

Traffic Accident in Wisconsin At a Glance

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GEOG - 970 Final Project Proposal Presentation

Wisconsin Crash Report



Introduction

Wisconsin's Highway Safety

Clock

1 General Highlights

2 Crashes

3 Drivers

4 Vehicles/Units

5 Impaired Driving Crashes

6 Speed-Related Crashes

7 Distracted Driving Crashes

8 Safety Equipment

Crash Report (DT4000)

Glossary

2 Crashes

2.1 Time of Day and Severity

Month and Crash Severity

Month	Fatal	Injury	Property Damage	Total Crashes	Persons Injured	Persons Killed
January	33	1,801	8,736	10,570	2,408	35
February	24	1,863	9,567	11,454	2,434	25
March	26	1,698	6,450	8,174	2,284	26
April	36	1,894	6,532	8,462	2,584	38
May	54	2,328	8,072	10,454	3,166	59
June	50	2,618	8,437	11,105	3,629	56
July	52	2,418	7,796	10,266	3,362	54
August	64	2,505	7,738	10,307	3,467	73
September	72	2,419	8,155	10,646	3,252	77
October	73	2,366	9,671	12,110	3,202	84
November	23	2,038	9,820	11,881	2,781	24
December	39	2,261	10,567	12,867	3,107	44
Total	546	26,209	101,541	128,296	35,676	595

Research Questions

1. What is the spatial pattern of traffic accidents in Wisconsin?
2. Are there specific times of day or month when traffic accidents are more likely to occur, and what is their impact on traffic patterns?
3. How do traffic signs and signals, road infrastructure, and traffic calming measures influence the frequency and severity of traffic accidents in Wisconsin?
4. How do weather conditions or other environmental stimuli affect the occurrence of traffic accidents?

Target Audience

1. Government entities and policymakers
 - Local and state transportation departments, law enforcement agencies, emergency services
 - Optimize resource allocation and provide more efficient emergency responses in traffic accidents
 - Identify critical areas needing immediate improvement and promoting safer road conditions
2. Wisconsin residents
 - make informed decisions about their travel routes and times.

Dataset

Original dataset

- Countrywide traffic accident dataset (Moosavi et al., 2019)
- Collected via MapQuest Accident and Bing Map Traffic data
- February 2016 to March 2023
- Approximately 7.7 million records of traffic accidents

Data Preprocessing

- Python(filtering and create new categorical columns)
- Power BI (Calculating new data fields)

Dataset

- 34688 WI Records out of 7.7 million data

Moosavi, S., Samavatian, M. H., Parthasarathy, S., & Ramnath, R. (2019). A countrywide traffic accident dataset. *arXiv (Cornell University)*. <https://arxiv.org/pdf/1906.05409.pdf>

Dataset

Categories	Features	Description	Data Format
Spatial Location	Lat, Long, Street, zip code, City, County, and States	Spatial Reference to the accident	Text
Temporal Attribute	Date	Precise accident time in minute level	Date
Accident Level	Severity	Impact of accident depending on how much time the traffic delays	Numeric
Nearby Road Features	Amenity, Bump, Crossing, Traffic Calming, Turning loop, Roundabout, Stop Sign, Station, Giveaway, Railway, No Exit Sign	POI annotation which indicates presence of features in a nearby location.	Binary
Weather Condition	Weather Condition, Visibility, Precipitation, etc..	Qualitative and quantitative description of the weather condition	Text
Description	Detailed location	Detailed location of the street (i.e. ramp of Highway X and Street Y)	Text

Methodology and Techniques

GVA Platform

- PowerBI
- Demo

GVA Techniques

- Spatial Pattern: Time Slider, Dot Density Map, Heatmap, Treemap
- Temporal Pattern: Bar chart, Pie chart, Radar chart
- Weather Condition: Pie chart, Gauge
- Road Information: Double donut chart, bar chart

Key Findings

Research Question 1.

What is the spatial pattern of traffic
accidents in Wisconsin?

All

01/01/2016 31/12/2023

Year

All

All

All



34688

Total Accidents

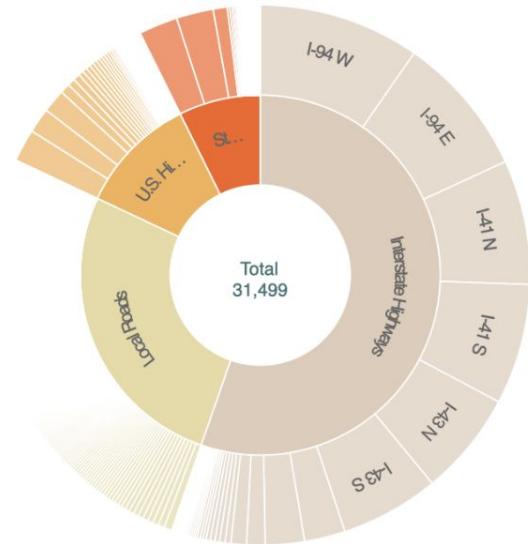
Wisconsin Car Crash Analysis Dashboard

Crash Data from 2016 through March 2023

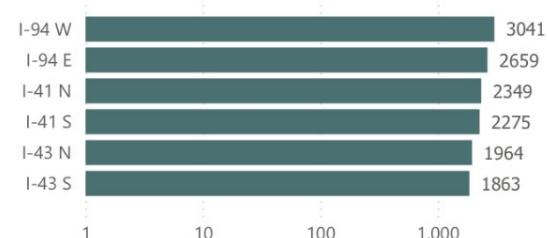
Yanbing Chen
Qianheng Zhang
April, 2024



Road Type and Street



Road



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

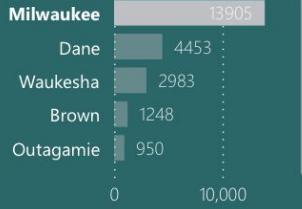
All

Severity to Traffic D...

All

Road Type

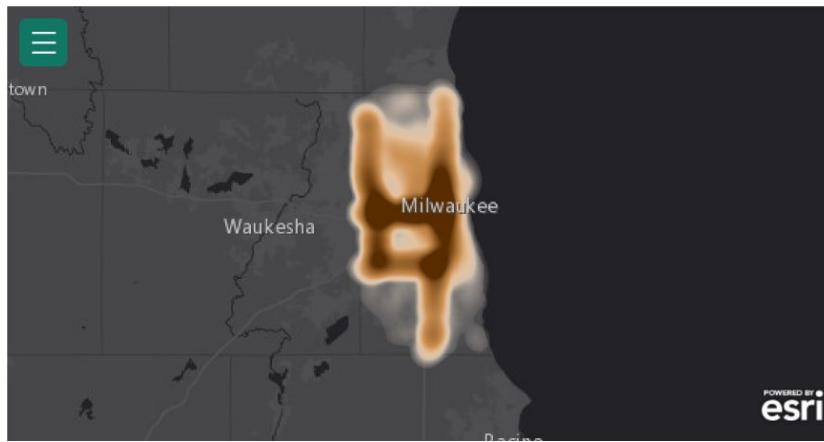
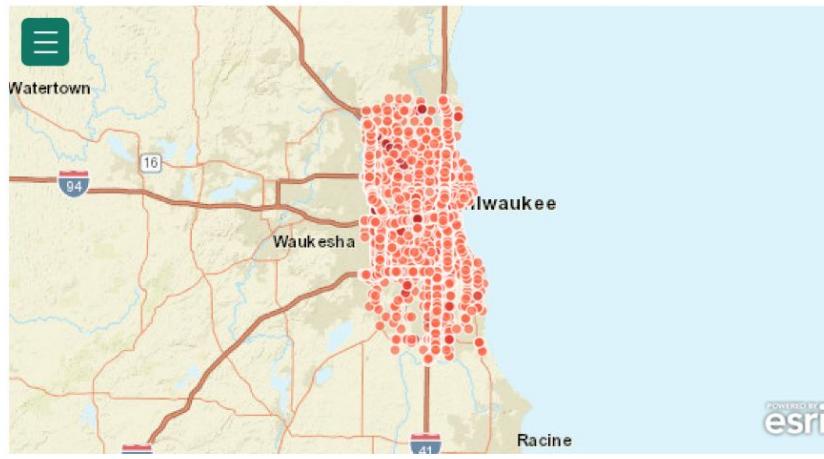
All



13905

Total Accidents

1. 40.1% of the accidents happened in Milwaukee



Road Type and Street



● State Highways ● U.S. Highways ● Local Roads ● Interstate Highways

Road

Road	Accidents
I-43 N	1462
I-43 S	1343
I-41 S	1256
I-94 W	1197
I-41 N	1175
I-94 E	1049

1 10 100 1,000 10,000

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023



County

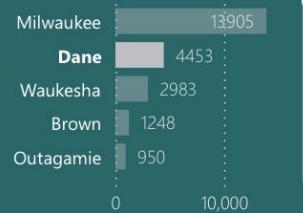
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Severity to Traffic D...

All

Road Type

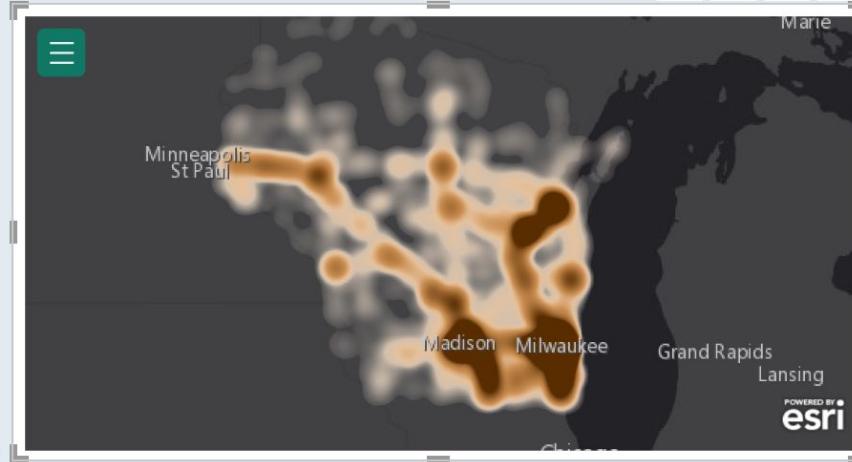
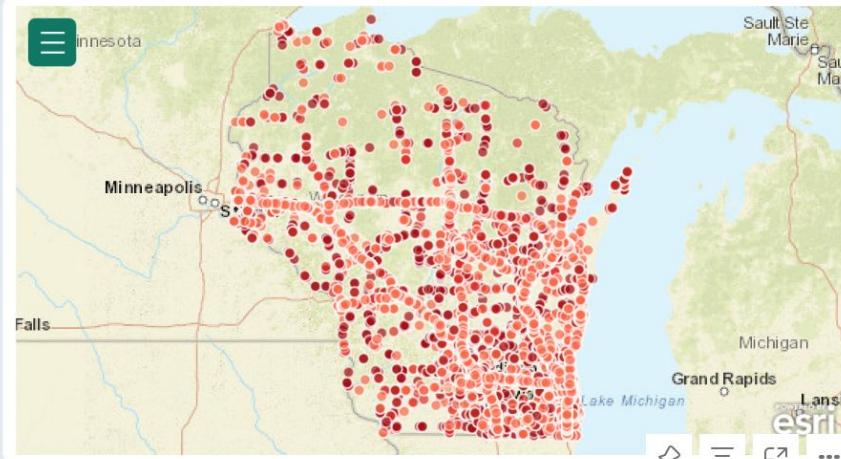
All



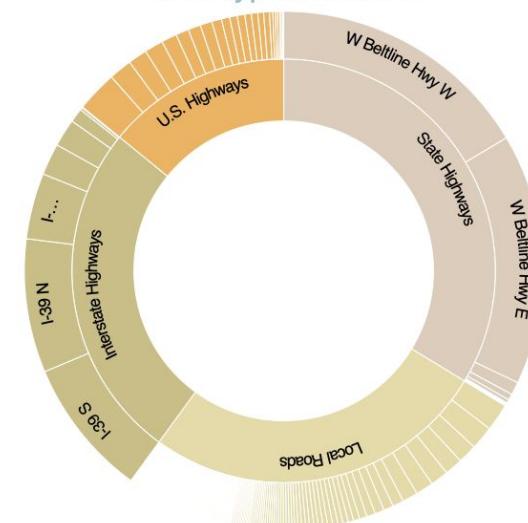
4453

Total Accidents

2. 65.15% of the accidents happened on Top 4 Counties



Road Type and Street



U.S. Highways Interstate High... Local Roads State Highways

Road



1 10 100 1,000

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023



County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

Brown 1248

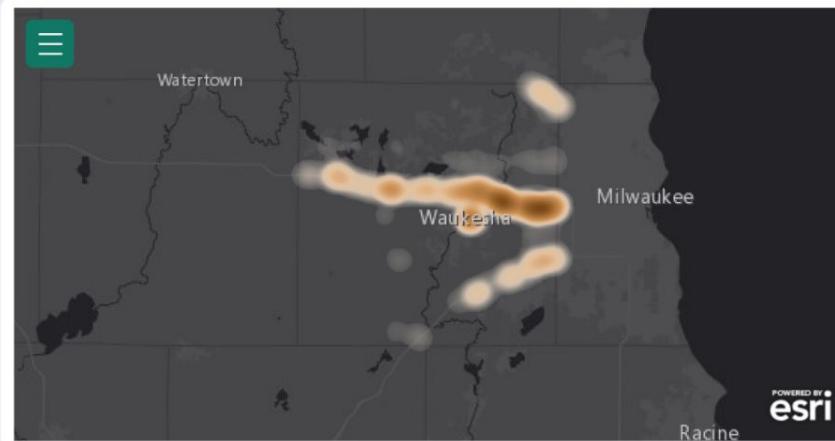
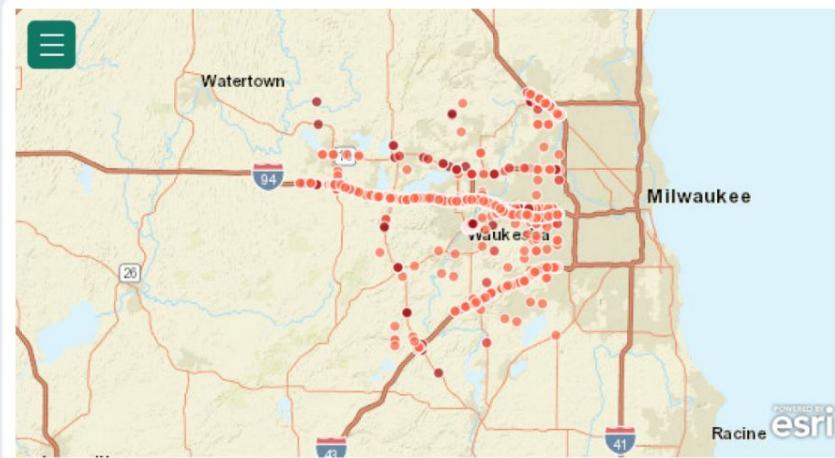
Outagamie 950

0 10,000

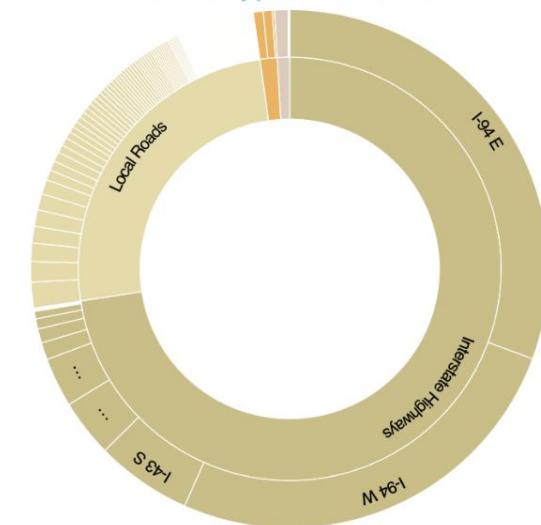
2983

Total Accidents

2. 65.15% of the accidents happened on Top 4 Counties

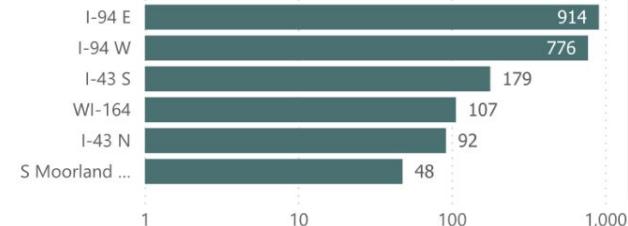


Road Type and Street



State Highways U.S. Highways Local Roads Interstate Highways

Road



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] [] [] Year

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

Brown 1248

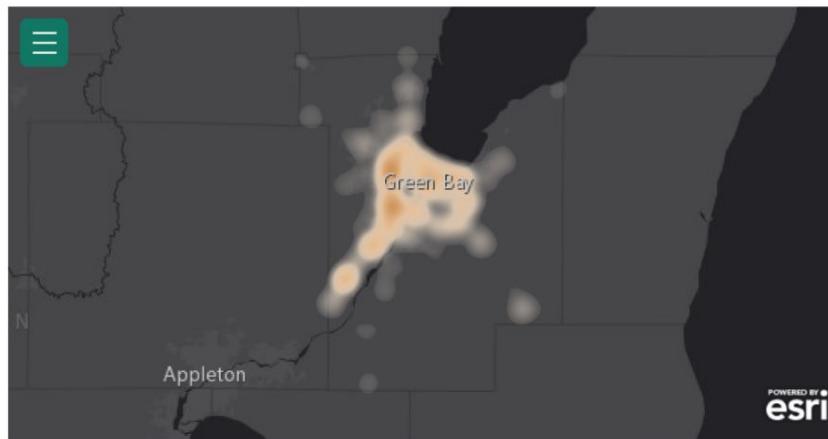
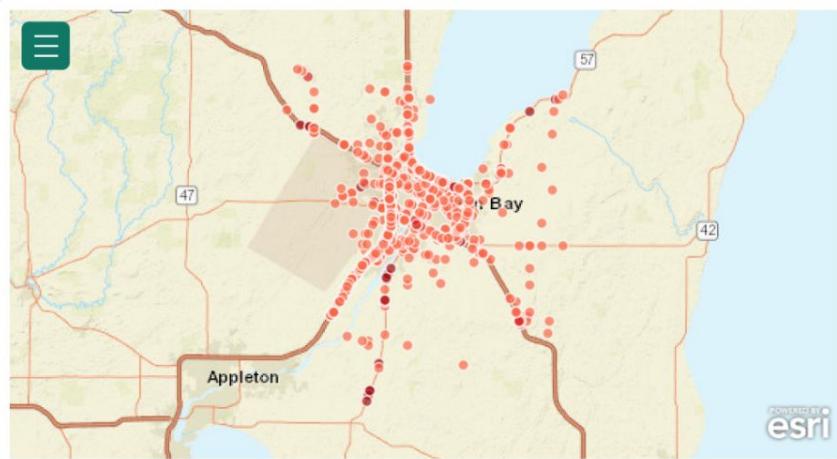
Outagamie 950

0 10,000

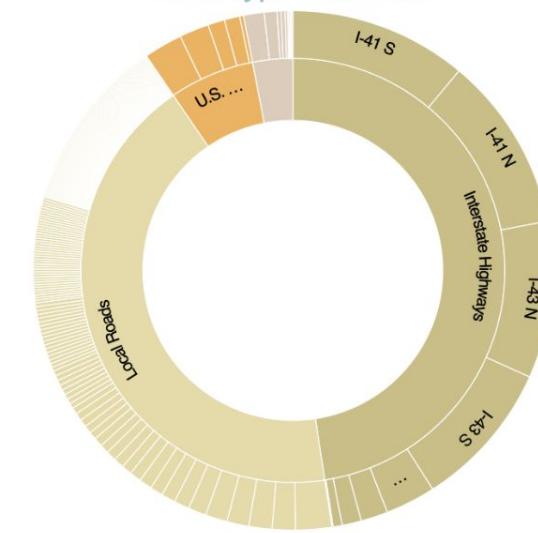
1248

Total Accidents

2. 65.15% of the accidents happened on Top 4 Counties

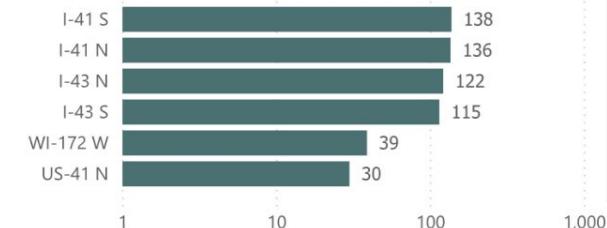


Road Type and Street



State Highways U.S. Highways Local Roads Interstate Highways

Road



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic D...

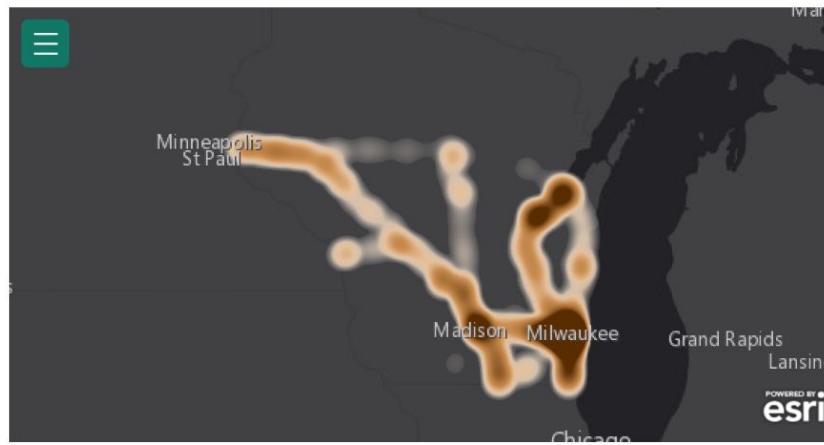
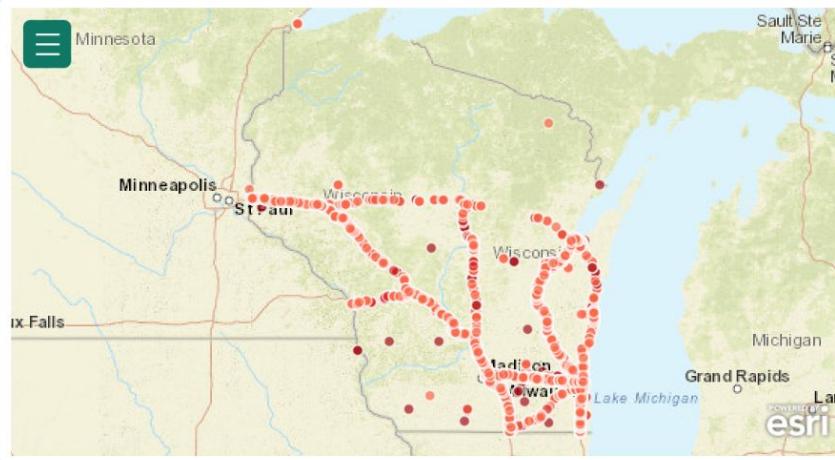
All

Road Type

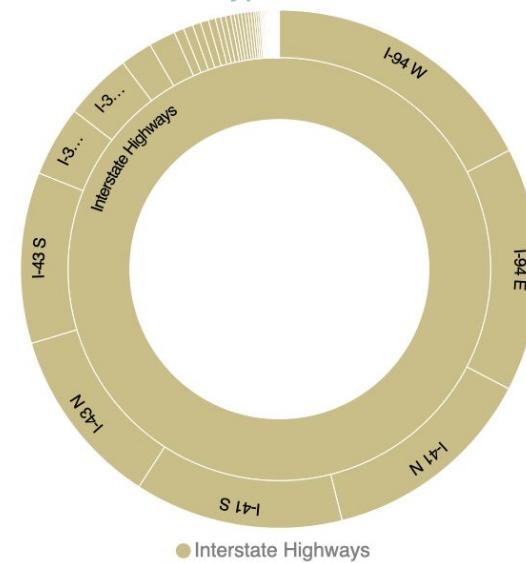
Interstate Highways



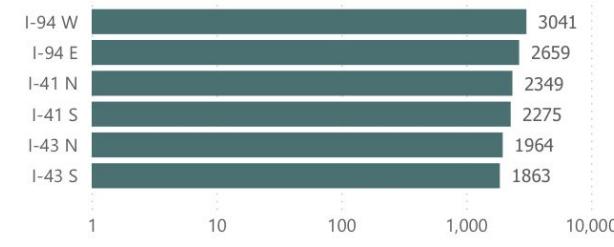
3. Half of the accidents (50.36%) happened on Interstate Highways



Road Type and Street



Road



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023



County

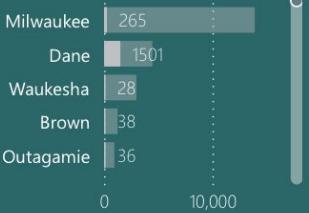
All

Severity to Traffic D...

All

Road Type

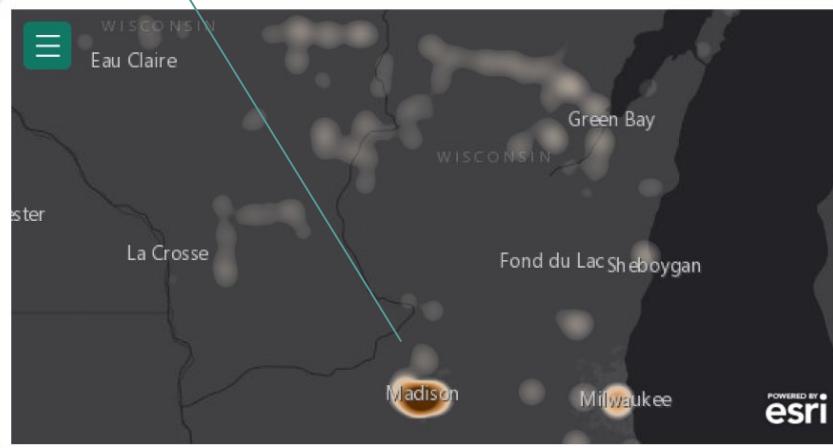
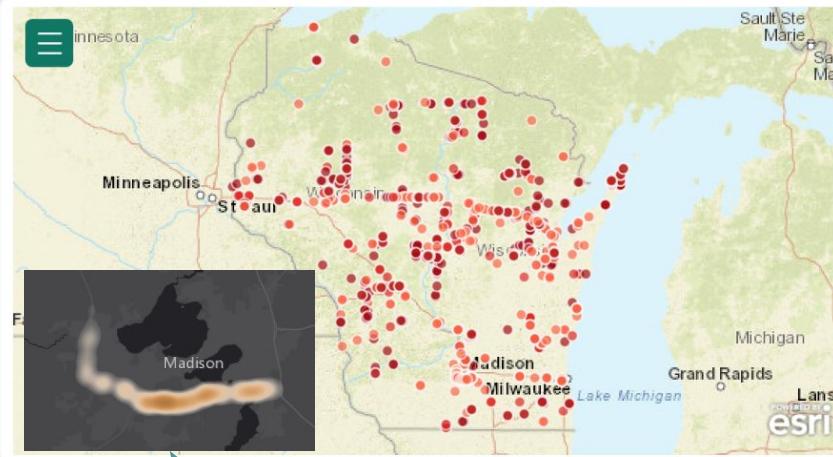
All



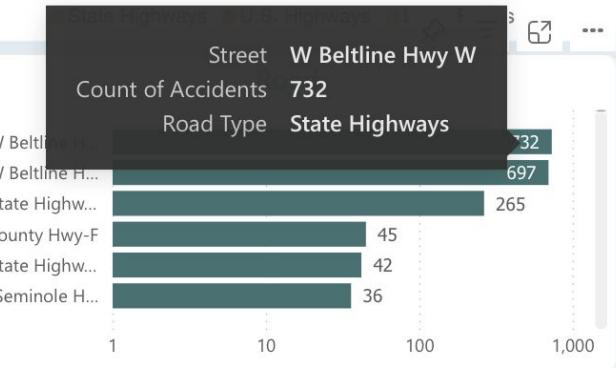
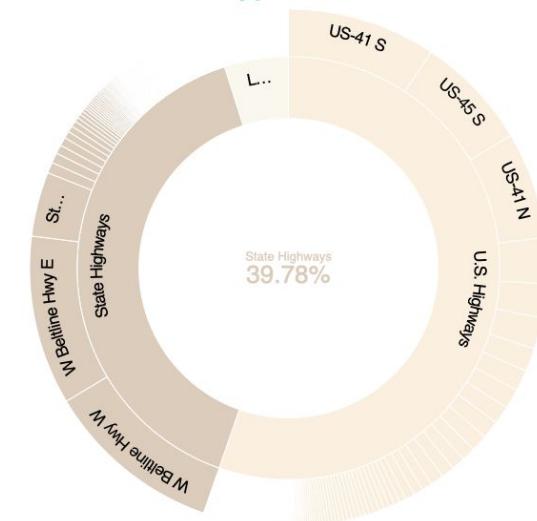
2624

Total Accidents

4. Madison Beltline Challenge



Road Type and Street



Key Findings

Research Question 2.

Are there specific times of day or month when traffic accidents are more likely to occur, and what is their impact on traffic patterns?

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

All

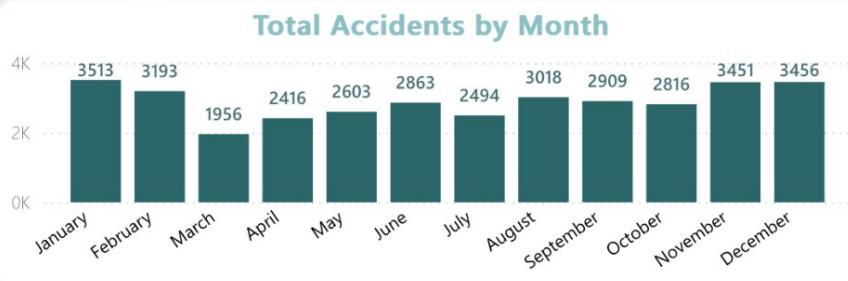
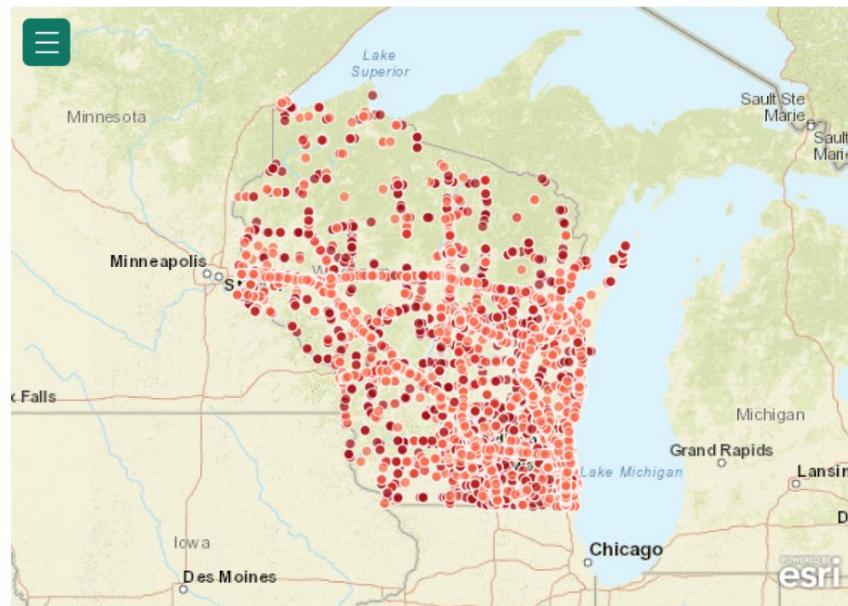
Milwaukee	13905
Dane	4453
Waukesha	2983
Brown	1248
Outagamie	950

34688

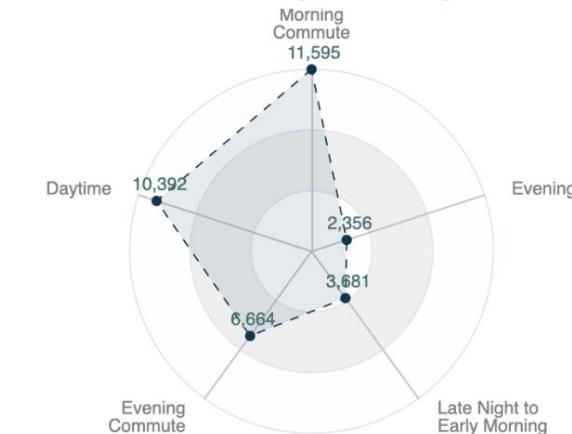
Total Accidents

Wisconsin Car Crash Analysis Dashboard

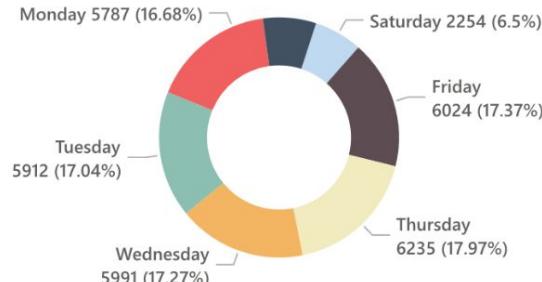
Crash Data from 2016 through December 2023

Yanbing Chen
Qianheng Zhang
April, 2024

Accidents by Time Range



Day of the Week



Primary Dashboard

Crash Map

Weather and Road Features

Summary / Export

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2017 [] []

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2018 [] []

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2019 [] []

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2020 [] []

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2021 [] []

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] 2022 [] []

County

All

County

All

County

All

County

All

County

All

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee

Dane

Waukesha

Brown

Outagamie

4111

Total Accidents

5039

Total Accidents

6889

Total Accidents

3933

Total Accidents

3030

Total Accidents

8078

Total Accidents

1. Gradual Increase in Accidents, with a Significant Reduction During the Pandemic; Post-pandemic Rebound in Accident Rates

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

Brown 1248

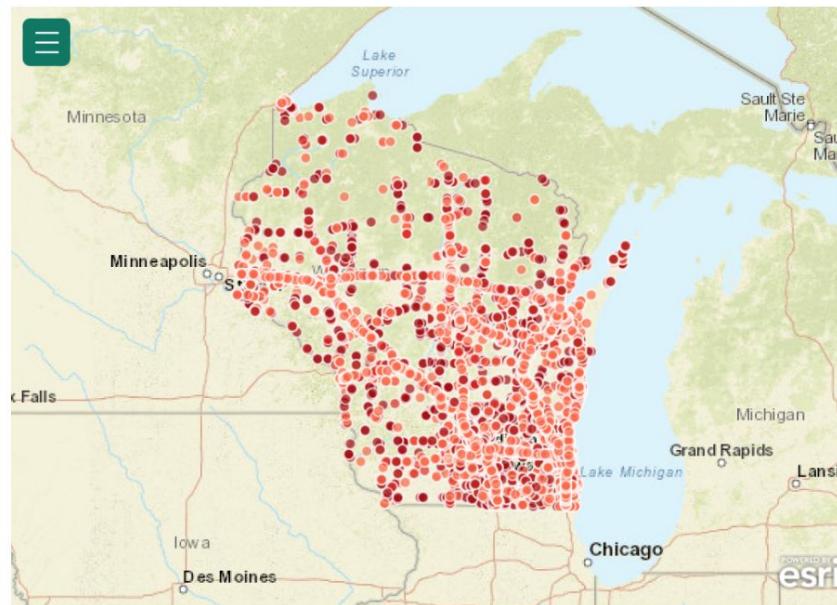
Outagamie 950

0 10,000

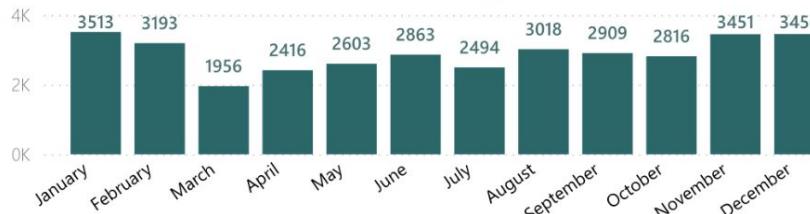
34688

Total Accidents

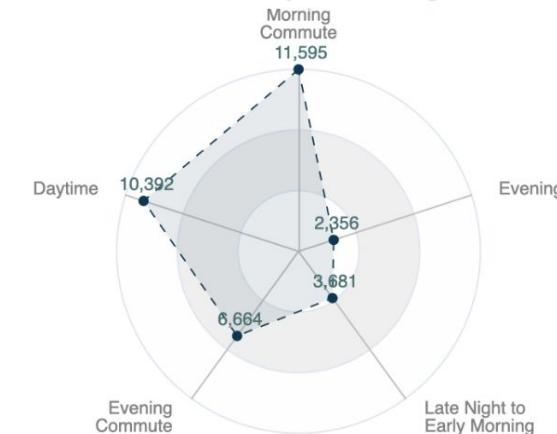
2. November To February Were Likely To Have More Accidents



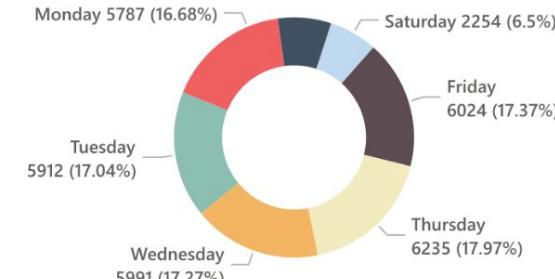
Total Accidents by Month



Accidents by Time Range



Day of the Week



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

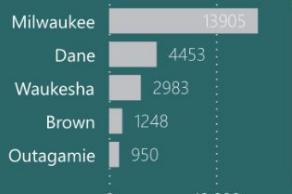
All

Severity to Traffic Delay

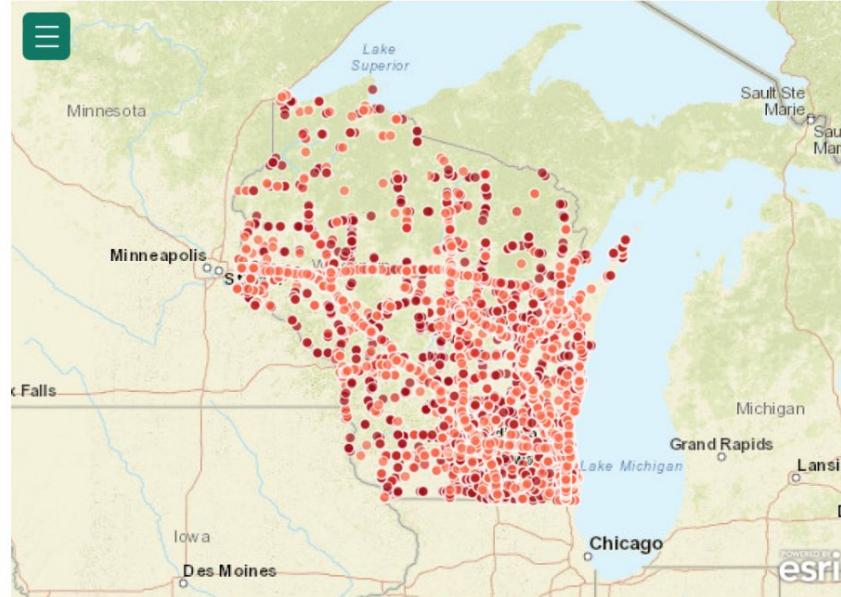
All

Road Type

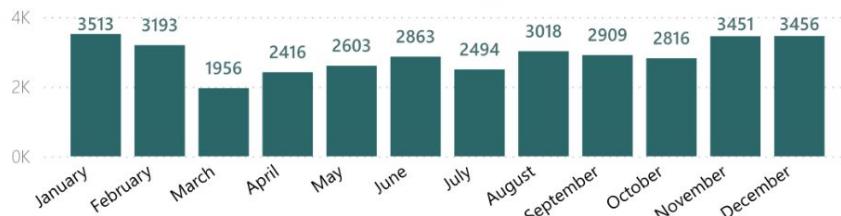
All



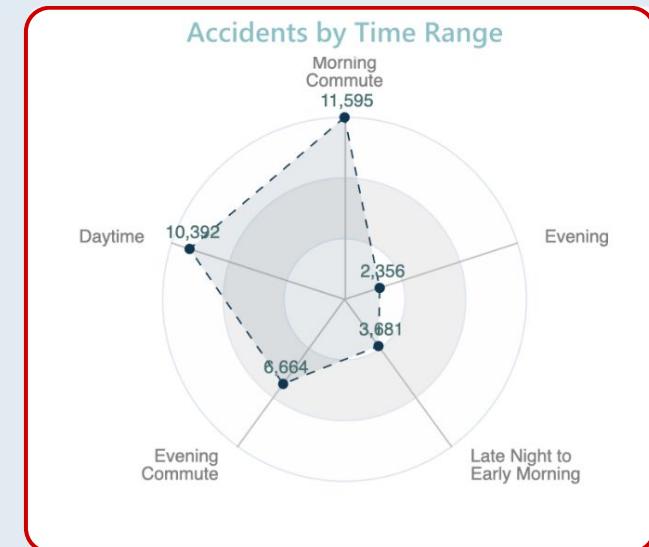
3. 82.59% of Accidents Occurred During Daytime and Commuting



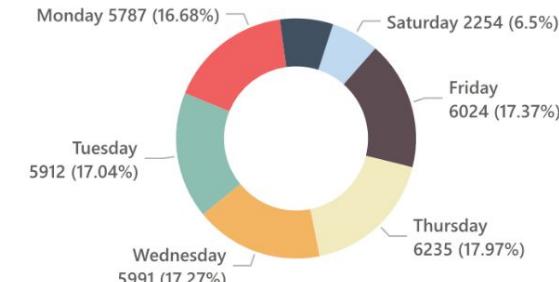
Total Accidents by Month



Accidents by Time Range



Day of the Week



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

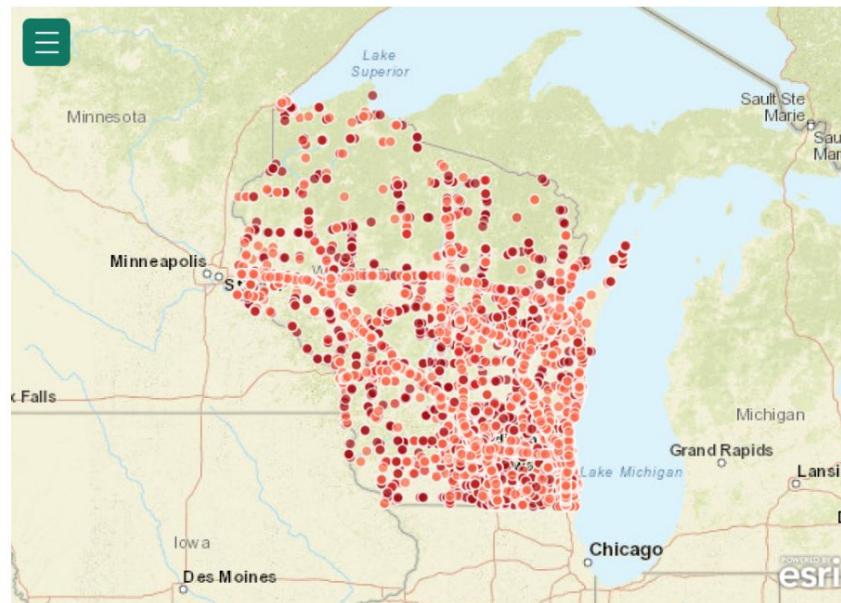
Brown 1248

Outagamie 950

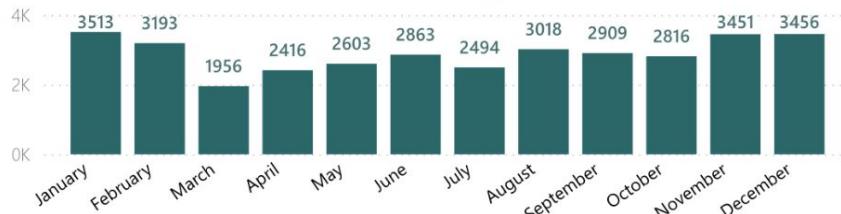
34688

Total Accidents

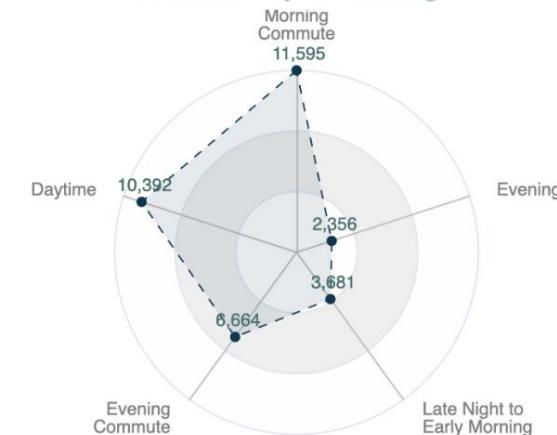
4. Accidents During Weekdays Were Evenly Distributed (86.33%)



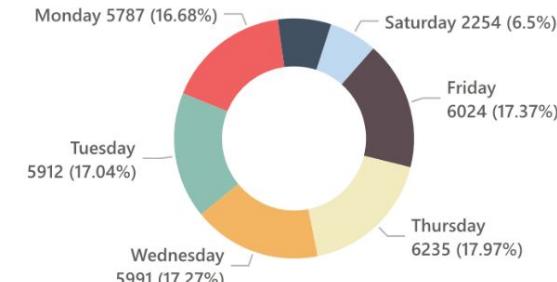
Total Accidents by Month



Accidents by Time Range



Day of the Week



Key Findings

Research Question 3.

How do traffic signs and signals, road infrastructure, and traffic calming measures influence the frequency and severity of traffic accidents in Wisconsin?

All

01/01/2016 31/12/2023



All

All

All

Milwaukee 13905

Dane 4453

Waukesha 2983

Brown 1248

Outagamie 950

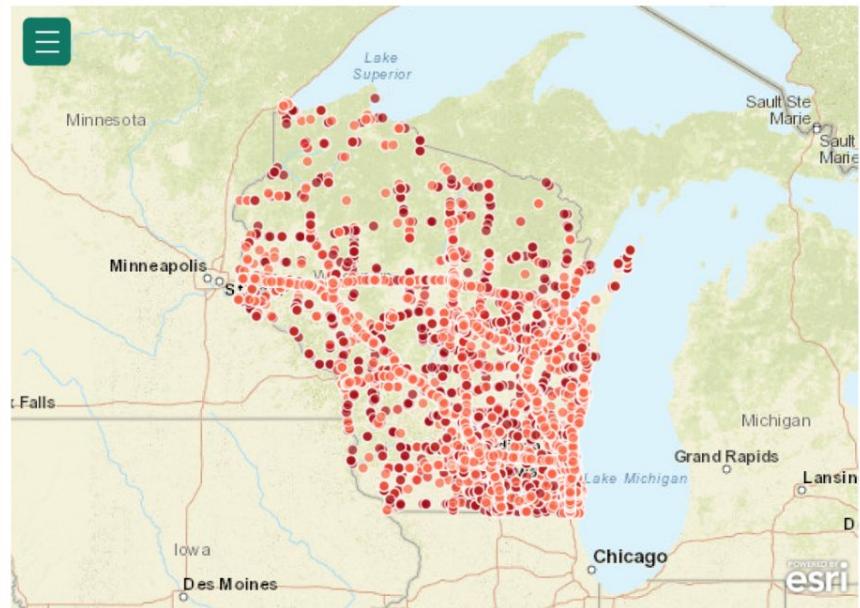
34688

Total Accidents

Wisconsin Car Crash Analysis Dashboard

Crash Data from 2016 through December 2023

Yanbing Chen
Qianheng Zhang
April, 2024



0.00 46.74

93.47

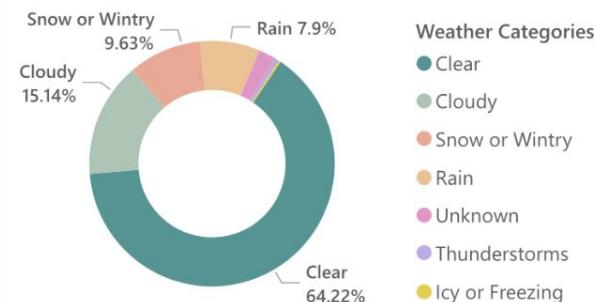
0.00 8.34

16.69

Nearby Road Features



Weather



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

1

Road Type

All

Milwaukee 40

Dane 26

Waukesha 9

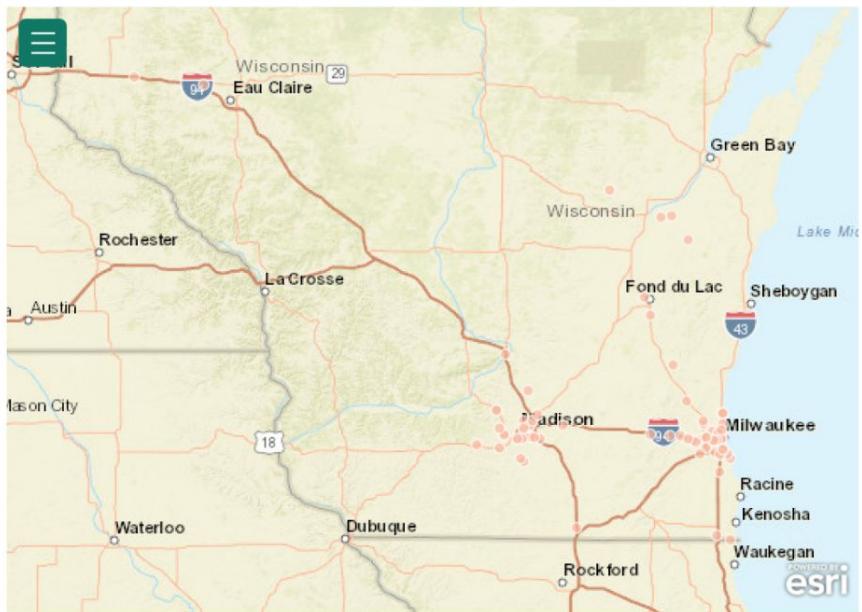
Calumet 3

Columbia 2

90

Total Accidents

1. Traffic Signals, Crossings, and Junctions Are Consistently the Top Nearby Road Features Around Traffic Accidents, Regardless of Severity



Total Accidents by Month



Temp. Avg. (F)

0.00 64.92 129.84

Visibility Avg. (mi)

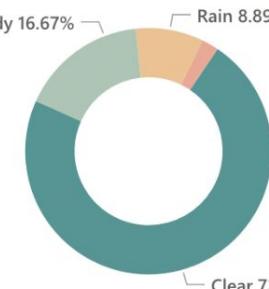
0.00 9.12 18.23

Nearby Road Features



Weather

Cloudy 16.67% Rain 8.89%



Weather Categories

- Clear
- Cloudy
- Rain
- Snow or Wintry

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

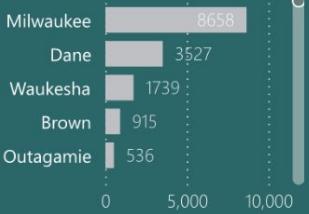
All

Severity to Traffic Delay

2

Road Type

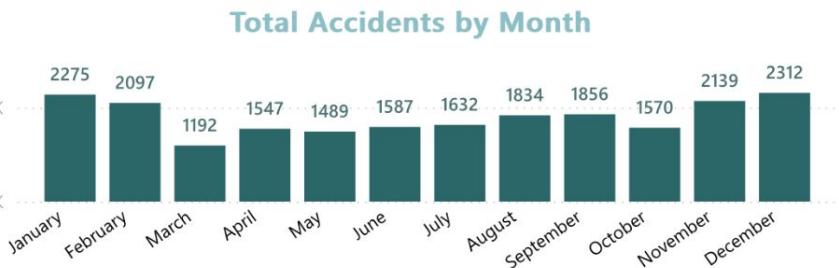
All



21530

Total Accidents

1. Traffic Signals, Crossings, and Junctions Are Consistently the Top Nearby Road Features Around Traffic Accidents, Regardless of Severity



Temp. Avg. (F)

0.00

46.12

92.24

Visibility Avg. (mi)

0.00

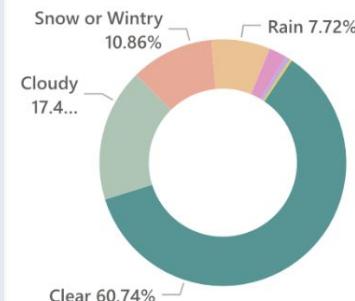
8.23

16.45

Nearby Road Features



Weather



Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary / Export

Crash Year

All 

01/01/2016

31/12/2023



County

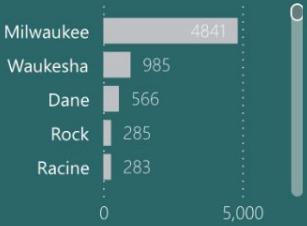
All 

Severity to Traffic Delay

3

Road Type

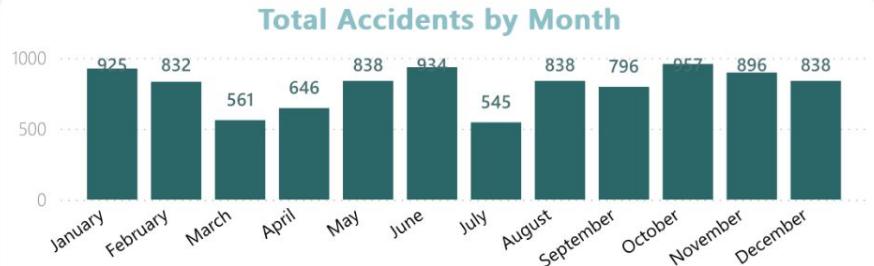
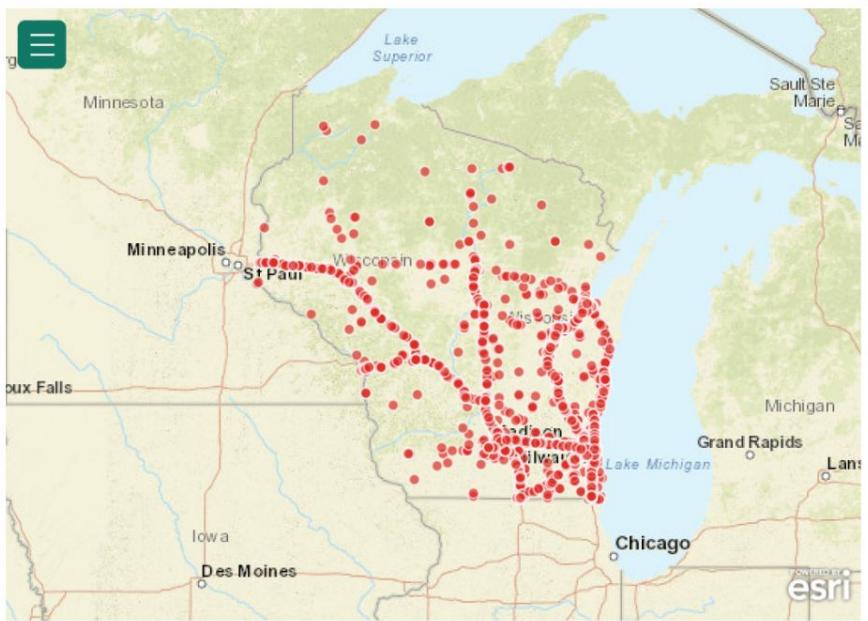
All



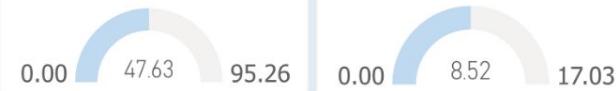
9606

Total Accidents

1. Traffic Signals, Crossings, and Junctions Are Consistently the Top Nearby Road Features Around Traffic Accidents, Regardless of Severity



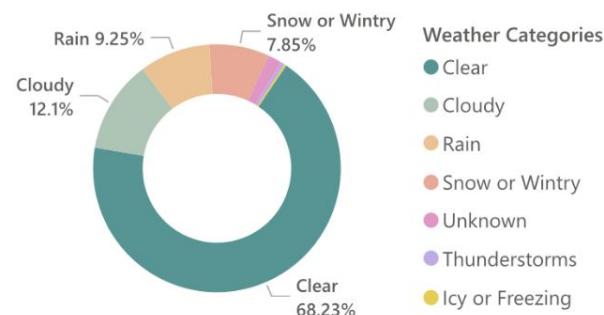
Temp. Avg. (F)



Nearby Road Features



Weather



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

4

Road Type

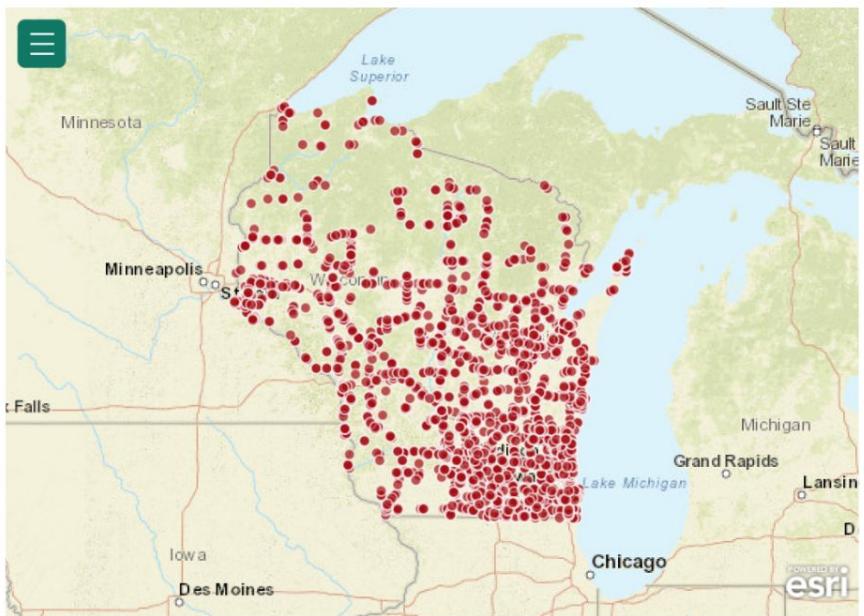
All



3462

Total Accidents

1. Traffic Signals, Crossings, and Junctions Are Consistently the Top Nearby Road Features Around Traffic Accidents, Regardless of Severity



Total Accidents by Month



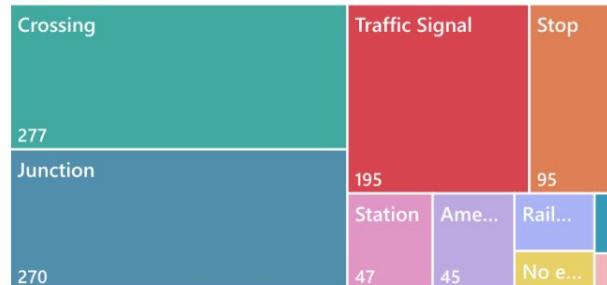
Temp. Avg. (F)

0.00 47.61 95.22

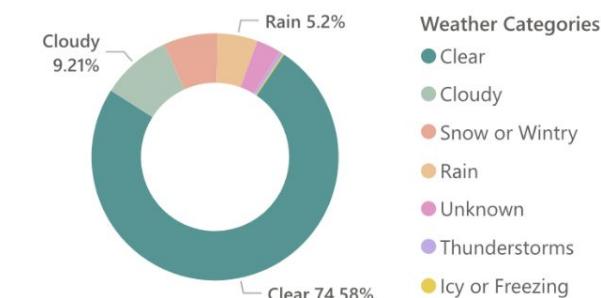
Visibility Avg. (mi)

0.00 8.57 17.15

Nearby Road Features



Weather



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

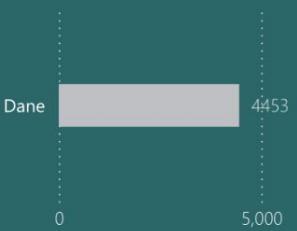
Dane

Severity to Traffic Delay

All

Road Type

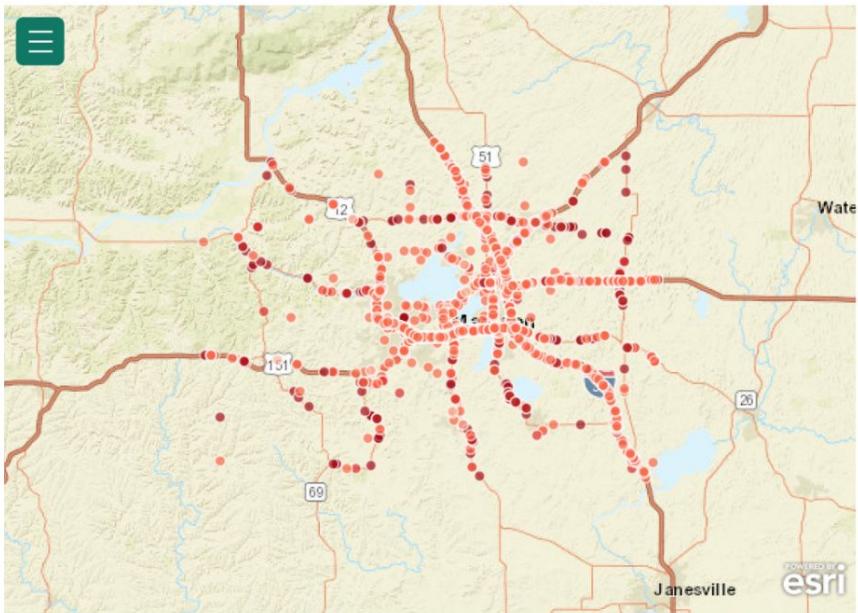
All



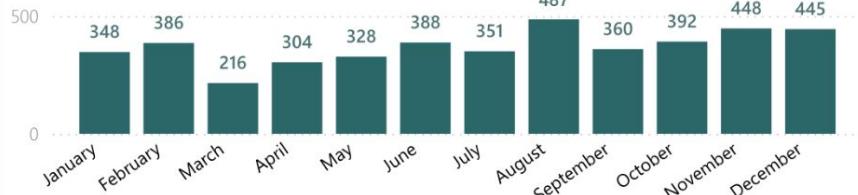
4453

Total Accidents

2. Accidents in Counties with Higher Population Density Feature a Greater Variety of Nearby Road Features Compared to Less Populated Counties



Total Accidents by Month



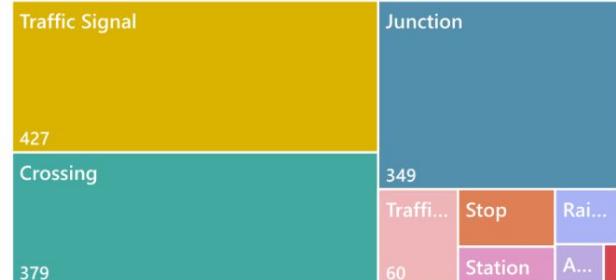
Temp. Avg. (F)

0.00 49.72 99.45

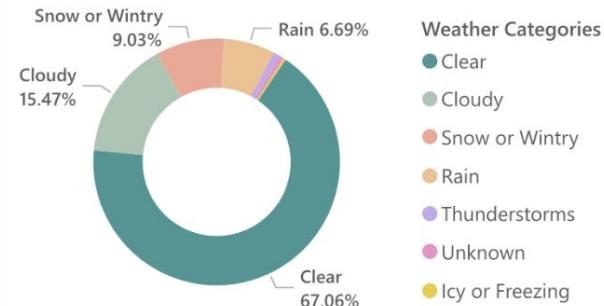
Visibility Avg. (mi)

0.00 8.53 17.06

Nearby Road Features



Weather



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

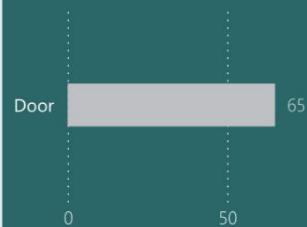
Door

Severity to Traffic Delay

All

Road Type

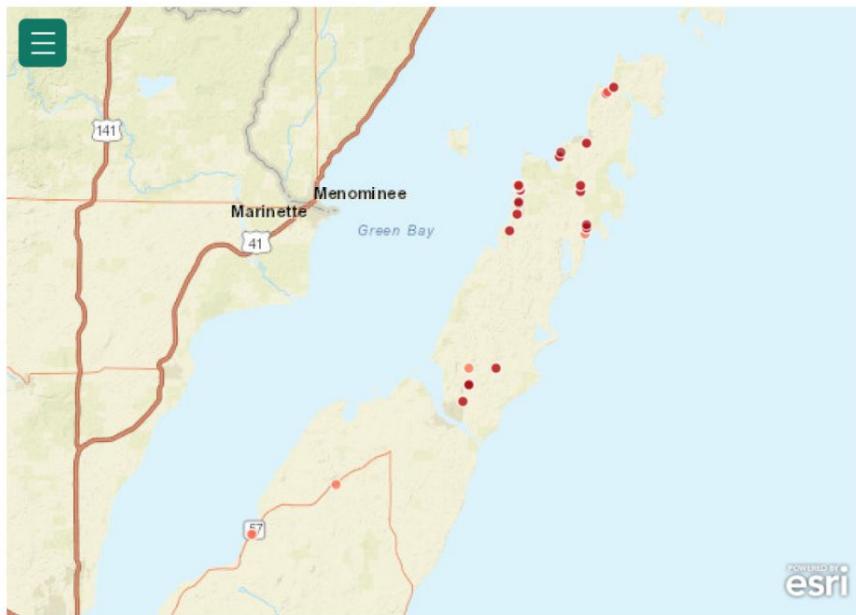
All



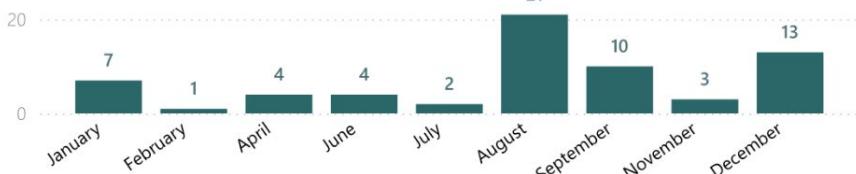
65

Total Accidents

2. Accidents in Counties with Higher Population Density Feature a Greater Variety of Nearby Road Features Compared to Less Populated Counties



Total Accidents by Month



Temp. Avg. (F)

0.00 54.45 108.91

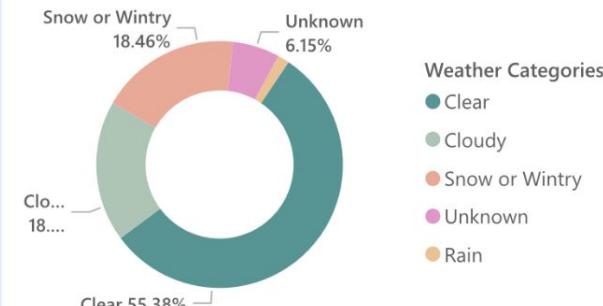
Visibility Avg. (mi)

0.00 8.62 17.24

Nearby Road Features



Weather



Key Findings

Research Question 4.

How do weather conditions or other environmental stimuli affect the occurrence of traffic accidents?

Crash Year

All

01/01/2016 31/12/2023



County

All

Severity to Traffic Delay

All

Road Type

All



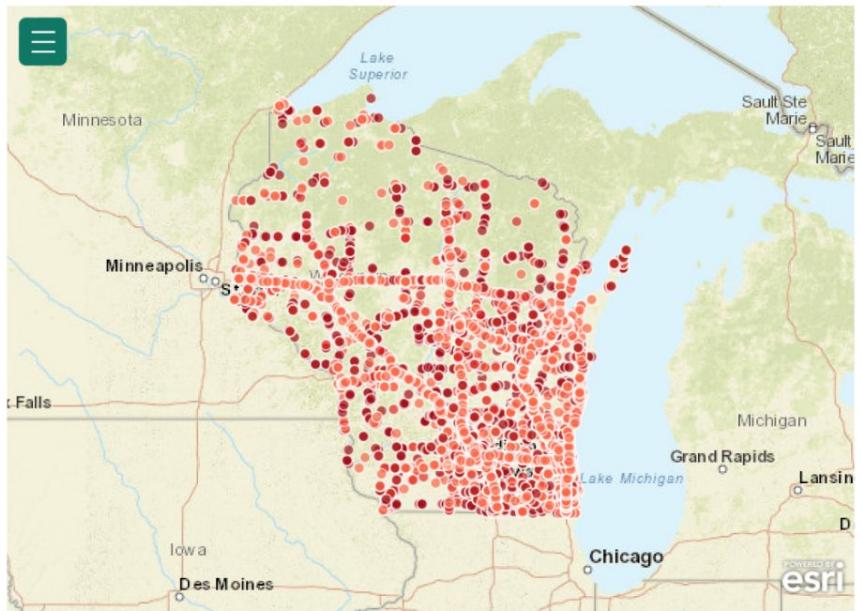
34688

Total Accidents

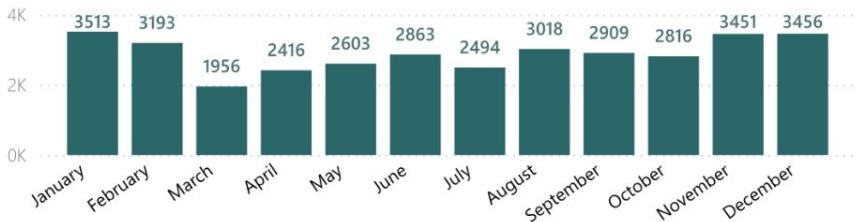
Wisconsin Car Crash Analysis Dashboard

Crash Data from 2016 through December 2023

Yanbing Chen
Qianheng Zhang
April, 2024



Total Accidents by Month



Temp. Avg. (F)

0.00

46.74

93.47

Visibility Avg. (mi)

0.00

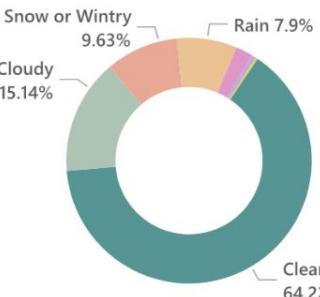
8.34

16.69

Nearby Road Features



Weather



Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023



County

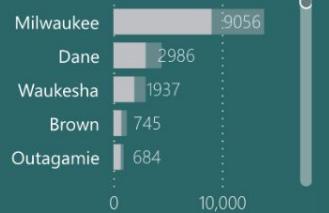
All

Severity to Traffic Delay

All

Road Type

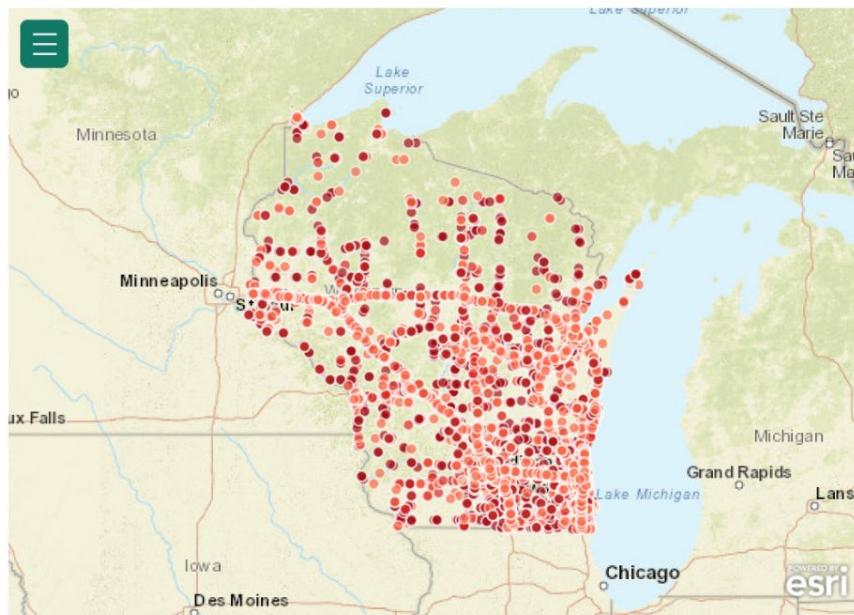
All



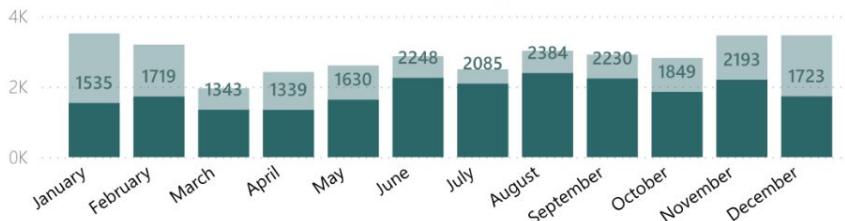
22278

Total Accidents

1. Over 60% of Car Crashes Occur in Fair Weather



Total Accidents by Month



Temp. Avg. (F)



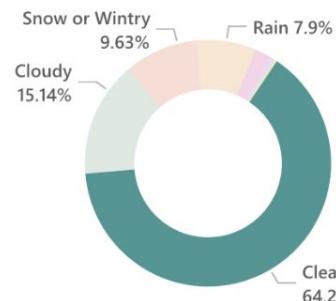
Visibility Avg. (mi)



Nearby Road Features



Weather



Clear

Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary / Export

Crash Year

All

01/01/2016 [] 31/12/2023 []



County

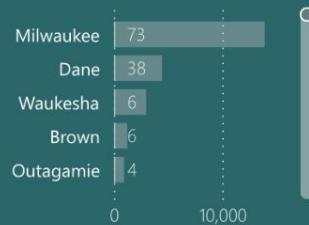
All

Severity to Traffic Delay

All

Road Type

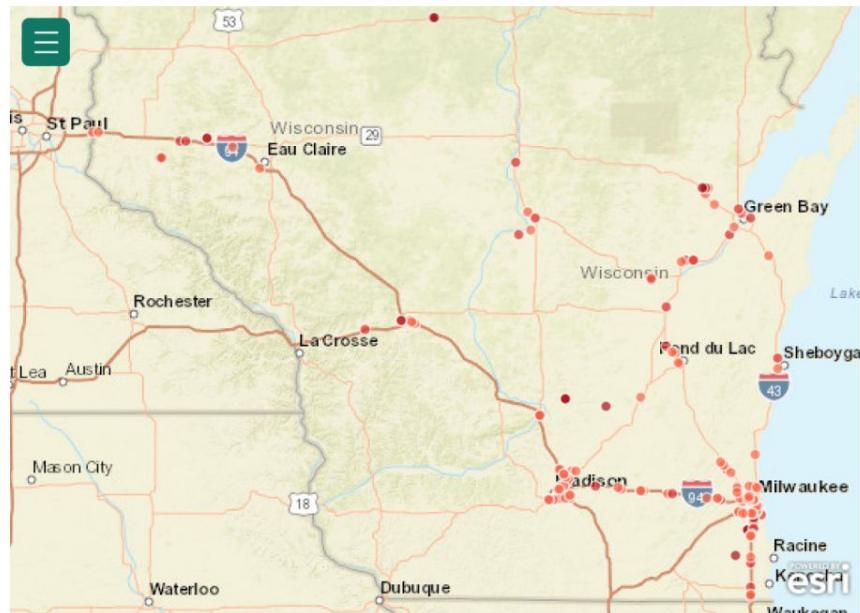
All



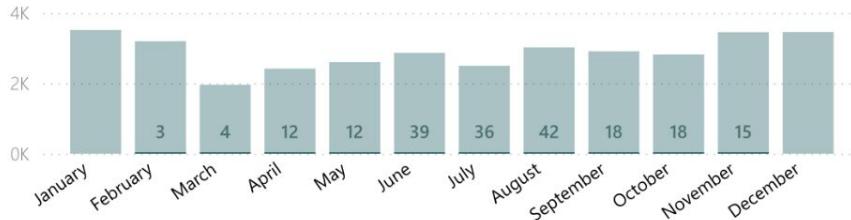
199

Total Accidents

2. Accidents during thunderstorms and icy conditions primarily occur on U.S. Highways in major cities



Total Accidents by Month



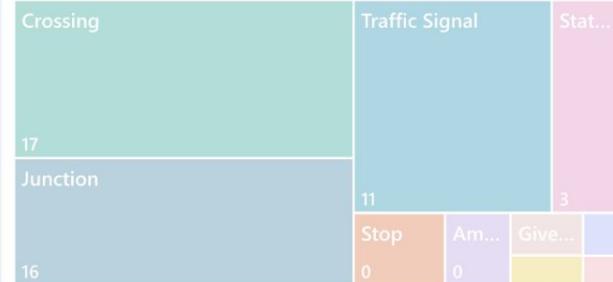
Temp. Avg. (F)

0.00 66.16 132.31

Visibility Avg. (mi)

0.00 5.07 10.13

Nearby Road Features



Weather



Thunderstorms

- Weather Categories
- Clear
 - Cloudy
 - Snow or Wintry
 - Rain
 - Thunderstorms
 - Icy or Freezing
 - Unknown

Primary Dashboard

Crash Map

Weather and Road Features

Summary / Export

Crash Year

All

01/01/2016 [] 31/12/2023 []

[] [] [] [] Year

County

All

Severity to Traffic Delay

All

Road Type

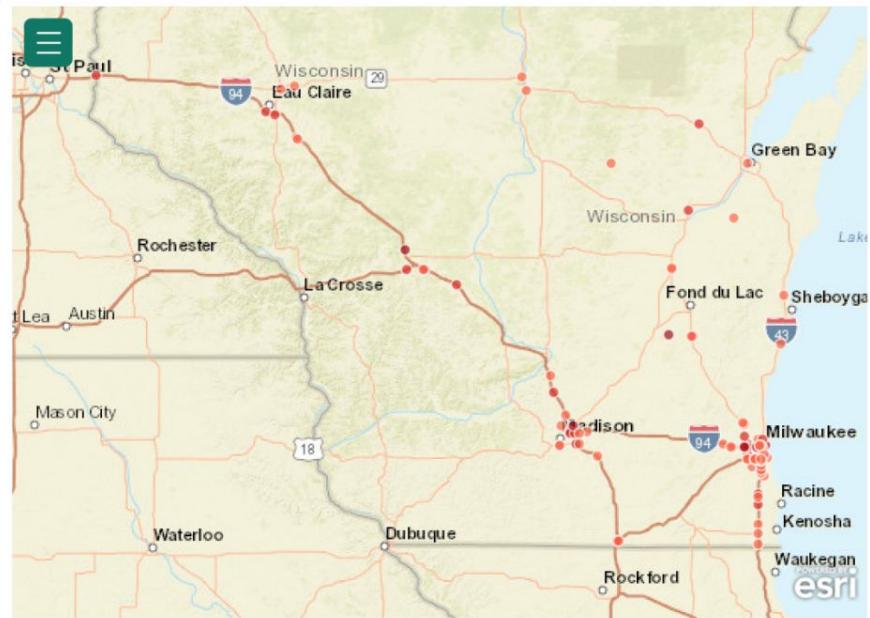
All



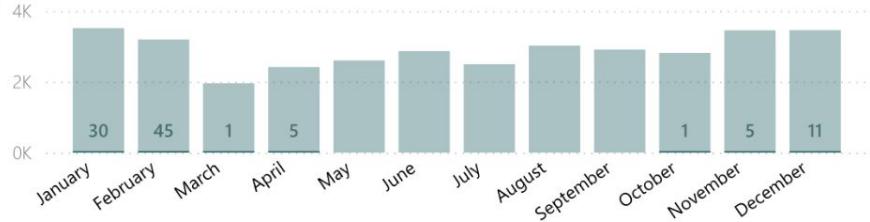
98

Total Accidents

2. Accidents during thunderstorms and icy conditions primarily occur on U.S. Highways in major cities



Total Accidents by Month



Temp. Avg. (F)

0.00 28.88 57.76

Visibility Avg. (mi)

0.00 2.89 5.77

Nearby Road Features

Crossing

Junction

Traffic Signal

Stat...

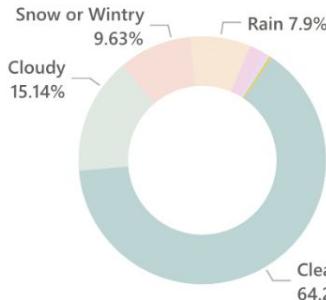
Stop

Am...

Give...

7

Weather



Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

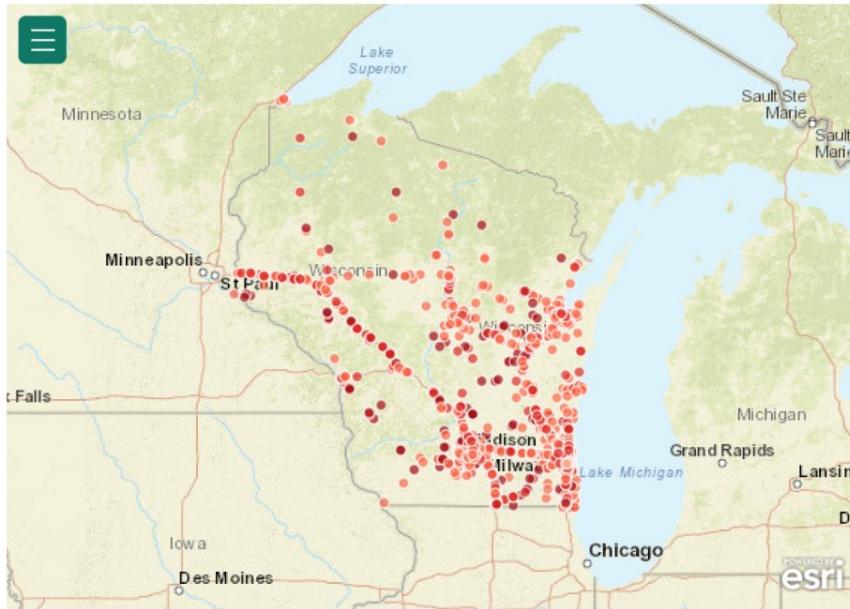
All



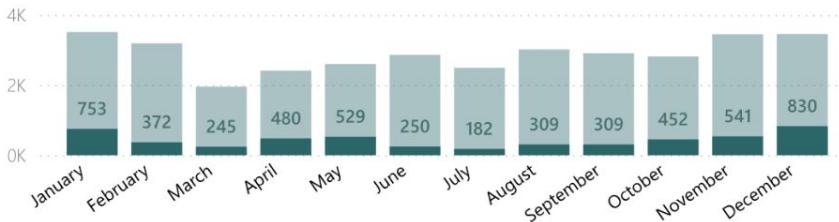
5252

Total Accidents

3. Accidents Under Other Conditions Were Spatially Dispersed



Total Accidents by Month



Temp. Avg. (F)

0.00 42.17 84.33

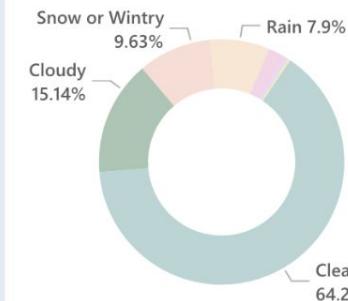
Visibility Avg. (mi)

0.00 8.78 17.55

Nearby Road Features



Weather



Cloudy

- Weather Categories
- Clear
 - Cloudy
 - Snow or Wintry
 - Rain
 - Unknown
 - Thunderstorms
 - Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

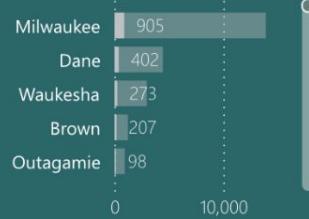
All

Severity to Traffic Delay

All

Road Type

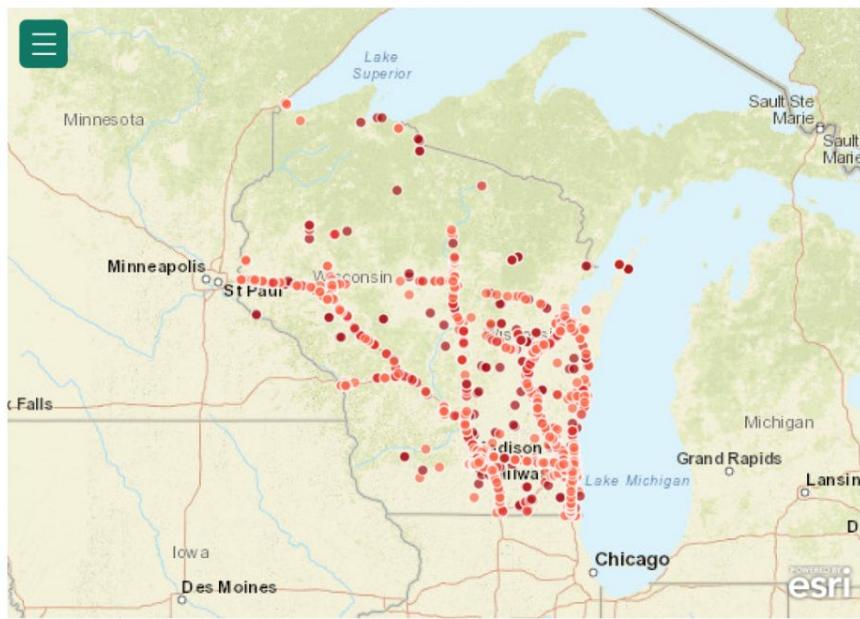
All



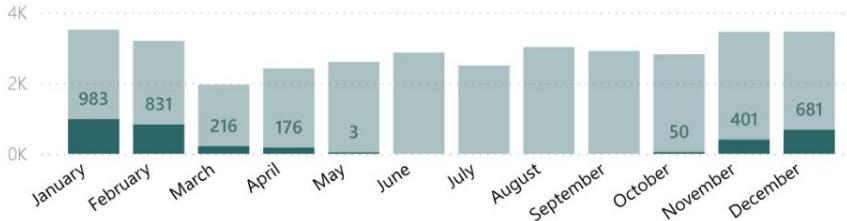
3341

Total Accidents

3. Accidents Under Other Conditions Were Spatially Dispersed



Total Accidents by Month



Temp. Avg. (F)

0.00 23.52

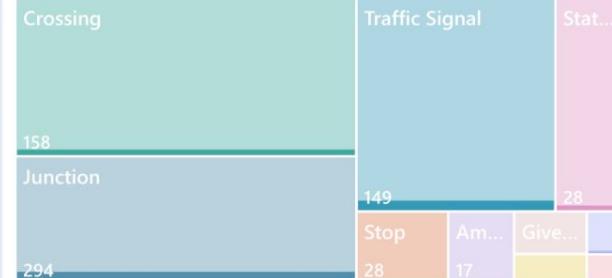
47.03

Visibility Avg. (mi)

0.00 2.58

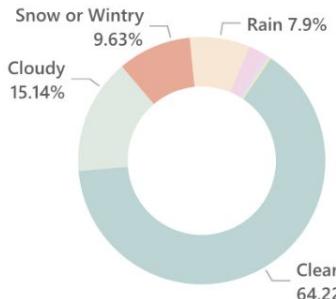
5.16

Nearby Road Features



Weather

Snow



- Weather Categories
- Clear
 - Cloudy
 - Snow or Wintry
 - Rain
 - Unknown
 - Thunderstorms
 - Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

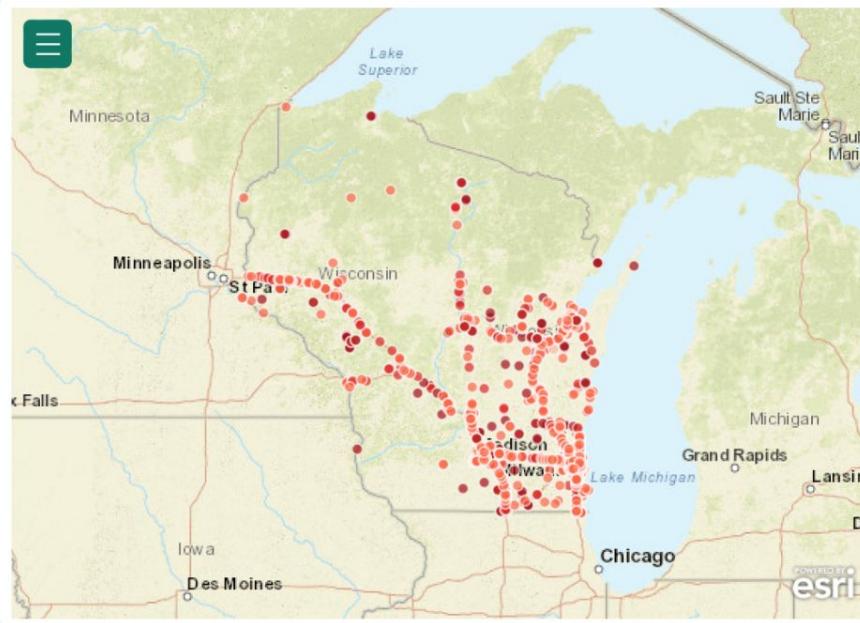
All



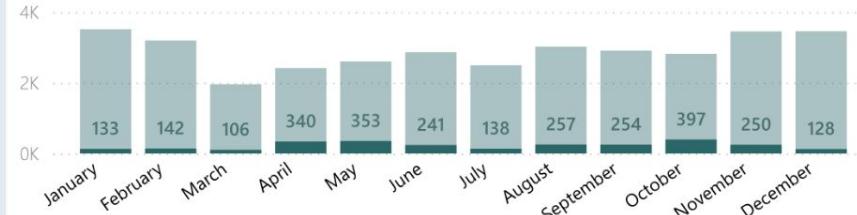
2739

Total Accidents

3. Accidents Under Other Conditions Were Spatially Dispersed



Total Accidents by Month



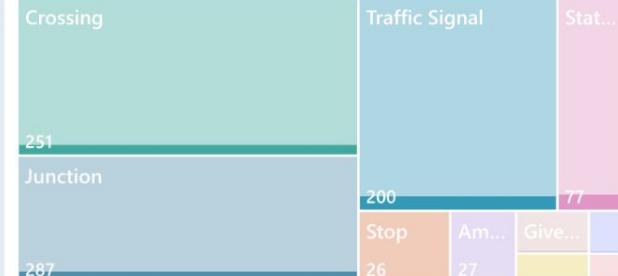
Temp. Avg. (F)

0.00 52.33 104.65

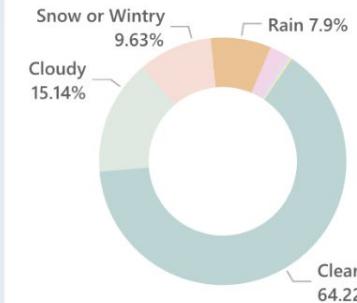
Visibility Avg. (mi)

0.00 5.66 11.33

Nearby Road Features



Weather



Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Other Features

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All ▼

01/01/2016 31/12/2023

Year

County

All ▼

Severity to Traffic Delay

All ▼

Road Type

All ▼

Milwaukee 13905

Dane 4453

Waukesha 2983

Brown 1248

Outagamie 950

0 10,000

34688

Total Accidents

1. Export Filtered Data for Further Analysis

Accidents	Lat	Lng	County	Zipcode	Time	Weather	Street	Description	Export
A-1228612	44.39	-89.80	Wood	54494	15/12/2020 7:15:21 AM	Clear	Peach St	Left lane blocked due to accident on WI-54 Westbound	
A-1254924	44.37	-89.77	Wood	54494-7004	23/11/2020 6:45:32 AM	Clear	45th St S	Accident on CR-W between 32nd St and 45th St.	
A-1382783	44.39	-89.80	Wood	54494	09/07/2020 3:41:00 PM	Rain	Washington St	Left lane blocked due to accident on WI-54 Eastbound	
A-1475854	44.62	-90.03	Wood	54412	20/05/2020 5:09:47 PM	Clear	State Highway 186	Left lane blocked due to accident on US-10 Westbound	
A-1843171	44.42	-89.74	Wood	54494	25/11/2019 6:21:45 PM	Cloudy	72nd St N	Right lane blocked due to accident on WI-54 Plover Rd V	
A-1892259	44.31	-89.74	Wood	54494-9589	04/09/2019 7:40:53 AM	Cloudy	64th St S	Accident on 64th St at Mill Ave.	
A-1925443	44.33	-89.81	Wood	54494	21/08/2019 4:13:17 AM	Clear	State Highway 13 S	Earlier accident on WI-13 both ways between Townline Rd	
A-1933103	44.62	-90.01	Wood	54412	26/08/2019 12:59:08 PM	Cloudy	North St	Right lane blocked due to accident on US-10 Westbound	
A-3002039	44.43	-89.93	Wood	54495-9275	09/02/2018 8:14:06 AM	Clear	State Highway 73	Lane blocked due to accident on WI-73 both ways at Co	
A-3464480	44.42	-90.13	Wood	54466-9208	25/10/2016 4:00:58 PM	Clear	State Highway 80	Closed at WI-54 (North) - Road closed due to accident.	
A-3464482	44.41	-90.13	Wood	54466-9208	25/10/2016 4:00:58 PM	Clear	State Highway 80	Closed at WI-13/WI-73/N Limit Rd - Road closed due to	
A-3464565	44.70	-90.14	Wood	54449-9211	25/10/2016 6:47:02 PM	Clear	M223 State Highway 97	At Galvin Ave N - Accident.	
A-3471170	44.42	-89.82	Wood	54495	16/11/2016 6:19:49 PM	Clear	W Riverview Expy	Closed at WI-66 - Road closed due to accident.	
A-3471174	44.43	-89.81	Wood	54475	16/11/2016 6:19:49 PM	Clear	State Highway 34	Closed at Edgewood Pl - Road closed due to accident.	
A-3495346	44.71	-90.11	Wood	54449-9212	01/09/2016 9:22:16 AM	Clear	M331 State Highway 97	Closed between Birch St and Staadt Ave - Road closed d	
A-3495347	44.71	-90.12	Wood	54449-9212	01/09/2016 9:22:16 AM	Clear	M302 State Highway 97	Closed between Staadt Ave and Birch St - Road closed d	
A-3561829	44.45	-90.14	Wood	54466	08/02/2017 2:12:18 PM	Clear	State Highway 73	Closed between WI-73 and 4th Ave - Road closed due to	
A-3561830	44.45	-90.13	Wood	54466	08/02/2017 2:12:18 PM	Clear	WI-80	Closed between 4th Ave and WI-73 - Road closed due to	
A-3561895	44.45	-90.13	Wood	54466-9508	08/02/2017 4:17:31 PM	Clear	1st Ave	Closed at WI-13/WI-73/N Limit Rd - Road closed due to	
A-3561896	44.45	-90.13	Wood	54466-9362	08/02/2017 4:17:31 PM	Clear	State Highway 73	Closed between WI-13/WI-73/N Limit Rd and Jonathan S	
A-3572876	44.37	-90.11	Wood	54466-9226	21/02/2017 6:28:54 AM	Clear	State Highway 80	Closed at WI-54 (North) - Road closed due to accident.	
A-3572880	44.38	-90.11	Wood	54466-9221	21/02/2017 6:28:54 AM	Clear	State Highway 80	Closed at WI-54 (South) - Road closed due to accident.	
A-3573007	44.37	-90.11	Wood	54466-9226	21/02/2017 11:42:00 AM	Clear	State Highway 80	Closed at WI-173 (North) - Road closed due to accident.	
A-3573013	44.31	-90.11	Wood	54413	21/02/2017 11:42:00 AM	Clear	Main St	Closed at WI-80 (South) - Road closed due to accident.	
A-3603195	44.38	-89.82	Wood	54494	27/04/2017 8:13:39 AM	Rain	8th St S	Closed between Riverview Expy and CR-W/Chestnut St -	
A-3603197	44.38	-89.82	Wood	54494-5245	27/04/2017 8:13:39 AM	Rain	8th St S	Closed at Riverview Expy - Road closed due to accident.	
A-3615133	44.38	-90.11	Wood	54466-9221	16/05/2017 4:33:30 PM	Clear	State Highway 80	At WI-54 - Accident.	
A-3629090	44.43	-89.67	Wood	54494-8719	13/06/2017 3:57:25 AM	Clear	State Highway 54 E	At Johnson Ave - Accident.	
A-3714987	44.51	-89.81	Wood	54475-9704	13/11/2022 2:22:06 PM	Clear	State Highway 13/34	Incident on WI-34 NB near WI-34 Road closed. Take alter	
A-3722055	44.34	-89.91	Wood	54457-8323	16/09/2022 2:50:16 AM	Clear	State Highway 54 W	WIS 54 West CLOSED from Swanson Rd to County G bec	
A-3722056	44.32	-89.95	Wood	54457-0619	20/06/2022 9:58:11 PM	Clear	State Highway 172	Incident on WI-172 WB near COUNTY ROAD CC Road cl	

Primary Dashboard

Crash Map

Weather and Road Features

Summary / Export

Crash Year

All

01/01/2016 31/12/2023



County

Multiple selections

- Crawford
- Dane
- Dodge
- Door
- Douglas
- Dunn
- Eau Claire

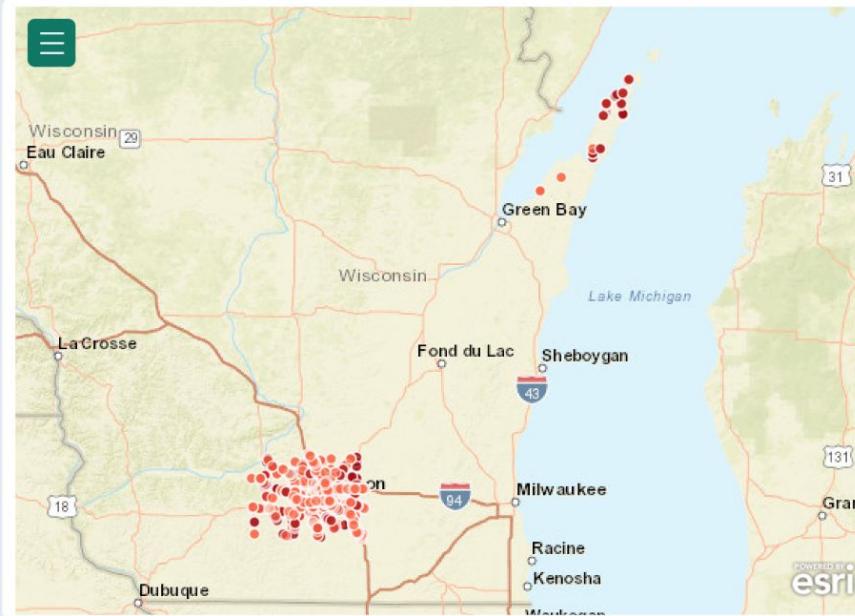
Door 65

0 5,000

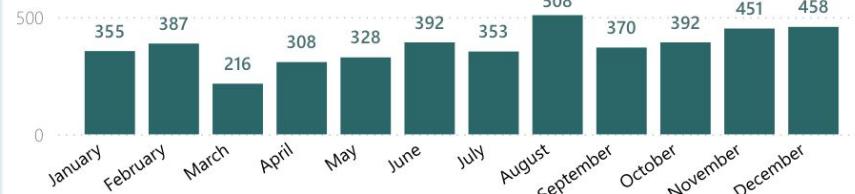
4518

Total Accidents

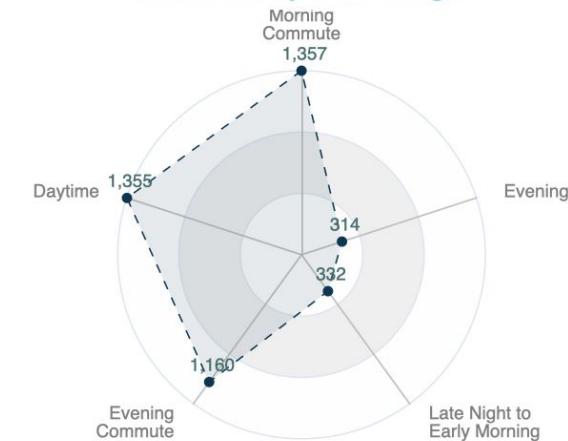
2. Support Multi-Selection for Comparison/ Aggregated Analysis



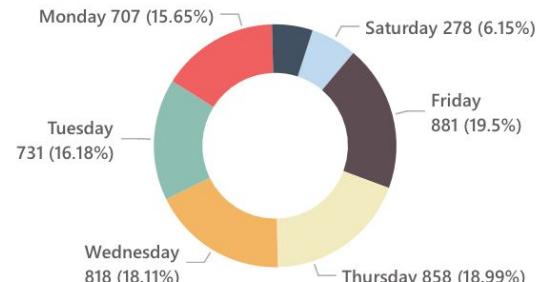
Total Accidents by Month



Accidents by Time Range



Day of the Week



Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All 



County

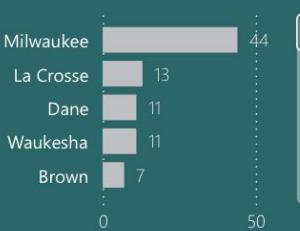
All

Severity to Traffic D...

All ✓

Road Type

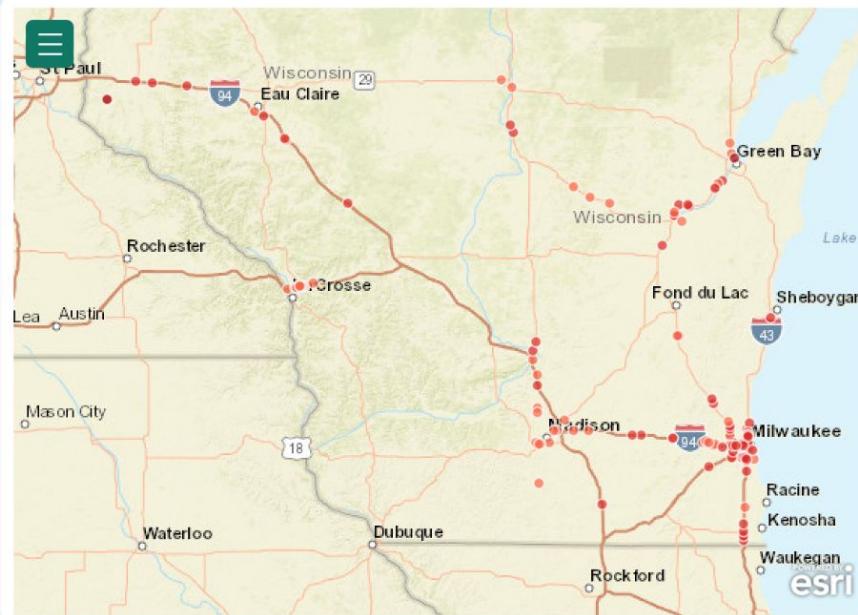
All ✓



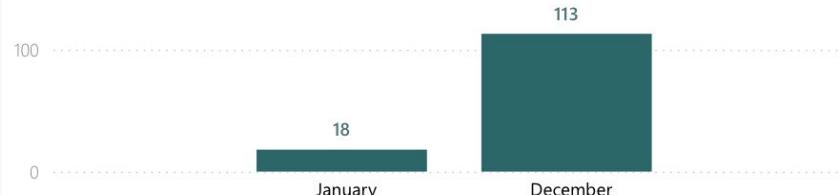
131

Total Accidents

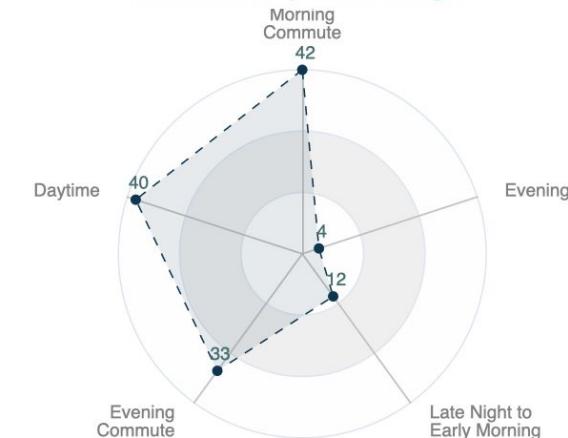
3. Support Specific Time Query



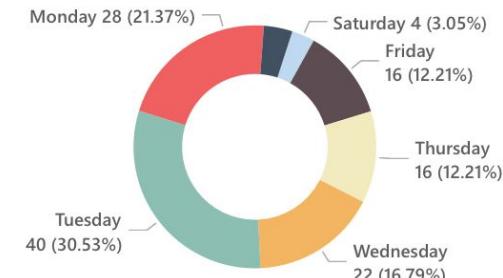
Total Accidents by Month



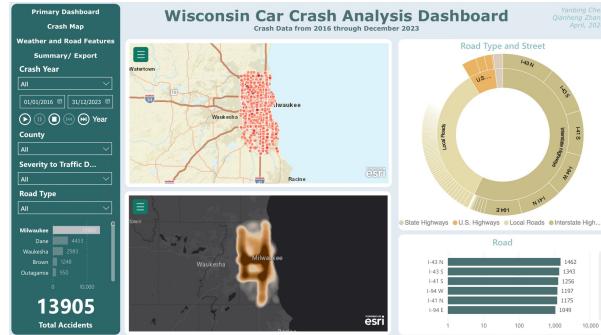
Accidents by Time Range



Day of the Week



Evaluation

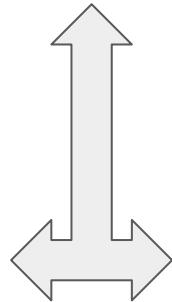


Interface

Expertises



Personal Interview



Public Audience



Online Web Survey

Evaluation

Four government officers
from state level



Department of
Transportation



Four government
officers from different
WI counties



Pre-Survey
Learning Materials



Solving specific tasks



2 weeks of familiarizing,
learning, and practicing

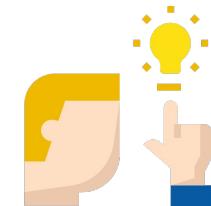


60 minutes of Interview for
each participant



Questionnaires for different
focus groups

Claim Analysis(Specific)



Scenario-Based
Design with the data
(General)

Expertise

Question No.	Question	Response Type
1	Which department or sector do you currently work in?	Text box
2	Can you briefly describe your main responsibilities?	Text box
3	How many years of experience do you have using geovisual analytics tools?	Text box
4	On a scale of 1 to 5, how would you rate your confidence in using geovisual analytics tools?	Radio buttons
5	Have you participated in any formal training or workshops for geovisual analytics tools? If yes, please specify.	Checkbox for Yes/No
6	In 2-3 sentences, what are your primary expectations from this geovisual analytics platform?	Text box

Table 1. Pre-Exploration Survey for Domain Experts

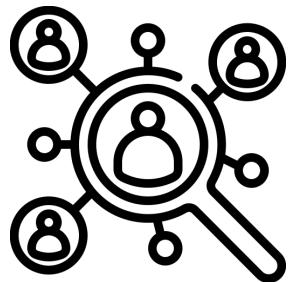
Expertise

Background and Participant Introductions (10 minutes)	
Key	Could you please introduce yourself, detailing your job role and experience with geovisual analytics tools?
Probe	How long have you been in your current role?
Probe	Could you describe a recent project where you utilized geovisual analytics?
Probe	What features do you prioritize in geovisual analytics tools?
Probe	How would you describe your familiarity with geospatial data and its analysis?
User Experience and Usability (20 minutes)	
Key	What were your initial impressions of the platform?
Probe	What specifically did you like or dislike upon first using the platform?
Probe	Did anything stand out to you as particularly useful or cumbersome?
Key	Could you discuss the functionalities and features you found most useful?
Probe	Were there any features you expected to find but didn't?
Probe	How do these features align with your daily tasks?
Key	Describe a scenario in which you used the platform. How did it meet or fail to meet your needs?
Probe	Were there any unexpected outcomes from using the platform in this scenario?
Probe	How could the platform be improved based on this use case?

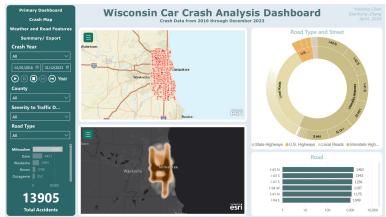
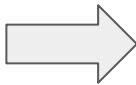
Assessment of Utility (20 minutes)	
Key	Earlier in the pre-exploration survey, you shared your expectations for the geovisual analytics platform. After spending some time exploring the platform, have your expectations changed? If so, how?
Probe	How have these insights impacted your work or decision-making?
Key	Could you share any insights you gained from using the platform?
Probe	How has the platform met or not met your initial anticipations?
Probe	Were these insights something you could not have obtained without the platform?
Key	How does this platform compare to other tools you've used for similar purposes?
Probe	Are there specific features or functionalities where this platform excels or falls short?
Probe	What could make this platform your go-to tool over others?
Key	Based on your experience, how likely are you to use this platform in the future?
Probe	What changes or additions would make you more likely to use this platform regularly?
Probe	How does the platform fit into your current workflow?
Feedback on Specific Use Cases and Feature Requests (10 minutes)	
Probe	Could you share any specific use cases where the platform was particularly beneficial or lacking.
Probe	Could you describe the context and outcome of one such use case?
Probe	How could the platform have better supported your needs in this instance?
Probe	Are there any specific tools or functionalities you've encountered elsewhere that you'd like to see integrated into this platform?
Probe	How would these additions change the way you use the platform?
Key	Are there any other comments or feedback you'd like to share about your experience with the platform?
Probe	Is there anything we haven't covered that you think is crucial for us to know about your experience?
Probe	How do you envision the future development of this platform affecting your work?

Table 2. Focus Group Interview Protocol

Public

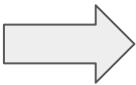


General Public Audience
who knows the link from
social media and friends

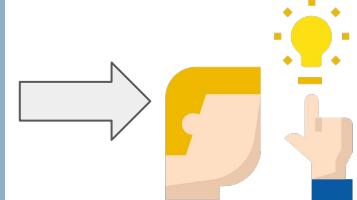


Playing and Trying different
functions on platform.

- Time(3-5 minutes)
- Tools(More than 10 interactions)



Fill out survey with
open-ended and multiple
choice questions



Usability Versus
Utility Studies
User Type Studies

Public

Question No.	Question	Response Type
Participants' Demographics		
1	Your Gender: Male, Female, Others	Dropdown
2	Age: 18-24, 25-33, 45-54, 55-65, 66-100	Dropdown
3	I Consider Myself Knowledgeable in These Topics Geographic Information Systems Data Visualization Transportation User Interface Design	Likert Scale

Background Survey(15%)

Usability Metrics		
4	I found it easy to find specific road safety information relevant to my daily routes.	Likert Scale
5	I found WAV useful for presenting accident and safety data for areas around my commuting routes.	Likert Scale
6	When using the WAV, I found the process of searching, filtering, and retrieving information is intuitive	Likert Scale
7	I have a strong motivation to explore different features of WAV.	Likert Scale
8	My motivation for using WAV is primarily driven by: a. Need for safety b. Curiosity c. _____	multiple selections
9	I feel satisfied with the level of detail provided about traffic accidents (e.g., location, time, severity) relevant to my commute.	Likert Scale
10	I plan to use WAV more in the future.	Likert Scale
11	I found WAV to be unnecessarily complex.	Likert Scale
12	I needed to learn a lot of things before I could get going with WAV.	Likert Scale

Usability Metrics(60%)

Utility Metrics		
13	I classify my daily commute as: Short distance (less time, fewer routes) Long distance (more time, multiple routes)	Single Choice
14	After utilizing the WAV, I feel more informed about traffic safety in my daily commute areas.	Likert Scale
15	WAV allows me to learn about routes that I don't use.	Likert Scale
16	I learnt to use WAV quickly.	Likert Scale
17	I need help to use WAV.	Likert Scale

Utility Metrics(35%)

Future Work

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

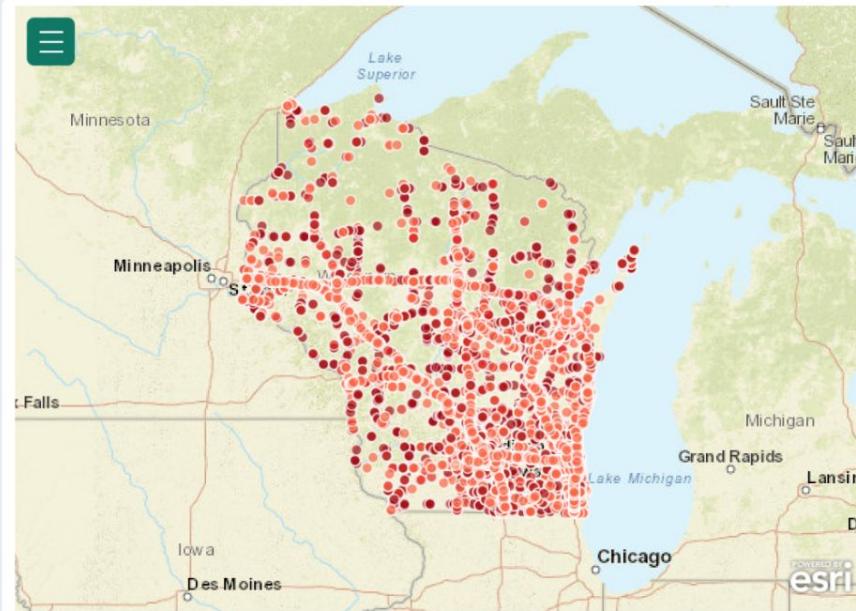
Brown 1248

Outagamie 950

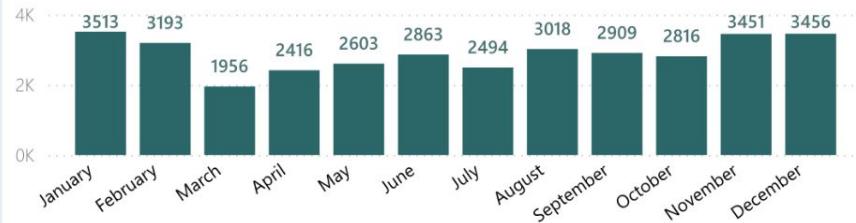
34688

Total Accidents

1. Support Spatial Filter based on Road Features



Total Accidents by Month



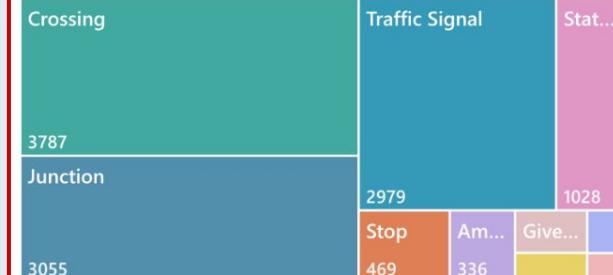
Temp. Avg. (F)

0.00 46.74 93.47

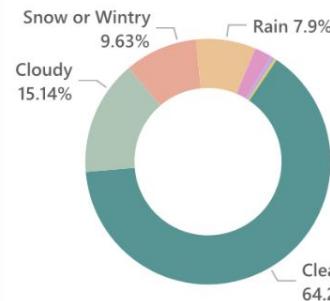
Visibility Avg. (mi)

0.00 8.34 16.69

Nearby Road Features



Weather



Weather Categories

- Clear
- Cloudy
- Snow or Wintry
- Rain
- Unknown
- Thunderstorms
- Icy or Freezing

Primary Dashboard

Crash Map

Weather and Road Features

Summary/ Export

Crash Year

All

01/01/2016 31/12/2023

Year

County

All

Severity to Traffic Delay

All

Road Type

All

Milwaukee 13905

Dane 4453

Waukesha 2983

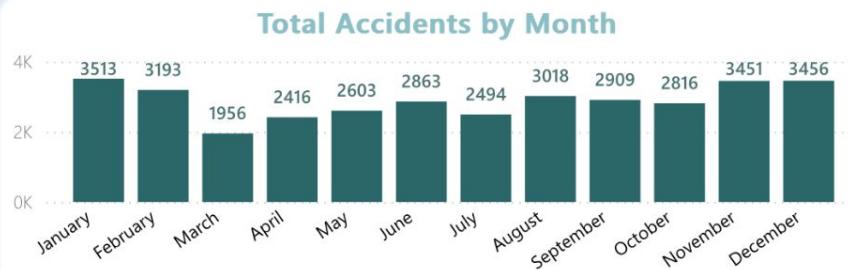
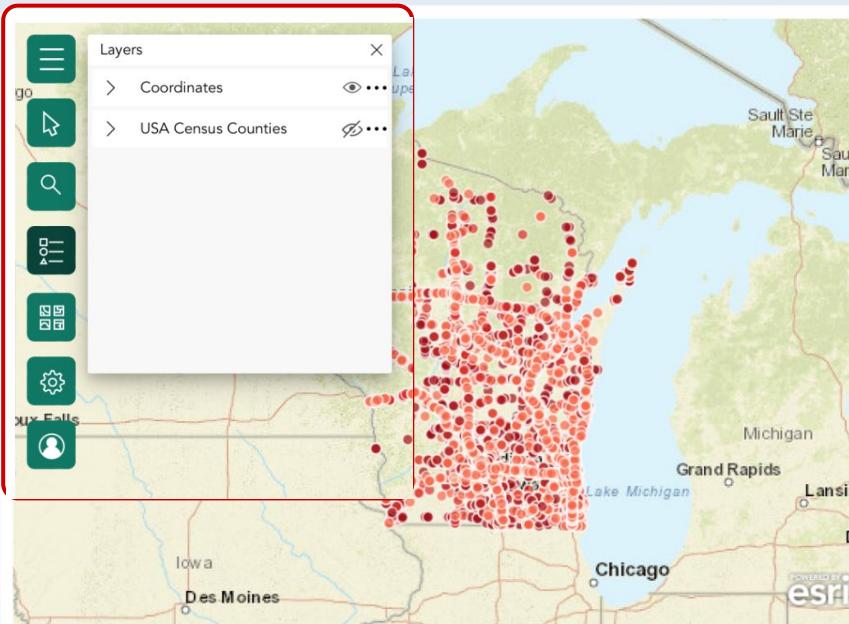
Brown 1248

Outagamie 950

34688

Total Accidents

2. Add Data Layers for Emergency Response Analysis



Temp. Avg. (F)

0.00 46.74

93.47

Visibility Avg. (mi)

0.00 8.34

16.69

Nearby Road Features

Crossing

Junction

3055

Traffic Signal

2979

Stat...

Stop 469

Am... 336

Give... 1028

Weather

Snow or Wintry 9.63%

Cloudy 15.14%

Rain 7.9%

Clear 64.22%

Weather Categories

Clear

Cloudy

Snow or Wintry

Rain

Unknown

Thunderstorms

Icy or Freezing

3. Aggregate Fatalities Data



About

The westernmost section of VT-105 from St. Albans Town to Enosburg Falls has become an area of concern due to the number of fatal and serious injury crashes occurring at this location.

This dashboard was created as part of a comprehensive Road Safety Audit Review (RSAR) conducted by the Vermont Agency of Transportation in 2023.

The goal of this dashboard is to provide current-year and historic information on the number and type of crashes occurring along this section of VT-105.

- Enosburg
- Sheldon
- St. Albans Town
- Swanton

2019

2024



VT-105 Crashes

2024 Crashes as of Tuesday, April 30, 2024

8

Crashes

0

Fatal

0

Serious Injury

5

Injury

3

No Injury

Crashes from 2019-2024

123

Crashes

10

Fatal

9

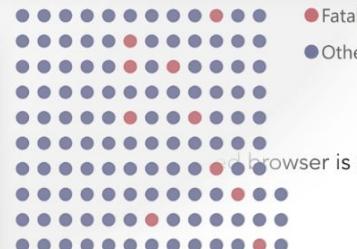
Serious Injury

44

Injury

60

No Injury



This browser is required to load this visual. [Learn more.](#)

Injuries from 2019-2024

12

Fatalities

13

Serious Injuries

77

Minor Injuries

4. Add Description and Help Guide

[Dashboard](#)[Summary/Export](#)[Crash Map](#)[Juris Map](#)[Crash Info](#)[Route Info](#)[Crash By MP](#)[Intersection Info](#)[People Injured](#)[User Guide](#)[User Manual](#)[FAQs](#)[Training Videos](#)[Crash Data Dictionary](#)

Please contact shan.di@vdot.virginia.gov or tien.simmons@vdot.virginia.gov if you have any questions.

Dashboard tab is an overview of the crash data. By default, the numbers in the charts are based on "Total Crashes". Show other crash measures using the switch from the top-right corner of the page.

Summary/Export tab provides two tables of detailed statistics by Year and by VDOT District/Jurisdiction. Follow the data downloading link to export data from VaRoads (Some filters cannot be passed to VaRoads).

Crash Map shows the location of selected crashes. Click each crash point to see more crash details in the crash table. **Note:** Power BI maps only show significant data points that defines the shape and outliers when data size is greater than 3,500 rows. Use AGOL map to view complete data points.

Juris Map is a color filled shape map showing the variation of crashes by Physical Jurisdictions.

Crash Info tab provides a tabular list of crash data by each document number.

Route Info tab provides aggregated crash data by route segments.

Crash by MP tab plots crash data of selected route by 0.25 Mile Point.

Intersection Info tab provides aggregated crash data by Intersection Node.

People Injured tab has statistics of people injuries (one crash collision may have multiple people injured).

[View all filters](#)[Clear filters/ Reset to default](#)[View detailed crash data](#)[Crash Diagram \(internal VDOT only\)](#)[ArcGIS Online Crash Map](#)[Personalize a table \(internal VDOT only\)](#)

Crash Severity KABCO Scale Definition

K - Fatality

A - Serious Injury

B - Minor Injury

C - Possible Injury

O - Property Damage Only

Injured People - the total number of A, B, and C Injuries

Injury Crash - the total number of A, B, and C Crashes

Other VDOT Safety Data and Analysis Tools

[RNS \(internal VDOT only\)](#)

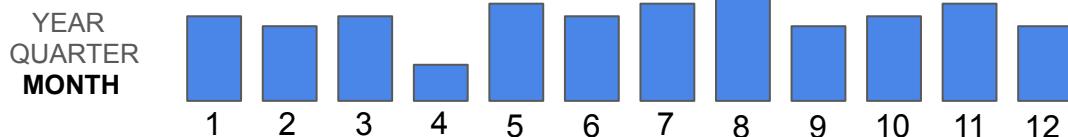
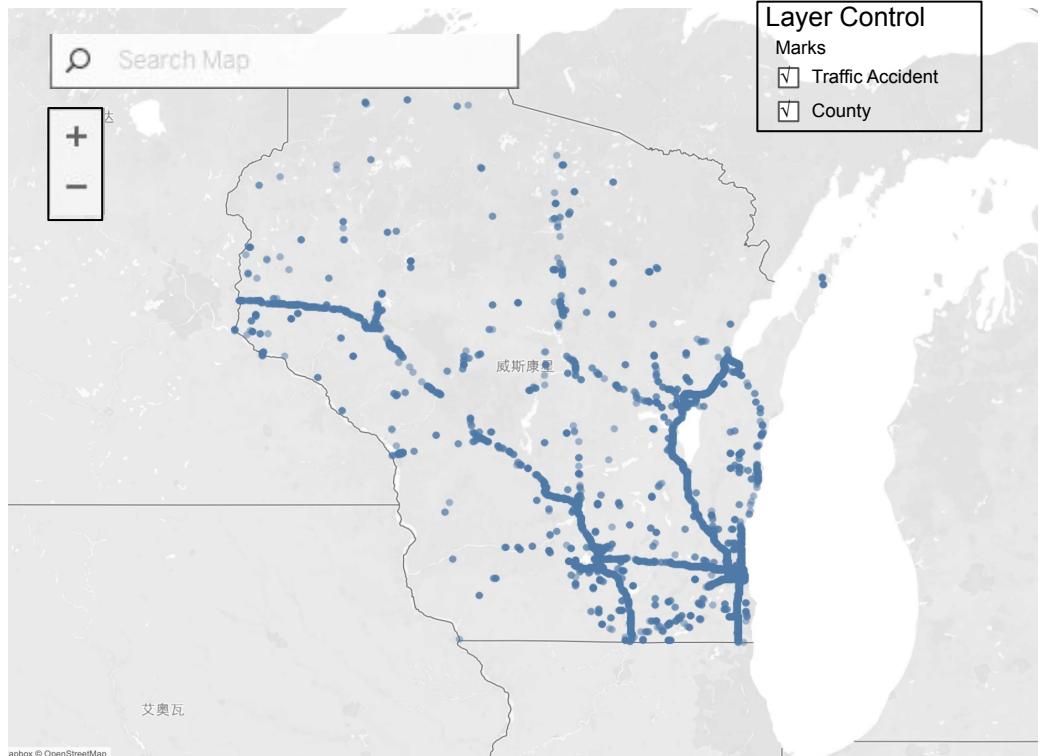
[Crash Summary Book](#)

[Top Potential for Safety Improvement \(PSI\) Map](#)

[Pedestrian Safety Action Plan \(PSAP\) Map](#)

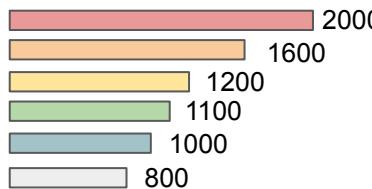
Download full crash data through [VirginiaRoads.org](#). Additional crash details can be downloaded from VaRoads [here](#).

Traffic Accident in Wisconsin At a Glance



Choose a County ▾

Street Names



I-41 N
I-41 S
I-94 E
I-94 W
I-43 E
Others

Road Features Near the Site of a Traffic Accident

