Milwaukee Comprehensive Crash Analysis

Robert J. Schneider, PhD, Professor of Urban Planning

Project team: Toole Design Group, UW-Milwaukee & City of Milwaukee – October 2022

Reckless Driving

N. 51st St & W. Fairmount Ave, October 2019

Reckless Driving

N. Humboldt Blvd, July 2021

Reckless Driving

W. Center St & N. 22nd St, October 2019: A'Mea N. Gee (age 4); Lisa Z. Gee (age 6)

Reckless Driving → Systemic Solutions

TRADITIONAL APPROACH		VISION ZERO
Traffic deaths are **INEVITABLE**		Traffic deaths are **PREVENTABLE**
PERFECT human behaviour	VS	Integrate **HUMAN FAILING** in approach
Prevent **COLLISIONS**		Prevent **FATAL AND SEVERE CRASHES**
INDIVIDUAL responsibility		**SYSTEMS** approach
Saving lives is **EXPENSIVE**		Saving lives is **NOT EXPENSIVE**

Source: Vision Zero Network. 2022.
https://visionzeronetwork.org/where-to-start/

Reckless Driving → Systemic Solutions

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Source: Vision Zero Network. 2022.
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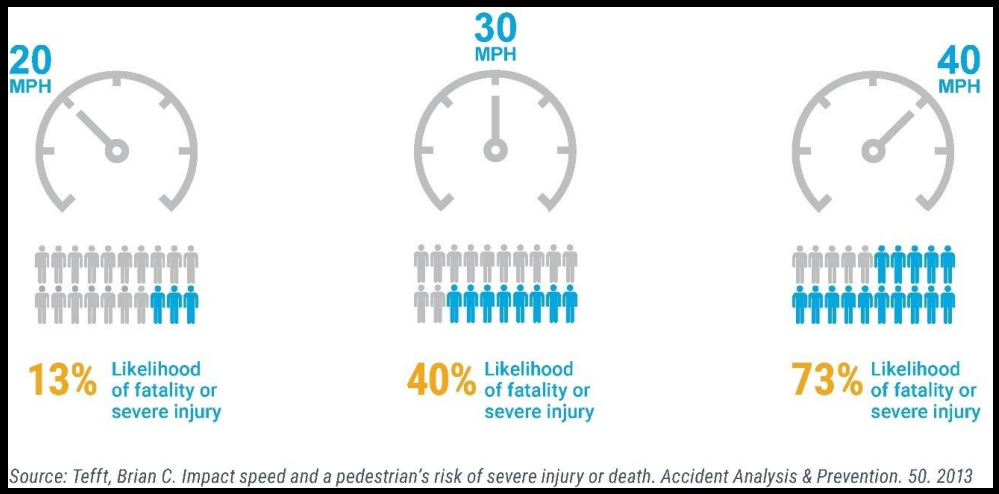
Risk Factors: Speed

>15% of vehicles exceeded the speed limit by 10 mph or more on:

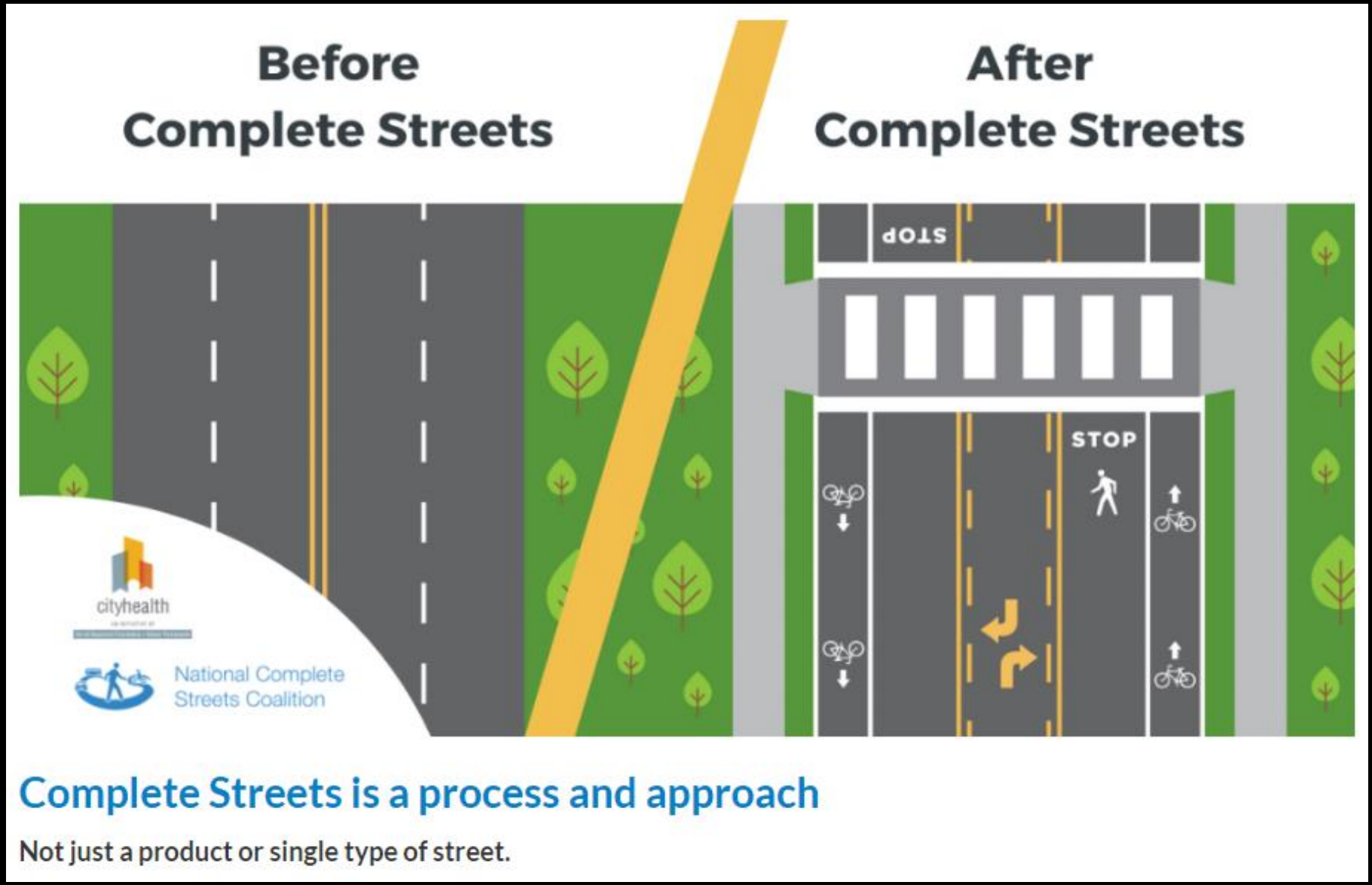
- S. 35th Street
- W. Capitol Drive
- N. 68th Street
- N. 35th Street
- N. Sherman Boulevard
- N. 84th Street
- N. 20th Street
- Locust Street Bridge over the Milwaukee River
- N. 51st Boulevard
- S. Clement Avenue

(only a small sample of city streets were studied)



Source: Milwaukee Pedestrian Plan, 2019. https://city.milwaukee.gov/ImageLibrary/Groups/cityBikePed/2019-Images/Pedestrian-Plan/MilwaukeePedestrianPlan-FINALAdopted20190730reduced.pdf

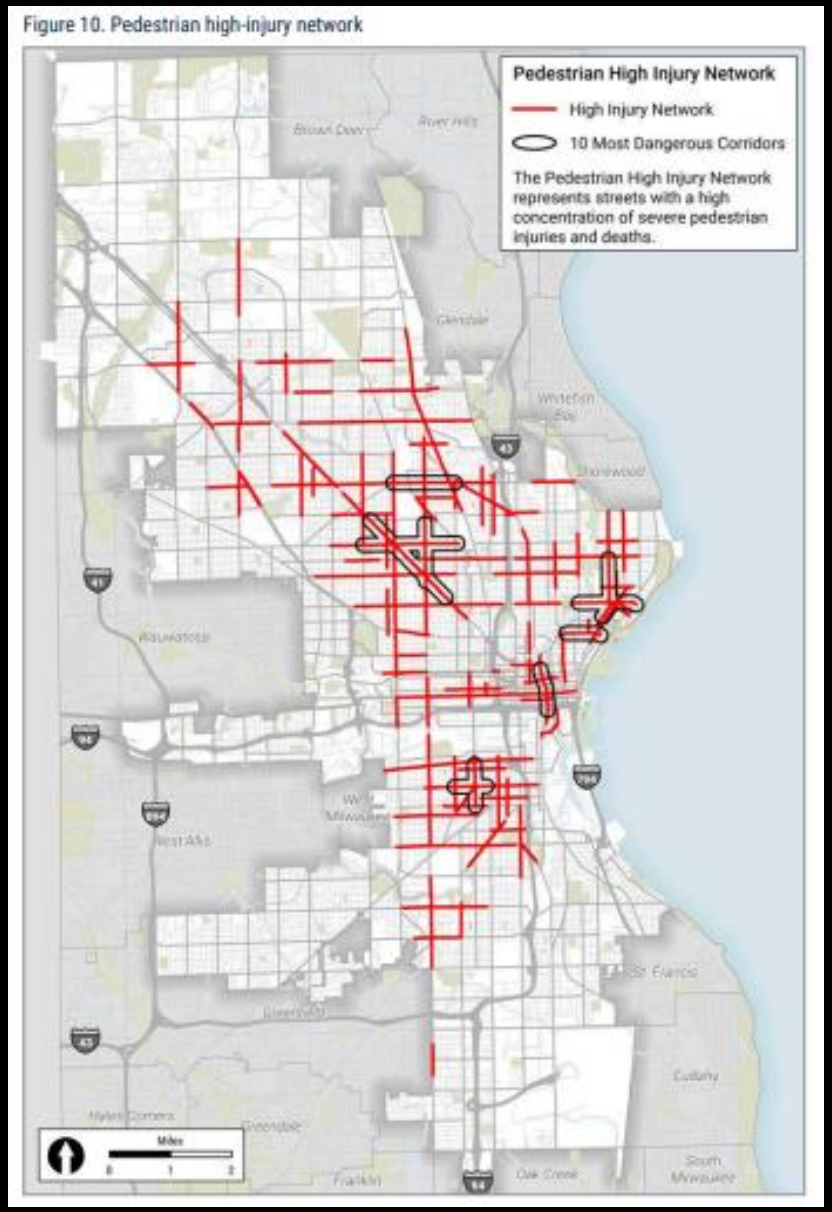
Reckless Driving → Systemic Solutions



Source: Smart Growth America, National Complete Streets Coalition. 2022.
https://smartgrowthamerica.org/what-are-complete-streets/

Reckless Driving → Systemic Solutions

Pedestrian High-Injury Network →



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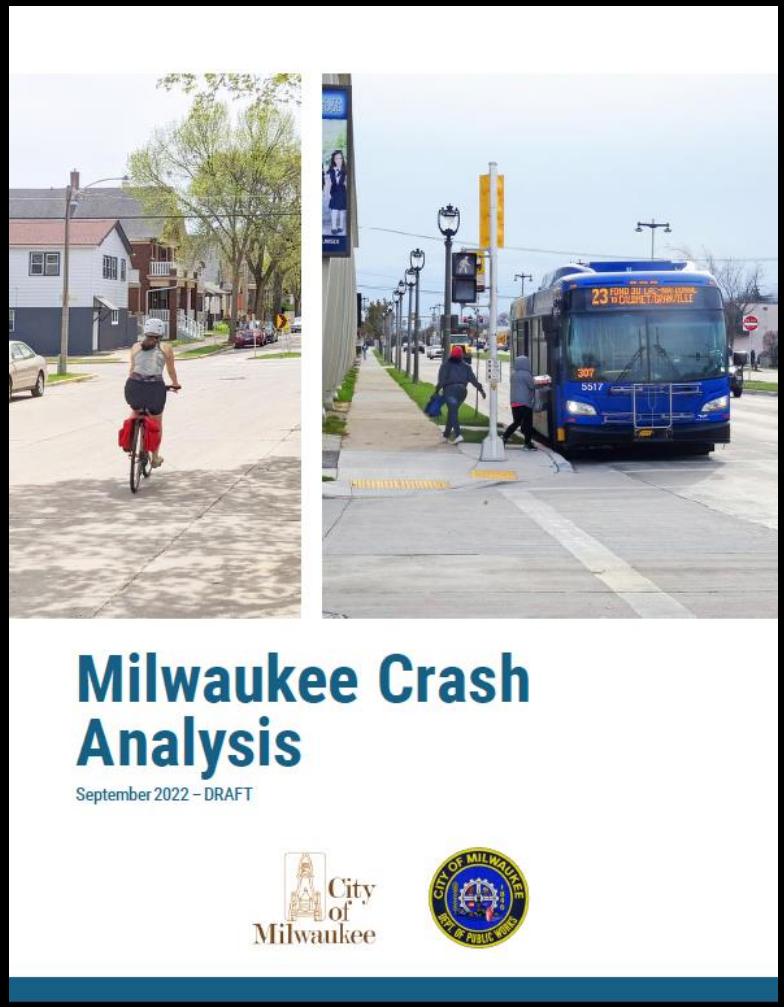
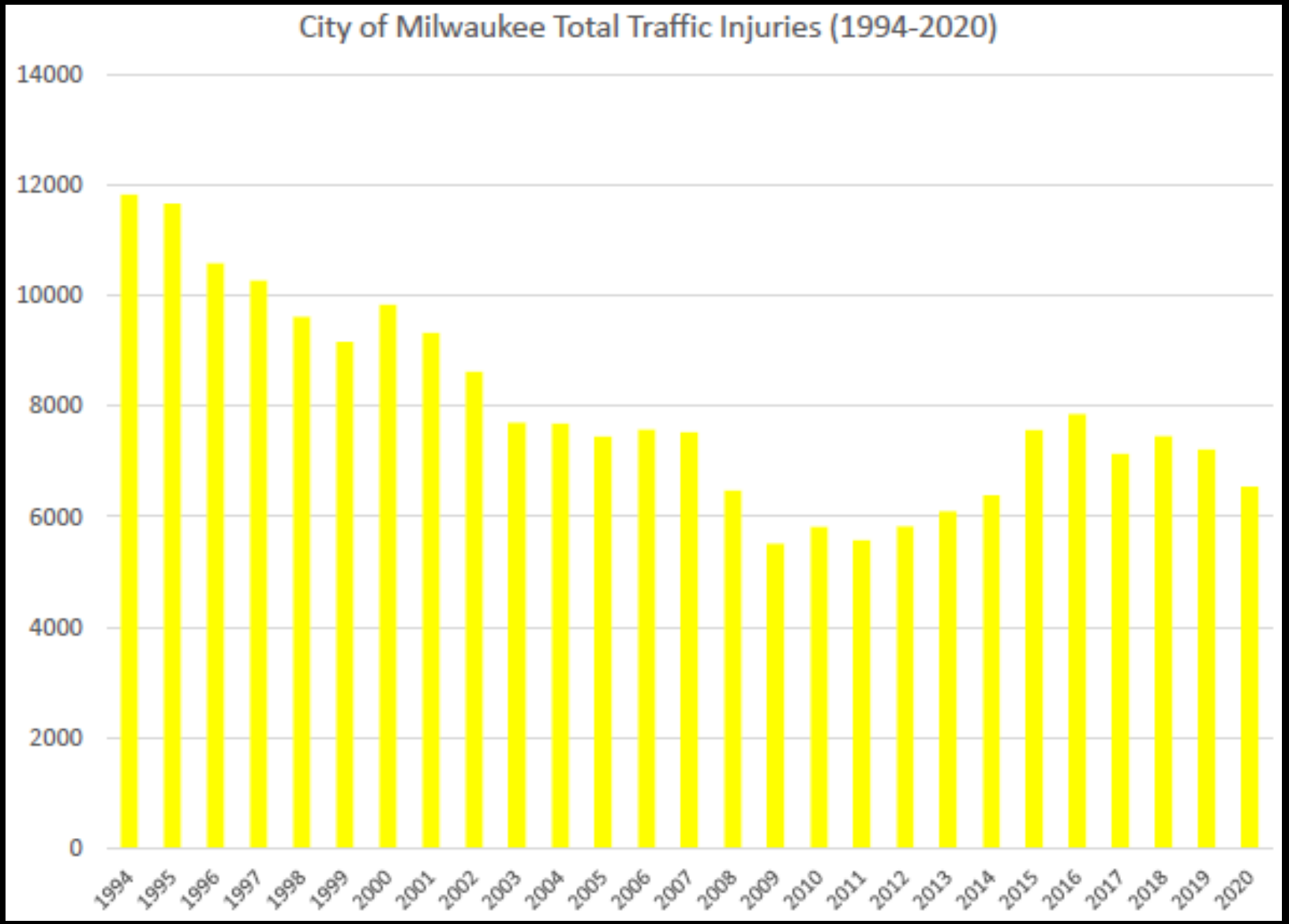
Milwaukee Crash Analysis: Establishing a Baseline for Vision Zero

1) Milwaukee traffic crash trends
2) Factors associated with fatal and severe injuries
3) Geographic distribution of risk



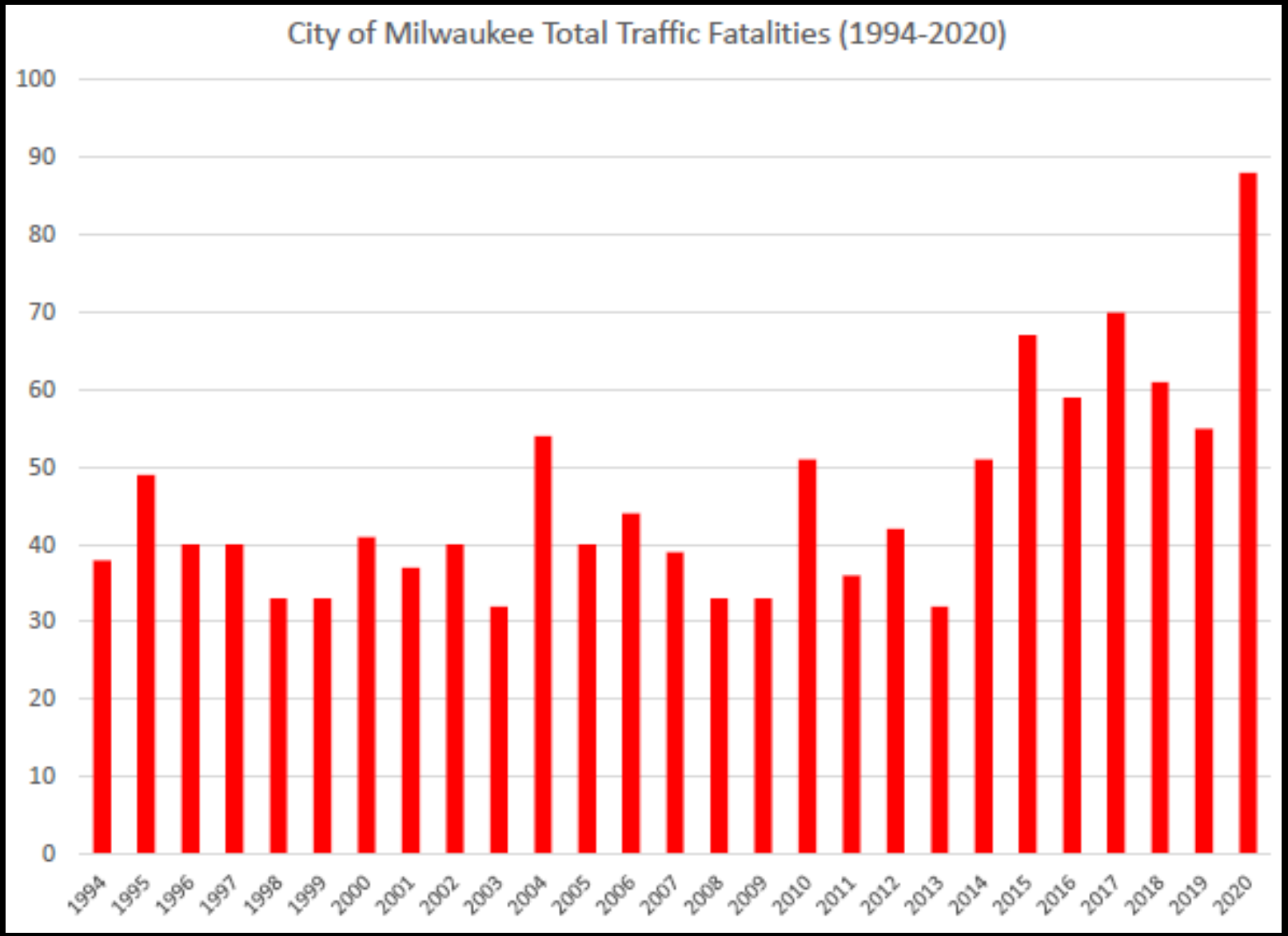
Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

1) Milwaukee Traffic Crash Trends



Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022. 453,542 crashes; 214,295 inj.

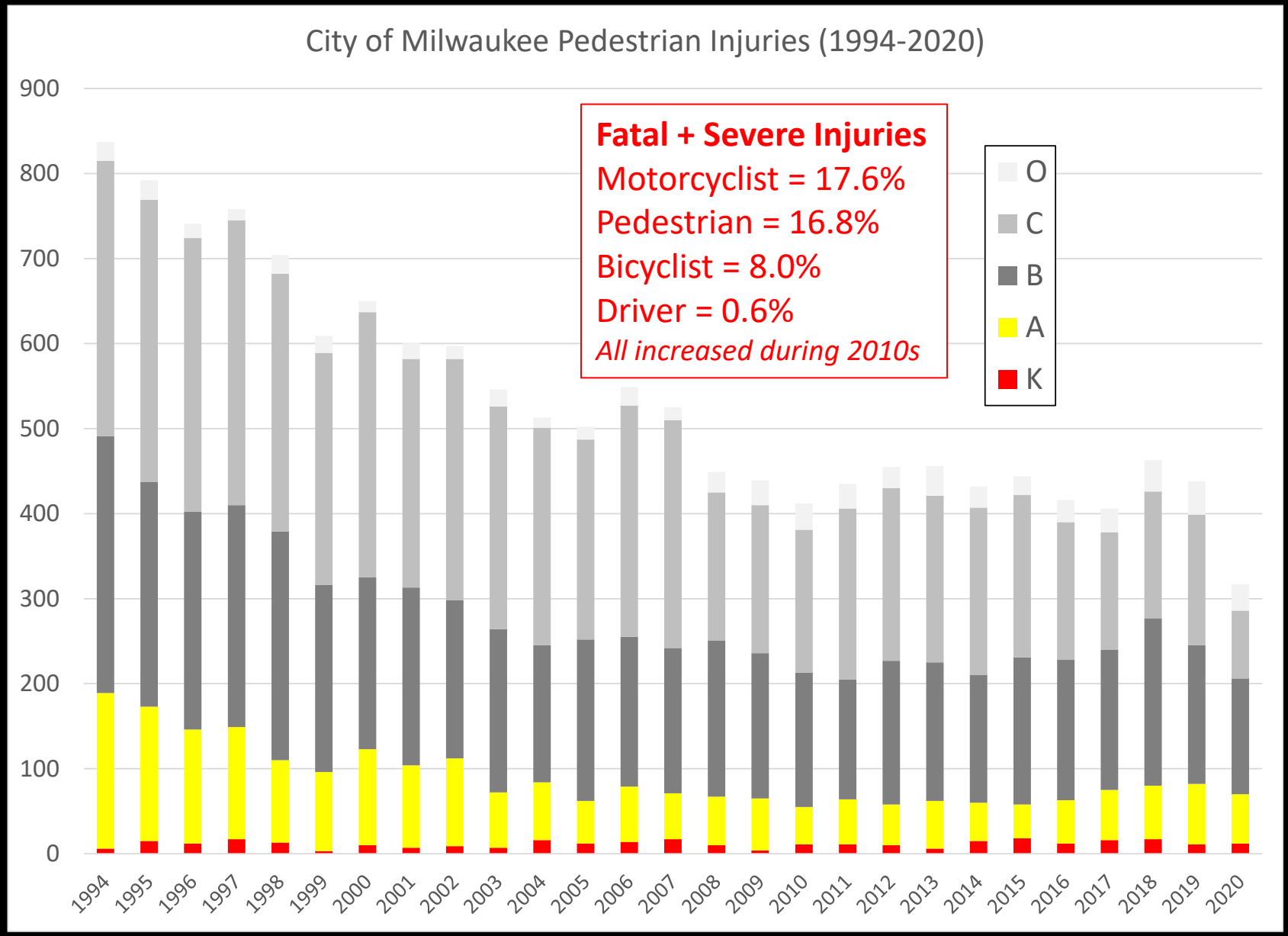
1) Milwaukee Traffic Crash Trends



Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

1,238 fatalities

1) Milwaukee Traffic Crash Trends



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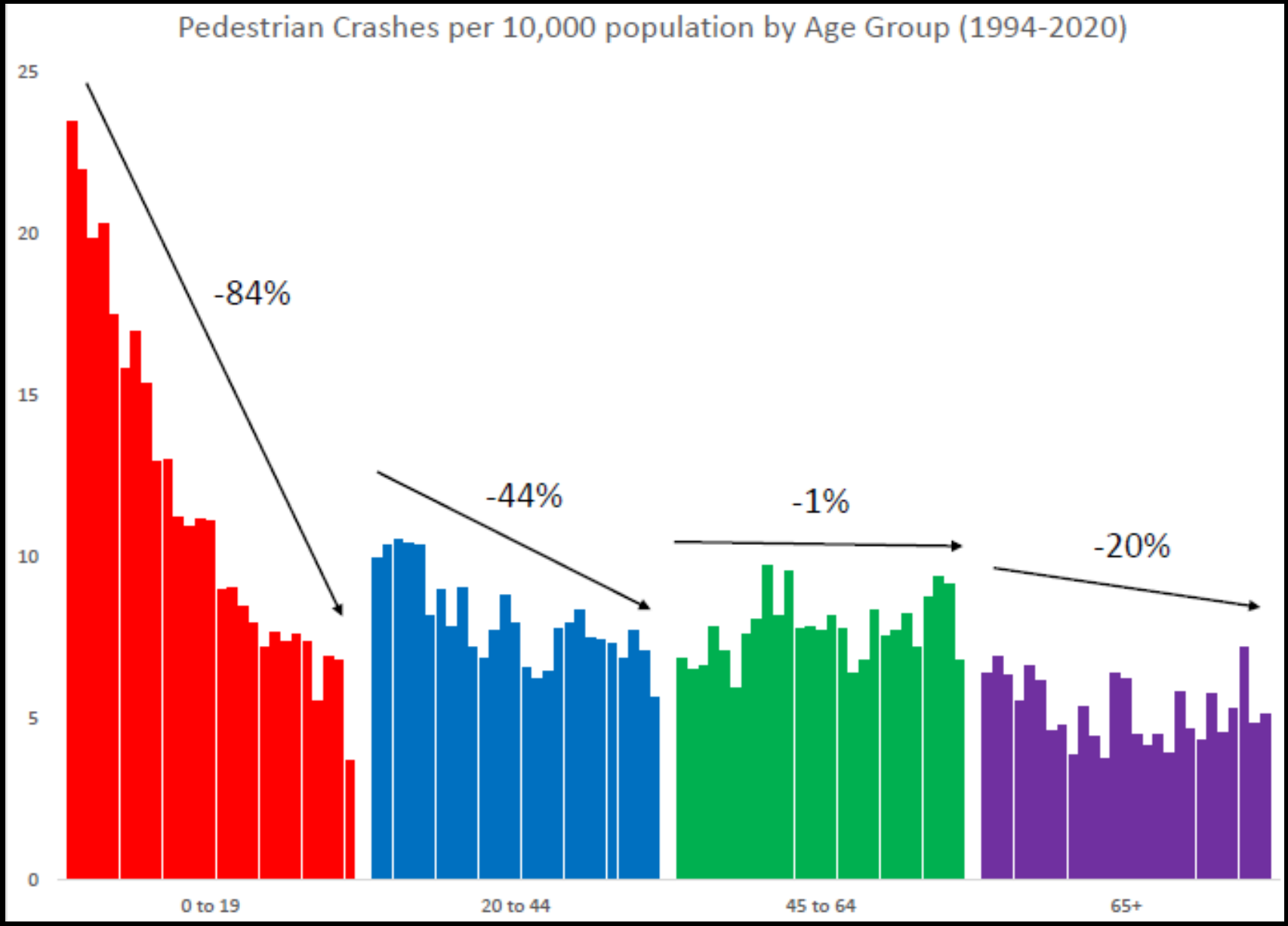

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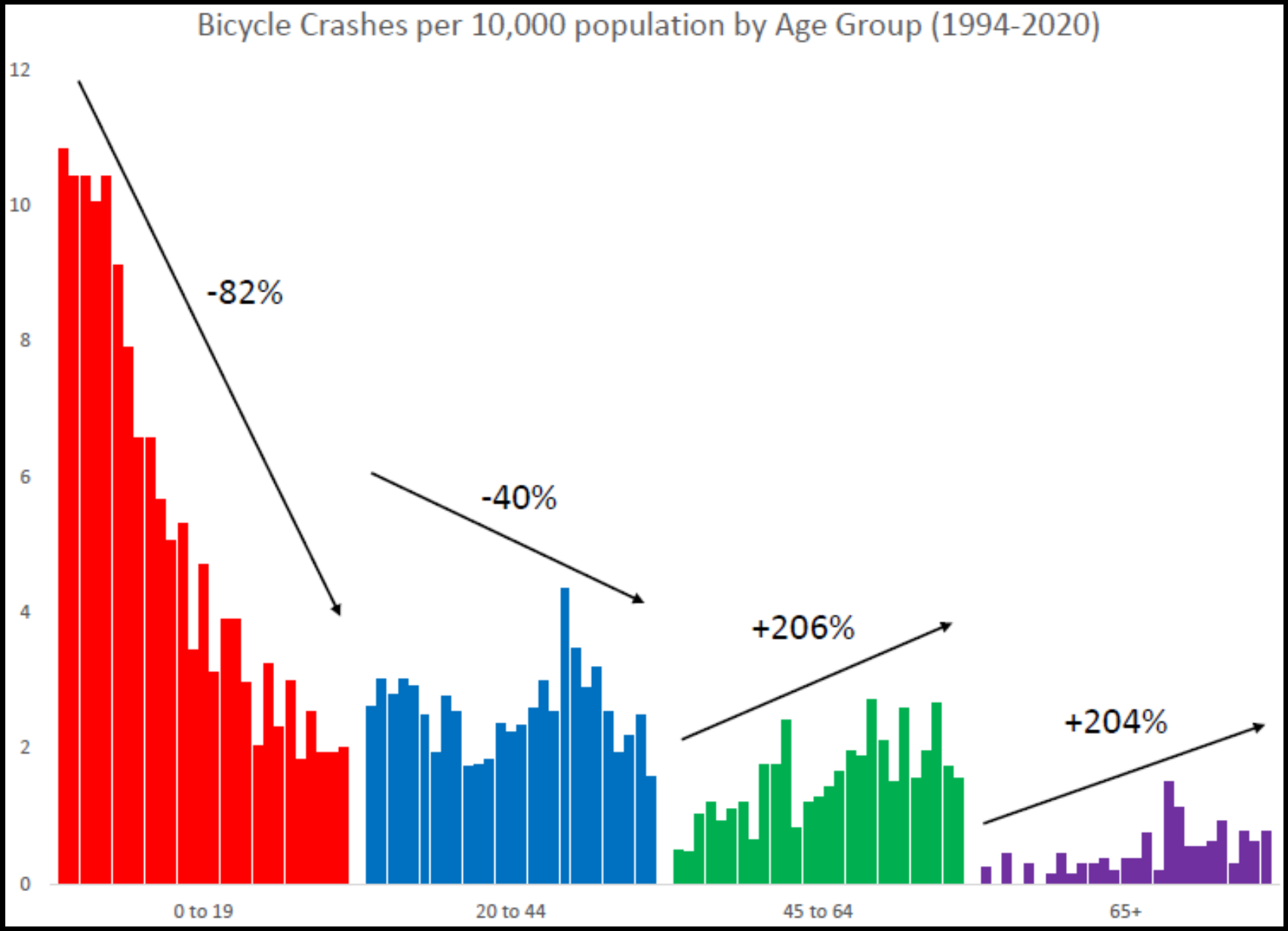


Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

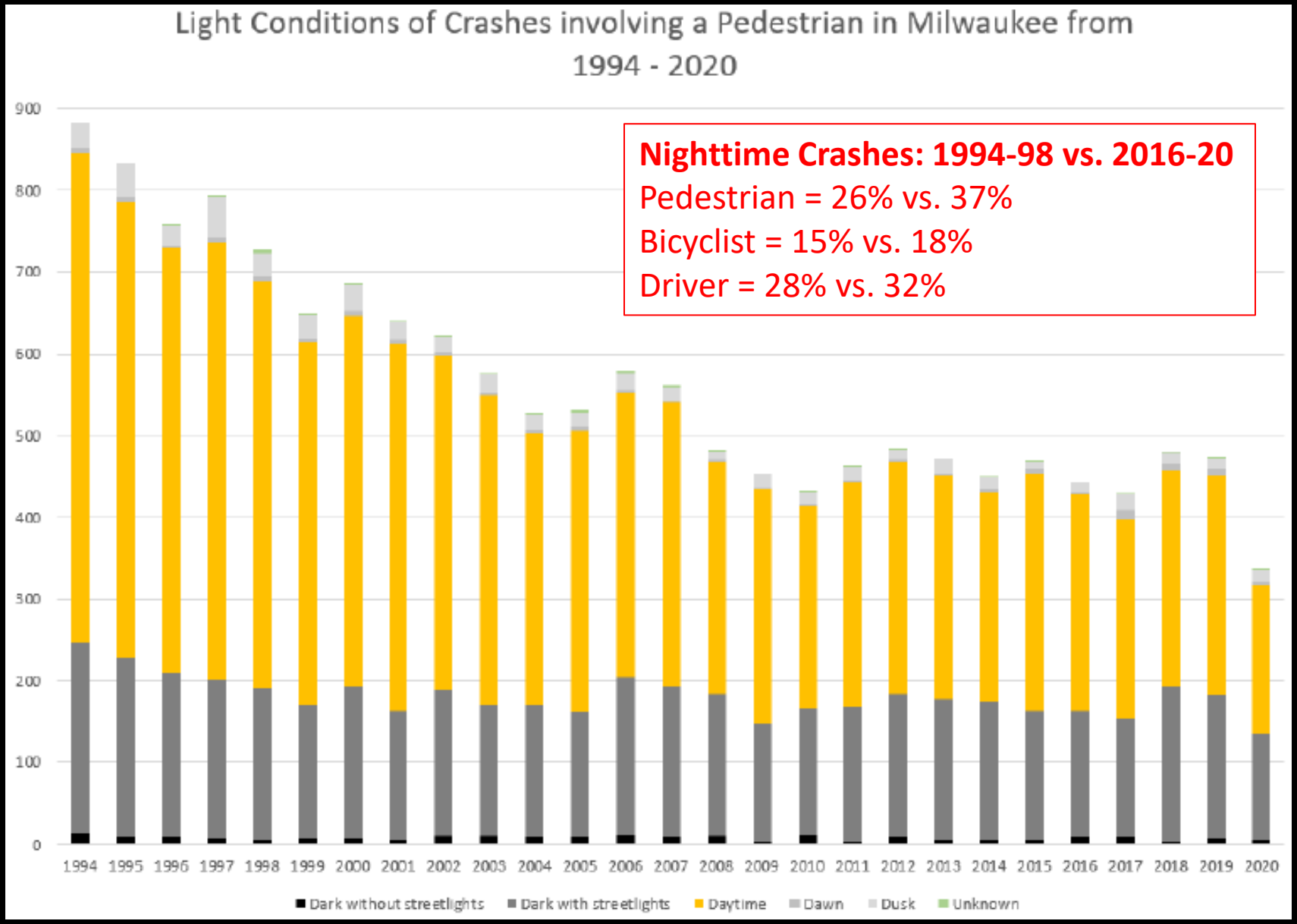
1) Milwaukee Traffic Crash Trends

Motor vehicle movement prior to crash

- Majority = straight
- Left turn vs. Right turn
  - Motor vehicle crash: 9% vs. 3%
  - Bicyclist crash: 12% vs. 23%
  - Pedestrian crash: 14% vs. 9% *(left increasing over time)*

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

1) Milwaukee Traffic Crash Trends



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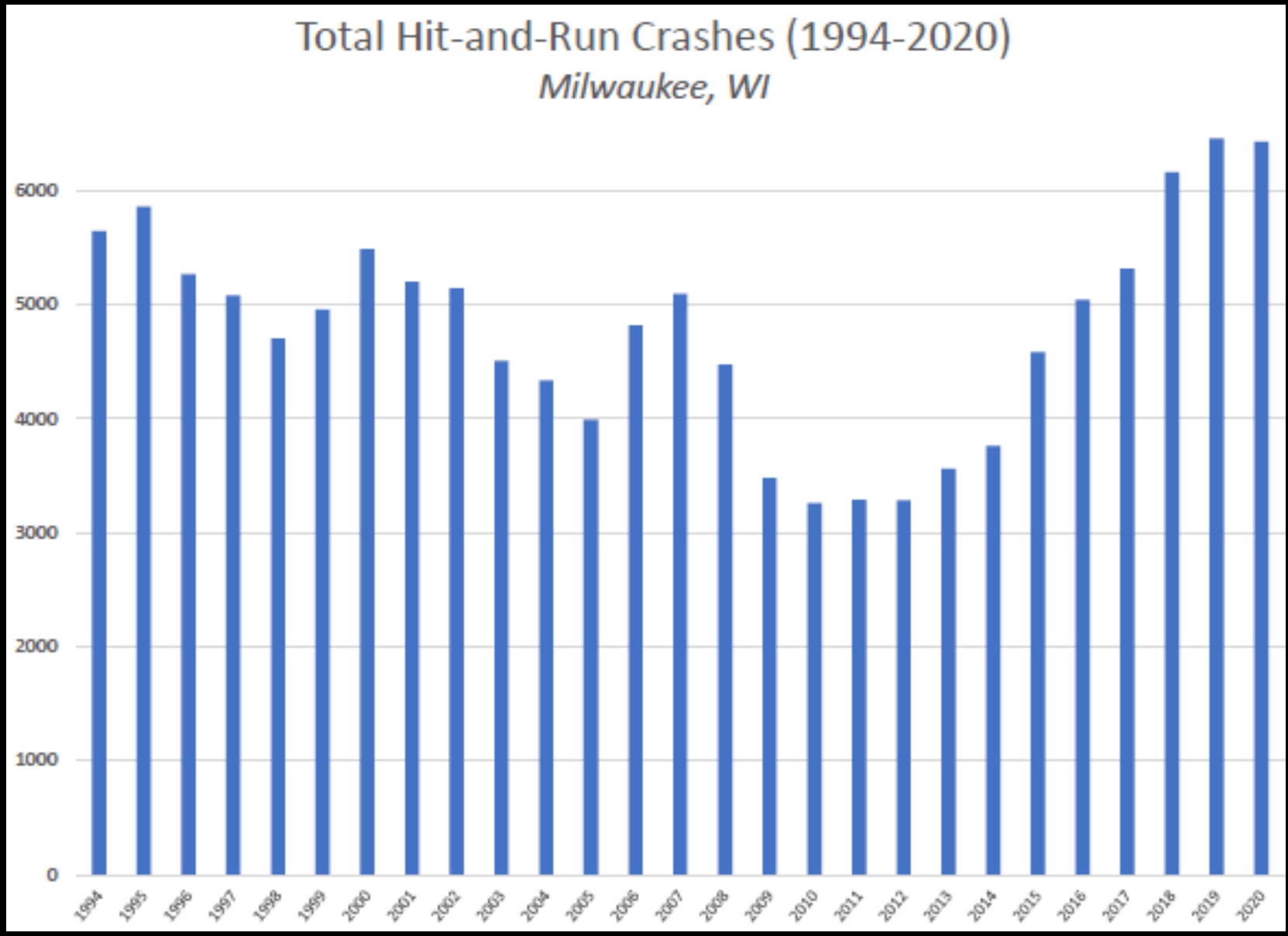

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

1) Milwaukee Traffic Crash Trends

	Population (2020)	Total Crashes (2017-20)	Hit-and-Run Crashes (2017-20)	Hit-and-Run %
Milwaukee	577,222	75,530	24,363	32%
Madison	269,840	19,664	3,230	16%
Green Bay	107,395	3,626	452	12%
Kenosha	99,986	8,657	1,803	20%
Racine	77,816	8,664	2,509	29%
Appleton	75,644	5,375	485	9%
Waukesha	71,158	5,220	554	10%
Eau Claire	69,421	7,369	1,540	20%
Oshkosh	66,816	5,664	529	9%
Janesville	65,615	6,315	1,066	17%
Statewide	*5,893,718*	*468,402*	*76,396*	*16%*

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

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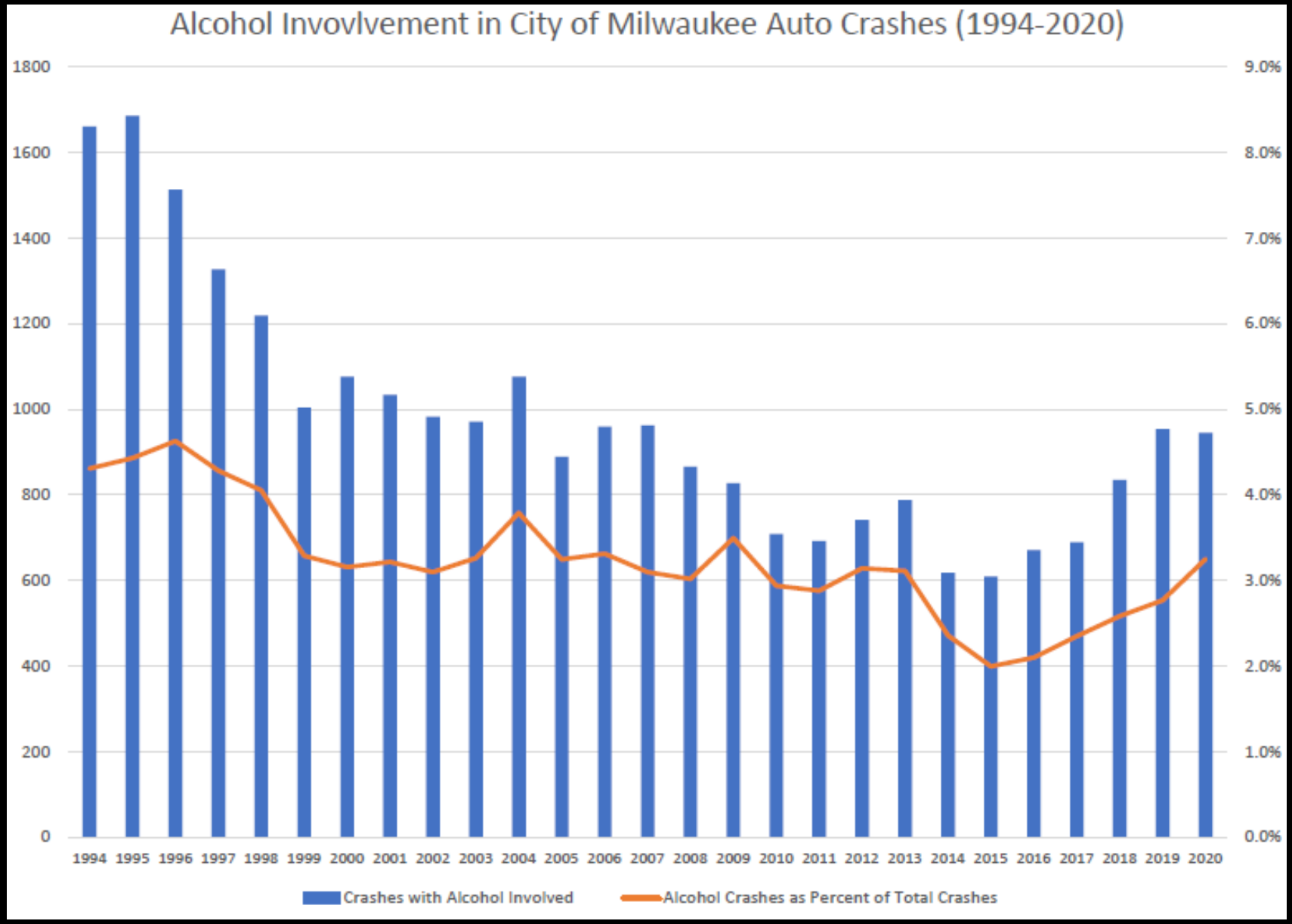

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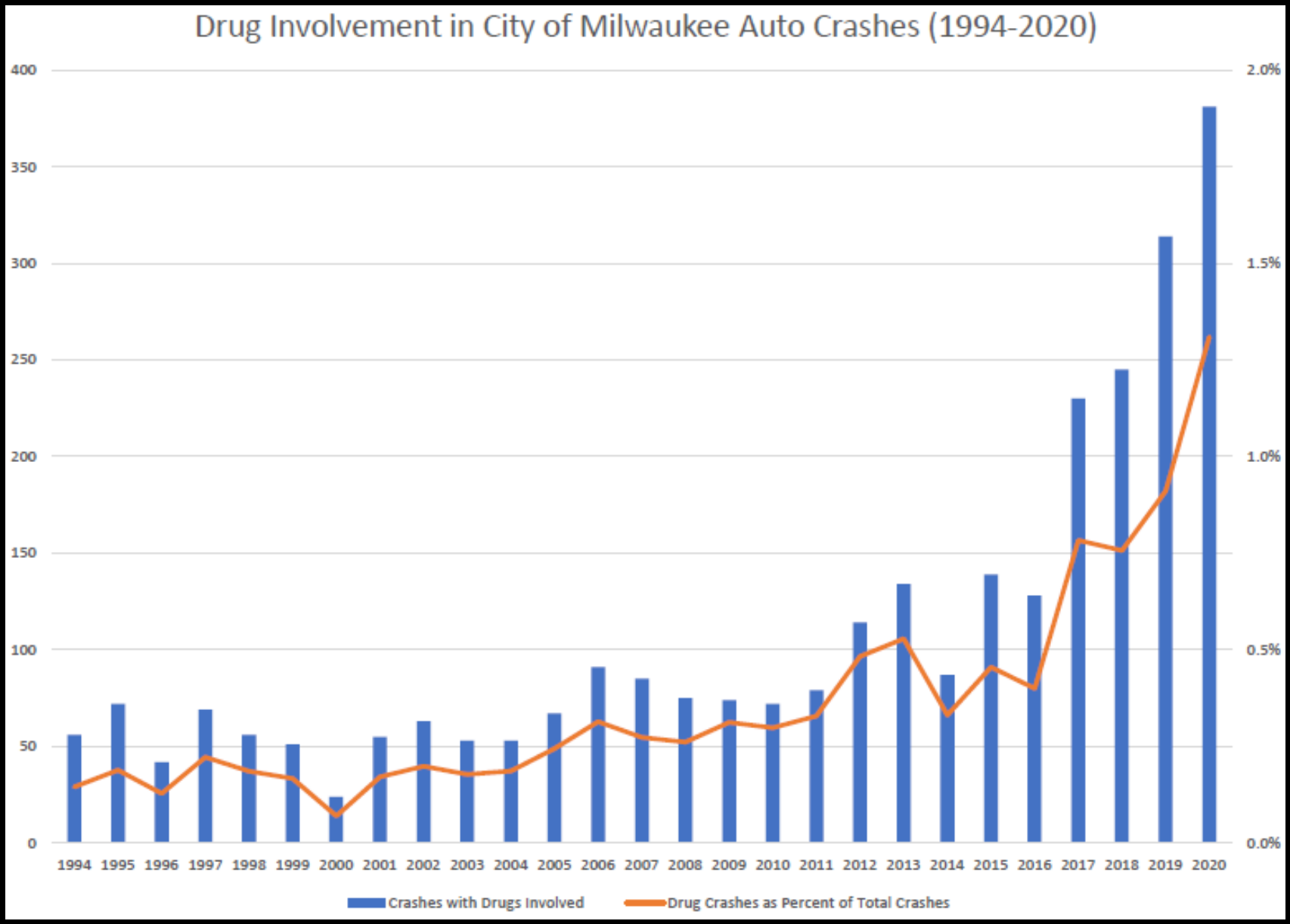

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2) Factors in Fatal & Severe Injuries

Table 26: Relationships between Fatal and Severe Injuries and Demographic Characteristics (Part 2: Sex and Race)

	Driver				Pedestrian				Bicycle			
Variable	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]
Driver Sex	**223,789**	**100%**	**0.88%**		**2,952**	**100%**	**16.02%**		**1,113**	**100%**	**6.47%**	
Male	127,730	57.08%	1.04%	+++	1750	59.28%	17.89%	+++	653	58.67%	7.81%	+
Female	96,059	42.92%	0.66%	---	1202	40.72%	13.31%	---	460	41.33%	4.57%	-
Pedestrian Sex					**4,074**	**100%**	**16.67%**					
Male					2,336	57.34%	18.36%	+++				
Female					1,738	42.66%	14.38%	---				
Bicyclist Sex									**1,400**	**100%**	**6.71%**	
Male									1,121	80.07%	7.14%	NS
Female									279	19.93%	5.02%	NS

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2015-2019

2) Factors in Fatal & Severe Injuries

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Male drivers & victims, Black drivers, Older victims

(age 55-74 victim crashes becoming more common)

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2015-2019

2) Factors in Fatal & Severe Injuries

Table 23: Relationships between Fatal and Severe Injuries and Street Characteristics

	Driver				Pedestrian				Bicycle			
Variable	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]
Speed Limit	**153,916**	**100.0%**	**0.83%**		**4,101**	**100.0%**	**16.58%**		**1,422**	**100.0%**	**6.68%**	
<30 mph	42,366	27.5%	0.66%	- - -	912	22.2%	15.46%	NS	302	21.2%	7.28%	NS
30-35 mph	104,500	67.9%	0.86%	NS	3,062	74.7%	16.79%	NS	1,087	76.4%	6.44%	NS
>35 mph	7,050	4.6%	1.42%	+++	127	3.1%	19.69%	NS	33	2.3%	9.09%	NS
AADT[2]	**153,916**	**100.0%**	**0.83%**		**4,101**	**100.0%**	**16.58%**		**1,422**	**100.0%**	**6.68%**	
<1,000	20,536	13.3%	0.58%	- - -	475	11.6%	14.53%	NS	137	9.6%	7.30%	NS
1,000-3,000	10,228	6.6%	0.83%	NS	234	5.7%	16.24%	NS	78	5.5%	10.26%	NS
3,000-5,000	5,967	3.9%	0.57%	-	130	3.2%	17.69%	NS	51	3.6%	3.92%	NS
5,000-10,000	24,225	15.7%	0.71%	-	650	15.8%	15.69%	NS	242	17.0%	8.26%	NS
10,000-15,000	27,923	18.1%	0.92%	NS	861	21.0%	16.38%	NS	313	22.0%	6.07%	NS
15,000-20,000	20,741	13.5%	0.80%	NS	622	15.2%	14.63%	NS	294	20.7%	5.44%	NS
20,000-30,000	29,377	19.1%	0.98%	++	779	19.0%	19.00%	+	215	15.1%	6.51%	NS
>30,000	14,287	9.3%	1.04%	++	345	8.4%	19.71%	NS	92	6.5%	6.52%	NS

Higher speed limits; Higher traffic volumes

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2015-2019

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>30,000	14,287	9.3%	1.04%	++	345	8.4%	19.71%	NS	92	6.5%	6.52%	NS

Higher speed limits; Higher traffic volumes

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022. 2015-2019

2) Factors in Fatal & Severe Injuries

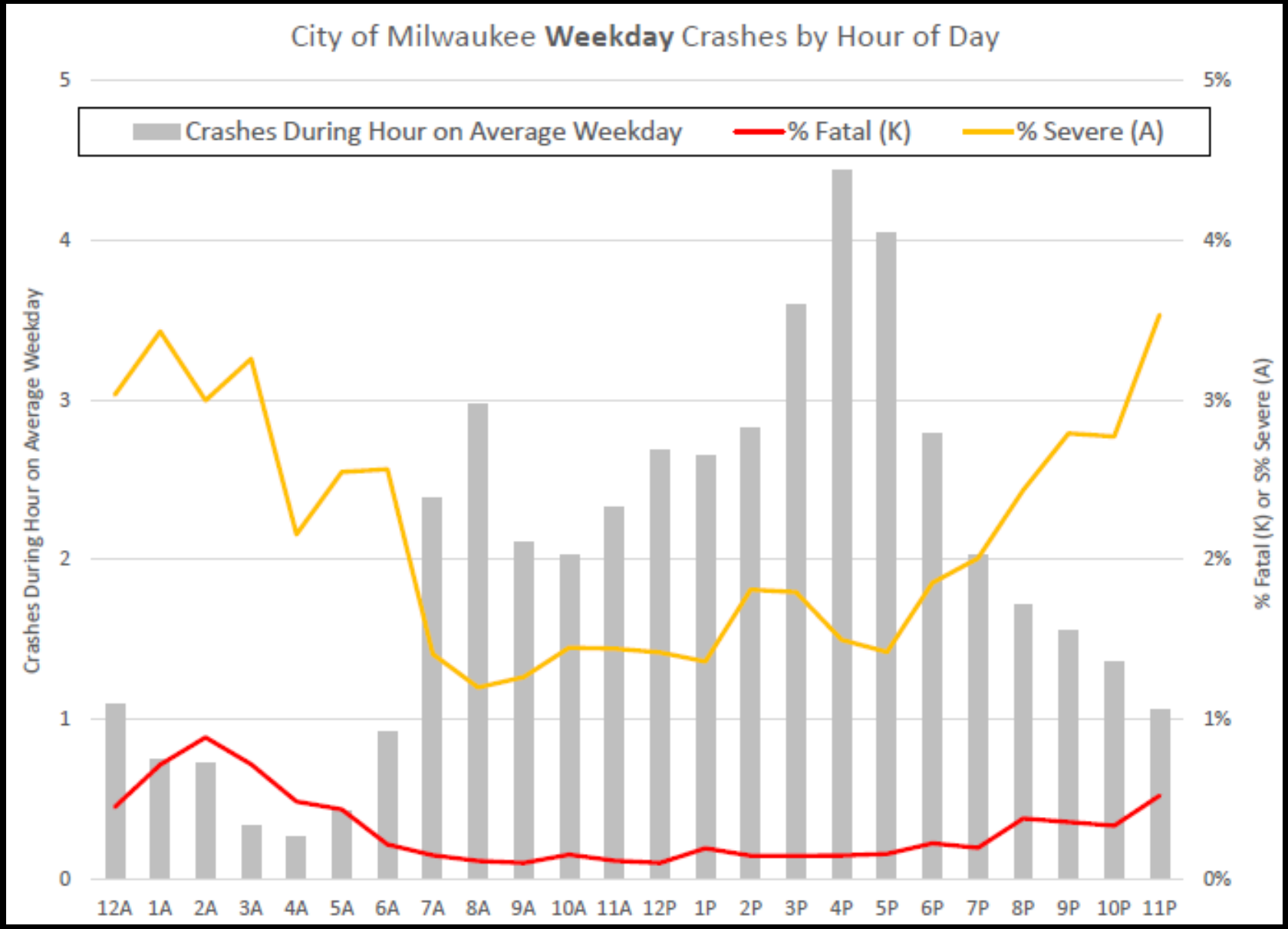
Table 24: Relationships between Fatal and Severe Injuries and Location and Environment Characteristics

	Driver				Pedestrian				Bicycle			
Variable	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]
Location Type	153,916	100.0%	0.83%		4,101	100.0%	16.58%		1,422	100.0%	6.68%	
Intersection	98,918	64.3%	0.75%	- - -	3,003	73.2%	13.99%	- - -	1,168	82.1%	6.76%	NS
Non-Intersection	54,998	35.7%	0.97%	+++	1,098	26.8%	23.68%	+++	254	17.9%	6.30%	NS
Intersection Type	98,918	100.0%	0.75%		3,003	100.0%	13.99%		1,168	100.0%	6.68%	
Signalized Intersection	44,898	45.39%	0.74%	NS	1,553	51.71%	14.68%	NS	526	45.03%	5.51%	NS
Non-signalized Intersection	54,020	54.61%	0.75%	NS	1,450	48.29%	13.24%	NS	642	54.97%	7.79%	NS
Light Conditions[2]	146,789	100.0%	0.84%		3,916	100.0%	16.60%		1,633	100.0%	22.23%	
Daytime	96,155	65.5%	0.61%	- - -	2,329	59.5%	12.15%	- - -	1,031	63.1%	6.01%	- - -
Darkness with street lighting	49,447	33.7%	1.28%	+++	1,525	38.9%	23.08%	+++	578	35.4%	50.00%	+++
Darkness with no street lighting	1,201	0.8%	0.67%	NS	62	1.6%	24.19%	NS	24	1.5%	50.00%	+++

Non-intersections *(non-intersection crashes becoming more common)*; **Darkness**

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2) Factors in Fatal & Severe Injuries



Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2) Factors in Fatal & Severe Injuries

Table 28: Relationships between Fatal and Severe Injuries and Driver Actions

	Driver				Pedestrian				Bicycle			
Variable	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]	n	% of total crashes	% K+A	Sig.[1]
Driver Action	**213,587**	**100%**	**0.82%**		**3,439**	**100%**	**16.49%**		**1,239**	**100%**	**6.38%**	
Left Turn	25,303	11.85%	0.44%	---	829	24.11%	9.17%	---	219	17.68%	7.31%	NS
Right Turn[2]	10,121	4.74%	0.17%	---	432	12.56%	7.41%	---	318	25.67%	2.20%	---
Going Straight[3]	166,211	77.82%	0.89%	+++	2,137	62.14%	21.01%	+++	654	52.78%	7.80%	+
Overtaking on left	1,002	0.47%	1.70%	++	13	0.38%	15.38%	NS	4	0.32%	0.00%	NS
Overtaking on right	985	0.46%	1.42%	+	14	0.41%	35.71%	NS	6	0.48%	16.67%	NS
Violating no pass zone	81	0.04%	0.00%	NS	3	0.09%	66.67%	+	2	0.16%	0.00%	NS
Merging or changing lanes	5,664	2.65%	0.44%	--	10	0.29%	10.00%	NS	5	0.40%	20.00%	NS
Other	4,220	1.98%	1.59%	+++	1	0.03%	0.00%	NS	3	2.50%	9.68%	NS

Going straight; Passing on left or right ***(passing crashes becoming more common)***

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2) Factors in Fatal & Severe Injuries

Table 30: Relationship between Fatal and Severe injuries and Drug and Alcohol Involvement

	Driver				Pedestrian				Bicycle			
	n	% of total crashes	% K&A	Sig.[1]	n	% of total crashes	% K&A	Sig.[1]	n	% of total crashes	% K&A	Sig.[1]
Alcohol[2]	110,671	100%	1.00%		2,681	100%	15.52%		1,031	100%	5.92%	
Involved	4,812	4.35%	4.16%	+++	275	10.26%	33.82%	+++	35	3.39%	20.00%	+++
Not Involved	105,859	95.65%	0.85%	---	2,406	89.74%	13.42%	---	996	96.61%	5.42%	---
Drugs[2]	110,220	100%	1.00%		2,590	100%	15.02%		1,023	100%	5.87%	
Involved	1,172	1.06%	9.39%	+++	64	2.47%	68.75%	+++	9	0.88%	44.44%	+++
Not Involved	109,048	98.94%	0.91%	---	2,526	97.53%	13.66%	---	1,014	99.12%	5.52%	---

Alcohol or Drug involvement ***(drug crashes becoming more common)***

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

2) Factors in Fatal & Severe Injuries

Table 29: Relationship between Fatal and Severe injuries and Hit-and-Run Crashes

	Driver				Pedestrian				Bicycle			
	n	% of total crashes	% K&A	Sig.[1]	n	% of total crashes	% K&A	Sig.[1]	n	% of total crashes	% K&A	Sig.[1]
All crashes	153,916	100%	0.83%		4,101	100%	16.58%		1,422	100%	6.68%	
Hit-and-run crashes	43,792	28.45%	0.38%	---	1,438	35.06%	20.58%	+++	371	26.09%	9.16%	+
Not hit-and-run crashes	110,124	71.55%	1.01%	+++	2,663	64.94%	14.42%	---	1,051	73.91%	5.80%	-

Hit-and-Run (for pedestrians & bicyclists) ***(hit & run becoming more common)***

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

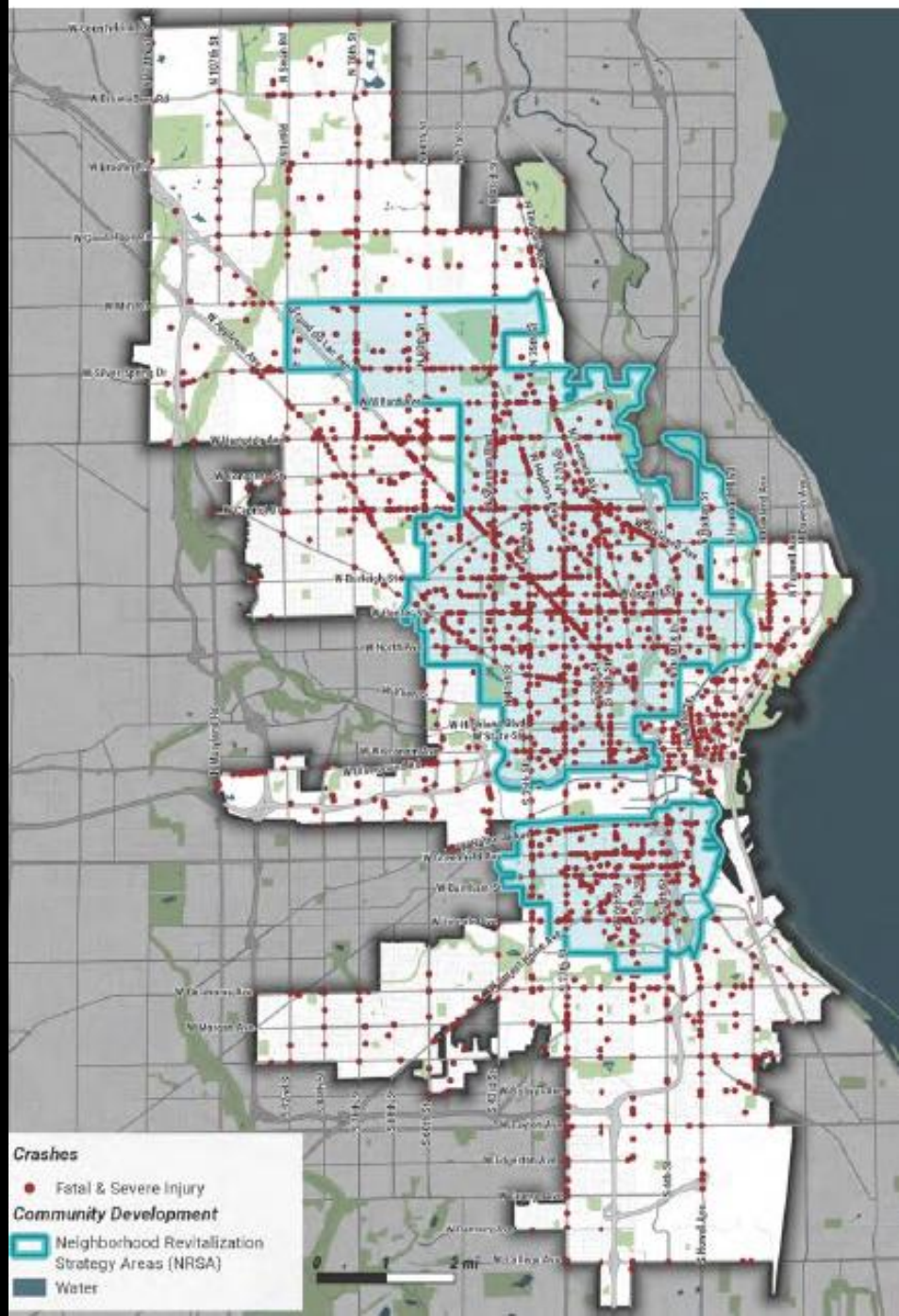
3) Geographic Distribution of Crashes

<u>Lower-income area overrepresentation</u>

- Male & younger
- 30-35 MPH
- <1K & 10K-20K AADT
- Passing on left/right
- Alcohol & drug
- Hit-and-run

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

Figure 65: Distribution of Fatal and Severe Injury Crashes in Relation to NRSAs

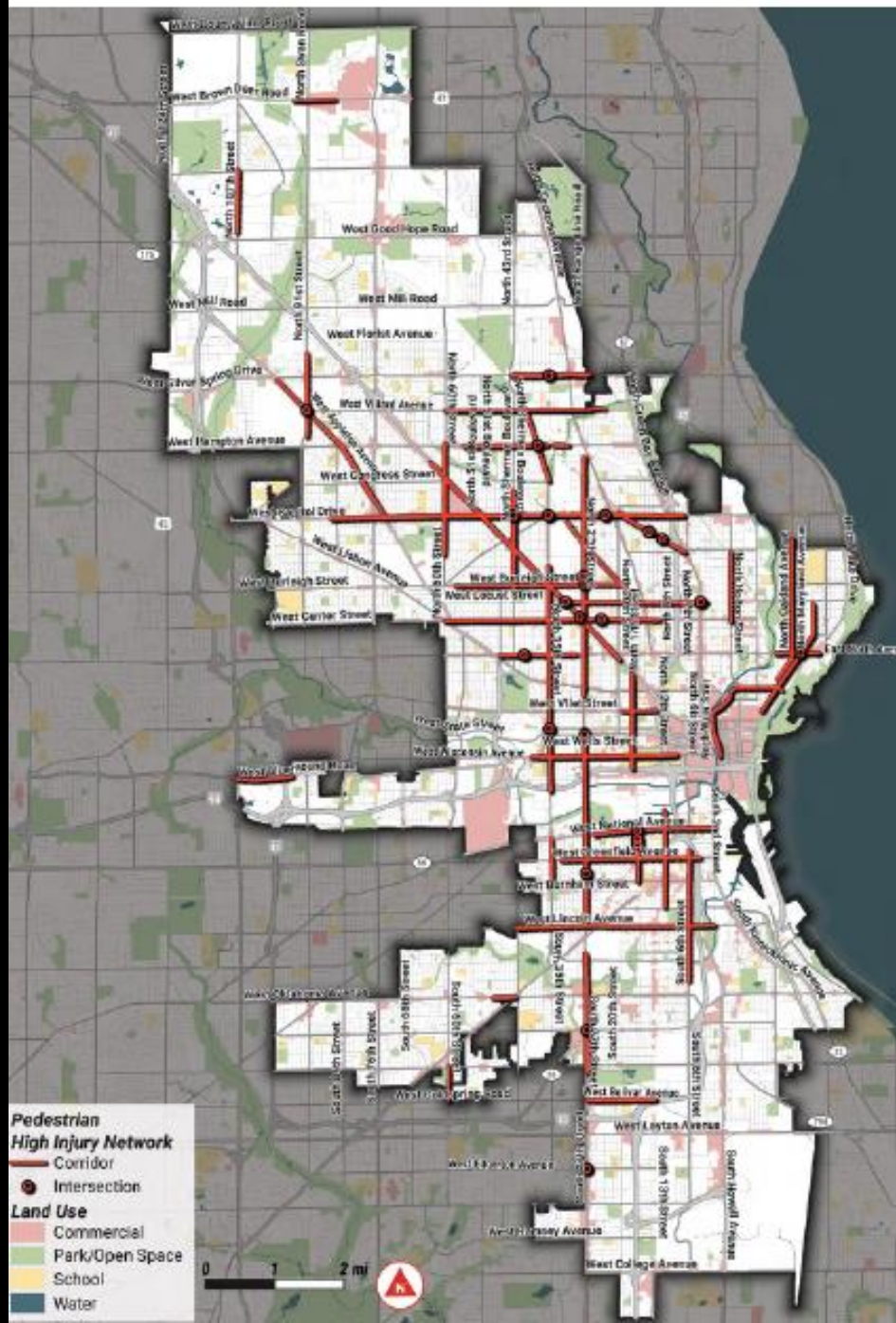


3) Geographic Distribution of Crashes

Pedestrian High-Injury Network

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

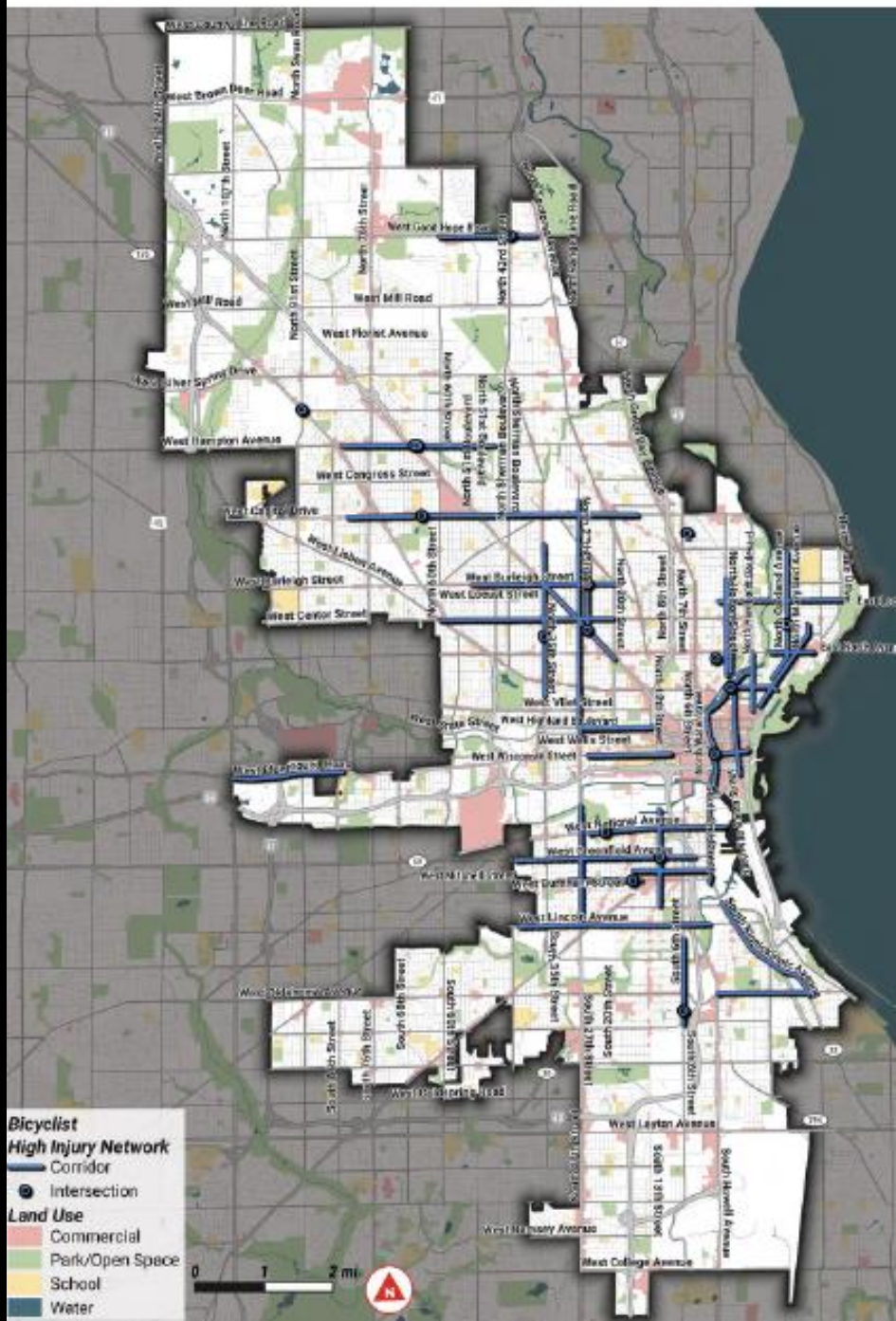
Figure 13: Pedestrian High Injury Network



3) Geographic Distribution of Crashes

Bicyclist
High-Injury Network

Figure 14: Bicyclist High Injury Network



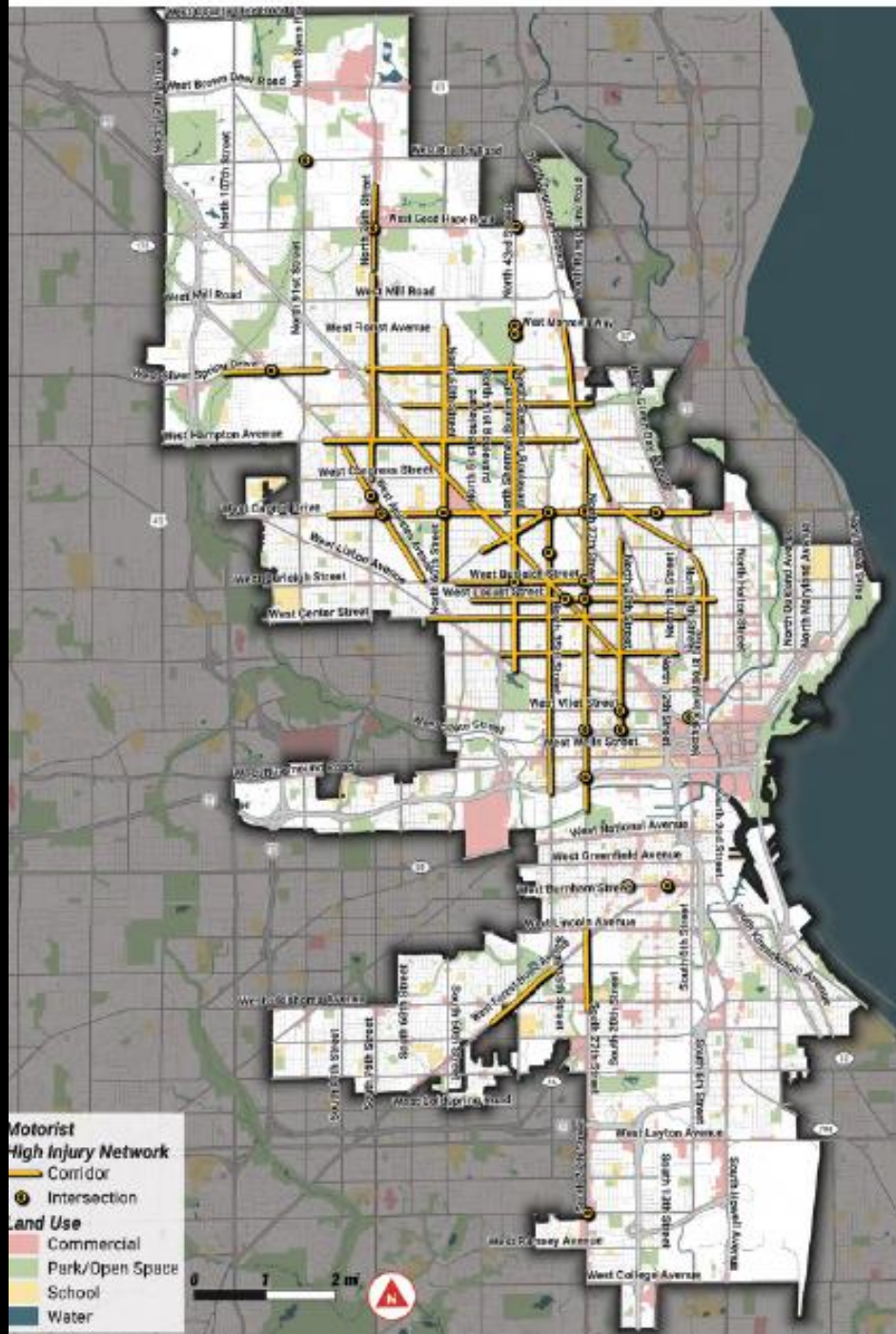
Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

3) Geographic Distribution of Crashes

Motorist High-Injury Network

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

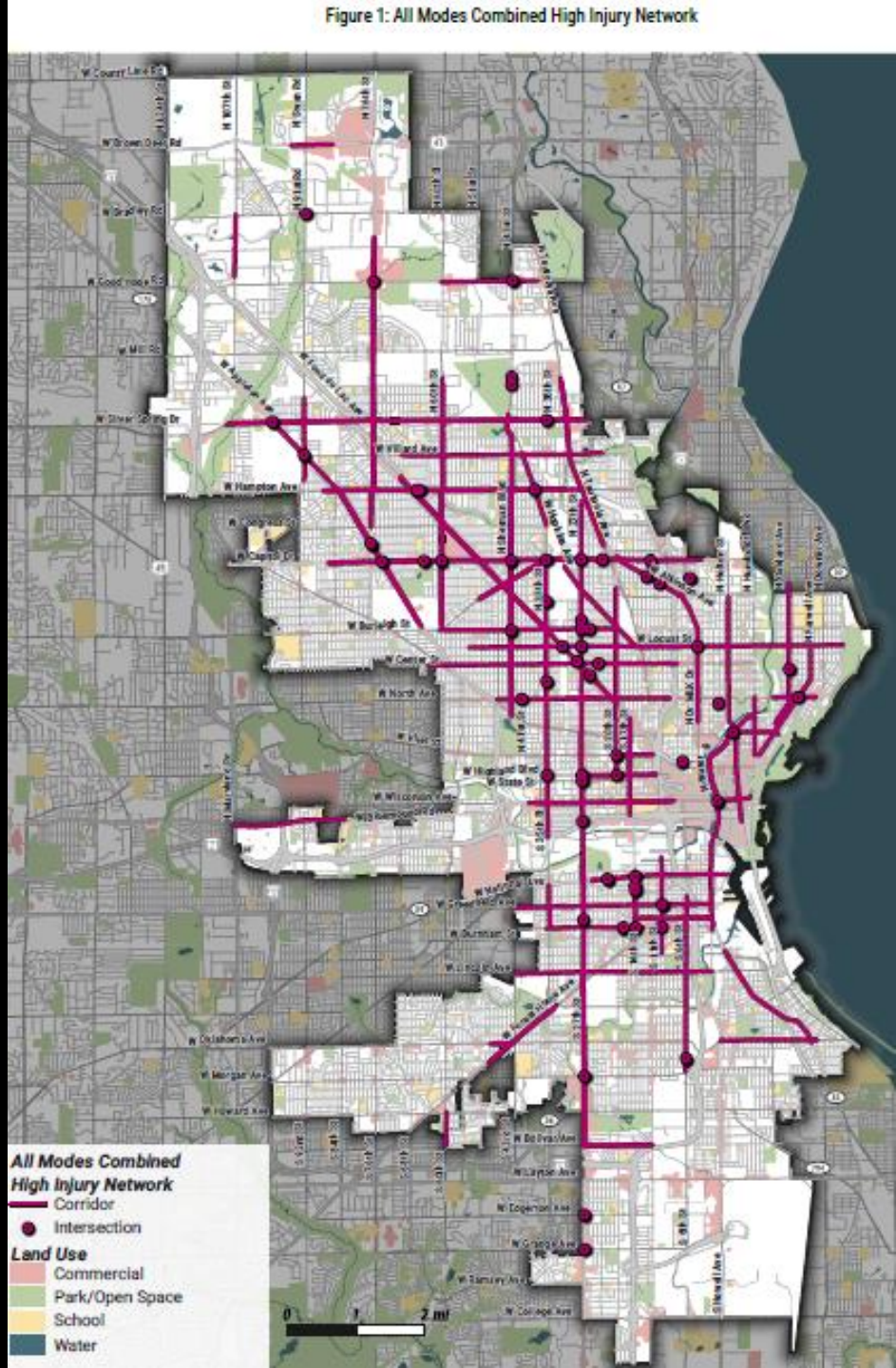
Figure 15: Motorist High Injury Network



3) Geographic Distribution of Crashes

Combined High-Injury Network

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.



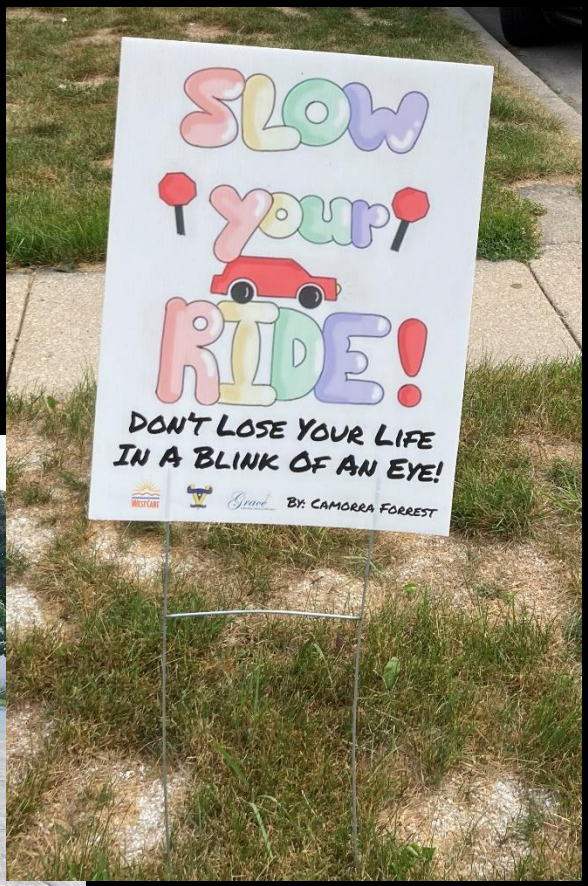
How should we create a safer system?

A few thoughts…

Source: City of Milwaukee, Department of Public Works. Milwaukee Crash Analysis. Draft. September 2022.

Work with Community: Slow Vehicle Speeds

N. 1st St



N. 2nd St

N. 2nd St

Work with Community: Slow Vehicle Speeds

N. 27th St

W. Galena St

N. 27th St

Increase walking, bicycling & transit

All else equal, communities that have more walking and bicycling are safer for pedestrians, bicyclists, and <u>everyone</u>

Source: Jacobsen, P.L. "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling," Injury Prevention, Volume 9, pp. 205-209, 2003.
Source: Marshall, W.E. and N.W. Garrick. "Evidence on Why Bike-Friendly Cities Are Safer for All Road Users," Environmental Practice, Volume 13, Number 1, pp. 16-27, 2011.

Increase walking, bicycling & transit

E. Center Street

Questions & Discussion

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