MT. JULIET

SAFETY ACTION PLAN

APRIL 2025


N Mt. Juliet Rd
Old Lebanon Dirt Rd.
TURNING
VEHICLES
YIELD

APPROVAL LETTER FROM LEADERSHIP

On behalf of the City of Mt. Juliet Board of Commissioners and the other leaders of our great City, I am proud to support this effort toward making our roadways safer for all who travel them. Between 2019 and 2023, our City experienced 3,688 reported roadway crashes, of which 57 crashes led to 10 deaths and 47 seriously injured individuals. These events are tragedies for the victims, their families, and our communities. The impacts are profound and devastating.

Fatalities and serious injuries due to traffic crashes are preventable, and the City of Mt. Juliet is committed to significantly reducing and ultimately eliminating these occurrences. This Comprehensive Safety Action Plan is a crucial first step toward making this commitment a reality. As a data-driven and actionable document, this Safety Action Plan lays the groundwork for projects and strategies that can make a tangible difference on our roadways.

Access to safer roadways is the goal for our entire population of the City of Mt. Juliet, as well as for those visiting or passing through Mt. Juliet. The City of Mt. Juliet cannot achieve its goals without the support and participation of the people in our communities and our partner agencies. Every person has a role to play and a responsibility to help make our roads safer. Together, we can accomplish a great deal.

Our intent is that this Safety Action Plan will provide a roadmap of the steps that the City of Mt. Juliet will take toward improving safety on the roadways within our jurisdiction. The plan will show us what to do first, what to do next, and how to keep track of our progress along the way. The work has only just begun, but having a solid plan is the foundation for achieving our goals and eliminating these preventable tragedies from our roadways.

Thank you for your interest in roadway safety in the City of Mt. Juliet.

Sincerely,

James Maness

Mayor of Mt. Juliet


WELCOME TO MT.JULIET
NOV
Heart of Dixie
1DH0207
Alabama
OCT
TENNESSEE
Sounds good to me
06
SQU 267
Volunteer State
DAVIDSON
06
TEXAS

SPECIAL THANKS

We extend our sincere appreciation and gratitude to the residents, advocacy groups, stakeholders, and the public who assisted in the public surveys, meetings, and the entire planning process. The critical input guided the development of the Safety Action Plan and in turn will have a positive impact on the city.

CITY OF MT. JULIET

Matthew White – Public Works Director

Abraham Farias – Transportation Project Manager

Todd Serbent – Traffic Engineer

Michael Mullins – Chief of Police

Eric Newman – EMS Chief

Mark Foulks – Fire Chief

David Rast – Planning Commissioner Representative

Matt Richardi – BPAC Representative

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INTRODUCTION

Alignment with SS4A

The Bipartisan Infrastructure Law (BIL) established the Safe Streets and Roads for All (SS4A) discretionary program to fund regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries involving motorists, pedestrians, and cyclists.

One of the initiatives funded by the SS4A program is the development of a Comprehensive Safety Action Plan. A Safety Action Plan is a planning document that prioritizes safety improvements and justifies investment decisions. Having a formal plan will help the City of Mt. Juliet communicate clearly with stakeholders and access funding opportunities under this program.

Purpose of the Safety Action Plan (SAP)

The Mt. Juliet SAP provides a framework for identifying and prioritizing safety improvements that can be implemented. The SAP recommendations focus on transportation improvements that can be used to reduce fatal and suspected serious injury crashes guided by the principles established in the Tennessee Strategic Highway Safety Plan (TN SHSP) and through a systemic data analysis conducted specifically for the City of Mt. Juliet.

This report serves as an SS4A Action Plan, aligning with the components required to apply for SS4A Implementation Grant funding. As such, the SAP involves a community-informed and data-driven approach to roadway safety, with commitment from City leadership to reducing roadway fatalities and suspected serious injuries.

Leadership Commitment and Goal Setting

The City of Harriman's leadership commits to making progress toward the long-term goal of zero traffic deaths and serious injuries with an interim goal of a 25-percent reduction in fatal and serious injury crash rates (expressed in crashes per 1 million vehicle miles traveled [VMT]) by 2035 from the projected trend. With a 55-percent reduction by the year 2045. Figure 1 illustrates the five-year rolling averages of fatal/serious injury crash rates for the years 2019 to 2023, including projected trends and City's goals. More detail is included in the Crash Data Analysis section of this document. The activities conducted during this study build upon the Federal Highway Administration (FHWA) Safe System Approach, the TN SHSP, City-specific data analysis findings and community feedback.

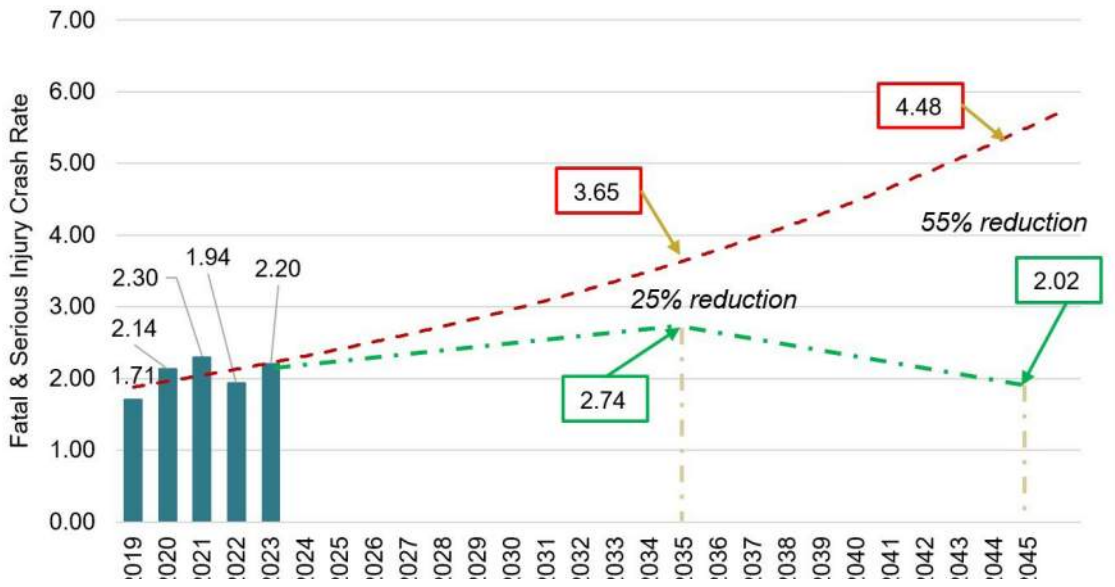


FIGURE 1: MT. JULIET FATAL AND SERIOUS INJURY CRASH RATE TREND

The Safe System Approach is the guiding paradigm of the US Department of Transportation (USDOT) regarding roadway safety (see **Figure 2**). It prioritizes the elimination of crashes that result in death or serious injury. This approach is a shift from the conventional safety approach in that it focuses on both human mistakes and vulnerability and seeks to design a

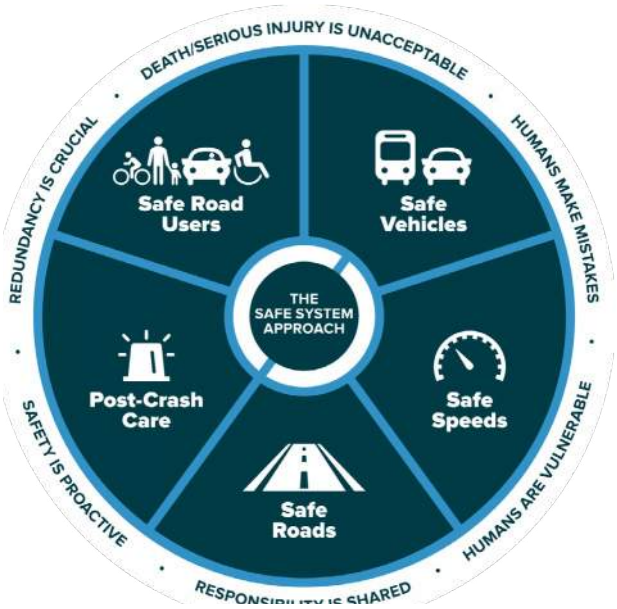


FIGURE 2: ELEMENTS OF THE SAFE SYSTEMS APPROACH (SOURCE: USDOT)

Traditional Approach	vs	Safe Systems Approach
Traffic Deaths and Serious Injuries are **Inevitable**		Traffic Deaths and Serious Injuries are **Preventable**
Improve Human Behavior		**Integrate** Human Error into Approach
Individual Responsibility		**Shared** Responsibility
Prevent **Collisions**		Prevent **Fatal** and **Serious Injury Crashes**
React Based on Crash History		**Proactively** identify and address risks
Saving Lives is **Expensive**		Saving lives is **Not Expensive**

FIGURE 3: TRADITIONAL APPROACH VS SAFE SYSTEMS APPROACH

system with multiple layers of protection. See **Figure 3** for a comparison between the traditional approach versus Safe System Approach. This SAP will integrate the Safe System Approach by analyzing the transportation system holistically and proposing solutions and strategies across the spectrum of principles that make up the Safe System Approach. Those principles are as follows:

- Deaths and Serious Injuries are Unacceptable
- Humans Make Mistakes
- Humans are Vulnerable
- Responsibility is Shared
- Safety is Proactive
- Redundancy is Crucial

Document Organization

The City of Mt. Juliet SAP is organized into the following Chapters:

- **Introduction:** Presents the project background, goals, and purpose of the SAP.
- **Safety Analysis:** Provides an overview of citywide crash trends and explains how equity informed the SAP.
- **Equity Considerations:** Identifies underserved communities through data and partner collaboration, and analyzing population characteristics equity impacts of proposed projects and strategies.
- **Engagement and Collaboration:** Provides a summary of the City's efforts to inform, consult, involve, collaborate with, and empower the public in the development of this plan.
- **Strategies:** Describes potential engineering and driver-related countermeasures.
- **Policy and Process Changes:** Includes and assessment of current policies, plans, and standards to identify opportunities for prioritizing transportation safety, with implementation through adopting revised or new policies and guidelines.
- **Project Selections:** Includes criteria for prioritizing projects and corridors, indicating where improvements should be implemented first.
- **Progress and Transparency:** Includes a description of measures the City will take over time to ensure transparency with stakeholders, including annual reporting on progress toward reducing roadway fatalities and serious injuries, and posting the Action Plan online.

Study Area

The City of Mt. Juliet is located within Wilson County, Tennessee, just east of the Nashville Metropolitan area. Mt. Juliet encompasses roughly 25 square miles and is home to approximately 40,000 residents. The City of Mt. Juliet operates under the City Manager-Commission System form of government, where the elected Mayor and Commissioners create policies, and the elected City Manager leads the various departments to ensure the entire community is served. Mt. Juliet shares its western border with Davidson County and its eastern border with the City of Lebanon.

History

Located in an eastern suburb of Nashville, approximately 17 miles from downtown, Mt. Juliet has evolved from a small farming community into a thriving suburban city propelled by its proximity to Nashville, BNA International Airport excellent schools, and rapid residential and commercial development.

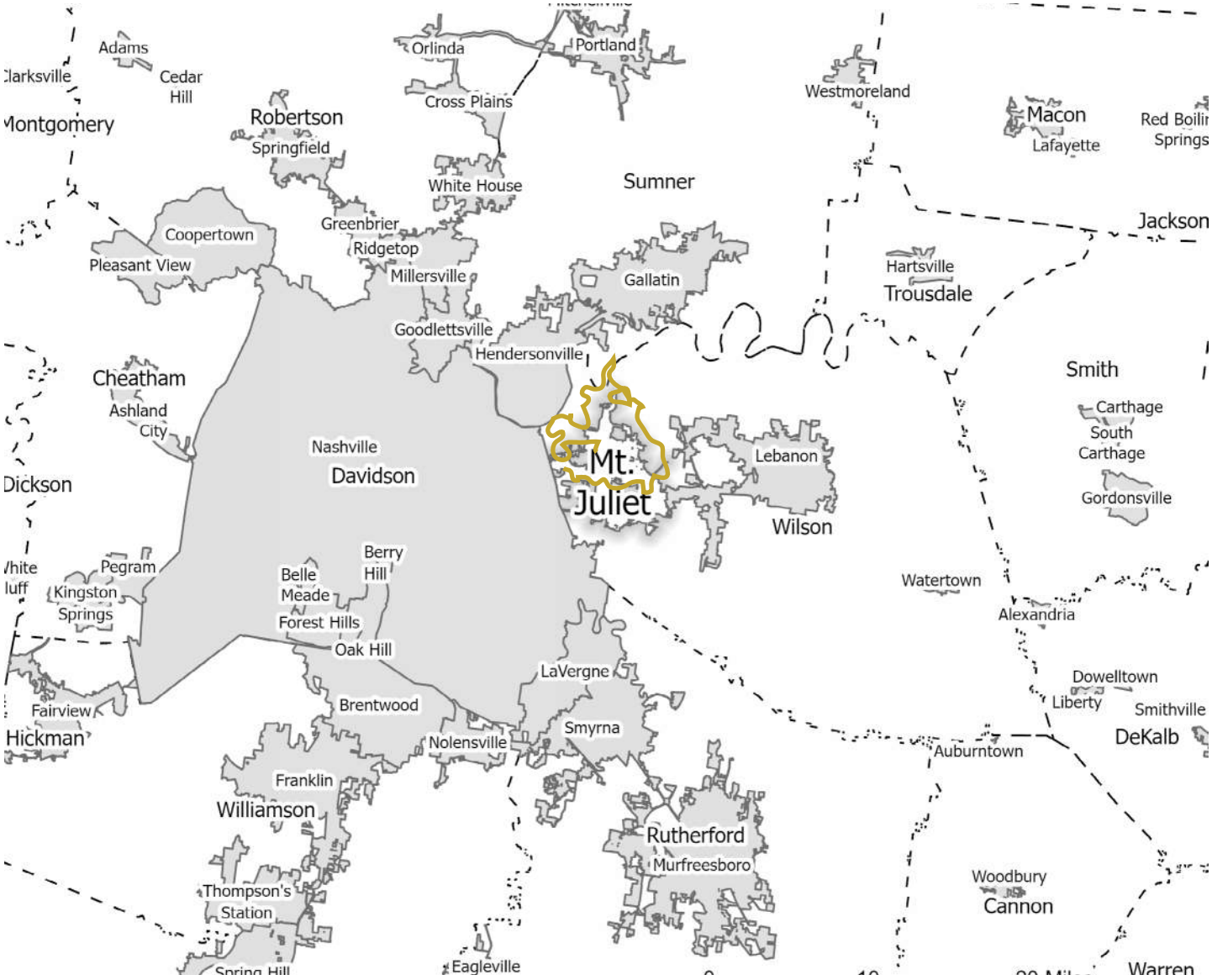


FIGURE 4: CITY OF MT. JULIET WITH SURROUNDING AREAS

The City is known as “The City Between the Lakes”, with Old Hickory Lake to the north and Percy Priest Lake to the south. The City is also served by the only commuter rail in Tennessee. The Music City Star Rail Line provides six stops between Mt. Juliet and downtown Nashville for daily commuters.

Mt. Juliet has become a magnet for both residents and businesses and has grown into one of the state’s most vibrant suburban cities. Since 2010, Mt. Juliet’s population has surged by 85%, placing immense pressure on regional transportation infrastructure, which struggles to keep pace with the rising traffic demands.

Land Uses and Attractions

The Under Armour and Amazon warehouses provide the highest volume of jobs in the area, with other companies such as Walmart, Costco, and Lowes also employing high number of residents. Other warehouse facilities in the City include ALDI and Inc, KHS America.

Mt. Juliet has one of the largest shopping complexes between Nashville and Knoxville. The Providence Marketplace is home to more than 50 retail, dining and entertainment locations. Mt. Juliet Village, The Valley Center Mall and Providence Commons are other large shopping, dining and entertainment attraction areas.

With regards to the quality of life for its residents, Mt. Juliet Parks and Recreation Departments beliefs are “Family, Fitness and Fun”. The department maintains many city parks and recreation facilities including the Robinson Park Walking Trail, Charlie Daniels Park, Sgt. Jerry Mundy Memorial Park and Sports Complex, the South Mt. Juliet Bark Park, Jones Family Park, Robinson Park, Eagle Park, Ethan Page Park and Hamilton-Denson Park. The parks in the City have various maintained facilities including ball parks, soccer fields, tennis and pickleball courts, sand volleyball, skate parks, dog parks, playgrounds, splash pads, picnic areas and walking trails. The Mt. Juliet Farmers Market, which is also maintained by the Parks and Recreation Department is a popular attraction located along Charlie Daniels Parkway and is open on Saturdays in the Spring, Summer and Fall months.

Schools

The Wilson County School system operates the schools in the City of Mt. Juliet. The following 11 schools are all located within the City limits:

- Etzie D. Patton Elementary
- Mt. Juliet Christian Academy
- Green Hill High School
- Rutland Elementary School
- Mt. Juliet Elementary School
- Stoner Creek Elementary School
- Mt. Juliet Middle School
- W. A. Wright Elementary School
- Mt. Juliet High School
- West Wilson Middle School

Roadway Networks

Most of the city is nestled between I-40 and US-70, along the stretch where both thoroughfares intersect with SR-171. Excluding I-40, the roadways with the highest volume include US-70 (Lebanon Road) and SR-171 (Mt. Juliet Road), which experience an Annual Average Daily Traffic (AADT) of approximately 28,000 and 26,000 vehicles per day, respectively. Other prominent roadways in Mt. Juliet include East and West Division Street and Central Pike (SR-265).

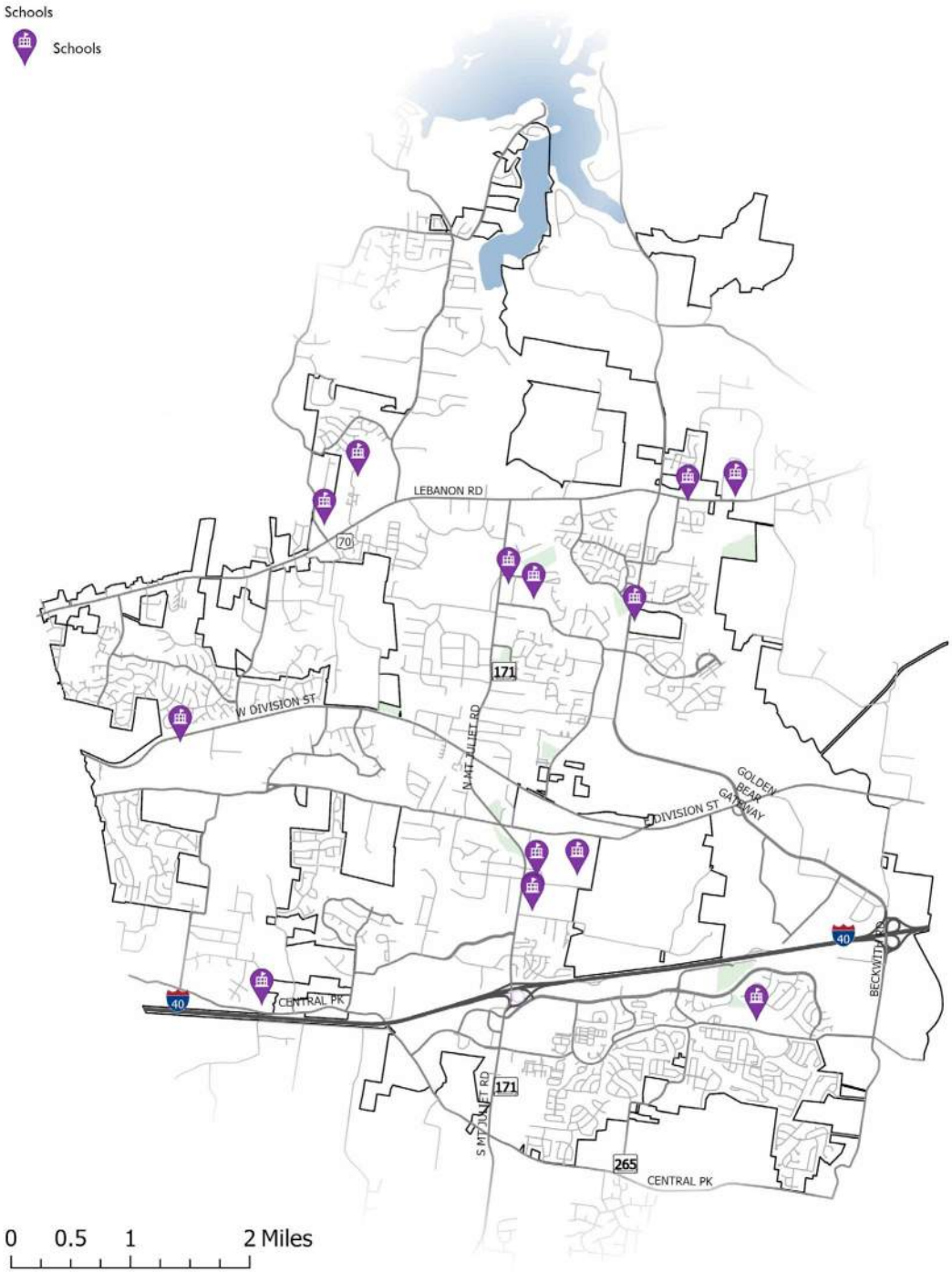


FIGURE 5: ROADWAY NETWORK OF MT. JULIET

SAFETY ANALYSIS

MT. JULIET SAFE STREETS

SAFETY ANALYSIS

The safety analysis for the Mt. Juliet SS4A SAP examined city-wide historical trends to understand crash locations, severities, and contributing factors. This section summarizes data sources, safety emphasis areas, city-wide crash trends, transportation equity considerations, and the identification of the high-injury network. The findings from this analysis informed the development of the engineering projects and strategies outlined in this plan

KABCO Crash Severity: The KABCO scale measures the injury severity for any person involved in the crash and is defined as K for fatal injury, A for suspected serious injury, B for suspected minor injury, C for possible injury, and O for no apparent injury. From January 2019 to December 2023, there were 3,688 reported crashes on roadways in the City of Mt. Juliet, of which 57 resulted in fatalities or serious injuries.

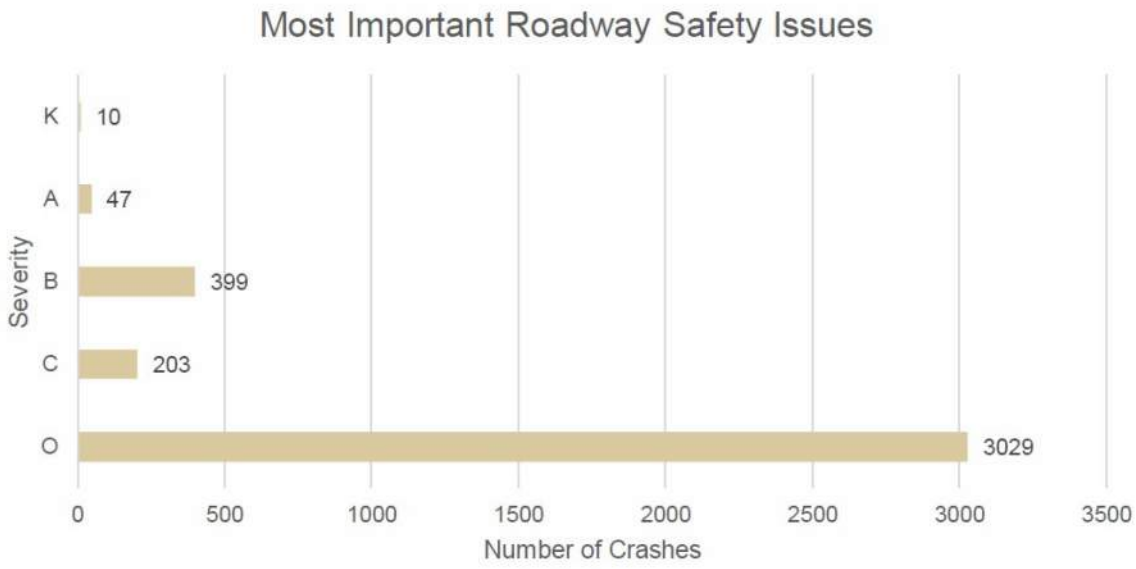


FIGURE 6: CRASHES IN MT. JULIET BY KABCO SCALE

Data Gathering

Historical crashes were obtained from Tennessee Department of Transportation's (TDOT) AASHTOWare Safety1 online crash database for crashes reported from 2019 to 2023. These findings are intended to represent trends for the study area, and the absolute values may not match different statewide crash data reporting sources. The data was combined and cleaned at a high level to provide a more complete record of crashes within the City. This cleaning included filtering out interstate crashes, duplicate crashes, erroneous crash information, and geographically inaccurate crash data. The analysis also incorporated roadway ownership information and additional roadway characteristics (such as road type and signal locations) provided by TDOT.

1 TDOT, AASHTOWARE SAFETY
HTTPS://TDOT.AASHTOWARESAFETY.COM/SIGNIN

Emphasis Areas

State DOTs develop Strategic Highway Safety Plans under the Federal Highway Administration's (FHWA) direction to identify safety emphasis areas based on historical crash trends and severities. Crashes resulting in fatalities and suspected serious injuries were evaluated in the 2020-2024 TN SHSP to identify the top statewide safety emphasis areas. These analysis results help inform how transportation safety funding should be directed to reduce statewide fatal and serious injury crashes for all road users.

Table 1 shows a comparison of the City of Mt. Juliet's fatal and serious injury crashes to statewide totals for crashes reported between 2019 and 2023 by emphasis area. As shown in the table, Mt. Juliet experienced a higher percentage of fatal and serious injury crashes for several emphasis areas, including crashes at intersections, involving unrestrained occupants, senior drivers or bicyclists. It should be noted that individual crash events may be associated with more than one emphasis area. For example, a roadway departure crash could have involved an impaired young driver. As such, the values in the columns may not add to equal the total number of crashes. In Table 1, green shaded cells show which contributing factors were more prevalent in the City of Mt. Juliet than the statewide data over the five-year study period while the blue shaded cells show which contributing factors were less prevalent in the City of Mt. Juliet.

TABLE 1: CRASHES IN MT. JULIET BY CONTRIBUTING FACTORS

Category	Emphasis Areas	City of Mt. Juliet (2019-2023)				State of Tennessee (2019-2023)			
		# of Fatal Crashes	# of Suspected Serious Injury Crashes	Total	% Fatal & Serious Injury Crashes	# of Fatal Crashes	# of Suspected Serious Injury Crashes	Total	% Fatal & Serious Injury Crashes
All Severe Crashes		10	47	57	100.0%	5344	25731	31075	100.0%
Roadway	Roadway Departure	4	10	14	24.6%	2892	10046	12938	41.6%
	Intersections	3	21	24	42.1%	1241	8267	9508	30.6%
Drivers	Unrestrained Occupants	8	7	15	26.3%	1659	4242	5901	19.0%
	Senior Drivers (65+)	4	11	15	26.3%	1155	4893	6048	19.5%
	Teen Drivers (13-19)	2	8	10	17.5%	941	5673	6614	21.3%
	Impaired Drivers	1	4	5	8.8%	1418	3495	4913	15.8%
	Inattentive, Distracted, and Drowsy Drivers	0	3	3	5.3%	341	2609	2950	9.5%
	Aggressive Drivers / Speeding	0	0	0	0.0%	916	2770	3686	11.9%
Vehicles	Motorcycles	1	3	4	7.0%	782	3558	4340	14.0%
	Large Trucks (Truck/Bus)	0	0	0	0.0%	474	1331	1805	5.8%
Special Users	Pedestrians	1	2	3	5.3%	754	1753	2507	8.1%
	Bicycles	0	1	1	1.8%	49	286	335	1.1%

Crash Data Analysis

Table 2 summarizes crashes by KABCO Scale severity and year occurring on all roadways (excluding interstates) within the City of Mt. Juliet.

TABLE 2: YEARLY CRASHES IN MT. JULIET BY KABCO SCALE

Year	Fatal Injury (K)	Suspected Serious Injury (A)	Suspected Minor Injury (B)	Possible Injury (C)	Property Damage Only (O)	Total
2019	1	10	126	18	407	562
2020	3	10	84	29	486	612
2021	1	10	74	64	761	910
2022	1	3	48	48	739	839
2023	4	14	67	44	636	765
Total	10	47	399	203	3,029	3,688
Percentage of All Crashes	0%	1%	11%	6%	82%	100%

For the purposes of this study, the data includes the total number of fatal and serious injury crashes within the analysis period. It's important to note that a single fatal crash can result in multiple fatalities, and similarly, a serious injury crash can lead to multiple serious injuries. Normalizing the crashes in a year by million vehicle miles traveled (VMT) allows for a comparison between trends as historical traffic fluctuates. Historical crash rates were calculated using crash records from TDOT's AASHTOWare Safety and annualized with VMT information for Wilson County obtained from TDOT's Highway Performance Monitoring System. **Figures 7-10** provide the VMT information used, and the five-year rolling averages of total fatal crashes, total serious injuries, and fatal and serious injuries combined for the period of 2019-2023. The historic data points are considered to have a "best fit" with the fatality trend as all values fall along or are close to the projected trendline. As shown in the figures, the overall trend for all three charts indicates an increase in fatal and serious injuries year over year.

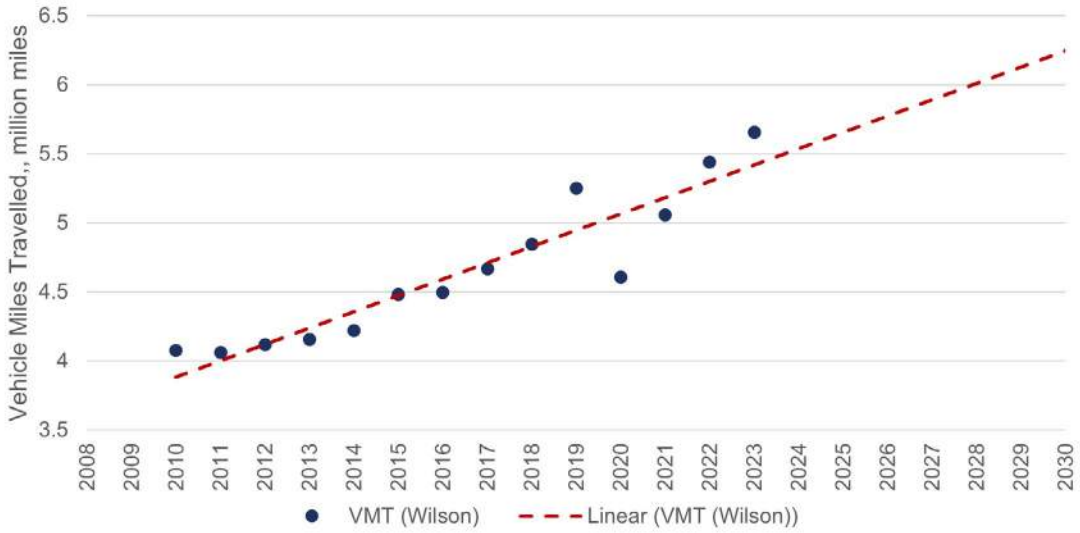


FIGURE 7: VEHICLE MILES TRAVELED, WILSON COUNTY

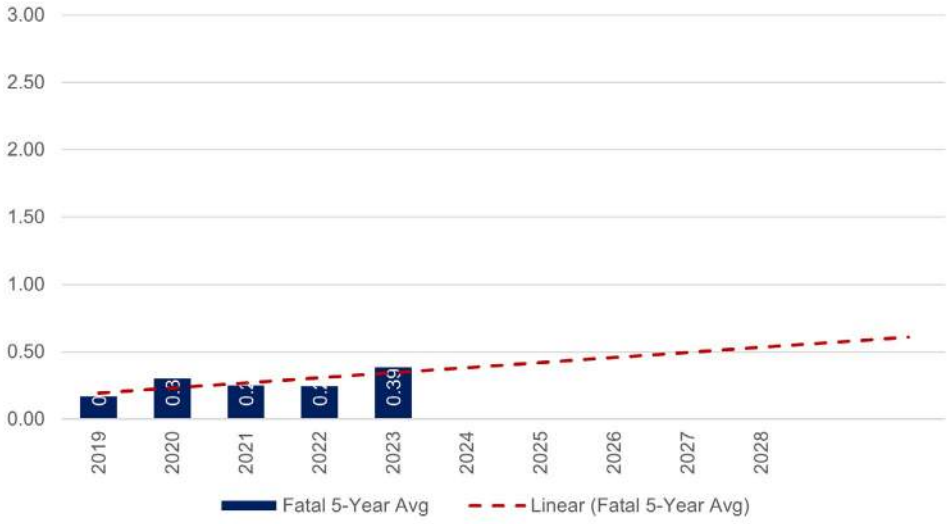


FIGURE 8: FIVE-YEAR ROLLING AVERAGE OF FATAL CRASH RATES

FIGURE 9: FIVE-YEAR ROLLING AVERAGE OF SEVERE-INJURY CRASH RATES

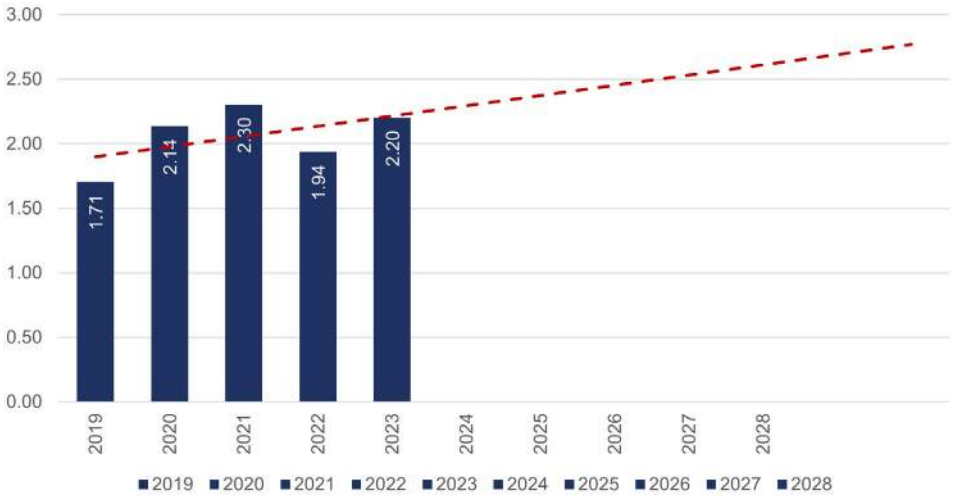


FIGURE 10: FIVE-YEAR ROLLING AVERAGE OF FATAL AND SEVERE-INJURY CRASH RATES IN MT. JULIET

Crash Density

Crash density is defined as the total number of crashes per unit of road length, commonly measured as crashes per mile. **Figure 11** displays a total crash density map, highlighting locations where fatal and suspected serious injury crashes occurred along the roadway network. The highest crash densities are typically observed at locations with higher traffic volumes, as this translates to more exposure and potential risk for all road users. The highest crash density is found near the interchange of Mt. Juliet Road (SR-171) and I-40.

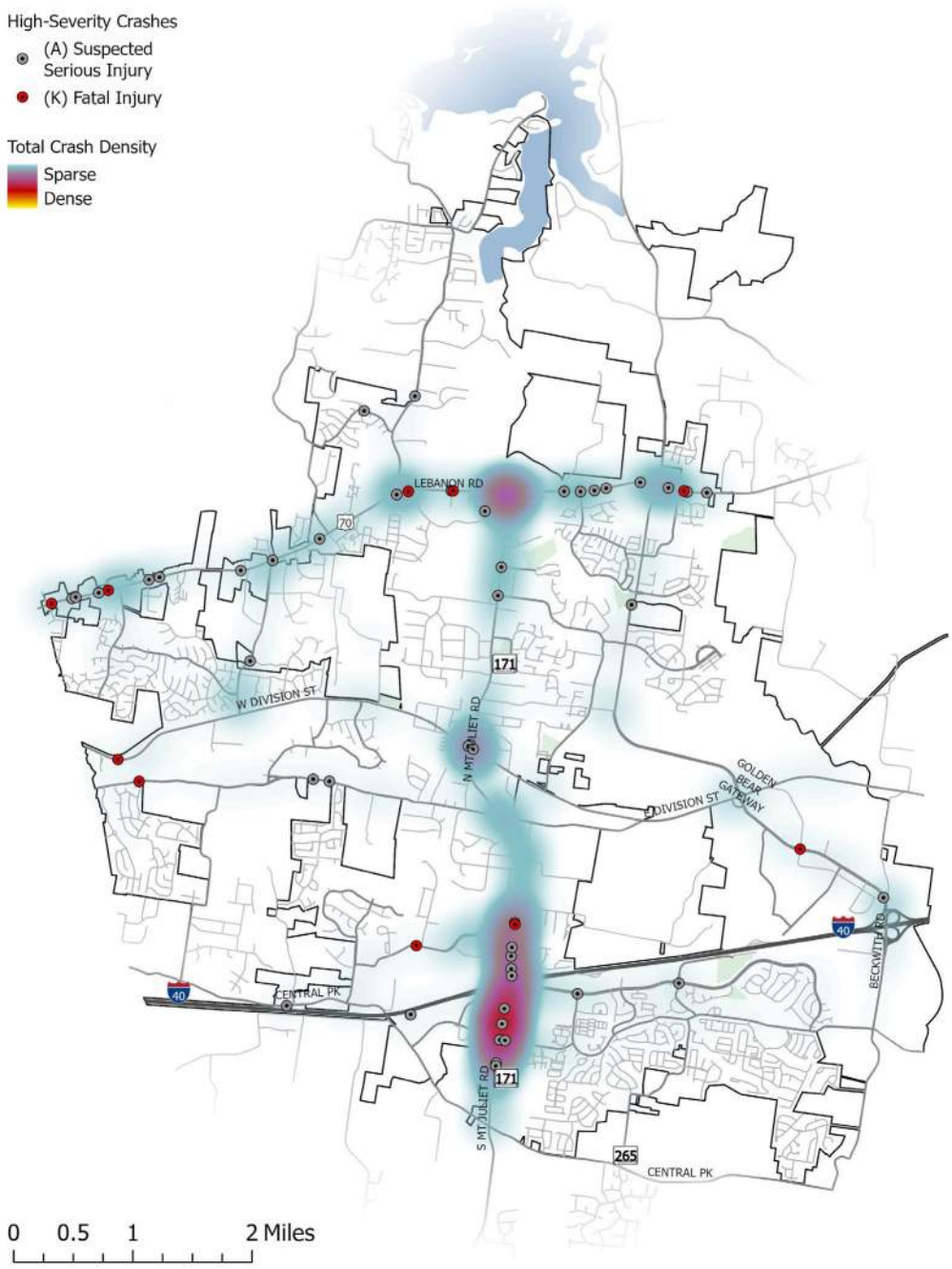


FIGURE 11: KA CRASHES WITH OVERALL HEATMAP

Crashes by Type

Crash density is defined as the total number of crashes per unit of road length, commonly measured as crashes per mile. **Figure 11** displays a total crash density map, highlighting locations where fatal and suspected serious injury crashes occurred along the roadway network. The highest crash densities are typically observed at locations with higher traffic volumes, as this translates to more exposure and potential risk for all road users. The highest crash density is found near the interchange of Mt. Juliet Road (SR-171) and I-40.

TABLE 3: CRASHES IN MT. JULIET BY TYPE

Type of Crash	2019	2020	2021	2022	2023	Total
Rear End	203	236	267	238	210	1154
Angle	151	119	197	150	149	766
Not a Collision with Motor Vehicle	103	111	113	126	99	552
Sideswipe - Same Direction	45	43	86	80	58	312
Head On	19	18	28	26	28	119
Sideswipe - Opposite Direction	21	12	30	22	20	105
Rear to Side	0	8	7	3	4	22
Rear to Rear	1	2	2	5	4	14
Other	19	63	180	189	193	644
Total	562	612	910	839	765	3688

Compared to the statewide data, the Mt. Juliet experienced a higher percentage of intersection related crashes and a lower percentage lane departure crash (typically single vehicle). This is likely due to the City having more urban characteristics than other areas in the state resulting in more intersections and congestion. Single-vehicle crashes often occur along curves and uninterrupted rural sections of roadways.

Crashes by Lighting Condition

Street lighting serves as a streetscaping asset and safety countermeasure if it fits the context of the community and built environment. Approximately 37.8% of crashes in Mt. Juliet occurred during non-daylight conditions (i.e., Dark, Dark – Not Lighted, Dark – Lighted, Dusk, Dawn and other) which is higher than the statewide average during the same period of 32% percent. Proper lighting along roadways and at intersections can increase driver awareness of the roadway and decrease the probability of a crash due to low visibility.

TABLE 4: CRASHES BY LIGHTING CONDITION

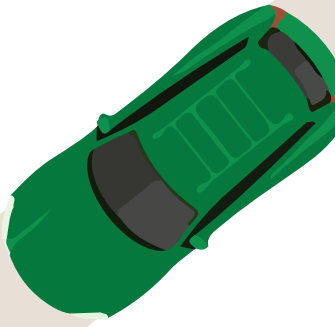
Lighting Condition	2019	2020	2021	2022	2023	Total
Daylight	391	424	593	466	419	2,293
Dark - Lighted	95	81	86	124	110	496
Dark - Not Lighted	40	42	52	47	34	215
Dusk	14	9	15	18	11	67
Dawn	2	2	5	8	7	24
Other	20	54	159	176	184	593
Total	562	612	910	839	765	3,688

Crashes by Road Surface Conditions

Pavement friction affects how vehicles interact with the roadway and directly influences the frequency of crashes. Wet pavement can further reduce traction and exacerbate the frequency and severity of vehicle crashes. Approximately 11% of crashes in Mt. Juliet occurred during wet road surface conditions, which is lower than the statewide average of 19% over the same period.

TABLE 5: CRASHES BY ROADWAY SURFACE CONDITIONS

Surface Condition	2019	2020	2021	2022	2023	Total
Dry	461	469	639	579	509	2,657
Wet	84	88	106	72	74	424
Ice	4	4	7	11	0	26
Snow	0	0	2	12	0	14
Other	13	51	156	165	182	567
Total	549	561	754	674	583	3,688



High-Crash Locations

The total number of crashes at a location could misrepresent the gravity of safety concerns, as areas with a higher traffic volume are more likely to experience a greater absolute number of crashes, as an example. Furthermore, locations with high traffic volumes often experience congestion which may result in lower crash severities but higher crash frequency. Crash rate calculations account for the traffic volumes at specific locations to provide a more effective comparison between similar locations with safety concerns. The crash rates shown below are expressed as crashes per 100 million vehicle-miles of travel and were calculated in AASHTOWare which uses methodology from the FHWA Roadway Departure Safety Manual. The following tables summarize the top 10 city roadway segments and intersections, respectively, ranked by total crash frequency and crash rates. Identifying these segments and intersections was an important step toward defining the High-Injury Network, which is introduced in a later section.

TABLE 6: HIGH-CRASH SEGMENTS

ID	Segment (Milepost Length)	Length (miles)	Crashes	Rank by Crashes	Segment AADT	Crash Rate	Rank by Crash Rate
1	S Mt. Juliet Rd (4.81-6.92)	2.11	298	1	31345	2.5	6
2	S Mt. Juliet Rd 3.56-4.3)	0.74	190	2	21705	6.5	3
3	Lebanon Rd (1.97-4.12)	2.15	185	3	25690	1.8	9
4	Lebanon Rd (5.38-8.28)	2.9	170	4	15100	2.1	7
5	N Mt. Juliet Rd (6.92-9.12)	2.2	153	5	23624	1.6	10
6	E Division St (2.67-6.33)	3.66	126	6	4381	4.3	4
7	E Division St (0-2.67)	2.67	89	7	6499	2.8	5
8	Belinda Pkwy (0-3.15)	3.15	79	8	6431	2.1	7
9	Beckwith Rd (0-2.25)	2.25	78	9	2786	6.8	2
10	S Mt. Juliet Rd (4.56-4.81)	0.25	72	10	21705	7.3	1

TABLE 7: HIGH-CRASH INTERSECTIONS

ID	Intersection	Crashes	Rank by Crashes	TEV	Crash Rate	Rank by Crash Rate
1	S Mt. Juliet Rd at Belinda Pkwy	122	1	28136	2.6	1
2	S Mt. Juliet Rd at Providence Pkwy	116	2	33751	2.1	2
3	S Mt. Juliet Rd at Crossings Cir	98	3	21705	1.4	4
4	N Mt. Juliet Rd at Lebanon Rd	90	4	49314	1.1	6
5	N Mt. Juliet Rd at Division St	69	5	46769	1.1	6
6	N Mt. Juliet Rd at Pleasant Grove Rd	65	6	35240	1.1	6
7	S Mt. Juliet Rd at Central Pk	64	7	23834	1.6	3
8	N Mt. Juliet Rd at Stonegate Dr	56	8	35240	1.0	9
9	Lebanon Rd at Benders Ferry Rd	50	9	29219	1.3	5
10	Lebanon Rd at Nonaville Rd	39	10	36568	0.6	10

Crashes Involving Vulnerable Users

Vulnerable road users (VRUs) include pedestrians, cyclists, mobility device users (e.g., wheelchairs), and micromobility device users (e.g., e-scooter). VRUs are more exposed and at-risk in the event of a crash with motorists. Over 30% of crashes involving VRUs resulted in serious injuries or fatalities in Tennessee between 2019 to 20232. Furthermore, fatal and serious injury involving VRUs increased by over 44% and 18%, respectively, from 2018 to 2022. The City of Mt. Juliet far exceeds that percentage, as over 36% of crashes involving vulnerable road users result in fatalities or serious injuries. In Mt. Juliet, serious injuries were the most likely outcome of a VRU crash, at roughly 27% (9% fatal). The percentage for serious injuries exceeds other urban areas in the state by over 10% (20% statewide urban areas). The characteristics of roadways and their surrounding areas such as retail density, number of travel lanes, and roadway speed limits can pinpoint locations with potentially higher risk for VRUs.

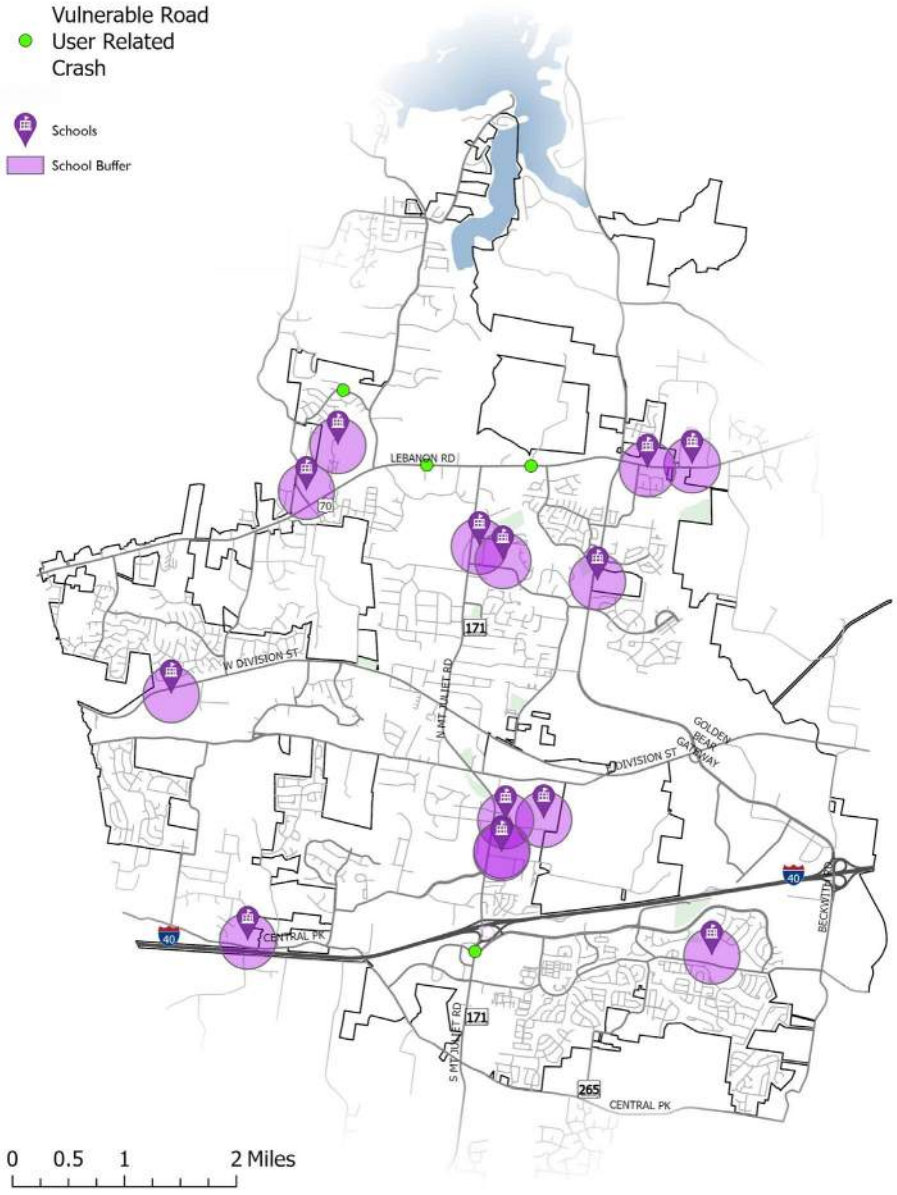


FIGURE 12: VRU CRASHES

[1] TDOT, Tennessee VRU Safety Assessment, 2023

https://www.tn.gov/content/dam/tn/tdot/strategic/TDOT%202023%20VRU%20Safety%20Assessment%20Final%20w%20Appendix%2011-15-2023.pdf

Identifying a High Injury Network

A High-Injury Network (HIN) was developed to identify the routes with the highest frequency of fatal and serious injury crashes in the City of Mt. Juliet. A HIN is a collection of corridors where a disproportionate number of these crashes occur, as well as corridors that may pose higher risks for all road users. Developing a HIN allows for the proper allocation of effort and funds towards specific areas of the City that need it most. While the HIN typically includes the major thoroughfares of a study area, the methodology used also allows for minor roads to be considered for improvements. Creating the HIN is a key step toward focusing resources in the right direction to develop projects that will help reduce fatal and serious injury crashes for all road users in the City of Mt. Juliet.

Methodology

The HIN was identified by first evaluating segments throughout the City of Mt. Juliet's roadway network with the highest reported crash rates during the study period (2019-2023) using TDOT's AASHTOWare Safety Network Screening platform. 18 high-crash-rate segments were identified at logical termini (i.e., municipal boundary, road name changes, or roadway characteristic changes such as number of lanes). **Figure 13** shows the HIN identified.

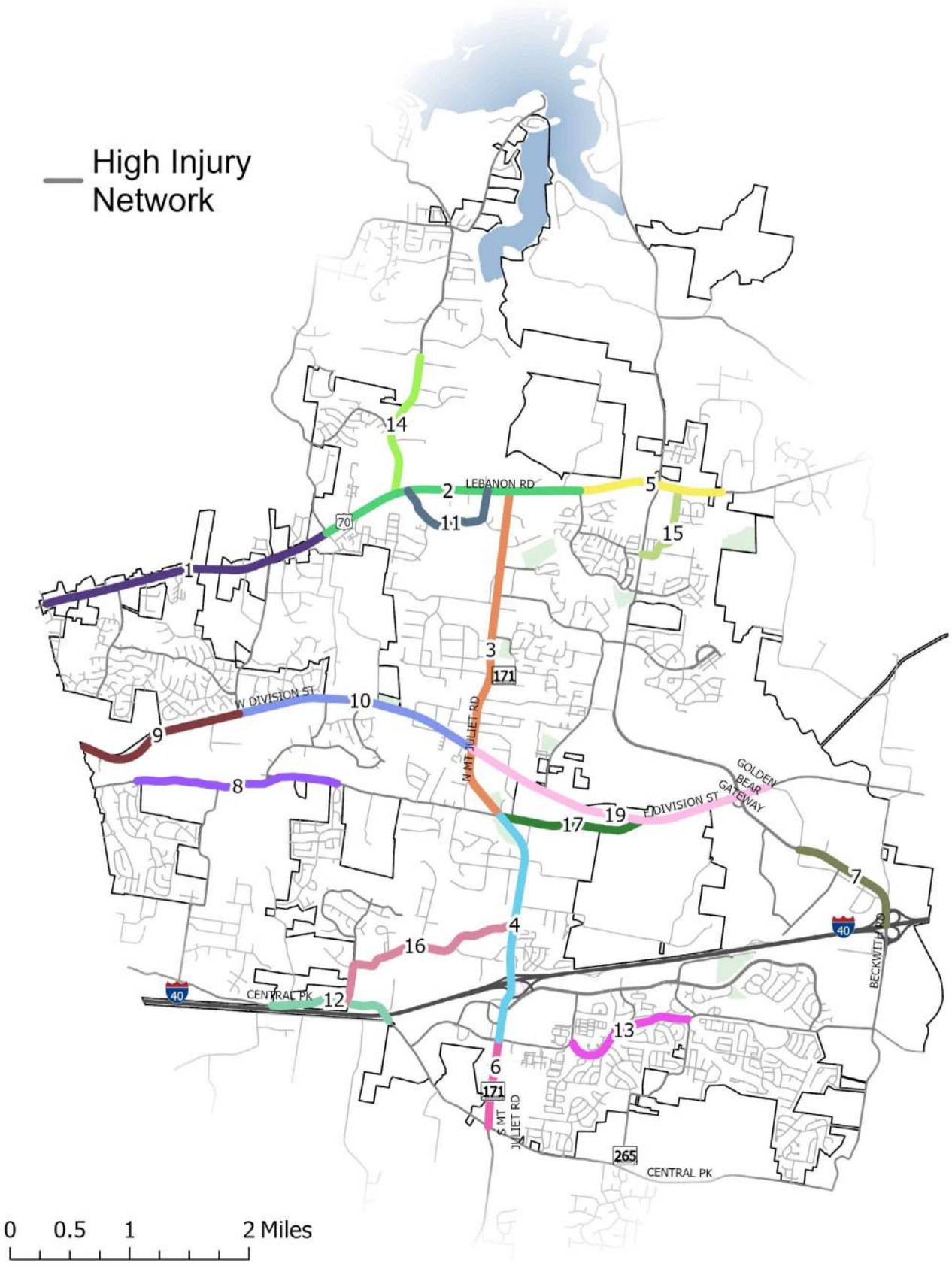


FIGURE 13: HIGH INJURY NETWORK

EQUITY CONSIDERATIONS

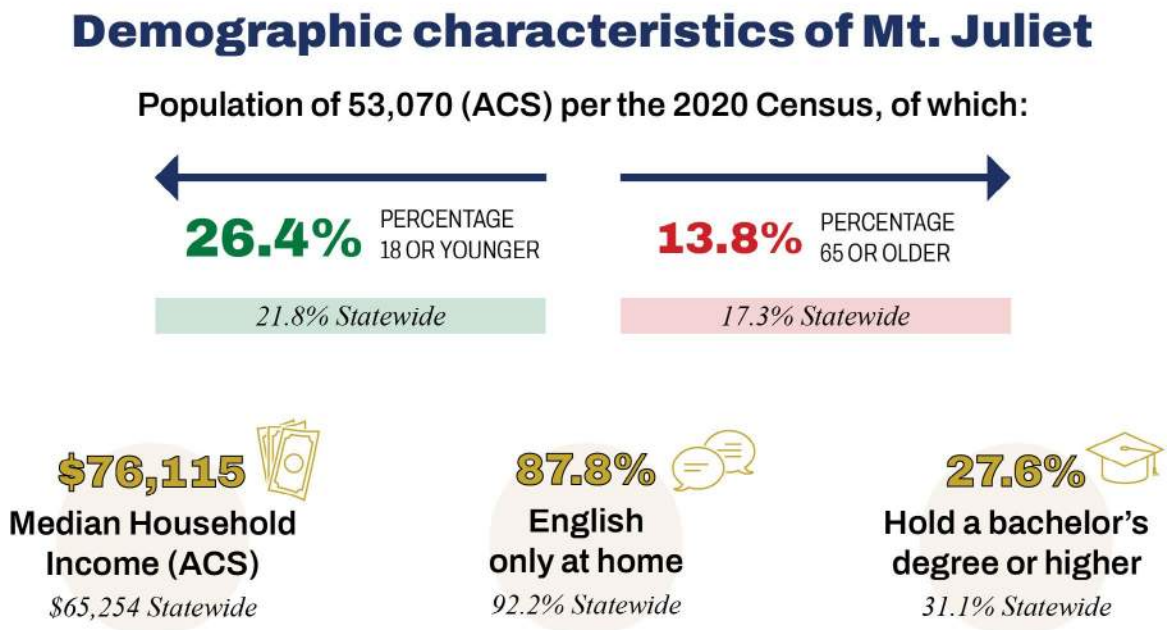
MT. JULIET SAFE STREETS

EQUITY CONSIDERATIONS

Equity considerations are integral to addressing the needs of disadvantaged communities or vulnerable populations

The Center for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI) uses a combination of socioeconomic factors, household characteristics, racial and ethnic minority status, and housing and transportation issues to rank the social vulnerability of each census tract across the City. Those falling in or above the Medium-High (0.5 – 0.75) or High Vulnerability (0.75 – 1.00) groups were considered tracts of concern in the Mt. Juliet SAP.

The City of Mt. Juliet SAP considers this index in developing project implementation prioritization as these geographic areas are representative of equity concerns. **Figure 14** shows the CDC SVI Areas of Persistent Poverty and Historically Disadvantaged Communities are not present in Mt. Juliet. The public and stakeholder involvement activities which were part of the City of Mt. Juliet SAP were done in person and virtually to be inclusive and representative of a broad cross-section of City's residents.



Social Vulnerability Index

The CDC developed the SVI 3 tool that considers four overall categories of vulnerability: Socioeconomic Status, Household Characteristics, Racial & Ethnic Minority Status, and Housing Type & Transportation. Between these four (4) categories, 159 individual sub-categories are scaled and calculated to form an overall index score, ranging from 0 to 1 (where an index value of 1 is defined as the most socially vulnerable). Of the 57 KA crashes occurring in Mt. Juliet, 14 KA crashes were found to have occurred in areas of high social vulnerability. This numbers represent approximately 25% of all total fatalities or suspected serious injury crashes within the City for the period between 2019 and 2023.

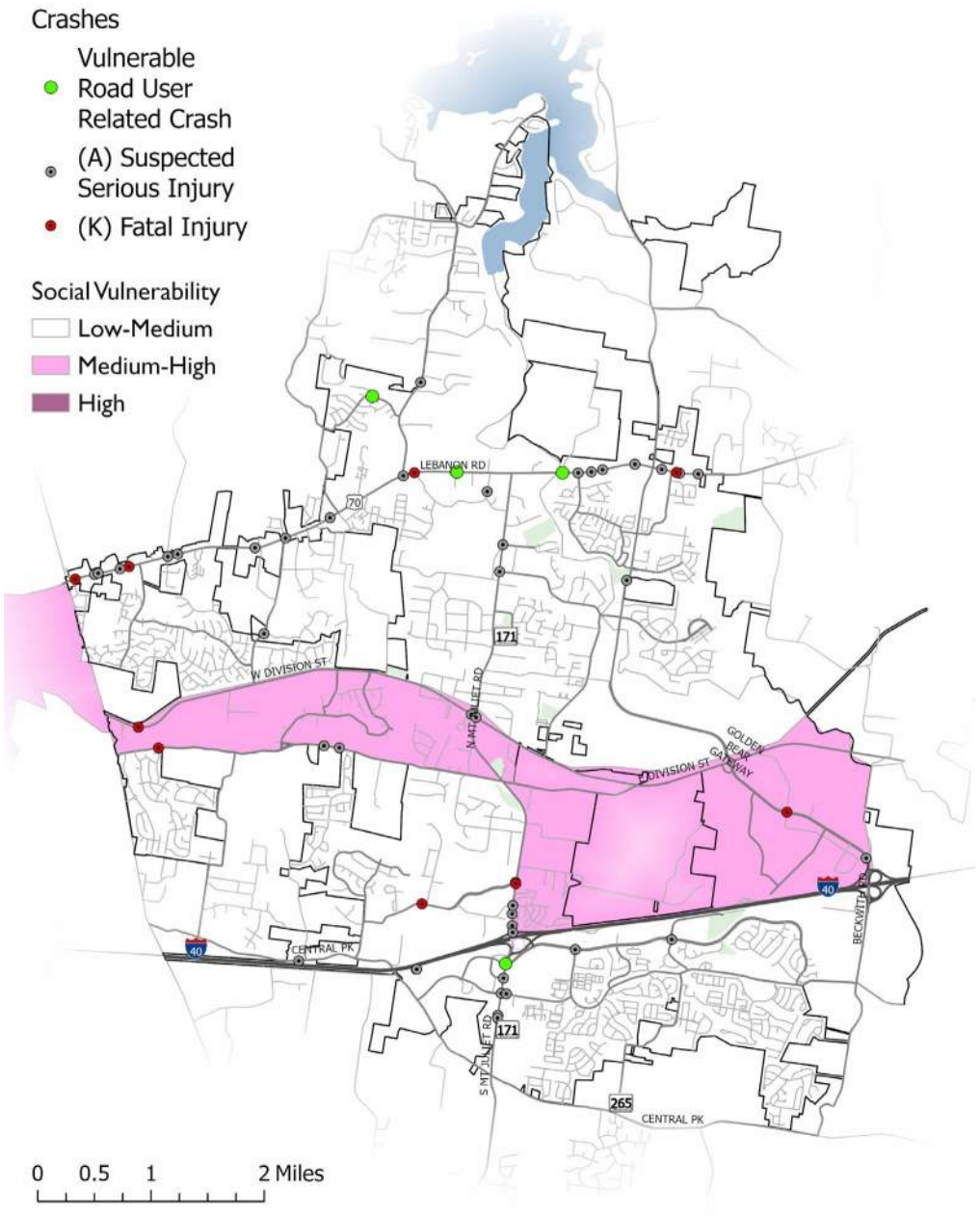


FIGURE 14: SOCIAL VULNERABILITY INDEX MAP

[2] CDC/ATSDR SVI

https://www.atsdr.cdc.gov/placeandhealth/svi/index.html

ENGAGEMENT & COLLABORATION

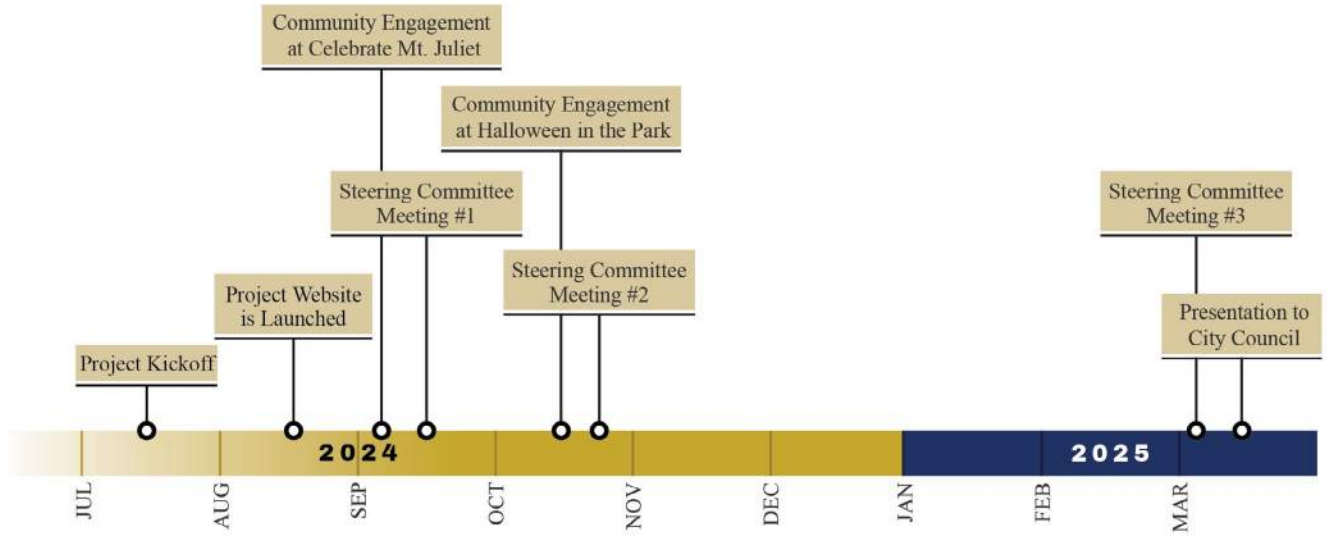
MT. JULIET SAFE STREETS

ENGAGEMENT AND COLLABORATION

Introduction

Public outreach and engagement play a crucial role in collecting valuable insights into what community residents encounter daily while traveling routes in the study area, whether by car, bike, foot, or bus. During the development of the plan, multiple opportunities for participation and input were offered to community stakeholders. These included in-person events, targeted email outreach, social media postings, and a dedicated project website to gather and record public input, as well as to disseminate information regarding the SS4A Grant Program. Through this variety of methods, the aim was to capture feedback from all residents, especially those from traditionally underserved populations.

Following the kick-off meeting in July 2024, the following engagement schedule was followed:



Formation of a Steering Committee (Planning Structure)

To help guide the development of the plan, a steering committee was created with a two-fold role. First, to provide local, informed input regarding current conditions and opportunities for improvement in Mt. Juliet. Second, the members of the steering committee were to act as outreach conduits to the community. During the public engagement phase, the City and members of the steering committee frequently engaged the community through direct email communications, social media blasts, or direct communication with community groups, encouraging them to get involved and provide input. The work of this committee is largely responsible for the success of the public outreach portion of this study.

Outreach Activities

Project Website

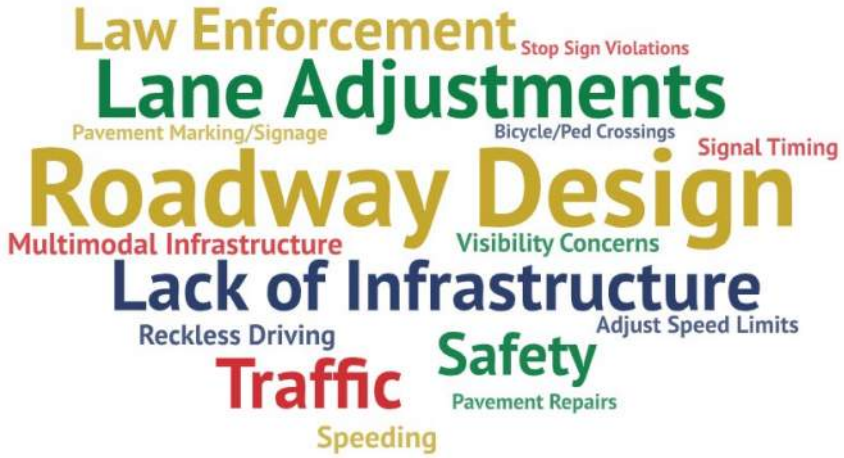
To facilitate the dissemination of crash related information as well as to provide a portal for input and information gathering from community stakeholders, a project specific website was created, http://safestreetsmtjuliet.com. Within the website, users could find information on what a Safety Action Plan is, how it can benefit the community, and how they can participate by providing input. **This site yielded nearly 764 individual page views.**

Public Meetings

attended the 'Celebrate Mt. Juliet' event to inform residents about the new Safety Action Plan. The team then attended the 'Halloween in the Park' event in October 2024. At both events, the team provided detailed information on the plan's objectives and implementation strategies. To ensure inclusive community engagement, QR codes were made available, allowing attendees to easily access the plan's website and complete an online survey to share their feedback and suggestions. These initiatives were a collaborative effort to create a safer environment for all Mt. Juliet residents through proactive public involvement. and suggestions. These initiatives were a collaborative effort to create a safer environment for all Mt. Juliet residents through proactive public involvement.

Public Engagement Process (Online Engagement)

Dispersion of the online survey and interactive map were achieved through a combination of tools as outlined in this section, each intended to drive traffic to and through the project website for ease of data collection and dissemination of project information.



"I really wish we would work on building areas where pedestrians are welcome in Mount Juliet. We are too car-dependent. We need comminuted that have mixed use developments where people can bike or walk to important things."

"Please widen Lebanon Road between Park Glen & 109! This needs to be 2 lanes in each direction & a turning lane. It can take 20 minutes to get down this short section of road during drive time & you keep allowing more business growth off this section of road. This is unacceptable & creates dangerous road conditions."

"Implement roundabout around Central Pike, John Hager Road, and Adams Lane to improve safety and lessen traffic. Additional roundabout around Central Pike and Pleasant Grove Road, which has been extremely dangerous for drivers driving out from Pleasant Grove Road due to blindsided uphill roads on Central Pike."

"There is a growing network of trails and sidewalks across town, mostly thanks to developers of new neighborhoods. Please invest more public money to connect these trails and create a true community wide trail network akin to the Stones River Greenway in Murfreesboro."

"Division Street needs to be widened, speed limit lowered and enforced, and have guardrails added. Old Lebanon Dirt Road and Central Pike all need widening, lighting for better visibility at night, and police patrols."

"Central Pike needs widening and shoulders. It's too narrow. The asphalt crumbling on edges in many areas. Need more guardrails."

Online Survey

In addition to providing a broad range of safety information, the website hosted two key participation avenues. The first was an **on-line** survey that focused on user demographics and concerns. A total of **363 participants completed the on-line survey**, providing input and background data, ranging from travel related characteristics and demographic information to specific safety concerns. Embedded within the survey were open ended questions that served to measure participant sentiment, which resulted in a broad range of inputs as shown below.

Improvements to roadway design and lane adjustments were mentioned frequently in the online survey. Lack of infrastructure was identified as a concern, followed by traffic, safety, and law enforcement. The data gathered from the online survey as well as individual comments provided were shared with the steering committee as part of their review and ranking of projects during their second steering committee meeting. as part of their review and ranking of projects during their second steering committee meeting. Please see the outreach summary below for a more detailed evaluation of the survey results.

Interactive Map

The second avenue for interactive input via the website was an interactive map that allowed users to identify concerns related to vehicle, pedestrian and bike safety as well as general concerns. This map allowed the users to drop 'pins' at specific locations where they had or have experienced safety related concerns.

This map provided 31 separate comments or replies to comments in the categories of pedestrian, near crash, mobility, driver, and bicyclist. Individual comments were analyzed and placed in descriptive categories for review by the Steering Committee as part of their considerations in project ranking. Below, a word cloud summarized many of the comments received via the interactive map.

"Please add turning lanes or lights to intersections at neighborhoods. The combination of speeding and poor visibility around curves result in near crashes almost daily!"

"Pedestrian crosswalk does not activate when crossing Mt. Juliet road from east to west."

"Connect northern and southern sections of Cedar Creek Greenway."

"Cars typically do not yield to pedestrians in crosswalk when crossing streets and pedestrian light is flashing."

"Despite having two signs warning of the right lane closing, drivers will continue eastbound on Lebanon Road past Park Glen Drive, forcing their way into the remaining lane."

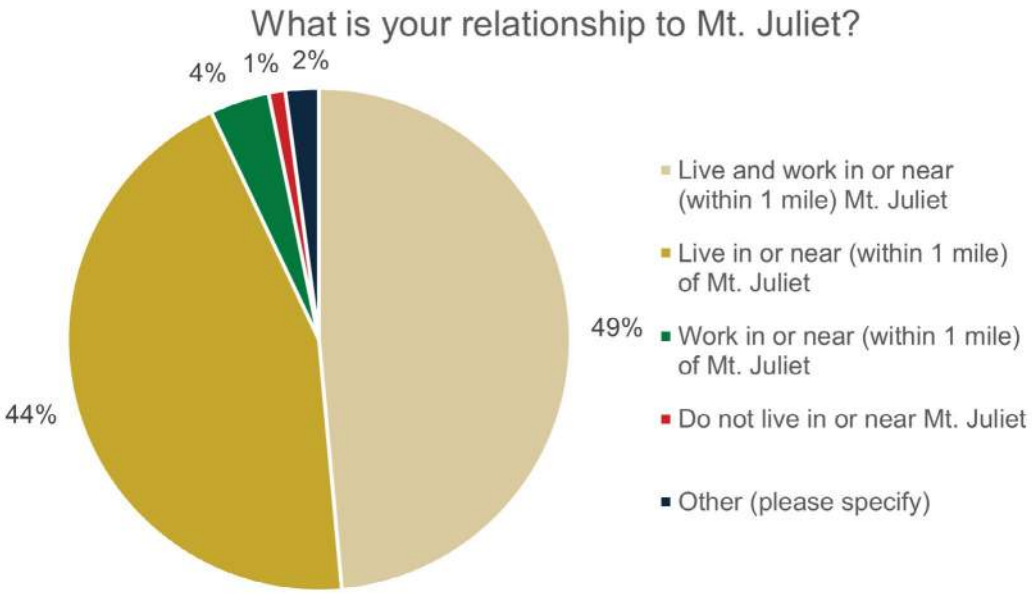
Public Outreach and Engagement Summary

Throughout the course of this study, thousands of community members were engaged across a variety of events and platforms as described previously. This resulted in a robust response with 764 pageviews being logged on the project website. Additional engagement metrics are shown below.

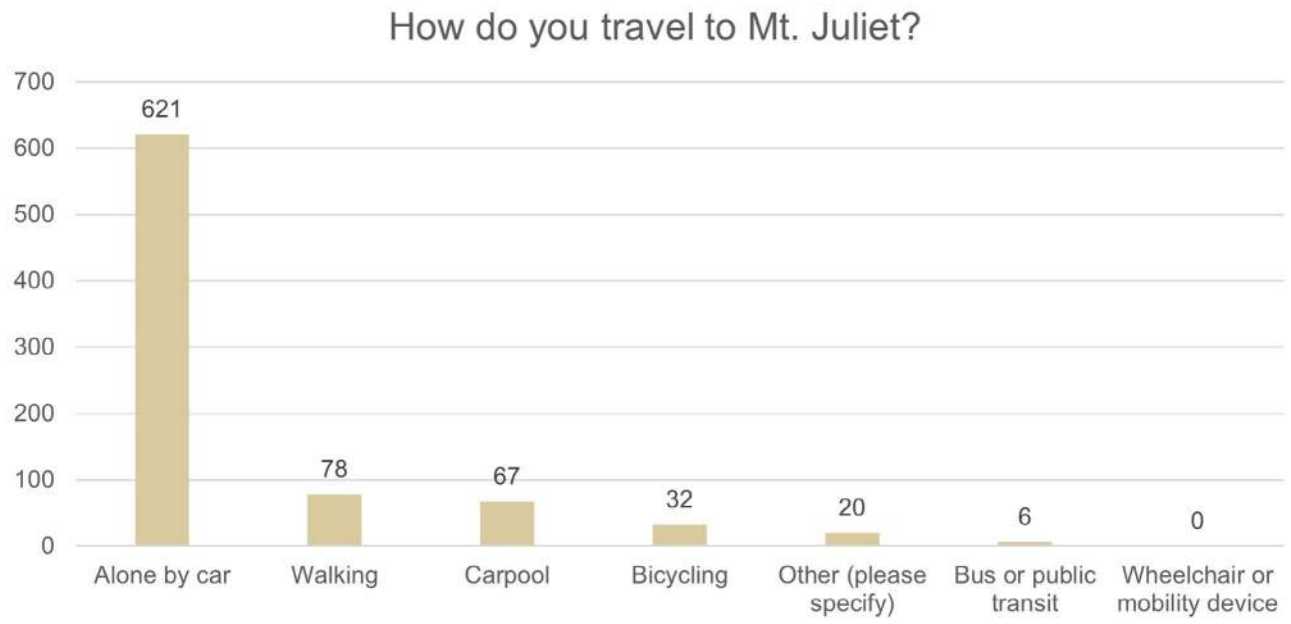
A "website pageview" refers to a single instance of a user loading the Mt. Juliet SAP website, whereas a "website session" refers to the instance of a user loading and remaining on the website. The online survey was designed to gather feedback from people in Mt. Juliet about safety issues or concerns they may have.

The online survey was designed to gather feedback from people in Mt. Juliet about safety issues or concerns they may have. The survey asked a series of questions to understand trends, concerns, and improvements that the public would like to see. The first few questions were about the respondents' relationship to the area and how they usually get around. Then, the survey asked about specific improvements for driving, walking/biking, and intersections. Finally, there were optional questions about the respondents' demographics. The goal of the survey was to gather a wide range of perspectives and suggestions to help improve safety in Mt. Juliet.

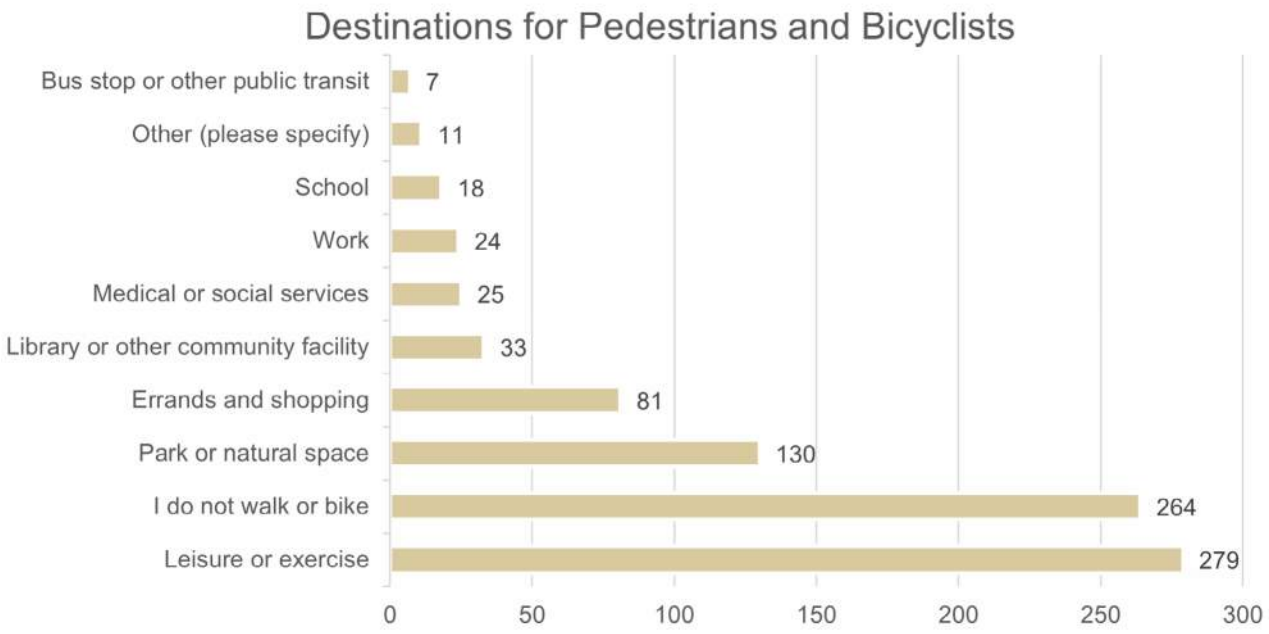
At the beginning of the survey, members were asked what their relationship to Mt. Juliet was, whether they live or work in the area. **96.7%** of all respondents live or work either in or within one mile of Mt. Juliet, further validating that their experiences are focused on areas within the county.



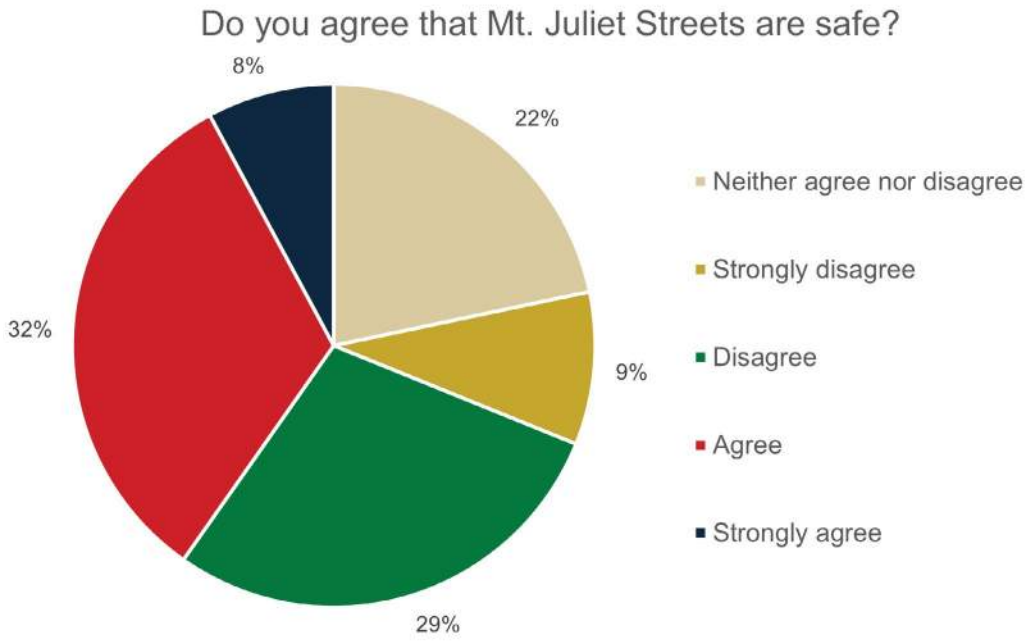
In the response to one question, people provided information on how they travel to Mt. Juliet. They were allowed to select all modes of travel that apply to them. Most respondents travel alone by car (621 responses). Some people walk (78 responses) and carpool (67 responses).



For people that walk or bike in Mt. Juliet, they were asked to select what destination they are going to. The top two responses were that they either do not walk or bike (264 responses) or do so for leisure or exercise (279 responses).

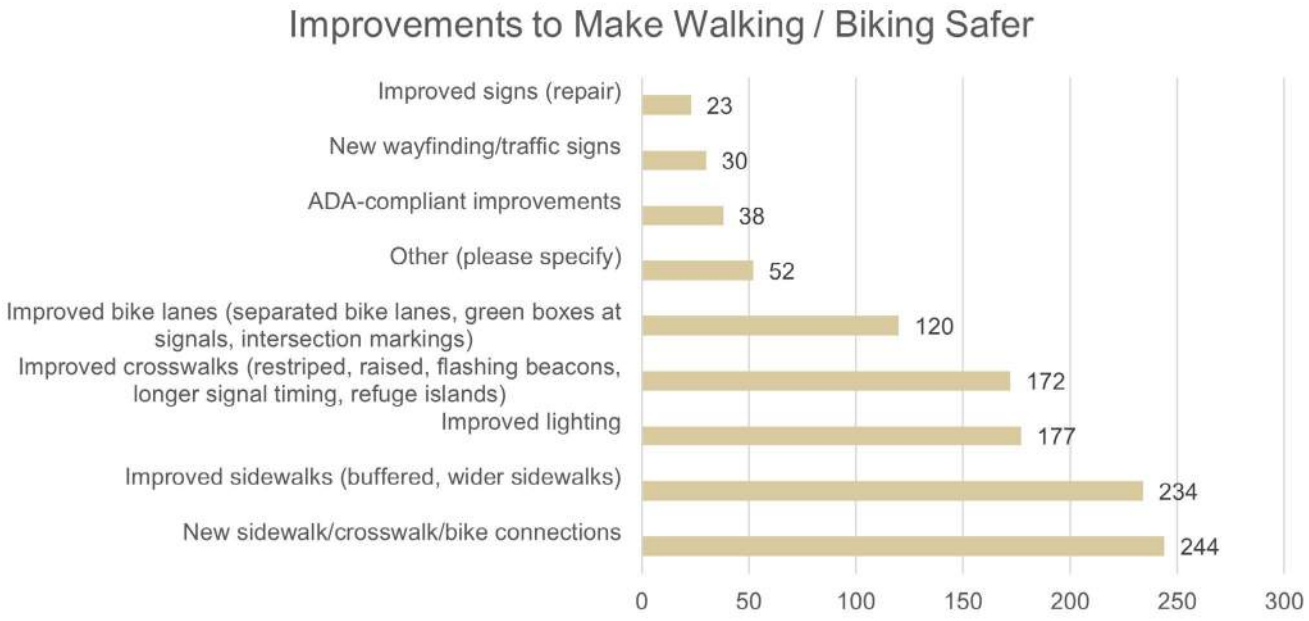


Respondents were also asked how strongly they agree that Mt. Juliet streets are safe. About a 40% of respondents felt that Mt. Juliet streets were safe. Around a third of respondents disagree indicating that they feel unsafe on the streets in Mt. Juliet.

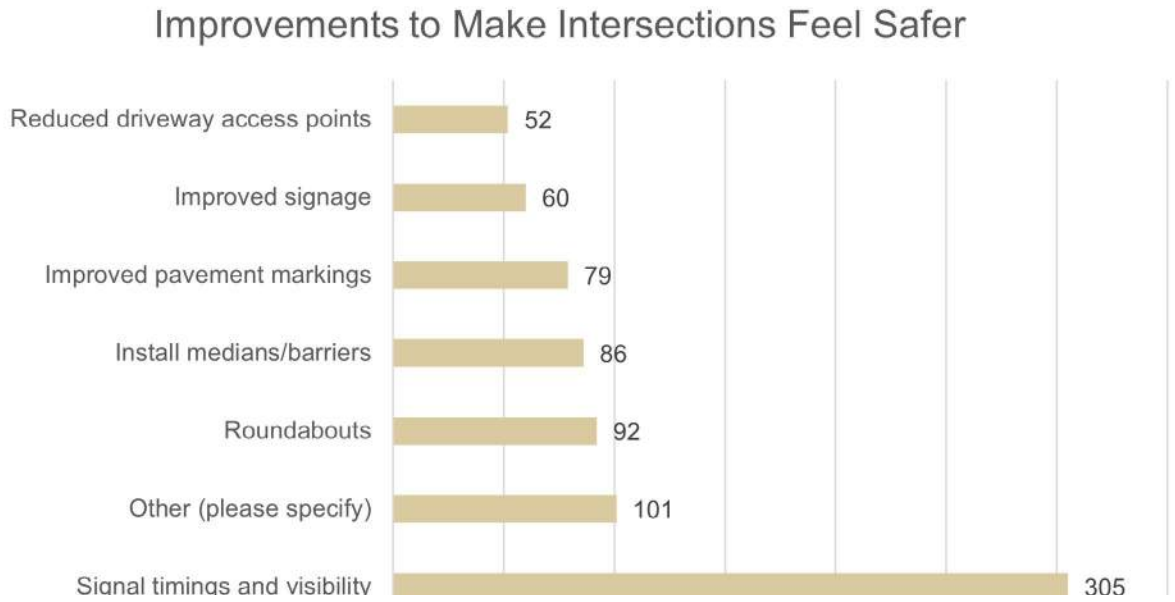


Respondents were asked to select up to three improvements that would make driving in Mt. Juliet feel safer. The top responses were improved lighting (178 responses) and improved road alignment, curves, and sight distance (176 responses).

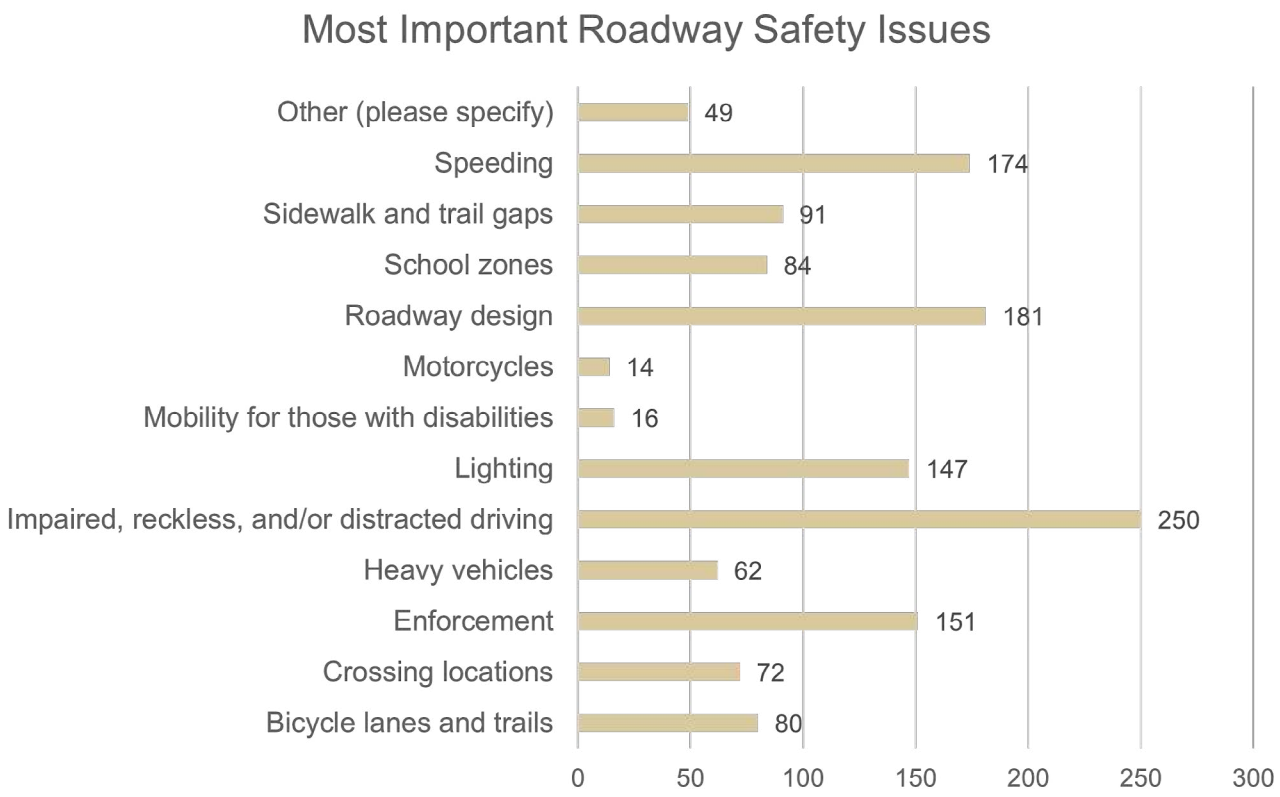
Respondents selected up to three improvements that may make walking/biking feel safer in Mt. Juliet. The top three were new sidewalk/crosswalk/bike connections (244 responses), improved sidewalks (234 responses), and improved lighting (177 responses).



Respondents then selected up to three improvements that would make intersections feel safer. Dedicated turn lanes (306 responses) received the highest count followed by signal timings and visibility improvements (305 responses) and other (101 responses).



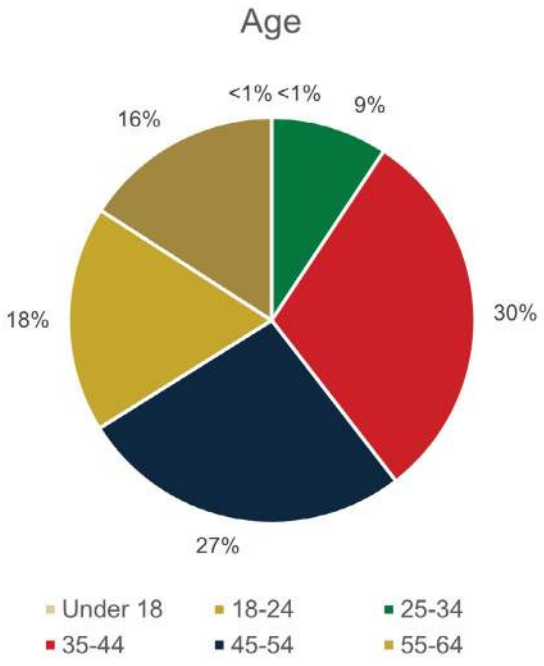
Respondents were then given the opportunity to select up to three safety issues that are most important to them. The most selected issue was impaired, reckless, and/or distracted driving (250 responses) then roadway design (181 responses) and speeding (174 responses), which indicate a desire for enforcement and operational improvements.

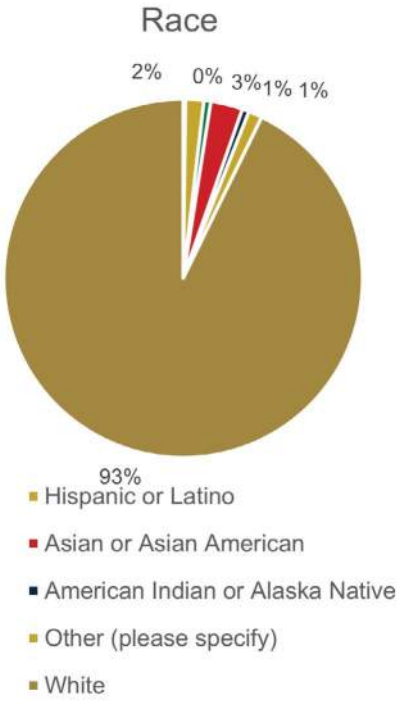


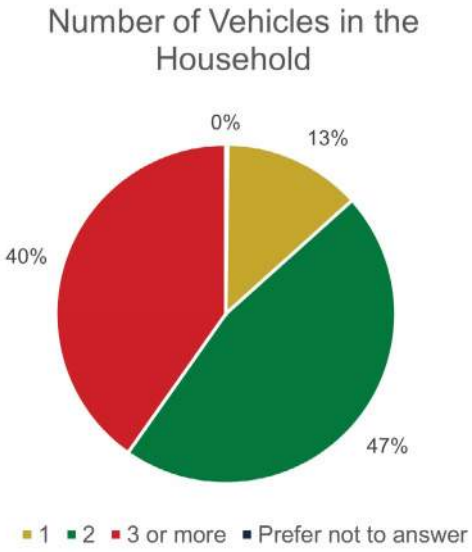
The next question then asked the preferred way people want to learn about safe roadway practices. The most common response was social media (417 responses). The second and third highest were City email communications (272 responses) and by website (149 responses), both of which were significant, indicating a broad communication approach would best serve the town.

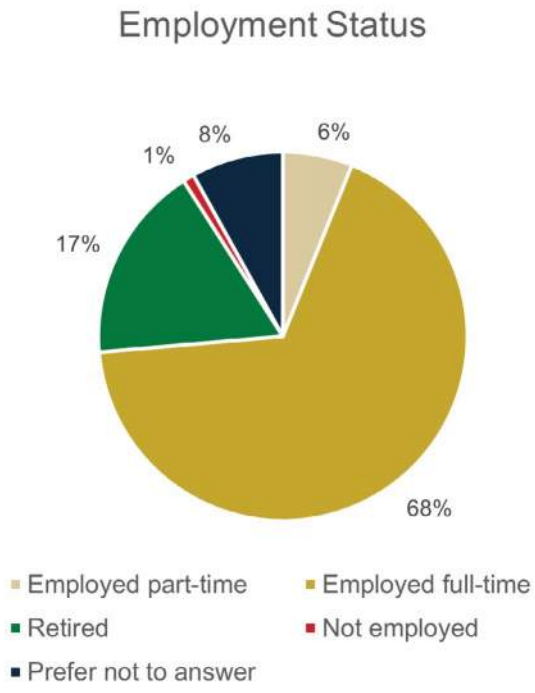
Key Demographics

The survey concluded with asking demographic questions that members could choose to answer. Responses were fairly representative of the community makeup.







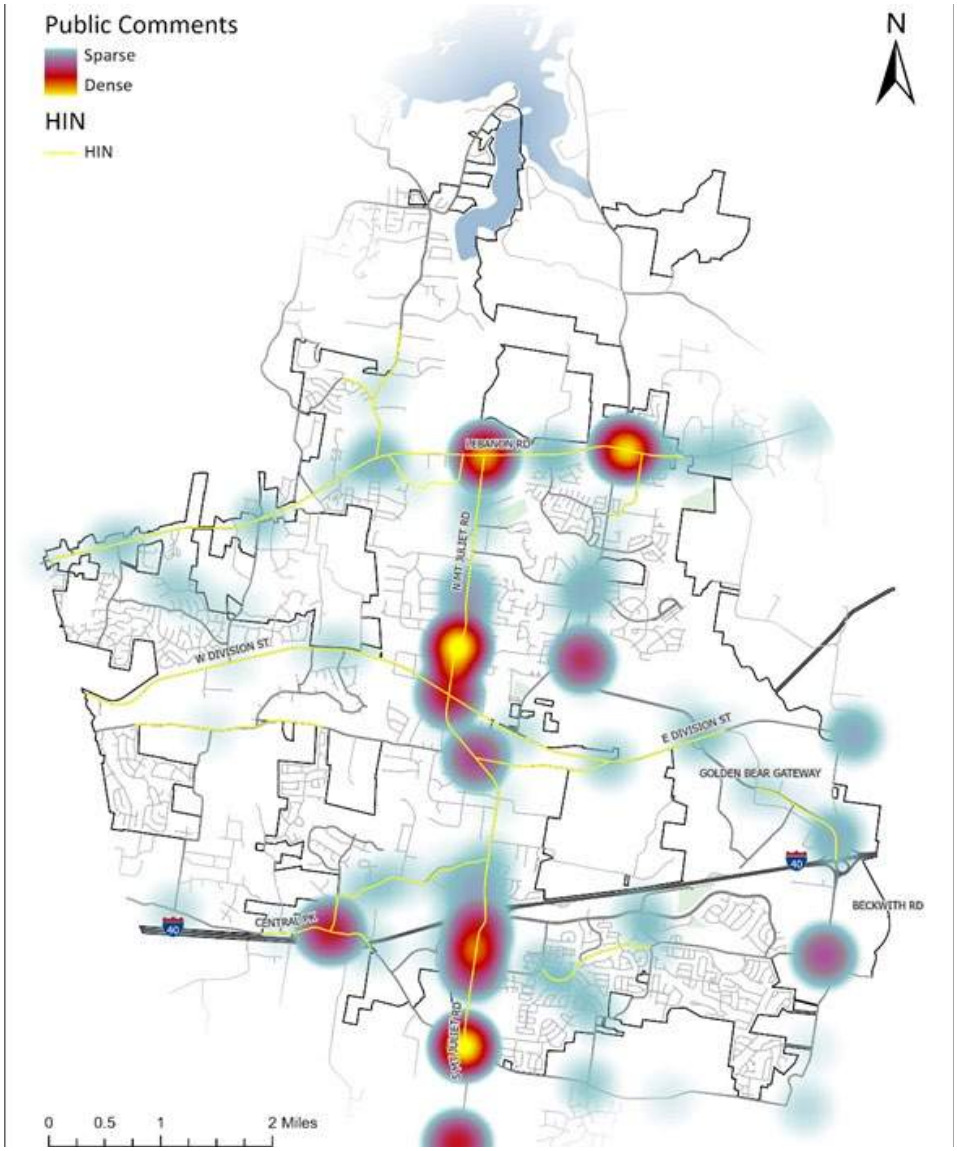


Summary of Survey Results

The survey results reveal that a significant number of respondents reside and work in Mt. Juliet, primarily relying on driving alone for their transportation needs. Respondents reported mostly biking or walking for leisure purposes or did not walk or bike at all. Roughly the same number of participants felt that the streets in Mt. Juliet were safe as those who felt they were unsafe. There was strong support for various improvements, including better lighting, new sidewalk/crosswalk/bike connections, creating dedicated turn lanes, and addressing signal timing and visibility. The survey also highlighted that the most prominent roadway issue in Mt. Juliet is impaired, reckless, and/or distracted driving. Concerns were expressed about intersections in Mt. Juliet, including vehicle speeds, signal timing, and poor visibility. Additionally, respondents indicated a preference for accessing safety information through social media platforms, City email communications, or the website.

Public Input Heat Map

Combining the input provided in Public Coordinate with the location specific comments provided in the survey, a heat map is expressed in Figure 15. As illustrated in the map, there is a direct correlation between the crash density heat map presented earlier in the report and the areas receiving the most public comments for safety concerns. Specifically, there were a high number of comments along Mt. Juliet Road and Lebanon Pike. Figure 15 shows the concentration of public input comments within the City. Additionally, areas with medium to high SVI were displayed on the map.



Key Takeaways

Many public comments call for improvements to roadway design and transportation infrastructure, especially multimodal elements. These recommendations aim to reduce accidents, improve traffic flow, foster better driving habits, and protect all road users. Additionally, there are several comments regarding lane widths, shoulders, and turn lanes. These comments align with the need to address safety concerns in locations with a higher likelihood of accidents or injuries, as reflected in the high injury network. By incorporating improvements in these areas, a targeted approach to enhancing transportation safety for both drivers and pedestrians can be achieved.

FIGURE 15: CONCENTRATION OF LOCATION SPECIFIC PUBLIC COMMENTS

STRATEGIES

MT. JULIET SAFE STREETS

STRATEGIES

The SAP identifies countermeasures and strategies addressing the City's fatal and suspected serious injury emphasis areas mentioned in the Safety Analysis Section. The countermeasures are classified into two categories: (1) Engineering Countermeasures (project recommendations) and (2) driver related countermeasures (Education, Enforcement, and Emergency Medical Services).

Engineering Countermeasures

Engineering countermeasures in an SAP refer to physical changes to the transportation infrastructure.

These measures can include:

- **Traffic signal upgrades:** Installing or improving traffic signals to better manage traffic flow.
- **Roadway design changes:** Modifying road layouts, such as adding roundabouts, medians, or bike lanes.
- **Pedestrian and cyclist infrastructure:** Enhancing crosswalks, sidewalks, and bike paths.
- **Speed management:** Implementing measures like road diets, bulb-out, chicanes, or reduce lane widths.
- **Visibility improvements:** Installing or improving street lighting, reflective signs, and roadway striping.

Crash Modification Factors (CMF)

Crash Modification Factors (CMF) can be used to assess the potential safety impact of improvements. A CMF is a numerical value that indicates the proportion of crashes that would be expected at a location after implementing a safety countermeasure. A CMF with a value of less than 1.0 indicates an expected decrease in crashes. Conversely, a CMF with a value greater than 1.0 indicates an expected increase in crashes. Because funding for infrastructure improvements is limited, the City of Mt. Juliet can benefit from a way to quantify and compare the potential benefit of safety countermeasures and treatments The FHWA maintains the CMF Clearinghouse, an online repository of CMFs documented in the Highway Safety Manual (HSM) and other industry resources. The following guidance should be considered when selecting and applying CMFs:

- Use a minimum of three years of crash data for urban and suburban sites and five years of crash data for rural sites.
- CMFs should be selected from Part D of the HSM or FHWA's CMF Clearinghouse website (https://www.cmfclearinghouse.org/).
- If possible, use CMFs with star ratings of four or five. The star rating indicates the quality or confidence in the results of the study producing the CMF.

Engineering Countermeasures Toolkit

A toolkit of engineering countermeasures was compiled based on general applicability in the study area, their level of evidence in crash reduction, and stakeholders and public feedback obtained during the public engagement. **Table 8** provides a summary of these countermeasures, their source, and the order of magnitude cost for their implementation.

TABLE 8: MT. JULIET TOOKLIT

Source	Countermeasure	Cost
● ●	Install Backplates w/ Retroreflective Borders to Traffic Signal Heads	$
● ● ●	Increase Crosswalk Visibility	$
●	Evaluate Mast Arm & Signal Head Locations	$
●	Install Flashing Yellow Arrows	$
	Upgrade Push-Buttons	$
●	Implement Appropriate Signage to Improve Driver Awareness	$
● ●	Install Curve Feedback Signage	$
●	Remove “Pork Chop”	$
● ● ●	Install High Emphasis Crosswalks & Pedestrian Facilities	$
●	Install Advance Warning Signage for 3-Leg Intersection (No Thru Movements)	$
●	Upgrade Striping & Signage at Two-Way Stop Controlled (TWSC) Intersections	$
●	Install Advance Warning Signage for Single-Lane Bridge	$
●	Install Raised Pavement Markings in Advance of Intersections	$
● ● ●	Install Rectangular Rapid Flashing Beacons (RRFBs)	$
●	Evaluate Left-Turn Lane Warrant	$
● ● ●	Install Vertical Separation for Bicyclists	$$
●	Reconfigure merge/turn/taper lane	$$
● ● ●	Evaluate/Upgrade Signal Timings and Coordination Plans	$$
● ● ●	Improve Lighting	$$
●	Close intersection by adding Cul-de-Sac	$$
● ● ●	Implement Road Diets (10’ Lanes, Bicycle Lanes, Lower Speed Limits, Street Trees)	$$
● ●	Install Pedestrian Refuge Island	$$
●	Install Wildlife Fencing and Obstructions to Restrict Various Cross Points	$$
● ●	Install Protected Two-Stage Multi-Use Crossing	$$
● ●	Install/Extend Guardrail, where warranted	$$
●	Clear and Grub to Optimize Driver Sight Distance (15 ft Both Sides of Road)	$$
●	Install RPMs	$$
● ●	Install Various Pavement Friction Applications Ready	$$
●	Extend Median to Restrict Illegal Turning Movements	$$
●	Consider ICE Study for Intersection Alteration	$$
● ●	Optimize Crosswalk Lenths / Alignments	$$
●	Conduct ICE Study (Consider Restricted Crossing U-Turn (RCUT) or Offset T)	$$
●	Install Raised Medians between Opposing Travel Lanes	$$
● ●	Improve Corridor Access Management	$$$
● ● ●	Install Pedestrian Hybrid Beacons at Mid-Block and Non-Signalized Intersections	$$$
● ●	Implement Access Management (Minimize Driveway Density)	$$$
● ●	Install a Traffic Signal, for a Signalized Crosswalk	$$$
● ● ●	Widen Shoulders	$$$
● ●	Install Combination Centerline / Edge line Rumble Strips	$$$
● ● ●	Replace TWLTL with Median (Install Left-Turn Lanes as Necessary)	$$$$
● ● ●	Convert sidewalks to non-contiguous sidewalks	$$$$
●	Widen Roadway from 2-lane to 4-lane	$$$$
● ●	Realign Intersection to Correct Skew	$$$$

● FHWA Proven Safety Countermeasure
● Crash Modification Factors Countermeasure
● Vulnerable Road User Related Countermeasure

$ 0 - 50,000
$$ 50,001 - 100,000
$$$ 100,001 - 500,000
$$$$ > 500,0000

Driver-Related Countermeasures

As described and presented in the Safety Analysis Section. The data shows the City of Mt. Juliet experienced higher percentages of crashes involving unrestrained occupants, older drivers and cyclists than the State of TN average. The following includes specific strategies to reduce crashes on these emphasis areas.

Unrestrained Occupants

Unrestrained occupants refer to individuals in a vehicle who are not using seat belts or other safety restraints (such as car seats for children) at the time of a crash. As shown earlier in the Safety Analysis Section, 26.3 percent (15 crashes) of all fatal and serious injury crashes between 2019 and 2023 in the City of Mt. Juliet involved unrestrained occupants as a contributing factor. This is 7.3 percent higher than the TN State Average of 19 percent.

In Tennessee, the Child Passenger Restrain Law requires that:

- **Children under 1 year old or weighing 20 pounds or less** must be secured in a rear-facing child passenger restraint system in the rear seat, if available
- **Children aged 1 to 3 years and weighing more than 20 pounds** must be secured in a forward-facing child passenger restraint system in the rear seat, if available
- **Children aged 4 to 8 years and measuring less than 4 feet 9 inches** must be secured in a belt-positioning booster seat system in the rear seat, if available
- **Children aged 9 to 12 years or any child through 12 years of age measuring 4 feet 9 inches** or more must be secured in a seat belt system
- **Children aged 13 to 15 years** must be secured using a passenger restraint system, including safety belts

The law also provides for the use of medically prescribed modified child restraints for children who cannot be safely transported in conventional systems.

The following are recommended strategies that should be implemented to reduce fatal and serious injury crashes with unrestrained occupants:

TABLE 9: COUNTERMEASURE VS. STRATEGY

Countermeasure	Strategy
Conduct High-Visibility Enforcement	Mt. Juliet's police department to continue conducting high-visibility enforcement at targeted areas for occupant protection compliance.
Promote Proper Child Restraint Use	Continue to offer free child restrained training for Day Cares and promote child passenger safety initiatives.
Conduct Social Media Campaigns	Promote high-risk driver-education programs and defensive driving programs targeting drivers aged 15-21 focusing on seatbelt usage such as Bucke Up in your Truck Campaign and Click it or Ticket.
Enforce the Child Passenger Restraint Law	Continue to participate in conference and training programs for law enforcement officers to be aware and implement the Child Passenger Restraint Law.

Older Drivers (65+)

Older drivers refer to drivers aged 65 and older. This group is more likely to experience age-related changes in vision, physical fitness, and cognitive abilities, which can affect driving performance and increase crash risk. As shown earlier in the Safety Analysis Section, 26.3 percent (15 crashes) of all fatal and serious injury crashes between 2019 and 2023 in the City of Mt. Juliet involved older drivers. This is 6.8 percent higher than the TN State Average of 19.5 percent. The following are recommended strategies that should be implemented to reduce fatal and serious injury crashes involving older drivers:

TABLE 10: OLDER DRIVERS(65+)

Countermeasure	Strategy
License Renewal Process	Support the State legislation to require in-person driver license renewal and vision testing to older drivers.
Educational Programs	Promote education programs for older drivers including Yellow Dot, AAA Driver Improvement Program, and Car Fit check events.
Encourage Alternative Transportation Options	Encourage efforts to link seniors to the Wilson Ride, and other ride-share options and increase awareness of public and private transportation alternatives to driving.

Aggressive Drivers/Speeding

Aggressive Drivers refer to individuals who engage in unsafe driving behaviors with deliberate disregard for safety. These behaviors can include speeding, tailgating, weaving in and out of traffic, running red lights, and other actions that endanger other road users. The data shows that 19 percent (11 crashes) of all fatal and serious injury crashes between 2019 and 2023 within the City of Mt. Juliet involved aggressive drivers and/or speeding. This is 7 percent higher than the TN State average of 12 percent. The following are recommended strategies that should be implemented to reduce fatal and serious injury crashes involving aggressive drivers and or speeding:

TABLE 11: AGGRESSIVE DRIVERS/SPEEDING COUNTERMEASURES

Countermeasure	Strategy
Enforcement at High-Frequency Areas	Develop and implement enforcement program aimed ataggressive driving in high frequency areas.
Develop a City-Wide Traffic Calming Program	Develop an initiative designed to implement various measures across the city to reduce vehicle speeds, involving physical changes to the roadway environment, such as roundabouts, curb extensions, and improved pedestrian crossings, to alter driver behavior and create safer conditions for all road users.

POLICY AND PROCESS CHANGES

MT. JULIET SAFE STREETS

POLICY AND PROCESS CHANGES

Document Reviewed

Existing City's plans and policies were reviewed and compiled as a part of the SAP process to gain perspective on the existing efforts for transportation-related improvements within Mt. Juliet. High-level key points regarding transportation improvements and safety-related topics were identified to inform recommendations in the SAP. The table below outlines the pertinent existing and past plans or policies that impact Mt. Juliet.

TABLE 12: EXISTING PLANS SUMMARY

Document	Summary/Goals
Mt. Juliet Greenway, Bike and Pedestrian Master Plan,	○ Mt. Juliet Greenway, Bike & Pedestrian Master Plan aims to build an ecosystem-based approach to achieve sustainable development and connective greenspace. ○ The plan provides a two-level framework for protecting, restoring, and linking greenspaces and natural features in Mt. Juliet to support a healthy natural environment and ecological diversity. ○ The plan outlines the history of trails in the areas, summarizes existing conditions, establishes trail standards and locations to enhances and connects existing natural features, and creates a sustainable oversight and funding mechanism.
Wilson County Bicycle and Pedestrian Master Plan, 2002	○ The purpose of the Bicycle and Pedestrian Master Plan was to enhance the mobility and access needs by recommending improvements that can successfully integrate into a multi-modal transportation plan for Mt. Juliet, Lebanon, and Wilson County. ○ The plan identifies the most feasible bicycle and pedestrian routes and recommends sidewalk ordinance changes along with specific types of facilities for each location with their respective design standards along with.
Mt. Juliet Town Center Master Plan, 2005	○ The Mt. Juliet, TN Town Center Master Plan, adopted in 2005, establishes a town center identity crafted by the city's leadership and community. ○ The plan goals are to create a vibrant civic space for events and recreation, boost tax revenue through future investments, establish a unique identity rooted in the city's heritage, enhance connections to adjacent neighborhoods via multi-modal transportation, reduce reliance on Mt. Juliet Road through diverse uses, attract visitors with compelling offerings, and promote retail, office, and residential opportunities.
Nashville MPO Regional Bicycle and Pedestrian Study, 2009	○ The Nashville Area Metropolitan Planning Organization Bicycle and Pedestrian Study, adopted in 2009, establishes a strategic vision for improving walking and biking opportunity in the greater Nashville region. ○ The plan offers an overview of existing conditions, establishes a framework for identifying bicycle and pedestrian projects, and provides guidance on enhancing safety for walking and biking in the region.
City of Mt. Juliet Land Use and Transportation Plan Update, 2015	○ The City of Mt. Juliet Land Use and Transportation Plan Update, completed in 2015, assessed existing conditions and provided guidance for future growth and redevelopment. ○ The plan focused on strategies and implementation to achieve the vision of a safe, attractive, and clean city with cohesive neighborhoods, strong economic vitality, and a financially responsible government providing high-quality services and infrastructure.

Document	Summary/Goals
City of Mt. Juliet ADA Self-Evaluation and Transition Plan, 2019	○ The City of Mt. Juliet's ADA Self-Evaluation and Transition Plan offers a comprehensive assessment of its programs, services, and activities (PSAs) to identify potential barriers to access for individuals with disabilities.
Mt. Juliet, Tennessee Comprehensive Transportation Plan, 2020	○ The Mt. Juliet, Tennessee Comprehensive Transportation Plan, adopted in 2020, was created to guide decision making in the city, recommending improvements for all modes of transportation. ○ The plan embraces "complete streets" policies to create a more robust multimodal transportation network as the city continues to grow. ○ The plan offers an overview of existing conditions in Mt. Juliet, highlighting key needs as it develops, and includes recommendations for improvements in roadways and freight, as well as enhancements for bicycle, pedestrian, and transit options.
Middle Tennessee Connected 2021-2045 Regional Transportation Plan	○ The Middle Tennessee Connected Regional Transportation Plan, prepared by the Greater Nashville Regional Council (GNRC),represents the collective goals of municipal and county governments, public transit agencies, county highway departments, and the Tennessee Department of Transportation (TDOT); process for improving mobility; and top priorities for state funding.
City of Mt. Juliet Multimodal Transportation Analysis Guidelines, 2024	○ The plan establishes a set of standard transportation analysis requirements and procedures to provide the city with information and data on multimodal transportation in city. ○ The analysis includes three components: a traffic review, a safety review, and a mitigation section detailing strategies for improvement. These reviews and recommendations will guide the city's development and redevelopment decisions to enhance multimodal transportation networks.

Plan Checklist

To ensure the safety and well-being of all individuals, it is imperative for agencies to have a set of plans and guidelines in place. A set of plans and guidelines have been compiled to serve as a roadmap for addressing safety concerns and implementing appropriate measures. The plans include Complete Street Policy Guidelines, ADA Transition Plan, Multi-Modal Plan, Traffic Impact Study Guidelines, Comprehensive Plan, and Pavement Management Plan. These plans provide strategies for designing and managing streets that prioritize safety, address accessibility needs, promote various transportation modes, assess traffic impacts of new developments, and outline a long-term vision for

land use, transportation, and community development with a focus on safety considerations.

Table 12 contains the list of plans and the corresponding plan in Mt. Juliet.

TABLE 13: ALIGNMENT OF SAFETY ROADMAP WITH EXISTING PLAN

Checklist	Plan	Corresponding Town of Mt. Juliet Plan
○	Complete Street Policy Guidelines	Middle Tennessee Connected 2021-2045 Regional Transportation Plan Mt. Juliet, Tennessee Comprehensive Transportation Plan, 2020
●	ADA Transition Plan	City of Mt. Juliet ADA Self-Evaluation and Transition Plan
○	Multi-Modal Plan	Mt. Juliet Greenway, Bike and Pedestrian Master Plan Mt. Juliet, Tennessee Comprehensive Transportation Plan, 2020
●	Traffic Impact Study Guidelines (with Safety)	City of Mt. Juliet Multimodal Transportation Analysis Guidelines
●	Comprehensive Plan	Mt. Juliet Land Use and Transportation Plan Update, 2016
●	Pavement Management Plan	Pavement Management Pan
Has Plan: ●	**Mentioned in Other:** ○	**Does not have:** ■

Recommendations

Policy recommendations were derived from the checklist of critical guidelines and policies described above, as well as a review of the emphasis areas that experienced high rates of serious and fatal injuries within the City. The top three emphasis areas identified were roadway intersections, accounting for 42.1% of total serious and fatal injury crashes, followed by unrestrained occupants at 26.3%, and senior drivers (65+) at 26.3%. The recommendations listed below aim to address these areas and create a safer place for all roadway users.

TABLE 14: RECOMMENDED POLICY AND PROCESS CHANGES

Action	Timeframe	Lead
Integrate safety policy into all existing documents	Short-Term	Public Works Department and Planning Department
Update roadway and intersection design standards to promote safety for all roadway users and address deficiencies	Short-Term	Public Works Department
Establish a targeted enforcement program (for aggressive driving and high speeds) and coordinate with local law enforcement.	Short-Term	Police Department

Action	Timeframe	Lead
PIO to organize educational campaigns/ provide information through community outreach. ○ Topics include: driving behavior, speed awareness, seatbelt usage, safe practices, for bicyclists and pedestrians ○ Celebrate projects that improve safety and positive movements toward the City's Safety Action Plan's goal annually. ○ Create increased awareness within agency departments	Short-Term	Communication Department
Partner with existing organizations that promote VRU safety.	Short-Term	Planning Department and Public Works Department
Review complete street policies regarding meeting the needs of the emergency responders.	Short-Term	Planning Department and Emergency Services
Update Municipal Codes Titles 15 and 16	Short-Term	Legal Department
Implement a speed management program and traffic calming program	Mid-Term	Public Works Department and Police Department
Reprioritize future projects that achieve safety goals for future funding allocations.	Mid-Term	Public Works Department
Implement streetscaping techniques to reduce distracted driving.	Mid-Term	Planning Department
Develop an Access Control Plan	Mid-Term	Engineering Department
Incorporate proposed safety projects from this plan into future developments and transportation projects	Mid-Term	Engineering Department
Implement the use of ITS technologies as appropriate. Develop and ITS Master Plan and identify system upgrades such as TMC, etc.	Mid-Term	Public Works Department and IT Department
Conduct detailed studies on crash hotspots and regularly update the High Injury Network (HIN) with future crash data and update project priorities as needed.	Long-Term	Public Works Department
Encourage businesses and special event permit holders to promote mobility alternatives for patrons through the permit process by identifying things such as bike parking areas or bike/ped connectors from parking areas to the event(s).	Long-Term	Planning Department and Communications
Establish a "Safety Team" that would meet regularly to review all fatal and serious injury crashes and identify/evaluate maintenance measures such as signage, pavement markings, and roadway/ sidewalk modifications.	Long-Term	Police Department and Public Works Department

PROJECT SELECTIONS

MT. JULIET SAFE STREETS

PROJECT SELECTIONS

Prioritization

After the review and validation of the HIN by the Steering Committee, ranking weight was determined for each of the After the review and validation of the HIN, a ranking weight was determined by the Steering Committee. The following percentages were used to prioritize potential projects:

- The number of fatal and serious injury crashes along the segment (35%).
- The number of pedestrian/bicycle crashes along the segment (10%).
- The total number of crashes (15%).
- High risk corridors (20%).
- The number of vehicles traveling from vulnerable communities (10%).
- Equity consideration, defined as the HIN segment crossing an area of the City with an SVI score of medium or high (10%).

Appendix A provides a summary of the HIN prioritization exercise that was completed by the Steering Committee.

Recommended Projects

Following the prioritization, a list of high-scoring City and State Route roadway segments and intersections was reviewed with City staff. Locations with known programmed capital improvements projects were removed from the list and replaced with subsequent high-ranking locations. City staff provided feedback on the locations to identify 18 road segments that would be candidates for determine engineering improvements for. The 18 recommended locations are shown in **Figure 16** and listed below:

- N Mt. Juliet Road (SR-171) from Providence Parkway to Old Lebanon Dirt Road
- Lebanon Road (SR-24) from Benton Douglas Parkway to Park Glen Drive
- N Mt. Juliet Road (SR-171) from Old Lebanon Dirt Road to Lebanon Road
- Lebanon Road (SR-24) from Pin Oak Drive to Benton Douglas Parkway
- Old Lebanon Dirt Road from Nighthawk Lane to Kelsey Glen Drive
- Lebanon Road from Park Glen Drive to Terrance Hill Road
- S Mt. Juliet Road (SR-171) from Providence Parkway to Central Pike
- Golden Bear Gateway From Beckwith Road to Rutland Drive
- Division Street from S Greenhill Road to N Mt. Juliet Road
- Division Street from Chandler Road to S Greenhill Road
- Pleasant Grove Road from Central Pike to N Mt. Juliet Road
- Central Pike (SR-265) from John Wright Road to John Hagar Road
- Nonaville Road from Tyrone Drive to Lebanon Road
- Sunset Drive/Circle from Lebanon Road to Lebanon Road
- Old Lebanon Dirt Road from N Mt. Juliet Road to E Division Street
- Providence Trail from Providence Parkway to S Rutland Road
- Curd Road from Lebanon Road to Golden Bear Gateway

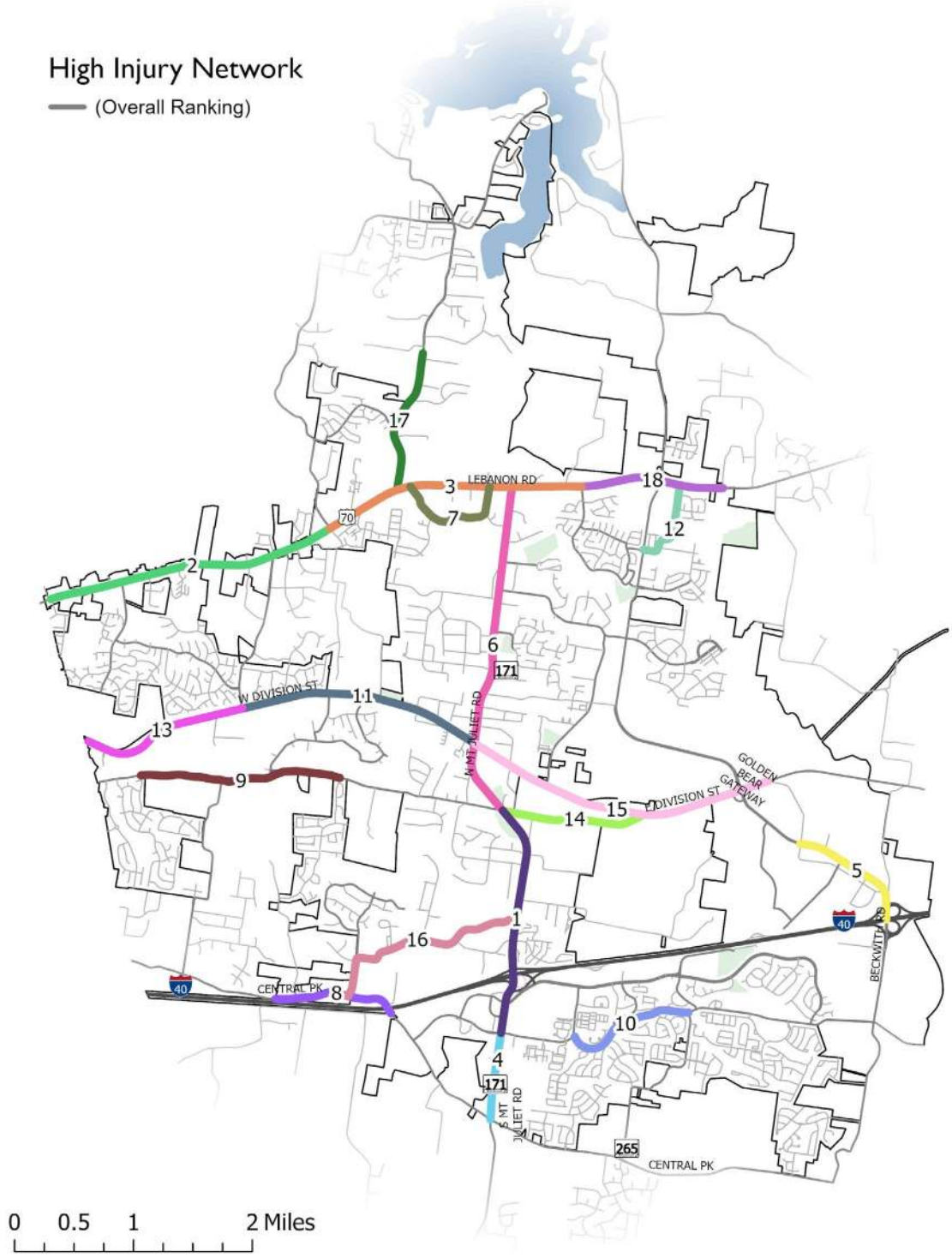
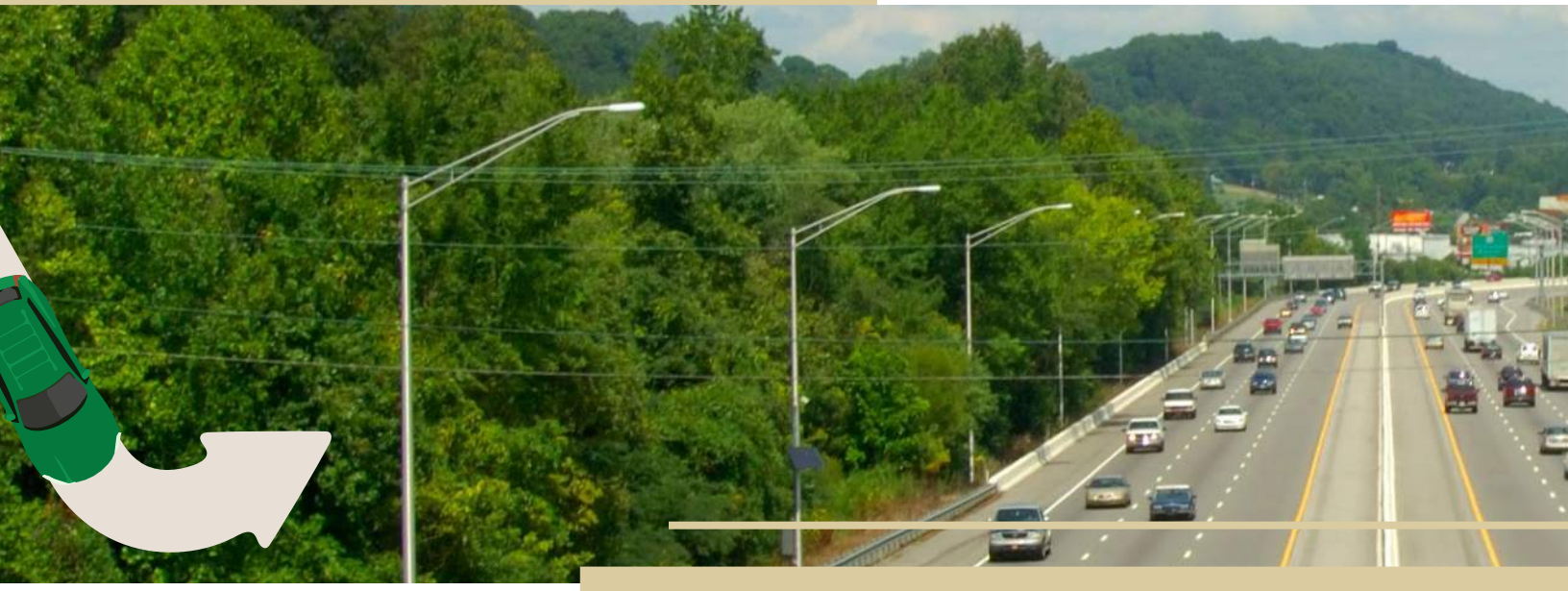


FIGURE 16: PROJECT LOCATIONS

Recommended Project Fact Sheets

Following the selection of the top 17 project locations, safety improvement recommendations were developed for each location using the Engineering Countermeasures Toolkit presented earlier in the SAP.

Project fact sheets were developed for each of the 17 locations and are included in **Appendix B**. The fact sheets summarize the crash data analysis, public input, and selected engineering countermeasures with their benefits. The draft project sheets were reviewed by City staff for input related to engineering judgment and site-specific knowledge.



PROGRESS AND TRANSPARENCY

MT. JULIET SAFE STREETS

PROGRESS AND TRANSPARENCY

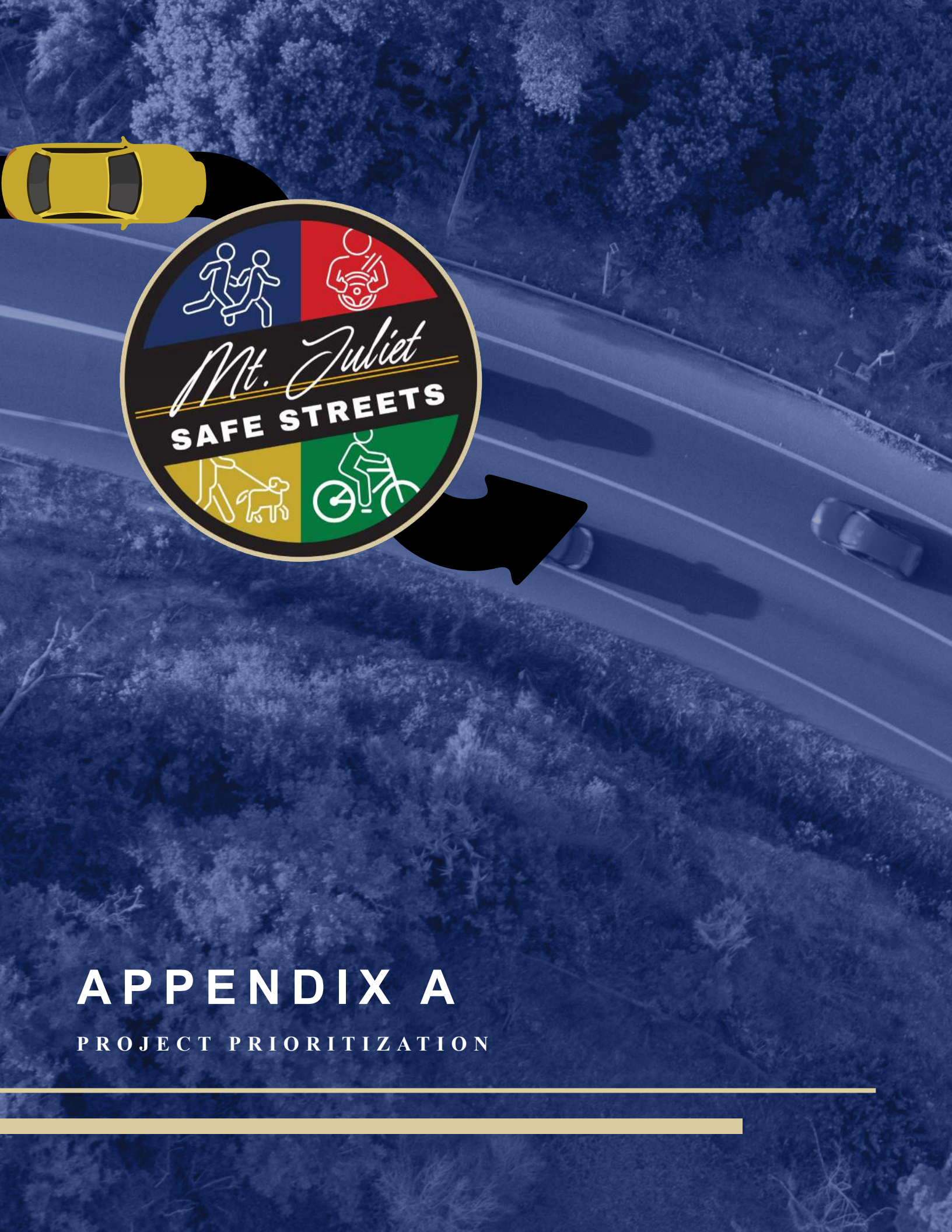
The Mt. Juliet SAP recommends a set of actions that will support the successful implementation and monitoring the progress of the recommended projects and strategies.

Task Force Implementationand Monitoring

It is recommended that a subset of the Steering Committee regroup as a Mt. Juliet Safety Task Force to direct the SAP implementation and future progress. The Task Force may consist of Public Works staff, other City of Mt. Juliet departments, Mt. Juliet Police Department, other local emergency service providers, key TDOT staff, other adjacent communities, and other stakeholders as needed. It is recommended that the task force meet annually after the adoption of the Mt. Juliet SAP to review the latest available crash data trends, project completion progress, and driver-related strategy performance measures. This will also provide the task force an opportunity to discuss modifications to the plan or identify additional resources needed based on changes in crash trends, community needs, and new technologies.

Public Posting of the Mt. Juliet SAP

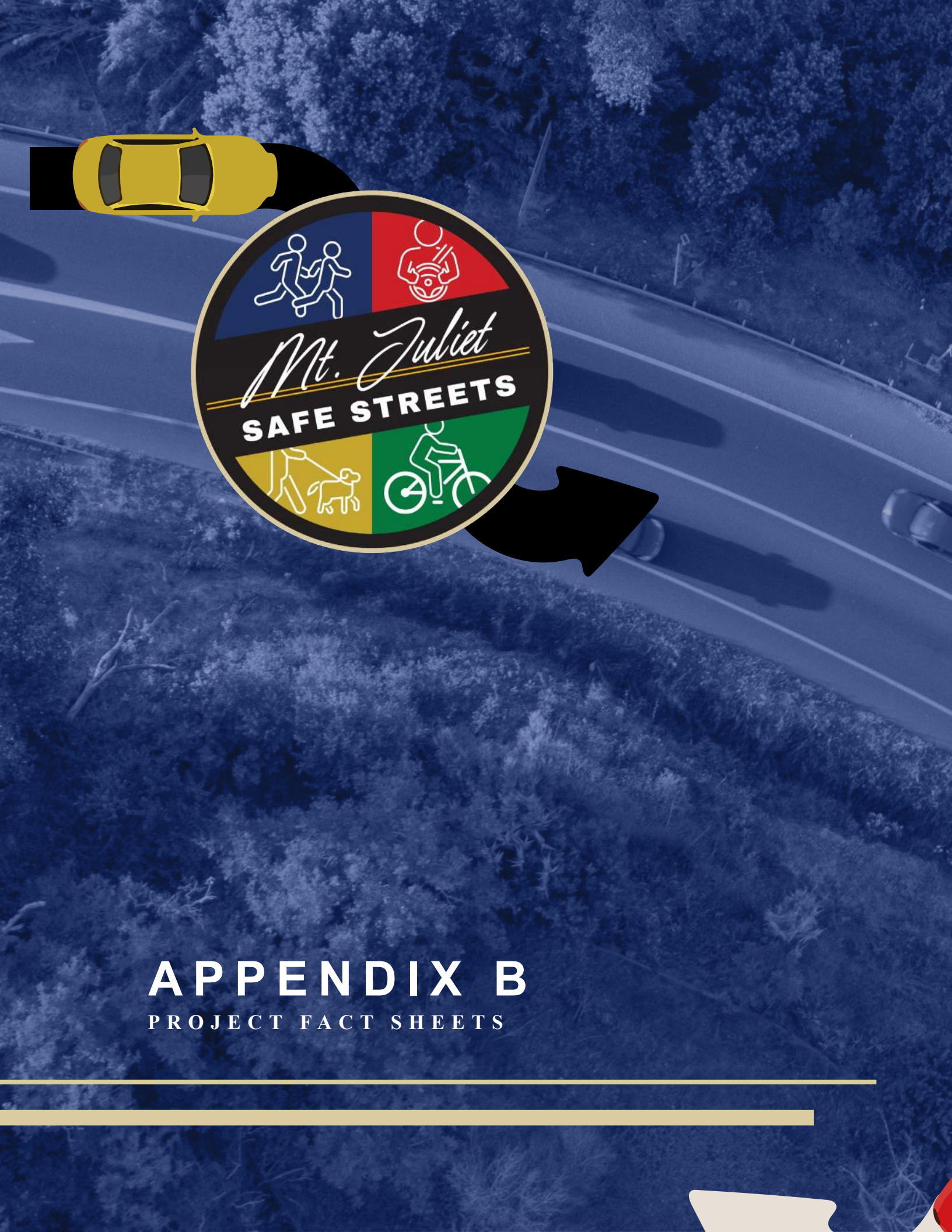
Upon completion and adoption, this plan will be made public on a dedicated project website and the City's website. The project website should be maintained to update the public with the latest crash data trends and implementation status of projects.



APPENDIX A

PROJECT PRIORITIZATION

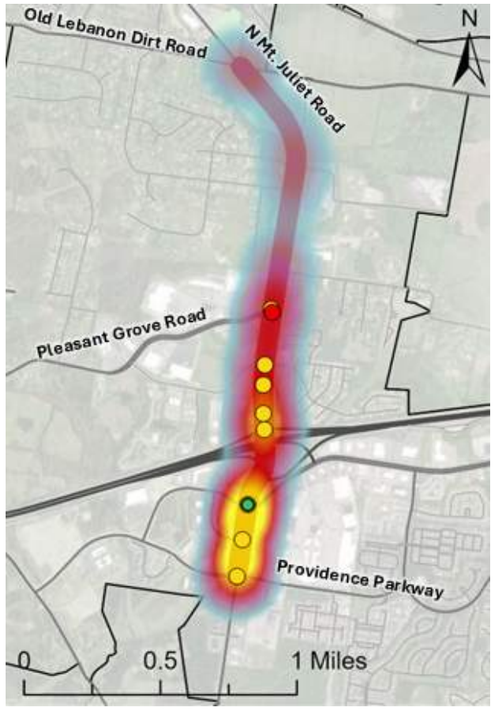
HIN ID	Road Name	From	To	Ownership	Length (miles)	K&A Crashes	Bike/Ped Crashes	Crash Rate	Vulnerable Community Travelers	Equity Considerations	SC Votes	Prioritization Score
4	Mt Juliet Road	Providence Parkway	Old Lebanon Dirt Road	State (SR171)	1.964	10	1	10.91	2300	1	4	91
1	Lebanon Road	Pin Oak Drive	Benton Douglas Parkway	State (SR024)	2.45	10	0	2.08	1500	0	2	63
2	Lebanon Road	Benton Douglas Parkway	Park Glen Drive	State (SR024)	2.207	6	2	3.91	1200	0	3	60
6	S Mt Juliet Road	Providence Parkway	Central Pike	State (SR171)	0.728	4	0	9.16	200	1	1	53
7	Golden Bear Gateway	Beckwith Road	Rutland Drive	Municipal	1.043	2	0	3.11	550	1	1	41
3	N Mt Juliet Road	Old Lebanon Dirt Road	Lebanon Road	State (SR171)	2.856	3	0	4.21	750	0	2	37
11	Sunset Drive/Circle	Lebanon Road	Lebanon Road	Municipal	0.455	1	0	14.45	150	0	2	33
12	Central Pike	John Wright Road	John Hagar Road	State	1.318	1	0	1.24	350	1	0	23
8	Old Lebanon Dirt Road	Nighthawk Lane	Kelsey Glen Drive	Municipal	1.68	3	0	1.84	100	1	1	23
13	Providence Trail	Providence Parkway	S Rutland Road	Municipal	1.68	0	0	1.50	300	0	0	21
10	W. Division Street	S Greenhill Road	N Mount Juliet Road	Municipal	2.06	2	0	1.89	200	1	3	20
15	Curd Road	Lebanon Road	Golden Bear Gateway	Municipal	0.545	0	0	2.01	100	0	0	20
9	W. Division Street	City Limits	S Greenhill Road	Municipal	1.422	1	0	2.56	300	1	3	19
17	Old Lebanon Dirt Road	N Mount Juliet Road	E Division Street	County	1.188	0	0	3.23	100	1	2	16
18	E. Division Street	N Mount Juliet Road	Rutland Drive	Municipal	2.665	0	0	2.09	200	1	5	13
16	Pleasant Grove	Central Pike	N Mount Juliet Road	Municipal	1.765	1	0	6.40	200	0	1	11
5	Lebanon Road	Park Glen Drive	Terrace Hill Road	State (SR024)	1.191	7	0	3.53	800	0	5	7
14	Nonaville Road	Sports Road	Lebanon Road	Municipal	1.201	1	0	1.05	300	0	0	6



APPENDIX B

PROJECT FACT SHEETS

Mt. Juliet Road (SR-171)
from Providence Parkway to Old Lebanon Dirt Road



VRU (1) Serious Injury (9) Fatal (1)

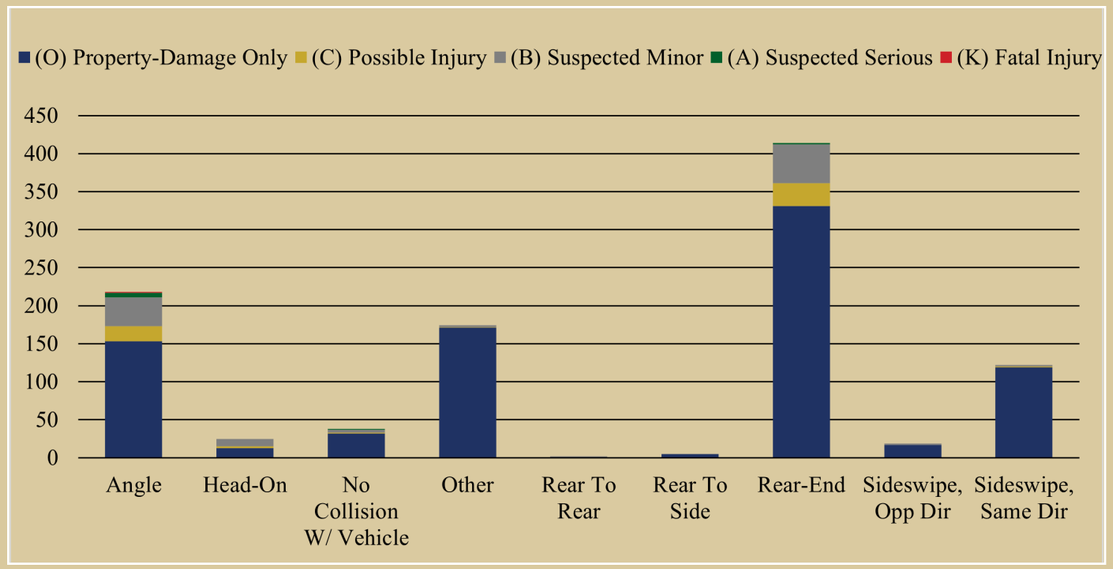
State Route

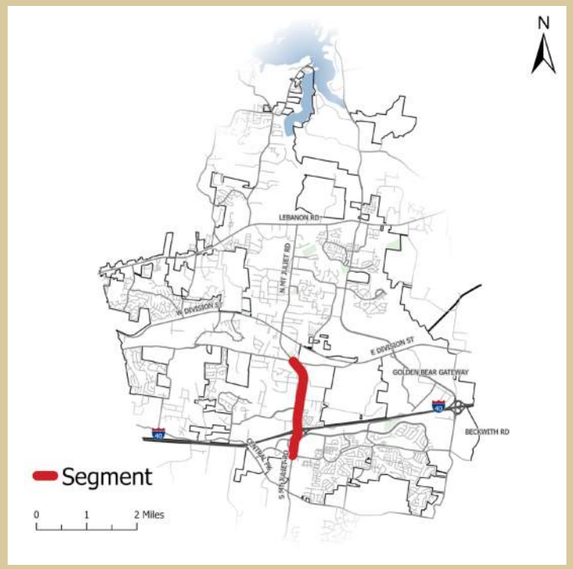
Speed Limit	45 mph
Lanes	4
Vehicles/Day	34,200
Total Crashes	1,017
HIN Intersections	7

Characteristics

This section of N Mt. Juliet Road is a two-way roadway, divided by a two-way left-turn lane (TWLTL). This segment follows a largely straight alignment, with a large curved section towards the northern end of the segment, and experiences a rolling grade. Sidewalks are present on both sides of the roadway along the entire length of this segment.

Along N Mt. Juliet Road, Facing South, Just South of Weston Drive





Overall Ranking: 1

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Traffic from the marketplace/shopping mall is a problem.
- Between the intersection of N Mt. Juliet Road with Providence Parkway and Crossings Circle there have been numerous rear ended crashes .
- Providence in general needs improvement, either an overpass or diversion around it.
- Old Lebanon Dirt Road and N Mt. Juliet is odd and hard to gauge turn heading North on Mt. Juliet or turning left onto Old Lebanon Dirt Road.
- Intersection of N Mt. Juliet Road and Providence Parkway is so dark at night.
- The light allowing people onto Mt. Juliet Road from Belinda and Adams does not seem to be timed appropriately. There have been many times when turning onto N Mt. Juliet Road from Belinda where cars almost have gotten hit over confusion on who has the right of way.
- With the high traffic and fast moving cars, a pedestrian bridge may be useful at Providence Parkway.

Mt. Juliet Road (SR-171)
from Providence Parkway to Old Lebanon Dirt Road

Mt. Juliet Road (SR-171)
from Providence Parkway to Old Lebanon Dirt Road

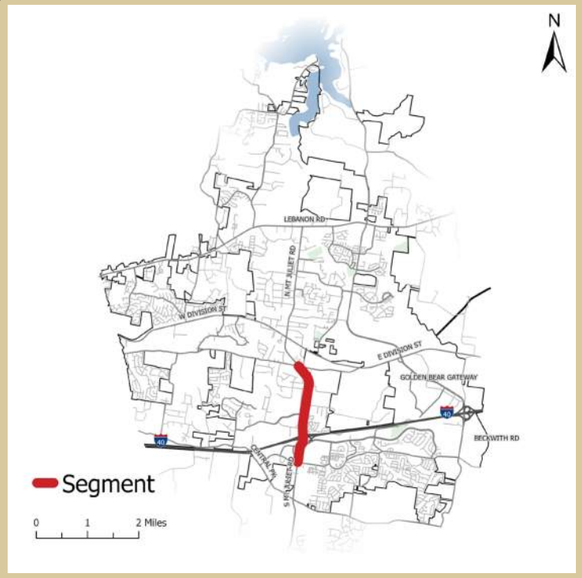
			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●		1.1	Improve Corridor Access Management (Minimizing Driveway Density)	$$	Short-Term	●
●	●	●	1.2	Install Vertical Separation for Bicyclists	$$	Short-Term	Ready
●	●	●	1.3	Convert Sidewalk to Non-Contiguous Sidewalks	$$$$	Long-Term	● ●
	●		1.4	Reconfigure Merge/Turn/Taper Lane	$$	Short-Term	● ●
●	●		1.5	Install Backplates w/ Retroreflective Borders to Traffic Signal Heads	$	Short-Term	Ready
●	●	●	1.6	Evaluate/Upgrade Signal Timings and Coordination Plans	$$	Short-Term	Ready
●	●	●	1.7	Evaluate Signal Clearance Intervals	$$	Short-Term	Ready
●	●	●	1.8	Increase Crosswalk Visibility	$	Short-Term	Ready
●	●	●	1.9	Improve Lighting	$$	Short-Term	● ●
	●		1.10	Evaluate Mast Arm & Signal Head Locations	$	Short-Term	Ready
	●		1.11	Install Flashing Yellow Arrows	$	Short-Term	Ready
	●		1.12	Close Intersection by adding Cul-de-Sac	$$	Short-Term	●
	●	●	1.13	Remove Intersection Skew Angle	$$$$	Long-Term	● ●
	●	●	1.14	Install Pedestrian Refuge Island	$$	Short-Term	Ready

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

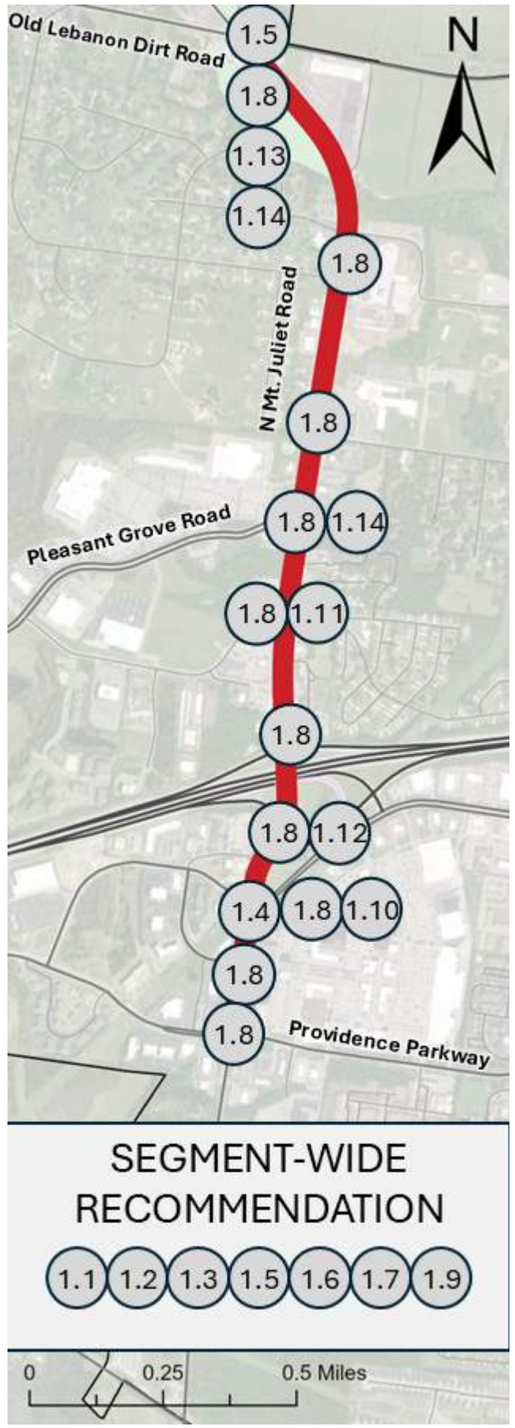
● FHWA Proven Safety Countermeasure
● Crash Modification Factors Countermeasure
● Vulnerable Road User Related Countermeasure
● Requires ROW Acquisition
● Requires Utility Relocation

Benefit Summary

- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- Roadway lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low-visibility conditions, reducing the likelihood of crashes.
- Vertical separations for bikeways, such as raised curbs or barriers, significantly increase safety by providing a physical buffer that protects cyclists from motor vehicle traffic, reducing the risk of collisions and enhancing the overall sense of security for cyclists
- Non-contiguous sidewalks enhance pedestrian safety by reducing crashes, improving comfort and accessibility, aiding traffic flow, and promoting community health.
- Correcting a skew can improve sight lines and reduce blind spots, allowing drivers to see oncoming traffic more clearly and make safer crossing or turning decisions.
- Reconfiguring a merge, turn, or taper lane at an off-ramp location can significantly enhance traffic flow, reduce congestion, and improve overall safety by providing clearer guidance for drivers and minimizing abrupt lane changes
- High-emphasis crosswalks are designed to improve pedestrian safety by making crosswalks more visible and conspicuous to drivers.



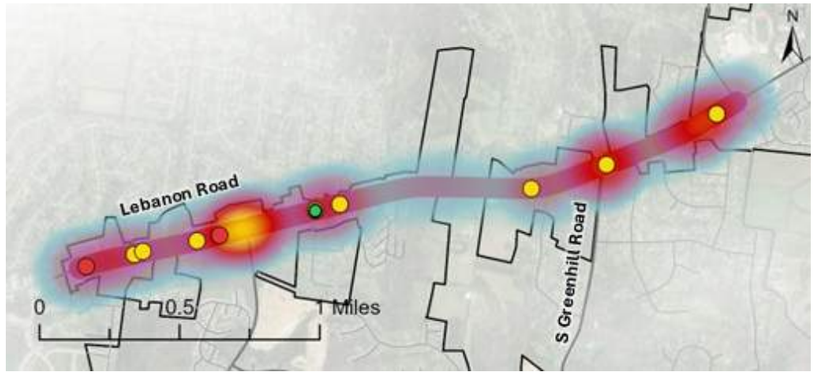
RECOMMENDED COUNTERMEASURES



Mt. Juliet Road (SR-171)
from Providence Parkway to Old Lebanon Dirt Road

Lebanon Road (SR-24)

from Pin Oak Drive to Benton Douglas Parkway



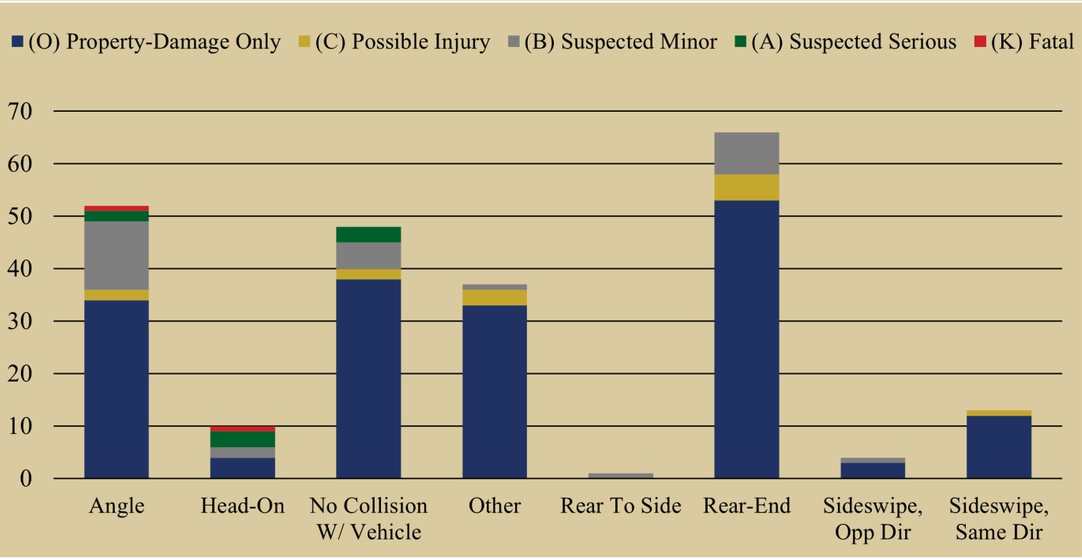
State Route

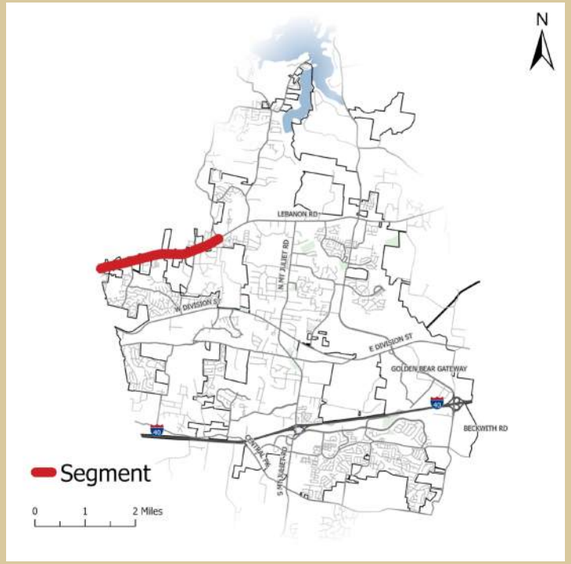
Speed Limit	45 mph
Lanes	4
Vehicles/Day	25,000
Total Crashes	233
HIN Intersections	6

Characteristics

This section of Lebanon Road is a two-way segment, divided by a Two-Way Left-Turn Lane (TWLTL). The segment experiences straight alignment, with rolling terrain. There are currently no sidewalks present on this portion of Lebanon Road.

Along Lebanon Road, Facing West, Just East of S Greenhill Road





Overall Ranking: 2

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- There is a bad blindspot on Devonshire turning on to Lebanon Road.
- People run red lights on Lebanon all the time, and there is not enough room for the turning lane onto Lebanon from S Greenhill Road.
- Identified intersections of concern include: S Greenhill Road, Springmount Boulevard, Santa Fe Trail, Grandview, Pin Oak Drive, and Devonshire Road.

Lebanon Road (SR-24)
from Pin Oak Drive to Benton Douglas Parkway

Lebanon Road (SR-24)
from Pin Oak Drive to Benton Douglas Parkway

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
	●		2.1	Install Wildlife Fencing and Obstructions to Restrict Various Cross Points	$	Short-Term	● ●
	●		2.2	Implement Appropriate Signage to Improve Driver Awareness	$	Short-Term	●
	●	●	2.3	Install Vertical Separation for Bicyclists	$$	Short-Term	Ready
●	●		2.4	Improve Corridor Access Management	$$$	Long-Term	●
●	●		2.5	Install Backplates w/ Retroreflective Borders	$	Short-Term	Ready
●	●	●	2.6	Evaluate/Upgrade Signal Timings and Coordination Plans	$	Short-Term	Ready
●	●	●	2.7	Install Pedestrian Facilities (Sidewalks/Crosswalks)	$$$	Long-Term	●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

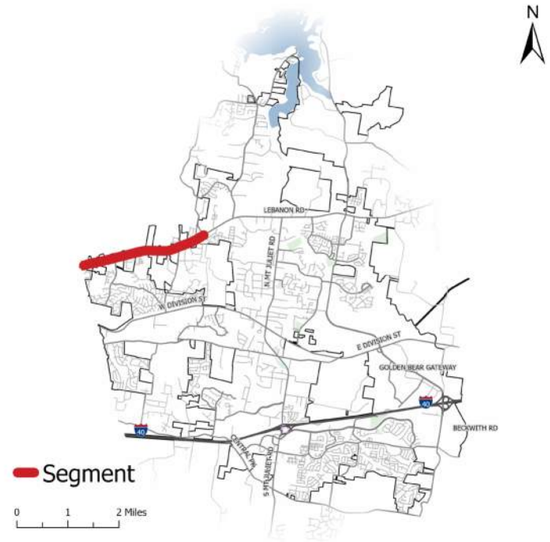
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

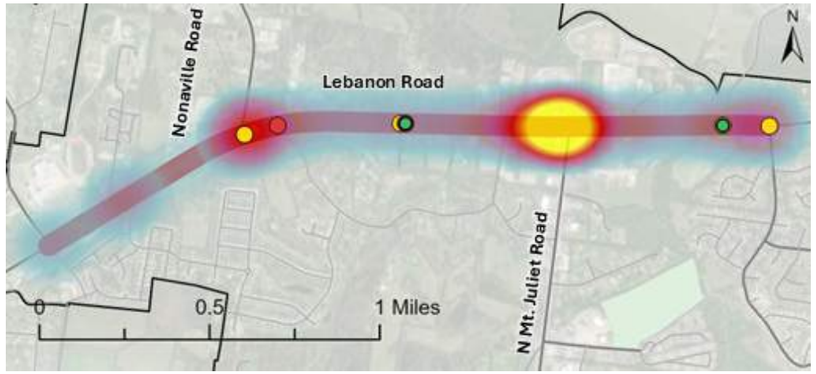
- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.
- Vertical separations for bikeways, such as raised curbs or barriers, significantly increase safety by providing a physical buffer that protects cyclists from motor vehicle traffic, reducing the risk of collisions and enhancing the overall sense of security for cyclists.
- Access management controls where vehicles can turn, thereby reducing unpredictable movements that can lead to crashes.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- Medians can prevent left-turn and head-on crashes by separating opposing traffic flows. They also facilitate better access management by controlling where vehicles can turn, thereby reducing unpredictable movements that can lead to crashes.



Lebanon Road (SR-24)
from Pin Oak Drive to Benton Douglas Parkway

Lebanon Road (SR-24)

from Benton Douglas Parkway to Park Glen Drive



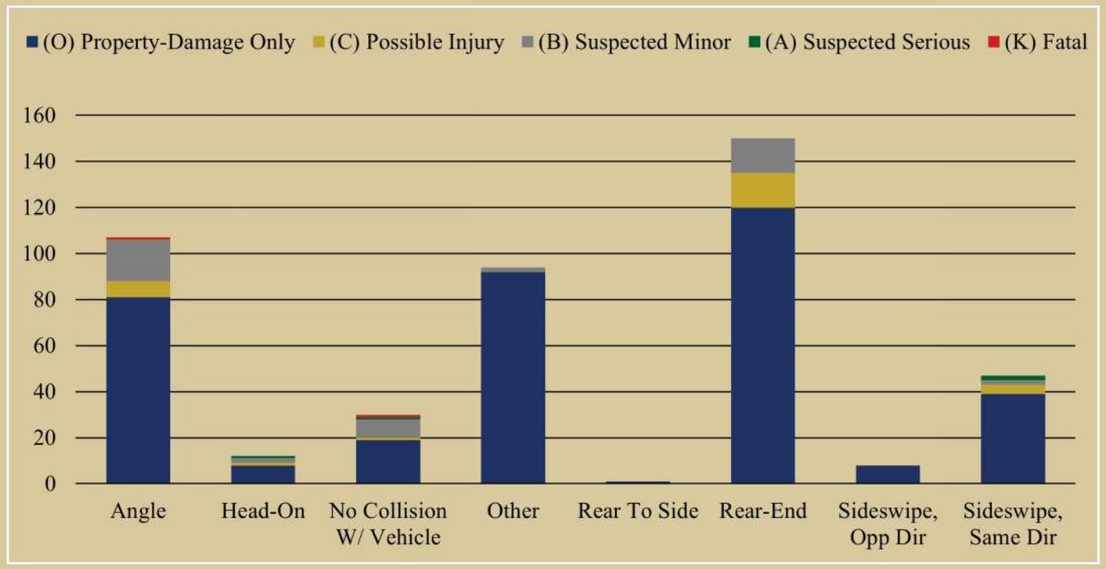
State Route

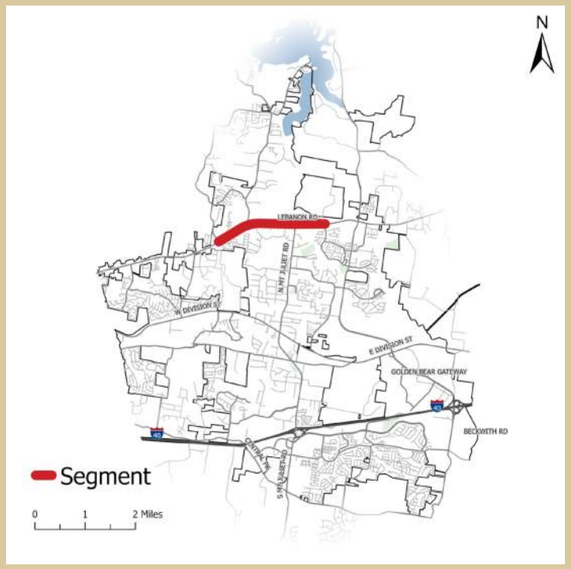
Speed Limit	40 mph
Lanes	4
Vehicles/Day	28,000
Total Crashes	425
HIN Intersections	6

Characteristics

This section of Lebanon Road is a 2-Way segment, divided by a Two-Way Left-Turn Lane (TWLTL). The segment exhibits straight alignment aside from a sharp curve at Nonaville Road, and follows a light rolling terrain. There are currently 6-ft sidewalks present on both sides of this segment, spanning from N Mt. Juliet Road to Nonaville Road. There are also partial 6-ft sidewalks near the intersection of Lebanon Road at N Greenhill Road.

Along Lebanon Road, Facing East, Just East of Lineberry Boulevard





Overall Ranking: 3

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Intersections that have safety concerns are Lebanon Road at Nonaville Road, Park Glen Drive, Market Place, and Nichols Vale Lane.

Lebanon Road (SR-24)
from Benton Douglas Parkway to Park Glen Drive

Lebanon Road (SR-24)
from Benton Douglas Parkway to Park Glen Drive

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
	●	●	3.1	Convert Sidewalks to Non-Contiguous Sidewalks	$$$$	Long-Term	● ●
●	●	●	3.2	Improve Lighting	$$	Short-Term	●
●	●	●	3.3	Install Pedestrian Hybrid Beacons at Mid-Block and Non-Signalized Intersections	$$$	Short-Term	Ready
●	●		3.4	Install Backplates w/ Retroreflective Borders	$	Short-Term	Ready
●	●	●	3.5	Evaluate/Upgrade Signal Timings and Coordination Plans	$$	Short-Term	Ready
●	●	●	3.6	Evaluate Signal Clearance Intervals	$$	Short-Term	Ready
	●	●	3.7	Increase Crosswalk Visibility	$$	Short-Term	Ready
●	●		3.8	Implement Access Management (Minimize Driveway Density)	$$$	Long-Term	● ●
	●		3.9	Install Flashing Yellow Arrows (FYAs)	$$	Short-Term	Ready

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

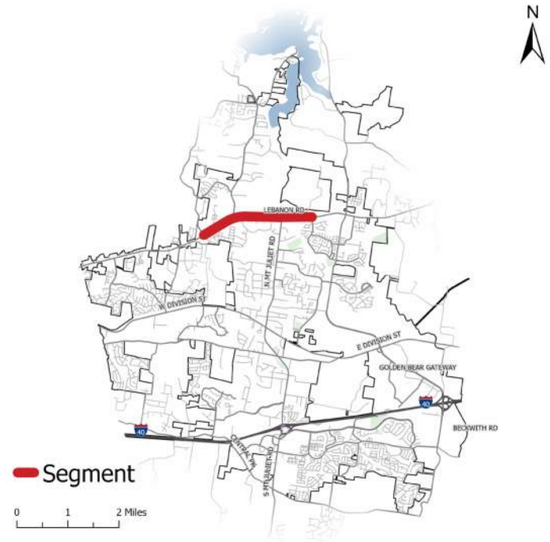
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

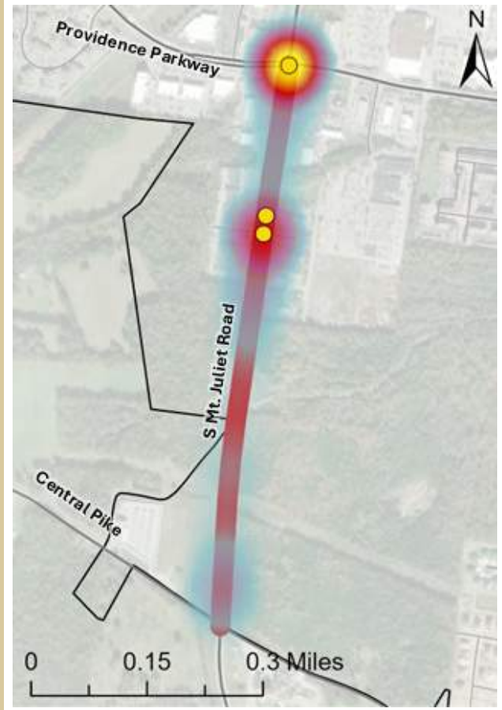
Benefit Summary

- Roadway lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low-visibility conditions, reducing the likelihood of crashes.
- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.
- High-emphasis crosswalks are deigned to improve pedestrian safety by making crosswalks more visible and conspicuous to drivers.
- Flashing yellow arrows at intersections reduce left-turn crashes, improve driver comprehension, enhance traffic flow, and increase safety for all road users.
- Non-contiguous sidewalks enhance pedestrian safety by reducing crashes, improving comfort and accessibility, aiding traffic flow, and promoting community health.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.



Lebanon Road (SR-24)
from Benton Douglas Parkway to Park Glen Drive

S Mt. Juliet Road (SR-171)
from Providence Parkway to Central Pike



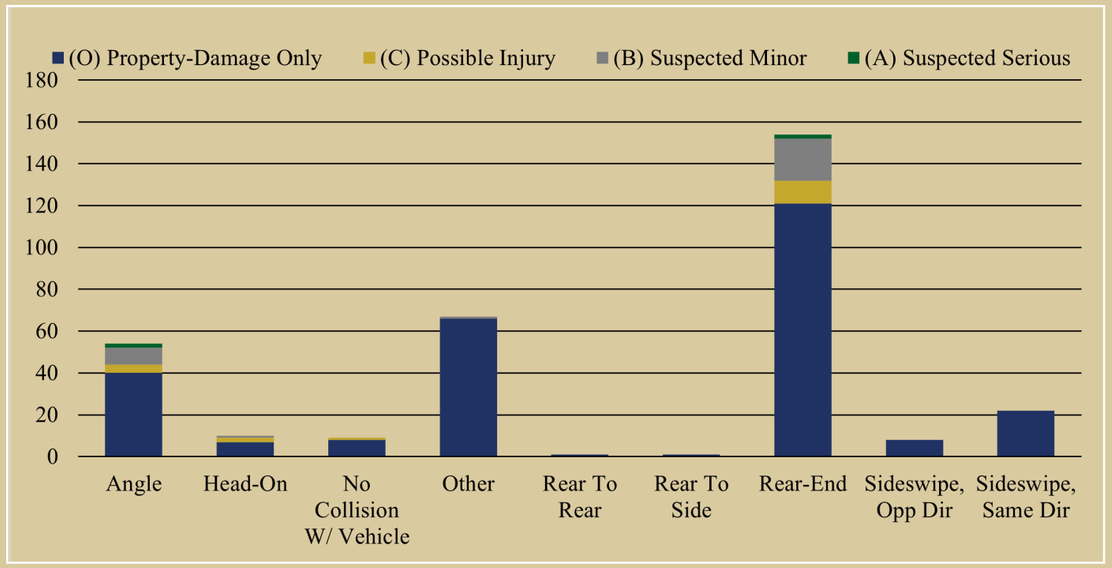
● VRU (0) ● Serious Injury (4) ● Fatal (0)

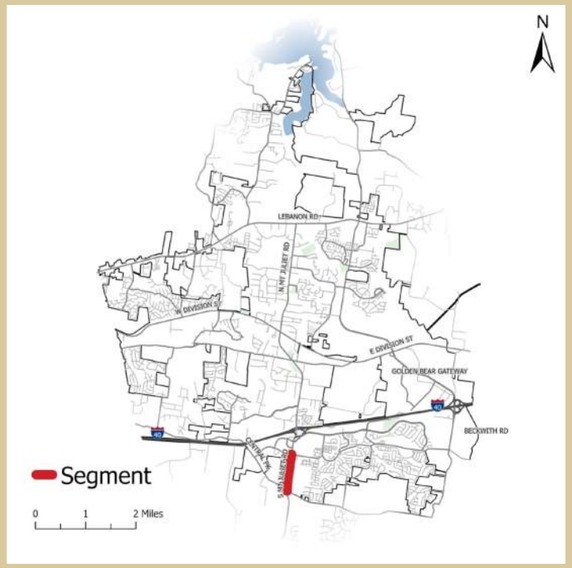
State Route

Speed Limit	40 mph
Lanes	2
Vehicles/Day	24,500
Total Crashes	280
HIN Intersections	1

Characteristics
This section of S Mt. Juliet Road is a two-way roadway, with no separation between opposing travel lanes. This segment follows a straight alignment, and experiences a rolling grade. Sidewalks are not present at any point over this segment.

Along S Mt. Juliet Road, Facing North, Just South of Graves Crossing





Overall Ranking: 4

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Need more lanes on Central Pike at intersection with S Mt. Juliet Road.
- People constantly run red lights at S Mt. Juliet Road and Central Pike.
- Light needs to be retimed at S Mt. Juliet Road and Central Pike.
- The area around S Mt. Juliet Road and Providence Parkway needs major improvements.

S Mt. Juliet Road (SR-171)
from Providence Parkway to Central Pike

S Mt. Juliet Road (SR-171)
from Providence Parkway to Central Pike

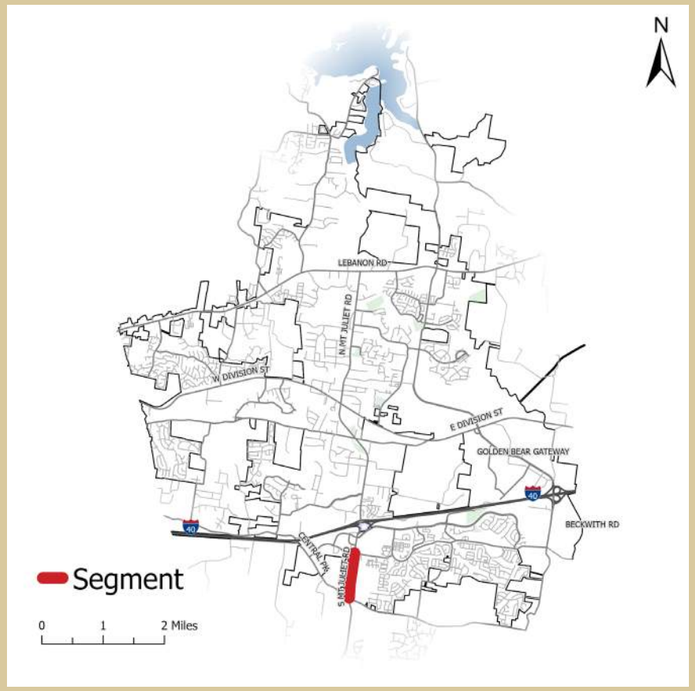
			ID	Countermeasure	Cost	Schedule	Project Readiness
	●		4.1	Widen Roadway from 2-lane to 4-lane	$$$$	Long-Term	● ●
●	●	●	4.2	Install Flashing Yellow Arrows (FYAs) on Minor-Street Approaches	$$	Short-Term	Ready
●	●	●	4.3	Evaluate/Upgrade Signal Timings and Coordination Plans	$$	Short-Term	Ready
●	●		4.4	Install Backplates w/ Retroreflective Borders	$	Short-Term	Ready
	●		4.5	Implement Appropriate Signage to Improve Driver Awareness	$	Short-Term	Ready
●	●	●	4.6	Improve Lighting	$$	Short-Term	●
●	●	●	4.7	Install High Emphasis Crosswalks & Pedestrian Facilities	$	Short-Term	Ready

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

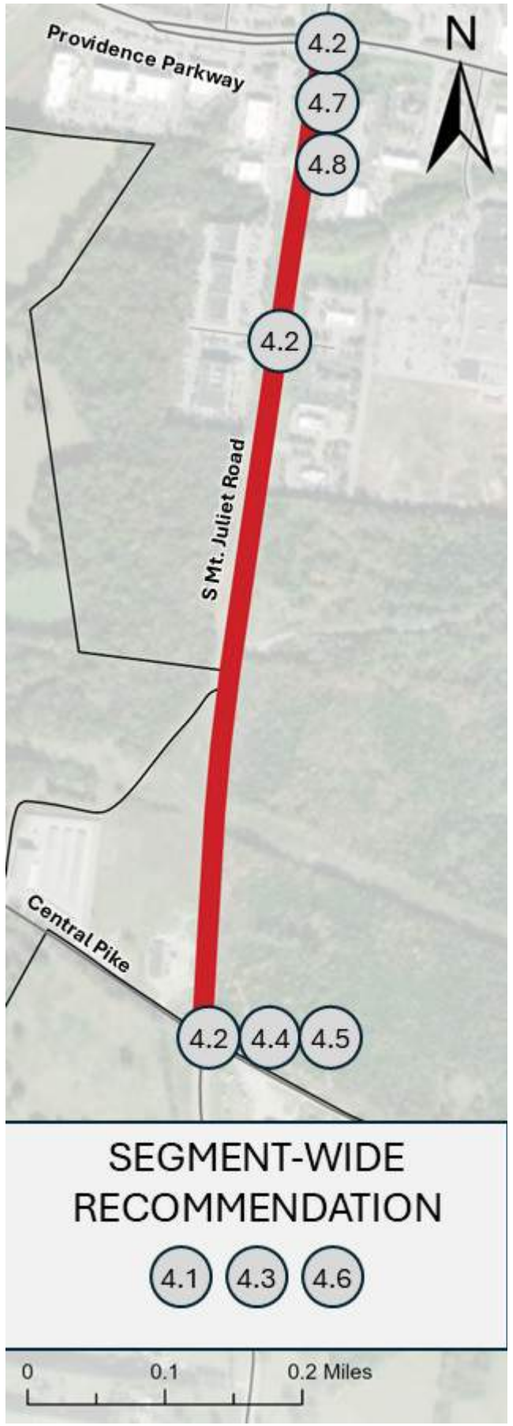
● FHWA Proven Safety Countermeasure
● Crash Modification Factors Countermeasure
● Vulnerable Road User Related Countermeasure
● Requires ROW Acquisition
● Requires Utility Relocation

Benefit Summary

- Intersection lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low-visibility conditions, reducing the likelihood of crashes.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- High-visibility crosswalks use patterns like bar pairs, continental, or ladder designs that are more noticeable to drivers from a greater distance compared to traditional crosswalks. This helps drivers see pedestrians earlier and react in time.
- With more lanes, traffic congestion is reduced, leading to smoother traffic flow. This can decrease the likelihood of rear-end collisions and other types of accidents caused by stop-and-go traffic
- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.



RECOMMENDED COUNTERMEASURES



S Mt. Juliet Road (SR-171)
from Providence Parkway to Central Pike

Golden Bear Gateway
from Beckwith Road to Rutland Drive

● VRU (0) ● Serious Injury (1) ● Fatal (1)

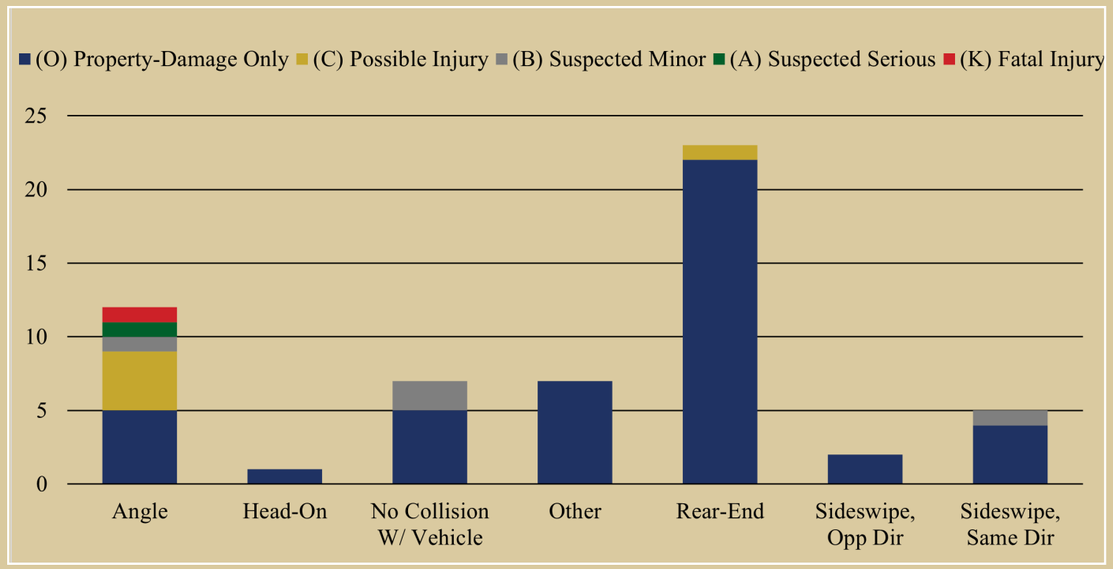
Municipal

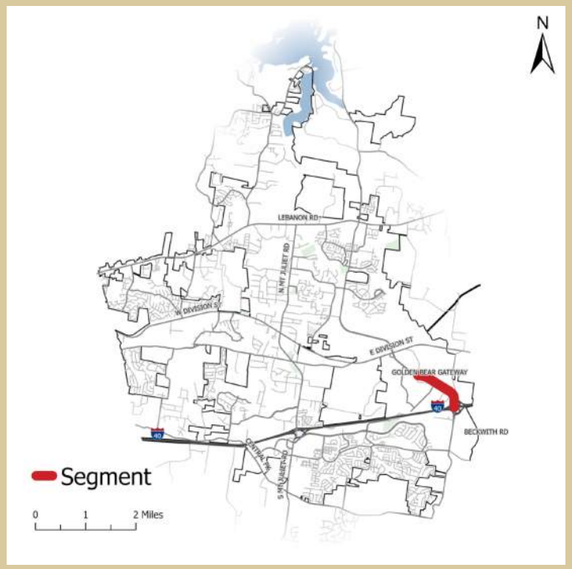
Speed Limit	45 mph
Lanes	4
Vehicles/Day	21,000
Total Crashes	58
HIN Intersections	2

Characteristics

This section of Golden Bear Gateway is a two-way roadway, divided by a 24-ft grass/striped median. This segment follows a largely curved alignment, and experiences a lightly rolling grade. Sidewalks are not present at any point over this segment.

Along Golden Bear Gateway, Facing Northwest, Just West of Legacy Point Boulevard





Overall Ranking: 5

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Beckwith Road and Golden Bear Gateway needs a stoplight
- Multiple respondents identified the intersection with Beckwith Road is a safety concern

Golden Bear Gateway
from Beckwith Road to Rutland Drive

Golden Bear Gateway
from Beckwith Road to Rutland Drive

	ID	Countermeasure	Cost	Schedule	Project Readiness
● ●	5.1	Install Edge line Rumble Strips	$$	Short-Term	Ready
●	5.2	Install Turn & Merge Lanes	$	Short-Term	● ●
●	5.3	Extend Median to Restrict Illegal Turning Movements	$$	Short-Term	Ready
● ● ●	5.4	Evaluate/Upgrade Signal Timings and Coordination Plans	$	Short-Term	Ready
● ● ●	5.5	Install Crosswalk & Signage Along Multi-Use Path	$	Short-Term	●
● ● ●	5.6	Realign Beckwith Road to Connect to Golden Bear Gateway at Legacy Pointe Boulevard or Volunteer Boulevard	$$$	Long-Term	● ●
● ● ●	5.7	Convert Beckwith Road to Right-In Right-Out (RIRO)	$	Short-Term	Ready
● ● ●	5.8	Install Multi-Use Paths	$$$	Mid-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

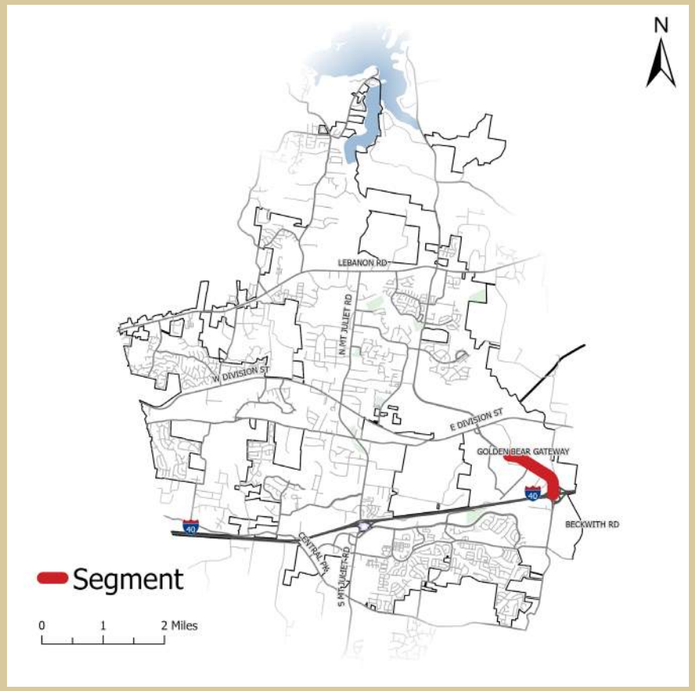
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.
- Medians can prevent left-turn and head-on crashes by separating opposing traffic flows. They also facilitate better access management by controlling where vehicles can turn, thereby reducing unpredictable movements that can lead to crashes.
- Crosswalks make pedestrians and cyclists more visible to drivers, especially at intersections and midblock crossings. This increased visibility helps reduce the risk of accidents.
- Rumble strips are particularly useful for alerting drowsy or distracted drivers, helping them to regain control of their vehicle before a potential accident. Centerline rumble strips help prevent head-on collisions by alerting drivers who may be crossing the centerline.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.



RECOMMENDED COUNTERMEASURES

Golden Bear Gateway
from Beckwith Road to Rutland Drive

N Mt. Juliet Road (SR-171)
from Old Lebanon Dirt Road to Lebanon Road

VRU (0) Serious Injury (3) Fatal (0)

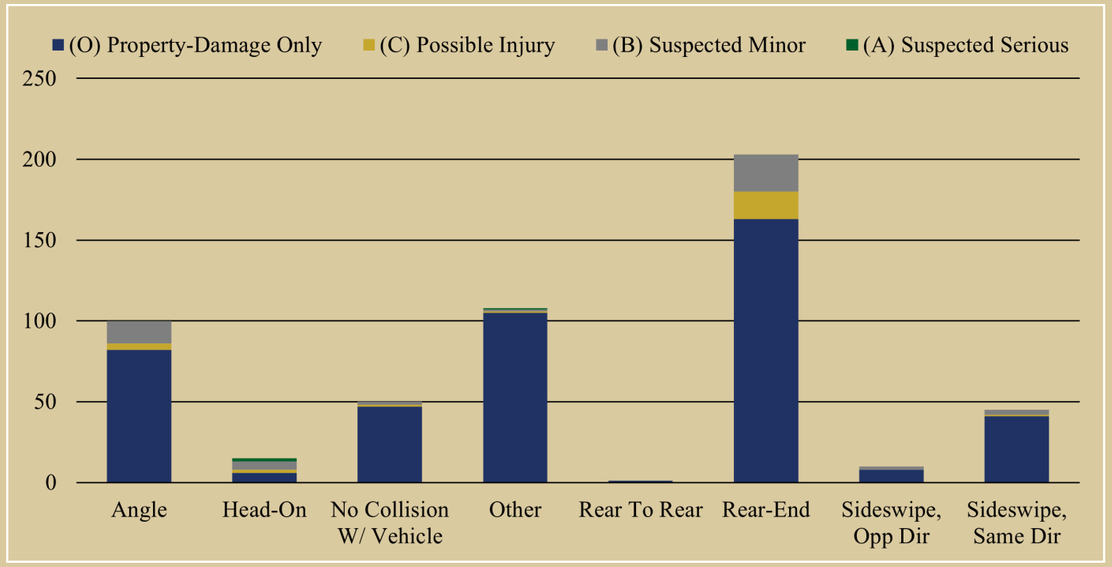
State Route

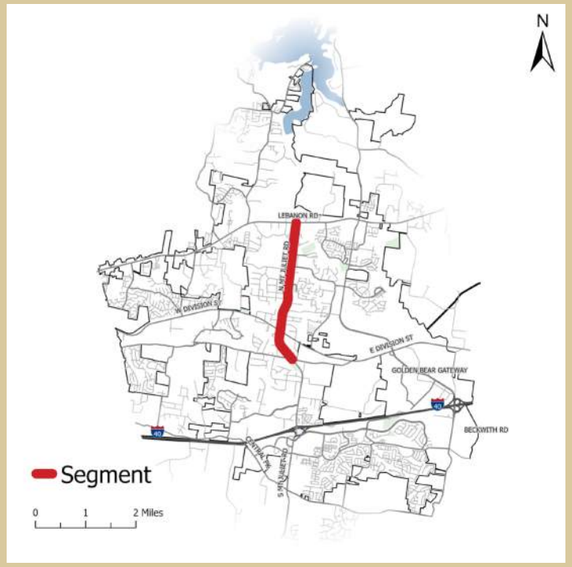
Speed Limit	40 mph
Lanes	4
Vehicles/Day	33,700
Total Crashes	527
HIN Intersections	3

Characteristics

This section of N Mt. Juliet Road is a two-way roadway, divided by a two-way left-turn lane (TWLTL). This segment follows a largely straight alignment, with a large curved section towards the southern end of the segment, and experiences a rolling grade. Sidewalks are present on both sides of the roadway along the entire length of this segment.

Along N Mt. Juliet Road, Facing North, Just South of Physician's Plaza Way





Overall Ranking: 6

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Folks illegally turn into slim chickens from N Mt. Juliet Road going south. This needs a barrier.
- Getting out of the library (by Due W Drive), post office (by Curd Road), and the Christmas Place (by Industrial Drive) are difficult.
- There are too many private drives around N Mt. Juliet Road and Lebanon Road.
- Light/crosswalk is needed at Oakhall Drive.
- Add lights/crosswalk/multimodal infrastructure along with new city hall development and Sprouts development to create a more walkable area.
- Other concerning intersections are N Mt. Juliet Road at Sunset Drive, Charlie Daniels Parkway, W Division Street, and the Railroad Crossing.

N Mt. Juliet Road (SR-171)
from Old Lebanon Dirt Road to Lebanon Road

N Mt. Juliet Road (SR-171)
from Old Lebanon Dirt Road to Lebanon Road

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●		6.1	Install Raised Pavement Markers (RPMs)	$	Short-Term	Ready
	●	●	6.2	Install Vertical Separation for Bicyclists	$$	Short-Term	Ready
●	●	●	6.3	Implement Road Diets (11' Lanes, Buffered Bike Lanes, Lower Speed Limits, Street Trees)	$$	Short-Term	●
●	●	●	6.4	Install Pedestrian Hybrid Beacons at Mid-Block and Non-Signalized Intersections	$$$	Short-Term	Ready
●	●	●	6.5	Evaluate Signal Clearance Intervals	$$	Short-Term	Ready
●	●	●	6.6	Evaluate/Upgrade Signal Timings and Coordination Plans	$$	Short-Term	Ready
●	●		6.7	Install Backplates w/ Retroreflective Borders	$	Short-Term	Ready
	●	●	6.8	Increase Crosswalk Visibility	$$	Short-Term	Ready
	●	●	6.9	Install a Traffic Signal, when warranted	$$$	Short-Term	● ●
			6.10	Upgrade East to West Push-Button	$	Short-Term	Ready
	●	●	6.11	Install Pedestrian Refuge Island	$$	Short-Term	Ready
	●		6.12	Install Flashing Yellow Arrows (FYAs)	$$	Short-Term	Ready
	●	●	6.13	Remove Intersection Skew Angle	$$$$	Long-Term	● ●
	●		6.14	Upgrade/Repair At-Grade Rail Crossing	$$	Mid-Term	Ready
●	●		6.15	Install Turn Lanes (Right & Left)	$$$	Long-Term	●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

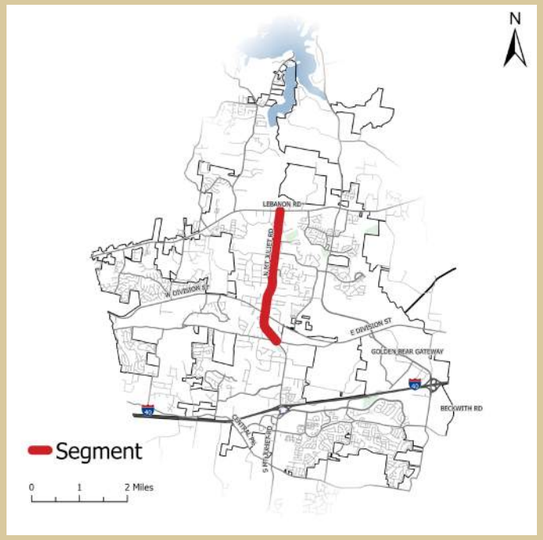
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

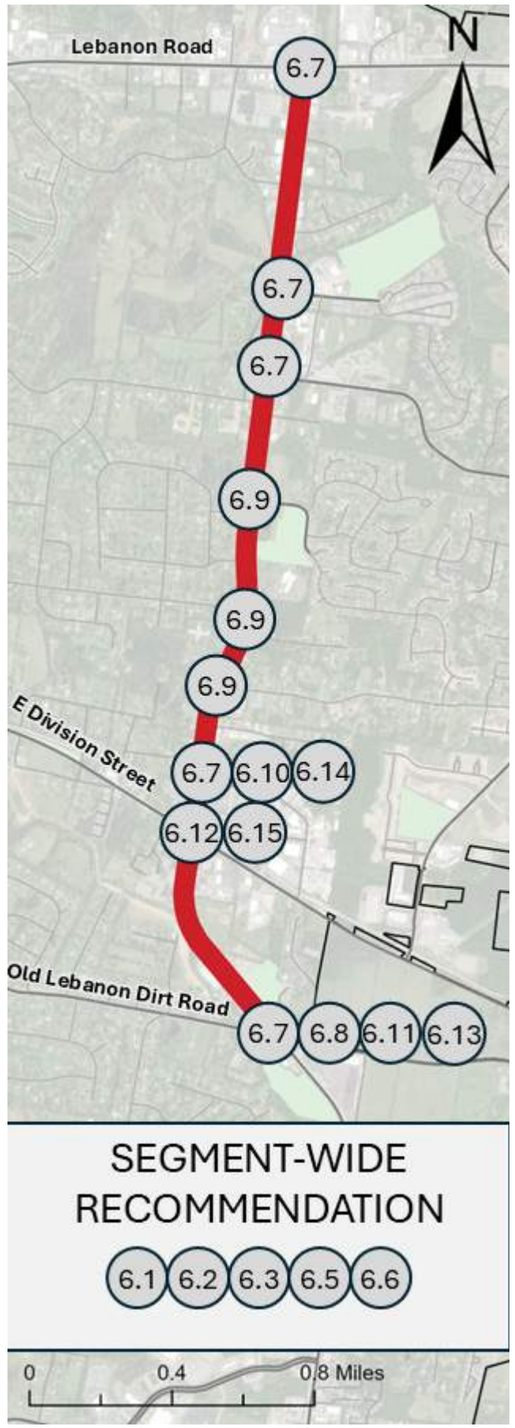
● Requires Utility Relocation

Benefit Summary

- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.
- Correcting a skew can improve sight lines and reduce blind spots, allowing drivers to see oncoming traffic more clearly and make safer crossing or turning decisions.
- Flashing yellow arrows at intersections reduce left-turn crashes, improve driver comprehension, enhance traffic flow, and increase safety for all road users.
- High-emphasis crosswalks are designed to improve pedestrian safety by making crosswalks more visible and conspicuous to drivers.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- A road diet, which involves reducing the width of vehicular lanes and repurposing the extra roadway width for other modes of travel, typically results in lower vehicle speeds, fewer conflict points, and safer accommodations for pedestrians and cyclists.

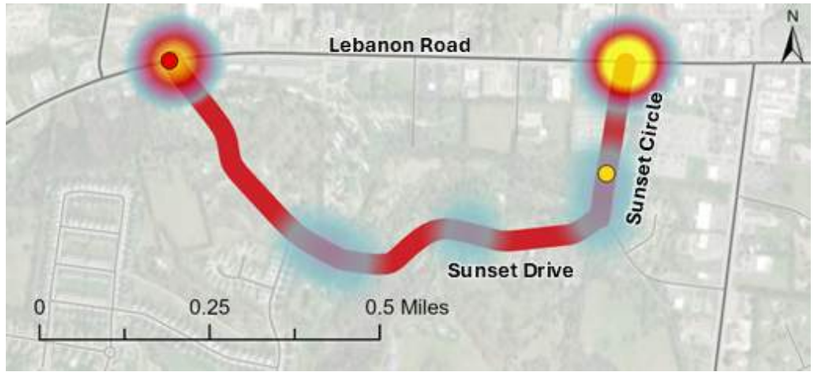


RECOMMENDED COUNTERMEASURES



N Mt. Juliet Road (SR-171)
from Old Lebanon Dirt Road to Lebanon Road

Sunset Drive/Circle
from Lebanon Road to Lebanon Road



VRU (0)
Serious Injury (1)
Fatal (0)

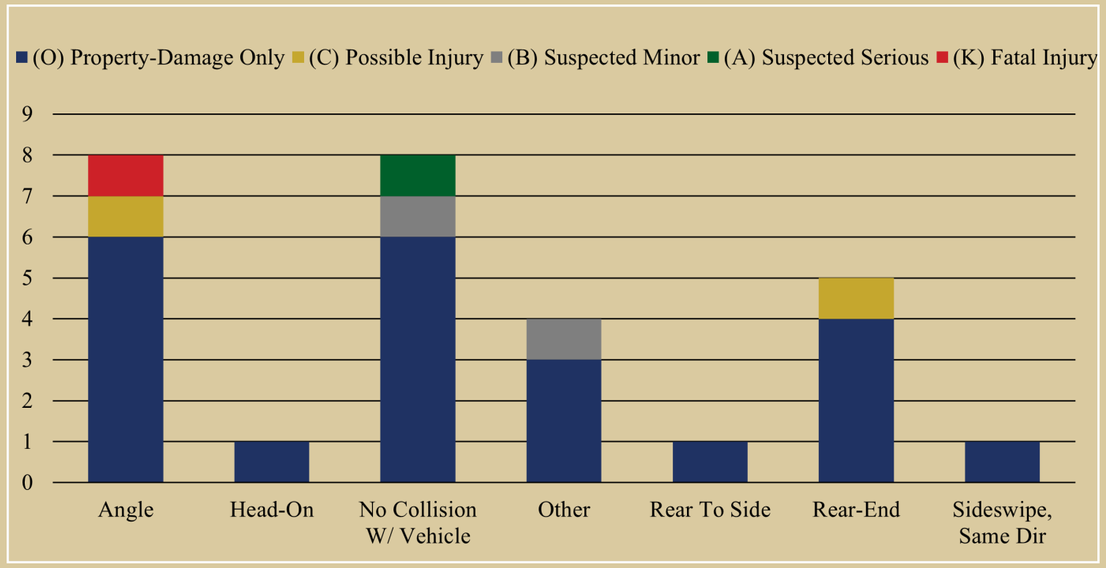
Municipal

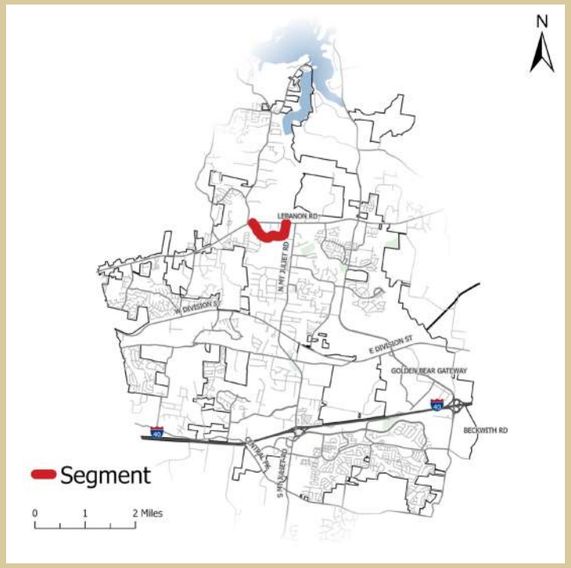
Speed Limit	30 mph
Lanes	2
Vehicles/Day	1,500
Total Crashes	28
HIN Intersections	1

Characteristics

Sunset Circle is a two-way segment, with no separation between opposing travel lanes. The segment experiences a curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Sunset Circle.

Along Sunset Circle, Facing East, Just West of Sunset Drive





Overall Ranking: 7

Ranking Index

Fatal & Serious Injury Crashes: low — high

Vulnerable Road User Crashes: low — high

Crash Rate: low — high

Replica Risk Index: low — high

Equity Consideration: low — high

Community Input

- Segment from Watermark Way to N Mt. Juliet Road is a concern.

Sunset Drive/Circle
from Lebanon Road to Lebanon Road

Sunset Drive/Circle
from Lebanon Road to Lebanon Road

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●		7.1	Install/Extend Guardrail	$$	Long-Term	● ●
●	●	●	7.2	Widen Lanes & Pave 2’ Shoulders	$$$$	Long-Term	● ●
	●		7.3	Install Advance Warning Signage for Single-Lane Bridge	$	Short-Term	●
●	●		7.4	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
	●	●	7.5	Realign Intersection to Correct Skew	$$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

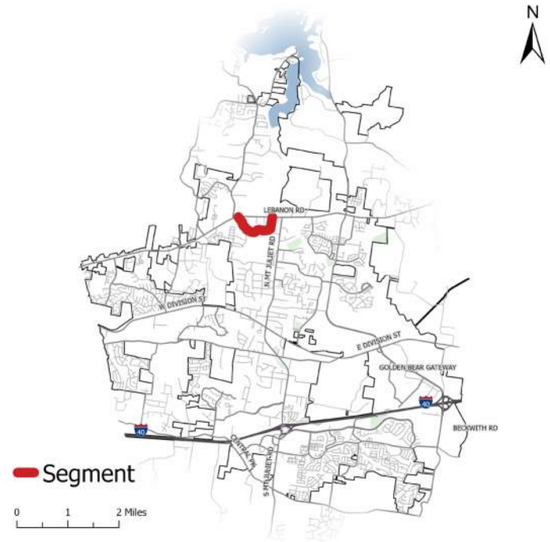
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

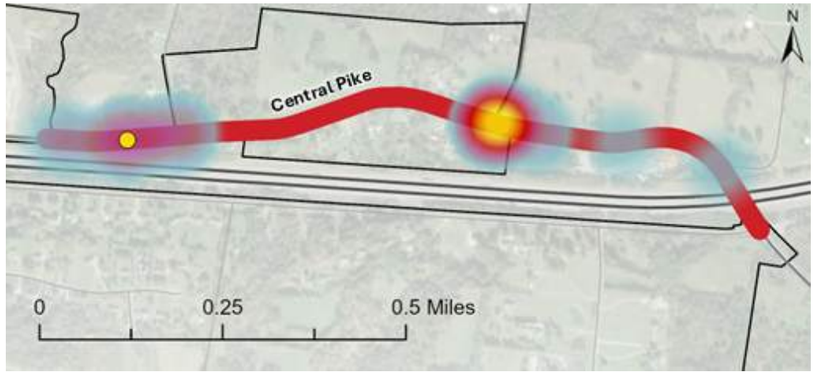
Benefit Summary

- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.
- Realignment can provide more space for turning lanes and improve the geometry of the intersection, making it safer and easier for vehicles to turn. By adjusting the angles at which roads intersect, realignment can reduce the number of conflict points where vehicles paths cross. This decreases the potential for crashes.
- Guardrails are designed to absorb and dissipate the energy of a crash, reducing the impact force on the vehicle and its occupants. This can significantly lower the risk of serious injuries or fatalities.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.



Sunset Drive/Circle
from Lebanon Road to Lebanon Road

Central Pike
from John Wright Road to John Hagar Road



- VRU (0)
- Serious Injury (1)
- Fatal (0)

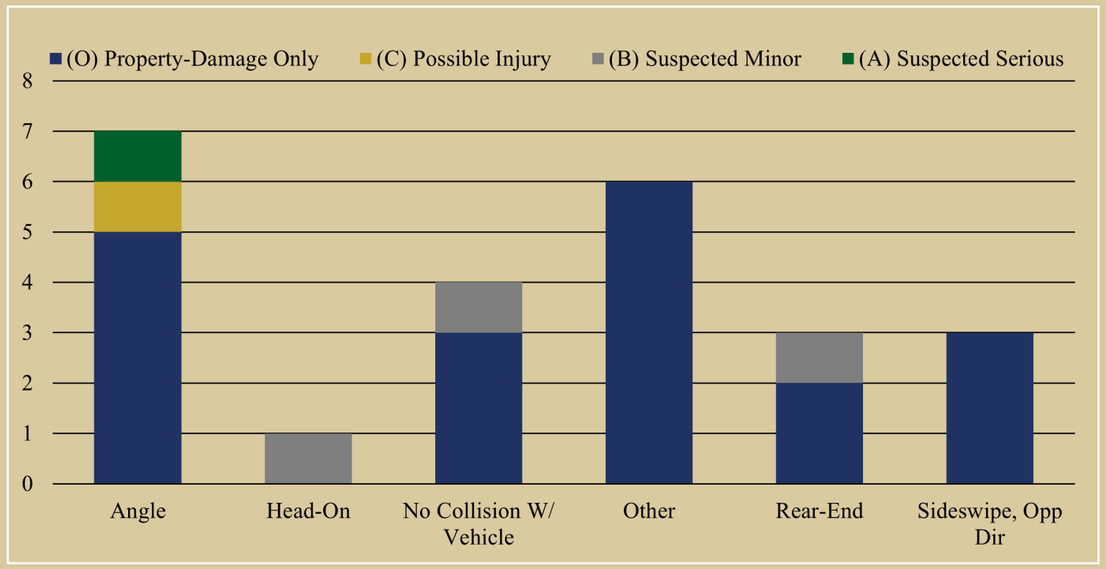
State Route

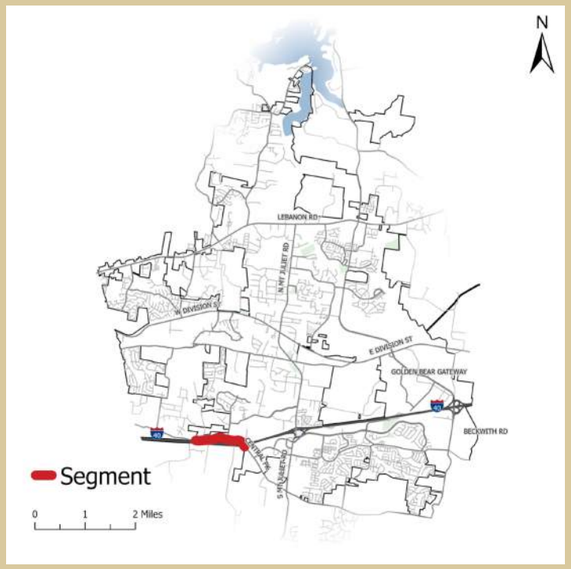
Speed Limit	35 mph
Lanes	2
Vehicles/Day	6,000
Total Crashes	23
HIN Intersections	0

Characteristics

This section of Central Pike is a two-way segment, with no separation between opposing lanes of travel. The segment experiences a curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Central Pike.

Along Central Pike, Facing East, Just West of John Wright Road





Overall Ranking: 8

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

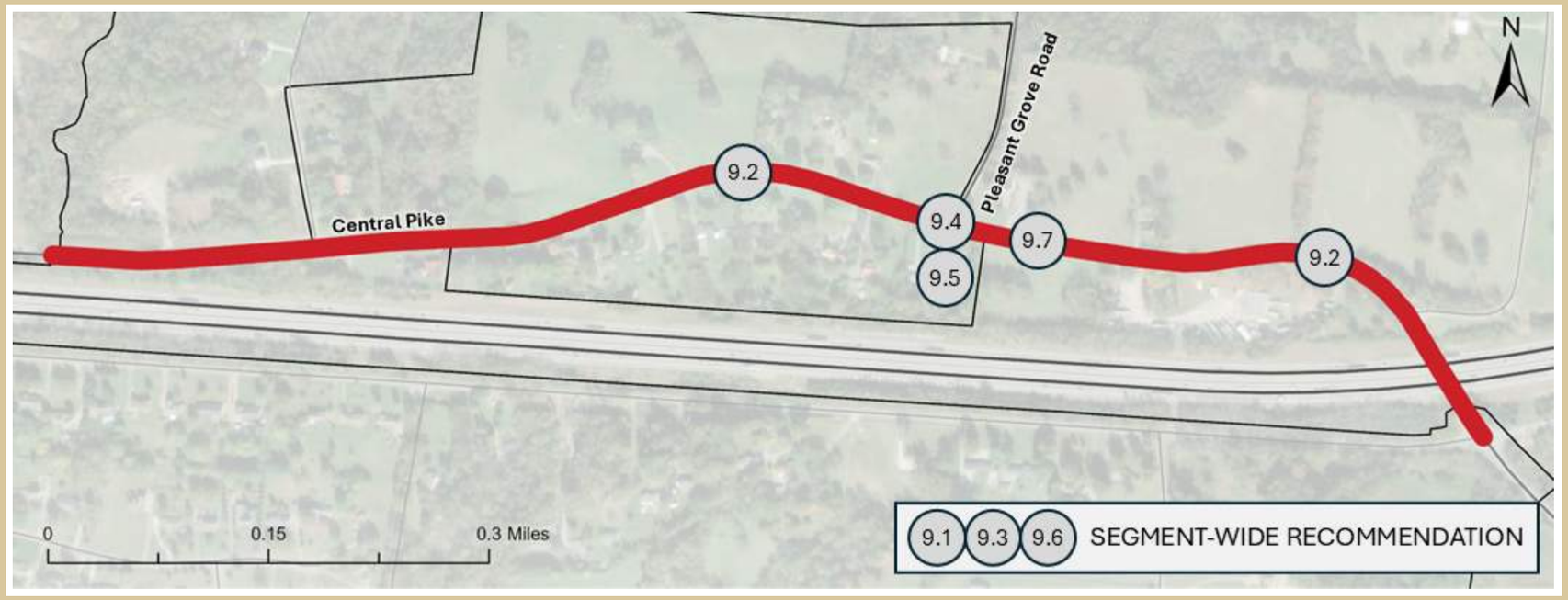
Community Input

- Implement roundabout around Central Pike, John Hager Road, and Adams Lane to improve safety and lessen traffic. Additional roundabout around Central Pike and Pleasant Grove Road, which has been extremely dangerous for drivers driving out from Pleasant Grove Road due to blindsided uphill roads on Central Pike.
- Turning left onto Central Pike from Pleasant Grove is difficult and visibility is awful. Please put a stoplight there.
- Intersection with Pleasant Grove Road is a major concern.

Central Pike
from John Wright Road to John Hagar Road

Central Pike (SR-265)
from John Wright Road to John Hagar Road

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	9.1	Widen Lanes & Pave 2’ Shoulder	$$$	Long-Term	● ●
●	●		9.2	Install Curve Warning/Feedback Signage	$	Short-Term	Ready
●	●		9.3	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
	●		9.4	Install a Traffic Signal, when warranted	$$$$	Long-Term	● ●
	●		9.5	Install Raised Pavement Markers on Minor Street Approach	$	Short-Term	Ready
●	●	●	9.6	Install Multi-Use Path	$$$	Long-Term	● ●
	●		9.7	Improve Sight Distance	$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

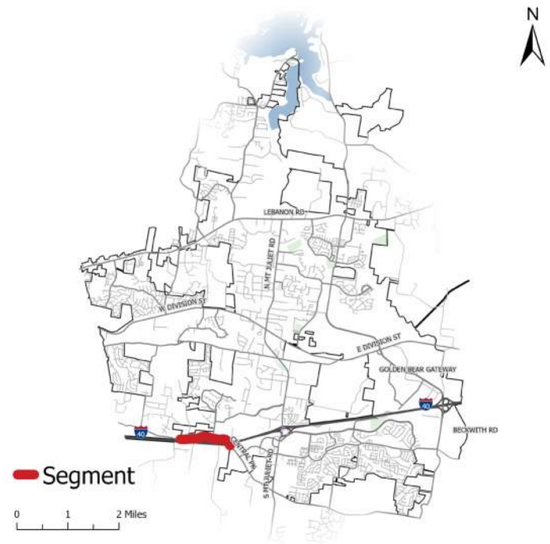
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

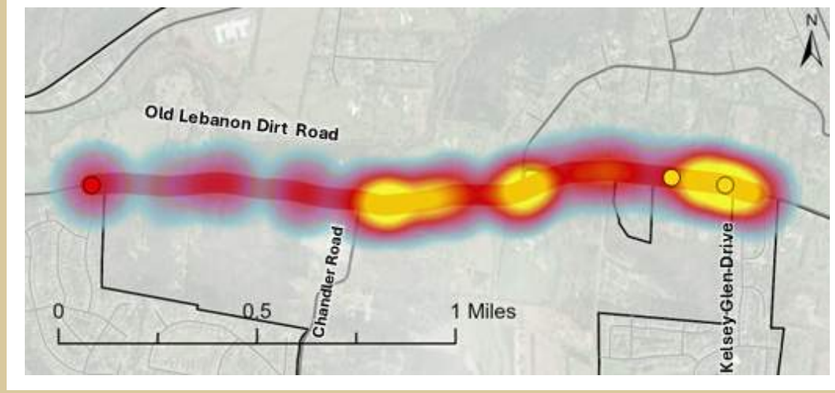
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.
- By adjusting the angles at which roads intersect, realignment can reduce the number of conflict points where vehicles paths cross. This decreases the potential for crashes.
- RPMs provide clear, reflective cues that help drivers maintain proper lane discipline, especially in low-light conditions and adverse weather such as fog, rain, or snow.
- Rumble strips are particularly useful for alerting drowsy or distracted drivers, helping them to regain control of their vehicle before a potential accident.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.



Central Pike
from John Wright Road to John Hagar Road

Old Lebanon Dirt Road

from Nighthawk Lane to Kelsey Glen Drive



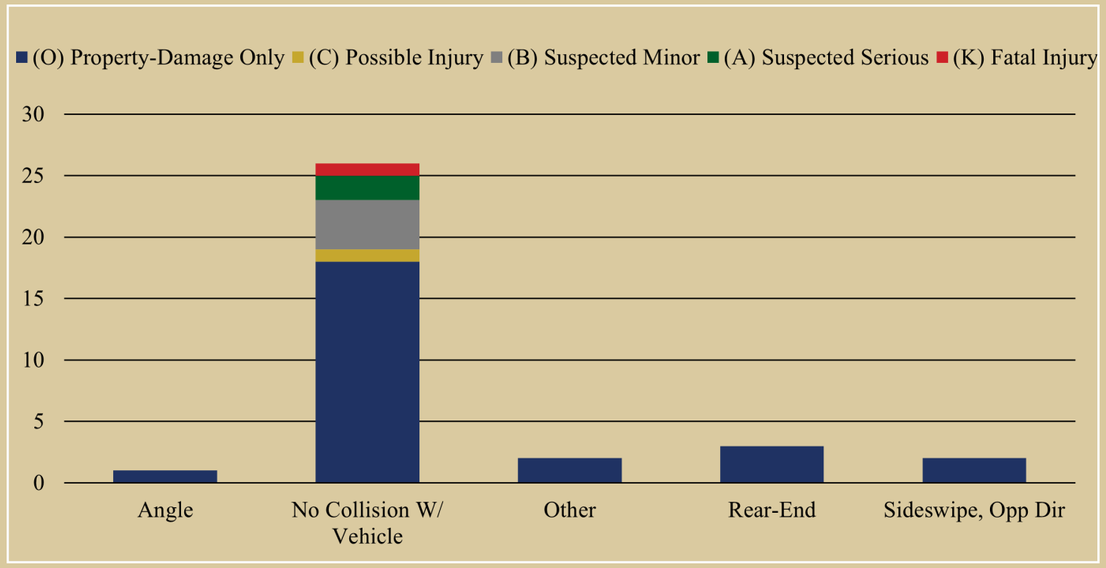
Municipal

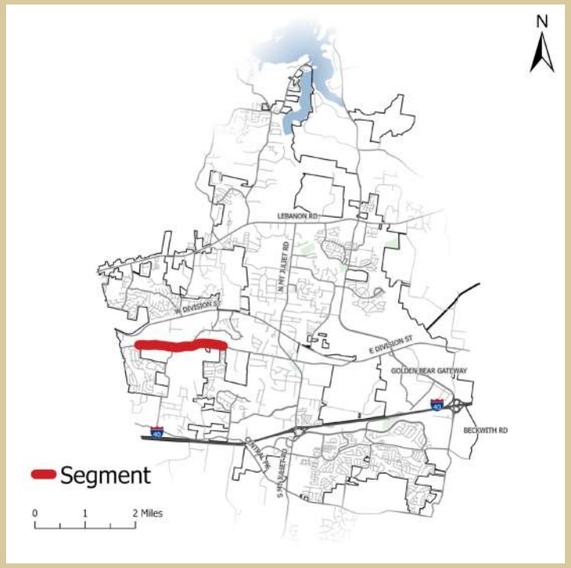
Speed Limit	35 mph
Lanes	2
Vehicles/Day	6,000
Total Crashes	31
HIN Intersections	1

Characteristics

This section of Old Lebanon Dirt Road is a 2-Way segment, with no separation between opposing travel lanes. The segment experiences a lightly curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Old Lebanon Dirt Road.

Along Old Lebanon Dirt Road, Facing East, Just East of Nighthawk Lane





Overall Ranking: 9

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

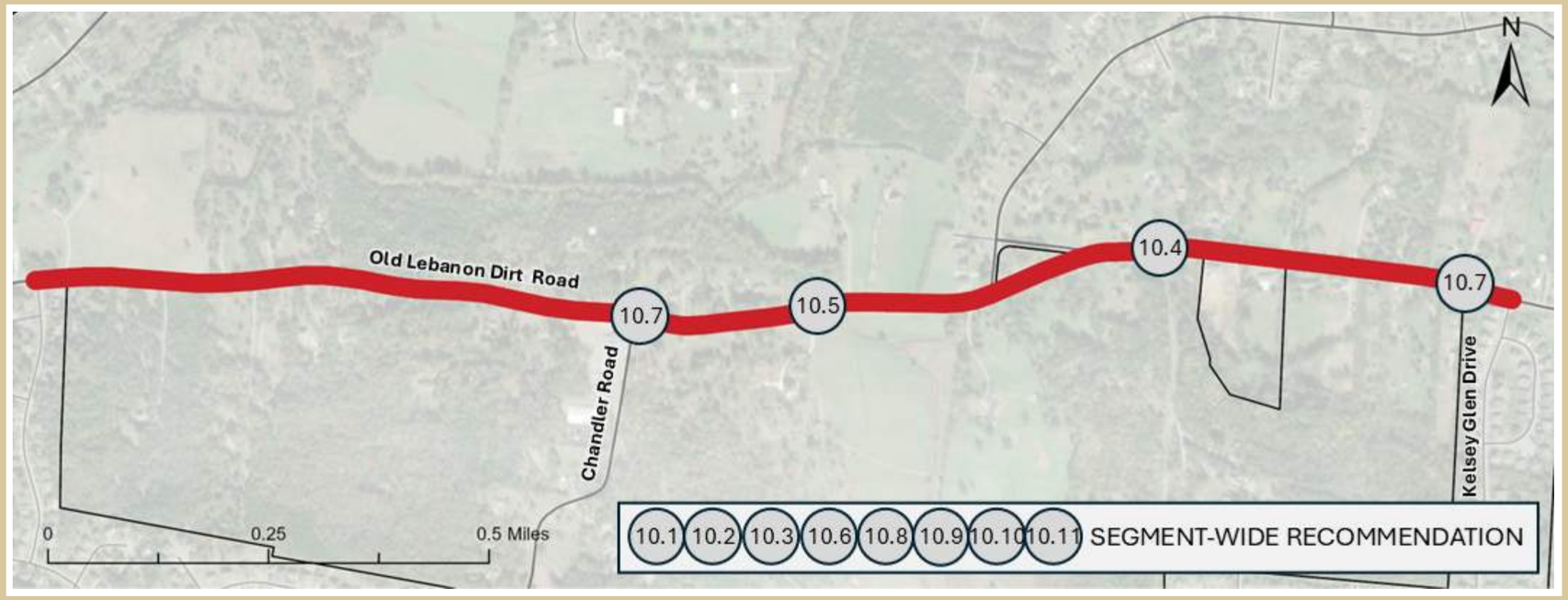
Community Input

- Intersection of Old Lebanon Dirt Road and Chandler Road is a concerning intersection.

Old Lebanon Dirt Road
from Nighthawk Lane to Kelsey Glen Drive

Old Lebanon Dirt Road
from Nighthawk Lane to Kelsey Glen Drive

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	10.1	Widen Lanes & Pave 2’ Shoulder	$$$	Long-Term	● ●
●	●		10.2	Install/Extend Guardrail, where warranted	$$	Short-Term	● ●
●	●		10.3	Install Combination Centerline / Edge line Rumble Strips	$$$	Short-Term	Ready
	●		10.4	Clear and Grub to Optimize Driver Sight Distance (15 ft Both Sides of Road)	$$	Short-Term	●
	●		10.5	Install Raised Pavement Markings (RPMs)	$$	Short-Term	Ready
●	●		10.6	Install Various Pavement Friction Applications	$$	Short-Term	Ready
●	●	●	10.7	Improve Lighting	$$$	Short-Term	Ready
●	●		10.8	Install Curve Feedback Signage	$	Short-Term	Ready
●	●	●	10.9	Install Multi-Use Path	$$$	Long-Term	● ●
●	●	●	10.10	Install a Two-Way Left-Turn Lane (TWLTL)	$$$$	Long-Term	● ●
●	●	●	10.11	Correct Horizontal & Vertical Geometry of Roadway	$$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

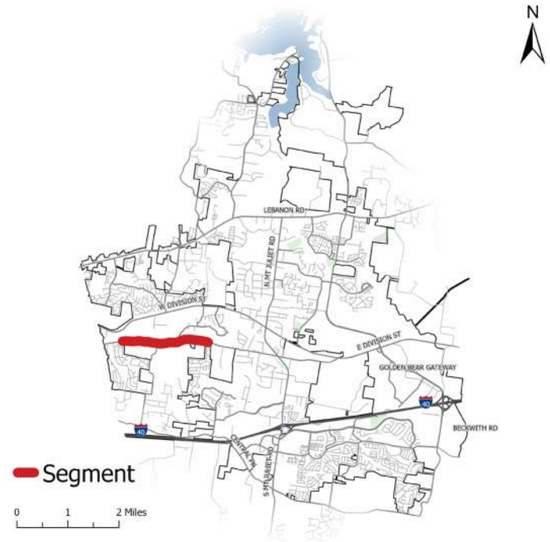
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

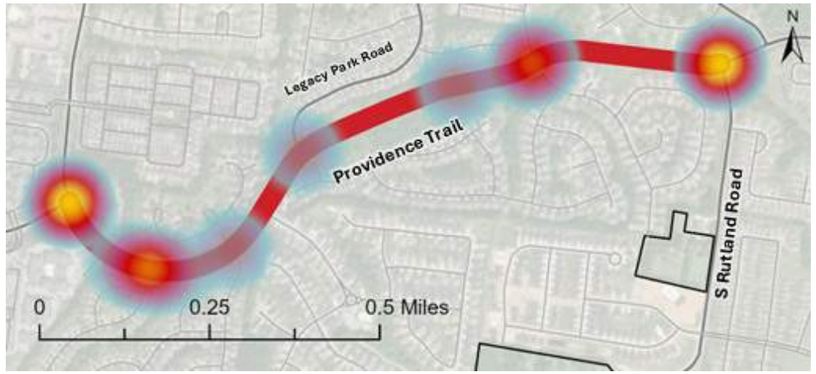
Benefit Summary

- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.
- RPMs are highly reflective, making them visible at night and during adverse weather conditions like fog, rain, or snow. This helps drivers stay within their lanes and navigate more safely. RPMs are durable and require minimal maintenance compared to traditional road markings, making them a cost-effective solution for long-term highway management
- By increasing the friction between tires and the road surface, these treatments can significantly reduce the number of crashes, particularly at high-risk locations like curves, intersections, and steep grades.
- Grooved edge/centerlines provide tactile and auditory feedback to drivers when their vehicle strays from the lane, helping to reduce the risk for roadway departure crashes and head-on collisions.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.



Old Lebanon Dirt Road
from Nighthawk Lane to Kelsey Glen Drive

Providence Trail
from Providence Parkway to S Rutland Road



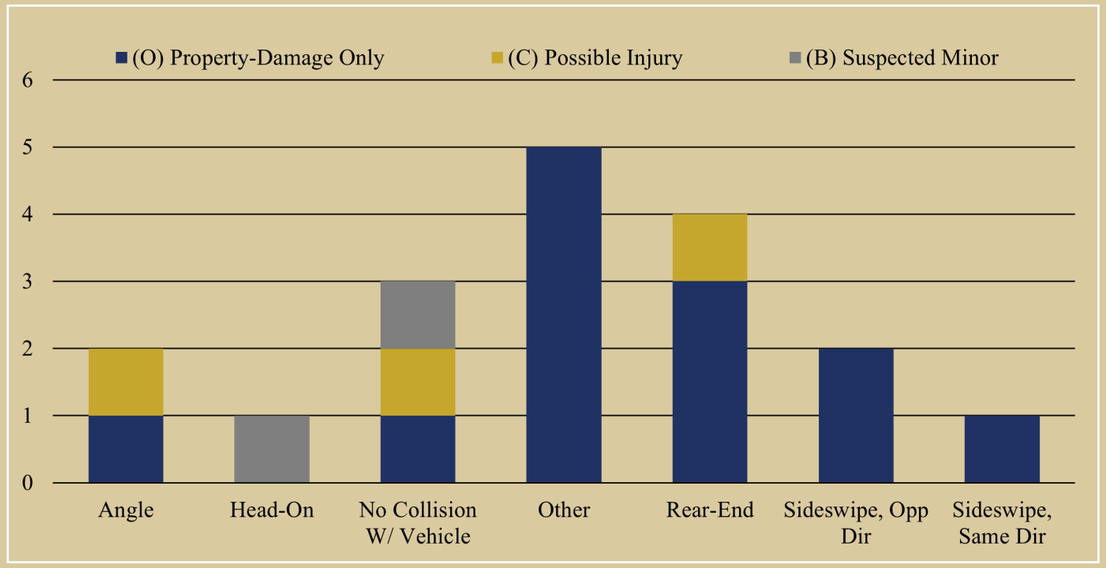
Municipal

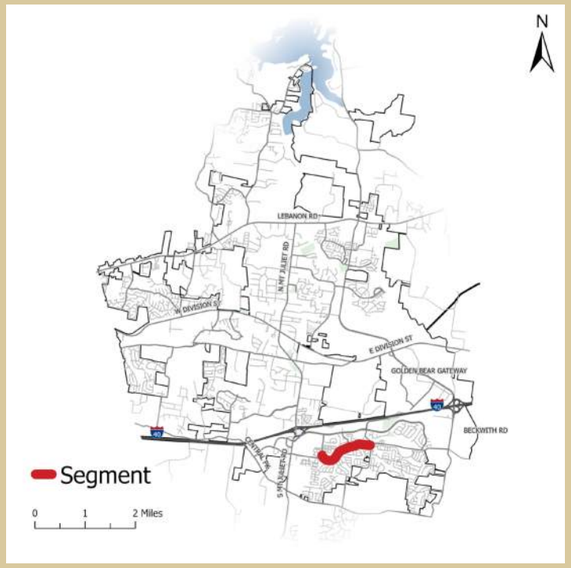
Speed Limit	30 mph
Lanes	2
Vehicles/Day	5,000
Total Crashes	18
HIN Intersections	0

Characteristics

This section of Providence Trail is a two-way segment, with no separation between opposing travel lanes. The segment experiences a curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Providence Trail.

Along Providence Trail, Facing East, Just East of Baird Farms Boulevard





Overall Ranking: 10

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

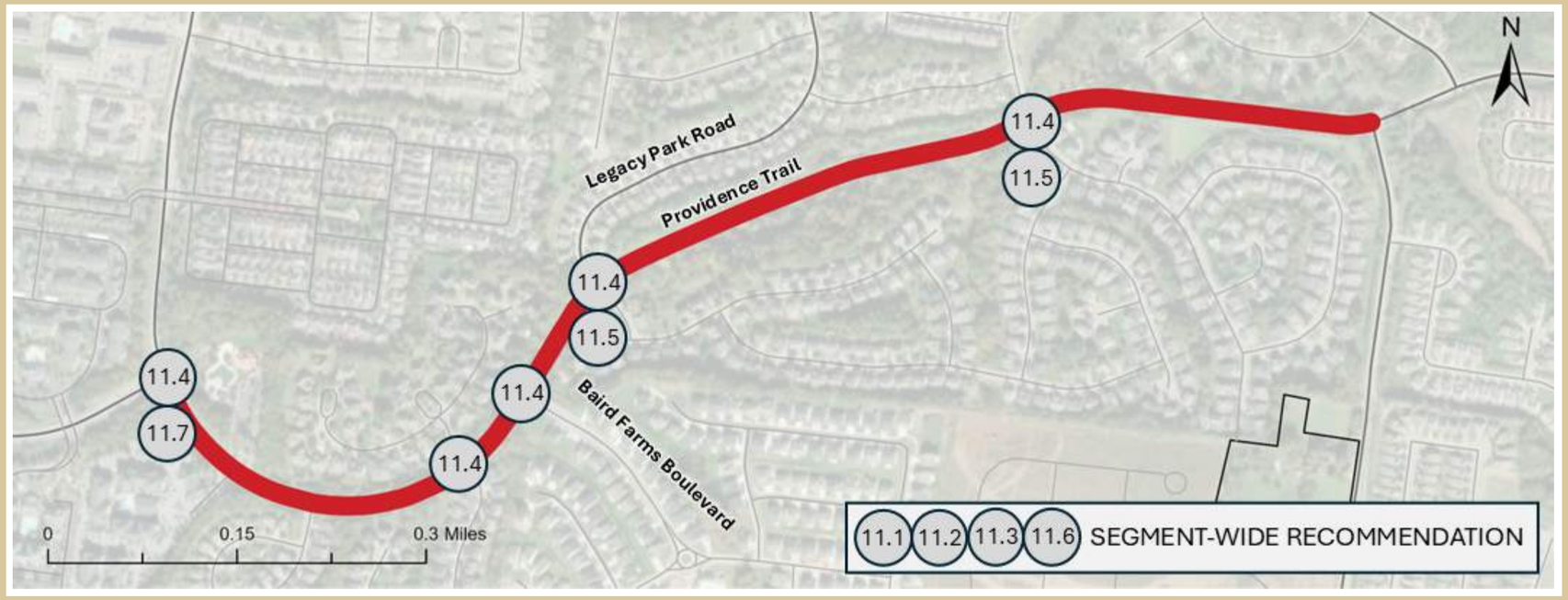
Community Input

- Concerning intersections include Providence Trail at Providence Parkway, South Rutland Road, and Arbor Springs Drive.

Providence Trail
from Providence Parkway to S Rutland Road

Providence Trail
from Providence Parkway to S Rutland Road

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●		11.1	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
	●		11.2	Install Raised Pavement Markings in Advance of Intersections	$	Short-Term	Ready
●	●		11.3	Implement Various Speed Reducing Countermeasures	$$	Short-Term	Ready
●	●	●	11.4	Install Rectangular Rapid Flashing Beacons (RRFBs)	$	Short-Term	Ready
	●		11.5	Upgrade Striping & Signage at Minor Street Approaches	$	Short-Term	Ready
	●		11.6	Install Raised Medians between Opposing Travel Lanes	$$	Short-Term	● ●
●	●	●	11.7	Install Roundabout	$$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

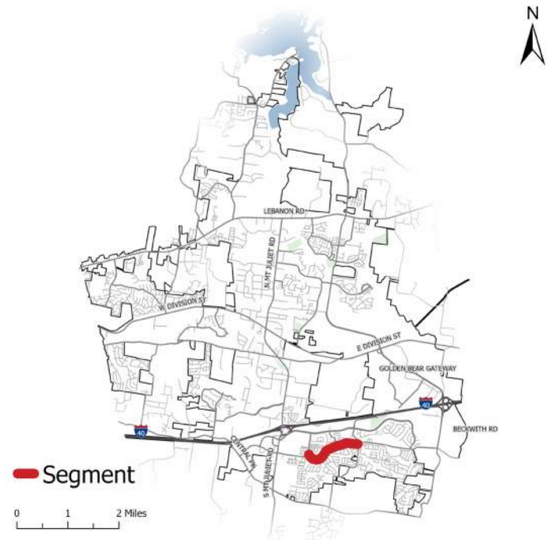
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Raised medians provide a safe refuge for pedestrians crossing the road, allowing them to focus on one direction of traffic at a time. This reduces the complexity of crossing and enhances pedestrian safety. Medians help streamline traffic flow by limiting left-turn movements to designated locations, reducing congestion and the likelihood of rear-end collisions.
- Slower speeds reduce the impact force in the event of a crash, leading to fewer severe injuries and fatalities. This is particularly important for vulnerable road users like pedestrians and cyclists.
- RPMs provide continuous lane guidance, which is particularly useful in navigating curves and complex intersections. The reflective properties of RPMs make them highly visible at night, reducing the risk of accidents by guiding drivers safely along the road.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.



Providence Trail
from Providence Parkway to S Rutland Road

W Division Street
from S Greenhill Road to N Mt. Juliet Road

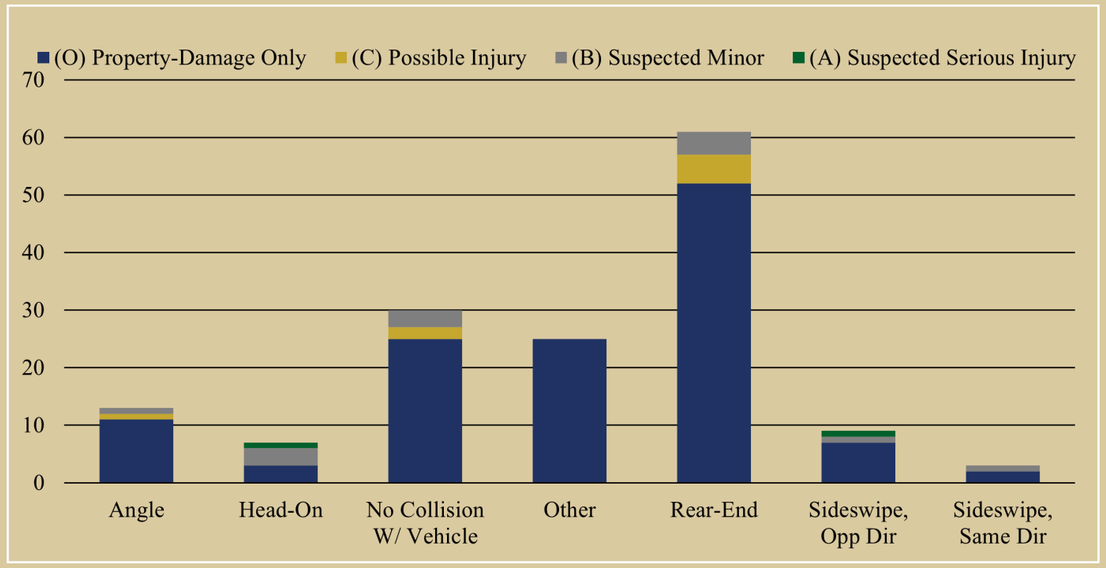
Municipal

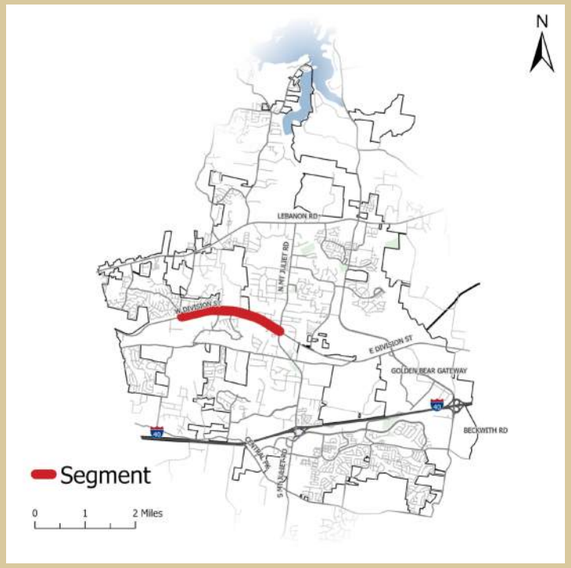
Speed Limit	40 mph
Lanes	2
Vehicles/Day	9,000
Total Crashes	64
HIN Intersections	1

Characteristics

This section of Lebanon Road is a 2-Way segment, with no separation between opposing lanes of travel. The segment experiences a curved alignment, with rolling terrain. There are currently only sidewalks on the the north side of the eastern end of the segment.

Along Division Street, Facing West, Just East of S Greenhill Road





Overall Ranking: 11

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Brookstone Boulevard crossing W Division Street to the greenway needs attention.
- Concerning intersections include Division Street at Brookstone Boulevard, S Greenhill Road, and Pascal Drive.

W Division Street
from S Greenhill Road to N Mt. Juliet Road

W Division Street
from S Greenhill Road to N Mt. Juliet Road

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●		12.2	Install/Extend Guardrail	$$	Short-Term	● ●
		●	12.2	Consider ICE Study for Intersection Alteration	$$	Short-Term	● ●
●	●	●	12.3	Widen Lanes & Pave 2’ Shoulder	$$$	Long-Term	● ●
●	●		12.4	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
	●		12.5	Upgrade to Retroreflective Signage and Pavement Markings	$	Short-Term	Ready
	●		12.6	Install Flashing Yellow Arrows (FYAs)	$$	Short-Term	Ready
	●	●	12.7	Optimize Crosswalk Lenths / Alignments	$$	Short-Term	Ready
●	●	●	12.8	Improve Lighting	$$	Short-Term	Ready
●	●	●	12.9	Install a Two-Way Left-Turn Lane (TWLTL)	$$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

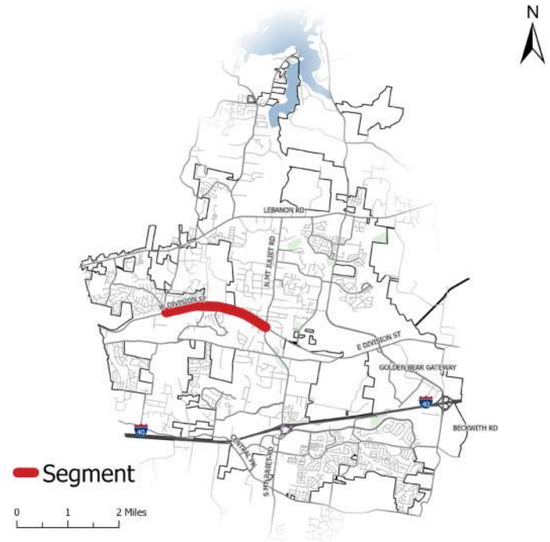
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.
- Improved lighting helps drivers see the road and its surroundings more clearly, reducing the likelihood of accidents caused by poor visibility. Adequate lighting at pedestrian crossings and intersections increases the visibility of pedestrians, reducing the risk of pedestrian-related accidents.
- Guardrails help prevent vehicles from leaving the roadway, which can reduce the severity of crashes by preventing vehicles from hitting fixed objects or rolling over.
- By evaluating different intersection control options, ICE helps identify solutions that can reduce crash rates and improve overall safety for all road users, including pedestrians, cyclists, and drivers.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.



W Division Street
from S Greenhill Road to N Mt. Juliet Road

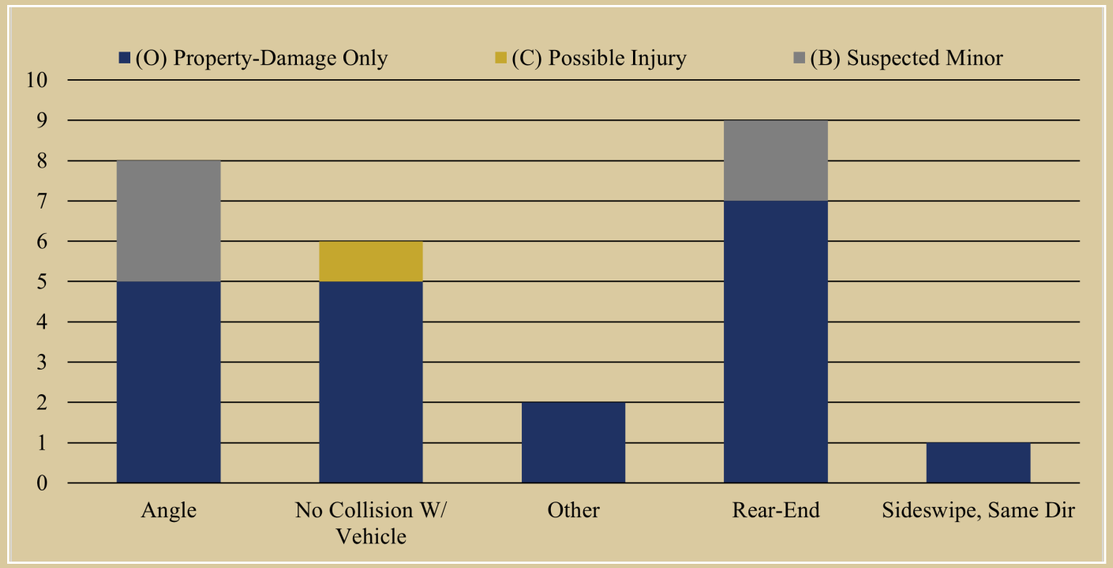
Curd Road
from Lebanon Road to Golden Bear Gateway

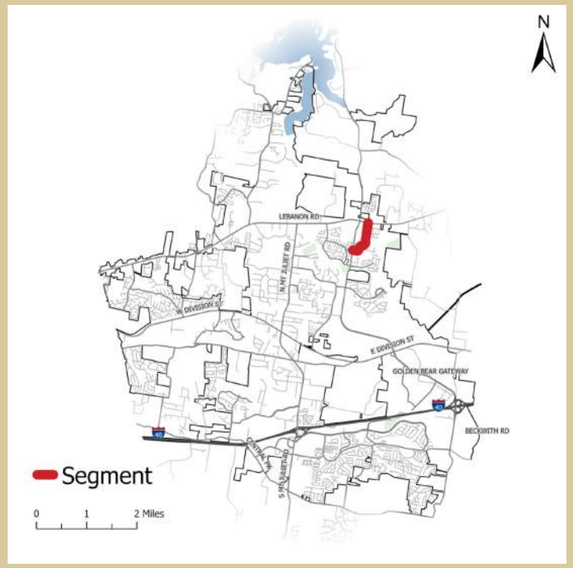
Municipal

Speed Limit	30 mph
Lanes	2
Vehicles/Day	1,100
Total Crashes	6
HIN Intersections	0

Characteristics
This section of Curd Road is a two-way roadway, with no separation between oppoisng travel lanes. This segment follows a largely curved alignment, with a large straight section towards the northern end of the segment, and experiences a rolling grade. Sidewalks are not present at any point over this segment.

Along Curd Road, Facing North, Just North of Tomlinson Pointe Drive





Overall Ranking: 12

Ranking Index

Fatal & Serious Injury Crashes:

low — high

Vulnerable Road User Crashes:

low — high

Crash Rate:

low — high

Replica Risk Index:

low — high

Equity Consideration:

low — high

Community Input

- Intersection with Lebanon Road is a safety concern.
- Widen Lebanon Road so traffic is not backed up coming into Mt. Juliet.

Curd Road
from Lebanon Road to Golden Bear Gateway

Curd Road
from Lebanon Road to Golden Bear Gateway

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	13.1	Widen Shoulder	$$$	Long-Term	● ●
●	●		13.2	Install Curve Feedback Warning Signs	$$	Short-Term	●
●	●		13.3	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
●	●		13.4	Upgrade Guardrail and Extend Guardrail Lengths at Bridges/Culverts	$$	Short-Term	● ●
	●	●	13.5	Conduct ICE Study for Intersection Geomerty	$$	Short-Term	● ●
●	●		13.6	Implement Various Speed Reducing Countermeasures	$$	Short-Term	Ready
●	●		13.7	Install Advanced Warning Signage Ahead of Intersection	$	Short-Term	Ready
	●		13.8	Evaluate Left-Turn Lane Warrant for Westbound Approach	$	Short-Term	Ready
	●		13.9	Correct Horizontal & Vertical Geometry of Roadway	$$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

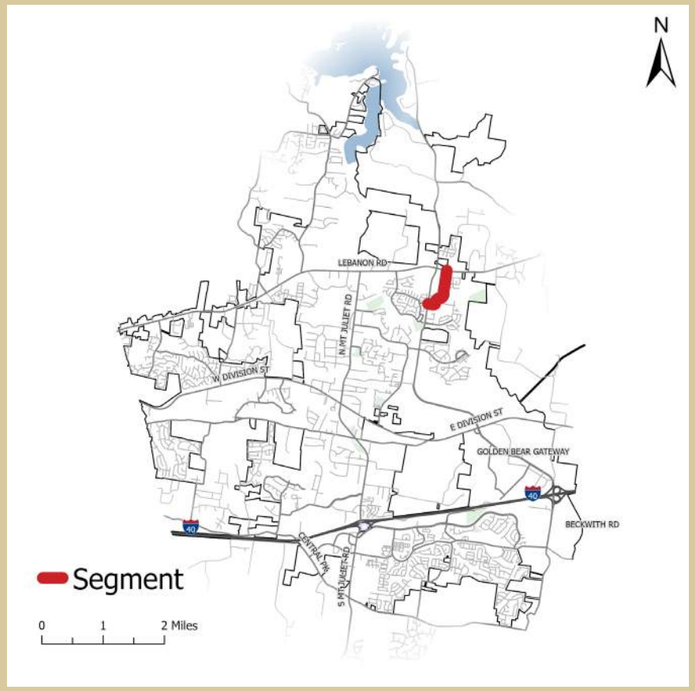
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

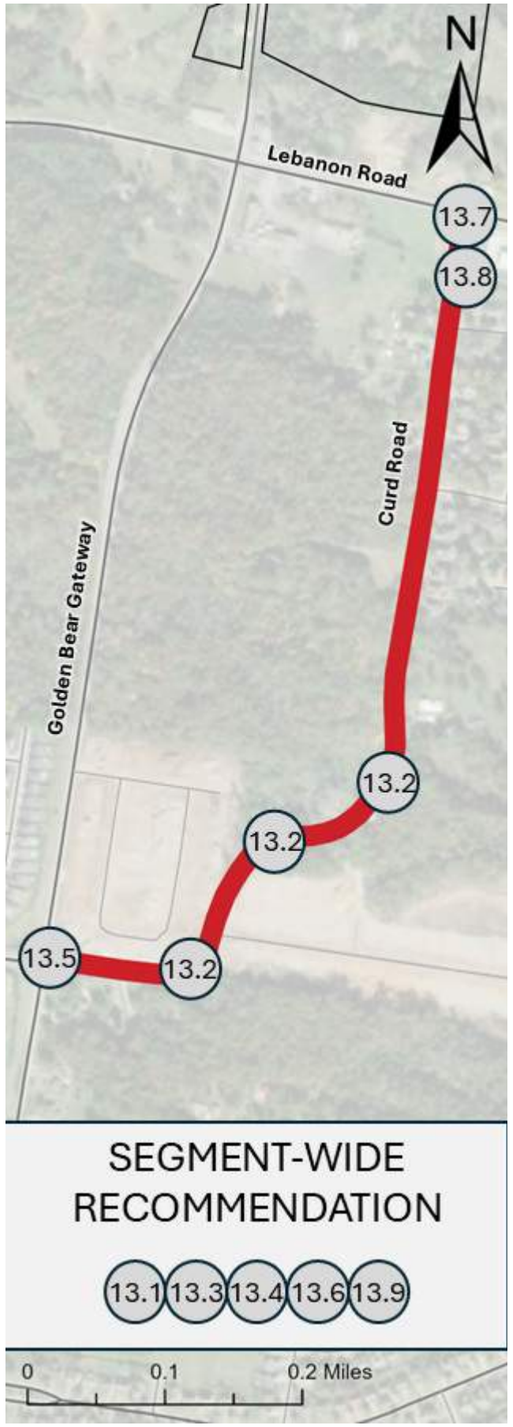
● Requires Utility Relocation

Benefit Summary

- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.
- Speed-reducing countermeasures make it clear to drivers that lower speeds are expected and required. Safer speeds have been shown to lead to lower crash severity, increased driver reaction time, enhanced pedestrian and cyclist safety, and environmental benefits.
- By evaluating different intersection control options, ICE helps identify solutions that can reduce crash rates and improve overall safety for all road users, including pedestrians, cyclists, and drivers.
- Guardrails are designed to absorb and dissipate the energy of a crash, reducing the impact force on the vehicle and its occupants. This can significantly lower the risk of serious injuries or fatalities.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.

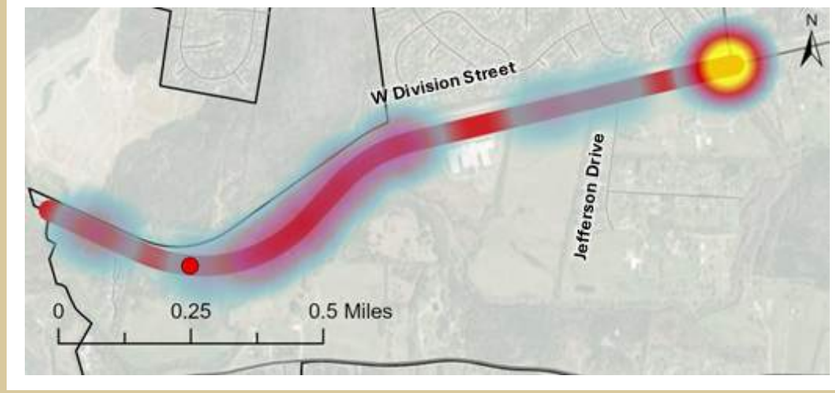


RECOMMENDED COUNTERMEASURES



Curd Road
from Lebanon Road to Golden Bear Gateway

W Division Street
from Chandler Road to S Greenhill Road



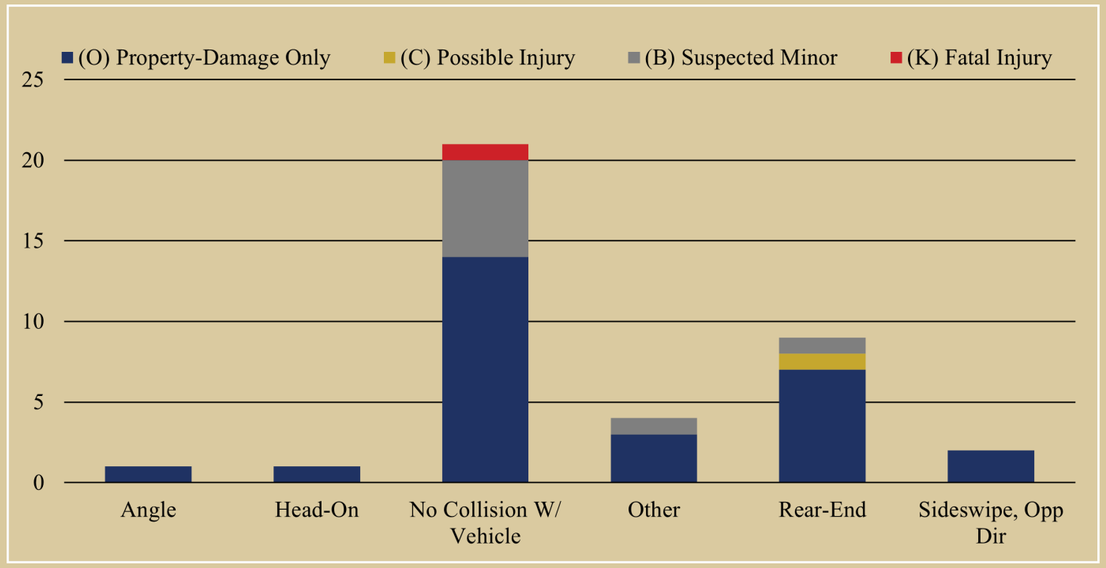
Municipal

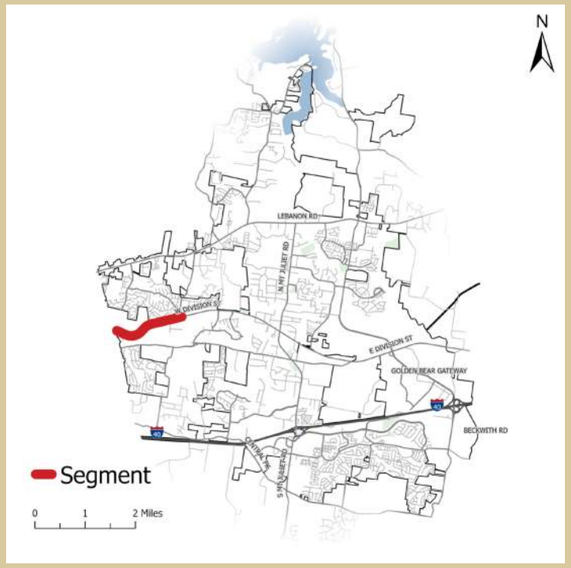
Speed Limit	40 mph
Lanes	2
Vehicles/Day	9,000
Total Crashes	37
HIN Intersections	0

Characteristics

Two-Way, Divided by TWLTL, Curved, Rolling, Add Sidewalks
This section of Division Street is a 2-Way segment, divided by a Two-Way Left-Turn Lane (TWLTL). The segment experiences a largely curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Lebanon Road.

Along Division Street, Facing East, Just West of Mt. Juliet Elementary School





Overall Ranking: 13

Ranking Index

Fatal & Serious Injury Crashes: low — high

Vulnerable Road User Crashes: low — high

Crash Rate: low — high

Replica Risk Index: low — high

Equity Consideration: low — high

Community Input

- Intersection with S Greenhill Road is a concerning intersection.

W Division Street
from Chandler Road to S Greenhill Road

W Division Street
from Chandler Road to S Greenhill Road

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	14.1	Widen Shoulders	$$$	Long-Term	● ●
●	●		14.2	Implement Various Speed Reducing Countermeasues	$$	Short-Term	Ready
●	●		14.3	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
●	●		14.4	Install/Extend Guardrail	$$	Short-Term	● ●
	●		14.5	Clear and Grub to Optimize Driver Sight Distance (15 ft Both Sides of Road)	$	Short-Term	●
●	●		14.6	Install Curve Feedback Signage	$	Short-Term	Ready
●	●	●	14.7	Extend Town Center Greenway to Mt. Juliet Elementary	$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

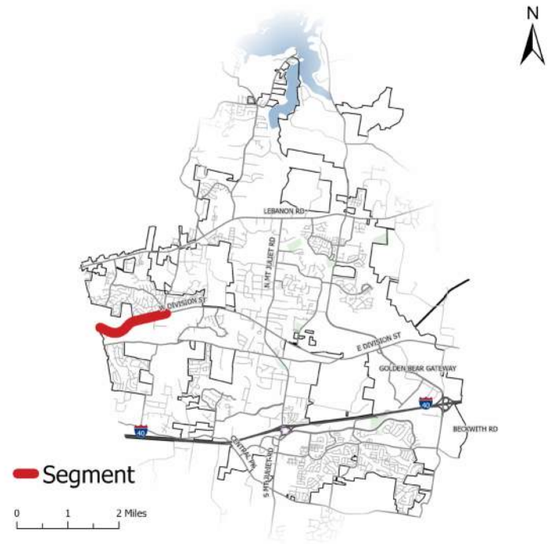
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Speed-reducing countermeasures make it clear to drivers that lower speeds are expected and required. Safer speeds have been shown to lead to lower crash severity, increased driver reaction time, enhanced pedestrian and cyclist safety, and environmental benefits.
- Guardrails help prevent vehicles from leaving the roadway, which can reduce the severity of crashes by preventing vehicles from hitting fixed objects or rolling over.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- FYAs help reduce the frequency of left-turn crashes, particularly those involving collisions between left-turning vehicles and oncoming traffic. Studies have shown a significant decrease in these types of crashes after implementing FYAs.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.



W Division Street
from Chandler Road to S Greenhill Road

Old Lebanon Dirt Road

from N Mt. Juliet Road to E Division Street

- VRU (0)
- Serious Injury (0)
- Fatal (0)

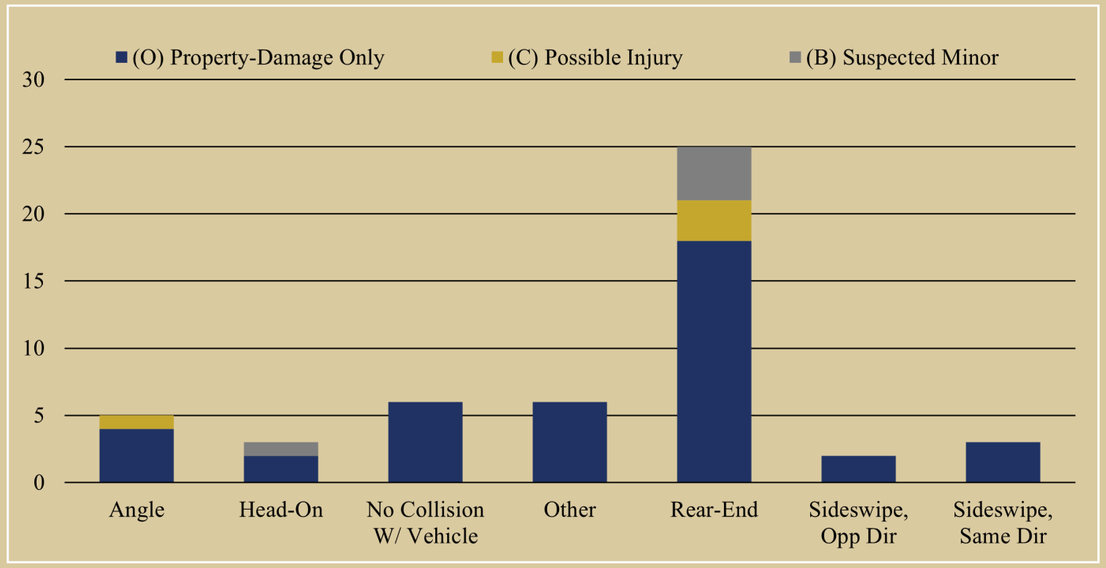
Municipal

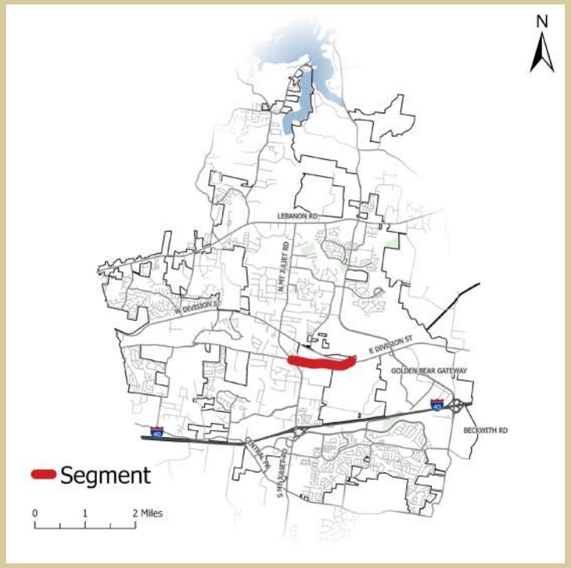
Speed Limit	35 mph
Lanes	2
Vehicles/Day	2,500
Total Crashes	7
HIN Intersections	0

Characteristics

This section of Old Lebanon Dirt Road is a two-way segment, with no separation between opposing travel lanes. The segment experiences a lightly curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Old Lebanon Dirt Road.

Along Old Lebanon Dirt Road, Facing West, Just East of Old Mt. Juliet Road S





Overall Ranking: 14

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

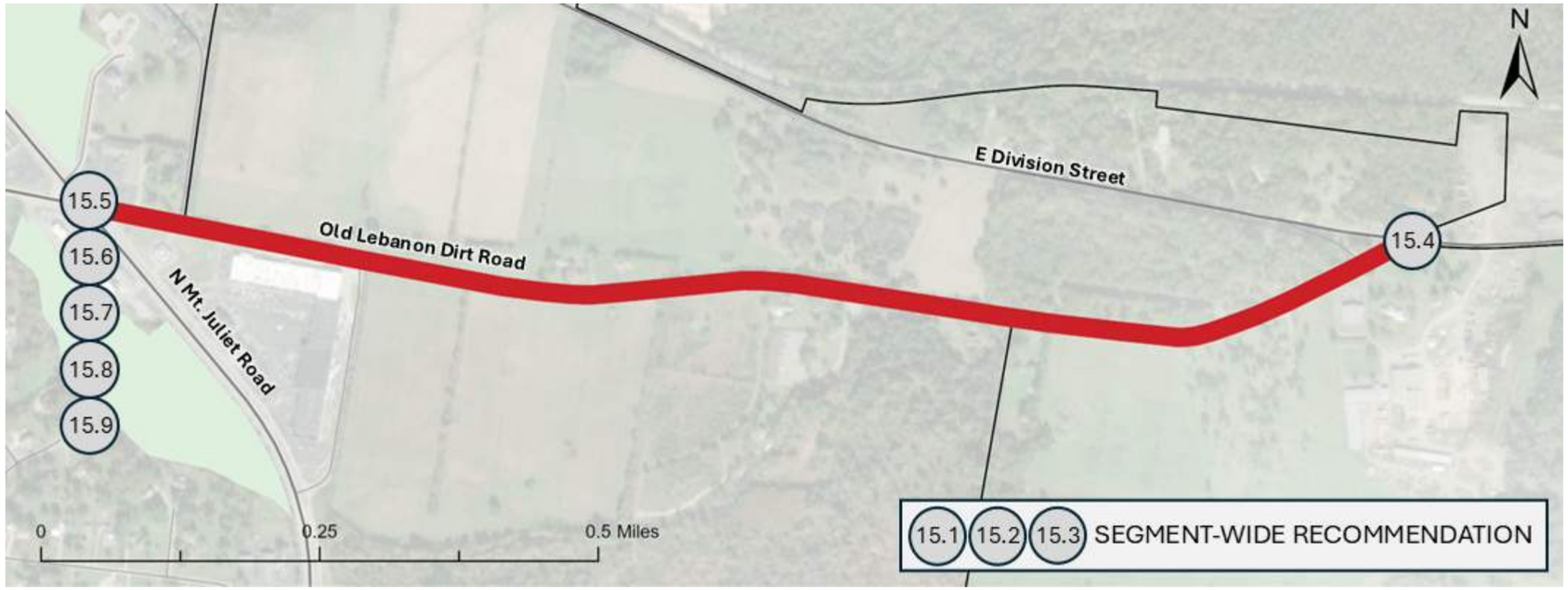
Community Input

- Old Lebanon Dirt Road and E Division Street is a safety concern.
- At N Mt. Juliet Road, it is a large area to cross the street. Consider reducing the length of the pavement or installing “resting island”.

Old Lebanon Dirt Road
from N Mt. Juliet Road to E Division Street

Old Lebanon Dirt Road
from N Mt. Juliet Road to E Division Street

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	15.1	Widen Lanes & Pave 2' Shoulders	$$$	Long-Term	● ●
●	●		15.2	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
●	●	●	15.3	Install/Extend Guardrail	$$	Short-Term	● ●
	●	●	15.4	Realign Intersectional Skew	$$$$	Long-Term	● ●
●	●	●	15.5	Optimize Signal Timings & Cycle	$	Short-Term	Ready
●	●		15.6	Install Backplates with Retroreflective Borders	$	Short-Term	Ready
	●		15.7	Install Flashing Yellow Arrows (FYAs)	$	Short-Term	Ready
●	●	●	15.8	Install High Emphasis Crosswalks	$	Short-Term	Ready
		●	15.9	Conduct ICE Study (Consider Restricted Crossing U-Turn (RCUT) or Offset T)	$$	Short-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

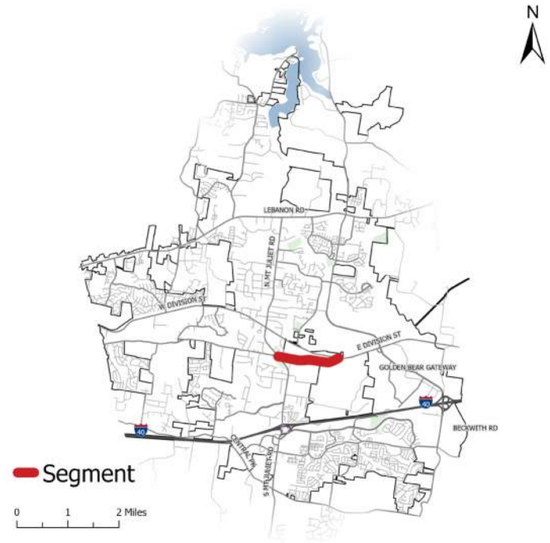
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.
- Guardrails are designed to absorb and dissipate the energy of a crash, reducing the impact force on the vehicle and its occupants. This can significantly lower the risk of serious injuries or fatalities.
- By evaluating different intersection control options, ICE helps identify solutions that can reduce crash rates and improve overall safety for all road users, including pedestrians, cyclists, and drivers.
- FYAs help reduce the frequency of left-turn crashes, particularly those involving collisions between left-turning vehicles and oncoming traffic. Studies have shown a significant decrease in these types of crashes after implementing FYAs.
- By adjusting the angles at which roads intersect, realignment can reduce the number of conflict points where vehicles paths cross. This decreases the potential for crashes.
- Correcting a skew can improve sight lines and reduce blind spots, allowing drivers to see oncoming traffic more clearly and make safer crossing or turning decisions.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.



Old Lebanon Dirt Road
from N Mt. Juliet Road to E Division Street

E Division Street

from N Mt. Juliet Road to Rutland Drive

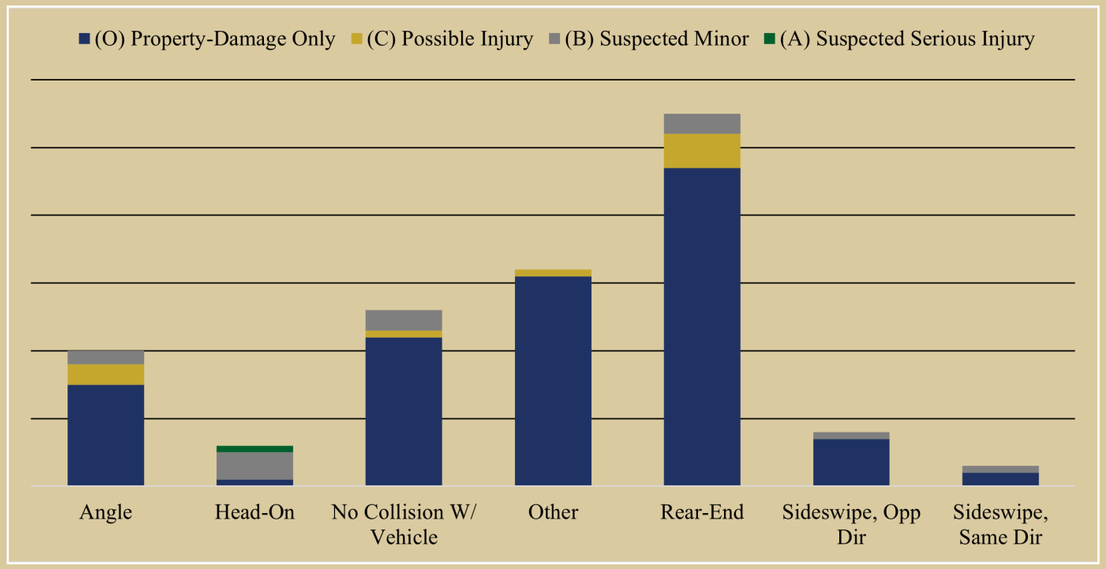
Municipal

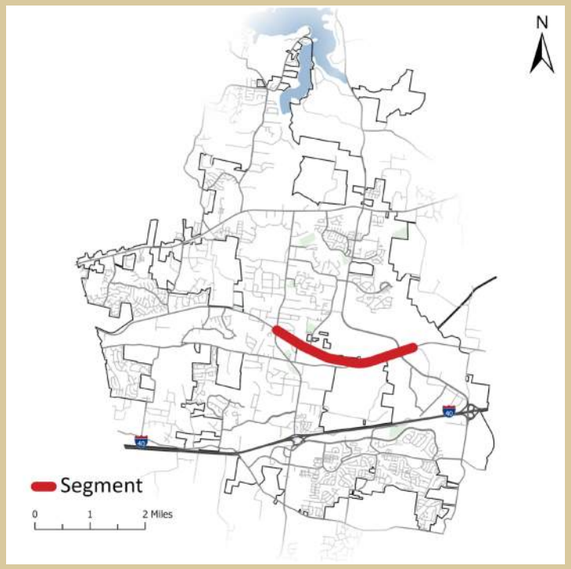
Speed Limit	45 mph
Lanes	2
Vehicles/Day	7,400
Total Crashes	150
HIN Intersections	1

Characteristics

This section of E Division Street is a two-way roadway, with no separation between opposing travel lanes.The segment experiences a curved alignment, with lightly-rolling terrain. There are currently no sidewalks present along this portion of E Division Street.

Along E Division Street, Facing West, Just West of Old Lebanon Dirt Road





Overall Ranking: 15

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

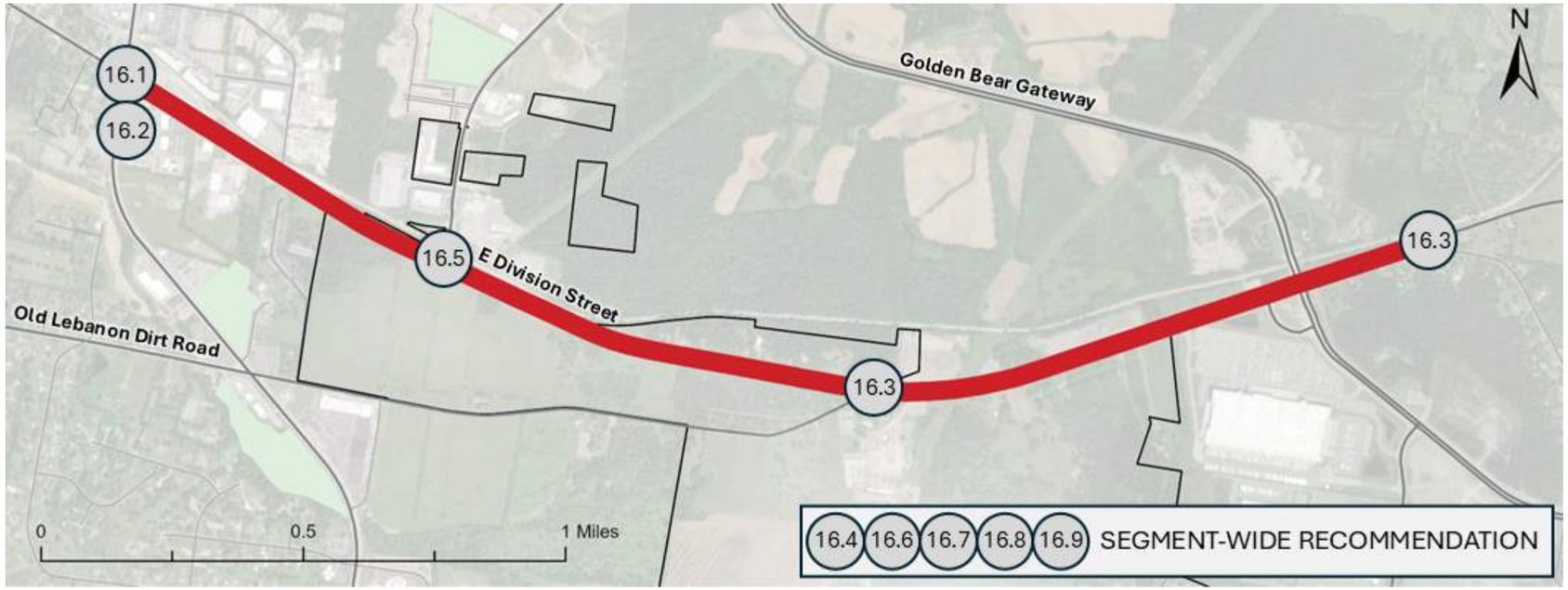
Community Input

- The intersections of E Division Street at N Mt. Juliet Road at Golden Bear Gateway are safety concerns.

E Division Street
from N Mt. Juliet Road to Rutland Drive

E Division Street
from N Mt. Juliet Road to Rutland Drive

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
	●		16.1	Install Flashing Yellow Arrows (FYAs)	$$	Short-Term	Ready
●	●		16.2	Install Turn Lanes (Right & Left)	$$$	Long-Term	●
	●	●	16.3	Realign Intersection Skew	$$$$	Long-Term	● ●
●	●	●	16.4	Improve Lighting	$$	Short-Term	●
●	●		16.5	Install Advanced Intersection Warning Signage	$	Short-Term	Ready
●	●		16.6	Install/Extend Guardrail	$$	Short-Term	● ●
●	●	●	16.7	Widen Shoulders	$$$	Long-Term	● ●
	●		16.8	Widen Travel Lanes	$$$	Long-Term	● ●
●	●		16.9	Install Combination Center/Edge Line Rumble Strips	$$	Short-Term	Ready

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

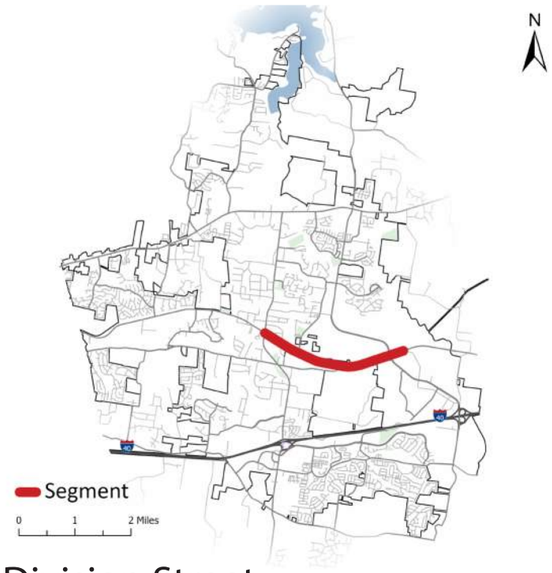
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

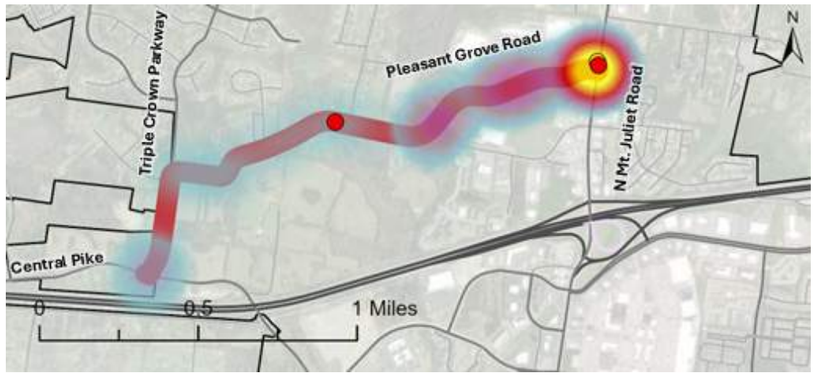
Benefit Summary

- Flashing yellow arrows at intersections reduce left-turn crashes, improve driver comprehension, enhance traffic flow, and increase safety for all road users.
- Guardrails help prevent vehicles from leaving the roadway, which can reduce the severity of crashes by preventing vehicles from hitting fixed objects or rolling over.
- Roadway lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low visibility conditions, reducing the likelihood of crashes.
- Rumble strips are highly effective in reducing severe roadway departure crashes. They use noise and vibration to alert drivers when they are drifting out of their lane, helping to prevent accidents caused by drowsy or inattentive driving.
- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.
- Correcting a skew can improve sight lines and reduce blind spots, allowing drivers to see oncoming traffic more clearly and make safer crossing or turning decisions.



E Division Street
from N Mt. Juliet Road to Rutland Drive

Pleasant Grove Road
from Central Pike to N Mt. Juliet Road



- VRU (0)
- Serious Injury (0)
- Fatal (1)

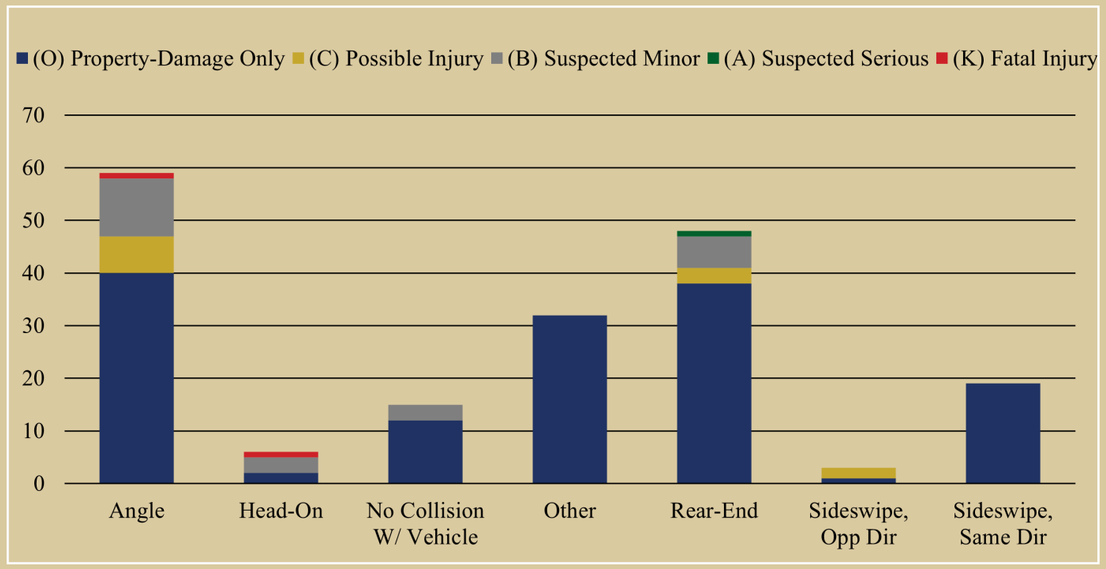
Municipal

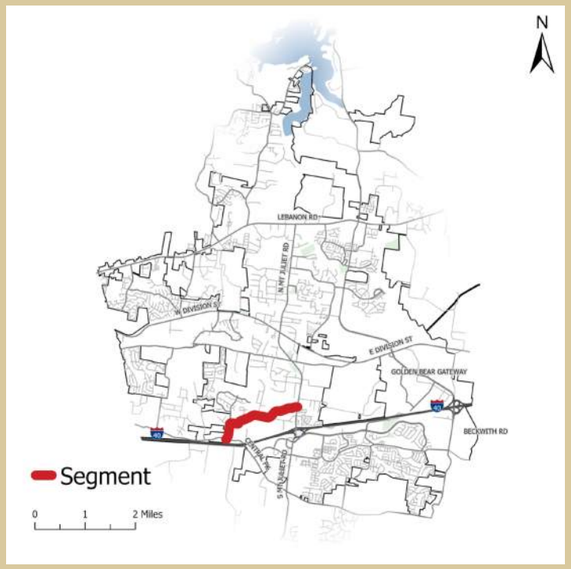
Speed Limit	35 mph
Lanes	2
Vehicles/Day	4,200
Total Crashes	103
HIN Intersections	2

Characteristics

This section of Pleasant Grove Road is a two-way segment, with no separation between opposing travel lanes. The segment experiences a curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Pleasant Grove Road.

Along Pleasant Grove Road, Facing East, Just West of Catalpa Drive





Overall Ranking: 16

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

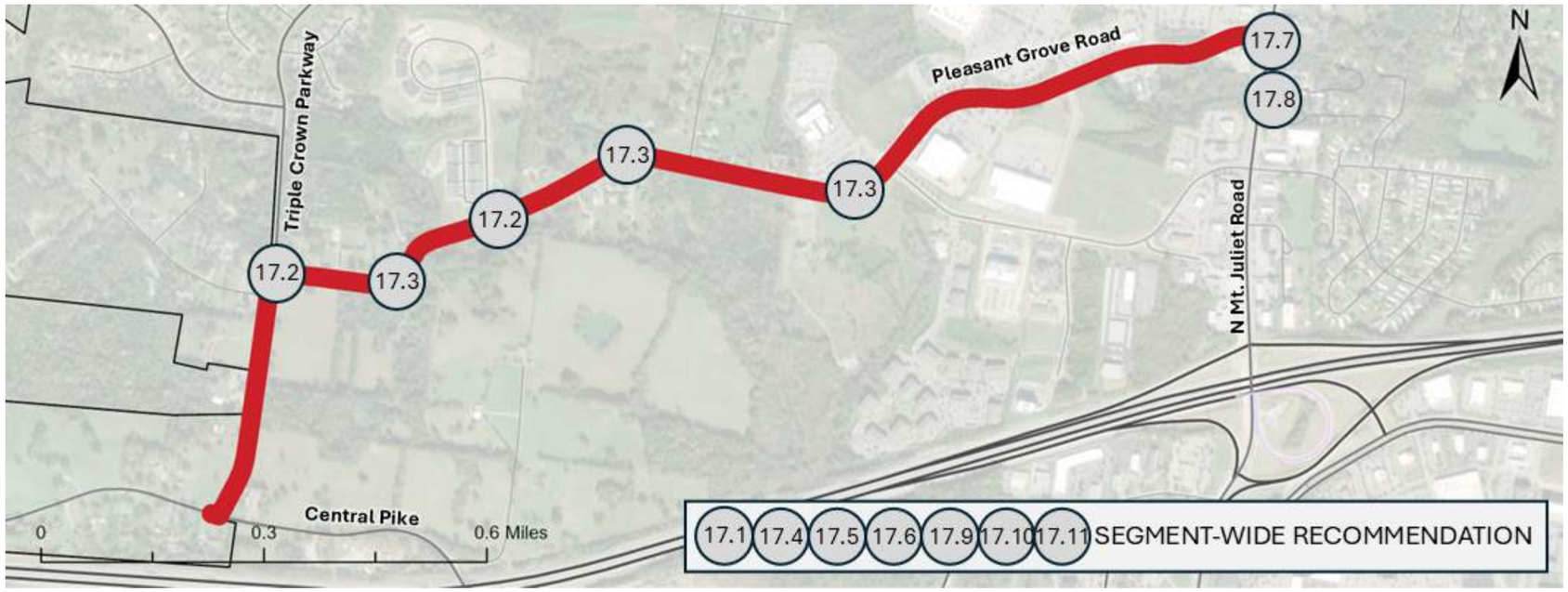
Community Input

- An additional roundabout is needed around Central Pike and Pleasant Grove Road, which has been extremely dangerous for drivers driving out from Pleasant Grove Road due to blindsided uphill roads on Central Pike.
- Please put a stoplight at Central Pike and Pleasant Grove Road; the visibility is awful.
- Other concerning intersections include Pleasant Grove Road at Trevor Drive and Old Pleasant Grove Road.

Pleasant Grove Road
from Central Pike to N Mt. Juliet Road

Pleasant Grove Road
from Central Pike to N Mt. Juliet Road

RECOMMENDED COUNTERMEASURES



			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	17.1	Widen Shoulders	$$$	Long-Term	● ●
	●	●	17.2	Install a Roundabout	$$	Short-Term	● ●
●	●		17.3	Install Curve Warning/Feedback Signage	$	Short-Term	●
●	●	●	17.4	Improve Lighting	$$	Short-Term	● ●
●	●		17.5	Install Combination Centerline / Edge line Rumble Strips	$$	Short-Term	Ready
●	●		17.6	Implement Various Speed Reducing Countermeasures	$$	Short-Term	Ready
●	●		17.7	Install Backplates with Retroreflective Borders	$	Short-Term	Ready
●	●	●	17.8	Install High Emphasis Crosswalks	$	Short-Term	Ready
●	●		17.9	Install a Two-Way Left-Turn Lane (TWLTL)	$$$$	Long-Term	● ●
	●		17.10	Correct Horizontal & Vertical Geometry of Roadway	$$$$	Long-Term	● ●
	●	●	17.11	Install a Multi-Use Path	$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

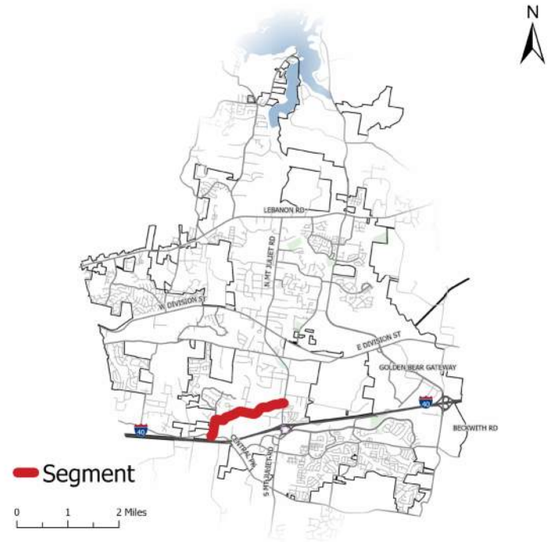
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

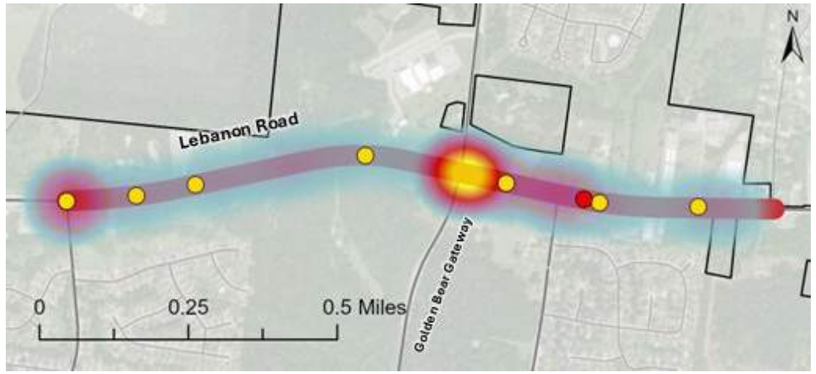
Benefit Summary

- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.
- Intersection lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low-visibility conditions, reducing the likelihood of crashes.
- Speed-reducing countermeasures make it clear to drivers that lower speeds are expected and required. Safer speeds have been shown to lead to lower crash severity, increased driver reaction time, enhanced pedestrian and cyclist safety, and environmental benefits.
- By evaluating different intersection control options, ICE helps identify solutions that can reduce crash rates and improve overall safety for all road users, including pedestrians, cyclists, and drivers.
- High-visibility crosswalks use patterns like bar pairs, continental, or ladder designs that are more noticeable to drivers from a greater distance compared to traditional crosswalks. This helps drivers see pedestrians earlier and react in time.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.



Pleasant Grove Road
from Central Pike to N Mt. Juliet Road

Lebanon Road (SR-24, US-70)
from Park Glen Drive to Terrace Hill Road

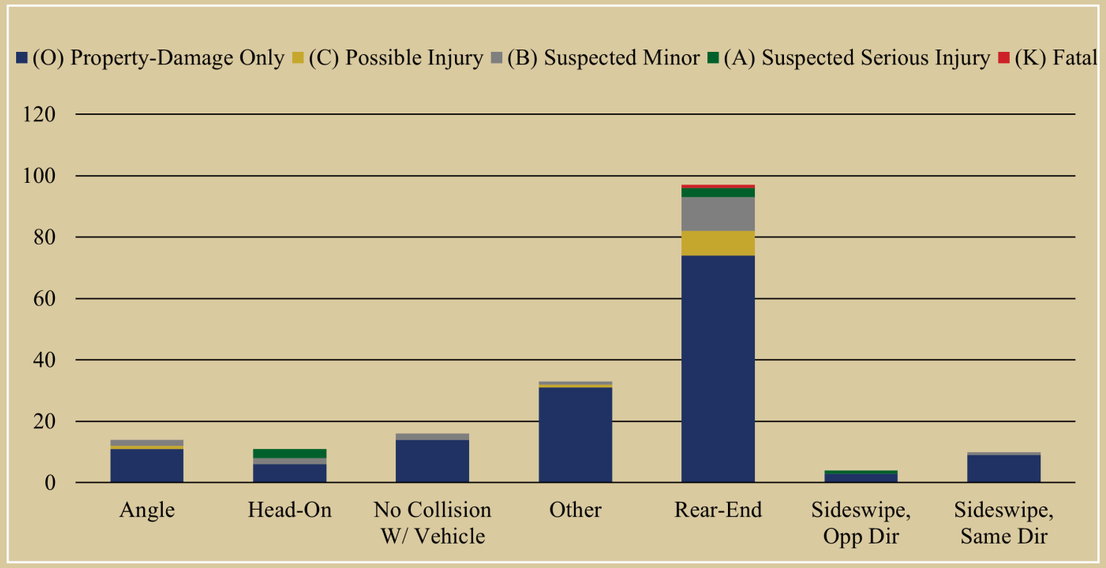


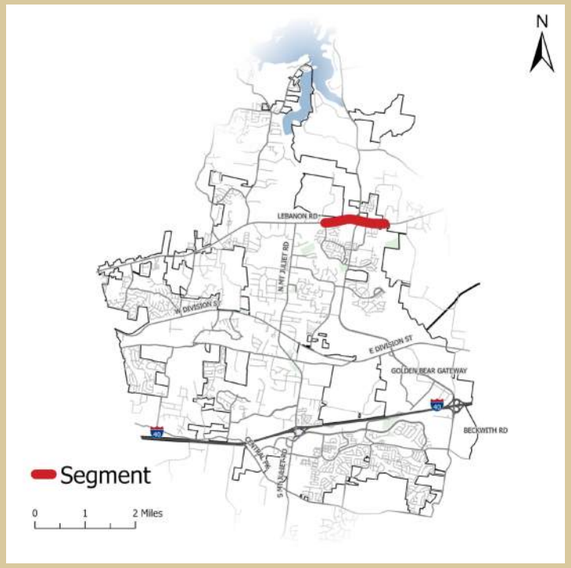
State Route	
Speed Limit	45 mph
Lanes	2
Vehicles/Day	21,000
Total Crashes	161
HIN Intersections	1

Characteristics

This section of Lebanon Road is a 2-Way segment, with no separation between opposing travel lanes aside from a two-way left-turn lane (TWLTL) near the intersection of Lebanon Road at Park Glen Drive. The segment experiences a lightly-curved alignment, with rolling terrain. There are currently no sidewalks present on this portion of Lebanon Road.

Along Lebanon Road, Facing East, Just East of Curd Road





Overall Ranking: 17

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- The traffic is terrible at Lebanon Road and Benders Ferry Road. There are so many homes being add that is is also going to get worse and continue to be backed up.
- Benders Ferry Road at Lebanon Road is a nightmare and all those new houses being built are going to make it impassable. There desperately needs to be a late turning right onto Lebanon Road because one car wanting to go straight will back the line up by 30 cars in one minute during mornings and afternoons. The lane turning left onto Lebanon Road needs to be extended because only 2 cars can fit into it now so anyone else in line misses the light.
- Widen Lebanon Road so that traffic is not backed up coming into Mt. Juliet.
- Traffic at Benders Ferry Road and Lebanon Road gets backed up so quickly especially during West Elemenatry arrival and dismassal times.
- Other concerning intersections mentioned include Lebanon Road at Park Glen Drive and Curd Road.

Lebanon Road (SR-24, US-70)
from Park Glen Drive to Terrace Hill Road

Lebanon Road (SR-24, US-70)
from Park Glen Drive to Terrace Hill Road

RECOMMENDED COUNTERMEASURES

			ID	Countermeasure	Cost	Schedule	Project Readiness
	●		18.1	Install Wildlife Fencing and Obstructions to Restrict Various Cross Points	$$	Short-Term	● ●
	●		18.2	Implement Appropriate Signage to Improve Driver Awareness	$$	Short-Term	●
●	●		18.3	Install Combination Centerline / Edge line Rumble Strips	$$$	Short-Term	Ready
	●		18.4	Widen Roadway from 2-lane to 4-lane including a Two-Way Left-Turn Lane (TWLTL)	$$$$	Long-Term	● ●
●	●	●	18.5	Improve Lighting	$$	Short-Term	●
	●		18.6	Reconfigure “Pork Chop”	$	Short-Term	Ready
●	●	●	18.7	Evaluate/Upgrade Signal Timings and Coordination Plans	$$	Short-Term	Ready
●	●		18.8	Install Backplates w/ Retroreflective Borders	$	Short-Term	Ready
●	●	●	18.9	Install Pedestrian & Bicyclist Facilities (Sidewalks/Crossings/Bike Lanes)	$$$	Long-Term	● ●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

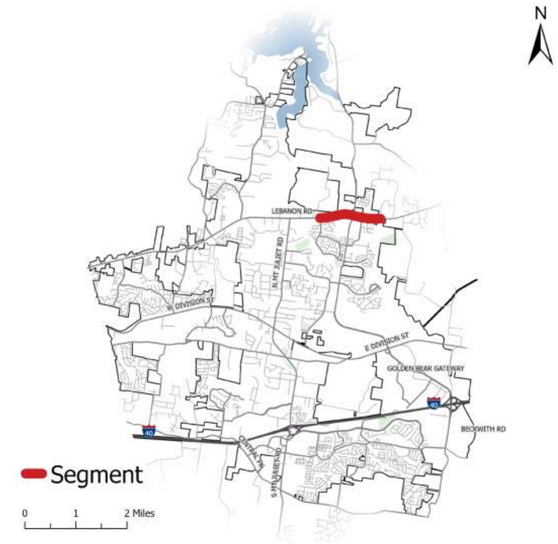
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

● Requires Utility Relocation

Benefit Summary

- Properly timed signals can encourage more uniform speeds, improve driver compliance with traffic signals, and may decrease incidences of red-light running.
- Enhanced signage, striping, and rumble strips can collectively reduce the risk of crashes at stop-controlled intersections. These low-cost countermeasures provide a significant safety return on investment, improving safety without the need for expensive infrastructure modifications.
- Grooved edge/centerlines provide tactile and auditory feedback to drivers when their vehicle strays from the lane, helping to reduce the risk for roadway departure crashes and head-on collisions.
- Backplates with retroreflective borders increase the conspicuity of traffic signal heads, especially under low-light conditions. They also help drivers quickly and easily identify traffic signals in the presence of visual clutter. This enhanced visibility and recognition can lead to a reduction in rear-end and angle crashes at signalized intersections.
- Roadway lighting helps drivers, cyclists, and pedestrians see each other more clearly, especially during nighttime and low visibility conditions, reducing the likelihood of crashes.
- Medians can prevent left-turn and head-on crashes by separating opposing traffic flows. They also facilitate better access management by controlling where vehicles can turn, thereby reducing unpredictable movements that can lead to crashes.



Lebanon Road (SR-24, US-70)
from Park Glen Drive to Terrace Hill Road

Nonaville Road
from Sports Road to Lebanon Road

VRU (0) Serious Injury (1) Fatal (0)

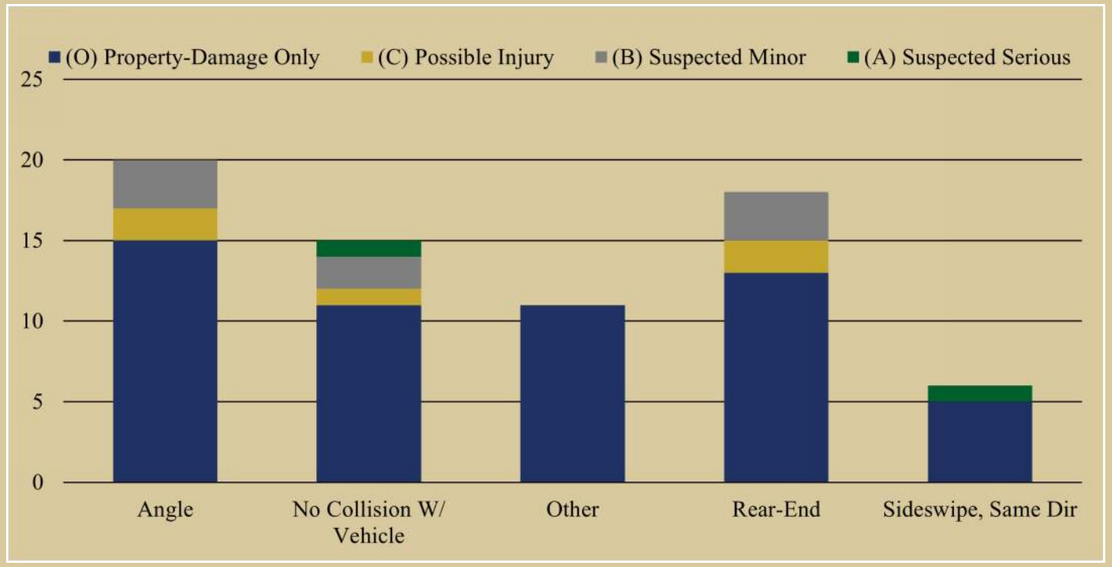
Municipal

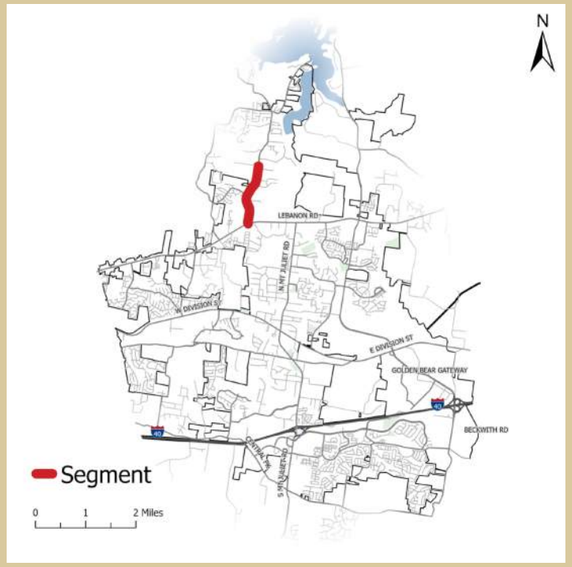
Speed Limit	35 mph
Lanes	2
Vehicles/Day	12,000
Total Crashes	38
HIN Intersections	1

Characteristics

This section of Nonaville Road is a two-way roadway, divided by a two-way left-turn lane (TWLTL). This segment follows a largely cuurved alignment, and experiences a rolling grade. Sidewalks are partially present along the western side of the roadway, spanning approximately from Lebanon Road to Windtree Club Drive.

Along Nonaville Road, Facing North, Just South of Doral Pointe





Overall Ranking: 18

Ranking Index

Fatal & Serious Injury Crashes:
low — high

Vulnerable Road User Crashes:
low — high

Crash Rate:
low — high

Replica Risk Index:
low — high

Equity Consideration:
low — high

Community Input

- Nonaville Road between Windtree Trace and Lebanon Road is a concern. With those apartments there has come a lot of kids and teens darting across the road to get to the market or dollar general. Difficult to see them at night especially.
- Intersection with Windtree Club Drive is an issue.

Nonaville Road
from Sports Road to Lebanon Road

Nonaville Road
from Sports Road to Lebanon Road

			ID	Countermeasure	Cost	Schedule	Project Readiness
●	●	●	19.1	Install Median (Install Left-Turn Lanes as Necessary)	$$$	Long-Term	Ready
	●		19.2	Upgrade Signage and Pavement Marking	$	Short-Term	Ready
●	●		19.3	Upgrade Guardrail and Extend Guardrail Lengths at Bridges/Culverts	$$	Short-Term	● ●
●	●	●	19.4	Implement Various Red-Light Running Countermeasures	$	Short-Term	Ready
●	●	●	19.5	Optimize Signal Timings & Coordination Plans	$$	Short-Term	Ready
●	●	●	19.6	Evaluate Yellow Clearance Intervals	$$	Short-Term	Ready
●	●		19.7	Install Raised Pavement Markers (RPMs)	$$	Short-Term	Ready
●	●	●	19.8	Improve Lighting	$$	Short-Term	●

$ - 0 to 50,000; $$ - 50,001 to 100,000; $$$ - 100,001 to 500,000; $$$$ - Over 500,000

● FHWA Proven Safety Countermeasure

● Crash Modification Factors Countermeasure

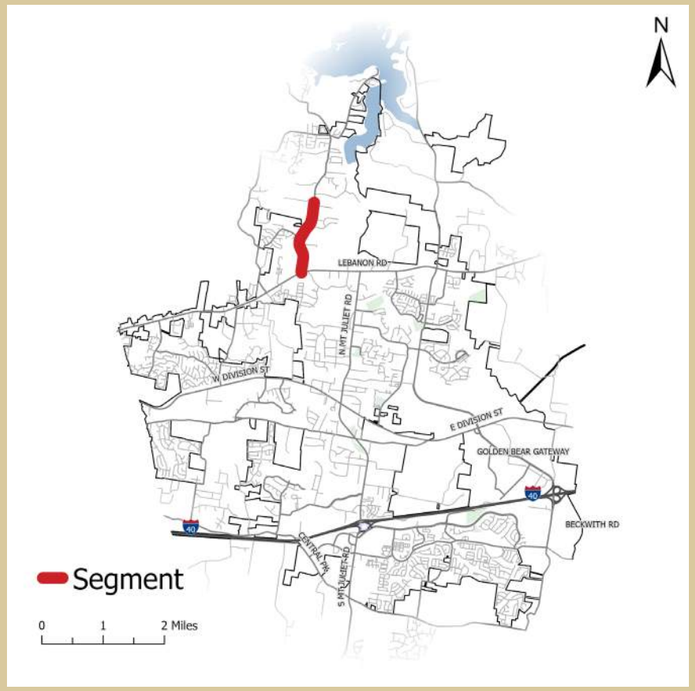
● Vulnerable Road User Related Countermeasure

● Requires ROW Acquisition

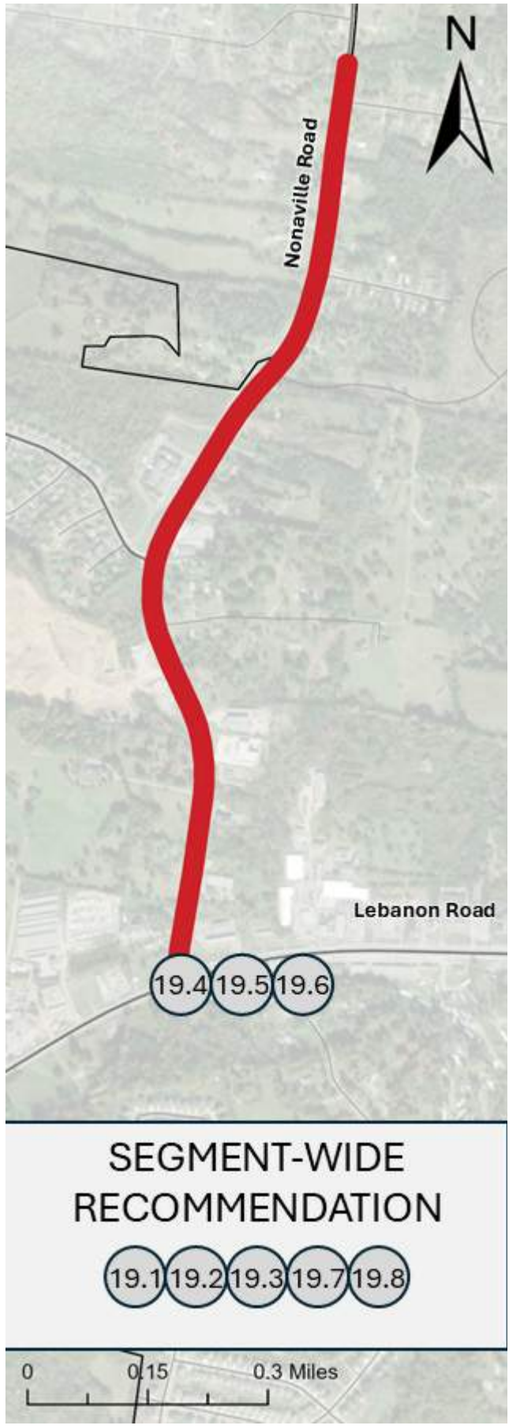
● Requires Utility Relocation

Benefit Summary

- Wider shoulders provide an increased recovery area for errant vehicles and offer a safer space for non-motorized roadway users.
- Properly timed signals reduce the likelihood of vehicles entering intersections simultaneously, thereby decreasing the risk of collisions.
- Shorter crosswalks reduce the time pedestrians spend in the roadway, minimizing their exposure to vehicular traffic and decreasing the likelihood of accidents.
- Guardrails are designed to absorb and dissipate the energy of a crash, reducing the impact force on the vehicle and its occupants. This can significantly lower the risk of serious injuries or fatalities.
- FYAs help reduce the frequency of left-turn crashes, particularly those involving collisions between left-turning vehicles and oncoming traffic. Studies have shown a significant decrease in these types of crashes after implementing FYAs.
- Medians can prevent left-turn and head-on crashes by separating opposing traffic flows. They also facilitate better access management by controlling where vehicles can turn, thereby reducing unpredictable movements that can lead to crashes.



RECOMMENDED COUNTERMEASURES



Nonaville Road
from Sports Road to Lebanon Road


Mt. Juliet
SAFE STREETS