Data-Driven Motorcycle Safety

Recent Trends in Central Ohio

SMSA Summit | *Friday, September 15th, 2023*

MID-OHIO REGIONAL
MORPC
PLANNING COMMISSION

Agenda

- About MORPC
  - 10-County Central Ohio Region
  - Regional Priorities
  - Safe System Approach
- Central Ohio Crash Trends (2018-2022)
  - Vulnerable Road Users
  - Severe Crash Types
- Motorcycle Crash Trends
  - Overview
  - Environmental Factors
  - Behavioral Factors
- Overarching Takeaways

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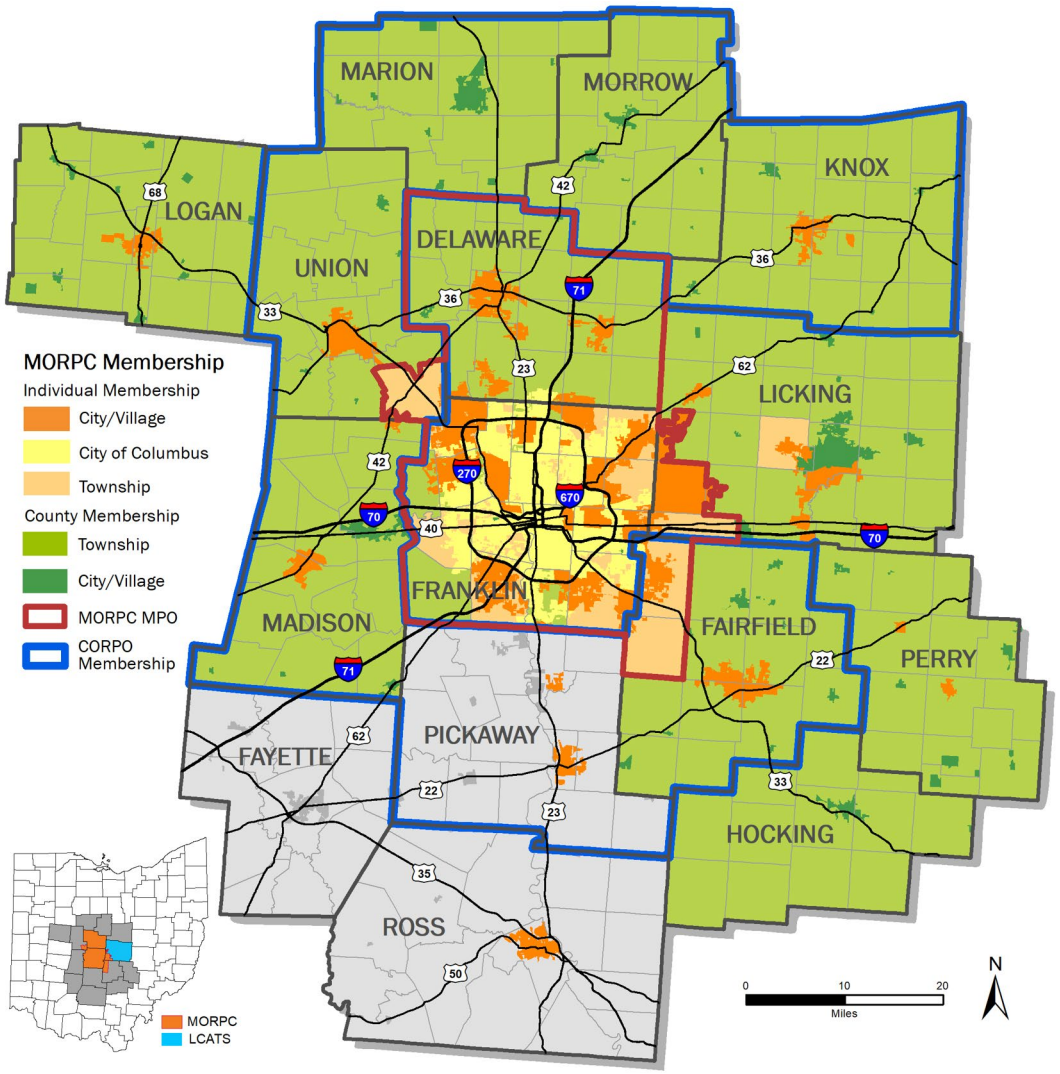
About MORPC



- Transportation & Mobility
- Direct Service Programs
- Community & Economic Development
- Planning & Sustainability
- Data & Mapping
- Engagement
- Public Policy

Metropolitan Transportation Plan (MTP)

What is the MTP?

- Long-range transportation plan for Central Ohio (MPO Planning Area)
- Identifies regional transportation strategies and projects
- Formal document submitted to ODOT and USDOT every 4 years
- Transportation projects must be on MTP to be eligible for federal funding
- Guides the work of MORPC and partners

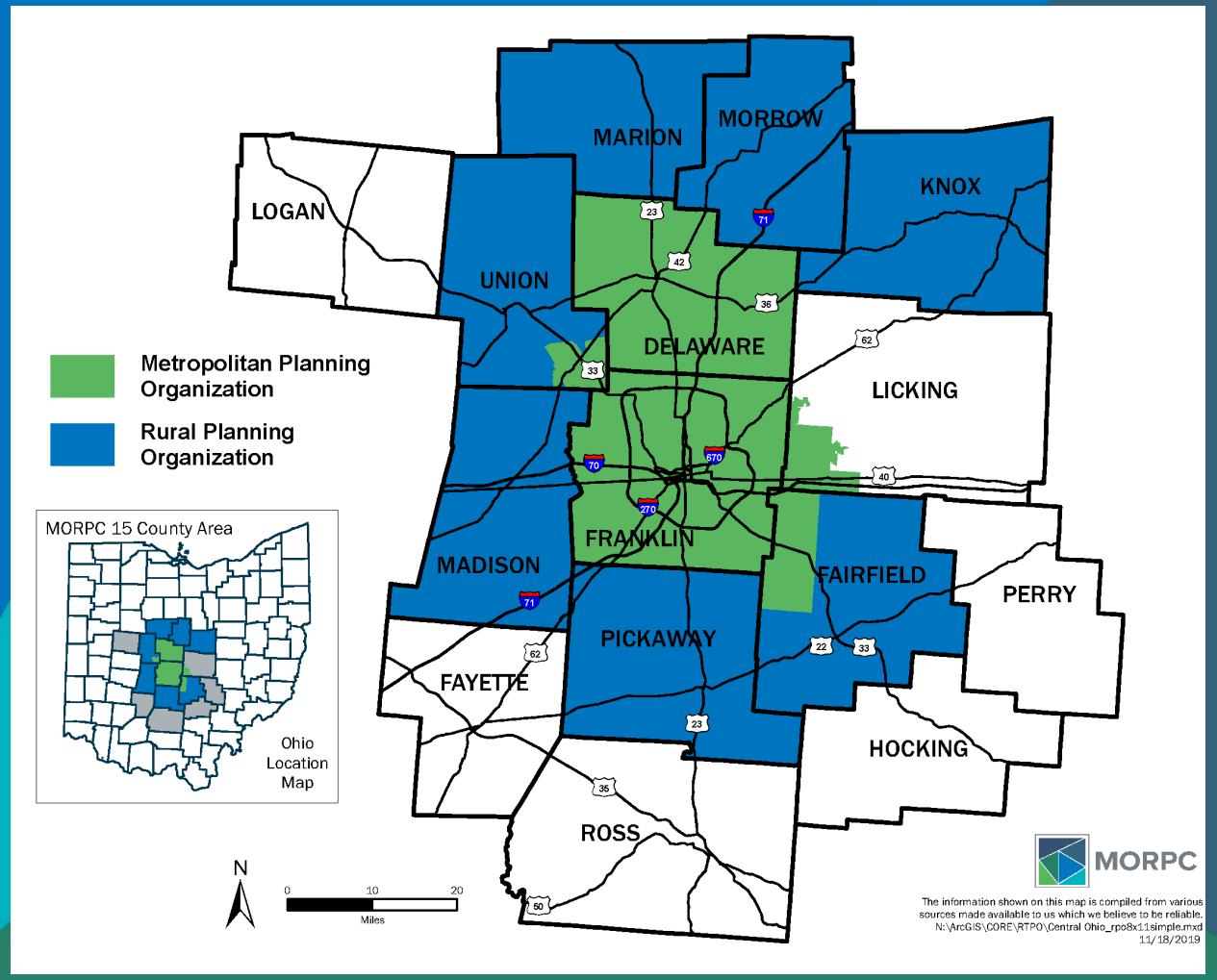
Key Safety Strategies

- Collect, develop, maintain, and analyze crash data and identify regional safety emphasis areas and priority safety locations
- Implement countermeasures that address priority safety locations
- Advance educational initiatives that address regional safety emphasis areas
- Advance legislative initiatives that address regional safety emphasis areas

Transportation Safety

MORPC Safety Program

- Regional Crash Data Analysis
- Technical Assistance
- Project Evaluation
- Special Projects and Studies
- Participation in Safety Committees
- Regional Safety Education



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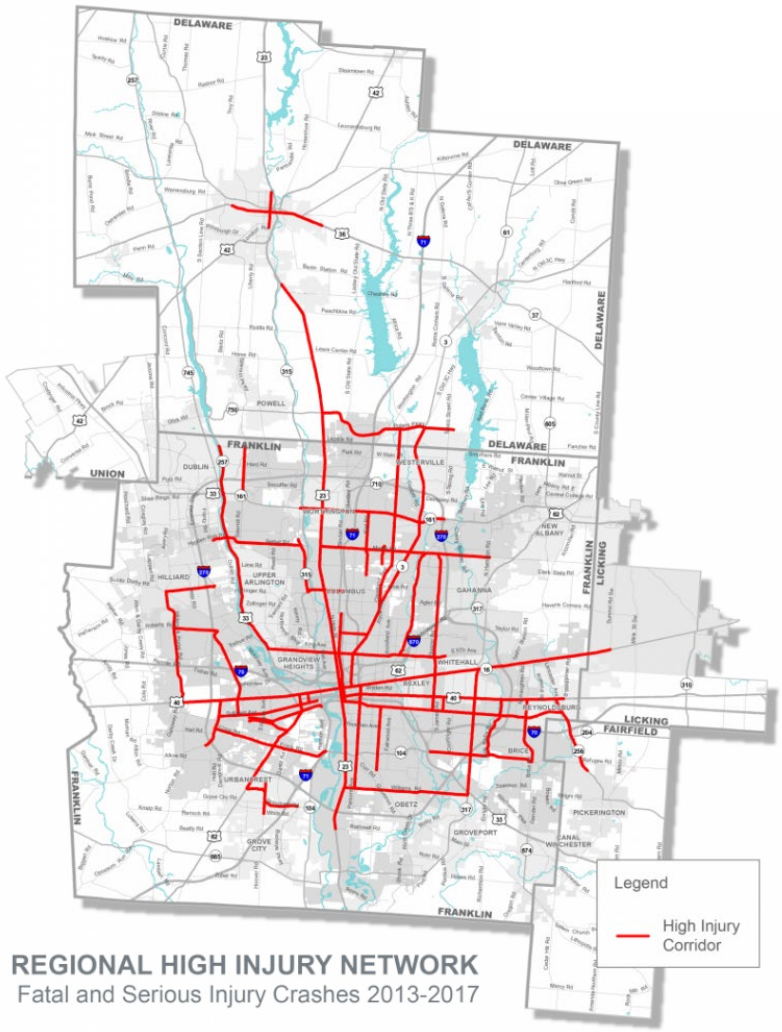
Transportation Safety at MORPC

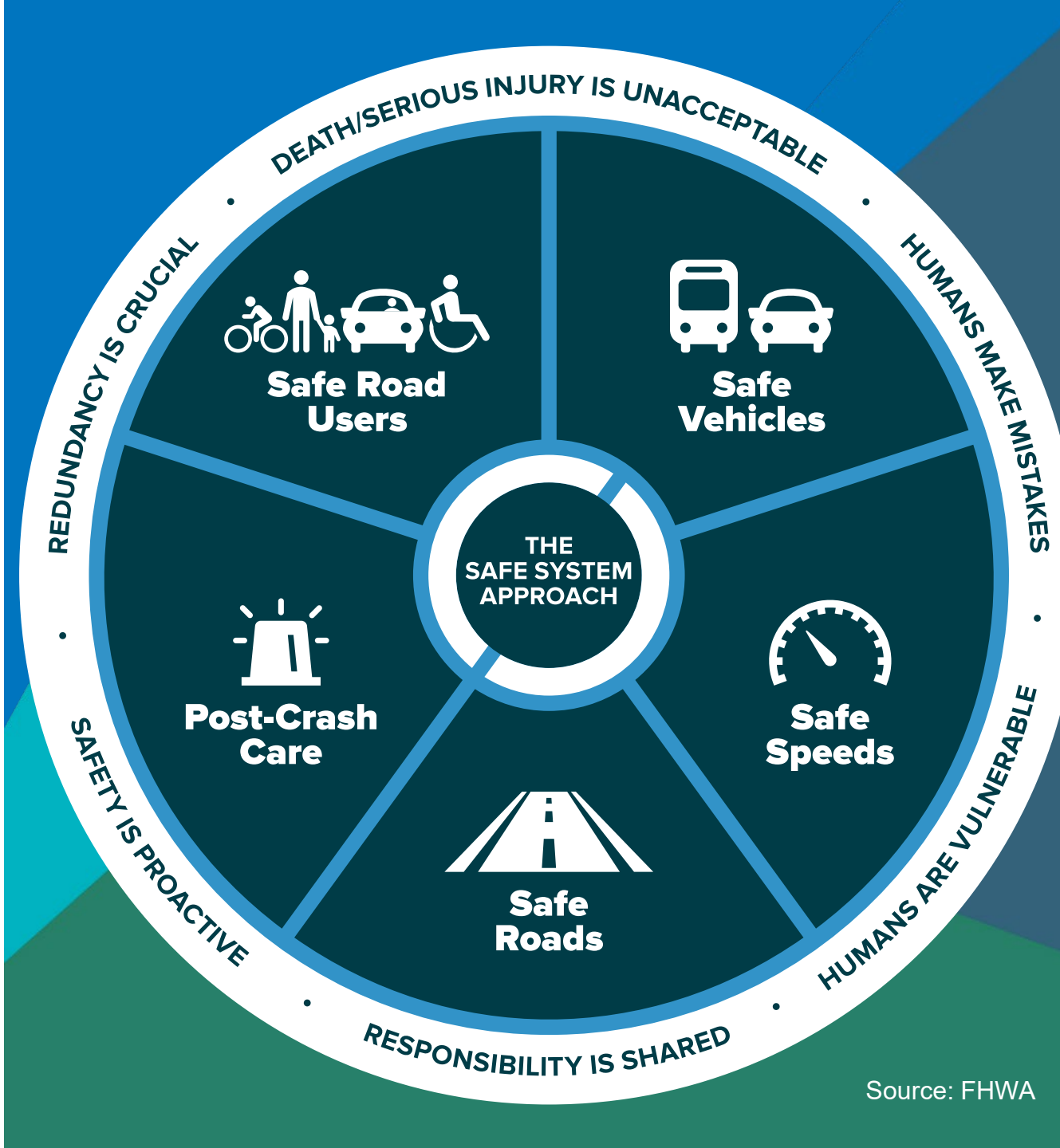


REGIONAL HIGH INJURY NETWORK
Fatal and Serious Injury Crashes 2013-2017

Safe System Approach

SAFE SYSTEM PRINCIPLES

1. Death and Serious Injury is Unacceptable
2. Humans Make Mistakes
3. Humans are Vulnerable
4. Responsibility is Shared
5. Safety is Proactive
6. Redundancy is Crucial



Source: FHWA

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Central Ohio Crash Trends

2018 - 2022

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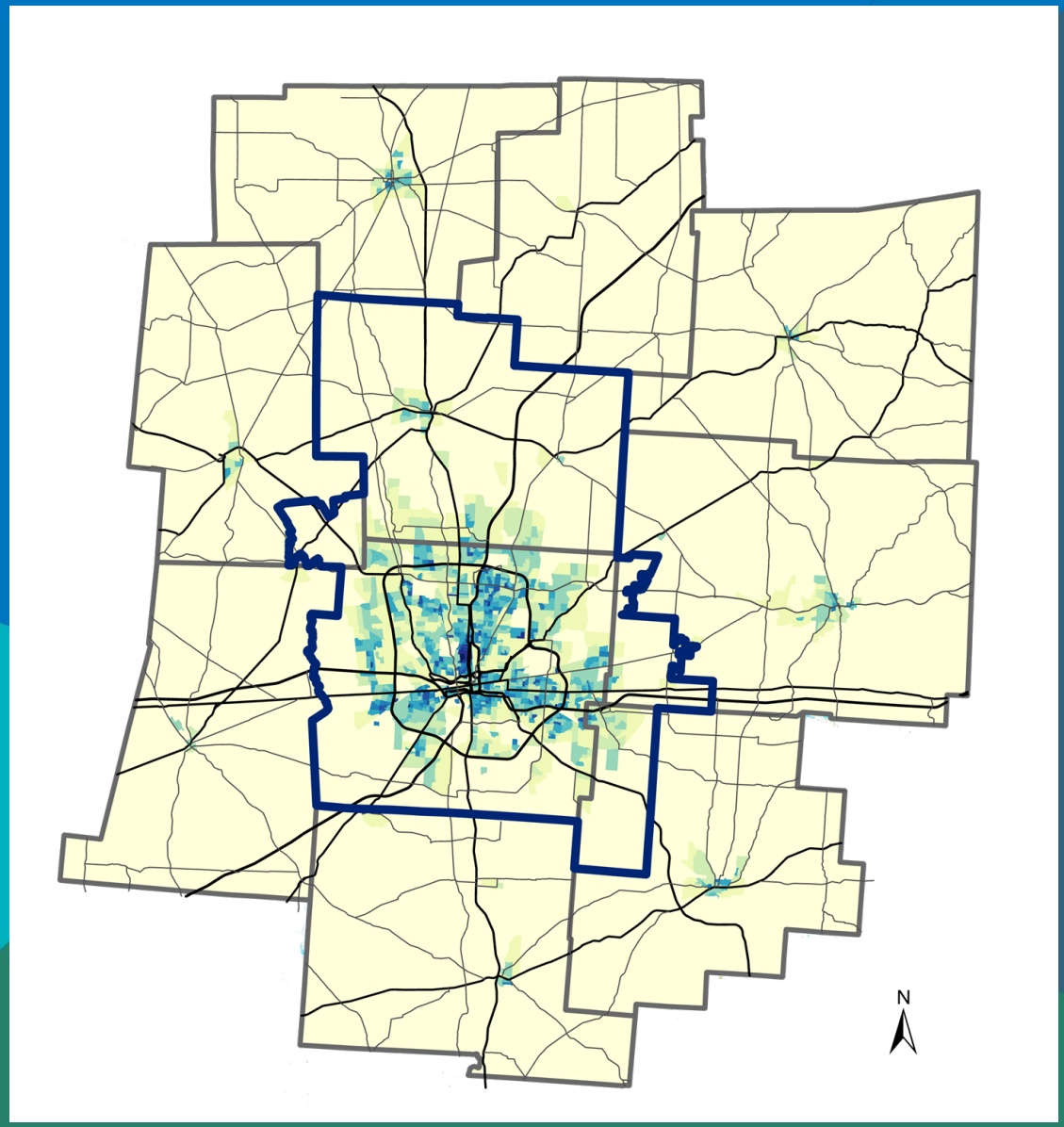
10-County Region

- Metropolitan Planning Organization (MPO) and Central Ohio Rural Planning Organization (CORPO) areas
- Central Ohio Context
  - Urban, Suburban, and Rural
- Demographic Context (2021)
  - **Population:** 2,400,500
  - **Households**: 230,000
- Population Distribution
  - Downtown core
  - County seats



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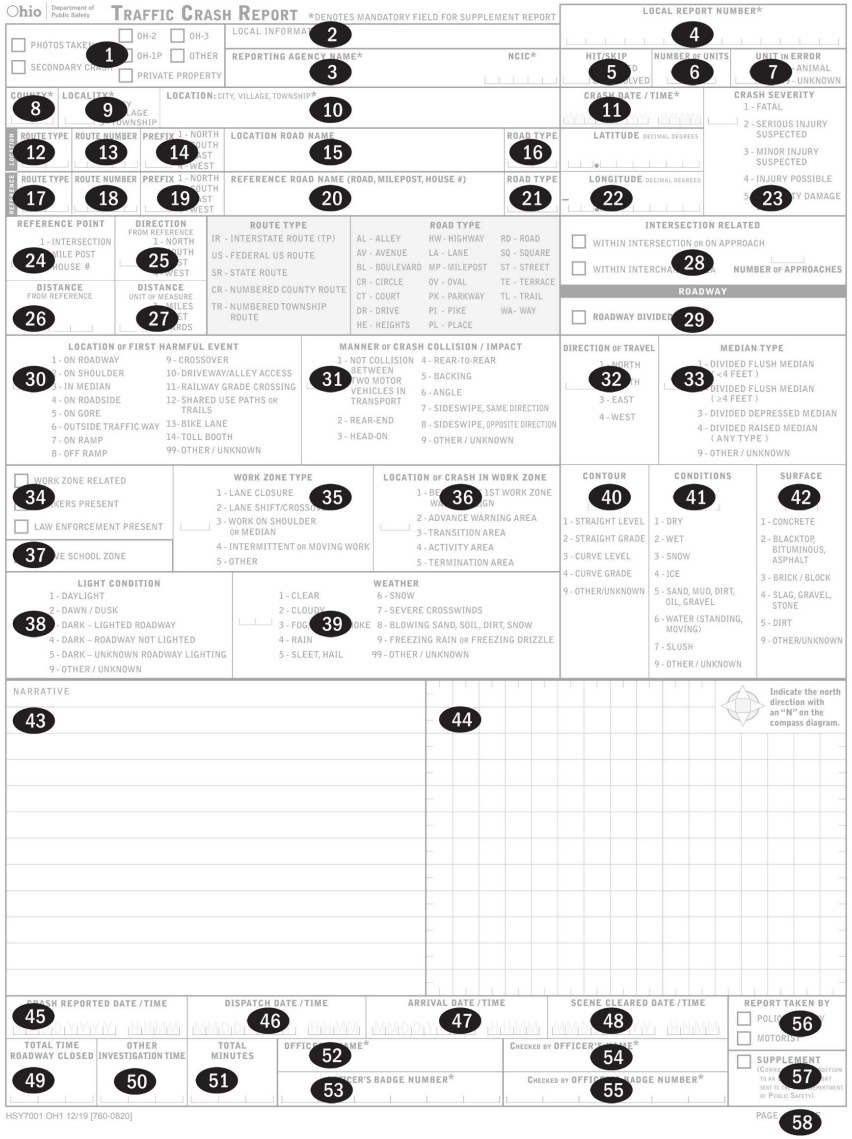
About the Data

- Most recent complete 5-year period
  - 2018-2022

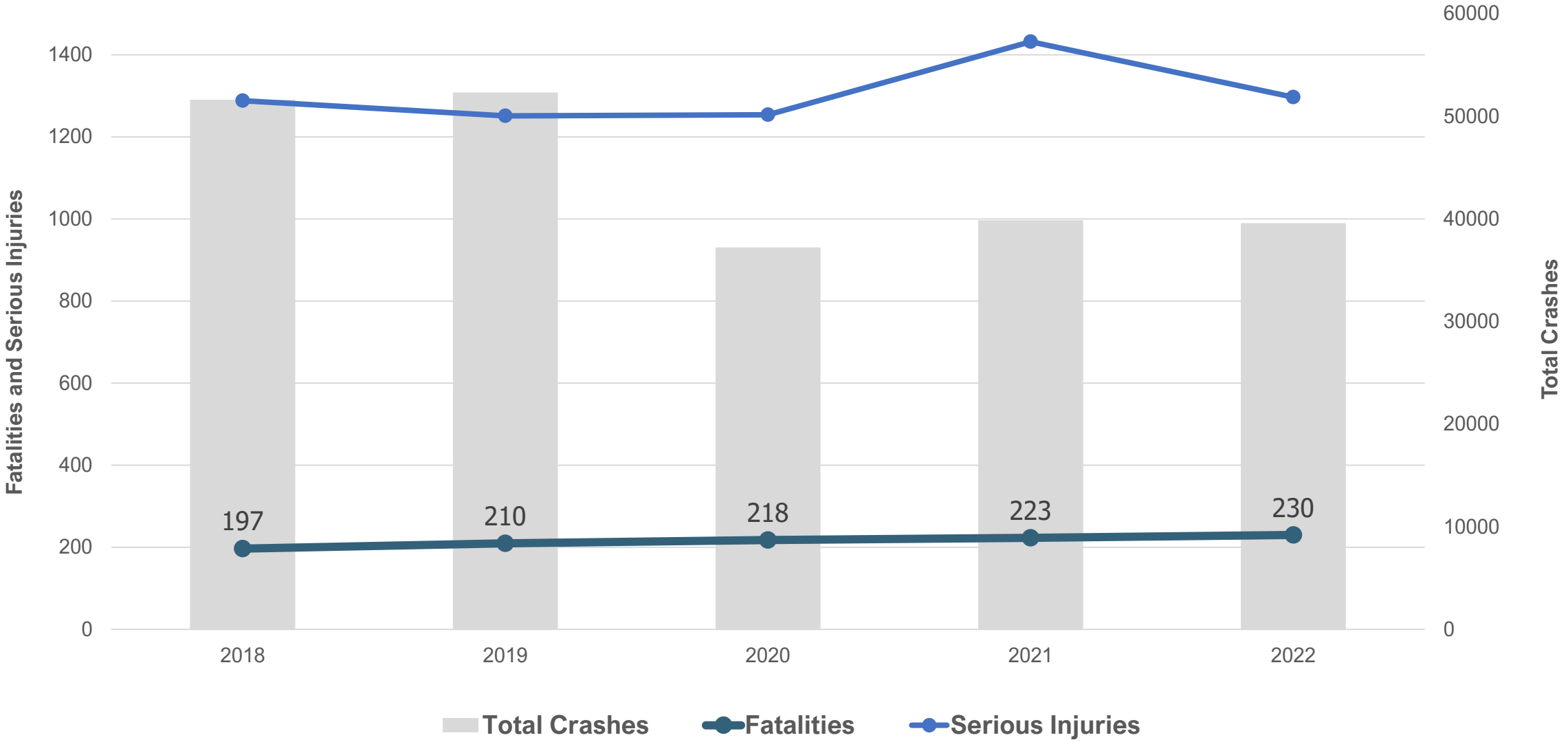
- 10-County *Reported* Crashes
  - Ohio Department of Public Safety
  - Ohio Department of Transportation

- Unit data from *reported* crashes
  - Unit or vehicle involved in crash
  - Includes occupants

- FSI = Fatal or Serious Injury
  - Also known as KA in “KABCO” rating system



Central Ohio Crash Trends – 2018-2022



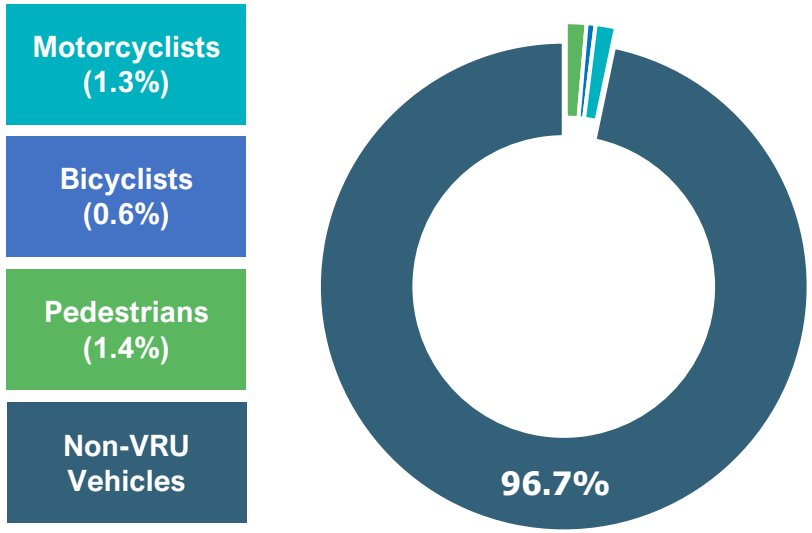
Vulnerable Road Users

Pedestrians

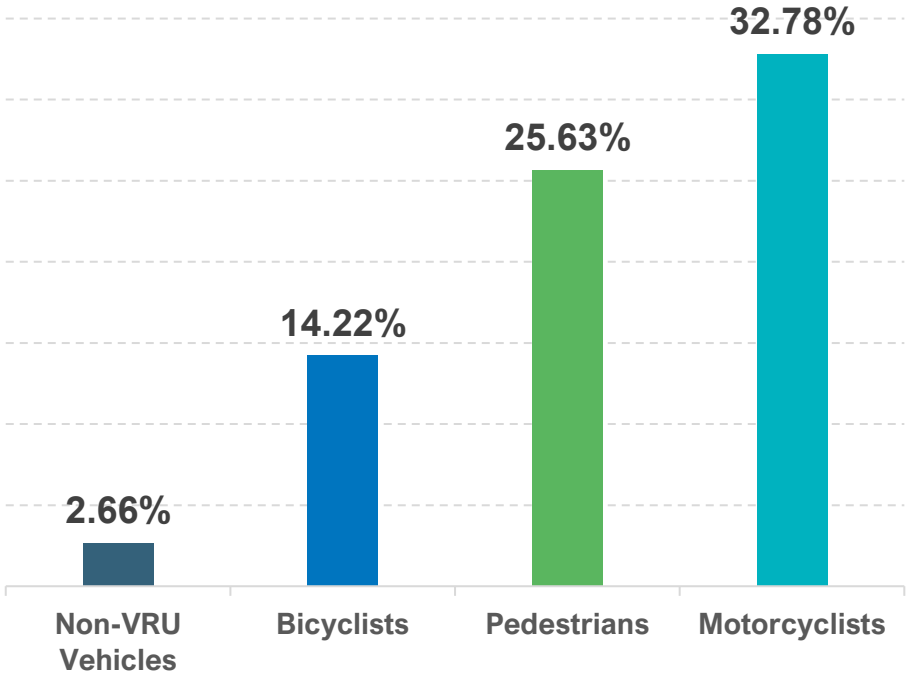
Bicyclists

Motorcyclists

Percentage of Units Involved in Crashes by Unit Type



Fatal & Serious Injury Rate by Unit Type



Vulnerable Road Users

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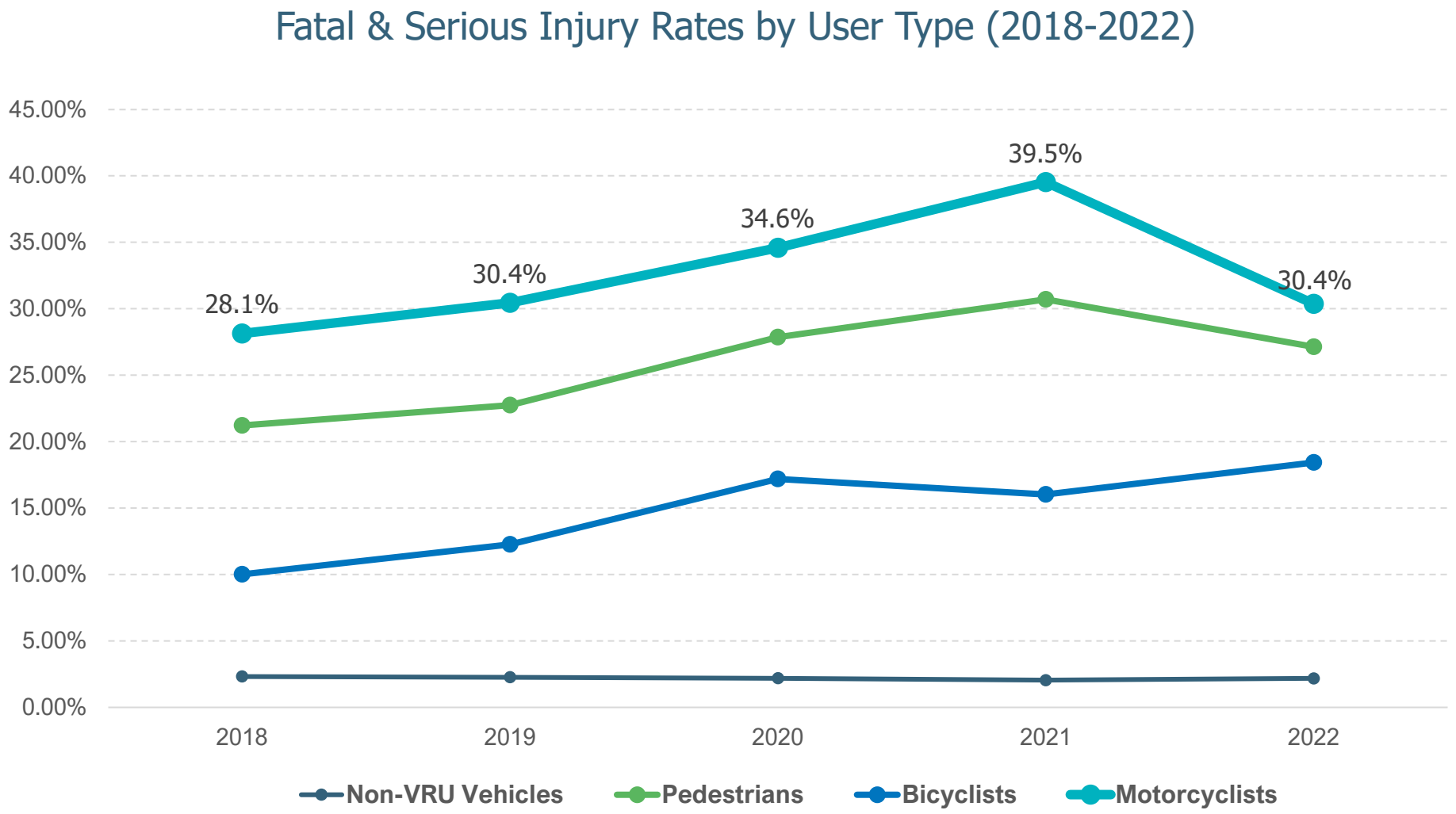


Serious Crash Types

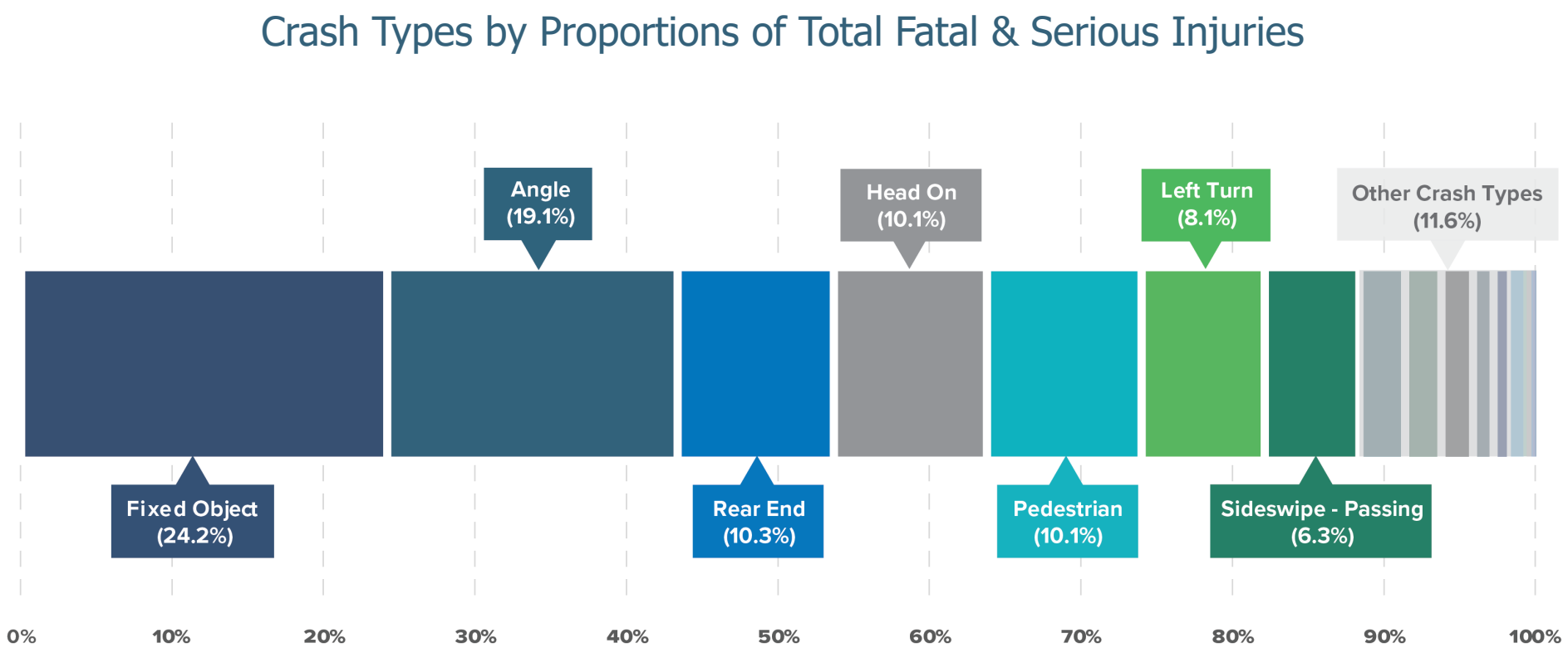
Fixed Object

Angle

Rear End

Head On

Pedestrian



Key Takeaways

- Vulnerable Road Users (VRUs) at greater risk of severe crash outcomes
  - Lack protection of steel frame
- VRU FSI rates increased during pandemic
  - More speeding behaviors
  - Vehicle sizes continue to increase
- Motorcyclists particularly at risk
  - Combination of vulnerability and speed

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Recent Motorcycle Crash Trends

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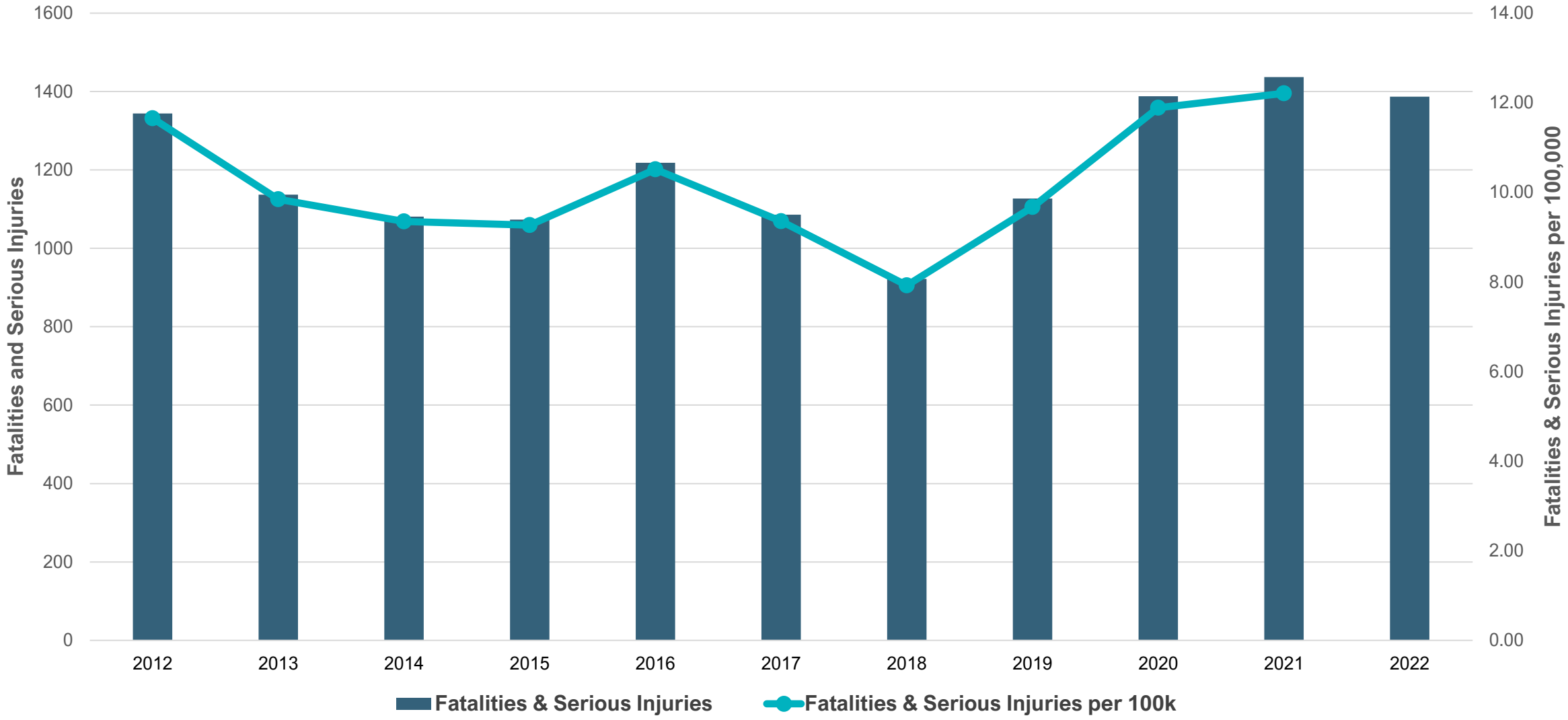
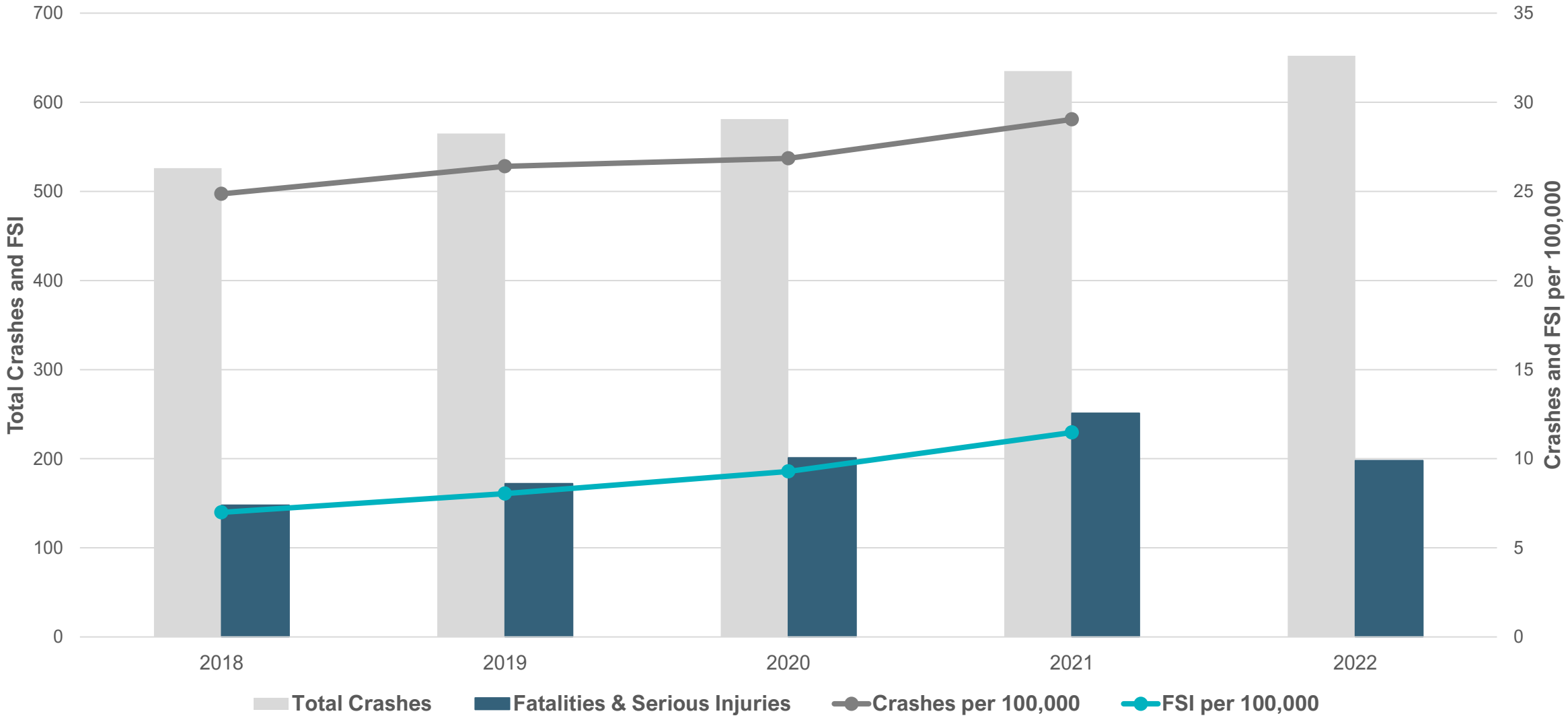
Ohio Statewide Trends in Motorcycle Crashes

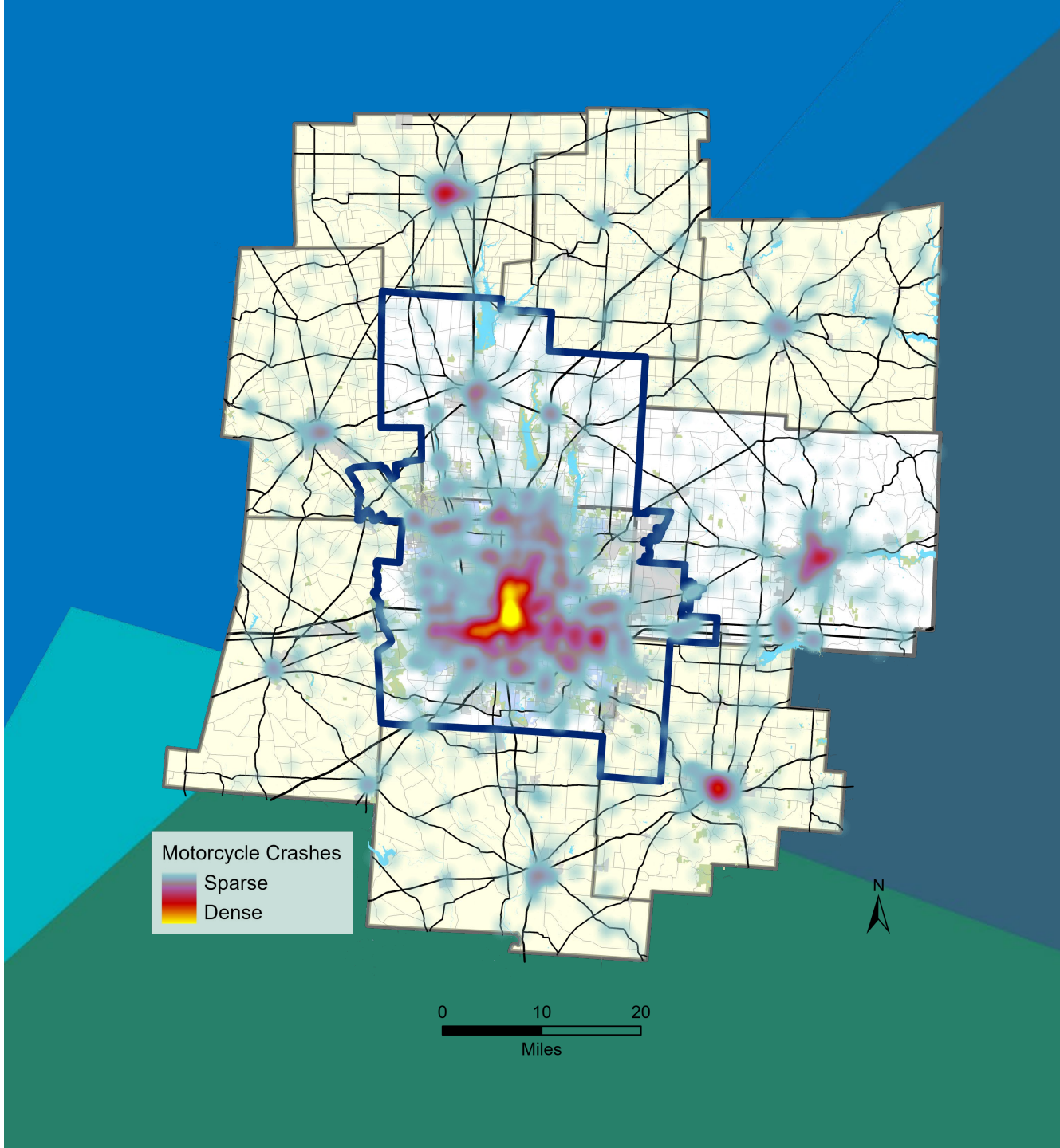


Central Ohio: Motorcycle Crashes and Fatalities & Serious Injuries (2018-2022)



Crash Locations

- Regional distribution of motorcycle crashes
  - Largely follows population density
- Downtown Columbus – epicenter
- County seats – hotspots
- Key corridors
- Major intersections



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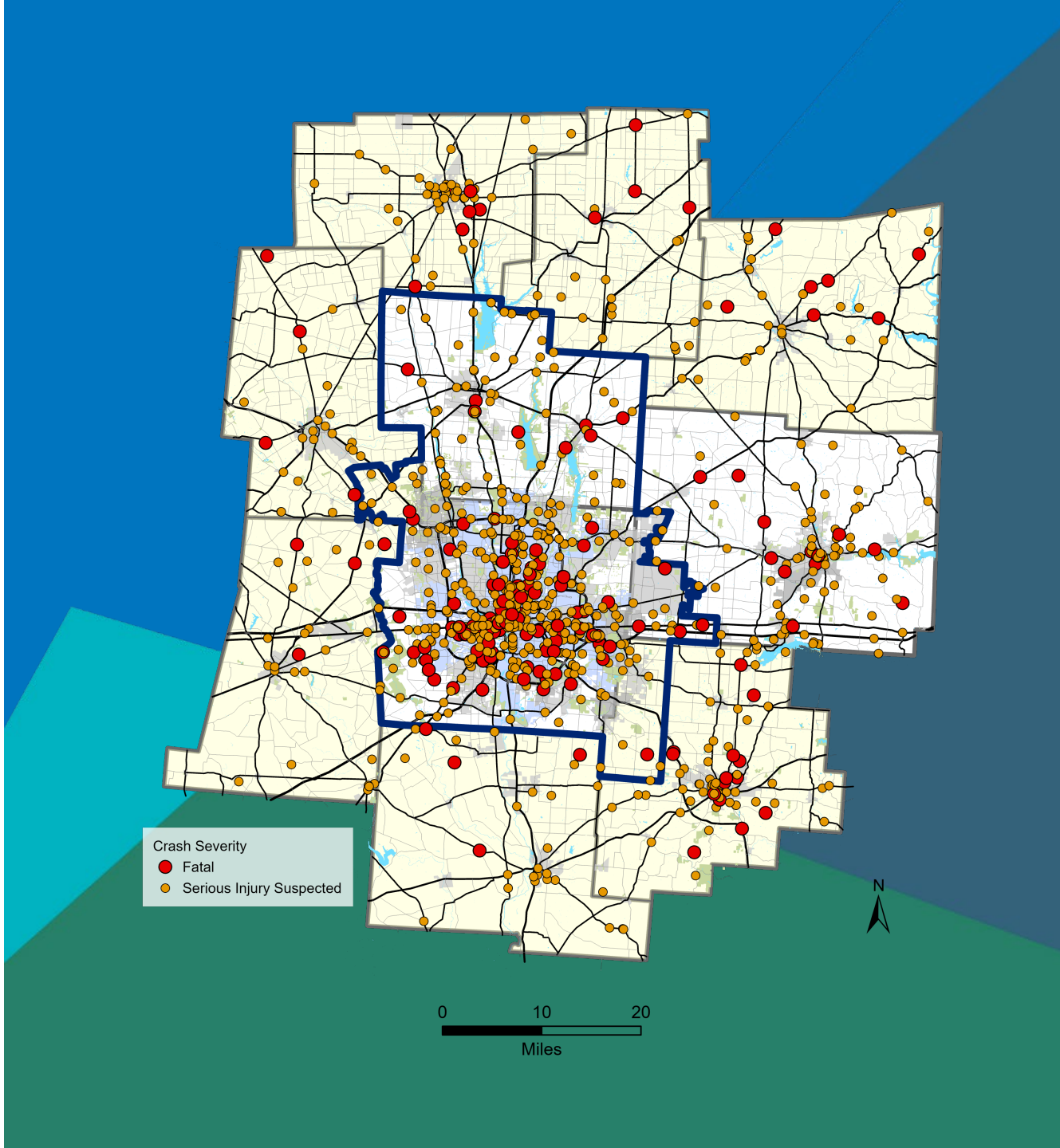
FSI Crash Locations

- Regional distribution of fatal & serious injury motorcycle crashes
  - Largely follows population density
- Downtown Columbus – epicenter
- County seats – hotspots
- Urban vs Rural
  - Motorcyclist FSI per capita
    - Higher in rural counties



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Motorcycle Crashes & Outcomes

Environmental Factors

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Section Agenda

- Roadway Characteristics
  - Speed Limits
  - Function
  - Combination
- Severe Crash Types
- Pandemic-related changes

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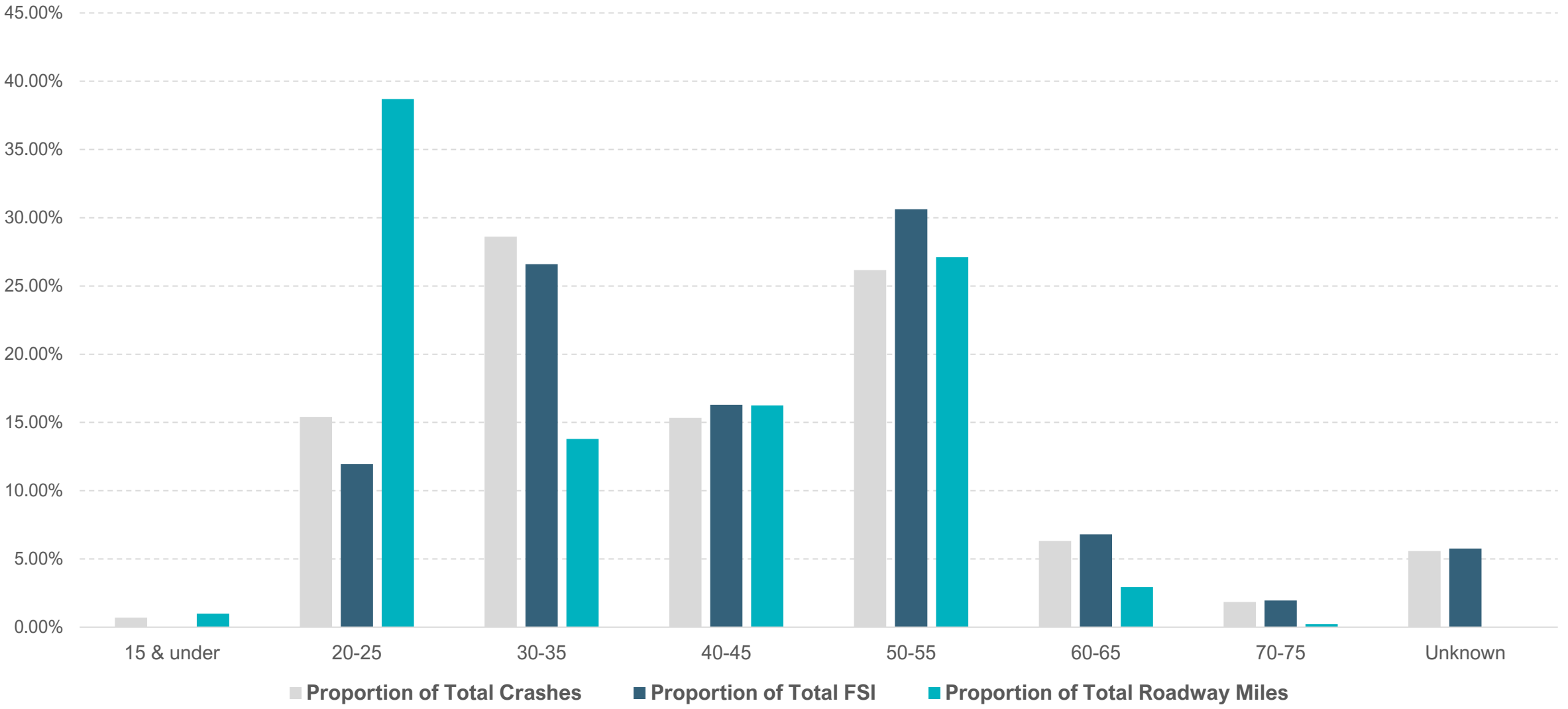
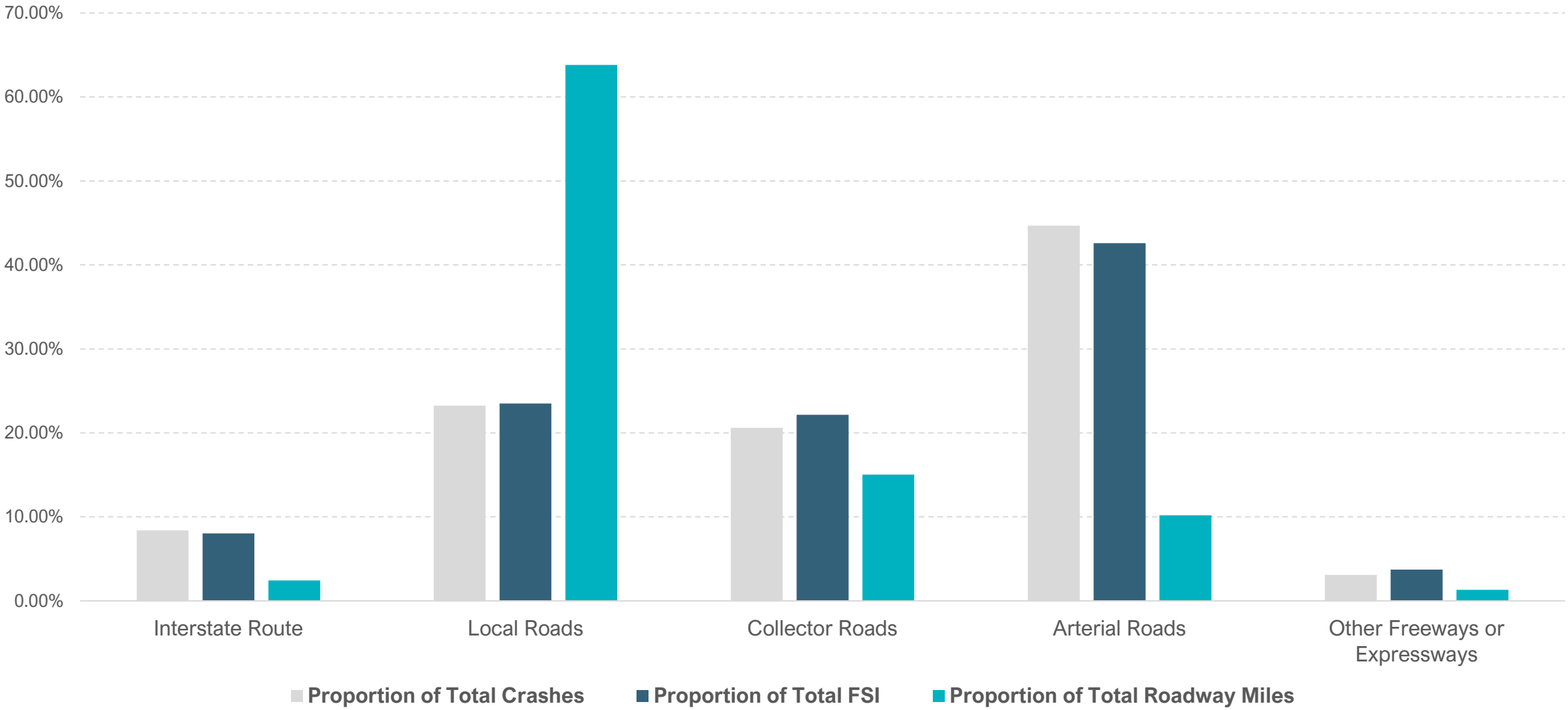
Proportions of Crashes and FSI by Speed Limit



Proportions of Crashes and FSI by Functional Classification



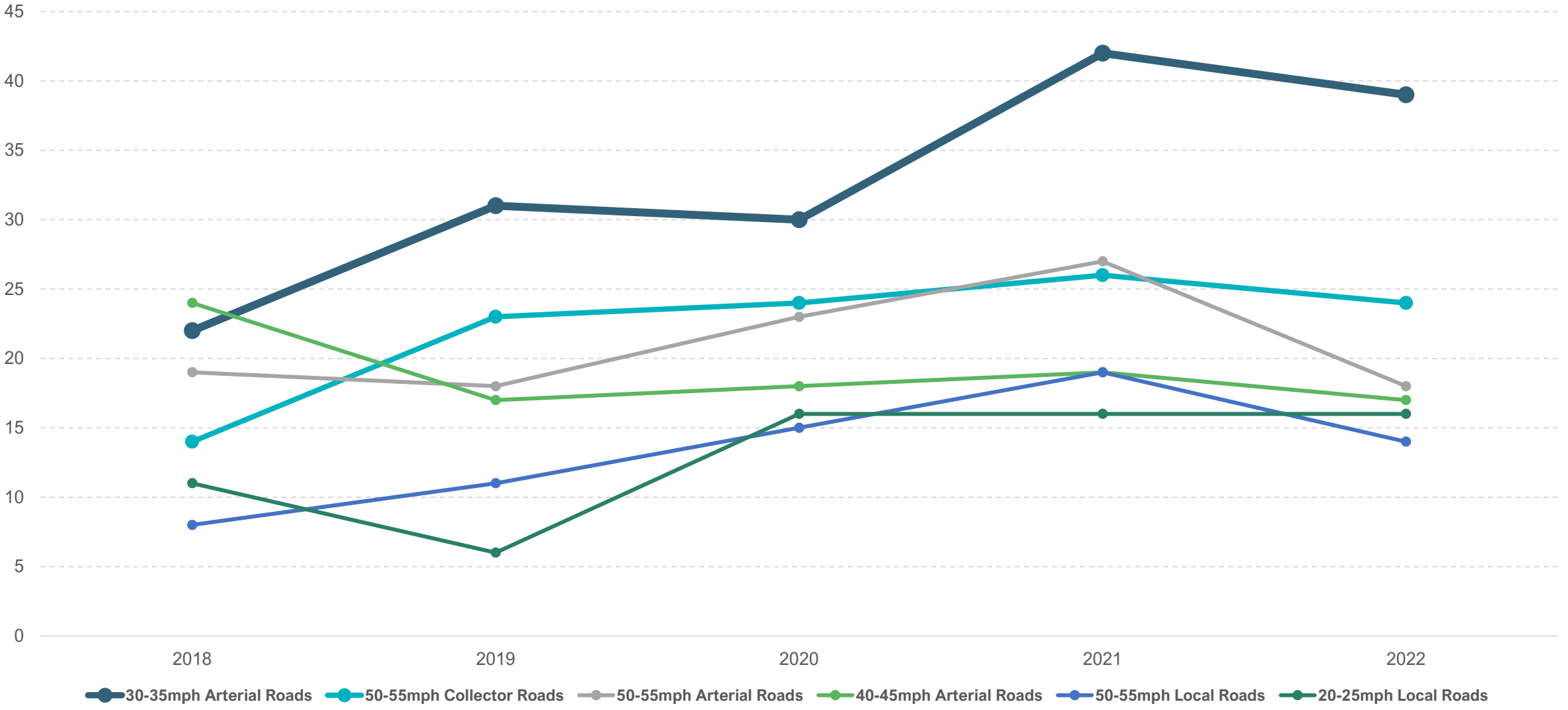
Speed Limit X Functional Classification

35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%

30-35mph Arterial Roads
50-55mph Collector Roads
50-55mph Arterial Roads
40-45mph Arterial Roads
50-55mph Local Roads
20-25mph Local Roads

Proportion of Total Crashes
Proportion of Total FSI
Proportion of Total Roadway Miles

Speed Limit X Functional Classification



Severe Crash Types Involving Motorcyclists

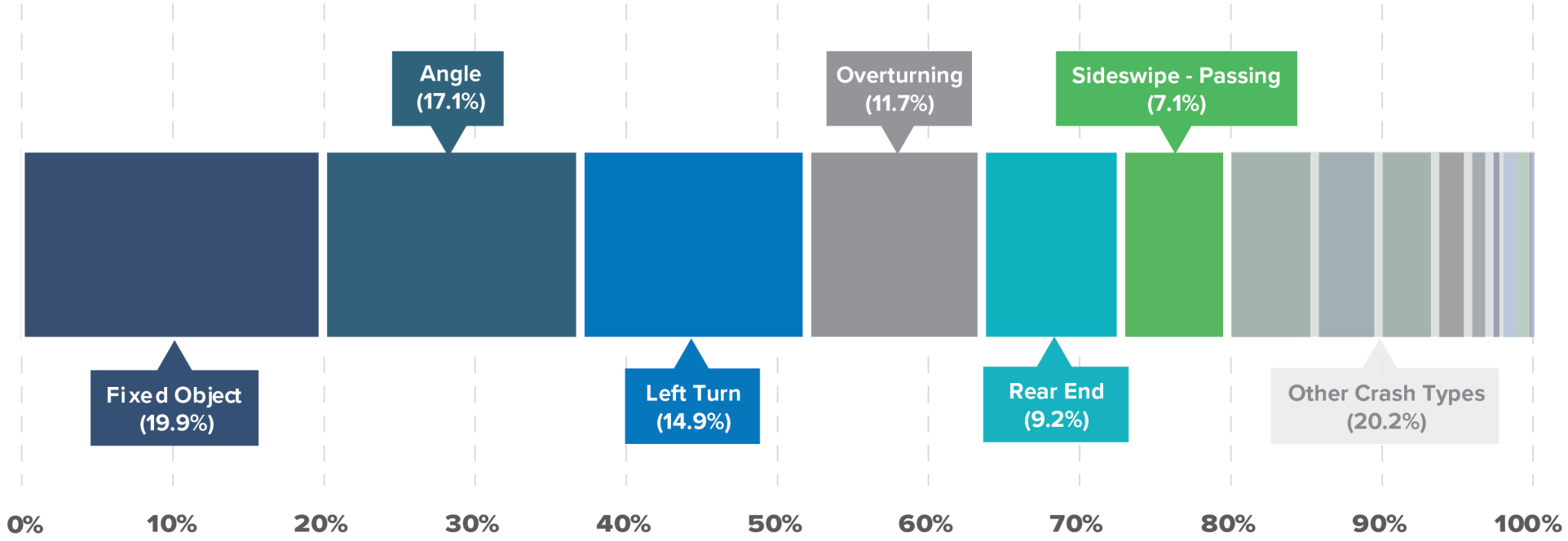
Fixed Object

Angle

Left Turn

Overturning

Rear End



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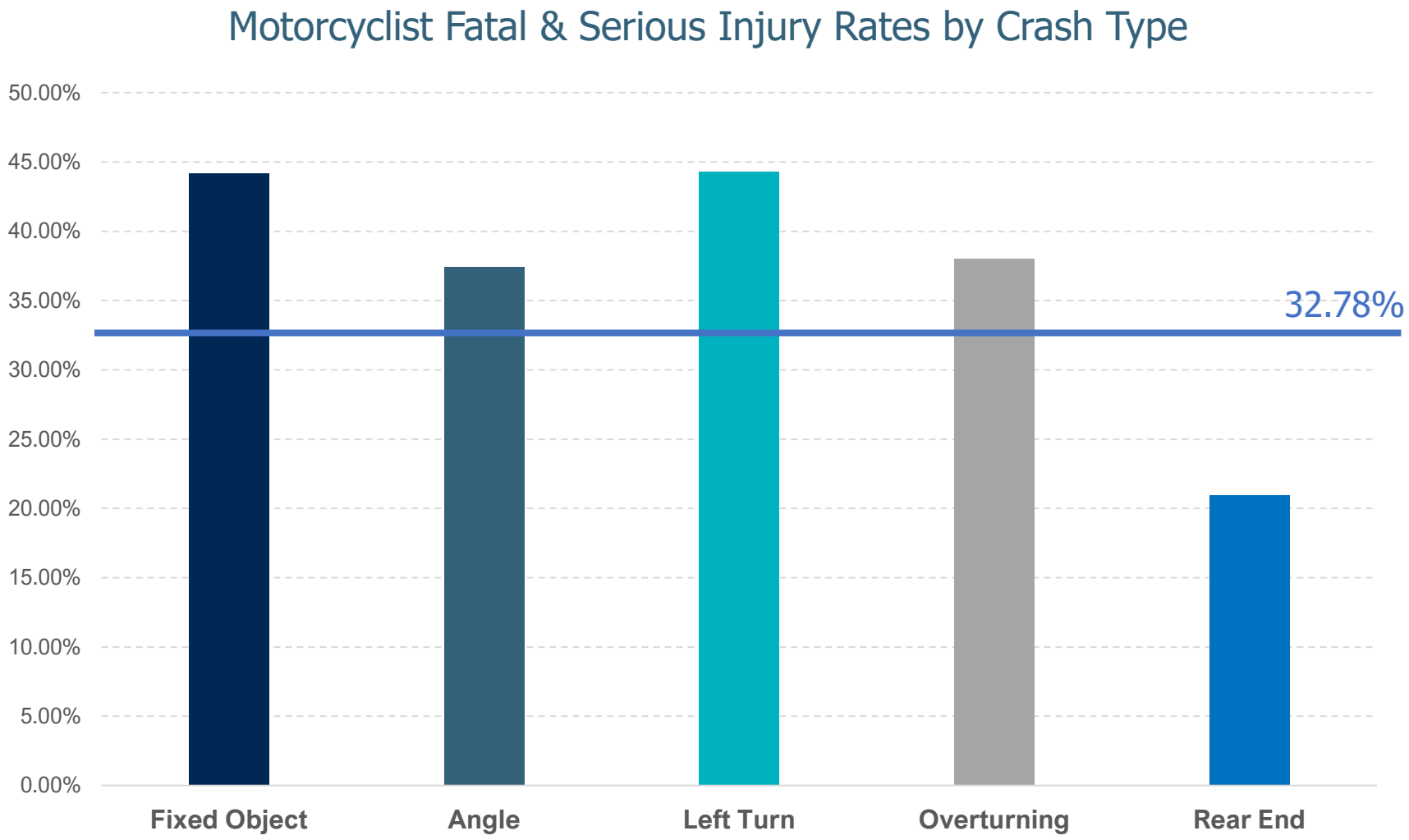

Table 3. Ratios of Adjusted Proportions of Drivers Who Reported Engaging in Various Driving Behaviors within the Past 30 Days Among Drivers Who Increased or Reduced Their Driving Due to the COVID-19 Pandemic Relative to Drivers Who Did Not Change How Much They Drove, Sample of 2,888 Licensed Active Drivers Aged 16 Years and Older, United States, October–November 2020.

	Reduced Driving vs. No Change		Increased Driving vs. No Change	
	Prevalence Ratio (95% Confidence Interval)			
Talking on cellphone	0.96	(0.84–1.09)	1.00	(0.75–1.33)
Reading text messages	1.07	(0.94–1.23)	1.27	(1.01–1.60)
Typing text messages	1.02	(0.84–1.23)	1.38	(1.01–1.88)
Speeding on freeways	1.13	(1.00–1.26)	1.40	(1.16–1.69)
Speeding on residential streets	1.14	(0.99–1.31)	1.40	(1.08–1.80)
Running red lights	1.08	(0.90–1.30)	1.67	(1.25–2.23)
Changing lanes aggressively	1.10	(0.90–1.33)	1.86	(1.37–2.52)
Drowsy driving	1.03	(0.82–1.29)	1.01	(0.61–1.69)
Alcohol-impaired driving	0.99	(0.68–1.46)	2.09	(1.11–3.92)
Driving after using marijuana	1.13	(0.70–1.83)	2.90	(1.34–6.30)
Driving without wearing seatbelt	0.67	(0.52–0.87)	1.31	(0.80–2.14)

Source: AAA Foundation for Traffic Safety

Section Takeaways

- Vehicle Speeds
  - Increasingly a transportation safety concern
- Arterial “Str-oads”
  - Excess roadway space
  - Inter-user conflicts
- Severe crash types
  - Fixed object and angle, increasingly so
  - Left turn and overturning, particularly so
- Roadway user behavior
  - Riskier driving behaviors during pandemic
  - 2021 indicates continuation
- How about in motorcyclists?

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Motorcycle Crashes & Outcomes

Behavioral Factors

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Section Agenda

- Speeding among motorcyclists
- Helmet-Use
- At-fault rates
- Motorcyclist age
- Motorcycle endorsement

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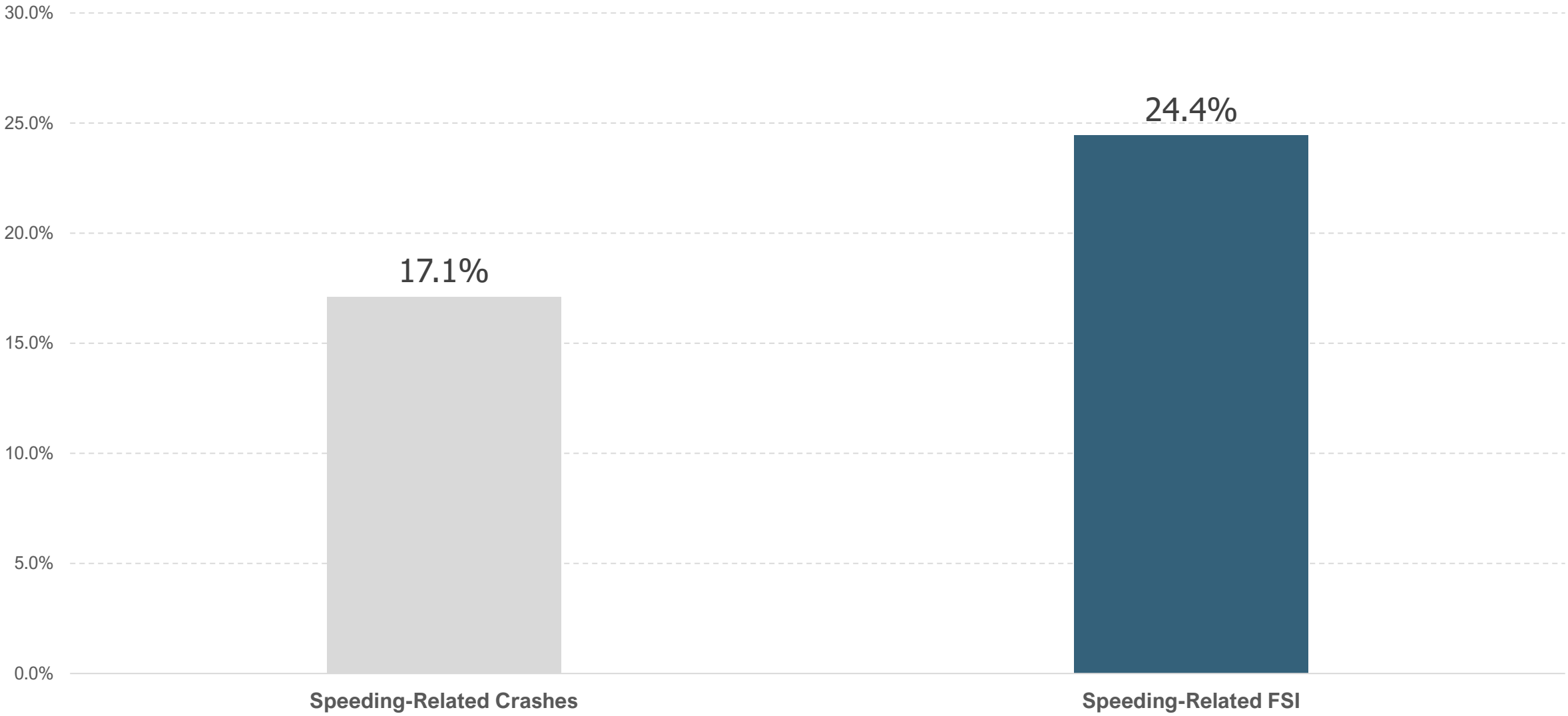
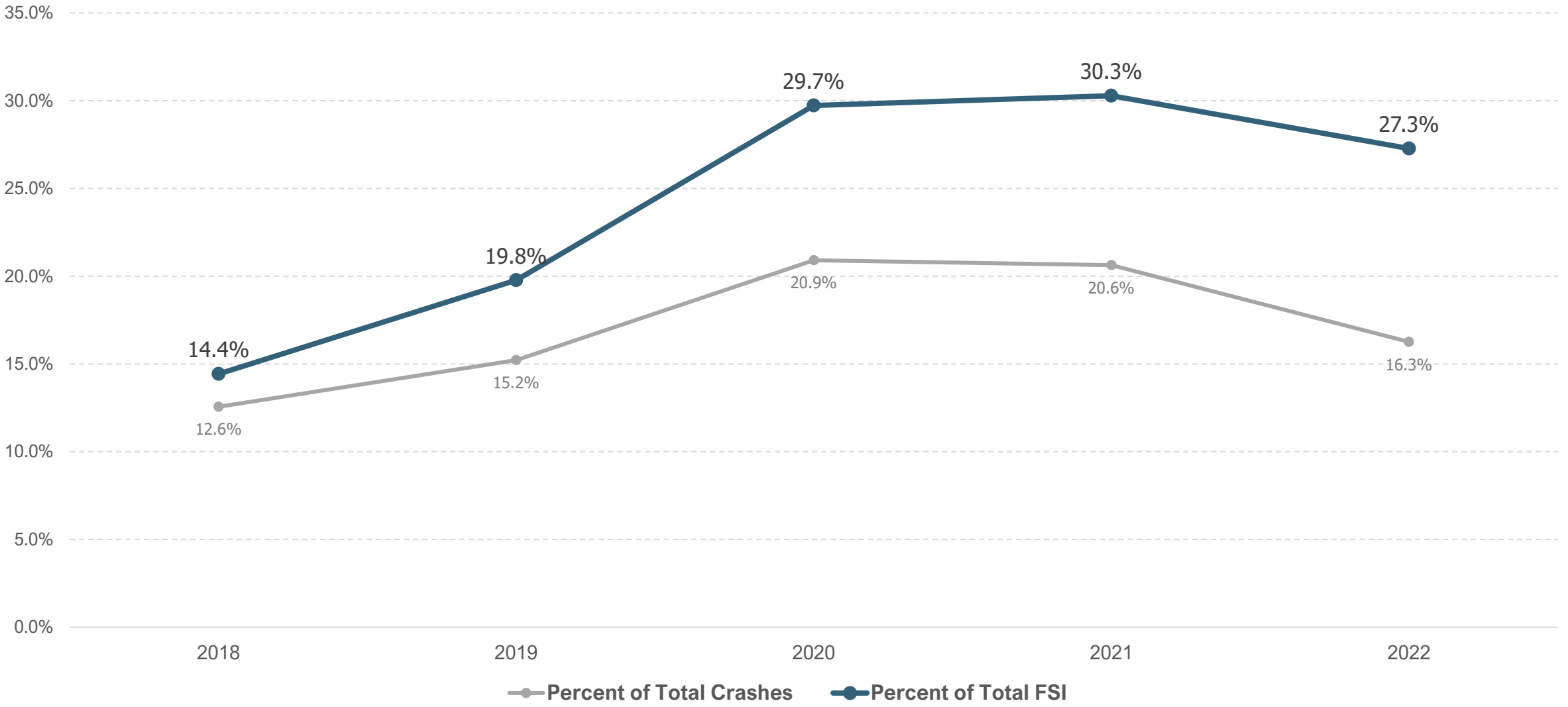
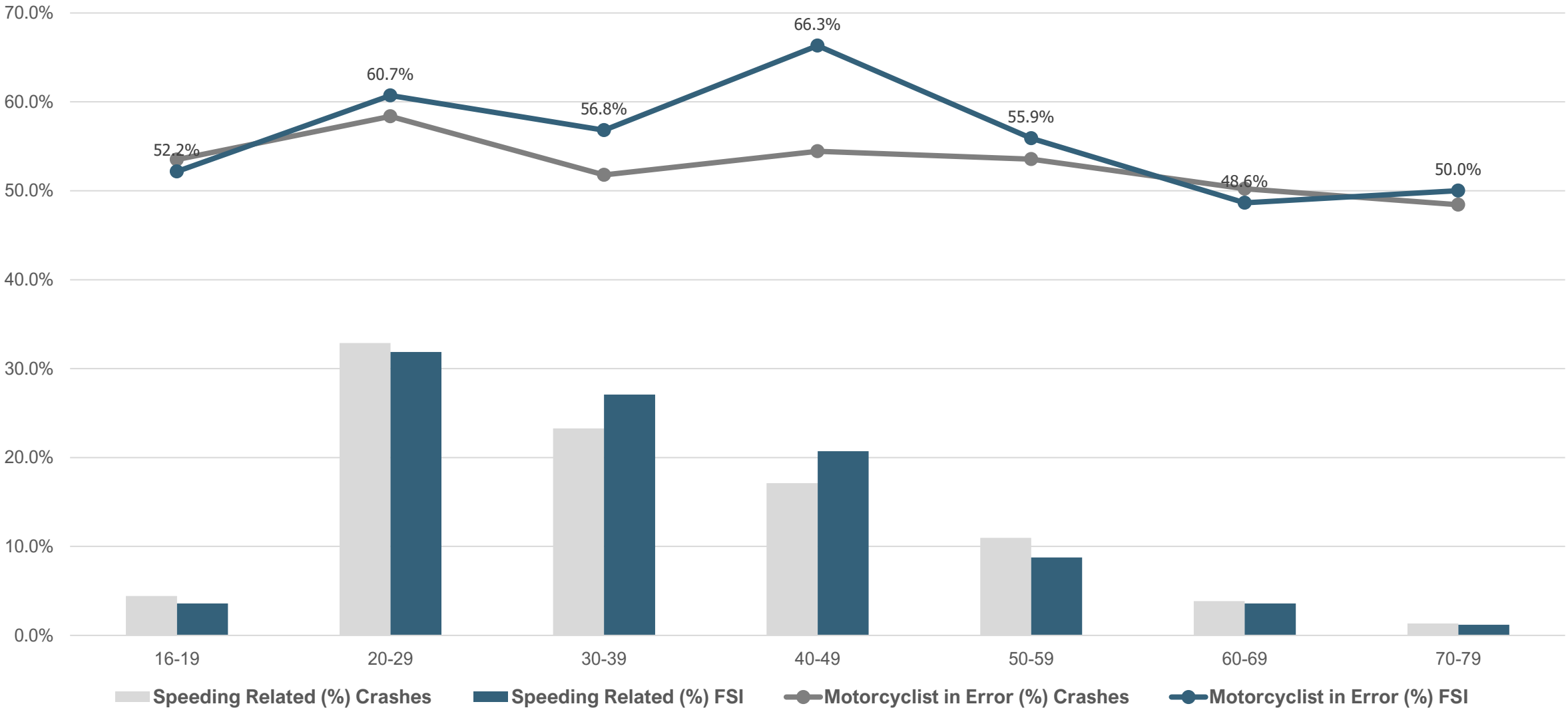
Proportion of Speeding-Induced** Motorcyclist Crashes & FSI



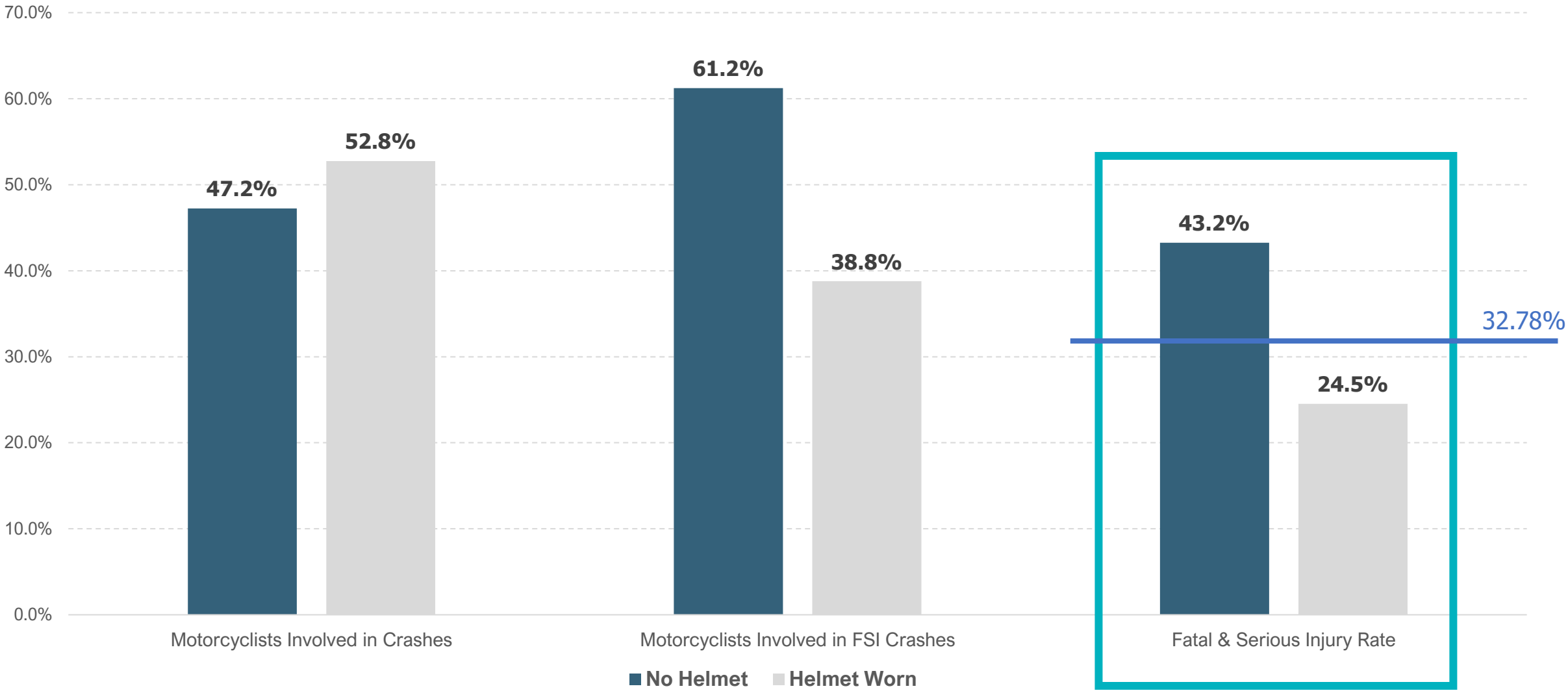
Proportion of Speeding-Induced** Motorcyclist Crashes & FSI



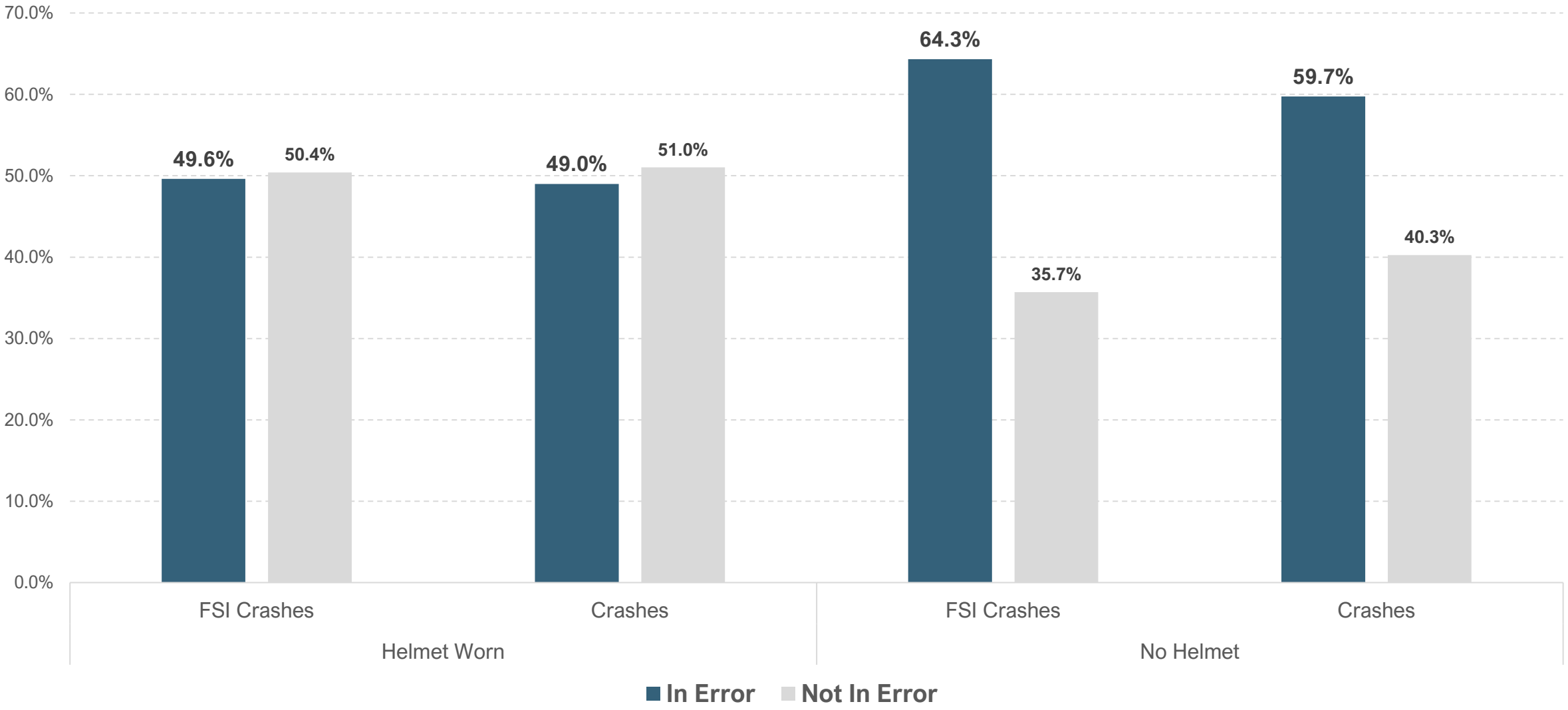
Motorcyclist Age and Speeding-Related & At-Fault Rates



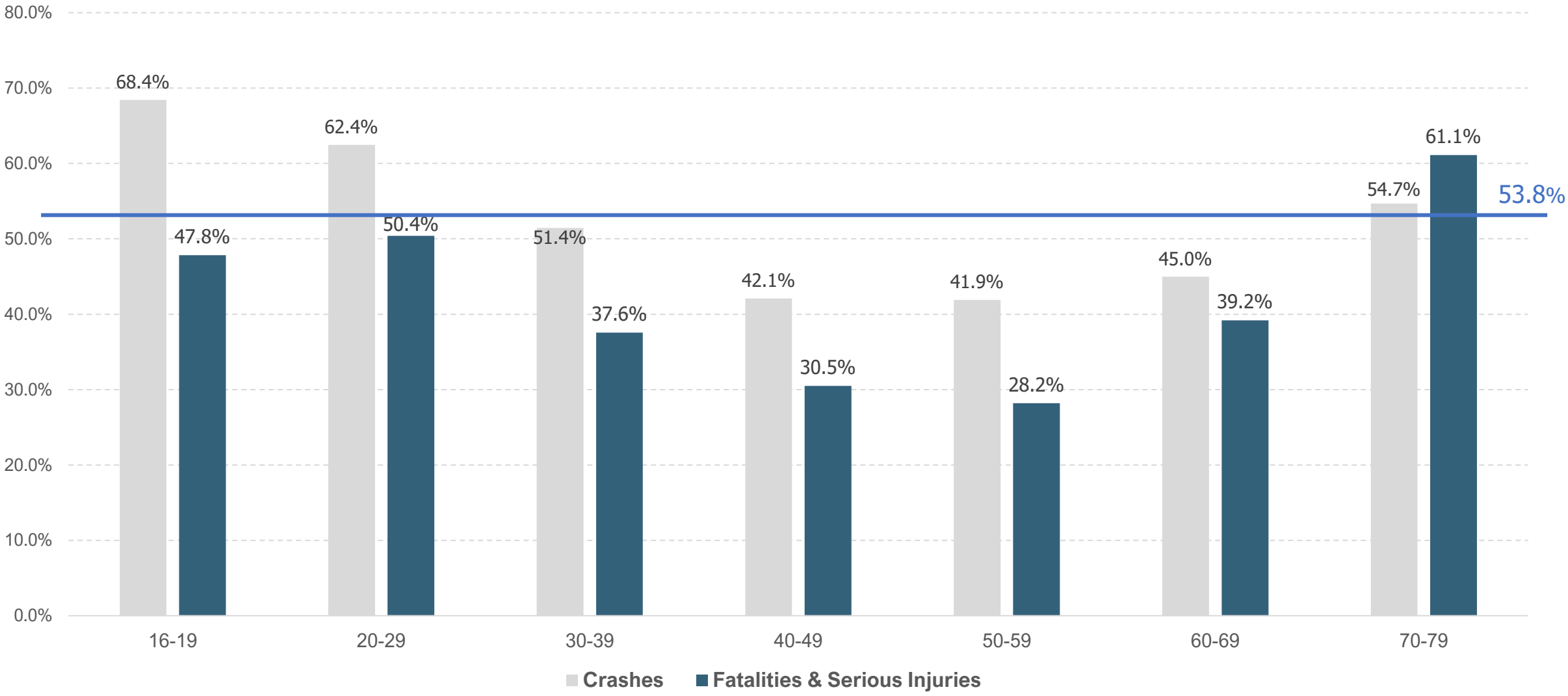
Motorcyclist Helmet-Use & Crash Outcomes



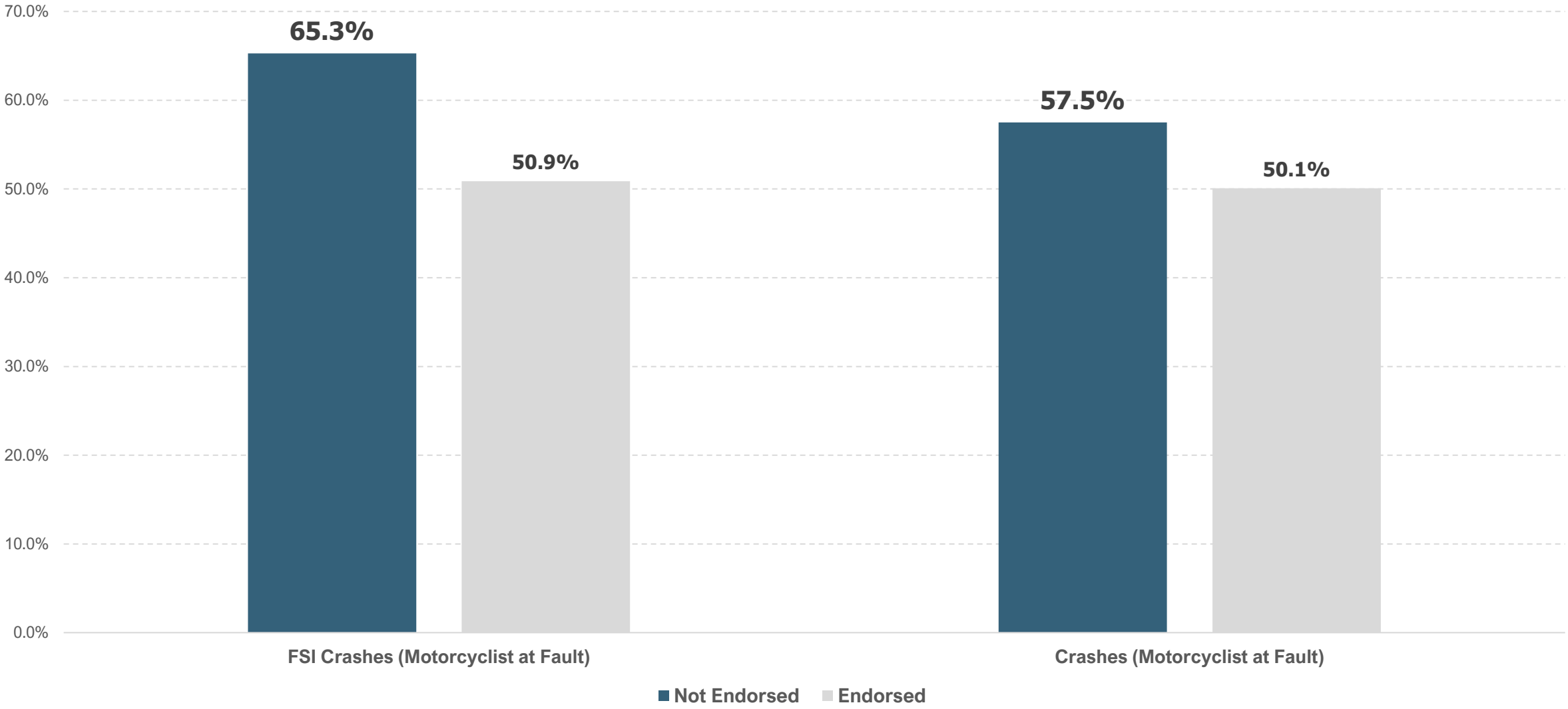
Motorcyclist Helmet-Usage & At-Fault Rates



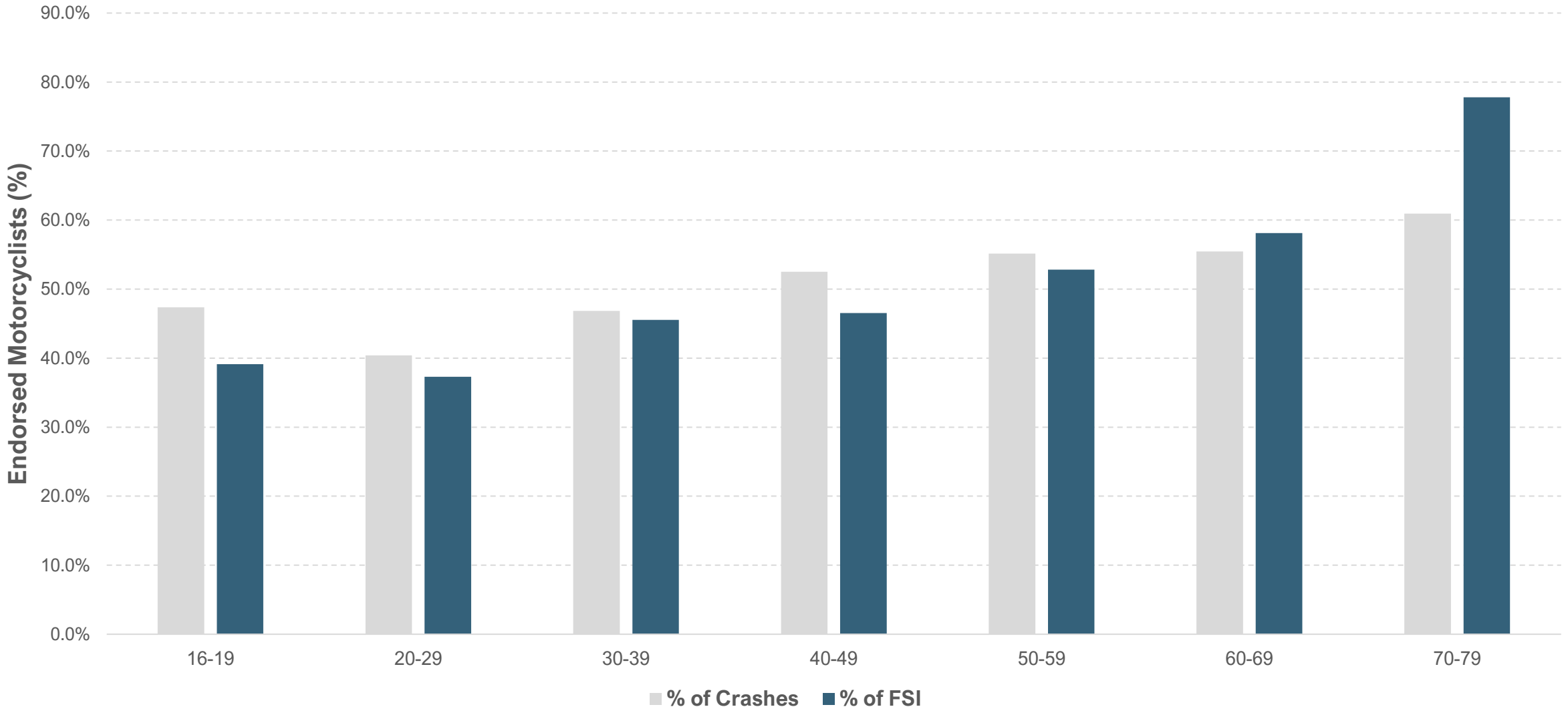
Percentage Helmeted X Motorcycle Age



Motorcycle Endorsement & At-Fault Rates



Motorcycle Endorsement and Motorcyclist Age



Section Takeaways

- Speeding → More severe crash outcomes
  - Increasingly so
  - Younger riders
- Wearing a helmet confers significant safety benefits to motorcyclists
  - Helmeted FSI Rate: 25%
  - Un-Helmeted FSI Rate: **43%**
  - Higher rates of use among younger rides
- Motorcycle endorsements
  - Correlated with in-error rates
  - Lower rates among younger rides

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Vulnerable Road Users

- Severe crashes rising
- Motorcyclists most at risk

Environmental Factors

- "Stro-ads"
- Key crash types

Behavioral Factors

- Speeding
- Helmet-Use
- Endorsements

Transportation Safety is Motorcycle Safety

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The Public Health Approach to Motorcycle Safety

Anna Piper, CHES, CPST
Franklin County Safe Communities

THE CITY OF COLUMBUS
ANDREW J. GINTHER, MAYOR
COLUMBUS PUBLIC HEALTH

How Can a Public Health Agency Improve Motorcycle Safety?

1. Fatal Crash Data Reviews

2. Programming and Messaging

3. Research

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COLUMBUS PUBLIC HEALTH

Fatal Crash Data Reviews

- Review all fatal crashes on Franklin County Roadways
- Develop action items for improving infrastructure, enforcement, and education to prevent future crashes

Fatal Crash Data Reviews

The Traffic Fatality Review Board is an interdisciplinary team made up of industry professionals that specialize in road safety and injury prevention

Photos

Photos from the scene of each case are displayed during the meeting to better understand the crash as a whole.

Law Enforcement

The investigating agency for each crash presents vital case information including conditions, pre-crash actions, sequence of events, and more.

Engineers

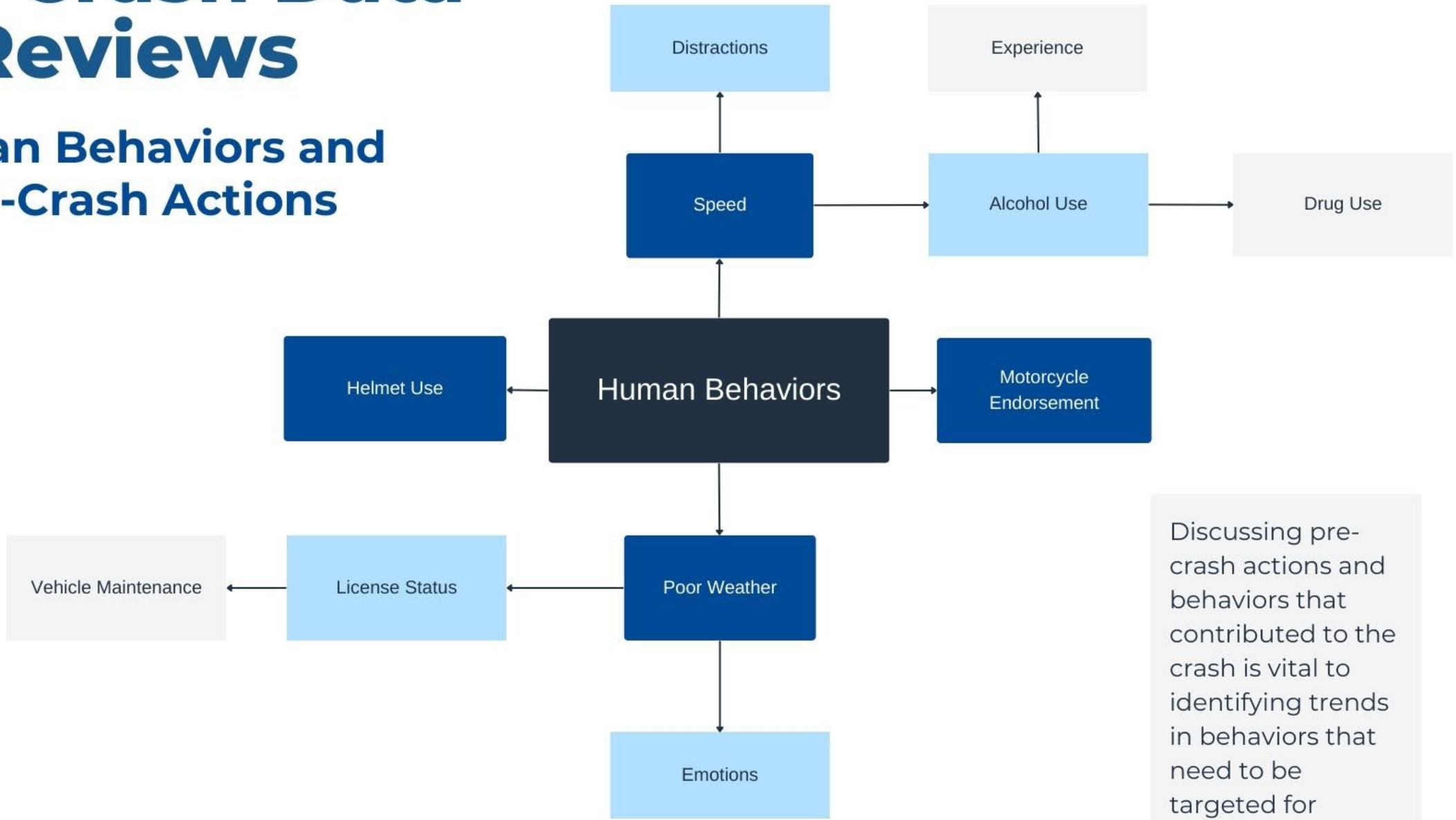
Traffic engineers present information related to the crash in question as well as history of crashes in the area, missing infrastructure and upcoming improvement projects.

Coroner

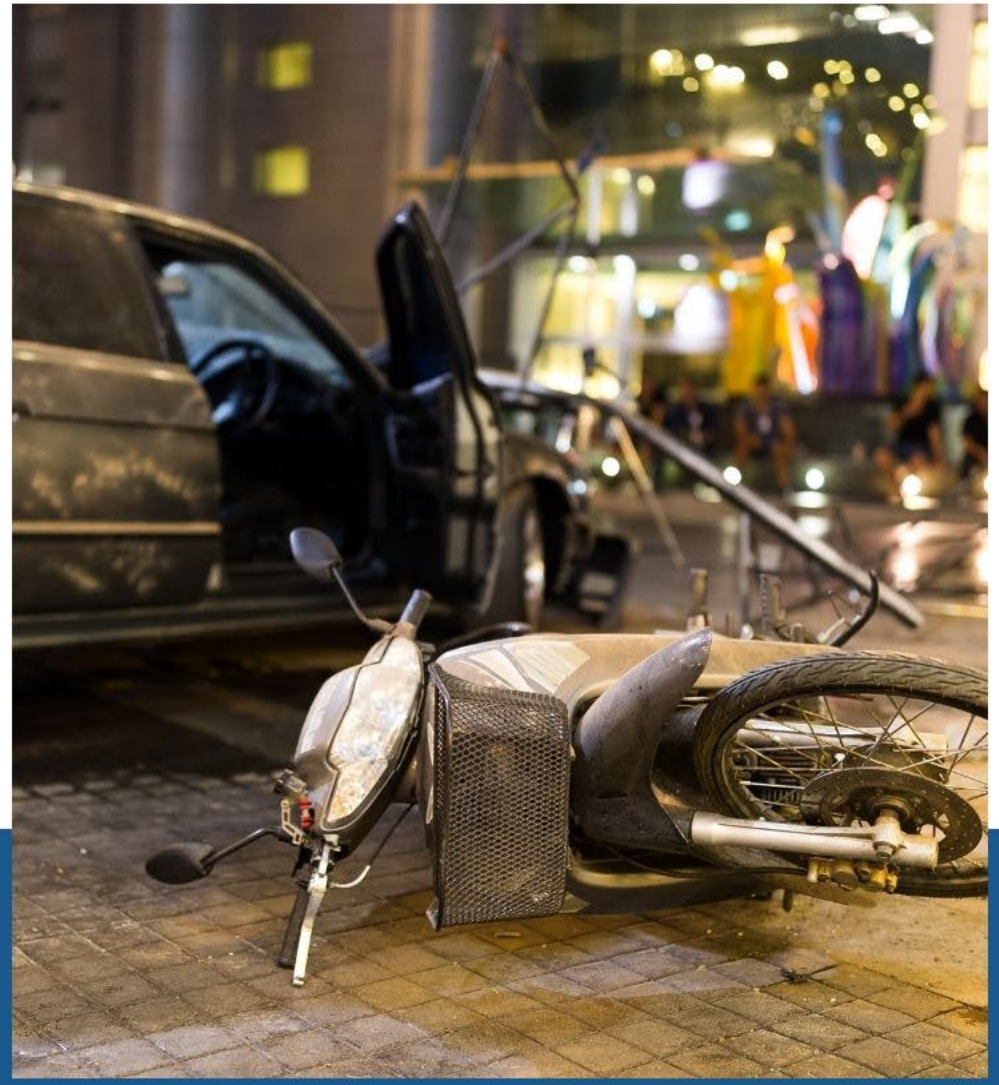
The County Coroner will present ruling and cause of death, significant injuries and/ or illness, and toxicology findings

Fatal Crash Data Reviews

Human Behaviors and Pre-Crash Actions



Discussing pre-crash actions and behaviors that contributed to the crash is vital to identifying trends in behaviors that need to be targeted for education.



Fatal Crash Data Reviews

After learning the facts of each crash review board members make recommendations for targeted education or prevention efforts, improvements to infrastructure, and ways law enforcement can improve enforcement strategies

After the completion of the Fatal Crash Data Review Meeting Franklin County Safe Communities staff create and send detailed case summaries and collect crash related data.

PROGRAMMING AND MESSAGING

Trends in fatal and serious injury crashes steer efforts in messaging and programming. Audiences are selected by targeted behaviors and geographic locations of concern. Messaging is developed to educate on prevalent factors that contributed to the outcome of crashes.

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COLUMBUS PUBLIC HEALTH

Research

Franklin County Road Use Behaviors, Knowledge, and Attitudes Survey

- Partnership with Franklin County Safe Communities and Ohio State University
- Will be used to better identify gaps in knowledge or understanding in targeted populations

Research

This study will be asking questions for all road user types and questions will differ based on the modes of transportation participants personally use.

General Questions

Do you lease or own, are you insured, have you been in a crash, have you been pulled over, do you have an endorsement, etc.

Road Sharing

When drivers share the road with a motorcyclist what behaviors do they have?

Rider Behaviors

How often if ever do you do the following when riding: riding high, riding buzzed, wear protective gear, speed, wore a helmet, etc.

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