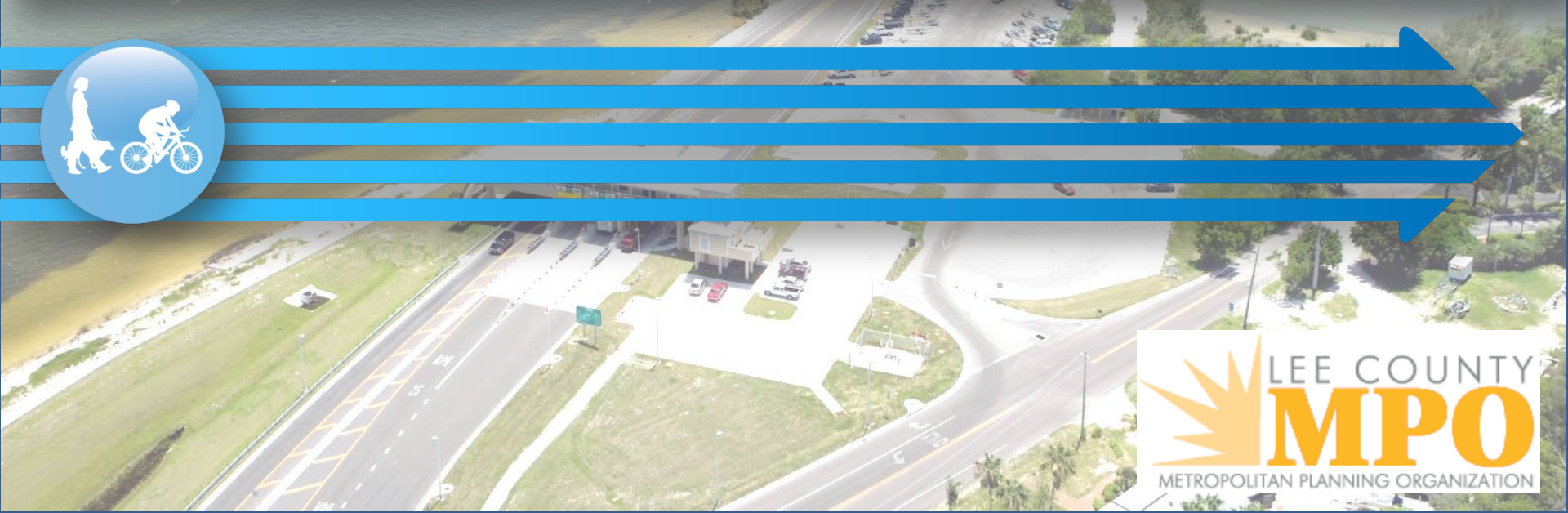


Status Update



Bicycle & Pedestrian Safety Action Plan Update





Agenda

- Introductions
- Scope & Schedule Review
- Overview of Analytical Process
 - Crash & Network Assessment
 - Risk Factor Analysis
 - Location Prioritization & Countermeasure Selection
- Project Development
 - High Priority Segments & Intersections
- Next Steps
- Adjourn/Discussion

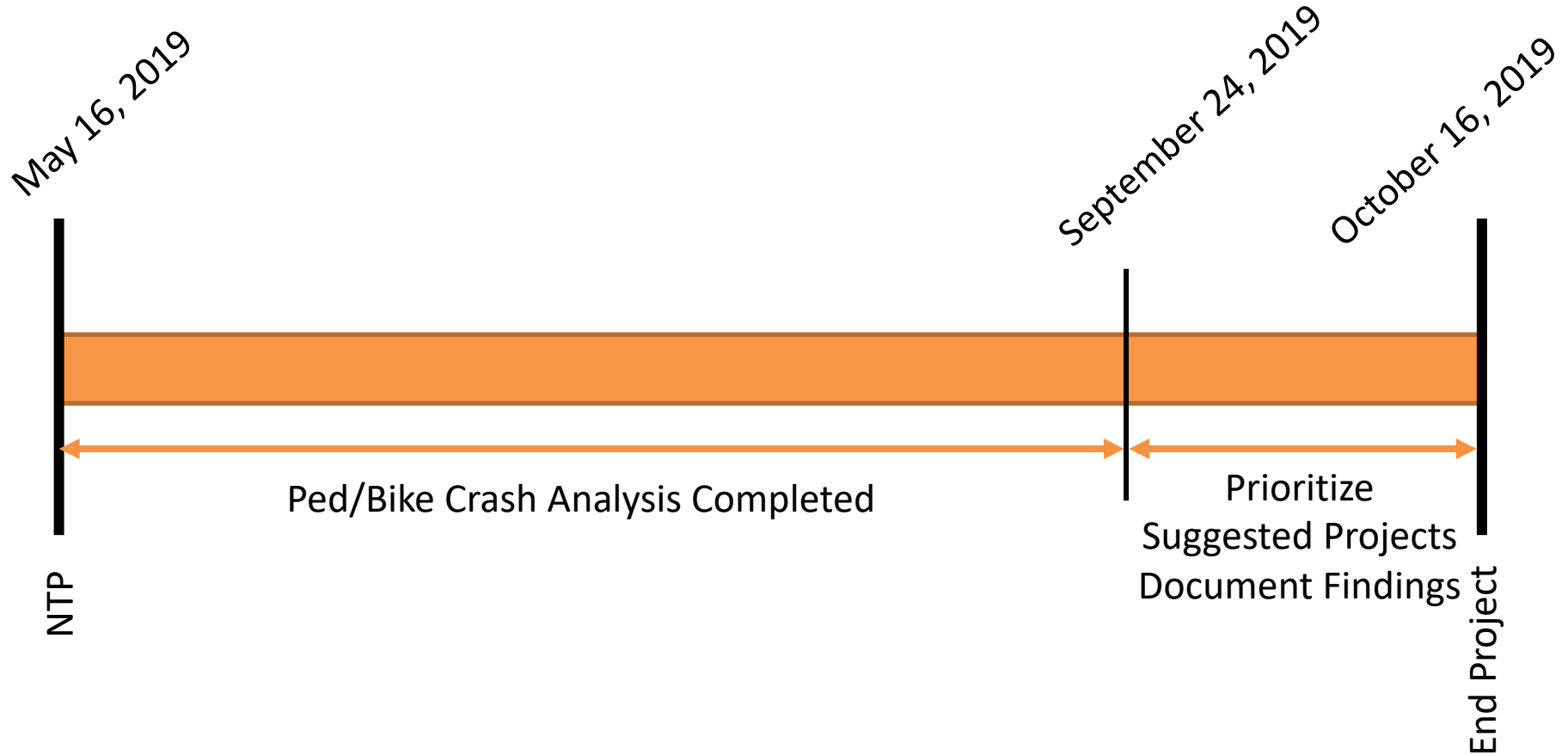


Overview of Scope

- Task 1
 - Analyze Crash Data
- Task 2
 - Project Management
- Task 3
 - Implementation Strategies & BPSAP Update



Schedule



OVERVIEW OF ANALYTICAL PROCESS



Analytical Process

- Crash Review & Disaggregation
- Network Areas & Data Collection
- Segment Crash Analysis
- Intersection Crash Analysis
- Risk Factor Identification
- Location Prioritization
 - Reactive
 - Proactive
- Countermeasure Selection



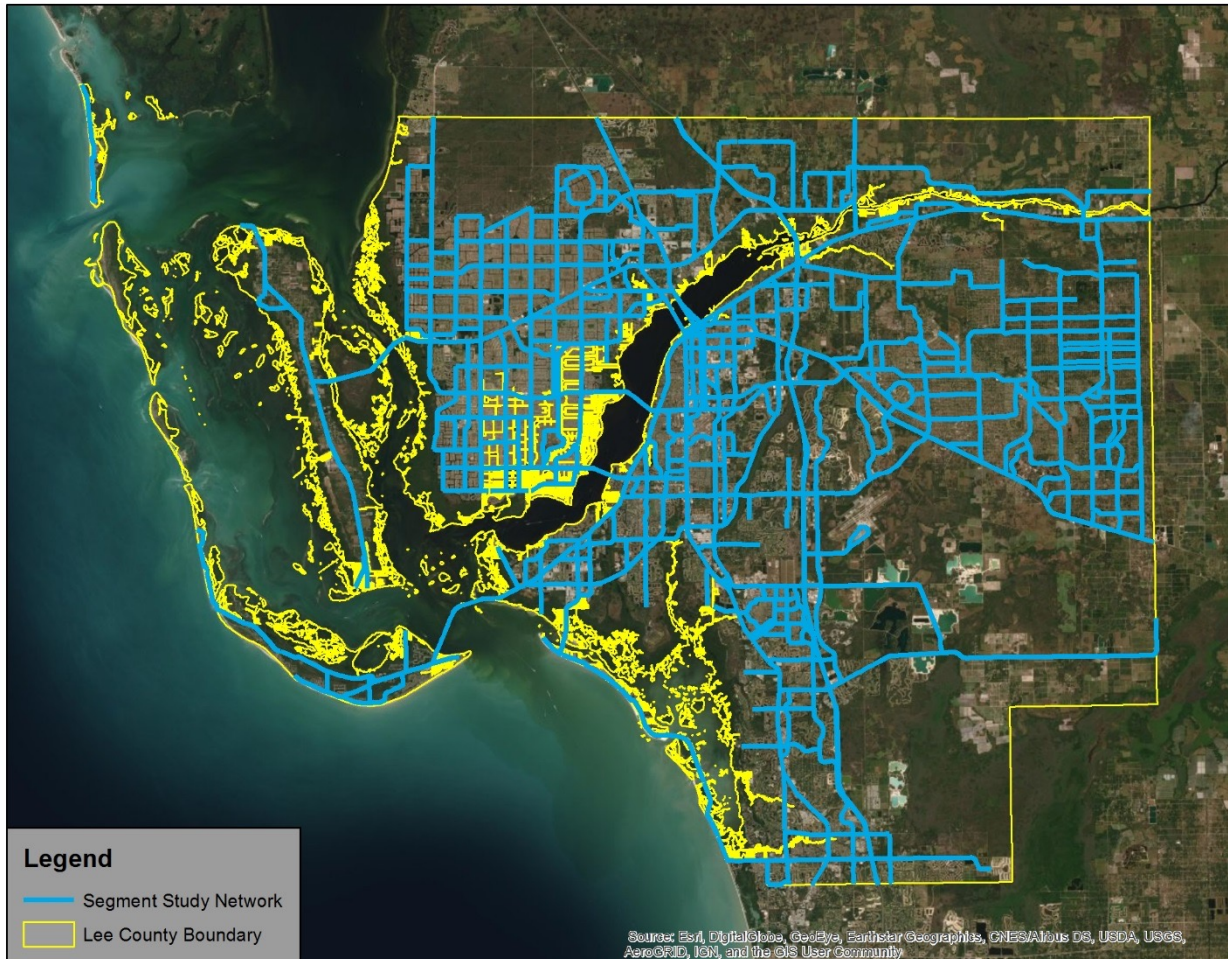
Crash Data Overview

- Time Period: 2012 – 2016
- Priority Crash Type: **Pedestrian & Bicycle Related**
- 1,008 Ped/Bike related crashes
 - 3% of total countywide crashes (38,666 total crashes)
- 284 Severe Ped/Bike related crashes
 - 13% of severe countywide crashes (2,241 severe crashes)
- Only considered crashes occurring on public roads
- Primary focus on fatal & incapacitating injury (severe) crashes



Study Area: Segments

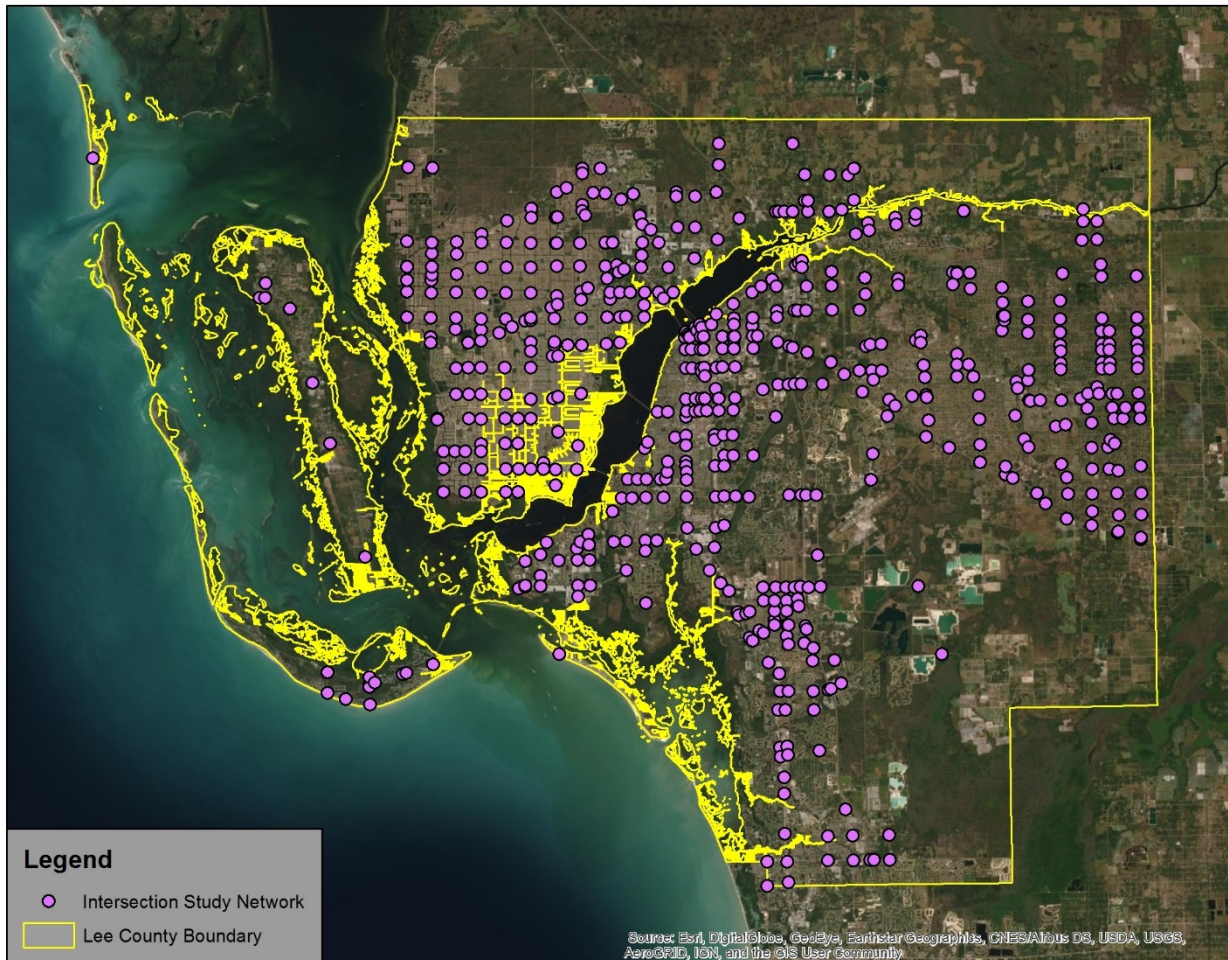
- 989 miles analyzed (22% of total)
- 4,560 total public road miles in Lee County





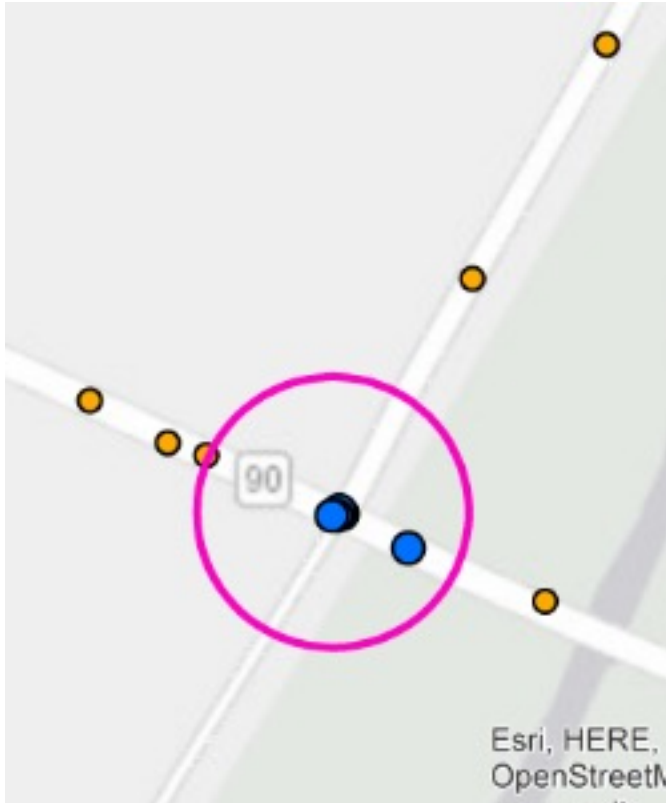
Study Area: Intersections

- 580 intersections analyzed
- Identified locations where major roads cross





Intersection Analysis

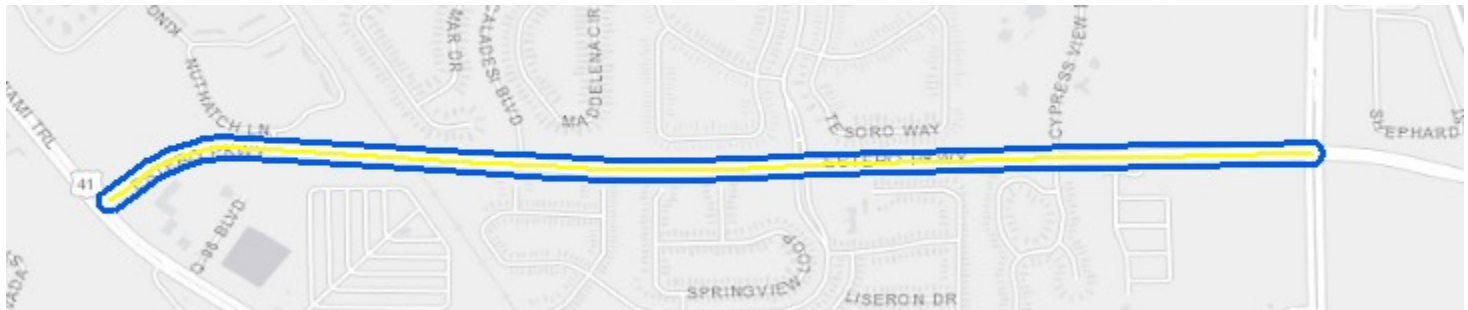


- 25% (143) of intersections had ≥ 1 crash
- 11% (63) of intersections had ≥ 1 severe crash
- 350-foot intersection influence area
- 244 total intersection-related crashes
- 74 severe intersection-related crashes



Segment Analysis

- 28% (278) of miles had ≥ 1 crash
- 13% (127) of miles had ≥ 1 severe crash
- 50-foot segment influence area
- 572 total segment-related crashes
- 175 severe segment-related crashes





Majority of Crashes on Minority of System

Relative Severity	Intersection-Related Crashes	Segment-Related Crashes	<u>Intersection + Segment Related</u>
Total Crashes	244	572	<u>816</u>
Severe Crashes	74	175	<u>249</u>

Relative Severity	Countywide	<u>Intersection + Segment Related</u>	<i>% of Crashes Matched</i>
Total Crashes	1,008	<u>816</u>	81%
Severe Crashes	284	<u>249</u>	88%

88% of severe crashes occurring on 22% of countywide miles

4 Intersection Risk Factors

4 Segment Risk Factors

RISK FACTOR ANALYSIS



Proposed Risk Factors

- **Intersection**
 - Control Type (Signalized)
 - Number of Approaches (Four)
 - FDOT Context Classification (C3C)
 - Presence of Sidewalk/Trail
- **Segments**
 - Speed Limit (45 MPH)
 - Segment Length (0.75 to 1.00 miles)
 - FDOT Context Classification (C3C)
 - Functional Classification (Arterial)



KABCO Severity Scale

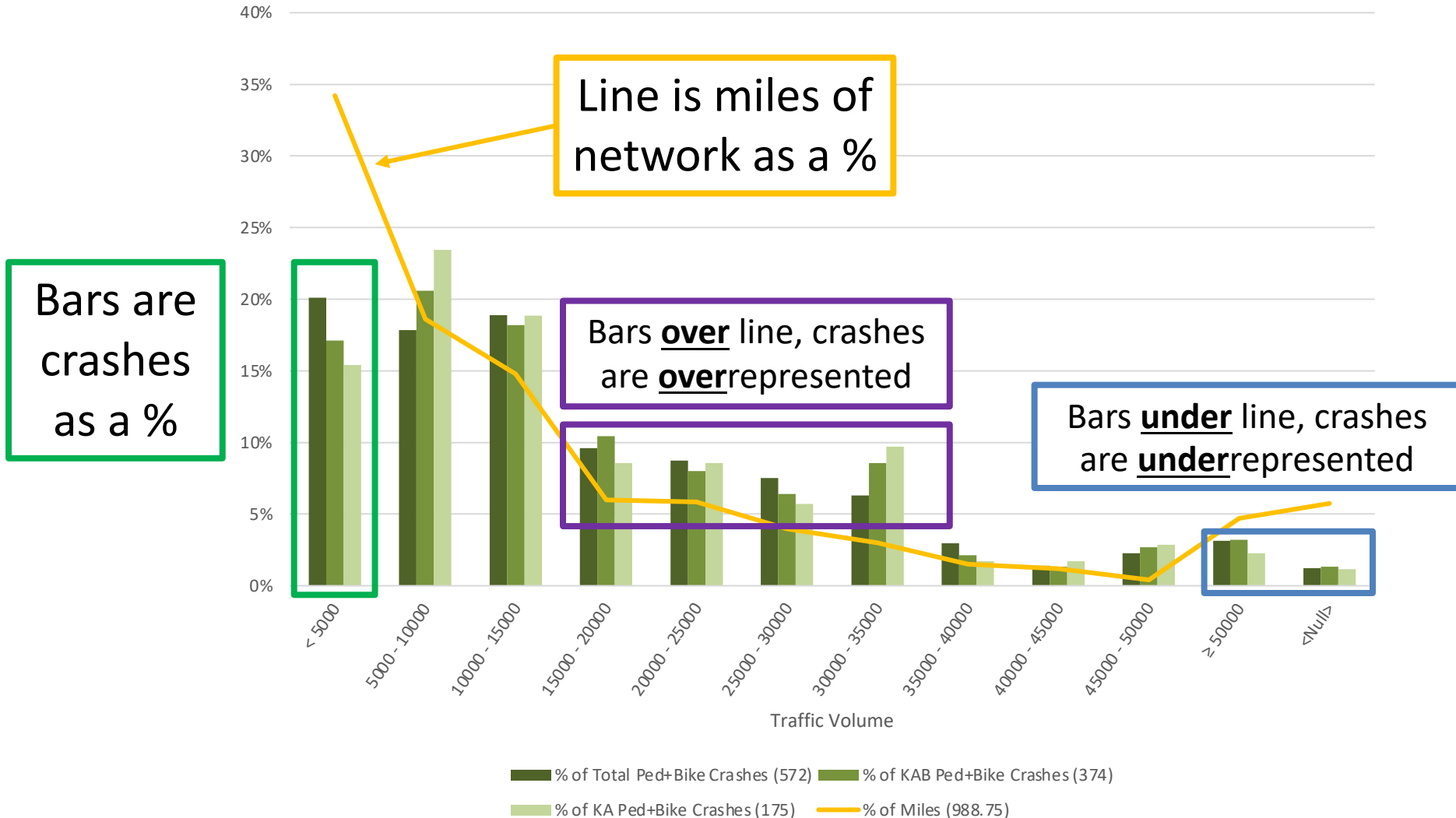
- K = Fatal Injury
- A = Incapacitating Injury
- B = Non-Incapacitating Injury (Minor Injury)
- C = Possible Injury
- O = Property Damage Only (PDO)

Crash Severity

K		Killed: Fatal Injury - An injury received in a traffic crash that results in death within thirty (30) days of the crash.
A		Awful: Incapacitating Injury - An injury, other than fatal, that prevents walking, driving, or performing other activities that were performed before the crash.
B		Bloody: Nonincapacitating Injury - An injury, other than fatal or incapacitating, that is evident at the scene. Evidence includes known symptoms.
C		Complaint: Possible Injury - Any injury that is not evident at the scene but that is claimed by the individual or suspected by the law enforce.
PD		Property Damage (O): A crash that involves a motor vehicle in transport on a public traffic-way and results in at least \$1,000.00 in property damage.

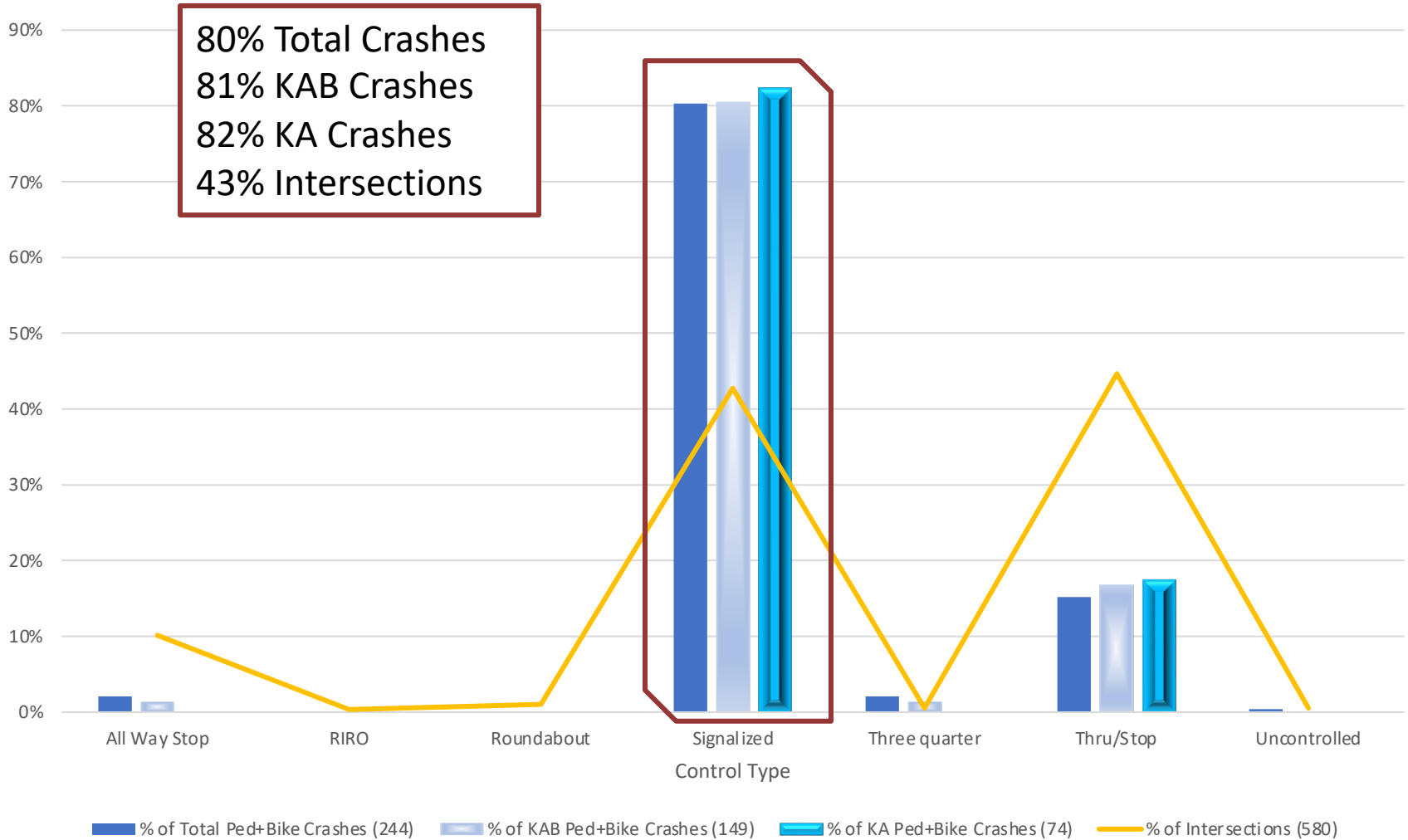


How do you interpret this chart?



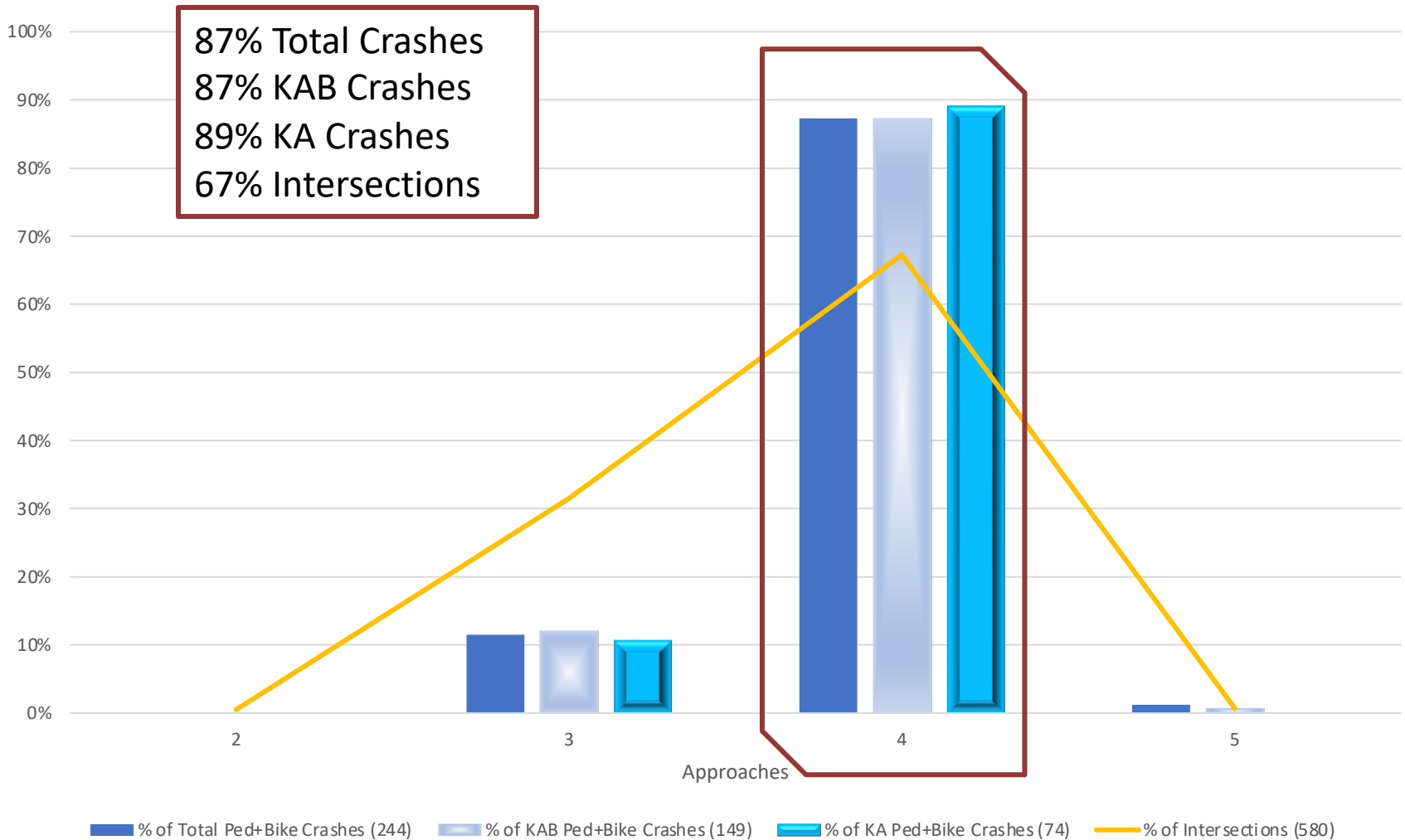


Intersection Risk Factor: Control Type



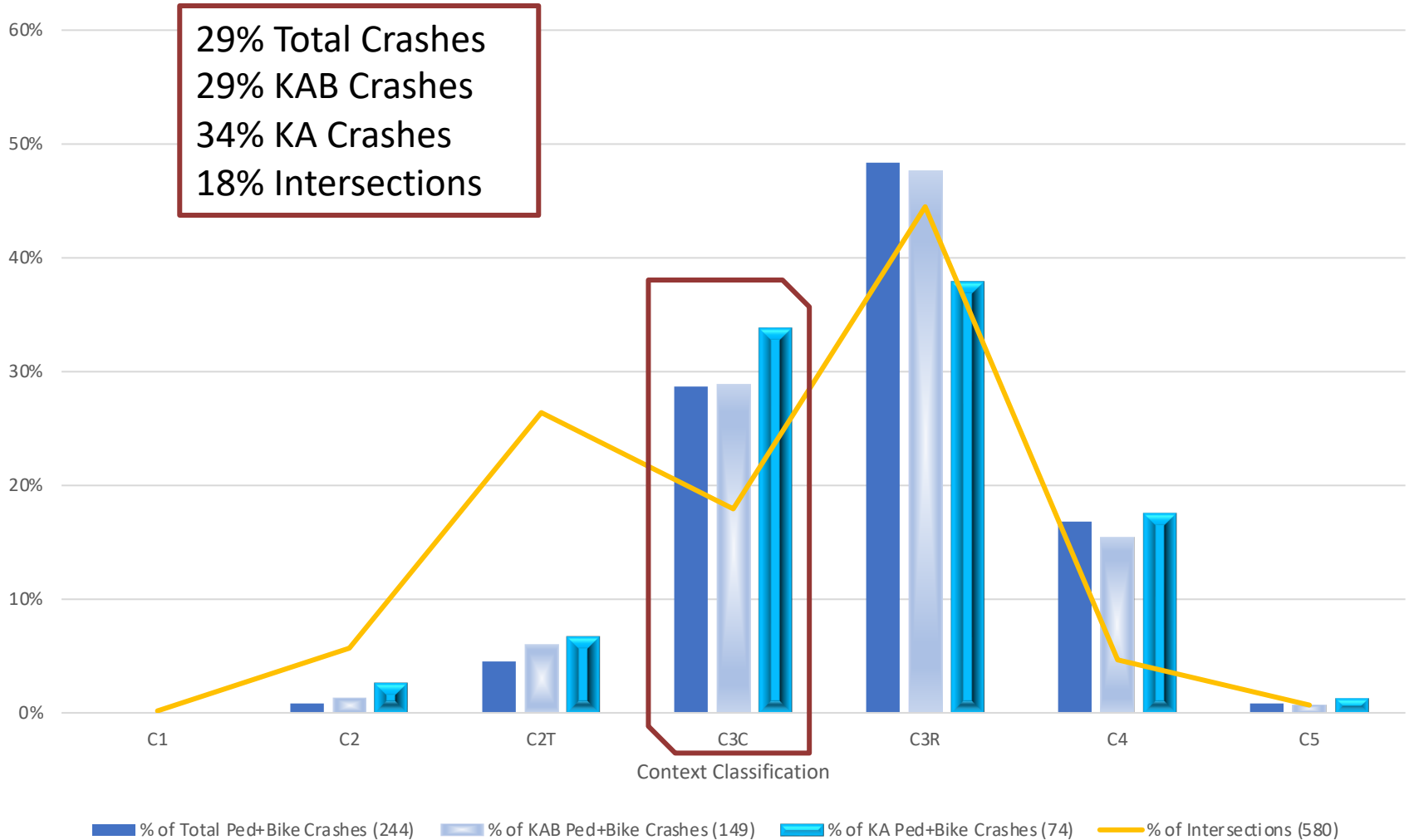


Intersection Risk Factor: Number of Approaches



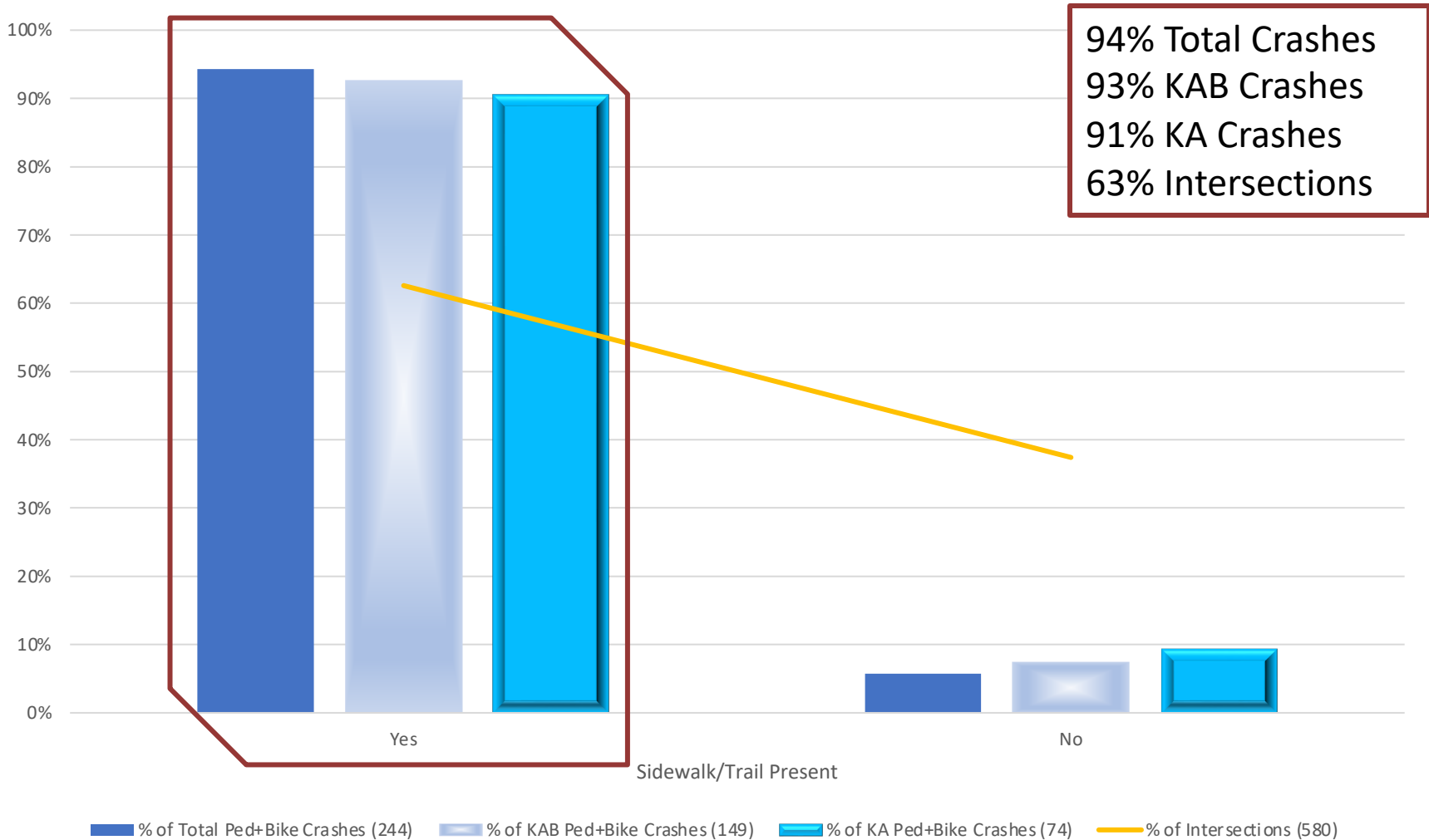


Intersection Risk Factor: Context Classification



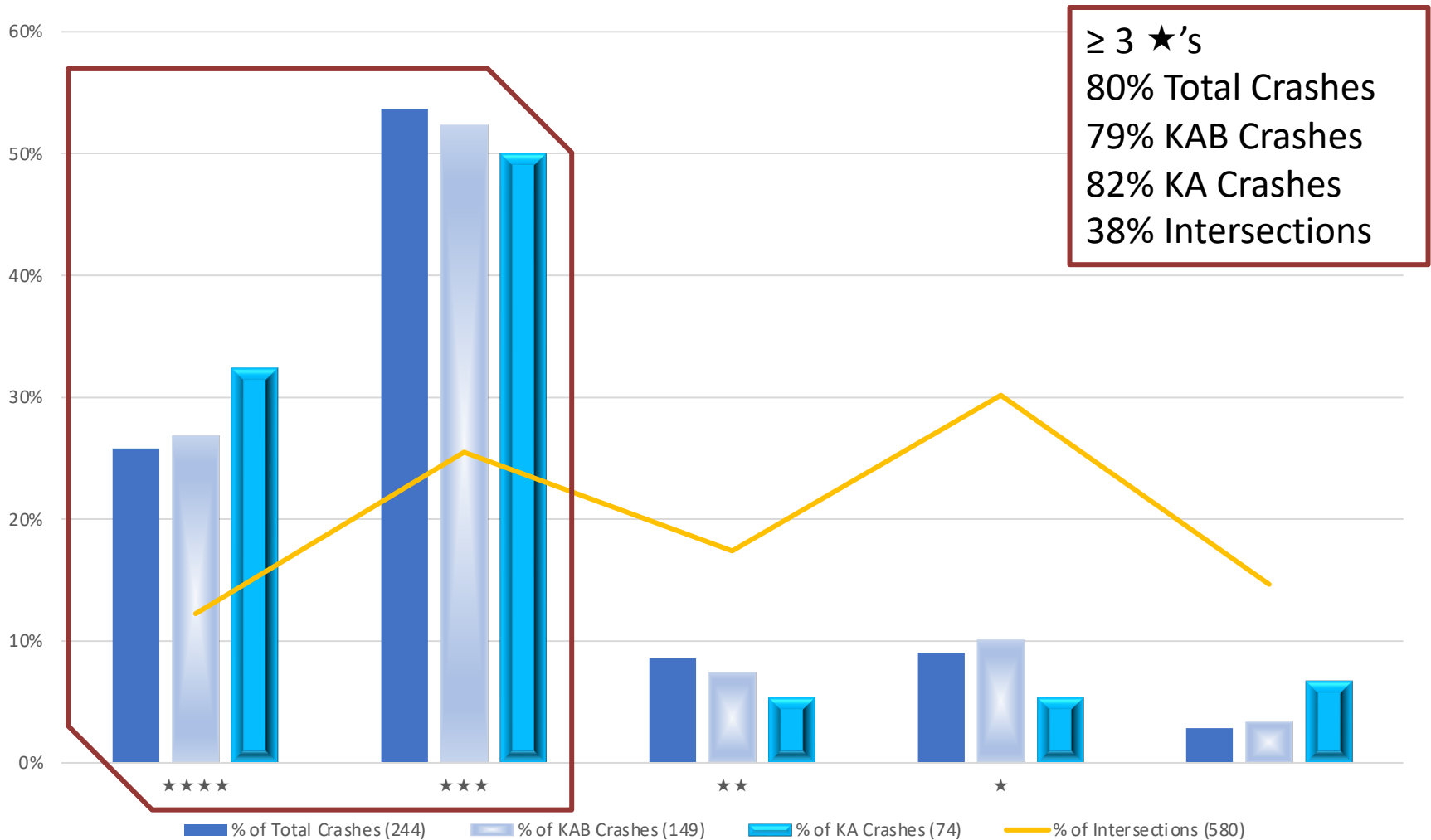


Intersection Risk Factor: Presence of Sidewalk/Trail



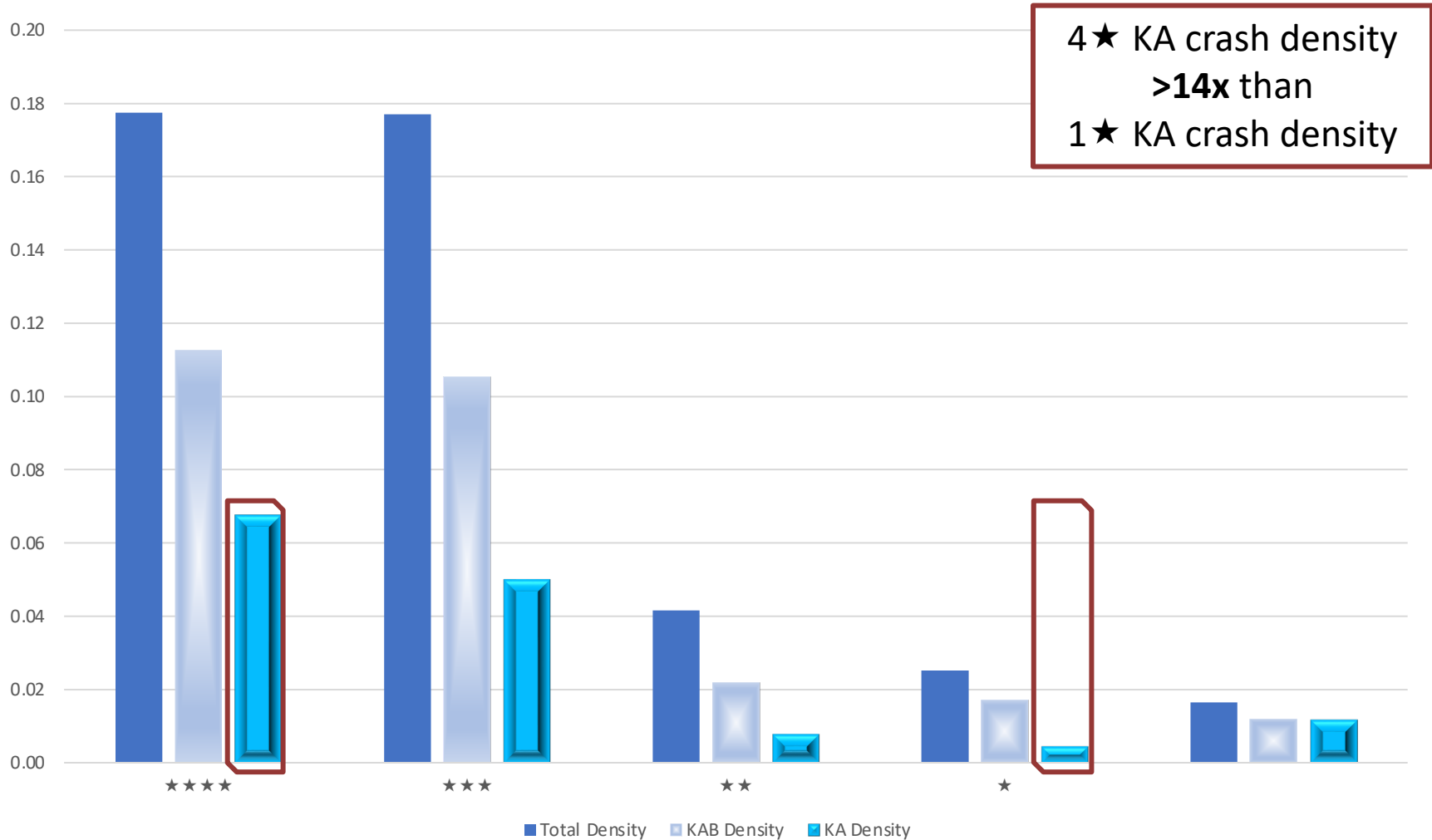


Intersection Risk Factor Summary





Intersection Crash Density



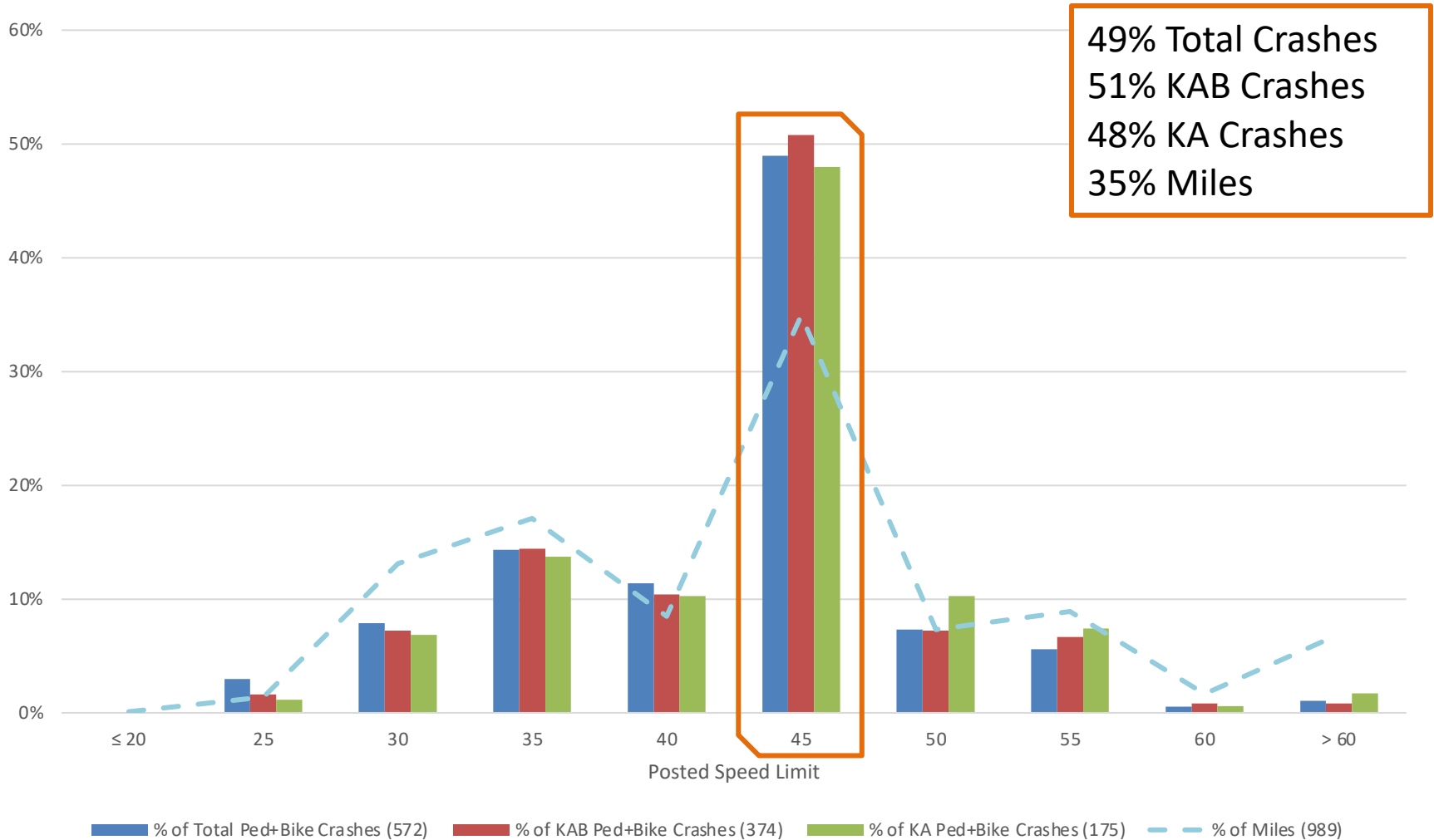


Intersection Example: Risk Factors



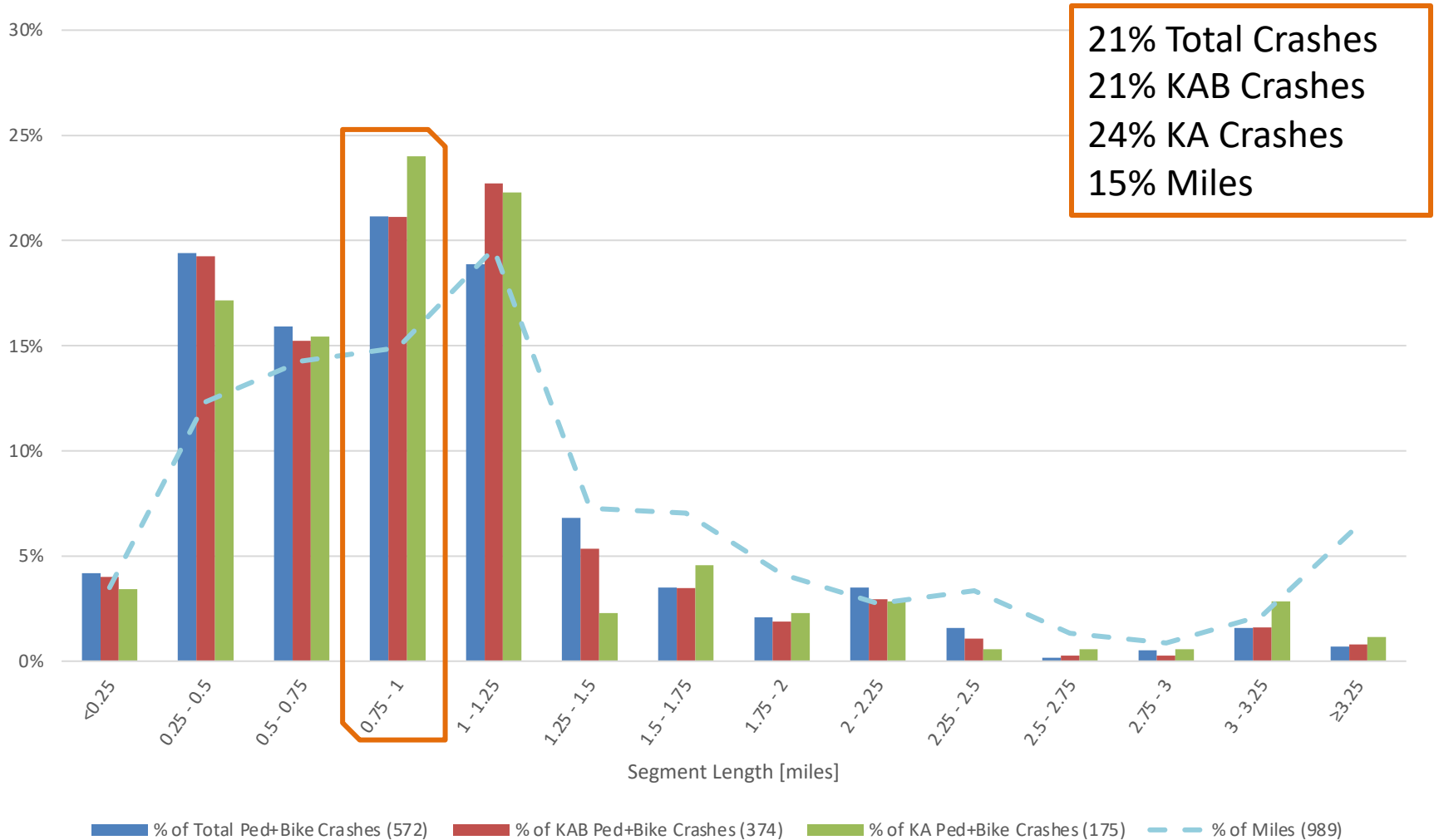


Segment Risk Factor: Speed Limit



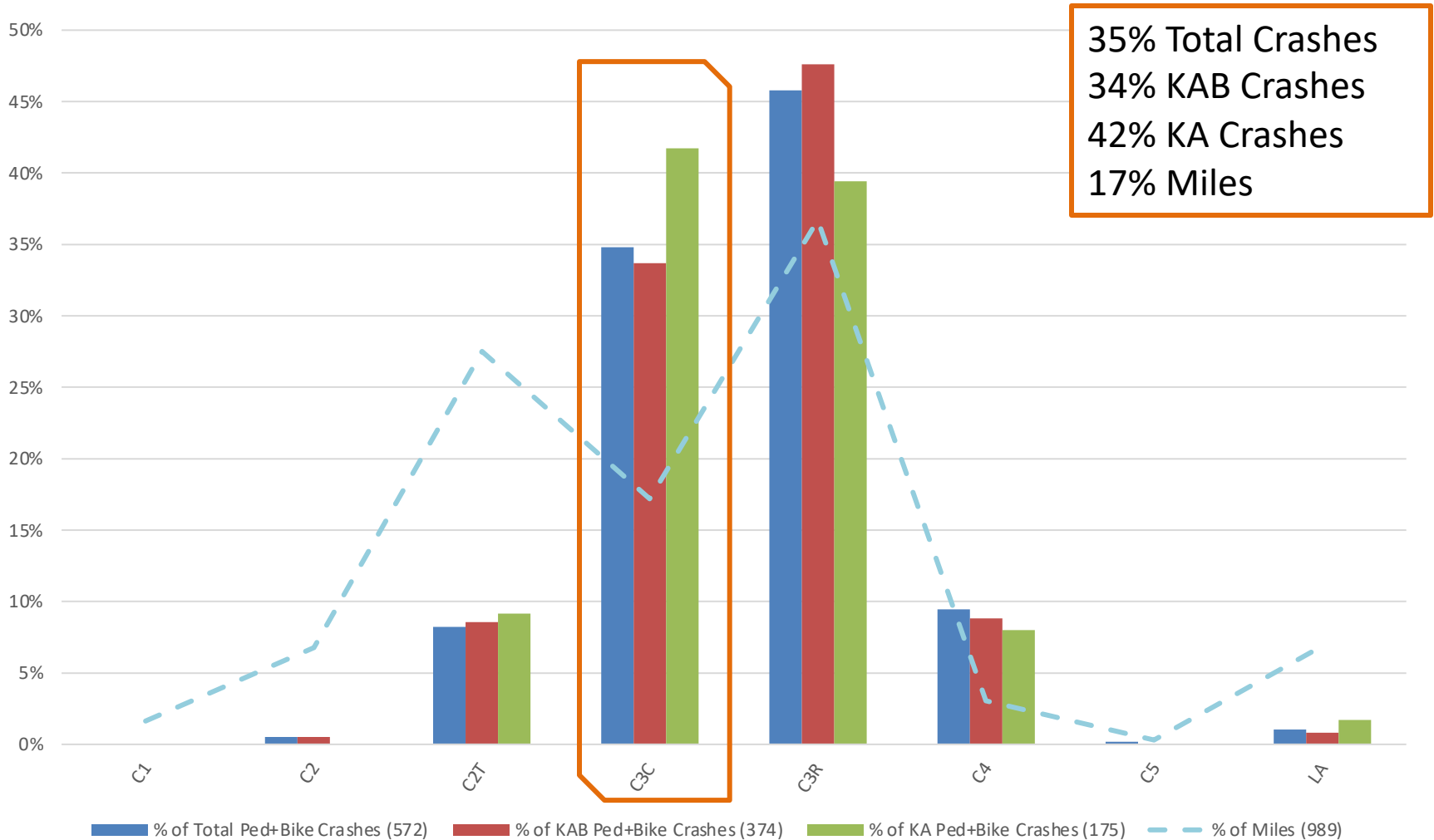


Segment Risk Factor: Segment Length



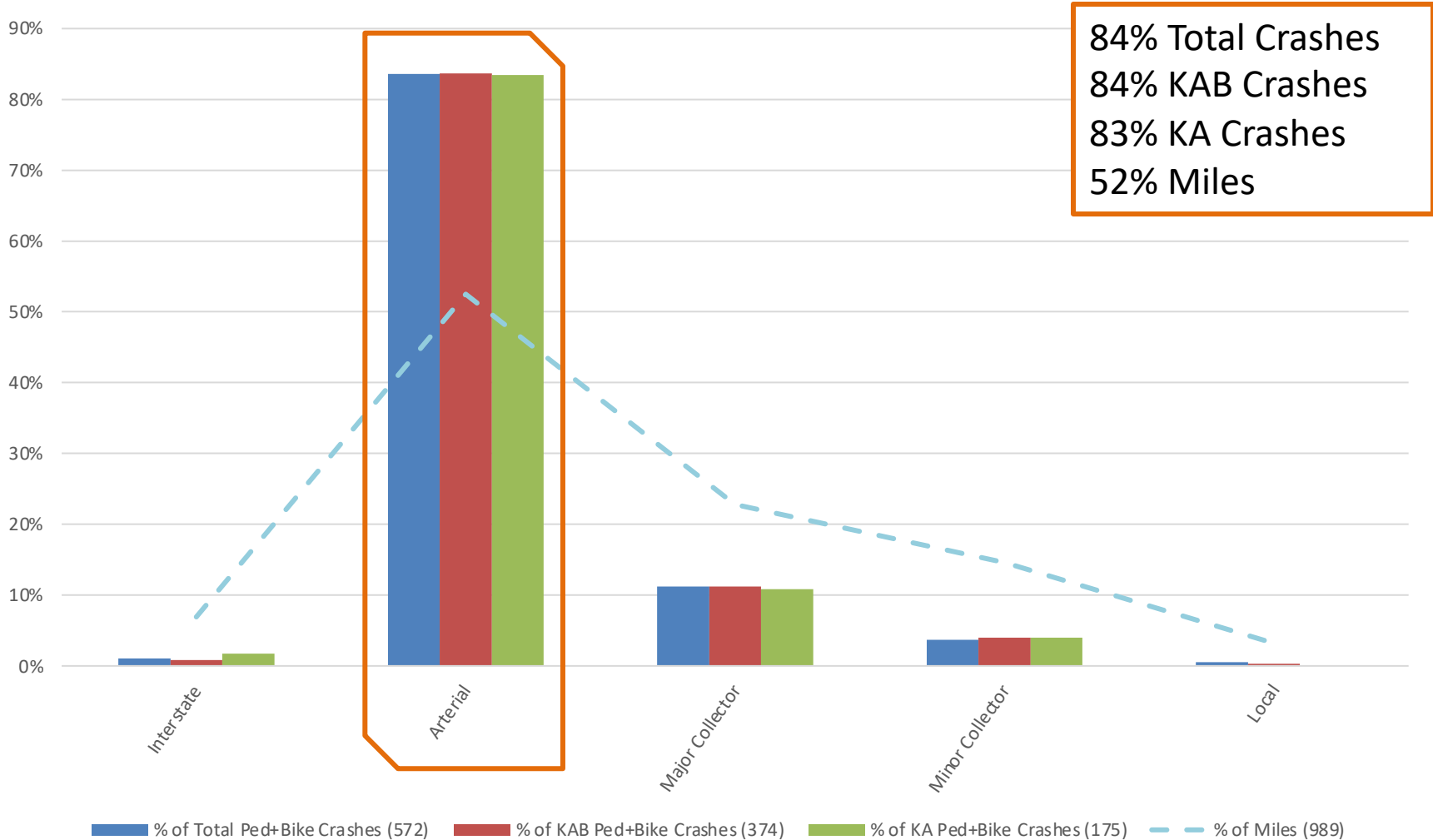


Segment Risk Factor: Context Classification



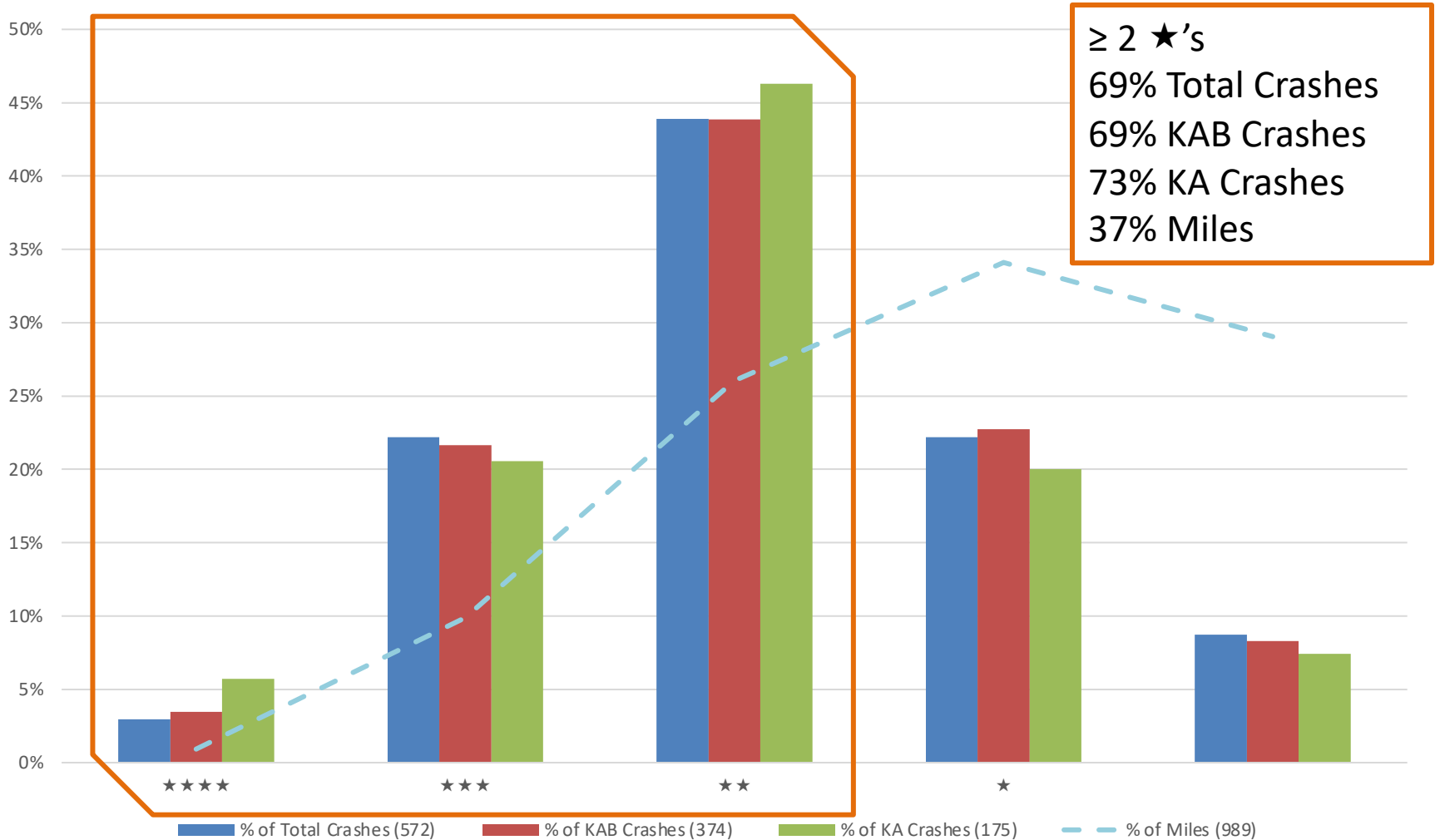


Segment Risk Factor: Functional Classification



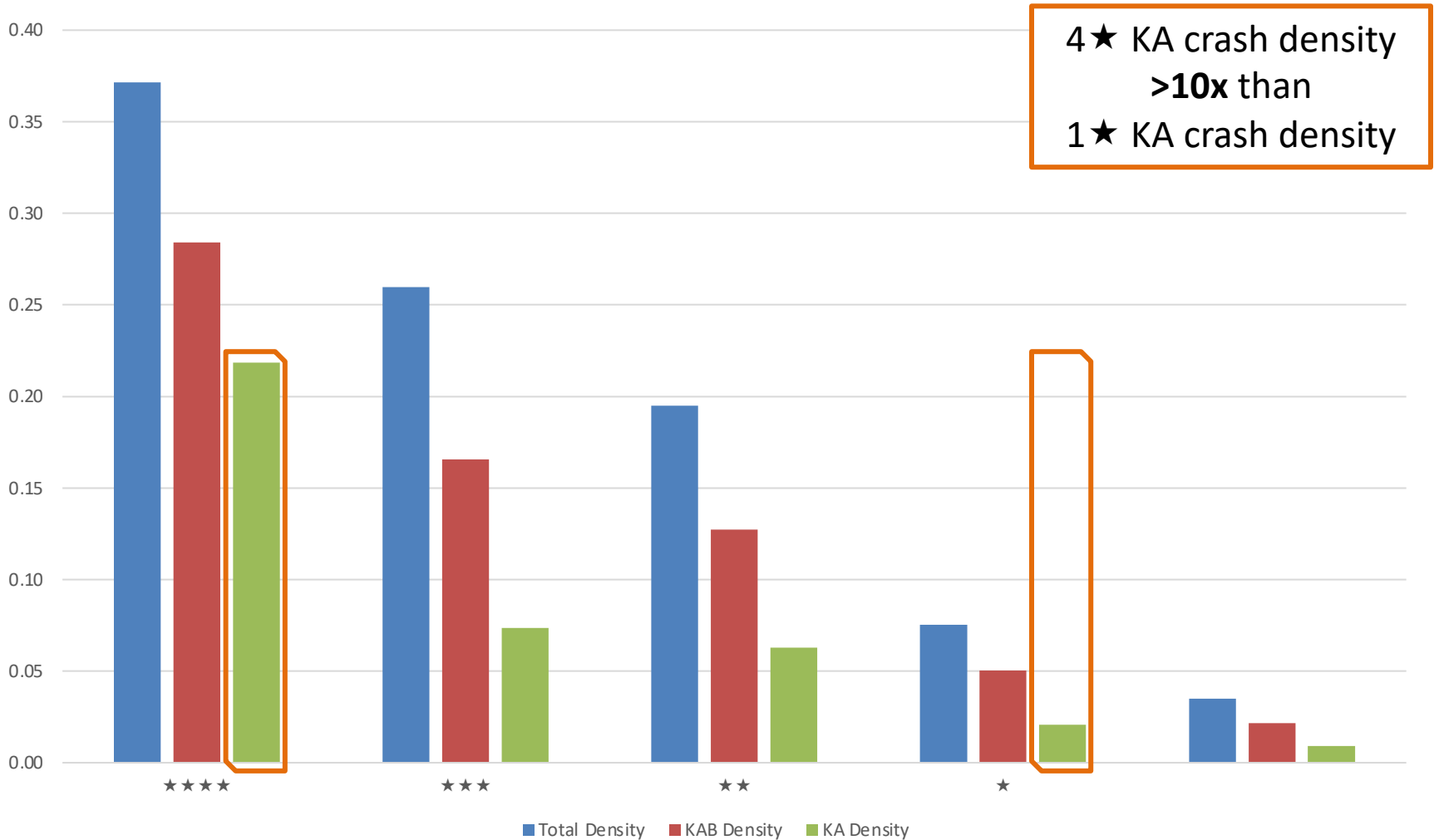


Segment Risk Factor Summary





Segment Crash Density



PRIORITIZATION

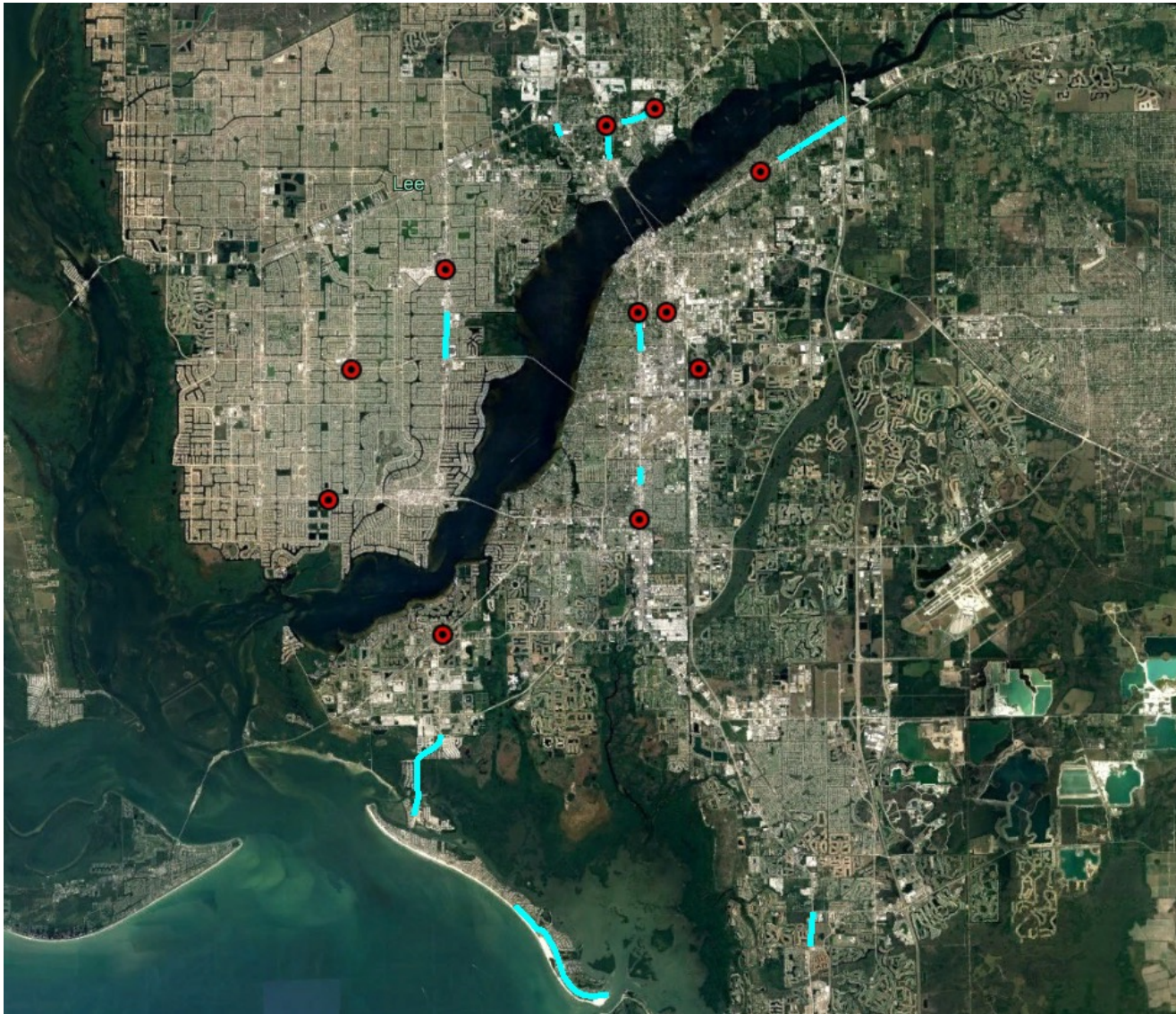


Reactive vs. Proactive

- Reactive approaches to traffic safety typically identify locations with multiple severe crashes
 - Reviewed 24 segments (~26 miles) with ≥ 2 severe crashes
 - 70 severe segment-related crashes
 - Reviewed 11 intersections with multiple severe crashes
 - 22 severe intersection-related crashes



"High-Crash" Locations





Reactive vs. Proactive

- **Proactive** approaches to traffic safety typically identify locations with multiple **risk factors present**
 - ~107 miles with 3 or 4 risk factors present
 - 46 severe segment-related crashes
 - 71 intersections with 4 risk factors present
 - 24 severe intersection-related crashes



High Priority Locations for Safety Investment

- Intersections
 - 4★ intersections (71) *Risk-based analysis*
 - Intersections with ≥ 2 severe crashes (11) *Hot spot analysis*
- Segments
 - Segments with ≥ 3 ★'s (107 miles) *Risk-based analysis*
 - Segments with ≥ 2 severe crashes (26 miles) *Hot spot analysis*



Countermeasure Selection

Crash Modification Factor Strategies Table

Focus Area	Site Location	Area Type	Control	Countermeasure	Crash Severity*	CMF		State(s) Observed	Publication Date	Prior Condition	
						Value Range	Star Rating Range				
Pedestrian	Intersection	Not Specified	Signalized	Permit Right Turn on Red	All	1.07 - 1.69	5	SC, AL	1983, 2010	A signalized intersection with prohibited right-turn-on-red operation	
				Street Lighting	K	0.19	3	N/A	2004	N/A	
					ABC	0.41 - 0.58	4	N/A	2004	N/A	
		Urban		Leading Pedestrian Interval (LPI)	All	0.413 - 1.136	3 - 5	PA, IL, NY, NC, Toronto	2009, 2018	Signal phasing without leading pedestrian interval	
					KABC	0.72 - 1.09	3 - 5	IL, NY, NC, Toronto	2018	Signal phasing without leading pedestrian interval	
				Countdown Timer	All	0.3 - 0.954	3 - 4	MI, FL	2012, 2016, 2017	Intersections without pedestrian countdown signals.	
					KABC	0.48 - 0.952	3 - 4	MI, FL	2016, 2017	Intersections without pedestrian countdown signals.	
		All Pedestrian Phase		All	0.49 - 1.1	2	NY	2012	All pedestrian phase not present		
		Rural		Thru/STOP	LED STOP Sign	All	0.585 - 0.59	3	MN	2012, 2014	Standard stop sign without LED flashers. Intersection with standard stop signs
					Street Lighting	All	0.56	3	GA	2008	Rural 2-lane intersection with no lighting
	Roundabout		All		0.17 - 4.66	3, 4	KS, MD, MN, OR, WA, WI	2012	Stop controlled intersection (3 or 4 leg). 4 leg intersection. 3 leg intersection.		
	Segment	Urban	Free	Rectangular Rapid Flashing Beacon	All	0.93	3	OR	2017	Previously unmarked or at a location with prior high-visibility markings.	
				Pedestrian Hybrid Beacon	All	0.30 - 0.876	3 - 5	AZ, FL, IL, MA, NY, NC, OR, VA, WI	2010, 2017	No PHB or advanced yield or stop markings and signs	
KABC					0.849	3-Jan	AZ	2010	No PHB or advanced yield or stop markings and signs		
Sidewalks	All	1.78 - 1.87	3	FL	2017	No sidewalk present					
Bicyclist	Intersection	All	N/A	Street Lighting	All	0.881 - 1.05	3	MN	2010, 2012	No lighting	
	Segment	Not Specified	Free	Protected Bike Lane	All	0.00 - 6.667	1-2	CA, DC, FL, IL, MT, NY, OR, TX	2016	No separate bicycle lane	
				Bike Lane	All	0.44 - 1.509	3	NY, FL	2012, 2016, 2017	No bicycle lane along the roadway segment. Roadway with narrower bike lane width. No bicycle lane.	
		KABC			0.946 - 1.07	3	NY, FL	2012, 2016	Install bicycle lanes. Increase bike lane width.		
	Urban	Shared Use Path	All	0.75	3	FL	2017	Install shared path			
			Intersection	N/A	Street Lighting	All	0.648 - 1.158	3	OR, MN, FL	2008, 2012, 2016, 2017	Full lighting. Full interchange lighting. Full lineal lighting. Partial plus interchange lighting. No lighting. Illuminance ≥ 0.2 fc and < 1.1 fc.
	ABC	0.6 - 0.913			3 - 4	OR	2008	Full interchange lighting. Full lineal lighting. Partial plus interchange lighting.			
	Rural	N/A	Street Lighting	All	1.07 - 1.09	3	MN	2012	No lighting		
			Segment	Rural	Free	Bike Boulevard	All	0.37	3	CA	2011

*Crash Severity Definitions: K = Fatal Injury Related Crash, A = Incapacitating Injury Related Crash, B = Minor Injury Related Crash, C = Possible Injury Related Crash, O = Property Damage Only, All = All Severities Included



Project Development

- Two main approaches to identify projects
 - Site review with Google Earth
 - Programming with existing data and MS Excel
- Project Types for Intersections
 - High emphasis crosswalk pavement markings
 - Retroreflective backplates on signal heads
- Project Types for Segments
 - Enhanced Pavement Markings
 - Street Lighting
 - Rectangular Rapid Flash Beacons
 - Pedestrian Refuge Islands/Pedestrian Hybrid Beacons
 - Access Management
 - Dynamic Speed Feedback Signs



Project Development

- Intersections
 - 208 ≥ 3 ★ intersections received at least 1 project
 - Estimated implementation cost \$3,125,000
 - ~\$15,000 per intersection
- Segments
 - ≥ 3 ★ segments (~80 miles) received at least 1 project
 - Estimated implementation cost \$14,700,000
 - ~\$185,000 per mile



Next Steps

- Review & prioritize suggested projects
- Quality Assurance & Quality Checks
- Synopsis report outlining approach & methodology
- Stakeholder Engagement & Outreach

Thanks!

OPEN DISCUSSION