

Technical Memorandum

March 20, 2026

To: Melissa Ackert, PE; Fadi Emil Nassar, Ph.D., PE, PTOE; Motasem Al-Turk Ph.D., PE
Palm Beach County

From: Jessica Josselyn, Kittelson & Associates, Inc.; Brad Davis, AICP, CNU-A and Ravi
Wijesundera, PE, Kimley-Horn and Associates, Inc.

RE: Palm Beach County SS4A Safety Action Plan – Project Identification and
Prioritization

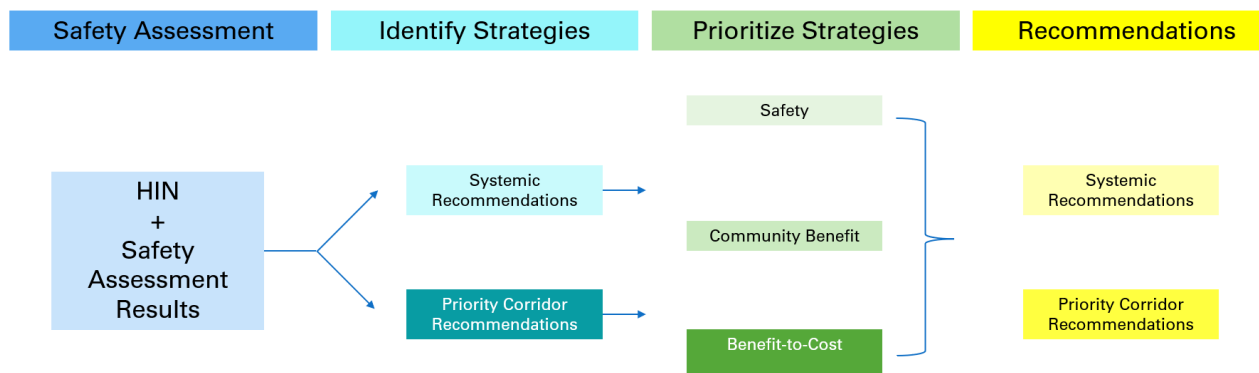
INTRODUCTION

Kittelison & Associates, Inc. (Kittelison) and Kimley-Horn and Associates, Inc. (Kimley-Horn) were tasked by Palm Beach County (PBC) to identify and prioritize recommendations in support of the Safe Streets and Roads for All (SS4A) Safety Action Plan (SAP). This technical memorandum outlines recommended safety countermeasures for County-maintained roads. The recommendations are divided into two key categories:

- **Priority Corridor Safety Recommendations.** These focus on operational and infrastructure improvements to address the most common crash types along the five priority corridors identified in this plan. The primary objective is to select the top corridor for a safety grant application—either through the Safe Streets for All (SS4A) program or other funding opportunities.
- **Systemic Safety Recommendations.** These present proven countermeasures that target the most frequent crash types across the High Injury Network (HIN). The goal is to establish a strategic framework for implementing these countermeasures throughout the HIN.
- **Policy and Procedure Memoranda (PPMs) Review.** Based on a thorough review of the PPMs for Palm Beach County, several key recommendations have emerged to address systemic issues and corridor needs.

The recommendations build upon the findings of the safety assessment, which provided the foundation for prioritization and decision-making. The following graphic describes how each step in the process informed the development of these recommendations.

Recommendations Development Process



Detailed descriptions of each recommendation are provided in the sections that follow. Additional technical information is included in the appendix.

PRIORITY CORRIDOR SAFETY RECOMMENDATIONS

This section summarizes the identification and analysis of five priority corridors on County-maintained roadways. The purpose of this process is to select a top project for submission to federal or state safety grant programs, including Safe Streets for All (SS4A).

The corridors were identified using the High Injury Network (HIN) developed for this plan, incorporating segments and intersections across all four travel modes—walking, biking, motorcycling, and driving. These segments were grouped into logical project extents, and each corridor was ranked based on the total number of serious injury and fatal crashes (FSI). This ranking ensures that the selected corridors target locations with the highest concentration of severe crashes.

Initially, fourteen corridors were identified. The five highest-ranked corridors (based on the total number of severe crashes) were selected for detailed analysis and the development of targeted safety countermeasures. These top five corridors account for approximately 20% of all FSI crashes on County-maintained roads in Palm Beach County. By focusing on these corridors, the plan aims to maximize impact and return on investment in reducing and ultimately eliminating severe crashes.

The five priority corridors selected for analysis are:

Corridor Name	Extent	Length (Miles)
6 th Ave/Melaleuca Lane	US 1 to Pine Hov Circle	4.8
South Military Trail	Clint Moore Road to Woolbright Road	7.2

Corridor Name	Extent	Length (Miles)
South Jog Road	Winston Trails Boulevard to Summit Boulevard	5.8
10 th Avenue North	Barnett Drive to South Jog Road	4.7
Linton Boulevard	A1A to South Jog Road	5.2

Summary of Findings for Top Five Priority Corridors

For each of the top five priority corridors, safety countermeasures were developed based on crash types, contributing factors, and the needs of various road users. The recommendations include both intersection-focused treatments and strategies to improve safety between intersections. In addition to immediate projects identified for the benefit cost analysis, a mixture of systemic and long-term projects were also recommended for each corridor but not included in the overall benefit cost analysis. This is due to these projects either not having applicable crash modification factors or high overall costs that placed them outside the scope of a SS4A implementation grant.

These strategies are multimodal, addressing the safety of people driving as well as vulnerable road users—those walking, biking, or riding motorcycles and mopeds.

Following the development of corridor-specific recommendations, a prioritization analysis was conducted using three key criteria:

- **Safety Opportunity.** Assesses the extent to which the project addresses FSI crashes involving both drivers and vulnerable road users. Corridors with higher numbers of FSI crashes received more points.
- **Community Benefit.** Evaluates the corridor's proximity and access to community assets such as parks, schools, transit stops, and places of worship. Corridors serving more destinations received higher scores.
- **Benefit-Cost.** Measures the return on investment for the proposed countermeasures. Projects with a higher benefit-to-cost ratio were scored more favorably.

According to the scoring framework, 10th Avenue is the top-ranked prioritization corridor. However, the scores for all corridors were very close, indicating they have similar levels of priority.

The following sections detail each step of the analysis and present the recommended safety countermeasures for each corridor.

Priority Corridor Identification

Fourteen corridors were identified for consideration as priority projects. This step focused on developing a long list of candidate corridors from the County's High Injury Network (HIN).

To create the corridors, all HIN segments and intersections were combined across four travel modes—motor vehicle, motorcycle, pedestrian, and bicycle. These segments were then grouped into logical project extents. In some cases, segments not included in the HIN were added to ensure practical and implementable project boundaries.

Once the corridors were defined, they were ranked based on the total number of fatal and serious injury (FSI) crashes. This ranking helped prioritize corridors with the greatest potential for safety impact.

The table below presents the initial list of fourteen corridors considered for prioritization.

Priority Corridor Long List

Corridor ID	Street Name	Corridor Length	Corridor FSI Crashes	Corridor Rank
17-A	Linton Blvd	5.21	83	1
2-B	S Military Trl	7.24	75	2
1-A	10th Ave N	4.70	67	3
5-A	6th Ave/Melaleuca Ln	4.84	62	4
4-B	S Jog Rd	5.77	60	5
3-B	N Congress Ave	6.03	55	6
8-A	Hypoluxo Rd	5.72	41	7
9-A	Lake Ida Rd	3.11	36	8
11-B	S Haverhill Rd	3.28	28	9
2-A	S Military Trl	3.61	28	9
11-A	N Haverhill Rd	3.79	25	11
4-A	N Jog Rd	4.59	25	11
3-A	N Congress Ave	4.73	23	13
3-C	S Congress Ave	1.47	23	13

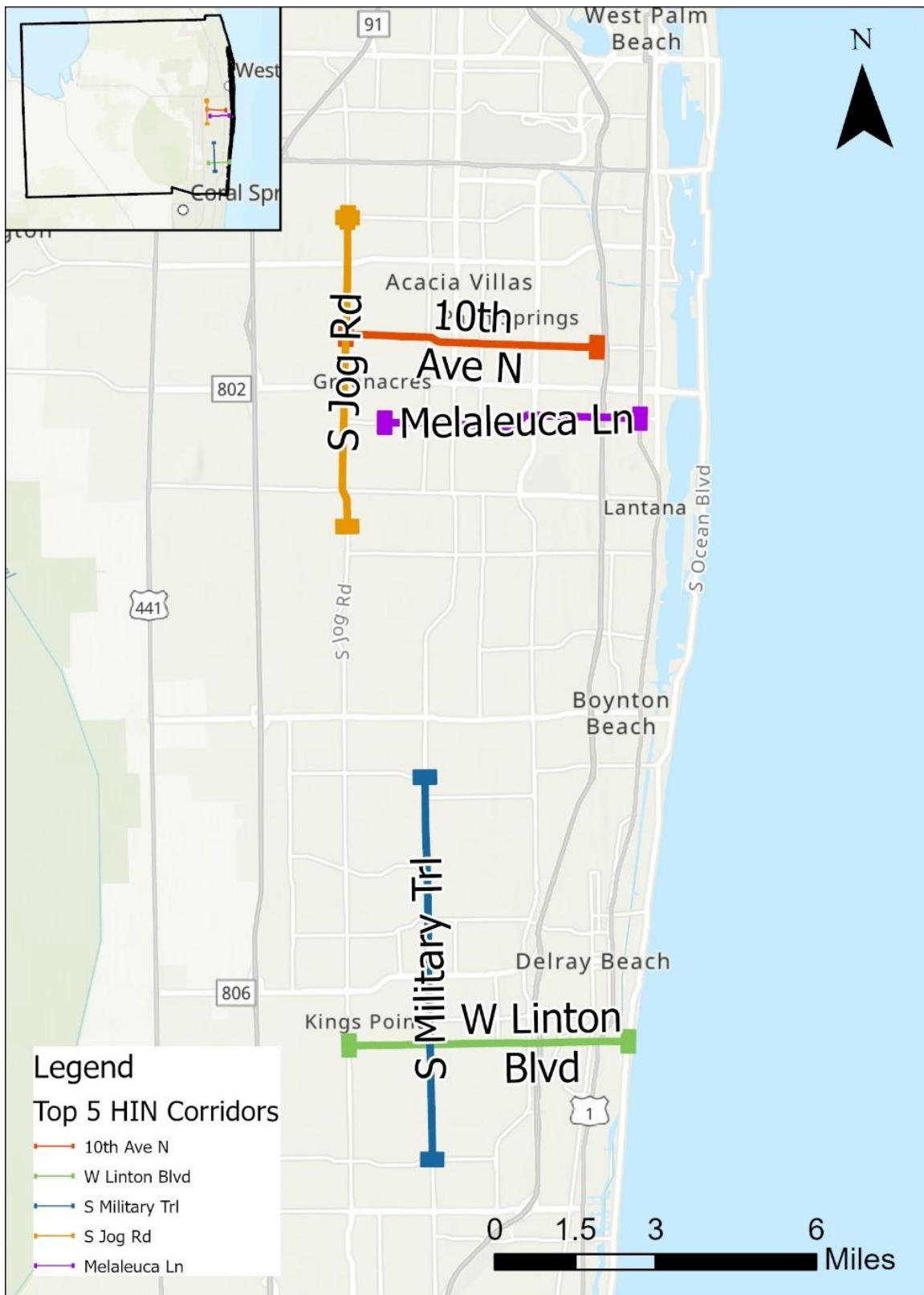
Top Five Priority Corridors

The top five corridors from the initial list of fourteen projects were carried forward for more detailed project development, analysis, and project prioritization. General information about each of the five corridors is provided in the table below. A map of the five corridors is provided on the next page.

Top Five Priority Corridor Summary Table

Corridor Name	Extent	Context
6 th Ave/Melaleuca Lane	US 1 to Pine Hov Circle	<ul style="list-style-type: none"> • 4.8 miles • Urban, Major Arterial • 4-5 Lanes • 80-110 feet of ROW • 35 to 45 MPH posted speed • 12,400 to 34,000 AADT (FDOT, 2024)
South Military Trail	Clint Moore Road to Woolbright Road	<ul style="list-style-type: none"> • 7.2 miles • Urban, Principal Arterial • 6 lanes • 120 feet of ROW • 45 MPH posted Speed • 37,500 to 40,500 AADT (FDOT, 2024)
South Jog Road	Winston Trails Boulevard to Summit Boulevard	<ul style="list-style-type: none"> • 5.7 miles • Urban, Principal Arterial • 6 lanes • 120 feet of ROW • 45 MPH posted Speed • 39,000 to 55,000 AADT (FDOT, 2024)
10 th Avenue North	Barnett Drive to South Jog Road	<ul style="list-style-type: none"> • 4.7 miles • Urban, Major Arterial • 4-5 Lanes • 80-120 feet of ROW • 40 MPH posted speed • 12,400 to 34,000 AADT (FDOT, 2024)
Linton Boulevard	A1A to South Jog Road	<ul style="list-style-type: none"> • 5.2 miles • Urban, Major Arterial • 4-6 lanes • 120 feet of ROW • 40 to 45 MPH posted Speed • 14,400 to 45,000 AADT (FDOT, 2024)

Top 5 Priority Corridor Map



Benefit-Cost Analysis

A data-driven benefit-cost analysis (BCA) was conducted for each of the top five priority corridors to evaluate the economic viability of proposed safety countermeasures. Crash data was reviewed to determine the most frequent crash types at both intersections and midblock segments for each corridor. Countermeasures were selected using the following inputs:

- **Crash Modification Factors (CMFs):** Proven safety impacts were reviewed, and where multiple strategies were available for a safety concern, the strategy with the higher CMF was selected.
- **Engineering Judgment:** Crash clusters were analyzed using aerial imagery and Google Street View to refine countermeasure placement and applicability.
- **Cost Considerations:** Emphasis was placed on low- to medium-cost treatments that do not require full roadway reconstruction.

Each corridor was assigned five to seven countermeasures tailored to its crash profile. Planning-level cost estimates and CMFs were used to calculate a cumulative cost-benefit score for each corridor.

Planning-Level Benefit-to-Cost Matrix

Planning-Level Benefit to Cost Matrix	Order of Magnitude Benefit	++++	+++	++	+
Order of Magnitude Cost	Weight	4	3	2	1
\$\$\$\$	4	1.00	0.75	0.50	0.25
\$\$\$	3	1.33	1.00	0.67	0.33
\$\$	2	2.00	1.50	1.00	0.50
\$	1	4.00	3.00	2.00	1.00

The procedure to generate the cost benefit score using the CMFs and estimated project costs followed three distinct steps.

First, CMFs were assigned to each recommended project within a corridor. The values of all CMFs for all five corridors were broken into ranges to assign them values based on the Planning-Level Benefit-to-cost Matrix.

Second, the project cost estimates for all five corridors were similarly broken into ranges to assign them values based on the Planning-Level Benefit-to-Cost Matrix.

Third, each individual CMF and associated cost were analyzed using the matrix values to derive a cost benefit score for each CMF within a corridor. The final cost benefit score for each corridor represents an average of the cost benefit scores for all of the projects identified along a priority corridor.

The table below summarizes the benefit and cost ranges used for the matrix.

Benefit and Cost Ranges

Cost Order of Magnitude Ranges			
	Order of Magnitude	Matrix Reference	Dollar Range
Highest	\$\$\$\$	4	Over \$406,746
	\$\$\$	3	\$124,273 - \$406,745.6
	\$\$	2	\$56,445 - \$124,272
Lowest	\$	1	Under \$56,444.16

Benefit Order of Magnitude Ranges			
	Order of Magnitude	Matrix Reference	CMF Lower Limit
Highest	++++	4	Less than or equal to 0.43
	+++	3	0.44 to 0.59
	++	2	0.60 to 0.84
Lowest	+	1	0.85+

Crash Modification Factors (CMFs) were sourced from the U.S. Department of Transportation's FHWA CMF Clearinghouse.

Cost estimates for countermeasures were developed using a combination of Florida Department of Transportation (FDOT) Long Range Estimates (LREs) and Historical Item Average Cost Reports. To ensure comparability, assumptions were established for each countermeasure to generate consistent per-mile cost estimates. These per-mile costs were then multiplied by the length of each corridor to produce planning-level cost estimates. This approach allowed for a standardized and data-driven comparison of safety benefits and estimated implementation costs across all five priority corridors.

The analysis found that South Jog Road, 10th Ave North, and Linton Boulevard offer the most cost-effective countermeasure packages. 6th Avenue/Melaleuca Lane scored the lowest within the cost benefit scoring matrix. However, the margins between all five corridors in terms of overall score were extremely close and indicative of minimal cost benefit differences between them.

Benefit-to-Cost Summary Results

Corridor	Cumulative Cost	Planning-Level Cost Benefit Score
South Jog Road	\$941,000	1.67
10 th Avenue North	\$1,384,000	1.67
Linton Boulevard	\$959,000	1.63
South Military Trail	\$1,471,000	1.52
6 th Ave / Melaleuca	\$1,258,000	1.43

Note that long-term or standalone countermeasures, as well as their associated costs, were not included in the benefit-to-cost analysis. This approach was adopted for two main reasons: first, potential grant programs prioritize low- to medium-cost countermeasures, which can be executed without significant roadway reconstruction; second, standalone or long-term countermeasures typically involve substantially higher costs and present more complex and variable scopes.

For example, implementing separated bike lanes along a corridor may necessitate various construction strategies to ensure continuity. In some segments, adequate right-of-way might be available, eliminating the need to relocate existing curbs and stormwater infrastructure. Conversely, other sections could require extensive roadway reconstruction to accommodate the separated bike lanes. Furthermore, many signalized intersections are inherently complex and demand additional design studies to determine feasible solutions for integrating separated bike lanes through these locations. Due to the considerable variability in costs and design considerations, these elements were excluded from the benefit-to-cost analysis and project prioritization.

Each project includes estimates for both short-term and long-term/standalone costs. Moving forward, it is recommended that each corridor undergo more detailed design and analysis to determine the appropriate timing and methods for implementing both short-term and long-term measures. Both types of interventions are essential to effectively address safety needs across priority corridors.

Priority Corridor Prioritization

After the BCA was performed to determine cost effectiveness, the corridors were prioritized based on specific weighted categories. The categories are: Safety (50%), Community Benefit (30%), and Benefit to Cost Ratio (20%). Metrics are tied to each category and assigned values to derive a final score.

Priority Project Prioritization Matrix

Category Weight	Subcategory	Evaluation Metric	Points
50%	Vehicle Safety	Number of Vehicle FSI	
		less than 33	1
		33 to 36	2
		37 to 60	3
	61 or more	4	
	Vulnerable Road User Safety	Number of Vulnerable Road User FSI	
		less than 19	1
		19 to 23	2
24 to 31		3	
32 or more	4		
30%	Parks	Number of Parks within 1/4 mile of Corridor	1-4 score based on total sum range
	Schools	Number of Schools within 1/4 mile of Corridor	
	Transit	Number of Public Transit Stops within 200 ft of Corridor	
	Equity	Number of Areas of Persistent Poverty Corridor Passes Through	
	Places of Worship	Number of Places of Worship within 1/4 mile of Corridor	
20%	Planning level Benefit-to-cost ratio	equal to or less than 1.52	1
		1.53 to 1.625	2
		1.63 to 1.66	3
		greater than 1.66	4

Based on this scoring, 10th Avenue North was identified as the top-ranked corridor for grant application consideration. A summary of the prioritization results is provided below. The detailed results are provided in the Appendix.

Priority Corridor Prioritization Results

Corridor	Weighted Prioritization Score
10th Ave North	4.20
South Jog Road	3.90
Linton Boulevard	3.90
6 th Ave/Melaleuca Lane	3.60
South Military Trail	3.40

TOP RANKED CORRIDOR SUMMARY

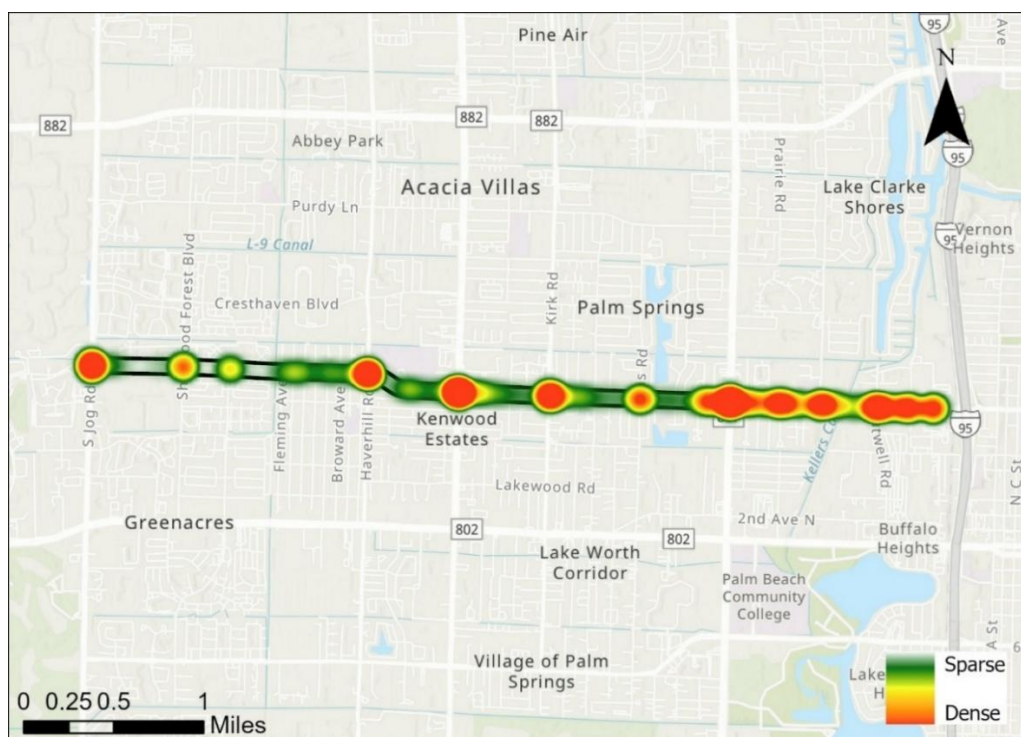
10th Avenue North

As a prominent urban major arterial, 10th Avenue North extends for 4.7 miles from Barnett Drive to South Jog Road. This essential corridor serves as a critical east-west route supporting significant community destinations, including residential areas, schools, and a key connection to I-95. The posted speed limit is 40 MPH. This corridor experiences varying traffic volumes. The annual average daily traffic (AADT) reported by FDOT in 2024 ranged from 12,400 to 34,000 vehicles. Additionally, the corridor traverses three school zones, contributing to its role as a vital thoroughfare in the area.

The study portion of 10th Avenue passes through a high number of community areas and points of attraction, which attributed to the corridor scoring high during the prioritization process. This portion of 10th Avenue was the shortest corridor studied in length, but it experienced the highest number of fatalities for the top five priority corridors. Between 2019 and 2023, the corridor experienced:

- 2,922 crashes
- 67 FSI, including 18 fatalities
- 130 vulnerable road user crashes

10th Avenue Crash Heat Map



Intersection Crash Profile and Countermeasures

User	Top 3 Crash Types		
	Crash Type 1	Crash Type 2	Crash Type 3
Vehicle	Rear end (43%)	Left turn (16%)	Angle (15%)
Vulnerable Road User	Bicycle (45%)	Pedestrian (32%)	Rear end (9%)

Based on these crash types, the recommended intersection countermeasures are:

- **High Visibility Crosswalk at South Military Trail and 10th Ave North** – Enhance visibility for pedestrians and cyclists
- **Leading Pedestrian Intervals (LPI)** – Improve crossing safety for pedestrians and cyclists
- **Signal Backplates with Retroreflective Borders** – Increase signal visibility to reduce rear end crashes
- **Protected Left-Turn Signal Phasing** – Reduce left entering crashes at intersections
- **Hardened Centerlines** – Reduce risk to pedestrians and cyclists within the crosswalk at signalized intersections.

Segment Crash Profile and Countermeasures

User	Top 3 Crash Types		
	Crash Type 1	Crash Type 2	Crash Type 3
Vehicle	Rear end (40%)	Angle (20%)	Left turn (15%)
Vulnerable Road User	Bicycle (36%)	Pedestrian (32%)	Left turn (11%)

Based on these crash types, the recommended segment countermeasures are:

- **Directional Median Conversion** – Reduce non-signalized intersection crashes along segments by controlling turning movements and preventing crossings of the roadway at specific locations.
- **Full Traffic Signal at Henthorne Drive and 10th Avenue North** – To reduce vulnerable road user risks associated with nearby generators north and south of the unsignalized intersection.

Detailed technical information and supporting analysis for this corridor and the other top five priority corridors are provided in the appendix.

SYSTEMIC SAFETY RECOMMENDATIONS

Systemic road safety is a proactive approach to managing and planning for roadway safety. Rather than reacting to individual crash locations, the systemic method focuses on implementing proven countermeasures across a network of roadways that share similar characteristics and risk factors. This approach is especially effective for deploying low- to moderate-cost treatments that help prevent crashes before they occur.

For this plan, systemic recommendations are guided by the High Injury Network (HIN) Framework, which includes four target travel modes:

- Motor Vehicles
- Motorcyclists
- Pedestrians
- Bicyclists

Each mode HIN includes both segments and intersections, resulting in eight systemic focus areas.

Crash data from both County- and State-maintained roadways was analyzed to identify patterns and develop targeted recommendations. The systemic safety strategies specifically address severe crashes—those resulting in serious injuries or fatalities—with the overarching goal of reducing and ultimately eliminating these incidents on County-maintained roads.

How to Use Systemic Safety Recommendations

The systemic safety recommendations developed in this plan are intended to guide proactive implementation of countermeasures across County-maintained roadways. These recommendations are based on the High Injury Network (HIN) segment and intersection rankings generated through the safety assessment.

There are two primary ways to apply these recommendations:

- **Annual Budgeting Tool.** The HIN rankings and associated systemic countermeasures can be used to inform annual safety investment decisions. This allows for broad, network-wide implementation of proven strategies that address common crash types and risk factors.
- **Project Integration.** When a roadway project is scheduled along a segment of the HIN, the systemic recommendations can be applied incrementally as part of the project scope. This ensures that safety improvements are embedded into planned infrastructure upgrades.

By using both approaches—annual programming and opportunistic integration—the County can strategically deploy systemic countermeasures to reduce and ultimately eliminate severe crashes.

A summary of each of the eight systemic safety recommendation focus areas is provided in the following pages. Each summary includes:

- A summary of the top crash types addressed.
- A flow chart linking crash types to recommended countermeasures.

The flow charts that follow provide a summary of the leading crash types and their connection to the recommended countermeasures. In the appendix, the more detailed information about the countermeasures is provided in tables. That information includes:

- Recommended treatments
- Preliminary cost estimates
- Crash Modification Factors (CMFs)
- Example applications or safety issues

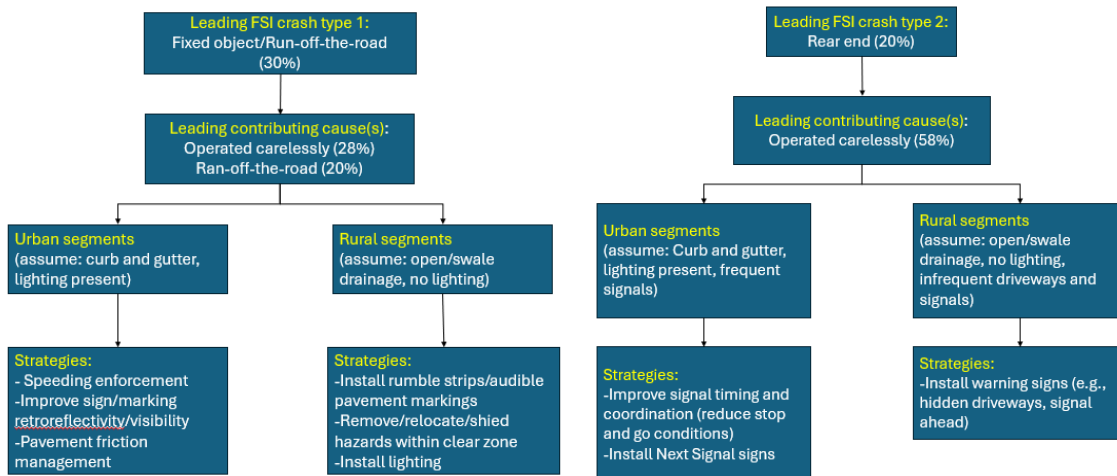
Motor Vehicle Systemic Safety Recommendations

From 2019 to 2023, there were 2,020 motor vehicle crashes on state and county-maintained roadways that resulted in someone being fatally or seriously injured. These crashes were split relatively evenly between segments and intersections, with 52% occurring along segments and 48% occurring at signalized intersections. The motor vehicle systemic safety recommendations are focused on reducing and eliminating these crash trends.

Motor Vehicle Roadway Segments

The two leading FSI crash types involving motor vehicles along segments are:

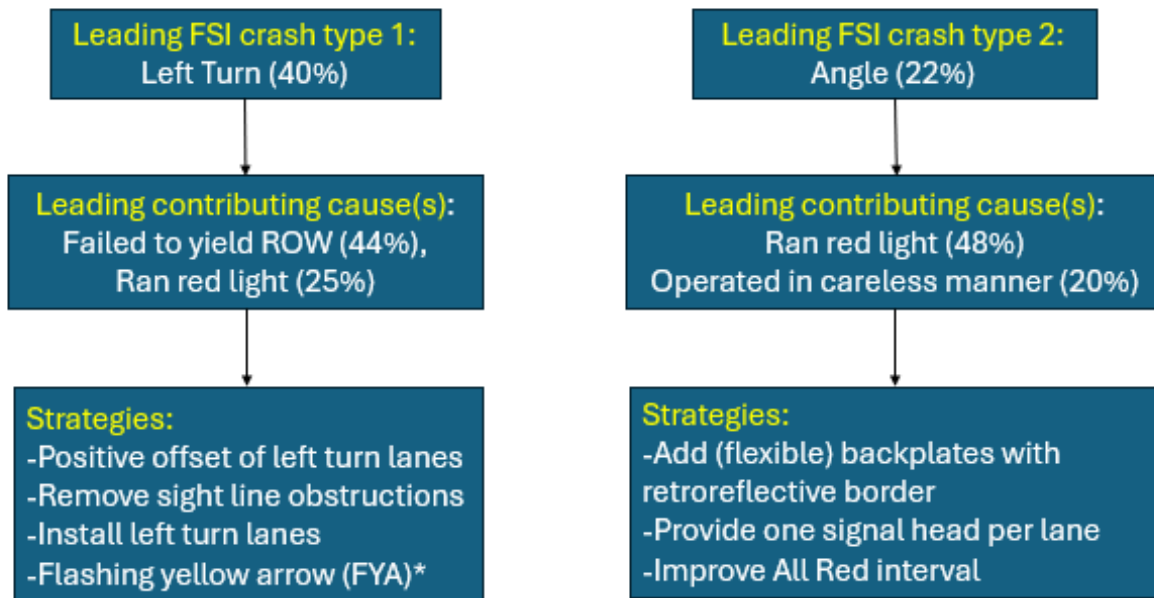
- Fixed Object / Run-Off-the-Road
- Rear End Collisions



Motor Vehicle Intersections

The two leading FSI crash types involving motor vehicles at intersections are:

- Left Turn
- Angle



* Applicable if the existing left turn phasing is permissive or protected/permissive

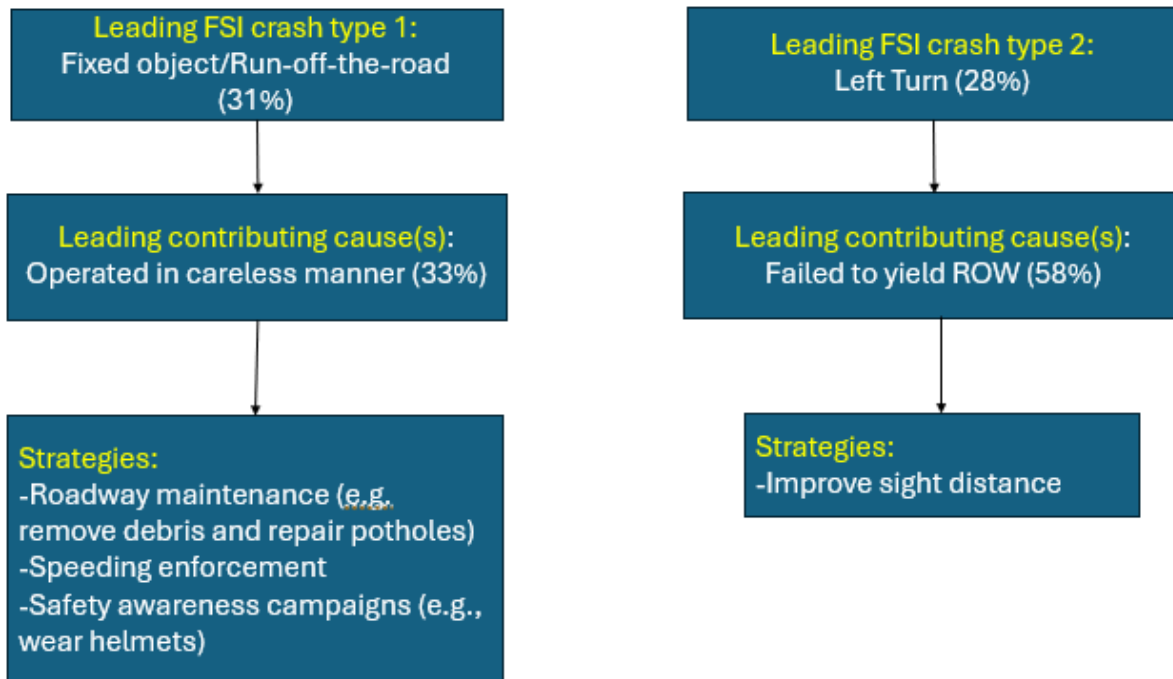
Motorcycle Systemic Safety Recommendations

From 2019 to 2023, there were 459 motorcycle crashes on state and county-maintained roadways that resulted in someone being fatally or seriously injured. Most of these severe crashes occurred on segments (68%), with the remaining 32% occurring at intersections. The motorcycle systemic safety recommendations are focused on reducing and eliminating these crash trends.

Motorcycle Roadway Segments

The two leading FSI crash types involving motor vehicles along segments are:

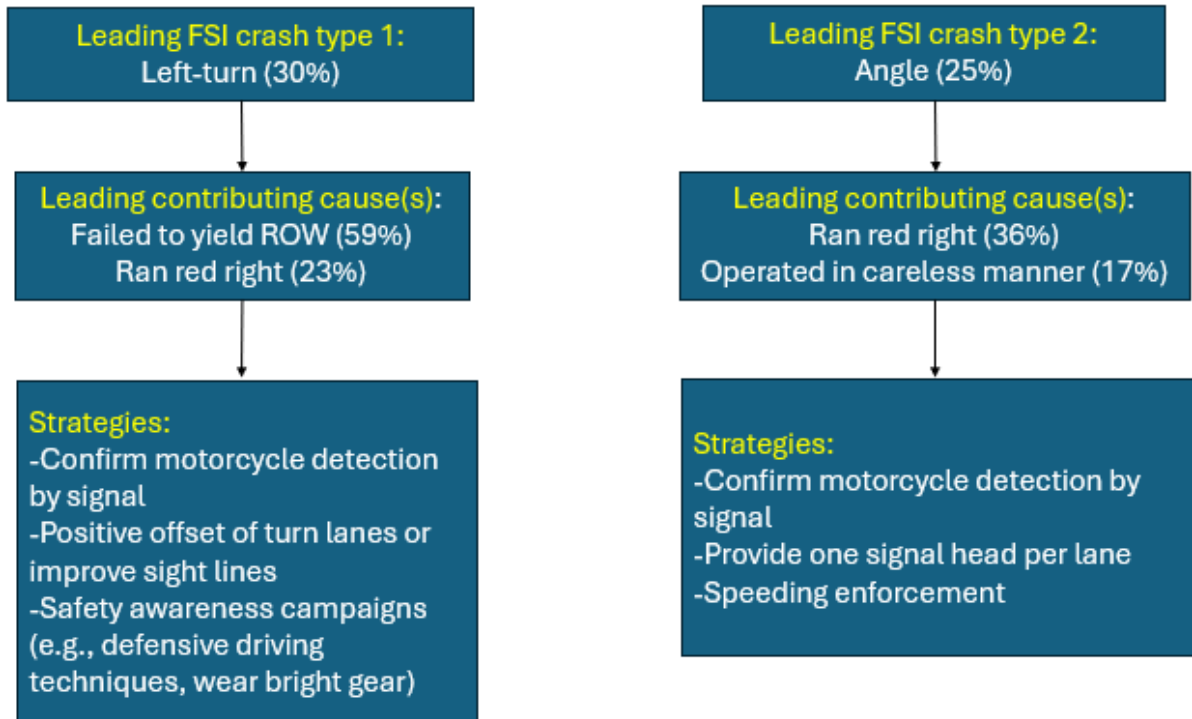
- Fixed Object / Run-Off-the-Road
- Left Turns



Motorcycle Intersections

The two leading FSI crash types involving motorcycles at intersections are:

- Left Turn
- Angle



Pedestrian Systemic Safety Recommendations

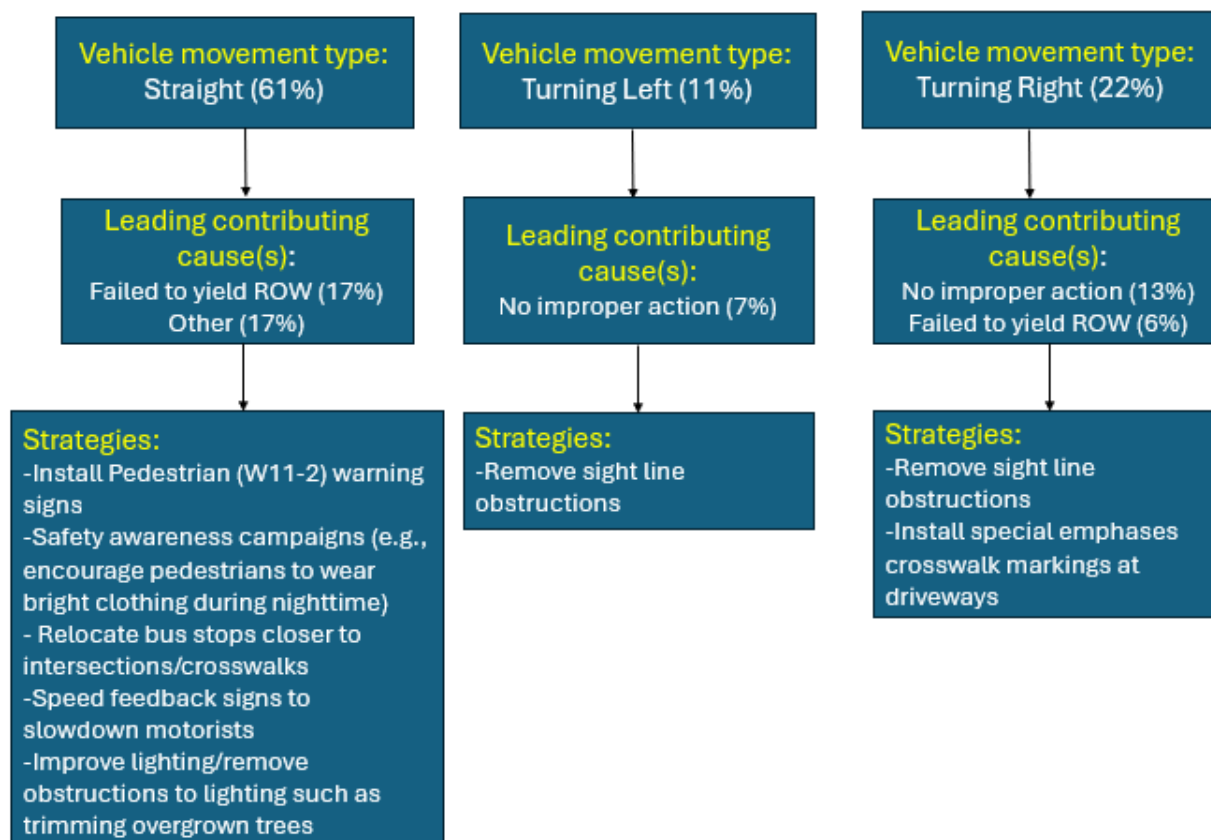
From 2019-2023, there were 458 crashes involving someone walking which resulted in a fatality or serious injury. The majority (61%) of these crashes occurred along segments, with the remaining (39%) occurring at intersections. The pedestrian systemic safety recommendations are focused on reducing and eliminating these crash trends.

Pedestrian Roadway Segments

The two leading vehicle movements along segments that involved a fatal or serious injury pedestrian crash are:

- Traveling straight
- Turning right

Failure to yield was the leading contributing factor.

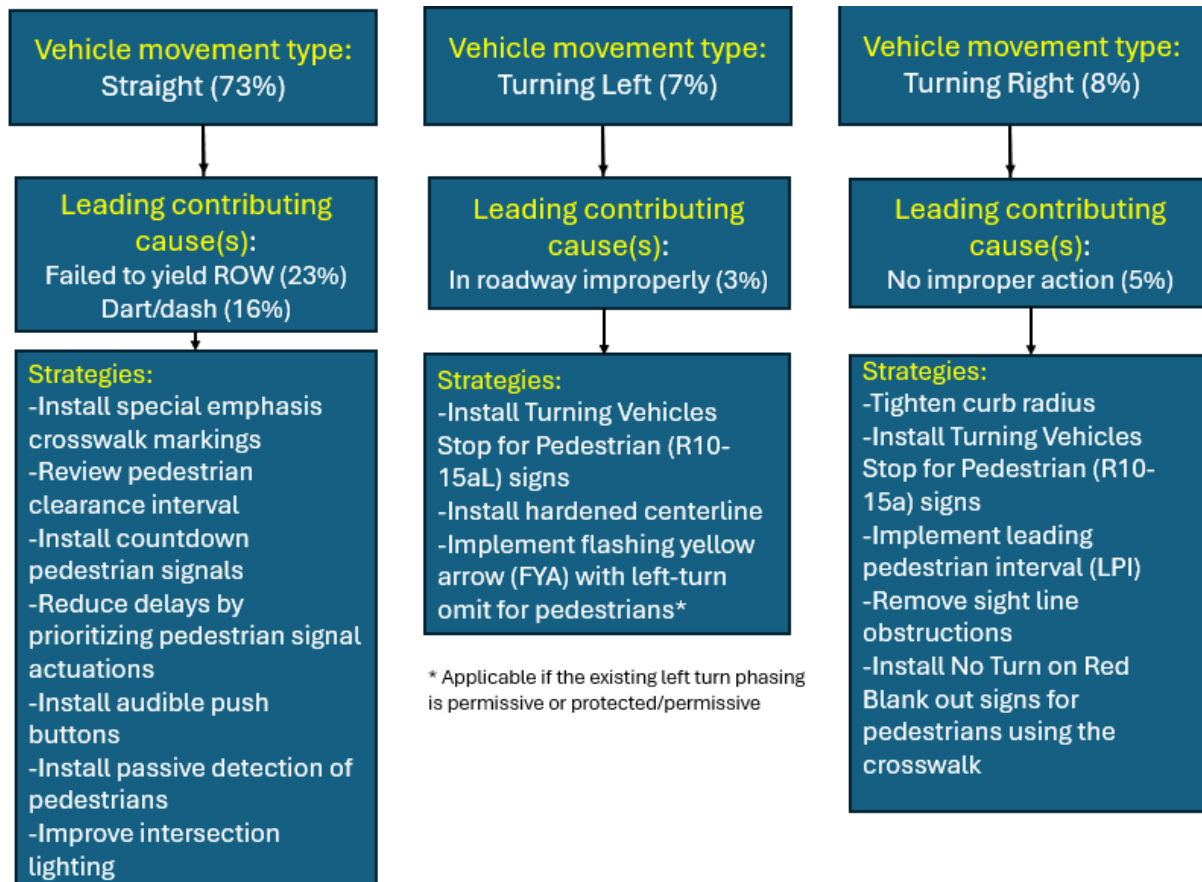


Pedestrian Roadway Intersections

The two leading vehicle movements at intersections that involved a fatal or serious injury pedestrian crash are:

- Traveling straight
- Turning right

Failure to yield was the leading contributing factor.



Bicycle Systemic Safety Recommendations

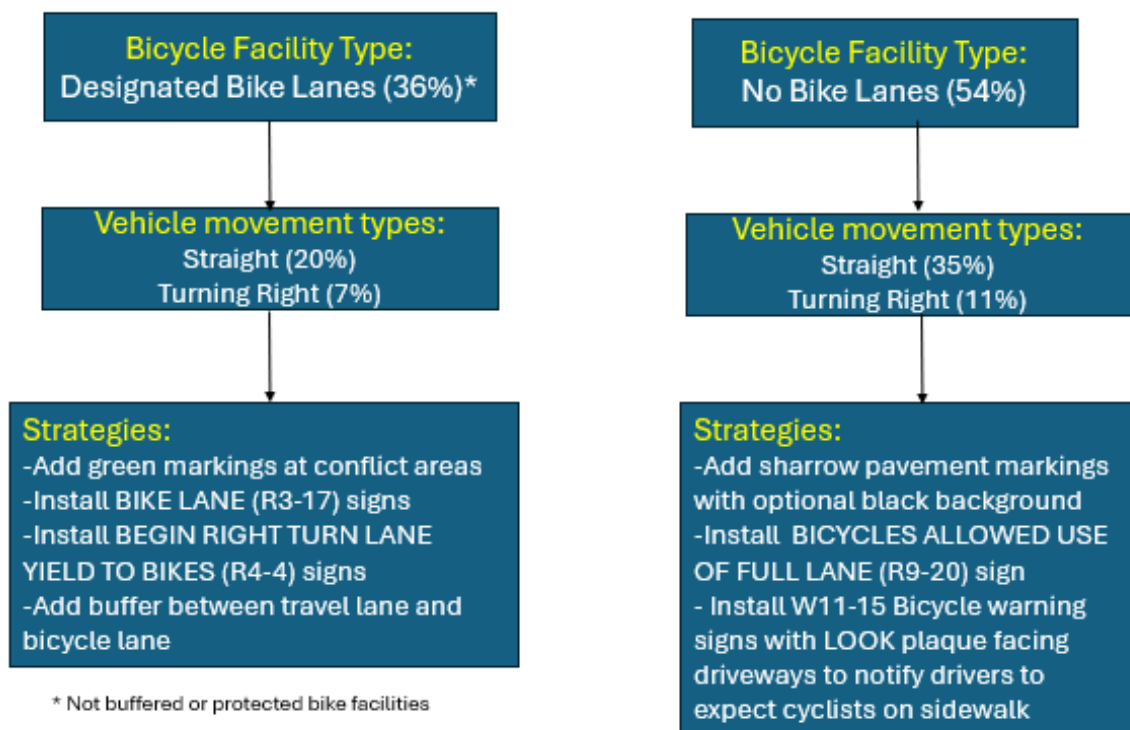
From 2019-2023, there were 255 crashes involving someone riding a bike which resulted in a fatality or serious injury. The majority (61%) of these crashes occurred along segments, with the remaining (39%) occurring at intersections. The bicycle systemic safety recommendations are focused on reducing and eliminating these crash trends.

Bicycle Roadway Segments

On roadway segments, most fatal and serious injury bicycle crashes occurred where no bike lanes exist. The top vehicle movements for these severe crashes are:

- Traveling straight
- Turning right

Failure to yield was the leading contributing factor.

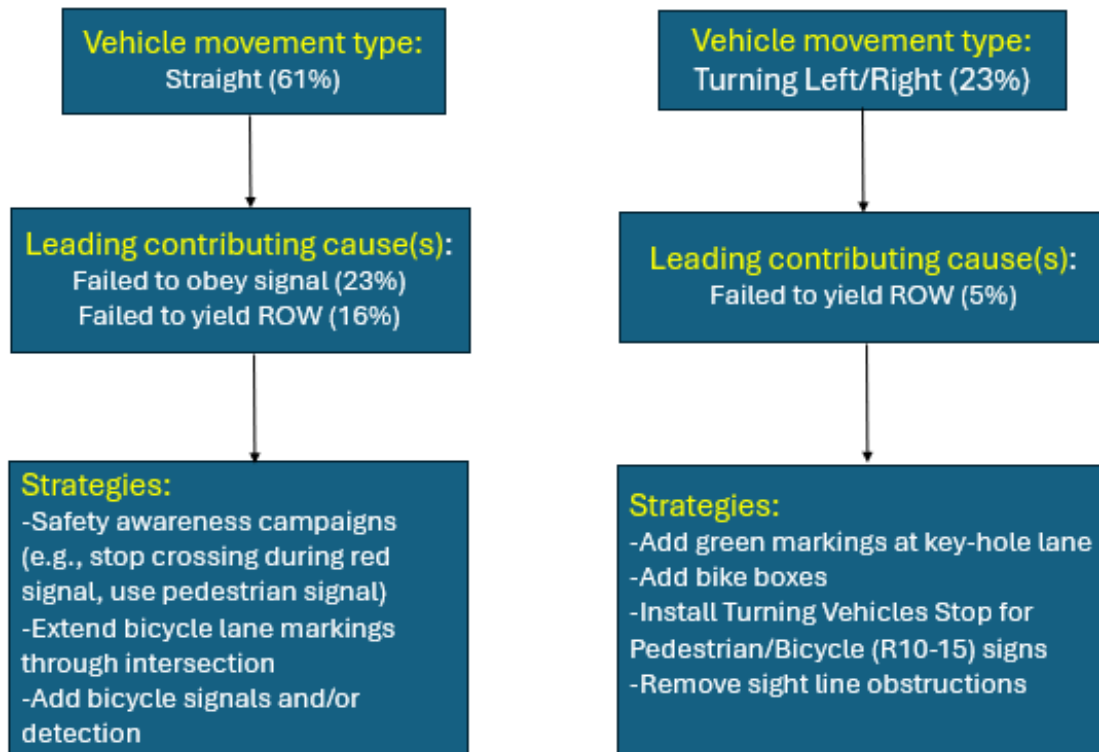


Bicycle Roadway Segments

At intersections, the top vehicle movements for these severe crashes are:

- Traveling straight
- Turning right

Failure to yield was the leading contributing factor.



POLICY AND PROCEDURE MEMORANDA (PPMS) REVIEW

Introduction

The Policy and Procedure Memoranda (PPMs) serve as the essential guidelines for Palm Beach County's approach to roadway safety and maintenance. Establishing uniform standards and procedures for varied aspects of traffic management, these PPMs ensure that infrastructure improvements are systematic and secure. Covering areas from street lighting to pedestrian signals, the policies underpin the County's commitment to proactively enhancing safety and operational efficiency on its roadways. By aligning with

national and state standards and incorporating specific recommendations, the PPMs focus on consistently applying industry standards to maintain and upgrade traffic systems effectively.

Summary of Findings

Based on a thorough review of the Policy and Procedure Memorandums (PPMs) for Palm Beach County, several key recommendations have emerged to address systemic issues and corridor needs.

- **Draft LPI PPM.** Consider allowing LPI based on data and observation rather than waiting for crashes. Do not recommend FYA over LPI but could recommend protected-only left turns.
- **ETO-100 Traffic Signal Installation Warrants.** Consider adding criteria for installing signals at intersections with demonstrated high pedestrian and/or bicycle volume, locations which would potentially handle significant pedestrian/bicycle, or locations with significant pedestrian/bicycle accidents.
- **ETO-105 FYA for Left Turn Movements.** Consider adding pedestrian/bicycle volumes and crash data as criteria for determining if FYA operates as protected-only during certain times of day.
- **ETO-108 Installation of Left Turn Signals.** Consider adding more restrictive criteria for allowing protected-permissive signals when pedestrian/bicycle activity may be higher.
- **ETO-300 Pavement Markings.** Require the use of thermoplastic materials with glass beads for pavement markings to enhance nighttime visibility.
- **ETO-602 Pedestrian Crosswalks at Uncontrolled Locations.** Eliminate the minimum ADT threshold and FDOT Context Classification requirements for installing pedestrian crosswalks at uncontrolled locations, prioritizing pedestrian demand and ensuring high visibility crosswalks, advanced stop markings, and pedestrian warning signs as standard applications.
- **ETO-603 Speed Limit Policy Procedure.** Ensure speed limit signs are clearly visible both day and night, revising placement strategies to align with MUTCD standards, including places speed changes and jurisdictional boundaries.
- **ETO-614 School Zones.** Reference the use of flashing beacons at school crossings in areas with higher speed limits within the policy to foster consistent safety measures.

These recommendations aim to enhance roadway safety comprehensively and address specific corridor needs effectively.

Opportunities Tied to Systemic Issues and Corridor Needs

PPM	Opportunities	
	Systemic Safety	Corridor Safety
Draft LPI PPM	Where applicable, do not recommend FYA over LPI. Protected only left turns are a good alternative as well.	Provide LPI based on data and observations, do not wait for crashes to happen
ETO-100 Traffic Signal Installation Warrant	Consider adding criteria for installing signals at intersections with demonstrated high pedestrian and/or bicycle volume, locations which would potentially handle significant pedestrian/bicycle volume (not many people crossing currently, because they can't, but would if they could), or locations with significant pedestrian/bicycle accidents.	
ETO-105 FYA for Left Turn Movements	Consider adding more restrictive criteria for allowing protected-permissive signals when pedestrian/bicycle activity may be higher.	
ETO-108 Turn Lane Requests	n/a	
ETO-200 Traffic Control Sign Policy	Place Wildlife crossing signs where applicable.	Consistent and compliant signage along HIN corridors.
ETO-300 Pavement Markings	Review roadways to identify if new markings need to be placed or if existing markings	On Corridors with high nighttime crash rates, confirm reflective materials are adequately utilized.

PPM	Opportunities	
	Systemic Safety	Corridor Safety
	need maintenance.	
ETO-500 Street Lighting Policy	Prioritize lighting where nighttime crashes are prevalent and lighting does not exist.	
ETO-501 Sidewalk Program	Prioritize locations with high pedestrian crash rates that lack existing sidewalks.	Review HIN corridors to confirm sidewalk connectivity, prioritize connectivity along these corridors.
ETO-602 Pedestrian Crosswalks at Uncontrolled Locations	Standardize the use of High visibility crosswalks and add advanced stop markings and warning signs at uncontrolled crosswalk locations.	
ETO-603 Speed Limit Policy Procedure	Confirm speed limit signs are adequately spaced on roadways and confirm they are visible during all light conditions.	Review high crash locations to determine if speeding is a consistent crash factor. If speed is a problem, consider conducting a review of the speed limit.
ETO-606 Turn Lanes Request	n/a	
ETO-609 Non-Conforming Landscaping or Other Obstructions in County Road Right-of-Ways	Conduct regular assessments of sight distance and clear zones can proactively prevent crashes caused by visibility obstructions.	
ETO-614 School Zones	Enhancing school zone safety with flashing beacons at crossings and school entrances.	
ETO-708 Accessible Pedestrian Signals and Detectors	Inventory pedestrian signals and detectors for accessibility levels to identify shortfalls and promote inclusive safety planning.	

Summary of PPMs

PPM: Draft LPI PPM

Summary of PPM: The policy establishes criteria for implementing a Leading Pedestrian Interval (LPI) to enhance pedestrian safety at County-maintained traffic signals. LPI gives pedestrians a 3-7 second head start before vehicles proceed, improving visibility and reducing conflicts. The evaluation criteria include pedestrian-vehicle crashes, high pedestrian volumes with turning vehicles, visibility issues, motorist non-yielding behavior, requests by visually impaired individuals, and intersection performance during peak hours. The procedure involves data analysis, consideration of alternative measures, and coordination between Traffic Engineering and Traffic Signal Systems Managers, ensuring the LPI's benefits outweigh any potential traffic delays.

Recommendations: Consider allowing LPI based on data and observation rather than waiting for crashes. Do not recommend FYA over LPI but could recommend protected-only left turns. These recommendations are based on a safe system approach that aims to transition policy from being reactive to proactive.

PPM: ETO-100 Traffic Signal Installation Warrants

Summary of PPM: This policy outlines the criteria and procedures for the installation of traffic signals within Palm Beach County. Governed by the Manual on Uniform Traffic Control Devices (MUTCD) and Florida State Statutes, the policy ensures that intersections meet specific signal warrants appropriate for traffic conditions. Key criteria include the jurisdiction of the intersection, compliance with Florida statutes, satisfaction of MUTCD signal warrants, and consideration of access management policies. For private roads or commercial driveways, the private entity must fund the design, utility relocation, and installation of the signal. Requests for signal installation initiate a data analysis process, with the Traffic Engineering Studies Manager evaluating and recommending the signal installation to the Director for final approval. Upon approval, the Signal Design Manager schedules the design and installation, and the requesting party is informed of the results.

Recommendations: Consider adding criteria for installing signals at intersections with demonstrated high pedestrian and/or bicycle volume, locations which would potentially handle significant pedestrian/bicycle volume, or locations with significant pedestrian/bicycle accidents.

PPM: ETO-105 FYA for Left Turn Movements

Summary of PPM: This policy establishes criteria for installing and operating Flashing Yellow Arrow (FYA) signals for left-turn movements at signalized intersections in Palm Beach County, following MUTCD guidelines. All new and modified signals must include FYA for Permissive Only and Protected/Permissive modes. Variable mode operation is considered

based on time-of-day and crash trends. Consistent application across intersection approaches and appropriate signage are required. Special considerations include avoiding mixed signal types, managing pedestrian activity, and ensuring structural feasibility. Requests for installation undergo evaluations by traffic management teams, with prioritization given to critical locations, including school crossings and high pedestrian crash areas.

Recommendations: Consider adding pedestrian/bicycle volumes and crash data as a criteria for determining if FYA operates as protected-only during certain times of day.

PPM: ETO-108 Installation of Left Turn Signals

Summary of PPM: This policy outlines guidelines for installing left turn signals at signalized intersections in Palm Beach County, based on criteria similar to those in the Manual of Traffic Signal Design and the Highway Capacity Manual. The need for a left turn signal is determined by peak hour volumes, average delay, and crash patterns. Protected-Permissive left turn signals may be installed if specific volume thresholds, delay, or crash conditions are met, including special considerations for senior citizen drivers. Protected-Only left turn signals are required for intersections with multiple left turn lanes or substantial opposing traffic, and may also be installed to enhance pedestrian safety, address specific crash patterns, or accommodate high-speed traffic areas. Evaluation ensures that left turn signals improve safety and traffic flow while maintaining an acceptable Level of Service (LOS).

Recommendations: Consider adding more restrictive criteria for allowing protected-permissive signals when pedestrian/bicycle activity may be higher.

PPM: ETO-200 Traffic Control Sign Policy

Summary of PPM: Establishes guidelines for the installation of traffic control signs on County and non-County roads in Palm Beach County, ensuring compliance with established standards.

- Sign Installation Authority: All County-installed signs must conform to the MUTCD and FDOT standard plans. Sign installation on County roads depends on maintenance acceptance, permits from responsible agencies, or inter-local agreements with municipalities.
- Non-County Road Signage: The County installs signs on non-County road projects on a case-by-case basis for street name signs, primarily at intersections with County roads or when public safety and responsibility conditions are met.
- Wildlife Crossing Signs: "Watch for Wildlife" warning signs are installed only if the road segment borders conservation land or greenways, has a speed limit of 45

mph or higher, and there is documented evidence of wildlife-vehicle collisions. Sign placement follows MUTCD guidelines with specific sizing and spacing.

- Procedures and Approvals: Initial sign installations require approved work orders from a Professional Engineer in the Traffic Division, with replacements documented by a specific form. The policy is subject to approvals by the Division and Department Directors.

Recommendations: No recommendations.

PPM: ETO-300 Pavement Markings

Summary of PPM: The guidelines outline the requirements for pavement markings on County roadways. Permanent markings must use thermoplastic materials, while paint is allowed for temporary conditions or initial layers. Low-volume residential and business roads generally do not qualify for markings unless approved by the Assistant Director. All new or widened roads need approved engineering plans or work orders for markings, and intersections with state road approaches fall under FDOT responsibility. Refurbishing decisions depend on upcoming projects and timeframes, with paint used for short-term projects and thermoplastic for longer-term or absent projects. Routine refurbishing that matches existing markings typically does not require new engineering plans, except for compliance changes or added bicycle lanes.

Recommendations: No recommendations

PPM: ETO-500 Street Lighting Policy

Summary of PPM: Establishes guidelines for the design, installation, and maintenance of street lighting on County-maintained roads. It mandates coordination with local utilities, adherence to national and state standards, and specific conditions for lighting intersections, thoroughfares, and roundabouts. Requests for new street lights must be reviewed by the Traffic Signal and Lighting Design Manager and are dependent on budget and field conditions. The policy also includes procedures for inspection and billing reconciliation of completed projects and defines the roles of the County and municipalities regarding street lighting installations and maintenance.

Recommendations: No recommendations.

PPM: ETO-501 Sidewalk Program

Summary of PPM: This document outlines the process for selecting projects to be funded under the Sidewalk Program for the upcoming fiscal year. The Traffic Division compiles a list of eligible projects, which is then reviewed by a Selection Committee made up of representatives from various county departments and agencies. Approved projects, including both school-related and general sidewalk requests, are chosen to serve the

interests of multiple stakeholders. The final list of recommended projects is submitted to the Board of County Commissioners for approval each October.

Recommendations: No recommendations.

PPM: ETO-602 Pedestrian Crosswalks at Uncontrolled Locations

Summary of PPM: Defines the criteria for installing pedestrian crosswalks at uncontrolled locations like midblock areas or unsignalized intersections. It outlines requirements for traffic volume, pedestrian demand, distance from other crosswalks, visibility, and specific enhancements like pavement markings and signs. The policy provides guidelines for additional safety measures such as flashing beacons and pedestrian signals, based on road conditions and speed limits. Requests for crosswalks are reviewed by the Traffic Engineering Studies Manager, who ensures proper study, approval, installation, and ongoing maintenance.

Recommendations:

- 1) Consider lowering minimum ADT threshold and providing flexibility with FDOT Context Classification requirements for installation of a pedestrian crosswalk at uncontrolled locations on County maintained roadways. Pedestrian demand should dictate the need for crosswalks, regardless of ADT or context classification. Crosswalks should be prioritized at key pedestrian generator locations. Low volume county roads without a crosswalk still create a potential safety risk. Removing these requirements is proactive and is aligned with the Safe System approach.
- 2) High Visibility Crosswalks (CMF 4123) should be the standard regardless of ADT on the roadway. They are a proven safety countermeasure, and their standardized application is a proactive approach to safety.
- 3) Advanced Stop markings and pedestrian warning signs should be used in conjunction with high visibility crosswalks as a standard application. They are a proven safety countermeasure (CMF 9017).
- 4) All crosswalks should be reviewed annually to determine maintenance needs and to keep their paint adequately visible.

PPM: ETO-603 Speed Limit Policy Procedure

Summary of PPM: This document outlines the guidelines and procedures for establishing speed limits on County maintained roads in Florida. Speed limits are set according to state statutes and the Florida Department of Transportation (FDOT) standards, with typical limits of 30 mph in business or residential districts and 55 mph elsewhere. The County Engineer, following proper engineering studies and recommendations, has the

authority to approve speed limits, which must be posted in accordance with FDOT criteria and Board of County Commissioners resolutions. Sign placement requirements and the process for adopting changes to speed limits are also specified.

Recommendations:

- 1) Indicate that signs shall be clearly legible and visible both in daylight and at night when illuminated by headlights.
- 2) Consider revising "Speed limit signs should be placed at the beginning of each speed zone, about 2500 feet apart and approximately 100 feet from intersection." Per MUTCD (2B.13) Speed Limit (R2-1) signs, indicating speed limits for which posting is required by law, shall be located at the points of change from one speed limit to another.
 - a. At the downstream end of the section to which a speed limit applies, a Speed Limit sign showing the next speed limit shall be installed. Additional Speed Limit signs shall be installed beyond major intersections and at other locations where it is necessary to remind road users of the speed limit that is applicable.
 - b. Speed Limit signs indicating the statutory speed limits shall be installed at entrances to the State and, where appropriate, at jurisdictional boundaries in urban areas.

PPM: ETO-606 Turn Lanes Request

Summary of PPM: This policy outlines the criteria and procedures for the installation of turn lanes on public roads, aimed at enhancing traffic flow and safety. For public roads serving other public roads, the county may fund the turn lane installation based on a warranted traffic engineering study. For private roads or public roads serving private developments, the developer typically covers the costs, unless a public health or safety benefit justifies county funding. Turn lanes are considered based on traffic volume thresholds: 75 right turns or 30 left turns during peak hours, with considerations for speed, volume, accident history, and road geometry. Requests initiate an engineering study, and justified requests are reviewed by the Capital Projects Committee for approval and assignment. Engineering plans for non-county projects require review and permits before construction begins.

Recommendations: No recommendations.

PPM: ETO-609 Non-Conforming Landscaping or Other Obstructions in County Road Right-of-Ways

Summary of PPM: Sets guidelines for addressing landscaping or other obstructions in the County right-of-ways. It's illegal to place items in these areas without permits. The County

investigates complaints to determine if obstructions violate clear zone and sight distance requirements per the FL Greenbook standards. If a violation is found, the owner is given time to remove it; otherwise, the County will remove the obstruction. For extreme cases, immediate removal may be warranted without prior notice. The policy includes specific procedures for assessing sight distance and clear zone compliance.

Recommendations: No recommendations.

PPM: ETO-614 School Zones

Summary of PPM: This PPM outlines the policy and procedures for establishing and maintaining school zones in Palm Beach County to ensure pedestrian safety and effective traffic control near schools.

- Authority and definitions: The policy is based on the MUTCD and FDOT's Speed Zone Manual, defining key terms such as school route maps and school speed zones used for traffic control planning.
- Procedures for school speed zones: Requests for school speed zones are handled by the Traffic Engineering Studies Manager who evaluates them per policy guidelines, issues work orders for signage and flashers, and coordinates installation with the signal section.
- School route maps and speed zone guidelines: Official school route maps include school property, crossings, traffic controls, and walk routes, updated collaboratively with schools and law enforcement. School speed zones of 20 mph are established on street segments with student crossings under specific conditions such as traffic control absence, speed limits above 35 mph, or multiple lanes. Flashers and signs comply with MUTCD standards and speed limits are enforced during designated school arrival and dismissal times.
- Additional traffic controls: School crossings require adult crossing guards and must be spaced at least 300 feet apart. Traffic signals may be installed at school entrances or major access intersections if MUTCD warrants are met to enhance safety.

Recommendation: As an enhancement or best practice for PPM, it is recommended to incorporate a direct reference to section 15.4.1 (3) of the Florida Speed Zoning Manual. This section suggests the addition of flashing beacons to improve safety at school crossing zones and school entrances in areas where speed limits are 45 mph or higher, as well as in locations that do not have posted school zone signage.

While the PPM currently states that the foundation of its policy is based on the standards outlined in both the MUTCD and the Speed Zoning Manual, which would include the

practice of installing flashing beacons, noting this recommendation explicitly within the PPM would help ensure that best safety practices are consistently implemented.

PPM: ETO-708 Accessible Pedestrian Signals and Detectors

Summary of PPM: This document outlines the process for evaluating and installing Accessible Pedestrian Signals and Detectors in Palm Beach County. It details the steps for submitting requests, the evaluation and approval procedures, coordination with relevant entities like FDOT, and the responsibilities of the Manager in documenting findings and consulting with other traffic signal managers. The document also covers ongoing maintenance, bi-annual reviews of installed devices, and the protocols for modification and training for visually impaired pedestrians.

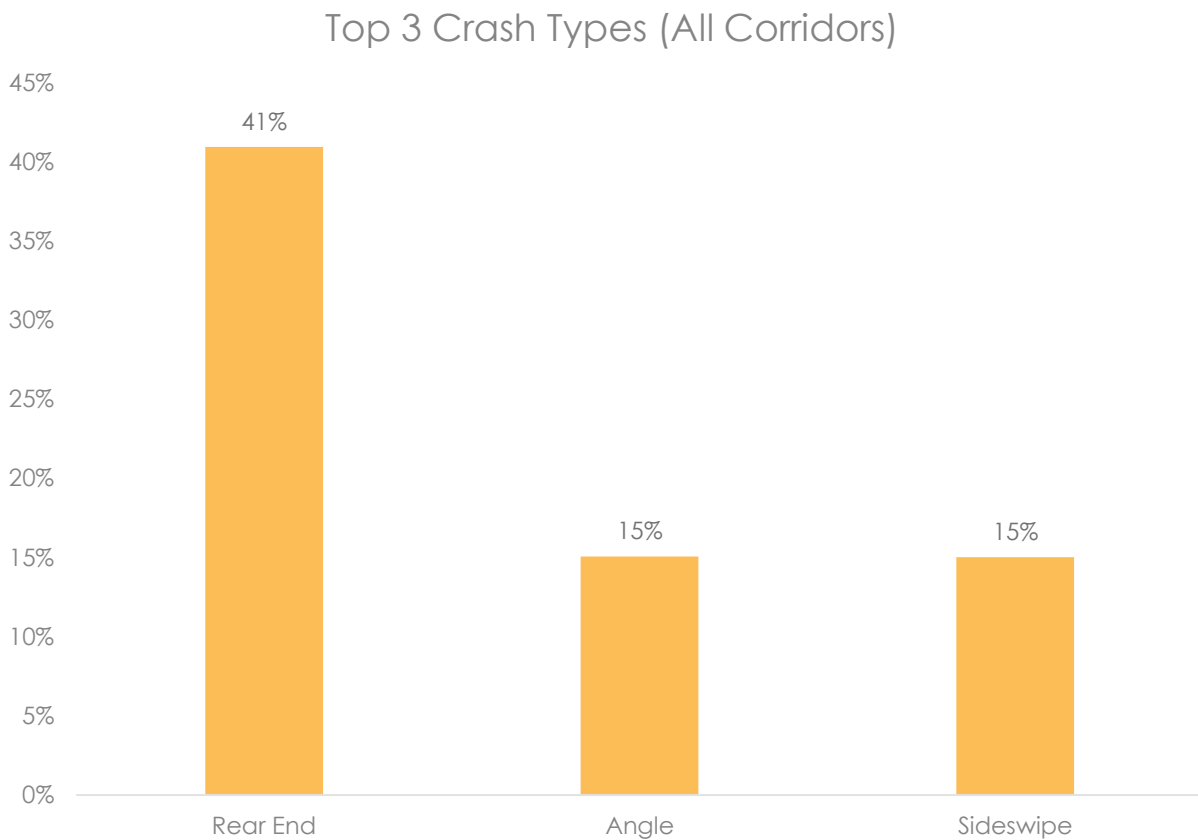
Recommendations: No recommendations.

APPENDIX A: TOP 5 PRIORITY CORRIDOR OVERVIEW

Overall Corridor Trends

For all five corridors combined (including intersections and segments together), the top crash types were Rear End (41%), Angle (15%), and Sideswipe (15%).

Total Crashes by Type (top 3 types for all levels of crash severity)



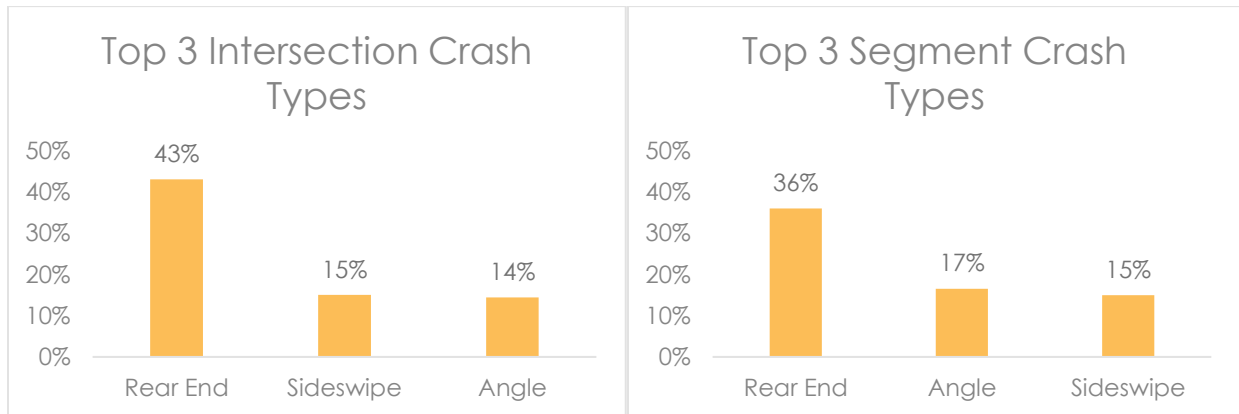
From 2019 to 2023, left turn crashes consistently resulted in the highest number of fatal or serious injuries (FSI), peaking at 26 in 2022. Rear end crashes showed steady FSI numbers around 12-14 from 2019 to 2021, with no data mentioned for 2022-2023. Angle crashes had notable FSI counts in 2019 and 2021 but decreased over time. Bicycle crashes appeared in 2020 with an FSI count of 13. Pedestrian crashes saw increasing FSI counts, peaking at 13 in 2022 and maintaining significant numbers in 2023. Fixed object/run-off-road crashes had moderate FSI counts in 2022 and 2023. Together, these five corridors account for 11% of all fatal or serious injuries (FSIs) in the county (2019-2023) while comprising only 2.2% of total county-maintained lane miles.

OF FSI CRASHES BY YEAR AND TYPE (TOP 3 TYPES FOR FSI)

Year	Top 3 Crash Types	Number of FSI per Crash Type
2019	Left Turn	21
	Rear End	14
	Angle	13
2020	Left Turn	18
	Rear End	14
	Bicycle	13
2021	Left Turn	21
	Rear End	12
	Angle	9
2022	Left Turn	26
	Pedestrian	13
	Fixed Object/Run-Off Road	8
2023	Left Turn	14
	Fixed Object/Run-Off Road	10
	Pedestrian	10

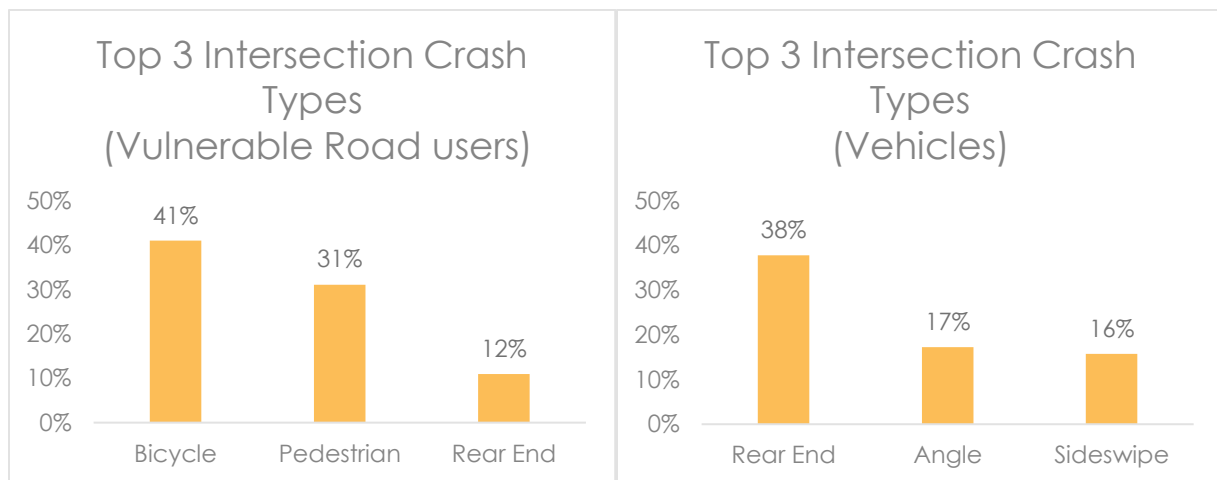
When comparing crash types between segments and intersections, the results remain consistent for each. For both, rear end crashes represent the most common type of crash. For intersections, sideswipe crashes were more common than angle crashes, with this relationship reversing for segment crashes.

Intersection Crash Types vs Segment Crash Types



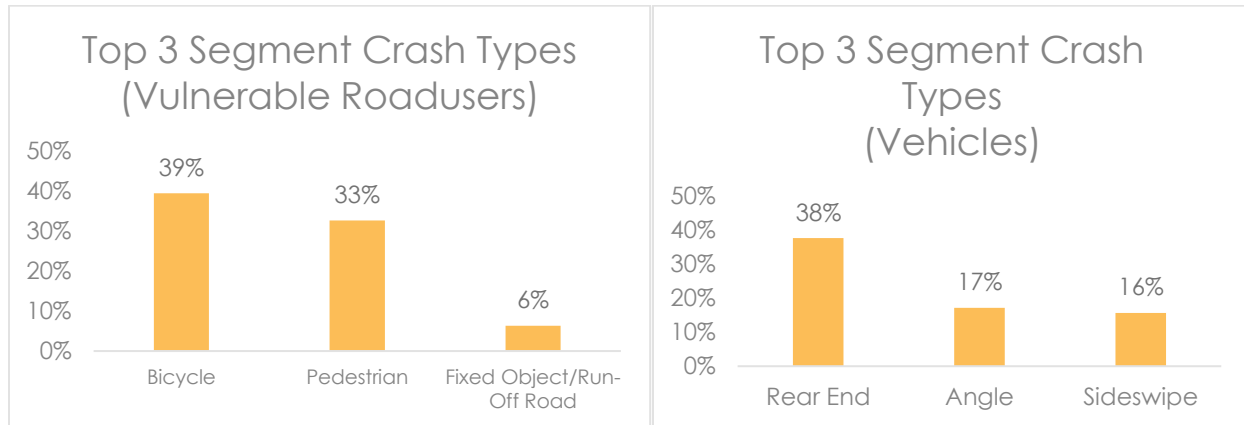
At intersections, the top crash types for vulnerable road users are mainly bicycle and pedestrian crashes, whereas for vehicles, rear end and angle crashes are more common.

Comparison of Vulnerable Road Users to Vehicles at Intersections



On segments, the pattern for vulnerable road users remains with bicycle and pedestrian crashes being predominant, while for vehicles, rear end and angle crashes again dominate alongside sideswipe incidents.

Intersection Crash Types vs Segment Crash Types



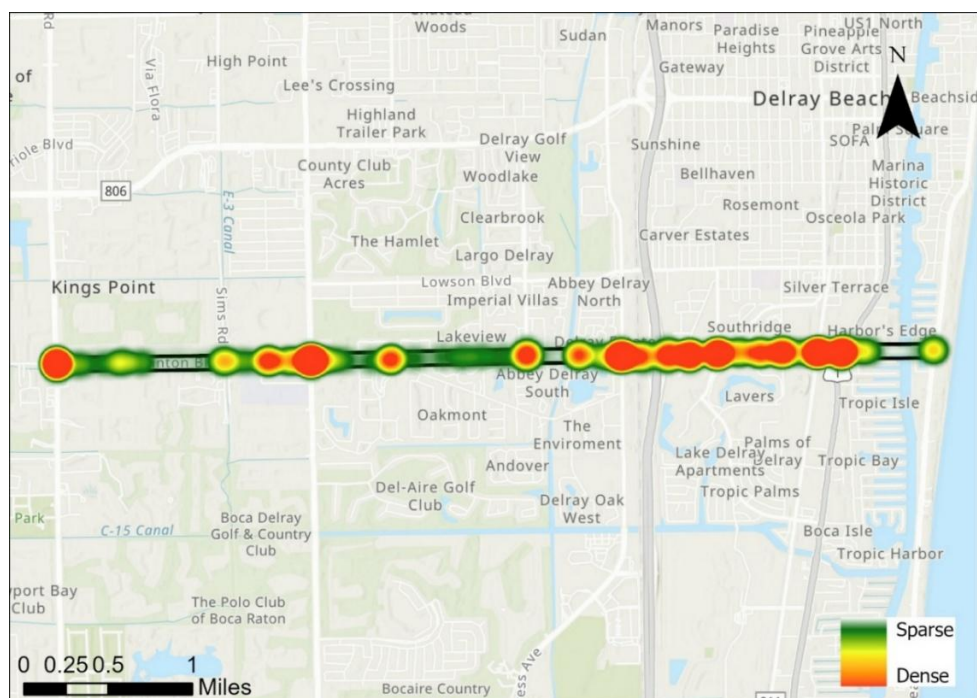
APPENDIX B: TOP 5 PRIORITY CORRIDOR CRASH PROFILES AND COUNTERMEASURE RECOMMENDATIONS

Linton Boulevard



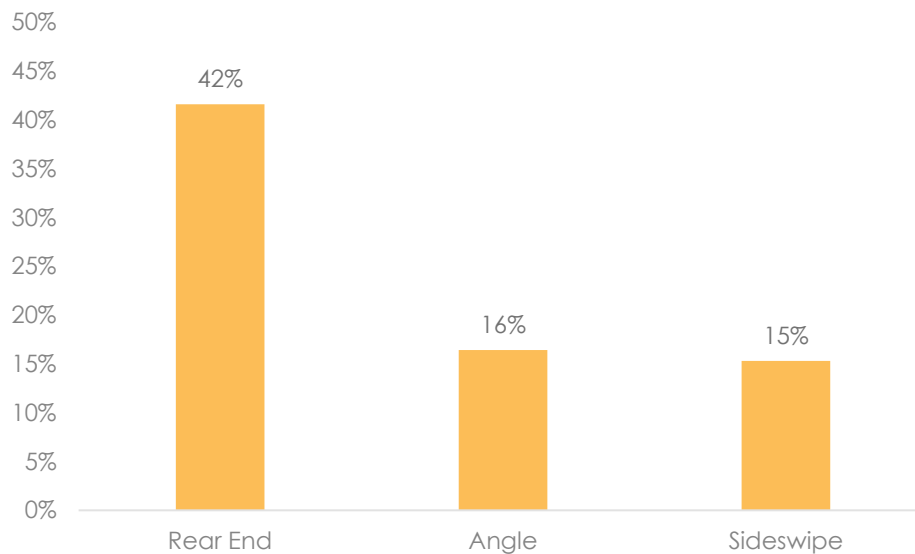
Linton Boulevard, spanning from A1A to South Jog Road over a length of 5.2 miles, serves as an urban major arterial roadway. The roadway accommodates 4 to 6 lanes within a 120-foot right of way, with posted speed limits ranging from 40 to 45 MPH. It experiences an annual average daily traffic (AADT) between 14,400 and 45,000, as reported by FDOT in 2024. The roadway is a major east/west corridor for the county and also connects to I-95.

Linton Boulevard Crash Heat Map



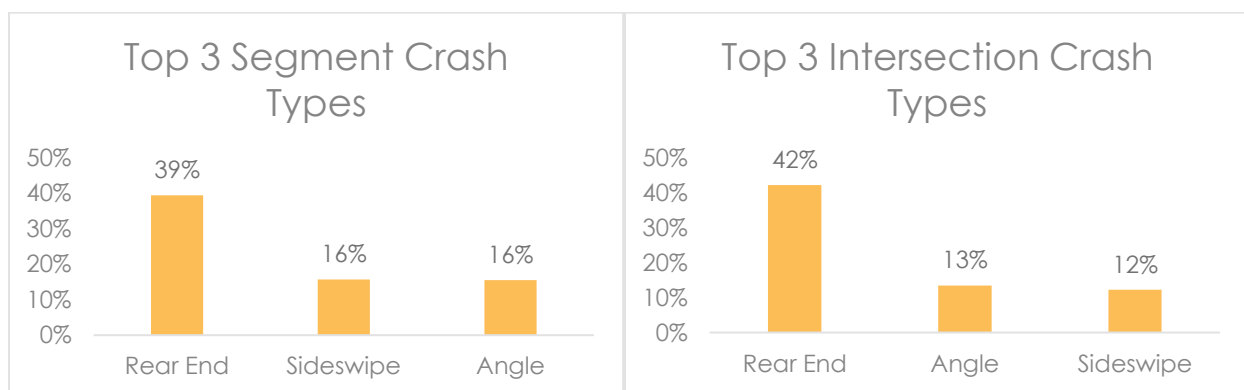
Linton Boulevard experienced a total of 2,555 crashes over the study period. There was a total of 83 FSI, including 7 fatalities. Of the five priority corridors, Linton Boulevard had the most FSI between 2019-2023. Of the 2,555 crashes, 81 were involving vulnerable road users. The most common crash types for all modes were 1) rear end, 2) angle, and 3) sideswipe.

Top 3 Crash Types (All Crashes)



In segments, rear end crashes account for 39%, sideswipe crashes for 16%, and angle crashes for 16%. At intersections, rear end crashes constitute 42%, angle crashes 13%, and sideswipe crashes 12%. For both crash locations, the same three crash types remain the most common.

Midblock Crash Types vs Segment Crash Types



Countermeasures Identified for Corridor

Intersections:

- Leading Pedestrian Intervals for bicyclist and pedestrian safety (CMF: 0.41).
- Update signal timing with protected left-turn phasing to prevent left entering crashes (CMF: 0.45).
- Backplates with retroreflective borders to increase signal visibility (CMF: 0.85).

Segments:

- Directional Median Conversions to restrict vehicle turning movements at specific locations (CMF: 0.43)

Short-term Project Costs

Countermeasure	Cost
Leading Pedestrian Interval (12)	\$31,000
Backplates for Signals (12)	\$124,000
Protected Left Turn Phase (9)	\$366,000
Directional Median Conversion (10)	\$438,000
Total Costs	\$959,000

Standalone and Longterm Projects

- Hardened Centerlines at 9 intersections to reduce risk for pedestrians and cyclists within the crosswalk.
- Separated Bike Lane for the length of the corridor to reduce cyclist and vehicle conflict.

Standalone and Longterm Project Costs

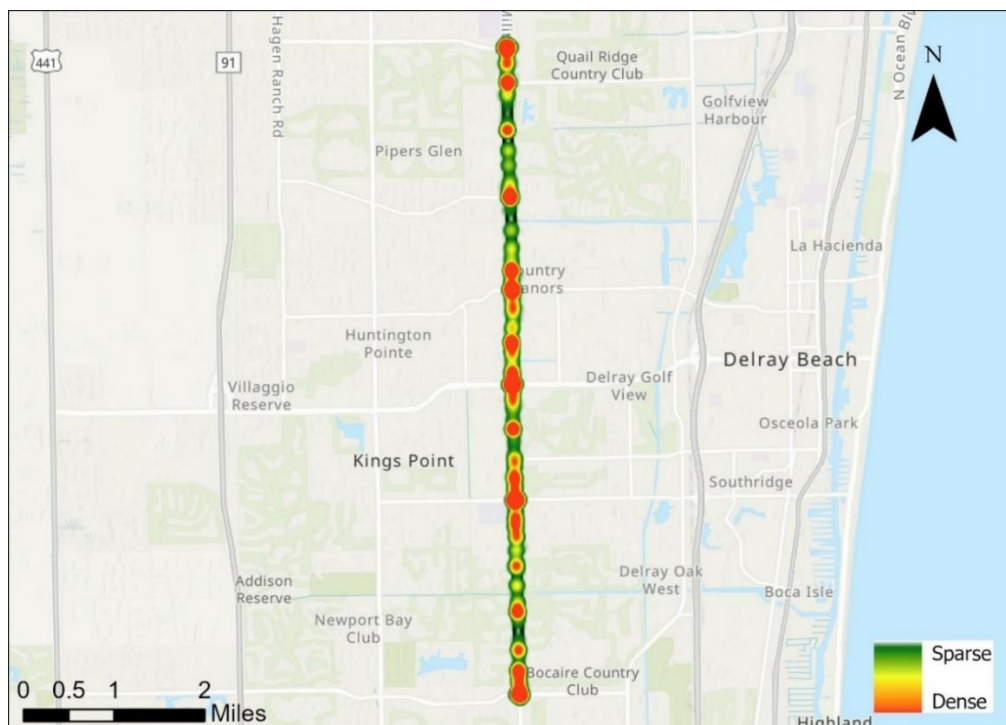
Countermeasure	Cost
Hardened Centerlines (9)	\$1,285,000
Separated Bike Lane	\$28,559,000
Total Costs	\$29,844,000

South Military Trail



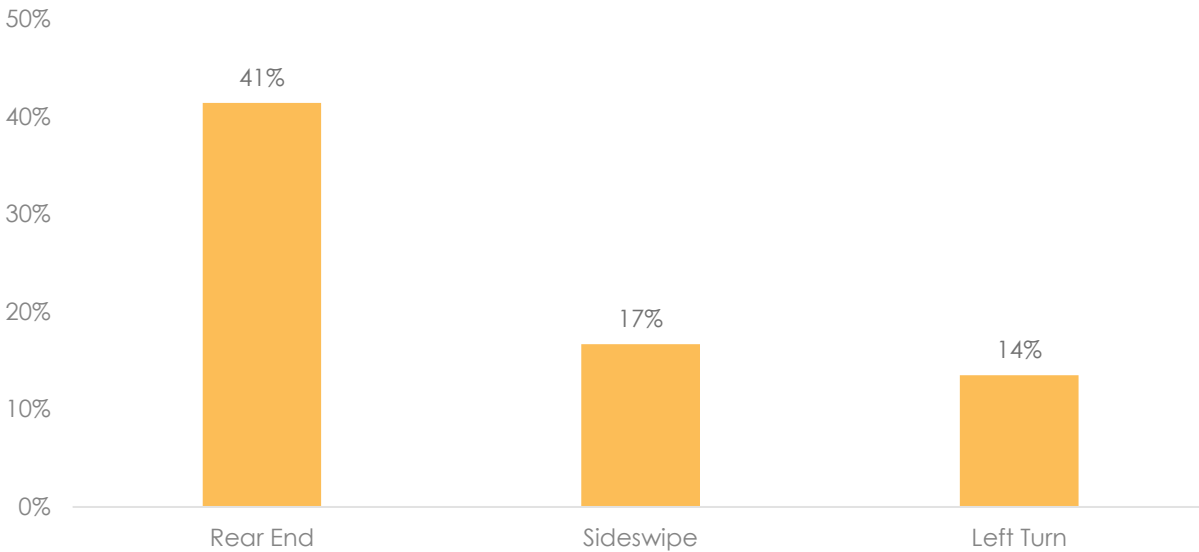
South Military Trail, spanning from Clint Moore Road to Woolbright Road over 7.2 miles, serves as an urban principal arterial roadway. The roadway features 6 lanes within a 120-foot right of way, with a posted speed limit of 45 MPH. According to FDOT in 2024, it experiences an annual average daily traffic (AADT) between 37,500 and 40,500.

South Military Trail Crash Heat Map



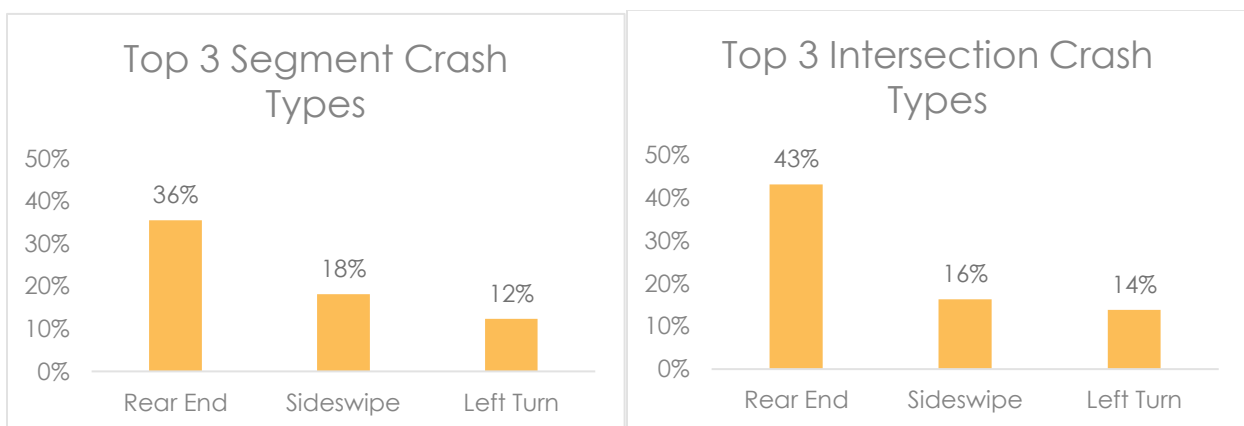
South Military Trail had a total of 2,302 crashes with 75 FSI, including 7 fatalities, over the 5-year study period of 2019-2023. 61 crashes of the 2,302 involved vulnerable road users, with the rest being vehicle crashes.

Top 3 Crash Types (All Crashes)



For segments, rear end crashes account for 36%, sideswipe crashes for 18%, and left turn crashes for 12%. At intersections, rear end crashes make up 43%, sideswipe crashes 16%, and left turn crashes 14%.

Midblock Crash Types vs Segment Crash Types



Countermeasures Identified for Corridor

Intersections:

- Leading Pedestrian Intervals for pedestrian and bicyclist safety (CMF: 0.41).
- Update signal timing with protected left-turn phasing to reduce left entering crashes (CMF: 0.45).
- Backplates with retroreflective borders to increase signal visibility (CMF: 0.85).

Segments:

- Directional Median Conversions to restrict vehicle turning movements at specific locations (CMF: 0.43)

Short-Term Project Costs

Countermeasure	Cost
Leading Pedestrian Interval (19)	\$48,000
Backplates for Signals (19)	\$197,000
Protected Left Turn Phase (14)	\$569,000
Directional Median Conversion (15)	\$657,000
Total Costs	\$1,471,000

Standalone and Longterm Projects

- Hardened Centerlines at 18 intersections to reduce risk for pedestrians and cyclists within the crosswalk.
- Separated Bike Lane for the length of the corridor to reduce cyclist and vehicle conflict.

Standalone and Longterm Project Costs

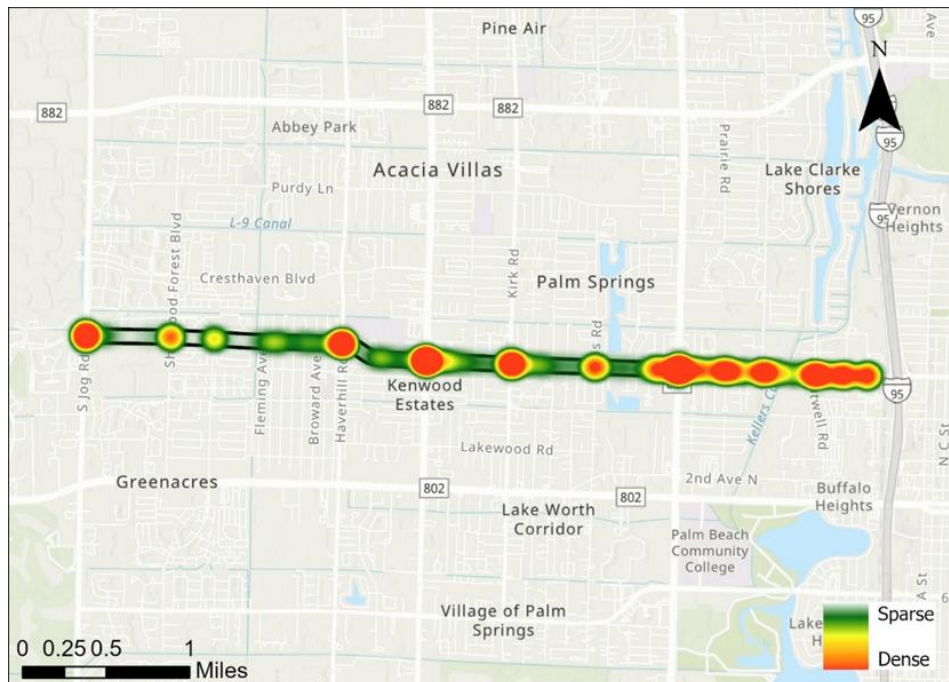
Countermeasure	Cost
Hardened Centerlines (18)	\$2,570,000
Separated Bike Lane	\$39,543,000
Total Costs	\$42,113,000

10th Avenue North



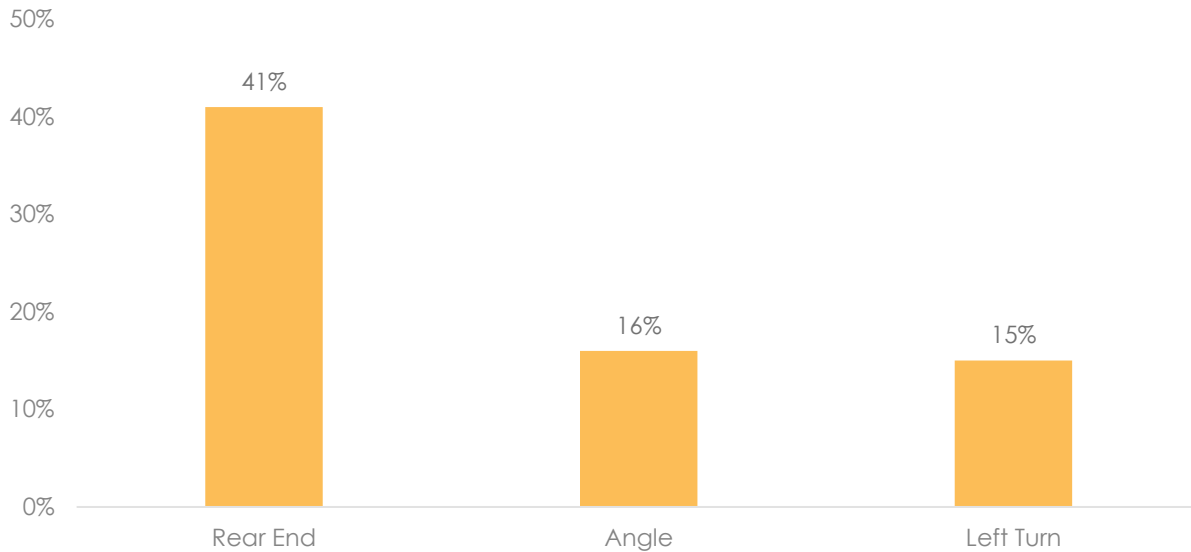
10th Avenue North, extending from Barnett Drive to South Jog Road over a length of 4.7 miles, functions as an urban major arterial roadway. This roadway consists of 4 to 5 lanes within an 80 to 120-foot right of way, with a posted speed limit of 40 MPH. According to FDOT in 2024, the annual average daily traffic (AADT) for this stretch ranges from 12,400 to 34,000. This portion of 10th Avenue North passes through 3 school zones and features a connection to I-95.

10th Avenue North Crash Heat Map



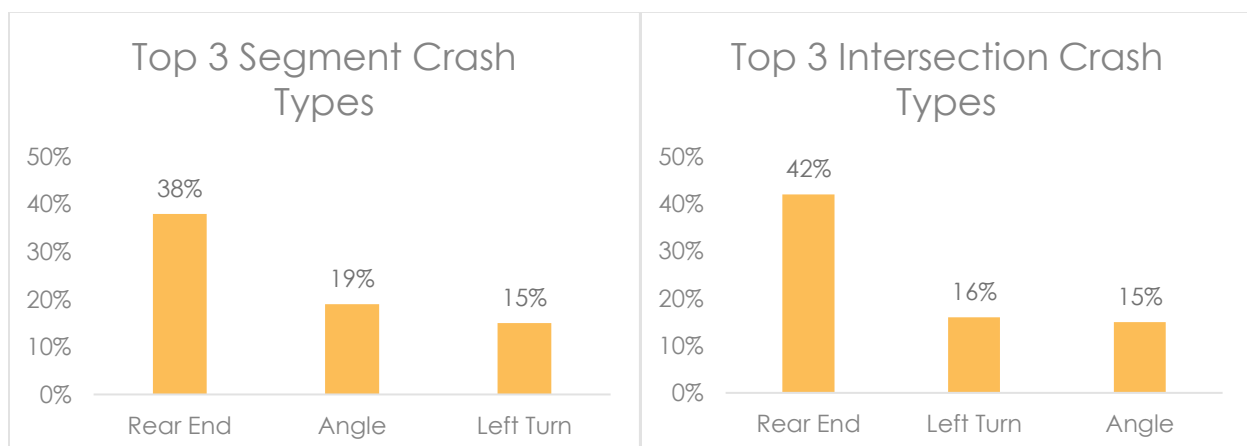
10th Avenue North experienced a total of 2,922 crashes with 67 FSI, including 18 fatalities. 10th Avenue North was the shortest corridor in length, but it experienced the most fatalities of the top 5. Of the full 2,922 crashes, 130 were vulnerable road users.

Top 3 Crash Types (All Crashes)



For segments, rear end crashes account for 38%, angle crashes for 19%, and left turn crashes for 15%. At intersections, rear end crashes make up 42%, left turn crashes 16%, and angle crashes 15%.

Midblock Crash Types vs Segment Crash Types



Countermeasures Identified for Corridor

Intersections:

- High Visibility Crosswalk for pedestrian and bicyclist safety (CMF: 0.60).
- Leading Pedestrian Interval for pedestrian safety (CMF: 0.41).
- Update signal timing with protected left-turn phasing to reduce left entering crashes (CMF: 0.45).
- Backplates with retroreflective borders to increase signal visibility (CMF: 0.85).

Segments:

- Directional Median Conversions to restrict vehicle turning movements at specific locations (CMF: 0.43).
- Full Traffic Signal to reduce vulnerable road user risks at unsignalized midblock location (CMF: 0.50).

Short-Term Project Costs

Countermeasure	Cost
High Visibility Crosswalk	\$56,000
LPI (12)	\$31,000
Backplates for Signals (12)	\$124,000
Directional Median Conversion (15)	\$657,000
Full Signal (1)	\$110,000
Signal Timing PLT (10)	\$407,000
Total Costs	\$1,384,000

Standalone and Longterm Projects

- Hardened Centerlines at 4 intersections to reduce risk for pedestrians and cyclists within the crosswalk.
- Installation and construction of new lighting infrastructure for the length of the corridor to reduce frequency of nighttime crashes.

Standalone and Longterm Project Costs

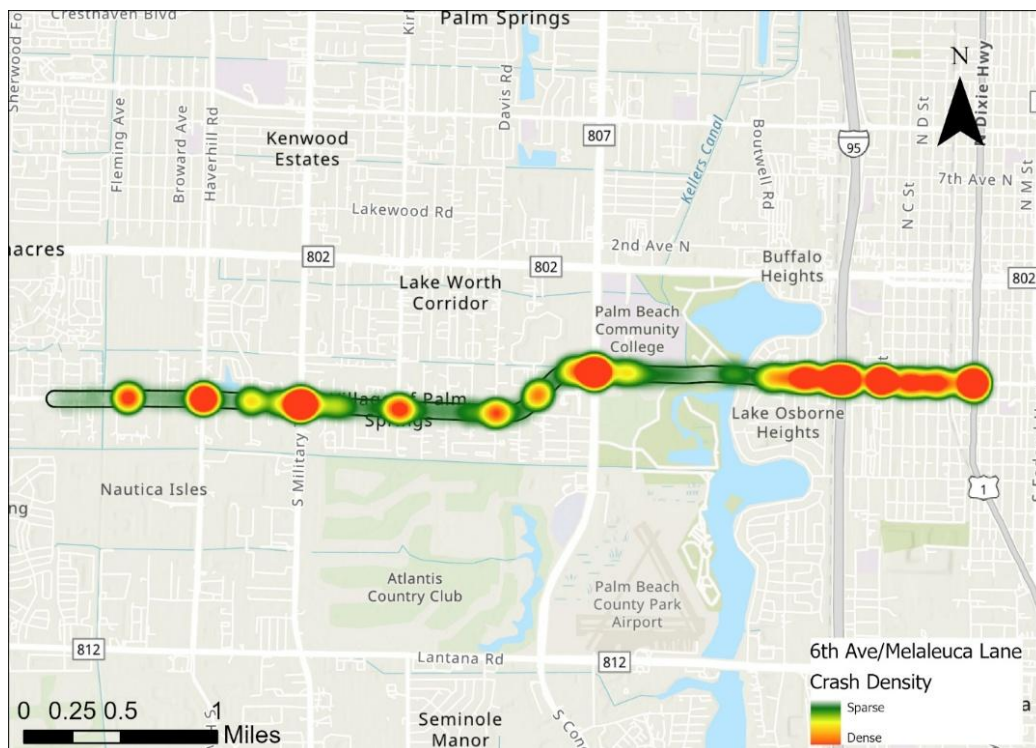
Countermeasure	Cost
Hardened Centerlines (4)	\$571,000
Lighting	\$12,365,000
Total Costs	\$12,936,000

6th Avenue/ Melaleuca Lane



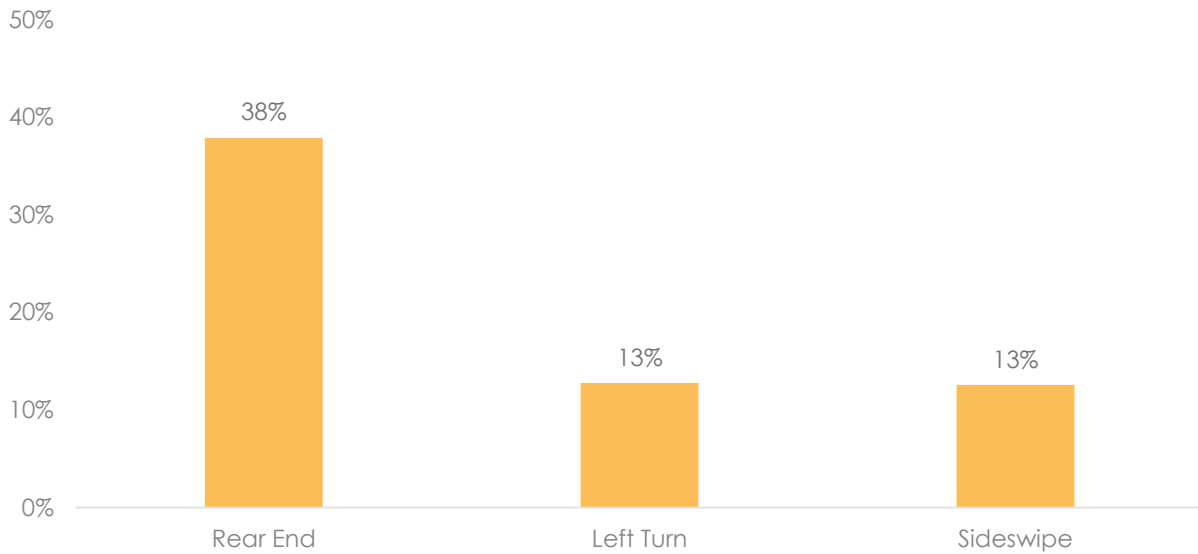
6th Ave/Melaleuca Lane, spanning from US 1 to Pine Hov Circle over 4.8 miles, serves as an urban major arterial roadway. The road features 4 to 5 lanes within an 80 to 110-foot right of way, with posted speed limits ranging from 35 to 45 MPH. According to FDOT in 2024, the annual average daily traffic (AADT) for this section is between 12,400 and 34,000. The road features a connection to I-95 and serves as a major route for east/west travel for the County.

6th Avenue/Melaleuca Lane Crash Heat Map



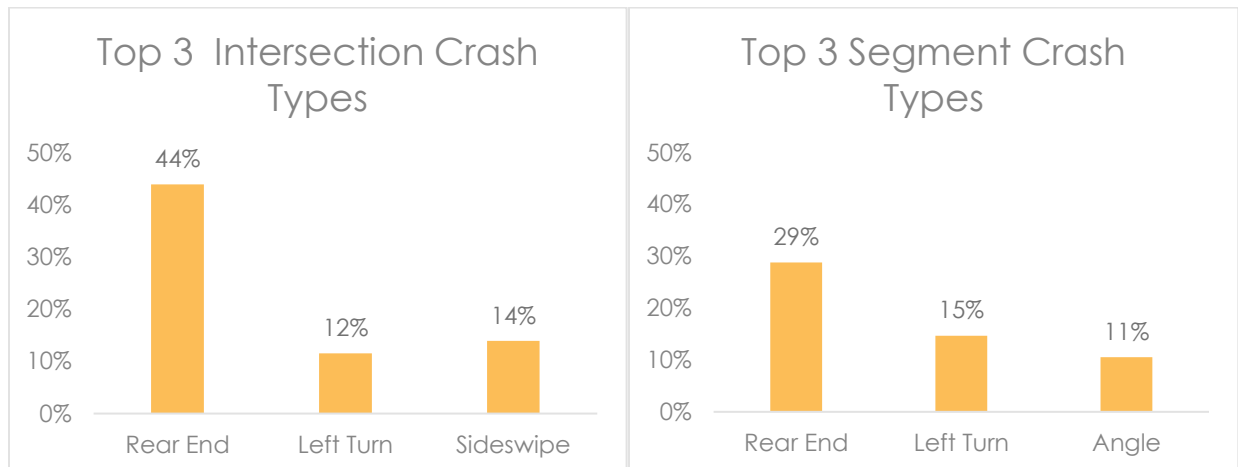
6th Ave/Melaleuca Lane experienced a total of 2,066 crashes over the study period, with 62 FSIs and 12 fatalities. Of the 2,066 crashes, 113 were vulnerable road users.

Top 3 Crash Types (All Crashes)



At intersections, rear end crashes account for 44%, left turn crashes for 12%, and sideswipe crashes for 14%. For segments, rear end crashes make up 29%, left turn crashes 15%, and angle crashes 11%.

Midblock Crash Types vs Segment Crash Types



Countermeasures Identified for Corridor

Intersections:

- High Visibility Crosswalk for pedestrian safety (CMF: 0.60).
- Leading Pedestrian Interval for pedestrian and bicyclist safety (CMF: 0.41).
- Backplates with retroreflective borders to increase signal visibility (CMF: 0.85).
- Update signal timing with protected left-turn phasing to reduce left entering crashes (CMF: 0.45).

Segments:

- Directional Median Conversions to restrict vehicle turning movements at specific locations (CMF: 0.43)

Short-Term Project Costs

Countermeasure	Cost
Leading Pedestrian Interval (7)	\$18,000
Backplates for Signals (7)	\$72,000
Protected Left Turn Phase (5)	\$203,000
High Visibility Crosswalk (7)	\$395,000
Directional Median Conversion (13)	\$569,000
Total Costs	\$1,258,000

Standalone and Longterm Projects

- Hardened Centerlines at 1 intersection to reduce risk for pedestrians and cyclists within the crosswalk.
- Installation and construction of new lighting infrastructure for the length of the corridor to reduce frequency of nighttime crashes.
- Separated Bike Lane for the length of the corridor to reduce cyclist and vehicle conflict.

Standalone and Longterm Project Costs

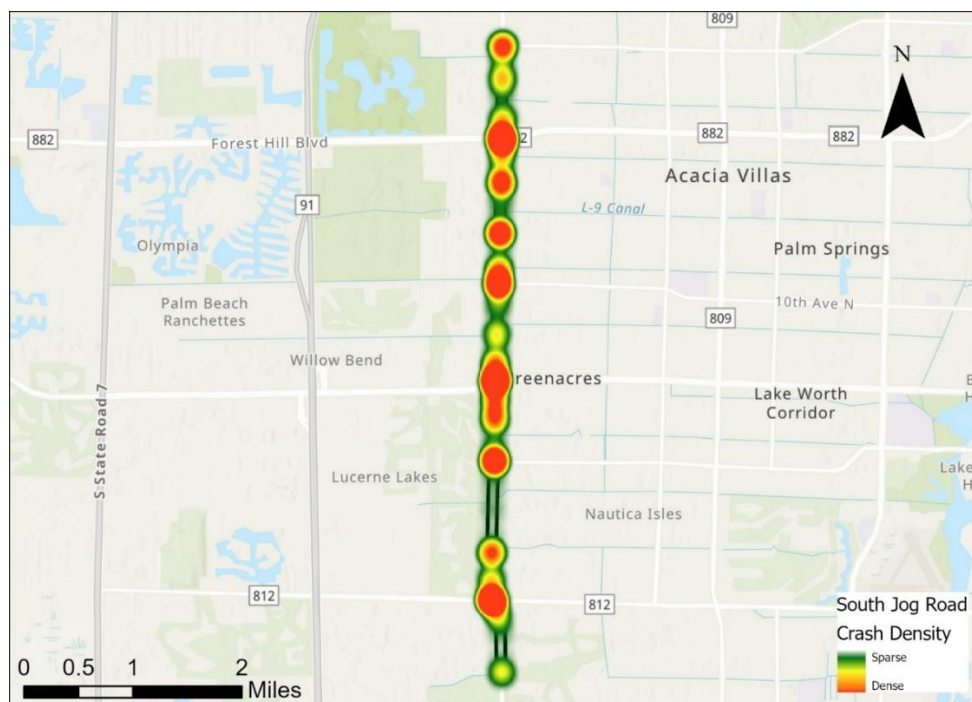
Countermeasure	Cost
Hardened Centerlines (1)	\$143,000
Lighting	\$6,314,000
Separated Bike Lane	\$26,362,000
Total Costs	\$32,819,000

South Jog Road



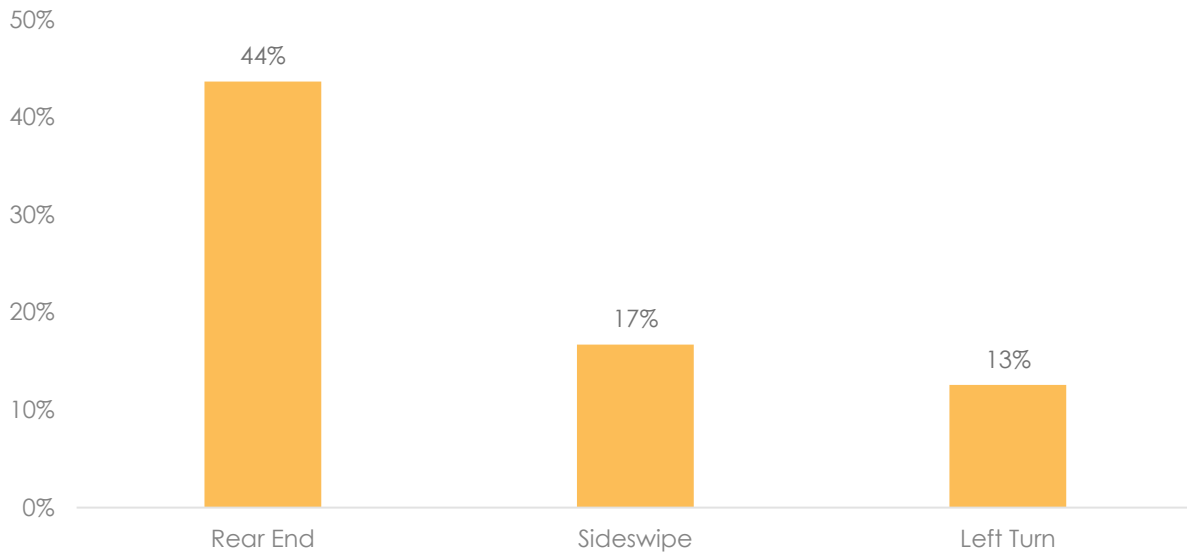
South Jog Road, extending from Winston Trails Boulevard to Summit Boulevard over a distance of 5.7 miles, serves as an urban principal arterial roadway. The road features 6 lanes within a 120-foot right of way, with a posted speed limit of 45 MPH. According to FDOT in 2024, the annual average daily traffic (AADT) for this segment ranges from 39,000 to 55,000. This corridor experiences the highest average AADT for all of the priority corridors.

South Jog Road Crash Heat Map



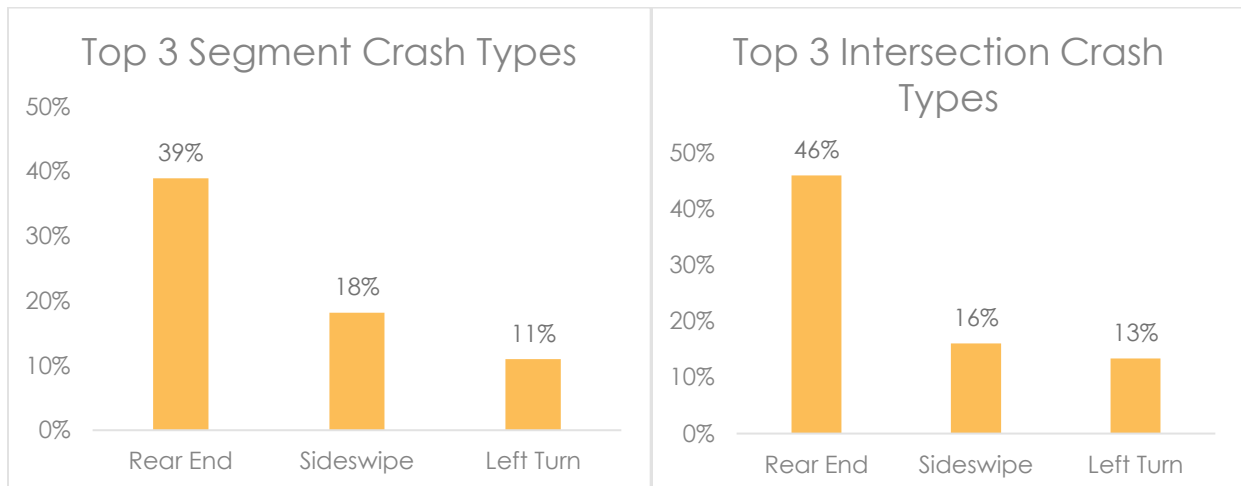
South Jog Road experienced a total of 3,133 crashes over the study period, with 60 FSIs and 10 fatalities. Of the 3,133 crashes, 124 were vulnerable road users.

Top 3 Crash Types (All Crashes)



For segments, rear end crashes account for 39%, sideswipe crashes for 18%, and left turn crashes for 11%. At intersections, rear end crashes make up 46%, sideswipe crashes 16%, and left turn crashes 13%.

Midblock Crash Types vs Segment Crash Types



Countermeasures Identified for Corridor

Intersections:

- High Visibility Crosswalk for bicycle safety (CMF: 0.60).
- Leading Pedestrian Interval for pedestrian safety (CMF: 0.41).
- Backplates with retroreflective borders to increase signal visibility (CMF: 0.85).
- Update signal timing with protected left-turn phasing to reduce left entering crashes (CMF: 0.45).

Segments:

- Full Traffic Signal to reduce vulnerable road user risks at unsignalized midblock location (CMF: 0.50).
- Directional Median Conversions to restrict vehicle turning movements at specific locations (CMF: 0.43)

Short-Term Project Costs

Countermeasure	Cost
Update Signal Timing with Protected Left Turn (5)	\$203,000
High Visibility Crosswalk (1)	\$56,000
Leading Pedestrian Interval (7)	\$18,000
Backplates with Borders (7)	\$72,000
Full Signal (1)	\$110,000
Directional Median Conversion (11)	\$481,000
Total Costs	\$941,000

Standalone and Longterm Projects

- Hardened Centerlines at 13 intersections to reduce risk for pedestrians and cyclists within the crosswalk.
- Separated Bike Lane for the length of the corridor to reduce cyclist and vehicle conflict.

Standalone and Longterm Project Costs

Countermeasure	Cost
Hardened Centerlines (13)	\$1,856,000
Separated Bike Lane	\$31,854,000
Total Costs	\$33,711,000

APPENDIX C: BENEFIT-TO-COST ANALYSIS RESULTS

Corridor	Length (mi)	CM	Individual CM cost	Quartile Cost Score	CMF Score	CMF Score to Matrix	Cost Benefit Score	Cumulative Cost	Averaged CBS
Linton	5.2	LPI (12)	\$ 30,505.0	1.00	0.41	4.00	4.00	\$ 958,572	1.63
		Backplates for Signals (12)	\$ 124,272.0	2.00	0.85	1.00	0.50		
		Signal Timing PLT (9)	\$ 366,071.0	3.00	0.45	3.00	1.00		
		Directional Median Conversion (10)	\$ 437,724.1	4.00	0.43	4.00	1.00		
Military	7.2	LPI (19)	\$ 48,301.0	1.00	0.41	4.00	4.00	\$ 1,471,095	1.52
		Signal Timing PLT (14)	\$ 569,443.8	4.00	0.45	3.00	0.75		
		Backplates for Signals (19)	\$ 196,764.0	3.00	0.85	1.00	0.33		
		Directional Median Conversion (15)	\$ 656,586.2	4.00	0.43	4.00	1.00		
10th Ave	4.7	High Visibility Crosswalk	\$ 56,444.2	1.00	0.60	2.00	2.00	\$ 1,384,254	1.67
		Full Signal (1)	\$ 109,700.00	2.00	0.50	3.00	1.50		
		LPI (12)	\$ 30,505.9	1.00	0.41	4.00	4.00		
		Backplates for Signals (12)	\$ 124,272.0	2.00	0.85	1.00	0.50		
		Directional Median Conversion (15)	\$ 656,586.2	4.00	0.43	4.00	1.00		
		Signal Timing PLT (10)	\$ 406,745.6	3.00	0.45	3.00	1.00		
6th/Melaleuca	4.8	LPI (7)	\$ 17,795.1	1.00	0.41	4.00	4.00	\$ 1,257,810	1.43
		High Visibility Crosswalk (7)	\$ 395,109.1	3.00	0.60	2.00	0.67		
		Directional Median Conversion (13)	\$ 569,041.3	4.00	0.43	4.00	1.00		
		Signal Timing PLT (5)	\$ 203,372.8	3.00	0.45	3.00	1.00		
		Backplates for Signals (7)	\$ 72,492.0	2.00	0.85	1.00	0.50		
Jog	5.8	High Visibility Crosswalk (1)	\$ 56,444.2	1.00	0.60	2.00	2.00	\$ 941,301	1.67
		LPI (7)	\$ 17,795.1	1.00	0.41	4.00	4.00		
		Full Signal (1)	\$ 109,700.00	2.00	0.50	3.00	1.50		
		Directional Median Conversion (11)	\$ 481,496.5	4.00	0.43	4.00	1.00		
		Signal Timing PLT (5)	\$ 203,372.8	3.00	0.45	3.00	1.00		
		Backplates for Signals (7)	\$ 72,492.0	2.00	0.85	1.00	0.50		

APPENDIX D: TOP 5 PRIORITY CORRIDOR PRIORITIZATION RESULTS

Category Weight	Subcategory	Evaluation Metric	Points	Linton Blvd	Military Trail	10th Ave	6th/Melaleuca	Jog Rd
50%	Vehicle Safety	Number of Vehicle FSI						
		less than 33	1					1
		33 to 36	2			2		2
		37 to 60	3			3		
	61 or more	4	4					
	Vulnerable Road User Safety	Number of Vulnerable Road User FSI						
		less than 19	1		1			
		19 to 23	2	2				
24 to 31		3			3		3	
32 or more	4					4		
30%	Parks	Number of Parks within 1/4 mile of Corridor	1-4 score based on total sum range	22	67	54	65	45
	Schools	Number of Schools within 1/4 mile of Corridor						
	Transit	Number of Public Transit Stops within 200 ft of Corridor						
	Equity	Number of Areas of Persistent Poverty Corridor Passes Through						
	Places of Worship	Number of Places of Worship within 1/4 mile of Corridor		1	4	3	3	2
20%	Planning level Benefit-to-cost ratio	equal to or less than 1.52	1		1		1	
		1.53 to 1.625	2					
		1.63 to 1.66	3	3				
		greater than 1.66	4			4		4
Total Points				9.00	9.00	11.00	11.00	9.00
Weighted Prioritization Scores				3.90	3.40	4.20	3.60	3.90

APPENDIX E: SYSTEMIC SAFETY RECOMMENDATIONS COUNTERMEASURE TABLES

Motor Vehicle Systemic Safety Recommendations



Segment Systemic Countermeasures





Leading Crash Type 1: Fixed Object/Run-off-the-road (30%)

Crashes: 1,047 fatal/serious injury (FSI) crashes

Contributing Causes: Operated carelessly, Ran-off-the-road

Fixed Object/Run-off-the-Road Crash Systemic Countermeasures

Area Type	Recommendation	Image	Cost	CMF
Urban	Speeding enforcement		N/A	N/A
	Improve sign/markings retroreflectivity/visibility		N/A	CMF range 0.717 – 0.852 (Note CMF for rural roads)

Area Type	Recommendation	Image	Cost	CMF
	Improve pavement friction		\$40-60 per sq. yard (FDOT)	CMF range 0.22 – 1.66
Rural	Install rumble strips/audible pavement markings		\$1,615,000 per mile (FDOT)	CMF range 0.31 – 1.08
	Remove/relocate/shield hazards within clear zone		N/A	CMF range 0.20 – 0.62
	Install lighting		\$10,600 per light pole (35 feet mounting height, FDOT)	CMF range 0.79 – 0.88

Leading Crash Type 2: Rear end (20%)

Crashes: 1,047 FSI crashes

Contributing Causes: Operated carelessly

Rear End Crash Countermeasures

Area Type	Recommendation	Image	Cost	CMF
Urban	Improve signal timing and coordination (reduce stop and go conditions)		\$2,500 per signal (FDOT)	CMF range 0.20 – 1.04
Urban	Install Next Signal signs		\$2,900 per sign (FDOT)	CMF: 0.897
Rural	Install warning signs (e.g., hidden driveways, signal ahead)		\$550 per sign (FDOT)	N/A

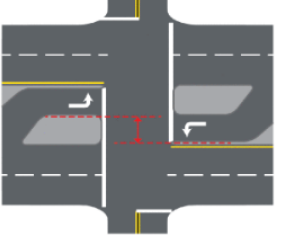
Signalized Intersection Systemic Countermeasures

Leading Crash Type 1: Left turn (40%)

Crashes: 973 FSI crashes

Contributing Causes: Failed to yield ROW, Ran red light

Left Turn Crash Countermeasures


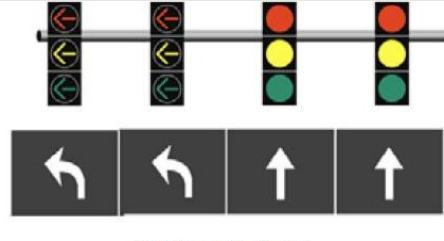
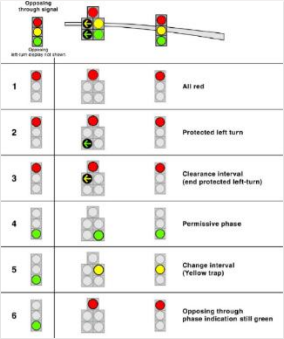
Recommendation	Image	Cost	CMF
Provide a positive offset of left turn lanes		N/A	CMF range 0.74 – 0.80
Remove sight line obstructions at left turn lanes		\$2,100 (remove/relocate a tree, FDOT)	N/A
Install left turn lanes		N/A	CMF range 0.81 – 1.25
Implement flashing yellow arrow (FYA)		\$2,400 per signal head (FDOT)	CMF range 0.598 – 0.85

Leading Crash Type 2: Angle (22%)

Crashes – 973 FSI crashes

Contributing Causes: Ran red light, Operated in careless manner

Angle Crash Countermeasures

Recommendation	Image	Cost	CMF
Add (flexible) backplates with retroreflective border		\$950 per signal (FDOT)	CMF range 0.80 – 0.85
Provide one signal head per lane		\$2,000 per signal head (FDOT)	0.54
Improve All Red interval		N/A	CMF range 0.96 – 1.12

Motorcycle Systemic Safety Recommendations




Segments Systemic Countermeasures

Leading Crash Type 1: Fixed Object/Run-off-the-Road (31%)

Crashes: 313 FSI crashes

Contributing Causes: Operated in careless manner

Fixed Object/Run-off-the-Road Crash Countermeasures

Recommendation	Image	Cost	CMF
Roadway maintenance (e.g. remove debris and repair potholes)		N/A	N/A
Speeding enforcement		N/A	N/A
Safety awareness campaigns (e.g., wear helmets)		N/A	N/A


Motorcycle Segments Systemic Countermeasures

Leading Crash Type 2: Left Turn

Crashes: 313 FSI crashes

Contributing Causes: Failed to yield ROW

Left Turn Crash Countermeasures

Recommendation	Image	Cost	CMF
Improve sight distance at left turn lanes		\$2,100 (remove/relocate a tree, source: FDOT)	N/A


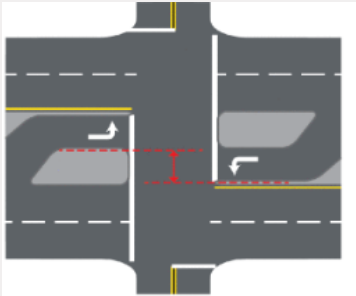

Signalized Intersection Systemic Countermeasures

Leading Crash Type 1: Left Turn (30%)

Crashes: 146 FSI crashes

Contributing Causes: Failed to yield ROW, Ran red right

Left Turn Crash Countermeasures


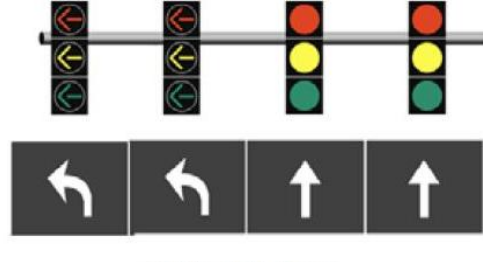

Recommendation	Image	Cost	CMF
Confirm motorcycle detection by signal		N/A	N/A
Provide positive offset of turn lanes or improve sight lines		N/A	CMF range 0.74 – 0.8
Safety awareness campaigns (e.g., defensive driving techniques, wear bright gear)		N/A	N/A

Leading Crash Type 2: Angle (25%)

Crashes: 146 FSI crashes

Contributing Causes: Operated in careless manner, Ran red right

Angle Crash Countermeasures

Recommendation	Image	Cost	CMF
Confirm motorcycle detection by signal		N/A	N/A
Provide one signal head per lane		\$2,000 per signal head (FDOT)	0.54
Speeding enforcement		N/A	N/A

Pedestrian Systemic Safety Recommendations



Segment Systemic Countermeasures




Vehicle Movement Type 1: Straight (84%)

Crashes: 281 FSI crashes

Contributing Causes: Failed to yield ROW, Dart/dash

Straight Crash Countermeasures

Recommendation	Image	Cost	CMF
Install Pedestrian (W11-2) warning signs		\$550 per sign (FDOT)	N/A
Safety awareness campaigns (e.g., encourage pedestrians to wear bright clothing during nighttime)		N/A	N/A


Recommendation	Image	Cost	CMF
Relocate bus stops closer to intersections / crosswalks		N/A	N/A
Install speed feedback signs to slowdown motorists		\$5,000-8,000 (web search, various sources)	CMF range 0.78 – 0.95
Improve lighting/remove obstructions to lighting such as trimming overgrown trees		N/A	N/A

Vehicle Movement Type 2: Turning left (3%)

Crashes: 281 FSI crashes

Contributing Causes: Failed to yield ROW

Turning Left Crash Countermeasures



Recommendation	Image	Cost	CMF
Remove sight line obstructions at left turn lanes		\$2,100 (remove/relocate a tree, source: FDOT)	N/A

Vehicle Movement Type 3: Turning right (1%)

Crashes: 281 FSI crashes

Contributing Causes: No improper action

Turning Right Crash Countermeasures

Recommendation	Image	Cost	CMF
Remove sight line obstructions at right turn lanes		\$2,100 (remove/relocate a tree, source: FDOT)	N/A
Install special emphases crosswalk markings at driveways/minor roads		\$23.75 per LF (FDOT)	CMF range 0.6 – 0.81


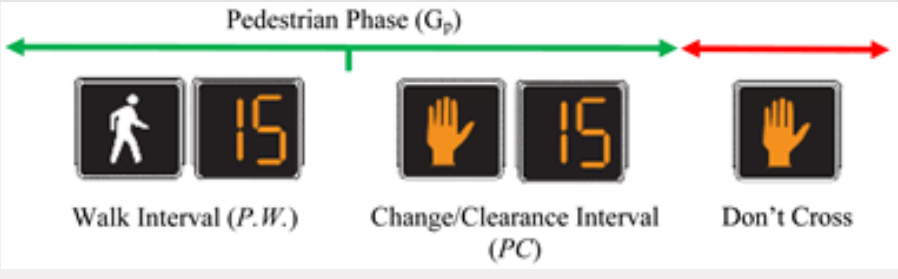
Signalized Intersection Systemic Countermeasures




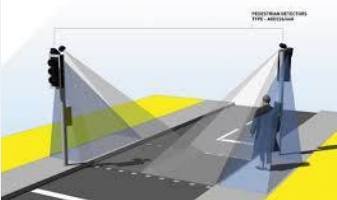
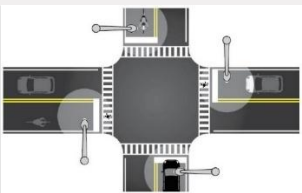
Vehicle Movement Type 1: Straight (73%)

Crashes: 177 FSI crashes

Contributing Causes: Dart/dash, Failed to yield ROW

Straight Crash Countermeasures

Recommendation	Image	Cost	CMF
Install special emphasis crosswalk markings		\$23.75 per LF/ \$7,410 per intersection (FDOT)	CMF range 0.6 – 0.81
Review pedestrian clearance interval		N/A	N/A



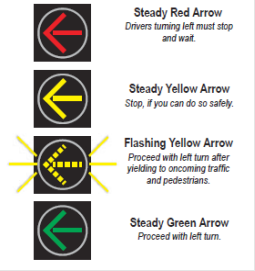
Recommendation	Image	Cost	CMF
Install countdown pedestrian signals		\$1,350 per unit	CMF range 0.51 – 1.13
Reduce delays by prioritizing pedestrian signal actuations		NA	N/A
Install audible push buttons		\$2,550 per unit (FDOT)	N/A
Install passive detection of pedestrians		\$11,700 unit (FDOT)	N/A
Improve intersection lighting		\$10,600 per light (35 feet mounting height, source: FDOT)	CMF range 0.79 – 0.88

Vehicle Movement Type 2: Turning left (7%)

Crashes: 177 FSI crashes

Contributing Causes: No improper action

Turning Left Crash Countermeasures

Recommendation	Image	Cost	CMF
Install Turning Vehicles Stop for Pedestrian (R10-15a) signs		\$550 per sign (FDOT)	N/A
Install hardened centerline		N/A	N/A
Implement flashing yellow arrow (FYA) with left-turn omit for pedestrians		\$2,400 per signal head (FDOT)	CMF range 0.598 – 0.85

Vehicle Movement Type 3: Turning right (9%)

Crashes: 177 FSI crashes

Contributing Causes: No improper action

Turning Right Crash Countermeasures

Recommendation	Image	Cost	CMF
Install Turning Vehicles Stop for Pedestrian (R10-15a) signs		\$550 per sign (FDOT)	N/A
Tighten curb radius		\$15,000 – \$40,000 per corner (source: PEDSAFE)	N/A
Implement leading pedestrian interval (LPI)		\$2,500 per signal (FDOT)	CMF range 0.49 – 1.05
Remove sight line obstructions for turning vehicles		\$2,100 (to remove/relocate a tree, source: FDOT)	N/A

Bicycle Systemic Safety Recommendations


Segment Systemic Countermeasures

Bicycle Facility Type 1: No bicycle lanes (54%)

Crashes: 155 FSI crashes

Vehicle Movement Types: Straight, Turning Right

No Bicycle Lanes Crash Countermeasures





Recommendation	Image	Cost	CMF
Add sharrow pavement markings with optional black background	 <p>Figure 9C-9. Shared Lane Marking</p>	\$165-\$250 each (web search, various sources)	N/A
Install BICYCLES ALLOWED USE OF FULL LANE (R9-20) sign		\$550 per sign (FDOT)	N/A
Install W11-15 Pedestrian/ Bicycle warning sign with LOOK plaque facing driveways to notify drivers to expect cyclists on sidewalk		\$600 per sign (FDOT)	N/A

Bicycle Facility Type 2: Designated bike lane (34%)

Crashes: 155 FSI crashes

Vehicle Movement Types: Straight, Turning Right

Designated Bike Lane Crash Countermeasures

Recommendation	Image	Cost	CMF
Add green markings at conflict areas		\$8.70 per square foot (FDOT)	N/A
Install BIKE LANE (R3-17) signs		\$550 per sign (FDOT)	N/A
Install BEGIN RIGHT TURN LANE YIELD TO BIKES (R4-4) signs		\$550 per sign (FDOT)	N/A
Add buffer between travel lane and bicycle lane		N/A	CMF range 0.34 – 1.69

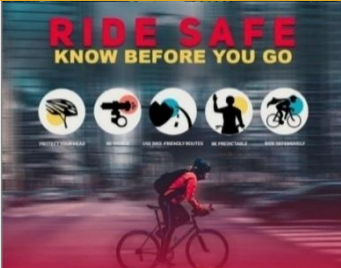


Signalized Intersection Systemic Countermeasures

Vehicle Movement Type 1: Straight (61%)

Crashes: 100 FSI crashes

Contributing Causes: Failed to obey signal, Failed to yield ROW

Straight Crash Countermeasures





Recommendation	Image	Cost	CMF
Safety awareness campaigns (e.g., stop crossing during red signal, use pedestrian signal)		N/A	N/A
Extend bicycle lane markings through intersection		N/A	N/A
Add bicycle signals and/or detection		N/A	N/A

Vehicle Movement Type 2: Turning Left/Right (35%)

Crashes: 100 FSI crashes

Contributing Causes : No improper action

Turning Left/Right Crash Countermeasures

Recommendation	Image	Cost	CMF
Add green markings at key-hole lane		N/A	N/A
Add bike boxes		N/A	N/A
Install Turning Vehicles Stop for Pedestrian / Bicycle (R10-15) signs		\$550 per sign (FDOT)	N/A
Remove sight line obstructions for turning vehicles		\$2,100 (to relocate a tree, source: FDOT)	N/A