

ENVISION ZERO ELIZABETHTOWN

SAFETY ACTION PLAN 2024



Department of Planning & Development

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Introduction

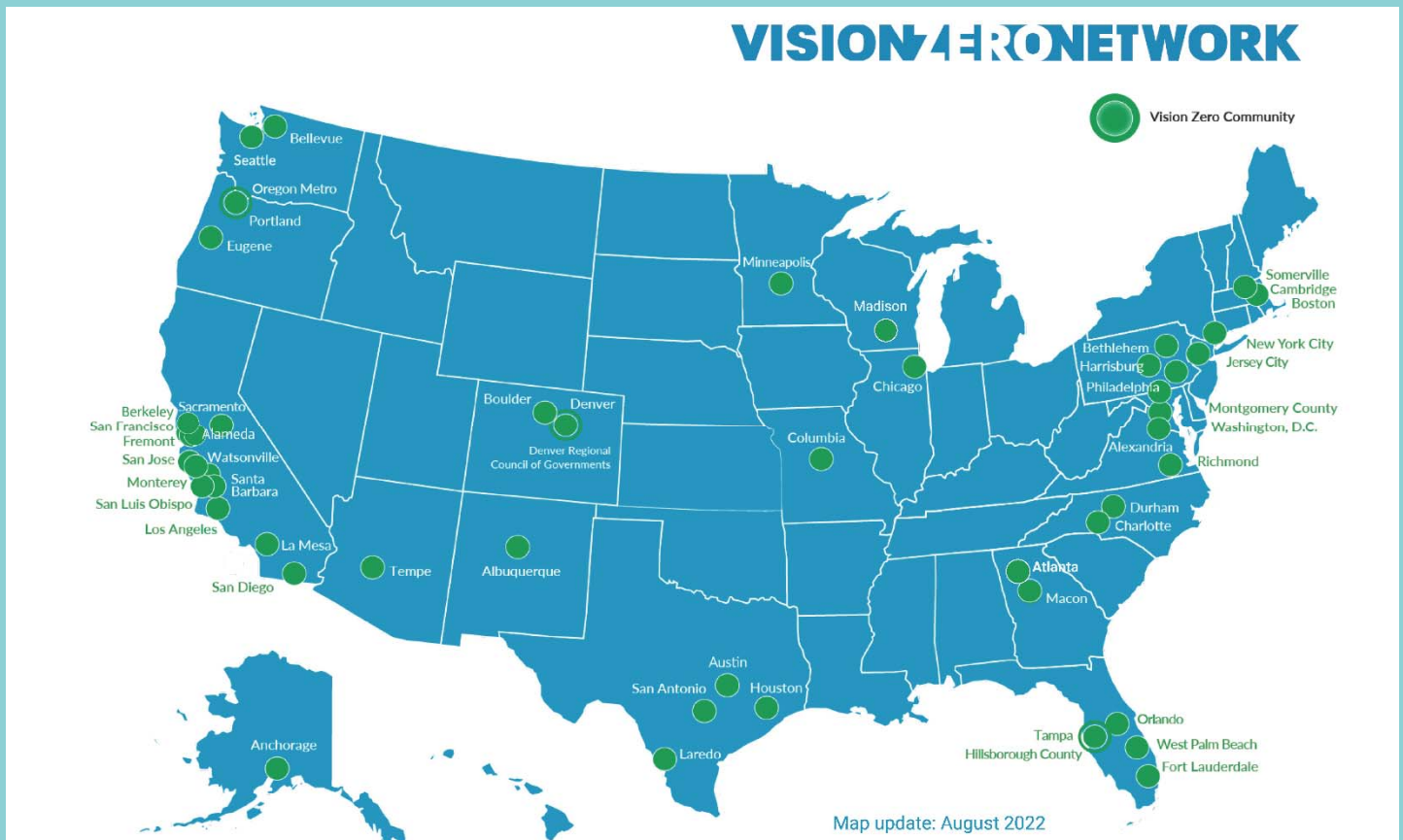
The City of Elizabethtown is committed to eliminating all traffic fatalities and severe injuries for all road users by 2050, transitioning from a focus on vehicle throughput to prioritizing safety, health, and equitable mobility of all road users.

The Vision Zero Safety Action Plan was initiated through the Safe Streets and Roads for All (SS4A) Grant Program. The plan includes the following eight key components.

1. Leadership commitment and goal setting
2. Planning structure
3. Safety analysis
4. Engagement and collaboration
5. Equity considerations
6. Policy and process changes
7. Strategy and project selections
8. Progress and transparency



The City of Elizabethtown aspires to join the Vision Zero Network, a campaign helping communities set and reach the goal of Vision Zero – eliminating traffic fatalities and severe injuries among all road users by 2050, while increasing safe, healthy, and equitable mobility.



What is Vision Zero?

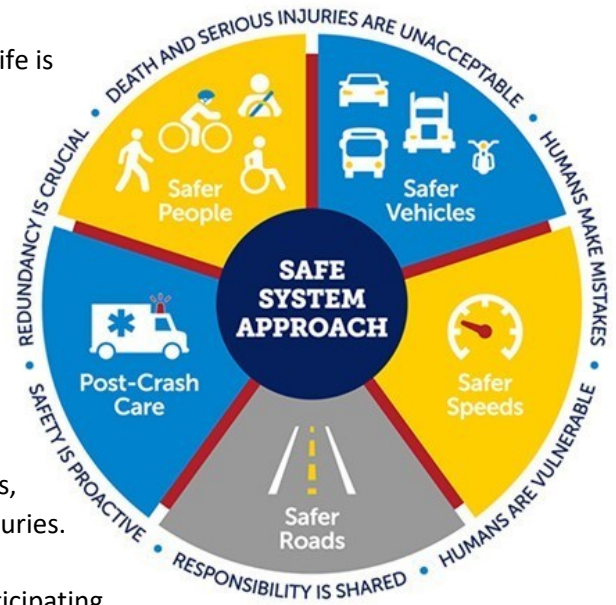
Vision Zero is a strategic commitment to eliminate all traffic fatalities and serious injuries driven by the principle that everyone has the right to move safely in their community. Originating in Sweden during the 1990's and now adopted globally by numerous cities, Vision Zero embraces the Safe System Approach and the principle that no loss of life is acceptable on our transportation network.

Safe System Approach

The Safe System Approach is a comprehensive approach based on the understanding that humans are fallible and may make mistakes, but those mistakes should not result in fatalities or serious injuries.

Safe System Key Principles

- *Death and Serious Injuries are unacceptable.* Every human life is valuable and safety is the highest priority.
- *Humans make mistakes.* Recognizing human fallibility, we design and manage our roads to be forgiving, mitigating the potential consequences of errors.
- *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.* Everyone, including all stakeholders, shares the responsibility for preventing fatal and serious injuries.
- *Safety is proactive.* Take a proactive stance on safety by anticipating and addressing risks before they lead to a crash.
- *Redundancy is critical.* Ensure that multiple layers of safety are embedded within the transportation system to protect people if one layer of safety fails.



Vision Zero vs Traditional Approach

The traditional approach to safety often relies on perfect behavior from all road users and tends to react to crashes rather than prevent them. In contrast, Vision Zero accepts that humans can and will make mistakes and builds a system that is geared towards minimizing the crash severity from those errors. This proactive approach is highlighted in the comparative graphic that demonstrates the shift from an individual-focused model to a system-centric model that recognizes shared responsibilities for a safe system.

TRADITIONAL APPROACH

Traffic deaths are **INEVITABLE**
PERFECT human behavior
 Prevent **COLLISIONS**
INDIVIDUAL responsibility
 Saving lives is **EXPENSIVE**

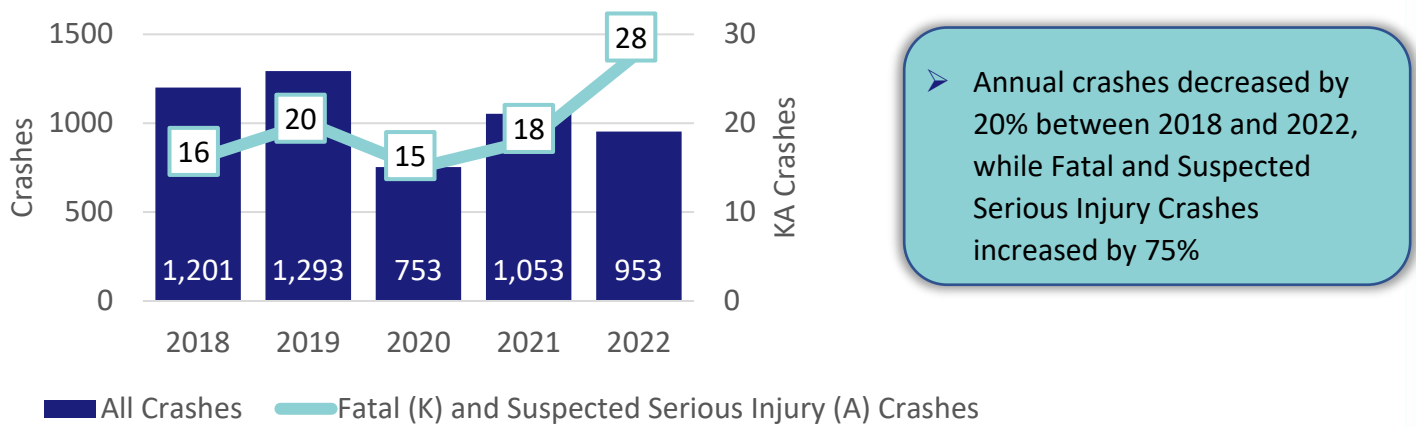
VISION ZERO APPROACH

Traffic deaths are **PREVENTABLE**
 Integrate **HUMAN FAILING** in approach
 Prevent **FATAL AND SEVERE CRASHES**
SYSTEMS approach
 Saving lives is **NOT EXPENSIVE**

Overview

In Elizabethtown, an average of 20 crashes occur annually resulting in a serious injury or fatality, representing not just statistics, but valued community members. Recognizing the profound impact on families and the community, Elizabethtown commits to a safer transportation network through comprehensive countermeasures including infrastructure improvements, education campaigns, enforcement, and continuous evaluations identified in this Safety Action Plan. The following Safety Action Plan is based on all crashes that occurred on NON-INTERSTATE AND NON-PARKWAY roads and streets in the City of Elizabethtown between 2018 and 2022.

Total and Fatal and Suspected Serious Injury Crashes



Elizabethtown Crashes by Mode (2018-2022)



Vehicle

42 SERIOUS INJURY
vehicle crashes

11 FATAL
vehicle crashes



Pedestrian

15 SERIOUS INJURY
pedestrian crashes

3 FATAL
pedestrian crashes



Bicycle

2 SERIOUS INJURY
bicyclist crashes



Motorcycle

19 SERIOUS INJURY
motorcyclist crashes

5 FATAL
motorcyclist crashes

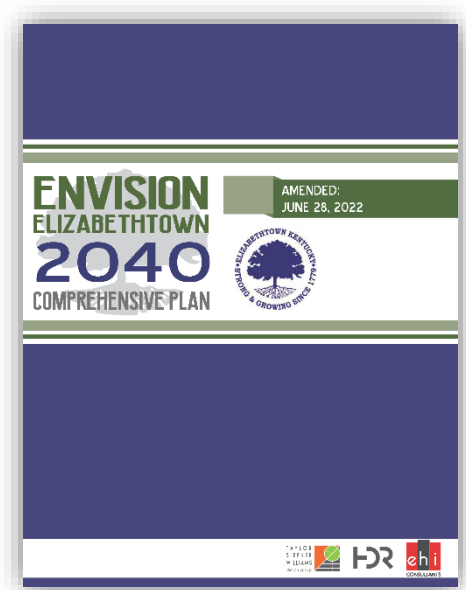
The Safety Action Plan sections follows the SS4A Safety Action Plan required components as outlined in the grant. These components reflect the process-oriented set of activities used to develop the Safety Action Plan.

1. Leadership Commitment and Goal Setting

The City of Elizabethtown is committed to achieving the goal of safe streets and roads for all users. This commitment is demonstrated by the resolution on the following page, which states that the city’s leaders have established *“a goal of achieving zero traffic fatalities and serious injuries by the year 2050.”* The resolution also provides a directive to develop *“various reports from data analysis and a community engagement program to identify safety improvement projects.”*

The City of Elizabethtown’s commitment and leadership in implementing safety-focused strategies and policies are also supported by many current policies and programs.

The City completed the Envision Elizabethtown 2040 Comprehensive Plan in 2022. This document will guide the growth and development of Elizabethtown over the coming two decades. In this plan, the goal for transportation is to *“advance connectivity in the city and region through multiple transportation types.”* This goal is separated into eight objectives, which are described in further detail and include action steps to fulfill the objective. Several of the objectives under this goal discuss the importance of safety. One objective closely related to transportation safety is to *“improve safety by focusing on upgrades to the highest-priority intersections or corridors as identified by KYTC’s safety screening process.”* The first action step under this objective is to create a Safety Action Plan (SAP) for Elizabethtown. It is noted that the SAP includes an analysis of existing conditions, historical trends, systemic needs, and specific needs. The comprehensive plan presents projects and strategies to address the identified needs, methods, and procedures to measure progress after the SAP development.



Improve pedestrian safety through expanding sidewalk connectivity is another safety-related transportation objective listed in the comprehensive plan. In the Envision Elizabethtown plan, community-wide guidelines are set as part of the recommended land-use plan. The community-wide guidelines elaborate on the pedestrian connectivity objective by stating pedestrians *“should be encouraged and connected to adjacent development.”* The objective aims to create a connected system of walkways to provide direct access to desired destinations without gaps or abrupt changes. Providing pedestrians with a designated place to walk will not only improve their comfort and accessibility, but it will also help reduce pedestrian crashes occurring mid-block and along the roadway.

A third transportation objective closely related to safety is to require access management for all development projects. The community-wide guidelines also include a section on access management and vehicular connectivity. Under these guidelines, developments should *“use access management techniques and provide alternative access points and routes for traffic flow.”* According to the FHWA, access management is proactively managing access to land parcels adjacent to roadways. It can increase roadway capacity, reduce crashes, and reduce delay for drivers. Access management includes intersection spacing, driveway spacing, median treatments and openings, turn and auxiliary lanes, and street connections.

RESOLUTION NO. 07-2023

A RESOLUTION OF THE CITY OF ELIZABETHTOWN, KENTUCKY
IN SUPPORT OF VISION ZERO

WHEREAS, the USDOT has developed a discretionary grant program to address roadway safety through the Safe Streets for All (SS4A) program and the City of Elizabethtown was awarded a SS4A grant (MO # 39-2023); and

WHEREAS, through the adoption and implementation of the Envision Elizabethtown 2040 comprehensive plan the City established improving safety of its transportation system as one of the community goals; and,

WHEREAS, the City aspires to reduce and eventually eliminate traffic related fatalities and serious injuries on its roadways; and

WHEREAS, the City is moving toward implementation of the SS4A grant through the efforts of developing various reports from data analysis and a community engagement program to identify safety improvement projects.

NOW, THEREFORE BE IT RESOLVED that the City of Elizabethtown hereby establishes a goal of achieving zero traffic fatalities and serious injuries by the year 2050.

Done this 4th day of December 2023 on a motion made by Council Member Bishop and seconded by Council Member Springsteen.

Members present voting in Favor: Council Members Tony Bishop, Marty Fulkerson, Julia Springsteen, Cindy Walker, Virgil Willoughby, and Bill Wiseman.

Members Present voting against: None



JEFFREY H. GREGORY, MAYOR

ATTEST:



JESSICA J. GRAHAM, CITY CLERK

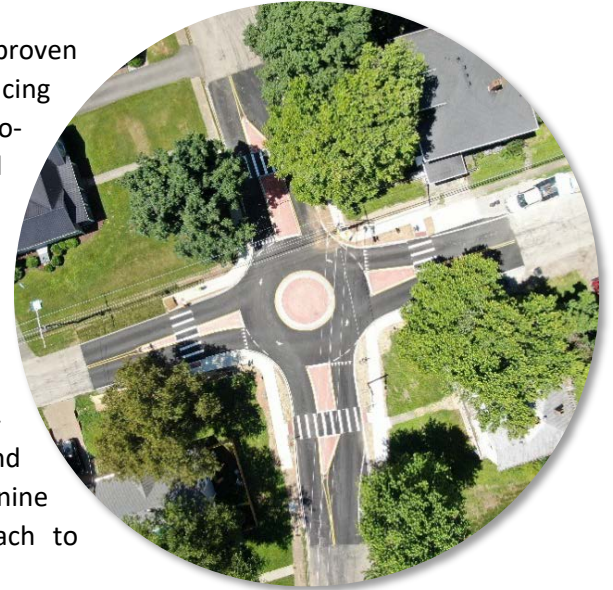
City Supported Safety Initiatives

The City of Elizabethtown is committed to advancing safety initiatives, supporting city-led projects, and actively collaborating with partners. Numerous safety-focused transportation projects have been successfully completed in Elizabethtown, including a road diet, introduction of roundabouts, the establishment of a Restricted Crossing U-Turn (RCUT) corridor, and the expansion of pedestrian facilities. These projects, often implemented in coordination with the Kentucky Transportation Cabinet (KYTC), are described in more detail below.

Roundabouts

Roundabouts are a Federal Highway Administration (FHWA) proven safety countermeasure that enhance traffic flow and safety by reducing speeds and conflict points. Roundabouts can replace signals, two-way stop-controlled intersections, or all-way stop-controlled intersections, offering safer crossing for bicyclists and pedestrians. (FHWA, n.d.). Recently, Elizabethtown adopted roundabouts as a safer intersection alternative to stop-controlled intersections.

In collaboration with the KYTC, the city selected multiple intersections that would benefit from the enhanced safety measures of a roundabout compared to the existing stop-controlled intersection. Selected based on traffic volume and historical crash data, this initiative led to construction of nine roundabouts in 2023, showcasing the city's proactive approach to improving safety.



Road Diet on Miles Street (KY 251)

A Road Diet typically involves reconfiguring a four-lane undivided roadway to a three-lane roadway consisting of two driving lanes and a center two-way left-turn lane (TWLTL). The Road Diet is an FHWA proven safety countermeasure, reducing rear-end, left-turn, and right-angle crashes, decreasing traffic speeds, and improving safety for pedestrians and bicyclists by simplifying crossing points and traffic flow.

Continuing the safety initiative, the City of Elizabethtown and KYTC partnered to apply the Road Diet concept to Miles Street (KY 251), extending from US 31W to Pear Orchard Road. The Road Diet project converted the existing four-lane roadway to three lanes (two driving lanes and a center TWLTL) and integrated roundabouts at W Poplar Street, Beech Street, Panther Lane, and Pear Orchard Road intersections. Completed in late summer 2023, the improvements reflect Elizabethtown's dedication to fostering safety.



Dixie Avenue (US 31W) RCUT Corridor

The Restricted Crossing U-Turn intersection (RCUT) is an innovative geometric design for intersections that prioritizes safety and efficiency. This innovative intersection reduces the number of conflict points by altering the left-turn movement of the minor approaches, significantly reducing the likelihood of high-severity angled and head-on crashes. In an RCUT, drivers on the minor approach making a left turn or traveling straight through must turn right then make a u-turn at a designated location. The RCUT intersection simplifies the driver’s decisions, streamlines traffic flow, and improves access management.

The US 31W RCUT project was Kentucky’s first RCUT corridor, transforming the multi-lane road with numerous side road and business access points into a safer corridor. The project focused primarily on improving safety by reducing conflict points and improving access management along the four-to-six lane stretch of US 31W. Seven RCUT intersections were constructed using funding from multiple KYTC sources within the city, and an additional three RCUT intersection were constructed north of Elizabethtown. Through these projects, five signalized intersections were eliminated to improve traffic flow and reduce delays. Notably, since completion of these projects in 2022, the corridor has experienced a 41% reduction in all crashes, and a 41% reduction in injury crashes.



Pedestrian Facility Expansion

The City has an initiative to expand the existing pedestrian facilities to serve all communities and neighborhoods. The initiative includes committing \$300,000 annually for constructing sidewalks to provide a safe and connected sidewalk network throughout the city. Annually the city evaluates an inventory of the sidewalk network and selects a project to construct sidewalks along a city street. Recent sidewalk projects include the North Main St. Sidewalk Improvements, Buffalo Creek Trail Project, S. Maple Street Sidewalk Reconstruction, and Stewart Street Sidewalk Rehabilitation Project.

2. Planning Structure

The Vision Zero Elizabethtown Safety Advisory Group (SAG) was formed in 2023, bringing together a diverse array of agencies and entities to collaborate on the Vision Zero Safety Action Plan. The multidisciplinary team, comprising key stakeholders, includes:

City of Elizabethtown

- City Council
- City Administrator
- Planning & Development
- Engineering



Kentucky Transportation Cabinet (KYTC)



City of Elizabethtown Police



HARDIN COUNTY SCHOOLS
HELPING CHILDREN SUCCEED

Hardin County Schools



Central Kentucky Wheelmen



Elizabethtown Independent Schools



Greenspace Trails



Elizabethtown Hardin County Industrial Foundation

The primary objective of the SAG is to provide advice and feedback to the City of Elizabethtown in the development, implementation, and monitoring of the Safety Action Plan. The SAG is focused on identifying safety needs and exploring both reactive and systemic safety countermeasures. By integrating diverse perspectives, the group aims to create and implement a comprehensive plan that aligns with the five objectives of the Safe System Approach. This collaborative structure will ensure that the plan is responsive to the specific needs of Elizabethtown and effectively addresses various safety challenges.



The SAG implemented a hybrid meeting model, accommodating both in-person and virtual participation to ensure inclusivity and comprehensive engagement. A brief summary of meetings held includes:

JANUARY

- Reviewed the background and grant requirements
- Discussed the overall process and objectives.
- Presented an overview of crash trends
- Initiated the process for identifying and ranking high-risk corridors and intersections.
- Discussed proven safety countermeasures

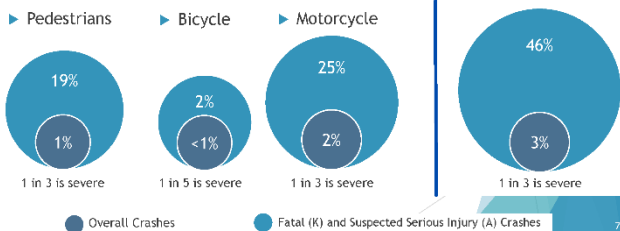
What is Vision Zero

- ▶ Commitment to eliminate all traffic fatalities and serious injuries
- ▶ Safe System Approach
 - ▶ Objectives:
 - ▶ Safer People
 - ▶ Safer Vehicles
 - ▶ Safer Roads
 - ▶ Safer Speeds
 - ▶ Post-Crash Care
 - ▶ Key Principles:
 - ▶ Death and Serious Injuries are unacceptable
 - ▶ Humans make mistakes
 - ▶ Humans are vulnerable
 - ▶ Responsibility is shared
 - ▶ Safety is proactive
 - ▶ Redundancy is crucial



Initial Focus Areas

Vulnerable Road Users



FEBRUARY

- Reviewed detailed crash analysis and trends
- Discussed approaches to reactive and systemic analysis
- Identified potential focus areas
- Discussed prioritization and reviewed top reactive lists
- Reviewed online survey and public meeting input
- Introduced potential countermeasures

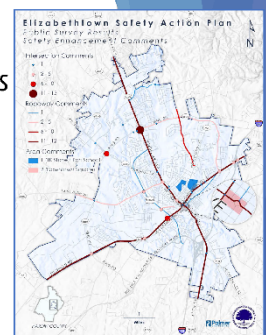
MARCH

- Gathered feedback on various locations and proposed improvements
- Introduced systemic safety risks identified through earlier analysis
- Discussed safety focused policy and plans updates
- Presented strategies and project selections

Engagement Analysis

SUGGESTED SAFETY ENHANCEMENTS

- ▶ Top Route Comments
 - ▶ Dixie Ave (US 31W)
 - ▶ Leitchfield Rd/Mulberry St (US 62)
- ▶ Top Intersection Comments
 - ▶ Ring Rd & Dixie Ave
 - ▶ Ring Rd & Patriot Pkwy
 - ▶ South Mulberry St & US 31W Byp Ramp
 - ▶ Nicholas St & US 62 Connector (RR)



The SAG is committed to ongoing dialogue and collaboration as the Safety Action Plan moves from planning to implementation and beyond. Regular meetings will continue, focusing on the evaluation of implemented strategies, updates based on new data and community feedback, and adjustments to ensure the plan remains effective and responsive to the city's evolving safety needs.

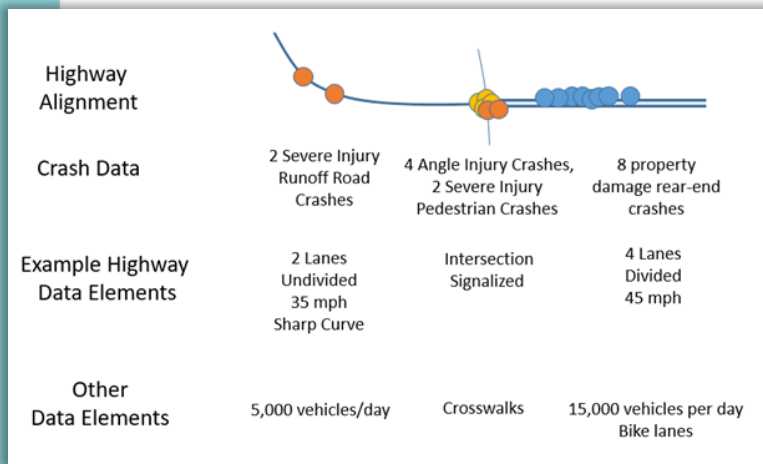
3. Safety Analysis

Study Area

The Safety Action Plan safety analyses study area includes all the public streets and roads within the city limits of Elizabethtown, with the exception of interstates and parkways. Interstate 65, Bluegrass Parkway and Western Kentucky Parkway are not included in the study. Crash data for the safety analysis is from January 1, 2018 to December 31, 2022.

Methodology

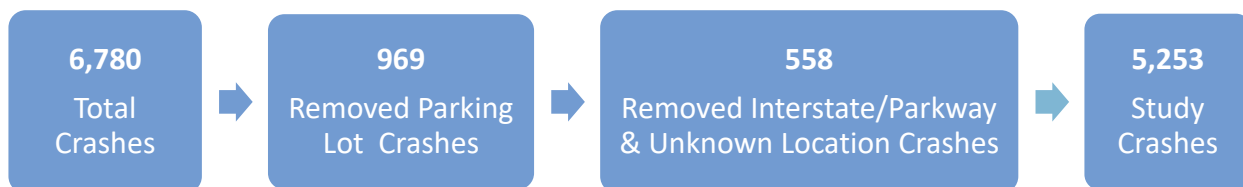
Crash data was provided by KYTC through an agreement with the Kentucky State Police (KSP). In Kentucky, state and local police complete detailed collision reports, which include information on the individuals and vehicles involved, crash location, manner of collision, roadway characteristics, and individual injury severity. The collision reports are then submitted to KSP, reviewed for accuracy, and stored in a secure database managed by KSP. As part of KYTC’s use agreement, the crash data provided used in the study does not contain personally identifiable information (PII).



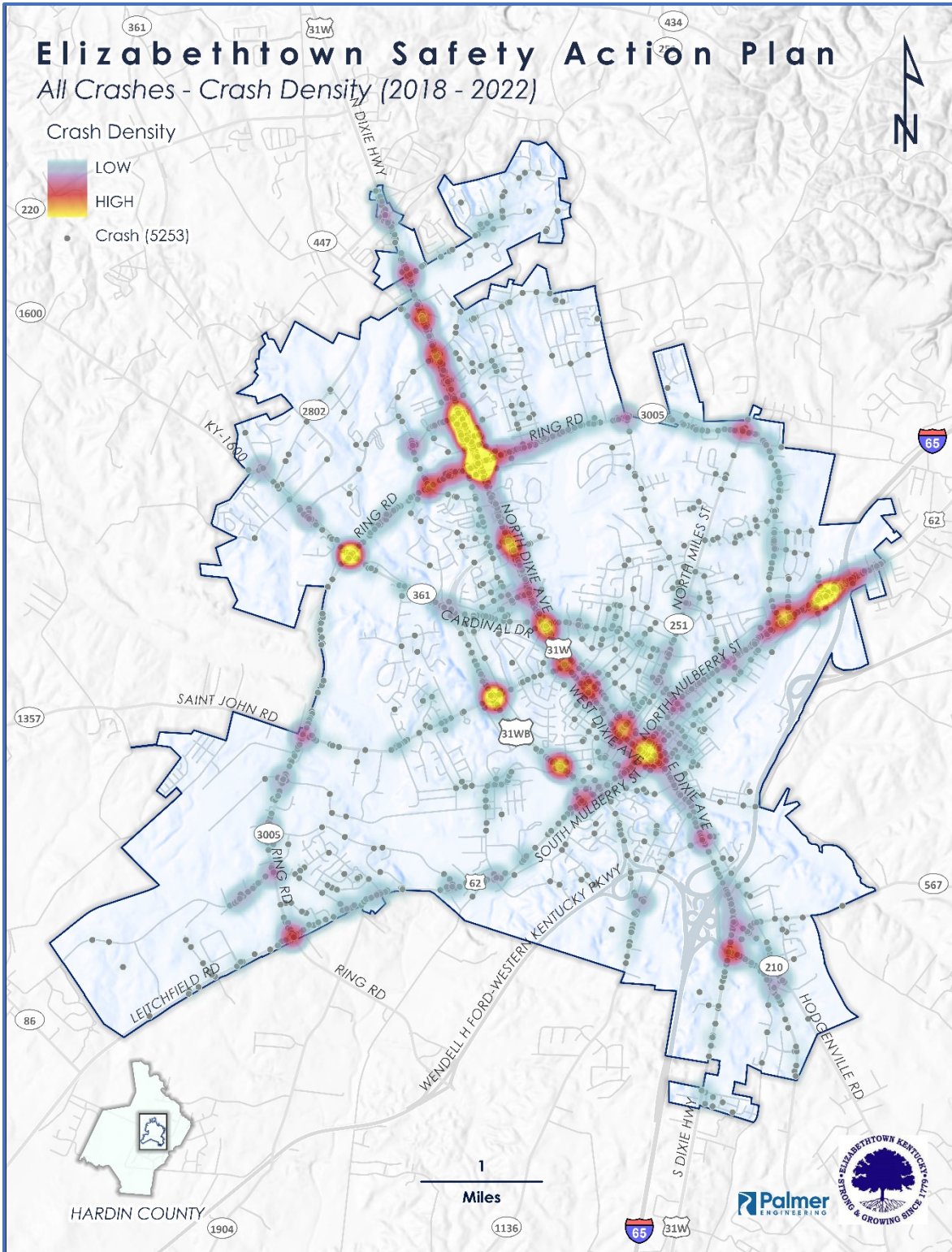
KYTC provided the geographic information system (GIS) files of roadway and traffic data, known as the Highway Information System (HIS) database. HIS data includes roadway characteristics and traffic data for state-owned roadways. The crash data provided was joined with GIS information to create a crash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

Crash Data

The initial crash data collected from KYTC included 6,780 crashes in the city from 2018 to 2022. There were 969 crashes that occurred in a parking lot. There were 557 crashes removed that were located on I-65 and the parkways. During the process of spatially joining the crashes to the provided GIS roadway network, 1 crash could not be joined to the roadway due to missing information. The final crash database for the study included 5,253 crashes.



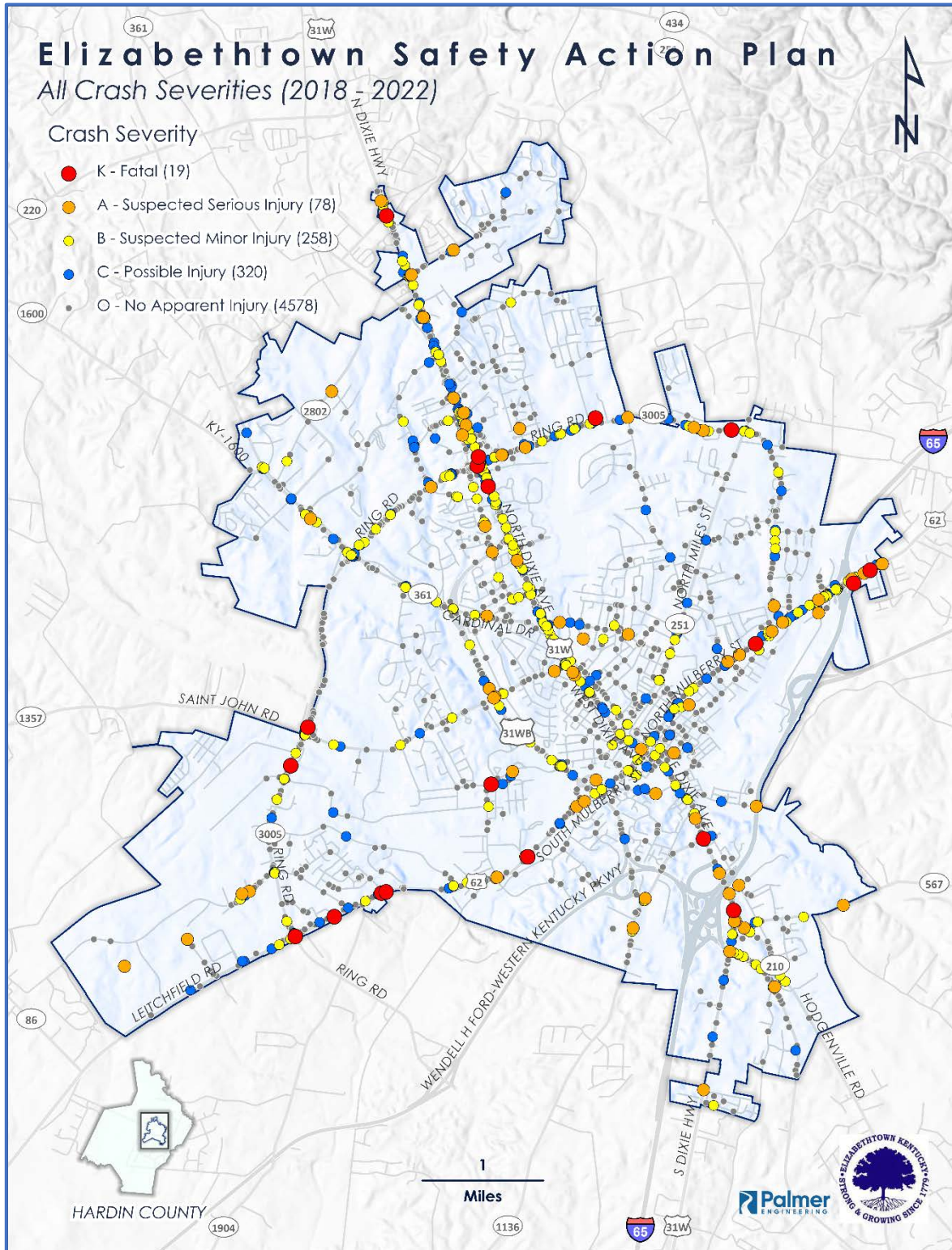
The following crash density map represents the density of crashes within the city. The corridors with the highest density of crashes include Dixie Ave, Ring Road, North Mulberry Street, and South Mulberry Street.

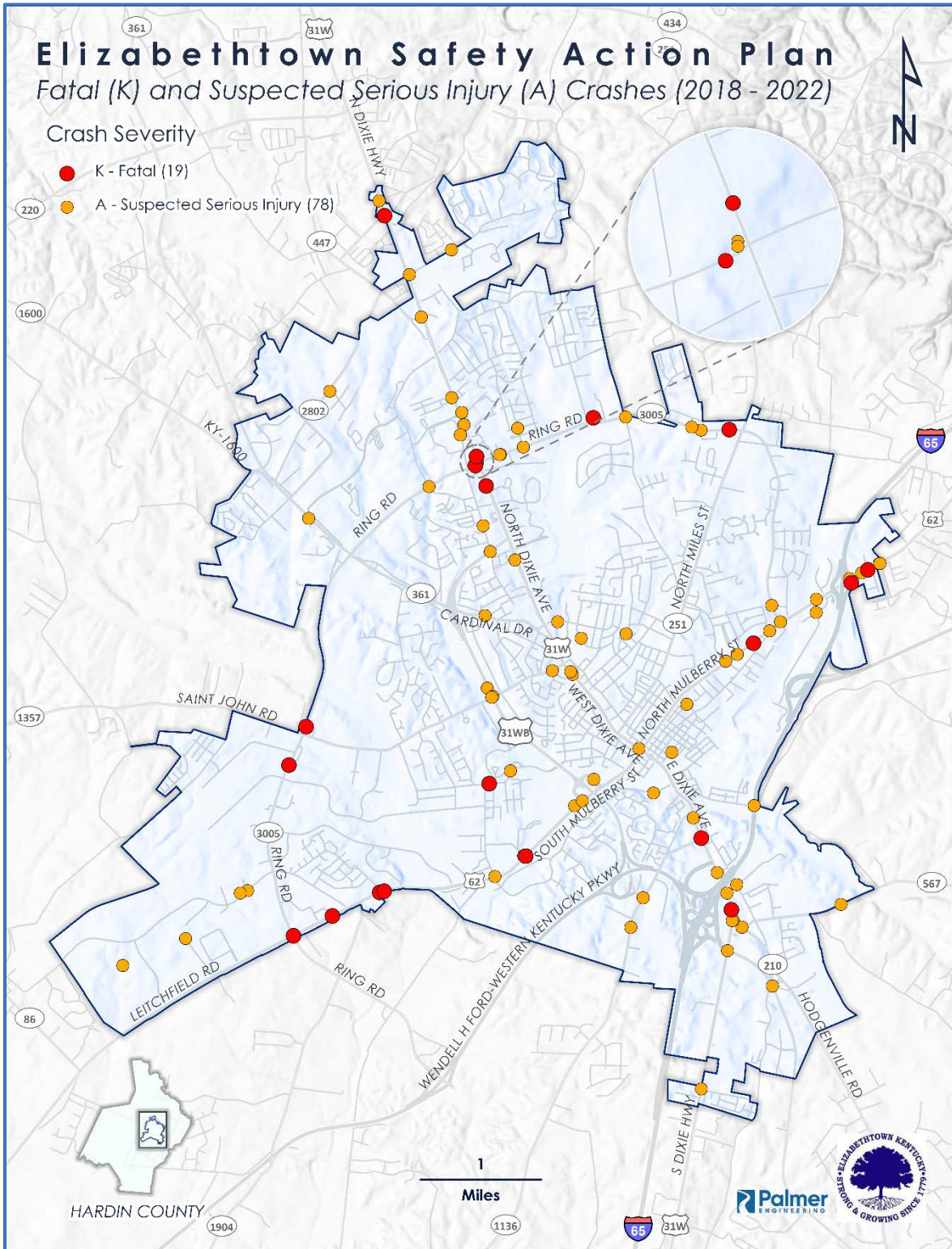


The crash database provided by KYTC utilizes the KABCO Crash Severity Designation. The KABCO scale is recommended as best practice for individual injury reporting per the Model Minimum Uniform Crash Criteria (MMUCC) developed by the National Highway Traffic Safety Administration (NHTSA). The KABCO scale is used by the Kentucky State Police in the field data collection for crashes. The severity of a crash is based on the greatest severity of injury occurring in the crash. For instance, if someone is killed in a crash, the crash is coded as a “K” or fatal crash. The following table provides a breakdown of the total crashes by severity.

Severity	MMUCC Description	Crashes	%
K	Fatal	19	<1%
A	Suspected Serious Injury	78	1%
B	Suspected Minor Injury	258	5%
C	Possible Injury	320	6%
O	No Apparent Injury	4,578	87%
TOTAL		5,253	

The crash maps on the following pages show crash location by severity.

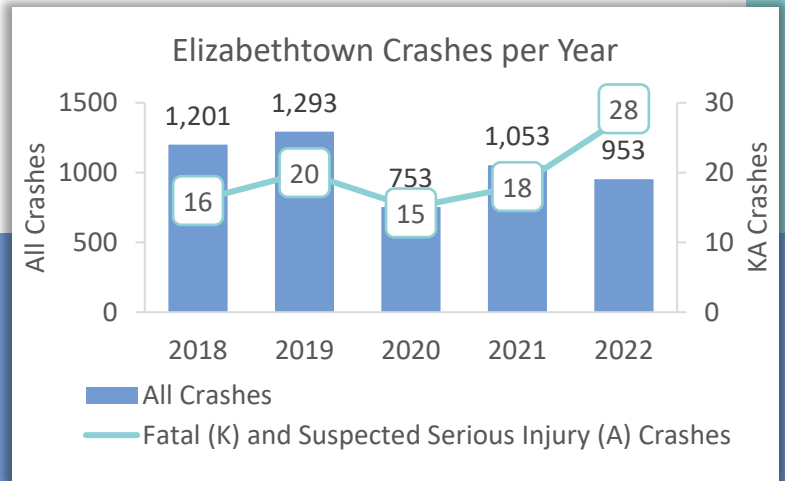




Crash Trends

Annual Crash Trends

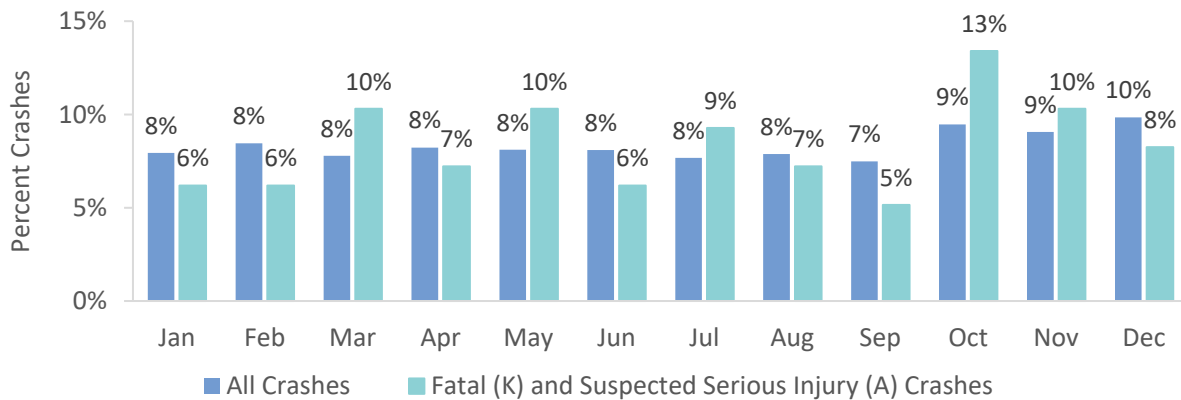
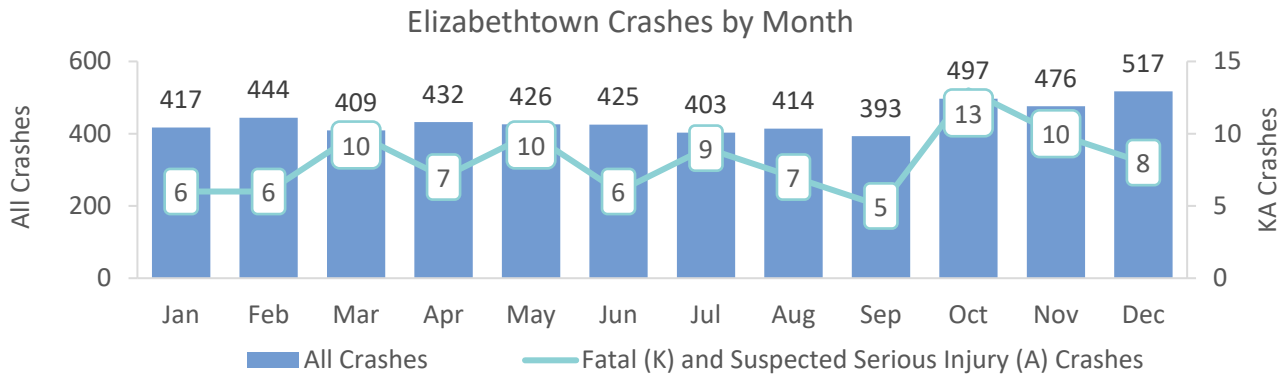
Between 2018 and 2022, annual crashes decreased by 20%, while fatal and suspected serious injury crashes increased by 75%.



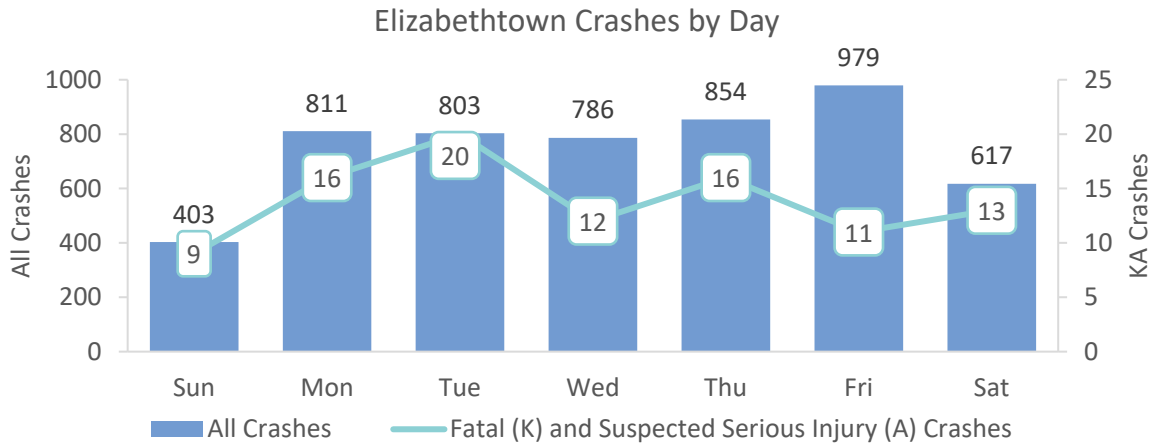
The COVID-19 pandemic greatly affected traffic patterns and crash reporting. In early 2020 police operating procedures were modified to minimize potential exposure. Consequently, the reported number of crashes in 2020 is likely distorted, as crashes were underreported compared to other years.

Crash Occurrence

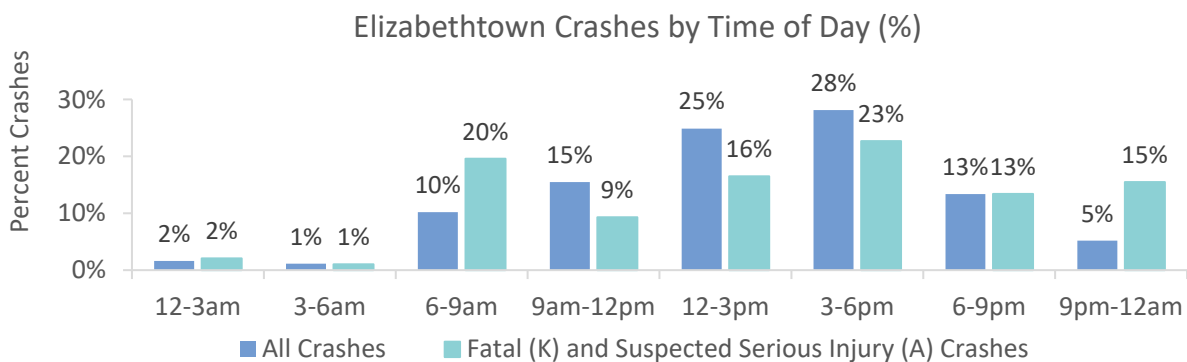
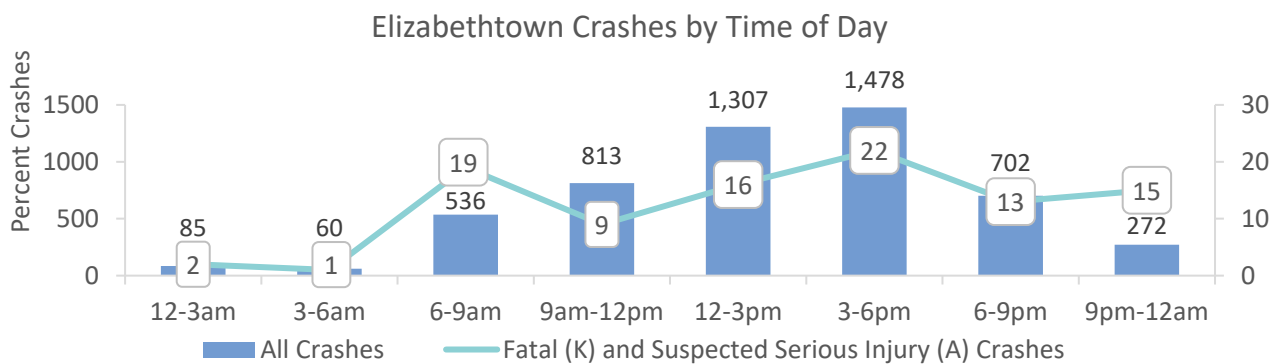
There was a higher crash occurrence during the winter months. October was the highest month for fatal and suspected serious injury crashes. In Kentucky, the month of October is normally the highest crash month due to the seasonal change to fall, days becoming shorter and temperatures falling.



There was a higher crash occurrence on Friday than any other day of the week. The higher crashes on Friday is likely due to increased weekend travel and end of workweek driving behavior. The weekends saw the fewest overall crashes perhaps related to lower traffic volumes, but the number of severe crashes is proportionately higher than most week days.



The time period with the most crashes, including fatal and serious injury crashes, is 3:00-6:00 PM, with totals of 1,478 crashes and 22 fatal and suspected serious injury crashes. Despite the lower total of all crashes, 272, the 9:00-12:00 PM window has a disproportionately high number of fatal and suspected serious injury crashes, 15 crashes, which is 15% of the severe crash total. Similarly, 6:00-9:00 AM period experienced an elevated rate of fatal and suspected serious injury crashes, accounting for 20% of the severe crash total, despite only experiencing 10% of all crashes.

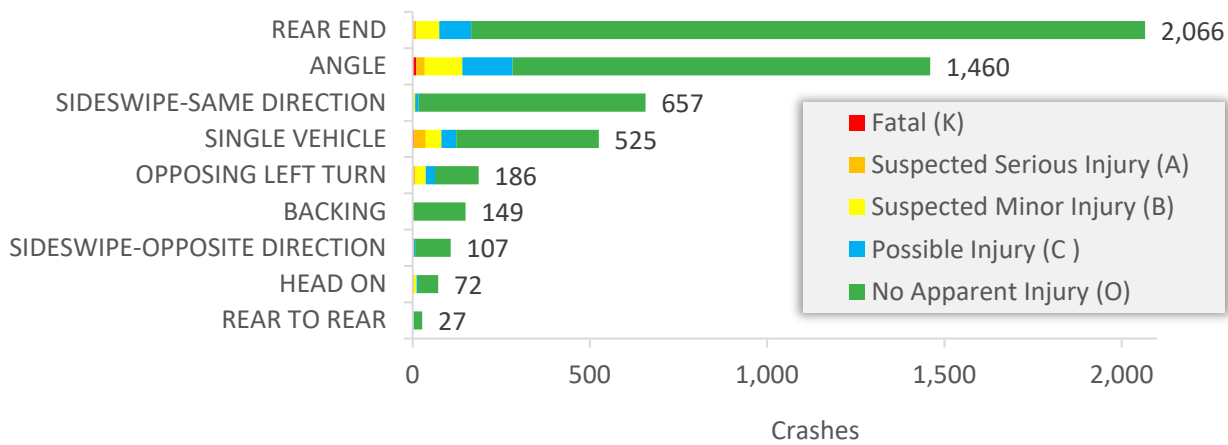


Manner of Collision

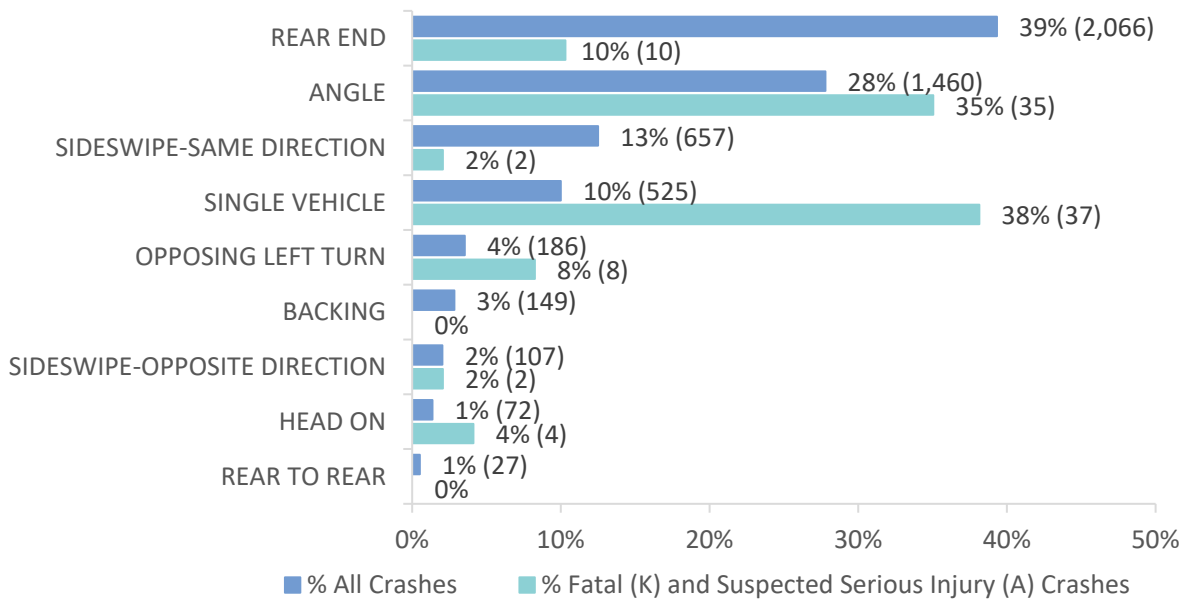
Rear-end crashes are the most frequent type of crash, totaling 2,066 crashes, followed by angle crashes at 1,460 crashes. The majority of rear-end, sideswipe (both same and opposite direction), backing, and rear-to-rear crashes tend to be less severe, with over 90% of the crashes resulting in no apparent injury.

The most severe crashes predominantly involve single vehicle crashes and angle crashes, representing 38% and 35% of all fatal and suspected serious injury crashes, respectively. Single vehicle crashes include crashes with pedestrians and angle crashes typically happening at intersections. Both crash types typically result in more severe injuries.

Elizabethtown Crashes by Manner of Collision Severity



Elizabethtown Crashes by Manner of Collision Severity (%)

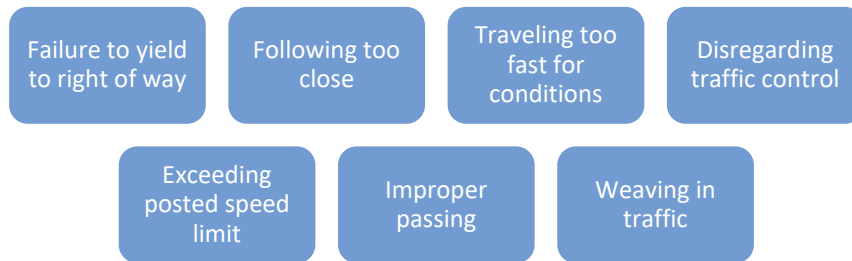


Driver Behavior

Driver behavior is a shared responsibility and can be the determining factor in a crash.

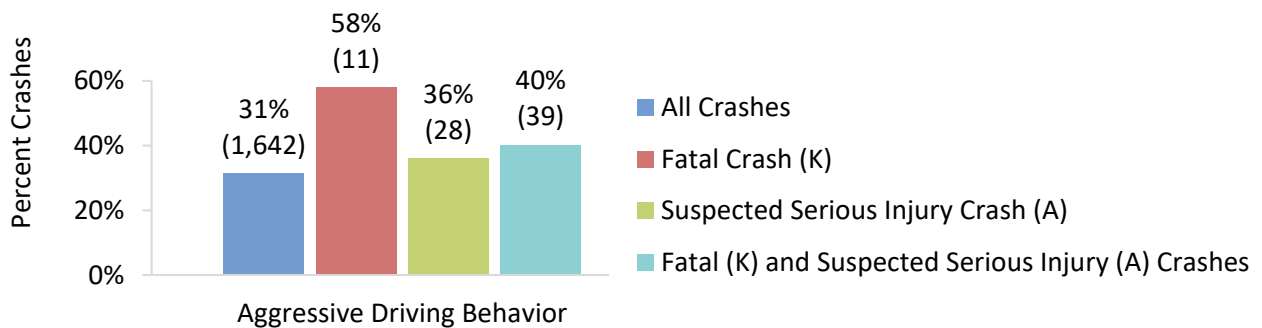
Aggressive Driving

Aggressive driving is generally defined as actions by drivers that result in adverse safety effects to other drivers or pedestrians that contribute to crashes. Aggressive driving crashes are coded to have the following behaviors.



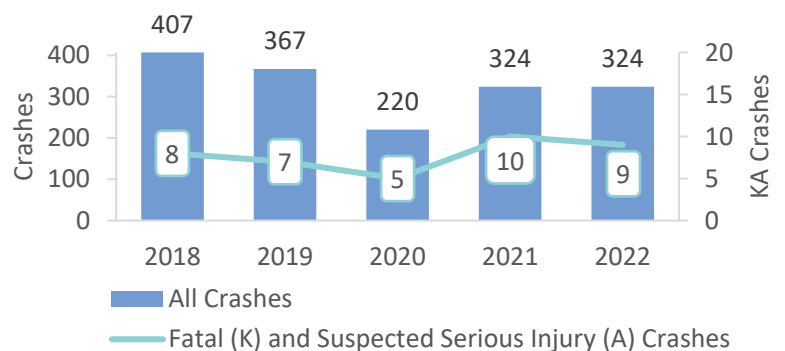
Crashes involving aggressive driving disproportionately contribute to fatal and suspected serious injury crashes compared to all crashes. While aggressive driving behaviors are identified in 31% of all crashes, they represented 40% of those crashes leading to fatalities and severe injuries, indicating a higher risk of severity associated with aggressive driving behaviors.

Aggressive Driving Crashes by Severity (%)



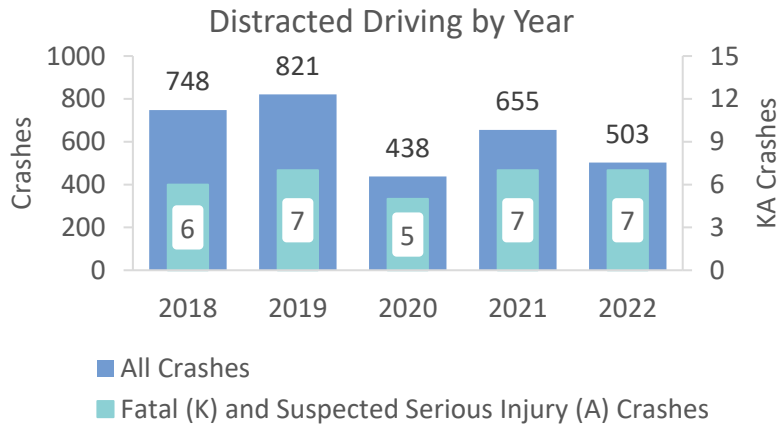
Annually, aggressive driving fatal and suspected serious injury crashes were consistent from 2018 to 2019 with a slight decrease in 2020.

Aggressive Driving Crashes by Year

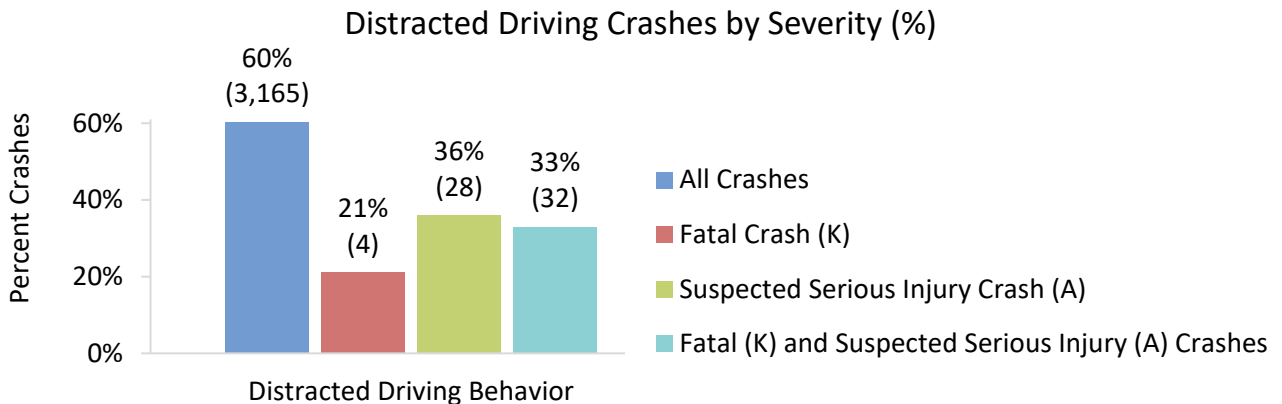


Distracted Driving

Distracted driving is any activity by the operator of a motor vehicle that has the potential to distract the operator from the primary task of driving, increasing the risk of crashing. The three main types of distracted driving involve drivers removing their eyes from the road, hands off the wheel, and mind away from driving. In Elizabethtown, fatal and suspected serious injury crashes linked to distracted driving were consistent throughout the study period.



In Elizabethtown, 33% of fatal and suspected serious injury crashes were linked to distracted driving, underscoring the rising concern with distracted driving. Comparatively, Kentucky saw distracted driving contribute to 22% of all fatal crashes in 2021; similar to Elizabethtown’s 21%.



Driving while using a cell phone reduces the amount of brain activity associated with driving by:

37%

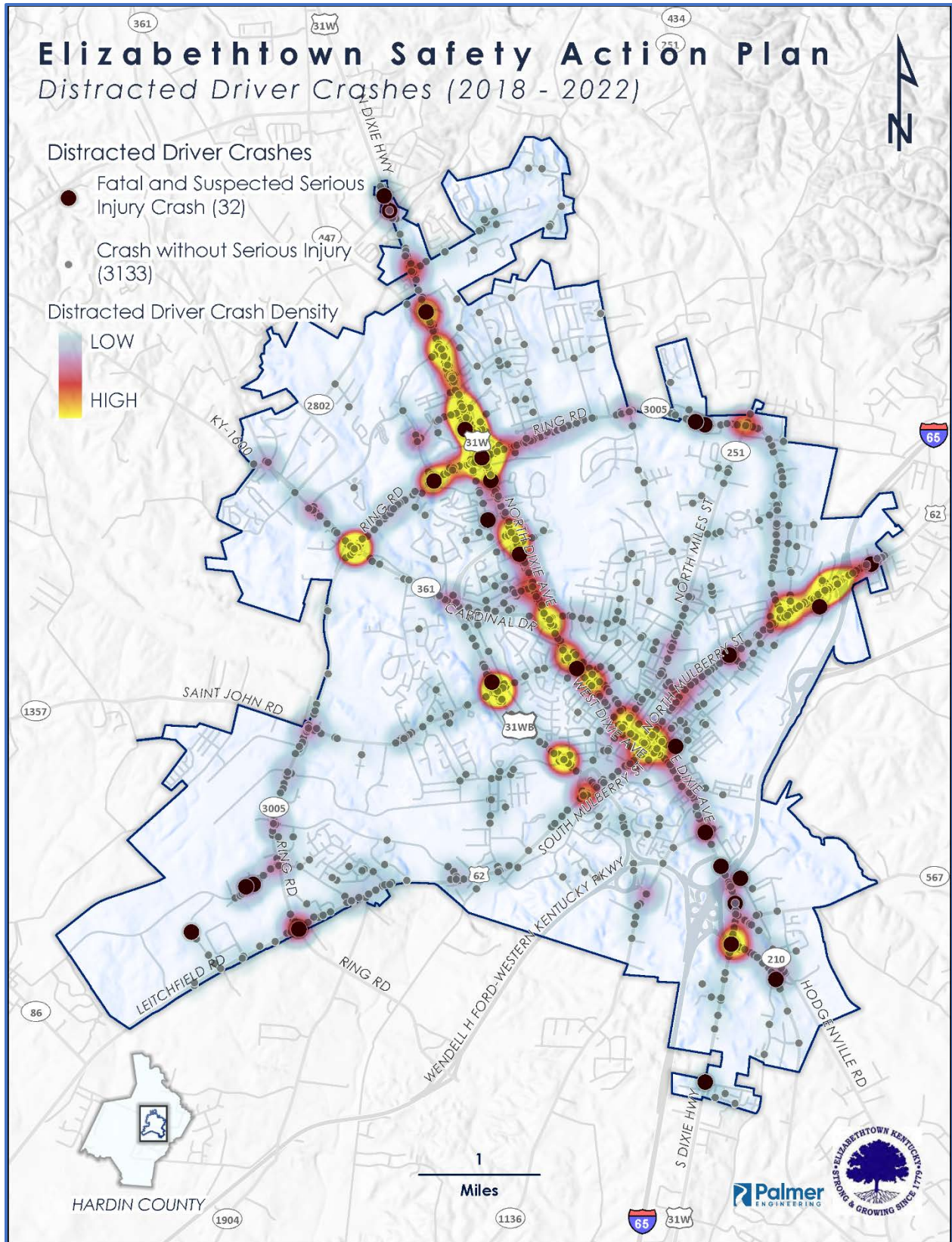
(Source: Carnegie Mellon)

Handheld or hands-free cell phone use while driving delays reaction time as much as a blood alcohol concentration at the legal limit of .08 percent.

(Source: University of Utah)

Kids are 4 times more distracting than adults as passengers and infants are 8 times more distracting.

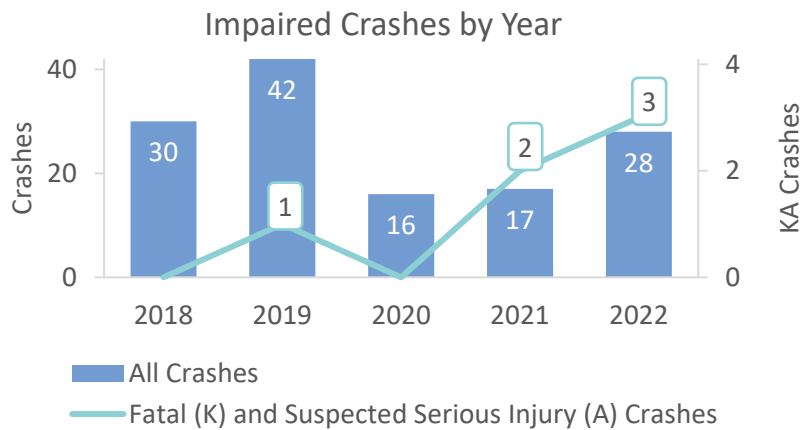
(Source: AAA Foundation for Safety)



Impaired Driving

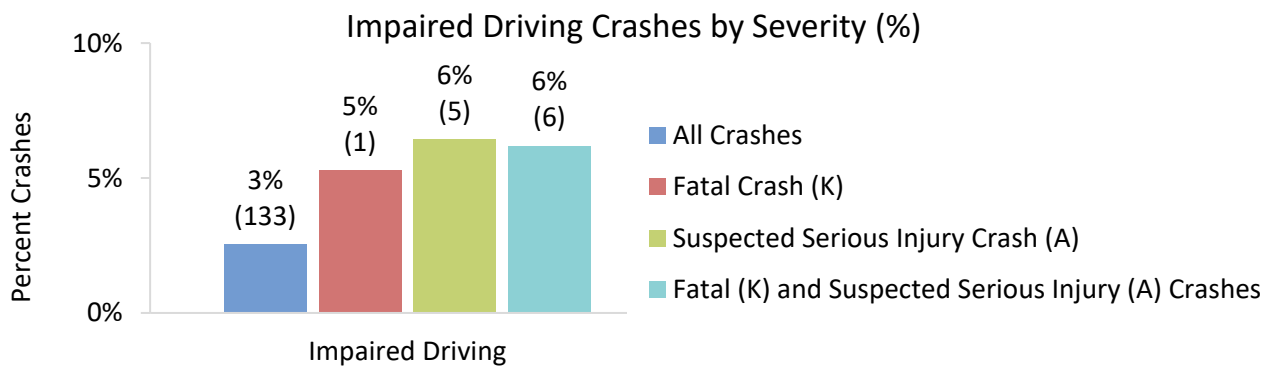
Impaired driving is recognized as driving while under the influence of alcohol or narcotics.

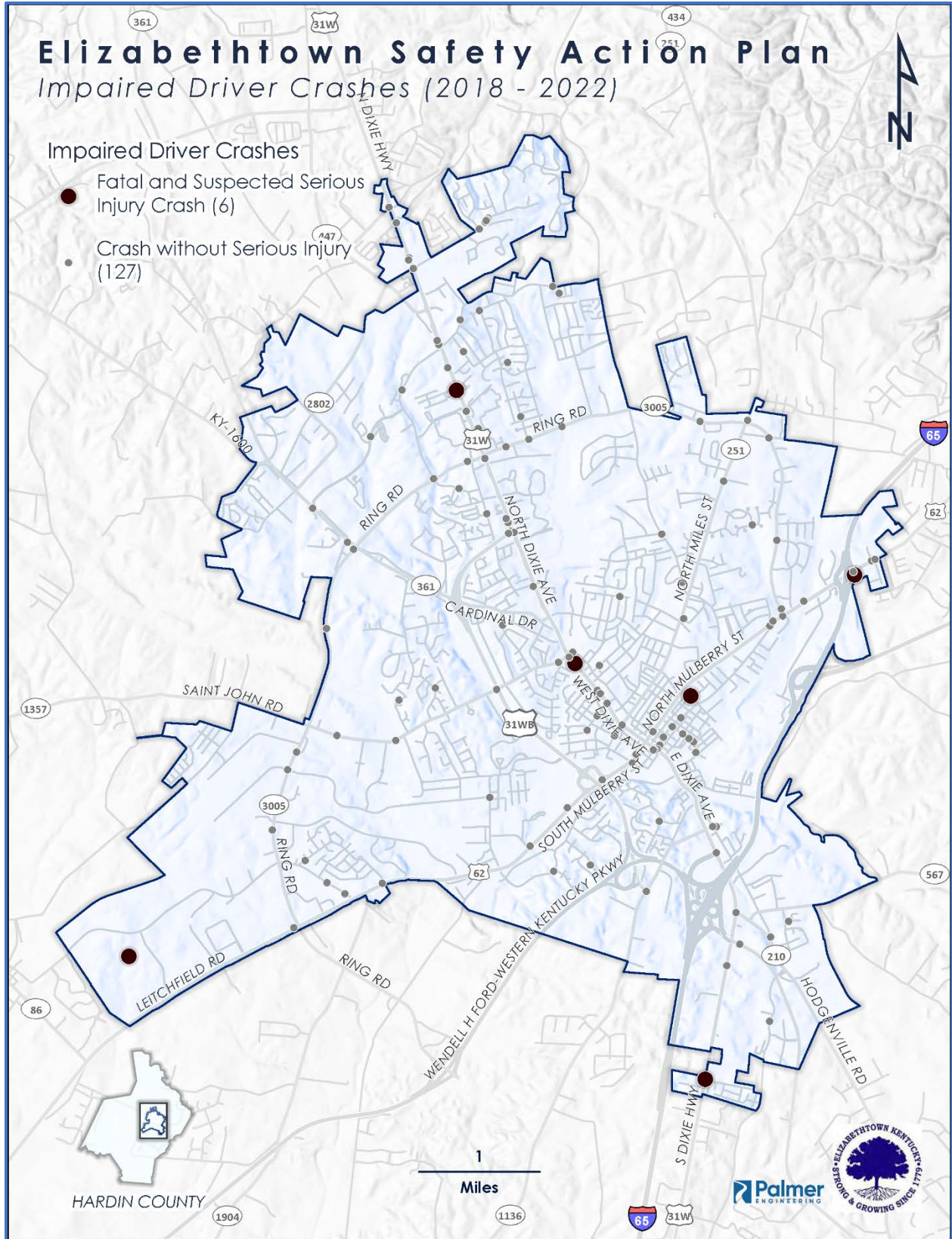
- Impairment was involved in **8%** of motorcycle crashes
- **56%** of impaired driving crashes were single vehicle crashes



Drunken driving crashes are 100% preventable.

Impaired driving significantly increases the likelihood of fatal and suspected serious injury crashes. Though only 3% of all crashes involve impaired driving, impaired driving accounts for 6% of crashes that result in fatalities or severe injuries.



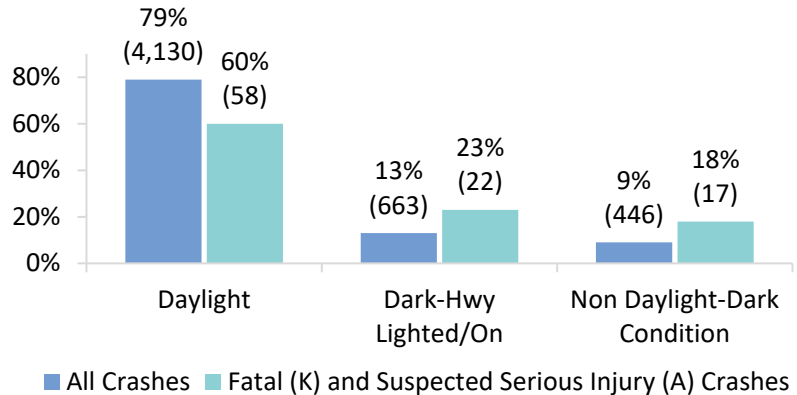


Lighting Conditions

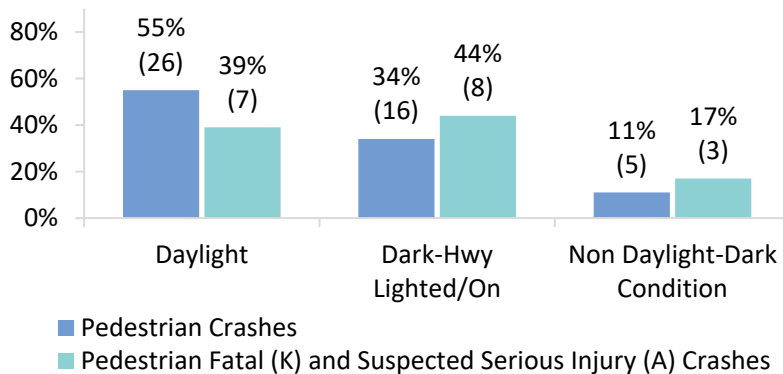
Appropriate lighting is a factor in road safety, influencing visibility and reaction times. However, the documentation of lighting infrastructure in Elizabethtown is not comprehensive. The crash data available offers only anecdotal evidence about the lighting at the crash. Currently, there is no established infrastructure database detailing the presence and condition of street lighting, which poses challenges in analyzing the correlation between illumination and road safety.

The chart indicates that while the majority of crashes in Elizabethtown occur during daylight conditions, a disproportionate percentage of fatal and suspected serious injury crashes happen in dark conditions – 18% versus the 9% of all crash severities. This suggests that lower visibility conditions at night may be a contributing factor to the increased severity of crashes.

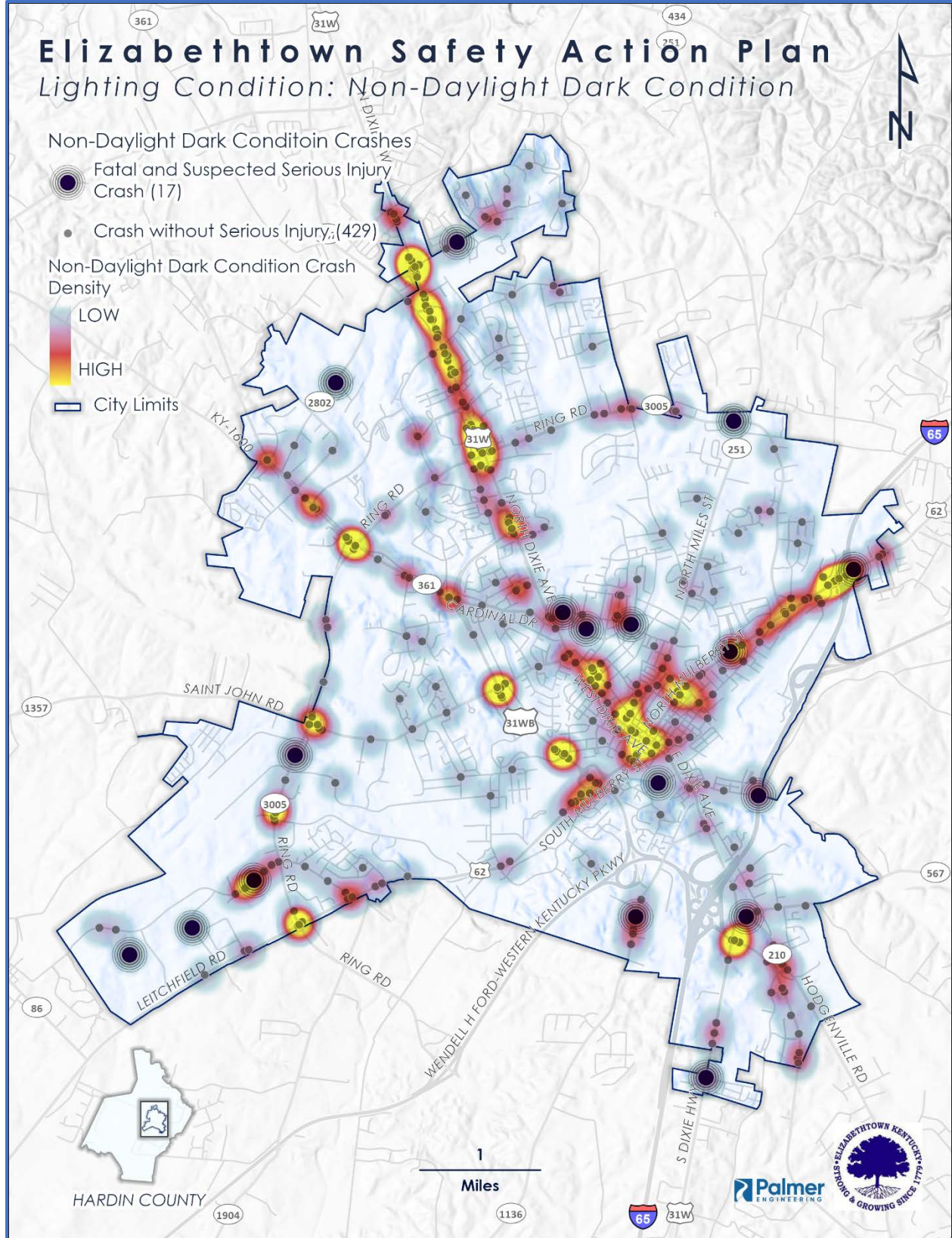
Elizabethtown Crashes by Light Condition



Elizabethtown Pedestrian Crashes by Light Condition



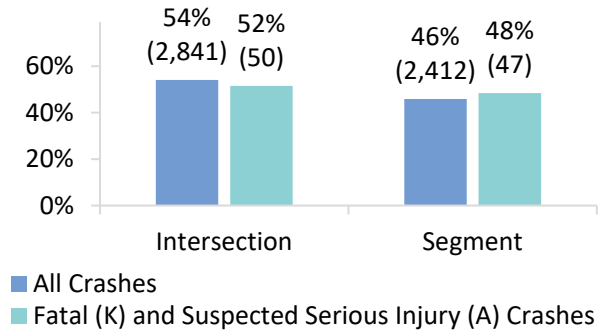
Over half of the pedestrian crashes occur in daylight, yet 61% of fatal and suspected serious injury crashes occur in dark conditions, regardless of lighting (61%). In addition, the proportion of fatal and suspected serious injury pedestrian crashes is notably higher in dark conditions when compared to daylight condition. This suggests that enhanced lighting could be critical factor in improving pedestrian safety during non-daylight hours.



Crash Locations

In the analysis, crashes were identified based on their location: intersections and non-intersection. A significant portion of crashes, about 54%, occurred at intersections, which is expected due to the higher number of conflict points at intersections.

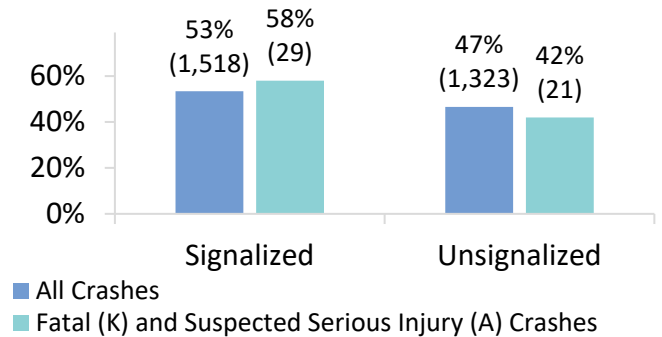
Elizabethtown Crashes by Location



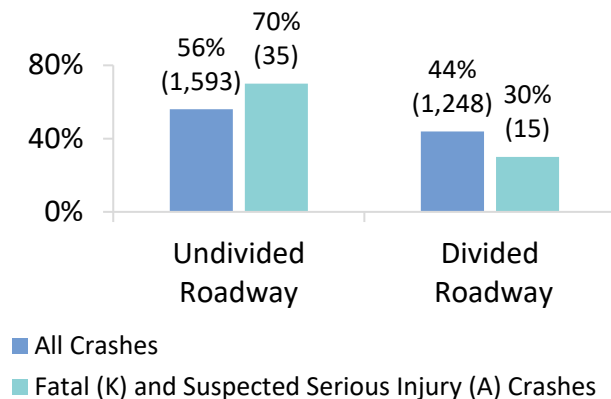
Intersections

Further analysis of intersection crashes shows 53% occurred at signalized intersections, which also accounted for 58% of the fatal and suspected serious injury intersection crashes. This indicates that signalized intersections disproportionately experience more severe crashes compared to unsignalized intersections.

Elizabethtown Crashes by Intersection



Elizabethtown Intersection Crashes by Roadway Type



Intersections – Roadway Type

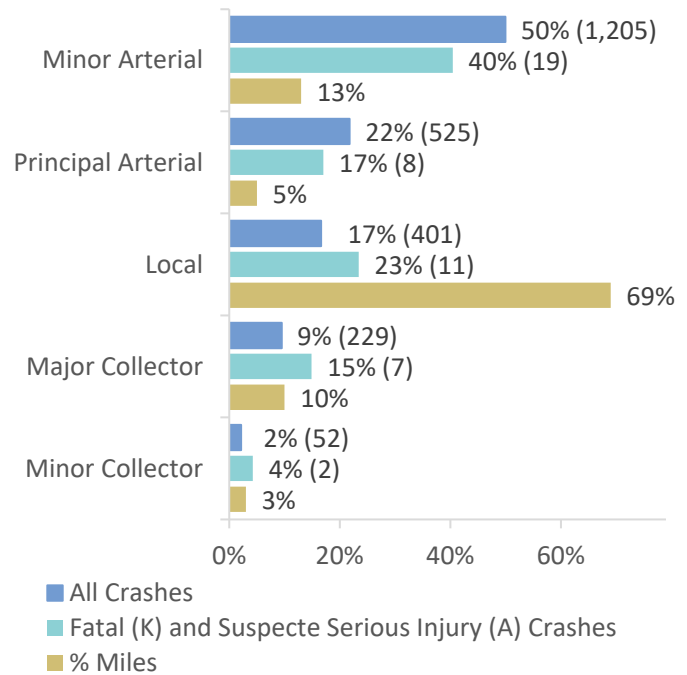
Roadways are classified as either divided or undivided. A divided roadway is characterized by the presence of a physical barrier or space that separates lanes of traffic moving in opposite direction. Of the more than 1,000 intersections in Elizabethtown, 95% are located at intersecting undivided roadways and 70% of the fatal and suspected serious injury crashes occurred at these intersections.

Segments

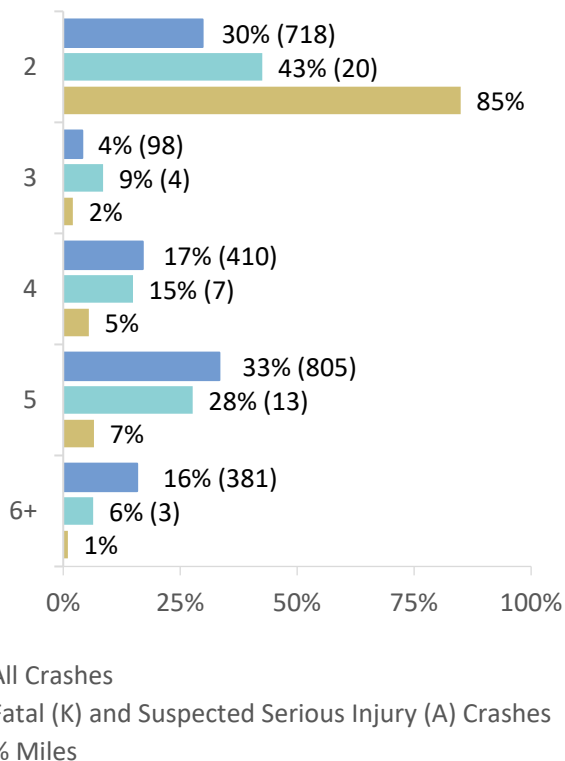
In Elizabethtown, 46% of all crashes occur on roadway segments, with a significant portion on Minor Arterials, such as Ring Road, North and South Mulberry Streets, Leitchfield Road, and Dixie Ave south of Elizabethtown Bypass. Roads with the Principal Arterial classification include the Elizabethtown Bypass and the northern portion of Dixie Ave. Principal and Minor Arterials combined account for 57% of the fatal and suspected serious injury crashes, despite making up only 18% of the roadway network.

In an urban environment, speeds and traffic volumes are typically higher on Principal and Minor Arterials when compared to Local Roads and Major Collectors.

Elizabethtown Segment Crashes by Functional Classification



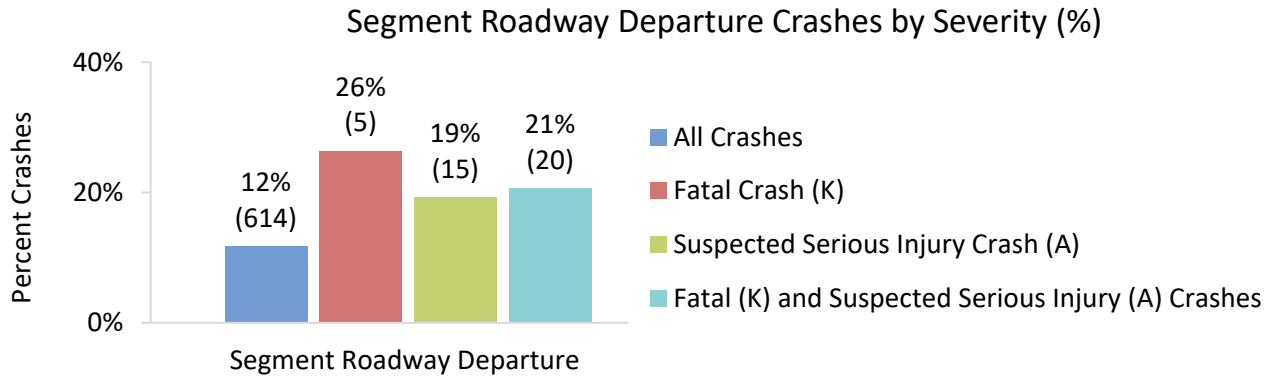
Elizabethtown Segment Crashes by Number of Lanes



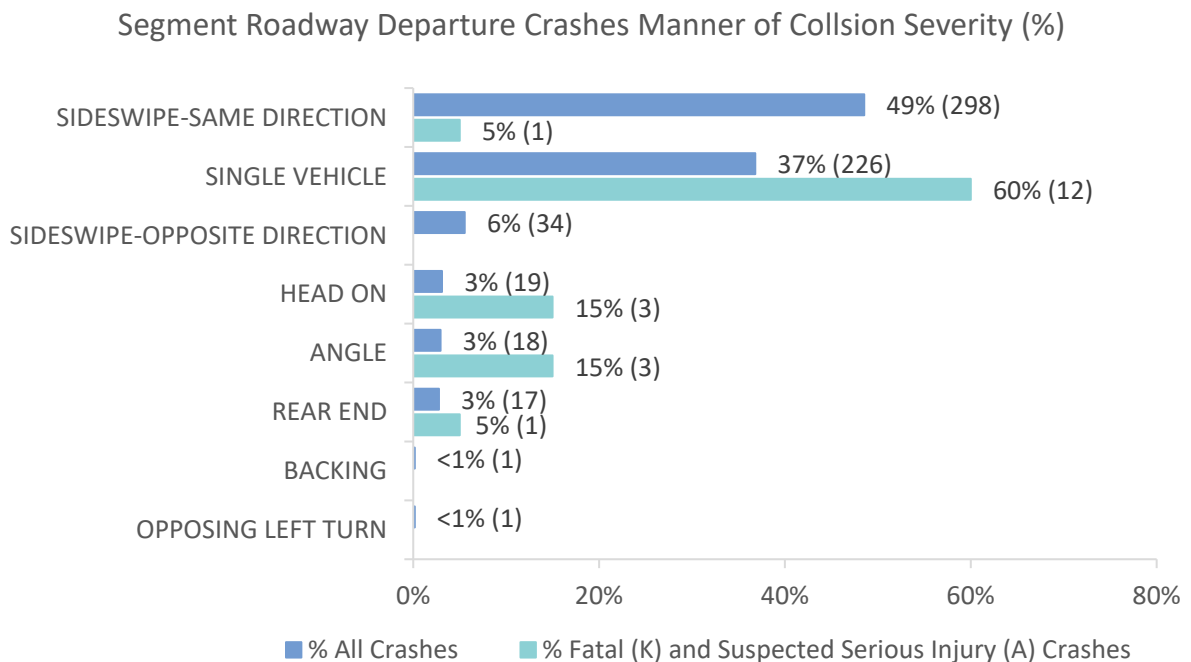
In Elizabethtown, 85% of the roadway network are two-lane roadways and a majority of the fatal and suspected serious injury crashes occur on these roads. Five-lane roadways account for only 7% of the roadways but experiences 28% of the fatal and suspected serious injury crashes. Typically, five-lane roadways have 4 thru-lanes and continuous left turn lane separating traffic. Roadways with more lanes typically have increased traffic volumes and higher speeds, contributing factors to crashes.

Roadway Departure Crashes

A roadway departure crash is a non-intersection crash that occurs after a vehicle crosses an edge line, a centerline, or otherwise leaves the roadway. Roadway departure crashes that occurred on segments (non-intersection) accounted for 12% (614) of all crashes (5,253) and 21% (20) of the fatal and suspected serious injury crashes (97).

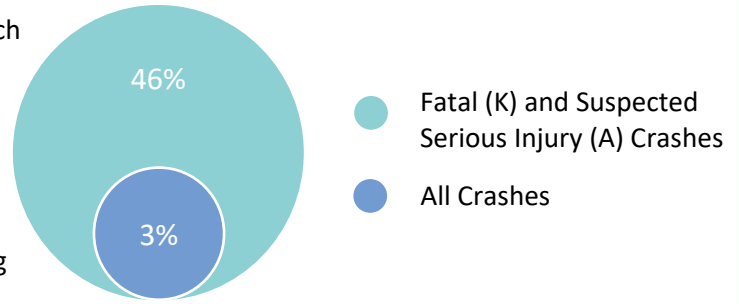


Sideswipe-same direction crashes are the most frequent type of segment roadway departures crashes, totaling 298 crashes, but tend to be less severe crashes. The most severe crash type involve single vehicle crashes, representing 60% of the segment roadway departure fatal and suspected serious injury crashes.



Vulnerable Road Users

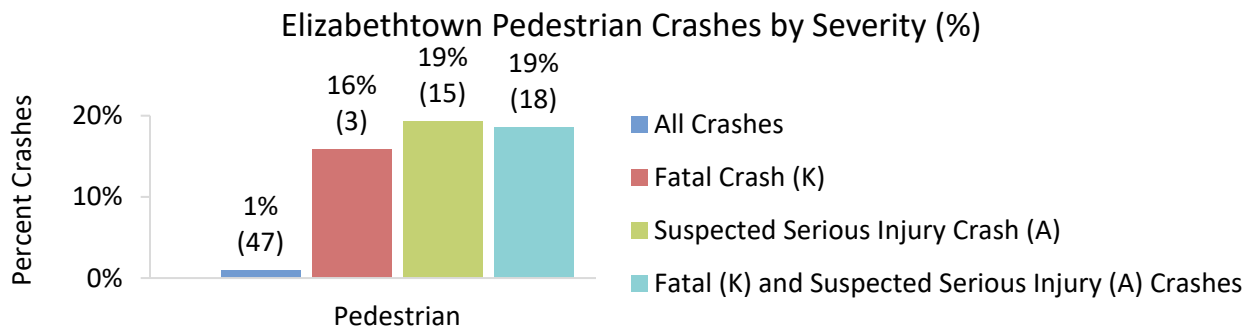
In Elizabethtown, vulnerable road users, which include pedestrians, bicyclists, and motorcyclists, are at an elevated risk of severe crashes in comparison to all crashes. Despite representing only 3% of all crashes, vulnerable road user crashes account for 46% of fatal and suspected serious injury crashes. Every third crash involving a vulnerable road user is severe.



Pedestrians

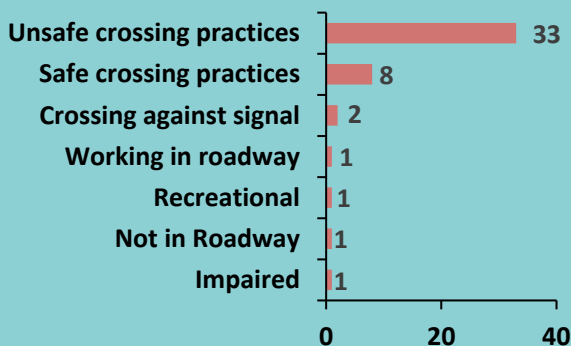
Pedestrian crashes, while less than 1% of all crashes, represent 19% of fatal and suspected serious injury crashes. Out of the 47 pedestrian crashes, 18 were severe. This discrepancy spotlights the disproportionate risks pedestrians face while traveling.

Severity	Description	Crashes	%
K	Fatal	3	6%
A	Suspected Serious Injury	15	32%
B	Suspected Minor Injury	15	32%
C	Possible Injury	5	11%
O	No Apparent Injury	9	19%
TOTAL		47	



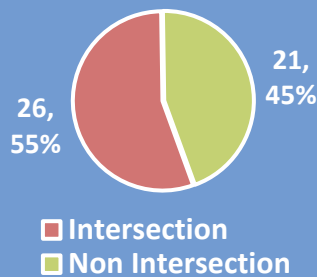
The most significant contributor to pedestrian crashes is unsafe crossing practices.

Elizabethtown Pedestrian Crashes Pedestrian Factors

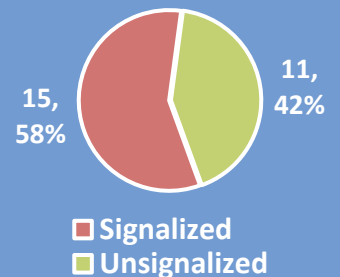


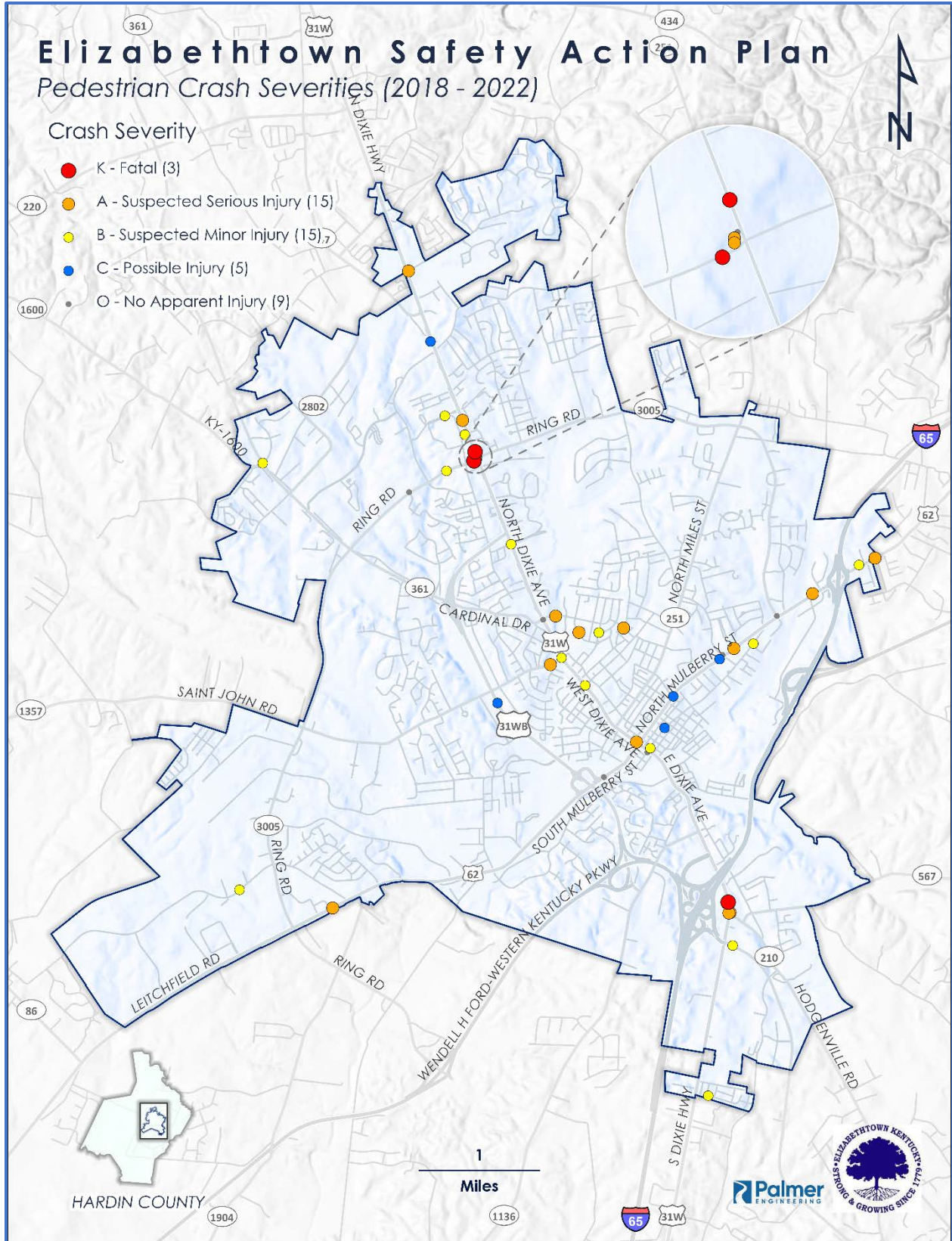
More than half of pedestrian crashes occur at intersections, with a significant amount happening at signalized intersections.

Pedestrian Crashes by Location



Pedestrian Crashes by Intersection

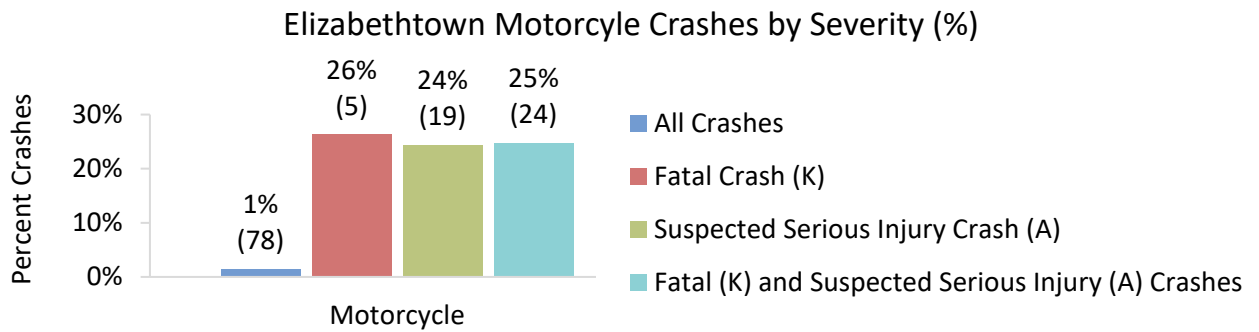




Motorcyclist

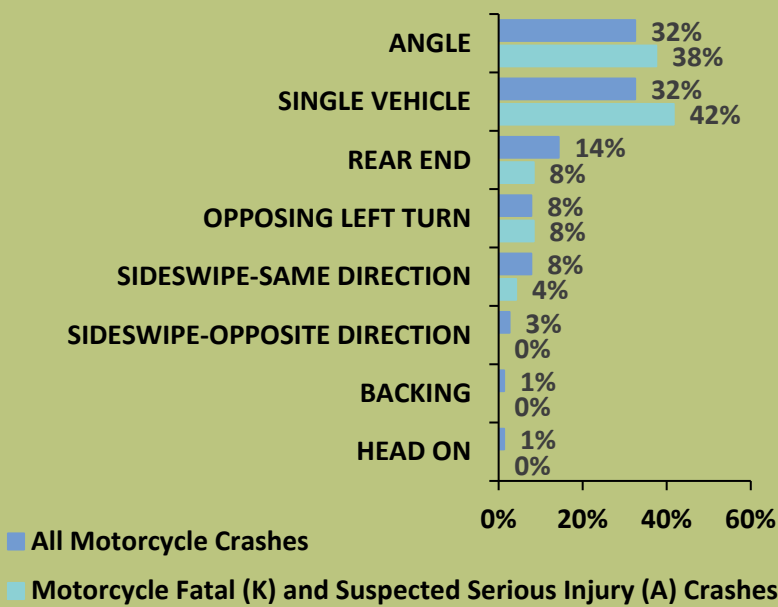
Motorcycle crashes make up 55% of all fatal and suspected serious injury crashes among vulnerable road users, with 24 crashes. From 2018 to 2022, motorcycle crashes represented 25% of Elizabethtown’s fatal and suspected serious injury crashes. Additionally, 31% of motorcycle crashes during this period resulted in fatalities or suspected serious injuries, highlighting a significant concern for motorcyclist safety.

Severity	Description	Motorcycle Crashes	%
K	Fatal	5	6%
A	Suspected Serious Injury	19	25%
B	Suspected Minor Injury	13	17%
C	Possible Injury	12	16%
O	No Apparent Injury	28	36%
TOTAL		77	



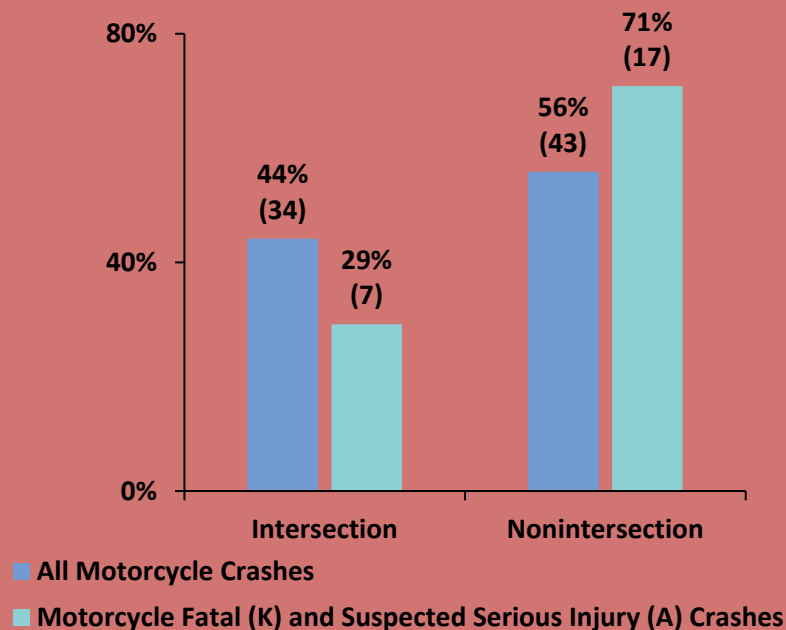
A majority of the motorcycle fatal and suspected serious injury crashes are single vehicle (42%) and angle crashes (38%).

Elizabethtown Motorcycle Crashes by Manner of Collision Severity (%)



A majority of the motorcycle crashes occurred on roadway segments.

Elizabethtown Motorcycle Crashes by Location

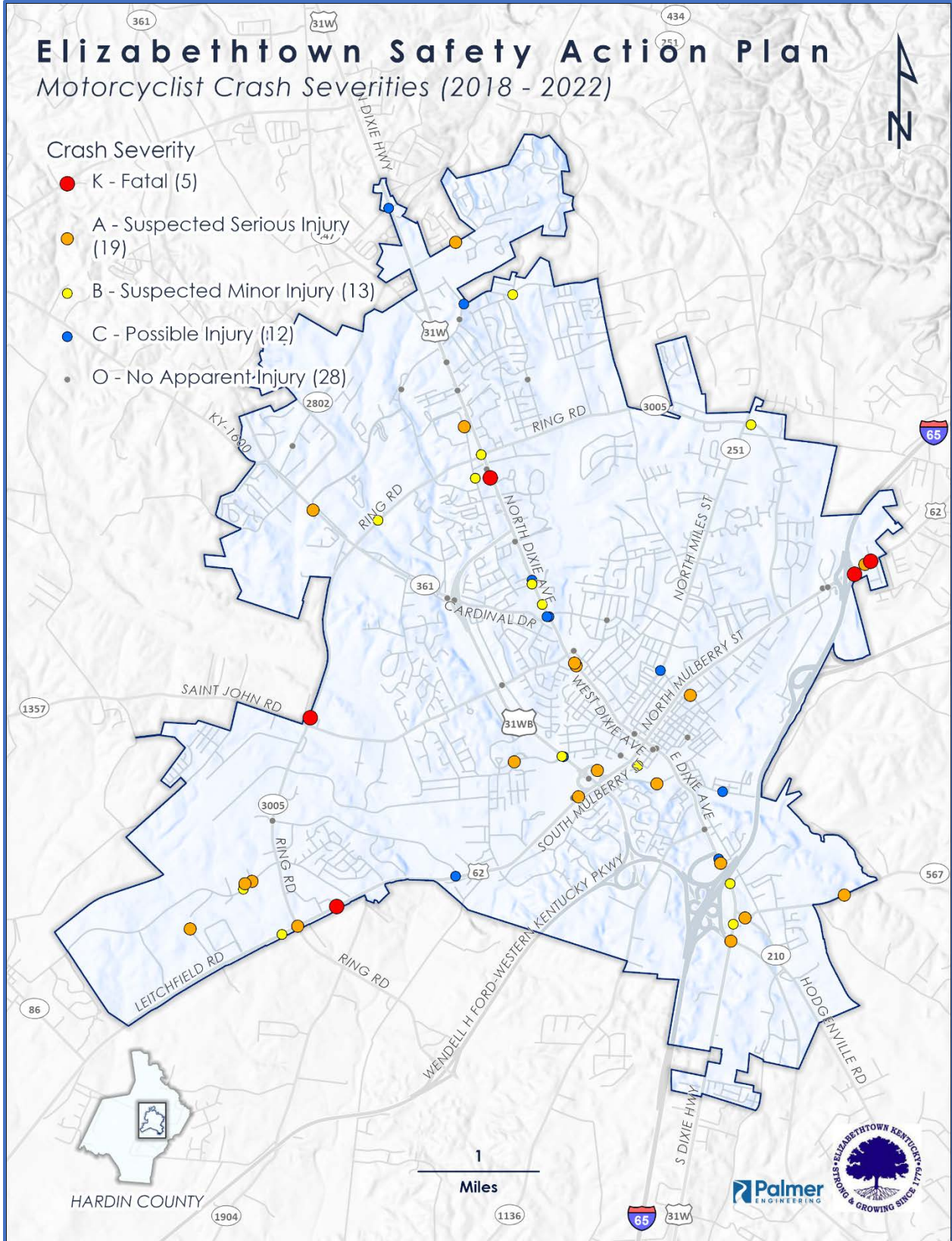


Elizabethtown Safety Action Plan

Motorcyclist Crash Severities (2018 - 2022)

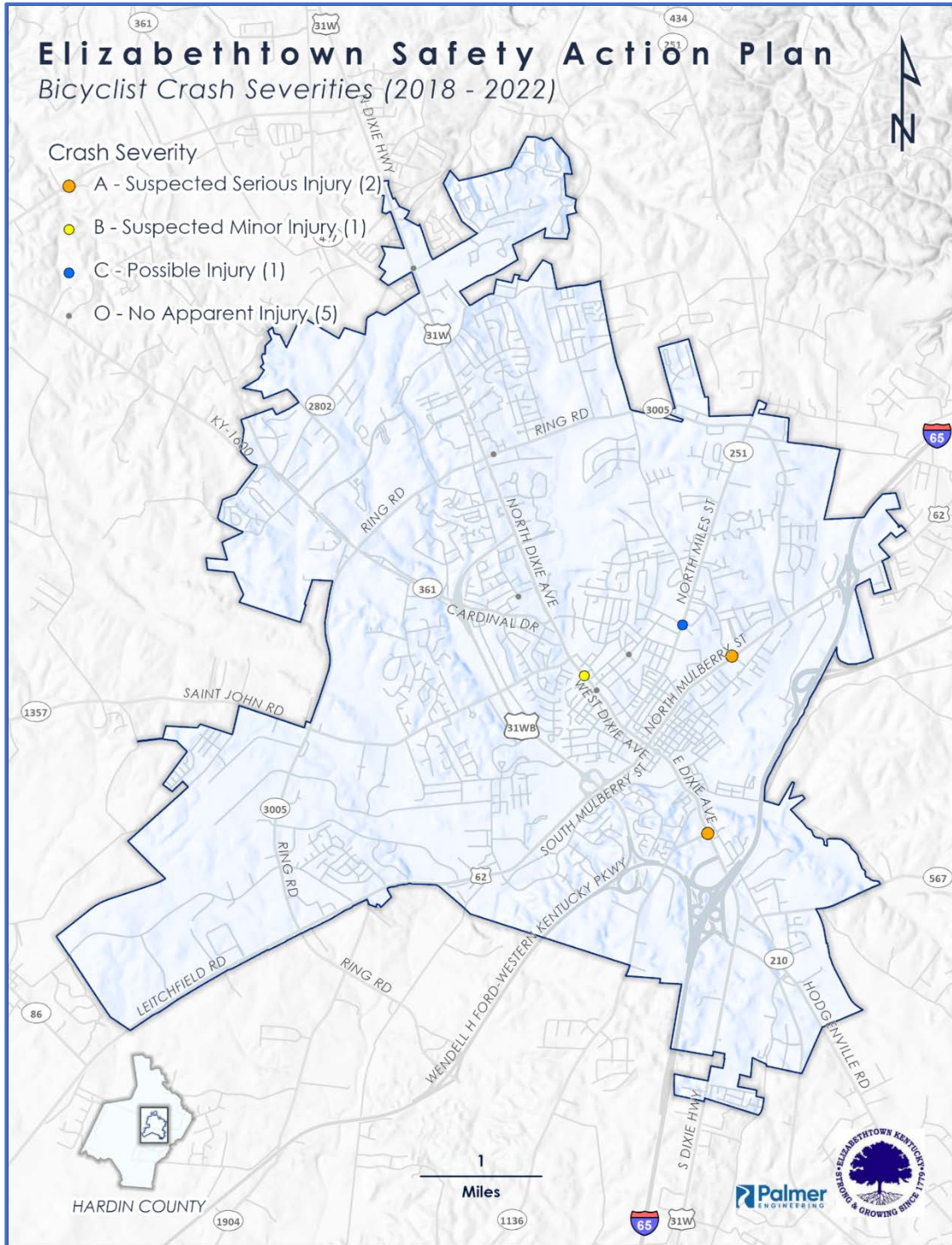
Crash Severity

- K - Fatal (5)
- A - Suspected Serious Injury (19)
- B - Suspected Minor Injury (13)
- C - Possible Injury (12)
- O - No Apparent Injury (28)



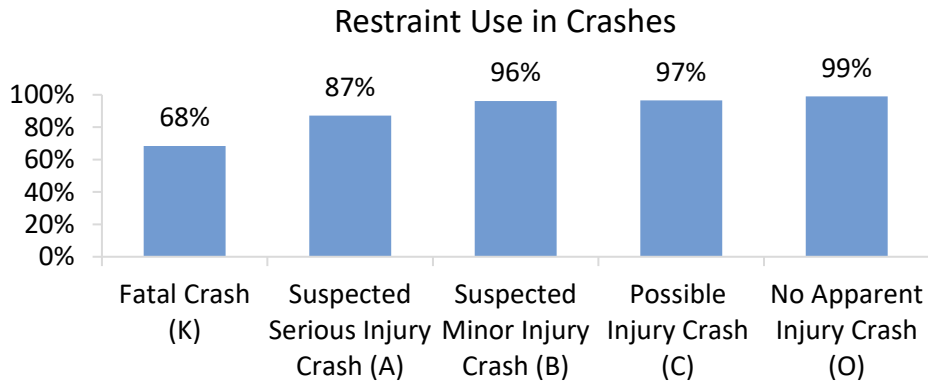
Bicyclist

During the study period in Elizabethtown, there were nine bicycle crashes, of which 2 were suspected serious injury crashes. Given the small number of bicycle crashes, drawing conclusions could be unreliable. The rarity of these crashes suggests a need for broader data to understand the factors contributing to bicycle crash severity and frequency.



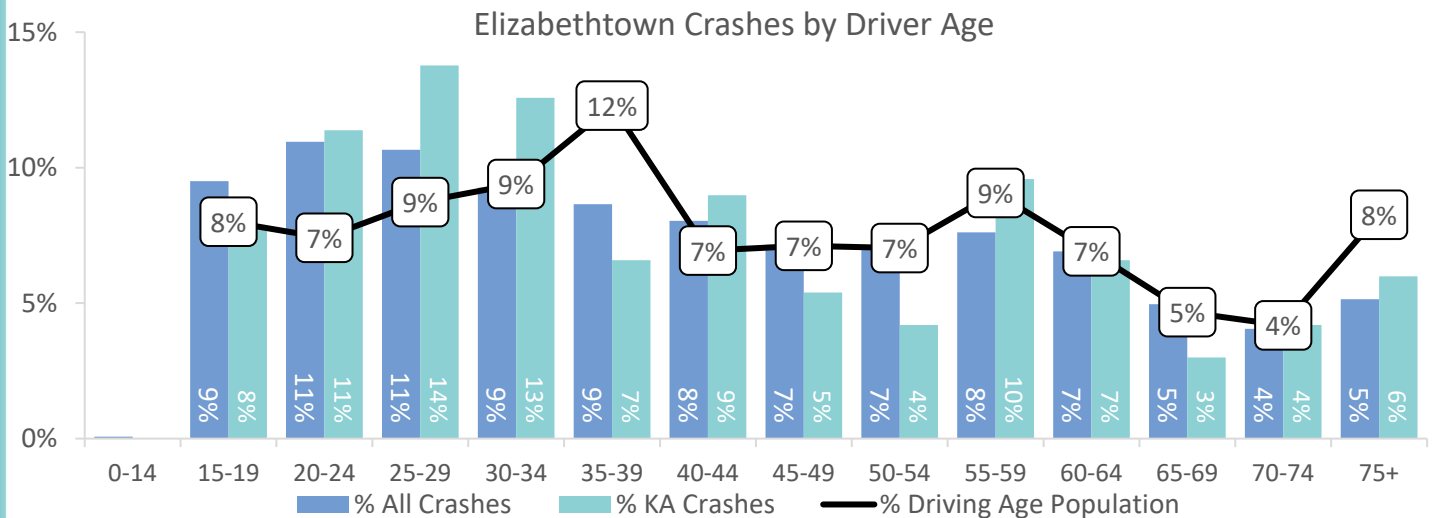
Occupant Protection

Occupant Protection involves any device which is 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 all vehicle occupants were restrained. If a single occupant was unrestrained, i.e. not wearing a seatbelt, then the crash was categorized as unrestrained. In 68% of the fatal crashes, all the occupants were restrained.



Driver Age

The following chart illustrates that drivers aged 20-24 are involved in a disproportionately high number of crashes. The age groups 15-19 and 25-29 also show a slight overrepresentation in crashes. Furthermore, the 20-34 age groups seem to experience a higher rate of fatal and suspected serious injury crashes. The 65+ age groups have a lower crash occurrence, potentially due to reduced driving frequency.



High Injury Network

A High Injury Network (HIN) is a data-driven approach which identifies roadway segments within the City that account for a disproportionate amount of a community's fatal and serious injury crashes. Developing an HIN is a national best practice among Vision Zero communities. The HIN allows communities to focus limited resources on improving safety along those high priority, dangerous corridors. Additionally, following the Safe Systems Approach, the HIN corresponds to the Safer Roads pillar. This pillar involves designing roadway environments to mitigate human mistakes and account for injury tolerances, to encourage safer behaviors, and to facilitate safe travel by the most vulnerable users.

Elizabethtown's roads witness almost 20 fatal and suspected serious injury crashes every year along the 227 roadway miles. The High Injury Network (HIN) provides a data-driven and focused list of corridors where a majority of these fatal and suspected serious injury crashes are occurring. The routes identified in Elizabethtown's HIN will guide the city's safety improvement strategy. These strategies and more information on the HIN can be found in Chapter 7 Strategy and Project Selection.

4. Engagement and Collaboration

Active engagement with the community and key stakeholders is essential in the planning process. The Safety Action Plan included review of existing and current plans, community engagement, an online public survey, and an open house public meeting to share with the community the goals and objectives of the Safety Action Plan while collecting feedback. The feedback from the survey and open house, supplemented by data, provided the necessary context for selecting projects and strategy implementation.

Comprehensive Plan

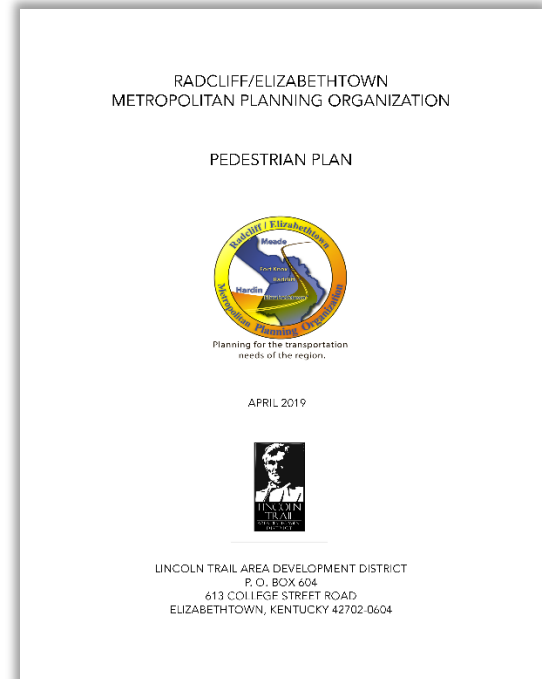
The Envision Elizabethtown 2040 Comprehensive Plan included several participatory events to gather public input on desired city developments. A Public Visioning Workshop featured interactive stations for feedback on future aspirations. This was followed by a Public Open House, where attendees prioritized the 14 outlined goals, ultimately voting for the most critical goal. The last event was an Adoptive Meeting where the Planning Commission recommended and approved plan elements, reflecting the community's vision and priorities discussed in earlier meetings.

Radcliff – Elizabethtown Metropolitan Planning Organization

The Radcliff – Elizabethtown Metropolitan Planning Organization (MPO) is composed of representatives of both local government and transportation authorities, and is a transportation policy making organization. The MPO has conducted two significant studies engaging the public on transportation needs, emphasizing the role of community input in shaping transportation safety initiatives.

Pedestrian Plan

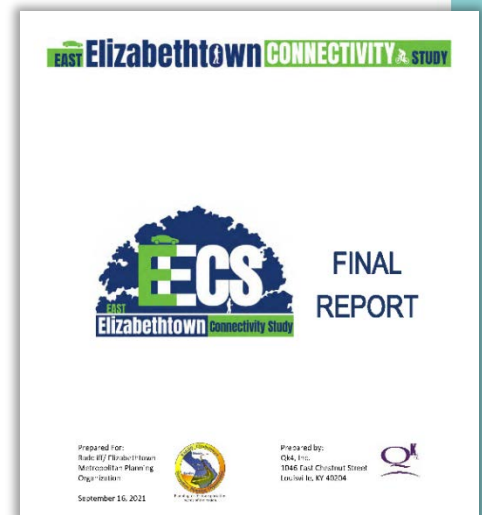
In 2019, the MPO completed the Pedestrian Plan aimed at improving and increasing the walkability in Elizabethtown. A survey solicited residents' experiences and views on pedestrian infrastructure, revealing dissatisfaction with current conditions - 57% rated them as poor, and 43% as fair. The community emphasized the need for better walking facilities, clearly indicating that improving safety and conditions for pedestrians should be the primary focus of the Pedestrian Plan.



Public input from the Pedestrian Plan supports the city's pedestrian facility expansion initiative to serve all communities and neighborhoods. Recent sidewalk projects include the North Main St. Sidewalk Improvements, Buffalo Creek Trail Project, S. Maple Street Sidewalk Reconstruction, and Stewart Street Sidewalk Rehabilitation Project.

East Elizabethtown Connectivity Study

The East Elizabethtown Connectivity Study, aimed at improving both highway and pedestrian infrastructure, altered from the traditional public engagement strategies to digital platforms due to COVID-19 restrictions. Leveraging social media and advertisements to gather community feedback, this method proved exceptionally effective, with 174 survey responses. The engagement allowed the MPO to gain a deeper understanding of the community’s infrastructure concerns, and played a pivotal role in shaping the development of well-informed recommendations.



US 31W Safety and Efficiency Improvement Project

In addition to the city’s broader community engagement efforts, special attention was given to public input for the US 31W Safety and Efficiency Improvement project, led by the Kentucky Transportation Cabinet. A project website facilitated stakeholder and public involvement, presenting benefits of the Restricted Crossing U-Turn (RCUT) design, project progress, and a repository of media stories, for transparency. Importantly, the website provided a channel for direct interaction between KYTC and the public with swift responses to email inquiries. This initiative ensured that the voices and concerns of the local community were integrated into the decision-making process, fostering a collaborative approach towards enhancing safety and mobility along US 31W.

US 31W Project in the Media

- March 25, 2023 – [RCUT analysis illustrates state’s desire for safety](#)
- November 18, 2022 – [New Dixie design focused on safety, official says](#)
- August 3, 2022 – [Change can be hard when it affects your commute](#)
- March 2, 2022 – [Roadwork resumes on Dixie in Elizabethtown](#)
- February 26, 2022 – [Be patient with work on Dixie](#)
- August 12, 2021 – [RCUTS change local traffic patterns](#)

Safety Action Plan Community Engagement

Safety Action Group

The Safety Action Group (SAG) is the planning structure for the Safety Action Plan development. The SAG represents a cross-section of the community, bringing together diverse perspectives. In SAG meetings, members actively discussed and highlighted their specific safety concerns, sharing valuable insights on perceived risks. This collaboration ensured that the plan is comprehensive of local safety issues.

The Safety Action Plan's development evolved through three SAG meetings. The first meeting provided an overview of the Safe System Approach and presented an overview of crash trends. The second meeting reviewed detailed crash analysis and discussed approaches to reactive and systemic analysis. Focus areas were identified based on feedback and local insights. The third meeting was focused on discussion of potential improvements at the prioritized intersections and corridors on the High Injury Network. Community engagement with the Safety Action Plan provided invaluable local knowledge and insight. The SAG will continue to meet and collaborate as the Safety Action Plan moves from planning to implementation.

Public Engagement

Engaging the public is a cornerstone of the Safety Action Plan, emphasizing the need for current and relevant input. To achieve this, an open house public meeting and online survey were performed to collect public feedback. The open house, conducted at the Pritchard Community Center on January 30th 2024, invited participants to share their views and experiences related to transportation safety in the city. Attendees were encouraged to fill out an online survey and email any additional thoughts to the city. A flyer advertisement of the Open House was shared on the city's website and across several social media outlets. The survey was available from January 24, 2024 to February 25, 2024 on the front page of the City of Elizabethtown website, where 119 responses were collected. The survey consisted of collecting feedback on modes of transportation, perception of safety on city roads and streets, enhancement suggestions, personal crash experience, and behavior observations.



At the Open House public meeting, informative displays highlighted crash data, FHWA Proven Safety Countermeasures, and the positive results from the recently completed US 31W RCUT project. The post construction crash analysis of the RCUT project was provided, exhibiting a 41% reduction in crashes along the corridor in the first year after construction. The survey responses are summarized on the following pages.



VISION ZERO ELIZABETHTOWN SAFETY ACTION PLAN



Welcome to the Vision Zero Elizabethtown Safety Action Plan Community Survey. As part of the City of Elizabethtown's commitment to eliminating all traffic fatalities and severe injuries for all road users, we invite you to contribute to the development of our Safety Action Plan. The following questions are designed to gather valuable insights and experiences regarding transportation safety in Elizabethtown. Your responses will be used to focus the plan to enhance safety for all users.

If you would like to receive future correspondence on the Safety Action Plan, please provide your email address:

1. Do you live in the City of Elizabethtown?
 Yes No
 What county do you live in?

2. How frequent do you travel within the City of Elizabethtown?
 Daily Weekly
 Monthly Rarely

3. What is your primary means of transportation?
 Drive alone Carpool
 Public Transit Walk, Bike
 Ride share

4. With traffic safety in mind, in general, how safe do you think it is to travel within the City of Elizabethtown?
 Not at all safe Not very safe Neutral Somewhat safe Very Safe

5. Provide a specific intersection or stretch of road that needs a safety improvement.

What safety improvement do you feel would have the most significant impact on reducing traffic crashes at the intersection or stretch of road?
 Roadway improvement projects Enhance street lighting Traffic education campaigns
 Traffic calming measures to reduce speed Increase traffic enforcement
 Other (Please Specify)

6. Provide an additional intersection or stretch of road that needs a safety improvement.

What safety improvement do you feel would have the most significant impact on reducing traffic crashes at the intersection or stretch of road?
 Roadway improvement projects Enhance street lighting Traffic education campaigns
 Traffic calming measures to reduce speed Increase traffic enforcement
 Other (Please Specify)

7. Please provide additional ideas for making our streets safer.

SURVEY CONTINUES ON THE BACKSIDE PAGE



8. What do you think are the top three challenges of traveling in Elizabethtown?
 Distracted Driving Right or left turning vehicles People drive too fast
 People running red lights or stop signs Distracted Pedestrians Not enough bike lanes or trails
 Poor or blocked views at intersections Drivers not yielding or stopping to pedestrians

9. Have you ever been seriously injured in a traffic crash in Elizabethtown?
 Yes No
 If yes, how were you traveling when the crash happened?
 Driving Biking Walking Passenger In a wheelchair Other:

What primary factor contributed to the crash?
 Distracted driving People running red light or stop sign People driving too fast
 Right or left turning vehicles Driver not yielding or stopping Poor or blocked view at intersection
 Driver under the influence Someone trying to cross the street Other:

10. Do you know someone who has been killed or seriously injured in a traffic crash in Elizabethtown?
 Yes No
 If yes, how were they traveling when the crash happened?
 Driving Biking Walking Passenger In a wheelchair Other:

What primary factor contributed to the crash?
 Distracted driving People running red light or stop sign People driving too fast
 Right or left turning vehicles Driver not yielding or stopping Poor or blocked view at intersection
 Driver under the influence Someone trying to cross the street Other:

11. Which of the following driving behaviors do you most frequently observe that contribute to unsafe conditions?
 Speeding Distracted Driving Aggressive Driving Failure to yield
 Other:

12. Gender: Male Female

13. Age: Under 18 18-24 25-34 35-44 45-54 55-64 65+

14. Race/Ethnicity: No Answer
 African American / Black Caucasian / White
 Hispanic/Latino Asian/Pacific Islander
 Other:

Do you have more thoughts about transportation safety in Elizabethtown? Let us know where you think the City should focus future pedestrian, bicycle, and driver safety improvements. Email: Melissa.Harrell-Nep@elizabethtownky.gov. Your input will help shape future safety investments in the City of Elizabethtown.

Location

To ensure the validity of the survey, basic information was gathered from the respondents through three questions: do you live in Elizabethtown, what county do you live in, and how frequently do you travel within the City of Elizabethtown.

Live in Elizabethtown

75%

Live in Hardin County

97%

Travel within
Elizabethtown daily

97%

Modes of Transportation

Modes of transportation gives information about how the public travels within the city of Elizabethtown.

Primary Means of Transportation

96%

Drive alone

3%

Carpool

<1%

Ride Share

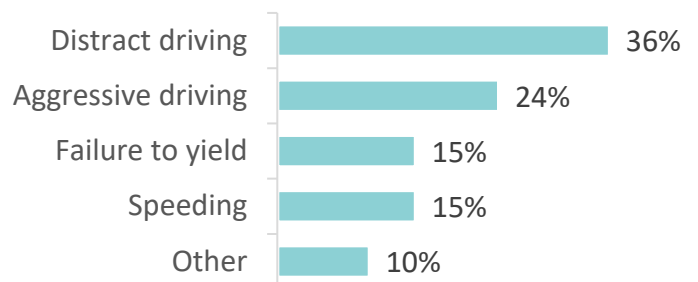
0%

Walking
 Bicycle

Behavior Observation

Understanding observed driving behaviors is crucial for enhancing road safety. By identifying which actions – such as speeding, distracted driving, aggressive driving, or failing to yield – are most commonly witnessed, we can better tailor safety improvements and educational campaigns. These responses help in prioritizing which behaviors to address, and in designing targeted countermeasures.

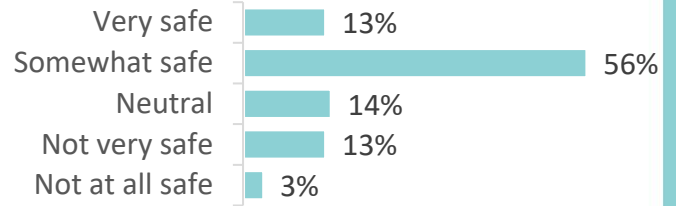
Which of the following driving behaviors do you most frequently observe that contribute to unsafe conditions?



Perception of Safety

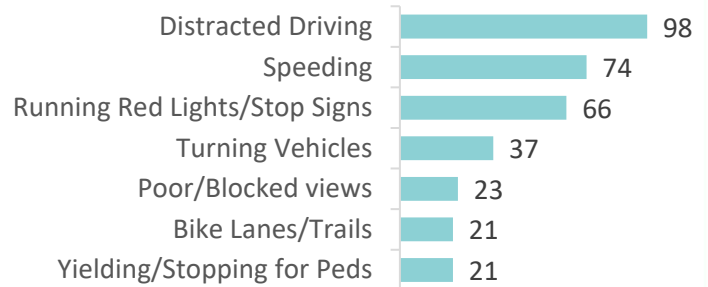
Public perception of safety influences the use of the transportation system. Residents rated their sense of safety traveling within the City of Elizabethtown from “Not at all safe” to “Very safe”. A majority, 69%, consider Elizabethtown either very to somewhat safe, yet 16% perceive it as not safe, and 14% hold a neutral stance on safety. This mixed perception highlights the importance of addressing safety concerns to enhance overall public confidence in the transportation network.

With traffic safety in mind, how safe do you think it is travel within the City of Elizabethtown?



Identifying key travel challenges in Elizabethtown is crucial for targeting improvements. Every identified challenge received at least 20 mentions, indicating significant areas of concern. Not yielding or stopping for pedestrians and insufficient bike facilities received 21 mentions, while issues with poor or blocked views received 23 mentions and Left or right turning vehicles received 37 mentions. The top three challenges noted by the public are distracted driving (98 mentions), speeding (74 mentions), and running red lights or stop signs (64 mentions) pointing to areas needing attention.

What are the Top challenges of Traveling in Elizabethtown



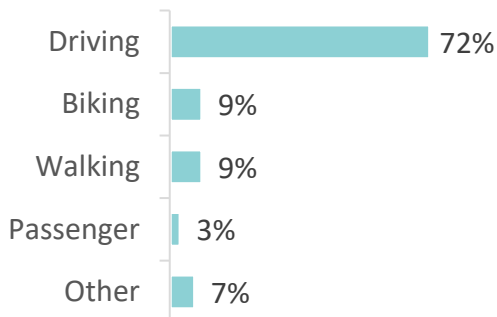
Personal Crash Experience

Do you know someone who has been killed or seriously injured in a traffic crash in Elizabethtown?

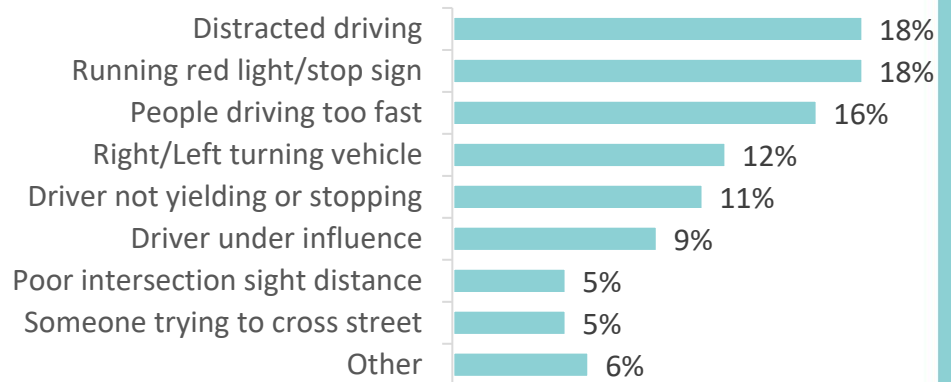
49% - YES

51% - No

How were they traveling?



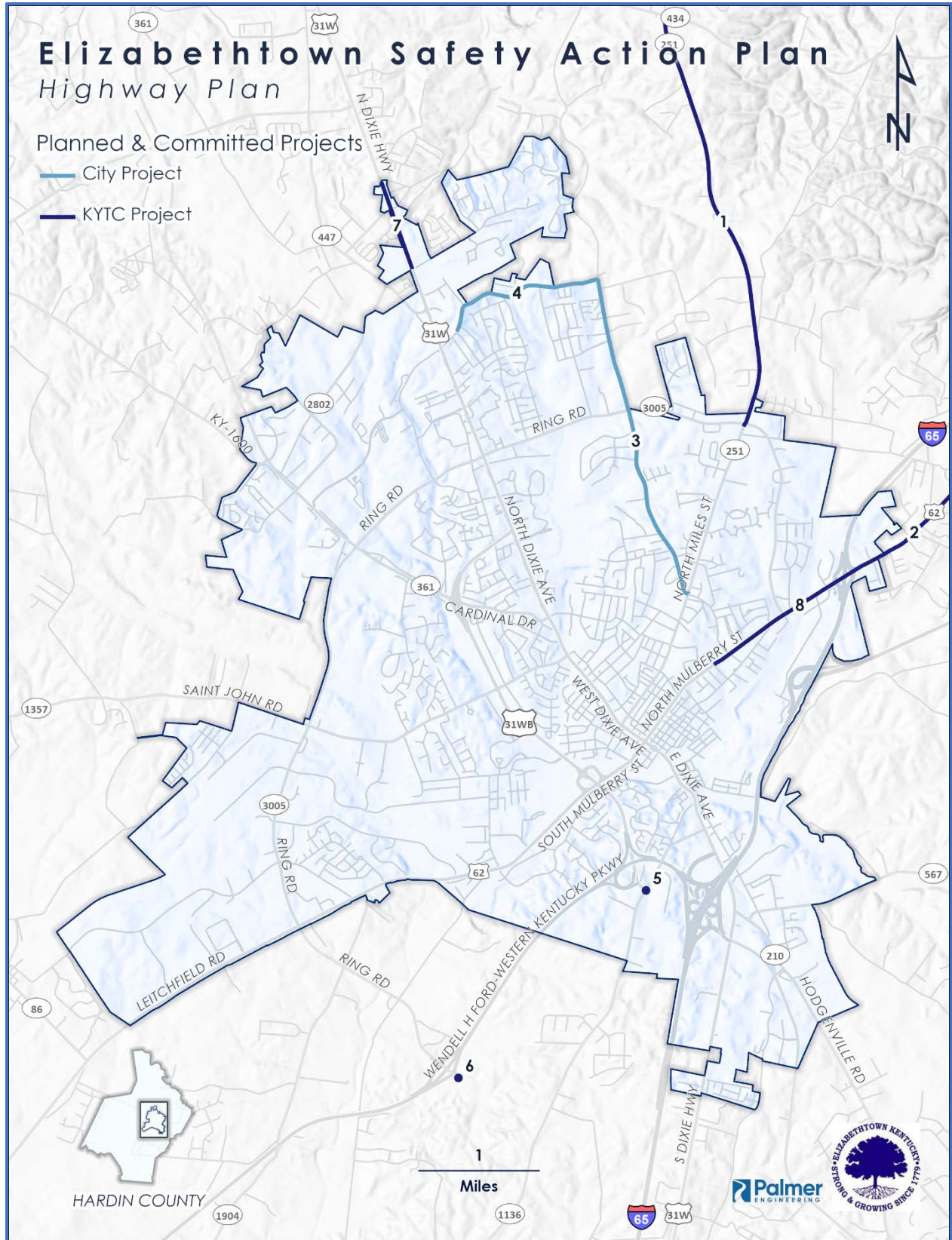
What primary factor contributed to the crash?



Collaboration

The transportation plans of all relevant stakeholders, including the Kentucky Transportation Cabinet 6-year plan and MPO Transportation Improvement Program (TIP), as well as ongoing City of Elizabethtown projects, were coordinated 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 KYTC Highway Plan projects with committed funding that are actively moving forward.

Map No.	KYTC Item (CHAF ID)	Route	Begin	End	Status	Description
1	4-153.01 (IP20150448)	Shepherdsville Road	Ring Road	Battle Training Road	Planned	Shepherdsville Road improvements from Ring Road (KY 3005) to Battle Training Road (KY 434)
2	4-442 (IP20070167)	US 62	I-65	Upper Colesburg Road	Planned	Improve safety, mobility, and geometrics of US 62 from I-65 to Upper Colesburg Road
3		Pear Orchard Road	North Miles Street	Pear Orchard Road NW	Planned	Pear Orchard Road Reconstruction
4	(IP20170082)	Pear Orchard Road NW	Pear Orchard Road	North Dixie Ave	Committed	Pear Orchard Road NW Realignment
5	4-9017	New Glendale Road & US 31W Bypass	-	-	Planned	Construct a roundabout at New Glendale Road and US 31W Bypass Intersection
6	4-198 (IP20150339)	KY 3005	Western Kentucky Parkway	South Dixie Highway	Committed	Ring Road Extension from Western Kentucky Parkway to South Dixie Highway (US 31W)
7	4-154.30	US 31W	Pine Valley	Knox Blvd	Planned	RCUT Corridor / Access Management
8	(IP20070166)	US 62	Brook Street	Gregory Street	Planned	Address safety, mobility, and access management, along with potentially reconfiguring the interchange to I 65



5. Equity Considerations

In the development of the Elizabethtown Safety Action Plan, commitment to equity stands at the forefront, ensuring a safe and accessible city for everyone. This initiative has been designed to develop an equitable transportation framework; leveraging in-depth equity studies. Elizabethtown is committed to engaging with the underserved communities. The focus is on ensuring equitable treatment and comprehensive participation across all sectors of our community, especially those historically disadvantaged, to equitably share the improvements in transportation safety, assuring that no sector of our community is overlooked.

Environmental Justice is the principle that all individuals, regardless of race, income, or social status, have the right to a clean and healthy environment. It recognizes that certain communities, often those marginalized or disadvantaged, disproportionately bear the burden of legacy pollution. These communities may lack the political power or economic resources to protect themselves from environmental hazards, leading to increased health risks and reduced quality of life. Environmental Justice advocates work to address these disparities by promoting equitable access to environmental resources, advocating for fair environmental policies, and empowering affected communities to participate in decision-making processes. By ensuring that environmental benefits and burdens are shared fairly among all people, Environmental Justice seeks to create a more inclusive and sustainable society.

Both Equity and Environmental Justice demand equal treatment for all individuals regardless of their backgrounds or financial circumstances. This Safety Action Plan takes a data driven approach that prioritizes equity to ensure everyone's voices are heard and needs are addressed.

Equity Areas

For the Safety Action Plan, disadvantaged and underserved communities were identified based on the Justice40 Initiative, Areas of Persistent Poverty, and the Historically Disadvantaged Community designation.

Justice40

The Justice40 Initiative is a comprehensive federal program introduced by the United States government aimed at addressing environmental and economic disparities within marginalized communities. The initiative seeks to allocate 40% of the benefits from federal investments in climate and clean energy projects to these communities, which have historically borne the brunt of environmental degradation and pollution. By prioritizing equity and inclusion, the Justice40 Initiative aims to empower vulnerable populations, improve public health, and promote sustainable development, thereby fostering a more just and equitable society.

The Climate and Economic Justice Screening Tool (CEJST) developed by the White House Council on Environmental Quality (CEQ) was developed to identify disadvantaged communities of the Justice40 Initiative includes eight categories of "Indicators of Burdens". They are: Climate Change, Energy, Health, Housing, Legacy Pollution, Transportation, Water and Wastewater, and Workforce Development.



Climate and Economic Justice
Screening Tool

Areas of Persistent Poverty

A key population group for identifying underserved communities are those affected by persistent poverty. The Safe Streets and Roads for All funding grant provided the guidance of using the Area of Persistent Poverty Project (APP) to assist in identifying underserved community census tracts.

An “Area of Persistent Poverty” is defined by the Bipartisan Infrastructure Law. A project is located in an Area of Persistent Poverty if: ([Areas of Persistent Poverty & Historically Disadvantaged Communities | US Department of Transportation](#))

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.

Historically Disadvantaged Communities

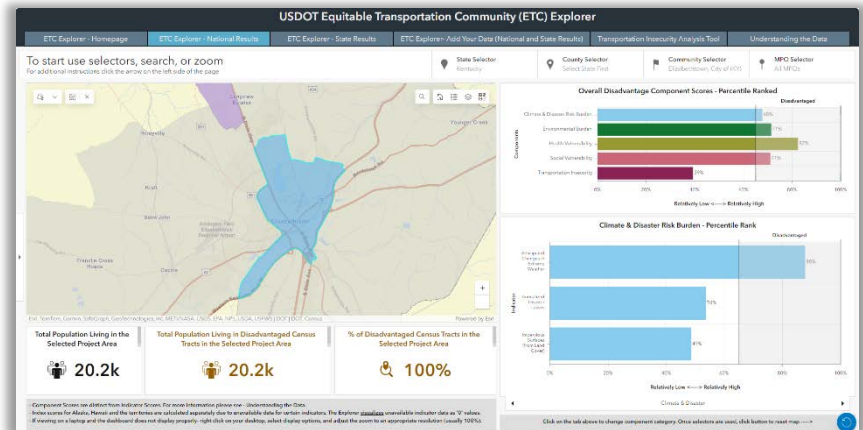
According to the Justice40 Interim Guidance Addendum issued by the White House Office of Management and Budget (OMB), White House Council on Environmental Quality (CEQ), and Climate Policy Office (CPO): ([Areas of Persistent Poverty & Historically Disadvantaged Communities | US Department of Transportation](#))

a “Historically Disadvantaged Community” is:

1. Any Census Tract identified as disadvantaged in the Climate & Economic Justice Screening Tool, which identifies such communities that have been marginalized by underinvestment and overburdened by pollution; OR
2. Any Federally Recognized Tribe or Tribal entity, whether or not they have land.

USDOT Equitable Transportation Community (ETC) Explorer

The Justice40 initiative under the U.S. Department of Transportation, spurred by the Biden-Harris Administration, focuses on remedying long-standing underinvestment in marginalized communities. The initiative employs tools like the U.S. DOT Equitable Transportation Community (ETC) Explorer, which utilizes Census data to evaluate the cumulative impact of such underinvestment.



The ETC Explorer specifically aids in understanding transportation-related disadvantages and supports the wider goals of the Climate & Economic Justice Screening Tool (CEJST). It’s a nuanced

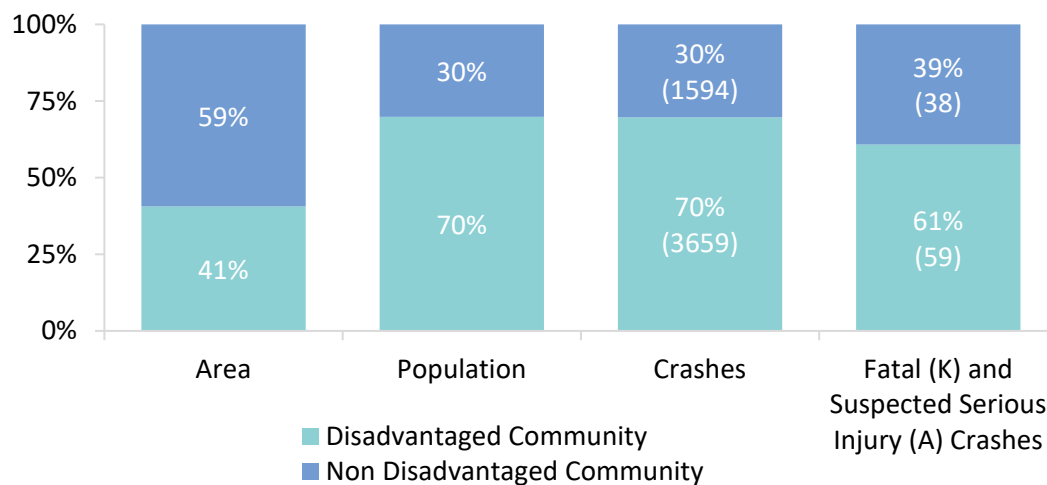
tool that provides insights rather than a binary indicator, helping guide investment to alleviate transportation burdens. The SS4A Grant provides guidance to utilize the ETC tool in identifying the Disadvantaged Communities census tracts.

The five components included with the ETC tool are the following ([USDOT ETC Explorer](#)):

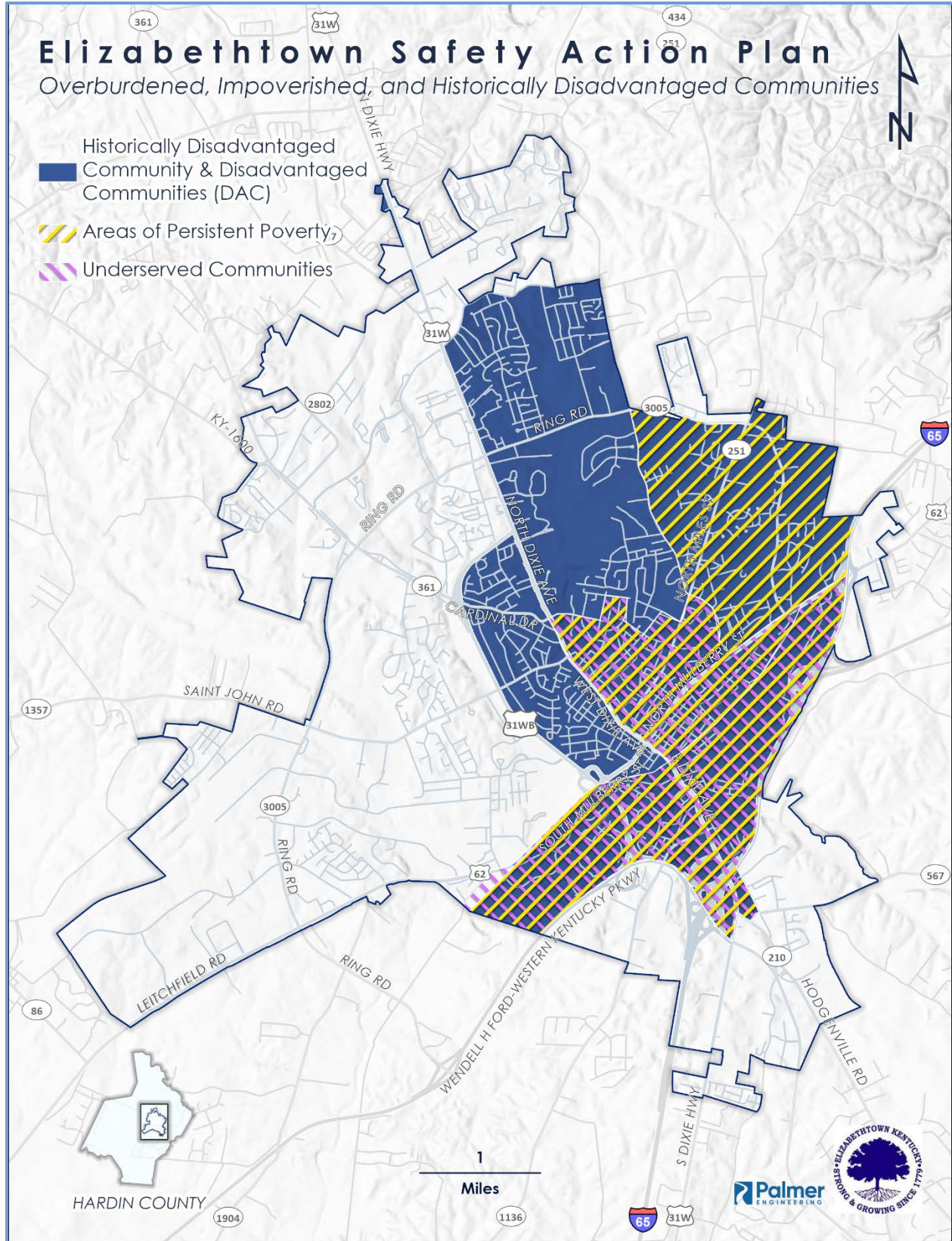
1. Climate & Disaster Risk Burden
2. Environmental Burden
3. Health Vulnerability
4. Social Vulnerability
5. Transportation Insecurity

Taking this into consideration, we looked at census tract area, population, and crash occurrences within these communities. In Elizabethtown, disadvantaged communities, encompassing 70% of the population, confront a disproportionate share of traffic safety risks. They account for 70% of crashes and 61% of severe or fatal crashes, despite covering 41% of the area. This data underscores the urgent need for strategic safety interventions that address the social equity dimensions of road safety, aiming to protect the majority of the city’s population who are at a heightened risk.

Crash Data Overview - Disadvantaged Communities



The Justice40, Areas of Persistent Poverty, and Historically Disadvantaged Communities within Elizabethtown are all shown in the following map:



Equity Populations

Another approach to identifying areas of equity concern involves directly locating the distribution of disadvantaged populations within the City of Elizabethtown. The following are four disadvantaged populations that were analyzed based on the United States Census American Community Survey (ACS). The 2021 ACS five year table was used.

Citywide Data Analysis

In our investigation of the following equity populations, it is important to recognize that our data analysis extends beyond the geographical confines of the Elizabethtown city limits due to limitations with the 2021 American Community Survey Census Data used. While the primary focus of this Safety Action Plan is Elizabethtown, we had to incorporate data from census block groups that are situated both inside and outside of the city limits. The broader inclusion of these block groups allows for a more comprehensive understanding of the factors at play, considering that phenomena such as economic influences and social dynamics often transcend municipal borders. By incorporating any census block group data that crosses the Elizabethtown city border, we aim to capture a more holistic view of the interconnected systems shaping our investigations, enabling us to draw accurate and meaningful conclusions about the equity populations identified. Throughout **Chapter 5. Equity Considerations – Equity Populations Section**, any mention of the following (including but not limited to):

Elizabethtown, City, City Limits, Citywide, City Border

fundamentally refers to the total area of equity population explained above.

Minority Population

A significant factor in determining which communities have access to fair treatment and are beneficiaries of transportation related improvements is race. The minority population of Elizabethtown encompasses all individuals who identify as non-white. Elizabethtown has approximately 17.6% of all individuals who meet this definition.

Elderly Population

To aid in determining certain roadway countermeasures, elderly population block groups were analyzed. Pedestrian refuge islands, Leading Pedestrian Intervals (LPIs), and raised crosswalks are some of the many countermeasures that benefit the elderly population. This safety action plan categorizes elderly population as individuals aged 65 or older. Elizabethtown has approximately 15.4% of all individuals who meet this definition.

Population Experiencing Poverty

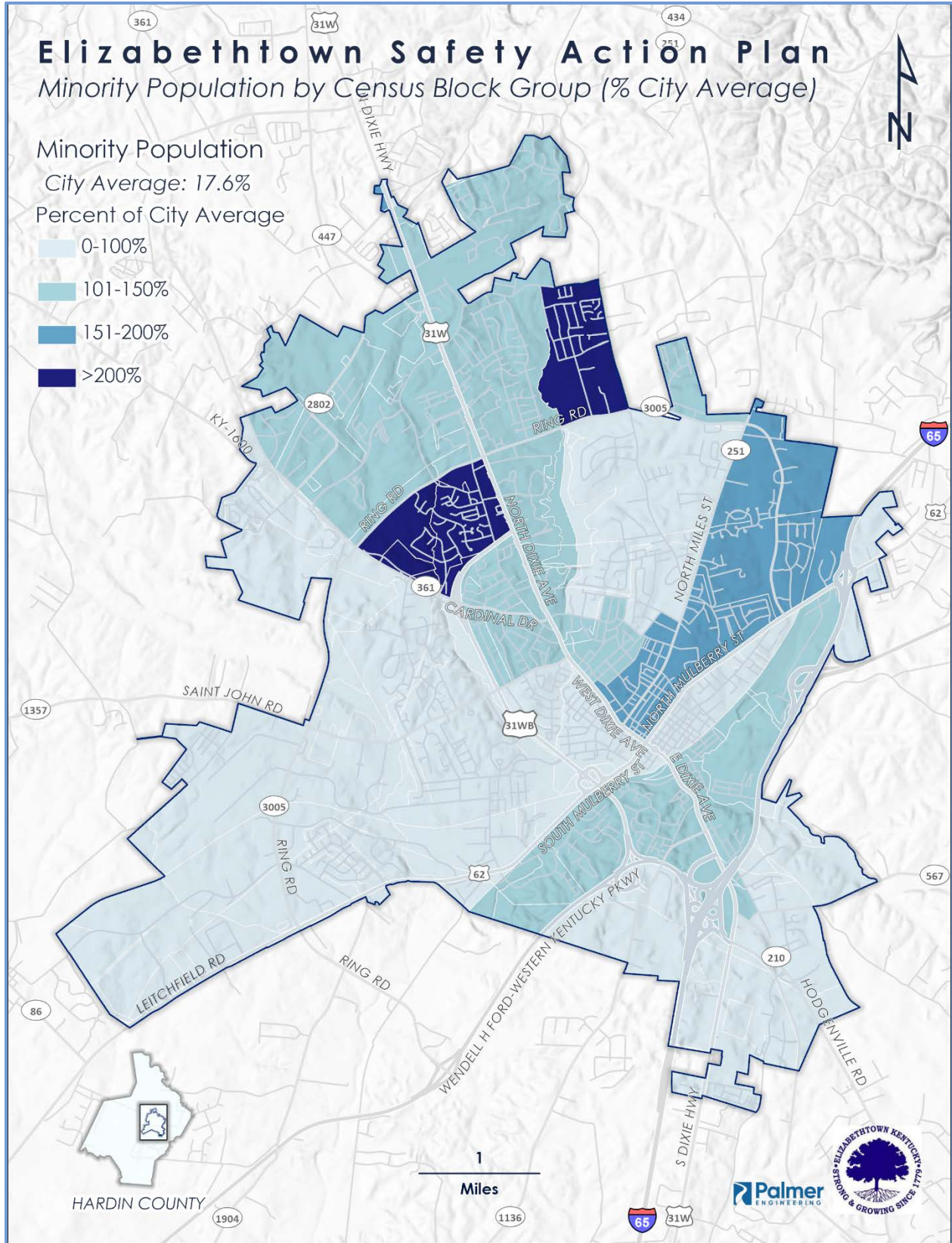
Income plays a crucial role in influencing societal, health, and recreational levels for all individuals. The poverty population of Elizabethtown includes individuals with incomes below the poverty level. Elizabethtown has approximately 9.7% of all individuals who meet this definition.

Population Impacted by Disability

Also to help in determining certain roadway countermeasures, disability population block groups were analyzed. Similar to elderly populations, there are pedestrian safety countermeasures available that can support disabled populations. This safety action plan evaluates disabilities based on a household-by-household basis. Any residence with one or more occupants with a disability meet the

disability designation. Elizabethtown has approximately 28.5% of all households who meet this definition.

For each respective Equity Population identified above, any census block group exceeding greater than 200% of the city average is considered to be a High Equity Population. All equity populations of 200% or greater of the city average occur within Historically Disadvantaged Communities. The majority of equity populations between 151%-200% of the city average occur within Historically Disadvantaged Communities. The following maps show each of the corresponding Equity Populations.

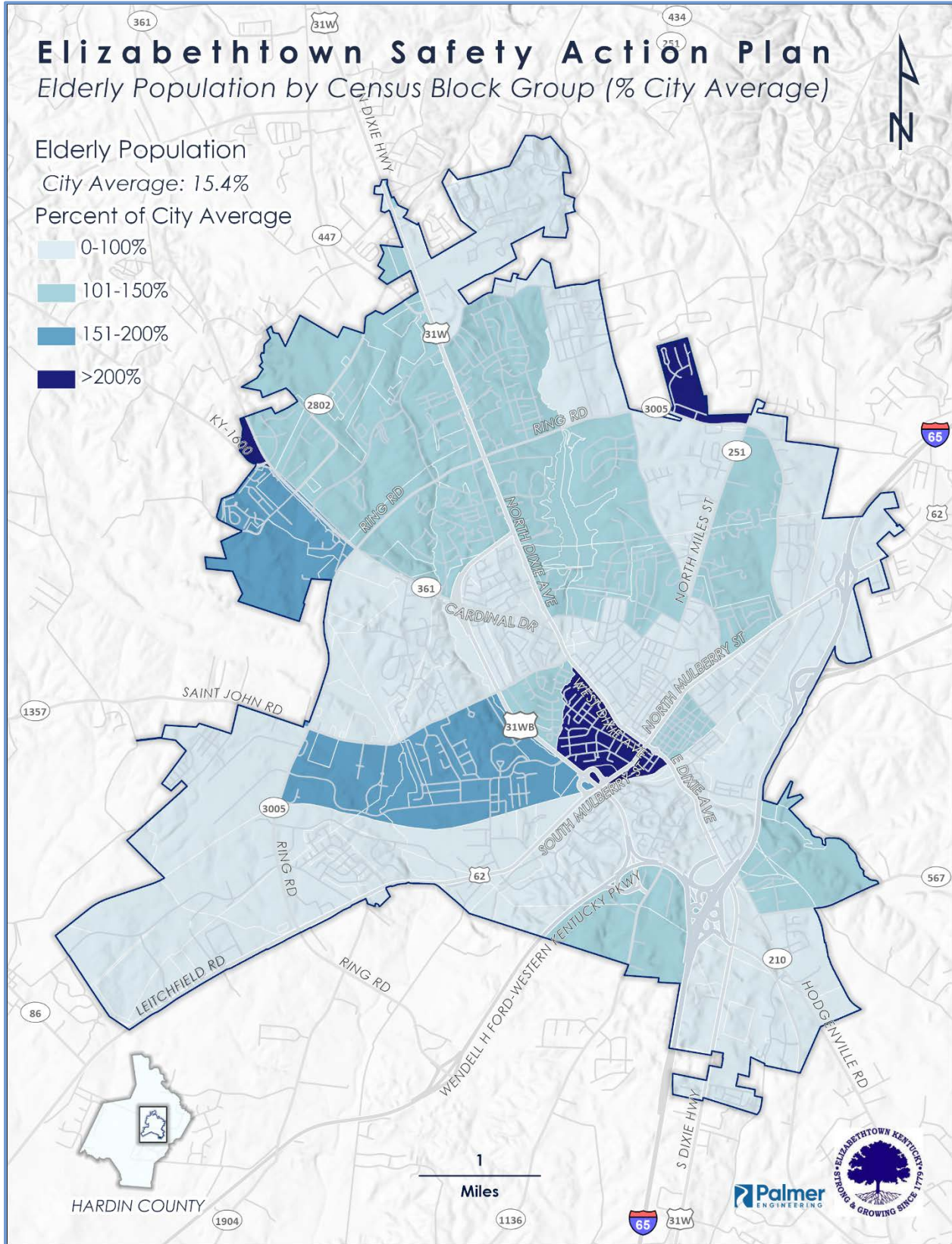


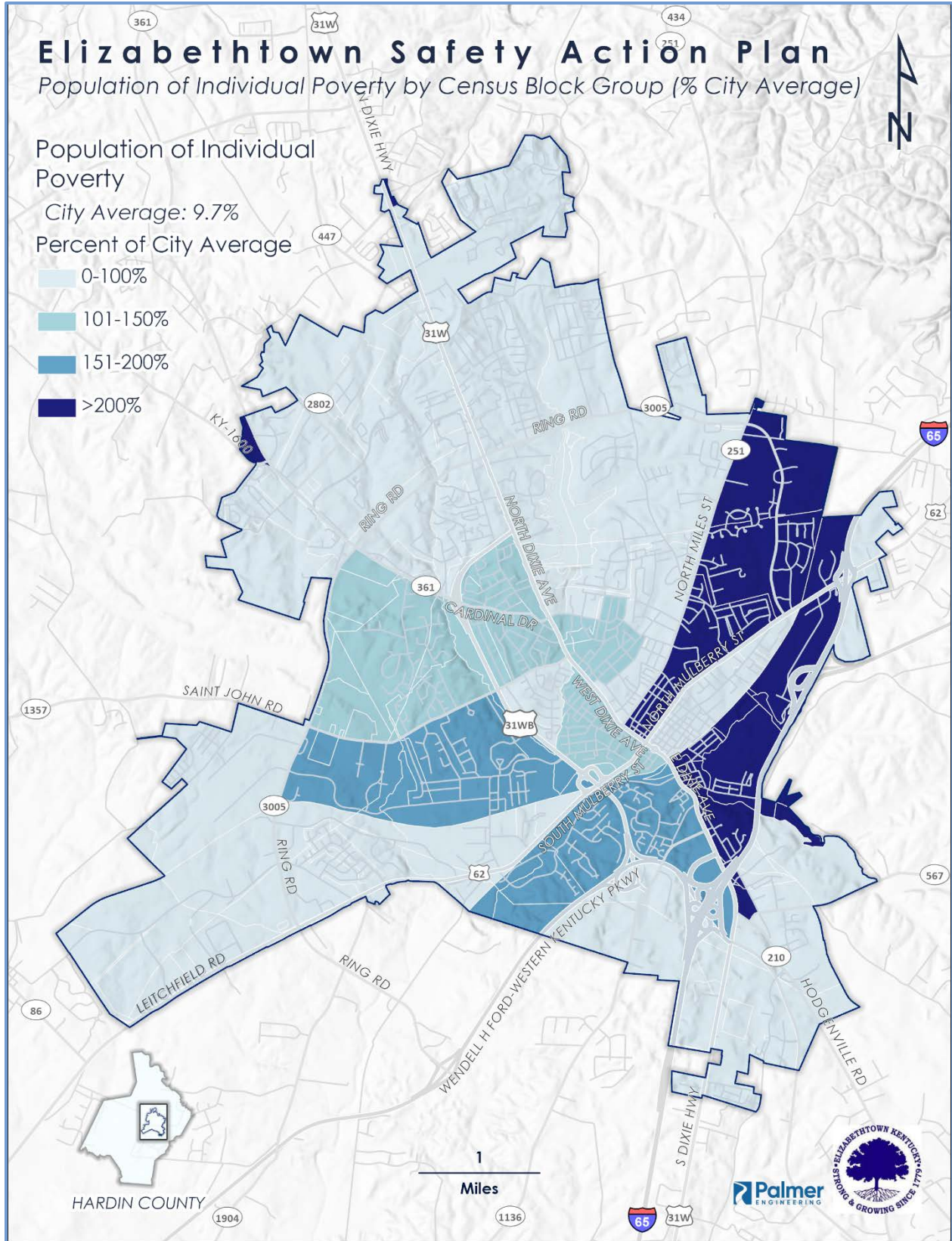
Elizabethtown Safety Action Plan

Elderly Population by Census Block Group (% City Average)

Elderly Population
 City Average: 15.4%
 Percent of City Average

- 0-100%
- 101-150%
- 151-200%
- >200%





Incorporating Equity Throughout the Safety Action Plan Process

Ensuring equity is woven into the Elizabethtown Safety Action Plan which requires an ongoing commitment. It begins with the project prioritization, development, and implementation.

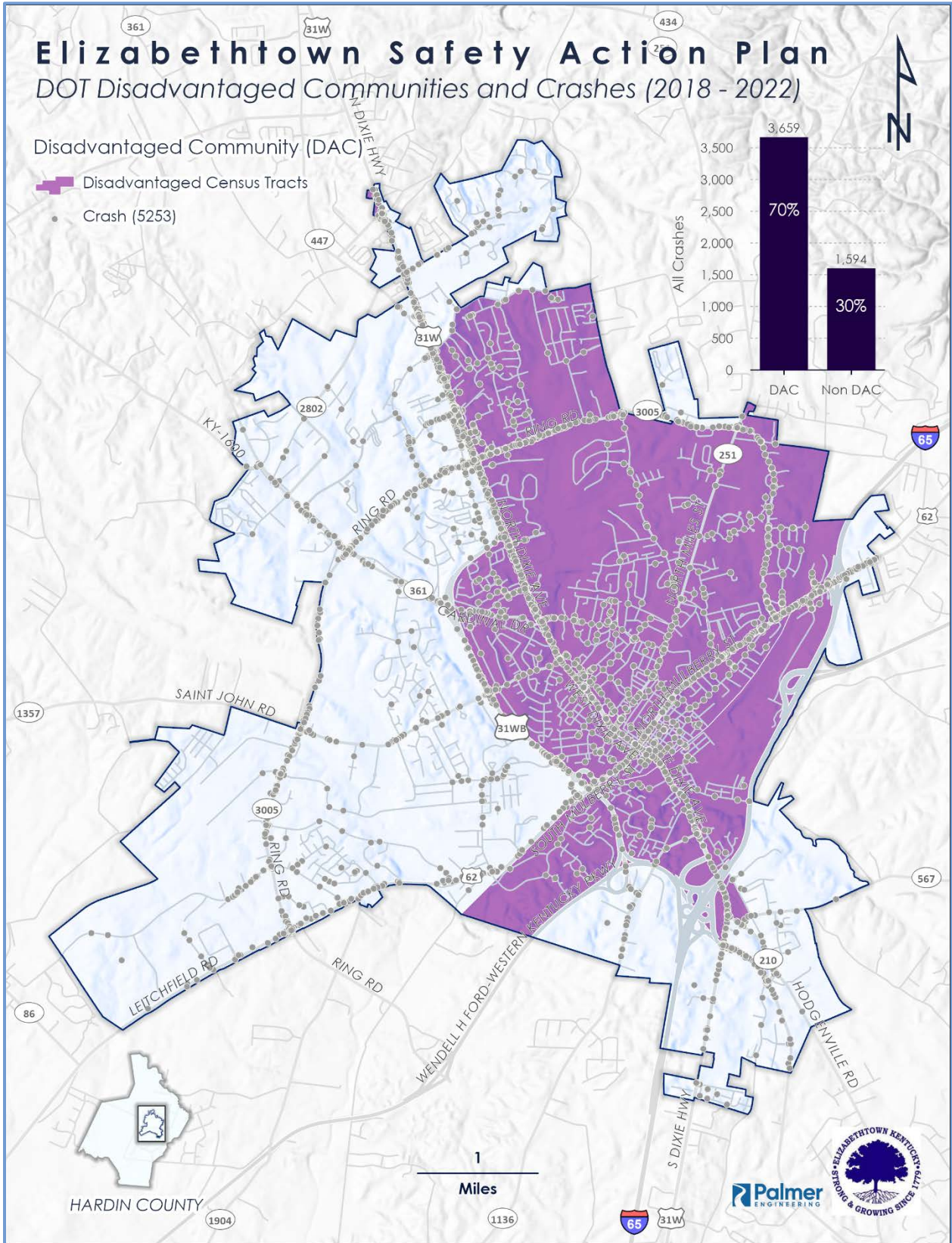
Project Prioritization, Development, and Implementation

The equity assessments conducted have identified the Disadvantaged Communities within the City of Elizabethtown. Projects and strategies will utilize the safety analyses performed to formulate a set of recommended corridor and intersection projects.

Equity considerations will play a central role in the process of project prioritization and selection, in combination with the severity of identified reactive and systemic safety issues. While prioritizing the most problematic intersections and corridors is imperative, subsequent project choices will be informed by the needs of underserved communities. Projects will be identified that strongly align with equity considerations by overlaying proposed project locations with Disadvantaged Communities.

The maps on the following pages highlight the Disadvantaged Community Census Tracts with respect to crash locations and High Injury Network. Details pertaining to the High Injury Network are provided in Chapter 7 – Strategy and Project Selection.

It's essential to sustain engagement with equity populations as the plan transitions from development to implementation. Elizabethtown pledges to maintain ongoing relations with affected equity populations and partner organizations highlighted in the Safety Action Plan throughout the implementation phase.



6. Policy and Process Shift

An examination of Elizabethtown’s existing policies, plans, guidelines, and standards identified key opportunities for improvement ensuring that safety considerations are a priority. Through a comprehensive review of these documents the City seeks to identify improvements and implement strategic changes.

Envision Elizabethtown 2040 Comprehensive Plan

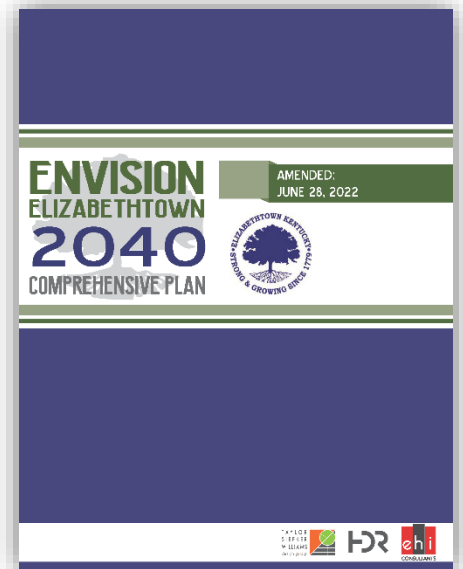
Link: [Envision-Elizabethtown-2040](#)

Envision Elizabethtown 2040 is a strategic planning document designed to shape the growth and development of Elizabethtown over the next twenty years. It serves as a blueprint for future policies, programs, and projects focusing on enhancing transportation, utility infrastructure, economic growth, tourism, and overall quality of life in the city. The plan sets forth goals and objectives to achieve these enhancements and offers a detailed overview of the current demographic profile, economic conditions, transportation networks, community facilities, utilities, and recreational opportunities in Elizabethtown. The plan incorporates safety throughout the document. A plan goal for transportation is to advance connectivity in the city and region for multiple transportation types. The plan provides specific objectives and recommendations to achieve the goal of advancing connectivity and providing safer streets and roads. The following are objectives related to transportation safety.

- Improve system connectivity by working with Kentucky Transportation Cabinet (KYTC) on priority projects.
- Improve traffic flow with a focus on optimizing signals, collector street spacing, requiring access management for all development projects, and optimizing school area traffic flow.
- Improve safety by focusing on upgrades to the highest-priority intersections and corridors as identified by KYTC’s safety screening process.
- Improve sidewalk network connectivity and the recreational trail network
- Coordinate all new development with the Recommended Land Use Plan to provide efficient and safe movement for users.

The detailed comprehensive plan provides prioritized action steps, potential partners, and resources for each of these objectives. The plan also includes a crash analysis of the transportation system.

It is recommended to incorporate design policies to achieve desired speeds, including implementing traffic calming measures such as roundabouts and narrower streets.



Traffic Calming Measures

Traffic calming measures offer significant benefits for all users, especially vulnerable road users like bicyclists and pedestrians, enhancing safety and mobility. For pedestrians, improvements like raised cross walks, median refuges, and corner extensions not only make crossing streets safer but also more accessible, especially for those with disabilities.

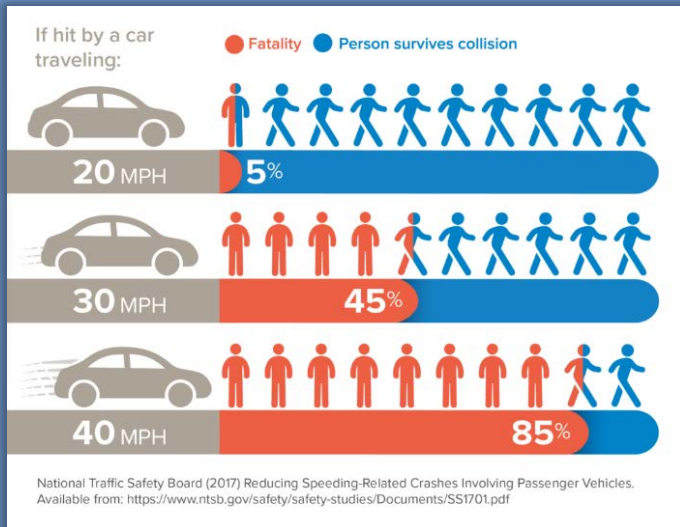
Speed humps were found to have a

53-60%

reduction in the odds of injury or death among children struck by a vehicle in their neighborhood.

Source:

[American Journal of Public Health](#)



SAFER SPEEDS

Speed plays a pivotal role in severity of crashes, particularly for pedestrians. The relationship between vehicle speed and pedestrian injury severity is both direct and unforgiving. At higher speeds, drivers have less time to react to unexpected pedestrian movement, and the force of impact is exponentially greater, leading to more severe injuries and fatalities. Implementing speed management strategies is a fundamental approach to safeguarding the most vulnerable road users and enhancing overall traffic safety.

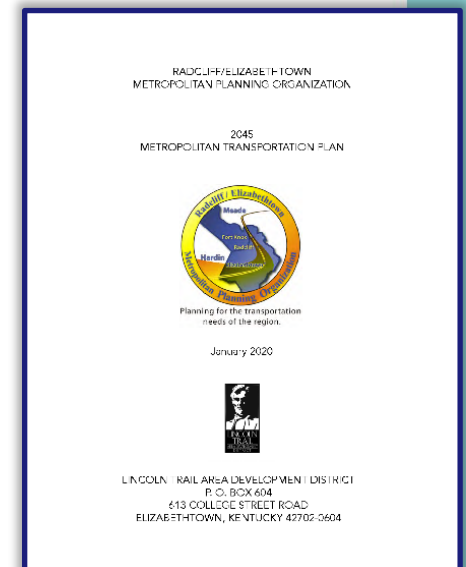
Radcliff/Elizabethtown 2045 Metropolitan Transportation Plan

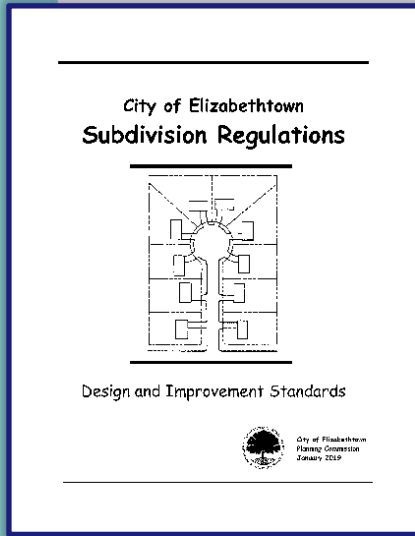
Link: [Radcliff/Elizabethtown 2045 Metropolitan Transportation Plan](#)

The Radcliff/Elizabethtown Metropolitan Organization (MPO) services Elizabethtown, Radcliff, Vine Grove, Fort Knox and portions of Unincorporated Hardin and Meade Counties. The 2045 Metropolitan Transportation Plan (MTP), adopted in January 2020, documents the transportation planning process and sets forth goals and objectives that guide transportation policies, projects and solutions. It encompasses an assessment of current transportation issues, forecasts future transportation demands, and outlines long-term, financially sustainable planning strategies up to the year 2045. Projects in the MTP are evaluated and ranked based on anticipated funding availability. As a multimodal document, the MTP analyzes the entire transportation network, including roadways, public transportation, and facilities for bicycles and pedestrians. Safety is at the forefront of the MPO as its highest transportation goal is to promote transportation safety by:

- reducing the number and severity of traffic crashes by improving existing and potential high crash locations,
- improving substandard roadway geometrics where necessary,
- supporting and/or undertaking public education programs to emphasize safety and promote safe driving practices, and
- providing improved conditions to enhance emergency services.

Given the content and objectives outlined in the MTP, no modifications to the plan are suggested at this time. As the MTP undergoes its scheduled update, it is advisable to review the goals related to safety and ensure they remain relevant and effective while complimenting the Vision Zero Elizabethtown objectives.





Subdivision Regulations

Link: [Subdivision Regulations - Design and Improvement Standards](#)

The City's subdivision regulations were last amended in January 2019. These regulations outline the rules and guidelines for the development of land within the city limits. The regulations provide street and layout requirements including hierarchy of streets to facilitate safe and efficient traffic flow and street and sidewalk widths that provide adequate vehicular and pedestrian space. The regulations provide guidelines on street continuity, network connectivity, intersection design requirements related to spacing and sight distance, and a street lighting requirement. As this document is amended, it is recommended to consider guidelines for traffic calming measures.

Policy and Process Considerations

The following policy and plan are for consideration to incorporate into practice in the City of Elizabethtown.

Complete Streets Policy

A Complete Streets policy is essential for fostering a more sustainable, safe and inclusive urban environment. The policy represents a commitment to designing and operating roadways with all users in mind, including pedestrians, bicyclists, motorists, transit riders, freight and individuals of all ages and abilities.

WHAT IS A COMPLETE STREET?

A Complete Street is thoroughfare design to be safe and accessible for all users, including pedestrians, cyclists, motorists, and transit riders, tailored to the specific context and characteristic of the area. It creates a diverse transportation network that supports safety, connectivity, comfort, equity, and accessibility, aligning with the Safe System Approach to accommodate various travel needs.

Neighborhood Traffic Management Plan

Assess the City's need for a Neighborhood Traffic Management Plan (NTMP). As population and traffic volumes continue to grow, major roadways and intersections will become more congested, and motorists may resort to using local streets to bypass the congestion. Neighborhood Traffic Management is a strategic approach to address traffic-related issues within residential areas or neighborhoods. These plans are tailored to mitigate the impacts of traffic volume, speed, and safety concerns that affect the quality of life for residents. NTMPs involve a comprehensive process that includes community engagement, and the implementation of traffic calming measures and strategies.

7. Strategy and Project Selection

Strategies and projects were developed from a thorough analysis of historical crash data, proven practices, and engagement from stakeholders and the public, with an emphasis in equity. The reactive approach involves a detailed crash analysis focused on frequency, severity and location to pinpoint areas with the most significant need for improvements. The prioritization of selecting projects and strategies is outlined in the following section.

Prioritization

The City’s goal is to eliminate fatal and serious injury crashes, making crash severity a critical factor in prioritizing projects and strategies. Therefore, a prioritization scale was established using crash severity costs. The following table provides the comprehensive costs by crash severity. The comprehensive crash cost is based on Federal Highway Administration (FHWA) research which developed national crash costs for use as default crash unit values ([Crash Costs for Highway Safety Analysis](#)). The national costs are adjusted to Kentucky-specific costs and adjusted for inflation. Comprehensive crash costs are the combination of the economic cost of a crash and monetized pain and suffering.

Severity	Description	Comprehensive Cost Per Crash (2022 Dollars)
K	Fatal	\$11,087,806
A	Suspected Serious Injury	\$642,593
B	Suspected Minor Injury	\$194,583
C	Possible Injury	\$122,993
O	No Apparent Injury	\$11,575

Equivalent Property Damage Only Method

The comprehensive crash costs are used to establish a value per crash severity equivalent to the No Apparent Injury Crash, also referred to as a Property Damage Only Crash. The following table shows the breakdown of the comprehensive crash costs and Equivalent Property Damage Only (EPDO) value by crash severity.

Severity	Comprehensive Cost Per Crash (2022 Dollars)	EPDO Value
K	\$11,087,806	958
A	\$642,593	56
B	\$194,583	17
C	\$122,993	11
O	\$11,575	1

The comprehensive cost of a fatal crash is significantly greater than the other crash types. The EPDO method may overly emphasize fatal crashes, potentially skewing focus towards areas with fewer crashes. To address this imbalance, a modified EPDO (MEDPO) approach was used to equally consider both fatal and suspected serious injury crashes by blending their values based on their comprehensive costs and frequency. The following table provides a breakdown of the MEPDO providing a more balanced evaluation while maintaining a focus on fatal and suspected serious injury crashes.

Severity	Crashes	Comprehensive Cost Per Crash (2022 Dollars)	Severity	Weighted Average Costs	MEPDO Value
K	19	\$11,087,806	KA	\$2,563,551	222
A	78	\$642,593			
B	258	\$194,583	B	\$194,583	17
C	320	\$122,993	C	\$122,993	11
O	4,578	\$11,575	O	\$11,575	1

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. The crash data was joined with GIS information to facilitate a detailed analysis by identifying the location of the crashes by road segment and intersection.

After joining the crashes to the roadway segments and intersections, the MEPDO method was applied to generate a list of prioritized intersections and corridors.

Intersections

Enhancing safety at intersections plays a crucial role in promoting a Safe System approach across planning, design, and road infrastructure initiatives. Assessing roadway features like geometrics and traffic operation and control strategies is fundamental to eliminating fatal and serious injury crashes. Intersections serve as deliberate points of interaction, where vehicles and non-motorized users converge, significantly influencing the overall safety performance of the transportation system. These conflict points are locations where historically, fatal and suspected serious injury crashes occur. Therefore, intersection projects offer distinctive prospects to integrate Safe System principles into planning, design, operational decision-making processes, and intersection improvement strategies providing the opportunity to eliminate fatal and serious injury crashes.

The City of Elizabethtown experienced 50 fatal and serious injury crashes (52%) at an intersection. These crashes occurred at signalized and unsignalized intersections. Both of these types of intersections are locations of multiple conflict points and present an opportunity to improve safety for all users.

Signalized Intersections

The City of Elizabethtown has 50 signalized intersections. These intersections account for 29 fatal and serious injury crashes (30% of total fatal and serious injury crashes). MEPDO was calculated for each intersection and the signalized intersections were ranked by MEPDO. The top 10 ranked signalized intersection by MEPDO include all signalized intersections that have a 300 or greater MEPDO value. This list of prioritized signalized intersections comprise the primary focal points where addressing safety concerns can have the most significant impact.

The following table lists the top 10 signalized intersections by MEPDO. These top 10 intersections account for 20 of the 29 fatal and serious injury crashes at signalized intersections.

Ranking	Intersection	K	A	B	C	O	KA	TOTAL	MEPDO
1	Ring Rd (KY-3005) and Leitchfield Rd (US-62)	1	3	4	4	34	4	46	1030
2	Dixie Ave (US-31W) and Ring Rd (KY-3005)	1	2	5	4	109	3	121	900
3	Elizabethtown Bypass (US-31WB) and St John Rd (KY-1357)	0	2	2	4	102	2	110	621
4	Dixie Ave (US-31W) and New Glendale Dr (KY-1136)	1	1	1	4	20	2	27	522
5	Ring Rd (KY-3005) and Lowes Dr	0	2	2	1	22	2	27	509
6	Dixie Ave (US-31W) and Hodgenville Rd (KY-210)	0	2	1	3	15	2	21	507
7	N Mulberry St (US-62) and W French St	0	2	2	1	15	2	20	502
8	Ring Rd (KY-3005) and Veterans Way	0	1	3	2	46	1	52	339
9	Dixie Ave (US-31W) and S Wilson Rd (KY-447)	0	1	2	4	39	1	46	337
10	N Mulberry St (US-62) and Ring Rd (KY-3005)	0	1	2	4	31	1	38	329

Detail maps displaying intersection crashes are provided on the following pages. Below are corresponding descriptions and insights of the crash data.

Signalized Intersections: Reactive Approach (2018 – 2022) Crash Totals: Map highlights the locations of all signalized intersections where crashes occurred. Signalized intersection crash totals are grouped in bins based on crash frequency and are displayed with different colors. The number of fatal and serious injury crashes are noted by a black outline circle. Each circle represents the number of fatal and serious injury crashes that occurred at each intersection. For example, Ring Road (KY-3005) and Leitchfield Rd (US-62) is outlined with four black circle to represent the four fatal and serious injury crashes that occurred at that intersection.

Signalized Intersections: Reactive Approach (2018 – 2022) Intersection by MEPDO Score: Map presents the top 10 signalized intersections by MEPDO score. The signalized intersections are marked with circles and sized based on the MEPDO score. The prioritized ranking score is noted for the top 10 signalized intersections. For example, Ring Road (KY-3005) and Leitchfield Rd (US-62) is noted with 1 since it is the highest ranked MEPDO signalized intersection.

Elizabethtown Safety Action Plan

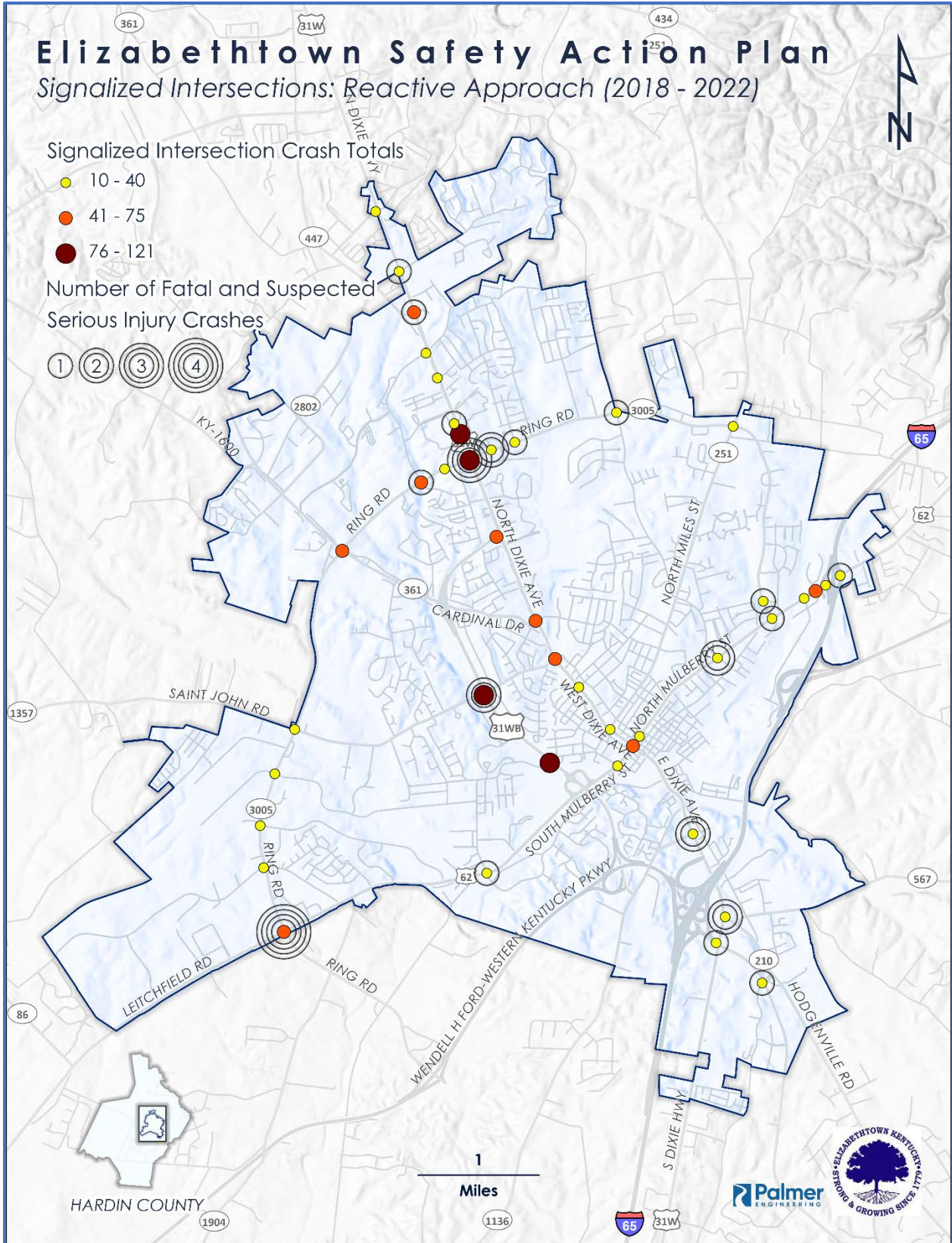
Signalized Intersections: Reactive Approach (2018 - 2022)

Signalized Intersection Crash Totals

- 10 - 40
- 41 - 75
- 76 - 121

Number of Fatal and Suspected Serious Injury Crashes

- ①
- ②
- ③
- ④



Prioritized Unsignalized Intersections

There are numerous unsignalized intersections throughout the city. These intersections account for 21 fatal and serious injury crashes (22% of total fatal and serious injury crashes). After calculating the MEPDO for each intersection, they were ranked accordingly. The following list of prioritized unsignalized intersections identifies key areas where enhancing safety could yield significant benefits.

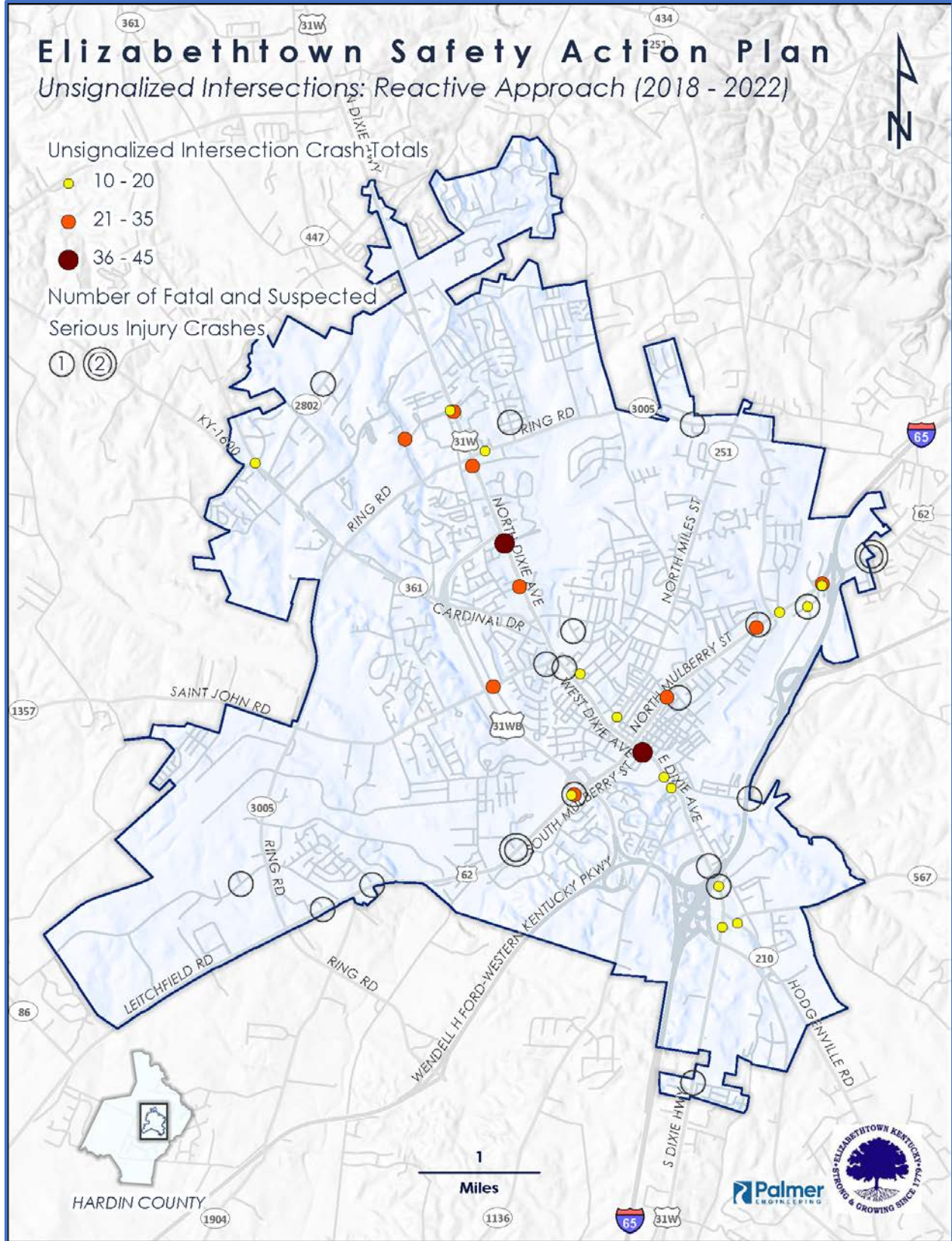
The following table lists the top 10 unsignalized intersections by MEPDO. These top 10 intersections account for 12 of the 21 fatal and serious injury crashes at unsignalized intersections.

Ranking	Intersection	K	A	B	C	O	KA	TOTAL	MEPDO
1	South Mulberry St (US-62) and Magnet Dr	1	1	0	1	6	2	9	460
2	North Mulberry St (US-62) and McCormack Ave	0	2	0	0	5	2	7	448
3	South Mulberry St (US-62) and US-31W Ramp	0	1	1	5	16	1	23	307
4	Dixie Ave East (US-31W) and Steel Dr	0	1	1	0	13	1	15	251
5	Dixie Ave East (US-31W) and Ivy Pointe Dr	0	1	1	1	2	1	5	251
6	North Black Branch Rd and Dana Dr 1	0	1	0	2	4	1	7	247
7	Hutcherson Ln (KY-2802) and Wolfe Run Rd	0	1	0	1	1	1	3	233
8	Commerce Dr and Executive Dr	1	0	0	0	9	1	10	231
9	Leitchfield Rd (US-62) and Kentucky Dr	1	0	0	0	5	1	6	227
10	Ring Rd (KY-3005) and Financial Dr	0	1	0	0	3	1	4	226

Detail maps displaying intersection crashes are provided on the following pages. Below are corresponding descriptions and insights of the crash data.

Unsignalized Intersections: Reactive Approach (2018 – 2022) Crash Totals: Map highlights the locations of all unsignalized intersections where crashes occurred. Unsignalized intersection crash totals are grouped in bins based on crash frequency in displayed with different colors. The number of fatal and serious injury crashes are noted by a black outline circle. Each circle represents the number of fatal and serious injury crashes that occurred at each intersection. Some locations may have a fatal and/or serious injury crash but have fewer than 10 total crashes, so that location only has a black outline circle.

Unsignalized Intersections: Reactive Approach (2018 – 2022) Intersection by MEPDO Score: Map presents the top 10 unsignalized intersections by MEPDO score. The unsignalized intersections are marked with circles and sized based on the MEPDO score. The prioritized ranking score is noted for the top 10 unsignalized intersections. For example, South Mulberry (US-62) and Magnet Drive is noted with 1 since it is the highest ranked MEPDO unsignalized intersection.

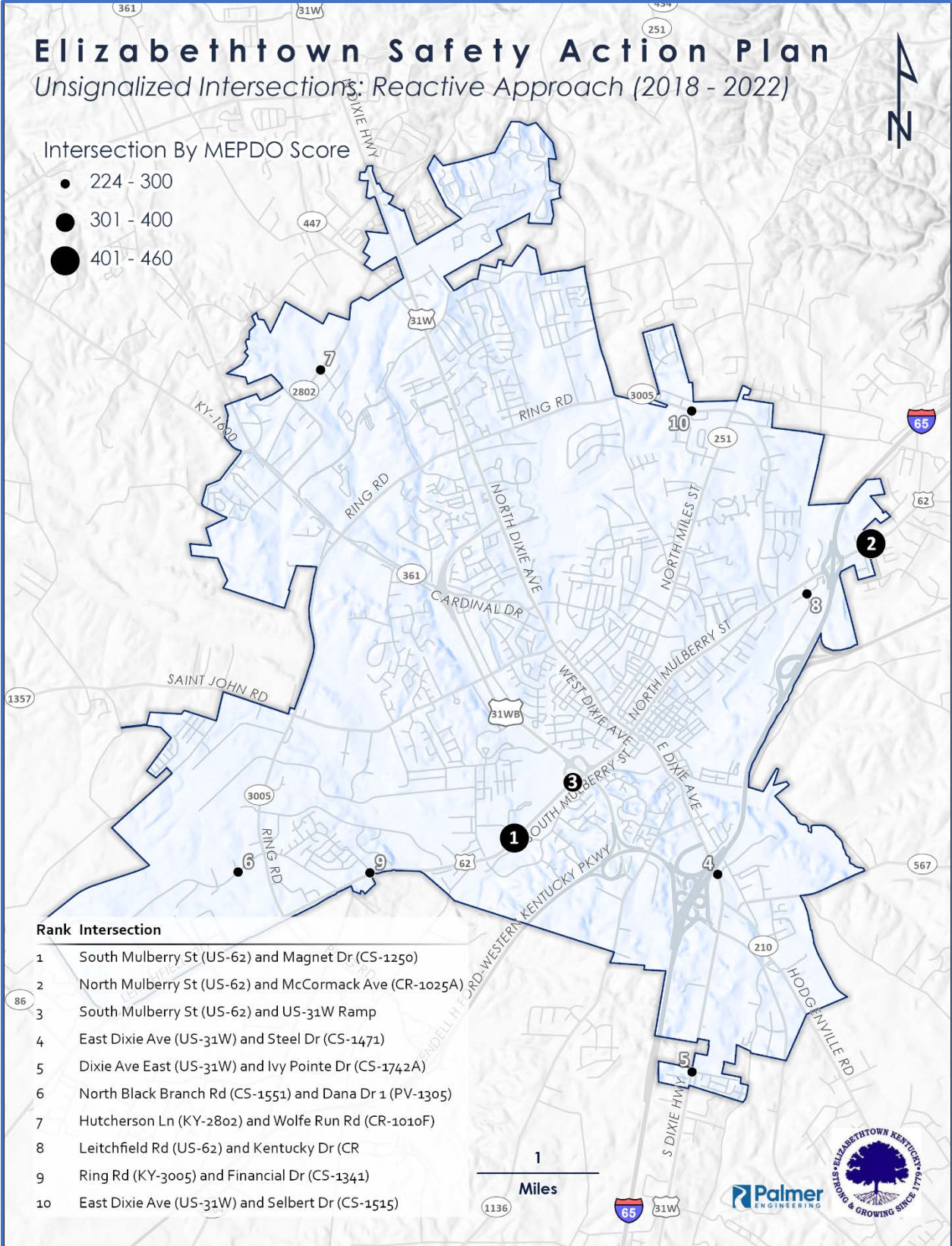


Elizabethtown Safety Action Plan

Unsignalized Intersections: Reactive Approach (2018 - 2022)

Intersection By MEPDO Score

- 224 - 300
- 301 - 400
- 401 - 460



High Injury Network and Prioritized Corridors

A High Injury Network (HIN) is a data-driven approach which identifies roadway segments that account for a disproportionate amount of a community’s fatal and serious injury crashes. The HIN allows communities to focus resources on improving safety along those high priority, dangerous corridors. Elizabethtown’s HIN was developed by analyzing crash data, integrating GIS information to create a detailed crash database, analyzing and identifying corridors, and selecting corridors with high concentrations of fatal and suspected serious injury crashes.

Ranking	Route	Begin	End	Length (mile)	MEPDO	MEPDO/mile
1	N Mulberry St (US-62)	Brooks St	City Limit	1.65	3,936	2,387
2	Dixie Ave (US-31W)	Parkway	New Glendale	0.96	1,551	1,617
3	Ring Rd (KY-3005)	Dixie Ave	Pear Orchard Rd	1.30	1,972	1,521
4	Dixie Ave (US-31W)	St John Rd	Crutz Ln	3.33	4,359	1,310
5	Dixie Ave (US-31W)	Pine Valley Dr	City Limit	0.89	990	1,106
6	Leitchfield Rd (US-62)	Ring Rd	Bypass	2.92	3,169	1,085
7	Dixie Ave (US-31W)	Mulberry St	St John Rd	0.97	1,050	1,077
8	Ring Rd (KY-3005)	Pear Orchard Rd	Shepherdsville Rd	0.99	1,069	1,074
9	North Black Branch Rd	Ring Rd	Aerial Dr	0.64	655	1,018
10	College St	Mary Knoll Dr	Bypass	0.83	696	837
11	Dixie Ave (US-31W)	New Glendale Rd	Mulberry St	0.93	777	833
12	New Glendale Rd (KY-1136)	Bypass	Dixie Ave	0.74	578	778
13	Bypass (US-31WB)	St John Rd	Dixie Ave	1.57	1,133	720
14	St John Rd (KY1357)	Bypass	Dixie Ave	0.69	436	634
15	Patriot Pkwy (KY-361)	Dixie Ave	Bypass	0.70	438	626
16	Ring Rd (KY-3005)	Patriot Pkwy	Dixie Ave	1.30	739	567
17	Patriot Pkwy (KY-361)	Ring Rd	City Limit	1.44	742	515
18	Ring Rd (KY-3005)	Leitchfield Rd	St John	1.74	887	508
19	New Glendale Rd (KY-1136)	Sarver Ln	Bypass	0.54	248	434
20	Bypass (US-31WB)	College St	St John Rd	0.79	317	402
21	Ring Rd (KY-3005)	Shepherdsville Rd	Mulberry St	1.74	673	386
22	Mulberry St (US-62)	Bypass	Brooks St	1.34	516	383

The HIN accounts for:

71%

of the City’s fatal and suspected serious injury crashes

12%

of the City’s roadway miles

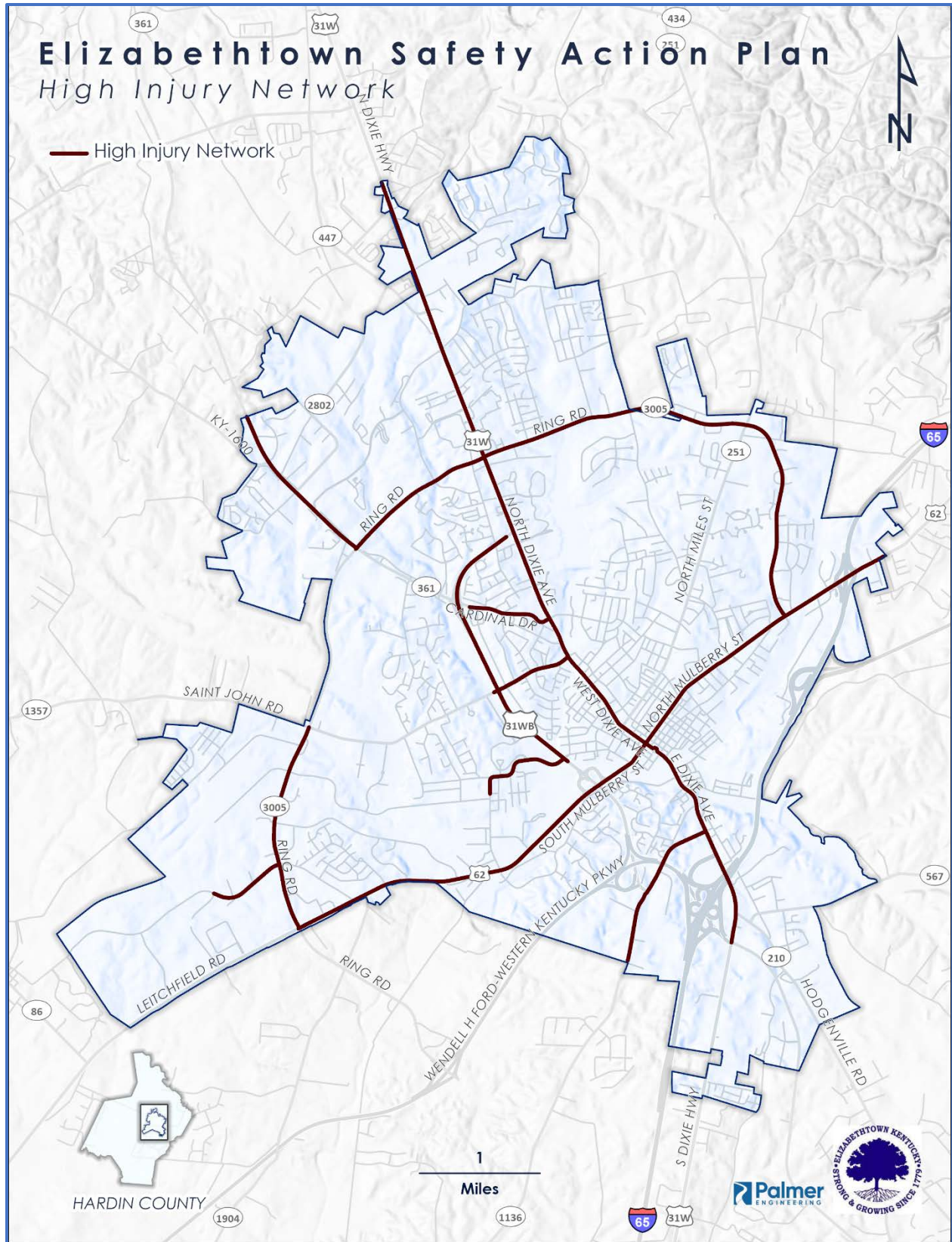
The HIN includes:

19 of top 20

prioritized signalized intersections

8 of top 10

prioritized unsignalized intersections

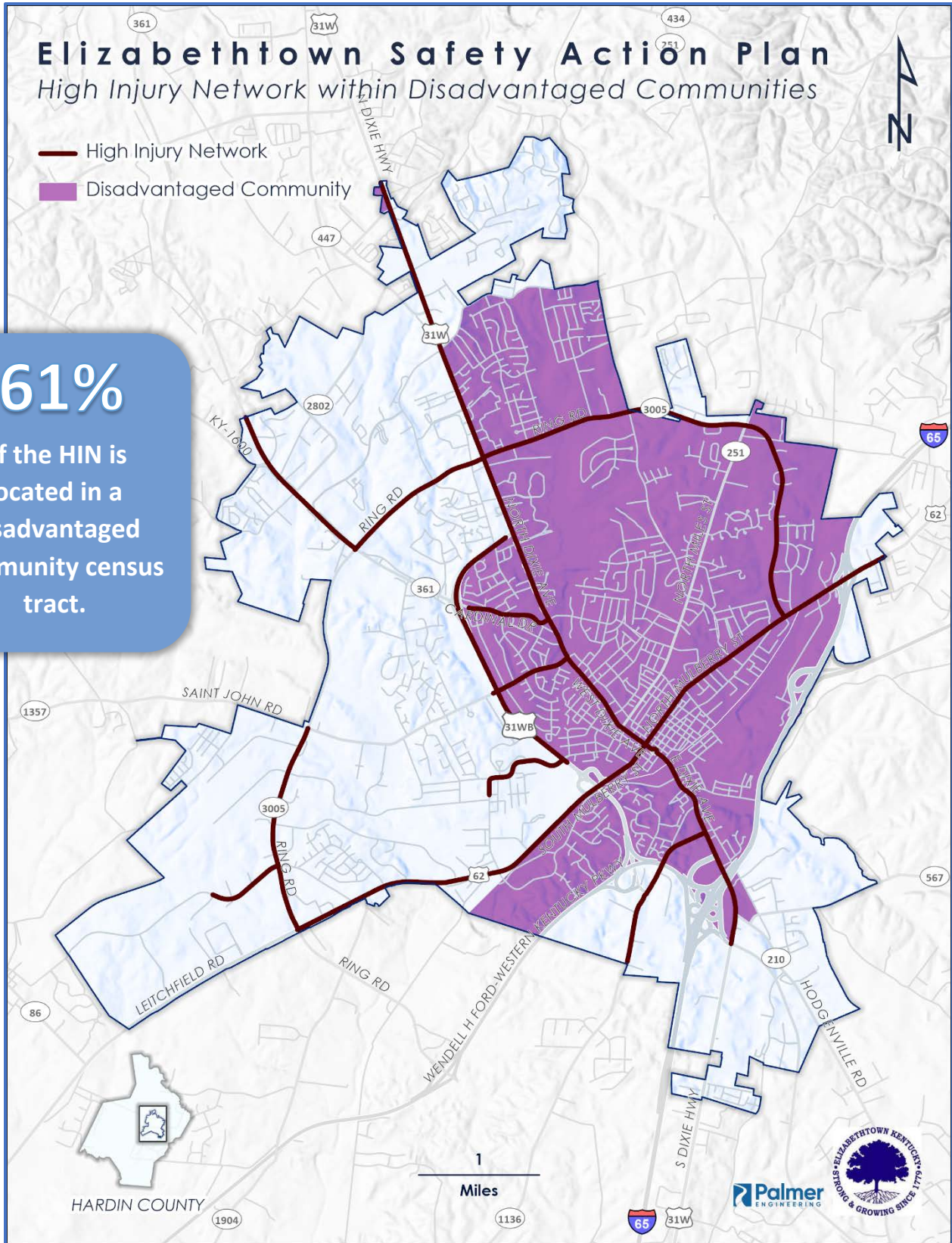


Elizabethtown Safety Action Plan

High Injury Network within Disadvantaged Communities

- High Injury Network
- Disadvantaged Community

61%
of the HIN is
located in a
disadvantaged
community census
tract.

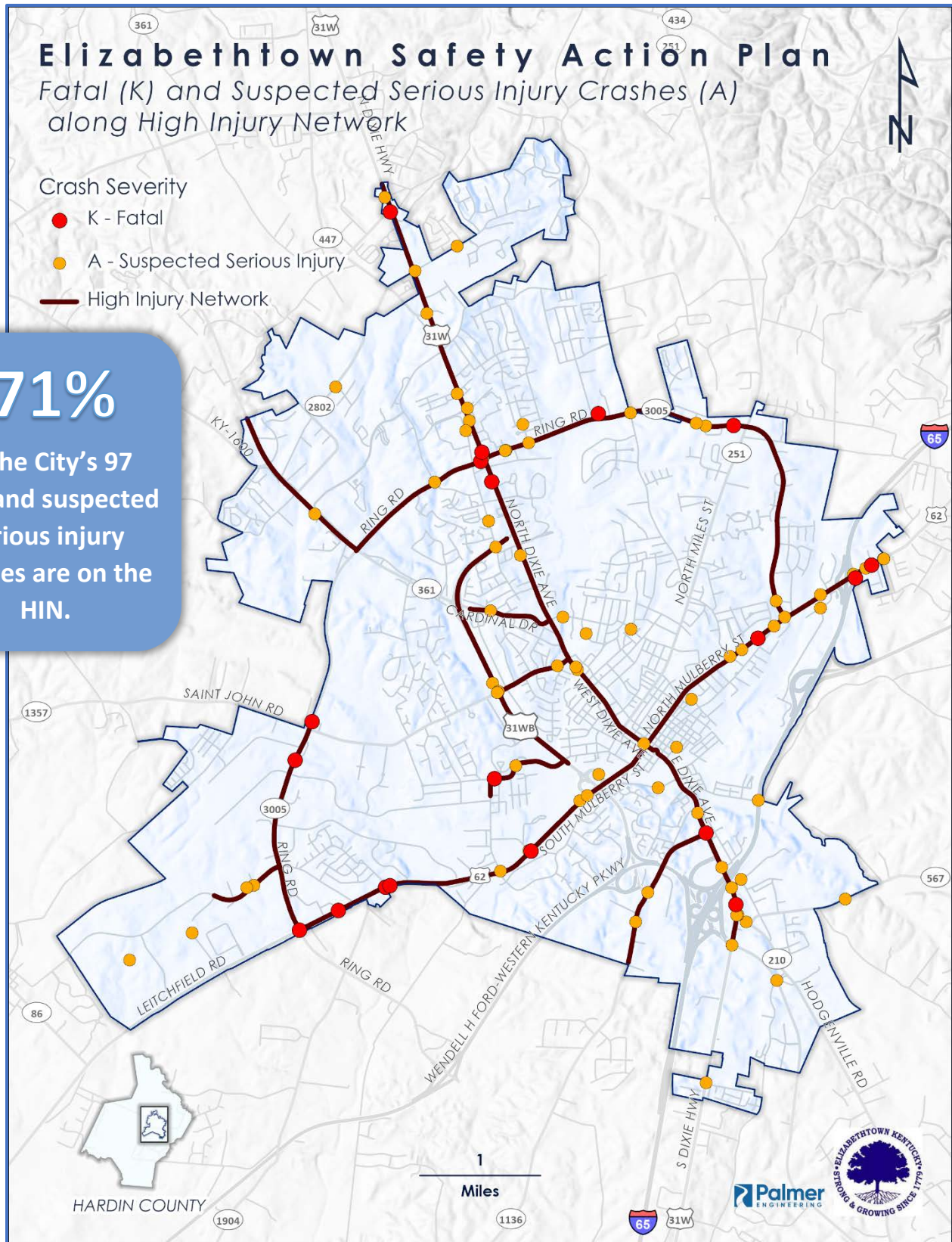


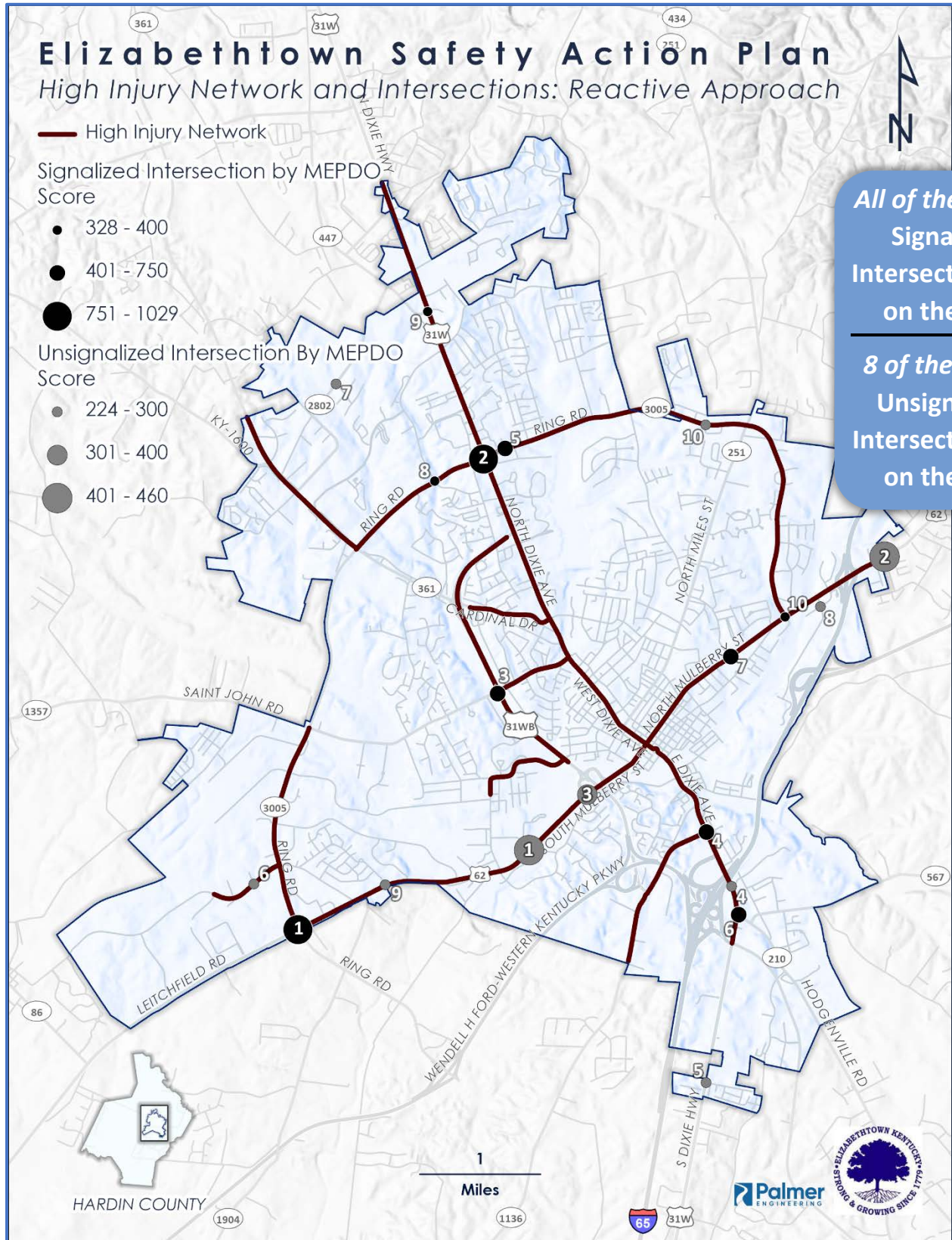
Elizabethtown Safety Action Plan Fatal (K) and Suspected Serious Injury Crashes (A) along High Injury Network

Crash Severity

- K - Fatal
- A - Suspected Serious Injury
- High Injury Network

71%
of the City's 97
fatal and suspected
serious injury
crashes are on the
HIN.







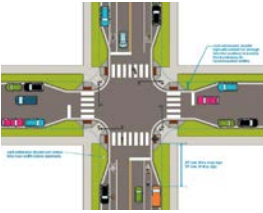
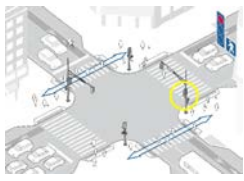





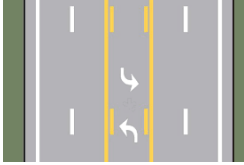

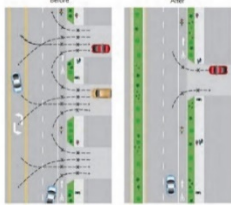


Project Selection

A comprehensive array of recommended strategies and safety improvements was compiled for the prioritized top ranking signalized intersections, unsignalized intersections, and the corridors on the High Injury Network. Improvements have been developed based on the safety analysis, input from the SAG and public, a commitment to equity considerations, and rooted in the principles of the Safe System Approach.





Proven Safety Countermeasures




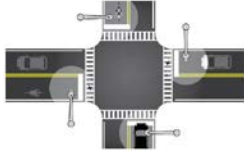
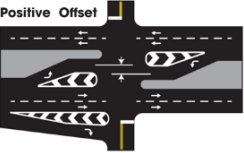

Potential safety countermeasures are provided in the following tables for pedestrian, unsignalized, and signalized intersection applications. These proven safety countermeasures are based on before and after crash data from case studies. Each countermeasure in the tables below include an image, a description of the countermeasure and how it can improve safety, a statistic of the estimated safety impact, and a link to learn more information. These expanded resources listed are provided by the U.S. Federal Highway Administration (FHWA) and the National Association of City Transportation Officials (NACTO). The countermeasures will be implemented where appropriate based on the prioritized list of project locations.




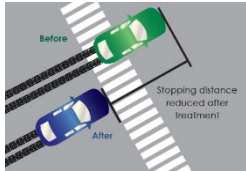
Pedestrian Countermeasures							
Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Raised Crosswalk				Crosswalk Visibility Enhancements			
	Ramped speed tables spanning the roadway, often placed at midblock crossings	All Crashes ↓ 30%	FHWA		Combination of high-visibility crosswalks, lighting, and signing and pavement markings. Can be implemented alone or in combination.	Ped Crashes ↓ 40%	FHWA
Medians and Pedestrian Refuge Islands				Advanced Stop / Yield Lines			
	Median with Marked Crosswalk Ped Crashes ↓ 46% ----- Pedestrian Refuge Island Ped Crashes ↓ 56%		FHWA		Provide notice to drivers of upcoming pedestrian crossings	Ped Crashes ↓ 25%	FHWA
Curb Extensions (Bulb Outs)				Leading Pedestrian Interval			
	Extend curbs to provide additional refuge, shorten crosswalks, slow traffic	Decrease turning speed & Decrease crash severity	NACTO		Provide pedestrians 3+ sec head start to improve visibility to turning traffic	Ped Crashes ↓ 13%	FHWA
Pedestrian Beacons				Install/Implement Pedestrian Signal Improvements			
	Ped Hybrid Beacon (PHB) All Crashes ↓ 12% Ped Crashes ↓ 43% ----- Rectangular Rapid Flashing Beacon (RRFB) Ped Crashes ↓ 47%		FHWA		Implementing leading pedestrian interval (LPI) and installing pedestrian pushbuttons and pedestrian countdown signals.	Ped crashes ↓ 8%	CMF

Segment Countermeasures							
Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Road Diet				Center Turn Lanes			
	Reallocate space within roadbed to calm traffic speeds and improve safety for all users	All Crashes ↓30%	FHWA		Provide painted median to remove left-turning traffic from travel lanes	All Crashes ↓24%	FHWA
Curbed Median				Consolidate Driveways (Access Management)			
	Provide curbed median separation between opposing travel lanes to provide separation, reduce minor driveway left-turn risks	All Crashes ↓28% ----- Angle Crashes ↓55%			Reduce number and proximity of access points to focus turning traffic to fewer locations. Reduces turning conflicts	Severe Crashes ↓25- 31%	FHWA
Dynamic Speed Feedback Signs				Shoulder Treatment – Safety Edge			
	Provides positive and negative feedback to drivers on speed.	All Crashes ↓5%	FHWA		Shoulder installation to improve recoverability for roadway departures.	Run-Off-Road Crashes ↓21% ----- Head-On Crashes ↓19% ----- Severe Crashes ↓11%	FHWA

Segment Countermeasures (Continued)

Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Enhanced Curve Delineation				Buffered Bike Lanes			
	High visibility markings and delineators around curves	Severe Crashes ↓18%	FHWA		Provides greater shy distance between motor vehicles and bicycles	Add additional space between vehicle and bicycle traffic	NACTO
Conventional Bike Lanes				Shoulder Rumble Strips			
	On streets with < 3,000 ADT and posted speed > 25mph, creates separation	Increase bicyclist comfort and predictability between motorist and cyclist.	NACTO		Longitudinal rumble strips are milled or raised elements on the pavement intended to alert drivers through vibration and sound that their vehicle has left the travel lane.	Run off Road Fatal and Serious Injury Crashes ↓13-51%	FHWA

Intersection Countermeasures							
Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Restricted Crossing U-Turn (RCUT)				Left Turn Phasing – Protected Only			
	Convert existing traditional intersection into RCUT (signalized or unsignalized). Eliminating and reducing conflicts.	Severe Crashes ↓ 22-63%	FHWA		Eliminates conflicts in areas where sight distance, spacing, judgement is difficult	All Crashes ↓18-42%	FHWA
Cycle Length and Clearance Intervals				Intersection Lighting			
	Shorter cycle lengths improve driver compliance, lessen red-light running.		NACTO		Increased visibility at nighttime can improve safety for all modes of travel.	Nighttime Ped Injuries ↓42% ----- Nighttime Crashes ↓ 33-38%	FHWA
Positive Left-Turn Lane Offset				Intersection Treatments for Conventional Bike Lanes			
	Provides increased visibility by preventing turning vehicles from blocking sightlines	Left Turn Crashes ↓ 36%	FHWA		Provide opportunity for cyclist to position themselves to approach and travel through intersections.	Predictability. Reduces conflict between turning motorists and bicyclists.	NACTO

Intersection Countermeasures (Continued)							
Countermeasure	Description	Safety Impact	Links	Countermeasure	Description	Safety Impact	Links
Modern Roundabouts				Reflective Backplates			
	Converting existing traditional intersection (stop or signal control) into single lane roundabout. Slowing traffic while eliminating and reducing conflicts.	2-way Stop conversion Severe Crashes ↓82% ----- Signal conversion ↓78%	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				High Friction Surface			
	Deploying a package of multiple low-cost countermeasures, including enhanced signing and pavement markings increasing driver awareness.	Severe and Fatal Crashes ↓10% ----- Nighttime Crashes ↓15%	FHWA		HFST consists of a layer of durable, anti-abrasion, and polish-resistant aggregate over a thermosetting polymer resin binder that locks the aggregate in place to restore or enhance friction and skid resistance.	Total Crashes ↓20%	FHWA

Potential Unsignalized Strategies

Below is a table of prioritized signalized intersections based on the MEPDO values. Each location was visited and evaluated for improvement. Based on the field analysis, relevant safety countermeasures were identified as potential improvements.

Unsignalized Intersections – Reactive Approach														
Ranking	Intersection	Potential Countermeasures												
		Innovative Concept	Road Diet	Added Left Turn Lane	Trim Trees (Sight Distance)	Markings/ Striping	Updated Signing	Lighting Improvements	Speed Calming Measures	Access Management	Right-In Right-Out	Guardrail Improvements	Edgeline Rumble Strips	Ped Access
1	South Mulberry St (US-62) and Magnet Dr	RCUT	X			X				X		X		X
2	North Mulberry St (US-62) and McCormack Ave	RCUT	X		X	X								X
3	South Mulberry St (US-62) and US-31W Ramp	RCUT				X								
4	East Dixie Ave (US-31W) and Steel Dr	RCUT	X			X								
5	Dixie Ave East (US-31W) and Ivy Pointe Dr			X	X									X
6	North Black Branch Rd and Dana Dr 1					X	X	X	X	X				
7	Hutcherson Ln (KY-2802) and Wolfe Run Rd					X	X				X		X	
8	Commerce Dr and Executive Dr	Recently constructed roundabout												
9	Leitchfield Rd (US-62) and Kentucky Dr	RCUT	X			X		X		X				
10	Ring Rd (KY-3005) and Financial Dr					X					X			X
11	East Dixie Ave (US-31W) and Selbert Dr		X	x		X	X			X	X			
12	Eagle Way and Nightingale Dr					X	X	X	X					

Potential Signalized Strategies

The subsequent pages present a table of prioritized signalized intersections, ranked by their MEPDO scores. Each intersection was evaluated in the field, and relevant safety countermeasures were identified for potential study and implementation.

Signalized Intersections – Reactive Approach

Ranking	Intersection	Potential Countermeasures																		
		Innovative Concept	Road Diet	Positive Offset LT Turn Lane(s)	Added RT Turn Lane	Tighten Intersection	Reflective Backplates	Marking / Striping	Updated Signing	Protected – Only Left-Turns	High Friction Surface	Advanced Warning Flasher	Yellow Change Intervals	Access Management	Right-in Right-out	Median Improvements	Ped Phasing	Crosswalk Visibility Enhancement	Ped Access	Bike Improvement
1	Ring Rd (KY-3005) and Leitchfield Rd (US-62)	RCUT ROUND-ABOUT					X	X		X	X		X	X	X				X	
2	Dixie Ave (US-31W) and Ring Rd (KY-3005)	ROUND-ABOUT									X		X				X	X		
3	Elizabethtown Bypass (US-31WB) and St John Rd (KY-1357)	ROUND-ABOUT RCUT				X	X				X	X	X						X	
4	Dixie Ave (US-31W) and New Glendale Dr (KY-1136)	RCUT		X			X			X							X		X	X
5	Ring Rd (KY-3005) and Lowes Dr						X	X	X		X		X							
6	Dixie Ave (US-31W) and Hodgenville Rd (KY-210)	ROUND-ABOUT					X	X	X				X			X	X		X	
7	N Mulberry St (US-62) and W French St	RCUT		X			X							X						X
8	Ring Rd (KY-3005) and Veterans Way	RCUT ROUND-ABOUT		X					X	X	X								X	
9	Dixie Ave (US-31W) and S Wilson Rd (KY-447)	Recently constructed RCUT																		
10	N Mulberry St (US-62) and Ring Rd (KY-3005)	RCUT					X	X									X		X	
11	Dixie Ave (US-31W) and Pine Valley	RCUT		X			X	X	X	X									X	
12	Ring Rd (KY-3005) and Pear Orchard Rd	RCUT		X			X	X	X		X									
13	N Mulberry St (US-62) and I-65 NB Exit Ramp			X			X	X	X											

Signalized Intersections – Reactive Approach (Continued)

Ranking	Intersection	Potential Countermeasures																		
		Innovative Concept	Road Diet	Positive Offset LT Turn Lane(s)	Added RT Turn Lane	Tighten Intersection	Reflective Backplates	Marking / Striping	Updated Signing	Protected – Only Left-Turns	High Friction Surface	Advanced Warning Flasher	Yellow Change	Access Management	Right-in Right-out	Median Improvements	Ped Phasing	Crosswalk Visibility Enhancement	Ped Access	Bike Improvement
14	Dixie Ave (US-31W) and Starlite Center Dr	Recently constructed RCUT																		
15	Lincoln Pkwy (KY-61) and Sportsman Lake Rd	RCUT		X	X		X	X												
16	Western Ky Pkwy (WK-9001) and Dixie Ave (US-31W)						X	X	X		X		X							
17	S Mulberry St (US-62) and College Street Rd	RCUT ROUND-ABOUT	X	X			X	X	X											
18	Ring Rd (KY-3005) and Nightingale Dr	RCUT		X				X	X		X									
19	Ring Rd (KY-3005) and Josale Dr	RCUT					X	X								X			X	
20	Elizabethtown Bypass (US-31WB) and College Street Rd	RCUT					X	X	X										X	
21	Dixie Ave (US-31W) and Woodland Dr (KY-361)	Recently constructed offset left turn lanes																		
22	Dixie Ave (US-31W) and Saint John Rd (KY-1357)						X	X											X	
23	N Mulberry St (US-62) and Executive Dr						X	X		X			X			X			X	
24	Dixie Ave (US-31W) and Walmart Dr	Recently Reconstructed with new signals with reflective backplates. Potential ped access improvement.																		
25	Ring Rd (KY-3005) and Shepherdsville Rd						X	X								X				
26	Ring Rd (KY-3005) and North Black Branch Rd	RCUT	X				X	X								X			X	
27	Dixie Ave (US-31W) and Mantle Ave							X					X			X				

Potential High Injury Network Corridor Strategies

The following table presents potential project strategies for the High Injury Network (HIN). These strategies include proven safety countermeasures and complete street design concepts. These routes will be studied further to identify the best strategies for preventing fatal and suspected serious injury crashes.

Rank MEPDO/Mile	Route Name	Begin and End Limits	Length	Potential Project Strategies
1	N Mulberry St (US 62)	Brooks St. to McCormack Ave	1.65	Current KYTC Preliminary Design. Address safety, pedestrians, and access management, along with improving intersections and the I-65 interchange.
2	E Dixie Ave (US 31W)	Lincoln Parkway (KY 61) to New Glendale Rd (KY 1136)	0.96	Road rightsizing to 3-lane two-way left-turn lane typical. Roundabouts at KY 61, KY 210, and KY 1136. Shared-use path and safe crossings.
3	Ring Road (KY 3005)	Dixie Ave (US 31W) to Pear Orchard	1.30	Intersection RCUTs, Access Management, Non-motorized safe Crossings, Refuge Islands
4	N Dixie Ave (US 31W)	St. John Road (KY 1357) to Crutz Lane	3.33	Construction Complete Spring 2023 and involved RCUT Corridor with access management.
5	N Dixie Ave (US 31W)	Pine Valley Dr. to north of W A Jenkins Rd (KY 2802)	0.90	Current KYTC Preliminary Design of RCUT Corridor.
6	Leitchfield Rd / S Mulberry St (US 62)	Ring Road (KY 3005) to US 31W Bypass	2.92	Road rightsizing. Intersection improvements such as roundabouts and RCUTs. Non-motorized facilities and safe crossings. Access Management.
7	W Dixie Ave (US 31W)	Mulberry St. (US 62) to St. John Rd (KY 1357)	0.97	Access Management close to intersections. Intersection Improvements. Non-motorized safe crossings, Refuge Islands.
8	Ring Road (KY 3005)	Pear Orchard to Shepherdsville Rd (KY 251)	1.00	Intersection RCUTs, Access Management, Non-motorized Safe Crossings, Refuge Islands, Intersection Improvements
9	N Black Branck Rd	Ring Road (KY 3005) to Aerial Dr	0.64	Roundabout to slow speeds. Turn lanes at intersections. Access Management.
10	College Street Rd	Mary Knoll Dr to US 31W Bypass	0.83	Low Cost signing enhancements for sharp curves. Wide edgeline striping. Curve widening and/or realignment. Rumble strips. Improve Sight Distance.
11	E Dixie Ave (US 31W)	New Glendale (KY 1136) to Mulberry St (US 62)	0.93	Road rightsizing completed in 2021. Access management, intersection improvements, safe pedestrian crossings are potential improvements.
12	New Glendale Rd (KY 1136)	US 31W Bypass to E Dixie Ave (US 31W)	0.74	Roundabout constructed at New Glendale @ US 31W Bypass. Pedestrian facilities and safe crossings are potential improvements.
13	US 31W Bypass	St. John Road (KY 1357) to Dixie Ave (US 31W)	1.57	Grade separated intersection for Bypass @ St. Johns. RCUT corridor. Reduce right turn yielding angles. Signal enhancements.
14	St. John Road (KY 1357)	US 31W Bypass to E Dixie Ave (US 31W)	0.69	Road rightsizing to 3-lane two-way left-turn lane typical. Shared-use path and safe crossings. Access management.
15	Cardinal Dr (KY 361)	N Dixie Ave (US 31W) to US 31W Bypass	0.70	Widened to 3-lane TWLTL in 2020. Access management. Safe pedestrian crossings.
16	Ring Road (KY 3005)	Patriot Pkwy (KY 361) to Dixie Ave (US 31W)	1.30	Intersection RCUTs, Access Management, Non-motorized Safe Crossings, Refuge Islands, Intersection Improvements
17	Patriot Pkwy (KY 361)	Ring Road (KY 3005) to Waterside Dr (City Limits)	1.44	RCUT corridor, Access Management, Lighting, Intersection Improvements
18	Ring Road (KY 3005)	Leitchfield Rd (US 62) to St. John Road (KY 1357)	1.75	Roundabout for Ring Road @ US 62. Access Management. Non-motorized Safe Crossings, Refuge Islands, Intersection Improvements
19	New Glendale Rd (KY 1136)	Sarver Lane to US 31W Bypass	0.57	Rumble Strips, Sidewalk Facilities, Lighting along the Corridor, Curve Signing
20	US 31W Bypass	College St to St. John Rd (KY 1357)	0.79	RCUT or Roundabout for US 31W Bypass @ College St, Intersection Improvements, Signal Enhancements, Lighting
21	Ring Road (KY 3005)	Shepherdsville Rd (KY 251) to Mulberry St (US 62)	1.74	Intersection RCUTs, Access Management, Non-motorized Safe Crossings, Refuge Islands, Intersection Improvements
22	Mulberry St (US 62)	US 31W Bypass to Brooks St.	1.35	Road Rightsizing to 3-Lane TWLTL typical. Access Management.
Corridor currently in planning or design.				
Corridor recently constructed improvements.				

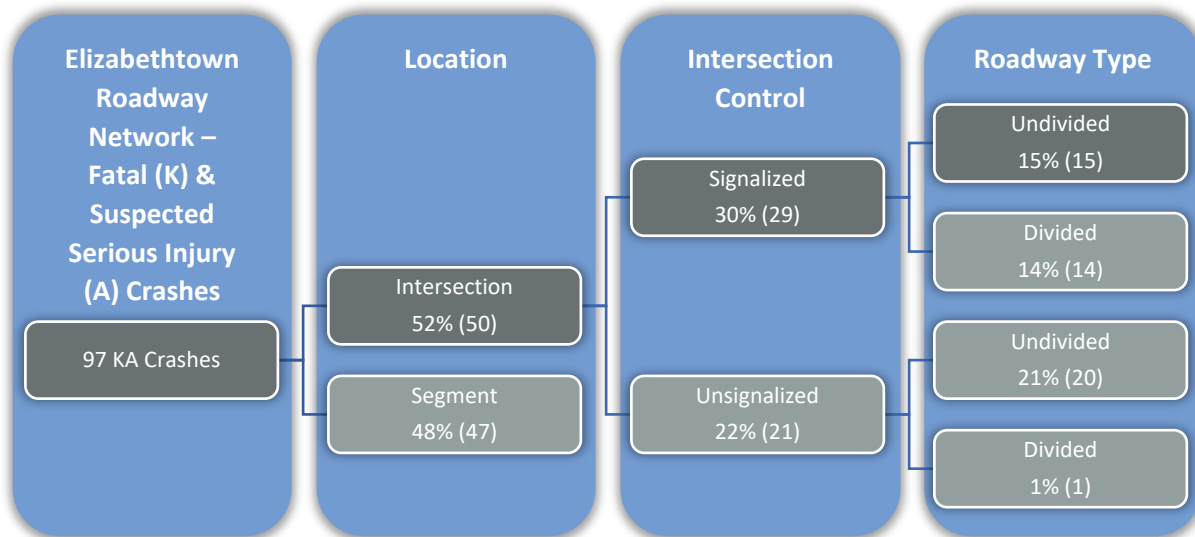
Systemic Approach and Strategies

The systemic approach to safety is a comprehensive strategy to identify and address high-risk features, or factors, across the entire roadway network, rather than focusing solely on specific crash locations such as the reactive approach. The crash data and roadway data were analyzed to identify the risk factors that seem to contribute to the crash history on Elizabethtown’s roadway network. The analysis resulted in Intersections, Roadway Segments, and Pedestrians as categories with risk factors.

Systemic strategies focus on widespread implementation of improvements to address identified risk features across an area, not just at specific locations. These improvements aim to reduce both the likelihood and severity of crashes throughout an area. Systemic strategies leverage data to proactively identify and mitigate potential hazards to prevent crashes.

Intersections

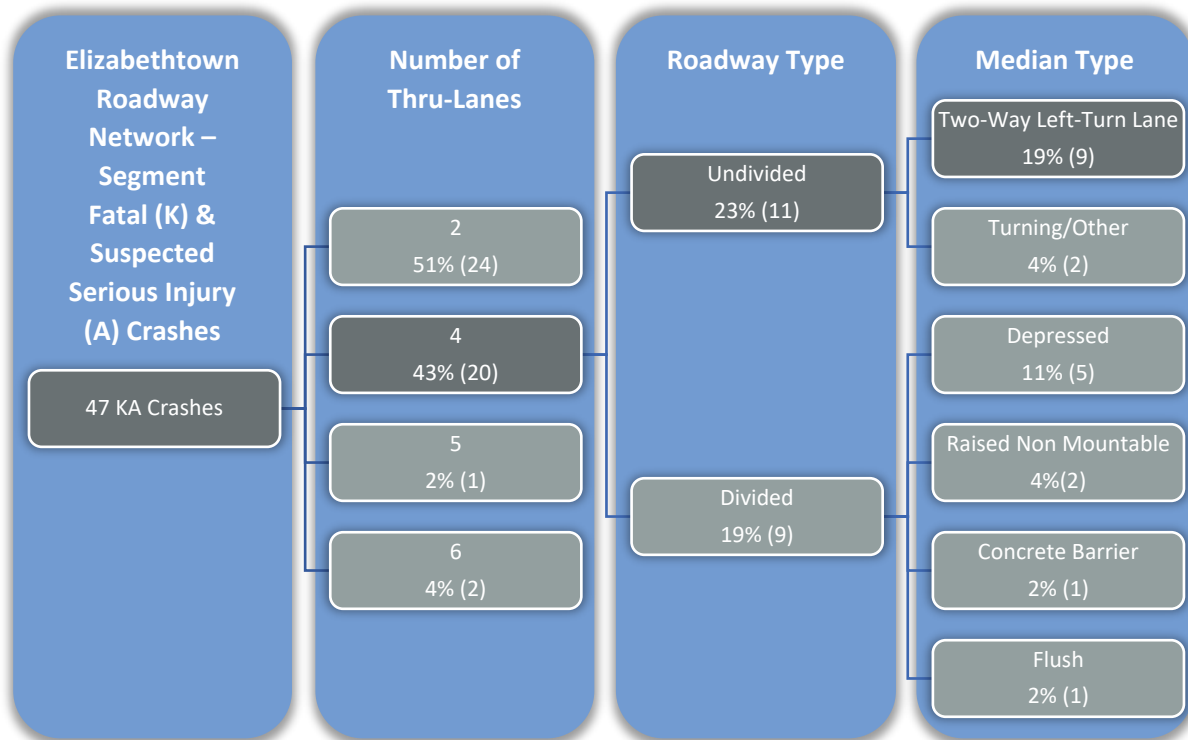
As previously discussed, crashes occur at intersections more often than on roadway segments. 54% of all crashes occur at intersections compared to 46% occurring on segments. The fatal and suspected serious injury crashes have a similar distribution, 52% of all crashes occur at intersections and 48% on roadway segments. The systemic approach was applied to the fatal and suspected serious injury crashes occurring at intersections. Based on the systemic analysis, signalized intersections located on divided roadways accounted for 15% of all fatal and suspected serious injury crashes. The following graphic presents the fatal and suspected serious injury crashes breakdown by location, intersection control and roadway type. Based on the systemic analysis, signalized intersections on undivided and divided roadways are a risk factor.



Systemic intersection improvements include low-cost countermeasures such as enhanced signing and striping and retroreflective backplates at signalized intersections. In Elizabethtown, there are 50 signalized intersections, of which 27 are located on undivided roadways. While unsignalized, undivided intersections account for 21% of the fatal and suspected serious injury crashes, they represent the vast majority of the city’s intersections.

Roadway Segments

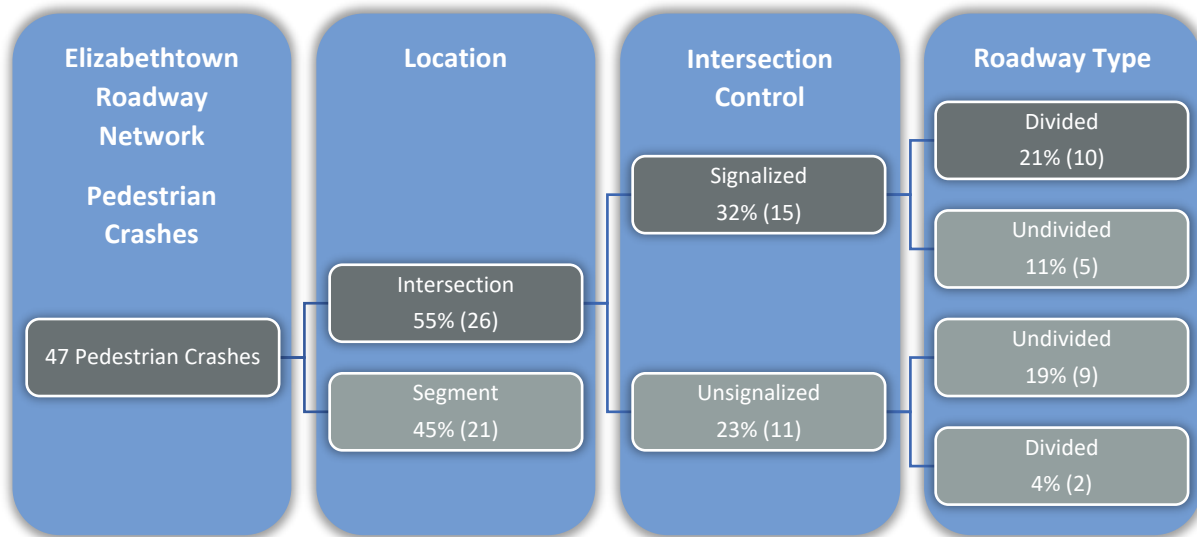
The crash analysis indicated that 46% (2,412) of all crashes and 49% (47) of fatal and suspected serious injury crashes occurred on a roadway segment. The systemic approach was applied to the fatal and suspected serious injury crashes occurring on roadway segments. 19% of the segment fatal and suspected serious injury crashes occurred on four-lane undivided roadways with a two-way left-turn lane. The following graphic presents the segment fatal and suspected serious injury crashes breakdown by number of lanes, roadway type, and median type. Based on the systemic analysis, a roadway with four thru- lanes, and a two-way left-turn median is a risk factor.



Undivided four-lane roadways typically carry a significant volume of traffic. However, a thorough review of these roadways may show that these roadways could perform safer and as efficient with fewer lanes. A road diet on a four-lane roadway could be a low-cost countermeasure and achieved during a maintenance project with restriping the roadway to reduce travel speeds and accommodate bicycle lanes. Enhanced striping is low-cost countermeasure that could improve safety in these roadway segments.

Pedestrians

Pedestrian crashes are less than 1% of all crashes, but account for 19% of all fatal and suspected serious injury crashes. Of the 47 pedestrian crashes, 26 (55%) occurred at intersections and 21 crashes (45%) were located along a roadway segment. The systemic approach was applied to all pedestrian crashes and based on the analysis, 21% of the pedestrian crashes occurred at signalized intersections along a divided roadway. The following graphic illustrates the pedestrian crashes breakdown by location, intersection control and roadway type. The systemic analysis shows that a risk factor for pedestrians are signalized intersections on divided roadways.



Low-cost pedestrian systemic improvements include enhancing sidewalks and enhancing crosswalk visibility with markings, signs, and lighting. Lead pedestrian intervals (LPI) at signalized intersections, along with rapid flashing beacons and refuge areas at unsignalized crossings, can significantly improve pedestrian safety.

8. Progress and Transparency

The City is committed to transforming our community’s roadways into safer spaces for everyone through continuous monitoring and evaluation of the Safety Action Plan. It is crucial for Elizabethtown’s success to track progress towards the goal of eliminating fatalities and serious injuries by 2050. The monitoring of the Safety Action Plan will be transparent, ensuring public accessibility and clear communication of data.

Safety Performance Measurement

The City will track safety improvements using safety performance metrics, with an emphasis on equity to ensure progress in disadvantaged communities. Additionally, project-specific performance will be monitored to ensure progress and a positive safety impact.

Annual Safety Performance Measures

Crash Severity

The total number of crashes by severity will be monitored annually. The measurement will include monitoring 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 will be monitored. The crash rate will be the total number of crashes per vehicle miles traveled in the city.

Fatal and Suspected Serious Injury Crashes

Fatal and suspected serious injury crashes will be monitored annually. The measurement will include monitoring the total number of fatal and suspected serious injury crashes and the crash rate. The crash rate will be the number of fatal and suspected serious injury crashes per vehicle miles traveled in the city by year.

Vulnerable Road User Crashes

Annually, the vulnerable road user crashes will be monitored, with an emphasis on fatal and suspected serious injury crashes. Nearly half of the fatal and suspected serious injury crashes was a vulnerable road user crash. Of the vulnerable road user crashes, 1 in 3 were severe.

Equity Focused

The City will monitor the annual safety performance measures listed above for the disadvantaged communities to ensure all communities benefit from the program and efforts to improve safety. An equity focused analysis of crashes annually will identify any potential trends in the disadvantaged communities that may differ from the entire city.

Project Specific Performance Measures

The City, in collaboration with stakeholders, will monitor project specific performance measures. The safety action plan recommends specific improvements based on the reactive approach (historical crashes analysis) and systemic approach. Project specific improvements will be tracked for the prioritized signalized intersections, unsignalized intersections, and along the corridors identified on the High Injury Network. Two main project specific performance measures are anticipated to be collected;

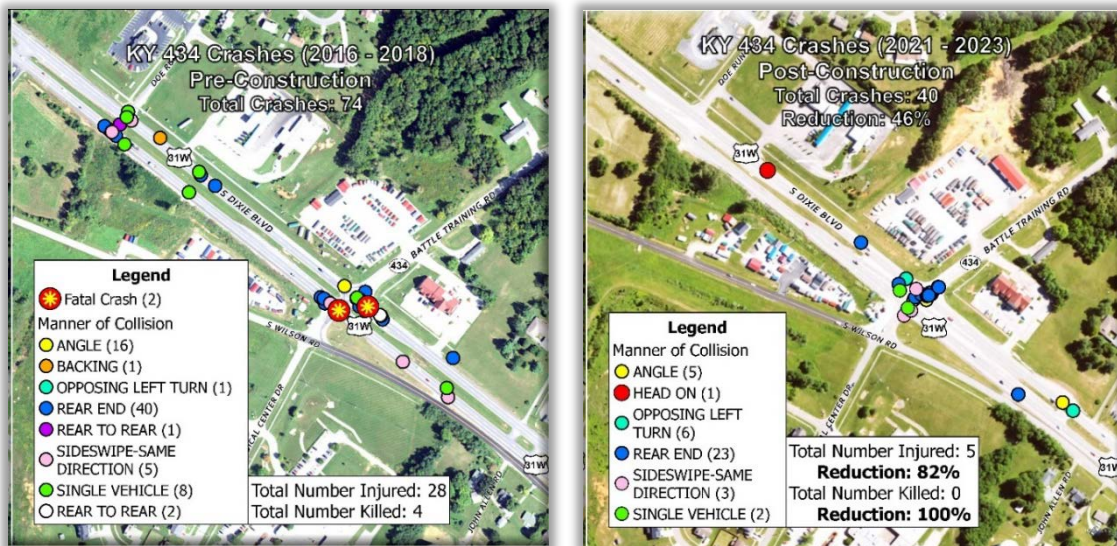
1. The total number of safety improvement projects being implemented at prioritized locations.
2. The crash trends of these implemented safety improvement projects.

Performance measures could include the overall total number of safety focused improvements projects that are constructed from the potential improvements listed in Chapter 7. Each year the total number of safety improvements implemented at the intersections and along the corridors identified on the High Injury Network will be measured.

Additionally, safety studies and design plans that are initiated and completed will be measured each year. Safety studies and designs that include cost estimates, public engagement, NEPA documentation, and project readiness, will move the projects closer to construction. Each location that has completed studies and designs are moved closer to actual implementation and realizing the goal of eliminating fatal and serious injury crashes.

The second main project specific performance measure will be focused on crash trends of implemented safety improvement projects. When a safety improvement project has been constructed, post-construction crash history can be collected to begin to document the realized crash reduction benefit. Crash trends can be measured for each project specific improvement and will aid the City in future safety improvement decisions. This performance measure will be focused on tracking fatal and serious injury crashes for each improvement project.

For example, crash trends for the recently completed RCUT corridor that was constructed along US 31W, were measured and shared with the public. Graphics were created for crashes that occurred before the project and crashes that have occurred following construction of the project. This performance measure showed a 41% reduction in crashes along the project. The crash data was posted to the project website that was setup to engage the public: [US 31W Safety Improvements](#)



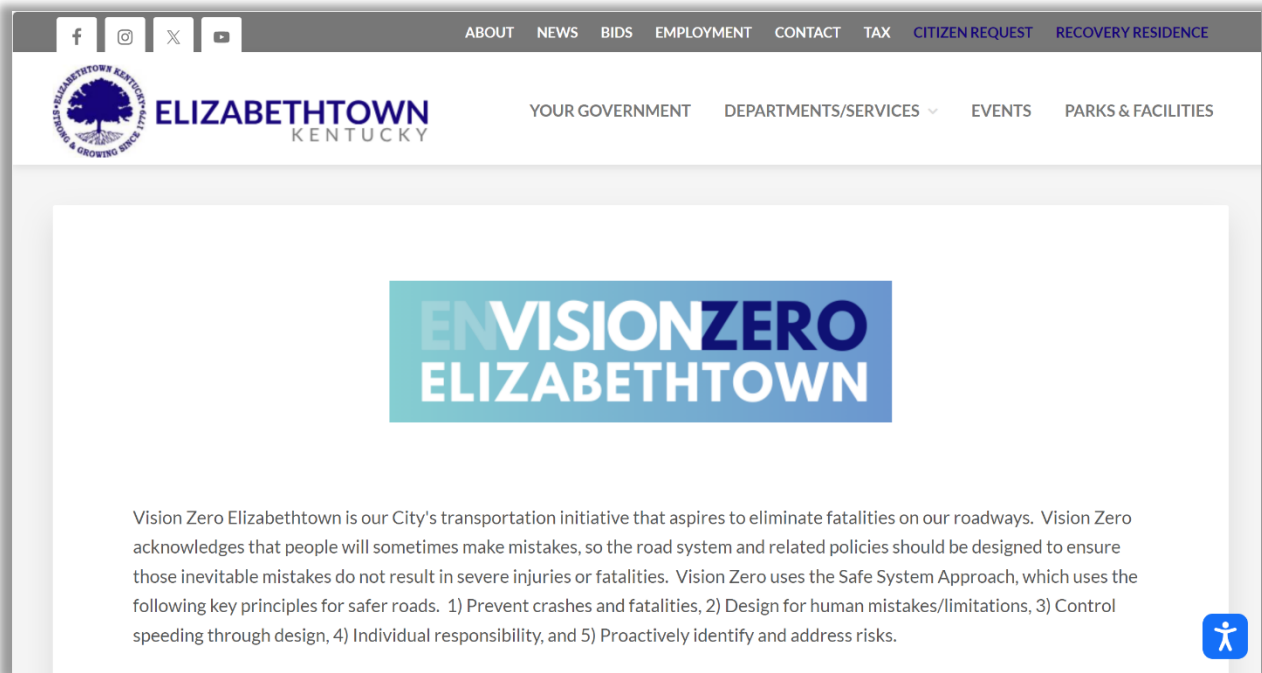
An example pre-project measurement period and post-project measurement period is provided below:

Pre-Project Measurement Period: 3 years prior to construction. If construction begins in June 2025, the three-year period will be June 1, 2022 – May 31, 2025.

Post-Project Measurement Period: 3 years post construction. If construction is completed in June 2025, the three-year period will be July 1, 2025 – June 30, 2028.

Transparency

The development of the Safety Action Plan has been shared publicly through the Vision Zero Elizabethtown website. The website was utilized to engage the public with a survey and share additional maps and resources such as the Vision Zero Network, Safe Streets and Roads 4 All Grant Program, and Safe Systems Approach. [Vision Zero Elizabethtown \(elizabethtownky.org\)](https://www.elizabethtownky.org)



The Safety Action Plan has been published to the website. The website will be utilized to post updates as well as present the performance safety measures.

Feedback and Continuous Improvement

During the development of the Safety Action Plan, community engagement focused on public surveys and meetings and stakeholder engagement through the Safety Action Group. The City will continue to engage with the public and stakeholders to gather feedback on progress and to update the Safety Action Plan.