Public Works and Transportation Committee

July 30, 2025

Lake County Safety Action Plan

Division of Transportation

Mike Klemens

Manager of Transportation Planning

Agenda

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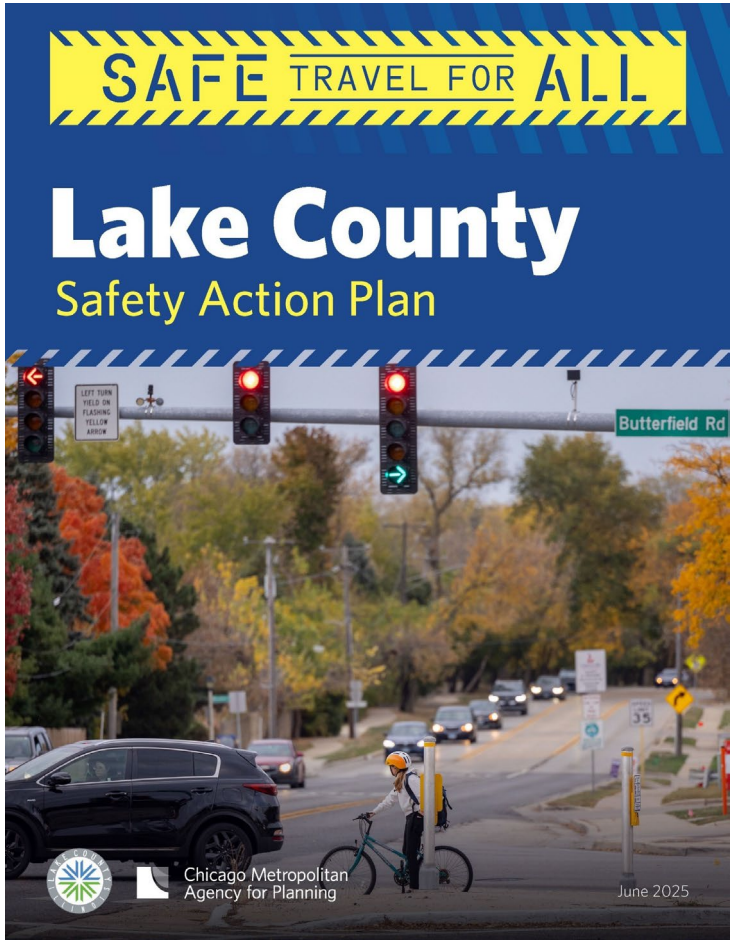
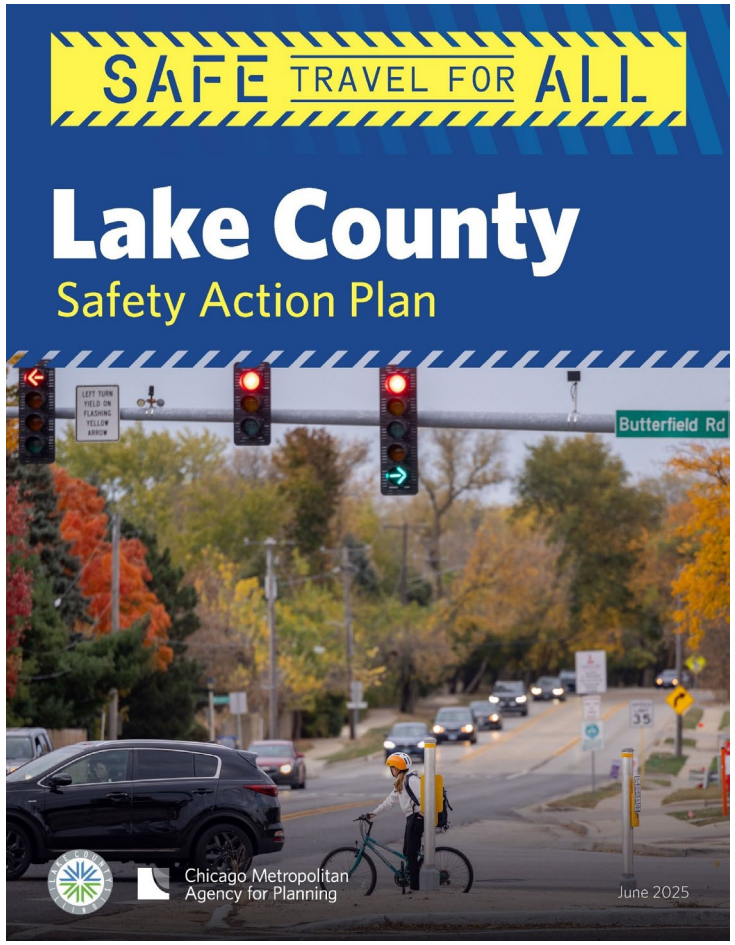
- Safe Street & Roads For All Program (SS4A)
- Safety Action Plan Development Process
  - Project Team
  - Engagement
- Crash Analysis
- Policy and Process Change Recommendations
- Safety Strategy and Project Selection
  - Countermeasures & Project Identification
- Tracking Plan Progress
- Next Steps





Plan Development Process

Safe Streets & Roads For All

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- **USDOT competitive grant program**
  - **Two types of grants:**
    - **Planning and demonstration grants**
    - **Implementation grants**
  - **A Safety Action Plan is required prior to submitting for implementation grants**

Required Components of Safety Action Plans for SS4A funding eligibility:

Safe Travel for All Roadmap

- Lake County partnered with the Chicago Metropolitan Agency for Planning (CMAP) to create the Safety Action Plan
- CMAP was awarded nearly $4 million in SS4A Planning Grant funding to develop a Safety Action Plan in 6 counties in NE Illinois
- Participating counties & IDOT contributed the local match
- Lake County and the five other countywide Safety Action Plans were adopted by the CMAP MPO Policy committee on May 30, 2025
- Safety Action Plans guided by FHWA's Safe System Approach

Safe System Approach

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We should eliminate the term "accident" to emphasize that crashes are often preventable and not random, chance events.

Zero is the goal. A Safe System is how we get there.

Plan Contributors

- **Staff Team**
  - **Mike Klemens, LCDOT**
  - **Lindsay Bayley, CMAP**
  - **Jules Voigt, CMAP**
  - **John Wirtz, AECOM**

- **Prepared By HDR, Inc.**

Steering Committee Members

- Bicycle Club of Lake County
- Clean Power Lake County
- Illinois Department of Transportation
- Lake County Center for Independent Living
- Lake County Forest Preserves
- Lake County Health Department
- Lake County Major Crash Assistance Team
- Lake County Regional Office of Education
- Lake County Sheriff Crash Team
- Lake County Transportation Alliance
- Mano a Mano Family Resource Center
- Metra
- NAACP Lake County Chapter
- City of Waukegan
- Village of Buffalo Grove
- Village of Fox Lake
- Village of Wauconda

Community Engagement

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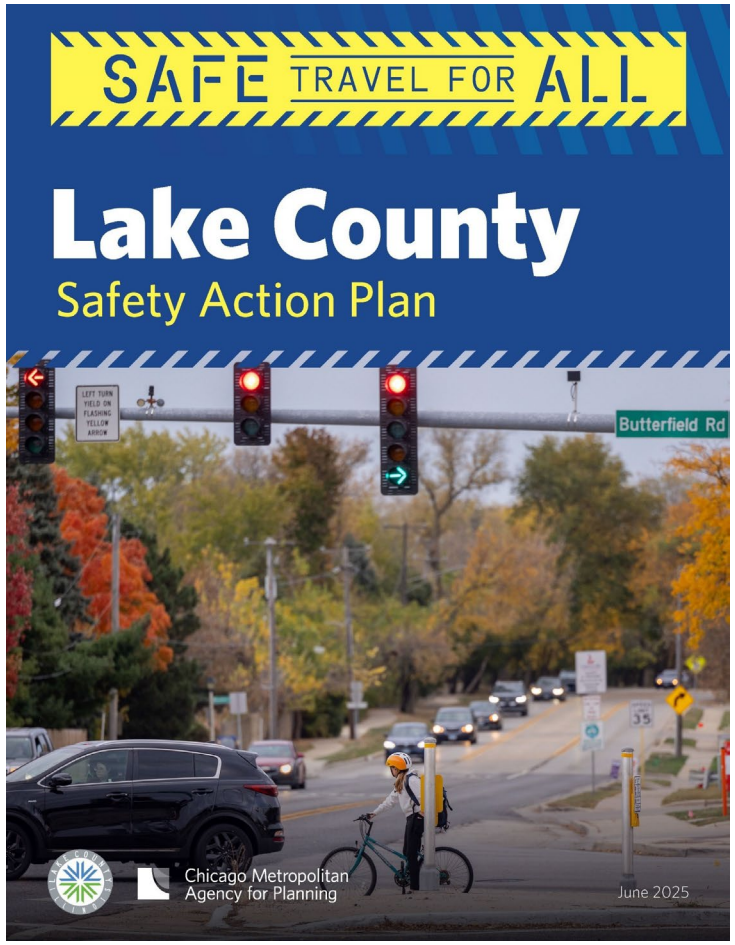
Guided by the mission to "reach people where they are," the project team used a variety of tools to engage the community including:

- **In-person community events**
- **A safety open house**
- **Project website**
- **Online survey**
- **Interactive safety hotspot comment map**
- **Social media**
- **Regular Steering Committee meetings**



Crash Data Analysis

Crash Definitions

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K-Fatality: A motor vehicle crash (single or multiple) that results in the death of one or more people within 30 days of the crash.

A- Incapacitating or serious injury- Any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities the person could perform before the injury occurred. Type A injuries commonly include severe lacerations, broken limbs, skull or chest injuries, and abdominal injuries.

B – Non-incapacitating injury – Any injury, other than a fatal or incapacitating injury, which is evident to observers at the scene of the crash. Type B injuries might include a lump on the head, abrasions, bruises, and minor lacerations.

C - Possible injury – Any injury reported or claimed that is not either an incapacitating, non-incapacitating, or fatal injury. Type C injuries may include momentary unconsciousness, claims of injuries not evident, limping, complaints of pain, nausea, and hysteria.

PDO- Crashes that do not result in any of the injuries above are commonly referred to as Property Damage Only (PDO) crashes

Disclaimers

- The observations, findings, conclusions, and recommendations of this report are protected under 23 CFR 407, which states these shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in this report or documents associated with this review.

- Results of the analyses are based on data received from the Illinois Department of Transportation. Unless otherwise noted, crash data represents years 2018 to 2022 and was obtained from the state police and other enforcement agencies. The data was used "as is" for analysis purposes and should be interpreted accordingly.

Crash Analysis (2018-2022)

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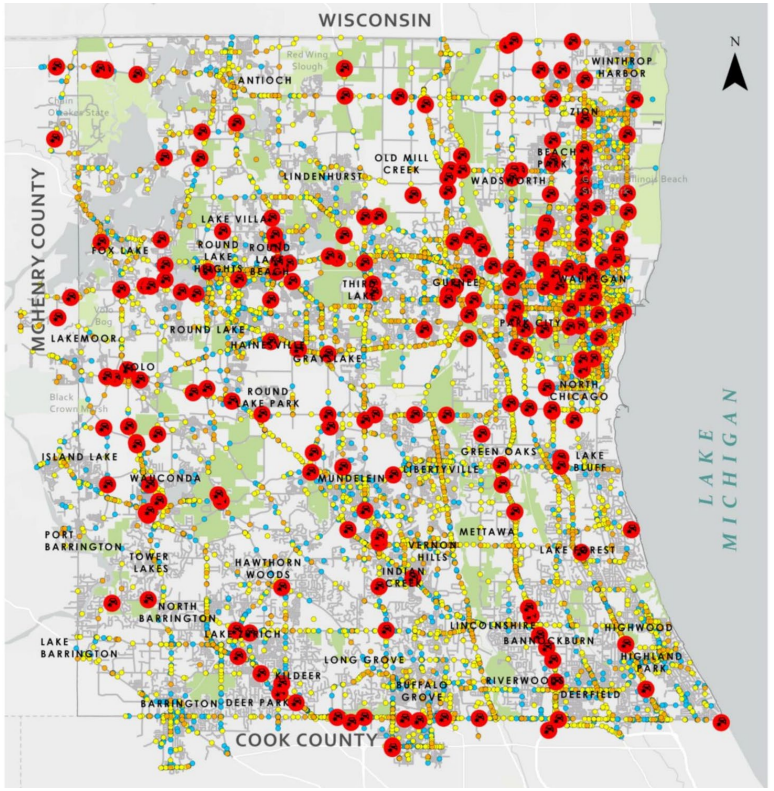
Type of Crash	Number of Crashes	Total Injured
Fatality (K)	225	248
A- Injury	1,655	2,083
B-Injury	7,023	9,607
C-Injury	7,183	10,867
PDO Crash	49,418	N/A
Total	**65,504**	**22,805**



All roads in Lake County included, regardless of jurisdiction

Crashes by Vehicle Type

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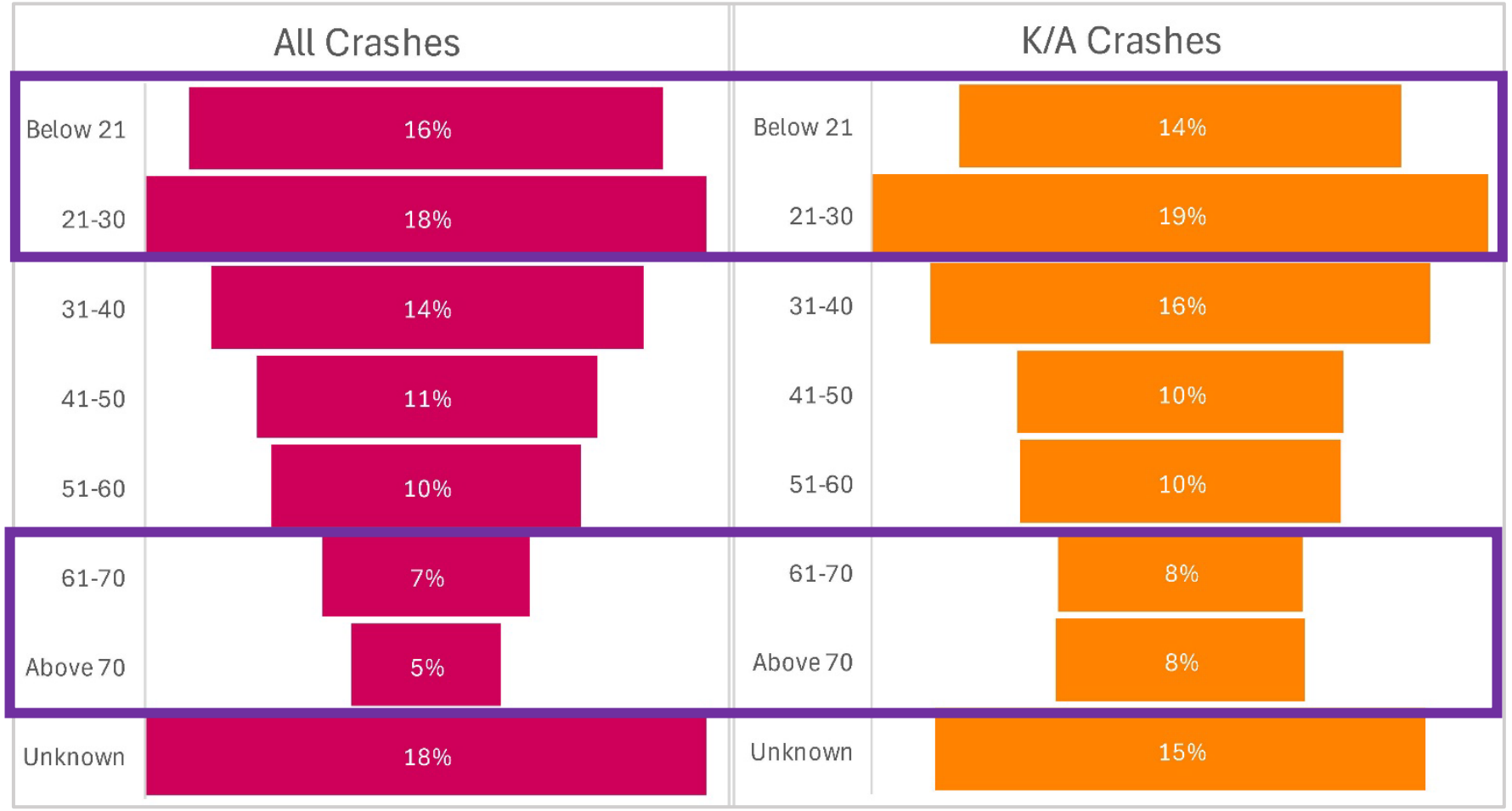
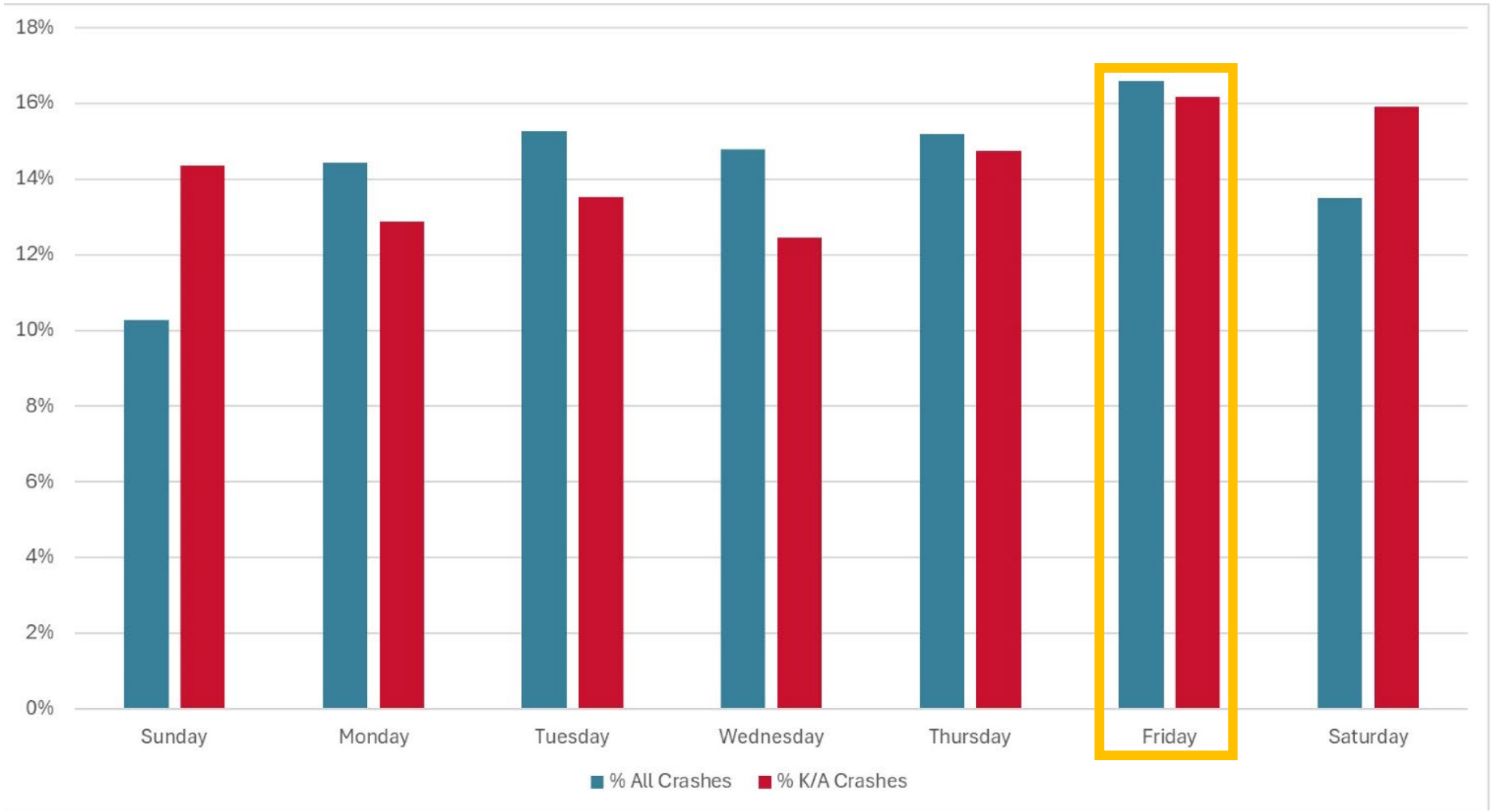
Vehicle Type	Vehicles Involved in All Crashes	Vehicles Involved in K/A Crashes	% All Crashes	% of K/A Crashes
Sedan/Saloon/Wagon	44,148	1,222	38%	37%
Van/SUV	40,711	1,062	35%	33%
Other	20,107	491	17%	15%
Pickup/SUT	7,858	218	7%	7%
Truck/Trailer	2,560	102	2%	3%
Motorcycle	462	151	0%	5%
Bus	247	4	0%	0%
Moped/Scooter	23	9	0%	0%
Total	**116,116**	**3,259**	**100%**	**100%**

Crashes by Driver Age



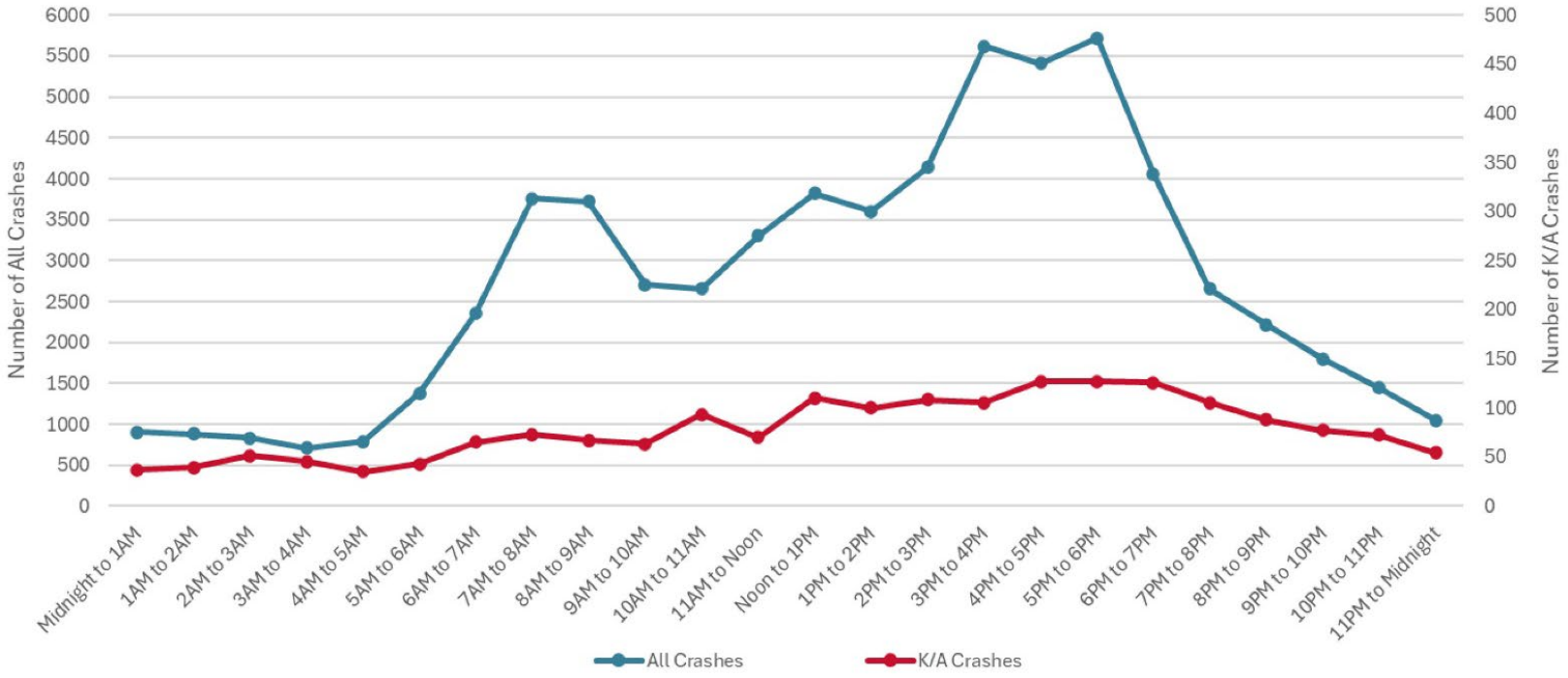
Crashes by Age of Presumed At-Fault Driver

Crashes by Day of Week



Injury Crashes as percentage of total crashes by day (2018-2022)

Crashes by Time of Day



Time of Day	All Crashes	K/A Crashes
Midnight to 1a.m.	902	37
1a.m. to 2a.m.	880	39
2a.m. to 3a.m.	830	51
3a.m. to 4a.m.	708	45
4a.m. to 5a.m.	787	35
5a.m. to 6a.m.	1,377	43
6a.m. to 7a.m.	2,351	65
7a.m. to 8a.m.	3,756	73
8a.m. to 9a.m.	3,723	67
9a.m. to 10a.m.	2,704	63
10a.m. to 11a.m.	2,656	93
11a.m. to Noon	3,306	70
Noon to 1p.m.	3,826	110
1p.m. to 2p.m.	3,602	100
2p.m. to 3p.m.	4,138	108
3p.m. to 4p.m.	5,617	105
4p.m. to 5p.m.	5,407	127
5p.m. to 6p.m.	5,719	127
6p.m. to 7p.m.	4,064	126
7p.m. to 8p.m.	2,653	105
8p.m. to 9p.m.	2,215	88
9p.m. to 10p.m.	1,794	77
10p.m. to 11p.m.	1,441	72
11p.m. to Midnight	1,048	54
Total	**65,504**	**1,880**

Crashes by Roadway Type

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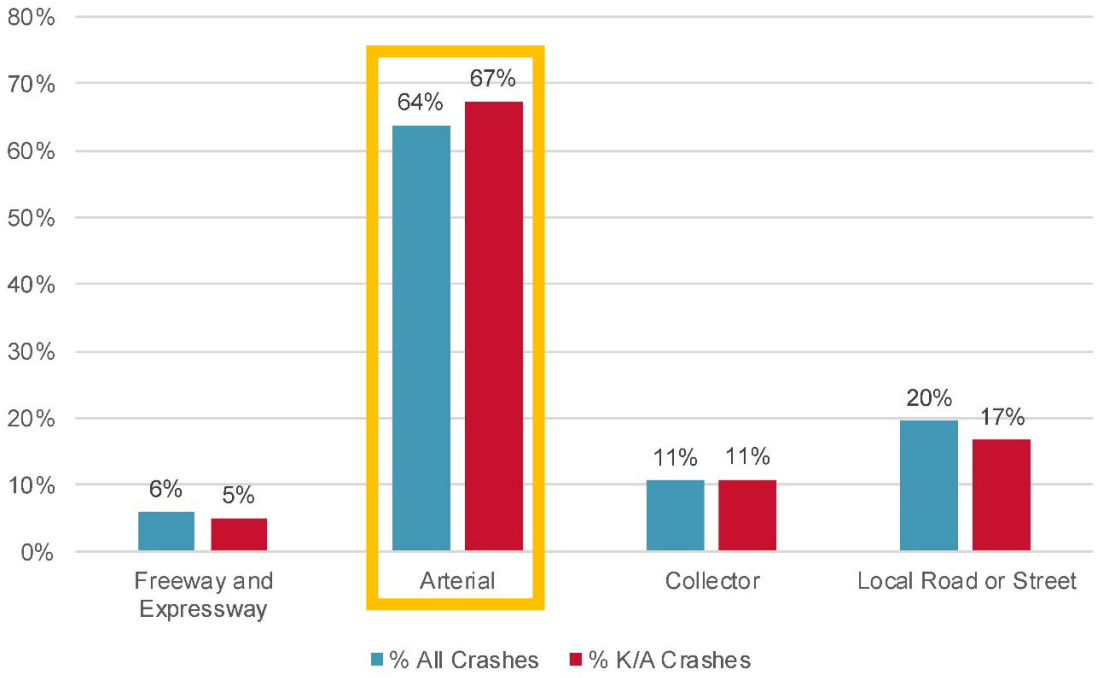
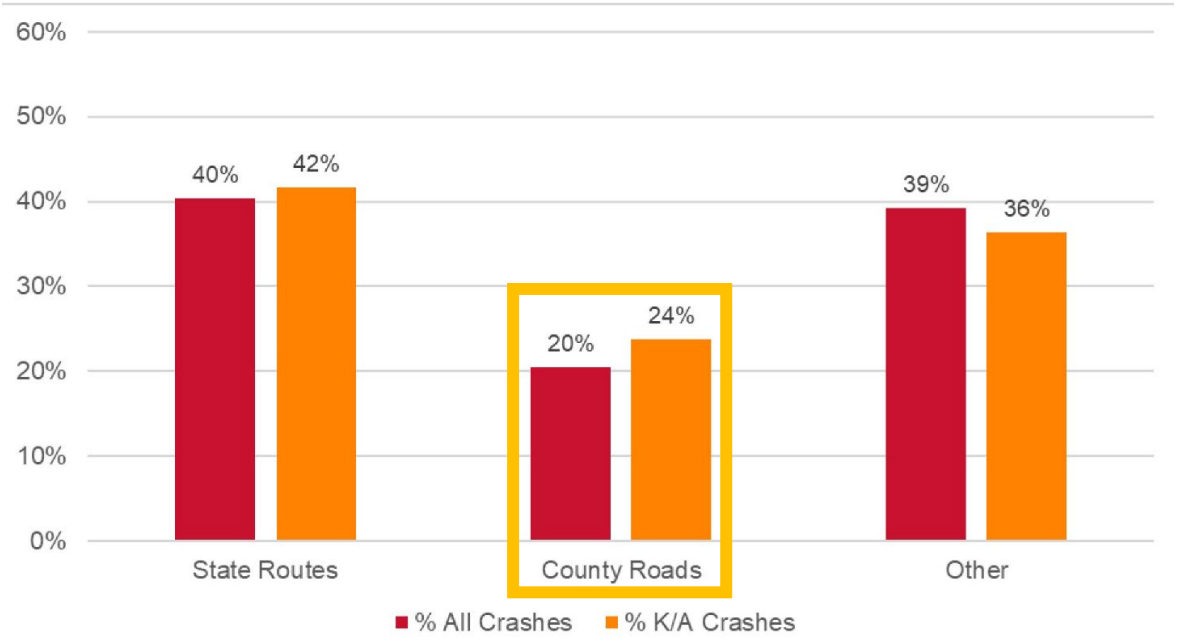
Roadway Classification



Roadway Jurisdiction



Crashes by Lanes & Speed

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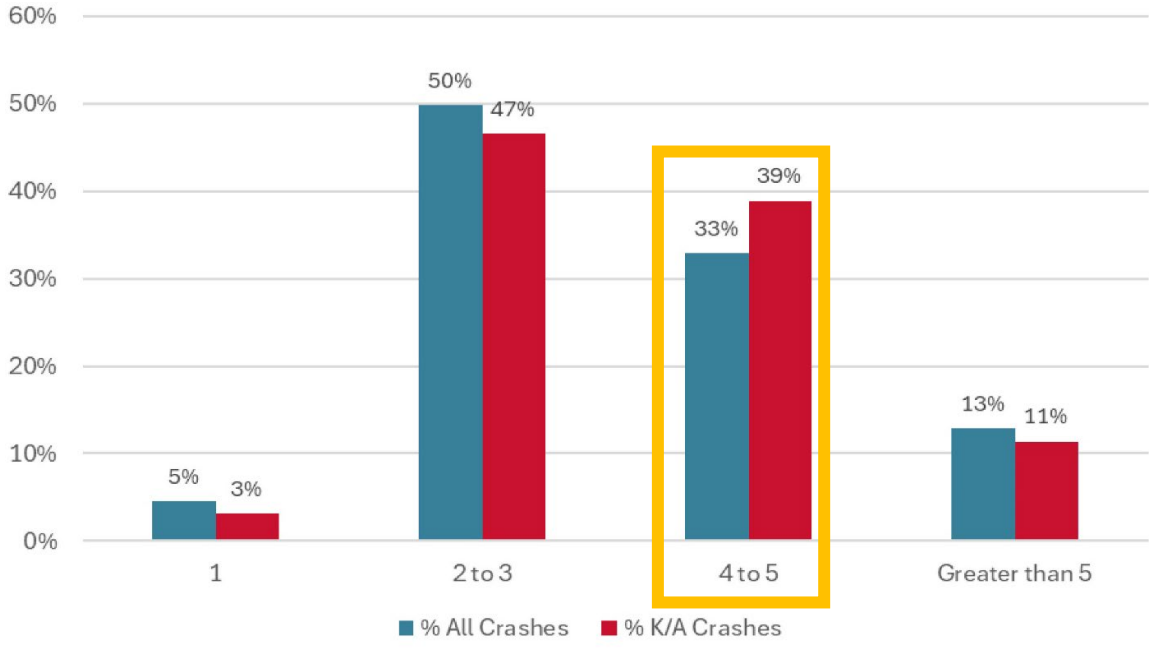
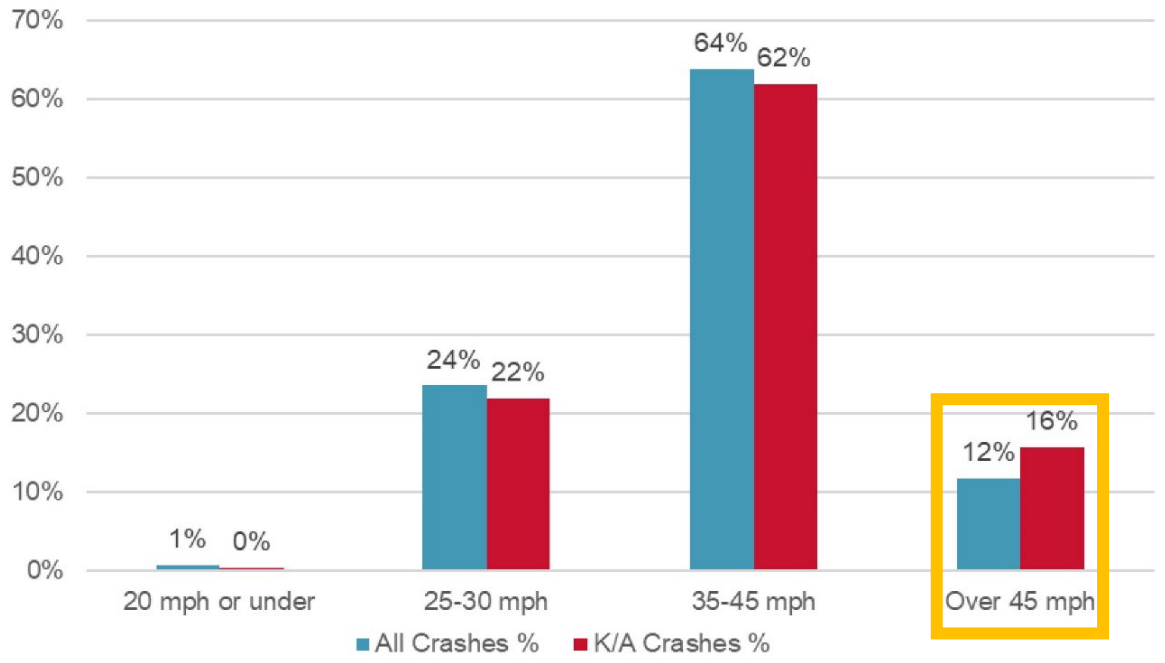
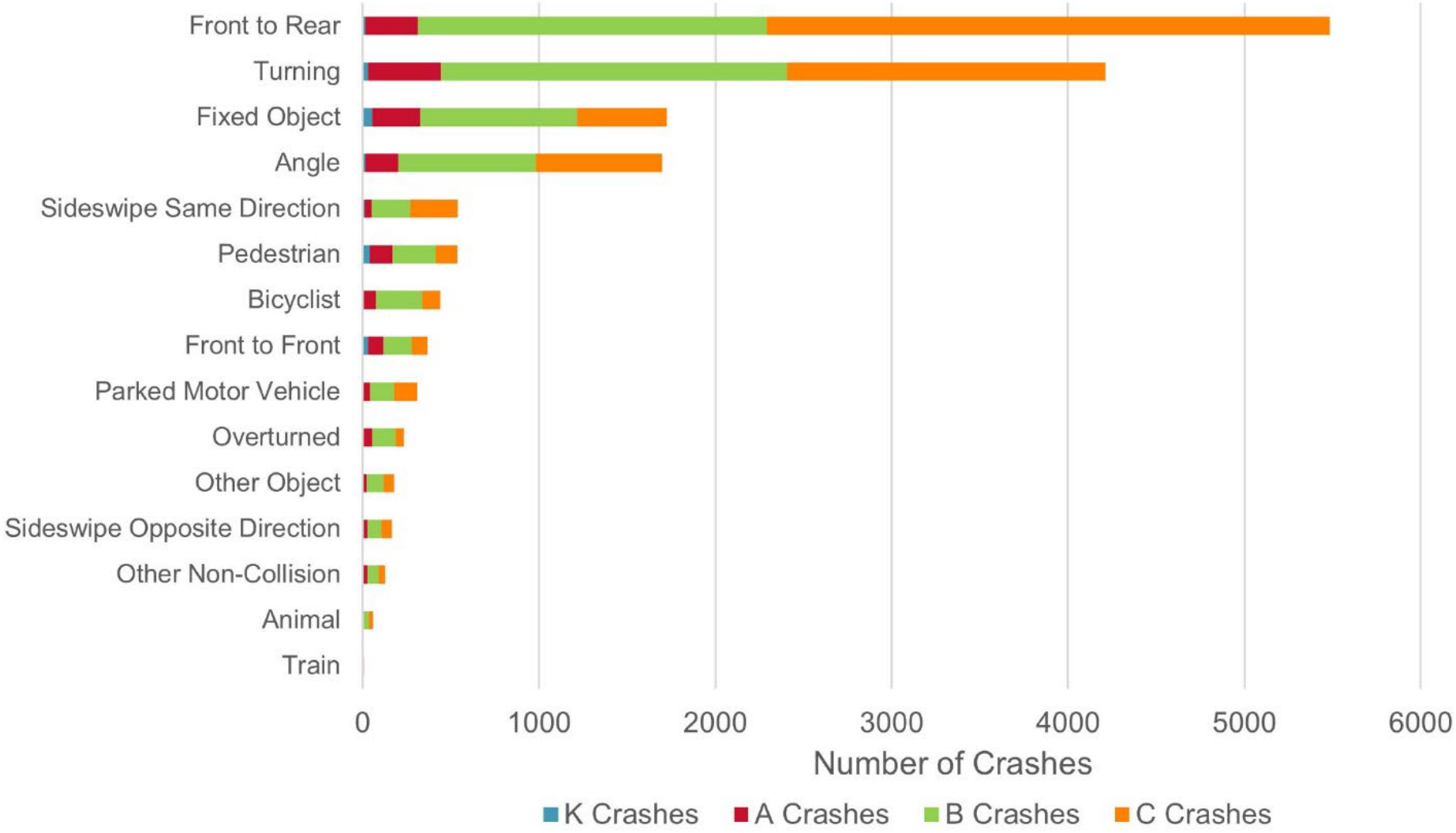
Number of Lanes



Posted Speed Limit



Injury Crash Type Analysis



Potential Crash Causes

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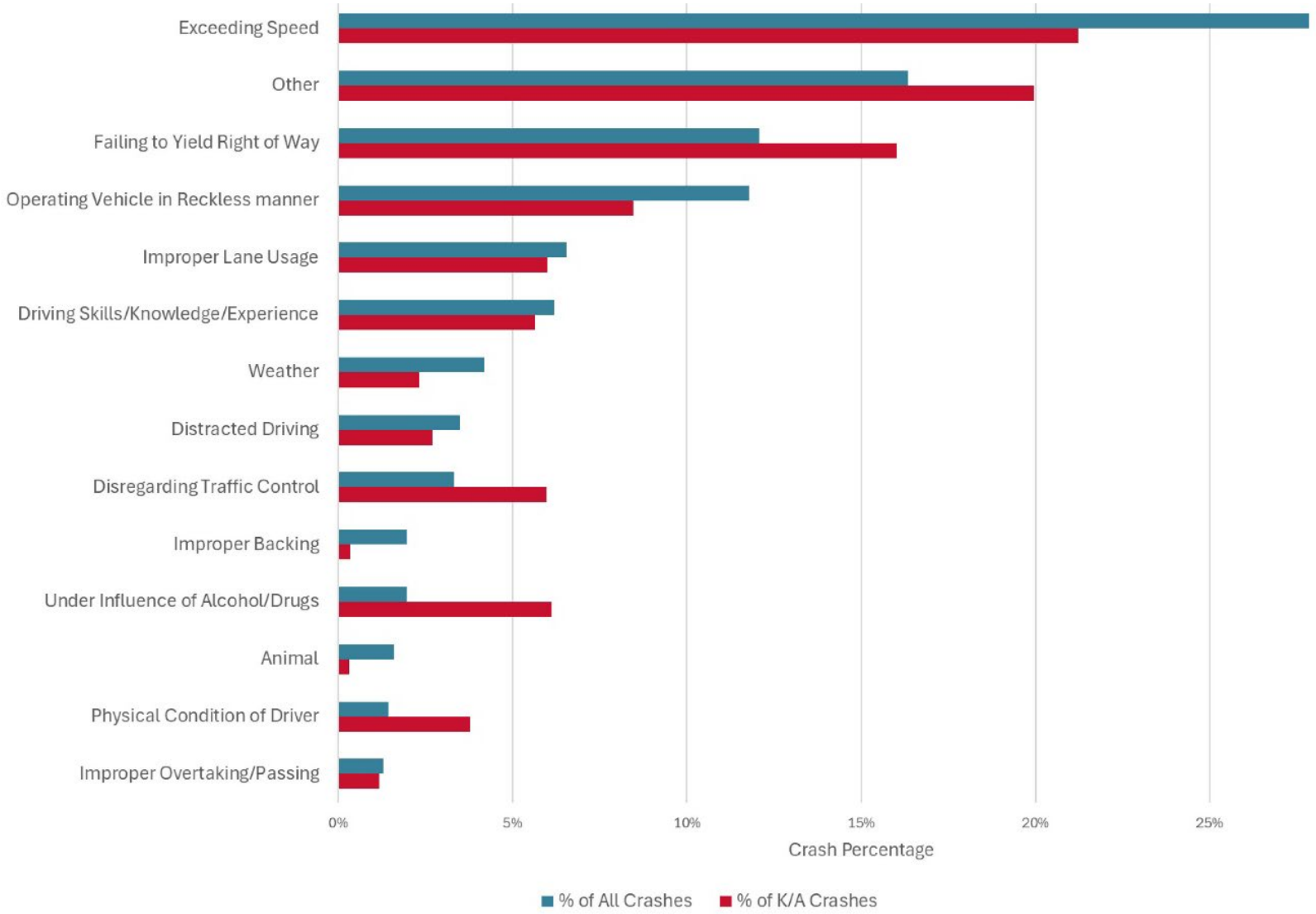
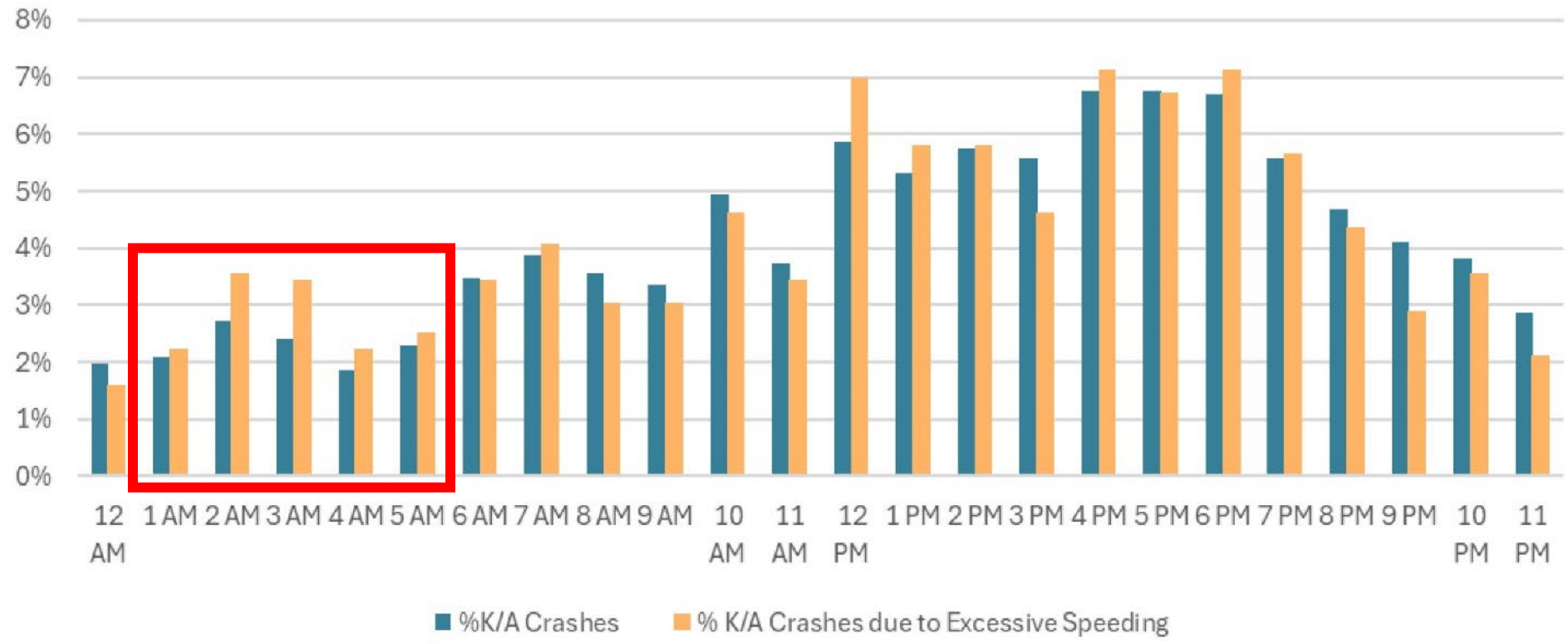


Excessive Speeding By Time



Excessive speeding crashes are disproportionately likely to result in serious injury or fatality when fewer vehicles are on the road

Impaired Driving

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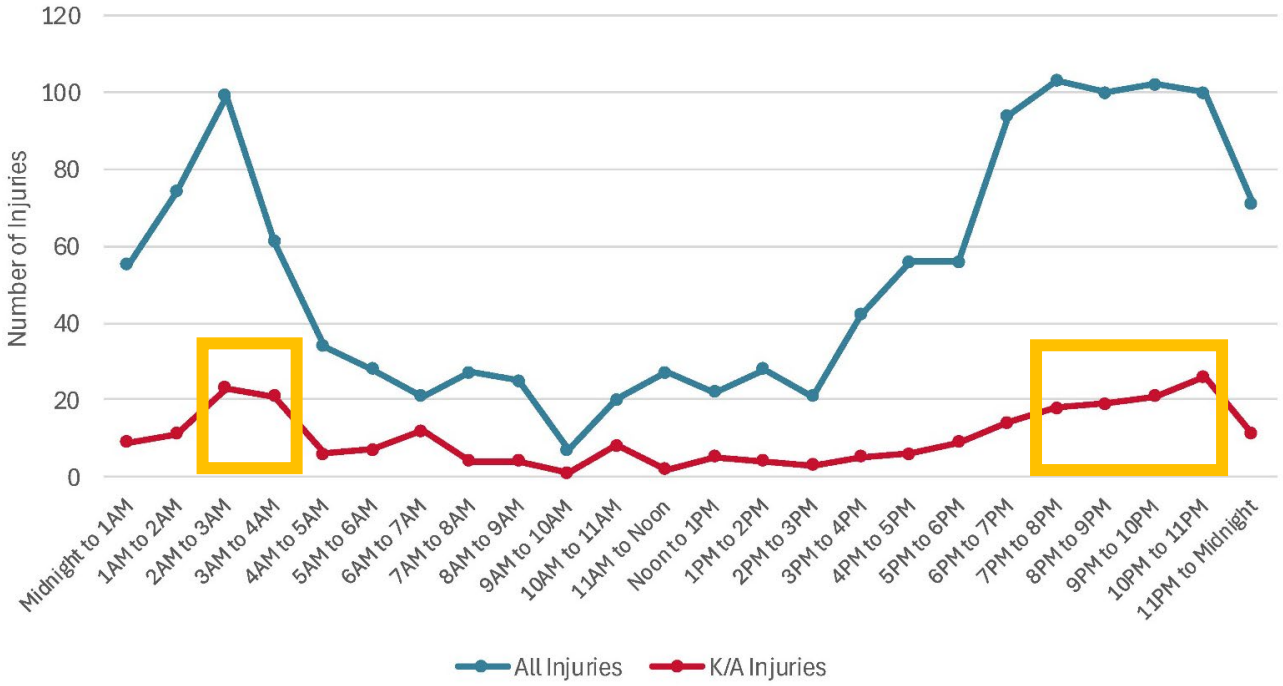
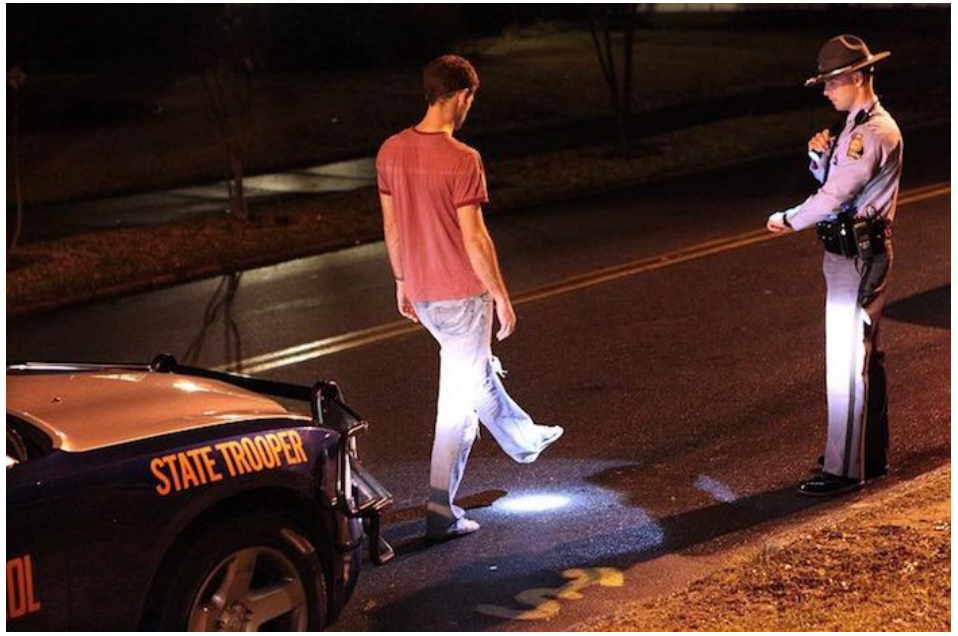
Six hours of the day (7pm-11pm & 2am-4am) make up over 50% of the fatal & serious injury crashes under the influence of alcohol or drugs.

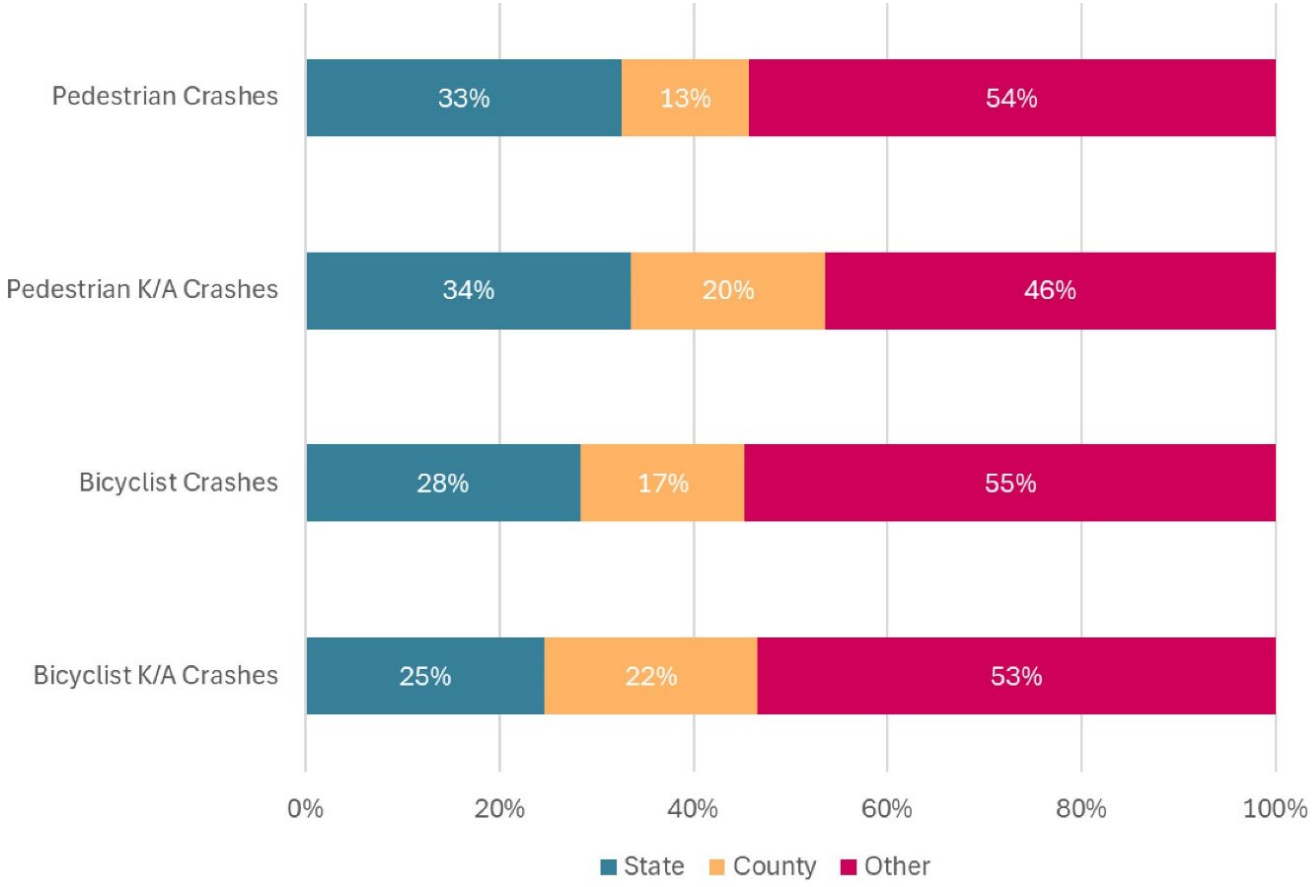


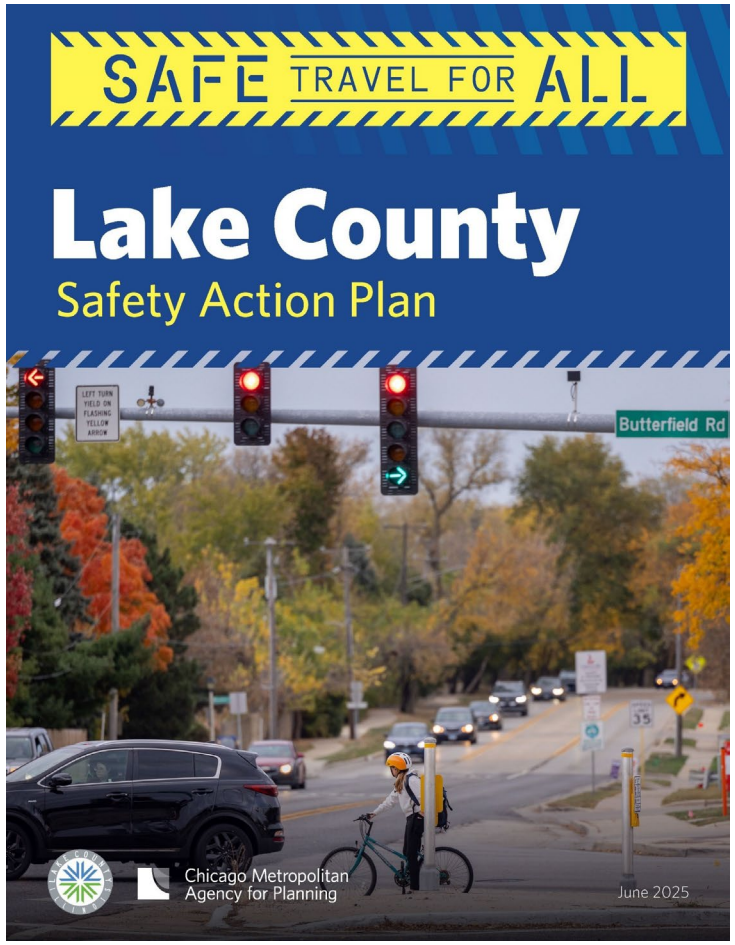


Pedestrian & Bicyclist Crashes

- 543 pedestrian crashes
  - 565 pedestrian injuries with 39 fatalities
- 455 bicyclist crashes
  - 448 bicyclist injuries with 8 fatalities
- Bike & Ped account for:
  - 2% of total crashes
  - 6% of injury crashes
  - 10% of fatal/serious injuries
- 98% of pedestrian crashes and 97% of bicyclist crashes resulted in some form of injury
- 31% of pedestrian crashes and 16% of bicyclist crashes resulted in fatal/serious injury

Pedestrian & Bicyclist Jurisdiction





Policy & Process Changes

Policy & Process Areas

1. Complete Streets
2. Context-Sensitive Speed Limit Setting
3. Lane Repurposing and Road Diet Policy
4. Sidewalk Master Plan
5. Bicycle Master Plan
6. Transit Access and Last-Mile Connectivity
7. Mid-Block Crossing Policy
8. Trails Master Plan
9. Parking / Curb Management Approach
10. Safe Routes to School

Policy & Process Examples

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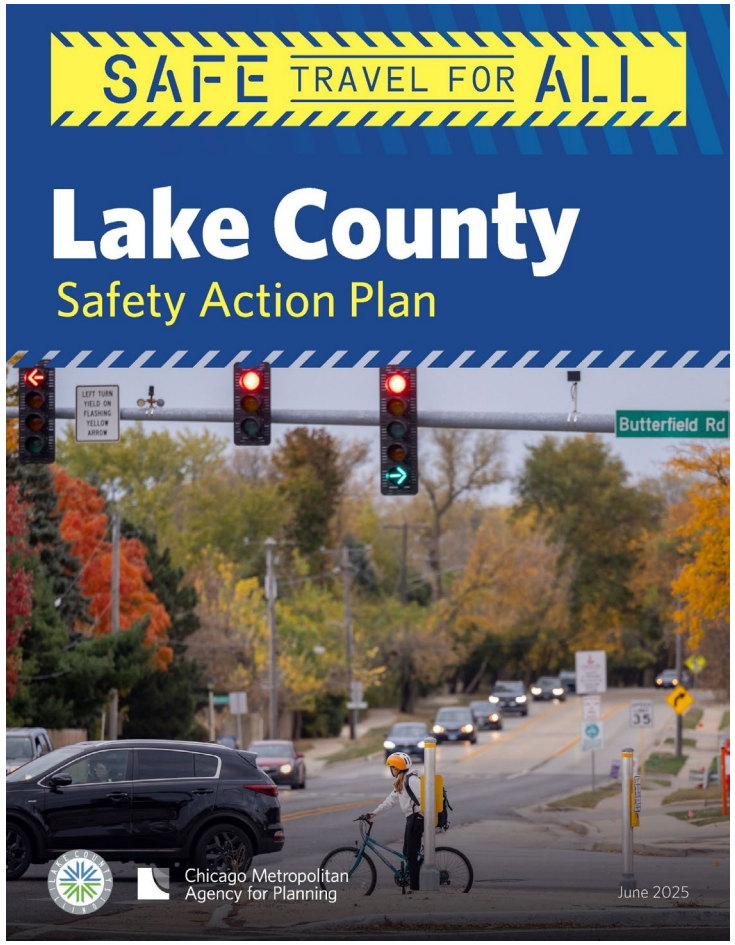
Strategy	TYPOLOGY							CRASH EMPHASIS AREAS				Timeline	Responsible Party	Expected Impact & Level of Effort (LOE)	
	Urban Four-Lane Undivided Segments	Urban Two-Lane Undivided Segments	Urban Four-Lane Divided Segments	Urban Two-Lane Undivided Intersections	Urban Four-Lane Divided Intersections	Rural Segments	Rural Intersections	Speeding & Aggressive Driving Crashes	Impaired Driving Crashes	Roadway Departure Crashes	Turning & Rear-End Intersection Crashes			Impact	LOE
BEHAVIORAL, POLICY & PROCESS STRATEGIES															
Develop and implement sidewalk master plan	X	X	X	X	X	X	X				X	Mid- to Long-term	County & Municipalities	High	Moderate
Develop and implement bicycle master plan	X	X	X	X	X	X	X				X	Mid- to Long-term	County & Municipalities	High	Moderate
Adopt a Complete Streets Policy	X	X	X	X	X			X			X	Near-term	CMAP & County	High	Lower
Require consideration of sidewalks, bike lanes, safe crossings, transit amenities, & ADA compliance in all capital projects	X	X	X	X	X	X	X	X	X		X	Mid-term	CMAP, County, & Municipalities	High	Moderate
Implement a curb management policy that prioritizes safe transit passenger pick-up/drop-off.	X	X	X	X	X			X			X	Mid-term	CMAP & Municipalities	Moderate	Moderate



Safety Strategy & Project Identification

High Injury Network

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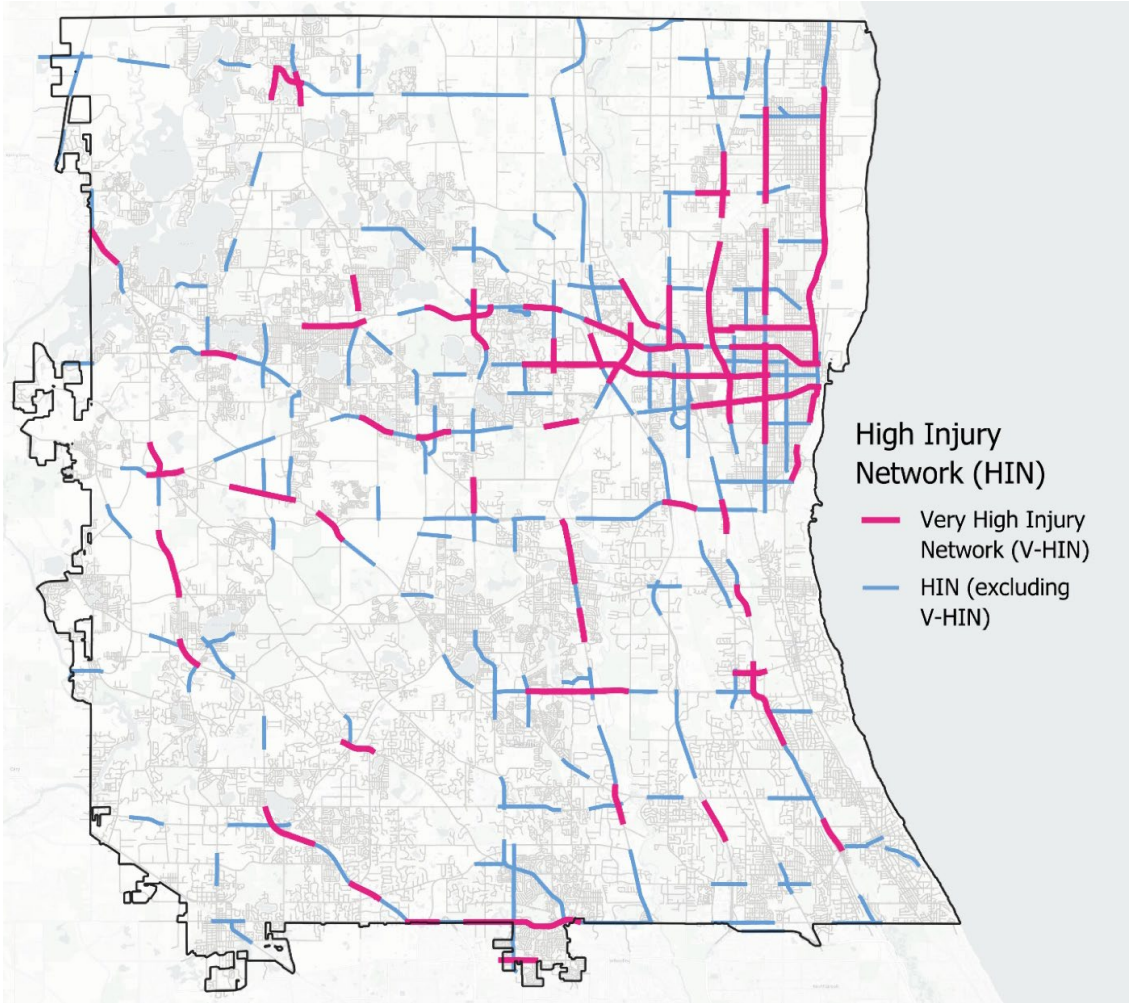
High Injury Network

- 2.5 fatal & serious injuries/mile
- 66% of all fatal/serious injury crashes
- 7.5% of total roadway miles

Very High Injury Network (subset of HIN)

- 6 fatal & serious injuries/mile
- 35% of all fatal/serious injury crashes
- 2.4% of total roadway miles

Identification of the network allows for prioritized intervention



Emphasis Areas

- Present in many fatal and serious injury crashes, and
- More often resulted in fatalities and serious injuries, and
- More prevalent in Lake County than in the six-county area.
- Emphasis Areas are:
  - Intersections
  - Speeding and Aggressive Driving
  - Roadway Departures
  - Impaired Driving
- These four emphasis areas account for more than 55% of all fatal/serious injury crashes in Lake County.

Roadway Risk Factors

- Used to determine which road characteristics are associated with the most fatal and serious injury crashes.
- They don’t necessarily contribute as a direct cause for the crash.
- Example wide shoulders on urban roadways:
  - The wider shoulder itself is likely not the cause for the increased crash risk, but rather serves as a surrogate risk factor, as wider shoulders are often found on higher speed and higher volume roadways.

Assigning Risk Scores

Urban Segment Characteristic	Vehicle Risk Factor	Ped/Bike Risk Factor
Volume	Greater than 2,500 vehicles per day	Greater than 2,500 vehicles per day
Speed Limit	45 mph or greater	30-40 mph
Outside Shoulder Width	4 ft or greater	-
Lane Width	12 ft	12 ft
Number of Lanes	4 or more lanes	4 lanes
Parking	No parking allowed	No parking allowed

Urban Intersection Characteristic	Vehicle Risk Factor	Ped/Bike Risk Factor
Control Type	Signalized	Signalized
Number of Legs	4-Legged	4-Legged
Volume	Daily entering traffic of 7,500 vehicles per day or greater OR AADT cross product of 2,000,000 or greater	Daily entering traffic of 2,500 vehicles per day or greater OR AADT cross product of 400,000 or greater
Speed Limit	Major road speed limit of 40 mph or greater OR Minor road speed limit of 35 mph or greater	Major road speed limit of 30-35 mph OR Minor road speed limit of 30-35 mph
Parking Any Legs	No parking allowed on any leg	No parking allowed on any leg
Major Lanes Count	4 or more lanes	4 or more lanes

Rural Segment Characteristic	Vehicle Risk Factor
AADT	Greater than 10,000 vehicles per day
Speed Limit	50 mph or greater
Outside Shoulder Width	6 ft or greater
Lane Width	12 ft
Number of Lanes	4 or more lanes

Rural Intersection Characteristic	Vehicle Risk Factor
Control Type	Signalized
Number of Legs	4 Legged
Volumes	Daily entering traffic of 7,500 vehicles per day or greater OR AADT cross product of 10,000,000 or greater
Speed Limit	Major road speed limit of 50 mph or greater OR Minor road speed limit of 50 mph or greater
Parking Any Legs	No parking allowed on any leg
Major Lanes Count	4 or more lanes

- **Risk scores were calculated based on the facility type and number of risk factors present.**
- **Each risk factor was weighted equally, adding one point to the total.**

Risk Score Summary

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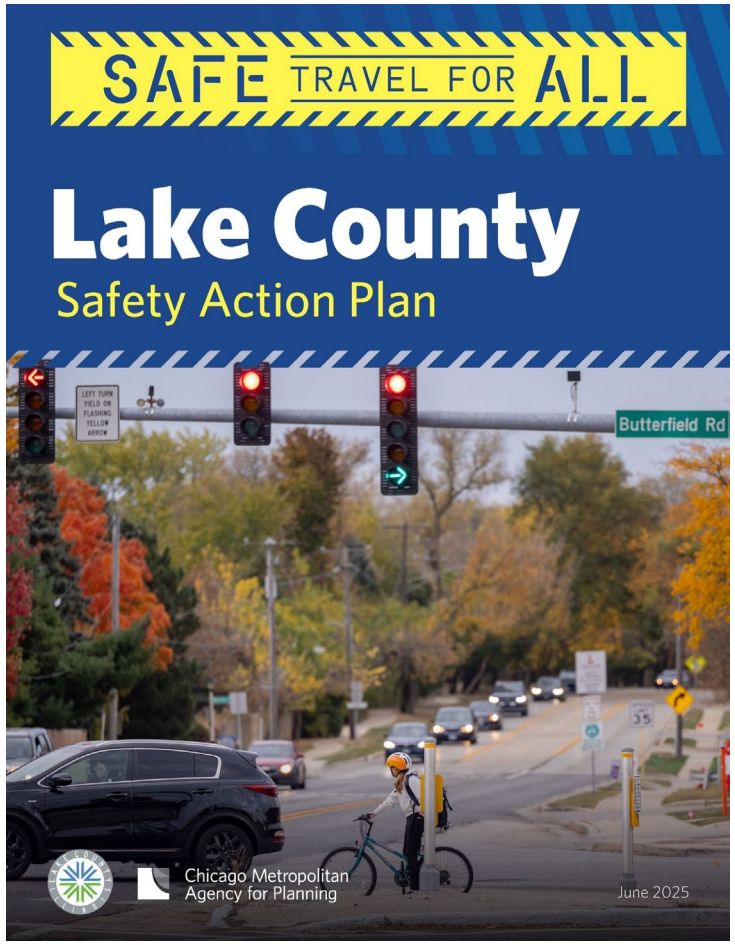
- **Locations with higher risk scores generally make up a small portion of the network but are associated with the highest frequencies of fatal and serious injury crashes**

Facility Type	Share of Network with Risk Score of 4 or Greater	Share of Fatal + Serious Injury Crashes on Network with Risk Score of 4 or Greater
Urban Segment	13%	60%
Urban Segment Ped/Bike	10%	45%
Urban Intersection	7%	67%
Urban Intersection Ped/Bike	7%	57%
Rural Segment	19%	50%
Rural Intersection	12%	60%

Community Impact Considerations

- USDOT has updated the definition of “underserved community” to be consistent with the Areas of Persistent Poverty (APP) definition
- Designated as APPs are primarily located in or around the communities of North Chicago, Waukegan, Zion, and Round Lake
- Roads within an APP makeup 7.5% of all roads but 14% of High Injury Network
- Nearly 60% of minor arterials within APP areas are on the High Injury Network
- Over 50% of principal arterials within APP are on the High Injury network



Countermeasures & Project Selection

Crash Reduction Factors

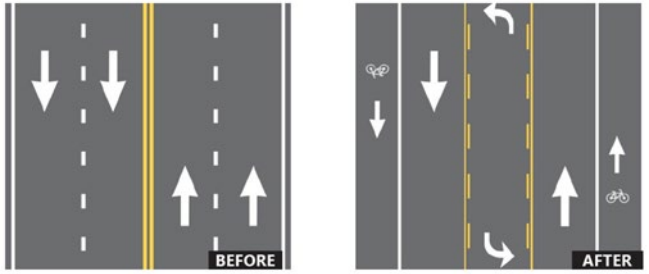
- **A Crash Reduction Factor (CRF) is derived from empirical studies comparing crash outcomes before and after a countermeasure is deployed**
- **The CRF Value represents the expected percent reduction in crashes associated with implementation of a specific treatment.**
- **For example, a CRF of 30% implies that if 100 crashes currently occur at a location, implementing the countermeasure could reduce that number to 70.**
- **CRF are drawn from FHWA's *Proven Safety Countermeasure* initiative and the *Crash Modification Factors Clearinghouse*.**

Road Safety Countermeasures

LakeCounty Division of Transportation

Description	Location Type	Applicable Crash Types	Crash Reduction Factor	Quick Build Capable	Relative Cost	Traffic and Other Considerations
Lane Departure Treatments (rumble strips, Safety Edge, clear zone, curve improvements)	Rural and urban segments with fixed object or single-vehicle crashes	Lane Departure, Fixed Object, Single Vehicle	20-40% (CMF ID 3394, 9230, 35, 36, 2439)	Yes	$ - $$	Systemic application; medium-term fix with strong rural impact
Stop-Control Upgrades (double/oversized stop signs, stop bars, all-way stop control)	High-risk stop-controlled intersections	Rear-End, Angle	68% (CMF ID 3127, 1692, 1661, 6051, 6602)	Yes	$ - $$	Quick-build capable
Signal Upgrades (retroreflective backplates, timing)	High-risk signalized intersections (urban)	Rear-End, Angle, Pedestrian	11-15% (CMF ID 586 & 1410)	Yes	$ - $$	Quick-build capable; improves visibility and reduces intersection conflicts
Lane Repurposing (4-to-3 lane conversion with turn lanes)	Urban 4-lane undivided segments with AADT <20,000	Rear-End, Angle, Speed	19-47% (CMF ID 5554 & 2841)	No	$$$$	Proven safety countermeasure; supports bike/ped facilities
Radius Tightening / Curb Hardening	High-risk intersections with ped/bike crash history or risk	Pedestrian, Bicycle, Speed	44% (CMF ID 8496)	Yes	$$	Option for low-cost temporary installation or medium-cost permanent installation
Lighting	High-risk locations with nighttime crash history	Nighttime	42% (CMF ID 11027)	Yes	$$ - $$$$	
Pedestrian Crossing Enhancements (RRFBs, PHBs, LPI, refuge islands, enhanced crosswalks, lighting)	Urban segments with pedestrian/bike crash history or long crossing gaps	Pedestrian, Bicycle	35-70% (CMF ID 11158, 10591, 1993, 2697, 11027)	Yes	$$	Proven countermeasures for pedestrian safety; applicable to mid-block and intersections
Speed Calming Design (raised medians, curb/gutter, lane narrowing)	High-risk segments with low-medium speed limit and speed crash history	Speed, Rear-End	39-46% (CMF ID 21 & 8163)	No	$$ - $$$	Long-term investment
Access Management (medians, driveway reduction)	High-risk segments with turning or angle crash history	Angle, Turning, Left-Turn	Up to 50% (CMF ID 5185)	No	$$$	Medium-term solution; requires design and buy-in
Roundabout Installation	High-risk intersections with angle/turning or speed crash history	Angle, Turning, Speed	78-82% (CMF ID 211 & 226)	No	$$$$	Long-term investment; strong crash reduction benefits
Zero or positive offset turn lanes	High-risk intersections with angle/turning crash history	Angle, Turning	20-36% (CMF ID 276, 277, & 6096)	Yes	$$	Quick-build capable in some locations; improves visibility

Lane Repurposing



Access Management

Safety Project Identification

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- Locations with countermeasure recommendations were:
  - On the high injury network and
  - Had a high-risk score
- Data used to determine countermeasures but may not always reflect all contexts
  - Transportation engineers should consider geometry and surrounding environment
- Multiple countermeasures could be recommended for the same location, but a single type was identified for each location

Roadway Segment Projects

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Segment Countermeasure	Number of HIN Segment Locations	Sum of Segment Miles	Percent of HIN Segment Miles
Urban Lane Repurposing	34	29.85	10.9%
Urban Access Management	136	121.13	44.2%
Urban Roundabout Corridor	14	13.27	4.8%
Urban Speed Calming	97	85.65	31.3%
Urban Variable Speed Limits	83	77.11	28.1%
Urban Speed Safety Cameras	135	123.44	45.1%
Urban Sidewalk	212	187.24	68.3%
Urban Bike Facility or Parallel Bike Blvd	20	17.78	6.5%
Rural Lane Departure Improvements and Curve Improvements	12	11.57	4.2%
Rural Ped/Bike Improvements	3	3.02	1.1%
Mid-Block Crossing	72	64.06	23.4%
Road Safety Audit	29	25.44	9.3%

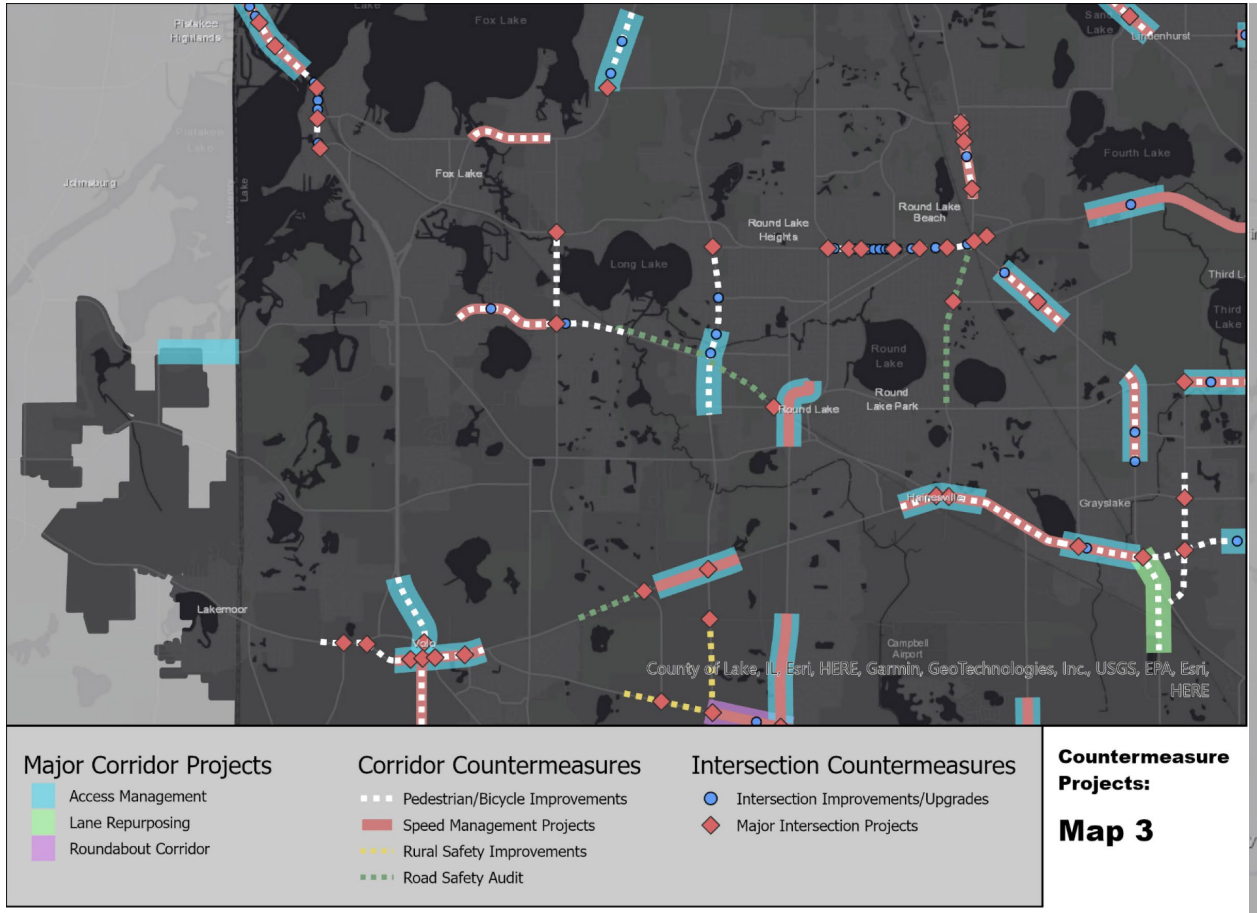
Roadway Intersection Projects

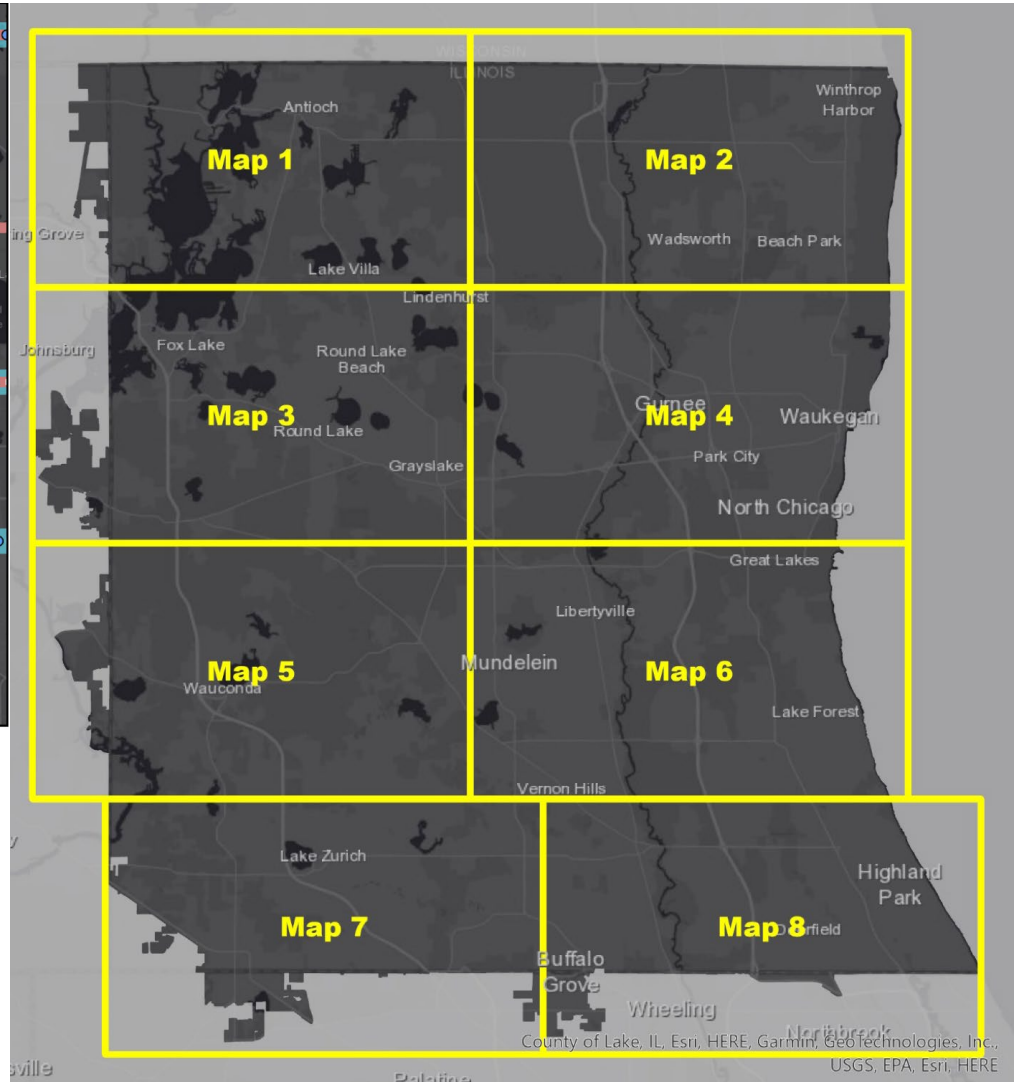
LakeCounty
Division of Transportation

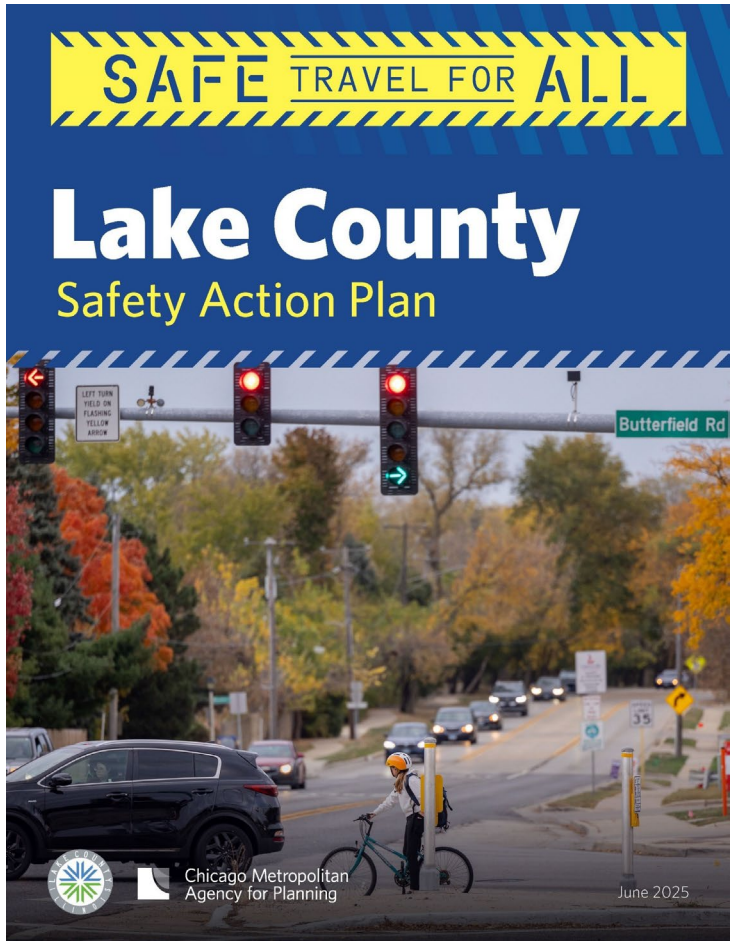
Intersection Countermeasure	# Intersections	% of HIN
Roundabout	113	8.1%
Reduced Conflict Intersection	339	24.3%
Radius Tightening	309	22.1%
Lighting	246	17.6%
Temporary Radius Tightening	623	44.6%
Stop-Control Intersection Upgrades	300	21.5%
Signalized Intersection Upgrades	323	23.1%
Pedestrian Improvements at Signalized Intersections	333	23.8%
Pedestrian Improvements at Non-Signalized Intersections	332	23.8%
Rural Intersection Improvements	33	2.4%
Rural Ped/Bike Intersection Improvements	0	0.0%

Project Maps

LakeCounty
Division of Transportation





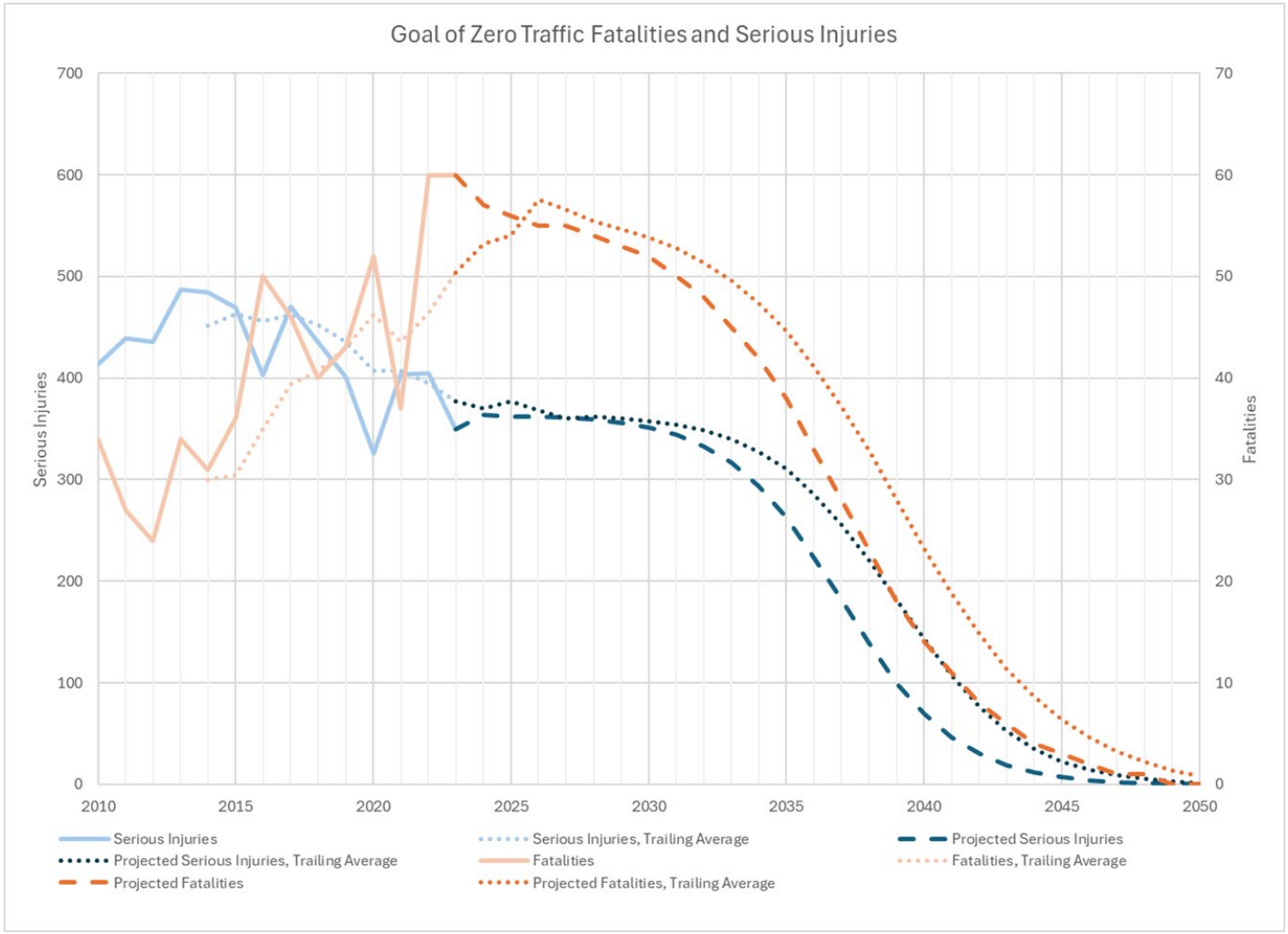


Goal Setting

Vision Zero

LakeCounty
Division of Transportation

- Goal of Zero Traffic Related Fatalities & Serious Injuries by 2050
- Aggressive but achievable
- Projecting an “S-Curve” out to 2050



Achieving Vision Zero

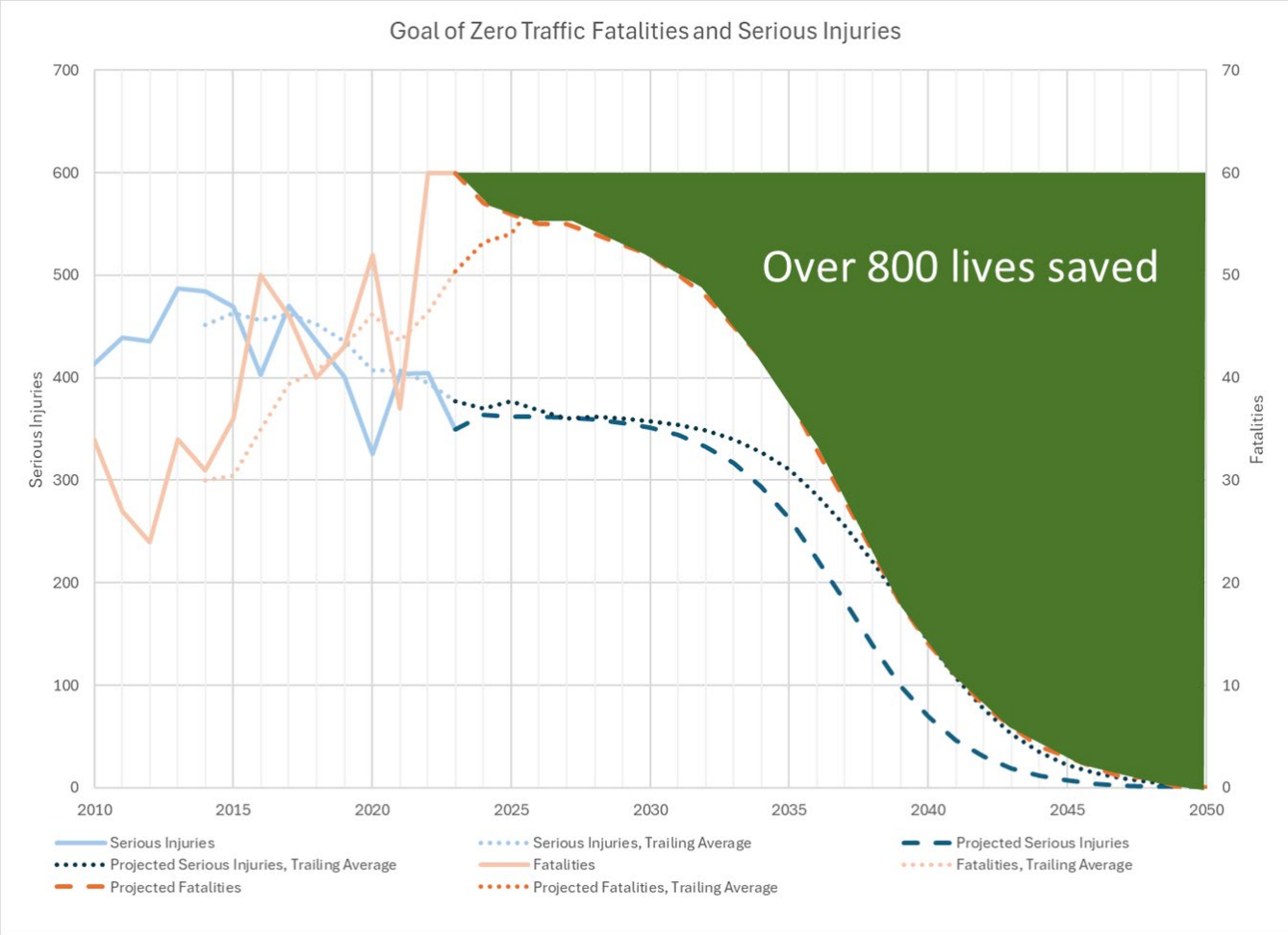
LakeCounty
Division of Transportation

The economic impact costs of crashes are estimated by the USDOT[1] as:

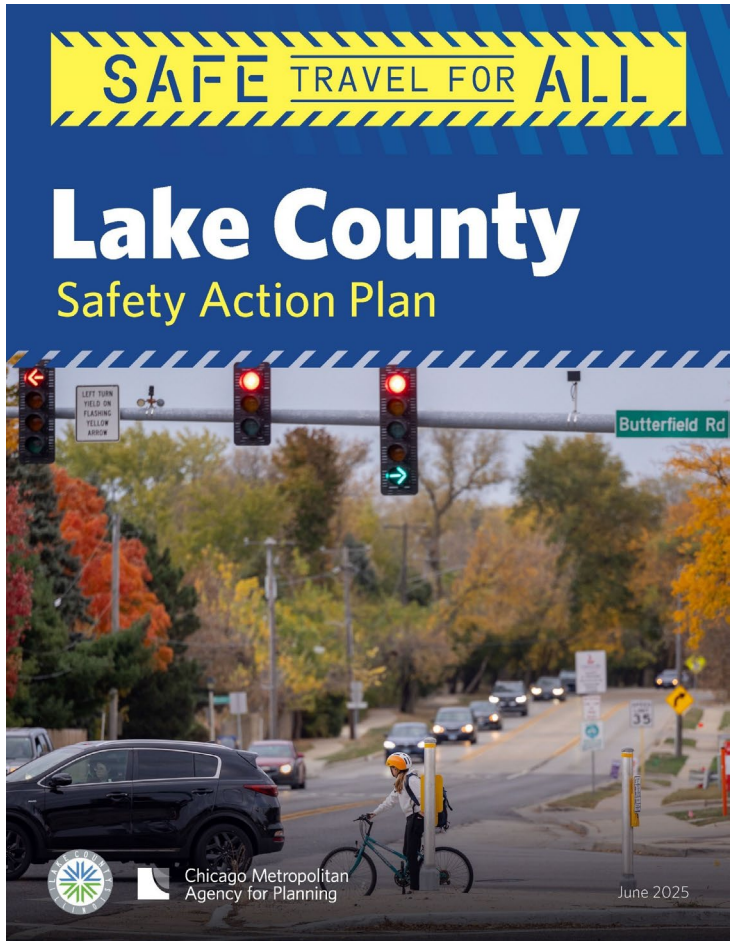
- **$3,000,000 for a traffic fatality.**
- **$2,290,000 for a critical injury.**
- **$565,000 for a severe injury.**
- **$175,000 for a serious injury.**
- **$45,000 for a moderate injury.**
- **$6,000 for a minor injury.**

Achieving zero traffic related fatalities & serious injuries by 2050:

$4-7 Billion in economic impact in Lake County



[1]-Source: https://highways.dot.gov/safety/data-analysis-tools/rsa/rsas-costs-and-benefits



Measuring Progress

Performance Measures

LakeCounty
Division of Transportation

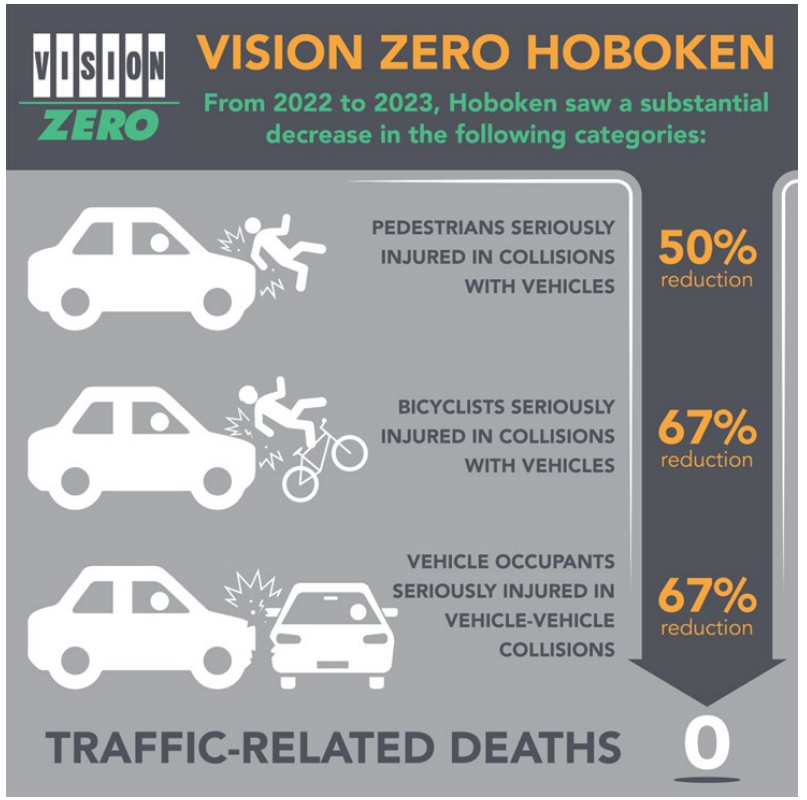
Performance Measure	Description	Baseline[1]
Number of Fatalities	The total number of persons suffering fatal injuries in a motor vehicle crash during a calendar year.	46.4
Rate of Fatalities per 100 million VMT	The ratio of total number of fatalities to the number of vehicle miles traveled (VMT, in 100 Million VMT) in a calendar year.	0.818
Number of Serious Injuries	The total number of persons suffering at least one serious injury in a motor vehicle crash during a calendar year.	394.4
Rate of Serious Injuries per 100 million VMT	The ratio of total number of serious injuries to the number of VMT (in 100 Million VMT) in a calendar year.	6.957
Number of Non-motorized Fatalities and Non-motorized Serious Injuries	The combined total number of non-motorized fatalities and non-motorized serious injuries involving a motor vehicle during a calendar year.	47.4

Performance Measure	Description	Baseline[1]
Project Completion	The total number of location-based projects which include safety benefits completed during a calendar year.	N/A
Project Completion within APP	The total number of location-based projects which include safety benefits completed in an APP during a calendar year.	N/A
Number of Fatalities and Serious Injuries due to Impaired Driving	The total number of fatalities and serious injuries due to impaired driving during a calendar year.	111.4
Number of Fatalities and Serious Injuries due to Distracted Driving	The total number of fatalities and serious injuries due to distracted driving during a calendar year.	57.4

Success Story: Hoboken, NJ

LakeCounty
Division of Transportation

7 consecutive years without a traffic related death!

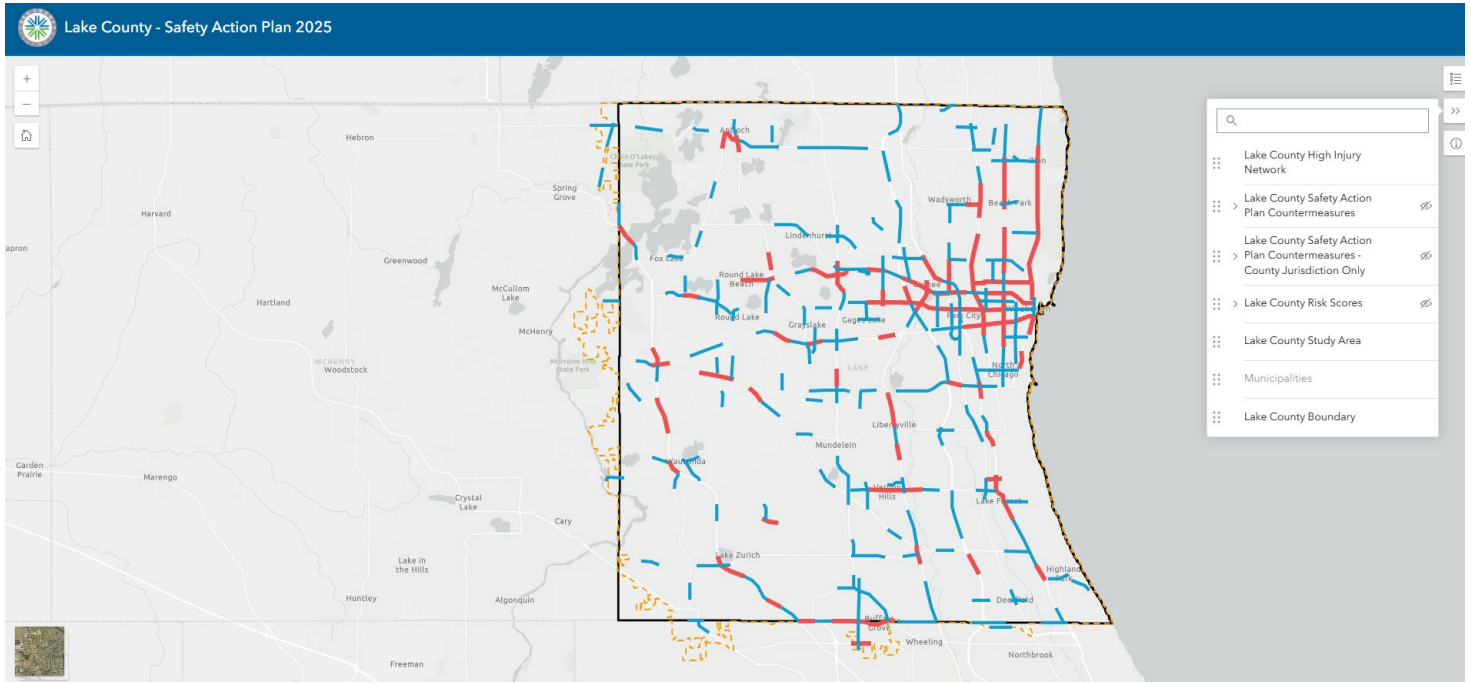


Next Steps

- County Vision Zero Policy
- Use SAP results for current project selection & project scoping
- Incorporate SAP policies & projects into Envision 2050
- Annual report out on progress

Report and Interactive Map

- **Full Report:**
  - https://www.lakecountyil.gov/5265/Safety-Action-Plan-2025
- **Interactive Map:**



Questions

Contact us!

Office: 847.377.7400

PASSAGE: 847.377.7000

Email: dot@lakecountyil.gov

Web: lakecountyil.gov/transportation