February 2026

Roanoke Safety Action Plan

Acknowledgments

Mayor and Council

Transportation staff

Communications and Community Outreach

Project Advisory Committee

Stakeholders

Prepared by:

TOOLE DESIGN

VISION ZERO ROANOKE

Information contained in this document is for planning purposes and should not be used for final design of any project. All results, recommendations, concept drawings, cost opinions, and commentary contained herein are based on limited data and information and on existing conditions that are subject to change. Existing conditions have not been field-verified. Further analysis and engineering design are necessary prior to implementing any of the recommendations contained herein.

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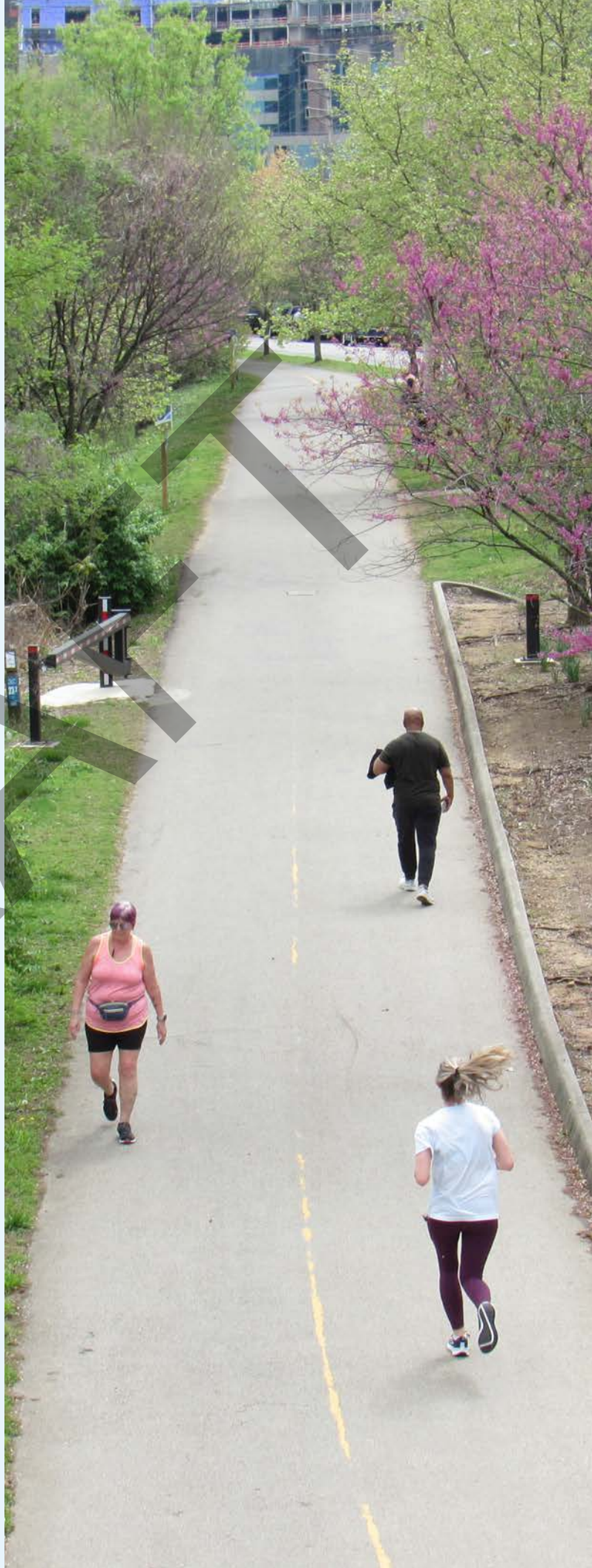

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EXECUTIVE SUMMARY

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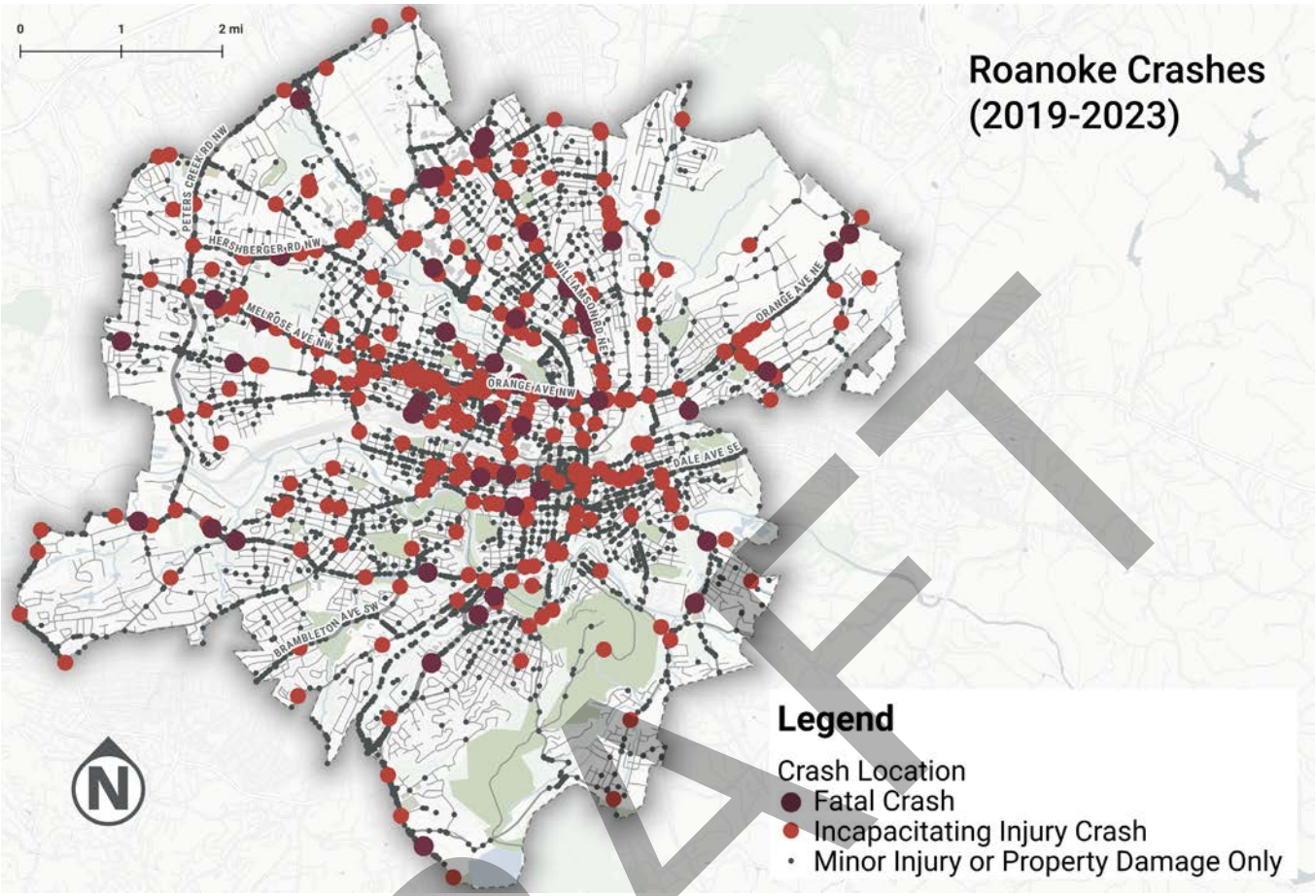
Figure 1 All crashes in Roanoke, 2019-2023. Includes VDOT roads.



The City of Roanoke Safety Action Plan (SAP) was initiated in the spring of 2024 and reviewed the most recent five years of crash data available at the time. Between 2019 and 2023 there were almost 9,500 reported crashes involving motor vehicles in Roanoke – an average of at least five per day (Figure 1). While more than 80% of these crashes resulted in minor (non-visible) injuries or property damage only, they all required police and other emergency personnel to respond; they cause delay and frustration to other travelers; and the damage is costly to repair for all parties involved.

The sheer volume of crashes reflects a general lack of safety culture in the city and beyond. This is unlikely to change overnight and will require continual improvement in the traditional areas of education, enforcement, and roadway engineering for the foreseeable future. Current street design lacks definition and encourages speeding, failure to yield, and other behaviors that contribute to a poor overall safety record. This affects everyone in the city. The Roanoke Safety Action Plan includes recommendations and safety measures that will help to address this reality.

However, the primary focus of this document are the 47 fatal crashes that resulted in 49 people losing their lives and on the more than 300 crashes during this five-year period that resulted in 350 people suffering life-altering injuries (Figure 2). The annual number of crashes and serious injuries has been rising since 2020, while the number of fatalities each year has remained constant between nine and ten.

A detailed analysis of the crash reports reveals that pedestrians, motorcyclists, and bicyclists are especially vulnerable in traffic. Pedestrians, bicyclists, and motorcyclists were involved in 425 (4.5%) of the 9,455 reported crashes in the city, however this includes 140 (40%) of the 350 fatal and serious injury crashes (Figure 3). This vulnerability is even more evident when looking at just the fatal crashes that occurred during the study period: pedestrians were involved in 18 (38%) and motorcyclists in 11 (23%) of the 47 incidents (Figure 4). This is even though pedestrians and motorcyclists were involved in less than 4% of all reported crashes.

Figure 2 Fatal and Serious Injury Crashes By Year

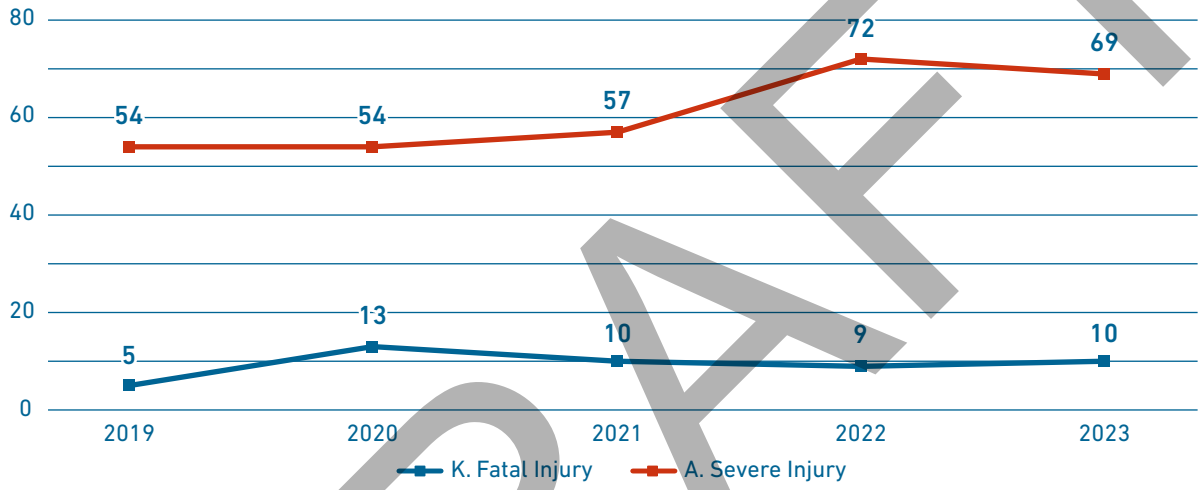


Figure 3 Share of Fatal and Serious Injury Crash Involvement by Mode

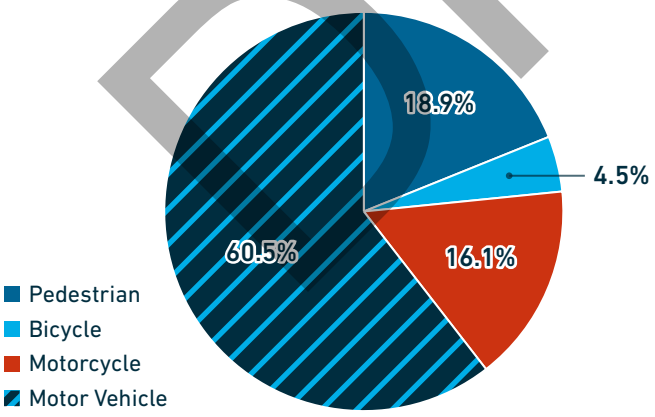
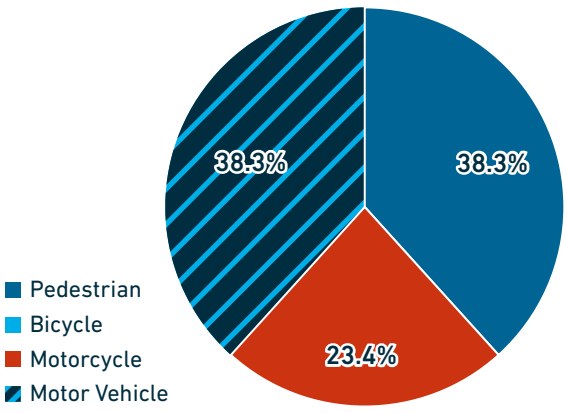
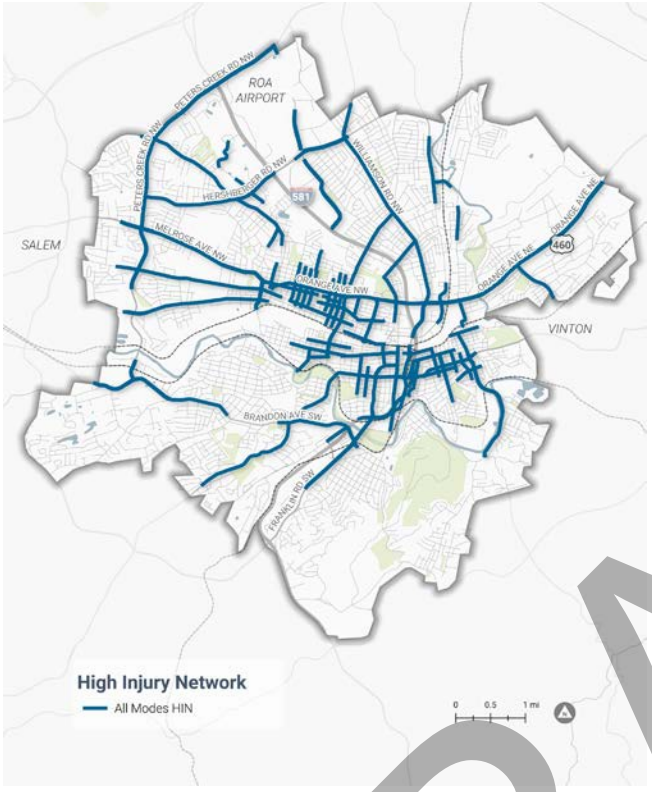


Figure 4 Share of Fatal Crash Involvement By Mode



The crash analysis also identified a relatively small percentage of city streets where most fatal or serious injury collisions are concentrated – this is the High Injury Network (HIN) (Figure 5).

Figure 5 High Injury Network



By looking at the roadway conditions and context of streets on the HIN it is possible to predict where crashes are most likely to happen in the future, based on the presence of those same conditions (e.g. four lane, undivided highways with no sidewalks or safe crossings, and poor lighting). This is the High Risk Network (HRN) (Figure 6).

Taken together, the HIN and HRN help to identify major streets, intersections, and areas of the city where the crash history and risk is the highest. These are the locations where the city should focus its efforts to eliminate the most serious crashes from happening to achieve the goal of zero fatalities and serious injuries (Figure 7).

So, while the goal of zero fatalities and serious injuries from traffic crashes may be aspirational today, it is critically important for the future of the city, and it is within reach. The Safety Action Plan is designed to usher in a culture of safety that is embraced by all government departments and agencies and championed by community organizations across the city.

Figure 6 High Risk Network

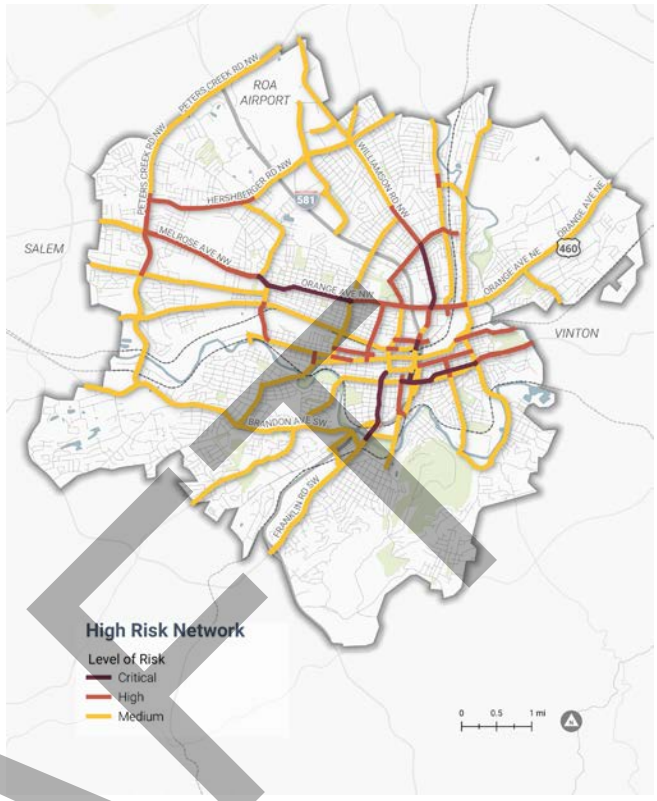
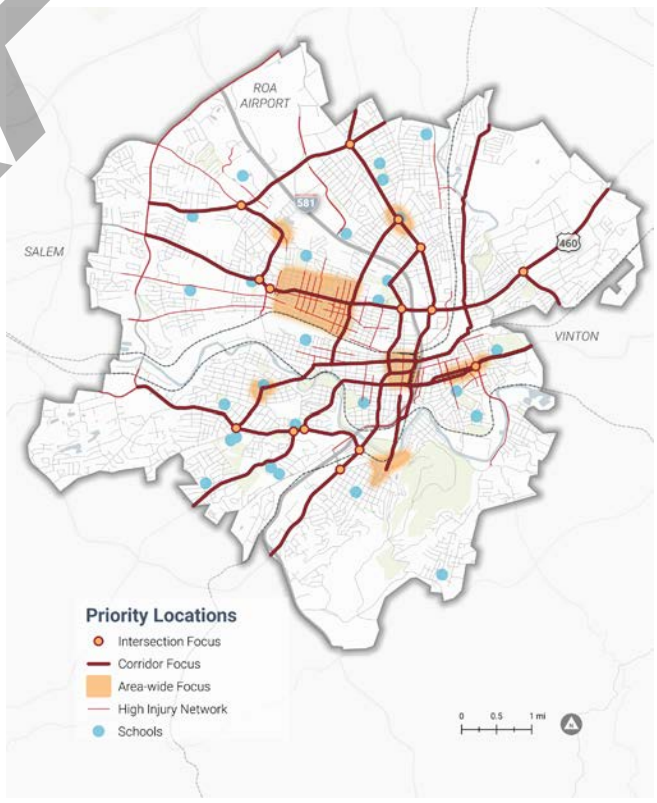


Figure 7 Focus Areas



Community and stakeholder input provided another critical source of data in the development of the plan. Input was gathered from people at events such as National Night Out; a series of Walk Audits in all four quadrants of the city; stakeholder meetings with the police, neighborhood associations, and local organizations; and through an on-line survey and interactive map that generated hundreds of comments. This outreach confirmed the importance of speed and distracted/impaired driving as a top community concern. Indeed, the police department shared that, whenever they are called out and for whatever the initial reason, residents want to talk about neighborhood traffic issues such as speed.

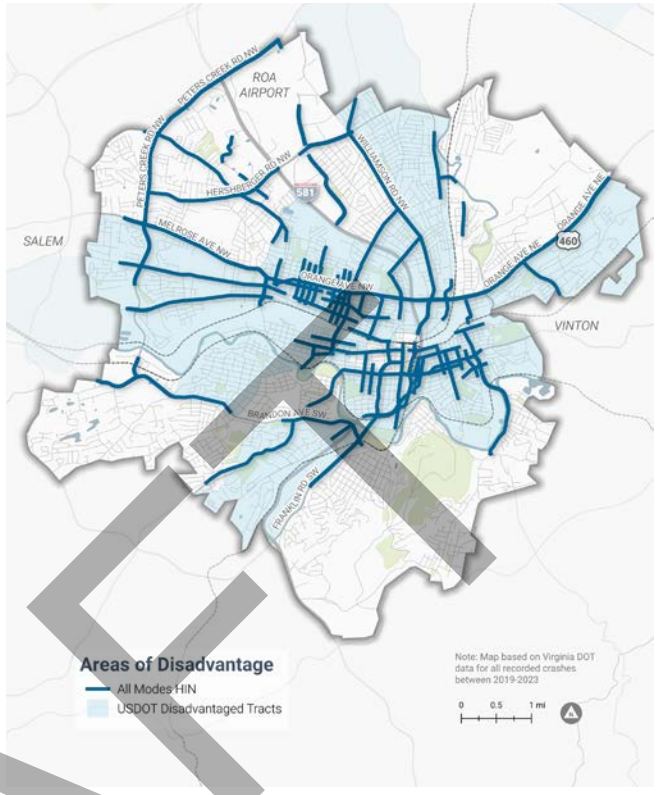
Public input and the crash analysis also highlighted the negative effects of missing sidewalks, crosswalks, and protected cycling infrastructure for the most vulnerable road users. Basic issues of fairness emerge from a situation where people living in areas of persistent poverty who are least likely to be able to afford a motor vehicle are also most likely to have to navigate the most dangerous streets without safe, comfortable, or accessible facilities. There is a strong overlap between these communities and streets on the High Injury Network (Figure 8). The plan recommends prioritizing implementation in these areas.

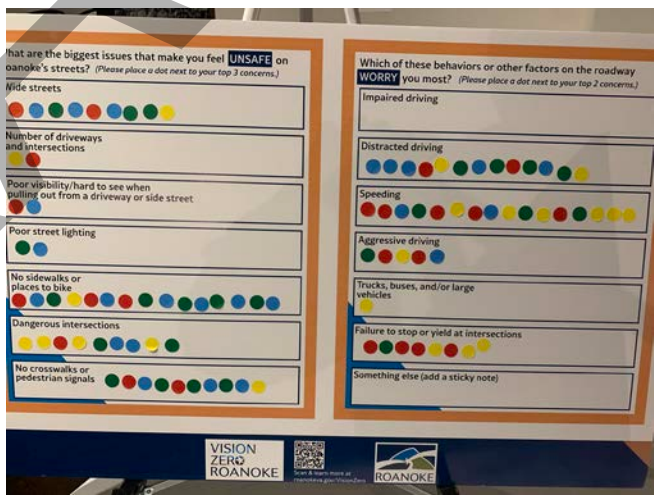
Solutions in the Safety Action Plan are organized around seven Priority Issues:

- Culture of Safety
- Speed
- Distraction/Impairment
- Motorcyclists
- Pedestrians
- Bicyclists
- Schools

Implementing solutions to address these issues will complement the City's vision as a safe, caring, and economically vibrant community in which to live, learn, work, play, and prosper.

Figure 8 HIN and Underserved Communities





Community feedback board from stakeholder event

Figure 9 Recommended Safety Measures

Measure	Relevance							Application		
	Speed	Distraction	Pedestrians	Bicyclists	Motorcyclists	Schools	Culture	Corridors	Intersections	Neighborhood
Corner Radius Reduction	x		x	x					x	x
Crossing Island/Median			x	x		x		x	x	
Curb Extensions	x		x						x	x
Curb Ramps			x			x	x	x	x	x
Daylight Intersections			x	x	x	x			x	x
Hardened Centerline	x		x		x				x	x
High Visibility Crosswalk		x	x			x			x	x
Horizontal Deflection	x				x		x			x
Leading Pedestrian Interval		x	x				x		x	
Mobility Track			x	x				x		
Neighborway	x		x	x						x
No Right Turn on Red			x				x		x	
Pedestrian Hybrid Beacon		x	x			x		x	x	

Measure	Relevance							Application		
	Speed	Distraction	Pedestrians	Bicyclists	Motorcyclists	Schools	Culture	Corridors	Intersections	Neighborhood
Protected Mobility Lane				x				x		
Protected Intersection				x					x	
Raised Crossing	x		x	x						x
Raised Intersection	x	x	x			x			x	x
Remove Slip Lanes	x		x	x	x	x			x	
Roadway Reconfiguration	x	x	x	x	x	x	x	x		
Roundabout					x				x	
RRFB		x	x			x				x
Safety Cameras	x					x	x	x		
Shared Street	x		x	x			x			x
Sidewalk			x			x		x	x	x
Speed Humps	x	x	x	x		x				x
Speed Limit Reduction	x						x	x		x
Traffic Circle	x	x	x	x						x
Traffic Diverters			x	x		x	x			x
Visual Narrowing	x	x	x				x	x	x	x

A toolbox of 30 proven safety countermeasures is provided in Appendix C of the Safety Action Plan – these safety measures were selected based on their relevance and effectiveness in addressing roadway design issues that contribute to Roanoke's particular traffic safety problems.

The SAP also includes a stand-alone micromobility network plan that can be used by the City to prioritize development of a micromobility network that is connected to the greenway system. Safety is the key to getting more people riding and walking.

Figure 10 Sample Action Item from the proposed Actions and Strategies

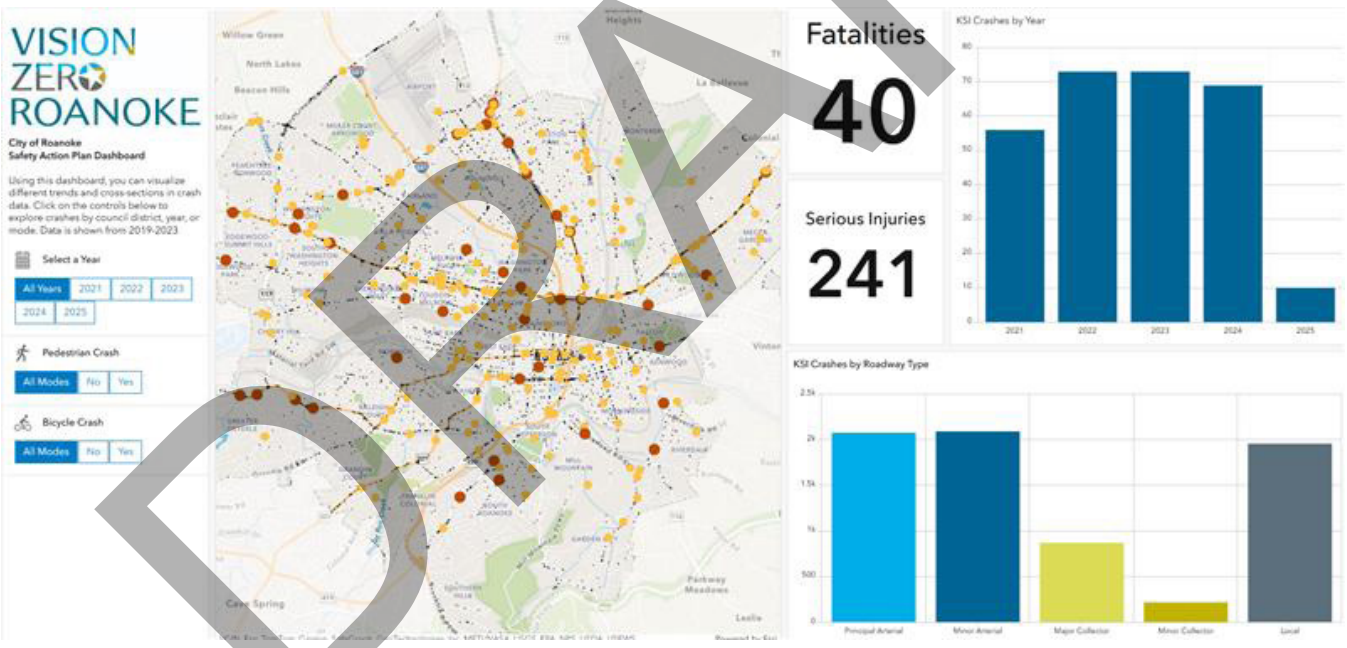
Short-term Actions	Lead	Support	Measure	Notes	Relevance	Cost
Purchase a small street sweeper	Stormwater	Transportation	Completed Purchase	Would enable wider selection of safety measures; needs driver training	Bicyclist	$$

The final sections of the Safety Action Plan recommend specific actions and strategies the City should pursue to hasten implementation of these proven safety measures. Nearly 50 specific actions are organized by short, medium, and long-term implementation timelines and by lead agency.

The plan also includes a commitment to produce an annual report and Vision Zero dashboard on the city website to track progress and ensure accountability.

Implementation of the plan will no doubt be possible in a shorter timeframe if new and external funding sources such as the U.S. Department of Transportation Safe Streets and Roadways for All program continue to be available. However, the greatest progress can be made by embracing the Safe System Approach in the way the city invests existing funding, programs, policies, and procedures. This is a different way of doing business: there is a laser-focus on saving lives and preventing catastrophic traffic crashes that affect dozens of Roanoke families every year.

Fatal and serious injury traffic crashes are preventable, and this Safety Action Plan is the blueprint to prevent or mitigate the most serious of them.



Safety Action Plan Dashboard

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DRAFT

VISION AND GOALS

The City of Roanoke is committed to eliminating fatal and serious injury crashes on city roadways by 2040.

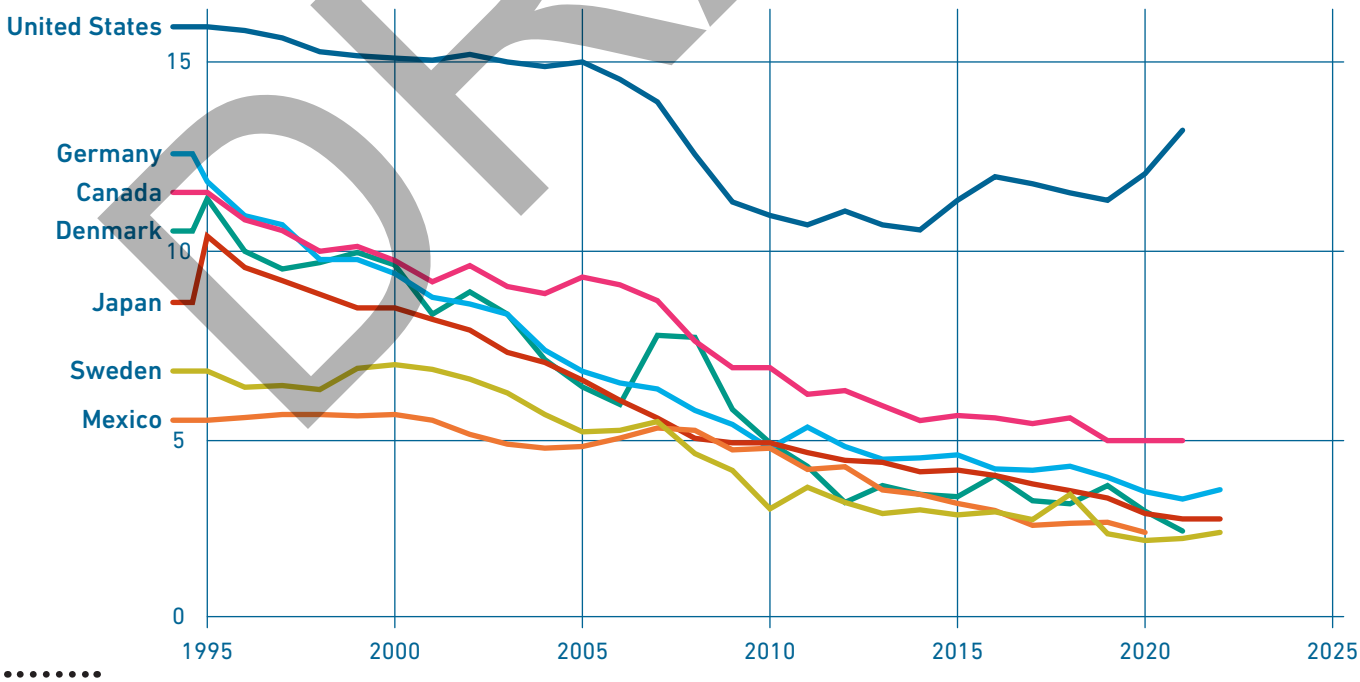
This is an ambitious goal. Traffic safety is a significant national concern as more than 40,000 people lose their lives in crashes every year in the United States. People on foot and on bike are an increasing share of that total[1]. For too long, this death toll has been accepted as inevitable, as the consequence of our mobile, modern-day lifestyle. Yet in countries all over the world, in stark contrast to the United States, traffic fatalities are falling dramatically because of the Safe System Approach to traffic safety (Figure 11).

The Safe System Approach (Figure 12) does not consider fatal and serious traffic crashes to be inevitable. In fact, it states that they are entirely preventable and that we have both the tools and the responsibility to stop them from happening, as soon as possible. Similarly, the Safe System Approach assumes that individual human error is inevitable and that we should strive to ensure the consequences of a mistake will not result in someone losing their life. Once we accept this principle, we can no longer simply blame the victim or driver of a motor vehicle involved in a fatal or serious injury crash; we must change the system to make deadly collisions virtually impossible.

The Safe System Approach requires a holistic, multi-disciplinary commitment to changing how we plan, design and operate our transportation system. This complements and supports many of the goals at the heart of the City's comprehensive plan and other guiding documents.

Figure 12 FHWA Safe System Approach

Figure 11 Traffic Deaths per 100,000 Inhabitants, International Comparison. OECD.



1 https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813705

Fairness: Traffic danger disproportionately affects the most vulnerable in society. Many of the most dangerous roads in Roanoke go through communities with the highest levels of poverty, the lowest percentage of people with access to a motor vehicle, and the highest percentage of people with limited access to healthcare and other basic services. Making the streets safer in these communities will expand safe and dignified access to transit, jobs, services, recreation facilities, shopping, schools and other critical destinations.

Quality of Life: Roanoke is committed to a sustainable and healthy future. A sustainable urban transportation system includes walking, biking, and taking the bus as comfortable, economical, and attractive options. Well used active transportation options reduce motor vehicle congestion, reduce air pollution, increase community health, and improve the safety of all street users. Making the streets safer in Roanoke will increase people's travel choices and ensure everyone can move around the community in safety and with dignity.

Health and Safety: Keeping people safe and healthy is a fundamental responsibility of government. Obesity and traffic crashes are among the biggest contributors to premature death in Roanoke and communities across Virginia and the United States – increasing safety saves lives by eliminating traffic crashes AND by enabling more people to be physically active as part of their daily routine.

This Vision Zero Safety Action Plan is an opportunity to save lives, improve the quality of life for Roanoke residents, and eliminate economic and social disparities that continue to blight the community. The plan complements ongoing community planning initiatives around Envision Williamson Road, the City's Neighborhood Revitalization Initiatives (Target Areas), and the introduction of a speed management plan and bikeway network plan.

So, while the goal of zero fatalities and serious injuries from traffic crashes may be aspirational today, it is critically important for the future of the city, and it is within reach. The Safety Action Plan is designed to usher in a culture of safety that is embraced by all government departments and agencies and championed by community organizations across the city.

Safety: A Promise to Roanoke Residents and Visitors

Safety is a fundamental promise of Roanoke's vision, mission, and strategic goals. The City Council's seven priorities include Safety. The mission statement of the City is to be a safe, caring, and economically vibrant community in which to live, work, play, and prosper. This vision cannot be realized without making our streets safe for people to use. The Safety Action Plan identifies the ways in which the goal of safety can be achieved.

Safe Streets are the hallmark of good government.

Just as importantly, the steps that we take to make our streets safe will also help realize every other part of that vision. Safe, welcoming streets are essential to create a vibrant urban center and economically vibrant community. The ability of people to enjoy the spectacular beauty of Virginia's Blue Ridge is only possible if city streets are safe enough for people who walk, ride a bike, or use a motorcycle.

Safer streets can lower the costs and stress of driving while making the system work better for everyone. Academic performance, physical and mental wellbeing, and access to human services all benefit from streets that encourage physical activity – which can only happen if people feel safe crossing the street, strolling through the neighborhood, riding their bike to school, or taking the bus downtown.

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Crash summary

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There were 9,455 reported crashes involving motor vehicles in Roanoke in the five years from 2019 to 2023 (Figure 13). While most of these crashes resulted in property damage only, there were 47 fatal crashes that resulted in the deaths of 49 people – an average of almost ten fatalities every year. There were 306 serious crashes that left 350 people with life-altering injuries – and average of 70 victims with serious injuries per year (Figure 14).

The trends are not good. The number of crashes has been rising steadily since 2020 and while fatal crashes have been level at ten per year, the number of serious injury crashes has risen sharply since 2019.

Roanoke numbers closely track national trends, but a detailed analysis of five years of crashes helped to reveal issues that are more unique to Roanoke, as well as confirming several significant priority areas that are common in communities across the country.

Figure 13 Annual Total Number of All Crashes

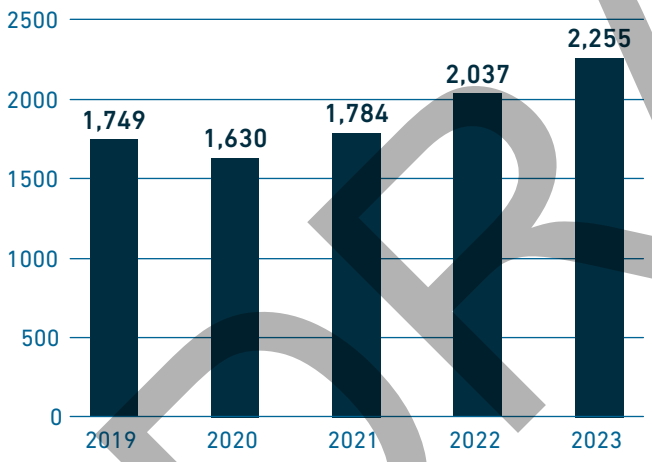
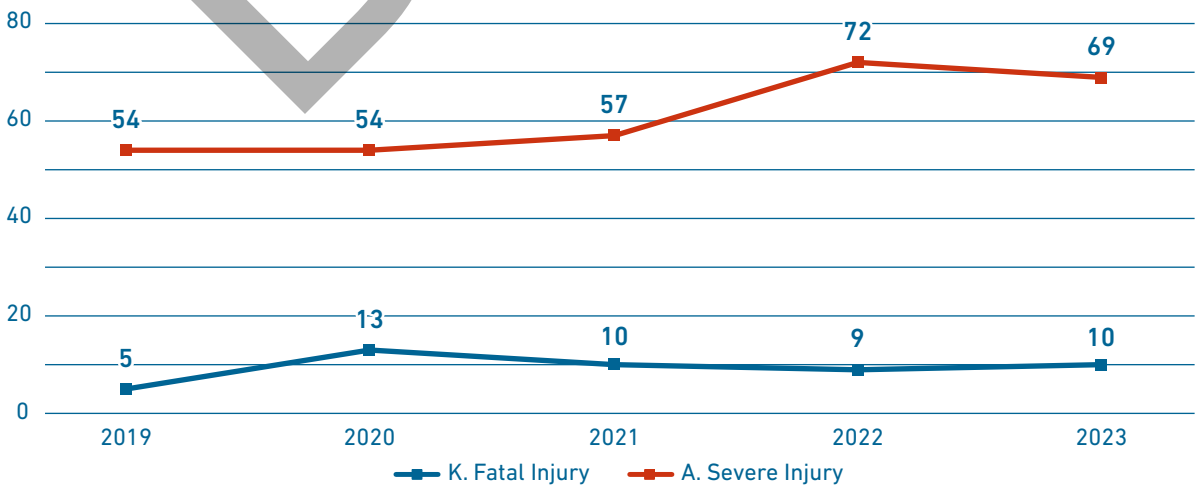


Figure 14 Fatal and Serious Injury Crashes By Year



Inside the Data

The data used in this study is generated from crash reports written by Roanoke Police Department Officers who are called to the scene of every collision in the city. These reports are forwarded to the Virginia Department of Motor Vehicles and shared with the Virginia Department of Transportation. There are some limitations with the data. Crash reports are only included if a motor vehicle is involved in the collision and the collision occurs on a public road. This means that, for example, a crash involving a bicyclist hitting a pothole does not get counted. Crashes in shopping center or other private parking lots are not included.

Reported crashes between 2019 and 2023 were used in this study. Data from 2022 and 2023 is still subject to change – for example, because of details emerging from crash investigations completed as part of legal proceedings. This means there may be small discrepancies between the data in this report and on the VDOT website. However, the benefit of having data for additional post-COVID years of 2022 and 2023 (rather than data from 2017 and 2018) outweighed these potential changes.

From the Community

"I have had 3 friends injured by cars. One in a crosswalk, one walking in their neighborhood street, and another walking on a neighborhood street without sidewalks!"

Major Findings

Some road users are more vulnerable than others. Motor vehicles were the only party involved in more than 9,000 of the 9,455 total crashes. Most of these collisions (more than 80%) resulted in property damage only or very minor injuries. Less than 2.5% resulted in a fatal or serious injury. By contrast, pedestrians, motorcyclists, and bicyclists were involved in far fewer crashes overall, but the consequences were starkly different: more than one-third of all the crashes involving people on foot, motorcycle, or bicycle resulted in death or serious injury (Figure 15).

Pedestrians and bicyclists were involved in less than 3% of all crashes but accounted for nearly a quarter (23.4%) of fatal and serious injuries in the city (Figure 16). Motorcyclists accounted for 16% of fatal and serious injury victims but were involved in less than 2% of crashes overall. This disparity is even more distinct when looking at just the fatal crashes. Pedestrians were involved in 38% of fatal crashes, the same as motor vehicle occupants; motorcyclists were involved in 23% of fatal crashes. No bicyclists were killed during this five-year period (Figure 17).

Figure 16 Share of Fatal and Serious Injury Crash Involvement by Mode

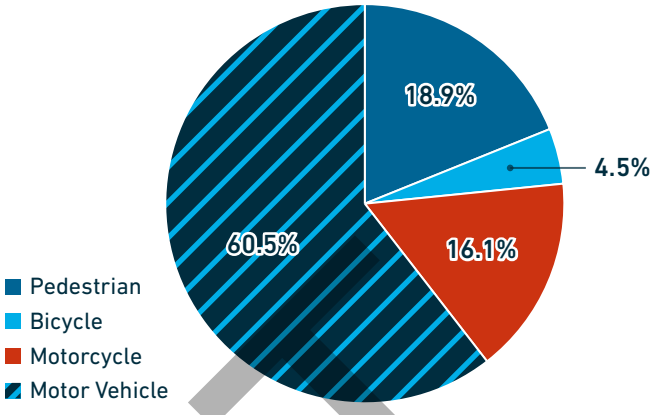


Figure 17 Share of Fatal Crash Involvement by Mode

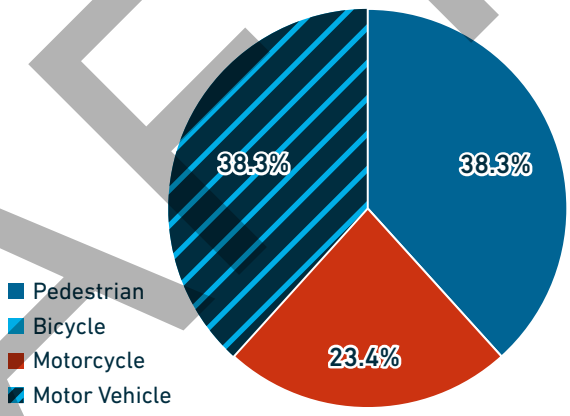
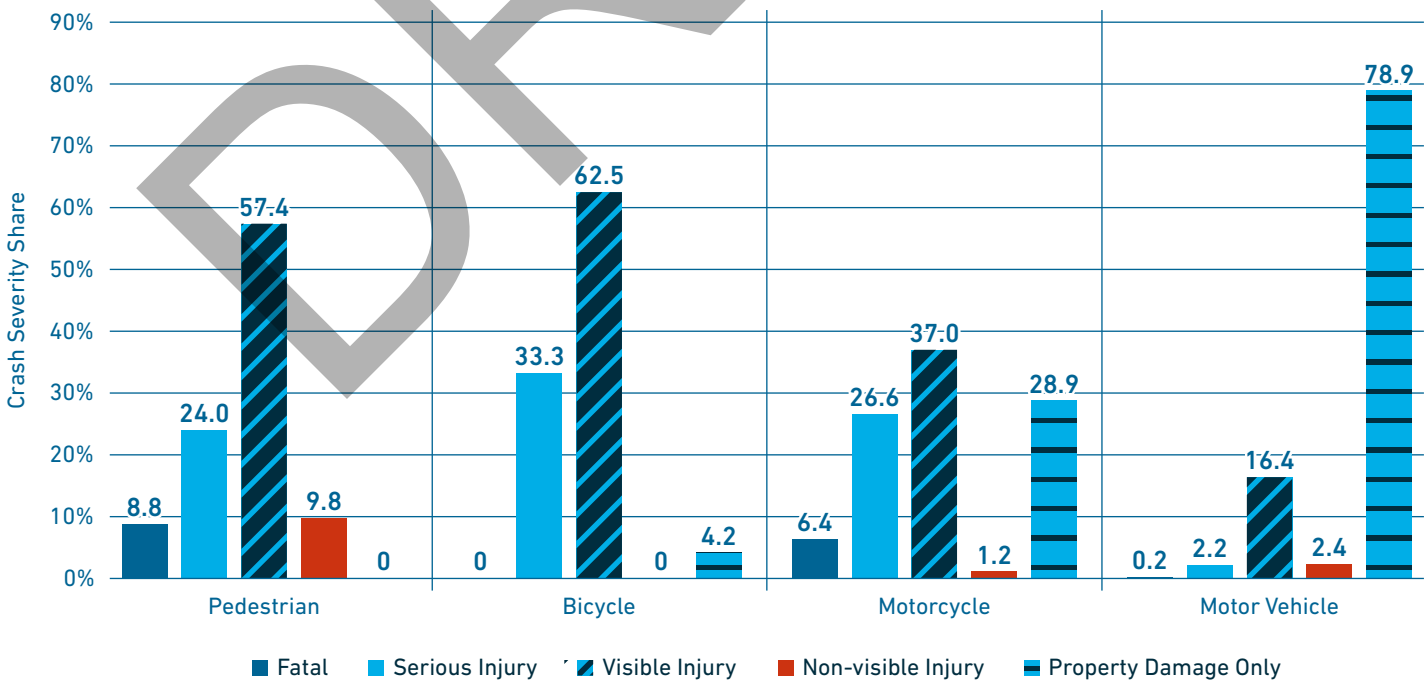


Figure 15 Outcome of Crash Involvement By Mode

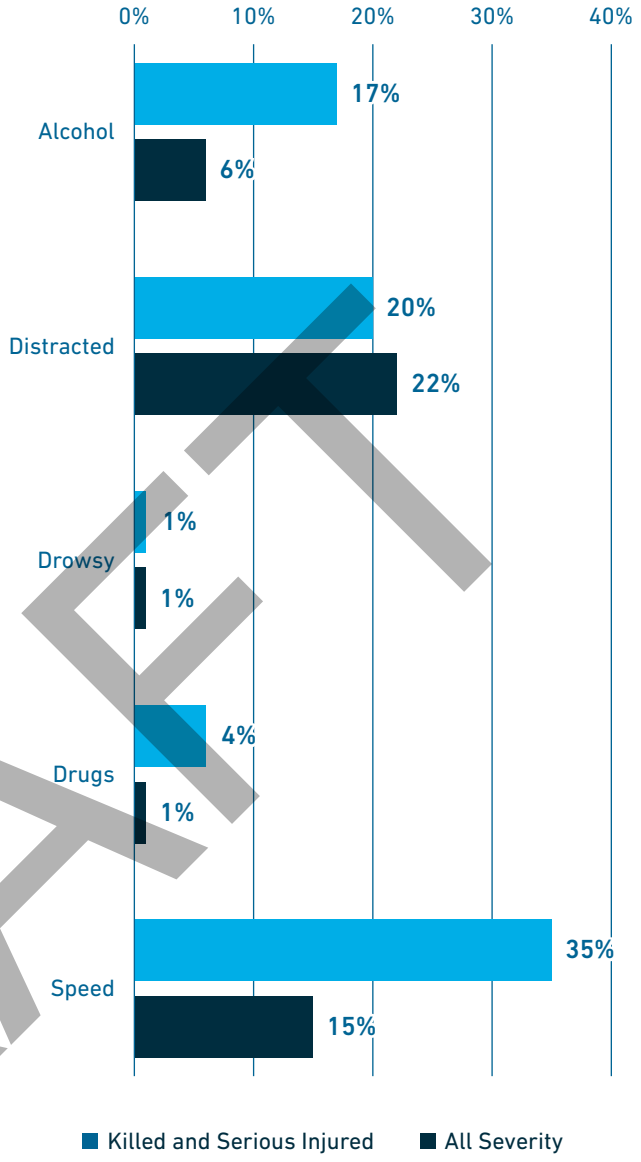


The most serious crashes occur at intersections and on major roads. More than half of fatal and serious injury crashes occurred at intersections, and the percentage is even higher for motorcyclists and bicyclists (56% and 75% respectively). The numbers are likely even higher as more than 30% of crash reports list the location as "other/unknown". The majority of fatal and serious injury crashes happened on main roads (arterials), including more than 70% of pedestrian and motorcycle crashes. Bicyclists were more likely to be involved in a serious collision on a local road or neighborhood street.

Speeding, distracted, and impaired (alcohol) driving are significant factors (Figure 18). Speed was the single greatest contributing factor in fatal and serious injury crashes in Roanoke during this period. More than one-third (35%) of these incidents involved one or more speeding vehicle, which is slightly above the national average of 29% in 2022[2]. Distracted driving was identified as the contributing cause in the greatest share (22%) of all crashes, as well as almost 20% of fatal and serious injury crashes. Alcohol use was implicated in more than 15% of fatal and serious injury crashes.

Other factors such as time of day, lighting, and weather conditions are largely consistent with national data[3]. Most crashes occur in dry, clear conditions. The late afternoon (3-6pm) saw the highest concentration of fatal and serious injury crashes (25.5%) for all road users, especially bicyclists (50%) and motorcyclists (39%). Pedestrians were more likely to be involved in a fatal or serious injury collision between 6pm and 9pm, when more than 30% of such crashes occurred.

Figure 18 Speeding and Distracted Driving Involvement



From the Community

"Cities that improve safety and walkability/ bikeability have a higher quality of life ...I'd love to not even have a car and use public transport."

From the Community

"We need to design streets to encourage driving at lower speeds in accordance with research. At a speed of 18mph pedestrians hit by a vehicle can mostly survive. As vehicles travel faster that chance drops dramatically. This is more than just posted speed limits."

2 https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813582

3 Traffic Safety Facts 2022: A Compilation of Motor Vehicle Crash Data, NHTSA 2024

Where Are Serious Crashes Happening in Roanoke?

The traditional approach to responding to traffic crashes has been to plot the location of all crashes on a map, identify the place where the greatest number of dots appear on the map, and take appropriate actions to try and eliminate crashes there in the future.

The limitation of this "hot-spot" approach is that it:

a. treats all crashes as equally important regardless of severity,

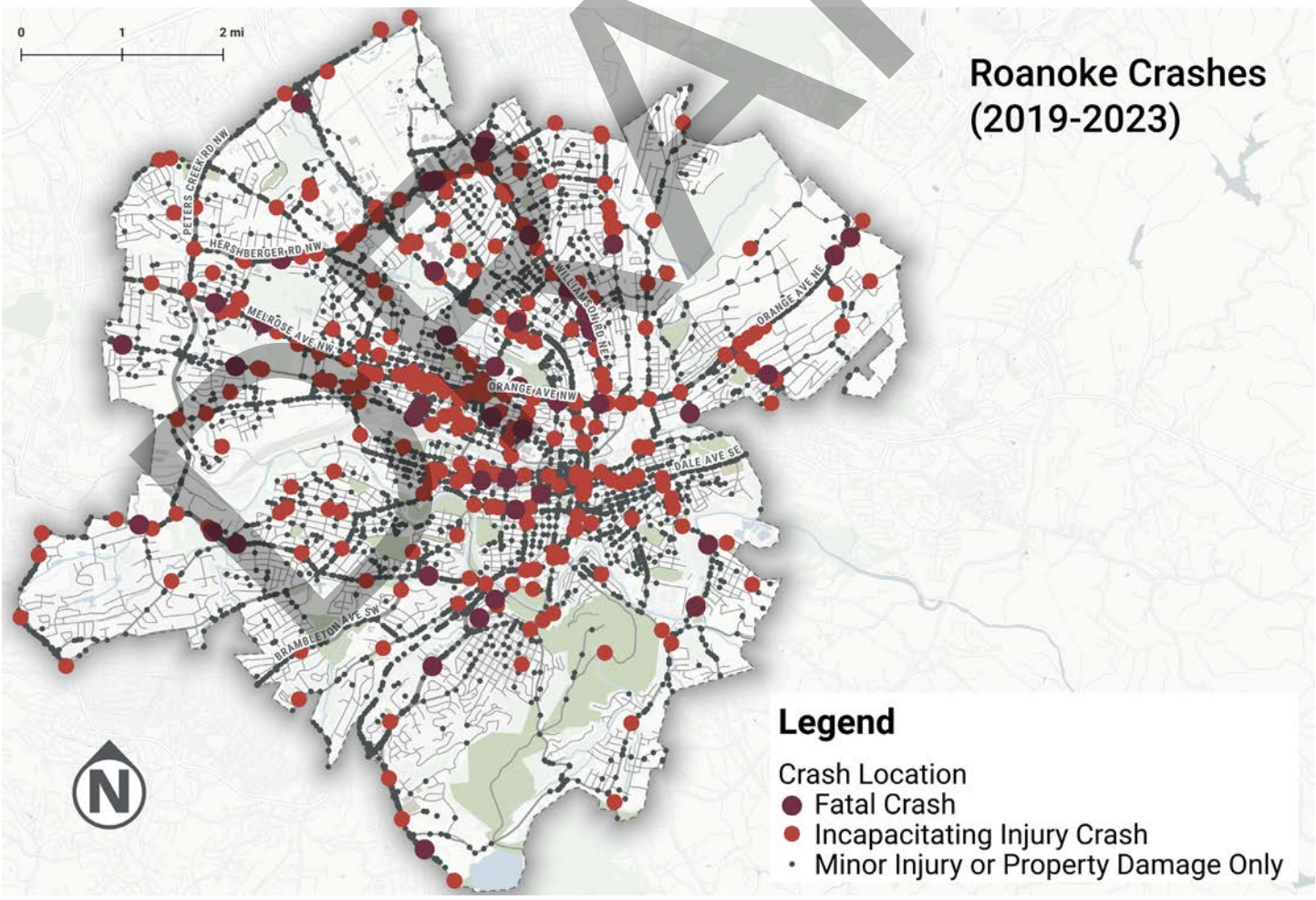
b. over-emphasizes solutions that are focused on motor vehicles (e.g. creating faster, wider, straighter roads), and

c. fails to address the root cause of crashes.

As a result, crashes keep happening. The most serious crashes continue to happen in locations across the city where similar conditions exist – for example, pedestrian fatalities occur on multi-lane arterial roads with posted speeds of 30 mph and above. The Safe System Approach is designed to break this cycle and tackle the systemic causes of the most serious crashes in a proactive, rather than a reactive, way.

The map below shows all reported crashes in Roanoke, including on I-581, US 220, and US 419 between 2019 and 2013 (Figure 19). The picture is overwhelming. The crash analysis that follows removes crashes on non-city streets (noted above) and focuses on the fatal and serious injury crashes as the top priority.

Figure 19 All Crashes, All Roads. VDOT.

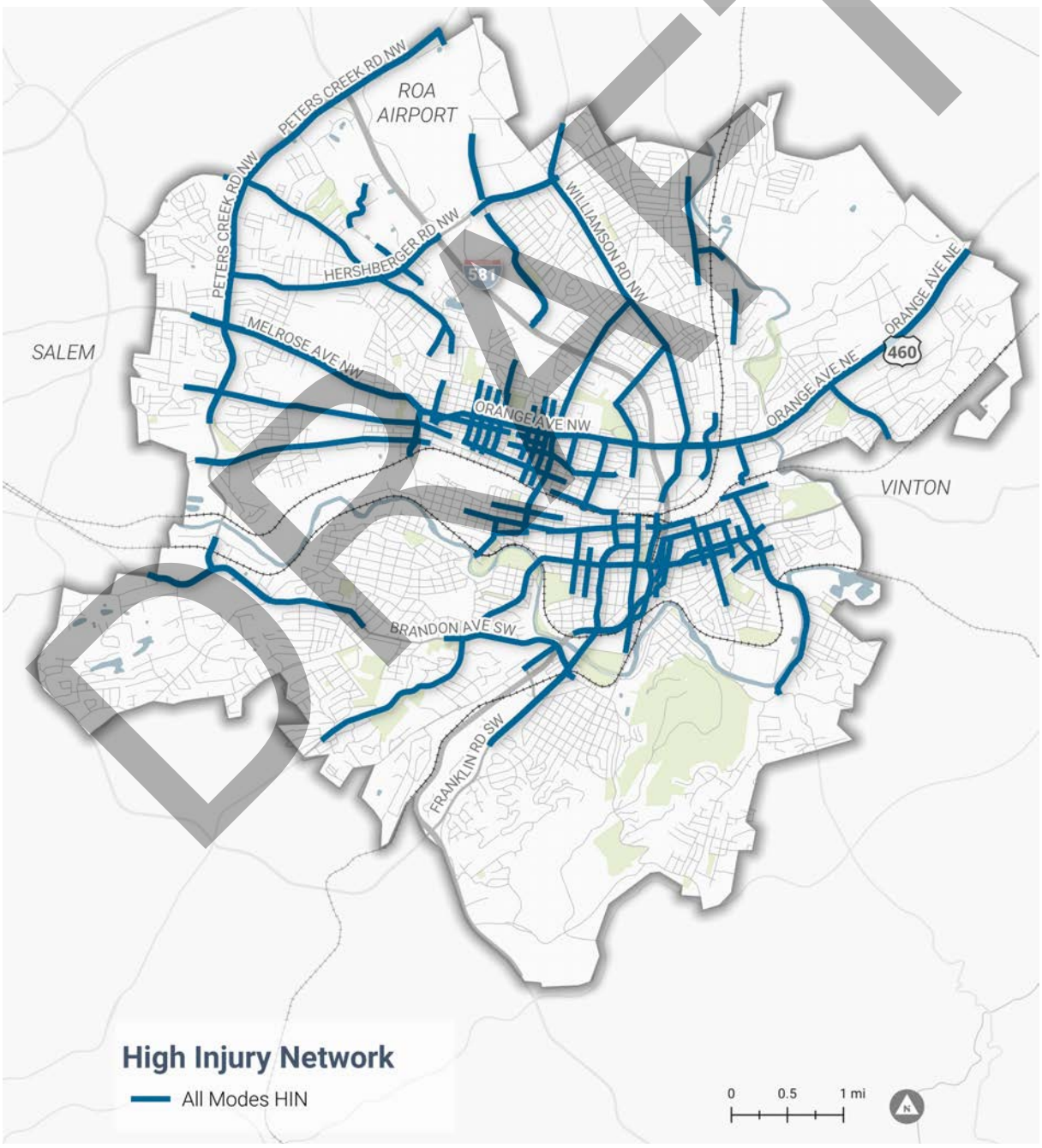


The High Injury Network

One way to go beyond the traditional hot-spot crash analysis is to identify a High Injury Network (HIN) map that focuses on segments of street network where the highest number of fatal and serious injury crashes occur (Figure 20). This provides a bigger-picture perspective on the streets and intersections with the highest concentration of the worst crashes in the city over the past five years. This can be used to identify locations where it is appropriate to make changes to the street to prevent similar crashes from happening in the future.

High Injury Network maps were also created for pedestrians, bicyclists, motorcyclists, and motorists individually. These maps, and the overall map, focused attention on several of the main streets (arterials) in the city including Orange Avenue, Melrose Avenue, Williamson Road, Hershberger Road, Brandon Road, Jamison and Bullitt Avenues, and 13th Street. There was also a notable concentration of streets on the HIN in downtown Roanoke and the neighborhoods either side of Orange Avenue NW between 10th and 22nd streets, driven in large part by pedestrian fatalities and serious injuries.

Figure 20 Roanoke High Injury Network

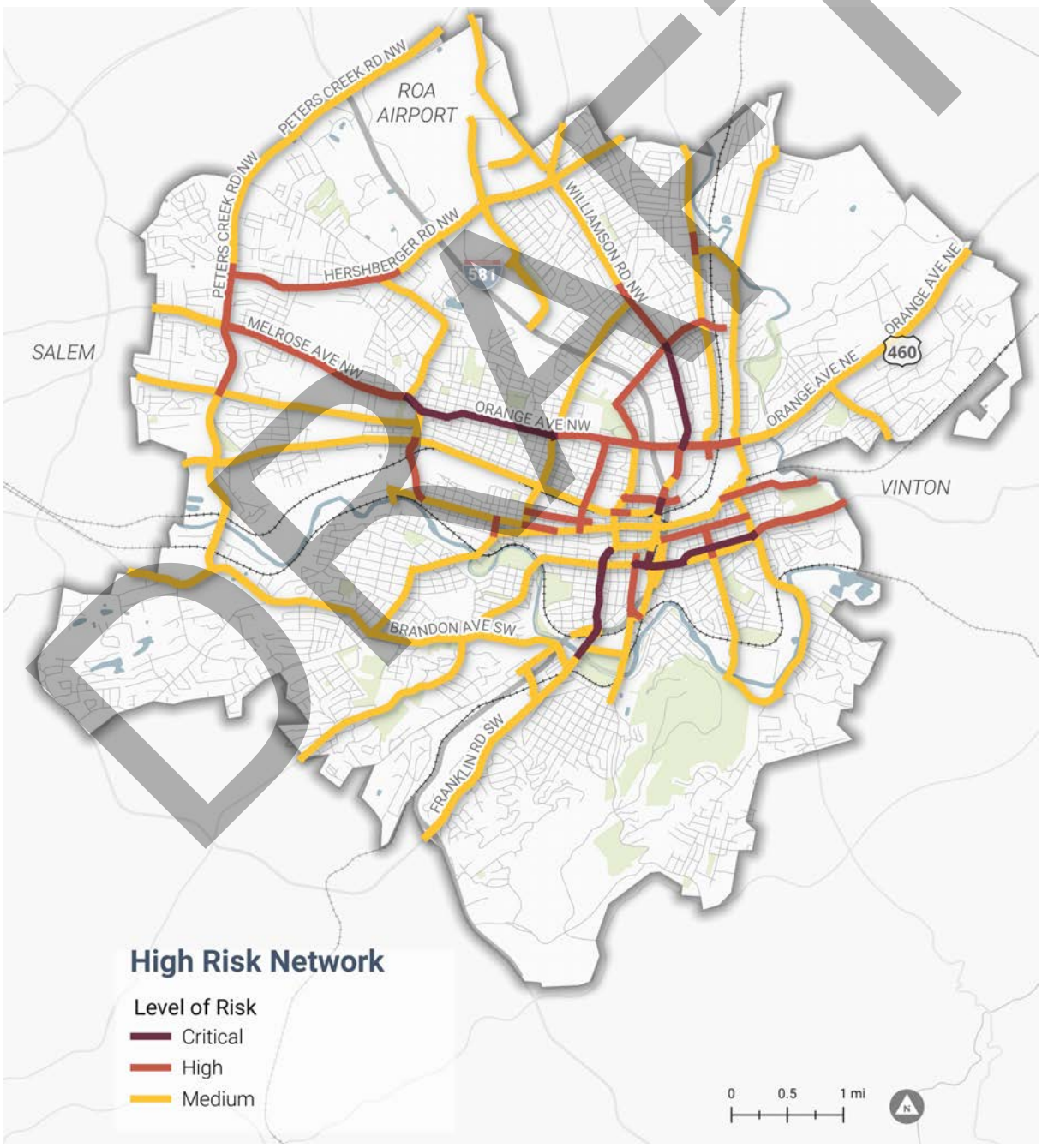


The High Risk Network

The HIN effectively captures what has happened in the immediate past. The HIN was also analyzed to identify any common conditions that exist on roadway segments on the HIN – for example, the land use context, number of lanes, or posted speed limit. The High Risk Network map (Figure 21) identifies locations throughout the city where those same conditions exist and where it is reasonable to anticipate that serious crashes are likely to happen in the future.

This can be used to identify systemic changes to the street network that need to be made whenever the opportunity presents itself, as well as elements of street design that should be avoided in the future. For example, right-turn slip lanes are a feature of the intersections that appear on the HIN and HRN and are known to increase risk for pedestrians and bicyclists nationwide.

Figure 21 Roanoke High Risk Network



The HRN is dominated by main streets in the city that have some or all of the following characteristics:

- Four or more travel lanes
- Posted speeds of 30 mph or higher
- Missing sidewalks and curb ramps
- Missing crosswalks
- Limited or no micromobility infrastructure
- On a bus route

Streets that emerged as having the highest relative risk included some of the same streets as were on the HIN such as Williamson Road NE between Orange Avenue and Liberty Road, and Orange Avenue NW between 10th Street and Lafayette Boulevard. It also includes streets with fewer reported crashes in the last five years but with all the conditions for serious collisions in the future. These included Elm Avenue and Jamison Avenue SE between South Jefferson Street and 13th Street, and Franklin Road SW between 2nd Street and Reserve Road.

Neighborhoods
Downtown
Melrose-Rugby and Loudon-Melrose
Williamson Road and Oakland Blvd
Crystal Spring Ave and 22nd Street
Belmont
Grandin Village
Cove Road and Lafayette Blvd

Intersections
Brandon Avenue and Brambleton Avenue
Brandon Avenue and Franklin Road
Brandon Avenue and Main Street
Dale Avenue and 13th Street
Franklin Road and Wonju Street
Grandin Road and Brandon Avenue
Gus Nicks Blvd and Orange Avenue
Hershberger Road and Cove Road
Melrose Avenue and Lafayette Blvd
Orange Avenue and 24th Street
Orange Avenue and Burrell/Gainsboro
Orange Avenue and Williamson
Williamson Road and 10th Street
Williamson Road and Hershberger Road
Williamson Road and Liberty Road

Corridors	From	To
10th Street	Williamson Road NE	Campbell Avenue SW
Brambleton Avenue	Brandon Avenue SW	SW City limit (Cave Spring)
Brandon Avenue	Franklin Road SE	SW City limit (Salem)
Burrell Street	Liberty Road NW	Orange Avenue, NW
Cove Road	Lafayette Blvd NW	Hershberger Road, NW
Dale Avenue	SE City limit (Vinton)	13th Street SE (Vinton)
Franklin Road	South Jefferson Street	US 220, SW
Gainsboro Road	Orange Avenue NW	Salem Avenue, SW
Gus Nicks Boulevard	Orange Avenue NE	SE City limit (Vinton)
Hershberger Road	Williamson Road NE	Peters Creek Road NW
Jamison & Bullitt Avenues	13th Street SE	Williamson Road SE
Jefferson Street	Franklin Road SE	McLanahan Street, SE
Lafayette Blvd	Melrose Avenue NW	Cove Road, NW
Liberty Road	Plantation Road NE	Burrell Street NW
Melrose Avenue	20th Street NW	NW City limit (Salem)
Memorial Ave & Grandin Rd SW	Campbell Avenue SW	Brandon Road, SW
Orange Avenue (US 460)	NE City limit	20th Street NW
Williamson Road	Hershberger Road NE	South Jefferson Street

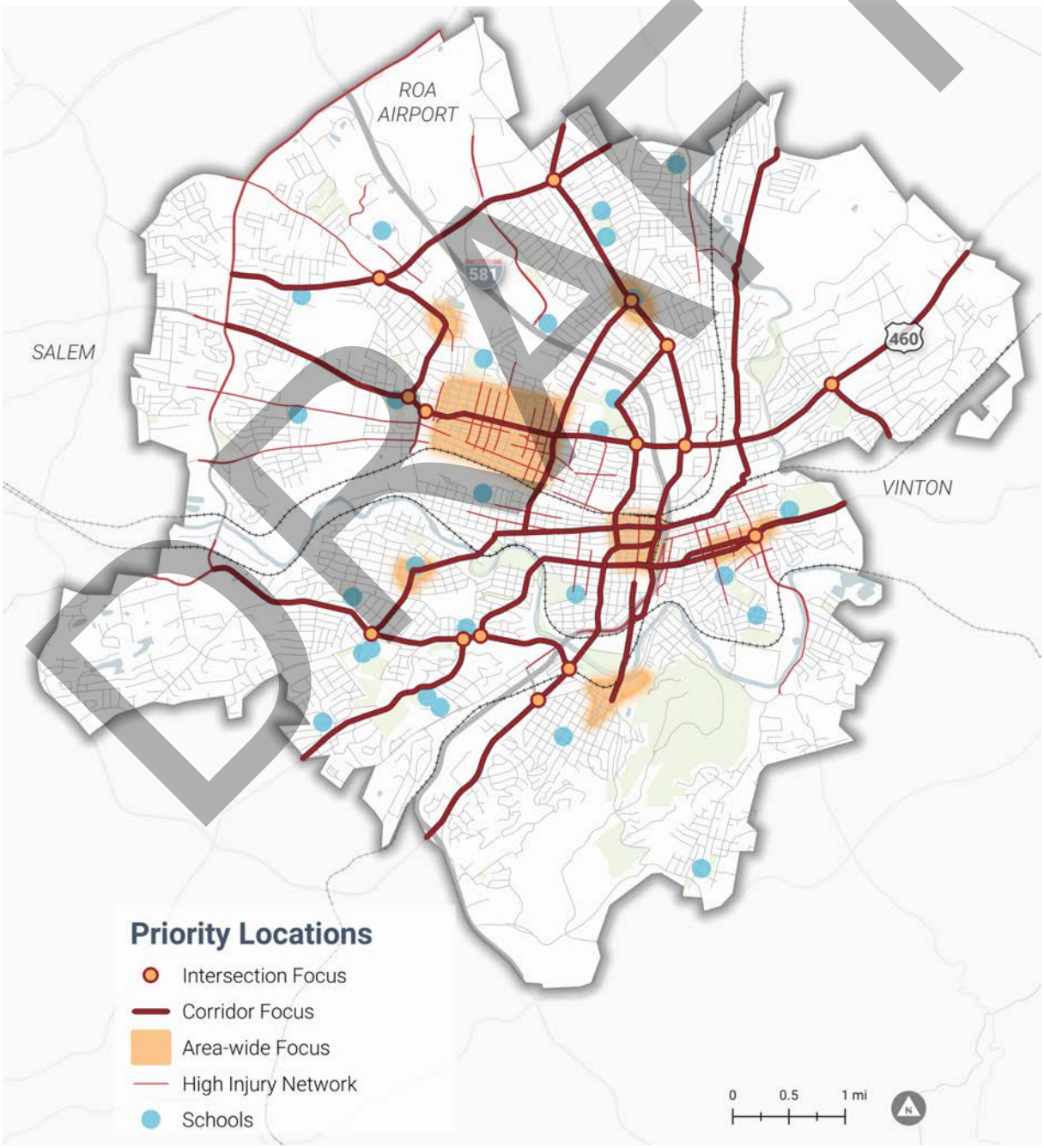
Conclusion

The crash data identified the types of crashes and the geographic location of crashes that result in the highest number and greatest risk of fatal and serious injury collisions in Roanoke. Based on this analysis, the City has identified Focus Areas comprising 18 corridors or street segments, 15 intersections, and 7 neighborhoods (areas that cover more than just one street or intersection) where future investments are likely to have the greatest safety benefits. These locations are shown in Figure 22 and listed in the table on the previous page.

These Focus Areas can be used to prioritize the investment of existing City funds, especially when overlaid with other policy priorities. They can also support grant applications from State and Federal sources such as the Highway Safety Improvement Program (VDOT) and Safe Streets and Roadways for All (USDOT) program.

These are not the only places where City investments are currently scheduled or planned, and the City will continue to seize opportunities to make changes to streets in the city whenever they arise. However, when there is an opportunity to prioritize or choose between potential projects, these Focus Areas should be a useful tool and data-source.

Figure 22 Roanoke Focus Areas



02

03

DRAFT

PUBLIC INPUT

04

The story of traffic safety in Roanoke is only partially told by the crash data. Police-reported crash information doesn't reflect near misses, the streets and intersections people avoid because they feel unsafe, the short trips forgone or driven because there isn't a safe place to walk or bike, or the undignified and hostile experience of having no choice but to walk or bike along busy streets with no sidewalks or crosswalks.

The best way to capture these experiences is to talk to people in the community, gather their stories firsthand, walk in their shoes, and ask them to share their insights. Community engagement and outreach activities included pop-up events, in-person meetings with stakeholders, walking audits of roads and corridors featured in the crash analysis, public meetings, and an Online survey and interactive map. A Project Advisory Committee provided invaluable guidance and input throughout the development of the plan.

The following summary of outreach activities is drawn from a detailed engagement report that is available in Appendix B.

The Project Advisory Committee

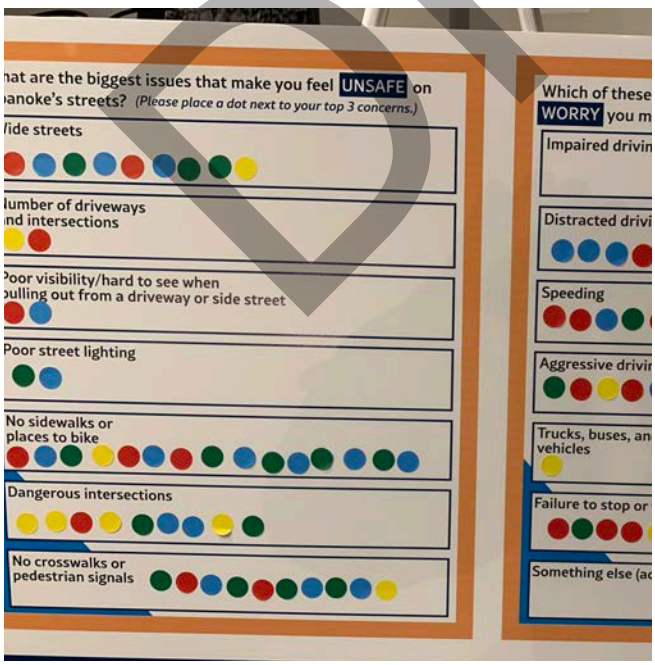
A Project Advisory Committee (PAC) met six times during the development of the Safety Action Plan. A group of more than 20 advisors, including numerous city and regional agencies as well as representatives of several community-based organizations, helped establish the vision and goals for the plan, assisted with outreach and gathering community input, and reviewed progress along the way. Committee members were also asked to contribute actions and strategies to which their agencies or organizations were able to commit as part of the overall plan. The PAC added valuable perspectives to the development of the plan and will be asked to continue meeting as a task force to monitor progress and help hold the city accountable for implementation.

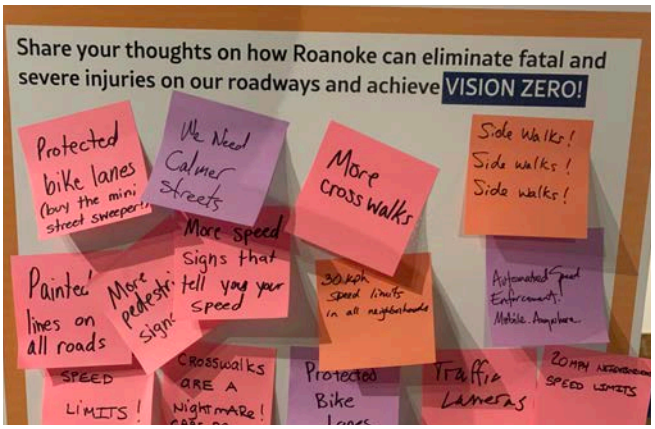
National Night Out

The project team participated in two block-party style National Night Out events at McCadden Park NW in the Melrose-Rugby neighborhood and at Fire Station #8 on Crystal Spring Avenue in Southeast Roanoke. People visiting the Vision Zero booth at these events were invited to share their thoughts and concerns on traffic safety issues in the neighborhood and were encouraged to take the Online survey. Participants used stickers to rank conditions and behaviors that cause most concern, and shared a variety of solutions they would use to eliminate fatal and serious injuries on city streets.

Among the solutions offered by people were:

- Neighborhood traffic calming such as speed cushions and mini traffic circles
- Crosswalks and pedestrian signals at major intersections
- Much needed culture change to discourage speeding and running red lights
- Increased visibility for pedestrians in crosswalks
- Lighting, especially in areas where people are commuting after dark
- Improved maintenance, especially to address poor pavement conditions and overgrown sidewalks





Stakeholder Meetings

The project team hosted several facilitated discussions with key stakeholders in the community.

Members of the **Roanoke Neighborhood Advocates (RNA)** confirmed the importance of traffic safety to every neighborhood association in the city and identified ways in which the RNA could continue to participate in the development of the plan. One follow-up was a presentation and discussion at the September **Neighborhood Presidents Meeting** where specific concerns were raised about traffic safety in their neighborhoods either side of Orange Avenue to the west of I-581.

The **Roanoke Police Department Community Policing Division** shared their unique insight into traffic safety issues in the community, including the reality that speeding issues are brought up in virtually every interaction they have with members of the public regardless of the original reason for the call out. They identified the particular vulnerability of people experiencing homelessness as a concern, because of their exposure to traffic danger at all hours of the day and night. They also noted the positive impact of engineering interventions such as the roundabout at 13th Street SE and Wise Avenue SE in bringing down speeds.

PedalSafe Roanoke and the **Regional Greenways Commission** hosted a well-attended community meeting and PedalSafe also devoted one of their monthly meetings to providing input into potential routes on the proposed Micromobility Network Vision Plan.

There was coordination with the **Envision Williamson Road (EWR)** project throughout the development of the plan, including a presentation and discussion at one of the regular EWR Steering Committee meetings. Williamson Road, NE is featured prominently in the crash analysis as it is the site of numerous pedestrian fatalities and serious injury crashes in recent years.

Input from the bicycling community was also gathered during two pop-up events that coincided with popular local evening rides hosted by Cardinal Bike Shop and Big Lick Brewing. Participants consistently expressed concern that they don't feel safe on major streets in the city, are only comfortable riding in groups or with others, and want to be able to ride for everyday trips as well as recreational and social rides.

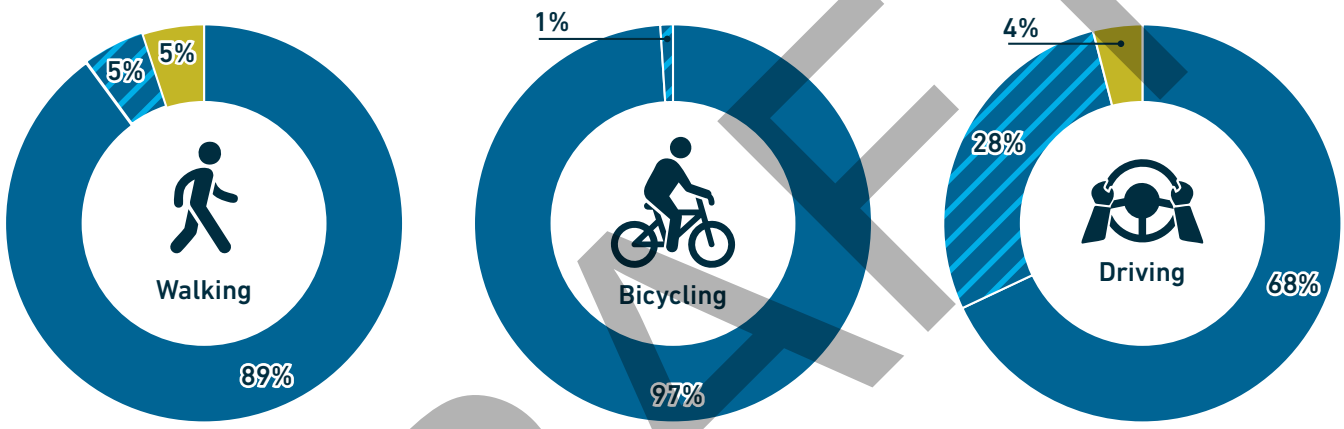
Top destinations people said they would like to be able to access by bike included:

- Downtown Roanoke
- Grocery Stores
- Park and Recreation Areas – e.g., Roanoke Greenways, Carvins Cove, and Dr. Pepper Park
- Schools
- Brandon/Brambleton Area
- Carilion Memorial Hospital
- West End Farmer's Market

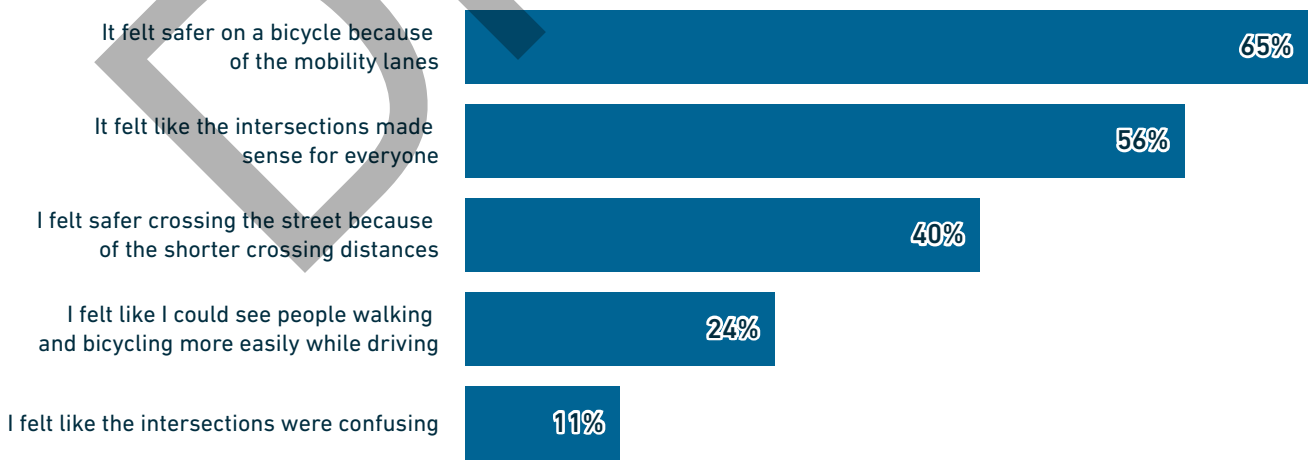
Demonstration Project

Roanoke's annual GoFest provided an excellent opportunity to gather input for the proposed micromobility network and to demonstrate in real time what dedicated space for people on bikes can feel like. South Jefferson Street (from Elm Avenue to Riverside Circle) was chosen as a location to test a design that might be applicable in locations throughout the city. Drivers and cyclists were encouraged to share their feedback on the installation (Figure 23). Feedback was also gathered at a booth at the event.

Figure 23 Summary of GoFest responses by user type



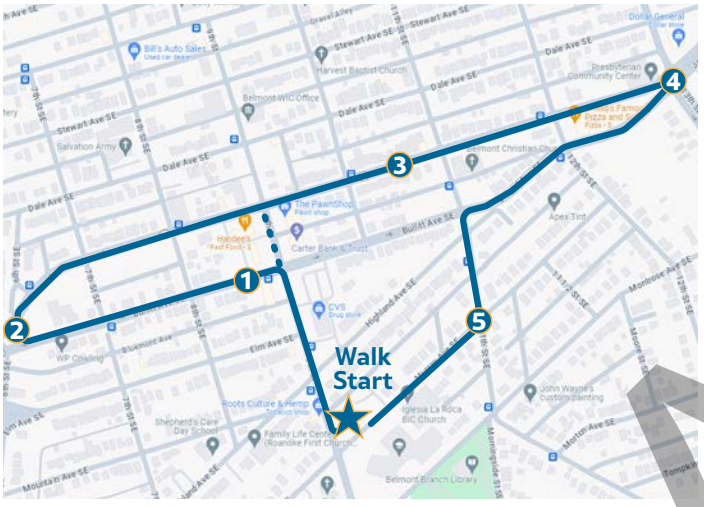
- It feels better than before the demonstration
- It feels same as it was before the demonstration
- It feels worse than it was before the demonstration



Walking Tours

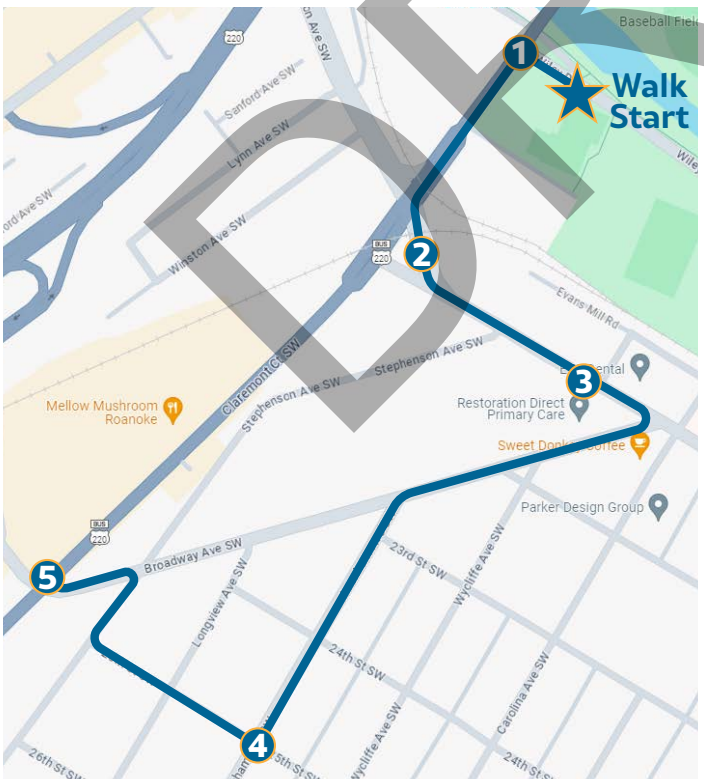
The project team hosted four "walk audits" to see firsthand some of the most challenging corridors in the city. Members of the community were invited to join the educational walks to share their experiences. The walks identified safety problems and concerns along the routes, and participants reviewed recent infrastructure investments – such as the 9th Avenue SE Mobility Track and street art project on Salem Turnpike, NW – to learn how these investments have changed conditions. Summarized comments included:

Southeast Roanoke: Belmont neighborhood



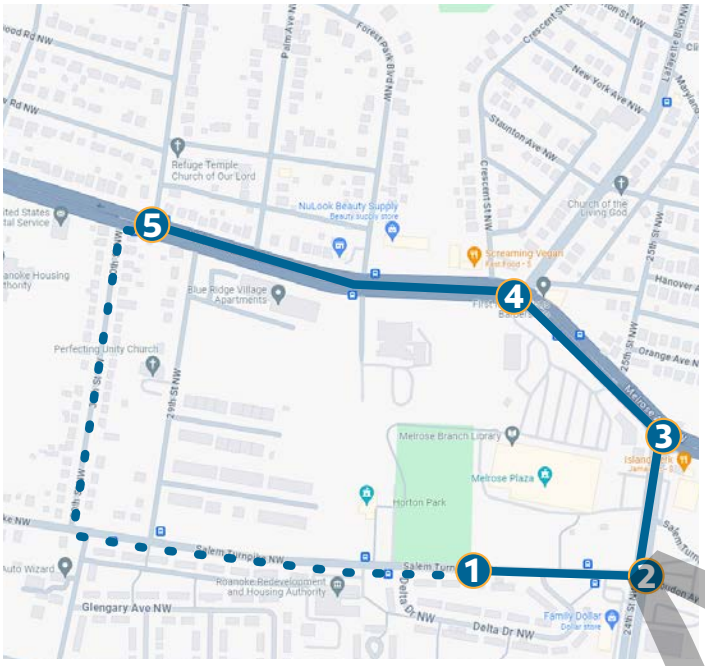
- Curb extensions and chicanes along Bullitt and Jamison Avenues have slowed traffic but vehicle speeds are still perceived as high.
- People park on the sidewalk (frequently blocking it entirely), likely because of vehicle speeds and the fear of being sideswiped.
- Wide turning radii and slip lanes at 13th Street SE and Jamison Avenue create long, exposed pedestrian crossings.
- Most people riding bikes use the sidewalk.
- The team witnessed the aftermath of a multi-vehicle crash at 9th Street and Bullitt Avenue.

Southwest Roanoke: Franklin Road and Broadway Corridor



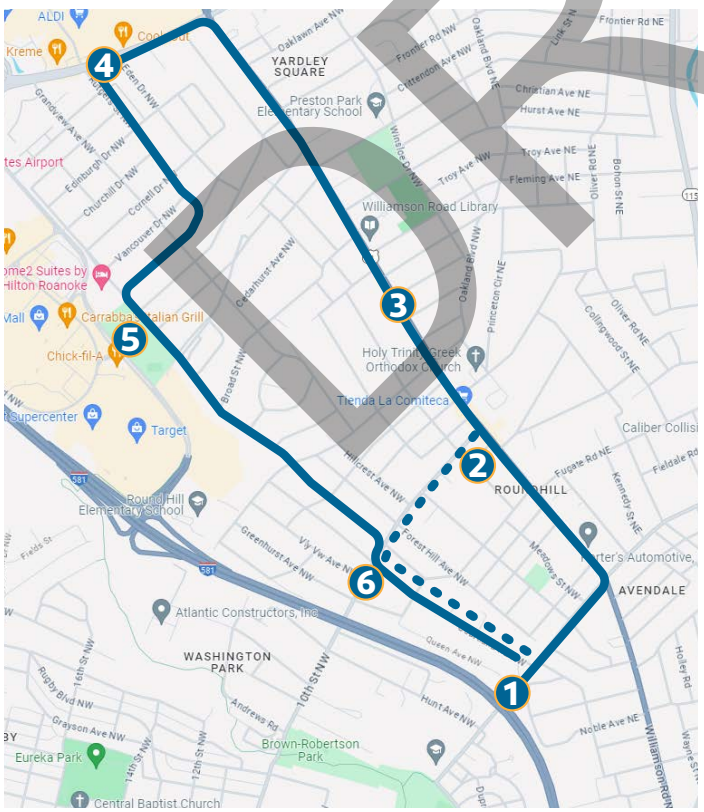
- The skewed intersection at McClanahan and Franklin (and other nearby intersections), the angle of the traffic lights, and lack of pedestrian signals, make it difficult for a pedestrian to know when it is safe to cross.
- Sidewalks end abruptly on Wiley Drive just before Franklin Road and on McClanahan Street at Jefferson Street.
- Despite being posted as 25 MPH, the wide lanes and sparsely used on-street parking on Avenham Avenue invite higher speeds.
- Franklin Road is difficult to cross. There are no pedestrian signals at the intersections with Broadway/ Wonju St or McCalanahan/Brandon Ave.
- Mobility lanes on Franklin Road are unprotected and adjacent to high speed, high-volume travel lanes; this makes them uncomfortable for most riders.

Northwest Roanoke: Salem Turnpike and Melrose Avenue



- Salem Turnpike has high truck traffic.
- Crossings distances at the intersection of Salem Turnpike and 24th Street are long and exposed, even with the recent painted curb extensions. People are still choosing to cross away from the intersections.
- Slip lanes at 24th Street and Melrose Avenue mean pedestrians have to cross fast moving traffic.
- The median on Melrose Avenue is too narrow for a turning vehicle to safely wait to make a turn and has no refuge space for people on foot or bike trying to cross.
- There are no marked crosswalks on Melrose Avenue.
- Speeding was identified as an ongoing issue by local residents.
- Mobility lanes on Melrose do not feel comfortable, even with a double stripe, for less confident riders.

Northeast Roanoke: Williamson Road Corridor



- Williamson Road sidewalks are in poor condition and have gaps and missing curb ramps.
- People frequently cross midblock because of missing crosswalks, and lack of signals and safe options at intersections and bus stops.
- High vehicle speeds, weaving traffic, and left-turning movements combine to create a chaotic roadway for all Williamson Road users.
- Hershberger Road has no pedestrian signals or marked crosswalks at major intersections. Mobility lanes could be improved with greater protection.
- Liberty Road NE is an important street that connects several neighborhoods to Williamson Road but it but has missing sidewalks, no crosswalks, limited sightlines, and high-speed traffic.
- Neighborhood streets have wide turning radii and no sidewalks or crosswalks; this invites speed and makes drivers less likely to stop or yield.

Online Survey

The City circulated an online survey and interactive map during the development of the plan. Nearly 200 people completed the survey and made more than 350 comments on the map.

Key findings from the survey included:

- **People in Roanoke have felt the personal cost of traffic crashes**. Nearly half of all respondents (43%) have been personally injured or know a family member, friend, or acquaintance who was killed or seriously injured in a crash.
- **Speeding and lack of bicycle and pedestrian infrastructure continue to be major concerns**. Top safety concerns from survey respondents included dangerous intersections, lack of sidewalks and places to bike, speeding, and distracted driving. Many believe that reducing speed limits and adding traffic calming measures, especially in residential areas, would significantly increase safety.
- **Respondents see stricter enforcement as the primary way to change behavior**. Unsafe behaviors like speeding, aggressive driving, running red lights, and not yielding to pedestrians all contribute significantly to respondents' safety concerns. Many called for stricter enforcement of traffic laws and installation of speed cameras.
- **Visibility and safety go hand in hand:** People identified many areas where complex, skewed, or poorly designed intersections lead to poor visibility and unsafe conditions for all modes. Inadequate lighting and other obstructions often further limit visibility in these areas.
- **High-speed arterials with poor bicycle and pedestrian infrastructure are the primary places where people feel unsafe**. Comments added to the interactive map further confirm the needs on many of the top scoring High Injury Network corridors. Williamson Road, Orange Avenue, 9th Street, Campbell Avene, Hershberger Road, and the Broadway-Franklin-McClanahan triangle were top corridors where people identified feeling unsafe or had safety improvement ideas.

From the Community

"The biggest issue I see is people not paying attention. I'm a runner, and I have had several instances where I have the walk sign and drivers simply do not pay attention and turn where I am legally running across the road."

Online survey responses confirmed need for more representative engagement. Despite African Americans making up nearly 1/3 of Roanoke's population, less than 2% of the respondents identified as Black or African American. The limitations of participation in the on-line survey informed the choice of locations for the National Night Out events and community walks that were part of the overall engagement plan.

Major Findings

The extensive community engagement and outreach activities coalesced around several recurring themes and issues (Figure 24).

Speed is a major concern among all residents and stakeholder groups in every part of the city. There is little deterrent to high vehicle speeds on city streets, and this combines with vehicle design (large, powerful vehicles that are quiet and insulated from the outside) to encourage excessive speed.

Lack of pedestrian infrastructure is a pervasive issue. Missing and poorly maintained sidewalks, the lack of safe crossings (with marked crosswalks and signals), and speeding and distracted drivers make walking difficult – especially for people with a disability or limited mobility options.

Transit users lack safe, comfortable, and dignified places to wait for the bus and to get to and from the bus stop. There is little incentive to cross the road at a marked crosswalk to get to or from a bus stop because crosswalks rarely exist and frequently have no pedestrian signals, even at major intersections.

People on bicycles avoid riding on arterial streets. Instead, they ride on the sidewalk (if present), choose longer alternative routes, or simply don't ride on their own or at all – despite wanting to do so. Legacy infrastructure such as striped mobility lanes on major roads are seen as insufficient; newer infrastructure such as the separated mobility tracks and the existing greenway system is more popular.

Motorists are frustrated by the unexpected and seemingly unpredictable behavior of people on foot and bicycle, as well as by anything that impedes their progress. Speeding and distracted driving are issues for all road users. There is no safety culture on city streets.

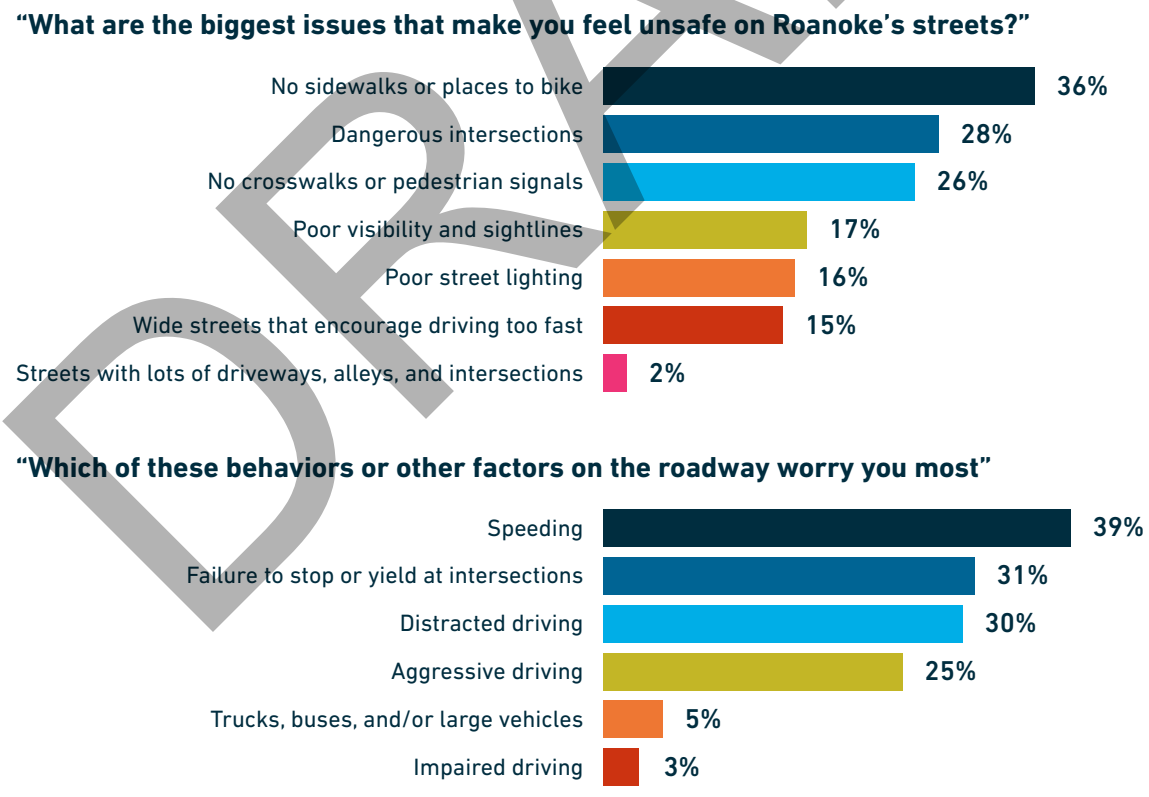
Definition. Street design sets drivers' expectations and establishes the safety culture (or lack thereof). Roanoke's streets have evolved to the point that it is too easy to drive too fast while paying too little attention. There is little incentive to follow the rules. As a result, cars dominate even the quietest of streets and people don't want to walk or bike for even the shortest trips. Those who have no choice are left to use a system that feels unsafe and hostile. Education and enforcement undoubtedly have a role to play in breaking this cycle. However, engineering holds the key to creating a Safe System in Roanoke.

Streets can be designed to operate at slower and safer speeds without restricting car use or access. The following chapter shows several safety measures that clarify how and where people can walk, ride a bike or motorcycle, and drive safely – providing the definition and certainty that people say they want, regardless of how they get around.

From the Community

"I am in wheelchair – we need more awareness and protection for disabled people crossing or walking adjacent to roadways"

Figure 24 Responses provided during engagement events.



04

PRIORITY ISSUES AND FOCUS AREAS

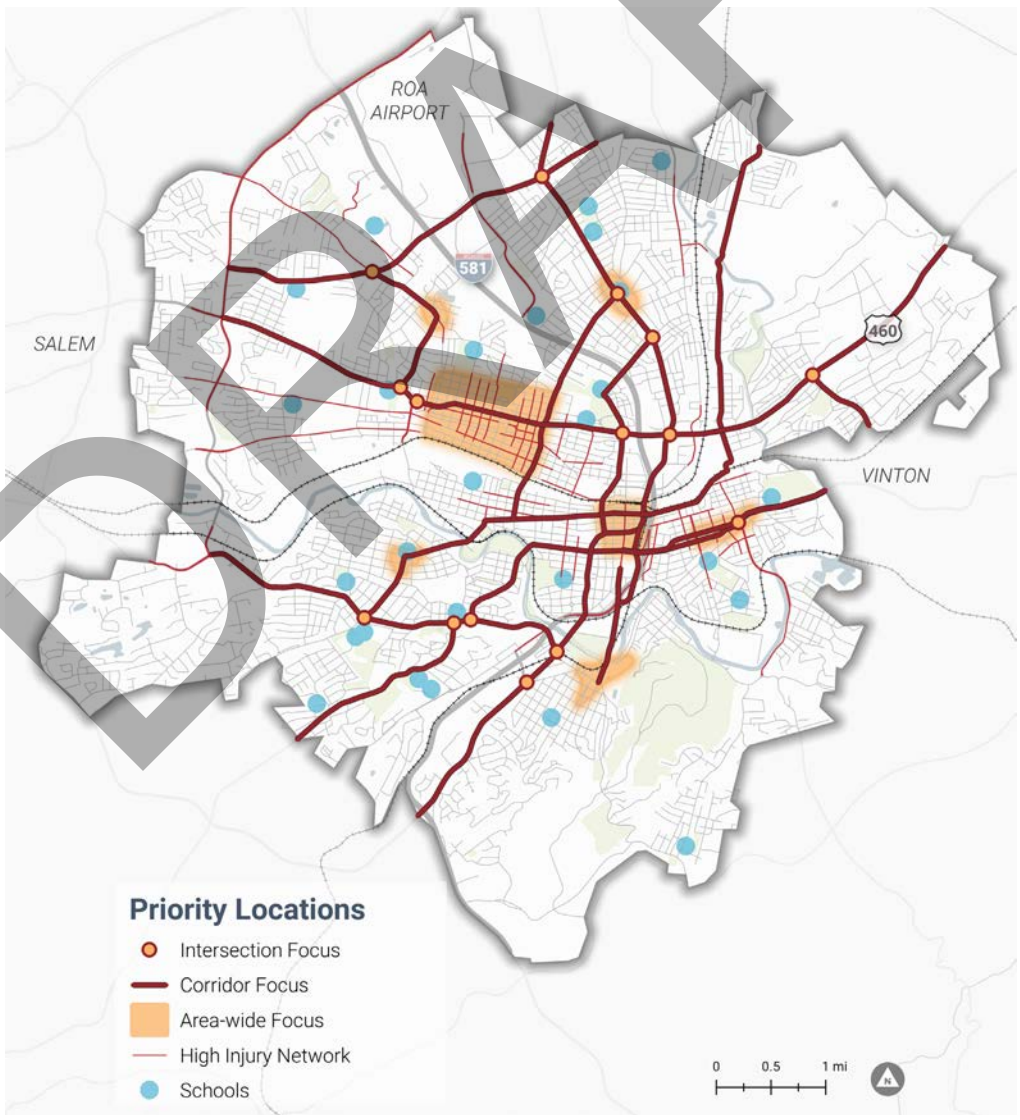
The planning process has identified the most significant causes of fatal and serious injury crashes in Roanoke as well as the locations throughout the city where there is greatest risk and most pronounced history of serious crashes occurring (Section 2). We have captured the lived experience of Roanoke residents through a variety of media (Section 3) and confirmed the over-riding policy priorities of the City in addressing these issues (Section 1).

In this section of the Safety Action Plan, these factors are combined into a more targeted list of seven priority issues. The project team has identified the most appropriate potential solutions that address these priority issues. These safety measures are presented in Appendix C in the form of a toolbox of safety measures. Examples are drawn from the toolbox to illustrate this section of the SAP.

The seven priority issues are:

- Speed
- Distraction and Impairment
- Pedestrians
- Bicyclists
- Motorcyclists
- Schools
- Culture of Safety

These priority areas are closely aligned with the geographic locations that were identified in the development of the High Injury and High Risk Networks. Together, they create Focus Areas where appropriate safety measures can be implemented to increase safety.



Safety Measures Toolkit

The crash analysis and community input process helped to identify the highest risk corridors, intersections, and areas in the city, as well as the behaviors and crash types that are the most common in fatal and serious injury crashes. The Safety Measures Toolkit in Appendix C includes detailed information on 30 proven roadway design changes that directly address these problems (Figure 25). Many of these safety measures are illustrated in the Safety Action Plan, showing how and where they might be applied to increase the safety of the people traveling throughout the city.

Each safety measure is described in detail and is connected to the issue and crash type it is designed to address. Many of them help to solve multiple risks and crash types at the same time. Most of the safety measures are based on the Federal Highway

Figure 25 Safety Measures

Measure	Relevance							Application		
	Speed	Distraction	Pedestrians	Bicyclists	Motorcyclists	Schools	Culture	Corridors	Intersections	Neighborhood
Corner Radius Reduction	x		x	x		x			x	x
Crossing Island/Median			x	x		x		x	x	
Curb Extensions	x		x			x			x	x
Curb Ramps			x			x	x	x	x	x
Daylight Intersections			x	x	x	x			x	x
Hardened Centerline	x		x		x				x	x
High Visibility Crosswalk		x	x			x			x	x
Horizontal Deflection	x				x		x			x
Leading Pedestrian Interval		x	x			x	x		x	
Mobility Track			x	x		x		x		
Neighborway	x		x	x						x
No Right Turn on Red			x			x	x		x	
Pedestrian Hybrid Beacon		x	x			x		x	x	

Measure	Relevance							Application		
	Speed	Distraction	Pedestrians	Bicyclists	Motorcyclists	Schools	Culture	Corridors	Intersections	Neighborhood
Protected Mobility Lane				x		x		x		
Protected Intersection				x					x	
Raised Crossing	x		x	x		x				x
Raised Intersection	x	x	x			x			x	x
Remove Slip Lanes	x		x	x	x	x			x	
Roadway Reconfiguration	x	x	x	x	x	x	x	x		
Roundabout					x				x	
RRFB		x	x			x				x
Safety Cameras	x					x	x	x		
Shared Street	x		x	x			x			x
Sidewalk			x			x		x	x	x
Speed Humps	x	x	x	x		x				x
Speed Limit Reduction	x					x	x	x		x
Traffic Circle	x	x	x	x						x
Traffic Diverters			x	x		x	x			x
Visual Narrowing	x	x	x				x	x	x	x

Administration's "Proven Safety Countermeasures", which have documented crash reduction benefits as well as guidance on when and where to deploy them. Where safety measures are not yet on FHWA's list, the toolkit provides available research and background information to document the potential benefits of the treatment. The toolkit includes a general order-of-magnitude cost estimate, potential maintenance implications, and typical timeframe for implementation for each of the measures.

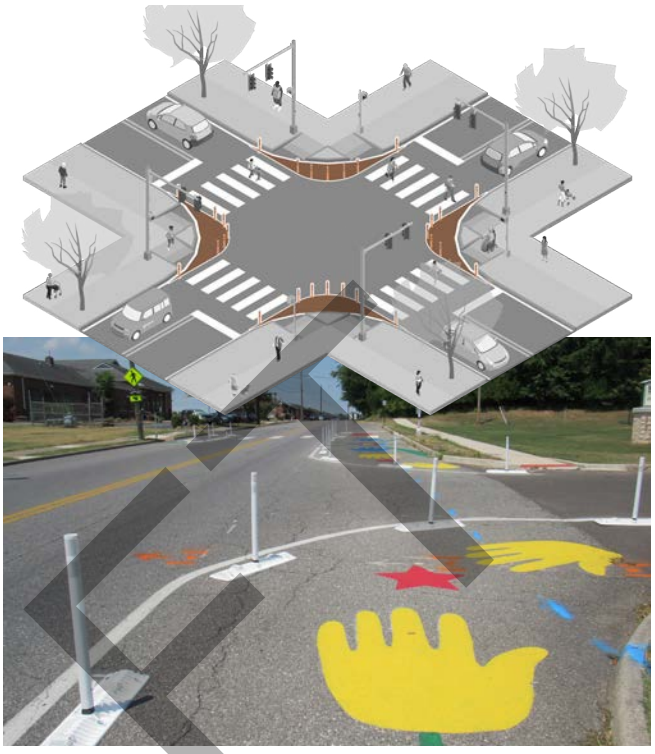
Almost all the measures can already be seen on the ground somewhere in Roanoke. The toolkit identifies additional locations where the different measures might be applied in Roanoke to have the greatest benefit on traffic safety (Figure 26).

Many of the safety measures are used in the illustrations in this section of the Safety Action Plan. These show how the safety measures might be applied at locations around the city that are on the High Risk and High Injury Networks and were identified by the community as feeling unsafe. These locations are also illustrative of common situations in Roanoke where implementation of the safety measures can be replicated. The illustrations are not meant to be seen as specific recommendations or proposed projects; they show potential applications.

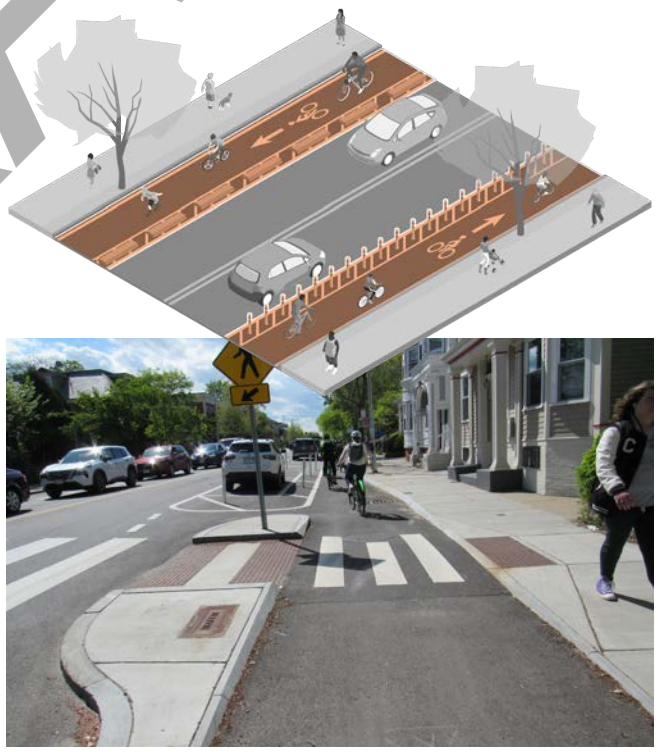
There are some measures, such as curb radius reductions and high visibility crosswalks, that are recommended to become a routine part of resurfacing projects and a standard design element for all city projects. These would not typically require additional study or public review every time they are installed. Other, more complex design features and combinations of safety measures (e.g., as part of a major intersection project or corridor study) would be reviewed as part of the normal public process before implementation.

These safety measures are highlighted because they directly address the most common crash types and locations in the city. There are many other roadway design elements such as lighting, traffic signals, and warning signs that will continue to be used as part of routine street design and operations. There are also ongoing education and enforcement initiatives in the City and region that complement these engineering solutions. Where possible, these should be integrated to have the maximum impact.

Figure 26 Sample graphics from Safety Measures Toolkit



Corner radius reduction using Shur-Curb and public art. Salem Turnpike, NW, Roanoke.



Curb and parking protected bike lane, Cambridge MA.

The Role of Enforcement in Traffic Safety

Enforcement remains a key strategy in tackling traffic safety issues in Roanoke, especially speeding and distracted/impaired driving. Targeted enforcement initiatives such as seasonal drink/drive campaigns and speed enforcement in response to community concerns remain critically important in establishing a culture of safety. Enforcement and education strategies are also an essential element in helping people adjust to new infrastructure projects.

While the Safe System Approach emphasizes that roadway design should naturally encourage safe speeds and attentive driving, enforcement remains essential to ensuring these designs function as intended, especially when they are first introduced. Permanent behavior change, particularly related to impairment and distracted driving, does not occur from infrastructure alone—it requires consistent, visible, and well-targeted enforcement to reinforce safe driving habits and deter dangerous behaviors. The Safe System Approach represents a cultural shift for all involved, including the police department, which has historically shouldered the primary responsibility for traffic safety despite limited staff capacity. By making enforcement a central, ongoing priority, the built environment can achieve its intended safety outcomes more effectively and consistently.

The engineering safety measures in this SAP, strategically supported by enforcement and education initiatives in collaboration with the Roanoke Police Department, are designed to address the contributing causes of crashes on the High Injury Network in the City. They also include systemic design solutions that will address the underlying behaviors and lack of safety culture that exists in the city today. Consistent implementation of these safety measures will enable the police department to focus on targeted enforcement and education initiatives that will have the greatest impact on crash numbers in the future.

Law enforcement officers engage with Roanoke residents as part of National Night Out events, and during a Walk Audit. They are on the Front Lines of traffic safety initiatives in the City.

Speed

The crash analysis and public input process highlight speed as a major issue in Roanoke. Fatal crashes are more likely to involve speed than any other contributing cause. This is consistent with experience in communities across the country and around the world: speed is the single most important element in the likelihood of a crash occurring and the severity of the consequences of a crash (Figure 27).

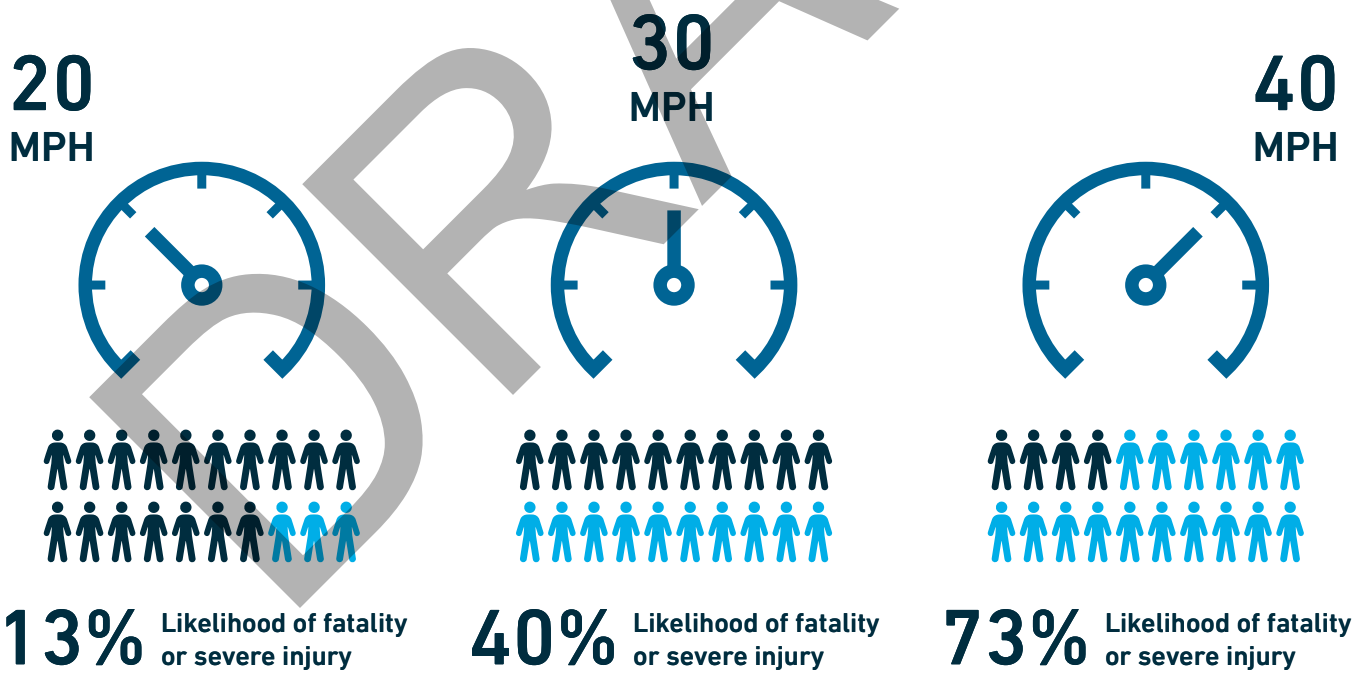
Speed is an issue for all road users. Motor vehicle drivers and occupants are at risk from roadway departure and lane departure crashes caused by excessive or inappropriate speed. Roadway departure crashes frequently involve one vehicle running off the road and striking a utility pole, traffic sign, or other fixed object. Lane departure crashes typically result in a head-on collision after a vehicle has crossed the centerline. The safety and comfort of pedestrians, bicyclists, and motorcyclists is also affected by the speed of motor vehicle traffic.

Street design is a more powerful influence on the speed at which people drive than education or enforcement of posted speed limits. This is one way that the Safe System Approach differs from past traffic safety efforts. For example, Gainsboro Road NW has a posted limit of 25 mph, but the design of the street encourages much higher speeds.

Design elements that encourage speed include:

- Wide traffic lanes
- Multiple lanes
- Clear, straight sightlines and an absence of signals and crosswalks
- Slip lanes and turn lanes
- Wide corner radii

Figure 27 The Impact of Speed on Crash Severity



Source: Tefft, B.C. Impact speed and a pedestrian's risk of severe injury or death. Accident Analysis & Prevention. 50. 2013.

Where is Speed an Issue?

Speed is a pervasive issue, as much of the public and stakeholder input highlighted. These streets from the Focus Areas are on the High Injury and High Risk Network for all modes and have many of the design elements that encourage speed.

- Elm Avenue SE between South Jefferson Street and Sixth Street SE, where the street divides and becomes the one-way pair of Bullitt and Jamison Avenues SE.
- Orange Avenue NW from Gus Nicks Boulevard NE to 10th Street NW where the street has multiple wide lanes, high-speed ramps and slip lanes.

At intersections, high speed traffic increases people's reaction times and vehicle stopping distances and reduces the cone of vision in which drivers see other vehicles and people around them. Angle crashes, especially involving a left-turning vehicle, are more common.

Examples of Focus Area Intersections where design elements encourage speed include:

- Hershberger Road NW and Cove Road NW. Hershberger Road has multiple wide lanes, turn lanes, and a posted speed of 35 mph. There are slip lanes and wide-angled right turns.
- Melrose Avenue NW and 24th Street NW where high-speed right turn slip lanes with limited visibility increase the risk of merging collisions and reduce the likelihood of drivers yielding to pedestrians.

Excessive speed contributes to a lack of perceived safety in neighborhoods throughout the city. Locations where it is a particular concern include:

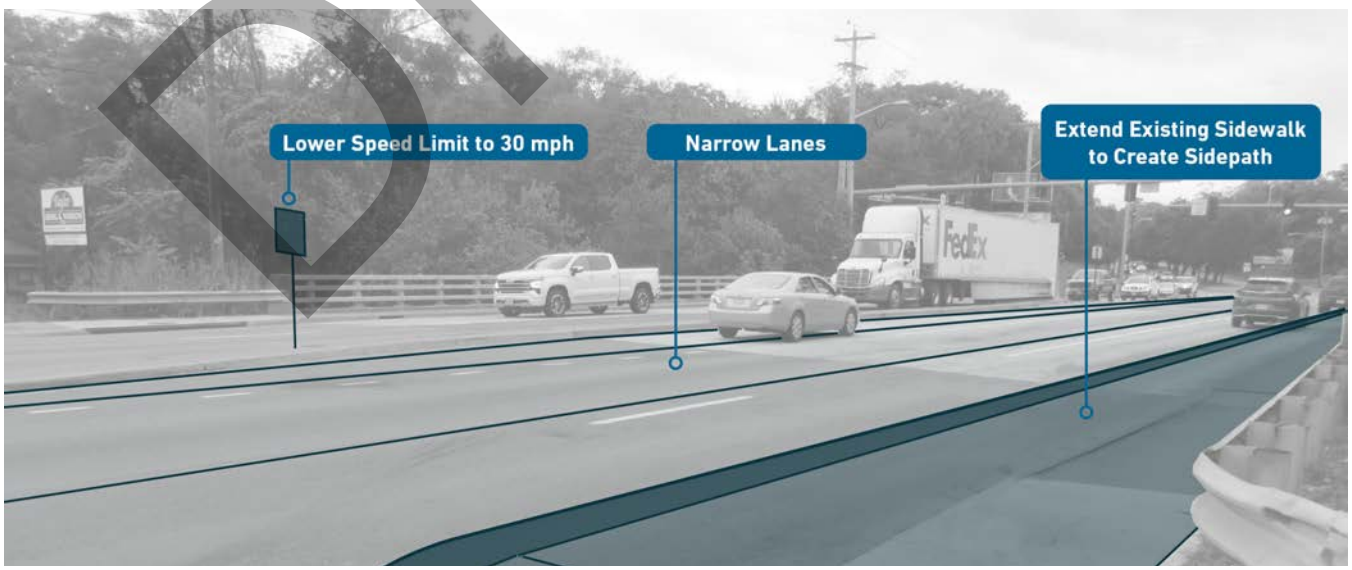
- Downtown Roanoke, where high pedestrian activity conflicts with motor vehicle traffic.
- The neighborhoods either side of Orange Avenue NW between 10th and 24th Streets NW. Orange Avenue has fast traffic which spills over onto long, straight neighborhood streets.

Design solutions to reduce speeds include:

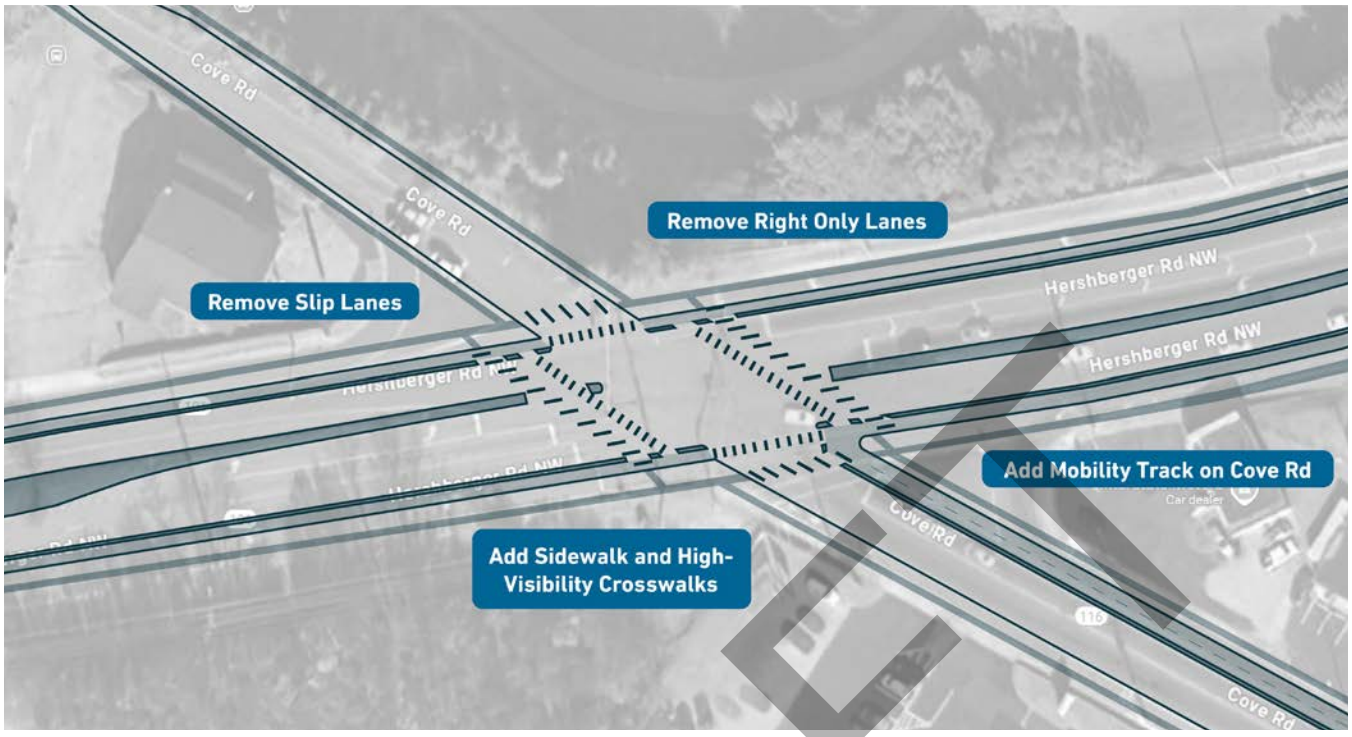
- Horizontal deflection
- Corner radius reductions
- Hardened centerlines
- Lower Speed Limits
- Raised crosswalks and intersections
- Speed humps
- Traffic circles
- Curb Extension

Supporting Initiatives

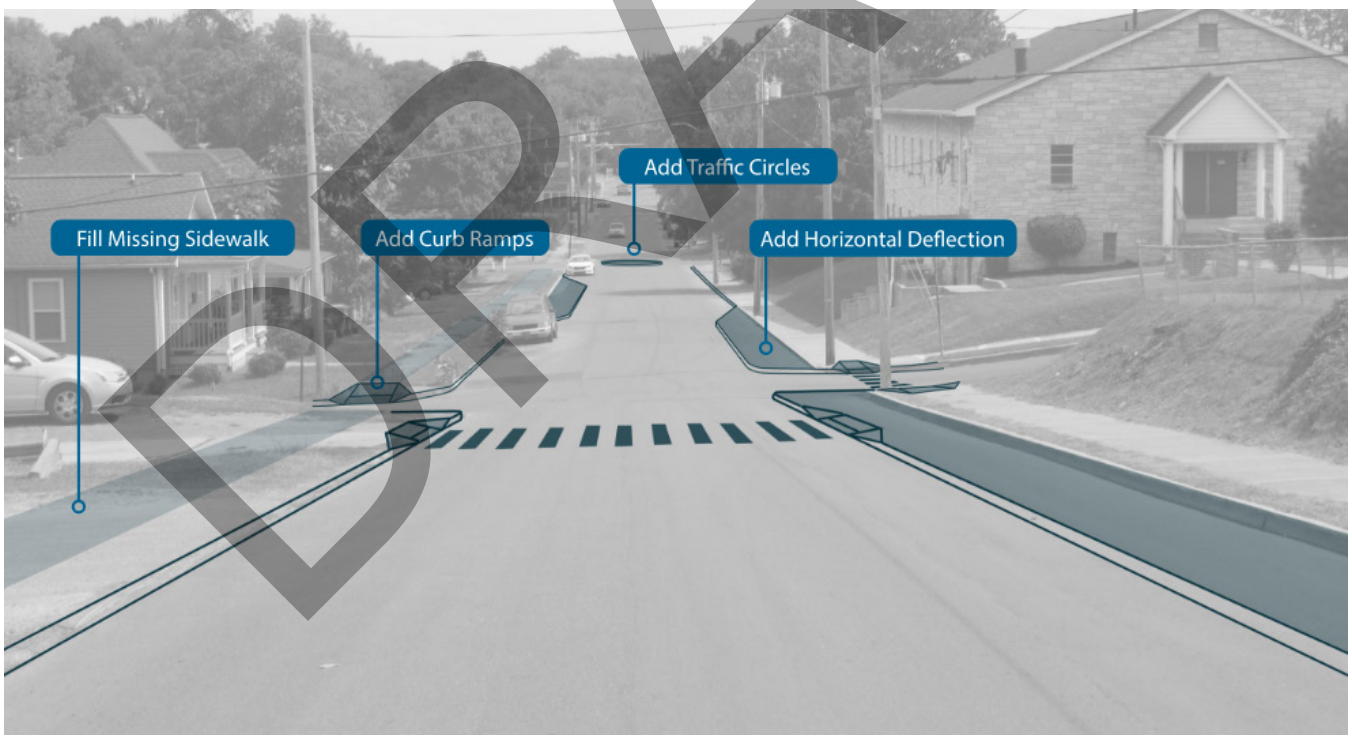
- The City is developing a Speed Management Action Plan (SMAP) SMAP will include actions and strategies consistent with this SAP. Concurrently with this Safety Action plan. The City will adopt and implement the recommendations of the Speed Management Plan.
- The City The City is exploring approaches to implementing Automated Speed Enforcement Cameras in City of Roanoke school zones. Automated Speed Enforcement Cameras have been shown to reduce speeding, increase safety, and have the potential to be enforcement multipliers while being revenue neutral.



Orange Avenue at Rhodes Avenue NE. *Options include lowering the speed limit to 30 mph, reducing lane widths to create a sidepath for people on foot and bike, reducing corner radius onto side roads to slow turning traffic.*



Hershberger Road NW and Cove Road NW. *Options include eliminating slip lanes, adding pedestrian signals and high visibility crosswalks to all legs of the intersection, and slowing speeds.*



Melrose Rugby and South of Orange Avenue neighborhoods. *Options include a combination of area-wide traffic calming measures – chosen in collaboration with neighborhood groups and residents – including speed humps, raised crossings, horizontal deflection, and lower speed limits. Also need to fill in missing sidewalks, crosswalks, and curb ramps.*

Distraction and Impairment

Stakeholders and Roanoke residents share a concern for the increasing level of distraction and impairment among drivers. Serious injury crashes are more likely to involve distracted or impaired driving than any other contributing cause, which is consistent with experience elsewhere and the most current research about people's driving habits.

Distracted drivers are prone to weaving, lane departure, and failing to stop or yield and may be distracted by mobile devices, passengers, activities such as eating and drinking, and mental stress.

While these are behavioral issues, street design can also contribute by failing to hold the attention of drivers. Examples include:

- Missing, worn, or indistinct roadway markings
- Inadequate lighting
- Changes in lane configuration
- Lack of a well-defined street edge such as a curb or raised median

Where is Distracted Driving an issue?

Like speeding, distracted driving can be an issue almost anywhere on Roanoke roads. These streets from the Focus Areas are on the High Injury and High Risk Network for all modes and have many or all of these design elements.

- Franklin Road SW from 2nd Street SW to the Roanoke River changes from 2, to 3, to 4 lanes, and has frequent intersections with faded markings.
- Hershberger Road NW between Williamson Road and I-581 has numerous distractions, and an unprotected mobility lane.
- Drivers heading towards the Memorial Bridge routinely encroach well into the mobility lane on Memorial Avenue as they make a sweeping turn, without slowing down.

Examples of Focus Area Intersections where design elements contribute to distracted driving include:

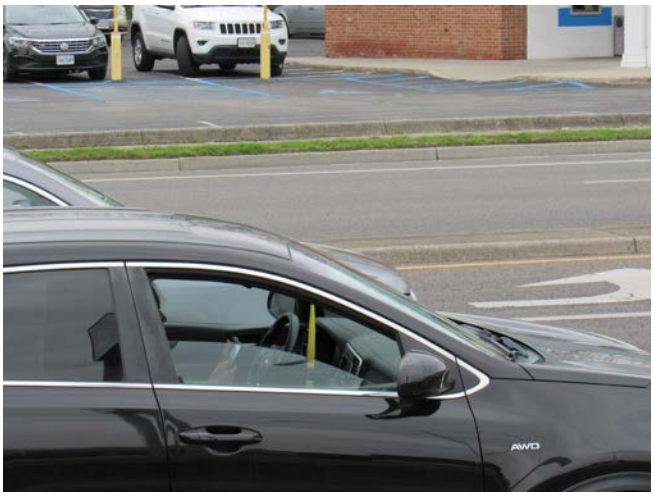
- Williamson Road intersections have indistinct markings, missing street edges, and a high incidence of vehicles stopped in the travel lane to make a left turn.
- Dale Avenue SE and 13th Street SE has fast approaches, changing lane configurations, unprotected mobility lanes, and significant pedestrian activity.

Distracted driving is an issue in neighborhood centers where there is unexpected activity such as on-street parking, driveways, and pedestrian activity. For example:

The commercial center at Cove Road NW and Lafayette Boulevard is at an angled intersection with indistinct roadway markings; through traffic goes around a significant bend on a roadway that is otherwise quite straight.

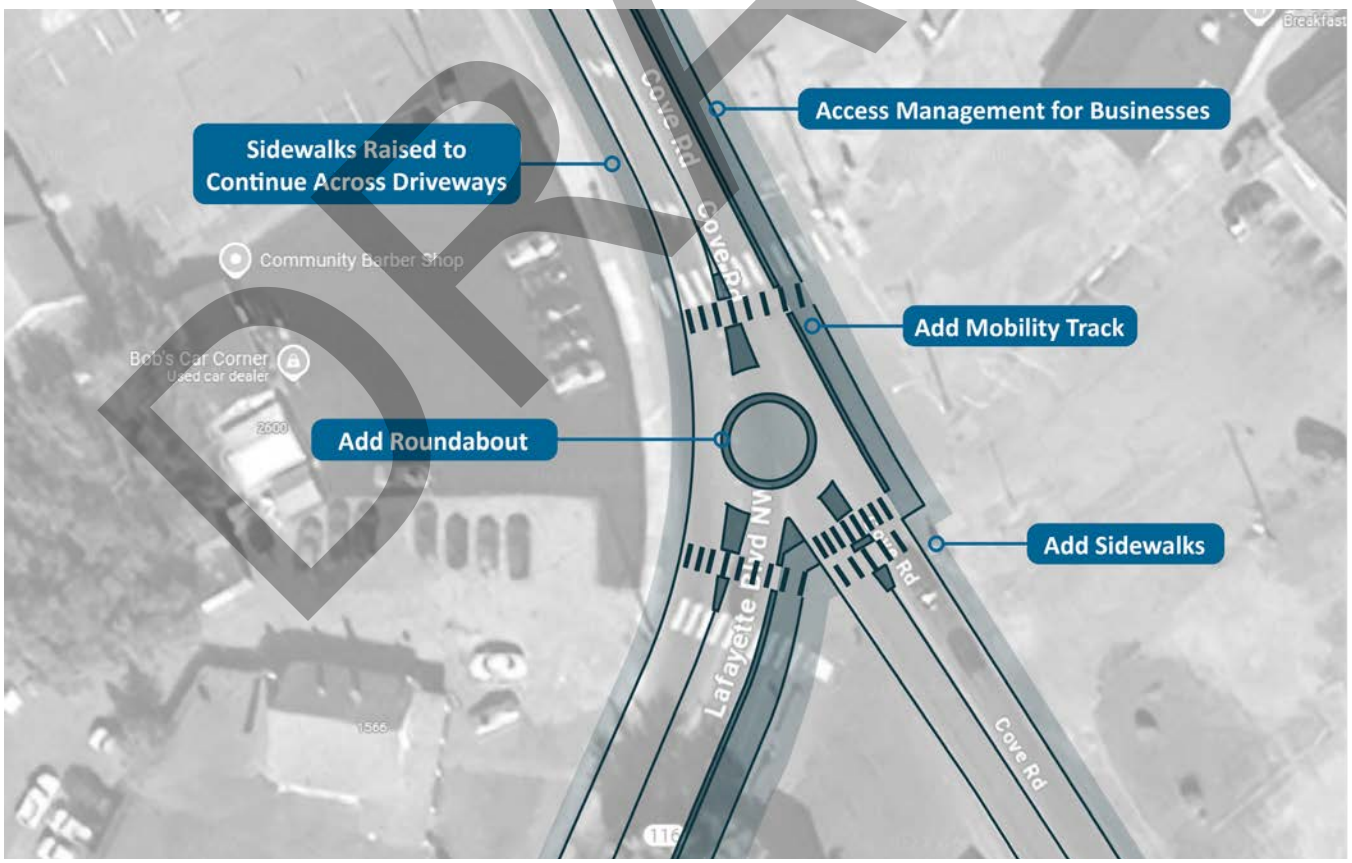
Design solutions to increase driver attention include:

- High visibility crosswalks
- Leading Pedestrian Intervals at signals
- Roundabouts and traffic circles
- Pedestrian Hybrid Beacons
- Protected mobility lanes
- Roadway reconfiguration



Texting and driving on Hershberger Road NE

Williamson Road NE and Liberty Road NE. *Options include adding pedestrian signals and crossings to increase visibility; reducing crossing distances and tightening the curb radius to slow turning vehicles down and require more care and attention.*



Cove Road NW and Lafayette Boulevard NW. *Options include adding a small roundabout to clarify priority and reduce speeds; adding crosswalks, sidewalks and curb ramps to serve churchgoers, business patrons at the neighborhood center.*

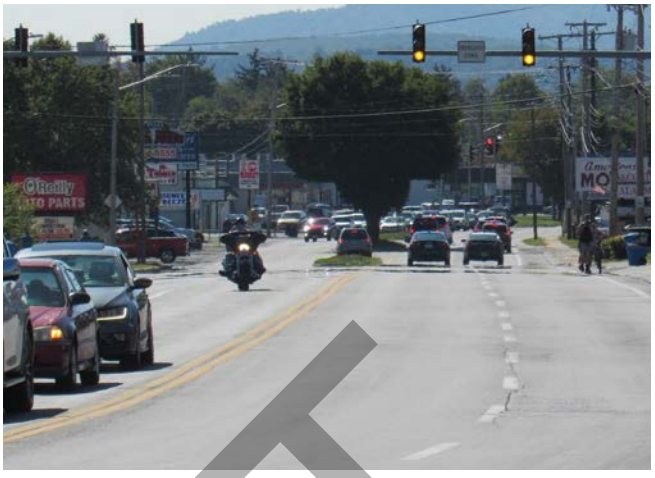
Motorcyclists

As noted in the crash analysis, people riding motorcycles are among the most vulnerable road users on Roanoke streets. They are disproportionately involved in fatal and serious injury crashes compared to the number of trips made by motorcycle and the overall number of crashes involving motorcyclists.

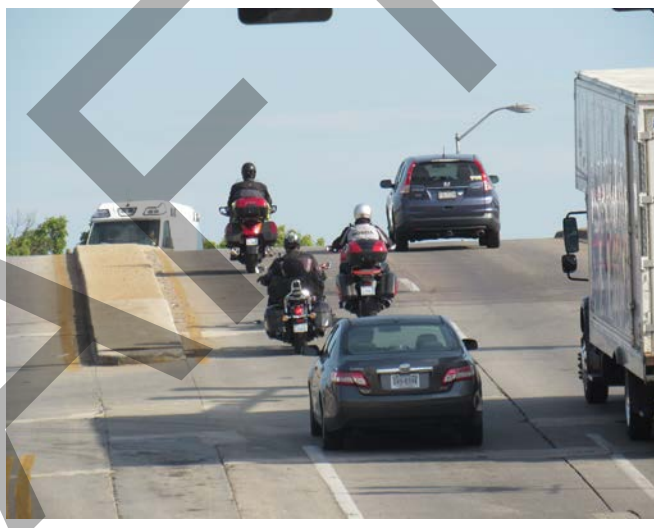
Fatal and serious injury crashes involving motorcyclists highlight the unique characteristics of motorcycling itself: some are single-vehicle, run-off-the-road crashes involving speed that are similar to motor vehicle collisions. However, many reflect the vulnerability and less visible profile of bicyclists and pedestrians: victims are struck by drivers who fail to see or misjudge the speed of a motorcyclist when making a turn.

Roadway design elements that contribute to fatal and serious injury collisions involving motorcyclists include:

- Slip lanes
- Permissive Left Turn Signals and Right Turn on Red
- Frequent driveways and uncontrolled intersections
- Multiple lanes



Williamson Road, NE looking North



Williamson Road at Shenandoah Avenue, SE

Where are Motorcyclists at Risk?

These streets from the Focus Areas are on the High Injury and High Risk Network for motorcyclists and have many or all of these design elements.

- Melrose Avenue NW from 22nd Street to Peters Creek Road has higher speeds, multiple lanes, and several uncontrolled intersections with limited visibility due to parked cars.
- Williamson Road NE from downtown Roanoke to Hershberger Road NW. South of Orange Avenue the road had multiple lanes, a lot of turning traffic and terrain that limits visibility. North of Orange Avenue, the four-lane undivided cross section has frequent intersections and driveways.

Examples of Focus Area Intersections where design elements contribute to motorcycle crashes include:

- State Highway 24 (Dale Avenue, Bullitt and Jamison Avenues, and Elm Avenue SE) from the city limit to downtown Roanoke has frequent intersections with awkward angles and slip lanes
- Orange Avenue NE between I-581 and Hollins Road NE has intersections with slip lanes, permissive left turn arrows, and extensive merging across multiple lanes at speed.

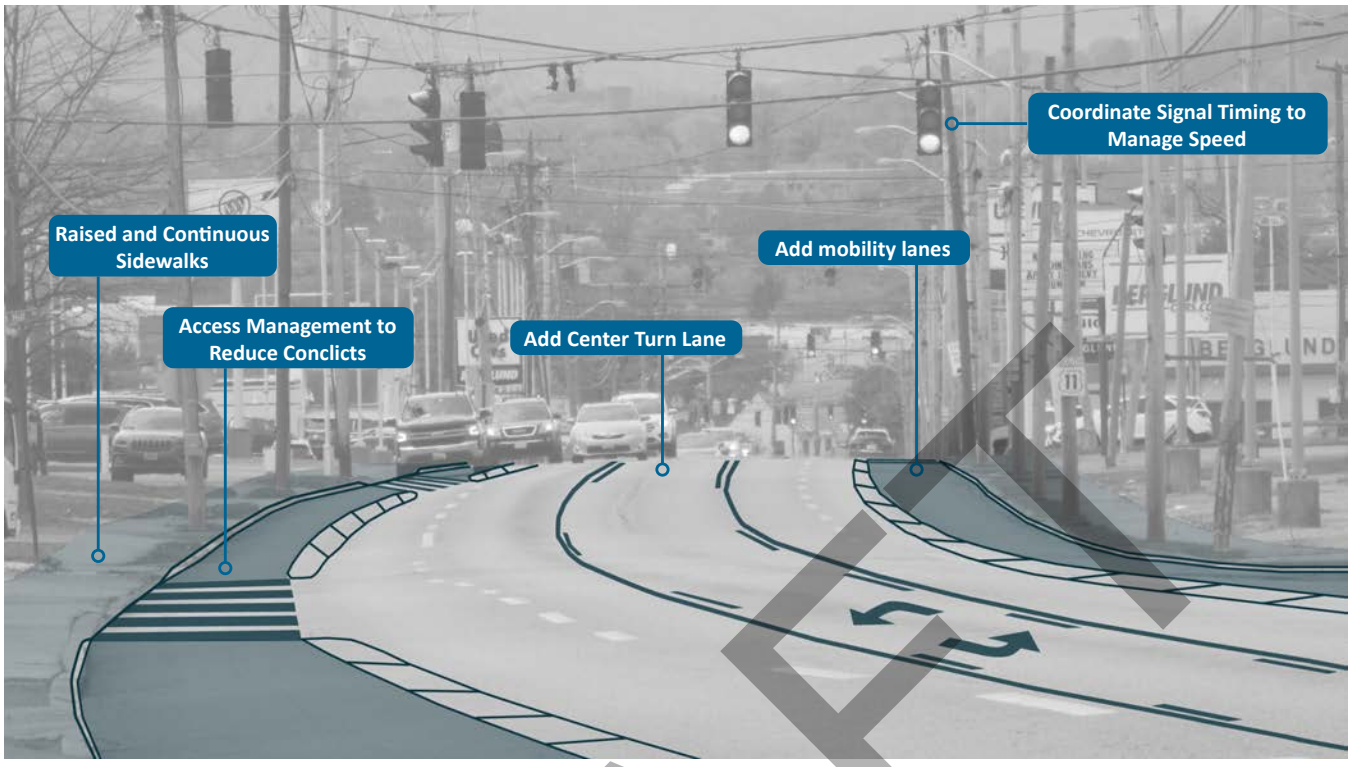
Design solutions to increase motorcyclist safety include:

- Daylighting intersections
- No Right Turn on Red or Permissive Left Turn signals
- Removing slip lanes
- Lower speed limits

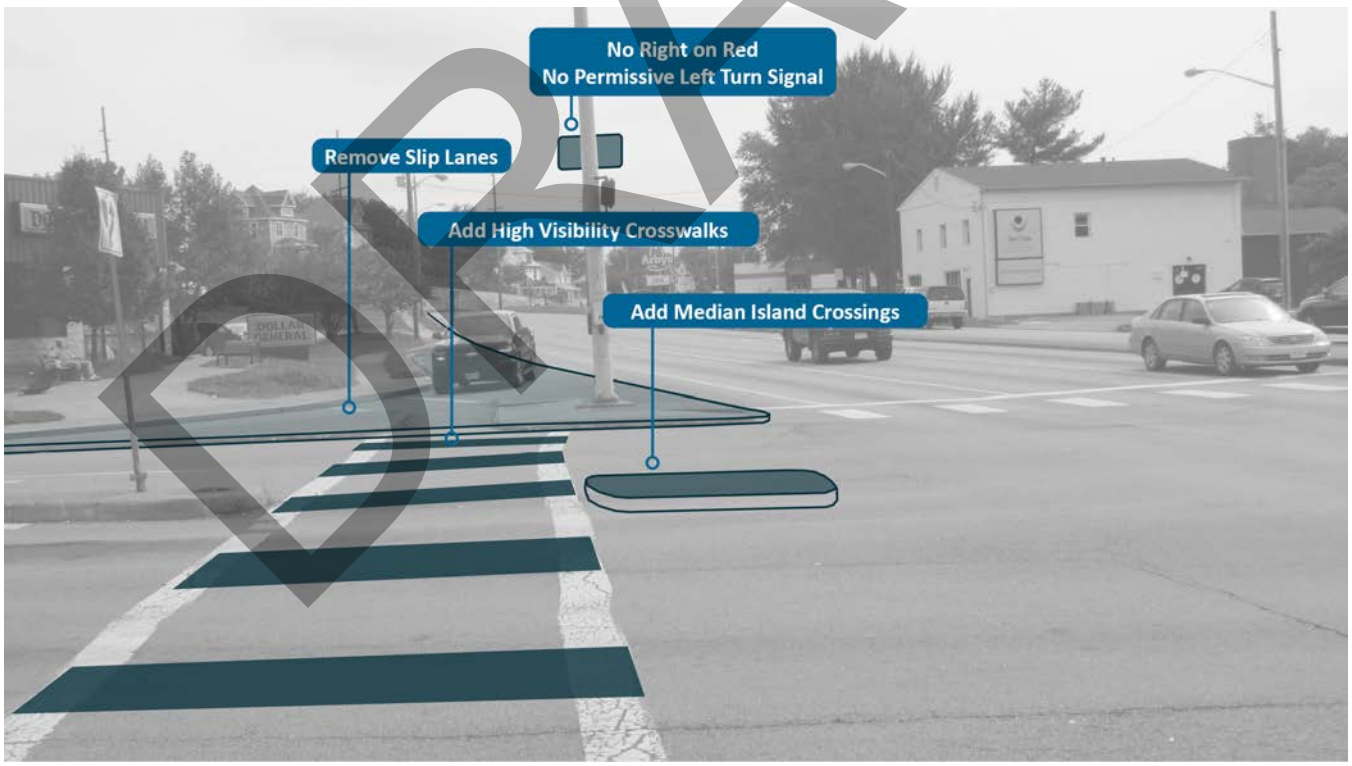
Supporting Initiatives

- The City has an annual traffic safety campaign that typically focuses on the safety of vulnerable road users. In future years, the City can develop the campaign around motorcycle issues, taking care to develop a messaging campaign and strategy that avoids victim-blaming.

Melrose Avenue NW. *Options include lowering the speed limit to 25 mph to reduce the incidence and severity of crashes; eliminate right turn on red and permissive left turns to stop drivers from pulling out in front of motorcyclists.*



Williamson Road NE. *Options include a roadway reconfiguration to provide a median to make left turns safely as well as adding safe places for people walking, biking, and crossing the street.*



Dale Avenue SE at 13th Street SE. *Options include eliminating slip lanes to slow turning traffic and reduce high speed merges; eliminating right turn on red and permissive left turns; adding high visibility crosswalks and pedestrian signals.*

Pedestrians

People traveling by foot (including people using a wheelchair) are among the most vulnerable road users in the city. Virtually every resident and visitor to the area experiences the city on foot at some point. Pedestrians are significantly more likely to die or be seriously injured in a crash than other road users and are particularly vulnerable to the impact of vehicle speeds[4].

Crash reports show that pedestrians are particularly vulnerable when walking in the roadway and when crossing busy roads, often when they are outside a marked crosswalk. The reports typically do not indicate whether adequate sidewalks or crosswalks are present or not. Pedestrian crashes frequently cluster near bus stops, as well as on busy streets in commercial areas.

Street design elements that contribute to fatal and serious injury crashes involving pedestrians include:

- Missing, narrow or poorly maintained sidewalks, curb ramps, and crosswalks
- Missing or faulty pedestrian signals
- Right Turn on Red and Left Turns that conflict with the pedestrian crossing phase
- Poor lighting and visibility at intersections
- Wide turning radii

Where Are Pedestrians at Risk

These roads from the Focus Areas are on the Pedestrian High Injury and High Risk Network and have many or all of these design elements.

- Hershberger NW pedestrians have long, exposed crossings with no pedestrian signals; frequent driveways and intersections with very wide corners; sidewalk is minimum width
- Liberty Road NE/NW has narrow or missing sidewalks with poor lighting and sightlines. Intersecting streets have excessively wide corners; there are no marked crossings or pedestrian signals.

Examples of Focus Area Intersections where design elements contribute to pedestrian crashes include:

- Williamson Road NE, has sections of missing sidewalk and curb ramps; only four of the fourteen signalized intersections have marked pedestrian crosswalks and signals
- Franklin Road SW where it intersects with Broadway Avenue and Brandon Avenue. No pedestrian signals at long, exposed, and poorly marked crossings and one slip lane. Broadway Avenue SW, at Franklin Road SW, is nearly 200 feet wide, has no marked crosswalk, and a sidewalk on only one side.

Examples of Focus Area neighborhood centers with significant pedestrian safety risks include:

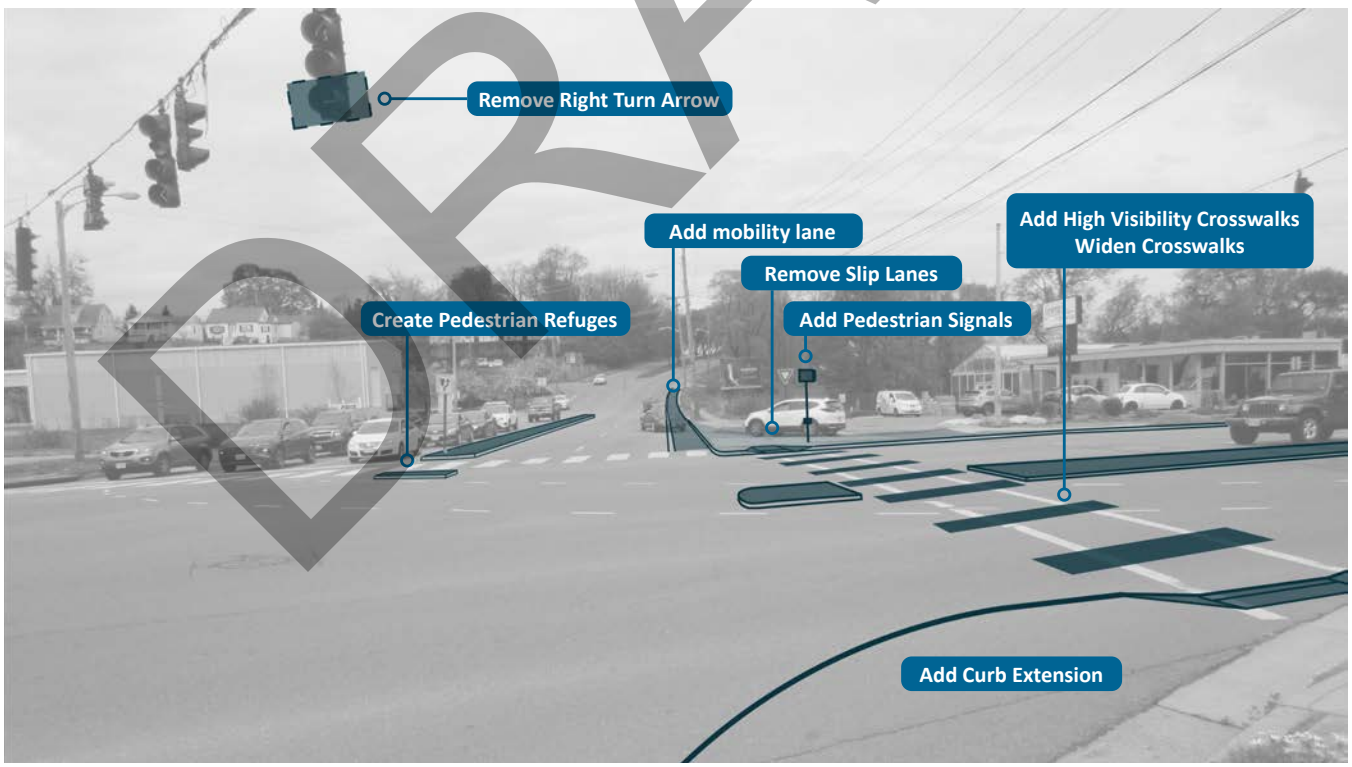
- Downtown streets typically have sidewalks, marked crosswalks, and pedestrian signals. However, vehicle traffic has priority, and the streetscape is dominated by parked and moving cars. Sidewalks are crossed by frequent driveways and garage entrances.
- South of Orange Ave NW between 10th and 22nd Streets. Basic pedestrian amenities such as sidewalks, crosswalks, and pedestrian signals are missing throughout this neighborhood. There is no indication that traffic should move slowly and yield to people.

Design solutions to increase pedestrian safety include:

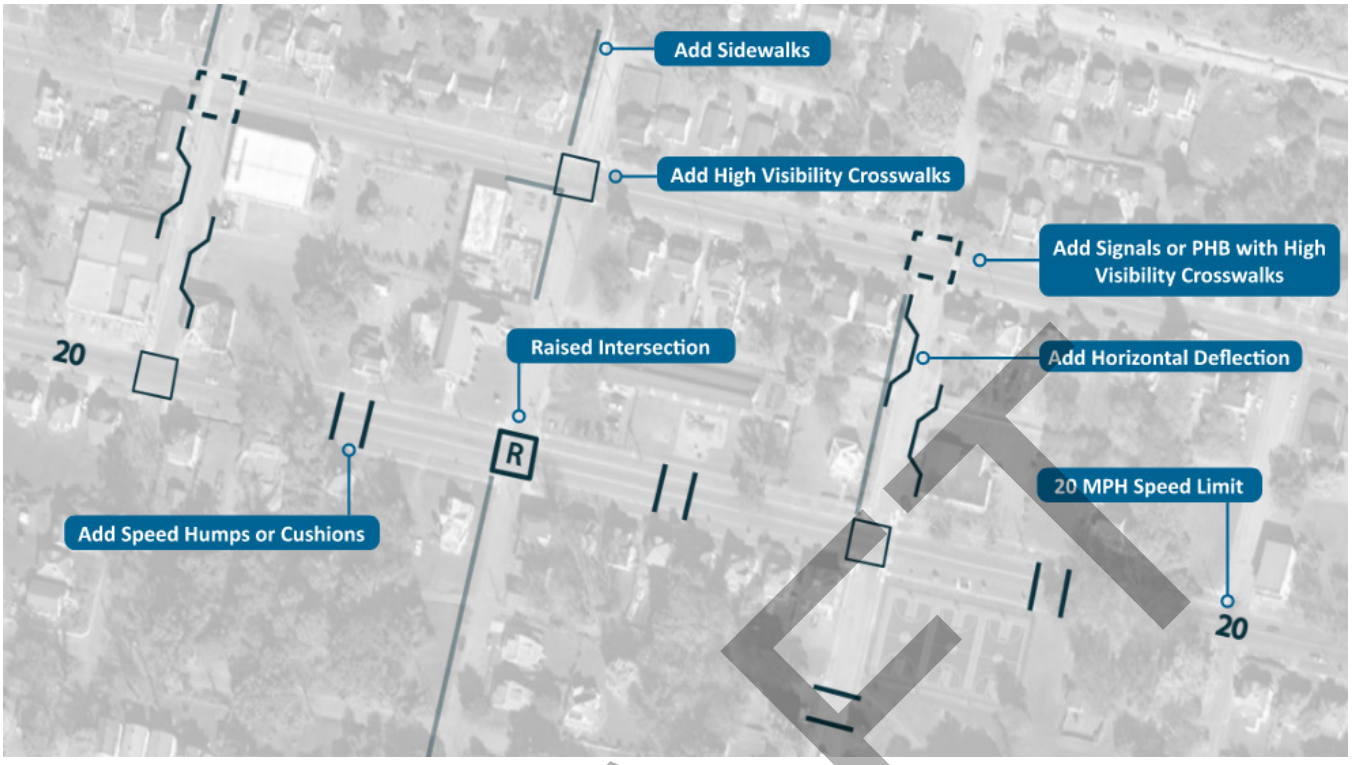
- Crossing islands
- Daylighting intersections
- High visibility crosswalk markings
- Rectangular Rapid Flashing Beacons
- Pedestrian Hybrid Beacons
- Traffic circles

4 https://www.iihs.org/news/detail/vehicle-height-compounds-dangers-of-speed-for-pedestrians

Liberty Road NE. *Options include adding sidewalks and curb ramps to provide safe, accessible places to walk; adding a crosswalk with warning lights to create a safer place to cross to the store; tightening intersections to reduce vehicle speeds and increase the likelihood of drivers yielding to pedestrians.*



Franklin Road SE and Brandon Avenue/McClanahan Street SE. *Options include removing slip lanes to eliminate high speed merging and pedestrian threat; adding pedestrian signals and crosswalk markings; reducing corner radius to slow turning traffic.*



Orange/Melrose/Moorman Avenues between 15th and 17th Streets. *Options include area-wide traffic calming solutions such as horizontal deflection, traffic circles, raised crosswalks and intersections to slow traffic; adding missing sidewalks, crosswalks, and curb ramps; reducing the speed limit near community destinations.*

Supporting Initiatives

- The City has embraced two successful street art projects in recent years. The project on Salem Turnpike NW narrowed the street and intersections quite significantly using flex posts and painted areas. The project on Ferdinand Avenue SW reclaimed large areas of pavement with paint and posts to help slow traffic down and discourage through traffic. Both projects were initiated by community organizations and used local artists. The City will encourage further collaborations and will support establishment of an annual street art program in conjunction with the Arts Commission.
- The annual street resurfacing program will be reviewed and roadway striping and layout options will be evaluated to optimize the safety and efficient movement of all users. Additional funding will be pursued for safety treatments that can be paired with repaving projects, such as corner radius reductions and curb extensions.
- The City will continue its program to systematically install and fix curb ramps at intersections.

From the Community

"A family friend was seriously injured in drunk driving crash this year on Franklin Rd. Easy to blame the drunk driver and say nothing can be done, but you could argue that if Roanoke had better walking, biking, and transit accommodations, the situation would have been less likely to occur."

From the Community

"I think speed plays one of the biggest factors in all of driving. If folks are speeding, they are more likely to cause an accident."

Williamson Road

Williamson Road is emblematic of safety, access, and fairness issues in Roanoke. The road has a poor safety record and several segments of the corridor feature on the High Injury and High Risk Networks. The intersection of Orange Avenue and Williamson Road has a high number of fatal and serious injury crashes as well as frequent less severe and property damage only collisions. There have been several pedestrian fatalities in recent years north of Orange Avenue and Williamson Road and fatal and serious crashes involving motorcyclists and bicyclists between Liberty Road NE and 10th Street NE.

The characteristics of the road between Pocahontas and Angell Streets – four lanes, undivided, missing sidewalks and crosswalks, no bicycle infrastructure, bus stops, numerous driveways and side streets – are associated with high crash and risk levels in communities across the country.

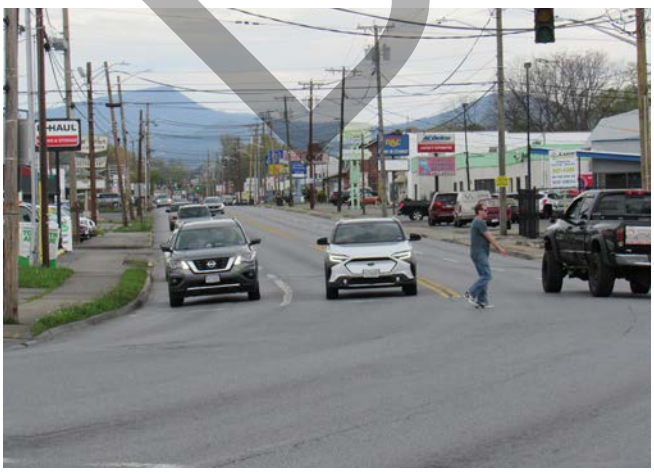
Williamson Road is an important north-south corridor through downtown Roanoke that also serves the Berglund Center and commercial activities all the way to Hershberger Road NW. Vibrant neighborhoods on both sides of Williamson Road rely on it for access to Valley View Mall, downtown Roanoke, schools, the library, and all points west of the city via 10th Street and Liberty Road, including access to the Lick Run Greenway and Lincoln Terrace Elementary and Addison Middle Schools.

Consequently, Williamson Road is currently the focus of a Thriving Communities grant through the United States Department of Transportation, and it is frequently identified as a priority for action throughout this Safety Action Plan. Most of the safety measures described in Appendix C can be applied to places along Williamson Road – from roadway reconfiguration, slip lane removal, and mobility lanes to curb extensions, sidewalk and crosswalk construction, and intersection daylighting.

Changes will be made incrementally along the entire corridor as community consensus and funding allows. Three areas of particular focus for the Safety Action Plan are the section in NE Roanoke between Orange Avenue and Hershberger Road, the intersection of Orange Avenue and Williamson Road, and the segment of Williamson Road that forms the eastern edge of downtown Roanoke.

NE Roanoke Section. Corridor-wide systemic safety measures that can be implemented relatively quickly and inexpensively include:

- Eliminating sidewalk gaps and missing curb ramps
- Marking all legal crosswalks, including high-visibility crosswalks at all signalized intersections
- Reducing turning radii with painted markings and flex-posts
- Changing bus stops to the far-side of intersections; adding shelters, benches etc.



Different views of Williamson Road NE at Liberty Road

Changes requiring a longer lead time and higher costs include:

- Adding pedestrian signals and phases at all signalized intersections
- Adding Leading Pedestrian Interval timing to signals
- Lowering the Speed Limit by 5 mph
- Implementing a Comprehensive Access Management Plan to consolidate and reduce the number of driveways
- Restriping the existing roadway to provide mobility lanes, a center turn lane/median, and one lane in each direction

Significant and more expensive changes could include:

- Reconstructing the road with sidewalk-level shared use path, raised median with left turn pockets, and one through travel lane in each direction
- Raised crossings at side streets and continuous sidewalk across driveways
- Burying utilities, pedestrian scale lighting

Intersection of Williamson Road and Orange Avenue. Immediate changes could include:

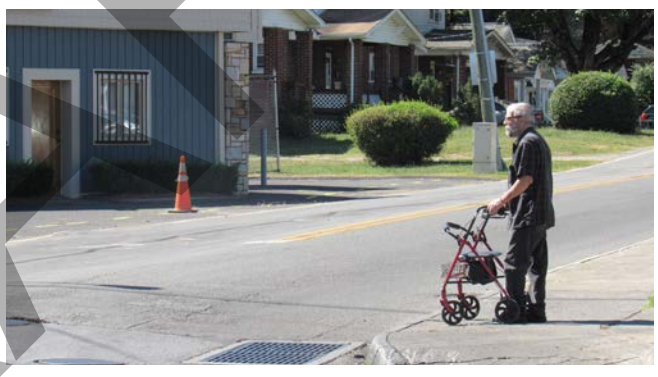
- Redesigning the slip lanes with flex posts to reduce speeds and improve sightlines
- Adding high visibility crosswalks and pedestrian signals/phases to all legs

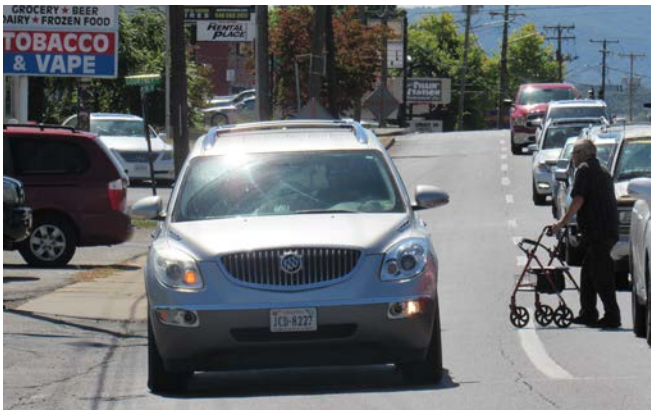
Downtown from Shenandoah Avenue NE to Elm Avenue SE. Immediate changes could include:

- Marking all crosswalks with high-visibility markings
- Reducing turning radii and crossing distances with painted markings and flex-posts
- Eliminating right turn on red and permissive left turns
- Closing slip lanes with flex posts

Longer term changes could include:

- Raised intersection at Campbell Avenue SE and Tazewell Avenue/Franklin Road SE





Bicyclists

Serious crashes involving people on bicycles are rare and typically happen on collector streets and minor arterials. Riders say this is because they choose to avoid busy major arterials that have no safe place to bike, or they don't ride in the city. People with no such choice tend to ride or walk their bikes on the sidewalk of main roads (where they exist). Increasing levels of everyday biking can help the City meet it's economic development, quality of life, and health goals; this will only happen if people feel safe when riding.

Crashes involving bicyclists are most likely to occur at intersections, although the greatest fear many cyclists have is being hit by a vehicle that is passing them too closely. Drivers frequently misjudge the speed of a bicyclist when they are turning. For example, drivers turning left will collide with a cyclist coming in the opposite direction; a right-hook crash happens when a driver turns right across the path of a rider going straight ahead. Riding on the sidewalk and riding against traffic are significant contributing causes to bicyclist crashes as drivers are not expecting people to be there.

Street design elements that contribute to bicyclist crashes include:

- Lack of separated or protected mobility lanes
- Mobility lanes that end suddenly (especially at intersections)
- Traffic signals that fail to detect a cyclist
- Abrupt changes in number of lanes and lane widths
- Slip lanes and high-speed merge areas (e.g. freeway ramps)

Williamson Road north of Hershberger Road NE

Where are Cyclists at Risk?

These streets from the Focus Areas are on the Bicyclist High Injury and High Risk Network and have many or all of these design elements.

- Brandon Avenue SW has intermittent shoulders and mobility between Main Street SW and Mud Lick Road and narrow striped lanes on the faster, four-lane segment from Mud Lick Road to Peters Creek Road.
- Cove Road NW and Lafayette Boulevard NW are important through streets that have intermittent mobility lanes on one side of the road only; in which cars routinely park. Passing a cyclist in the travel lane is difficult.

Examples of Focus Area Intersections where design elements contribute to bicyclist crashes include:

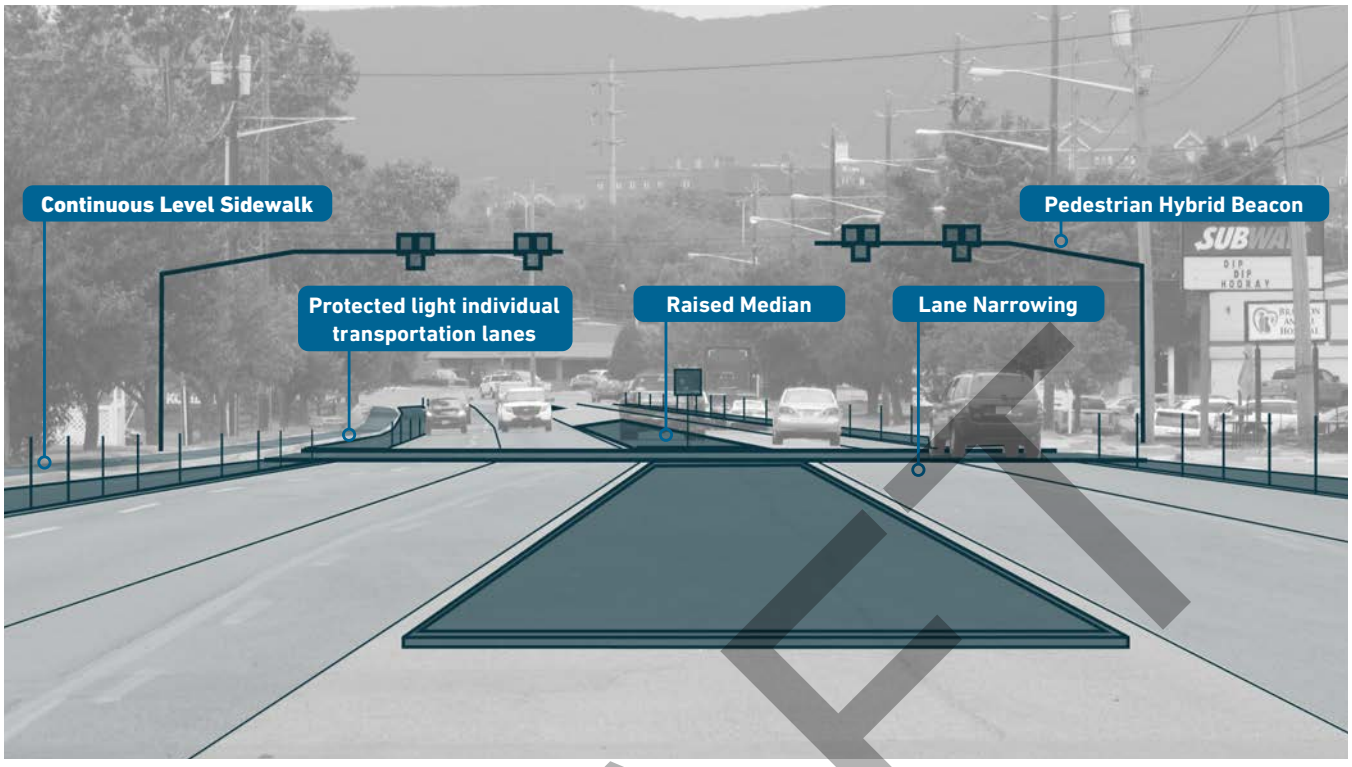
- Liberty Road NE and Williamson Road NE. Neither road has mobility lanes approaching the intersection; lanes are narrow, sightlines are poor and the signalized intersection doesn't detect bicyclists on their own. Many less confident riders will use the sidewalks on Williamson and one side of Liberty.
- Melrose Avenue NW and Lafayette Blvd NW. Although both streets have mobility lanes, they are narrow on Melrose Avenue and only northbound on Lafayette Blvd. The intersection markings set up right-hook crashes Westbound on Melrose and Southbound on Lafayette.

Examples of Focus Area neighborhood centers with significant bicyclist safety risks include:

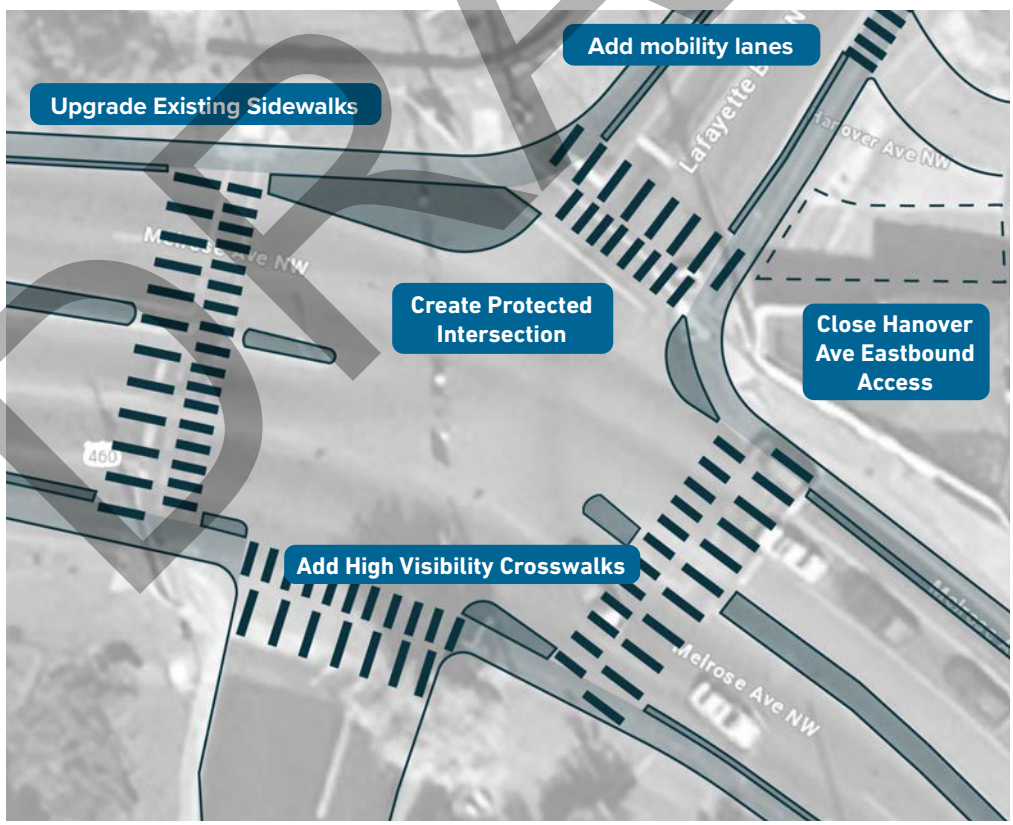
- The Belmont SE neighborhood has popular cycling streets such as Tazewell Avenue, Campbell Avenue, and 9th Street but the mobility lanes are inconsistent and disconnected. Main roads such as Jamison, Bullitt Avenues are critical through streets that have no bikeways; Dale Avenue and 13th Street have minimum-width striped lanes.

Design solutions to increase bicyclist safety include:

- Traffic Diverters
- Neighborways
- Mobility Tracks
- Protected intersections
- Shared streets



Brandon Avenue, SW (between Mudlick/Edgewood and Salem city limits). *Options include adding physical protection to existing striped mobility lanes; adding safe, controlled crossing with a Pedestrian Hybrid Beacon; adding raised median to center turn lane area.*



Melrose Avenue NW and Lafayette Boulevard NW. *Options include eliminating slip lanes; adding mobility lanes on Melrose and Lafayette; reducing crossing distances, adding high visibility crosswalks, pedestrian signals on each leg; closing one leg of Hanover Avenue NW to limit turning conflicts.*

Micromobility Network Plan

The Roanoke area is a popular destination for road and mountain bicyclists and there is a vibrant community of clubs, shops, and organizations offering formal and informal rides, and events across the region. The Roanoke River Greenway system is an important venue for active transportation and recreation.

However, one of the most consistent themes that emerged from community engagement activities during the development of the Safety Action Plan was the pent-up demand for more opportunities to ride in the city. Riders of all levels of confidence said they would ride more for everyday trips and for recreation if they felt safer on city streets, especially the main roads.

The crash analysis for the Safety Action Plan found that while no-one was killed riding a bike during the study period of 2019-2023, there were numerous crashes that resulted in serious injuries to people on bikes. These were most frequent on collector and minor arterial streets – for example, 10th Street NE and NW and Liberty Road NE. This suggests that people on bikes are, if they are able, choosing to avoid main roads such as Orange Avenue, Williamson Road, and Franklin Road in favor of less direct and quieter roads – or they simply don't ride at all, even though they would like to do so.

What is a Micromobility Network?

A micromobility network is a connected system of streets, lanes, and greenways that can be used comfortably, safely, and conveniently by people of all ages and abilities using a variety of human-powered and electric-assisted devices. The network is supported by policies and programs to facilitate the use of these non-motor vehicle modes of travel. Micromobility devices include bicycles (standard, cargo, and tandem), electric scooters (shared and privately owned), e-bikes (not e-motos), skateboards, inline skates, and other low speed mobility devices including adaptive and assistive devices.

Takeaways from Community Engagement for the Micromobility Network Plan

Roanoke area residents participated in pop-up events at popular local rides, a workshop hosted by PedalSafe, tabling at GoFest (including providing feedback on the South Jefferson Street demonstration project), and the on-line survey and map developed for the Safety Action Plan. Key takeaways included:

- Roanoke Greenways are a tremendous community asset for recreational and everyday riding.
- Connectivity to the greenway system and on-road facilities is limited
- Barriers such as rail lines, I-581, and major roads and intersections are a significant deterrent as there are few or no ways to safely cross them
- Existing facilities are discontinuous and do not provide sufficient protection from motor vehicles
- New Mobility Tracks on Shenandoah Avenue NW and 9th Street SE are welcome additions to the mobility network, especially where they connect to greenways.

From the Community

"I've been on both sides. I know people who have been seriously injured and/or lost loved ones in bicycle/vehicle related accidents. I've also hit a cyclist. It was a child who did not look/stop when exiting the family driveway. Thankfully, the boy was not hurt but I was 1000% shook up. "

The Micromobility Network Vision

The crash analysis, public input, and existing conditions informed the development of a Micromobility Network Vision that provides safe, comfortable, and convenient bicycling opportunities for Roanokers of all ages, abilities, and backgrounds with the goal of:

- Connecting people to the places they want to go
- Increasing separation between people on bikes and motor vehicles on main roads
- Closing gaps in the existing system
- Providing access to local destinations (shops, schools, churches, recreation facilities, medical and civic services etc.) across the city.

The network vision is comprised of separated or protected mobility lanes on main roads, neighborways on quieter streets, and greenways along rail, river, and other corridors.

The resulting network was then prioritized by segment based on the degree to which the proposed facility will:

- Connect across major barriers (15%)
- Help people reach daily/local destinations (25%)
- Link to parks/recreation (15%)
- Address safety concerns (15%)
- Leverage existing investments (30%)

The prioritization factors were weighted, as shown in parentheses, to create a score for each logical segment of the proposed network. This helps the City determine which projects to move forward first, while still taking advantage of unexpected opportunities to move other segments forward whenever they arise. The Micromobility Network Vision Plan is a long-term vision that will implemented over many years.

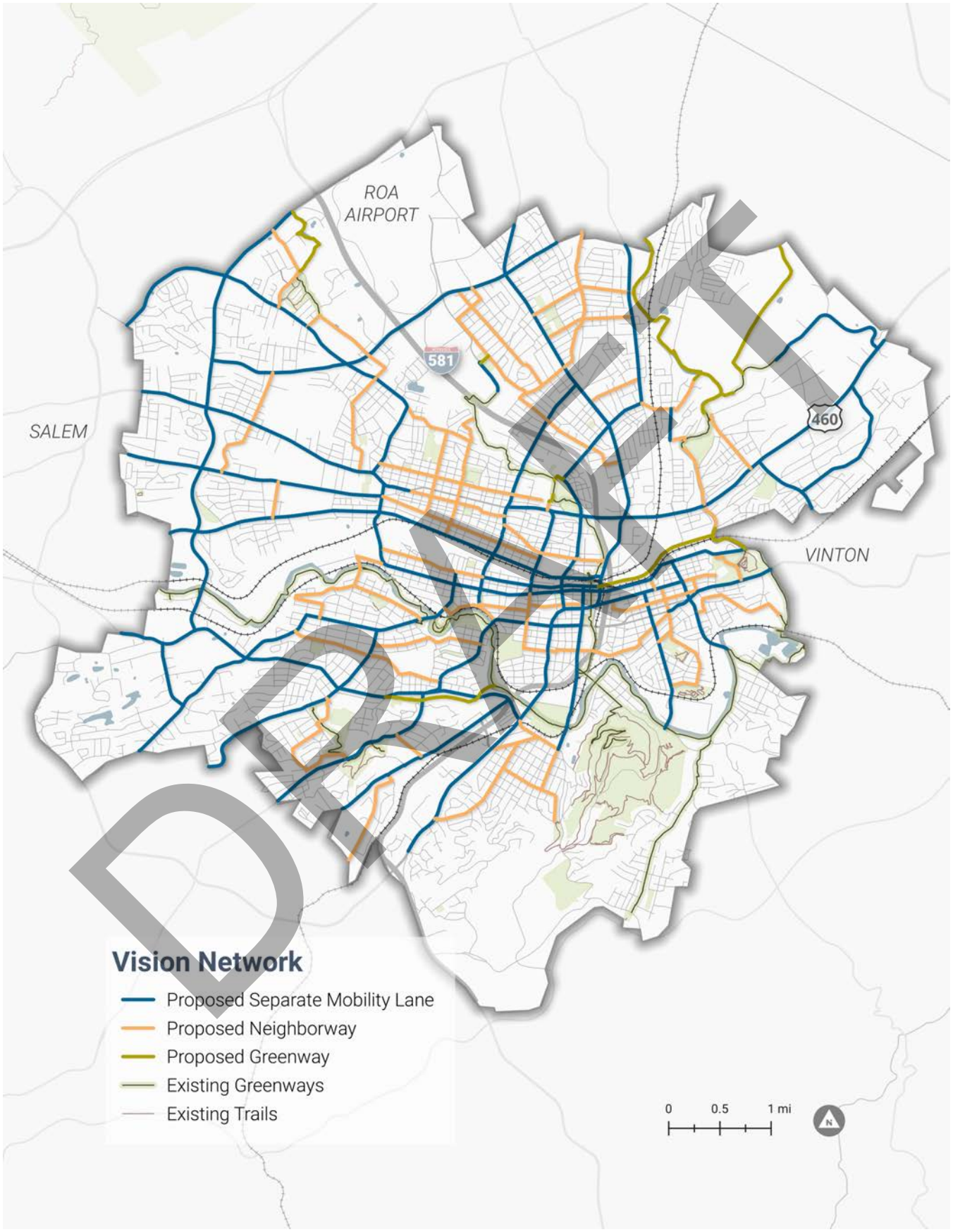
More details about the development of the Micromobility Network Plan are available in Appendix D of the Vision Zero Safety Action Plan.

Protected Bike Lane, Washington DC

Neighborhood Bikeway, Vancouver, BC

[Lick Run] Greenway, Roanoke, VA

Figure 28 Vision network



School Trips and Youth Travel

A significant number of Roanoke schools are located on or near the High Injury and High Risk Networks, which is a significant cause for concern. Recent changes in school walk zones have resulted in children walking on streets where there are no sidewalks or crosswalks. Conditions such as this encourage parents to drive their children short distances to school...a vicious circle creating the very safety and traffic congestion issues people want to reduce.

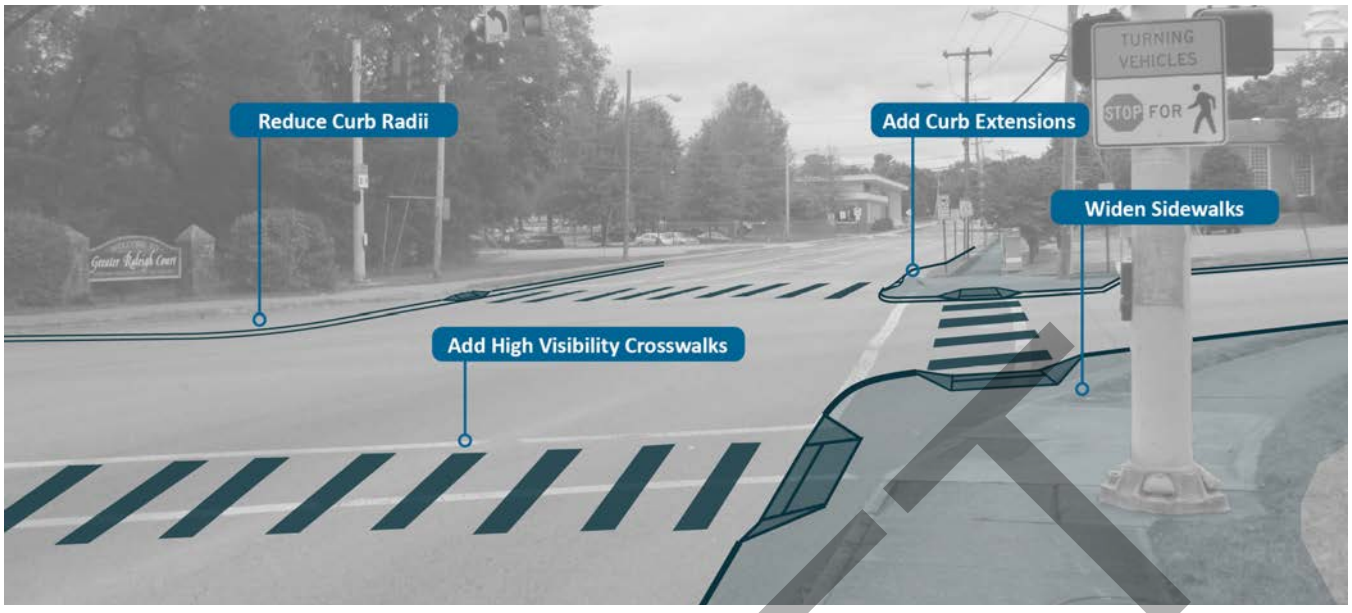
The proximity of schools to roads on the High Injury and High Risk Networks is one of the factors that was used to identify the Focus Areas for this Safety Action Plan. It is quite common for schools to be activity centers year-round and to be located adjacent to other community resources that people of all ages need to access.

Examples of places where this is important include:

- Preston Park Elementary School near Williamson Road NE. Recently redeveloped school has new roadway access onto Williamson Road.
- Lincoln Terrace Elementary School on Liberty Road and Burrell Street NW. Liberty Road NW and Burrell Street are on the High Risk Network and are critical N-S connector streets; the school serves children in an Environmental Justice Community. The Lick Run Greenway passes immediately behind the school. Potential Safety Measures: protected mobility lanes; high visibility crosswalks; PHB; Sidewalks
- Addison Middle School on 5th Street NW (adjacent to Orange Avenue NW). Orange Avenue is on the High Risk Network. There is one signalized crossing of Orange Avenue. Connected to the Lick Run Greenway. Potential Safety Measures: new sidewalks on 5th Street NW (South of Orange) and Orange Avenue; traffic calming on Staunton Avenue and Hanover Avenue NW; pedestrian crossings of 10th Street NW.
- Patrick Henry High School at the intersection of Brandon Ave SW and Grandin Road SW. Both roads are on the High Risk Network; they have sidewalks but no signalized crossings other than at the very large main intersection. Murray Run Greenway connects behind the school; other educational and community facilities on Lofton Road. Potential Safety Measures: High visibility crosswalks at all crossings; curb extensions and turning radius reductions at Grandin and Brandon; PHBs (e.g. at Grandin and Avenel, Laburnum).
- James Madison Middle School and Fishburn Park Elementary School on Overland Road SW (near Brambleton Avenue SW). Brambleton Avenue is on the High Risk Network; there is one signalized intersection at Overland Road; missing sidewalks along Brambleton to the west. Overland Road connects to the Elementary School; very wide road with mobility lanes; connects to Colonial Avenue mobility lanes. Potential Safety Measures: protected bikeway and sidewalk from Overland Road to Ross Lane (connect to greenway); protected mobility lane on Overland Road; redesign intersection to connect mobility lanes, add signalized crossing; Raised intersection and PHBs at Overland Road and school entrance.
- Fallon Park Elementary School near Dale Avenue, SE. Dale Avenue is on the High Risk Network; there is an RRFB on one leg of the intersection of Dale Avenue and 19th Street SE. The nearest signalized crossing of Dale Avenue is at 13th Street or Vernon Street, nearly half a mile to the east. The school is adjacent to several community recreation facilities and provides access to the Roanoke River Greenway System (Tinker Creek Trailhead). Potential safety measures: signalized crossings of Dale Avenue, neighborhood traffic calming in the Belmont-Fallon area; neighborway along Tazewell Avenue.

Design solutions to increase safety around schools include:

- Crossing islands
- Hardened Centerlines
- High Visibility Crosswalks
- RRFB and PHB
- Sidewalks



Grandin Road SW and Brandon Avenue SW. *Options include significantly reducing intersection crossing distances by tightening curb radii and extending curbs; adding high visibility crosswalks; widening sidewalks.*

Avenel Avenue SW and Grandin Road SW. *Options include installing a Pedestrian Hybrid Beacon (especially for non-school arrival/dismissal times); eliminating right turn only lane and creating a bus pull-out bay; reducing crossing distances through curb extensions; extending the Murray Run Greenway through this intersection.*

Supporting Initiatives

The City will:

- Continue to apply for USDOT and VDOT grants to implement pedestrian safety measures on roads in the Focus Areas near schools.
- Consider establishing a formal Safe Routes to School program
- Continue to explore a Safety Camera enforcement program in school zones. The cost of law enforcement staff necessary to implement a citywide program is prohibitive; the City may identify a small number of sites where the program can be piloted to better assess staffing needs and costs.

Culture of Safety

The City recognizes the need to create a much stronger culture of traffic safety in order to eliminate fatal and serious injuries by 2040. This requires an ongoing, holistic, multi-agency initiative that has the active support of community organizations. The Safety Action Plan is a first step. The City will implement several high-profile projects and adopt visible commitments to change that will continue to signal to the community that in Roanoke, people's safety on the road comes first.

Potential Projects and Commitments

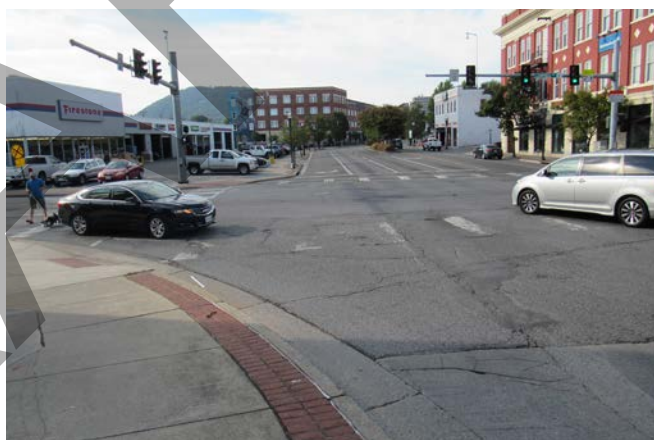
Envision Williamson Road

The City will continue to develop a community consensus around implementation of the forthcoming Envision Williamson Road plan. Williamson Road NE is a high-profile city street, features prominently on the High Injury and High Risk Networks, and is an excellent candidate for a roadway reconfiguration in the future. There are a number of significant changes to the roadway that can be made as part of a demonstration project to improve the safety, comfort, and convenience of people driving, walking, biking, and using the bus, on Williamson Road. This package of measures include marking high-visibility crosswalks, eliminating gaps in the sidewalk, adding missing curb ramps, relocating bus stops, and tightening up intersections with side streets and driveways.

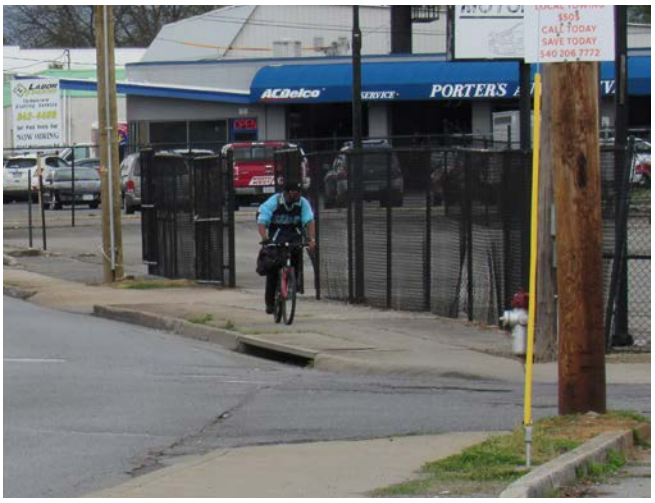
South Jefferson Street pilot project during GoFest, October 2024.

Initiate Downtown Safe Streets Design Project

Downtown Roanoke is the cultural, political, and economic heart of the city. It should also be a beacon of inspiration and model for traffic safety in the community. Downtown streets have a complete sidewalk network and have marked crosswalks and pedestrian signals at most intersections, many with a Leading Pedestrian Interval already. However, the streets are still dominated by traffic and several signature roads in the downtown are on the Pedestrian High Injury and High Risk Networks (e.g., Campbell, Salem, Williamson, and 2nd Street SW). The City will consider a design project to reinforce pedestrian priority in the downtown area through, a series of gateway treatments using safety measures such as raised intersections and crossings, and more shared streets around City Market to boost walkability.



Pedestrian conflicts with turning vehicles, downtown Roanoke.



Cyclist on the sidewalk, Williamson Road

Create New Street Design Guidance

The city's streets lack definition. One reason for this is that the City doesn't have a current street design guidance document that lays out best practices for the design and operation of city streets. The City will explore creating new street design guidance that will enshrine design principles associated with the Safe System Approach in all projects.

From the Community

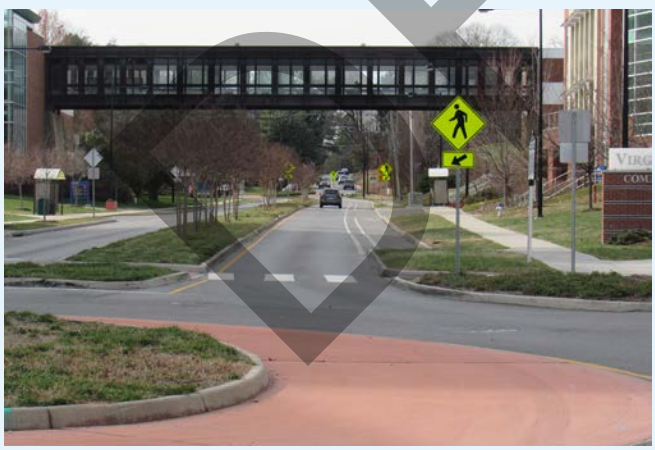
"Make streets reflect their speed limit. Building a road that people can drive 45mph on and then posting a 25mph sign means people will drive 55 through there. We need to build more bike paths, sidewalks and intersections that slow cars down and prioritize pedestrians. We need a more comprehensive public transit system to reduce the use of cars, parking and roadways. Building a city around cars will ruin it for all citizens and make it go bankrupt trying to build and maintain the infrastructure "

Early Roanoke Success Stories

There are several examples around the city where implementation of these kinds of safety measures is already making a difference. For example, during the crash analysis, the project consultants identified two roads that were notably absent from the High Injury and High Risk Networks: Colonial Avenue SW and Garden City Boulevard SE. In both cases, these looked like arterial roadways that would typically have a poor crash record.

However, Colonial Avenue SW has recently been rebuilt in the vicinity of the Community College with roundabouts, sidewalks, and mobility lanes; the section of Colonial Avenue immediately adjacent to the Towers Shopping Center also has mobility lanes.

Similarly, Garden City Boulevard has a sidepath (protected mobility lane) for almost it's entire length. This provides a safer place for people to walk and bike along this corridor and also makes it easier for people to drive.



Complete Street infrastructure on Colonial Avenue SW

05

ACTIONS AND STRATEGIES

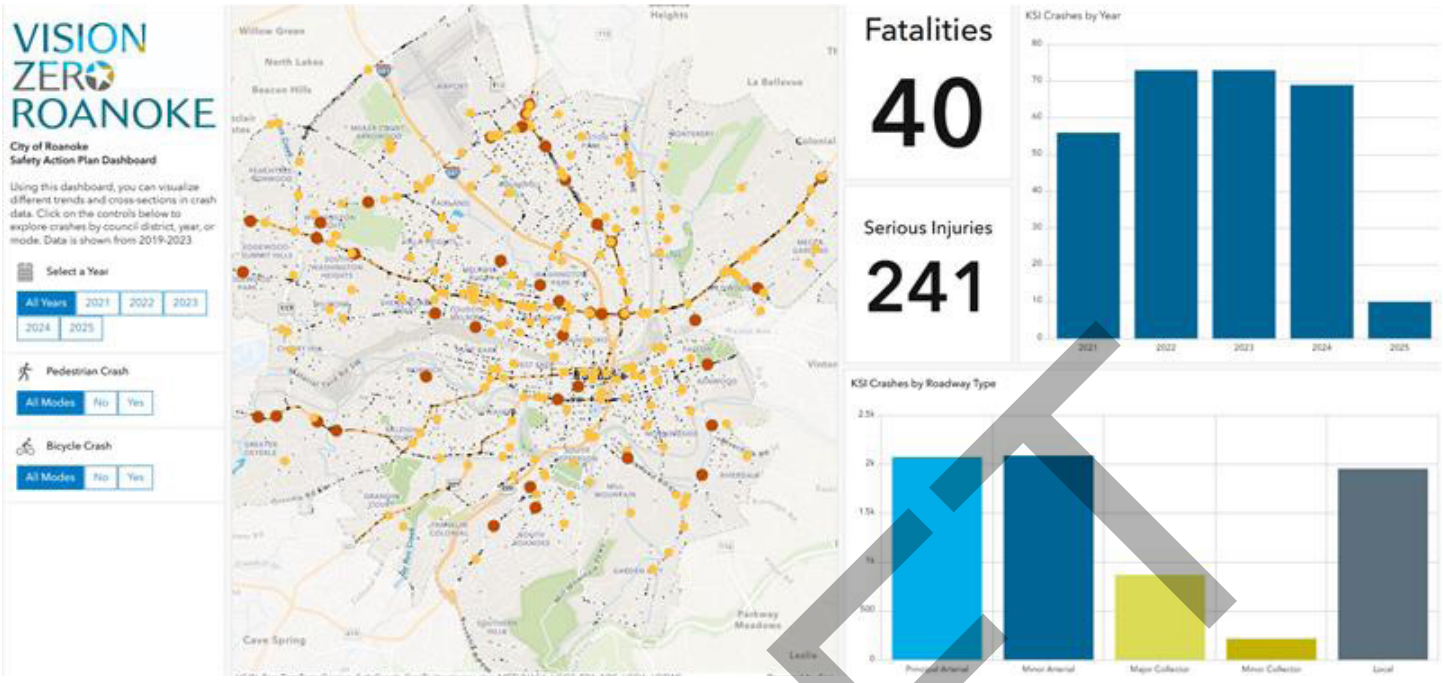
Short-Term Actions	Lead	Support	Measure	Notes	Relevance	Safe System Element	Cost
Adopt the speed management plan	Transportation	RPD	Adoption	Several implementation items included in the Speed Management Plan overlap with the Safety Action Plan	Speeding	Safe Speeds	$
Integrate Safe System language and metrics into updated Complete Streets Policy	Transportation	Planning	Updated Guidance and metrics	Ensure street design guidance contributes to safe system and meets current best practice designs	Culture of Safety	Safe Roads	$
Launch Vision Zero Dashboard on City website	Asset Management	Transportation	Page on website	Commitment to transparency and accountability	Culture of Safety	Safe System	$
Update Right-of-Way Permit standards to reflect Safe System approach and language	Transportation	Stormwater, Engineering	New Standards Adopted	Ensure utility work occurs safely and meetings City/VDOT standards	Culture of Safety	Safe Roads	$
Update guidelines for deployment and use of traffic control devices in school zones	Transportation	RCPS, RPD	Revised guidance	Example: add High Schools to locations where RRFBs can be used in school zones	Schools	Safe Roads	$
Continue PAC as a Vision Zero Task Force	Transportation	PAC	4 mtgs/year	Commitment to transparency and accountability	Culture of Safety	Safe System	$
Implement School Zone demonstration project (SS4A)	Transportation	RCPS	Execute grant award, install demonstrations	Funding secured from USDOT Safe Streets and Roads for All program	Schools	Safe Roads	$$
Introduce speed enforcement cameras in schools zones	RPD/Sherrif's office	Transportation, RCPS	Number of pilot sites	Publish RFP in 2026	Schools	Safe Speeds	$$$
Dedicate operations and maintenance resources to Vision Zero implementation	Stormwater/ Transportation	Transportation	Sweeping & maintenance metrics	Purchase equipment (e.g., small streetsweeper) for maintenance of quick build infrastructure delineated by shur-curb, flex-posts etc.	Culture of Safety	Safe Roads	$$$
Schedule and host ADA Training from LTAP	Transportation	Engineering, Stormwater	Training Completed	Train staff on designing, building, and maintaining infrastructure to meet PROWAG standards	Pedestrians	Safe Road Users	$
Revise Valley Metro bus stop location policy	Transportation	GRTC	Revisions completed	Adjust to Far Side locations and/or closer to safe crossings and ADA-compliant locations	Pedestrians	Safe Roads	$$
Integrate Transportation Demand Management programs with SAP	RVARC	Transportation	Ongoing	TDM programs support safety by encouraging the use of non-auto trips	Culture of Safety	Safe Road Users	$$
Install Traffic Gardens at all Elementary Schools	RCPS/RVARC	Transportation	Number of Traffic Gardens	One currently exists; work towards at least one in each quadrant, add more as opportunities arise	Schools, Culture of Safety	Safe Road Users	$$$
Evaluate effectiveness of existing RRFB's	Transportation		Updated Guidance and metrics	Establish criteria to assess effectiveness of current installations to inform future use	Pedestrian	Safe Roads	$
Establish regular liaison with motorcycle community	Transportation	RPD	Minimum quarterly interactions	Opportunities to engage riders through RPD and VWCC motorcycle training and retailers.Potential for a formal advisory committee	Motorcyclist	Safe Road Users	$
Include updated safety features in scheduled replacement of City vehicle fleet	Fleet Management	All departments	Uodated procurmenet specifications	Older vehicles in city fleet may not have current safety equipment and features	Culture of Safety	Safe Vehicles	$$$

Medium-Term Actions	Lead	Support	Measure	Notes	Relevance	Safe System Element	Cost
Lower default speed limit by 5 mph in Neighborhood Centers	Transportation	RPD	Lower Speed Limits	Lower speed limits by 5mph on neighborhood center streets	Speeding	Safe Speeds	$$
Lower default speed limit by 5 mph on collector and arterial streets	Transportation	RPD	Lower Speed Limits	Lower speed limits by 5mph on collector and arterial streets	Speeding	Safe Speeds	$$
Update City Development/Zoning Code to include Safe System design standards	Planning	Transportation, Economic Development	Revisions completed	Ensure default design standards and practices supporting the Safe System Approach	Culture of Safety	Safe Roads	$
Update City Street Design Manual to reflect Safe System design standards	Transportation	Planning, Engineering, Stormwater	New guidance	For use internally, share with developers, and other agencies	Culture of Safety	Safe Roads	$
Establish a formal Safe Routes to School Program	RCPS, RVARC	Transportation	Secure Funding	Overall SRTS program would include education, encouragement, and engineering elements	Schools	Safe System	$$
Secure funding for safety projects around schools	Transportation	RCPS, RVARC	Secure Funding	Potential funding sources inlcude VDOT Transportation Alternatives and HSIP programs, SS4A	Schools	Safe System	$$$
Long-Term Actions	**Lead**	**Support**	**Measure**	**Notes**	**Relevance**	**Safe System Element**	**Cost**
Lower default speed limit by 5 mph on all residential streets	Transportation	RPD	Lower speed limits	Lower default speed limit for residential streets	Speeding	Safe Roads	$$
Secure funding for safety projects on neighborhood street	Transportation	Neighborhood services	Funding award	Potential for SS4A, HSIP funds to implement Neighborhood Slow Zones initiative	Speeding	Safe Roads	$$$
Study downtown multimodal safety improvemetns	Transportation	Planning, Engineering, RPD	Adoption of Plan	Develop action plan for area-wide traffic calming downtown, gateways	Pedestrian, Bicyclist, Motorcyclist	Safe Roads	$$
5-year Update of Safety Action Plan	Transportation		Update Focus Areas	Revise crash analysis, HIN, HRN to reflect progress, changes to crash picture	Culture of Safety	Safe System	$
Establish sidewalk gap elimination program in focus areas	Engineering	Transportation	Linear feet of sidewalk	Identify and fill sidewealk gaps on HRN and focus areas	Pedestrians	Safe Roads	$$$

Annual-Ongoing Actions	Lead	Support	Measure	Notes	Relevance	Safe System Element	Cost
Publish Vision Zero annual report	Transportation	Communications	Annual report published	Provide annul report on crash data, projects and action items completed	Culture of Safety	Safe System	$
Secure funding for implementation of neighborhood street art projects	Arts Commission	Transportation	Number of Completed Projects	Establish a goal of securing funding for two or more street painting projects each year to build on the success of Old Salem Turnpike and Ferdinand	Culture of Safety	Safe Roads	$$
Coordinate city-wide grant writing to focus on safety in priority locations	Grants Manager	All departments	Number & Content of Grant Applications	Several potential USDOT and VDOT grant sources to consider every funding cycle	Culture of Safety	Safe Roads	$
Annual safety education and awareness campaign	Transportation	Communications	Completed Campaigns	Continue successful campaigns; consider motorcyclist safety as future focus area	Culture of Safety	Safe Road Users	$
Review current capital projects for opportunities to incorporate safety measures	Engineering, Transportation, Planning, Stormwater	PAC	Revised Plans and Projects	Make sure ongoing development and construction projects are improving safety and not maintaing status quo	Culture of Safety	Safe Roads	$
Implement targeted enforcement to support engineering measures	RPD	Transportation	Completed Campaigns	Work with RPD to support implementation of new infrastructure with warnings, citations	Culture of Safety	Safe Road Users	$
Review RCPS School Construction plans	RCPS	Transportation	Number of Plans Reviewed	Coordination to identify opportunities to make safety improvements based on crash history, proximity to HRN, and equity criteria.	Schools	Safe Roads	$$
Host an Annual Regional Safety Summit	RVARC	Transportation	Completed event	Host an annual coordination and planning summit to ensure safety work is holistic, regional	Culture of Safety	Safe System	$$
Establish ongoing training on safety measures to multidisciplinary audiences	Transportation	Planning, Police, RVARC, Stormwater, Engineering, VDOT	Number of Training Participants	4-6 hour training on safety measures, new design guidance, for multiple agencies/staff, consultants	Culture of Safety	Safe System	$
Continue Curb Ramp Installation Program at intersections	Transportation	Engineering	Number of Curb Ramps	Prioritize installation of missing ADA infrastructure at priority intersections	Pedestrian	Safe Roads	$$$
Formalize Crosswalk Striping Program	Transportation		Number of Crosswalks	Consistent crosswalk striping	Pedestrians	Safe Roads	$$$
Identify opportunities to implement projects from Micromobility Network Vision Plan	Transportation	Planning, Public Works	Number of Miles	Include incidental and stand-alone project opportunities	Bicyclists	Safe Roads	$$$
Submit funding requests, grant applications for projects identified in the SAP	Transportation	Engineering, Planning, RCPS	Applications Submitted	Include RAISE, TAP, Smart Scale, HSIP, SS4A, Thriving Communities	Culture of Safety	Safe System	$
Coordinate with Street Design Team	Transportation	Engineering, Stormwater	Regular Meetings	Ensure Street Design team members are using current best practices designs, policies	Culture of Safety	Safe Roads	$

06

METRICS AND ACCOUNTABILITY



Safety Action Plan Dashboard

Fatal and serious injury crashes in Roanoke will not be eliminated overnight. This makes it important to track short-and long term steps taken to implement the Safety Action Plan as well as progress towards the overall goal. There are three key steps to maintaining transparency and accountability:

- The Project Advisory Committee established for the development of the Safety Action Plan will continue to meet, albeit less frequently, to monitor progress and maintain a focus on implementation of the actions and strategies.
- The City will publish an annual report each Spring, documenting the projects, programs, and policies that have been implemented in the prior year. The annual report should track crash data and trends from 2019 onwards.
- The City will publish and maintain a data dashboard on its Vision Zero webpage. The dashboard will track crashes in the city so that the information is easily accessible.

The City is already moving forward with projects in several Focus Area locations. The project pipeline includes four key phases: Planning, Funding, Design, and Construction. These projects will be monitored and progress will be reported in subsequent Vision Zero annual reports.

Phases

Planning: Pre-funding Project Development
Design: Funding Awarded, Design Underway
Design: Funding Awarded, Design Underway

State Funding Sources

HSIP: Highway Safety Improvement Program
OIPI: Office of Intermodal Planning and Investment
SS: Smart Scale

Corridors	From	To	Planning	Funding	Design	Construction
10th Street	Williamson Road NE	Campbell Avenue SW				
Brambleton Avenue	Brandon Avenue SW	SW City limit (Cave Spring)				
Brandon Avenue	Franklin Road SE	SW City limit (Salem)				
Burrell Street	Liberty Road NW	Orange Avenue, NW			X	
Cove Road	Lafayette Blvd NW	Hershberger Road, NW			X	
Dale Avenue	SE City limit (Vinton)	13th Street SE (Vinton)				
Franklin Road	South Jefferson Street	US 220, SW				
Gainsboro Road	Orange Avenue NW	Salem Avenue, SW		X		X
Gus Nicks Boulevard	Orange Avenue NE	SE City limit (Vinton)				
Hershberger Road	Williamson Road NE	Peters Creek Road NW		HSIP	HSIP	
Jamison & Bullitt Avenues	13th Street SE	Williamson Road SE				9th Street
Jefferson Street	Franklin Road SE	McLanahan Street, SE				
Lafayette Blvd	Melrose Avenue NW	Cove Road, NW				
Liberty Road	Plantation Road NE	Burrell Street NW				
Melrose Avenue	20th Street NW	NW City limit (Salem)	OIPI	HSIP	HSIP	
Memorial Ave & Grandin Rd SW	Campbell Avenue SW	Brandon Road, SW				
Orange Avenue (US 460)	NE City limit	20th Street NW		X	X	
Williamson Road	Hershberger Road NE	South Jefferson Street	X	X	HSIP	

Intersections	Planning	Funding	Design	Construction
Brandon Avenue and Brambleton Avenue				
Brandon Avenue and Franklin Road	X			
Brandon Avenue and Main Street				
Dale Avenue and 13th Street				
Franklin Road and Wonju Street				
Grandin Road and Brandon Avenue				
Gus Nicks Blvd and Orange Avenue		X	X	
Hershberger Road and Cove Road		HSIP	HSIP	
Melrose Avenue and Lafayette Blvd	OIPI	HSIP	HSIP	
Orange Avenue and 24th Street		SS	SS	
Orange Avenue and Burrell/Gainsboro		X	X	Gainsboro
Orange Avenue and Williamson		SS	SS	
Williamson Road and 10th Street			X	
Williamson Road and Hershberger Road			HSIP	
Williamson Road and Liberty Road			X	

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07

NEXT STEPS

08

Actions to Increase Safety

The Safety Action Plan identifies numerous ambitious projects, programs, and policy changes that will take time to fully implement. In the short term, ongoing traffic safety concerns often require a more immediate response. The SAP provides a data-driven analysis that identifies where investments are most needed and where they can have the greatest return. The City can use the Safety Measures to effectively reduce the negative impacts of speeding and distracted and impaired driving. Similarly, there are efficient ways to change elements of the roadway network that increase the risk of serious or deadly crashes today.

Making Safety the Default

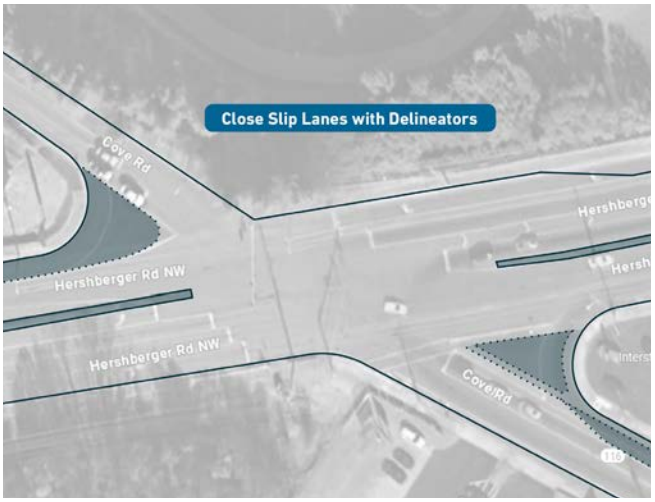
Several of the systemic safety measures can be implemented as part of the city's ongoing capital improvement program, resurfacing work, and development projects. Opportunities include:

- Intersection design changes such as curb extensions, corner radius reductions, intersection daylighting, and high visibility crosswalks.
- Signal timing changes and reprogramming such as a Leading Pedestrian Interval, eliminating permissive left turn signals, and prohibiting Right Turn on Red movements.
- Slip lane closures prior to more substantial intersection reconstruction.
- Proactively filling missing sections of sidewalk and ensure all intersections with sidewalks have the required curb ramps.
- Upgrading existing mobility lanes through the addition of vertical separation (e.g. flex posts or curbing) at intersections and specific locations where people on bikes are most vulnerable to speeding or turning vehicles.

Paint markings to daylight intersections, Jersey City, NJ

Paint markings to reduce lane widths and turning radius, Jersey City, NJ

Paint and posts used to reduce curb widths, slow vehicle speeds, and reduce crossing distances, Jersey City, NJ



Interim slip lane removal (e.g. at Cove Road and Hershberger Road NW) can be implemented quickly and inexpensively by using Flex Posts or Jersey Barriers (if needed) in advance of more substantial intersection reconstruction.

While some of these measures may require site-specific assessments prior to implementation (for example, determining the impact of signal timing changes on vehicle flow at busy intersections), most are able to be implemented without additional study – as timing, staff capacity, and funding permit. They are tried and tested safety solutions that will create greater clarity and definition to the operation of motor vehicles on city streets which will increase the safety of all road users.

Neighborhood Slow Zones

The impacts of traffic are disproportionately felt in areas of the city that also have the highest levels of poverty, lowest car ownership, and worst access to safe, reliable, and affordable transportation options. These are the same areas where the City is committed to engaging with the community to build capacity and develop the skills necessary to help people participate fully in the local economy.

One approach to addressing area-wide traffic safety concerns is to identify "neighborhood slow zones" where a suite of safety measures can be used in combination to calm traffic, to enable people to more safely walk, bike, and take transit, and to increase community cohesiveness. The Focus Area map created as part of the Safety Action Plan can be used to identify neighborhoods where this would have the greatest return on investment.

New curb ramp

City staff adding Flex Posts to ShurCurb Separators, Roanoke VA

The cities of Philadelphia and Boston have used this approach. In Philadelphia, the city has an application process for neighborhoods to join this program, with priority given to those in underserved areas with the worst safety numbers. Neighborhoods are empowered to co-create the overall traffic calming plan for their neighborhood using a toolbox of safety measures such as raised crosswalks, traffic diverters, high visibility crossings, intersection daylighting, traffic circles, and curb extensions. The City can pursue Federal and/or state funding to establish a neighborhood slow zones program, tackling one or more areas per funding cycle.

Curb extension and high visibility crosswalk, Richmond, VA

Quick-build pedestrian infrastructure and visual narrowing, Silver Spring, MD.

Neighborhood traffic circle in Henrico County, VA

08 CONCLUSION

Eliminating fatal and serious injury crashes on Roanoke's streets by 2040 will take a significant commitment by all City departments and regional partners, elected officials, and individuals working together. It is an ambitious goal, but it can be done. We know what the issues are, and we have the tools and solutions to address them.

City departments and regional agencies must share responsibility and collaborate fully to achieve the common goals of this Safety Action Plan. Individual departments and agencies must understand the implications of their actions and think and act holistically. For example, a recent decision by the Roanoke City Public Schools to increase the distance students must travel before being eligible for school bus transport failed to consider whether there are sidewalks and crosswalks on the streets students must now walk or ride. In the future, a decision such as this should be made in collaboration with partner agencies responsible for building and maintaining sidewalks and crosswalks. The Safety Action Plan is an all-of-government initiative that will save people's lives.

We must prioritize the lives of Roanokers and visitors to the city when balancing safety and access for all against the loss of a parking space or the minor inconvenience of occasionally driving a little more slowly. If this Safety Action Plan is fully implemented, people will still be able to drive everywhere they can today with minimal inconvenience – the difference is that people will also be able walk, bike, ride a motorbike, and take transit with greater safety, dignity, and convenience. And everyone, including motorists, will get home safely at the end of the day.

We can do a lot to create a Safe System: building a roadway network that eliminates opportunities for crashes to occur at speeds the human body cannot survive. However, every individual in the city also shares a responsibility to drive safely, follow the rules of the road, and champion implementation of this Safety Action Plan. We encourage everyone to sign the Safe Streets Pledge.

Although this plan is focused on creating safer streets, it has the potential to deliver many additional benefits to the community – cleaner air, quieter neighborhoods, greater access to jobs and services, more gathering spaces, a healthier and more livable community, and a city where everyone can thrive.

It's time for action.

Roanoke Vision Zero Pledge

I pledge to play my part in making Roanoke streets safer for everyone. Because my choices and actions matter, I will:

Take responsibility for the safety of others, especially the most vulnerable road users and community members including people on foot and bike, motorcyclists, children, the elderly, and people with disabilities. This includes never obstructing crosswalks, sidewalks, mobility tracks, bus stops or loading zones.

Drive safely at all times by never texting or using my phone while driving, always keeping my eyes on the road, and never driving under the influence of alcohol or drugs.

Follow the rules of road and all traffic laws, signs, and signals. Specifically, I will always obey the posted speed limit, stop or yield to people crossing the street, maintain a safe distance from those around me – including giving cyclists at least 3 feet of space when passing, and look twice for motorcyclists.

Residents are reminded of their traffic safety responsibility on painted signal boxes and ongoing information and education campaigns.

2025 Traffic Safety Campaign – Focused Driving, Safe Arriving

TRAFFIC SAFETY CAMPAIGNS

This year's "Focused Driving, Safe Arriving" campaign addresses one of the greatest dangers on Roanoke streets – distracted driving. Whether it's texting, adjusting the GPS, or reaching for something in the backseat, even a moment of distraction can have life-changing consequences. The campaign will run from June 2 to July 13 and work to decrease distraction-involved crashes by:

- Raising awareness of the risks, consequences, and relevant laws of distracted driving
- Encouraging focused driving behavior by providing practical solutions to avoid distracted driving
- Fostering a social norm of safe, focused driving in Roanoke

" Focused Driving saves lives. We encourage drivers and passengers to pledge to reduce distractions while in a vehicle. "

Rob Issem
Vision Zero Coordinator

Visit the City's Vision Zero website for more information and to take the pledge.

DRAFT

VISION ZERO ROANOKE

Roanoke Speed Management Action Plan

toXcel, LLC

12/4/2024

Contents

Executive Summary

This Speed Management Action Plan (SMAP) was developed to support the City of Roanoke's Vision Zero goal of eliminating all fatal and severe injury crashes (KSI) by 2035. Speeding plays a disproportionately large role in these serious and fatal crashes, making speed management a critical component of the City's safety strategy. To support this goal, the SMAP sets measurable interim targets, including reducing speeding related KSI crashes by 3 crashes/year and reducing vulnerable road users (VRU)- including pedestrians and bicyclists- KSI crashes by 3 crashes/year.

The SMAP aligns with existing city and state initiatives, integrating relevant programs, plans, and policies to ensure consistency with broader safety efforts. It establishes a clear framework for identifying speeding-related safety issues and deploying targeted, data-driven countermeasures at high-risk locations across Roanoke.

To inform the plan, the project team analyzed crash data from 2016 to 2023 and conducted speed differential studies across the entire city. Roadways were categorized into five typology groups based on their function, posted speed limit, and surrounding land use. The analysis revealed that while speeding related crashes accounted for 16% of all crashes, they comprised 34% of fatal or serious injury crashes, showing the disproportionate role speeding plays in the severity of crashes. Additional insights indicated that arterial and collector roadways had a higher rate of severe outcomes compared to local streets, VRUs are more susceptible to severe outcomes, and school and work zones have a small but notable share of speeding-related crashes.

Each roadway was categorized into one of five typology groups:

- Downtown: Local - 25
- Downtown: Collector & Arterial - 25-35
- Local - 15-25
- Collector & Arterial - 25-35
- Collector & Arterial - 40+.

Crash and speed data were analyzed for each typology group, normalized by roadway mileage, to determine both the typologies with the largest impact on speeding-related crashes and the highest-risk locations within each typology group.

The SMAP outlines a comprehensive set of countermeasures tailored to roadway typologies and crash types. The toolbox includes a range of solutions from engineering treatments, educational campaigns, and enforcement strategies, each matched to its appropriate roadway context. Potential funding sources and opportunities were also identified to support implementation.

Finally, the plan includes a summary of key speeding-related safety concerns, high-risk corridors, and countermeasure recommendations for each roadway typology. Together, these elements form a structured, actionable roadmap for making Roanoke's streets safer and more equitable for all users through strategic speed management.

Chapter 1: Introduction

Speed Management – A Roadmap for Getting to Safe Speeds

Excessive speeds significantly increase both the likelihood and severity of crashes by reducing drivers' reaction and stopping times, which endangers not only drivers but also pedestrians and other vulnerable road users (VRUs) who lack vehicle-level protections. This Speed Management Action Plan (SMAP) is Roanoke's roadmap towards safe speeds on all Roanoke roads towards the goal of Vision Zero through appropriate speed limits, roadway design, education, and enforcement. This SMAP provides a tailored strategy for Roanoke, using data analysis, stakeholder input, and specific countermeasures to tackle speed-related concerns and ensure safer roadways for all Roanoke roadways.

Safety Goals of the SMAP (Interim Goals to help meet Roanoke's VZ Goals)

Speed management is central to achieving Roanoke's goal of Vision Zero by 2035, through focusing on reducing speed-related crashes and improving compliance with posted speed limits across the city. Vision Zero calls for the elimination of all fatal and serious injury (KSI) crashes. Below are specific targets to work towards the elimination of all speed related KSI crashes on Roanoke Roadways by 2035.

- Reduce speeding related KSI crashes by 3 crashes/year.
- Reduce VRU KSI crashes by 3 crashes/year.
- Reduce VRU speeding related KSI crashes by 1 crash/year.
    - VRUs include pedestrians, bicyclists, and motorcyclists
- Improve compliance with posted speed limits.
- Targets for reduction in speeding and aggressive driving.
- Implementation of 20 is Plenty
- Target reductions in speeding-related fatal crashes for roadway typologies:
    - Downtown: Collector and Arterial, 25-35 (9)
    - Collector and Arterial, 25-35 (8)
- Target reductions in speed related serious injury crashes for roadway typologies:
    - Collector and Arterial, 25-35 (51)
    - Local, 15-25 (42)
    - Downtown: Collector and Arterial, 25-35 (27)

Through a combination of targeted enforcement, infrastructure improvements, and community-focused programs, Roanoke's speed management goals seek to foster a safer, more livable environment for all.

Virginia and Regional Speed Management Policies

Across Virginia: The Virginia Strategic Highway Safety Plan (SHSP) 2022-2026[1] emphasizes speed management as a key strategy to reduce traffic fatalities and serious injuries. It advocates for:

- **Setting Safe Speed Limits**: Establishing speed limits appropriate for specific road types and conditions.
- **Implementing Traffic Calming Measures**: Utilizing design features to naturally reduce vehicle speeds.

[1] https://www.vdot.virginia.gov/about/safety-plan/

- **Enhancing Enforcement**: Increasing the use of speed enforcement technologies and targeted enforcement campaigns.

Regionally: The Roanoke Valley-Alleghany Regional Commission has a Pedestrian Vision Plan[2] focusing on pedestrian safety, with speed management as a central element. The plan recommends:

- **Lowering Speed Limits in High-Pedestrian Areas**: To protect vulnerable road users.
- **Implementing Traffic Calming Measures**: Such as road diets and speed humps to reduce vehicle speeds.

Speed Limit Setting Policies and Legislation

For speed limit setting, Virginia's General Assembly establishes statewide statutory speed limits, while cities, towns, and the Virginia Department of Transportation (VDOT) have the authority to adjust speed limits on roads they oversee. Below are the default, statutory speed limits for Virginia[3]:

- Residential and Business Areas: 25 MPH
- Unpaved Roads: 35 MPH
- Most Highways: 55 MPH for passenger vehicles; 45 MPH for trucks on routes numbered 600 or higher

In Roanoke, these general limits apply unless otherwise posted. Making adjustments to these defaults requires an engineering study to ensure the speed aligns with roadway safety standards. Notably, in June 2019, the city reduced speed limits in most neighborhood school zones from 25 MPH to 15 MPH to enhance student safety.

The 11th edition of the Manual on Uniform Traffic Control Devices (MUTCD)[4], released in December 2023, introduces updated guidelines for setting speed limits to enhance road safety. Notably, it de-emphasizes the traditional reliance on the 85th percentile speed—the speed at or below which 85% of drivers travel under free-flowing conditions—as the primary determinant for speed limits. Instead, the MUTCD now recommends a more comprehensive approach that considers multiple factors, including:

- **Roadway Environment:** The surrounding land use and its impact on traffic dynamics.
- **Roadway Characteristics:** Features such as lane width, shoulder conditions, and alignment.
- **Geographic Context:** Urban, suburban, or rural settings and their unique traffic patterns.
- **Crash Experience:** Historical data on traffic incidents in the area.
- **Speed Distribution:** The range and variability of vehicle speeds observed.
- **Analysis of Speed Trends:** Patterns in speed behavior over time.

This holistic approach aims to set speed limits that are context-sensitive and promote safety for all road users, including pedestrians and cyclists. By moving beyond a sole focus on driver behavior, the MUTCD encourages transportation agencies to tailor speed limits to the specific conditions and safety needs of each roadway segment.

[2] https://rvarc.org/2021/06/22/faster-dangerous-traffic-what-is-roanoke-doing-about-it/
[3] https://www.vdot.virginia.gov/about/our-system/highways/speed-limits/
[4] https://mutcd.fhwa.dot.gov/pdfs/11th_Edition/Chapter2b.pdf

Speed Enforcement

In Roanoke, speed enforcement combines traditional methods with community-focused initiatives:

- Targeted Patrols: The Roanoke Police Department conducts regular speed enforcement in areas with high traffic volumes and frequent speeding complaints. Notable locations include Hershberger Road, Orange Avenue, and the Roy Webber Expressway.
- Community Reporting: Residents can report speeding issues in their neighborhoods, prompting the police to conduct speed monitoring and implement enforcement measures as needed[5].

Virginia imposes fines based on the severity and location of the speeding offense:

- General Speeding: $6 per mph over the limit.
- School or Work Zones: $7 per mph over the limit.
- Certain Residential Areas: $200 plus $8 per mph over the limit.
- Highway Safety Corridors: Up to $500, with a $200 minimum if classified as a criminal offense.

In Virginia, the use of Speed Safety Cameras (SSCs) is regulated and permitted in specific areas to enhance road safety. According to § 46.2-882.1 of the Code of Virginia, SSCs, referred to as "photo speed monitoring devices," are authorized in the following zones[6]:

- School Crossing Zones: These are areas designated for pedestrian crossing near schools, where speed cameras can monitor and enforce speed limits to protect students.
- Highway Work Zones: Active construction or maintenance areas on highways where speed cameras help ensure the safety of workers by enforcing reduced speed limits.
- High-Risk Intersection Segments: Specific highway segments located within 1,000 feet of school property boundaries, particularly at intersections with marked crosswalks where a traffic fatality has occurred since January 1, 2014.

In these designated zones, vehicles detected traveling at least 10 miles per hour above the posted speed limit may incur a civil penalty of up to $100. The implementation of SSCs in these areas aims to enhance safety for pedestrians, construction workers, and all road users by encouraging adherence to speed limits.

Existing Safety Plans & Initiatives

Roanoke has implemented several measures to address speeding and enhance safety in both residential and commercial areas. The “No Need to Speed” campaign is a key initiative aimed at raising awareness about the dangers of speeding and encouraging safer driving habits[7]. This campaign includes educational efforts, community engagement, and visible road signage to remind drivers of the importance of adhering to speed limits. Additionally, the city has increased fines for speeding violations in these areas to deter reckless driving and protect pedestrians[8]. These efforts are part of a broader strategy to reduce traffic fatalities and injuries, particularly those involving pedestrians, which have been a significant concern in recent years.

[5] https://www.roanokecountyva.gov/1085/Crime-Reports
[6] https://law.lis.virginia.gov/vacode/title46.2/chapter8/section46.2-882.1/
[7] https://planroanoke.org/wp-content/uploads/2021/07/APD-NewsRelease-FINAL2.pdf
[8] https://rvarc.org/2021/06/22/faster-dangerous-traffic-what-is-roanoke-doing-about-it/

Roanoke Programs to Coordinate with:

- City of Roanoke Pedestrian Safety Initiative Shifts Focus to School Zones[9] - Traffic Safety Campaigns[10]
    - Reduce Distracted Driving (2025)
    - Keep each other safe campaign
    - Change lanes to pass campaign
    - School zone safety campaign
    - No need to speed campaign
    - Every corner is a crosswalk campaign
- Pedestrian and Bicyclist Safety Action Plan (PBSAP)[11]
- Roanoke Technical Education Center[12]
- Roanoke BRITE Program[13]
- Roanoke Bee City USA Program[14]
- Clean Valley Council Adopt-A-Street[15]

VDOT Programs to Coordinate with:

- VDOT Vulnerable Road User Safety Assessment (VRUSA)[16]
- Virginia's 2022-2026 Strategic Highway Safety Plan (SHSP)[17]
    - Speeding strategies and actions in SHSP:
        - Adopt an approach that considers risk when prioritizing locations for safety improvements and programs
        - Recognize traffic safety as a public health issue and establish policies and programs that promote safe behavior and reduce crash severity outcomes.
        - Develop and implement programs that provide education and awareness to high risk road users.
        - Implement innovative solutions and utilize current and emerging technologies.
- Relevant VDOT Safety Programs[18]
    - Pedestrian and bicycling programs
        - Bicycle and pedestrian program
        - Safe routes to school
    - Safety programs
        - Highway safety corridors
        - Safety service patrol

[9] https://planroanoke.org/wp-content/uploads/2020/04/APD-Schools-NR_FINAL.pdf
[10] https://planroanoke.org/pedestriansafety/
[11] http://bit.ly/VDOTPBSAP
[12] https://www.rcps.info/rotec
[13] https://www.roanokeva.gov/1910/BRITE-Corporate-Sponsorship
[14] https://www.playroanoke.com/bee-city-usa/
[15] https://www.cleanvalley.org/adopt-a-street
[16] https://www.vdot.virginia.gov/media/vdotvirginiagov/about/strategic-highway-safety-plan/vru-safety-assessment-2024-2026_acc03182024_JE.pdf
[17] https://www.vdot.virginia.gov/media/vdotvirginiagov/about/strategic-highway-safety-plan/Virginia-2022-2026-Strategic-Highway-Safety-Plan_acc04102024_JE.pdf
[18] https://www.vdot.virginia.gov/about/programs/

        - Work zone safety
    - Infrastructure programs
        - Neighborhood traffic programs
        - Arterial preservation
    - Innovation programs
        - Virginia transportation research council
        - Connected and automated vehicles
        - Virginia's smart road

Chapter 2: Speed Related Safety Concerns Overview

Speed Related Crash Data (2016-2023: Roanoke, VA)

Crash data from all Roanoke roadways from 2016-2023 was analyzed to identify speed related trends. The data showed that speeding related crashes accounted for 16% of all crashes, but 34% of fatal or serious injury crashes, showing that speeding plays a disproportionate role in the severity of the crashes on Roanoke Roadways. Below are some high-level insights from the crash data across Roanoke:

1. **Overall Crashes**:
    - **Total crashes**: 12,778.
    - **Speed-related crashes**: 2,024 (16% of total crashes).
2. **KSI (Killed or Seriously Injured) Crashes**:
    - **Total KSI crashes**: 520 (4% of all crashes).
    - **Speed-related KSI crashes**: 179 (34% of KSI crashes).
    - Speed-related KSI crashes by road type:
        - Local Streets: 45 (8.5% of speed-related crashes).
        - Arterials: 98 (11% of speed-related crashes).
        - Collectors: 24 (9% of speed-related crashes).
3. **Crash Categories**:
    - **Pedestrian crashes**:
        - Speed-related: 21 (0.2% of total crashes).
        - Speed-related KSI: 12 (7% of speed-related KSI crashes).
    - **Bicyclist crashes**:
        - Speed-related: 1 (0% of total crashes).
        - Speed-related KSI: 0 (0% of speed-related KSI crashes).
    - **School zone crashes**:
        - Speed-related: 29 (0.2% of total crashes).
        - Speed-related KSI: 4 (2% of speed-related KSI crashes).
    - **Work zone crashes**:
        - Speed-related: 56 (0.4% of total crashes).
        - Speed-related KSI: 3 (2% of speed-related KSI crashes).
4. **Key Insights**:
    - Speeding plays a significant role in severe crashes, contributing to over one-third of KSI incidents.
    - While most speeding-related crashes result in property damage only (PDO), arterials and collectors have higher rates of severe outcomes compared to local streets.
    - Vulnerable users (pedestrians and bicyclists) are minimally represented in speed-related crashes, but their KSI rates underscore their susceptibility to severe outcomes.
    - School and work zones have a small but notable share of speed-related crashes, highlighting areas for targeted safety improvements.

This data underscores the importance of addressing speeding, particularly on higher-speed roadways and in critical zones, to enhance roadway safety.

Chapter 3: Roadway Typologies – Speed Safety Concerns Specific to Various Types of Roadways

Introduction to Roanoke's Speed Management Typologies

Five typologies are identified in this SMAP to categorize the speed-related safety concerns and identify appropriate countermeasures. They are classified based on posted speed limit, functional classification, and land use (Downtown, Village Center, Local Commercial, Suburban, Traditional, Industrial, Open Space and Recreational, Regional Commercial).

Downtown: (Downtown, Village Center, Local Commercial)

1. Local – 25 MPH
2. Collector & Arterial – 25-35 MPH

Local: (Suburban, Traditional, Industrial, Open Space and Recreational, Regional Commercial)

3. 15-25 MPH

Collector & Arterial: (Suburban, Traditional, Industrial, Open Space and Recreational, Regional Commercial)

4. 25-35 MPH
5. 40 + MPH

The typologies are illustrated below, both graphically and visually, in Figure 2 and Figure 2 below.

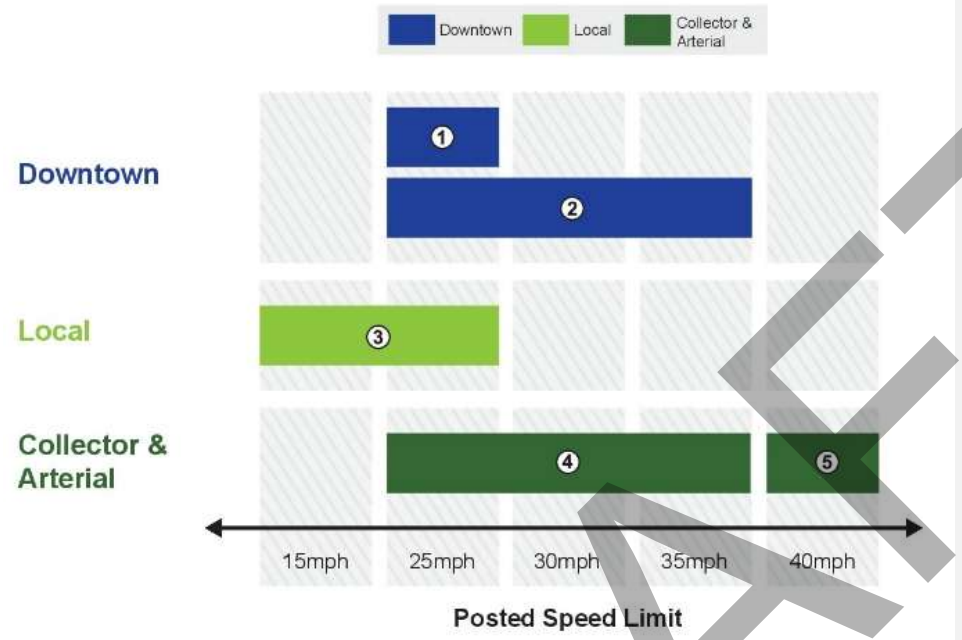


Figure 1. Roadway Typology Classifications – Graph of Land Use vs Posted Speed Limit

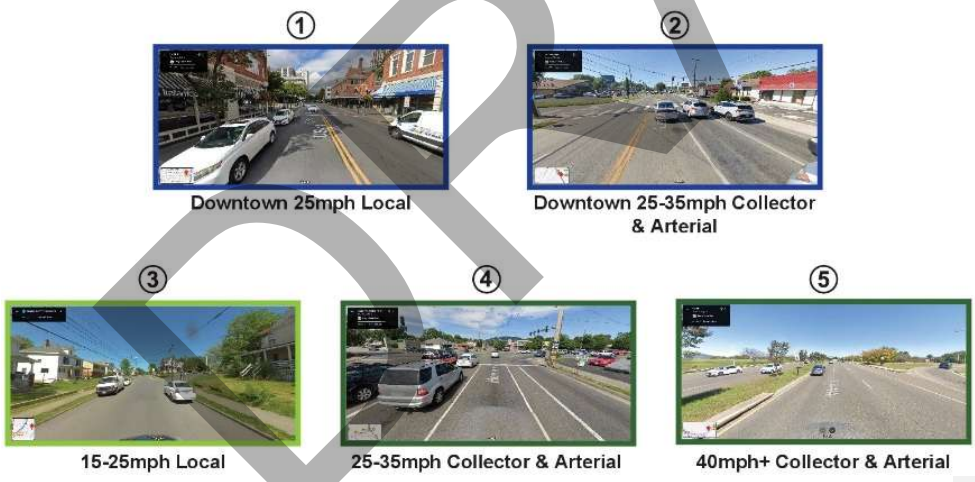


Figure 2. Roadway Typology Classifications – Example Images of Roanoke Roadways for each Typology

The typologies represent all local, collector, and arterial roadways in Roanoke, Virginia. However, those roadway miles are not spread evenly throughout the typology groups. Because of this, the number of

crashes in each typology were normalized by the number of roadway miles of each typology. The percentage of total roadway miles for each typology is indicated under the typology name on the horizontal axis (Figure 3).

The graph below (Figure 3) shows the speeding versus non-speeding related KSI crashes by roadway miles for each typology group. The total number of speeding-related KSI crashes and the percentage of that to the total number of KSI crashes were added for each typology group.

The local, 15-25 mph typology group has the highest number of roadway miles in Roanoke and a high number of total speeding-related KSI crashes, however, it also has the lowest crash per mileage rate. It is important to note that this typology group has significantly more miles than the rest of the typology groups which could account for the small crash per mile rate.

Both collector and arterial, 25-35 typology groups have the largest crash per mile rates and high total number of speeding-related KSI crashes. These typology groups account for the second and third highest number of roadway miles in Roanoke.

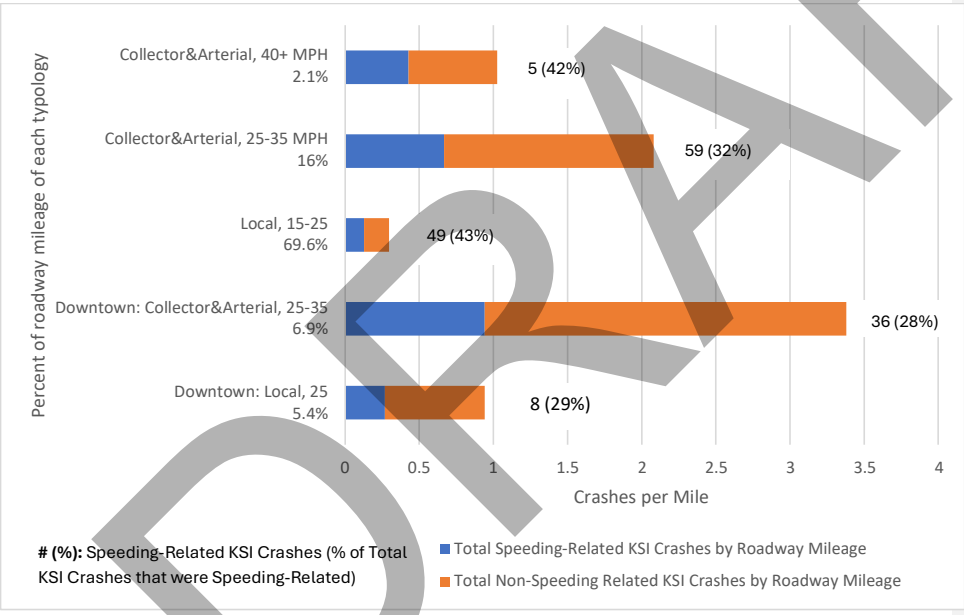


Figure 3 - Speeding-Related and Non-Speeding Related KSI Crashes for each typology group from 2016 to 2023, divided by the roadway mileage for each category.

1) Downtown: Local, 25

This typology includes local roads with a speed limit of 25 mph within downtown areas (Downtown, Village Center, and Local Commercial) pictured to the right in Figure 4. This encompasses many lower speed roads in downtown Roanoke including 1st Street SW, 3rd Street SW, Market Street SE, Luck Avenue SW, and Norfolk Avenue SW. These roadways typically have high levels of pedestrian activity.

Figure 4 - Example of a Downtown: Local, 25 MPH Roadway

Crash Data

The roadways with the highest number of total crashes between 2016 and 2023 (744) were:

- Melrose Avenue NW (103)
- 5th Street SW (42)
- 3rd Street SW (35)

The roadways with the highest number of fatal or severe injury (KSI) crashes (28) were:

- Melrose Avenue NW (7)
- Burrell Street NW (3)

The roadways with the highest number of total speeding-related crashes between 2016 and 2023 (76) were:

- Melrose Avenue NW (10)
- 5th Street SW (5)

The roadways with the highest number of speeding-related KSI crashes (8) were:

- Burrell Street NW (2)
- Melrose Avenue NW (2)

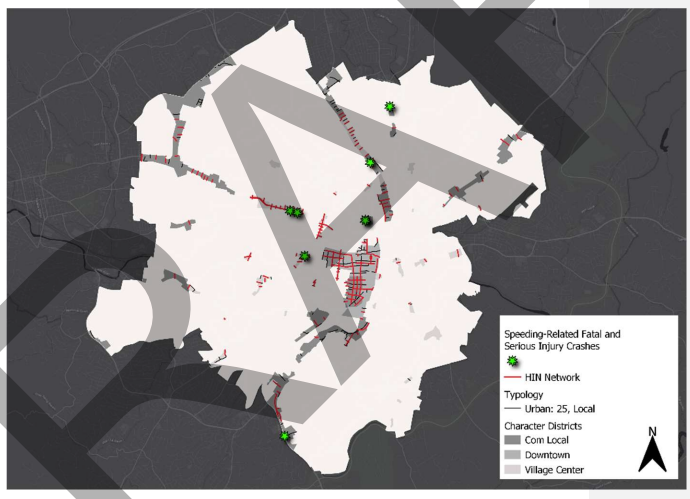


Figure 5 - Downtown: Local, 25 Roadways with the HIN and Speeding-Related KSI Crashes

Of the 8 speeding-related KSI crashes:

- 1 (12%) was fatal and 7 (88%) were severe injury crashes.
- 4 (50%) were angle crashes and 2 (25%) were head on crashes.
- 7 (88%) had no adverse conditions and 1 (12%) was foggy conditions.
- 4 (50%) were during darkness with the road lit and 3 (38%) were during daylight.
- 7 (88%) were during dry conditions and 1 (12%) was during wet conditions.
- 6 (75%) were within an intersection.
- 7 (88%) were on straight-level roadways and 1 (12%) was on a straight-grade roadway.
- 2 (25%) were under the influence of drugs or alcohol.
- 3 (38%) were distracted.

- 1 (12%) involved a pedestrian.

There are a high number of angle (50%) and intersection (75%) speeding-related KSI crashes on this roadway typology. It is recommended that an intersection analysis be performed to evaluate sight distance and traffic control device (TCD) compliance. A speed study should also be performed to determine the appropriate or target speed of the roadways and ensure the posted speed limit aligns.

There were also a number of risky behaviors other than speeding (6 of 8), such as drug/alcohol usage, distracted driving, and unrestrained occupants that were associated with these speeding-related KSI crashes. Targeted education and enforcement campaigns are recommended to reduce risky driving behavior and increase road safety.

Speed Data

The difference between the 85th percentile speed and the speed limit was analyzed across this typology. The roadways with the highest speed differentials were:

- Commonwealth Avenue NE: 13.68 (weekdays) and 13.66 (weekends)
- Melrose Avenue NW: 9.57 (weekdays) and 10.16 (weekends)
- Sanford Avenue SW: 8.83 (weekdays) and 17.18 (weekends)

For the difference between the 85th percentile speed and the average speed, the roadways with the highest differentials were:

- Commonwealth Avenue NE: 9.88 (weekdays) and 9.07 (weekends)
- Luck Avenue SE: 9.58 (weekdays) and 8.47 (weekends)

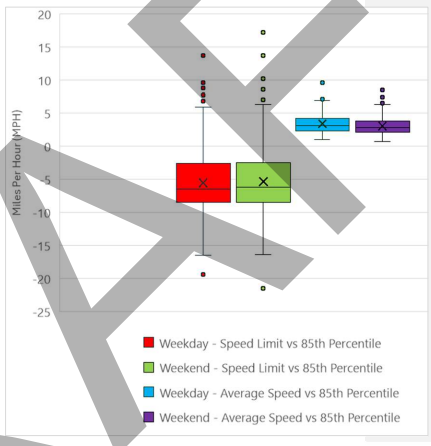


Figure 6 - Downtown: Local, 25 MPH Speed Differential Box Plots

Figure 6 is a box plot that compares speed differentials for this typology group, which included the differential between the 85th percentile speeds and both the posted speed limits and the average speeds.
Speed Limit vs. 85th Percentile: For weekdays (red box), the 85th percentile speeds are mostly below the posted speed limits, resulting in negative differentials. However, there are notable outliers where the 85th percentile speeds exceed the posted limits by more than 10 MPH. A similar trend is observed for weekends (green box), with negative differentials being typical but with some outlier roadways showing significant positive differentials.
Average Speed vs. 85th Percentile: For both weekdays (blue box) and weekends (purple box), the speed differentials between the average and the 85th percentile speeds are only a few miles per hour, but some outlier roadways have differentials of almost 10 MPH, which shows a wide variation in driver speed choice.

The plot highlights variability in speed patterns, with weekdays and weekends showing broadly similar trends but with subtle differences in the range and distribution of differentials. Outliers indicate certain

roadways where speed management may be needed – these roadways were listed at the beginning of this section.

2) Downtown: Collector and Arterial, 25-35

This typology includes collector and arterial roads with a speed limit between 25 and 35 mph within downtown areas (Downtown, Village Center, and Local Commercial) pictured to the right in Figure 7. This encompasses many urban streets in Roanoke including Williamson Road NW, Melrose Avenue NW, and Jefferson Street. These roadways typically have pedestrian infrastructure and fast-moving vehicles.

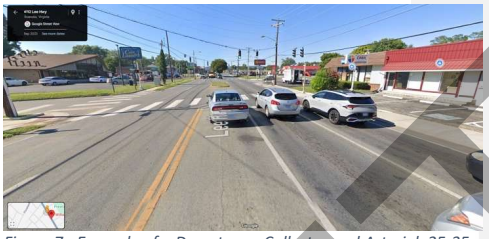


Figure 7 - Example of a Downtown: Collector and Arterial, 25-35 MPH Roadway

Crash Data

The roadways with the highest number of total crashes between 2016 and 2023 (3422) were:

- Williamson Road NW (438)
- Orange Avenue NE (398)
- Orange Avenue NW (263)

The roadways with the highest number of KSI crashes (129) were:

- Orange Avenue NE (17)
- Williamson Road NW (17)
- Orange Avenue NW (16)

The roadways with the highest number of total speeding-related crashes between 2016 and 2023 (356) were:

- Williamson Road NW (46)
- Orange Avenue NE (31)
- Melrose Avenue NW (30)

The roadways with the highest number of speeding-related KSI crashes (36) were:

- Williamson Road NW (9)
- Orange Avenue NE (7)
- Melrose Avenue NW (6)

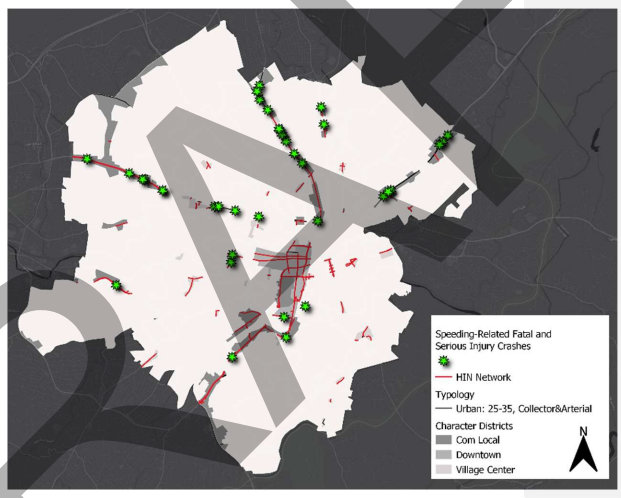


Figure 8 - Downtown: Collector and Arterial, 25-35 MPH Roadways with the HIN and Speeding-Related KSI Crashes

Of the 36 speeding-related KSI crashes:

- 9 (25%) were fatal and 27 (75%) were severe injury crashes.
- 15 (42%) were fixed objects off the road crashes and 8 (22%) were rear end crashes.
- 34 (94%) had no adverse conditions and 2 (6%) were rain conditions.
- 20 (56%) were during darkness with the road lit and 13 (36%) were during daylight.
- 34 (94%) were during dry conditions and 2 (6%) were during wet conditions.
- 17 (47%) were not within an intersection and 11 (31%) were within an intersection.
- 33 (92%) were on straight-level roadways and 2 (1%) were on a straight-grade roadway.
- 11 (31%) were under the influence of drugs or alcohol.

- 13 (36%) were distracted.
- 4 (11%) involved a pedestrian

There are a high number of fixed object off the road crashes (42%) and crashes during night with the roadway lit (56%). It is recommended that a speed study and TCD evaluation be performed to adjust speed limits based on roadway conditions and ensure the current TCDs are effective in increasing roadway safety. Additional TCDs may need to be considered and implemented to reduce operating speeds and increase compliance. It is recommended that roadway lighting also be evaluated to ensure visibility during nighttime conditions.

There were also a number of risky behaviors other than speeding (25 of 36), such as drug/alcohol usage, distracted driving, and unrestrained occupants that were associated with these speeding-related KSI crashes. Targeted education and enforcement campaigns are also recommended to reduce risky driving behavior and increase road safety.

Of the 36 speeding-related KSI crashes, 4 (11%) involved a pedestrian. It is recommended that existing pedestrian infrastructure be evaluated to ensure adequate sight distance and safety of pedestrian and additional infrastructure or countermeasures be implemented if deemed necessary.

Speed Data

The difference between the 85th percentile speed and the speed limit was analyzed across this typology. The roadways with the highest differentials were:

- Franklin Road SW: 11.90 (weekdays) and 12.76 (weekends)
- Liberty Road NW: 11.73 (weekdays) and 12.00 (weekends)
- Williamson Road NE: 11.19 (weekdays) and 12.27 (weekends)

For the difference between the 85th percentile speed and the average speed, the roadways with the highest differentials were:

- Gus Nicks Boulevard NE: 9.86 (weekdays) and 9.43 (weekends)
- Electric Road SW: 9.09 (weekdays) and 9.12 (weekends)
- Old Vinton Road SE: 8.64 (weekdays) and 8.42 (weekends)

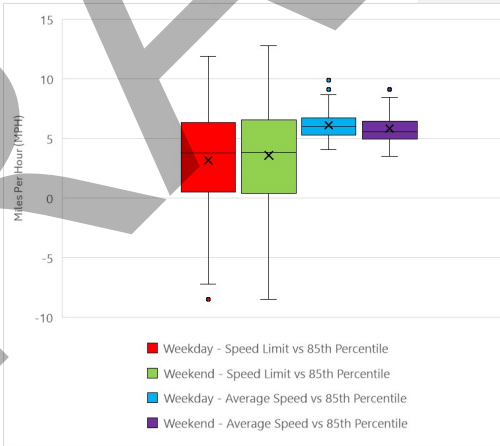


Figure 9 - Downtown: Collector and Arterial, 25-35 MPH Speed Differential Box Plots

Figure 9 is a box plot that compares speed differentials for this typology group, which included the differential between the 85th percentile speeds and both the posted speed limits and the average speeds.

Speed Limit vs. 85th Percentile: For weekdays (red box), the 85th percentile speeds are mostly above the posted speed limits by a few miles per hour. There are notable outliers where the 85th percentile speeds exceed the posted limits by more than 10 MPH. A similar trend is observed for weekends (green box), with some negative differentials but with most roadways showing significant positive differentials.
Average Speed vs. 85th Percentile: For both weekdays (blue box) and weekends (purple box), the speed differentials between the average and the 85th percentile speeds are only a few miles per hour, but some outlier roadways have differentials of almost 10 MPH, which shows a wide variation in driver speed choice.

The plot highlights variability in speed patterns, with weekdays and weekends showing broadly similar trends but with subtle differences in the range and distribution of differentials. Outliers indicate certain roadways where speed management may be needed – these roadways were listed at the beginning of this section.

3) Local, 15-25

This typology includes local roads with speed limits of 25 mph or less in residential areas (Suburban, Traditional, Regional Commercial, Open Space/Recreational, and Industrial) pictured to the right in Figure 10. This encompasses low speed roads in Roanoke including Main Street SW, Staunton Avenue NW, and Loudon Avenue NW. These roadways typically have some pedestrian activity and low-speed vehicles in residential areas.

Figure 10 - Example of a Local, 15-25 MPH Roadway

Crash Data

The roadways with the highest number of total crashes between 2016 and 2023 (2797) were:

- Loudon Avenue NW (63)
- Main Street SW (45)
- Staunton Avenue NW (43)

The roadways with the highest number of KSI crashes (114) were:

- Hanover Avenue NW (3)
- Highland Farm Road NW (3)
- Loudon Avenue NW (3)
- Melrose Avenue NW (3)
- Staunton Avenue NW (3)
- Westside Boulevard NW (3)

The roadways with the highest number of total speeding-related crashes between 2016 and 2023 (541) were:

- Staunton Avenue NW (16)
- Loudon Avenue NW (12)
- Westside Boulevard NW (11)

The roadways with the highest number of speeding-related KSI crashes (49) were:

- 13th Street NE (2)
- Albemarle Avenue SE (2)
- Highland Farm Road NW (2)
- Loudon Avenue NW (2)
- Melrose Avenue NW (2)
- Staunton Avenue NW (2)
- Westside Boulevard NW (2)

Of the 49 speeding-related KSI crashes:

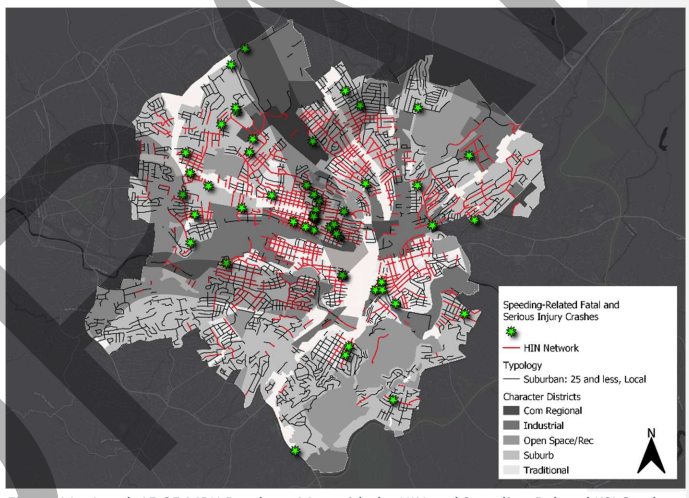


Figure 11 – Local, 15-25 MPH Roadway Map with the HIN and Speeding-Related KSI Crashes

- 7 (14%) were fatal and 42 (86%) were severe injury crashes.
- 15 (31%) were fixed object off the road crashes and 14 (29%) were angle crashes.
- 45 (92%) had no adverse conditions and 2 (4%) were rainy conditions.
- 30 (61%) were during daylight and 13 (27%) were during darkness with the road lit.
- 45 (92%) were during dry conditions, 2 (4%) were during wet conditions, and 2 (4%) were during icy conditions.
- 17 (35%) were within an intersection and 14 (29%) were not within an intersection.
- 29 (59%) were on straight-level roadways and 11 (22%) were on a curve-level roadway.
- 16 (33%) were under the influence of drugs or alcohol.
- 13 (27%) were distracted.
- 3 (6%) involved a pedestrian.

There are a high number of fixed object off the road crashes (31%) and angle crashes (29%). It is recommended that a speed study and TCD evaluation be performed to adjust speed limits based on roadway conditions and ensure the current TCDs are effective in increasing roadway safety. Additional TCDs may need to be considered and implemented to reduce operating speeds and increase compliance. It is recommended that roadway lighting also be evaluated to ensure visibility during nighttime conditions. It is also recommended that an intersection analysis be performed since 17 of the 49 (35%) crashes were within an intersection. The analysis should evaluate existing TCDs, sight distance, and lighting since 13 of the 49 (27%) of the crashes were during night when the road was lit.

Of the 49 speeding-related KSI crashes, 14 (29%) occurred on a curved roadway. Because of this, it is recommended that a curve declination study be performed to evaluate the existing TCDs and posted speed limit to identify if additional TCD should be implemented or an advisory speed limit should be posted.

There were also a number of risky behaviors other than speeding (32 of 49), such as drug/alcohol usage, distracted driving, and unrestrained occupants that were associated with these speeding-related KSI crashes. Targeted education and enforcement campaigns are also recommended to reduce risky driving behavior and increase road safety.

Speed Data

The difference between the 85th percentile speed and the speed limit was analyzed across this typology. The roadways with the highest differentials were:

- Walker Avenue NE: 40.22 (weekdays) and 40.67 (weekends)
- Hunting Hills Drive SW: 27.75 (weekdays) and 29.29 (weekends)

- Frontage Road NW: 19.18 (weekdays) and 19.93 (weekends)

For the difference between the 85th percentile speed and the average speed, the roadways with the highest differentials were:

- Hunting Hills Drive SW: 7.75 (weekdays) and 6.74 (weekends)
- Berkley Road NE: 6.70 (weekdays) and 6.35 (weekends)
- Levelton Avenue NW: 6.39 (weekdays) and 6.61 (weekends)

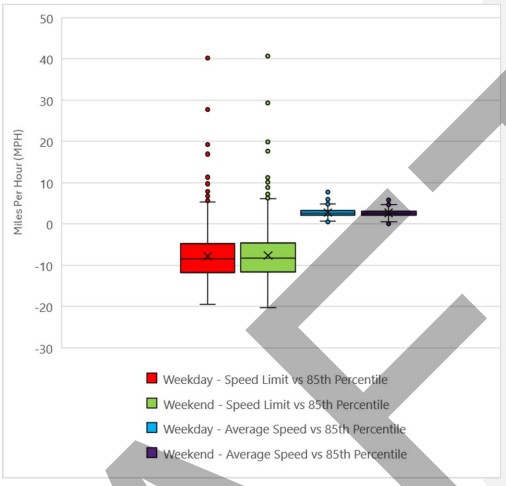


Figure 12 - Local, 15-25 MPH Roadway Speed Differential Box Plots

Figure 12 shows a box plot illustrating the speed differentials within this typology group, which included the differential between the 85th percentile speeds and both the posted speed limits and the average speeds.

Speed Limit vs. 85th Percentile: For weekdays (red box), the 85th percentile speeds are generally below the posted speed limits by a few miles per hour. There are notable outliers where the 85th percentile speeds exceed the posted limits by as much as 40 MPH. A similar trend is observed for weekends (green box), with some negative differentials but with most roadways showing negative differentials.

Average Speed vs. 85th Percentile: For both weekdays (blue box) and weekends (purple box), the speed differentials between the average and the 85th percentile speeds are only a few miles per hour, but some outlier roadways have differentials of 6-7 MPH, which shows a variation in driver speed choice.

The plot highlights variability in speed patterns, with weekdays and weekends showing broadly similar trends but with subtle differences in the range and distribution of differentials. Outliers indicate certain roadways where speed management may be needed – these roadways were listed at the beginning of this section.

4) Collector and Arterial, 25-35

This typology includes collector and arterial roadways with speed limits between 25 mph and 35 mph in residential areas (Suburban, Traditional, Regional Commercial, Open Space/Recreational, and Industrial) pictured to the right in Figure 13. This typology group also includes a local road with a speed limit between 30 and 35 MPH. Although this roadway did not fully align with any of the categories, it was included in this group due to its shared cha racteristics and overall similarity. This encompasses moderate speed roads in Roanoke including Orange Avenue NE, Hershberger Road NW, and Brandon Avenue SW. These roadways typically have low pedestrian presence and are the main connectors between neighborhoods.

Figure 13 - Example of a Collector and Arterial, 25-35 MPH Roadway

Crash Data

The roadways with the highest number of total crashes between 2016 and 2023 (3764) were:

- Orange Avenue NE (464)
- Hershberger Road NW (451)

The roadways with the highest number of KSI crashes (184) were:

- Hershberger Road NW (23)
- Orange Avenue NE (20)
- Brandon Avenue SW (11)

The roadways with the highest number of total speeding-related crashes between 2016 and 2023 (544) were:

- Hershberger Road NW (58)
- Orange Avenue NE (36)
- 10th Street NW (34)

The roadways with the highest number of speeding-related KSI crashes (59) were:

- Hershberger Road NW (6)
- 10th Street NW (4)
- Orange Avenue NE (4)

Figure 14 -Collector and Arterial, 25-35 MPH Roadway Map with the HIN and Speeding-Related KSI Crashes

Of the 59 speeding-related KSI crashes:

- 8 (14%) were fatal and 51 (86%) were severe injury crashes.
- 22 (37%) were fixed object off the road crashes and 16 (27%) were angle crashes.

- 52 (88%) had no adverse conditions and 6 (10%) were rainy conditions.
- 31 (53%) were during daylight and 18 (31%) were during darkness with the road lit.
- 51 (86%) were during dry conditions and 6 (10%) were during wet conditions.
- 22 (37%) were within an intersection and 19 (32%) were not within an intersection.
- 38 (64%) were on straight-level roadways and 12 (20%) were on a curve-level roadway.
- 9 (15%) were under the influence of drugs or alcohol.
- 15 (25%) were distracted.
- 4 (7%) involved a pedestrian.

There are a high number of fixed object off the road crashes (37%) and angle crashes (27%). It is recommended that a speed study and TCD evaluation be performed to adjust speed limits based on roadway conditions and ensure the current TCDs are effective in increasing roadway safety. Additional TCDs may need to be considered and implemented to reduce operating speeds and increase compliance. It is recommended that roadway lighting also be evaluated to ensure visibility during nighttime conditions. It is also recommended that an intersection analysis be performed since 22 of the 59 (37%) crashes were within an intersection. The analysis should evaluate existing TCDs, sight distance, and lighting since 18 of the 59 (31%) of the crashes were during night when the road was lit.

Of the 59 speeding-related KSI crashes, 12 (20%) occurred on a curved roadway. Because of this, it is recommended that a curve declination study be performed to evaluate the existing TCDs and posted speed limit to identify if additional TCD should be implemented or an advisory speed limit should be posted.

There were also a number of risky behaviors other than speeding (33 of 59), such as drug/alcohol usage, distracted driving, and unrestrained occupants that were associated with these speeding-related KSI crashes. Targeted education and enforcement campaigns are also recommended to reduce risky driving behavior and increase road safety.

Speed Data

The difference between the 85th percentile speed and the speed limit was analyzed across this typology. The roadways with the highest differentials were:

- Welcome Valley Road SW: 14.83 (weekdays) and 15.04 (weekends)
- Ramp to Hershberger W: 13.84 (weekdays) and 13.60 (weekends)
- Mt Pleasant Boulevard SE: 13.42 (weekdays) and 13.86 (weekends)

For the difference between the 85th percentile speed and the average speed, the roadways with the highest differentials were:

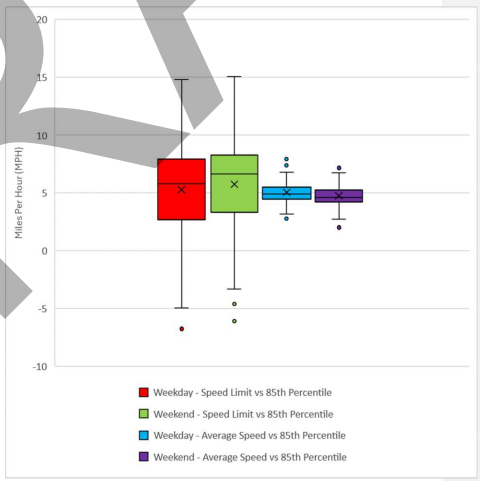


Figure 15 -Collector and Arterial, 25-35 MPH Roadway Speed Differential Box Plots

- Orange Avenue NE: 7.94 (weekdays) and 7.17 (weekends)
- 24th Street NW: 7.60 (weekdays) and 7.17 (weekends)
- 5th Street NW: 7.54 (weekdays) and 6.44 (weekends)
- Hershberger Road NW: 7.43 (weekdays) and 7.39 (weekends)

Figure 15 shows a box plot illustrating the speed differentials within this typology group, which included the differential between the 85th percentile speeds and both the posted speed limits and the average speeds.
Speed Limit vs. 85th Percentile: For weekdays (red box), the 85th percentile speeds are on average more than 5 MPH above the posted speed limits. A similar trend is observed for weekends (green box), with some negative differentials but with most roadways showing positive differentials.
Average Speed vs. 85th Percentile: For both weekdays (blue box) and weekends (purple box), the speed differentials between the average and the 85th percentile speeds are around 5 MPH, but some outlier roadways have differentials of 6-7 MPH, which shows a variation in driver speed choice.

The plot highlights variability in speed patterns, with weekdays and weekends showing broadly similar trends but with subtle differences in the range and distribution of differentials. Outliers indicate certain roadways where speed management may be needed – these roadways were listed at the beginning of this section.

5) Collector and Arterial, 40+

This typology includes collector and arterial roadways with speed limits 40 mph and above in residential areas (Suburban, Traditional, Local Commercial, Regional Commercial, Open Space/Recreational, and Industrial) pictured to the right in Figure 16. In Roanoke, this typo logy is limited to Peters Creek Road NW and SW. These roadways typically have low pedestrian activity and a high volume of vehicles traveling at high speeds.

Figure 16 - Example of a Collector and Arterial, 40 MPH+ Roadway

Crash Data

Total crashes from 2016 and 2023 (377):

- Peters Creek Road NW (359)
- Peters Creek Road SW (18)

Of the 12 KSI crashes, 11 were on Peters Creek Road NW, which had 35 speeding related crashes, 4 of which were KSI.

Of the 5 speeding-related KSI crashes:

- 0 (0%) were fatal and 5 (100%) were severe injury crashes.
- 4 (80%) were fixed object off the road crashes and 1 (20%) was angle crash.
- 5 (100%) had no adverse conditions.
- 2 (40%) were during darkness with the road lit, 2 (40%) were during daylight, and 1 (20%) was during darkness with the road unlit.
- 5 (100%) were during dry conditions.
- 2 (40%) were on a main-line roadway and 2 (40%) were within an intersection.
- 5 (100%) were on straight-level roadways.
- 4 (80%) were under the influence of drugs or alcohol.
- 0 (0%) were distracted.
- 0 (0%) involved a pedestrian.

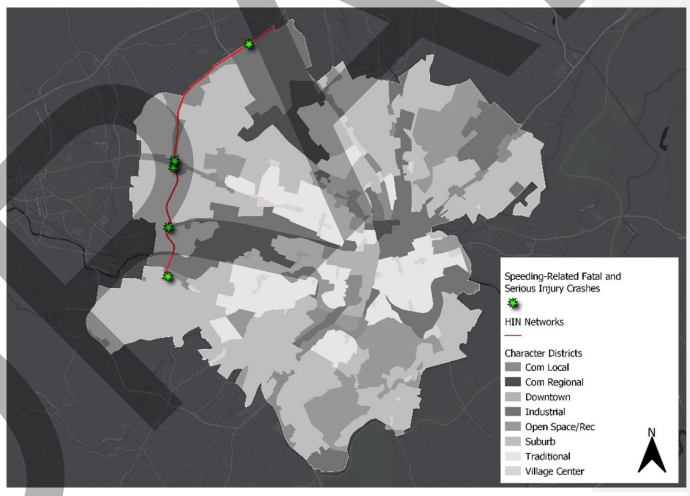


Figure 17 - Map of Collector and Arterial, 40 MPH+ Roadways with the HIN Network and Speeding-Related KSI Crashes

Of the five speeding-related KSI crashes, four (80%) were fixed object off the road collisions and one (20%) was an angle crash. It is recommended that a speed study be performed and the existing TCDs be evaluated for effectiveness. Additional TCDs should be implemented if there is little compliance with the posted speed limit. The speed limit should also be evaluated to ensure it is appropriate for the roadway environment and all road users.

Of the five speeding-related KSI crashes, three (60%) were during night, two were with the road lit and one was with the road unlit. It is recommended that roadway lighting also be evaluated to ensure visibility during nighttime conditions.

There were also risky behaviors other than speeding (4 of 5), such as drug/alcohol usage and unrestrained occupants, that were associated with these speeding-related KSI crashes. Targeted education and enforcement campaigns are also recommended to reduce risky driving behavior and increase road safety.

Speed Data

The difference between the 85th percentile speed and the speed limit was analyzed across this typology. The roadways with the highest differentials were:

- Peters Creek Road NW: 0.39 (weekdays) and 1.47 (weekends)
- Peters Creek Road SW: -0.43 (weekdays) and 0.80 (weekends)

For the difference between the 85th percentile speed and the average speed, the roadways with the highest differentials were:

- Peters Creek Road SW: 6.94 (weekdays) and 6.76 (weekends)
- Peters Creek Road NW: 6.29 (weekdays) and 6.18 (weekends)

Since there are only two roadways in this typology group, no box plot was created.

Chapter 4: Countermeasure Toolbox

This section contains a toolbox of countermeasures matched to the various roadway types in the previous section.

Note: ✓ Countermeasure is applicable for this location/speed-safety concern; ● Countermeasure is sometimes applicable and should be considered on a case-by-case basis

Strategy	Countermeasure	Roadway Typologies					
		1	2	3	4	5	Cost
Alert Driver to Condition Requiring Reduced Speed	Advance Curve Warning Signs/Advisory Speeds	●	●	●	✓	✓	Low
	Signal Backplates with Retroreflective Borders	✓	✓	✓	✓	✓	Low
	Bicycle Lane/Bicycle Pavement Markings	✓	✓	✓	✓	●	Low
	Crosswalk Enhancement Break Out into Individual Items	✓	✓	✓	✓	✓	Low-Medium
	Retroreflectivity Strips on Posts	✓	✓	✓	✓	✓	Low
	Flashing LED Sign Border – Curve Warnings		●		●	✓	Moderate
	Gateway Treatment - Landscaping	●	●	●	●	●	Vary Widely
	Gateway Treatment - Signing	●	●	●	●	●	Vary Widely
	In-Street Pedestrian Crossing Sign	✓	✓	✓	●	●	Low (<$500 each)
	Speed Activated Feedback Sign	✓	✓	✓	✓	●	$5 per lf + $300 per bike emblem
	Streetprint Crosswalks	✓	●	✓	●		Low
	Pedestrian Hybrid Beacons		●		●	✓	$21,000-$57,680 (Avg $57,680)
	Rectangular Rapid Flashing Beacons	✓	✓	✓	✓	●	$4,500-$52,000
	Transverse rumble strips					✓	Low-Medium
	Vertical Delineators	●	●	●	●	●	Low
Create Driver Discomfort Above Target Speed	Offset Speed Table	✓	●	✓	●		Medium
	Speed Cushion	✓	●	✓	●		Low
	Speed Table/Raised Crosswalk	✓	●	✓	●		Medium
	Intersection/Median Barrier (Arterial Only)		●		●	●	$1,500-$20,000
	Mini roundabout	✓	●	✓	●		High, up to $250,000
	Raised Intersection	✓	●	✓	●		High, $15,000-$60,000
	Raised Median Island	✓	✓	✓	✓	✓	Medium, $1,500-$10,000
	Realigned Intersections	✓	●	✓	●		$15,000-$60,000

	Roundabout		●		●	✓	High
	Tighten Corner Radius at Intersections (Tee-up Intersection/Angle of Intersection)	✓	✓	✓	✓	✓	Low
Safer Speed Limits	Appropriate Speed Limits for all Road Users	✓	✓	✓	✓	✓	Low
Self-Enforcing Roadway Element	Chicanes	✓	●	✓	●		$8,000 to $25,000 (ITE in 2017 dollars)
	Corner Extensions/Bulb-outs	✓	✓	✓	✓	✓	$7,000-$10,000
	Neckdowns/Choker	✓	✓	✓	✓	✓	$4,000
	Lateral Shift	✓	✓	✓	✓	●	$8,000-$25,000
	Reduce Width of Travel Lane	✓	✓	✓	✓	✓	Low
	Lane Reconfiguration	✓	✓	✓	✓	✓	Low-Medium
Enforcement	Signs: Notification of additional fines for Speeding	✓	✓	✓	✓	✓	Low
	Speed Activated Warning Sign					●	Moderate
	Speed Feedback Signs/Radar Trailer	✓	✓	✓	✓	✓	$5,000-$12,000
	Right-in, Right-out	●	●	●	●	●	$3,500-$7,500
	Street Trees and Landscaping	✓	✓	✓	✓	✓	Medium-High

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Funding

Below are potential funding sources for the proposed safety projects identified in this plan.

6) Virginia Highway Safety Improvement Program (VHSIP)[19]: Administered by the Virginia Department of Transportation (VDOT), VHSIP provides federal and state funds for projects aimed at reducing traffic fatalities and serious injuries. Eligible projects include infrastructure improvements, traffic calming measures, and pedestrian safety enhancements.
7) Safe Streets and Roads for All (SS4A) Grant Program[20]: Established under the Bipartisan Infrastructure Law, SS4A offers $5 billion over five years to support local initiatives that prevent roadway deaths and serious injuries. Roanoke can apply for these grants to fund comprehensive safety action plans and implement safety improvements.
8) Highway Safety Grants Program by NHTSA[21]: The National Highway Traffic Safety Administration provides grants to states for effective highway safety programs. These funds can support various initiatives, including speed management, impaired driving prevention, and pedestrian safety projects.
9) VDOT's SMART SCALE Program[22]: This program allocates state funding for transportation projects based on factors like safety, congestion reduction, and accessibility. Roanoke can submit projects for consideration to receive funding for roadway safety improvements.
10) Local Funding and Partnerships: Roanoke can leverage local funds, including municipal budgets and bonds, to finance safety projects. Collaborations with regional planning organizations, non-profits, and

[19] https://www.vdot.virginia.gov/doing-business/technical-guidance-and-support/traffic-operations/vhsip/
[20] https://www.vaco.org/county-connections/safe-streets-and-roads-for-all-grant-program-available-now/
[21] https://www.nhtsa.gov/highway-safety-grants-program
[22] https://www.roanokecountyva.gov/3029/Carson-Road-Safety-Improvements-Study

private sector partners can also provide additional resources and support for implementing safety countermeasures.

11) Coordinate with Roadway Maintenance Projects: Integrating roadway safety countermeasures into routine maintenance projects is an efficient and cost-effective strategy. By aligning new safety installations with scheduled maintenance—such as re-striping, updating signage, or resurfacing—Roanoke can reduce implementation costs and streamline improvements. Instead of initiating standalone projects, which may require additional planning and funding, safety measures like enhanced pavement markings, speed reduction treatments, or pedestrian crossings can be incorporated when lines are repainted or signs are replaced. This approach maximizes resource use and ensures that safety upgrades are implemented more swiftly across the city, contributing to the overall goal of reducing traffic incidents and enhancing road safety.

By utilizing these funding avenues, Roanoke can effectively implement roadway safety countermeasures to enhance the well-being of all road users.

Chapter 5: Summary of Key Speed-Related Safety Concerns by Typology

The last chapter defined each of the typologies and went into detail on what the specific crash and speed related data showed. This chapter is a summary of that information with specific recommendations based on the identified speed related safety concerns.

1) Downtown: Local, 25 MPH

Summary of Speed Related Safety Concerns:

- High pedestrian activity, especially in intersections.
- Frequent angle and intersection-related crashes (75% within intersections).
- Notable risky behaviors: drug/alcohol use and distraction.
- Speed differential outliers exceed posted limits by significant margins.

Corridors within Typology with the most Speeding-Related KSI Crashes or Highest Speed Differentials

- **Melrose Avenue NW (from Forest Park Blvd NW to 16th St NW – 1.5 miles):**
  - **2 Speeding-Related KSI Crashes**
  - **Speed Limit vs 85th Percentile Speed: 9.57 MPH (weekdays) and 10.16 MPH (weekends)**
- Burrell Street NW (from Douglass Ave NW to Orange Ave NW – 0.075 miles)
  - 2 Speeding-Related KSI Crashes
- Commonwealth Avenue NE (from Wells Ave to Dead End – 0.129 miles):
  - Speed Limit vs 85th Percentile Speed: 13.68 (weekdays) and 13.66 (weekends)
  - Average Speed vs 85th Percentile Speed: 9.88 (weekdays) and 9.07 (weekends)
- Sanford Avenue SW (from Broadway Ave to Dead End – 0.147 miles):
  - Speed Limit vs 85th Percentile Speed: 8.83 (weekdays) and 17.18 (weekends)
- Luck Avenue SE (from Jefferson St SE to Church Ave SE – 0.081 miles):
  - Average Speed vs 85th Percentile Speed: 9.58 (weekdays) and 8.47 (weekends)

Downtown: Local, 25 MPH Roadway Countermeasure Recommendations

Countermeasures from Chapter 4 for this typology are listed below by the identified speed-related safety concerns they address:

High pedestrian activity, especially in intersections:

- Crosswalk Enhancements
  - Includes raised crosswalks, high-visibility markings, and signalized pedestrian crossings to improve visibility and safety.
- In-Street Pedestrian Crossing Signs
  - Draw driver attention to pedestrian crossings in high-activity areas.
- Corner Extensions/Bulb-Outs
  - Shorten crossing distances for pedestrians and improve their visibility to drivers.
- Rectangular Rapid Flashing Beacons (RRFBs)
  - Add visibility to pedestrian crossings in areas with moderate pedestrian activity and speeding concerns.

Frequent angle and intersection-related crashes (75% within intersections):

- Raised Intersections

    - Slow vehicles at intersections and improve pedestrian safety.
- Tighten Corner Radii
    - Reduces vehicle speeds during turns and improves pedestrian safety.
- Mini Roundabouts
    - Replace traditional intersections to reduce conflict points and angle crashes.
- Appropriate Traffic Control Devices (TCDs)
    - Improve visibility and compliance at intersections with updated signage and signals.
- Lane Reconfiguration
    - Adjust lane widths and alignments to manage speeds and improve turning movements.
- Signal Backplates with Retroreflective Borders
    - Increase signal visibility to drivers, especially in high-conflict areas.

Notable risky behaviors: drug/alcohol use and distraction:

- Speed Feedback Signs/Radar Trailers
    - Alert distracted or impaired drivers to their speed and encourage compliance.
- Targeted Education and Enforcement Campaigns
    - Focus on reducing risky behaviors, including impaired and distracted driving, through public education.
- Gateway Treatments (Signing and Landscaping)
    - Indicate entry into high-risk zones and encourage drivers to reduce speeds and increase focus.
- High-Visibility Enforcement (HVE)
    - Combine targeted campaigns with visible law enforcement presence.

Speed differential outliers exceed posted limits by significant margins:

- Chicanes and Lateral Shifts
    - Force vehicles to maneuver and slow down, reducing excessive speed.
- Lane Reconfiguration (Road Diets)
    - Narrow or reduce lanes to calm traffic and discourage speeding.
- Vertical Speed Control Elements (Speed Tables and Cushions)
    - Physically reduce speeds, especially in urban and transitional areas.
- Appropriate Speed Limits for All Road Users
    - Reevaluate speed limits to ensure they align with the roadway context and user needs.

2) Downtown: Collector & Arterial, 25-35 MPH

Summary of Speed-Related Safety Concerns

- High pedestrian activity combined with fast-moving vehicles.
- High volume of fixed-object off-road crashes (42%) and nighttime incidents (56% during darkness).
- Risky behaviors: drug/alcohol use (31%) and distraction (36%).

- Speeding contributes significantly to crashes, with frequent non-compliance of speed limits.

Corridors Within Typology with the Most Speeding-Related KSI Crashes or Highest Speed Differentials

- **Williamson Road NW (from Hildebrand Rd NW to Liberty Rd NE – 1.76 miles):**
  - 9 Speeding-Related KSI Crashes.
- **Orange Avenue NE (from 20th St NE to Granby St Ne & from Seibel Dr NE to End – 3.422 miles)**
  - 7 Speeding-Related KSI Crashes.
  - Speed Limit vs 85th Percentile Speed: 7.94 MPH (weekdays)
- Melrose Avenue NW (from 31st St NW to Ward St NW – 3.85 miles)
  - 6 Speeding-Related KSI Crashes.
- Franklin Road SW (from Frontage Rd SW to Avenham Ave SW & from Beechwood Dr SW to McClanahan St SW & from King George Ave SW to Jefferson St SE – 4.36 miles)
  - Speed Limit vs 85th Percentile Speed: 11.90 MPH (weekdays) and 12.76 (weekends).
- Liberty Road NW (from Forest Hill Ave NE to near Lukens St NE – 0.216 miles)
  - Speed Limit vs 85th Percentile Speed: 11.73 MPH (weekdays) and 12.00 (weekends).

Recommendations

Countermeasures from Chapter 4 are listed below by the identified speed-related safety concerns they address:

High pedestrian activity, especially in intersections:

- Crosswalk Enhancements (high-visibility markings).
- In-Street Pedestrian Crossing Signs for driver awareness.
- Corner Extensions/Bulb-Outs to shorten crossing distances.
- Rectangular Rapid Flashing Beacons (RRFBs) to improve visibility and controlled crossings.

Fixed-object and nighttime crashes:

- Appropriate Traffic Control Devices (TCDs) to improve compliance.
- Lane Reconfiguration to manage speeds and optimize turning movements.
- Evaluate and enhance roadway lighting to ensure visibility at night.

Risky behaviors:

- Speed Feedback Signs/Radar Trailers to alert and educate drivers.
- Targeted Education and Enforcement Campaigns focusing on drug/alcohol use and distraction.
- High-Visibility Enforcement (HVE) for deterrence.

Speed differential outliers:

- Speed Feedback Signs
- Lateral Shifts to reduce excessive speeds.
- Lane Reconfiguration (Road Diets) to narrow lanes and discourage speeding.

3) Local, 15-25 MPH

Summary of Speed-Related Safety Concerns

- High number of fixed-object (31%) and angle crashes (29%).
- Significant intersection-related crashes (35%) and nighttime crashes (27%).
- Risky behaviors: drug/alcohol use (33%) and distraction (27%).

Corridors Within Typology with the Most Speeding-Related KSI Crashes or Highest Speed Differentials

- Staunton Avenue NW (from Crescent St NW to near 8th St NW – 1.74 miles)
  - 2 Speeding-Related KSI Crashes.
- Walker Avenue NE (from 2nd St to Dead End – 0.059 miles)
  - Speed Limit vs 85th Percentile Speed: 40.22 MPH (weekdays) and 40.67 (weekends).

Recommendations

Intersection and nighttime crashes:

- Raised Intersections.
- Intersection Analysis to improve TCDs and sight distances.
- Enhance roadway lighting.

Risky behaviors:

- Speed Feedback Signs.
- Targeted Education Campaigns for drug/alcohol use and distraction.

Speed differential outliers:

- Chicanes and Lateral Shifts.
- Curve Delineation Studies for advisory speed limits on curves.

4) Collector & Arterial, 25-35 MPH

Summary of Speed-Related Safety Concerns

- High fixed-object crashes (37%) and intersection-related crashes (37%).
- Risky behaviors: drug/alcohol use (15%) and distraction (25%).
- Speed differentials exceeding posted limits.

Corridors Within Typology with the Most Speeding-Related KSI Crashes or Highest Speed Differentials

- Hershberger Road NW (from Peters Creek Rd NW to Florist Rd NW – 5.56 miles)
  - 6 Speeding-Related KSI Crashes.
  - Average Speed vs 85th Percentile Speed: 7.43 MPH (weekdays) and 7.39 (weekends).
- Orange Avenue NE (from Gainsboro Rd NW to 20th St NE & from Granby St NE to Blue Hills Village Dr NE – 3.48 miles)
  - 4 Speeding-Related KSI Crashes.
  - Average Speed vs 85th Percentile Speed: 7.94 MPH (weekdays) and 7.17 (weekends).

Recommendations

Fixed-object and intersection crashes:

- Evaluate TCDs and implement updates.
- Curve Delineation Studies for advisory speed limits.
- On a case-by-case basis: Mini Roundabouts or Raised Intersections.
- Ensure unobstructed views around curves by trimming overgrown vegetation

Risky behaviors:

- Speed Feedback Signs.
- Gateway Treatments and Education Campaigns.

Speed differential outliers:

- Lane Reconfiguration and Road Diets.
- On a case-by-case basis: Vertical Speed Control Elements.

5) Collector & Arterial, 40+ MPH

Summary of Speed-Related Safety Concerns

- High speeds with limited pedestrian involvement but significant off-road crashes (80%).
- Frequent crashes during nighttime conditions (60%) with inadequate lighting.
- Speeding-related risky behaviors: drug/alcohol use (80%).

Corridors Within Typology with the Most Speeding-Related KSI Crashes or Highest Speed Differentials

- **Peters Creek Road NW (from Wood Haven Rd NW to near Thirlane Rd NW & from Melrose Ave NW to Aerial Way Dr SW – 5.69 miles)**
    - 4 Speeding-Related KSI Crashes.

Recommendations

Fixed-object and nighttime crashes:

- Evaluate and enhance roadway lighting, especially in unlit sections.
- Speed Feedback Signs for immediate driver feedback.

Speeding-related risky behaviors:

- Targeted Education Campaigns addressing impaired driving.
- High-Visibility Enforcement (HVE).
- Adjust TCDs for better compliance with speed limits.

Speed differential outliers:

- Evaluate speed limits to align with the roadway environment.

Each typology's safety concerns point to the need for a mix of enforcement, engineering improvements, and education initiatives tailored to roadway characteristics and user behavior.

Chapter 6: Action Items

This chapter will contain the populated action items table that was shared with the City previously.