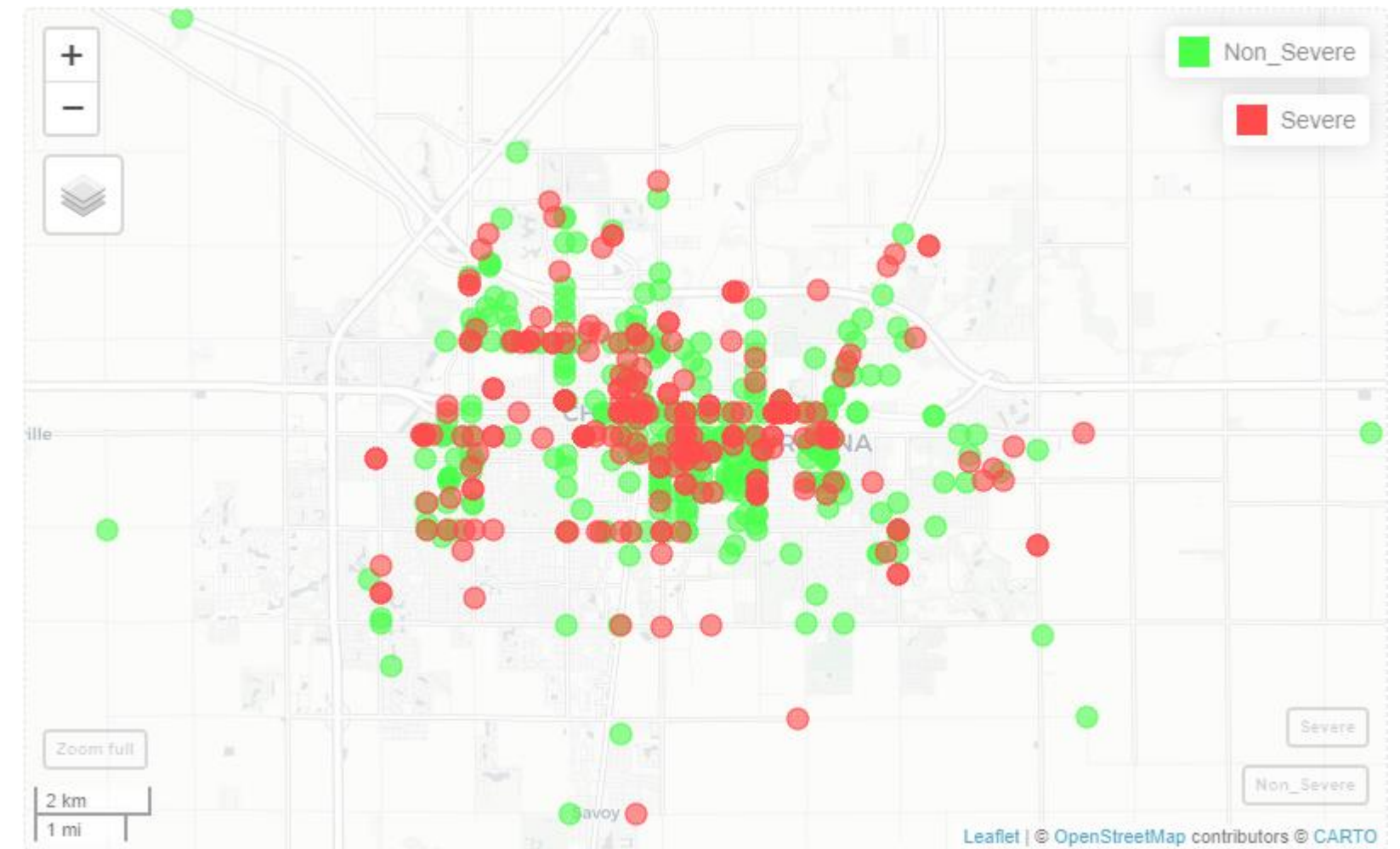
Bike vs Pedestrian Crash Map



Bike Crash



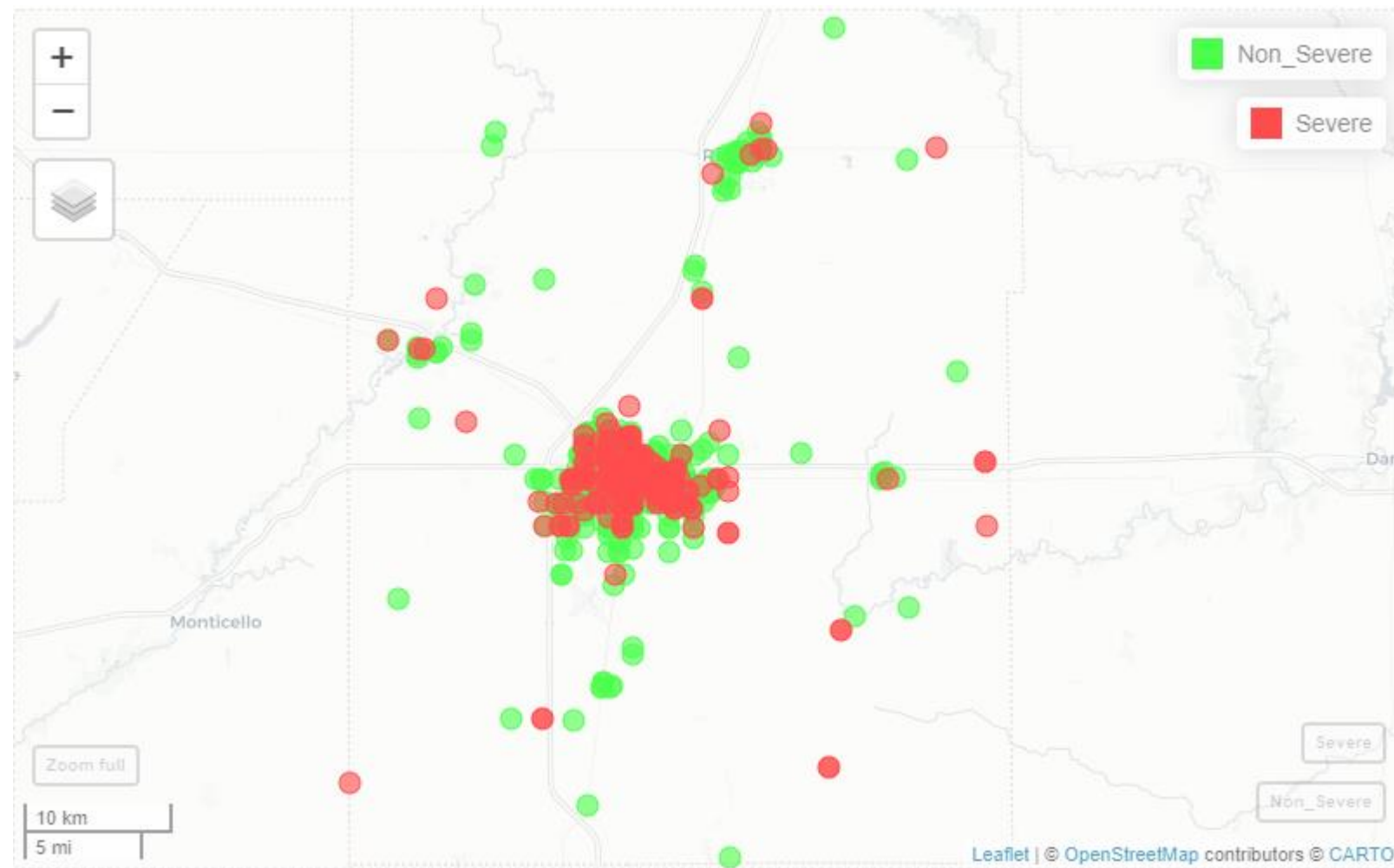
Pedestrian Crash



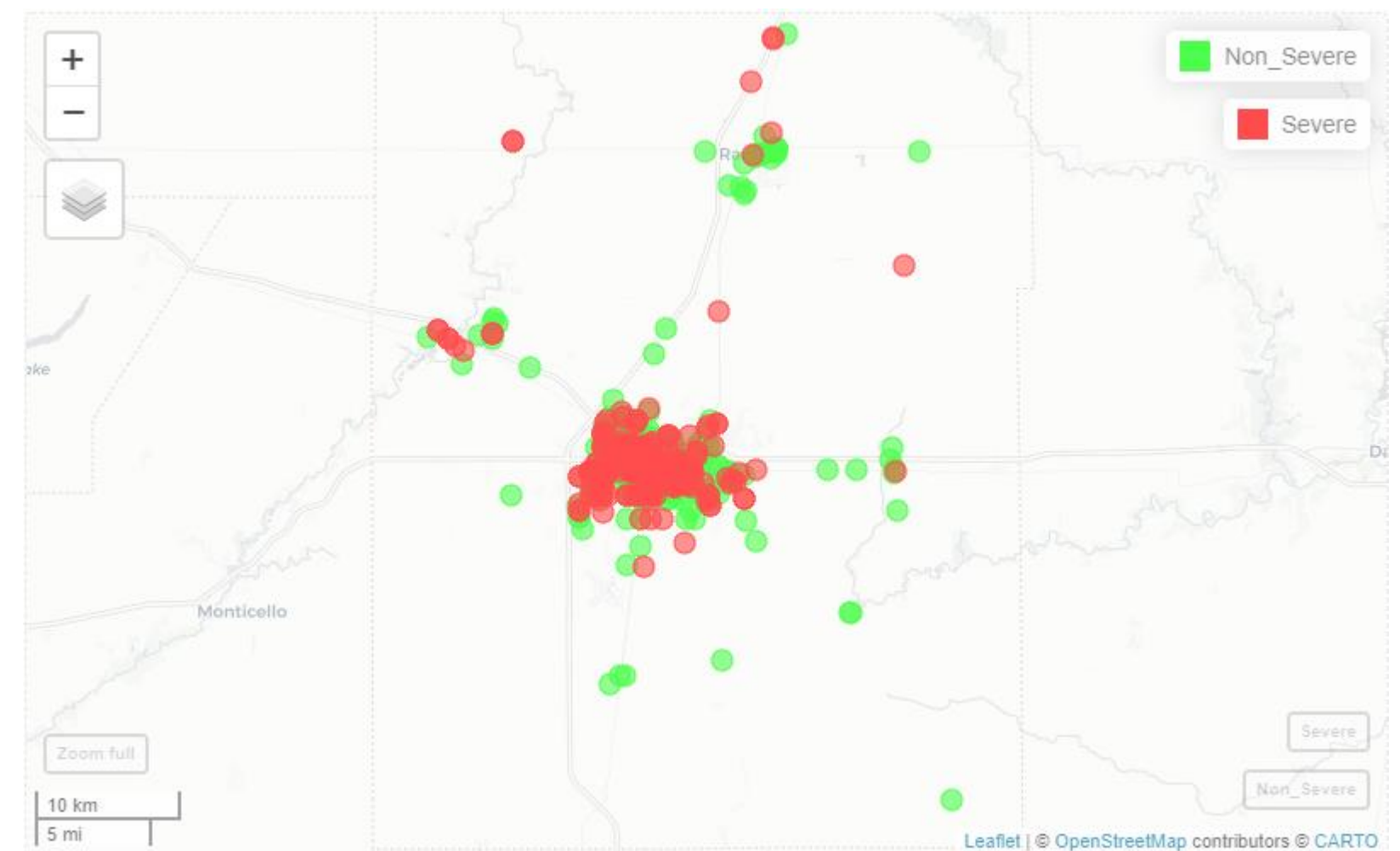
Bike vs Pedestrian Crash Map



Bike Crash



Pedestrian Crash



Pedestrian Contingency Table & Odds Ratio



Weather	Severe	Non-Severe
Bad	43	86
Good	229	385
Odds Ratio/ 95% CI	0.84	[0.55, 1.27]

Traffic Control	Severe	Non-Severe
Bad	143	218
Good	129	253
Odds Ratio/ 95% CI	1.29	[0.94, 1.75]

Light	Severe	Non-Severe
Bad	62	74
Good	210	397
Odds Ratio/ 95% CI	1.58	[1.07, 2.35]

City	Severe	Non-Severe
Unincorporated	18	26
City Area	254	445
Odds Ratio/ 95% CI	1.21	[0.61, 2.35]

Road Surface	Severe	Non-Severe
Bad	61	97
Good	211	374
Odds Ratio/ 95% CI	1.11	[0.76, 1.62]

Summary

- Severe bike crash statistically happened more frequently in unincorporated area.
- Light condition is statistically significant for pedestrian crash severity, so avoid walking in dark area.

What's next?

- Where is the safest area to go cycling?
- Does traffic crime affect crash severity?

Thank you for listening