KENTUCKIANA REGIONAL SAFETY ACTION PLAN

On the Road to Safety, Every Life Counts

Trimble County, KY

Safety Action Plan

6/25/25

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Introduction

In 2023, Trimble County, in collaboration with the Kentuckiana Regional Planning & Development Agency (KIPDA) and 15 other participating cities and counties, applied for and successfully received a Safe Streets and Roads for All (SS4A) Action Plan Grant. The SS4A Action Plan Grant is a vital component of the broader federal SS4A initiative to improve road safety across the United States. The goal of the SS4A Program is to create a safer transportation network by supporting the development and implementation of comprehensive safety plans that are data-driven and community-focused.

Trimble County is dedicated to working towards a goal of zero traffic deaths and serious injuries by 2050. Achieving this goal will require a clear focus on prioritizing safety for all road users. The Trimble County Safety Action Plan addresses the seven important SS4A Program safety components. Each component is a chapter in the Safety Action Plan.

- Leadership Commitment and Goal Setting
- Planning Structure
- Safety Analysis
- Engagement and Collaboration
- Policy and Process Changes
- Strategy and Project Selections
- Progress and Transparency

Safe System Approach

The Safe System Approach is a comprehensive approach based on the understanding that humans are fallible and make mistakes, but those mistakes should not result in fatalities or serious injuries. There are five broad impact areas for achieving this goal: **Safer People, Safer Vehicles, Safer Speeds, Safer Roads, and Post-Crash Care**. This approach significantly expands the traditional safety plan focus on roadway infrastructure. Six key principles undergird the approach.

Safe System Key Principles

Death and Serious Injuries are Unacceptable: Every human life is invaluable, and ensuring safety is the highest priority.

Humans Make Mistakes: Recognizing that human error is inevitable, we design and manage our roads to be forgiving, mitigating the potential consequences of these errors to prevent serious harm.

Humans are Vulnerable: We design the roadway system to account for the biological limits the human body can tolerate in a crash.

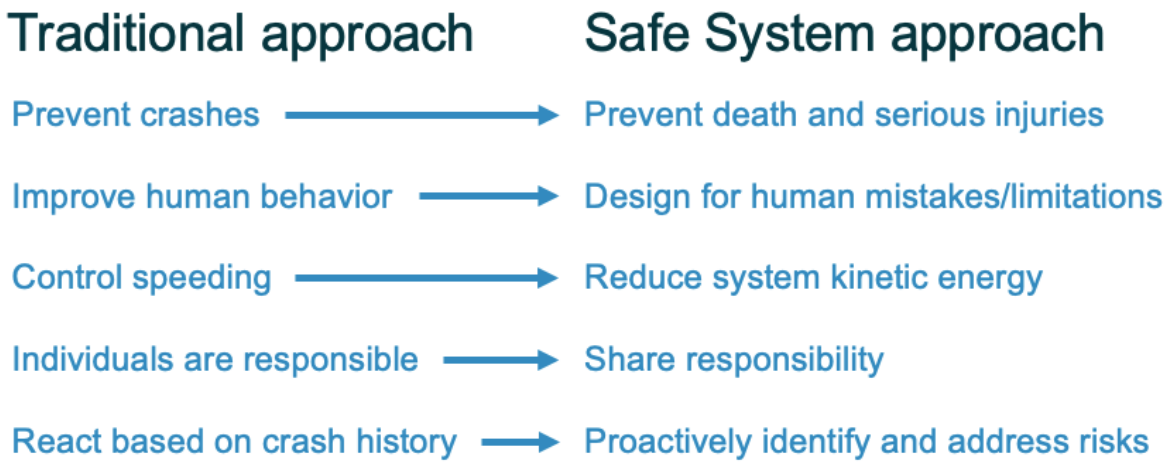
Responsibility is Shared: Preventing fatal and serious injuries is a shared responsibility. All stakeholders must work together to enhance road safety.

Safety is Proactive: Taking a proactive stance on safety means anticipating and addressing risks before they result in crashes. Being proactive involves identifying potential hazards and implementing measures to mitigate them.

Redundancy is Crucial: Embedding multiple layers of safety within the transportation system is important, so that if one layer fails, others can still protect people. This redundancy is vital for creating a resilient transportation network.

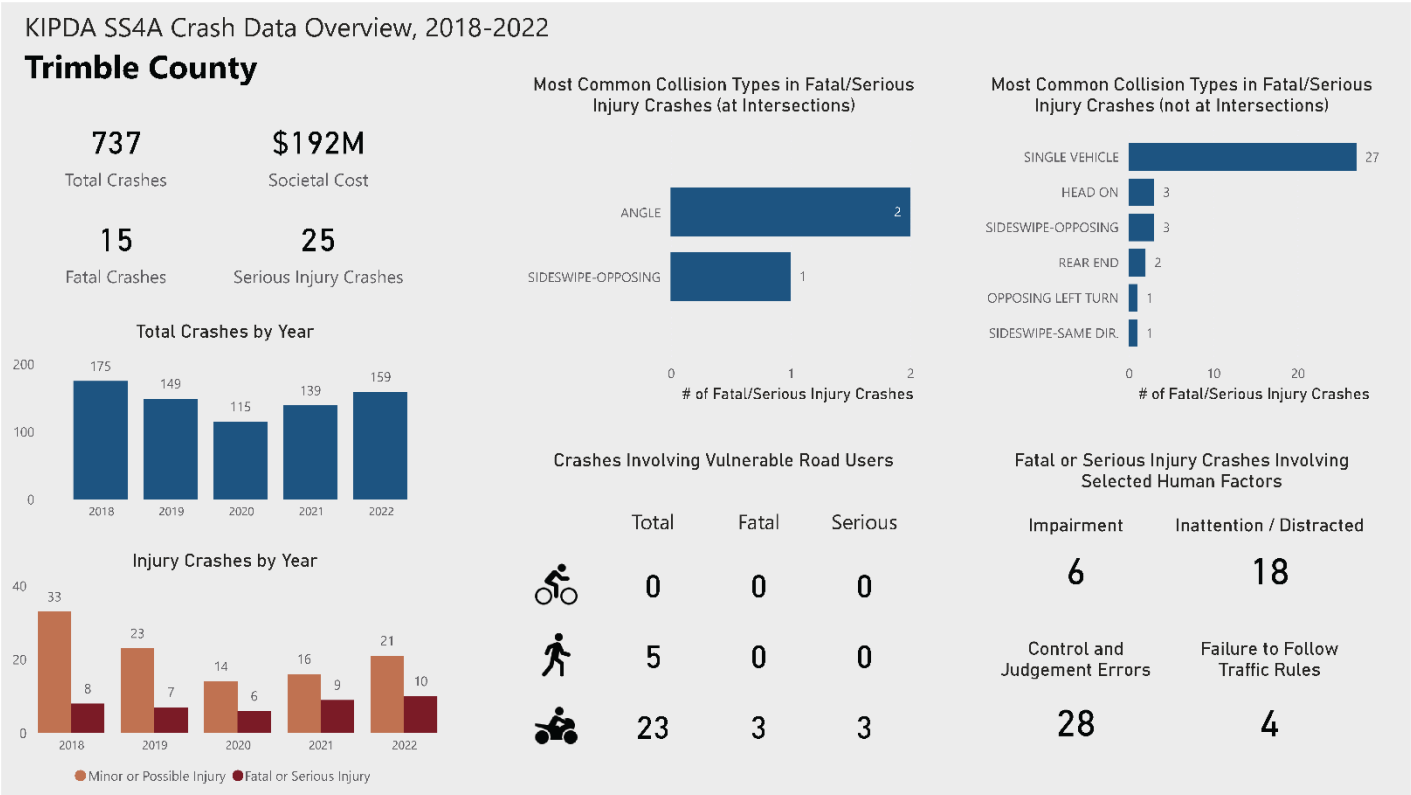
Safe System Approach vs Traditional Approach

The traditional approach to road safety often relies on perfect human behavior from all road users and tends to react to crashes *after* they occur, focusing on individual accountability. In contrast, the Safe System Approach acknowledges that humans are fallible and will inevitably make mistakes. This approach builds a system designed to minimize the severity of crashes resulting from those errors. This shift from an individual-focused model to a system-centric one highlights all stakeholders' shared responsibilities. The comparative graphic below illustrates this fundamental shift, showcasing how the Safe System Approach aims to create a safer, more forgiving transportation system.



Overview

Trimble County had 15 fatal crashes and 25 serious injury crashes during the five-year period from 2018 to 2022, for a total of 40. There were 737 total crashes during this time. The total societal cost of all crashes was $192 million (including economic and quality of life factors). The figure below provides an overview of the crash data.



Important safety findings for Trimble County include:

- Fatal and serious injury crashes are spread across the county on state and local highways
- Lower severity crashes have hot spots in Bedford and Milton
- 27 of 40 fatal / serious injury crashes were single vehicle crashes
- 0 of 40 fatal / serious injury crashes involved a pedestrian or bicyclist
- 31 of 40 fatal / serious injury crashes involved speeds of 50 mph+
- 27 of 40 fatal / serious injury crashes involved a vehicle not under proper control
- 18 of 40 fatal / serious injury crashes involved driver inattention / distraction

1. Leadership Commitment and Goal Setting

Trimble County is dedicated to ensuring safety for all users on the County's streets and highways. The County's commitment is demonstrated by the resolution on the following page, which states that its leaders have established "a goal of working towards zero traffic fatalities and serious injuries by the year 2050."

The commitment and leadership in implementing safety-focused projects, strategies, and policies are also supported by current programs and policies.

The Trimble County Comprehensive Plan was adopted in 2017 and is implemented through the coordinated efforts of the Trimble County Planning Commission, local government officials, and community stakeholders.

The Comprehensive Plan outlines strategies to enhance road safety and improve transportation infrastructure. The plan emphasizes the development of new walking and biking trails to create alternative transportation networks. The construction and repair of sidewalks in residential subdivisions and incorporated areas like Bedford and Milton are highlighted to promote pedestrian safety and improve walkability.

Maintaining existing roadways to support good condition and safety is a priority, along with identifying high-priority transportation improvements for inclusion in Kentucky's Six-Year Road Plan. The plan promotes improvements along US 421 to address safety issues and access concerns. It also calls for upgrading substandard roadways and rights-of-way during development.

RESOLUTION NO 2024-30

A RESOLUTION OF THE TRIMBLE COUNTY FISCAL COURT IN SUPPORT OF VISION ZERO

WHEREAS, the TRIMBLE COUNTY FISCAL COURT is utilizing a planning grant through the Safe Streets and Roads for All Program (SS4A) and coordinating with the Kentuckiana Regional Planning and Development Agency (KIPDA) to develop a safety action plan for TRIMBLE COUNTY FISCAL COURT to analyze existing conditions, historical trends, systemic and specific needs and to identify projects and strategies to address identified problems; and

WHEREAS, a safety action plan is an eligibility requirement for implementation grants through the SS4A Program; and

WHEREAS, community commitment to an eventual goal of zero fatalities and serious injuries is an important component for USDOT consideration of an implementation grant through the SS4A program.

NOW, THEREFORE BE IT RESOLVED that the TRIMBLE COUNTY FISCAL COURT hereby establishes a goal of working towards zero traffic fatalities and serious injuries by the year 2050.

Done this 30TH Day of December, 2024 on a motion made by J.D. Jones and seconded by Melissa Gibson-Cornish

Members present voting in favor: All in favor

Members present voting against: None

JOHN D OGBURN JR
TRIMBLE CONTY JUDGE EXECUTIVE

ATTEST:

Susan Barnes
SUSAN BARNES
TRIMBLE COUNTY FISCAL COURT CLERK

2. Planning Structure

The planning structure for the Trimble County Safety Action Plan consisted of various committees, each playing a crucial role. The following describes these bodies and their collaborative efforts in the plan development.

Regional Steering Committee

The Regional Steering Committee provided oversight and strategic direction for the Safety Action Plan development process. The Committee was composed of representatives from 16 local government agencies, including Trimble County. It also included KIPDA and Regional Transportation Council (RTC) staff. Steering Committee meetings were held at key points to provide information and gather input and feedback. Topics covered during the meetings included:

- Purpose of safety action plans
- Data collection and safety analysis
- Identification of high crash highways and intersections
- Countermeasure identification and prioritization
- Documentation and implementation opportunities

Trimble County Leadership Meetings and Plan Review

Meetings were held with county leadership at two key points during the plan development to receive and relay detailed input and feedback. The first meeting focused on presenting the initial data analysis and prioritization of needs, allowing county leadership to identify, confirm, and prioritize critical safety issues. The second meeting gave county leadership the opportunity to provide feedback on the draft High Injury Network (HIN) and potential safety countermeasures. These interactions allowed the unique concerns and priorities of Trimble County to be adequately addressed in the plan.

The final Safety Action Plan was also reviewed by county leadership to provide feedback and yield a plan that is useful for moving Trimble County forward toward a safer future.

Safety Committee Meetings

The Safety Committee is the cornerstone of the planning structure, providing localized oversight and input into the plan. The Safety Committee also provides a means of continuing the safety planning and project implementation process in the future. The Committee consisted of a multidisciplinary team comprising key stakeholders from the community, including:

- Trimble County Judge Executive
- City of Bedford Mayor
- Trimble County EMS / Trimble County Ambulance Service

- Trimble County Office of Emergency Management
- Bedford Fire and Rescue
- Milton Fire and Rescue
- Regional Transportation Council (RTC) staff
- Kentuckiana Regional Planning & Development Agency (KIPDA) staff

The Safety Committee provided advice and feedback on the plan development and is intended to continue this advisory role as the plan moves into implementation and monitoring. The Committee provided input and feedback on potential safety needs and possible reactive and systemic safety countermeasures. Having many different perspectives and agencies in the meetings facilitates effective communication and results in a more effective safety action plan that better addresses the five elements of the Safe System Approach. A detailed review of the Safety Committee Meetings is provided in **Chapter 4. Engagement and Collaboration.** The dialogue is expected to continue in the future, facilitated by RTC and KIPDA staff, as the plan is implemented, updated, and enhanced over time.

3. Safety Analysis

Study Area

The study area for the safety analysis includes the entirety of Trimble County, Kentucky, as shown in Figure 3-1. This study includes all public streets and roads within the County except interstate highways, private streets, and parking lots.

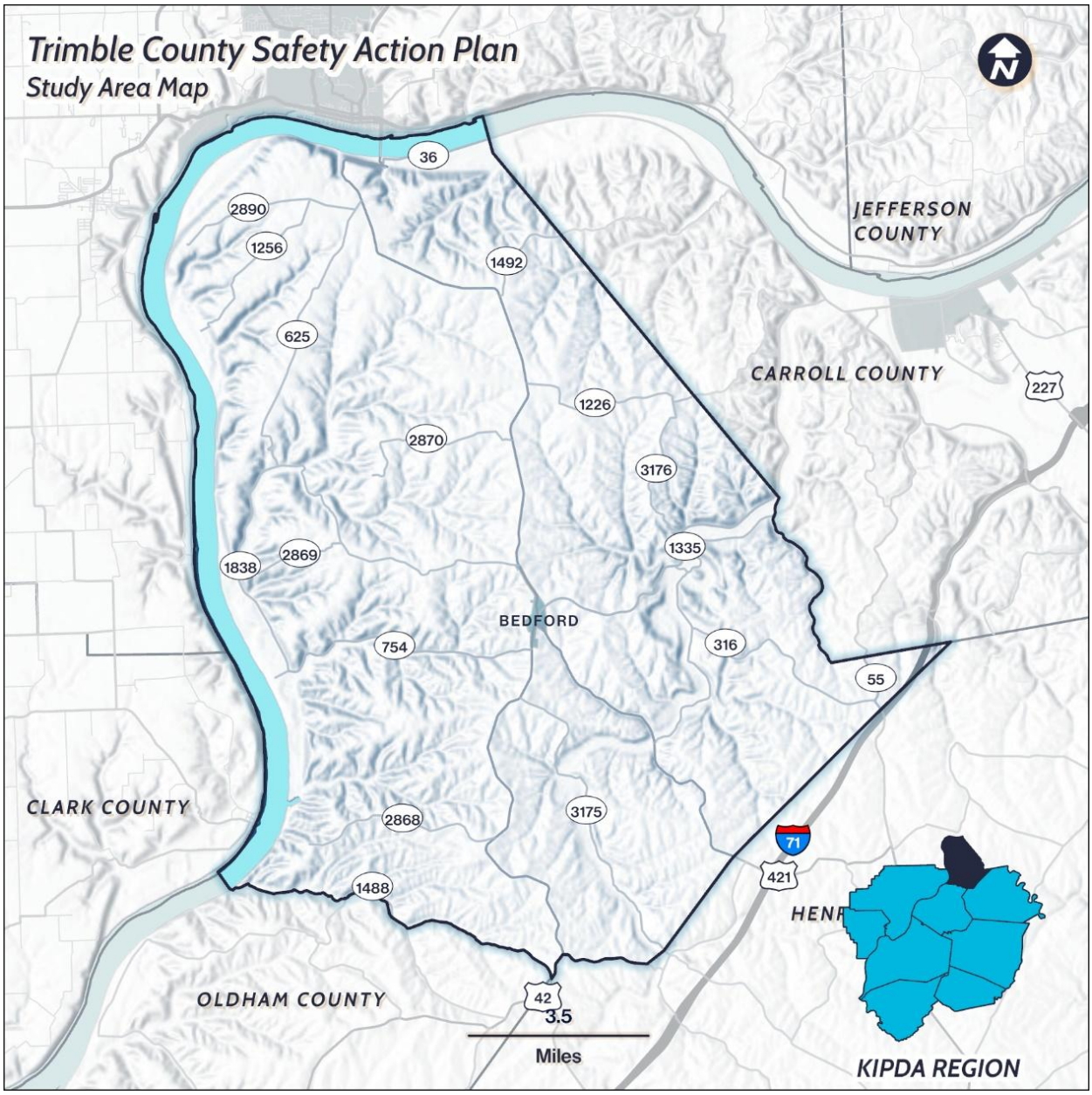


Figure 3-1: Study Area

Crash Data

The safety analysis was conducted using the five years of crash data between 2018 and 2022. This period was selected based on the desire to study consistent crash trends over a consecutive period, the availability of data when the project started, and expectations regarding future funding application data requirements.

The project team obtained the crash data from the Kentucky State Police (KSP) Crash Database through a custom dataset provided by the Kentucky Transportation Cabinet (KYTC) in partnership with the Kentucky Transportation Center (KTC). This data is primarily collected by city, county, and state police department crash investigation teams when they complete a Kentucky Uniform Police Traffic Collision Report form. This form captures critical information about the crashes, including location, type, severity, individuals and units involved, environmental factors, and the contributing factors of each crash. Departments enter this information into a database maintained by KSP.

The initial crash data included all Trimble County crashes from 2018 to 2022. Crashes on I-71 and those that occurred in parking lots were removed from the dataset. Additionally, some crashes could not be linked to the GIS roadway due to missing information. After these adjustments, the final crash database used for the study included 737 crashes.

This report focuses on crash events based on the most severe injury sustained in each incident. Since the analysis is event-based rather than individual-based, a single crash involving multiple injuries is counted as one event, categorized by the highest severity level recorded. Pedestrian crashes involve at least one pedestrian and one motor vehicle. Similarly, bicycle crashes refer to crashes involving at least one bicycle and one motor vehicle. Vehicle crashes involve at least one vehicle and do not involve a pedestrian or a bicycle.

KYTC provided geographic information system (GIS) files of roadway characteristics and traffic data for state-owned roadways, known as the Highway Information System (HIS) database. The crash data was joined with GIS information to create a crash database that facilitates detailed analyses to identify crash trends, areas of opportunity, and risk factors to assist in prioritizing projects.

Crash Severity

The crash database provided by KYTC uses the KABCO Injury Classification Scale. The KABCO injury classification system categorizes traffic crash injuries into five levels: Fatal (K), Suspected Serious (A), Suspected Minor (B), Possible (C), and No Apparent Injury (O). The KABCO scale is the recommended best practice for individual injury reporting by the Model Minimum Uniform Crash Criteria (MMUCC), developed by the National Highway Traffic Safety Administration (NHTSA). KSP uses the KABCO scale and MMUCC during field data collection and reporting the injury severity of a crash. Crash severity is determined by the most severe injury occurring in the crash. For example, if a fatality occurs, the crash is classified as a “K” or fatal injury crash. Table 3-1 provides a breakdown of the crashes in Trimble County by severity.

Severity	MMUCC Severity Description	Crashes (2018-2022)	%
K	Fatal Injury	15	2%
A	Suspected Serious Injury	25	3%
B	Suspected Minor Injury	67	9%
C	Possible Injury	40	6%
O	No Apparent Injury	590	80%
	Total	**737**	**100%**

Table 3-1: Crashes by Severity

Figure 3-2 shows the location of all 737 crashes documented during the study period. Density of crashes is shown with a gradient scale. The highest number of crashes during the study period occurred near Milton and Bedford.

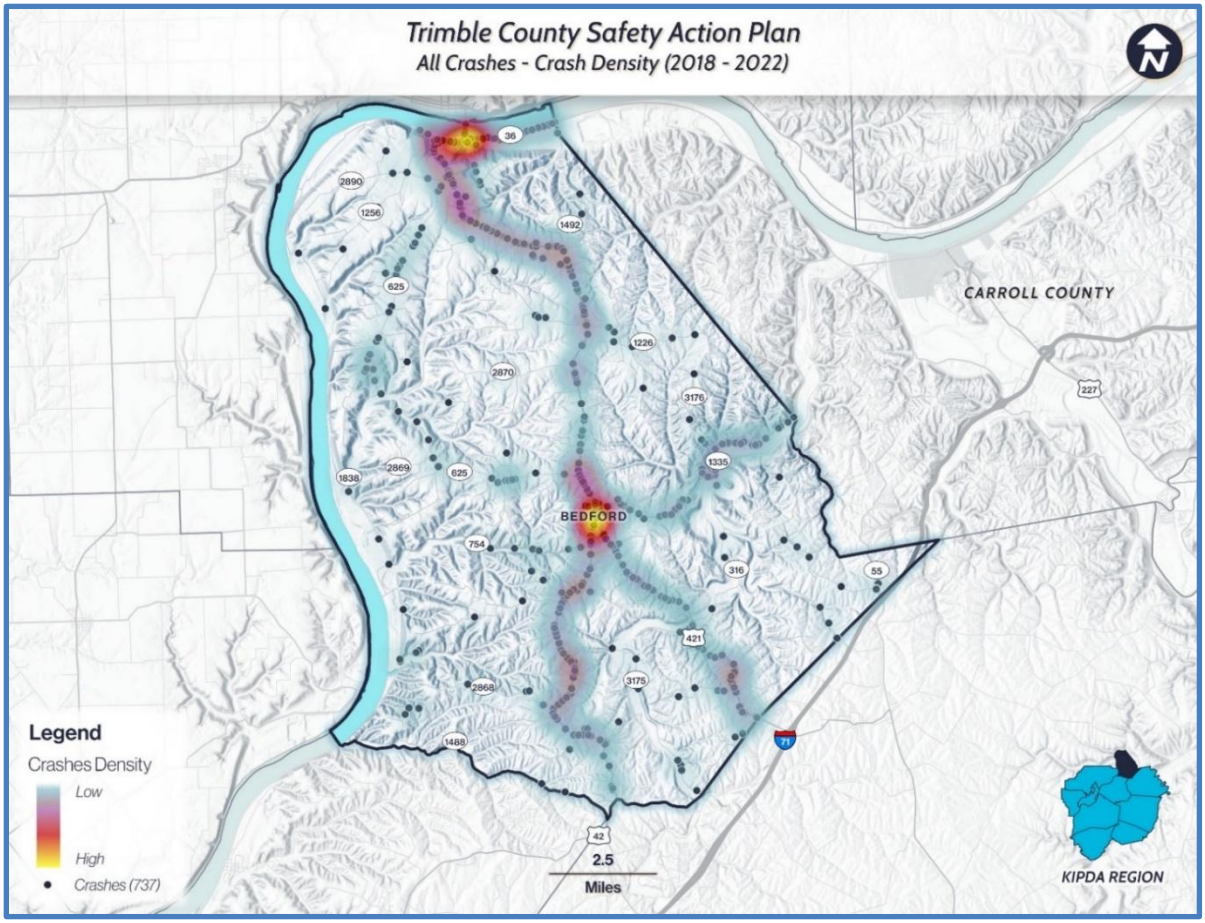


Figure 3-2: Crash Density Map.

Figure 3-3 shows the locations of fatal and suspected serious injury crashes. These crashes are located throughout the county and are not clustered in the same manner as the lower severity crashes.

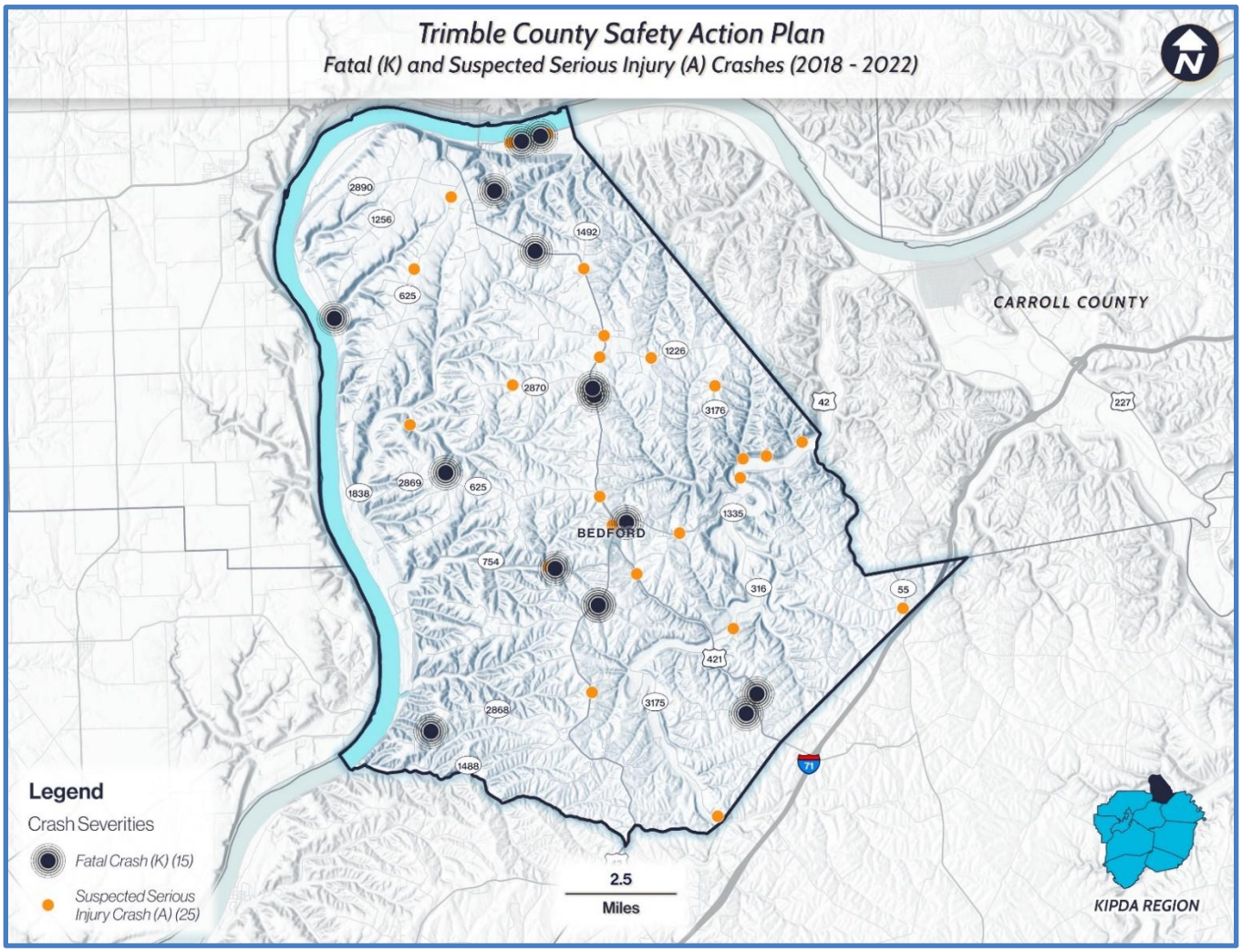


Figure 3-3: Fatal and Suspected Serious Injury Crash Map

Crash Trends

The crash data has been examined considering a number of different factors to identify patterns and safety needs. This trend analysis also provides information about potential safety countermeasures and approaches that could be explored to address those needs.

Annual Crash Trends

The 2018-2022 crash analysis shows a fluctuation in the number of crashes per year, ranging between 115 and 175 annually. The highest number of crashes occurred in 2018, followed by a decrease in the subsequent years, reaching the lowest point in 2020 with 115 crashes. This decline in 2020 aligns with COVID-19 pandemic, which greatly affected traffic patterns and volumes. It also likely led to an underreporting of crashes, especially low severity crashes. In early 2020, police operating procedures were modified to minimize potential exposure to the virus. Consequently, the reported number of crashes in 2020 may not reflect all of the crashes that occurred during that year. Crashes rose in 2021 (139 crashes) and 2022 (159 crashes).

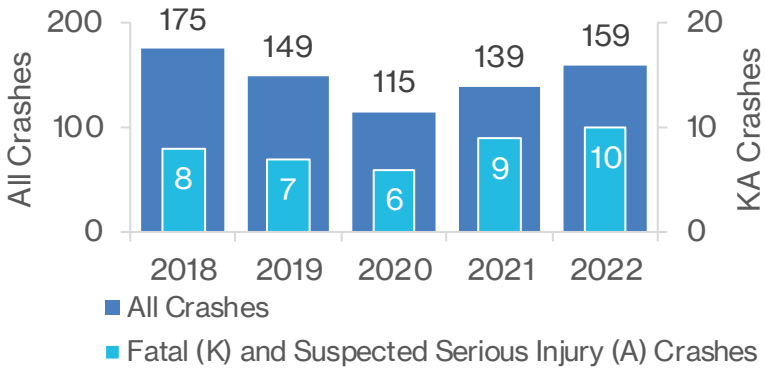


Figure 3-4: Overall Crashes per Year

The above figure also shows the number of severe fatal (K) and suspected serious injury (A) crashes through the study period. These severe crashes remained relatively steady, with 6-10 crashes reported annually.

Crash Occurrence

Month

The following charts present the crashes by month over the 5-year study period. This monthly crash data shows notable variations in crash frequency and severity throughout the year. The highest total crashes occurred in September and November, with 72 and 71 crashes, respectively. July and September accounted for 35% of all fatal and serious injury crashes despite making up only 19% of all crashes. June and September had the highest percentage of severe crashes.

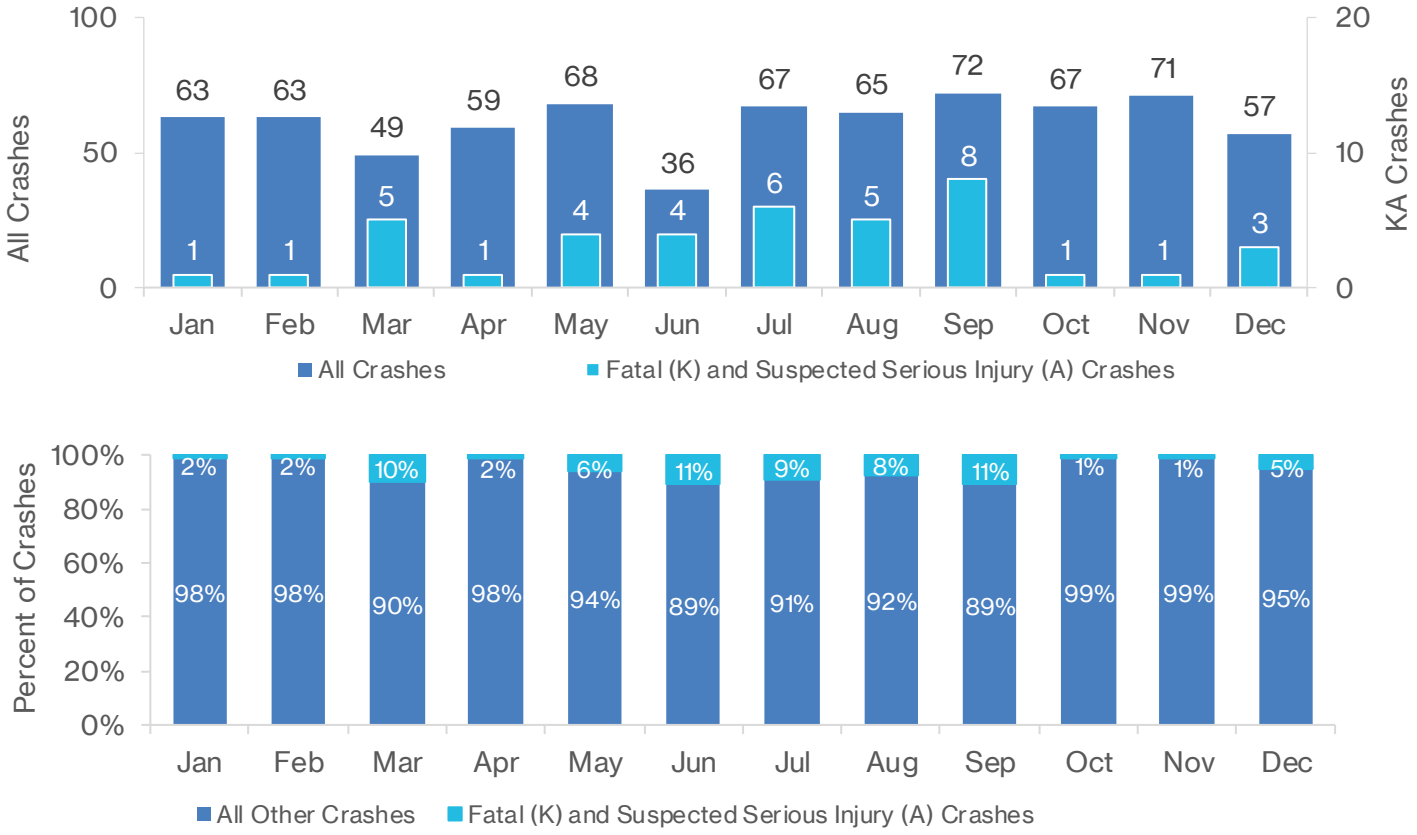


Figure 3-5: Monthly Crash Breakdown

Day of Week

As seen in the Figure 3-6, crashes remain relatively consistent across the weekdays, ranging from 94 crashes on Wednesday to 125 crashes on Monday. A slight decline is observed on weekends, with 79 crashes on Sunday, representing the lowest crash frequency. The decrease in weekend crashes is most likely attributed to lower traffic exposure, lowering the potential for crashes.

The most severe crashes do not follow the same pattern. Despite having the fewest crashes overall, Sunday accounts for the highest number of fatal and suspected serious injury crashes (8), indicating a higher severity of crashes on this day. Saturday is the second highest at seven crashes. This pattern appears to be related to weekend recreational activities, especially in the summer, which the prior figure showed is a higher period for severe crashes. This data indicates that weekends in the summer are important times for promoting good driver behavior and possibly for stepping up education and enforcement activities.

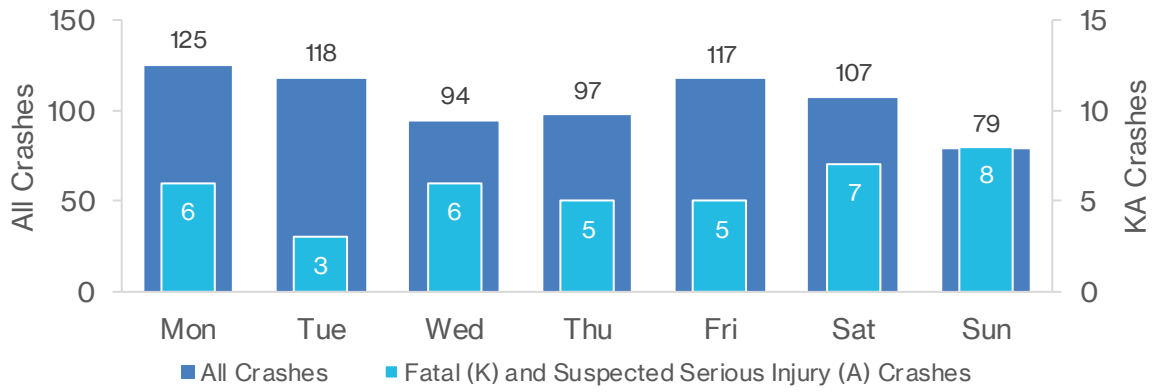


Figure 3-6: Crashes by Day of Week

Time of Day

In general, the crashes by time of day follow general traffic patterns. The afternoon (3 to 6 pm) period experiences the highest number of crashes, with 173, or 23% of all crashes. The early morning hours, such as 12 to 3 am and 3 to 6 am, report the lowest crash frequencies, with 35 and 37 crashes, respectively.

Severe crashes are relatively evenly distributed across the middle of the day, with 5 to 8 fatal and suspected serious injury crashes per hour between 6 am and 6 pm. As is common in many communities, the 12 to 3 am time period has the highest percentage of severe crashes at nearly 10%.

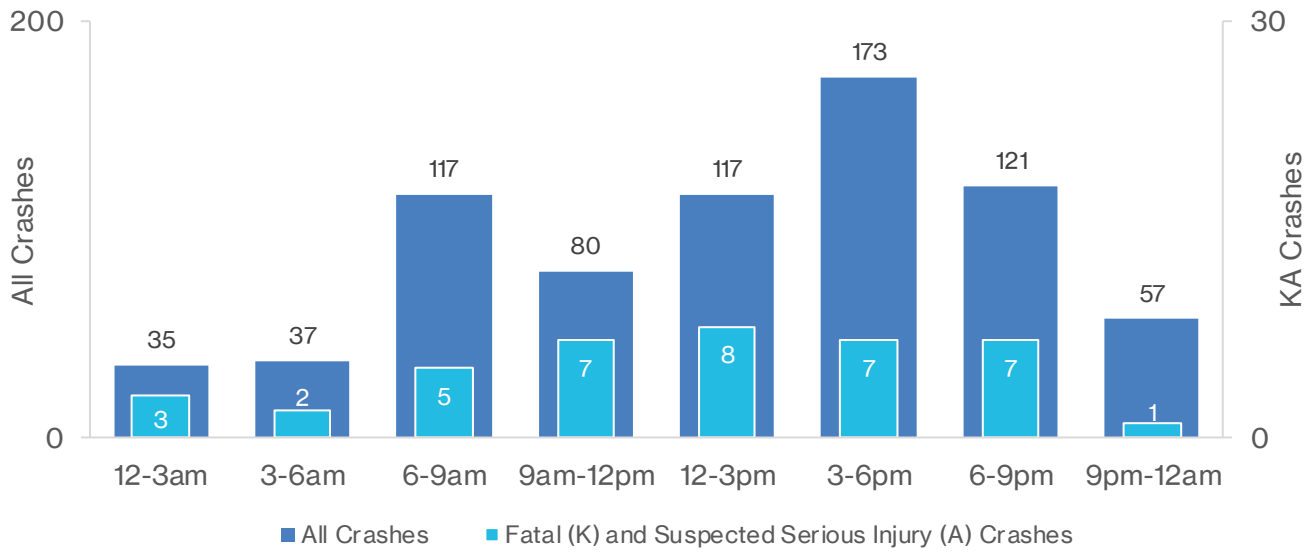


Figure 3-7: Crashes by Time of Day

Manner of Collision

As shown, single-vehicle crashes are both the most common and the most severe type of crash, accounting for 51% of all crashes and a notable 68% of fatal and suspected serious injury crashes. Head-on crashes, while only comprising 4% of all crashes, contribute to 8% of fatal and suspected serious injury crashes, demonstrating that they are disproportionately severe when they occur.

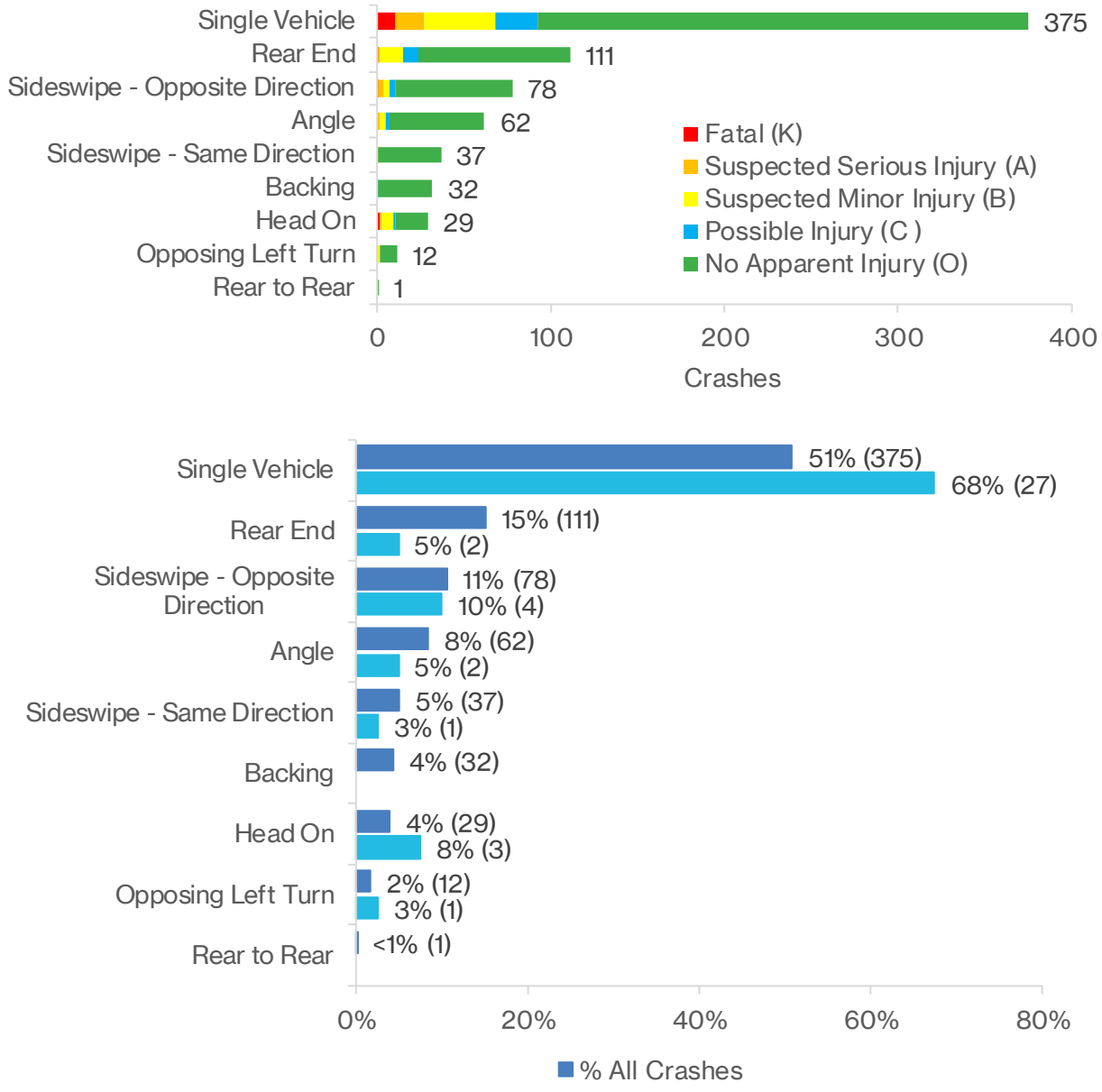


Figure 3-8: Manner of Collision by Severity

Driver Behavior

Driver behavior is a shared responsibility and can be the determining factor in a crash. The actions and decisions drivers make can significantly influence the likelihood and severity of crashes. Addressing key areas of concern, such as aggressive, distracted, and impaired driving, is essential to fostering a safer roadway environment. These three behavior areas have been selected as key to promoting safety in Trimble County.

Aggressive Driving

Aggressive driving is generally defined as behavior by drivers that negatively impacts the safety of other motorists or pedestrians, contributing to crashes. Aggressive crashes are coded to have the following behaviors.

- Failure to yield to the right of way
- Following too close
- Traveling too fast for conditions
- Disregarding traffic control
- Exceeding the posted speed limit
- Improper passing
- Weaving in traffic

Crashes involving aggressive driving contribute disproportionately to fatal crashes when compared to all crashes. While aggressive driving behaviors are present in 14% of all crashes (103), they account for 20% of crashes resulting in fatalities, indicating a higher risk of severity associated with aggressive driving behaviors.

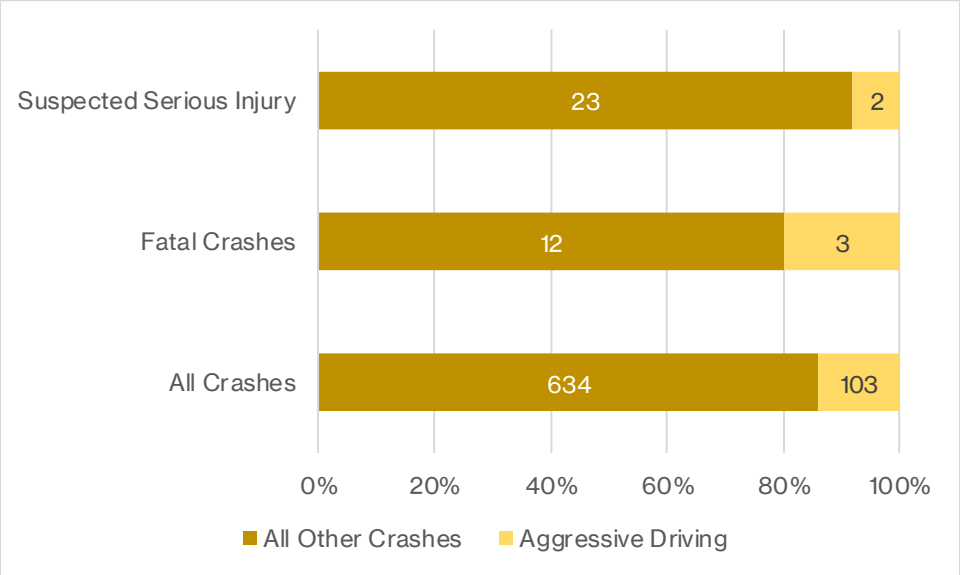


Figure 3-9: Aggressive Driver Crashes by Severity

Figure 3-10 illustrates the locations of the 103 crashes attributed to aggressive driving.

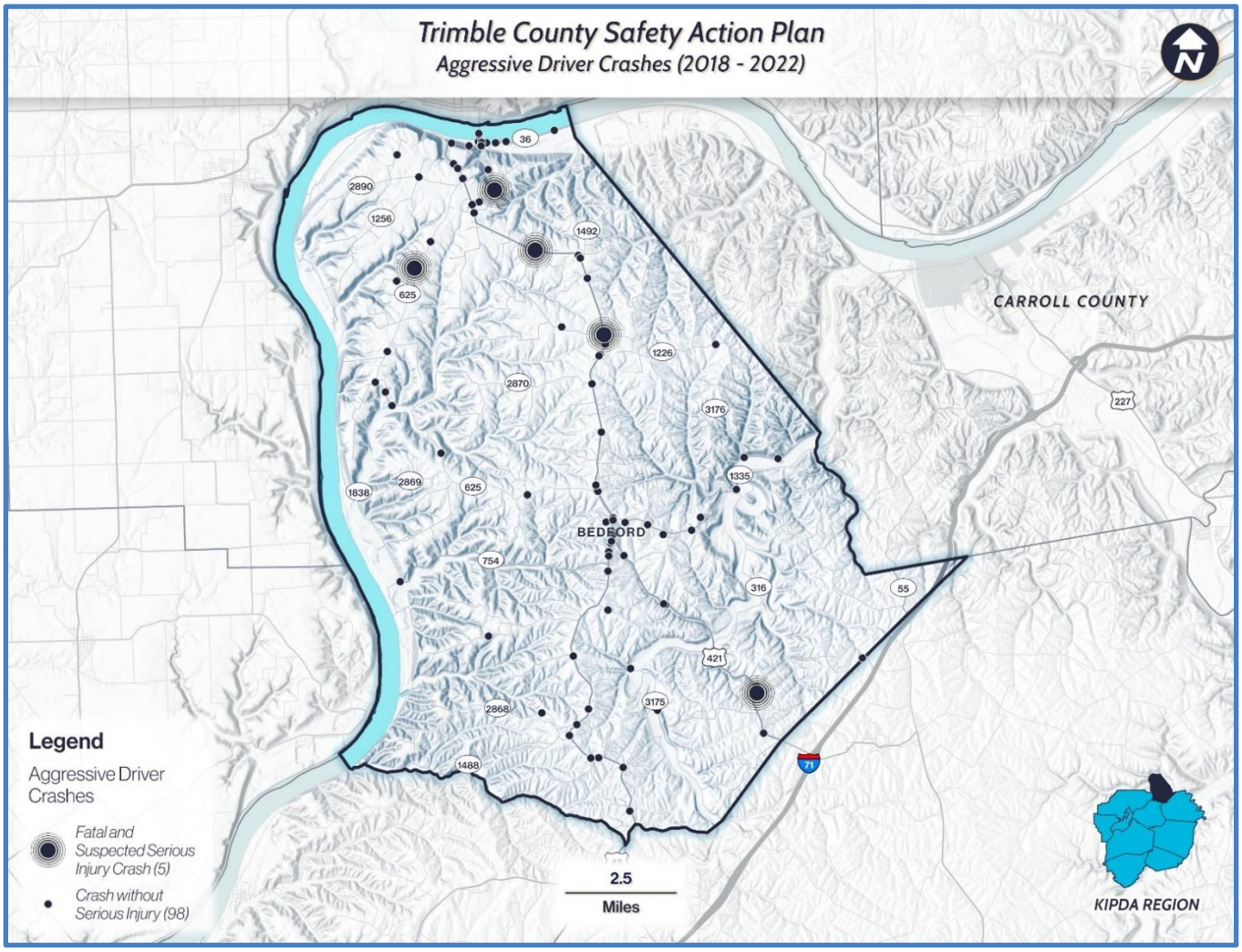


Figure 3-10: Aggressive Driver Crashes Map

Distracted Driving

Distracted driving refers to any activity by a vehicle operator that diverts their attention from the primary task of driving, thereby increasing the risk of a crash. The three main types of distracted driving involve drivers taking their eyes off the road, hands off the wheel, and minds away from driving. In Trimble County, distracted driving accounted for a varying number of crashes annually, with a peak of 68 in 2018 and a low of 40 crashes in 2020, mirroring overall crash trends.

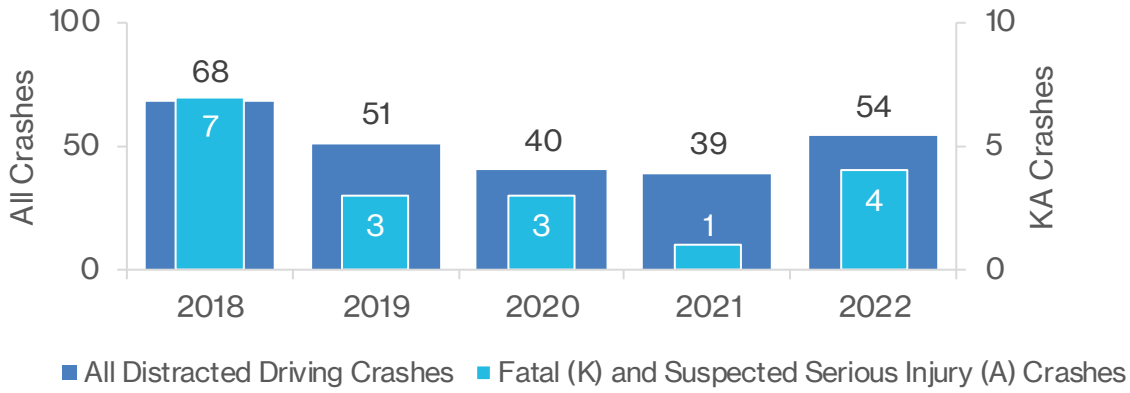


Figure 3-11: Distracted Driver Crashes by Year

In Trimble County, distracted driving is a safety concern, accounting for 34% of all crashes but contributing to a disproportionately higher 45% of fatal and suspected serious injury crashes (Figure 3-12). Figure 3-13 illustrates the locations of distracted driving crashes in the County.

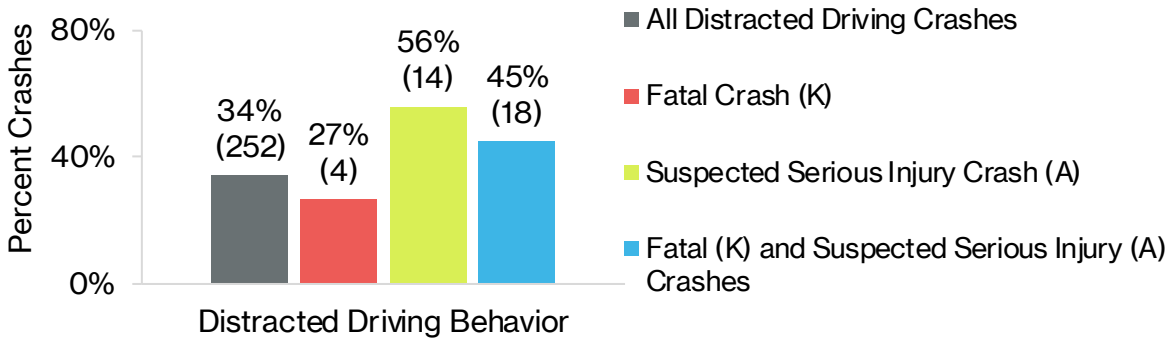


Figure 3-12: Distracted Driver Crashes by Severity

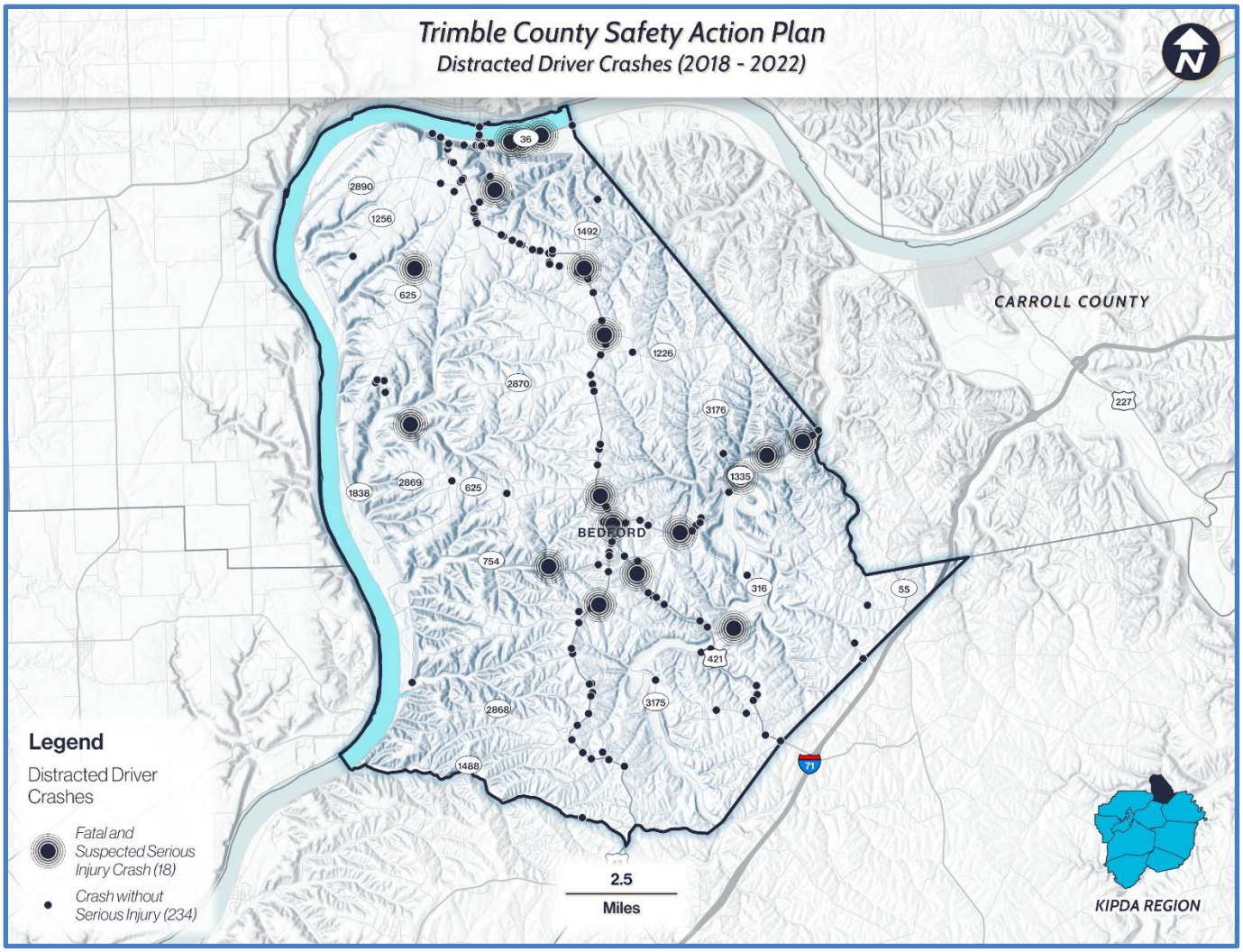


Figure 3-13: Distracted Driver Crashes Map

Impaired Driving

Impaired driving is the act of driving a motor vehicle while under the influence of alcohol or narcotics. Impairment affects reaction time, judgment, and coordination, which are critical to safely operating a vehicle. In Trimble County, impaired driving crashes occurred relatively consistently throughout the study period.

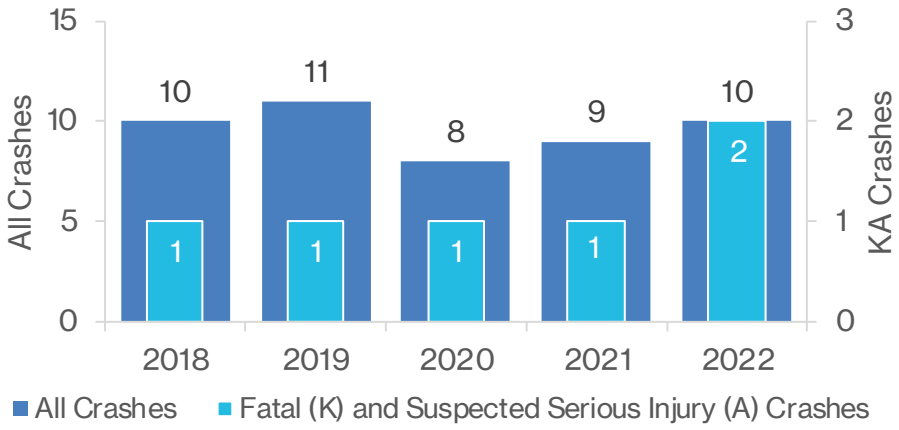


Figure 3-14: Impaired Driver Crashes by Year

The data reveals a critical issue with impaired driving. Although impaired driving accounts for approximately 6% of all crashes, it is involved in a disproportionately high number of severe crashes. Specifically, impaired driving accounts for 27% of all fatal crashes and 8% of all suspected serious injury crashes. This data highlights the heightened risk that impaired driving poses, as crashes involving impaired drivers are much more likely to result in fatal or serious injuries compared to non-impaired driving crashes. Figure 3-16 shows the locations of impaired driving crashes in the County.

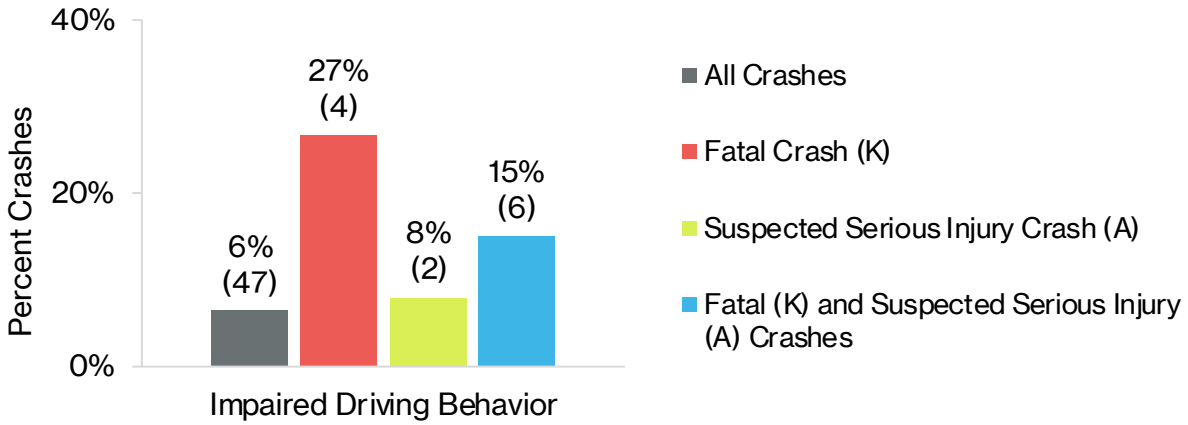


Figure 3-15: Impaired Driver Crashes by Severity

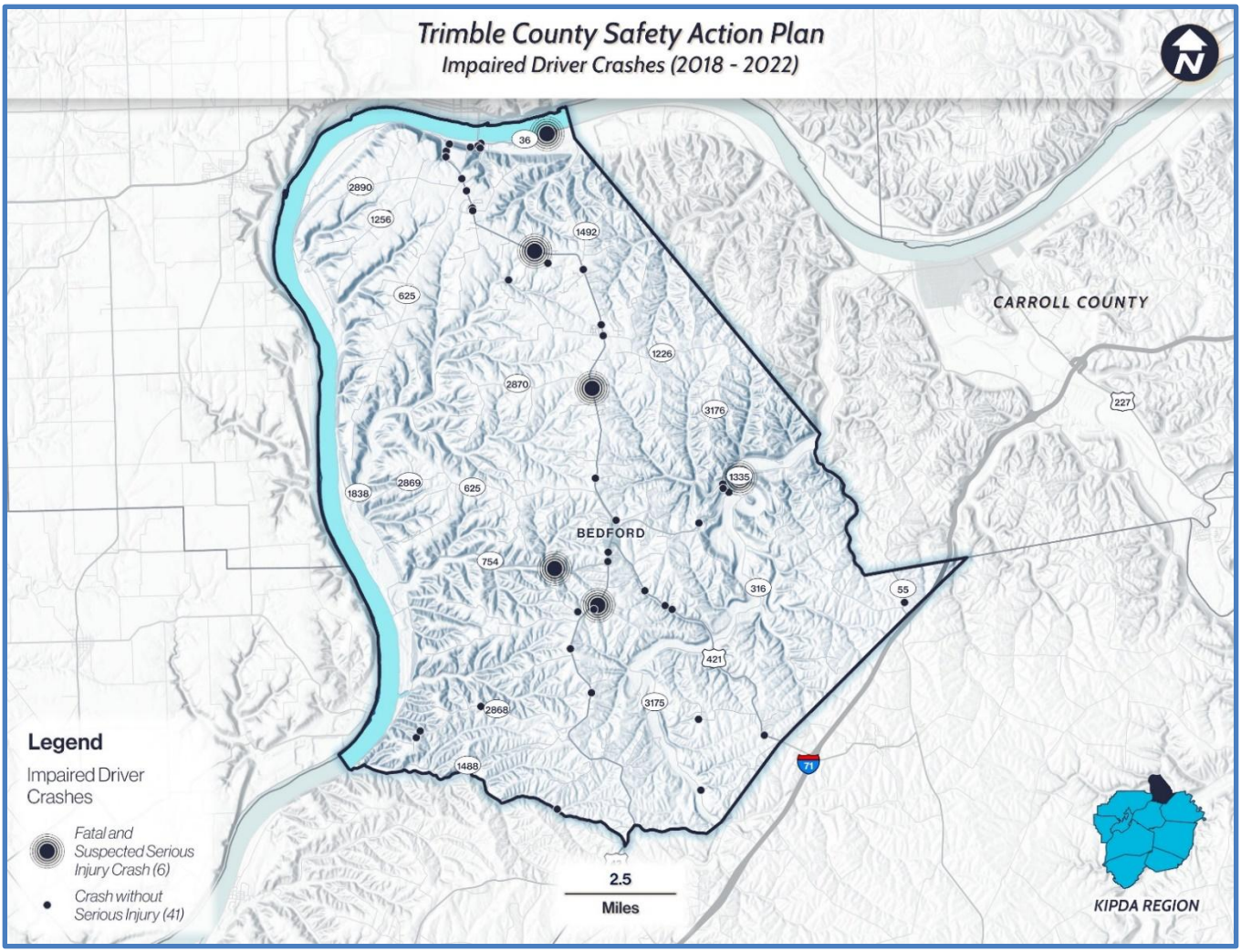


Figure 3-16: Impaired Driver Crashes Map

Lighting Conditions

Roadway lighting is a safety factor that impacts visibility and reaction times. However, the documentation of lighting infrastructure is not comprehensive. The available crash data provides only anecdotal evidence regarding the lighting condition during a crash. Currently, there is no established infrastructure database detailing the presence and condition of street lighting, making it challenging to analyze the correlation between illumination and road safety.

The following chart indicates that 63% of all crashes during the five-year study period occur during daylight. Still, a higher percentage (73%) of fatal and serious injury crashes occur during daylight. In contrast, 34% of all crashes occur in non-daylight dark conditions. In comparison, 25% of fatal and suspected serious injury crashes occur during non-daylight dark conditions. This distribution suggests that while reduced visibility may increase crash risk, most severe crashes in Trimble County occur under daylight conditions.

Lighting Condition	Total Crashes	Fatal (K) and Suspected Serious Injury (A) Crashes
Daylight	461 (63%)	29 (73%)
Non-Daylight - Dark Conditions	251 (34%)	10 (25%)
Non-Daylight - Highway Lighting On *	21 (3%)	1 (3%)
Unknown/Other	4 (1%)	0 (0%)

* *This is officially designated as Dark – Highway Lighting On*

Table 3-2: Fatal and Suspected Serious Injury Crashes by Light Condition

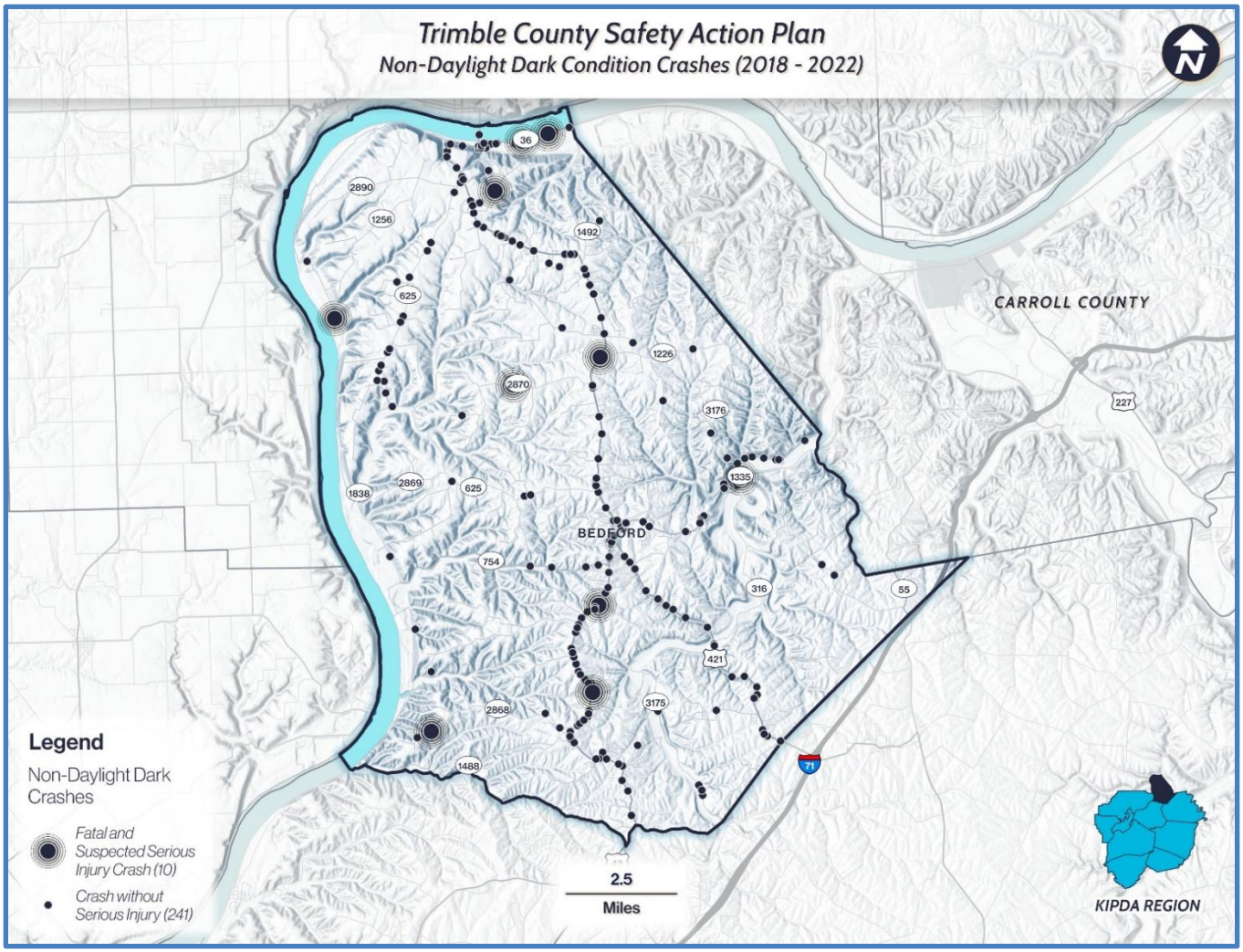


Figure 3-17: Lighting Condition: Non-Daylight Dark Condition Crashes Map

Crashes by Locations

The crash data shows that 67% of all crashes and 70% of all severe crashes occur on highway segments and not at intersections. This is expected due to the rural nature of Trimble County. Approximately 33% of all crashes and 30% of fatal and serious injury crashes occur at intersections.

Location	Total Crashes	Fatal (K) and Suspected Serious Injury (A) Crashes
Intersections	240 (33%)	12 (30%)
Highway Segments	497 (67%)	28 (70%)

Table 3-3: Crashes by Location

Intersections

The four intersections with the highest number of total crashes (12 to 21) over the five years are located in downtown Bedford and Milton. One of these is the only signalized intersection in the county at US 42 (Main Street) and US 421/ Spring Street. However, the crashes at these four intersections were primarily property damage only crashes, resulting in a low average crash severity. The serious fatal and injury crashes tended to occur in more rural locations. This trend is explored in detail in **Chapter 6. Strategy and Project Selection** where the intersections have been mapped and prioritized.

With regard to intersection types, those classified as four-leg urban intersections tended to have higher numbers of crashes, while three-leg rural intersections tended to have higher crash severities.

Of the 12 fatal and serious injury crashes that occurred at intersections, 7 (58%) were single-vehicle crashes and only two of the 12 were angle crashes.

Highway Segments

Higher speed (55 mph) highways in the county were associated with higher severity crashes, while lower speed (35 mph) highways had a much lower average crash severity. Sharp curves were also associated with high crash severities. As is typical for rural highways, the combination of high speeds, sharp curves, and narrow lanes increases driver risks and tends to result in higher crash rates and severities.

A review of the crash data for highway segments showed US 421 as having both a high number and severity of crashes. Barebone Road (SR 754) was also highlighted as having a high crash severity. **Chapter 6. Strategy and Project Selection** provides more detailed information.

Roadway Departure Crashes

Roadway departure crashes occur when a vehicle crosses an edge line, a centerline, or leaves the traveled way. These crashes often lead to some of the most severe outcomes due to the increased risk of collision with fixed objects, overturning, or encountering unsafe roadside conditions. The inherent dangers of leaving the roadway contribute to higher rates of serious injuries and fatalities compared to other crash types.

The crash data indicates that roadway departure crashes significantly contribute to severe outcomes. Although roadway departure crashes account for 55% of all crashes, they disproportionately represent a much higher percentage of fatal and serious injury crashes. Specifically, 85% of fatal and suspected injury crashes are related to roadway departures.

Figure 3-19 shows the locations of roadway departure crashes resulting in injuries or fatalities.

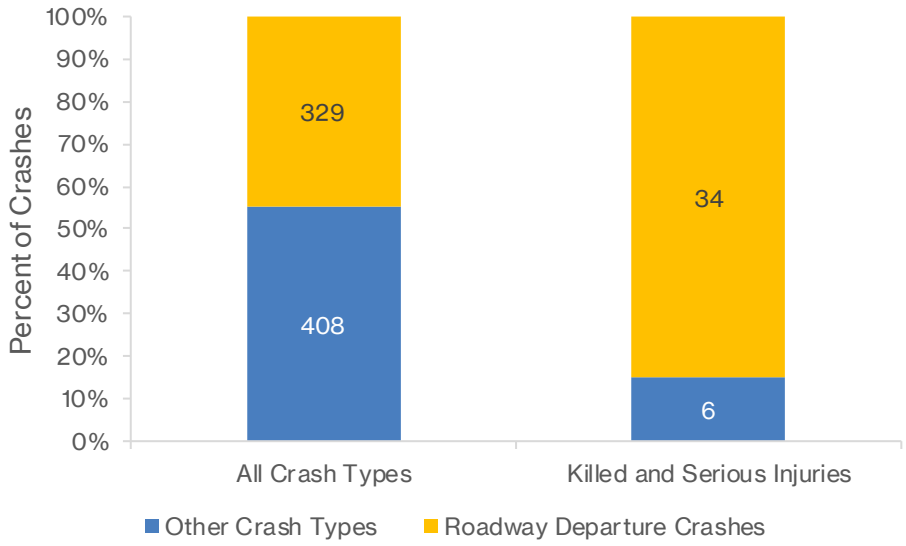


Figure 3-18: Roadway Departure Crashes by Severity

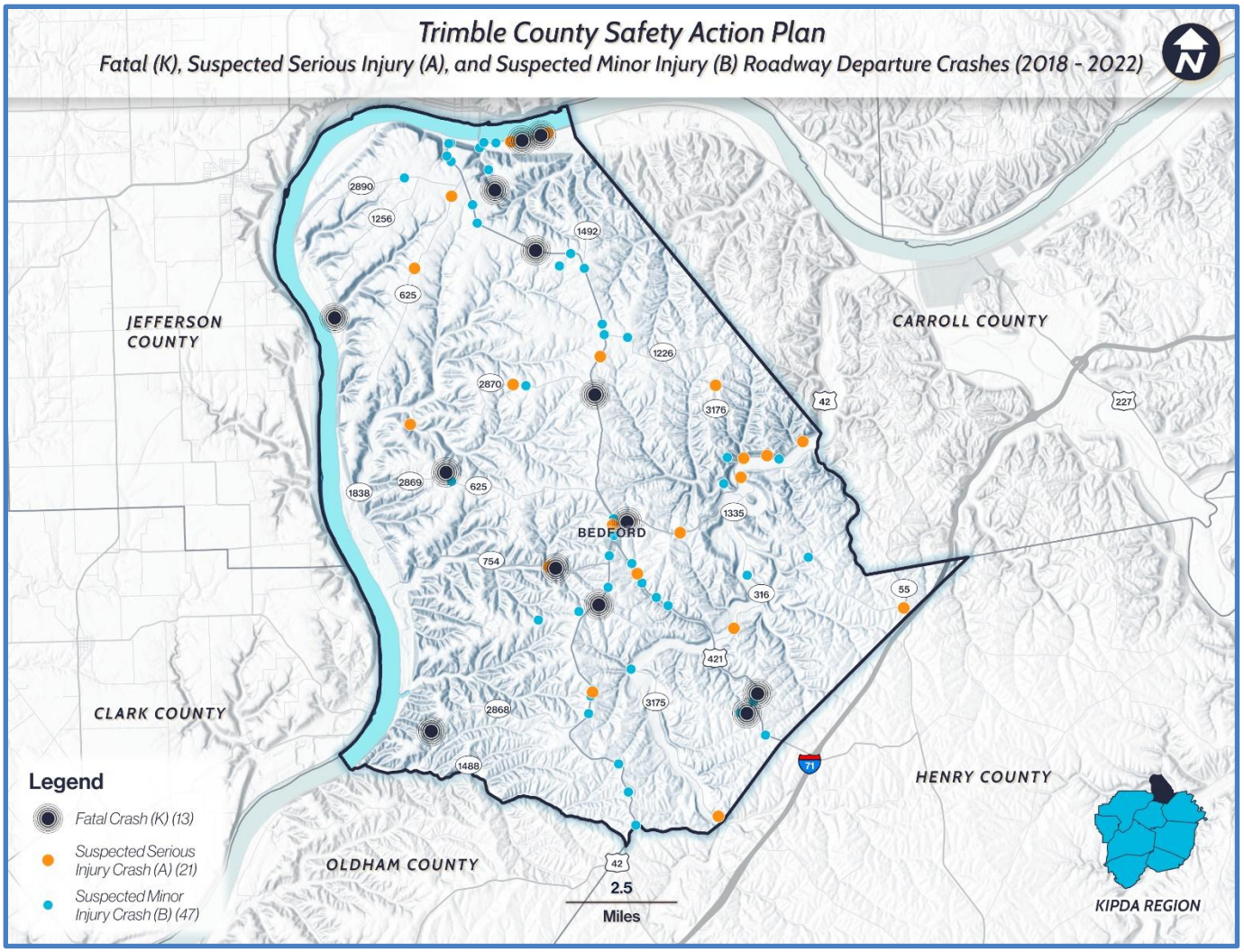


Figure 3-19: Roadway Departure Crashes Map

Vulnerable Road Users

Vulnerable road users, including pedestrians and bicyclists, are at greater risk due to their lack of physical protection compared to motor vehicle occupants. These crashes typically result in more severe injuries and fatalities because there is little to no buffer between these users and the force of a collision. No bicycle crashes were reported during the study period.

Pedestrians

Trimble County is primarily rural with limited urban areas and has experienced a small number of pedestrian crashes. The majority of the pedestrian crashes occurred in the vicinity of Bedford. Although pedestrian crashes are relatively infrequent in the County, they tend to result in injuries when they do occur.

For example, outside the study crash time period, a student was struck and injured while walking to her driveway after exiting a school bus on KY 625 (Peck Pike). The section of KY 625 where the crash occurred is included on the High Injury Network in **Chapter 6 Strategy and Project Selection**.

This example highlights the need for continued emphasis on pedestrian safety throughout the county.

Severity	Description	Crashes	%
K	Fatal	-	-
A	Suspected Serious Injury	-	-
B	Suspected Minor Injury	3	60%
C	Possible Injury	1	20%
O	No Apparent Injury	1	20%
	TOTAL	**5**	**100%**

Table 3-4: Crashes by Pedestrian Severity

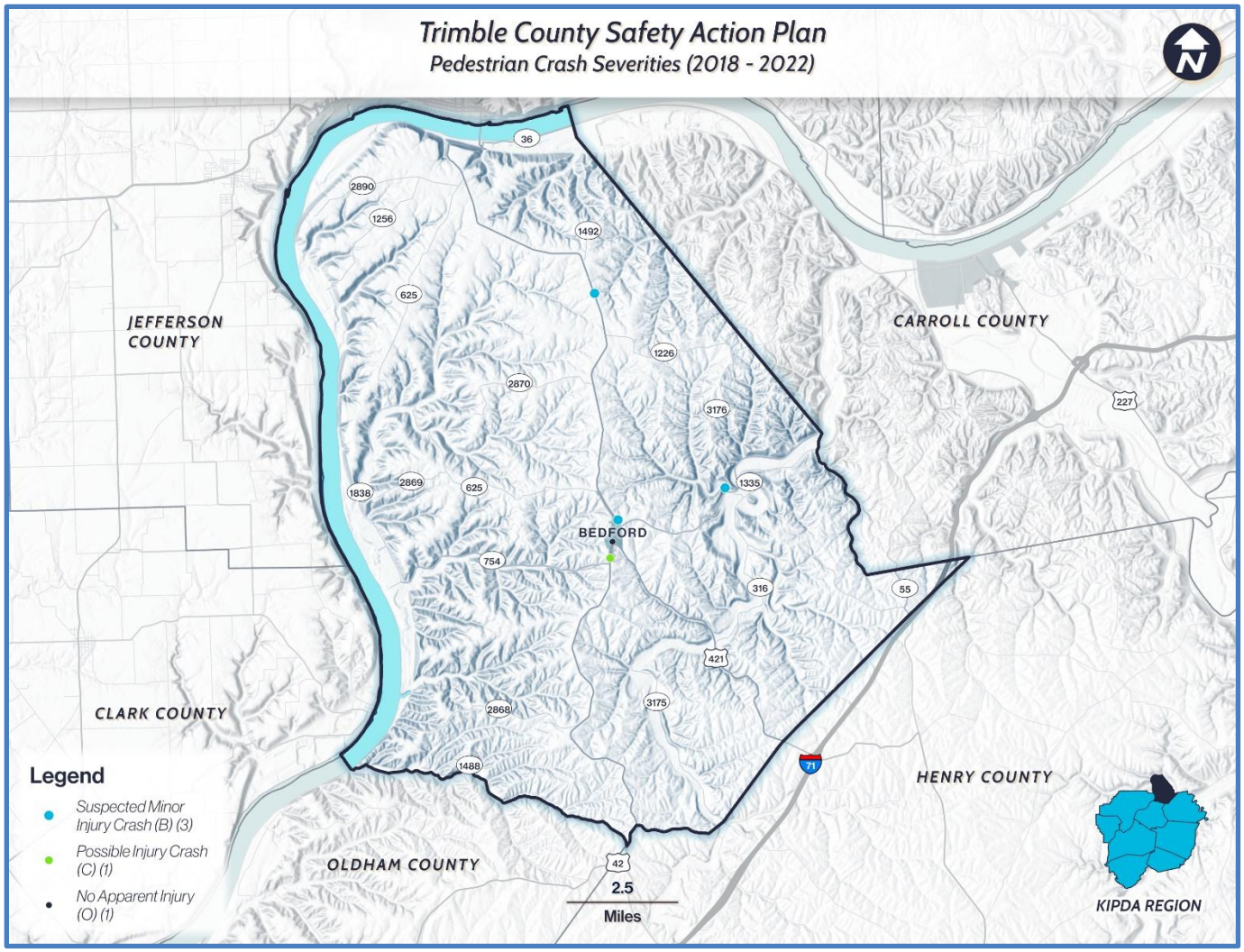


Figure 3-20: Pedestrian Crash Map

Occupant Protection

Occupant protection involves any device intended for protective use in a vehicle, such as a seatbelt, airbag, child safety seat, or booster seat, which helps prevent death or serious injury in the event of a crash. The restraint crash data used for this study was based on whether all vehicle occupants were restrained. The crash was considered unrestrained if an occupant was unrestrained, not wearing a seatbelt.

The data indicates a clear relationship between restraint usage and crash severity. In fatal crashes, 47% of all occupants were properly restrained, meaning that in 53% of fatal crashes, at least one occupant was unrestrained. Similarly, restraint use was low in suspected and serious injury crashes, where 39% of crashes involved all occupants being properly restrained. Restraint usage is significantly higher in less severe crashes (those classified as suspected minor injury, possible injury, or no injury). This trend highlights the critical role of occupant protection devices in mitigating the severity of crashes. The high percentage of unrestrained occupants in fatal and severe crashes underscores the need for targeted education campaigns to promote consistent and proper restraint usage.

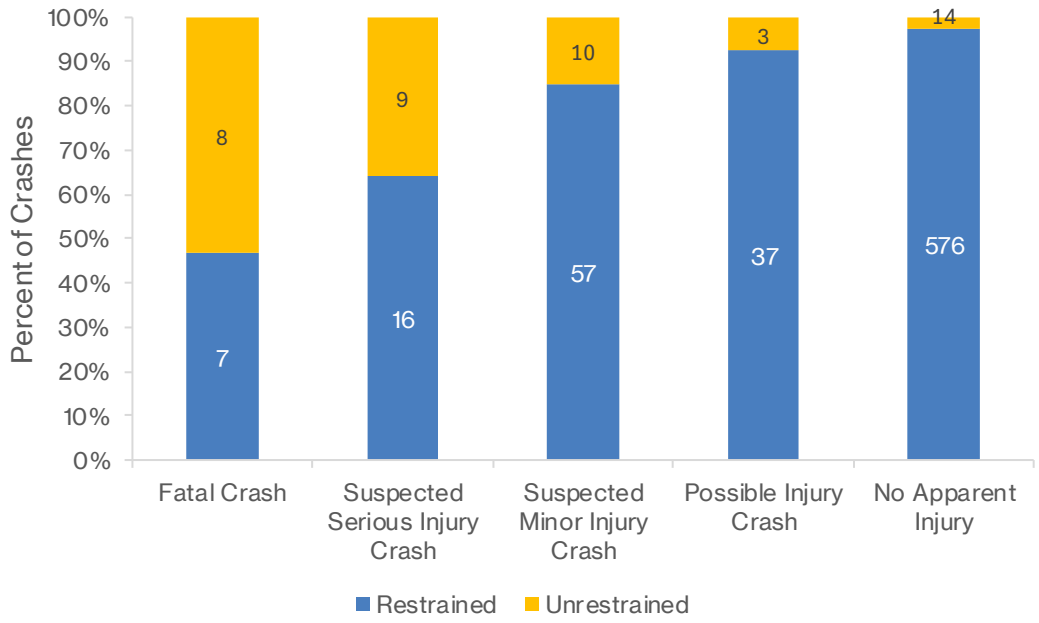


Figure 3-21: Restraint Use in Crashes

Driver Age and Gender

In Trimble County, 46% of fatal and suspected serious injury crashes involved drivers aged 20-39. Historically, this age group has been particularly prone to risky driving behaviors such as speeding and distracted driving. Older drivers (75+) have a high percentage of severe crashes as shown in the figure. Both young drivers and older drivers could benefit from outreach and education programs.

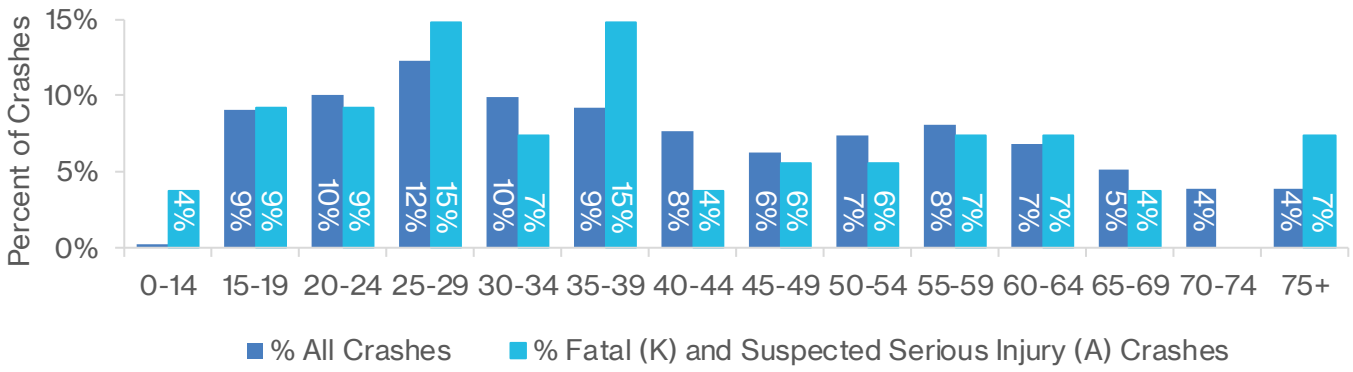


Figure 3-22: Crash Percentages by Driver Age

Approximately 63% of the drivers involved in crashes in the county were male and 37% were female. For fatal crashes 71% of the drivers involved were male and 29% were female. The male drivers tended to be in their late 20s and 30s with some older drivers. The female driver ages were more varied and included some teenagers.

Contributing Human Factors

Human factors play a significant role in crash occurrences, often tied to errors in judgment and risky behaviors. These factors include speeding, failing to yield, distractions, fatigue, and the influence of alcohol or drugs.

Driving while Not Under Proper Control is the leading factor in Trimble County, contributing to 249 crashes, followed by Driver Inattention (240). Figure 3-23 lists the number of crashes attributed to each human factor. Driving while Not Under Proper Control typically refers to situations where a driver loses control of their vehicle due to speeding, sudden maneuvers, or poor road conditions.

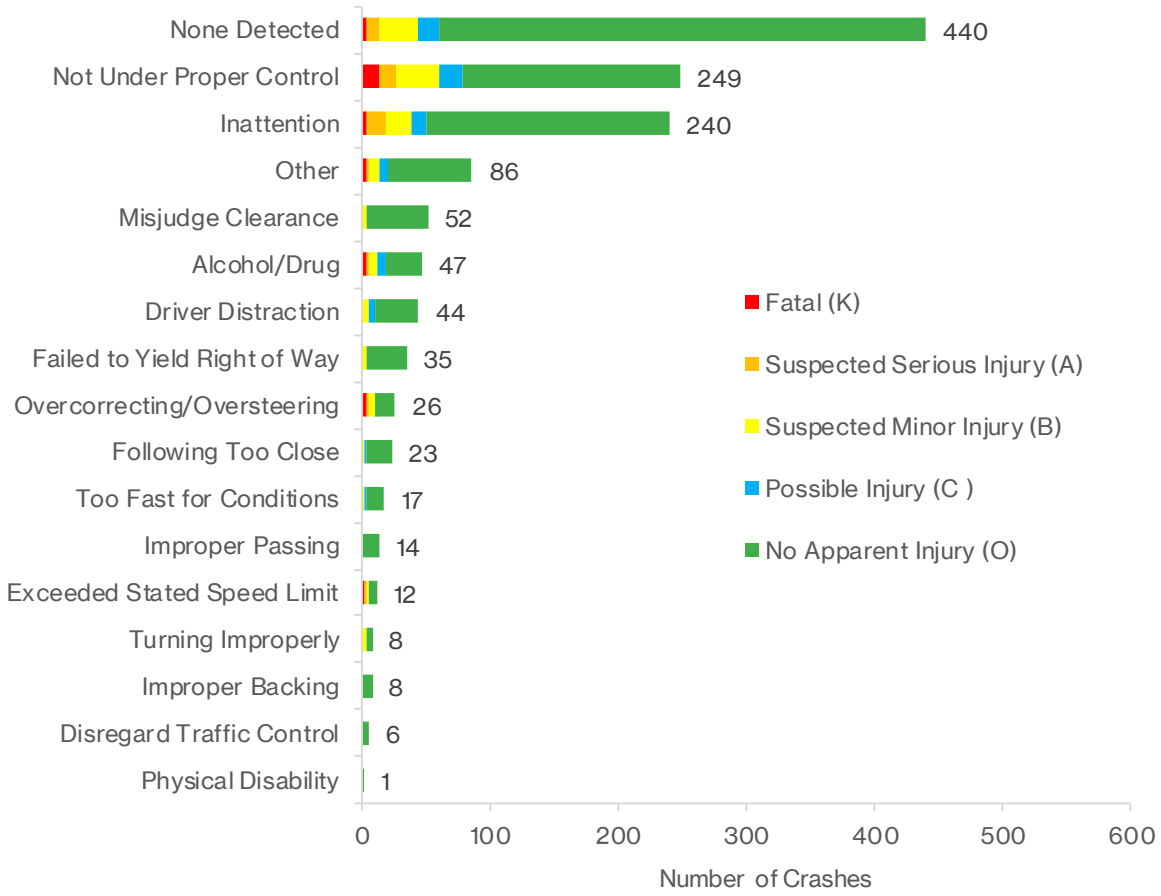


Figure 3-23: Crashes by Human Factor

The factor contributing to the highest number of fatal and suspected serious injury crashes is Not Under Proper Control at 68% (27). Driver Inattention contributed to 45% of fatal and suspected serious injury crashes.

Given the high proportion of severe single-vehicle crashes and drivers not having proper control or being inattentive, a speed management program is recommended. This would be designed to encourage drivers to make better decisions regarding their speed in various conditions . It could include infrastructure, behavioral, educational, and enforcement elements.

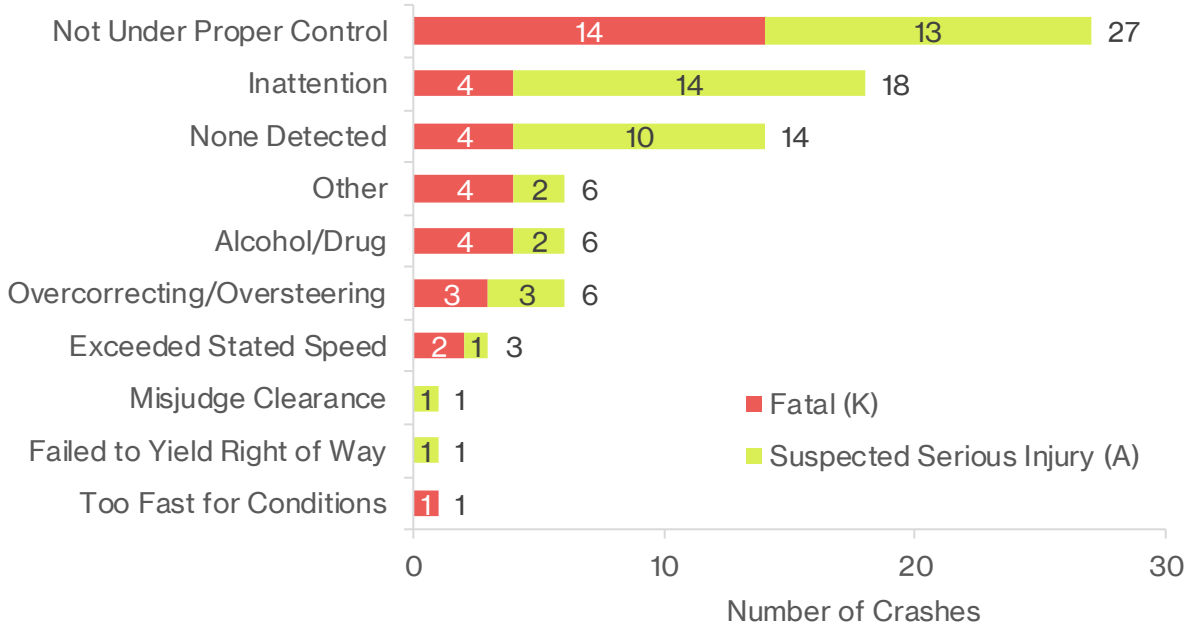


Figure 3-24: Fatal and Suspected Serious Injury Crashes by Human Factor

Environmental and Roadway Conditions

Environmental roadway conditions do not appear to contribute significantly to crash occurrence or severity. Adverse roadway conditions, defined as wet, snow, ice, or less common road conditions, comprise a small portion of the overall crashes. Wet roads account for 19% of all crashes and 15% of fatal and suspected serious injury crashes. In comparison, icy conditions account for just 1% of all crashes and 3% of severe crashes. Snow, slush, standing water, and other conditions combined account for less than 2% of all crashes with no associated severe outcomes. Data suggests that most crashes in Trimble County occur under typical dry conditions, with no clear pattern indicating that adverse environmental conditions play a substantial role in crash severity.

Roadway Condition	All Crashes		Fatal and Suspected Serious Injury Crashes	
	#	%	#	%
Dry	579	79%	33	83%
Wet	137	19%	6	15%
Ice	9	1%	1	3%
Snow/Slush	8	1%	-	-
Other	2	<1%	-	-
Sand-Mud-Dirt-Oil-Gravel	1	<1%	-	-
Water (Standing or Moving)	1	<1%	-	-

Table 3-5: Crashes by Roadway Condition

High Injury Network

A High Injury Network (HIN) is a data-driven approach used to identify roadway segments that account for a disproportionate amount of a community's fatal and serious injury crashes. The HIN enables communities to concentrate their limited resources on improving safety along those high-priority, dangerous corridors. Following the Safe System Approach, the HIN also corresponds to the Safe Roads pillar. This pillar focuses on designing roadway environments to mitigate human mistakes and account for injury intolerances, encourage safe behaviors, and facilitate safe travel by the most vulnerable users.

The HIN provides a data-driven and focused list of corridors where a majority of the community's fatal and suspected serious injury crashes are occurring. The routes identified in the HIN will guide the development of strategies and project selection. These strategies and more information on the HIN can be found in **Chapter 6. Strategy and Project Selection**.

4. Engagement and Collaboration

A key component of the planning process is meaningful engagement with both the public and stakeholders. Throughout the development of this Safety Action Plan, engagement took various forms, allowing for a deeper understanding of current conditions, safety concerns, and challenges. These insights provide crucial context for the safety analysis. The following summarizes the community and stakeholder engagement completed for this Safety Action Plan.

Safety Action Plan Community Engagement

Regional Steering Committee

The Regional Steering Committee, comprised of diverse members from the region, was the guiding force and planning structure for the Safety Action Plan development. The Safety Action Plan's development evolved through a series of Committee meetings.

The first meeting provided an overview of the Safe Streets for All (SS4A) program and plan components, an explanation of the safety analysis process, outline of the engagement process connection points and tools, an overview of community considerations, and an overview of the project selection strategy and potential countermeasures. The second meeting reviewed detailed preliminary findings from the crash analysis. The project team identified focus areas based on feedback and local insights. Then, the project team guided the communities to adopt a Leadership Commitment resolution, setting a goal for each community to achieve the eventual goal of zero fatalities and serious injuries. The third meeting focused on the data collected from the public engagement to date and updates to the draft Safety Action Plan documents. During the fourth meeting, the discussions of the Committee centered on how the communities can use the Safety Action Plans, project identification, and potential improvements at the prioritized intersections and corridors on the High Injury Network (HIN).

Stakeholder Meetings

Twice during the planning process, the project team held one-on-one meetings with key stakeholders in the community to discuss elements brought up during the overall steering committee meetings. Local community engagement with the Safety Action Plan provided invaluable local knowledge and insight.

Meeting One

In July 2024, the first meeting introduced the project and set expectations for the project team and local leadership. The meeting included a request for previous plans and initiatives for community safety and future commitment goals to safety. The project team informed Stakeholders that the team would form Safety Committees following the first stakeholder meeting. The project team then

provided a more extensive discussion of the currently available data and facilitated a discussion focusing on local conflict areas.

Meeting Two

The second meeting, held in February 2025, focused on reviewing the crash analysis dashboard and getting feedback on the initial prioritized High Injury Network (HIN) segments and priority intersections. Data on the dashboard included the location of the crash, mode of transportation, directional analysis, manner of collision, roadway condition, light condition, and the updated human factor. The group then discussed edits to the presented HIN potential corridor strategies, priority intersections, and potential intersection strategies. Feedback included a general agreement with the high priority corridors. There was discussion regarding several rural highways, such as School Hollow Lane being used as a cut-through when US 41 is closed and the need for upgrades to Barebone Road to accommodate trucks going to/from the Trimble County Generating Station. Improved intersection safety (including sight distance) was highlighted as were treatments to address speeds. Traffic safety in Bedford and near the schools was mentioned. There was also discussion regarding KYTC projects in the County.

Safety Committee

The Trimble County Safety Committee, comprised of diverse members from the community, such as emergency response representatives and Trimble County Building and Development, played a key role in developing both the KIPDA Regional Safety Action Plan and the Trimble County Safety Action Plan. Participants provided valuable feedback and insights into existing safety issues and concerns through two safety committee meetings.

Meeting One

Four committee members attended the first meeting, which introduced the Safety Action Plan, its key components, and the Safe System Approach. The committee discussed historic crashes and brainstormed improvements for their local vehicular, pedestrian, and cyclist safety concerns. Data provided to the Committee included detailed crash maps organized by severity – including those for pedestrians and bicyclists – and intersection crash maps showing total and severe crashes. The committee's discussion focused on vehicular and pedestrian safety concerns, road maintenance, driver visibility, lack of sidewalks, and vehicular speed. Other safety topics identified in the meeting included messaging for safety-related agencies to coordinate engagement efforts.

Figure 4-1: Meeting One Brainstorming Exercise

Meeting Two

Five committee members attended the second meeting. The Committee reviewed the draft prioritized HIN corridor segments, prioritized intersections, and potential safety countermeasures. The data provided included a preliminary ranking for each intersection and HIN corridor. It also included descriptions of potential countermeasures with their expected safety impacts. The project team provided maps of the HIN corridors and intersections for reference. The committee provided their priorities for both the HIN and the intersection list. They also provided feedback on what improvements they thought would be most appropriate and beneficial. There were four activities designed to elicit this information.

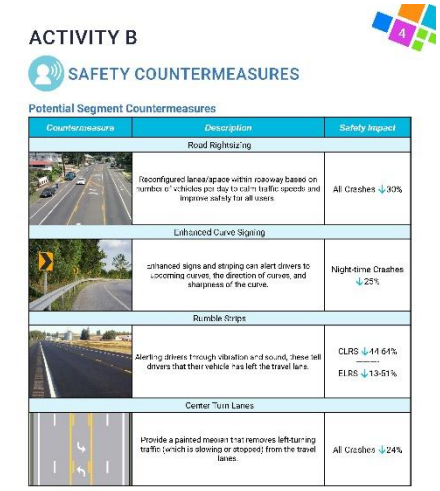


Figure 4-2: Meeting Two Handout: Potential Safety Countermeasures

Activity A: Prioritizing HIN Corridors – There was general agreement on the top ranked HIN corridors with participants agreeing on the top three in that order. The committee thought HIN segments 8 (US 421 near Henry County) and 9 (Barebone Road) should be considered as a high priority due to frequently carrying hazardous materials.

Activity B: Potential Corridor Improvements - Most participants noted that all recommendations were appropriate with only minor notes about high friction surfacing and defined school bus stops. The committee noted that turn lanes for the high school get backed up and they think 3 lanes should be considered on US 421 through Bedford.

Activity C: Prioritizing Intersections – The committee expressed interest in prioritizing several intersections that they thought were critical even though they had not had a fatal or serious injury crash in the last five years. The crash data from the last five years had them ranked lower on the list. These locations have been highlighted in **Chapter 6. Strategy and Project Selection**. The committee also thought the safety issues at intersection 10 (US-42 and Millers Branch Rd) had already been addressed.

Activity D: Potential Intersection Safety Countermeasures – The committee agreed with the recommendations but also proposed additional improvements at several of the intersections, such as adding turn lanes, improving lighting, and enhancing pedestrian safety. These suggestions have been incorporated into **Chapter 6. Strategy and Project Selection**.

The committee also discussed the desire for a third lane through Bedford and key safety improvements such as sidewalks on US 421 north of Bedford, signage upgrades throughout the county, and crosswalks near schools. Additionally, concerns were raised about sight-distance and the potential for a flashing caution light near the Dollar General store.

Public Engagement

Survey One

The project team and committees conducted public engagement for the Safety Action Plan through an interactive online map. Residents within the KIPDA Region, including Trimble County, could provide input by identifying specific pedestrian, bicycle, or vehicle concerns on a map. Participants could add comments, images, and review or react to the contributions of others. This input offered valuable community perspectives on local safety issues.

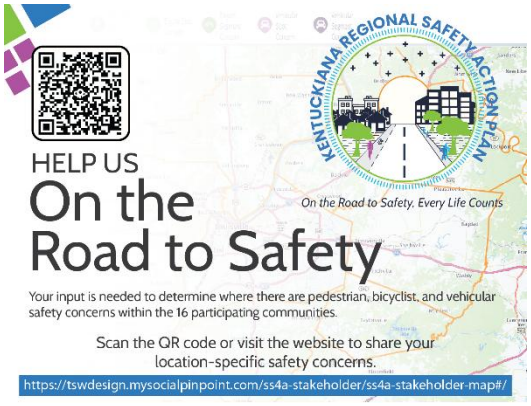


Figure 4-3: Promotional Flyer for Community Survey

The survey was available between July 9, 2024, and October 18, 2024. A total of 1,047 comments were collected for the entire region, with 13 comments located within Trimble County. Figure 4-4 provides an example view of the engagement map. The table that follows provides identified safety concerns.

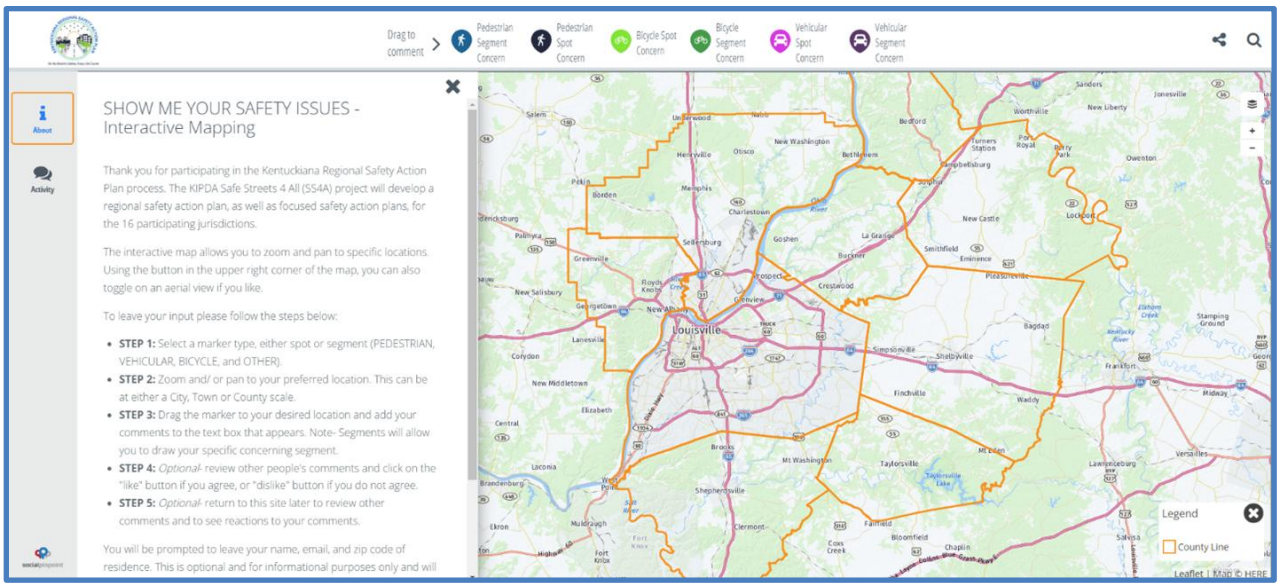


Figure 4-4: Social Pinpoint Online Engagement

Vehicular Safety Concerns

- Signalization
- Blind Turns
- Narrow roads
- Speed Limits
- Roadway Markings
- Pavement Condition
- Roadway Width
- Intersection Improvements
- Roadway geometrics
- Signage
- New Roadway
- Bridge Approach
- Turning lanes

Pedestrian Safety Concerns

- Adding sidewalks
- Adding crosswalks

The feedback collected from this platform played an integral role in identifying high-risk areas and shaping safety strategies so that the KIPDA Regional Safety Action Plan and the Trimble County Safety Action Plan address the concerns and needs of the public. The project team compared comment locations to the fatalities (K) and suspected serious injuries (A) in the 2018-2022 crash data to compare public perception of safety and data-driven crash densities. The following map shows the crash locations (blue) with the public comments (yellow). The locations where these two colors overlap (green-toned areas) represent locations where the perception of a safety issue is consistent with where severe crashes have occurred. An example of this is along the US Highway 42 corridor.

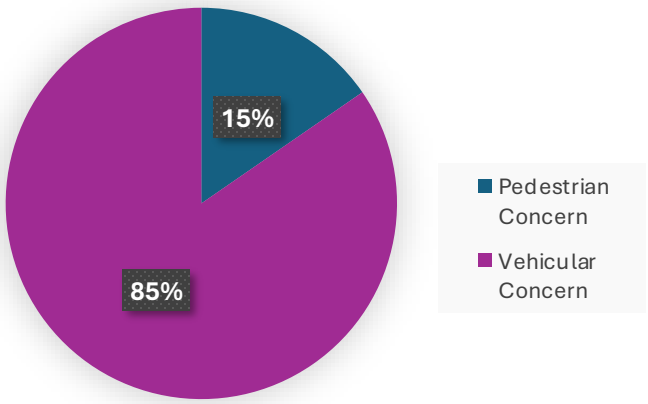


Figure 4-5: Total Comments from Trimble County

"KY 36 is very narrow, including the bridge. The turn at the bottom of the intersection of US 421 and KY 36. Several fatalities have happened in this stretch of road."

- *Vehicular Safety comment along KY 36*

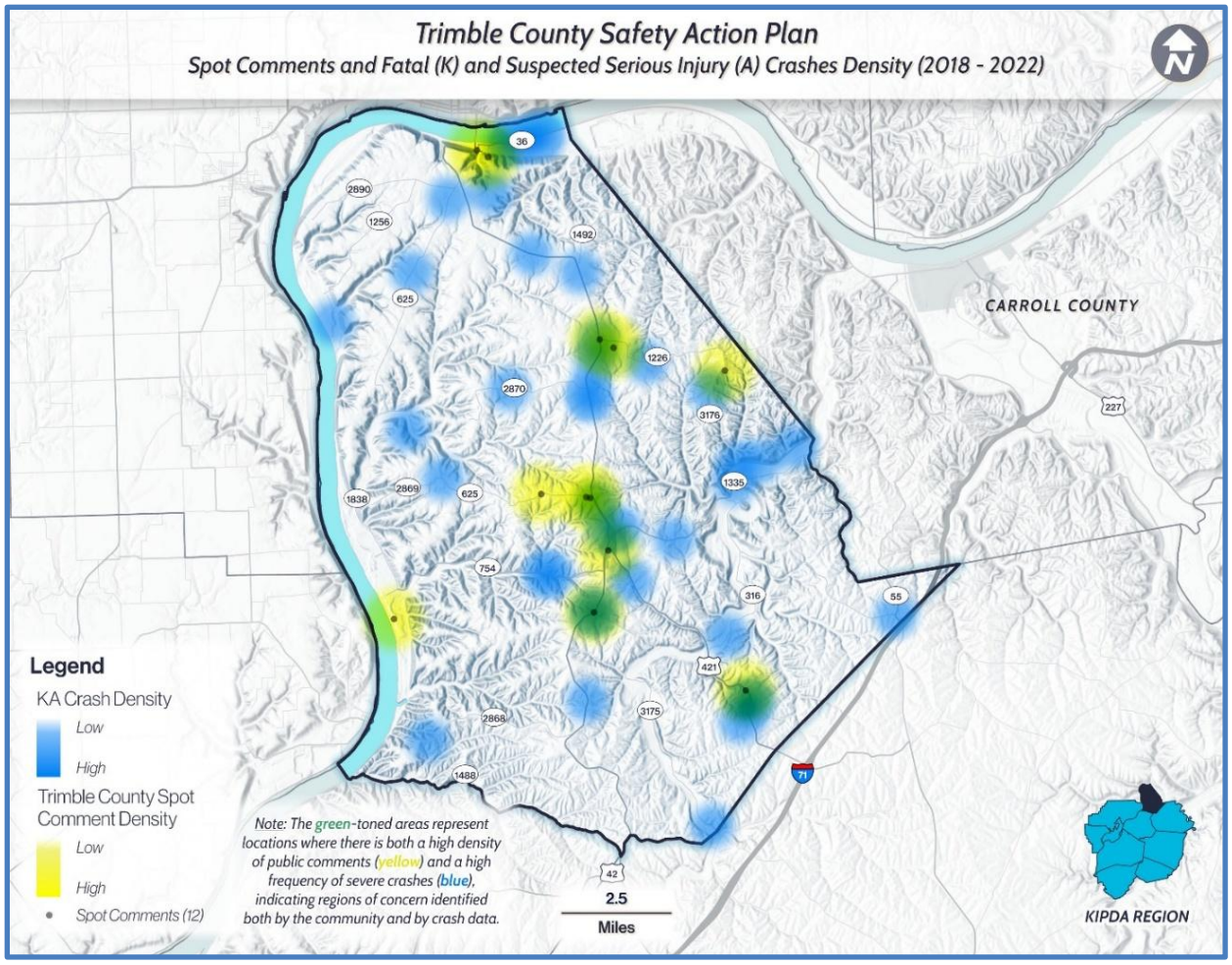


Figure 4-6: Safety Concern Comments and High Severity Crash Density

Survey Two

The project team and committees conducted a second public survey for the Safety Action Plan. Residents within the KIPDA Region, including Trimble County, could provide input on the results of the crash data analysis and potential countermeasures to improve safety in each community. Participants could provide opinions on whether the identified recommended strategies and safety improvements were appropriate for each community. Links to additional information about the recommended strategies were included for reference.

The survey was available between April 1, 2025, and April 30, 2025. A total of 524 responses were collected for the entire region, but only a small number of these were in Trimble County. The respondents generally agreed with the top priority projects, especially KY 36 along the Ohio River.

Active and Planned Projects

The transportation plans of all relevant stakeholders, including the Kentucky Transportation Cabinet Enacted Highway Plan (2024-2030) and ongoing Trimble County projects were considered to identify and document project overlaps and stages of project development. This collaborative effort is summarized in the following table and map highlighting the current projects with committed funds that are actively moving forward. Note that projects 3 and 4 listed below are potential future projects in planning and are not shown on the map. Projects in the county that are listed in the Continuous Highway Analysis Framework (CHAF) are provided in Appendix A for reference.

Map No.	KYTC Item (CHAF ID)	Route	Begin	End	Status	Description
1	5-905.00	US 421	11.278	11.678	Committed	Address safety issues and access at the intersection of US 421 and Palmyra Rd (KY 1226)
2	5-8712.00	US 421	7.6	7.9	Complete	Construct turn lanes into Trimble County High School
3	5-80309.00	KY-36	0.0	2.2	Planning	Improve safety, truck mobility, and address geometric deficiencies along KY 36 [approximately from Carroll County line to US 421].
4	5-80337.00	US 421	7.0	7.8	Planning	Construct pedestrian facilities from Cutshaw Lane to Trimble County High School and along KY 625 to Bedford Elementary School

Table 4-1: Current Highway Plan Projects

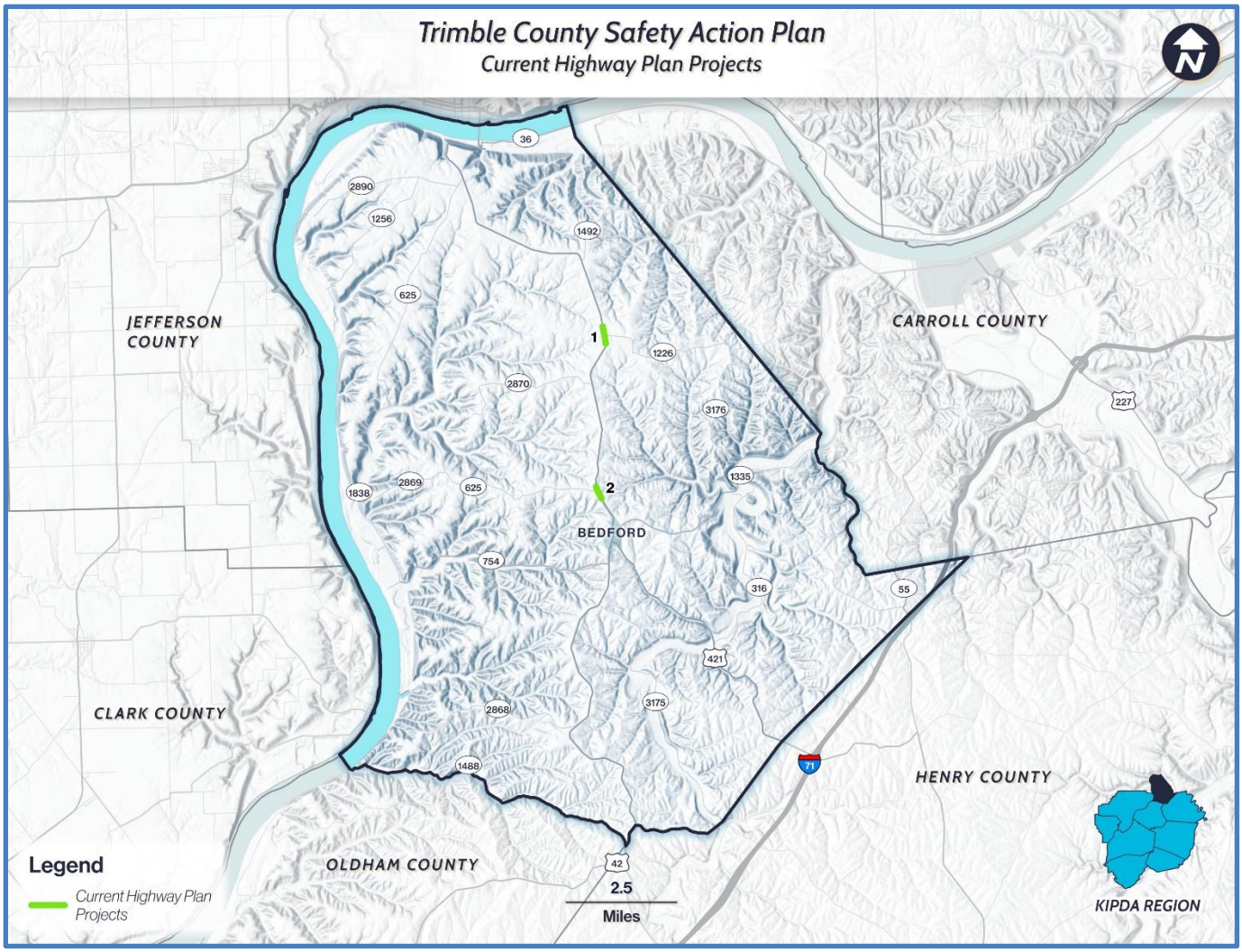


Figure 4-7: Highway Plan Map

Community Considerations

The Safety Action Plan analyzed socio-economic and demographic data together with the crash data to determine if there are important trends, findings, or considerations related to specific areas or communities within the county.

Areas of Persistent Poverty

The Safe Streets and Roads for All 2025 Notice of Funding Opportunity defines Areas of Persistent Poverty based on the Infrastructure Investment and Jobs Act (IIJA, 49 U.S.C. 6702(a)(1)). It also states that this applies as the definition of Underserved Communities. Based on this definition, a project is located in an Area of Persistent Poverty if:

1. *The County in which the project is located consistently had greater than or equal to 20% of the population living in poverty in all three of the following datasets: (a) the 1990 decennial census; (b) the 2000 decennial census; and (c) the most recent (2021) Small Area Income Poverty Estimates; OR*

2. *The Census Tract in which the project is located has a poverty rate of at least 20% as measured by the 2014-2018 5-year data series available from the American Community Survey of the Bureau of the Census; OR*

3. *The project is located in any territory or possession of the United States.*

Trimble County is not located within a designated Area of Persistent Poverty.

Community Demographic Summary

Elderly Population

Approximately 18.1% of the population in Trimble County is 65 or older. The north and west portions of the county have higher percentages as shown on Figure 4-8. Portions of the county with high elderly populations should consider tailored roadway safety countermeasures. Oversized signage, lighting, pedestrian refuge islands, leading pedestrian intervals (LPIs), and raised crosswalks are some of the countermeasures that benefit elderly populations.

Population Impacted by Disability

In Trimble County, approximately 37.5% of households have one or more occupants with a disability. Similar to elderly populations, there are safety countermeasures available that support disabled populations. Many of these relate to pedestrian facilities such as curb ramps.

Population Experiencing Poverty

Approximately 13.7% of the population are at or below the poverty line. The southeast portion of the county has the highest poverty rate. Areas with high poverty rates are often areas of

underinvestment with regard to infrastructure and safety. Many of the severe crashes have occurred in or along the border of the southeast portion of the county; therefore, consideration should be given to investing in safety upgrades in this area.

Minority Population

Approximately 6.4% of the population of Trimble County identifies as non-white. The southeast portion of the county has the highest percentage of minorities. Given the location of crashes in the county over the five-year period, consideration should be given to investing in safety upgrades in this area.

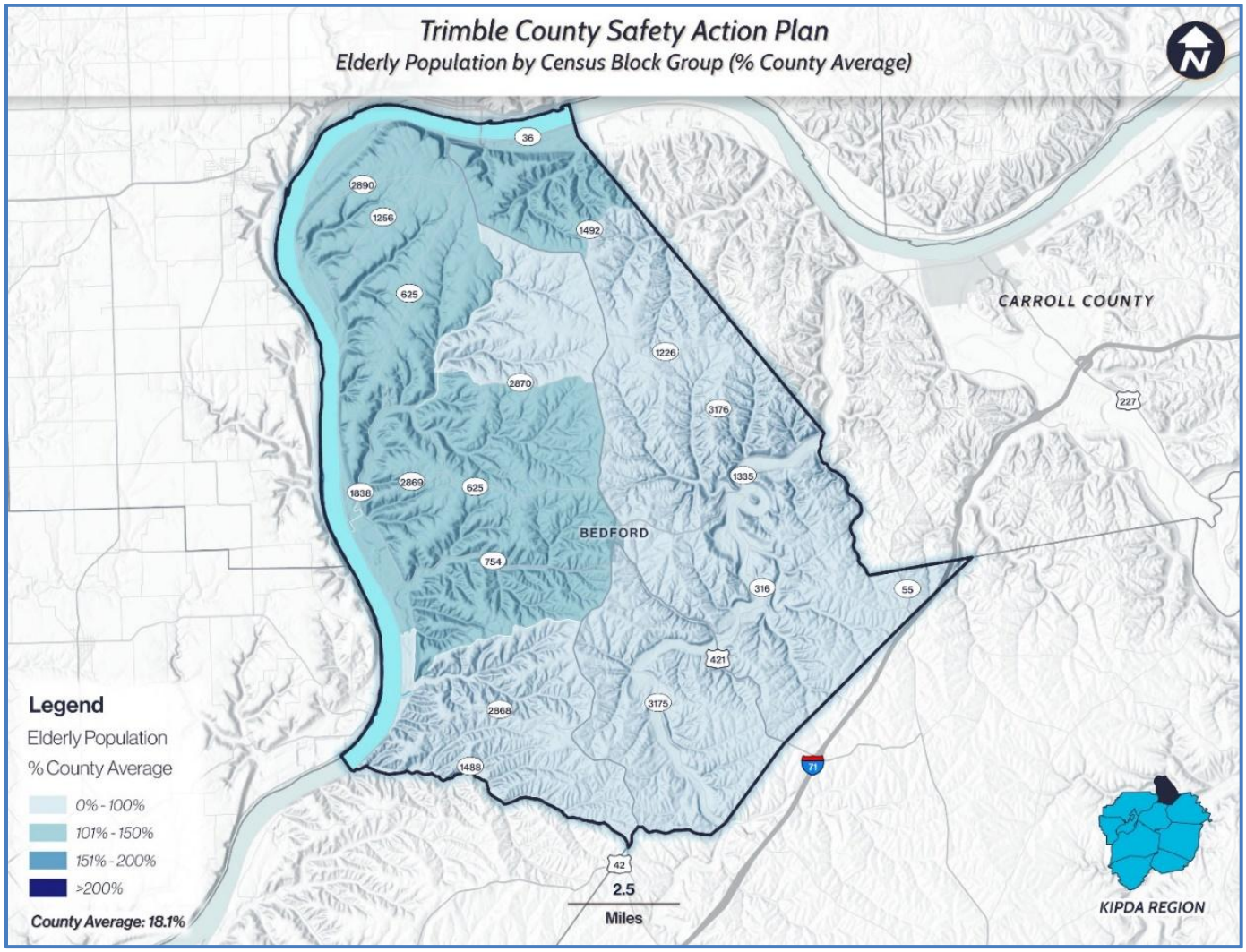


Figure 4-8: Elderly Population by Census Block Group Map

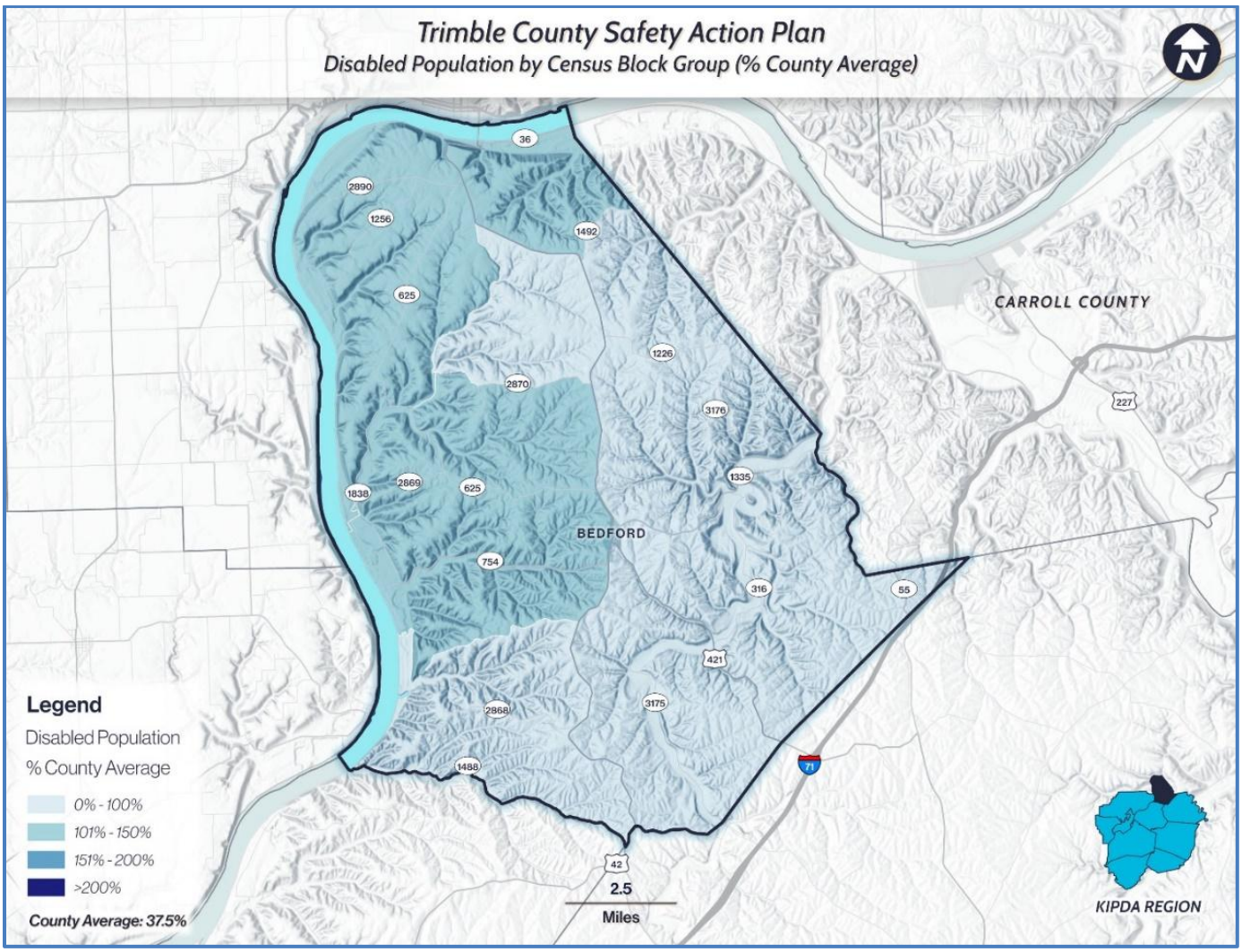


Figure 4-9: Disabled Population by Census Block Group Map

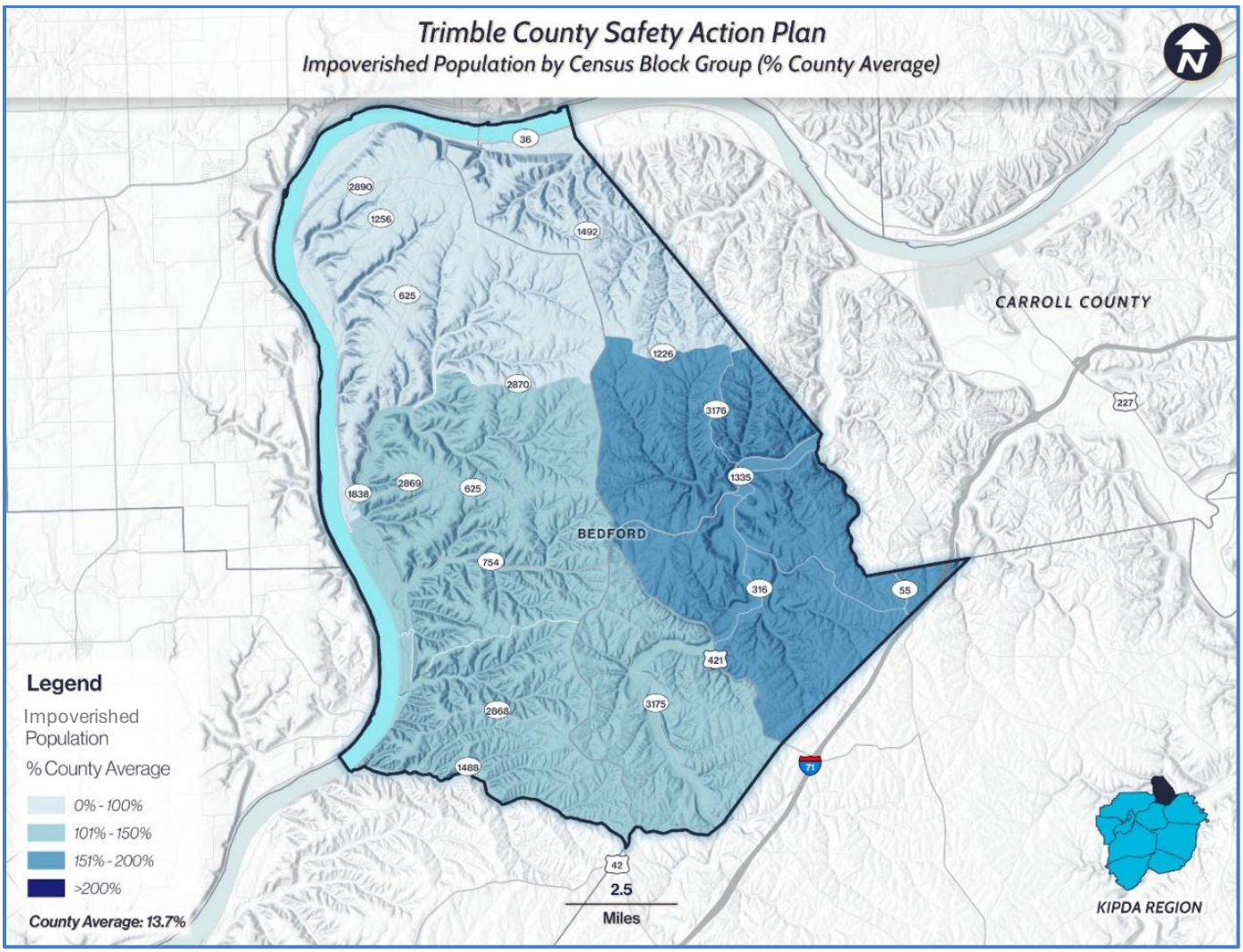


Figure 4-10: Impoverished Population by Census Block Group Map

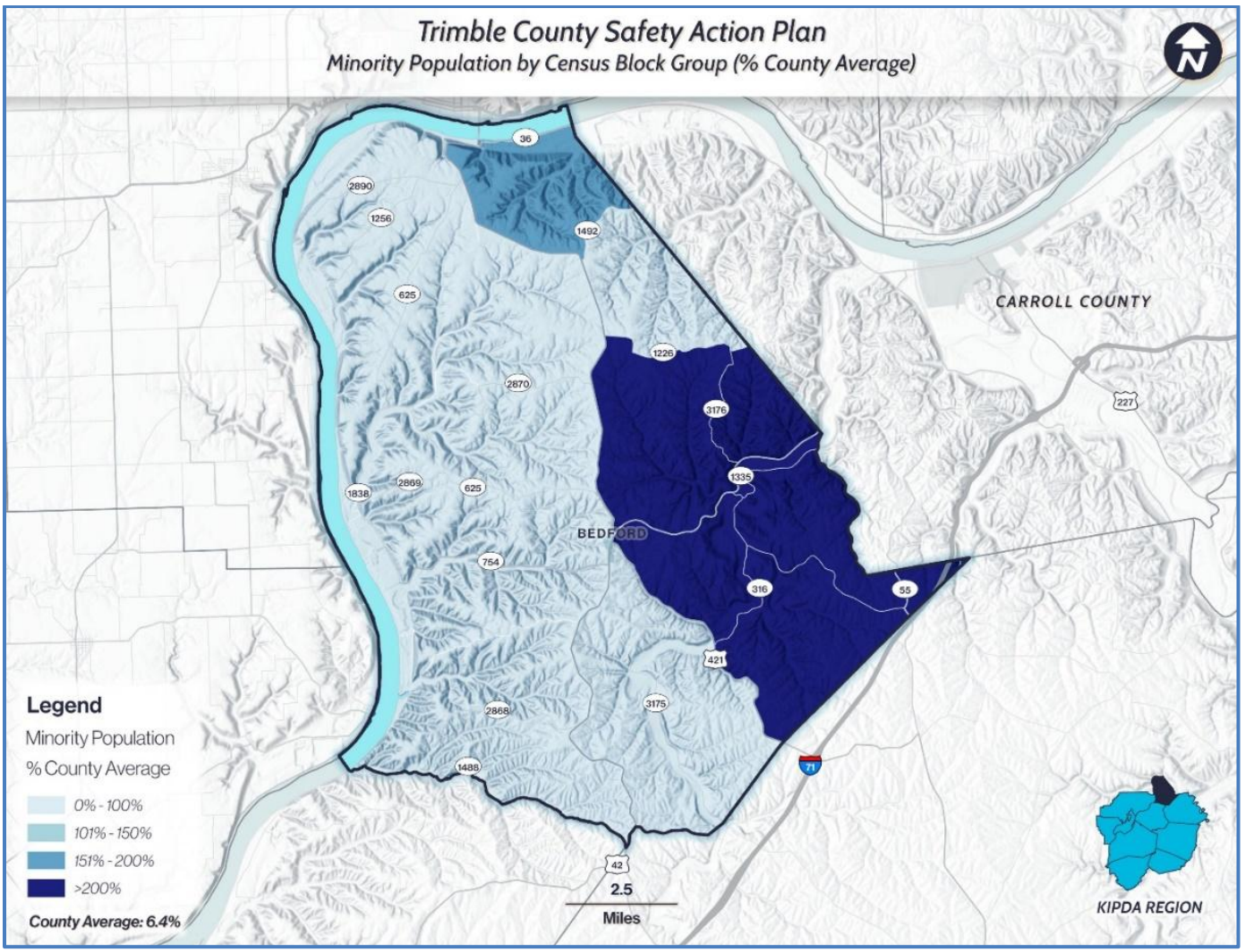
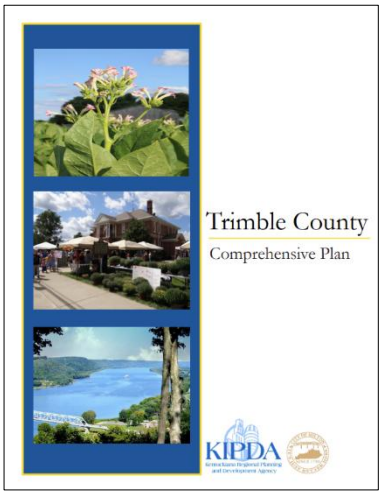


Figure 4-11: Minority Population by Census Block Group Map

5. Policy and Process Changes

A comprehensive review of Trimble County's existing policies, plans, guidelines, and standards has identified key opportunities to enhance transportation safety. The county aims to elevate safety as a priority while also creating a more accessible transportation network for all users.

Comprehensive Plan - 2017



Link: Trimble County Comprehensive Plan 2017

The Trimble County Comprehensive Plan is a planning document prepared and adopted by the citizens and officials of Trimble County and its cities. This plan is intended to provide a long-range guide for the public and private sectors of the county and its two incorporated cities.

The overall transportation goal of this comprehensive plan is to promote the most efficient and safe movement of people and goods throughout the transportation system. To achieve this goal, the plan provides six objectives:

Objective A: Support the development of new walking and biking trails to create an alternative transportation and recreation network.

Objective B: Existing substandard rights-of-way and roadways should be upgraded when new development occurs.

Objective C: The construction and repair of sidewalks should provide for the safe movement of pedestrians through new residential subdivisions and in Bedford and Milton.

Objective D: Maintain the existing roadways to ensure good condition and safety. Improve street systems by upgrading existing roads in accordance with county criteria.

Objective E: Identify high-priority transportation improvements and advocate for their inclusion in the State of Kentucky's Six-Year Road Plan.

Objective F: Continue to promote the improvements along US 421.

Future Comprehensive Plan Considerations

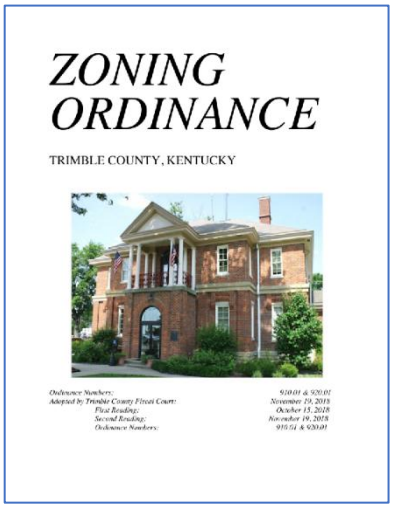
It is recommended that future comprehensive plans and/or amendments consider the following:

Implement Context Sensitive and Active Transportation Street Policies: To improve how processes prioritize safety, it is recommended to develop context-sensitive street guidelines that support safety, connectivity, comfort, and accessibility for all users. These guidelines would be applied to new and existing road projects, ensuring that streets are designed to accommodate

pedestrians, cyclists, motorists, and transit riders. These types of policies are sometimes referred to as complete street policies. KYTC has an adopted a Complete Streets, Roads, and Highways Manual that can serve as a reference.

Promote Safe and Accessible Transportation for All: Promote transportation improvements that address the needs of all community members. Conduct periodic community-focused analyses to identify and mitigate transportation safety and access hot spots.

Zoning Ordinance As Amended – 2024/2025


ZONING ORDINANCE

TRIMBLE COUNTY, KENTUCKY

The regulations and requirements were established in accordance with the comprehensive plan with reasonable consideration, among other things, of the prevailing land uses, growth characteristics, and the character of different zoning districts and their suitability for uses. The ordinance is intended to encourage the most appropriate use of land throughout the planning unit. This Code provides regulations to implement the adopted Comprehensive Plan's goals, objectives, and policies. References to the individual goals, objectives, and policies are contained in the Chapters of this Code.

Future Zoning and Subdivision Considerations

These recommendations include guidance for future plan amendments that support eliminating road deaths and serious injuries.

Traffic Calming Measures: Consider updating regulations to include guidelines for traffic calming measures, such as roundabouts, speed humps, chicanes, and raised intersections and crosswalks in residential subdivisions to reduce vehicle speeds and enhance safety for pedestrians and bicyclists. Implementing traffic calming strategies will reduce the risk and severity of crashes.

Active Transportation Infrastructure: Consider updating active transportation infrastructure requirements for new developments within the county to encourage safe access for all vulnerable road users. Sidewalks should meet accessibility standards and provide safe crossings at all intersections. Consider incorporating dedicated pathways or multi-use trails in all new developments and requiring connectivity to existing pedestrian and active transportation networks.

Traffic Safety Analysis and Improvements: Consider including language that requires a traffic safety analysis to demonstrate that the development or subdivision is not significantly impacting safety on nearby roads or intersections. Language could also be integrated into zoning and subdivision ordinances to provide for the analysis of, and recommendations for, potential countermeasures to address any potential impacts.

6. Strategy and Project Selections

The development of strategies and project selection is based on a comprehensive analysis of historical crash data, implementation of best practices, active engagement with stakeholders and the community, and an assessment of Areas of Persistent Poverty (APP) and Underserved Communities. The reactive approach involves a detailed examination of crash data by frequency, severity, and location to identify the areas needing improvement the most. The following sections detail the methodology for prioritizing projects and strategy selection.

Prioritization

The County's goal is to eliminate fatal and serious injury crashes. Therefore, crash severity is a critical factor in prioritizing projects and strategy selection. Comprehensive crash costs combine the economic cost of a crash and monetized pain and suffering. The Federal Highway Administration (FHWA) developed national crash costs to use as default crash unit values (Crash Costs for Highway Safety Analysis), that states and municipalities can adjust based on regional differences. Table 6-1 provides the comprehensive cost per crash adjusted to the KIPDA region as prescribed in the FHWA Crash Costs for Highway Safety Analysis.

Severity	Severity Description	Comprehensive Cost Per Crash (2022 Dollars)
K	Fatal Injury	$10,175,024
A	Suspected Serious Injury	$594,471
B	Suspected Minor Injury	$182,274
C	Possible Injury	$116,572
O	No Apparent Injury	$12,220

Table 6-1: KIPDA Comprehensive Crash Cost

Equivalent Property Damage Only Method

The Equivalent Property Damage Only (EPDO) is a method of weighting crashes by severity using the equivalent number of No Apparent Injury Crash costs, also called Property Damage Only (PDO) crash costs, to develop the weights. The following table shows the comprehensive costs and EPDO value breakdown by crash severity.

Severity	Comprehensive Cost Per Crash (2022 Dollars)	EPDO Weighted Value
K	$10,175,024	833
A	$594,471	49
B	$182,274	15
C	$116,572	10
O	$12,220	1

Table 6-2: KIPDA EPDO Crash Value

As shown in Table 6-2, the comprehensive cost of a fatal crash (K) compared to the other crash severities is significant. The EPDO method, however, may overly emphasize fatal crashes, potentially skewing focus towards areas with fewer crashes. To address this imbalance, analysts used a modified EPDO (MEPDO) approach to equally consider both fatal and suspected serious injury crashes by blending their values based on their comprehensive costs and frequency. Table 6-3 presents a breakdown of the MEPDO, providing a more balanced evaluation while maintaining a focus on fatal and suspected serious injury crashes. The crashes for the entire KIPDA region were used to calculate weighted average costs and MEPDO.

Severity	Crashes	Comprehensive Cost Per Crash (2022 Dollars)	Severity	Weighted Average Costs*	MEPDO Value
K	618	$10,175,024	KA	$2,224,193	182
A	3,015	$594,471			
B	12,841	$182,274	B	$182,274	15
C	11,770	$116,572	C	$116,572	10
O	113,611	$12,220	O	$12,220	1

** KA Cost = (618*$10,175,024+3,015*$594,471) / (618+3,015) = $2,224,193*
*** KA Value = $2,224,193 / $12,220 = 182*

Table 6-3: KIPDA MEPDO Crash Value

Reactive Approach

Methodology

The reactive approach for analyzing crashes includes joining the crash data with roadway data. KYTC provided geographic information system (GIS) files of roadway and traffic data, known as the Highway Information System (HIS) database. HIS data includes roadway characteristics and traffic data for state-owned roadways. Analysts combined the crash data with GIS information to facilitate detailed analysis by identifying the location of the crashes by road segment and intersection.

After joining the crashes to the roadway segments and intersections, analysts applied the MEPDO method to generate lists of prioritized intersections and corridors.

The lists are for planning purposes only. The intersections and corridors identified could potentially benefit from safety countermeasures; however, it is not necessary to make improvements in the listed order. In addition, there may be other high priority locally identified safety projects. Therefore, these lists provide high-level planning guidance for future agency consideration

Intersections

Enhancing safety at intersections is vital for achieving a Safe System Approach. Evaluating roadway features such as geometrics and traffic operation and control is necessary for eliminating fatal and serious injury crashes. Intersections are deliberate points of interaction where vehicles and non-motorized users converge, significantly impacting the overall safety performance of the transportation system. These conflict points are historically where fatal and serious injury crashes occur. Therefore, intersection projects present unique opportunities to incorporate Safe System principles into planning, design, and operational decisions. Improving intersections can play a significant role in eliminating fatal and serious injury crashes.

Prioritized Intersections

Trimble County experienced 12 fatal and suspected serious injury crashes at intersections, representing 30% of all fatal and suspected serious injury crashes. These crashes occurred at both signalized and unsignalized intersections. Both intersections contain multiple conflict points and offer significant opportunities to enhance safety for all users. MEPDO was calculated and ranked for each intersection.

Table 6-4 lists the top 20 intersections by MEPDO. The top 11 intersections account for all 12 fatal and suspected serious injury crashes that occurred at intersections. The remaining nine intersections tended to have higher numbers of crashes but with lower severities.

Ranking	Intersection	K	A	B	C	O	KA	TOTAL	MEPDO
1	US-42 and Sulphur Bedford Rd	2	0	0	0	2	2	4	366
2	Main St (US-421) and Palmyra Rd (KY-1226)	0	1	1	0	4	1	6	201
3	Main St (US-42) and Wentworth Ave	0	1	1	0	1	1	3	198
4	KY-55 and KY-316	0	1	0	1	0	1	2	192
5	KY-36 and Richwood Rd Ext	1	0	0	0	1	1	2	183
6	KY-36 and Riverdale Dr	0	1	0	0	1	1	2	183
7	Main St (US-421) and Greenbriar Rd	1	0	0	0	0	1	1	182
8	Burkhardt Bottom Rd and Spring Creek Ln	1	0	0	0	0	1	1	182
9	Palmyra Rd (KY-1226) and Trout Ridge Rd	0	1	0	0	0	1	1	182
10	US-42 and Millers Branch Rd *(recently improved)*	0	1	0	0	0	1	1	182
11	Mount Pleasant Rd (KY-625) and Conner Ridge Rd	1	0	0	0	0	1	1	182
12	US-42 (Main St) and Spring Ave	0	0	1	3	14	0	18	58
13	US-42 (Main St) and US-421	0	0	1	0	20	0	21	35
14	US-42 and Pendleton Ave	0	0	1	1	0	0	2	24
15	Main St (US-421) and Mount Pleasant Rd (KY-625)	0	0	1	0	7	0	8	22
16	Main St (US-421) and Milton-Bedford Pike	0	0	1	0	6	0	7	21
17	Main St (US-421) and KY-36 (Ferry St)	0	0	0	1	11	0	12	21
18	Main St (US-421) and New Hope Rd	0	0	1	0	4	0	5	19
19	US-42 and Persell Rd	0	0	1	0	2	0	3	17
20	KY-36 (Ferry St) and High St	0	0	0	1	7	0	8	17

Table 6-4: Prioritized Intersections by MEPDO

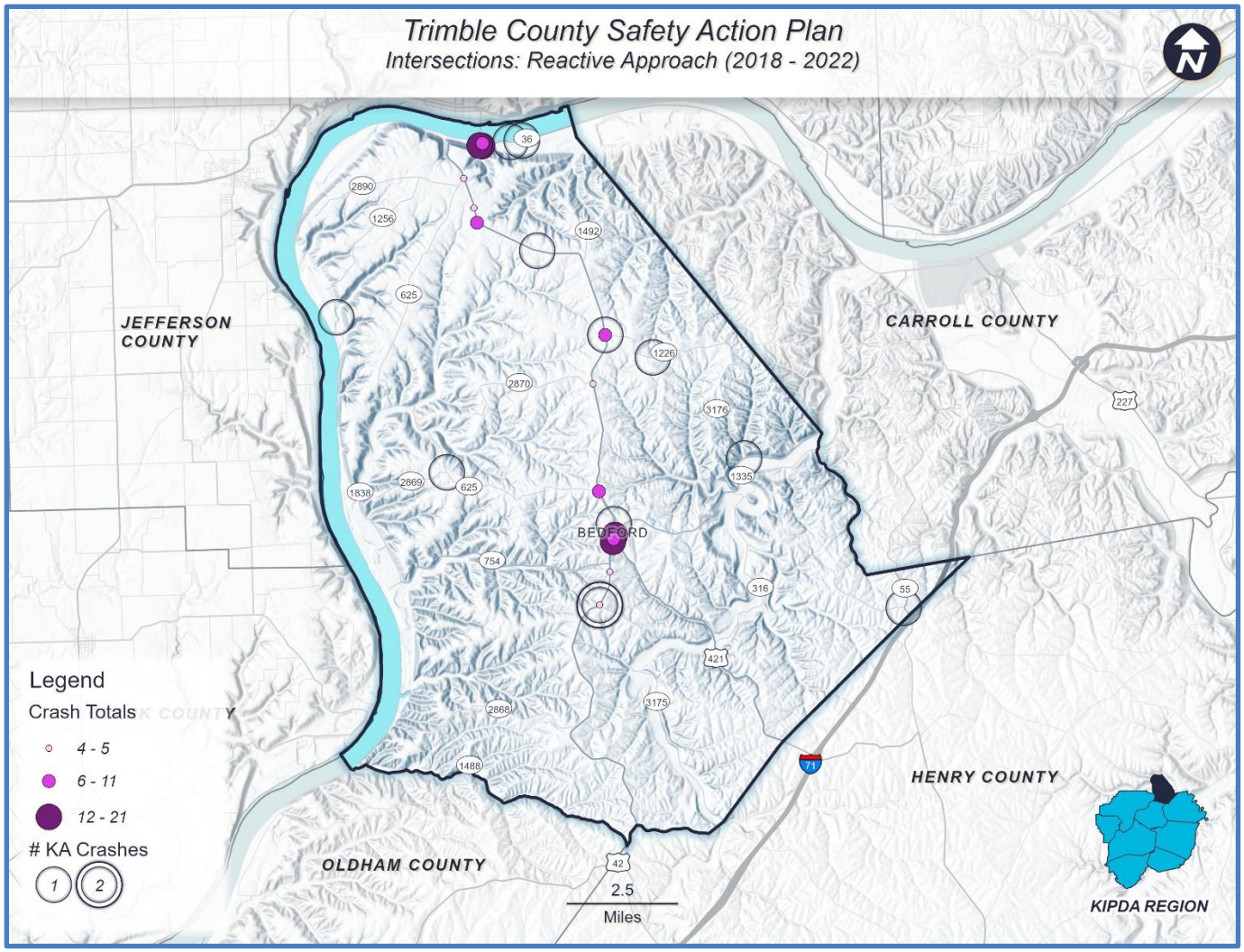


Figure 6-1: Intersections - Reactive Approach Map

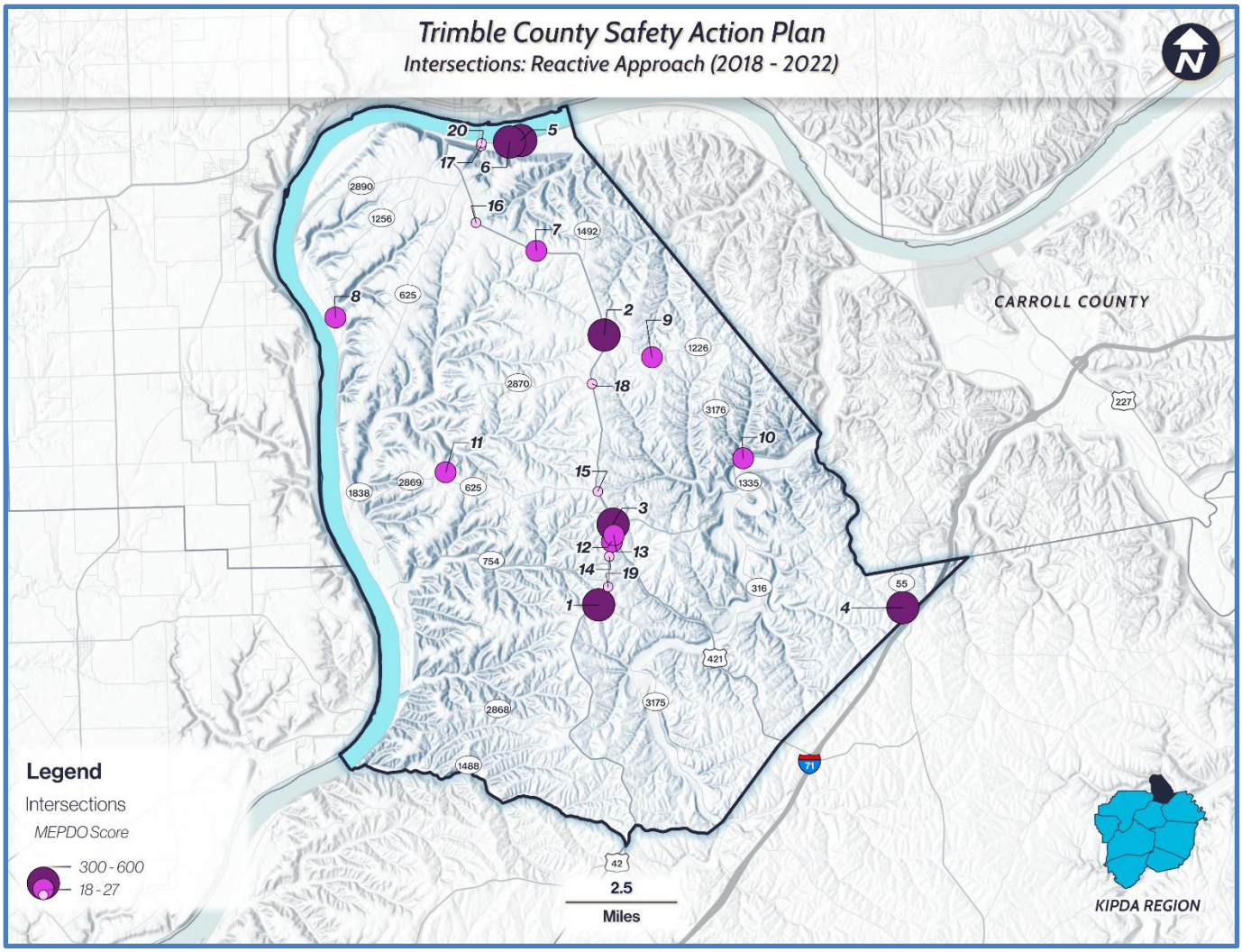


Figure 6-2: Intersections Prioritized by MEPDO Map

High Injury Network and Prioritized Corridors

A High Injury Network (HIN) is a data-driven approach to identify roadway segments that experience a disproportionately high number of fatal and serious injury crashes. This approach enables communities to focus resources on improving safety along those high-priority corridors. Trimble County's HIN was developed using detailed crash data analysis and GIS mapping to pinpoint corridors with the highest concentration of severe crashes. The following table and maps illustrate Trimble County's HIN, highlighting its overlap with locations of fatal and serious injury crashes, and prioritized intersections based on MEPDO analysis.

Ranking	Route	Begin	End	Length (mile)	MEPDO	MEPDO/ mile
1	Main St (US-421)	Main St (US-42)	Mount Pleasant Rd (KY-625)	1.08	563	523
2	Highway KY-36	US-421	Carroll County Line	2.21	841	381
3	Highway US-421	Mount Pleasant Rd (KY-625)	Palmyra Rd (KY-1226)	3.70	803	217
4	Highway US-42	Hardy Creek Rd (KY-1104)	Carroll County Line	2.97	617	208
5	Highway US-42	Morton Ridge Rd (KY-2868)	Persell Rd	3.67	710	193
6	Highway US-42 / Main St	Lawson Ave	Stark Ln	1.81	295	162
7	Highway US-421	Palmyra Rd (KY-1226)	Sprague Ln	3.06	495	162
8	Highway US-421	Henry Co. Line	KY-316	3.16	454	144
9	Barebone Rd (KY-754)	Perkinson Ln	Main St (US-42)	2.61	367	141
10	Peck Pike (KY-625)	Watson Tandy Rd	Highway US-421	2.77	379	137
11	Highway US-42	Stark Lane	Landy Hill Ln	1.71	192	113
12	McCord Ln / School Hollow Rd	Highway US-421	Spring Street	1.88	183	97
13	Highway US-421	KY-316	Town Branch Rd	3.21	302	94
14	Burkhardt Bottom Rd	Coopers Bottom Rd	End of Route	2.25	183	82

Table 6-5: Prioritized Corridors - High Injury Network

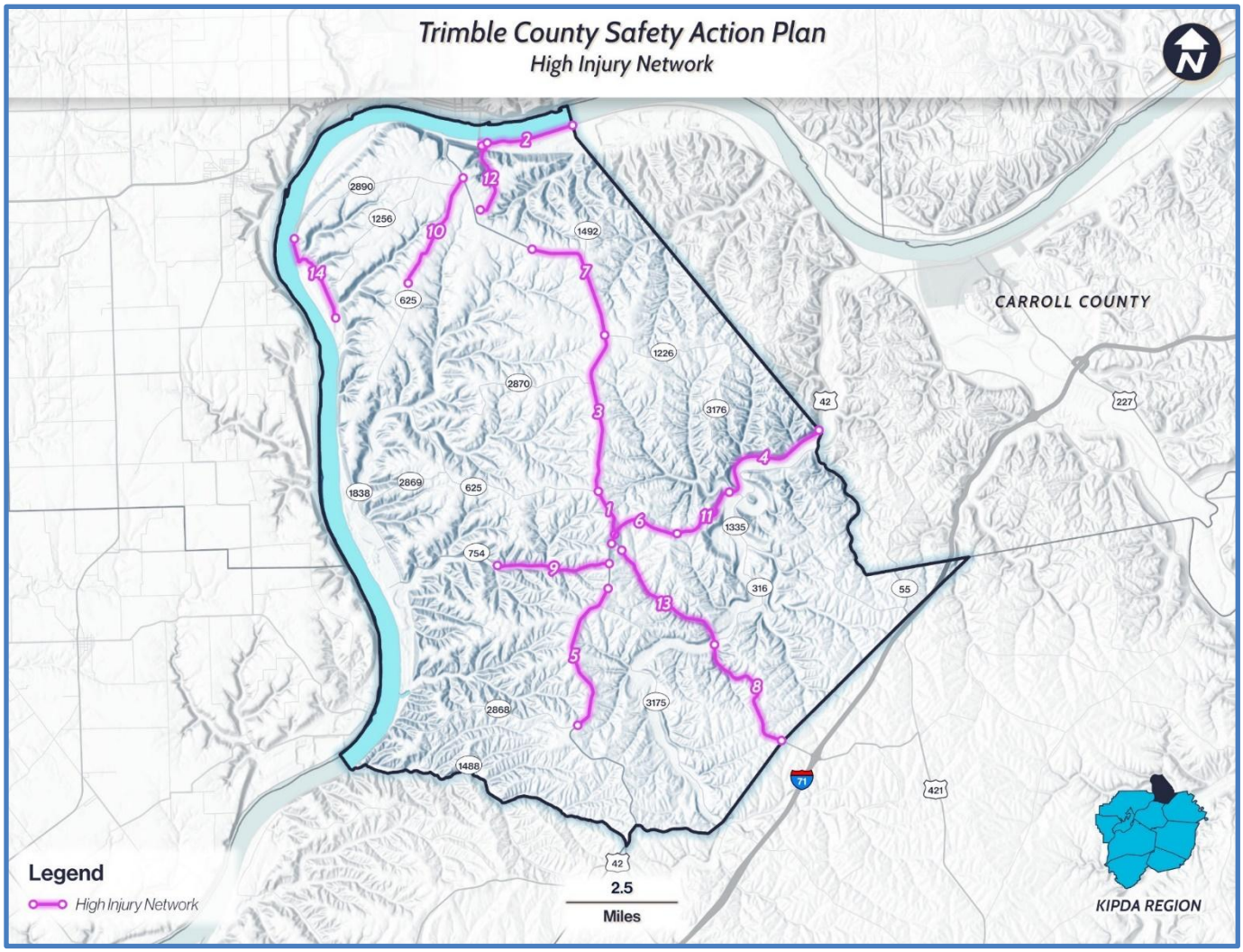


Figure 6-3: High Injury Network

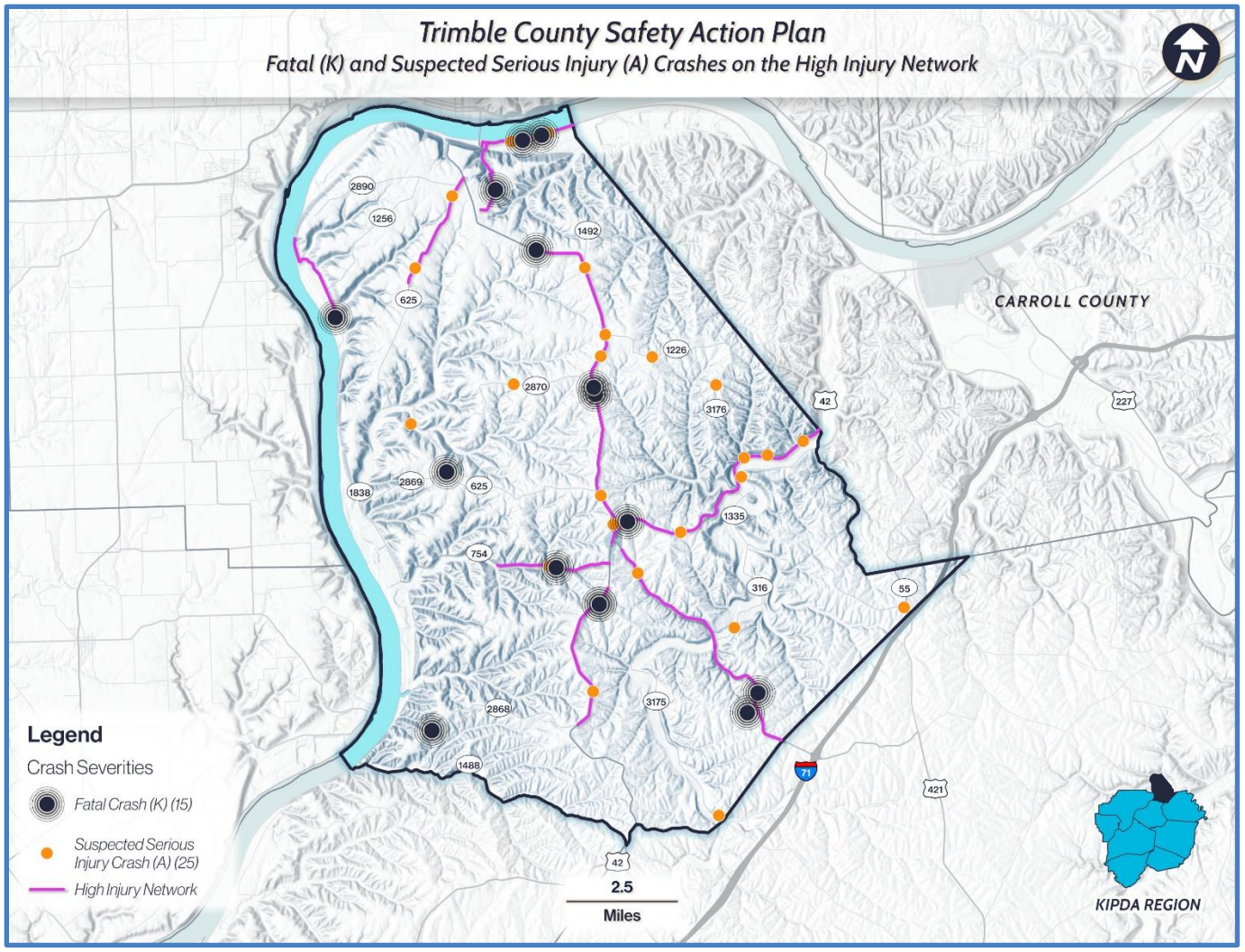


Figure 6-4: High Injury Network and Fatal and Suspected Serious Injury Crashes

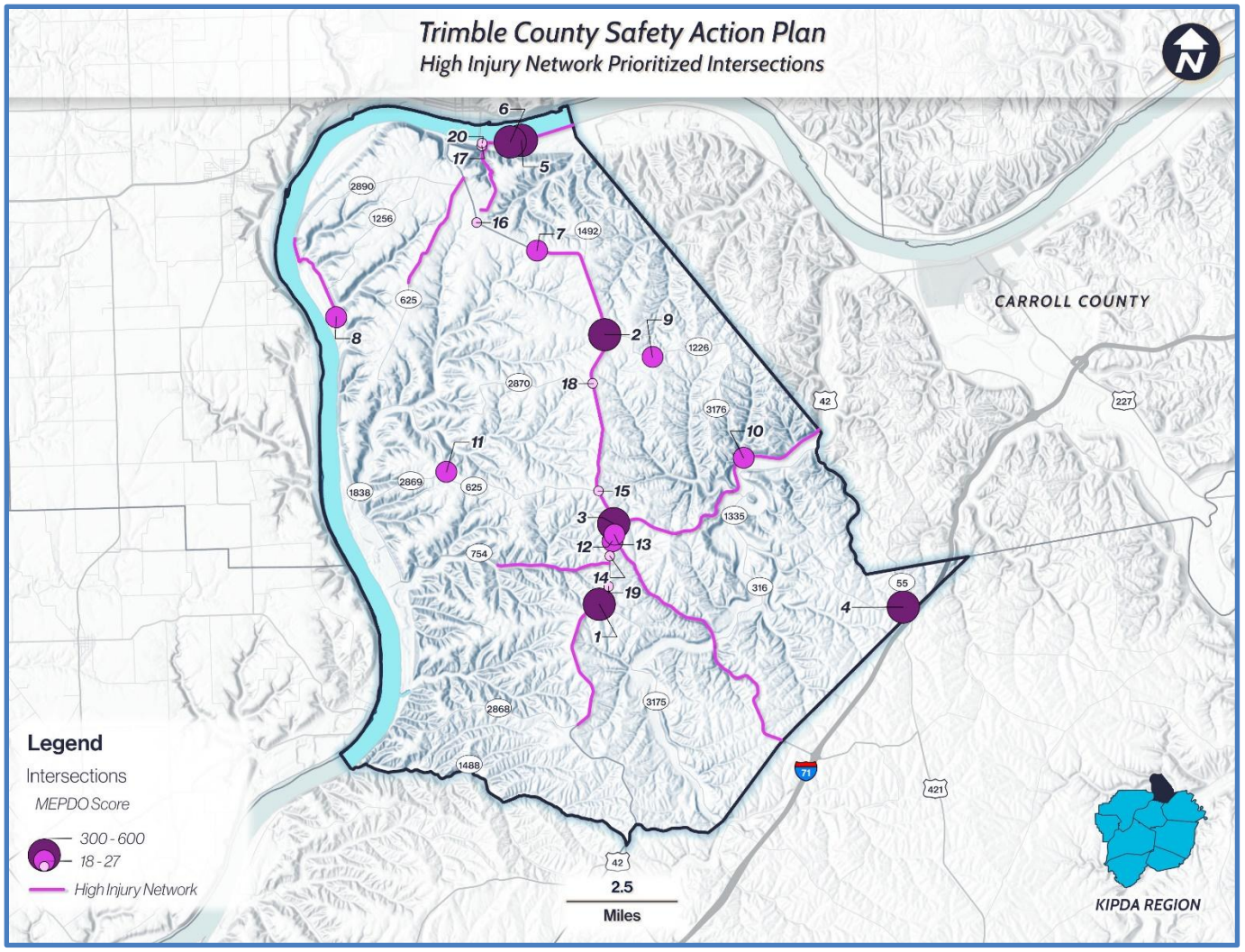


Figure 6-5: High Injury Network and Prioritized Intersections

Project Selection

A comprehensive set of recommended strategies and safety improvements was developed for the top-ranked intersections and corridors within the HIN. The improvements are based on the results of the safety analysis, feedback from Safety Committee and the public, and are guided by the principles of the Safe System Approach.

Proven Safety Countermeasures

The following tables present a selection of proven safety countermeasures designed to reduce crashes. These measures are informed by before-and-after crash data from case studies. The countermeasures are organized into roadway segment and intersection improvement tables. The countermeasures includes an image, a description of the countermeasure's safety benefits, estimated safety impact statistics, and a link for further information.

Countermeasures should be implemented as appropriate based on the prioritized project locations. Estimated cost ranges for safety countermeasures can be found in Appendix B. This appendix also includes a project implementation timeline reference chart, which provides high-level guidance on the time required to complete a range of potential safety improvement projects. Please refer to the notes on the chart during the development of project timelines.

Additional information on potential safety countermeasures can be found using these links:

Proven Safety Countermeasures (Federal Highway Administration)
https://highways.dot.gov/safety/proven-safety-countermeasures

Innovative Intersections (Virginia Department of Transportation)
https://www.vdot.virginia.gov/about/our-system/highways/innovative-intersections/virginia-icap/

Federal Highway Administration Safety Programs
Intersection Safety - https://highways.dot.gov/safety/intersection-safety/about
Roadway Departure Safety – https://highways.dot.gov/safety/RwD
Speed Management Safety - https://highways.dot.gov/safety/speed-management
Pedestrian and Bicycle Safety – https://highways.dot.gov/safety/pedestrian-bicyclist
Local and Rural Safety - https://highways.dot.gov/safety/local-rural
Safety Data Analysis and Tools - https://highways.dot.gov/safety/data-analysis-tools

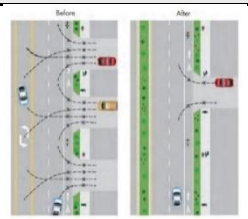
Example Segment Countermeasures							
Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Enhanced Delineation for Horizontal Curves				**Roadside Design Improvements at Curves**			
	High visibility markings and delineators around curves provide drivers with better information about curves.	Severe crashes ↓15-18%	FHWA		Includes treatments that improve horizontal curves, giving drivers the opportunity to recover safely or reducing crash severity.	Single Vehicle or All Crashes ↓8-44%	FHWA
Access Management (segment treatments)				**Medians and Pedestrian Refuge Islands**			
	Reducing the number and proximity of access points to focus turning traffic to fewer locations. Reduces turning conflicts.	2-lane Rural Road Crashes ↓5- 23% Urban Severe Crashes ↓25- 31%	FHWA		Provide curbed median between opposing travel lanes to provide separation, reduce left-turn risks, and improve pedestrian safety.	Ped Crashes ↓46-56% Vehicle Crashes ↓15%	FHWA and FHWA
Roadway Reconfiguration (Right Sizing or Road Diet)				**Shoulder Treatment – Safety Edge**			
	Often involves converting a 4-lane undivided road to a 3-lane road with 2 through lanes and a center two-way left-turn lane, which slows traffic and reduces conflicts.	All Crashes ↓19-47%	FHWA		Shoulder edge upgrades to improve recoverability for roadway departures.	Severe ↓11% Run-Off-Road ↓21% Head-On ↓19%	FHWA
Dynamic Speed Feedback Signs				**Pavement Friction Management**			
	Provide positive and negative feedback to drivers regarding their speed.	All Crashes ↓5%	FHWA (pg 5) FHWA Clearing house		High Friction Surface Treatment (HFST) can prevent roadway departure, intersection, and pedestrian-related crashes.	Severe Crashes at Curves ↓48% Crashes at Intersections ↓48%	FHWA

Table 6-6: Example Segment Countermeasures

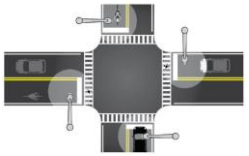
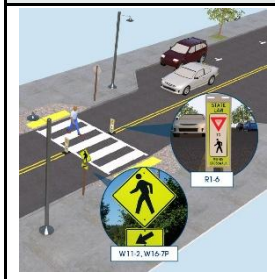
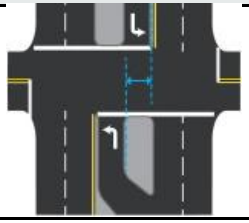
Example Intersection Countermeasures							
Countermeasure	Description	Safety Impact	Links		Countermeasure	Description	Safety Impact	Links
Access Management (intersection treatments)					**Intersection Lighting**			
	This refers to the design and control of access points including intersections which can enhance safety for all modes.	2-lane Rural Road Crashes ↓5- 23% Urban Severe Crashes ↓25- 31%	FHWA			Increased visibility at nighttime can improve safety for all modes of travel.	Nighttime Ped Injuries ↓42% Nighttime Crashes ↓33-38%	FHWA
Crosswalk Visibility Enhancement					**Reflective Backplates**			
	High-visibility crosswalks can reduce pedestrian injury crashes.	Pedestrian Injury Crashes ↓40%	FHWA			Improve the visibility of the illuminated face of the signal by introducing a controlled-contrast background.	Total Crashes ↓15%	FHWA
Low-Cost Countermeasures at Stop-Controlled Intersections					**Modern Roundabouts (RAB)**			
	Deploying a package of low-cost countermeasures, including enhanced signing and pavement markings increasing driver awareness.	Severe Crashes ↓10% Night Crashes ↓15% Rural Severe Crashes ↓27%	FHWA			Converting an intersection (stop or signal) into a roundabout can slow traffic. It also minimizes conflicts and reduces crash severity.	2-way Stop to RAB Severe Crashes ↓82% Signal to RAB Severe Crashes ↓78%	FHWA
Left and Right Turn Lanes					**Positive Offset Left-Turn Lane**			
	Left and right turn lanes provide physical separation between through traffic and turning traffic that is slowing or stopped.	Left Turn Lane ↓28-48% Right Turn Lane ↓14-26%	FHWA			Provides increased visibility for drivers turning left. It prevents opposing left turning vehicles from blocking sightlines.	Severe crashes ↓36%	FHWA

Table 6-7: Example Intersection Countermeasures

Potential Intersection Strategies

The following table lists the prioritized intersections based on their MEPDO values. Each intersection was evaluated and potential safety countermeasures were identified.

Intersections – Reactive Approach													
Ranking	Intersection	Potential Countermeasures											
		Roundabouts	Turn Lanes	Tighten Intersection	Reflective Backplates	Enhanced Striping	Enhanced Signing	Access Management	Lighting	Sight Distance Improvements	Pedestrian Enhancements	Re-Align Intersection	Speed Management
1	US-42 and Sulphur Bedford Rd		X			X	X			X			X
2*	Main St (US-421) and Palmyra Rd (KY-1226)	X	X			X	X	X	X	X		X	X
3	Main St (US-42) and Wentworth Ave					X	X	X			X		X
4	KY-55 and KY-316	X	X			X	X			X		X	
5	KY-36 and Richwood Rd Ext		X			X	X		X	X			
6	KY-36 and Riverdale Dr		X			X	X	X	X	X			
7	Main St (US-421) and Greenbriar Rd					X	X	X	X	X			X
8	Burkhardt Bottom Rd and Spring Creek Ln						X						
9	Palmyra Rd (KY-1226) and Trout Ridge Rd					X	X		X	X			
10	US 42 at Millers Branch Rd *(recently improved)*					X	X						X
11	Mount Pleasant Rd (KY-625) and Conner Ridge Rd					X	X			X			
12	US-42 (Main St) and Spring Ave	X		X	X	X	X	X	X		X	X	X
13	US-42 (Main St) and US-421	X	X	X	X	X	X	X	X	X	X	X	X
14	US-42 and Pendleton Ave		X			X	X	X	X				X
15*	Main St (US-421) and Mount Pleasant Rd (KY-625)		X			X	X		X				X
16	Main St (US-421) and Milton-Bedford Pike		X	X		X	X	X	X	X		X	X
17	Main St (US-421) and KY-36 (Ferry St)	X		X		X	X	X	X	X		X	
18	Main St (US-421) and New Hope Rd		X	X		X	X	X	X	X	X	X	X
19	US-42 and Persell Rd					X	X					X	
20	KY-36 (Ferry St) and High St			X		X	X	X	X	X	X	X	

* Intersection currently in planning or design. The scope may not match the potential countermeasures listed.
XX – Top Local Priorities - Corridor mentioned as having local safety concerns.

Table 6-8: Potential Intersection Strategies

Potential High Injury Network Corridor Strategies

The following table outlines potential safety improvement strategies for the identified HIN. The list of improvements was developed using proven safety countermeasures aimed at reducing and eventually eliminating severe crashes. These routes can be further studied to guide implementation efforts.

Rank	Route Name	Begin and End Limits	Length (mile)	Potential Project Strategies
1*	Main St (US-421)	Main St (US-42) to Mount Pleasant Rd (KY-625)	1.08	Rural: Roadway/shoulder widening, rumble strips, enhanced curve signage, transition zone treatments Urban: Access management, roundabouts, improved lighting; upgraded signage, improved pedestrian facilities **Active Projects:** 5-80337.00 – Construct pedestrian facilities along US 421; 5-8712.00 - Construct turn lanes into Trimble County High School (nearing completion).
2*	Highway KY-36	US-421 to Carroll County Line	2.21	Roadway/shoulder widening, centerline rumble strips, bridge upgrades, intersection signage, roadside safety treatments, tree trimming, pedestrian infrastructure, pre-warnings, signage, summer enforcement and programming **Active Project:** 5-80309.00 Improve safety, truck mobility, and address geometric deficiencies along KY 36 from US 421 to 250 feet east of School Hollow Road in Milton. Project submitted for CY 2025 BUILD through KIPDA.
3*	Highway US-421	Mount Pleasant Rd (KY-625) to Palmyra Rd (KY-1226)	3.70	Roadway/shoulder widening, centerline rumble strips, enhanced curve re-alignment, widening, and/or signage, speed management **Active Project:** 5-905.00 Safety project at US-421 and KY-1226 Intersection
4	Highway US-42	Hardy Creek Rd (KY-1104) to Carroll County Line	2.97	Roadway/shoulder widening, rumble strips, curve widening, enhanced curve signage, speed management
5	Highway US-42	Morton Ridge Rd (KY-2868) to Persell Rd	3.67	Roadway/shoulder widening, centerline rumble strips, high friction surface, curve widening, enhanced curve signage, speed management
6	Highway US-42 / Main St	Lawson Ave to Stark Ln	1.81	Rural: Roadway/shoulder widening, rumble strips, curve signage, guardrail, transition zone treatments Urban: Roundabout, intersection lighting, improved pedestrian facilities, speed management
7*	Highway US-421	Palmyra Rd (KY-1226) to Sprague Ln	3.06	Roadway/shoulder widening for centerline rumble strips, guardrail upgrade, upgraded signage **Active Project:** 5-905.00 Safety project at US-421 and KY 1226 Intersection.
8	Highway US-421	Henry Co. Line to KY-316	3.16	Roadway/shoulder widening, centerline rumble strips, horizontal curve signing, high friction surface, curve widening, tree trimming

Rank	Route Name	Begin and End Limits	Length (mile)	Potential Project Strategies
9	Barebone Rd (KY-754)	Perkinson Ln to Main St (US-42)	2.61	Roadway/shoulder widening, rumble strips, guardrail upgrade, striping enhancement, enhanced curve signing (access to the Trimble County Generating Station)
10	Peck Pike (KY-625)	Watson Tandy Rd to Highway US-421	2.77	Roadway widening for edgeline rumble strips, striping enhancements, tree trimming, defined/signed school bus stops, horizontal curve signing, curve widening, curve re-alignment (access to the Trimble Co. Generating Station)
11	Highway US-42	Stark Lane to Landy Hill Ln	1.71	Roadway widening for edgeline rumble strips, horizontal curve signing, curve widening, tree trimming, guardrail upgrade
12	McCord Ln / School Hollow Rd	Highway US-421 to Spring St	1.88	Enhanced striping, horizontal curve signing, speed management, and education (the only alternative to US-421 over the Ohio River when there are issues on the north section of US-421)
13	Highway US-421	KY-316 to Town Branch Rd	3.21	Roadway widening for centerline rumble strips, guardrail upgrade, curve widening, horizontal curve signing, tree trimming
14	Burkhardt Bottom Rd	Coopers Bottom Rd to End of Route	2.25	Enhanced striping, horizontal curve signing, stabilize (noted that fatalities on this and other locations around the county on narrow roads occupants were unrestrained. Address with education campaign)

* Corridor currently in planning or design.
XX – Top Local Priorities - Corridor mentioned as having local safety concerns.

Table 6-9: Potential Corridor Strategies

System Level Approach and Strategies

The system level (or systemic) approach to safety identifies and addresses high-risk features across the entire roadway network rather than focusing solely on specific crash locations, as in the reactive approach. Risk factors for Trimble County's roadway network were identified by analyzing crash and roadway data, with high speeds, narrow lanes, and sharp curves emerging as key areas of concern.

Systemic strategies involve implementing widespread improvements to reduce the likelihood and severity of crashes across an area, not just at specific locations. These strategies proactively identify and mitigate potential hazards to prevent crashes.

Strategy 1 – Curve Signing and Striping

Upgrade the signing and striping in sharp curves (approximately 8.5 degrees or more) throughout the county. This could be prioritized based on speeds and volumes but should ultimately lead to upgrades for all 45 mph and higher roadways.

Strategy 2 – Shoulder / Lane Widening and Rumble Strips

Widen the paved surface on roadways with 8-foot and 9-foot lanes throughout the county. The additional paved width could be added to the lanes or shoulders as determined to be most appropriate. Rumble strips (edge and center) should also be added where possible. For example, on Sulphur Bedford Road (SR 3175) edge lines have been added to the highway and the additional width could be used to either provide shoulders or widen the lanes, or both. Edge rumble strips could also be added to this roadway.

Strategy 3 – Speed Management

High speeds in Trimble County are associated with more severe crashes. As highways are upgraded over time, steps should be taken to incorporate speed management techniques. For example, roundabouts could be installed at key intersections on US 421 north of Bedford and/or south of Milton to promote slower speeds on the approaches to both communities. This approach could also be used for the US 421 / Palmyra Road intersection.

Safety Action Plan Implementation

This plan has documented and prioritized many safety challenges. Based on the data, agency / stakeholder input, and best practices, it has also identified potential strategies and projects that would address these challenges. The focus continues to be on reducing high-severity crashes across the community. This section outlines an initial action plan for deploying potential strategies, projects, and safety programs. The actions are proposed to be implemented in four time ranges: short-term (0-3 years); mid-term (4-6 years); long term (7+ years); and ongoing. They cover the main intervention categories: infrastructure, behavioral safety, operational safety, and policies/procedures.

The implementation of each project, strategy, or program is dependent on funding availability. It is also dependent on the support of all relevant agencies and the County's capacity to execute each action. In cases where the County does not have primary authority for implementing the action, they will need to play a supporting role.

Timeframe	No	Project / Strategy / Program Description	Document Reference	Recommended First Step	Primary Category
Short Term (0 to 4 years)	1	Adopt Complete Street, Active Transportation and/or updated safety related zoning policies	Chapter 5	Work with RTC/KIPDA to obtain model policies for adoption	Policy / Procedures
	2	Submit agreed on joint application for SS4A grant funding for one of top HIN segments	Chapter 6; Table 6-9	Work with RTC/KYTC to identify and agree on a project and match funding	Infrastructure
	3	Begin outreach and education initiative with young and older drivers	Chapter 3	Collaborate with school district, public agencies, and non-profits	Behavioral
	4	Implement initial low-cost Speed Management strategies	Chapters 3 and 6; Systemic Sec.	Work with law enforcement, RTC, and KYTC to identify key corridors	Operational
	5	Support targeted speed and traffic control enforcement	Chapter 3	Work with law enforcement, RTC, and KYTC to identify key locations	Operational
Mid Term (4 to 8 years)	6	Implement one easy to implement systemic infrastructure focused project	Chapters 3 and 6; Systemic Sec.	Work with RTC/KYTC to identify a promising project and funding	Infrastructure
	7	Implement high priority HIN segment project	Chapter 3 and Chapter 6	Work with RTC/KYTC to identify a promising project and funding	Infrastructure
	8	Implement high priority intersection project	Chapter 3 and Chapter 6	Work with RTC/KYTC to identify a promising project and funding	Infrastructure
	9	Implement safety focused local street/highway upgrades and maintenance	Chapter 3 and Chapter 6	Use local funds to advance priority local projects / maintenance	Infrastructure
	10	Initiate countywide safety initiative; Consider focusing on rural highway speeds, rural to urban transition zones, seat belt usage, and impaired driving	Chapter 3	Work with RTC/KIPDA and other counties to develop a multi-county outreach approach	Behavioral
Long Term (9+ years)	11	Implement additional systemic infrastructure focused projects (goal is one or more every five years)	Chapters 3 and 6; Systemic Sec.	Build long-term partnership with KYTC (District 5 and HSIP) to identify and address key systemic needs	Infrastructure
	12	Implement additional infrastructure projects on HIN (goal is one or more every five years)	Chapter 3 and Chapter 6	Build long-term partnership with KYTC (District 5 and HSIP) to identify and address key HIN needs	Infrastructure
	13	Implement additional intersection infrastructure projects (goal is one or more every five years)	Chapter 3 and Chapter 6	Build long-term partnership with KYTC (District 5 and HSIP) to identify and address key intersection needs	Infrastructure
	14	Implement additional safety focused local street/highway improvements (goal is one or more every five years)	Chapter 3 and Chapter 6	Increase local funds to advance priority local projects / maintenance	Infrastructure
Ongoing	15	Continue Local Safety Meetings	Chapters 2 and 4	Schedule quarterly meetings	Policy / Procedures
	16	Collaborate with RTC/KIPDA to monitor, assess, and publicly report progress	Chapter 7	Coordinate with RTC/KIPDA to implement reporting plan	Policy / Procedures
	17	Continue building staff/agency knowledge regarding highway safety	Chapters 4, 5, and 6	Coordinate with RTC/KIPDA to schedule annual sessions	Policy / Procedures

Table 6-10: Implementation Action Plan Timeline

7. Progress and Transparency

Trimble County, with support from KIPDA and the RTC, is dedicated to the success of this Safety Action Plan. Effective communication, continuous monitoring, and evaluation are crucial to eliminating fatalities and serious injury crashes by 2050. Maintaining ongoing transparency through public accessibility and clear communication of outcome data is also essential.

The following chapter outlines the plan for measuring progress, maintaining transparency, and continuously incorporating feedback to enhance this road safety initiative.

Safety Performance Measurement

Safety improvements are measured using community-wide performance metrics to assess progress. Additionally, project-specific performance is monitored to promote effective implementation and positive safety impacts. The following sections outline the annual public and accessible progress reporting structure and proposed metrics.

Annual Safety Performance Measures

Crash Severity

The County and KIPDA expect to monitor the total number of crashes annually by crash severity: Fatal, Suspected Serious Injury, Suspected Minor Injury, Possible Injury, and No Apparent Injury. In addition, the crash rate for the total number of crashes would be estimated. The crash rate is the total number of crashes per vehicle miles traveled in the County.

Fatal and Suspected Serious Injury Crashes

Evaluating fatal and suspected serious injury crash trends is a key focus. Fatal and suspected serious injury crashes should be monitored annually. The measurement includes monitoring the total number of fatal and suspected serious injury crashes and the crash rate. The crash rate is the number of fatal and suspected serious injury crashes per vehicle miles traveled in the County annually.

Vulnerable Road User Crashes

Crashes involving vulnerable road users should be monitored annually, focusing on fatal and suspected serious injury crashes. Since a significant portion of severe crashes involve vulnerable road users, this metric is critical for assessing safety improvements.

Community Focused

The County and KIPDA expect to assess the above safety performance metrics by Census Tract to explore underlying factors contributing to crash trends. By comparing these metrics to county-wide results, patterns can be identified, allowing for tailored solutions and resources to meet the needs of different parts of the community. This approach aims to create a safer environment for all, by addressing concerns and promoting safety across the different parts of the community.

Project-Specific Performance Measures

The safety action plan recommends improvements using both the reactive and systemic approaches. Monitoring focuses on project-specific improvements at prioritized signalized intersections, unsignalized intersections, and along the corridors identified on the High Injury Network. Key project-specific measures anticipated to be collected include:

Safety Improvement Projects Implemented at Prioritized Locations

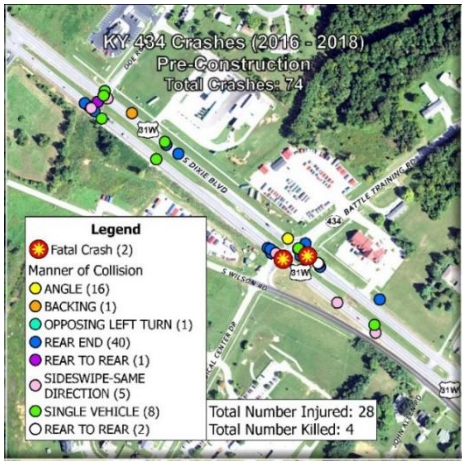
This performance measure tracks the number of safety-focused improvement projects constructed from the potential improvements listed in **Chapter 6. Strategy and Project Selection**. The total number of safety improvements implemented at the intersection and along the corridors identified on the HIN would be recorded annually.

Crash Trends at Project Locations

When a safety improvement project has been constructed, pre-construction and post-construction crash data can be collected to document the realized crash reduction benefit. Crash trends would be assessed for each project specific improvement to aid decision-makers in future safety improvement decisions. This performance measure tracks fatal and suspected serious injury crashes for each improvement project.

Safety Studies and Design

The status of safety studies and design plans would be monitored annually. These studies and design plans, which include cost estimates, public engagement, NEPA documentation, and project readiness, move projects closer to construction and the ultimate goal of eliminating fatal and suspected serious injury crashes.

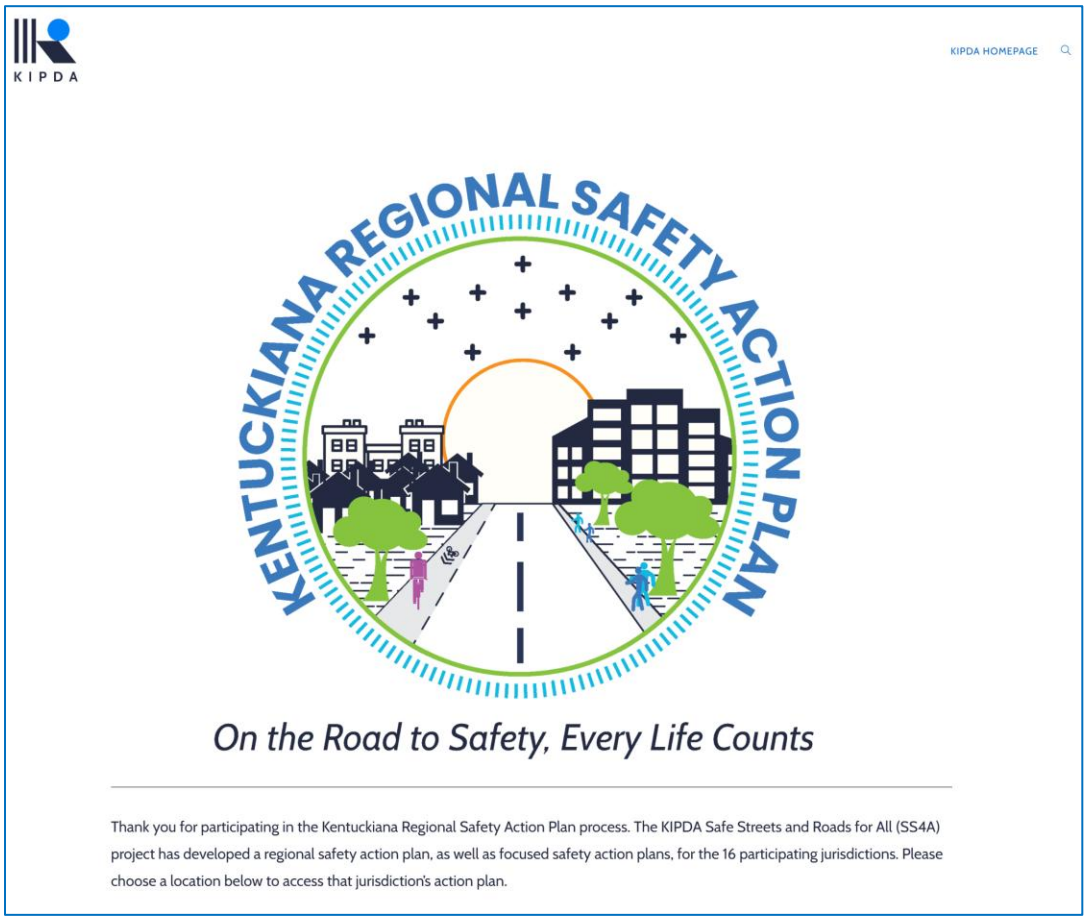


Geospatial representation of crash trends for specific projects is an effective method to demonstrate their impact to the community. Illustrating pre and post-construction crash data, with a focus on the decrease in fatal and suspected serious injury crashes, clearly communicates safety improvements.

PRE-CONSTRUCTION → **POST-CONSTRUCTION**

Transparency

The development of the Safety Action Plan has been shared publicly with residents and other relevant stakeholders through the KIPDA website. The MPO utilized its website to engage the community and disseminate further resources, including maps, the Safe Streets and Roads for All Grant Program, and the Safe Systems Approach. The Trimble County Safety Action Plan is posted publicly online at **SS4A – KIPDA Transportation**. The KIPDA website will continue to be the platform to engage the community and serve as a source of information and updates to the public.



Feedback and Continuous Improvement

Creating the Safety Action Plan involved a collaborative effort with active community participation. The project team conducted comprehensive public surveys and facilitated stakeholder discussions through Stakeholder and Safety Committees. This engagement underscored the importance of continuous improvement in achieving safety goals. By advancing ongoing dialogue, feedback is used to assess the plan's efficacy and provides for regular plan amendments. This can help keep the Safety Action Plan relevant and effective in addressing community needs.

Appendix A

Continuous Highway Analysis Framework (CHAF) List

CHAF	Highway Plan Project	Primary Route	Primary BMP	Primary EMP	Length	Project Description	Type of Work
IP20230136	5-80337.00	US 421	7.03	7.78	0.983	Construct pedestrian facilities along US 421 from Cutshaw Lane to Trimble County High School/KY 625 and along KY 625 to Bedford Elementary School (total 0.983 mi.)	Bike/Ped Facility
IP20240017		KY 36	0	2.211	2.211	Improve safety, truck mobility, and address geometric deficiencies along KY36 from US 421 to Carroll County line.	Reconstruction
IP20240021		US 421	15.45	18.78	3.33	Construct a realignment of US 421 through Milton between the Milton-Madison Bridge (MP 18.78) and extending south to reconnect to the existing US 421 near MP 15.45.	Transportation Study
IP20080267	5-905.00	US 421	11.278	11.678	0.4	Address safety issues and access at the intersection of US 421/KY 1226 at MP 11.5. (12CCR.)	Safety
IP20100047		US 421	1	2.4	1.4	Improve safety and address geometric deficiencies along US 421 from 400 feet north of Martini Lane to 0.8 miles south of KY 316	Reconstruction
IP20080266		US 421	6.704	18.773	12.069	Improve safety and address geometric deficiencies along US 421 from US 42 to the Ohio River Bridge (from Bedford to Milton).	Reconstruction
IP20080265		US 421	0	6.704	6.704	Improve safety and address geometric deficiencies along US 421 from I-71 in Henry County to US 42 in Bedford (Trimble County)	Reconstruction
IP20250001		US 42	7.3	7.94	0.64	Construct pedestrian facilities along US 42 from Ball Lane to Trimble County Public Library and MP 7.3.	Bike/Ped Facility
IP20130006		I-71	38.086	38.808	0.722	Improve safety and reduce congestion on I-71 from the Henry/Trimble County line to the Trimble/Carroll County line.	Major Widening
IP20080270		KY-1226	2.41	2.61	0.2	Address substandard roadway geometry on KY 1226 between MP 2.4 and MP 2.6 to improve system reliability between Trimble and Carroll counties.	Spot Improvement
IP20080269		KY 754	1.42	1.62	0.2	Address sight distance and substandard curve issues on KY 754 between MP 1.42 to MP 1.62 to improve truck access.	Spot Improvement

Appendix B

Safety Countermeasure Cost Estimate Ranges

and

Project Implementation Timeline Reference Chart

Planning Level Safety Countermeasure Cost Estimate Ranges

Values are based on an assumed construction cost and percentages for all other categories
Results are for order of magnitude cost estimation only
6/12/2025

Notes: ***Low Cost*** *Assumes Minimal Scope, Low Cost Approaches, and/or Ideal Conditions*
High Cost *Assumes Full Scope and Several Project Challenges*
All category and contingency percentages may need to be adjusted based on project size and complexity

													(7%/yr compounded)	
Cost Percentages ==>		*5%*	*15%*	*20%*	*10%*	*12%*			*15%*	*50%*			*61%*	*61%*
Project	**Unit**	**Planning**	**Design and Environmental Permitting**	**Right-of-Way**	**Utilities**	**Construction Inspection**	**Construction**	**Subtotal**	**Low Planning Level Contingency**	**High Planning Level Contingency**	**Low Total 2025 Cost**	**High Total 2025 Cost**	**Low Total 2032 Programming Cost**	**High Total 2032 Programming Cost**
Curve Realignment (moderate right-of-way/utilities)	Curve	$37,500	$112,500	$150,000	$75,000	$90,000	$750,000	$1,215,000	$182,250	$607,500	$1,397,250	$1,822,500	$2,243,678	$2,926,537
Dynamic Speed Feedback Sign	Each	$1,250	$3,750	$5,000	$2,500	$3,000	$25,000	$40,500	$6,075	$20,250	$46,575	$60,750	$74,789	$97,551
Enhanced Signing/Striping - Curves	Curve	$750	$2,250	$3,000	$1,500	$1,800	$15,000	$24,300	$3,645	$12,150	$27,945	$36,450	$44,874	$58,531
Enhanced Signing/Striping - Intersection	Intersection	$1,500	$4,500	$6,000	$3,000	$3,600	$30,000	$48,600	$7,290	$24,300	$55,890	$72,900	$89,747	$117,061
Enhanced Signing/Striping - Transition Zones	Location	$1,500	$4,500	$6,000	$3,000	$3,600	$30,000	$48,600	$7,290	$24,300	$55,890	$72,900	$89,747	$117,061
Enhanced Striping - Highway	Mile	$1,000	$3,000	$4,000	$2,000	$2,400	$20,000	$32,400	$4,860	$16,200	$37,260	$48,600	$59,831	$78,041
Guardrail Upgrades (minimal regrading)	500 Feet	$1,500	$4,500	$6,000	$3,000	$3,600	$30,000	$48,600	$7,290	$24,300	$55,890	$72,900	$89,747	$117,061
High Friction Surface Treatments ($40/sq yd)	Curve	$5,000	$15,000	$20,000	$10,000	$12,000	$100,000	$162,000	$24,300	$81,000	$186,300	$243,000	$299,157	$390,205
Lighting - Highway (multilane)	Mile	$30,000	$90,000	$120,000	$60,000	$72,000	$600,000	$972,000	$145,800	$486,000	$1,117,800	$1,458,000	$1,794,943	$2,341,229
Lighting - Intersection	Intersection	$3,750	$11,250	$15,000	$7,500	$9,000	$75,000	$121,500	$18,225	$60,750	$139,725	$182,250	$224,368	$292,654
Pedestrian Enhancements (signs, striping, ADA, bulb outs)	Location	$5,000	$15,000	$20,000	$10,000	$12,000	$100,000	$162,000	$24,300	$81,000	$186,300	$243,000	$299,157	$390,205
Pedestrian Enhancements (signs, striping, ADA, refuge)	Location	$2,500	$7,500	$10,000	$5,000	$6,000	$50,000	$81,000	$12,150	$40,500	$93,150	$121,500	$149,579	$195,102
Positive Offset Left Turn Lanes	Each	$15,000	$45,000	$60,000	$30,000	$36,000	$300,000	$486,000	$72,900	$243,000	$558,900	$729,000	$897,471	$1,170,615
Raised Median (no widening)	Sq Yards	$8	$23	$30	$15	$18	$150	$243	$36	$122	$279	$365	$449	$585
Reflective Backplates (no signal rebuild)	Intersection	$1,250	$3,750	$5,000	$2,500	$3,000	$25,000	$40,500	$6,075	$20,250	$46,575	$60,750	$74,789	$97,551
Reflective Backplates (with signal rebuild)	Intersection	$10,000	$30,000	$40,000	$20,000	$24,000	$200,000	$324,000	$48,600	$162,000	$372,600	$486,000	$598,314	$780,410
Restricted Crossing U-Turn Crossing Intersection (un-signalized)	Location	$87,500	$262,500	$350,000	$175,000	$210,000	$1,750,000	$2,835,000	$425,250	$1,417,500	$3,260,250	$4,252,500	$5,235,249	$6,828,586
Restricted Crossing U-Turn Crossing Intersection (signalized)	Location	$150,000	$450,000	$600,000	$300,000	$360,000	$3,000,000	$4,860,000	$729,000	$2,430,000	$5,589,000	$7,290,000	$8,974,713	$11,706,147
Road Reconfiguration (Convert 4-lane to 3-lane, w/ resurfacing)	Mile	$25,000	$75,000	$100,000	$50,000	$60,000	$500,000	$810,000	$121,500	$405,000	$931,500	$1,215,000	$1,495,785	$1,951,024
Roundabout (dual-lane)	Each	$120,000	$360,000	$480,000	$240,000	$288,000	$2,400,000	$3,888,000	$583,200	$1,944,000	$4,471,200	$5,832,000	$7,179,770	$9,364,918
Roundabout (single lane)	Each	$50,000	$150,000	$200,000	$100,000	$120,000	$1,000,000	$1,620,000	$243,000	$810,000	$1,863,000	$2,430,000	$2,991,571	$3,902,049
Rumble Strips - Center (no widening)	Mile	$1,000	$3,000	$4,000	$2,000	$2,400	$20,000	$32,400	$4,860	$16,200	$37,260	$48,600	$59,831	$78,041
Rumble Strips - Edge (no widening, both sides)	Mile	$1,250	$3,750	$5,000	$2,500	$3,000	$25,000	$40,500	$6,075	$20,250	$46,575	$60,750	$74,789	$97,551
Rural Re-Align Skewed Intersection (limited ROW/utilities)	Intersection	$37,500	$112,500	$150,000	$75,000	$90,000	$750,000	$1,215,000	$182,250	$607,500	$1,397,250	$1,822,500	$2,243,678	$2,926,537
Rural to Urban Transition Zone Treatments (high-cost)	Location	$37,500	$112,500	$150,000	$75,000	$90,000	$750,000	$1,215,000	$182,250	$607,500	$1,397,250	$1,822,500	$2,243,678	$2,926,537
Rural to Urban Transition Zone Treatments (low-cost)	Location	$12,500	$37,500	$50,000	$25,000	$30,000	$250,000	$405,000	$60,750	$202,500	$465,750	$607,500	$747,893	$975,512
Shoulder Widening & Roadside Improvements (limited ROW/utilities)	Mile	$60,000	$180,000	$240,000	$120,000	$144,000	$1,200,000	$1,944,000	$291,600	$972,000	$2,235,600	$2,916,000	$3,589,885	$4,682,459
Sidewalks - Highway (one side only)	Mile	$20,000	$60,000	$80,000	$40,000	$48,000	$400,000	$648,000	$97,200	$324,000	$745,200	$972,000	$1,196,628	$1,560,820
Sidewalks - Intersection (includes ADA)	Intersection	$4,000	$12,000	$16,000	$8,000	$9,600	$80,000	$129,600	$19,440	$64,800	$149,040	$194,400	$239,326	$312,164
Sight Distance Improvements (vegetation)	Intersection	$1,000	$3,000	$4,000	$2,000	$2,400	$20,000	$32,400	$4,860	$16,200	$37,260	$48,600	$59,831	$78,041
Signal Timing - Cycle Length, Clearance and Leading Ped Intervals	Intersection	$500	$1,500	$2,000	$1,000	$1,200	$10,000	$16,200	$2,430	$8,100	$18,630	$24,300	$29,916	$39,020
Signal Upgrade (may be required for protected left turn phasing)	Intersection	$10,000	$30,000	$40,000	$20,000	$24,000	$200,000	$324,000	$48,600	$162,000	$372,600	$486,000	$598,314	$780,410
Tighten Intersection (small intersection, limited drainage)	Each	$17,500	$52,500	$70,000	$35,000	$42,000	$350,000	$567,000	$85,050	$283,500	$652,050	$850,500	$1,047,050	$1,365,717
Tree Trimming	Linear Foot	$3	$8	$10	$5	$6	$50	$81	$12	$41	$93	$122	$150	$195
Turn Lanes (one turn lane, 150 ft plus taper)	Each	$12,500	$37,500	$50,000	$25,000	$30,000	$250,000	$405,000	$60,750	$202,500	$465,750	$607,500	$747,893	$975,512
Urban Re-Align Skewed Intersection (limited ROW/utilities)	Intersection	$75,000	$225,000	$300,000	$150,000	$180,000	$1,500,000	$2,430,000	$364,500	$1,215,000	$2,794,500	$3,645,000	$4,487,356	$5,853,073
Access Management (Low Complexity)	Mile	$75,000	$225,000	$300,000	$150,000	$180,000	$1,500,000	$2,430,000	$364,500	$1,215,000	$2,794,500	$3,645,000	$4,487,356	$5,853,073
Adjusted Cost Percentages ==>		*3%*	*12%*	*20%*	*10%*	*10%*			*10%*	*35%*			*61%*	*61%*
Access Management (Moderate Complexity)	Mile	$120,000	$480,000	$800,000	$400,000	$400,000	$4,000,000	$6,200,000	$620,000	$2,170,000	$6,820,000	$8,370,000	$10,951,430	$13,440,391
Access Management (High Complexity, Often Complete Rebuild)*	Mile	$300,000	$1,200,000	$2,000,000	$1,000,000	$1,000,000	$10,000,000	$15,500,000	$1,550,000	$5,425,000	$17,050,000	$20,925,000	$27,378,574	$33,600,977

Project Implementation Timeline Reference Chart
6/23/2025

This chart is intended to provide high-level guidance on the time required to complete a range of potential safety improvement projects.
1) The time required to secure funding for each phase (federal, state, or local) is not included. The time to execute federal grant agreements or other state or federal project agreements is also not included.
2) Time to procure planning, design, or other professional services should be added as required. Construction and inspection procurement are included if they can reasonably be accommodated during the pre-construction phases.
3) Local agencies should coordinate with state and KIPDA staff to estimate the time required for each task. This applies to local public agency (LPA) projects and includes projects using federal, state, and KIPDA funding.

To use this table, please determine the level of complexity for each phase of the project you are considering. For example, a project may be moderate with respect to planning, design, and construction, but complex with respect to right-of-way and utility coordination. This would likely result in a project that is somewhere between those two categories for the total project timeline.

Level of Complexity for Each Phase	Planning	Preliminary Engineering and Environmental	Final Design	Right-of-Way (ROW)	Utility Coordination	Construction	Estimated Total Project Timeline
Simple	3-6 months Few alternatives Limited or no public involvement No anticipated controversy No TIP/STIP issues	6 - 9 months Minimal design No survey or geotech NEPA CE (programmatic or low level)	6 months Minimal design effort	N/A Within existing ROW	3-6 months Notification only No relocations	6 - 9 months <$500K No phasing needed	2 to 3 years
Moderate	6–12 months Several alternatives Public involvement May require TIP/STIP mods	6–12 months Straightforward design Survey required NEPA CE (with public input)	6-12 months Moderate design effort Agency reviews	6–12 months Easements and/or minor acquisitions	6-18 months Relocations possible Agreements possible	6–12 months $500K–$2M Lane closures/phasing	3 to 6.5 years
Complex	12–18 months Numerous alternatives Public involvement May require TIP/STIP mods Multiple agencies involved	12–18 months Alternatives analysis Extensive design (survey, traffic, geotech) NEPA EA or CE (with public input)	12-18 months Major design effort Extensive permitting Environmental constraints	12–24 months Full ROW Relocations/eminent domain	12–18 months Major relocations Agreements required	12–24 months $2M+ Detours or complex staging	6 to 10 years

Notes:
Schedule estimates assume all required project funding is available
NEPA = National Environmental Policy Act of 1969
CE = Categorical Exclusion
EA = Environmental Assessment
TIP/STIP = Transportation Improvement Program / State Transportation Improvement Program