Local Road Safety Plan

Study Report

CITY OF GAITHERSBURG

Summer 2024

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Acknowledgments

The development of this document was funded through a Regional Roadway Safety Program (RRSP) grant administered by the Metropolitan Washington Council of Governments (MWCOG). The RRSP provides short-term consultant services to member jurisdictions or agencies to assist with planning or preliminary engineering projects that address roadway safety issues.

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Executive Summary

The City of Gaithersburg promotes a safe, efficient, and reliable multi-modal transportation system that serves all those that travel in the City. The City is committed to improving transportation safety by eliminating traffic fatalities and serious injuries. To achieve this, the City initiated, through a grant from the Metropolitan Washington Council of Governments (MWCOG) Regional Roadway Safety Program (RRSP), a Local Road Safety Plan (LRSP) to prioritize road safety investments on City roadways and to coordinate with County and State agencies on safety initiatives on their roadways.

An LRSP is a Federal Highway Administration (FHWA) Proven Safety Countermeasure[1] that provides a framework for identifying, analyzing, and prioritizing roadway safety improvements. The LRSP development process and content are tailored to the City's issues and needs. The process results in a prioritized list of issues, risks, strategies, and improvements that help to reduce fatalities and serious injuries. The LRSP uses a strategic approach to achieve the vision of creating a transportation system that is safe for all users. It expands on past safety efforts by providing a data-driven framework to collaboratively and equitably focus multi-disciplinary safety strategies and allocate resources. This LRSP focuses on the safety issues of all public roads within the City limits and aligns with the goals, objectives, emphasis areas, and strategies of the Maryland Strategic Highway Safety Plan (SHSP)[2]. It adopts a Safe System Approach[3] which is based on the principles that the human body is vulnerable, humans make mistakes, responsibility is shared, safety is proactive, redundancy is crucial, and it is unacceptable that these mistakes result in death and injury. This supports the Maryland Department of Transportation (MDOT) State Highway Administration (SHA) implementation of the Toward Zero Deaths' National Strategy on Highway Safety[4]. This also supports Montgomery County's Vision Zero Action Plan.[5] The LRSP when implemented helps the City fulfill its commitment toward eliminating traffic fatalities and serious injuries. Developed using the collaborative six-step process documented by FHWA, the LRSP's intent is to:

- Create a framework for achieving a significant reduction of traffic fatalities and serious injuries.
- Leverage partnerships and resources to maximize implementation of this plan.
- Complement efforts to develop and implement transportation plans and other plans and studies.
- Identify strategies and future action items based on data analysis and crash trends.
- Help to prioritize needed roadway safety improvements.
- Develop support for funding applications.
- Support implementation of the Maryland SHSP and the Montgomery County Vision Zero Action Plan.

[1] https://highways.dot.gov/safety/proven-safety-countermeasures
[2] https://roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=240
[3] https://highways.dot.gov/safety/zero-deaths
[4] https://www.towardzerodeaths.org/tzd-national-strategy/
[5] https://www.montgomerycountymd.gov/visionzero/index.html

The City has a multi-modal transportation system that includes roadways, sidewalks, and bike lanes. The roadways in the City are a combination of arterial, collector, and local streets that are owned by the City, County, or State. However, while the LRSP prioritizes efforts on City roadways, recommendations are also applicable to County and State roadways.

This LRSP includes an analysis of safety data (crash, roadway, and traffic volume) within the City limits between 2015 to 2023, including the 98 miles of City-maintained roads. This analysis identified crash trends, over-represented crash types, and the High Injury Network (HIN). During this nine-year analysis period, a total of 7,973 crashes occurred of which 1,951 occurred on City-maintained roadways. There were 14 fatal crashes within the City limits, four of which were on City-maintained roadways. The data analysis results indicated intersection crashes are the predominant crash type, and that driver distraction, roadway departure, impaired driving, and non-motorists make up a notable share of the City's crashes.

The HIN is comprised of those roadways with a concentration of fatal and injury crashes. Data analysis facilitated the identification of 19% of the roadways within the City limits which account for 74% of the total fatal and serious-injury crashes. Many of these roadways also overlap with Census Tracts identified by the United States Department of Transportation (USDOT) as being transportation disadvantaged[6] as well as those areas identified by MWCOG as an Equity Emphasis Area[7]. Data analysis of these locations and other portions of the HIN indicate a need for a variety of safety countermeasures to address both infrastructure and behavioral crash factors. Safety improvements on the HIN will have the greatest impact on reducing fatal and injury crashes.

The data analysis results along with priorities in the County and State safety plans informed the establishment of vision, mission, and goal statements, LRSP emphasis areas selection, and development of the strategy toolbox. The LRSP uses the five elements of the Safe System Approach (Safe Roads, Safe Road Users, Safe Speeds, Safe Vehicles, and Post-Crash Care) as a framework for integrating the emphasis areas, strategies, and action items. It uses a proactive approach and considers redundancy in the implementation of strategies and action items. Redundancy means that reducing risks requires that all parts of the transportation system play a role, so that if one part fails, the other parts still protect people.

To facilitate implementation of the LRSP, each strategy and action item includes lead and partner agencies, and implementation prioritization. The City recognizes the limitation of resources including funding, staffing, and existing protocols, and has therefore prioritized actionable strategies in this LRSP.

The LRSP identifies and prioritizes potential projects to help advance implementation, particularly on the HIN. The LRSP is a living document that will be updated every few years to reflect changing safety needs and priorities of the City. It is the combined, collaborative efforts of the stakeholders that will advance the implementation of the LRSP and achieves the vision of creating a transportation system that is safe for all users.

[6] https://usdot.maps.arcgis.com/apps/dashboards/99f9268777ff4218867ceedfabe58a3a

[7] https://www.mwcog.org/transportation/planning-areas/fairness-and-accessibility/environmental-justice/equity-emphasis-areas/

Acronym List

BIL	Bipartisan Infrastructure Law
CMF	Crash Modification Factor
FHWA	Federal Highway Administration
HIN	High Injury Network
HSM	Highway Safety Manual
HSO	Highway Safety Office
HSP	Highway Safety Plan
HSIP	Highway Safety Improvement Program
LRSP	Local Road Safety Plan
MCDOT	Montgomery County Department of Transportation
MDOT	Maryland Department of Transportation
MWCOG	Metropolitan Washington Council of Governments
NHTSA	National Highway Traffic Safety Administration
PDO	Property Damage Only
PSC	Proven Safety Countermeasure (As identified by FHWA)
RRSP	Regional Roadway Safety Program
SS4A	Safe Streets and Roads for All
SHA	State Highway Administration
SHSP	Strategic Highway Safety Plan
USDOT	United States Department of Transportation

Introduction

The City of Gaithersburg, incorporated in 1878, is at the center of Montgomery County, Maryland, 13 miles from the northwestern border with Washington, D.C. The total land area of the City is about 10 square miles and it is home to a diverse population of over 70,000 residents.

The City maintains 98 miles of roadway, while the Montgomery County Department of Transportation (MCDOT) and the Maryland Department of Transportation State Highway Administration (MDOT SHA) also each maintain several miles of roadway within the City limits. The City is served by Ride On transit buses operated by MCDOT as well as Maryland Area Rail Commuter (MARC) trains operated by the MDOT Maryland Transit Administration (MTA).

Data analysis shows that 76% of all fatal and serious-injury crashes in the City occur on 19% of the roadway network. Figure 1 shows the location of fatal and serious-injury crashes. This is also where most pedestrian and bicycle crashes occur. There have been 91 crashes on City-maintained roadways involving pedestrians, 15 of which resulted in a fatality or a serious injury.

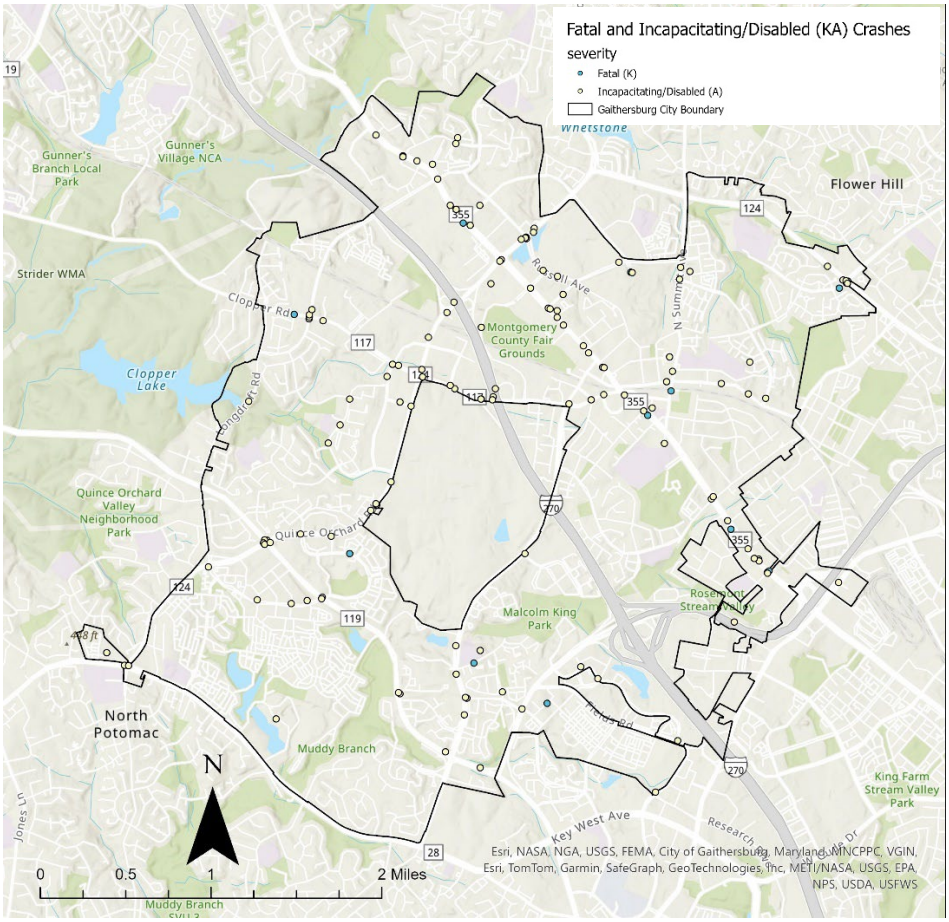

Figure 1. Fatal and Serious-Injury Crash Locations (Source: MCDOT, 2024)

The Gaithersburg Local Road Safety Plan (LRSP) is important for establishing a data-driven approach to address safety issues on roads in the City. The LRSP explores the most relevant safety issues and desired safety goals for the City. The LRSP aligns with the Maryland Strategic Highway Safety Plan (SHSP),[8] as emphasis areas identified for the LRSP relate to those in the SHSP. In addition, the LRSP references the Montgomery County Vision Zero plan[9]. Key emphasis areas in the City's LRSP are:

- Intersections
- Roadway Departure
- Distracted Driving
- Impaired Driving
- Pedestrians and Bicyclists

The SHSP calls for coordination with localities to reduce crash rates through using the four E's (education, enforcement, engineering, and emergency medical services), which the LRSP is helping foster through exploring countermeasures to address safety emphasis areas. The LRSP also shares a similar goal of strategic safety improvements as the Maryland Highway Safety Improvement Program (HSIP), which funds engineering improvements to reduce fatalities and serious injuries on public roads. The HSIP lists systemic project priorities in areas that intersect with the emphasis area countermeasures. The LRSP will be important to identify potential countermeasures to be funded by HSIP.

Developed using the collaborative six-step LRSP process outlined by the Federal Highway Administration (FHWA), the City LRSP's intent is to:

- Create a framework for achieving a significant reduction of traffic fatalities and serious injuries.
- Leverage partnerships and resources to maximize implementation of this plan.
- Complement efforts to develop and implement transportation plans and other plans and studies.
- Identify strategies and future action items based on data analysis and crash trends.
- Help to prioritize needed roadway safety improvements.
- Develop support for funding applications.
- Support implementation of the Maryland SHSP and the Montgomery County Vision Zero Action Plan.

In addition, the Safe System Approach will be used in the LRSP to create a comprehensive safety plan for the City. It has become increasingly important in transportation safety to shift the focus from solely crash frequency reduction to acknowledging that humans are fallible and that crashes will occur, but that their severity can be mitigated with systemic approaches.

Since transportation is a determinant of quality of life, equity within the transportation system is essential to ensuring that everyone within a community can attain affordable and accessible transportation options based on their needs. It is important that all residents continue to have equal and safe access to transportation.

[8] https://roads.maryland.gov/mdotsha/pages/Index.aspx?PageId=240
[9] https://www.montgomerycountymd.gov/visionzero/index.html

Safe System Approach

This LRSP adopts the Safe System Approach, which acknowledges the human body is vulnerable and that humans make mistakes, but that it is unacceptable for these mistakes to result in death and injury. Understanding that humans are fallible, and that crashes will occur as a result, this Approach refocuses safety on managing those crashes that do occur to minimize impact. This is done with a focus on safety in design and project planning. FHWA promotes the use of the Safe System Approach,[10] and calls for it to be incorporated in plans that address the frequency and severity of crashes; this LRSP will be implementing such an approach.

As shown in Figure 2, six principles form the basis of the approach:

- Deaths and serious injuries are unacceptable.
- Humans make mistakes.
- Humans are vulnerable.
- Responsibility is shared.
- Safety is proactive.
- Redundancy is crucial.

Figure 2. Safe System Approach (Source: FHWA)

Additionally, there are five Safe System elements, all working together to create a Safe System which anticipates human mistakes and mitigates crash impacts. These elements are:

Safe Roads: Safe roads use engineering strategies to plan, design, construct, maintain, and operate roads to prevent against crashes and manage impacts should a crash occur.

Safe Road Users: Crashes are influenced by road user factors such as age, ability, and other behaviors. Enforcement and education campaigns are among the activities that can be used to address road user limitations and encourage safer behavior.

[10] https://safety.fhwa.dot.gov/zerodeaths/zero_deaths_vision.cfm

Safe Speeds: As speed increases, the risk of death and serious injury dramatically increase (Figure 3). Pedestrians are even more vulnerable to death and serious injuries from higher speeds. Their risk of fatality quintuples when speeds increase from 23 mph to 42 mph and increases ninefold at 58 mph. Lowering speed increases the likelihood that a road user survives the crash. To reduce the speed of users, infrastructure changes, speed limits, signage, and radar speed feedback signs can be used in combination with education and enforcement.

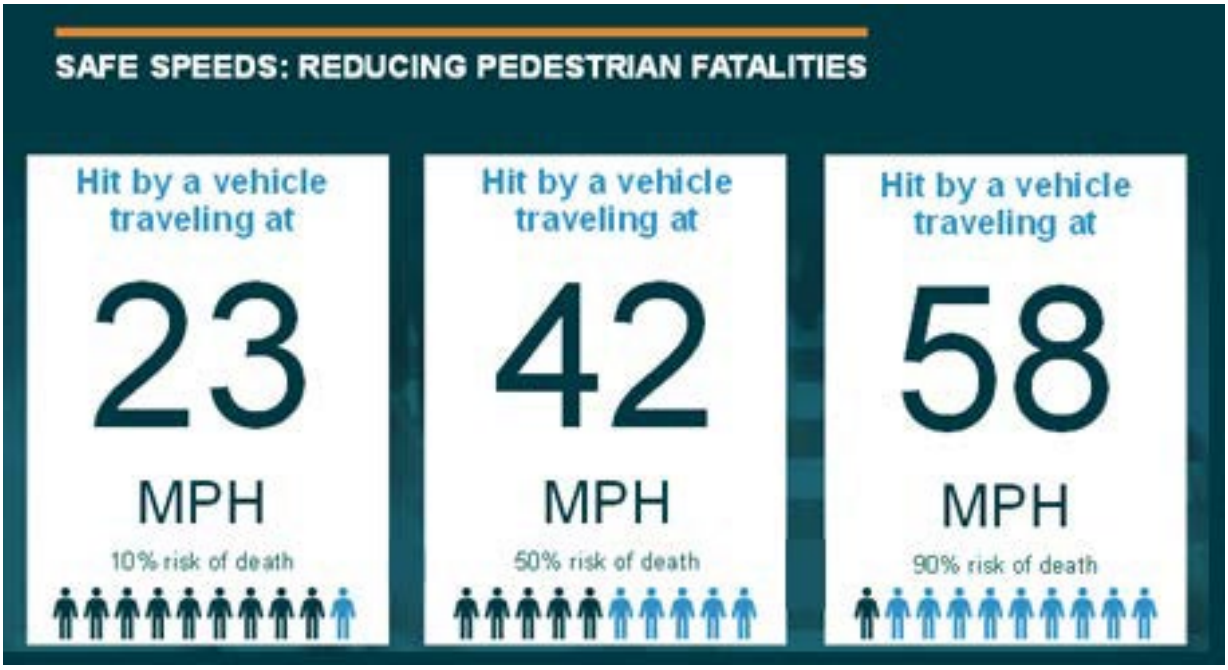

Figure 3. Relationship Between Pedestrian Crash Risk and Speed (Source: FHWA and AAA)

Post-Crash Care: Emergency vehicle operators need to arrive at the scene of a crash quickly to provide prompt assistance, while also not causing an additional crash on their way. Communication and coordination are needed to optimize emergency response.

Safe Vehicles: Safe vehicles are important in protecting the driver and occupants if a crash occurs. We must understand that the body has a limited ability to tolerate crash impacts. Safe vehicle technology and the promotion of fleet management and company policies against unsafe driving practices are among the types of activities that can address this element.

This LRSP uses the five elements of the Safe System Approach to guide the selection of emphasis areas and development of strategies. These elements also integrate the Four E's of safety.

Equity

Transportation equity seeks fairness in mobility and accessibility to meet the needs of all community members, especially those individuals traditionally underserved. These include populations with limited English proficiency, elderly persons, persons with disabilities, minority populations, and low-income populations. A transportation system is a vital component of the quality of life of the people in a community. Addressing equity can enhance how road users travel to work and school and what services and recreational activities are available.

According to the United States Census Bureau, the population of the City is 35% non-Hispanic/Latine White and 65% minority. This is a higher range of racial and ethnic diversity than the statewide average of 51% for Maryland. There is a lower share of individuals above the age of 65 and a higher share of those under 18 years of age compared to the State. The Census Bureau data also shows that just under 6% of persons in the City live below the poverty line, compared to just under 10% statewide. The median household income in the City is over $95,000, compared to just under $95,000 statewide. Approximately 7.5% of the City population under the age of 65 have a disability, close to the statewide average of 8%. It is essential to consider these various populations and communities in the City to address potential impacts and transportation equity.

The City understands that the demographic composition (age, gender, race/ethnicity, ability/disability, income) of the City is critical to making informed transportation investment decisions and achieving the City's social equity goal of providing equitable investments in transportation to enable quality of life for all residents. The consideration of demographics and equity also influences the safety of all road users. For example, presence of houses with zero vehicles means that there will be more people walking, bicycling, or using transit as a means of transportation. Without adequate facilities, this increased exposure can lead to a higher percentage of pedestrian crashes in these communities. Implementation of safety countermeasures in these areas such as installing and properly maintaining sidewalks and multi-use paths, adding high-visibility crosswalks, providing adequate lighting, and evaluating intersections for safe pedestrian accommodations can enhance the safety of all road users while focusing on equity at the same time.

The City considered transportation equity during each step of the LRSP development process. This included considerations of the MWCOG Equity Emphasis Areas[11] and the USDOT Equitable Transportation Community Explorer tool[12] and plans to prioritize implementation of projects at these locations. The LRSP identifies strategies that address the safety needs of all road users. The implementation of projects in the years ahead will recognize the safety needs of all road users.

[11] https://www.mwcog.org/transportation/planning-areas/fairness-and-accessibility/environmental-justice/equity-emphasis-areas/

[12] https://www.transportation.gov/priorities/equity/justice40/etc-explorer

Figure 4 overlays fatal and serious-injury crashes in the City against the Equity Emphasis Areas as defined by MWCOG. MWCOG uses tract-level Census data to identify communities that have significant concentrations of low-income and/or minority populations. Tracts must have either (1) a concentration of low-income individuals more than 1.5 times the regional average; (2) high concentrations of at least two racial minority population groups; and/or (3) high concentrations of at least one racial minority population group in combination with with low-income concentrations of at least the regional average.

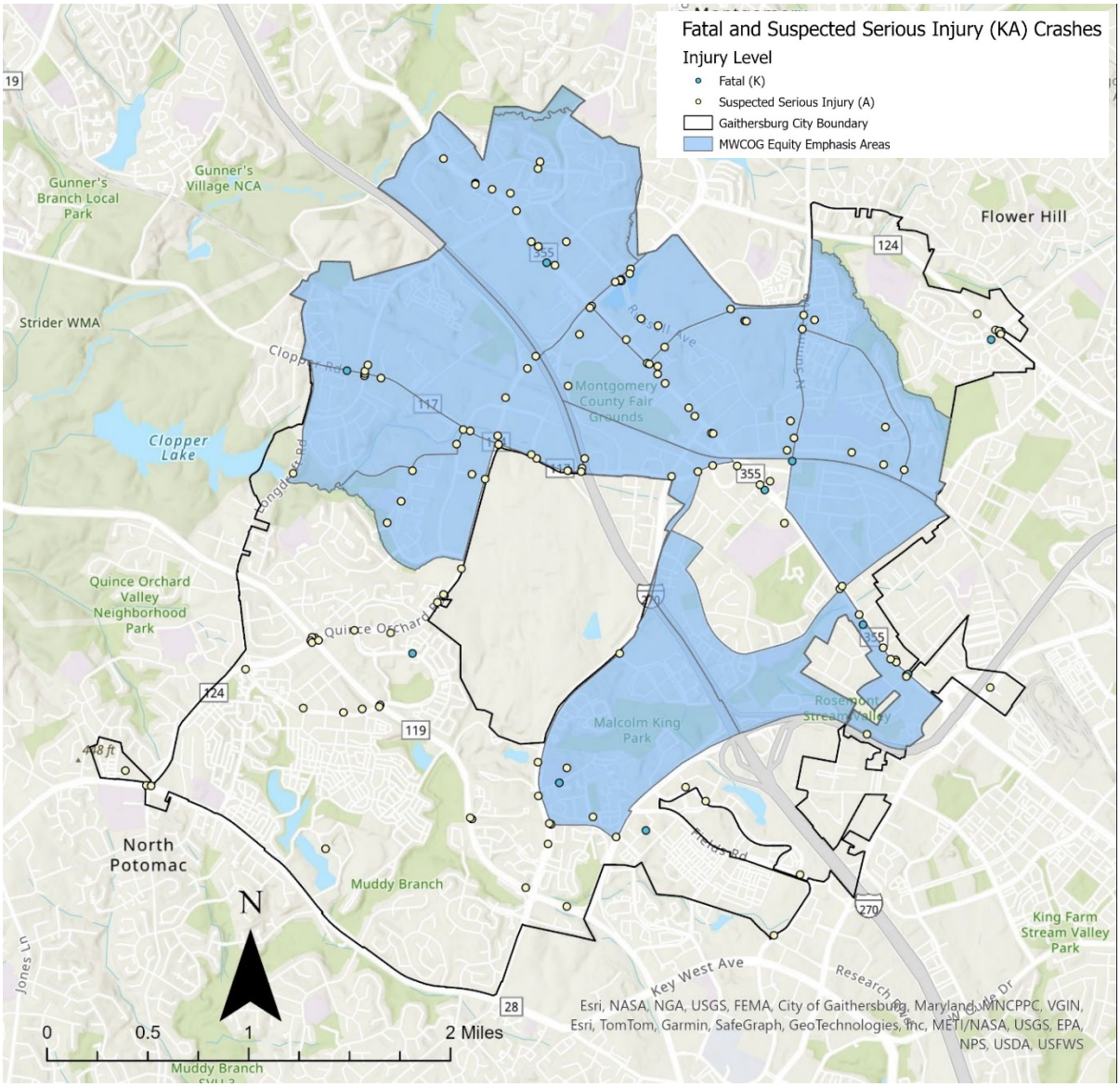

Figure 4. Relationship between Fatal and Serious-Injury Crashes and MWCOG Equity Emphasis Areas (Source: MCDOT and MWCOG)

Figure 5 overlays fatal and serious-injury crashes in the City against Census tracts defined by USDOT as being underserved or at a disadvantage. USDOT has developed an index scoring mechanism that combines indicators from five components: transportation insecurity, environmental burden, social vulnerability, health vulnerability, and climate and disaster risk burden. Each Census tract in the United States is scored and if a tract scores in the top third of tracts nationwide, it is classified as disadvantaged.

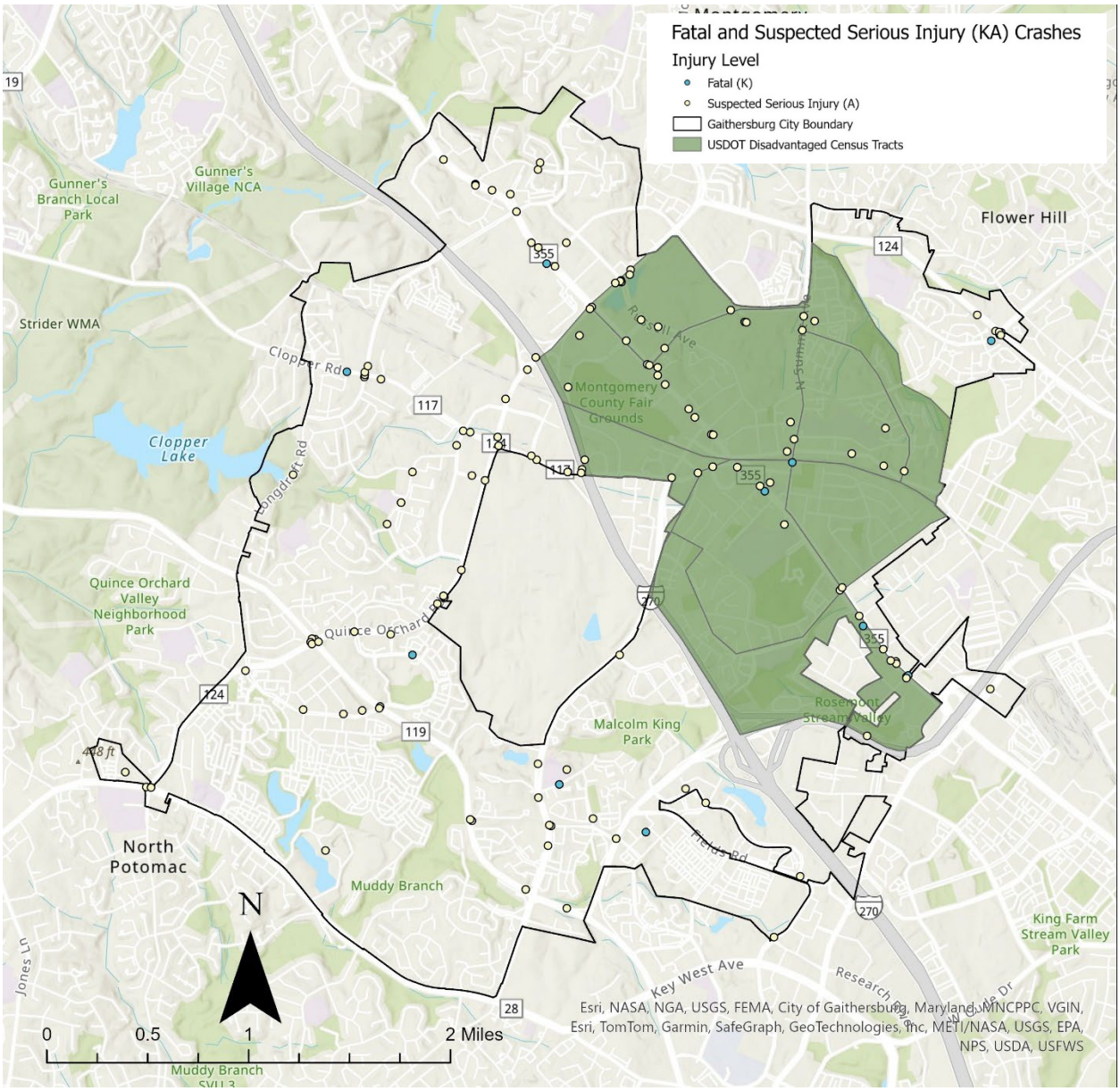

Figure 5. Relationship between Fatal and Serious-Injury Crashes and MWCOG Equity Emphasis Areas (Source: MCDOT and USDOT)

Local Road Safety Plan Process

An LRSP is an FHWA Proven Safety Countermeasure[13] and is developed using a collaborative six-step process (Figure 6). The following sections describe each step. More detail can be found in later sections of the plan. This LRSP builds upon past and ongoing safety activities and considers the unique needs and issues specific to the road system within the planning area limits and the users of these roadways. The LRSP references the Maryland SHSP and the Montgomery County Vision Zero Action Plan and its goals and strategies to eliminate traffic fatalities and serious injuries. This is supported by adopting the principles and elements of the Safe System Approach. LRSP implementation is key to saving lives and kept at the forefront during the LRSP development process.

Figure 6. LRSP development process (Source: FHWA).

Establish Leadership

The LRSP is led by representatives from City agencies to develop and implement safety projects, programs, and policies. The City engaged the Transportation Committee and conducted an online public survey to provide input into the development of the LRSP. Results of the survey can be found in the Survey Summary supplement. Continued partnerships and collaborative efforts recognize a shared responsibility to eliminate fatal and serious-injury crashes and provide the opportunity to share knowledge, leverage resources, and maximize implementation of the LRSP.

Analyze Safety Data

Analyzing safety data (e.g., crash, traffic, roadway data) identifies crash trends, high-risk factors, and those locations and infrastructure characteristics with a higher concentration of fatal and injury crashes. Crash Data from MCDOT for the period 2015 to 2023 informed the development of the LRSP. The safety analysis for the LRSP considered the over-representation of major crash types and their relationship to each other. This guided the selection of LRSP emphasis areas. An assessment of crashes and key corridors identified a High Injury Network (HIN) where most fatal and injury crashes occur. An overlay of the HIN with equity demographic indices showed a

[13] https://safety.fhwa.dot.gov/provencountermeasures/

correlation between the HIN and equity areas of concentration. The analysis results guided the selection of the emphasis areas and strategies and identification of potential projects.

Determine Emphasis Areas

Emphasis areas in an LRSP enable the safety stakeholders to better focus available resources. The Maryland SHSP contains six emphasis areas. This LRSP considered those along with the data analysis results for the roads within the City limits for 2015 to 2023 and identified key emphasis areas for the LRSP:

- Intersections
- Roadway Departure
- Distracted Driving
- Impaired Driving
- Pedestrians and Bicyclists

Other emphasis areas and user groups, while not called out in the list above, are addressed by integrating these concerns into the other emphasis areas. The Safe System elements serve as "pillars," and each emphasis area aligns with the appropriate Safe System element.

Identify Strategies

The LRSP identifies strategies and action items that address emphasis areas and align with the appropriate Safe System element. This allows for the strategies to take all road users and modes of transportation into account, while addressing multiple emphasis areas simultaneously. This also makes it easier for the various stakeholders to coordinate, strategize, and implement the LRSP. The LRSP also considered the data analysis results, potential to address identified safety issues, different types of road users, equity, and how to ensure the strategies are actionable when identifying multi-disciplinary countermeasures for inclusion in the LRSP. Many of the action items are identified in the Montgomery County Vision Zero Action Plan as well as the Maryland Strategic Highway Safety Plan and are considered as effective countermeasures by FHWA and the National Highway Traffic Safety Administration (NHTSA).

Prioritize and Incorporate Strategies

The LRSP considers each strategy and action item as well as the feasibility of implementation in the process of prioritizing them. The cost and availability of resources as well as the ease of implementation or how a strategy could influence implementation of other strategies were factors that influenced the prioritization. Each action item is listed in priority order and includes the lead agency, partners, and effectiveness.

Evaluate and Update

It is essential that this LRSP moves beyond a planning document. Implementation of the identified strategies and action items by the various stakeholders is key to achieving the goal set forth in this LRSP. A benefit of the alignment of the LRSP with the SHSP is that it leverages existing funding sources to support LRSP implementation. These include State funds from Maryland SHA as well as Federal funding from sources such as HSIP and Highway Safety Plan (HSP) administered by FHWA and NHTSA, respectively. In addition, the Bipartisan Infrastructure Law (BIL) established the Safe Streets and Roads for All (SS4A) Grant Program[14] to support efforts such

[14] https://www.transportation.gov/SS4A

as the implementation of the LRSP. This discretionary program provides funding to support regional and local initiatives through grants to prevent roadway deaths and serious injuries. The City is the recipient of a planning grant from the SS4A program and will complement this LRSP with additional planning efforts to bolster public engagement and project prioritization initiatives.

The LRSP is a living document that the City will evaluate and update periodically. Tracking the allocation of resources, positive changes in user behavior, and the reduction in crashes as the various strategies and action items are implemented can be the mechanism by which the City and its safety stakeholders evaluate the effectiveness of the LRSP implementation. This also will assist the City and its stakeholders to identify new action items or those that should be expanded, determine necessary resources for implementation, and pursue additional grant opportunities.

Vision, Mission, and Goal

The vision, mission, and goal statements for the LRSP reflect the Safe System Approach principles that death and serious injuries are unacceptable and that shared responsibility by all stakeholders is necessary. The vision for the LRSP demonstrates the intent that all users of the roadway system within the City reach their destination safely. The mission statement recognizes that a collaborative effort by all the safety partners is necessary to achieve the reductions in traffic-related fatalities and serious injuries set forth by the goal. This is critical as the City, County, and State each maintain roadways within the City limits and coordination between stakeholders helps to optimize safety benefits for all those who travel in the City. Strategies and action items identified in this LRSP reflect elements of the Safe System Approach and support achieving the vision, mission, and goal statements.

Vision:
Eventual elimination of all preventable crashes on Gaithersburg roadways.

Mission:
Implement a collaborative, data-driven, Safe System-oriented local road safety plan to reduce and prevent fatalities and serious injuries.

Goal:
50% reduction of fatalities and serious injuries within the first five years of implementation.

Existing Efforts

Several City, County, and State resources were reviewed as background research for this LRSP. These resources included the 2021-2025 Maryland SHSP, the Montgomery County Vision Zero Action Plan, the Maryland HSIP annual report, and the Maryland Highway Safety Office Triennial Highway Safety Plan.

The five-year Maryland SHSP was released in 2021 and was developed based on input from numerous agencies and multi-disciplinary stakeholders. This document is a valuable resource for the development and implementation of the LRSP as it informs potential strategies and actions for local adoption.

The Maryland SHSP outlines six emphasis areas:

- Highway Infrastructure (includes intersections and roadway departure crashes)
- Impaired Driving
- Distracted Driving
- Speed and Aggressive Driving
- Occupant Protection
- Pedestrians and Bicyclists

These six emphasis areas are then connected to six different user groups:

- Children
- Young Drivers
- Older Drivers
- High Risk 21-34
- Motorcyclists
- Commercial Drivers/Transit Users

The Maryland HSIP Annual Report identified the types of projects the State would like to allocate funds toward, including:

- Bicycle Safety
- Horizontal Curve
- Intersection
- Left Turn Crash
- Local Safety
- Low-Cost Spot Improvements
- Median Barrier
- Pedestrian Safety
- Right Angle Crash
- Roadway Departure
- Rural State Highways
- Segments
- Sign Replacement and Improvement
- Skid Hazard

Understanding that these programs are a MDOT SHA priority helps the City prioritize their projects toward these types of programs while considering the outcomes from the data analysis.

The Highway Safety Plan[15] is developed by Maryland HSO to identify behavioral safety issues and pair them with available funds from NHTSA. The Maryland HSO then offers a competitive grant process for localities to access these NHTSA funds. The funds provide an opportunity for the LRSP to contribute to the reduction of fatalities within the City. The HSP indicates safety initiatives that target behaviors such as impaired driving, occupant protection, and speeding.

The Montgomery County Vision Zero Action Plan, updated in 2023 with the 2024-2025 work plan, is built on three pillars and focuses on seven action areas that relate to the Safe System approach:

- Complete Streets
    - Safe Streets
    - Safe Speeds
- Multimodal Future
    - Safe Transportation
    - Safe and Sustainable Communities
    - Safe Vehicles
- Culture of Safety
    - Safe People
    - Safe Post-Crash Emergency Response and Care

The County Vision Zero Action Plan provides several actions that are relevant for implementation in the City. With County ownership of several miles of roadway within the City, it is important to find opportunities to implement common actions on both City and County roads. Similarly, with several State routes such as MD 355, Clopper Road, and Great Seneca Highway serving as key commuting corridors, it is also important to coordinate efforts with MDOT SHA in implementing common solutions.

[15] https://zerodeathsmd.gov/wp-content/uploads/2023/12/2024-Triennial-Highway-Safety-Plan_MASTER_MERGED.pdf

Data Analysis

Montgomery County maintains the Data Montgomery portal which houses MCDOT's Vision Zero open crash data. These data served as the source of information for the LRSP crash analysis and covered the period from 2015 to 2023. During this period, there were almost 8,000 crashes within the City limits, of which almost 2,000 were on City-maintained roads.

Roadway Ownership	*Fatal (F)*	*Serious Injury (A)*	*Minor Injury (B)*	*Possible Injury (C)*	*Property Damage Only (PDO)*	*Total*
All Owners	*14*	*133*	*1,037*	*1,262*	*5,527*	*7,973*
City-Owned	*4*	*27*	*248*	*279*	*1,393*	*1,951*

Table 1. Crash Severity Summary, 2015-2023 (Source: MCDOT, 2024)

Safety data analysis identifies trends and proportions in the types of crashes, risk factors, and locations of the injury crashes. Figure 7 shows that, over the analysis period, the number of crashes has ranged from 178 to 240, with those involving a fatality, serious injury, or minor injury making up 10 to 20% of them.

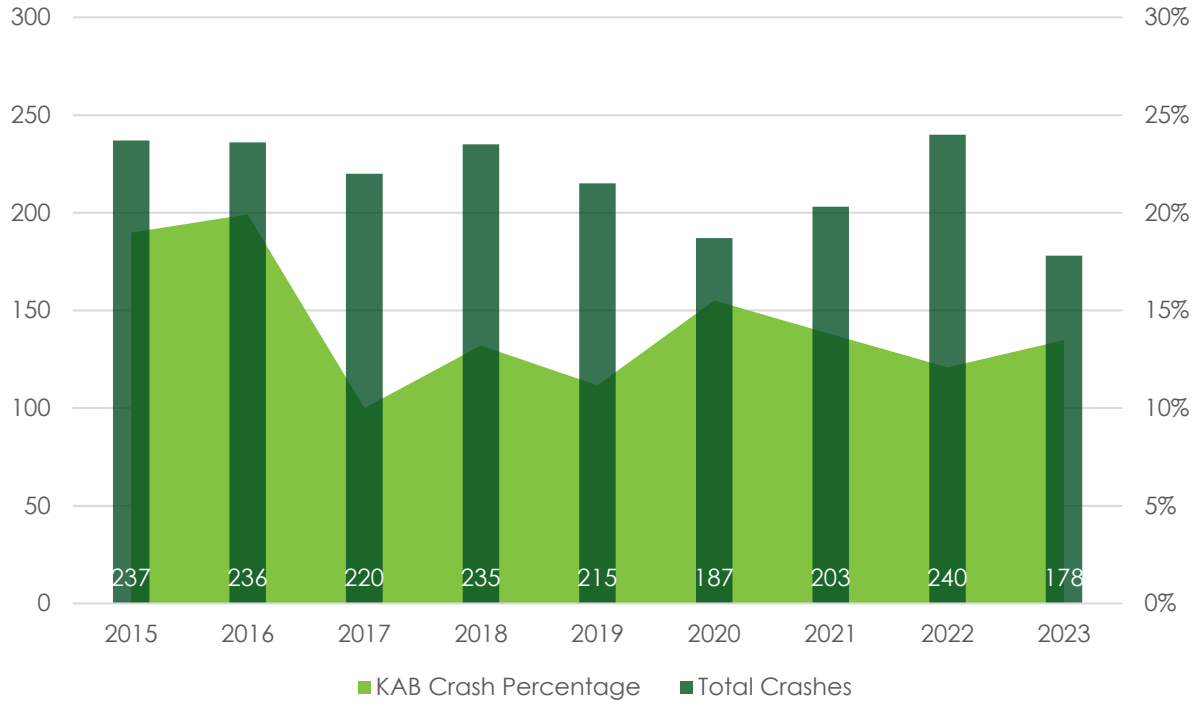

Figure 7. Crashes by Year on City Roadways, 2015-2023 (Source: MCDOT, 2024)

Note: 2023 data is through to October 2023

Figure 8 shows that crashes peak during October and February, however, the fatal, serious-injury, and minor-injury crashes peak in September and December.

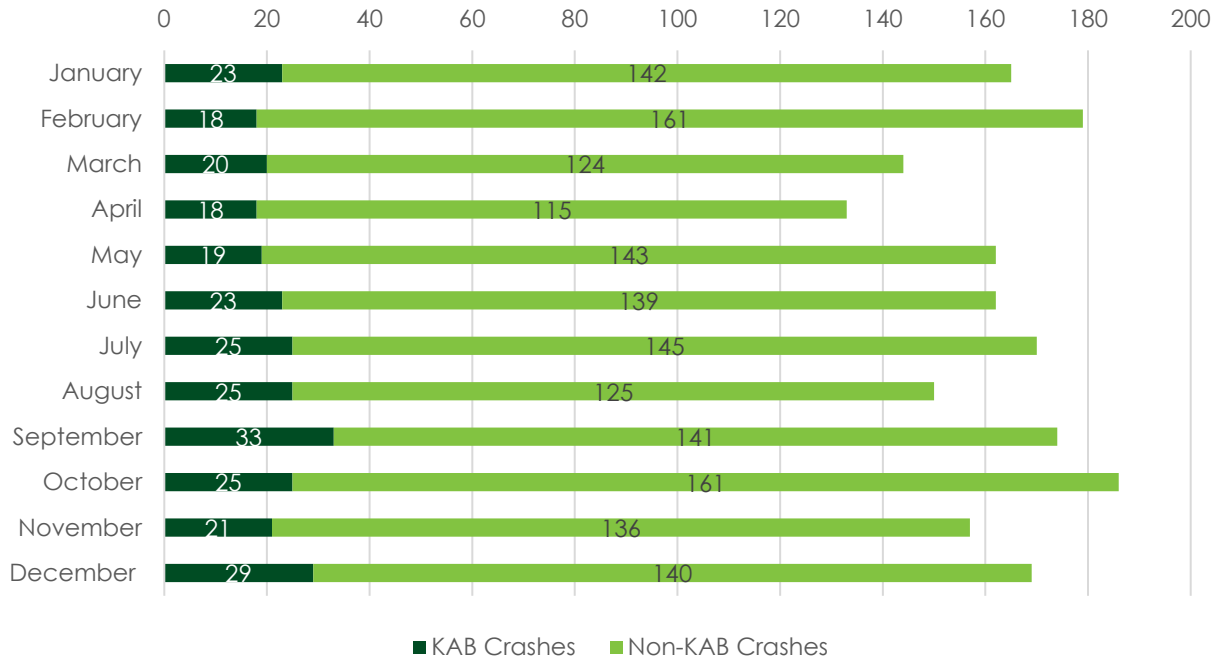

Figure 8. Crashes by Month on City-Owned Roadways, 2015-2023 (Source: MCDOT, 2024)

Figure 9 shows that Tuesday and Friday are days with a larger number of more severe crashes, while Friday has the greatest number of total crashes.

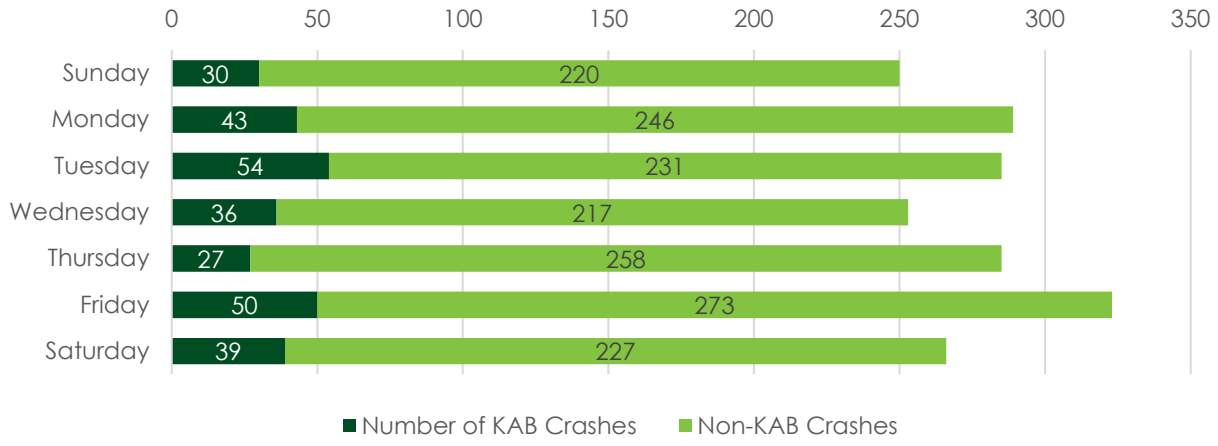

Figure 9. Crashes by Day of Week on City-Owned Roadways, 2015-2023 (Source: MCDOT, 2024)

Figure 10 shows that many crashes in the City are located on State-owned roadways. This includes roads such as MD 355, Clopper Road, and Great Seneca Highway. Furthermore, there are many crashes on County-owned roadways such as Muddy Branch Road. This shows the need to coordinate roadway safety efforts with MCDOT and MDOT SHA to address crashes on all public roads.

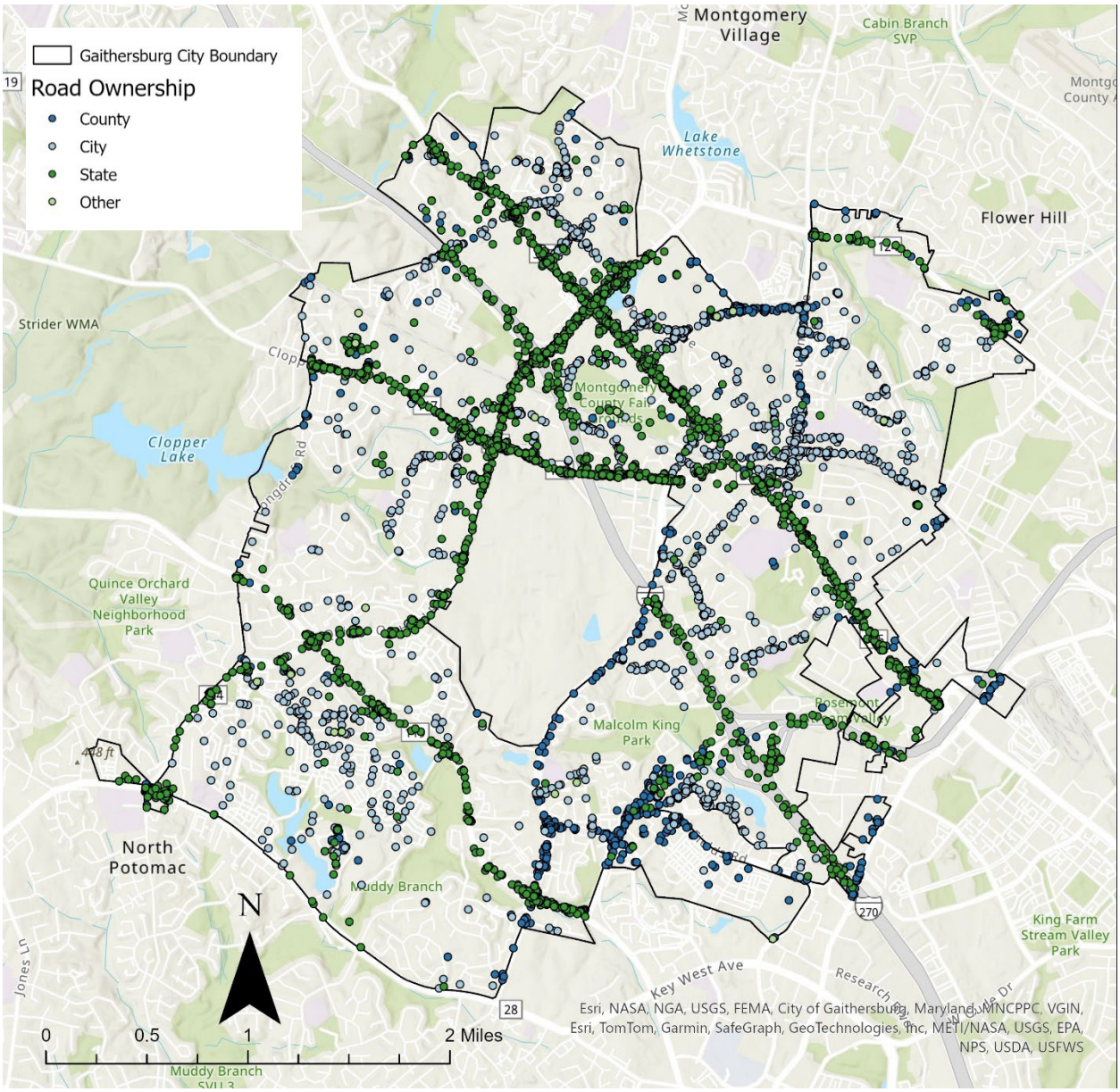

Figure 10. Crashes by Roadway Ownership, 2015-2023 (Source: MCDOT, 2024)

Table 2 provides a breakdown of the City's crash data by Maryland SHSP emphasis area and comparison to the State. There are several emphasis areas in the City that are generally overrepresented when compared to all crashes, particularly intersections, impaired driving, pedestrians, and bicycles. When compared to the emphasis area share of fatal and injury crashes at the State level, intersections, pedestrians, and bicyclists are overrepresented. While distracted driving crashes are not overrepresented, when compared to State averages, they do make up a notable share of the City's crashes and therefore should be considered as emphasis areas for the LRSP.

Table 2: Crash Proportion Comparison by Emphasis Area (Source: MCDOT, MDOT SHA annual averages)

Emphasis Area (EA)	*EA Share of All Crashes on public roads in City*	*EA Fatal and Injury Crashes as share of all City Fatal and Injury Crashes*	*EA Share of All State Crashes*	*EA Fatal and Injury Crashes as share of all State Fatal and Injury Crashes*
Intersections	*46%*	*58%*	*34%*	*44%*
Roadway Departure	*16%*	*13%*	*24%*	*21%*
Impaired Driving	*7%*	*5%*	*6%*	*7%*
Distracted Driving	*29%*	*32%*	*47%*	*52%*
Pedestrians	*4%*	*12%*	*3%*	*9%*
Bicycles	*1%*	*3%*	*1%*	*2%*

Pedestrians and bicyclists are vulnerable users since they do not have the physical protection that is provided to a car driver or occupant. Crashes involving vulnerable road users are often more severe. Of the crashes involving pedestrians, 95% involved a fatality or injury. Of the crashes involving a bicycle, 87% involved an injury.

Systemic and Cross Tab Analysis

A systemic crash analysis looks beyond crashes at a particular location and instead evaluates risk across the entire system. This system-based approach can help identify characteristics that are overrepresented in crashes (i.e., road type, four-way intersection, behavioral factor) and then characteristics can be combined to determine risk profiles. Such risk profiles can help the City locate where these characteristics are found and implement solutions before serious-injury and fatal crashes occur. The City will conduct systemic analyses throughout LRSP implementation to determine additional opportunities for projects. The systemic approach is consistent with the Safe System Approach, in which safety is proactive. The City can use the proactive approach to identify, prioritize, and implement strategies and action items.

A starting point for the systemic analysis is to expand on the overrepresentation of these emphasis areas as described above and to determine factors that further explain these overrepresentations. These analyses lead to recommendations of specific infrastructure and behavioral activities such as increasing visibility at pedestrian crossings, marking bike lanes, and education to raise awareness.

The emphasis area matrix shown in Table 3 shows how the relationship between two emphasis areas can help to inform additional analyses. The matrix helps to quickly identify trends, while providing additional depth to the emphasis area analysis. For example, reading the table vertically, 26% of roadway departure crashes involve driver distraction. Knowing this information, one can dig deeper to understand why over quarter of roadway departure crashes involve distraction by adding additional factors, like driver demographics, time of day, and roadway classification. Showing these relationships between factors allows stakeholders to leverage resources and address multiple emphasis areas simultaneously.

Table 3: Emphasis Area Cross-Matrix for Fatal, Serious-Injury, and Minor-Injury Crashes on City-Owned Roadways, 2015-2023 (Source: MCDOT, 2024)

	Roadway Departure	Motorcycle/ Moped	Driver Impaired	Non-Motorist Impaired	Intersection	Emergency Vehicle	Commercial	Pedestrian	Cyclist	Distracted
Roadway Departure		10.0%	40.0%	-	9.3%	-	9.1%	-	-	14.3%
Motorcycle/ Moped	2.2%		6.7%	-	3.5%	-	9.1%	-	-	4.8%
Driver Impaired	13.0%	10.0%		-	5.2%	-	-	1.7%	-	3.6%
Non-Motorist Impaired	-	-	-		1.2%	-	-	5.2%	-	-
Intersection	34.8%	60.0%	60.0%	66.7%		100.0%	54.6%	62.1%	82.4%	66.7%
Emergency Vehicle	-	-	-	-	2.3%		-	1.7%	-	2.4%
Commercial	2.2%	10.0%	-	-	3.5%	-		1.7%	-	3.6%
Pedestrian	-	-	6.7%	100.0%	20.9%	25.0%	9.1%		-	17.9%
Cyclist	-	-	-	-	8.1%	-	-	-		4.8%
Distracted	26.1%	40.0%	20.0%	-	32.6%	50.0%	27.3%	25.9%	23.5%	
Total Crashes	**46**	**10**	**15**	**3**	**172**	**4**	**11**	**58**	**17**	**84**

Note: The percentage indicates the share of crashes listed at the bottom of the column. For example, 40% of the 10 motorcycle/moped crashes involved distracted driving.

HIN Analysis

The goal of the HIN is to identify which roads account for a high proportion of injury crashes. This analysis is inherently reactive, and thus, crashes need to have occurred for this analysis to be possible. Figure 11 below is the City HIN map based on the 2015-2023 dataset. The shaded streets are part of the HIN, which represents 19% of the City-owned roadway network and is the location of 76% of the fatal and serious-injury crashes. A HIN segment must be at least 0.1-miles in length and have a minimum of 0.0005 fatal and serious-injury crashes per linear foot to be considered for inclusion in the HIN. Roads such as Russell Avenue, Kentlands Boulevard, and Summit Avenue are featured in the network.

Figure 11. HIN for City-owned roadways, (Source: City of Gaithersburg, 2024)

For comparison, an HIN that considers all roadways, regardless of ownership, show that roads under the authority of MDOT SHA make up a large share of the network. Figure 12 shows 19% of the public roadway mileage in the City limits and accounts for 74% of all fatal and serious-injury crashes. For this network, a HIN segment must be at least 0.1-miles in length and have a minimum of 0.00084 fatal and serious-injury crashes per linear foot. For this HIN, MD 355, Clopper Road, and Quince Orchard Road are among roadways featured prominently. These roads were also frequently mentioned during the public survey process.

Figure 12. HIN for all roadways, (Source: City of Gaithersburg, 2024)

Priority Corridors

Based on analysis of the High Injury Network for City-owned roadways and input from the public survey, Figure 13 presents priority corridors for where actions in this LRSP can be applied. The supplemental Corridor Analyses document details contributing crash factors and potential treatments. The four corridors and their extents are as follows:

- Russell Avenue (from Watkins Mill Road to East Diamond Avenue).
- Kentlands Boulevard (from Quince Orchard Road to Great Seneca Highway).
- East Diamond Avenue (from Chestnut Street to Washington Grove Lane/Railroad Street.
- South and North Summit Ave (from MD 355 to Park Avenue).

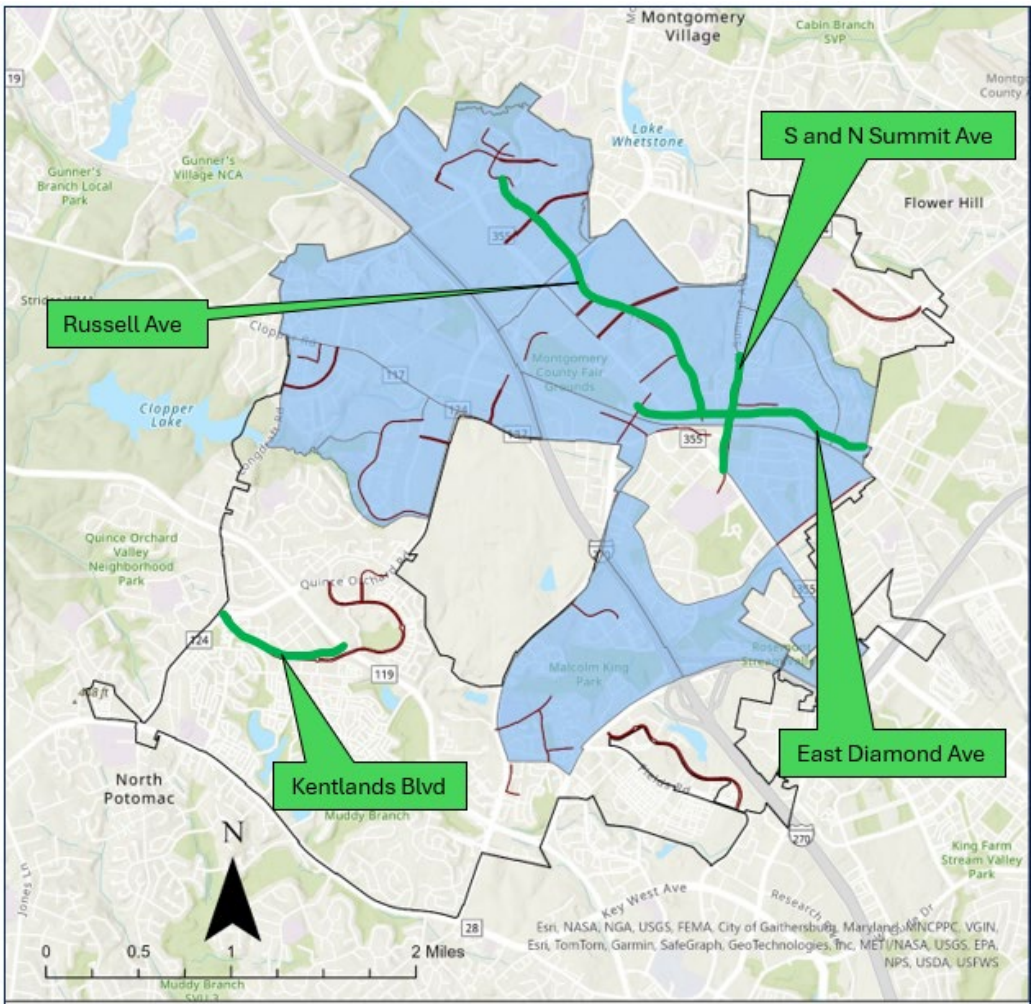

Figure 13. LRSP Priority Corridors (Source: City of Gaithersburg, 2024)

Emphasis Areas

The data analysis highlighted key emphasis areas to achieve significant reductions in fatal and injury crashes and to meet the safety goal of the LRSP. However, other emphasis areas will also be addressed based on the interrelationship of crash factors, contributing factors and recommended solutions that may benefit multiple emphasis areas.

The emphasis areas highlighted through the data analysis include:

- Intersections
- Roadway Departure
- Distracted Driving
- Impaired Driving
- Pedestrians and Bicyclists

Table 4 shows how each emphasis area is grouped with the Montgomery County Action Plan action areas which tie into the Safe System approach. These groupings show which Safe System element has the greatest association with an emphasis area. However, this does not mean an emphasis area has no association with the other elements. The Strategy Toolbox section of this LRSP provides additional discussion about the relationship between emphasis areas and the Safe System elements and how actions are arranged for implementation. The following pages provide systemic analysis highlights from each emphasis area.

Table 4. LRSP emphasis areas by Montgomery County Vision Zero Action Plan and Safe System Elements.

Safe Streets	Safe Speeds	Safe Multimodal Transportation	Safe and Sustainable Communities	Safe Vehicles	Safe People	Safe Post-Crash Care
Roadway Departure	All	Pedestrians	All	All	Impaired Driving	All
Intersections		Bicyclists			Distracted Driving	

Roadway Departure Crashes

Roadway departure crashes account for 16% of all crashes and 13% of fatal and injury crashes in the City. About one-third of fixed object crashes involved a vehicle hitting the curb, while 9% involved hitting a light support pole. Over 40% of fixed object crashes occurred in low-light or dark conditions, compared to one-third of all crashes. This may indicate a need to improve lighting or road edge delineation. About 15% of fixed object crashes in all lighting conditions involved an impaired driver, however, about 30% of fixed object crashes in low-light or dark conditions involved these drivers. There appears to be a need to education and enforcement activities to address this crash pattern.

Intersection Crashes

Intersection crashes make up 46% of all crashes and 58% of fatal and injury crashes in the City. Approximately two-thirds of crashes occur at a traffic signal and of these crashes, one-third occur during low-light or dark conditions. Over two-thirds of crashes involving pedestrians or bicyclists occur at intersections. While approximately 12% of intersection crashes occur at locations with a stop-sign control, 20% of non-motorist crashes are at stop-controlled intersections. This may indicate a need to improve intersection crossing visibility and to discourage high approach speeds.

Impaired Driving Crashes

Impaired driving crashes make up 7% of all crashes and 5% of fatal and injury crashes in the City. These impaired crashes are occurring in dark or low-light conditions, with three quarters of the crashes in such conditions. Comparatively, most crashes in the City, about two-thirds, occur during daylight conditions. Over half of the fatal and injury impaired driving crashes during low-light or dark conditions occur at intersections. These insights suggest that there are opportunities to enhance education and enforcement activities to curtail high-risk driving behavior.

Distracted Driving Crashes

Distracted driving crashes make up 29% of all crashes and 32% of fatal and injury crashes in the City. About 14% of distracted driving crashes involved roadway departure and over 40% of these occur during low-light or dark conditions. Two-thirds of fatal, serious-injury, and minor-injury distracted driving crashes occur at intersections, and of these one-third occur during low-light or dark conditions. A slightly higher percentage of distracted driving crashes occur at stop-controlled intersections (9%) compared to the share of all crashes at these locations (8%). Encouragement to take less risky behavior could help to address this crash concern.

Pedestrian Crashes

Pedestrian-involved crashes account for 5% of all crashes on City-owned roadways; however, they represent 48% of fatal and serious-injury crashes on these roads. Similarly, when looking at all public roads in the City, 4% of all crashes involve pedestrians. Of fatal and serious-injury crashes on all roads, 25% involve pedestrians. Figure 14 shows the geographic spread of pedestrian crashes across the City, with a greater concentration on MD 355 and Olde Towne. Around half of fatal and serious-injury pedestrian crashes occur in non-daylight conditions. Over half of severe pedestrian crashes occurred at intersections. This illustrates the need to provide safe pedestrian accommodations at intersections and the need to partner with County and State agencies.

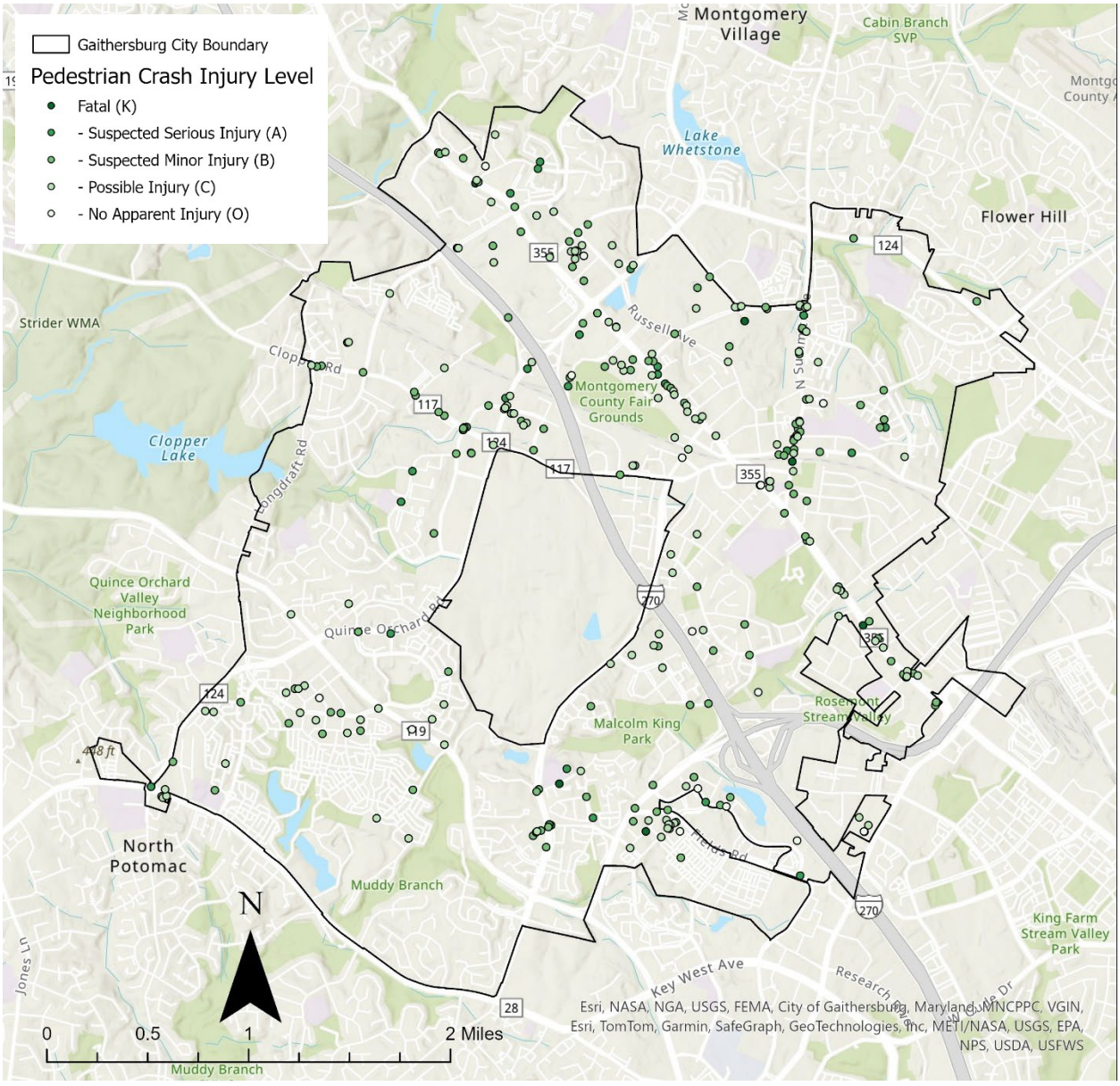

Figure 14. Pedestrian crashes, 2015-2023 (Source: MCDOT, 2024).

Bicyclist Crashes

Bicyclist-involved crashes account for 1.5% of all crashes on City-owned roadways; however, they represent 13% of fatal and serious-injury crashes on these roads. Similarly, when looking at all public roads in the City, 1% of all crashes involve bicyclists. Of fatal and serious-injury crashes on all roads, 8% involve bicyclists. Figure 15 shows that bicyclist crashes are distributed across the City, however, there is a pattern of crashes along MD 355. Most of these crashes occurred at intersections.

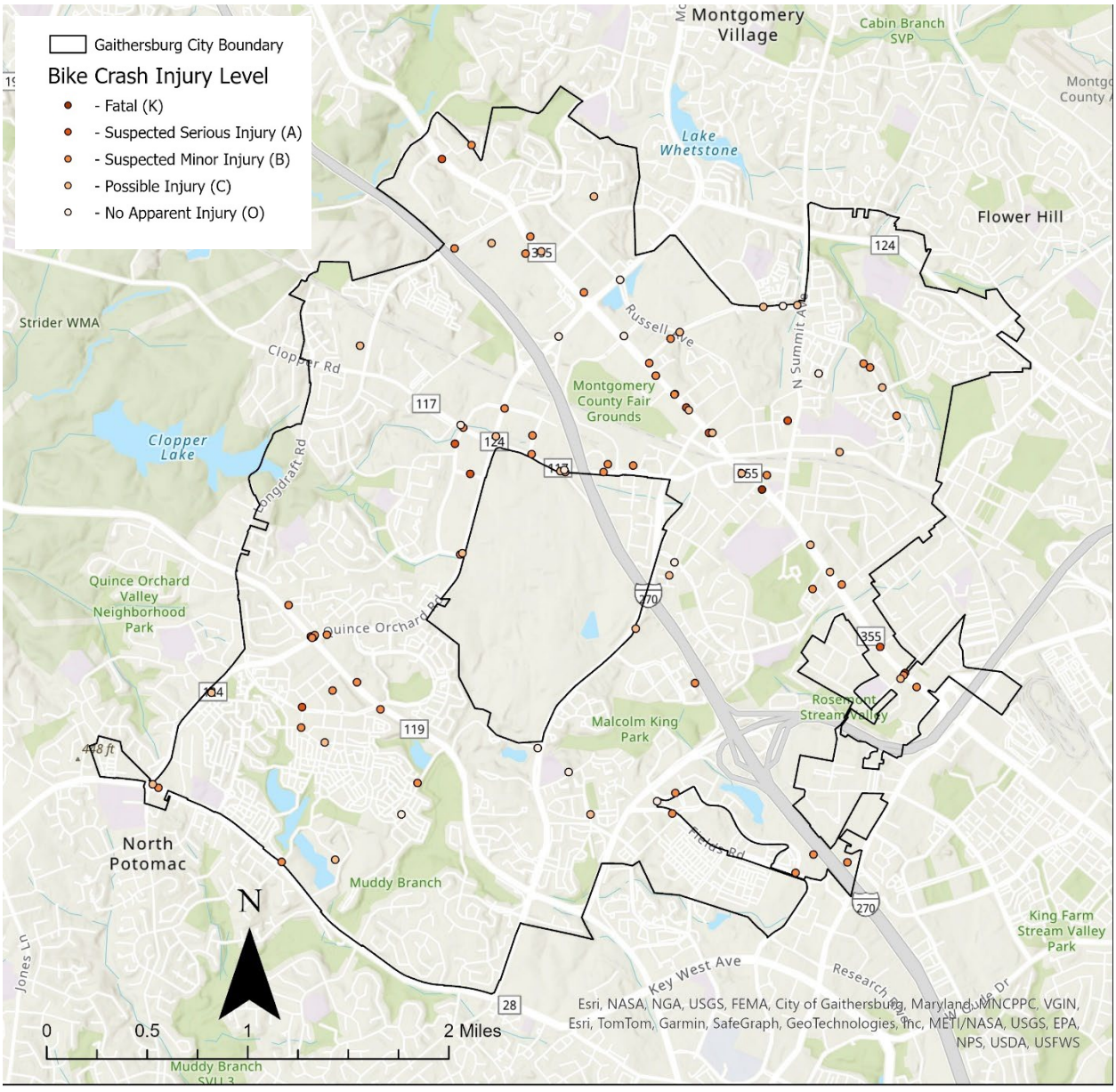

Figure 15. Bicyclist crashes, 2015-2023 (Source: MCDOT, 2024).

Strategy Toolbox

The City, using the Safe System Approach as the framework and informed by the Maryland SHSP and the Montgomery County Vision Zero Action Plan, established a toolbox containing the strategies and action items represented in the LRSP. The strategies are organized around Safe System elements and are related to emphasis areas. Each of these elements identifies strategies and action items which when implemented with leadership and partnership support and input will achieve the LRSP safety goals. However, in a cost-constrained environment, not all actions are proposed to take place simultaneously.

The supplemental Strategy Toolbox document organizes the strategies and actions under the following headings:

Safe Streets - The roadway is the platform in which users move across the system. The category considers the interaction of all users and incorporates engineering-related strategies during planning, design, construction, maintenance, and operations of the system to prevent crashes and manage impacts to keep kinetic energy at tolerable levels should a crash occur.

Safe Speeds - As speeds increase, the risk of death and serious injury dramatically increase, especially when pedestrians and bicyclists are involved. Safe speeds increase the likelihood of an individual surviving a crash and can be accomplished through implementation of strategies such as speed management, enforcement, and outreach efforts. Designing roadways with all users in mind and establishing appropriate speed limits help reduce the speed of users.

Safe Multimodal Transportation – These actions help to Improve safe multimodal access to transit, schools, businesses, and homes.

Safe and Sustainable Communities – This section integrates the Safe System approach into master planning for community, transportation demand management programs, and roadway design guidelines.

Safe Vehicles - Safe vehicles incorporate new technology and other features to prevent crashes from occurring, and if they do, reduce the severity of a crash.

Safe People - This element addresses all users of all modes of travel. Their capabilities are influenced by factors such as age, level of impairment, and other behaviors. System owners and other stakeholders can use strategies such as enforcement and education campaigns to address these limitations and encourage behavior change.

Safe Post-Crash Response and Care - Post-crash care is critical to the survivability of a crash victim. The ability of emergency responders to quickly locate and respond to a crash and stabilize and transport an individual injured in a crash influences the chances of survival. Communication and collaboration between all stakeholders are necessary to improve post-crash care and reduce the potential of crashes resulting in fatalities and injuries.

Where applicable, action items in the toolbox include an effectiveness rating based on crash modification factor or star rating. The effectiveness of an engineering-related action item is measured by a crash modification factor (CMF) from the FHWA Crash Modification Factors Clearinghouse.[16] Each CMF in the Clearinghouse is given a star rating to indicate the quality or confidence in the results of the study producing the CMF.

A CMF is an estimate of the change in crashes expected after implementation of a countermeasure. For example, an intersection is experiencing 100 angle crashes and 500 rear-end crashes per year. If you apply a countermeasure that has a CMF of 0.80 for angle crashes, then you can expect 80 angle crashes per year following the implementation of the countermeasure (100 x 0.80 = 80). If the same countermeasure also has a CMF of 1.10 for rear-end crashes, you will also expect 550 rear-end crashes per year following implementation (500 x 1.10 = 550).

NHTSA's publication Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices[17] contains star ratings to measure the effectiveness of behavior-related (education and enforcement) countermeasures that are used most regularly by State Highway Safety Offices. The more stars a countermeasure receives, the greater the level of effectiveness indicated.

[16] FHWA, Crash Modification Factor Clearinghouse, http://www.cmfclearinghouse.org/
[17] NHTSA, https://www.nhtsa.gov/book/countermeasures/countermeasures-that-work

Implementation and Evaluation

For an LRSP to foster a Safe System and reduce fatalities and serious injuries from crashes, the strategies and countermeasures identified within it must be implemented. To continue to keep the LRSP relevant and addressing current safety concerns in the City, it should be updated periodically. Evaluation using a data-driven approach will allow monitoring of the effects of transportation safety policies and guide future changes within the plan.

A key benefit of the LRSP is aligning the emphasis areas and strategies with those in the Maryland SHSP. This enhances their eligibility for Federal and State safety funds. These include State funds from MDOT SHA as well as Federal funding from sources such as HSIP and HSP administered by FHWA and NHTSA, respectively. In addition, the BIL established the SS4A Grant Program which may support implementation of the LRSP. This discretionary program provides funding to support regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries. MDOT SHA uses the SHSP and its emphasis areas to guide spending HSIP funds. Federal funding from the HSIP to support infrastructure projects is predicated on this linkage to emphasis areas in the SHSP; therefore, the City's alignment with the State's safety efforts is critical. Accessing these Federal funds helps to supplement local funding for projects identified in this LRSP. Additionally, Federal behavioral safety grant funding from NHTSA and managed by the Maryland HSO is available on an annual basis.

The timing of the LRSP update can mirror the five-year update cycle required for the Maryland SHSP. This would allow enough time for data collection to reflect changes in safety trends prompted by the LRSP, while still being a short enough time frame to ensure the document is being frequently improved upon. It is also important to contribute to meeting the target goals set by the SHSP to stay on track with safety goals and continue following State guidance to be a strong applicant for potential funding.

Future efforts include the facilitation of a stakeholder group to guide the implementation of the plan. The committee will be composed of members from across City agencies as well as MCDOT and MDOT SHA. The group should convene periodically to support the implementation of the plan and ensure that the LRSP remains actionable and relevant.

Evaluation of the LRSP will be in the form of process and outcomes. Process evaluation involves reviewing each numbered action under the strategies in the LRSP and determining if progress has been made. Outcome evaluation looks at the impact of activities. For some projects, such as site-specific projects, safety impact can be based on pre-construction and post-construction crash statistics. For other projects, it may be a combination of several activities that lead to a change in crash frequency. For example, a change in the frequency of impaired driving crashes may be a result of a combination of educational and enforcement initiatives. Therefore, because of the interrelationship between different safety activities, the City will use fatalities and injuries as the metric for annual progress in each of the emphasis areas. The City will consider other metrics if data allow. Changes in traffic volumes, crash severity, and characteristics of

crashes also provide meaningful insight into the effect of safety countermeasures. Further information on different performance measures and evaluation methods can be found in Part B of the Highway Safety Manual (HSM).

Funding Sources

Funding is critical to implement the strategies and action items in this LRSP and may come from a variety of sources: Federal, State, local, and the private sector. These include standard funding program mechanisms and grants as well as new initiative grants. Some potential sources of funding may include the following:

- **City Funding.** The City has various funding sources that can be used to improve and maintain roadways and perform other safety activities. Consideration of the LRSP strategies during the allocation of funding, especially for maintenance activities or other roadway improvement projects can support implementation of the LRSP.
- **Highway Safety Improvement Program (HSIP).** MDOT SHA manages the HSIP program. This core Federal-aid highway program funds projects and strategies that are data-driven, align with the State SHSP, and through implementation, help reduce traffic-related fatalities and serious injuries on all public roads. The HSIP supports advancing implementation of the Safe System Approach and LRSPs.
- **Safe Streets and Roads for All (SS4A).** The BIL established the SS4A discretionary program to fund planning, demonstration, and implementation projects. Funding supports regional, local, and Tribal initiatives through grants to prevent roadway deaths and serious injuries.
- **Federal NHTSA Grant Funding.** The Maryland HSO manages NHTSA grant funding that the State receives to support enforcement, education, and emergency response activities to improve driver behavior and reduce deaths and injuries from motor vehicle-related crashes.
- **FHWA Grants and Technical Assistance.** FHWA may make other funding available through grants to advance various safety activities. Other initiatives through FHWA that can provide resources to assist locals with LRSP activities include technical assistance.
- **MDOT SHA Transportation Alternatives.** This program awards grant funding to projects that enhance mobility and accessibility, as well as the cultural, aesthetic, historic, and environmental aspects of Maryland's transportation network. This program funds projects to create bicycle and pedestrian facilities, restore historic transportation buildings, convert abandoned railway corridors to pedestrian trails and mitigate highway runoff.
- **MDOT SHA Bikeways.** This program provides grant support for a wide range of bicycle network development activities. The program supports projects that maximize bicycle access and fill missing links in the State's bicycle system, focusing on connecting bicycle-friendly trails and roads and enhancing last-mile connections to work, school, shopping, and transit.
- **MWCOG Transportation Land-Use Connections Program.** This program provides short-term consultant services to local jurisdictions for small planning projects that promote mixed-use, walkable communities and support a variety of transportation alternatives.
- **MWCOG Regional Roadway Safety Program.** This program provides short-term consultant services to member jurisdictions or agencies to assist with planning or preliminary engineering projects that address roadway safety issues. Examples

include studies, planning, or design projects that will improve roadway safety and lead to a reduction in fatal and serious-injury crashes on the jurisdiction's roadways.

- **MWCOG Transit Within Reach Technical Assistance.** This program funds design and preliminary engineering projects to help improve bike and walk connections to existing high-capacity transit stations or stations that will be open to riders by 2030.

Implementation of Strategies and Action Items

Agency leads, potential funding sources, and priority for implementation have been provided for each item in the Strategy Toolbox. The implementation priority is ranked by the number of stars; more stars indicate a higher priority.

The strategies and actions in the LRSP can also link to the current and future updates of City-led programs. Bringing together the LRSP with these other plans and programs has the potential to reduce administrative burden, encourages the use of consistent data and analysis methods, and allocates resources to identified locations and programs that address the greatest safety needs in the City.

CITY OF
GAITHERSBURG

Local Road Safety Plan

Corridor Analyses

CITY OF GAITHERSBURG

Summer 2024

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1. Introduction

This supplement provides a summary of the analysis on crashes for a nine-year period from 2015 to 2023 along four City-maintained corridors in Gaithersburg, Maryland that were identified during the development of the City's Local Road Safety Plan (LRSP). Whereas the LRSP provides a high-level listing of strategies and actions for implementation in the years ahead, this supplement provides specific recommendations for key corridors. The four corridors are located on the high injury network identified in the LRSP and highlighted in Figure 1 and listed below.

- Russell Avenue (from Watkins Mill Road to East Diamond Avenue)
- Kentlands Boulevard (from Quince Orchard Road to Great Seneca Highway)
- East Diamond Avenue (from Chestnut Street to Washington Grove Lane/Railroad Street
- South and North Summit Avenue (from MD 355 to Park Avenue)

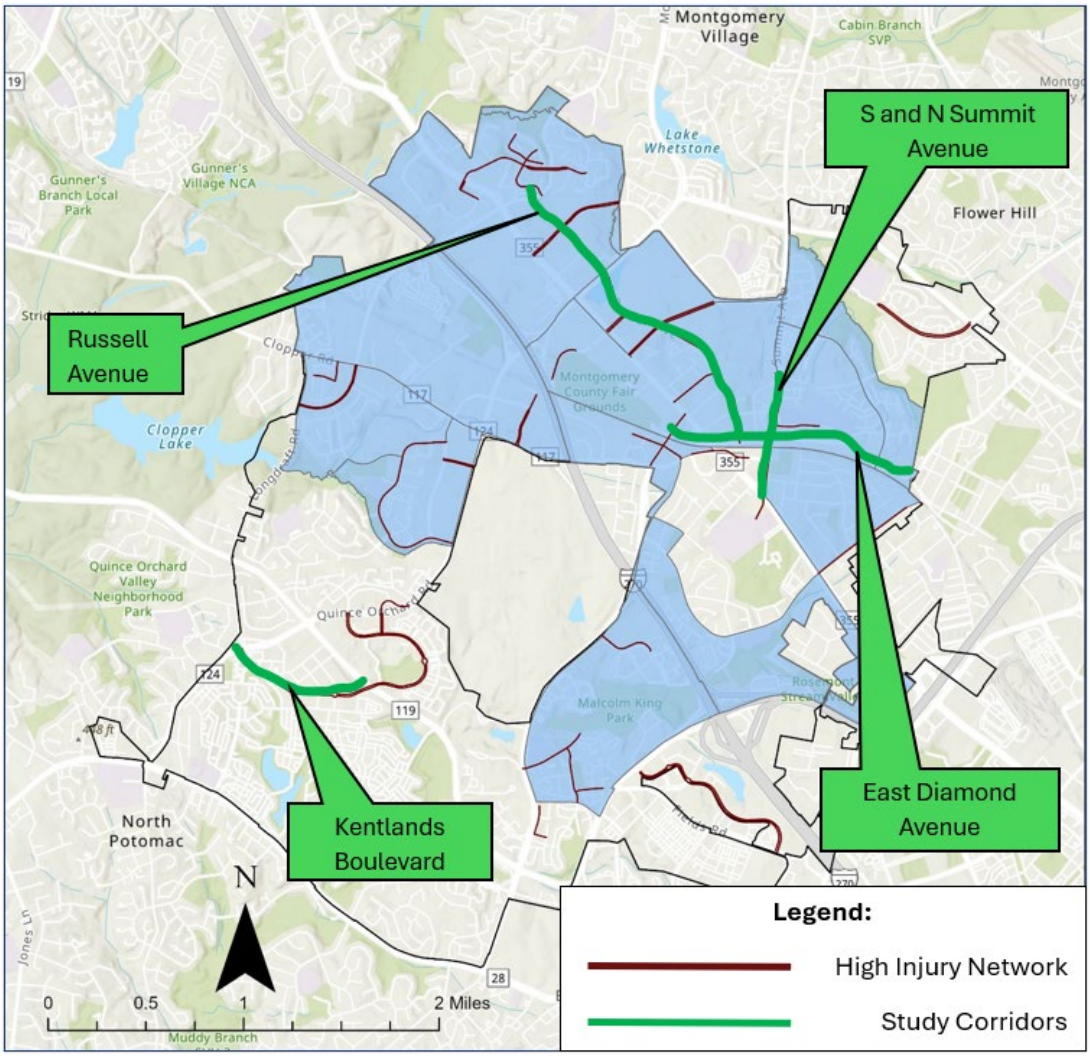

Figure 1: Study Corridors

This analysis in this supplement highlights the following parameters of the crash data:

- Key crash factors
- Key locations, key intersections and key segments
- Heat maps
- Potential treatments and locations

A summary of all crashes by severity along the study corridors can be seen in Table 1, Figure 2 and Figure 3.

Table 1: All Crashes along Study Corridors

Corridor	KAB Total	Total Crashes
E DIAMOND AVENUE	16	108
KENTLANDS BOULEVARD	13	54
RUSSELL AVENUE	38	222
S AND N SUMMIT AVENUE	22	132
Total		516

K = Fatal, A = Serious Injury, B = Minor Injury

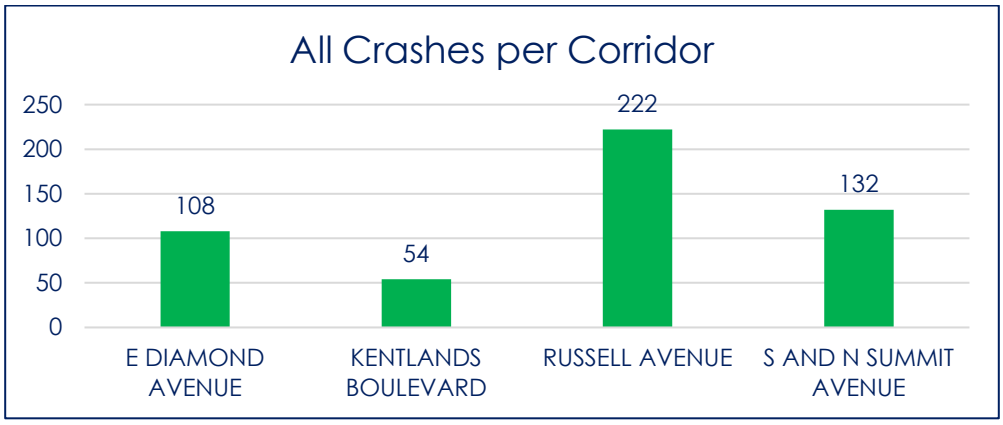

Figure 2: All Crashes along Study Corridor

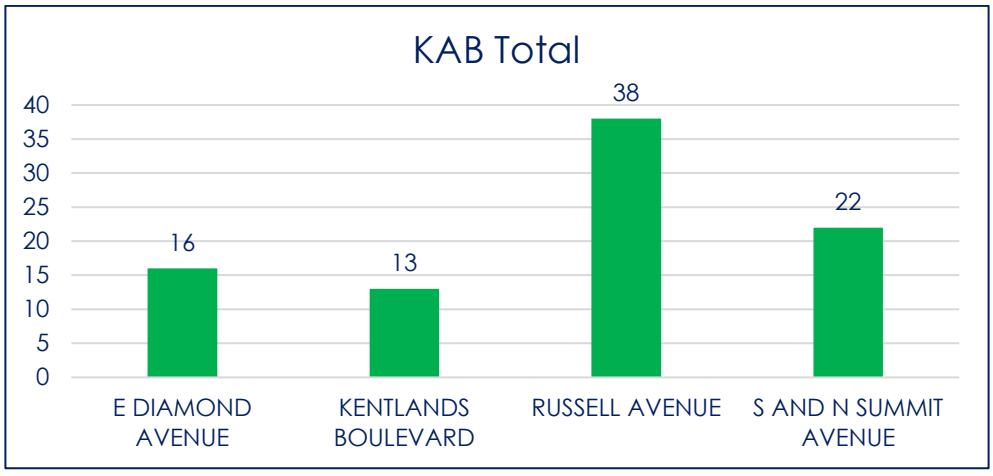

Figure 3: All KAB Crashes along Study Corridor

2. Russell Avenue (from Watkins Mill Road to E Diamond Avenue)

The location of the Russell Avenue corridor can be seen in Figure 4.

Figure 4: Russell Avenue Corridor

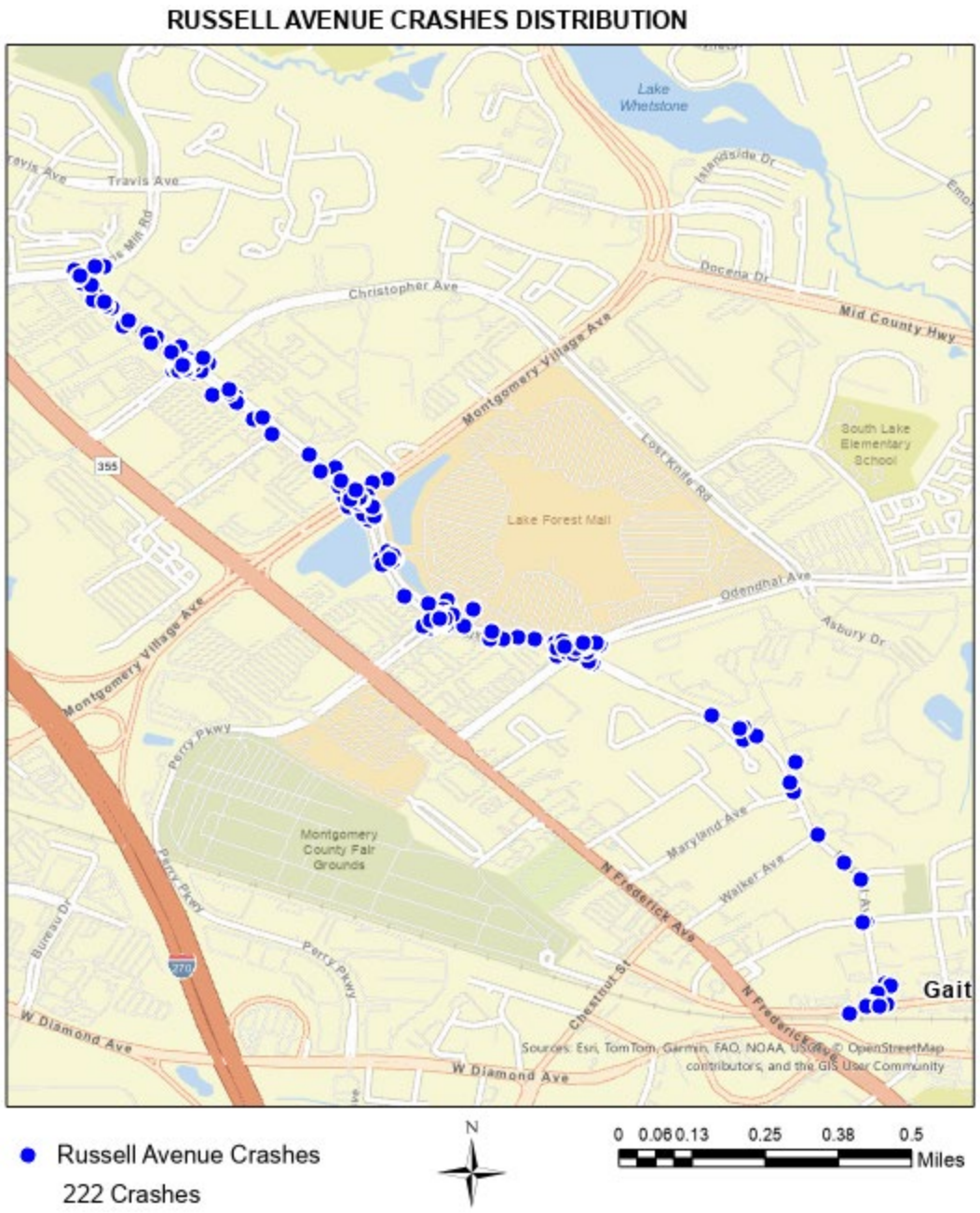

Figure 5: Crash Distribution along Russell Avenue

A geospatial distribution of crashes along Russell Avenue can be seen in Figure 5. A heat map indicating the key locations can be found in Figure 6. The figure also shows the locations of the serious- and minor-injury crashes.

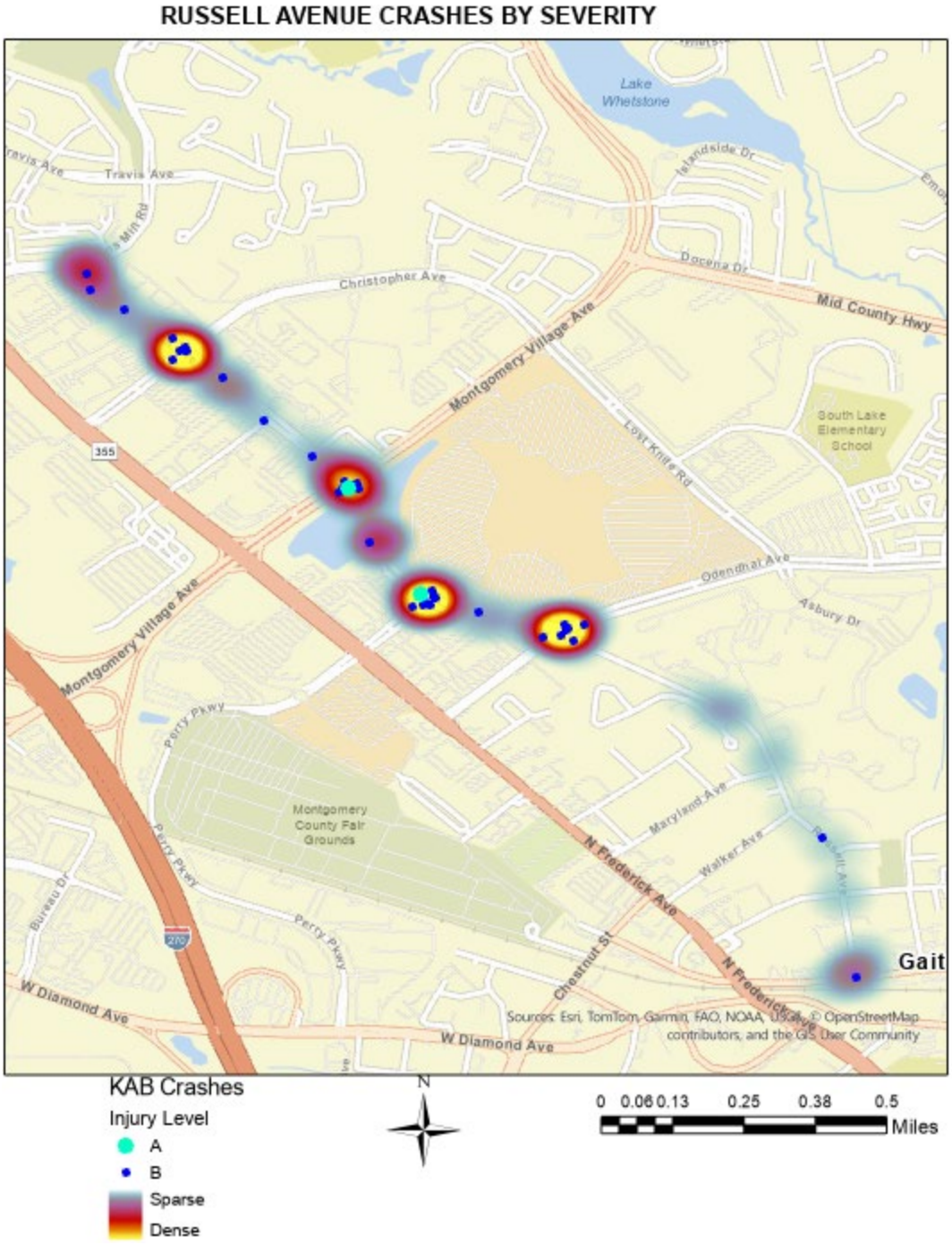

Figure 6: Crash Heat Map along Russell Avenue

A summary of crashes along Russell Avenue by severity and year of occurrence is presented in Table 2 and Figure 7. The figure shows a general decline in serious- and minor-injury crashes from 2016 to 2022.

Table 2: Russell Avenue Crashes by Year

Year	A	B	C	PD
2015	0	6	2	25
2016	0	7	5	14
2017	0	3	4	20
2018	0	5	4	22
2019	0	4	6	11
2020	0	4	5	15
2021	0	4	6	10
2022	1	0	8	16
2023	1	3	3	8

A = Serious Injury, B = Minor Injury, C = Possible Injury , PD = Property Damage

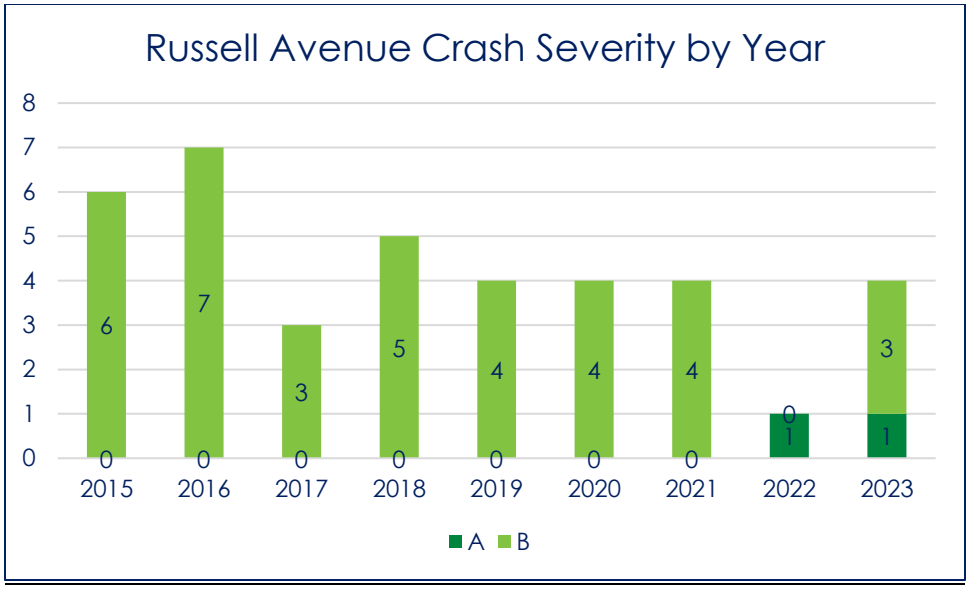

Figure 7: Russell Avenue Crashes by Severity and Year

A summary of crashes along Russell Avenue by severity and month of occurrence is presented in Table 3 and Figure 8. The figure shows a general seasonal pattern in which most of the serious- and minor-injury crashes occur in the months of July through September- typically, summer.

Table 3: Russell Avenue Crashes by Severity and Month

Month	K	A	B	C	PD
Jan		0	4	4	11
Feb	0	0	3	5	10
March	0	1	1	1	13
April	0	1	1	2	5
May	0	0	3	4	11
June	0	0	2	4	11
July	0	0	6	5	12
Aug	0	0	4	1	13
Sept	0	0	5	3	13
Oct	0	0	3	3	9
Nov	0	0	1	1	18
Dec	0	0	3	10	15

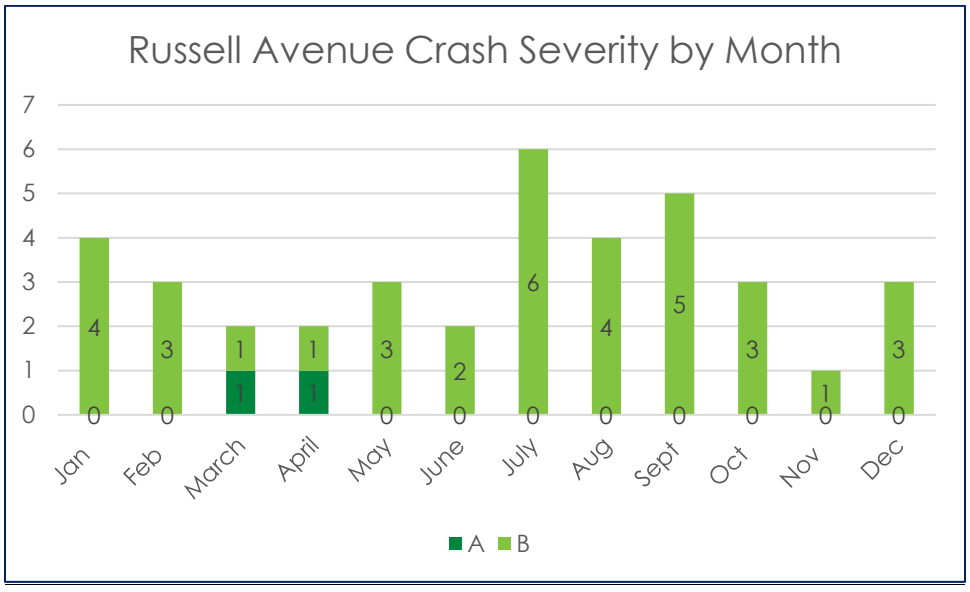

Figure 8: Russell Avenue Crashes by Severity and Month

A summary of crashes along Russell Avenue by severity and day of the week of occurrence is presented in Table 4 and Figure 9. Even though most of the minor-injury crashes occurred on Mondays and Tuesday, it can be depicted that the crash occurrence by day of the week is generally a random event.

Table 4: Russell Avenue Crashes by Severity and Day of Week

Day	K	A	B	C	PD
Monday	0	0	7	7	27
Tuesday	0	0	6	7	16
Wednesday	0	0	4	5	27
Thursday	0	0	5	6	15
Friday	0	1	4	8	22
Saturday	0	1	5	2	17
Sunday	0	0	5	8	17

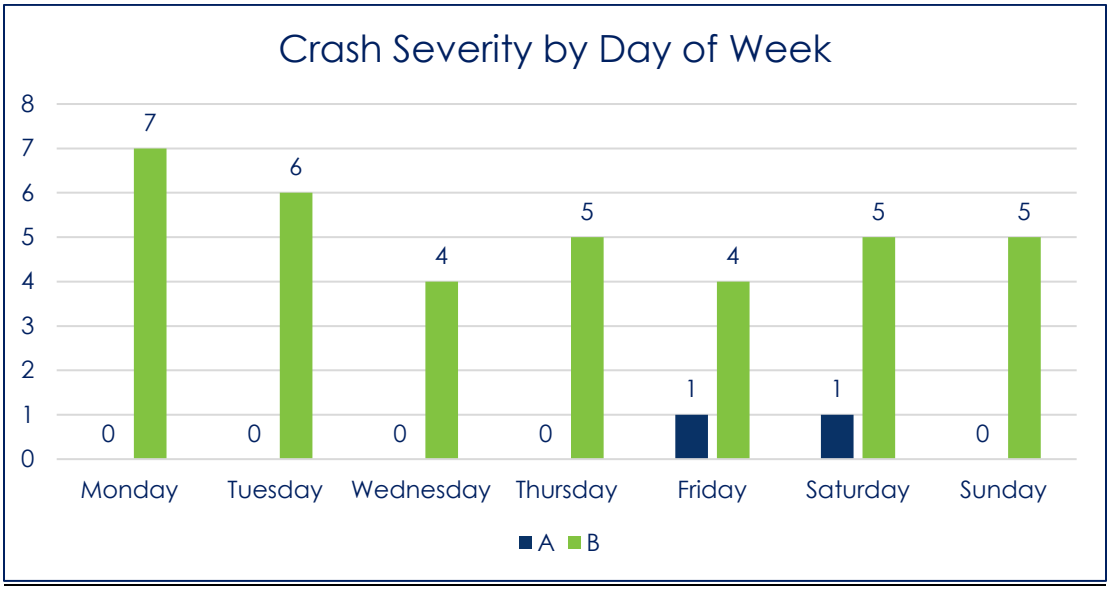

Figure 9: Russell Avenue Crashes by Severity and Day of Week

A summary of crashes along Russell Avenue by severity and time of occurrence is presented in Table 5 and Figure 10. The figure depicts a pattern in which most of the serious- and minor-injury crashes occur during midday peak and PM peak periods.

Table 5: Russell Avenue Crashes by Severity and Hour

Hour	K	A	B	C	PD
12:00 AM	0	0	0	0	2
1:00 AM	0	0	1	0	0
2:00 AM	0	0	0	0	1
3:00 AM	0	0	2	0	1
4:00 AM	0	0	1	0	0
5:00 AM	0	0	0	0	2
6:00 AM	0	0	0	0	1
7:00 AM	0	0	0	0	1
8:00 AM	0	0	1	1	2
9:00 AM	0	0	0	1	5
10:00 AM	0	0	2	2	6
11:00 AM	0	0	2	4	8
12:00 PM	0	2	2	3	12
1:00 PM	0	0	2	4	20
2:00 PM	0	0	3	6	9
3:00 PM	0	0	2	4	5
4:00 PM	0	0	2	8	13
5:00 PM	0	0	4	3	13
6:00 PM	0	0	4	4	18
7:00 PM	0	0	3	1	7
8:00 PM	0	0	2	0	6
9:00 PM	0	0	3	1	2
10:00 PM	0	0	0	1	5
11:00 PM	0	0	0	0	2

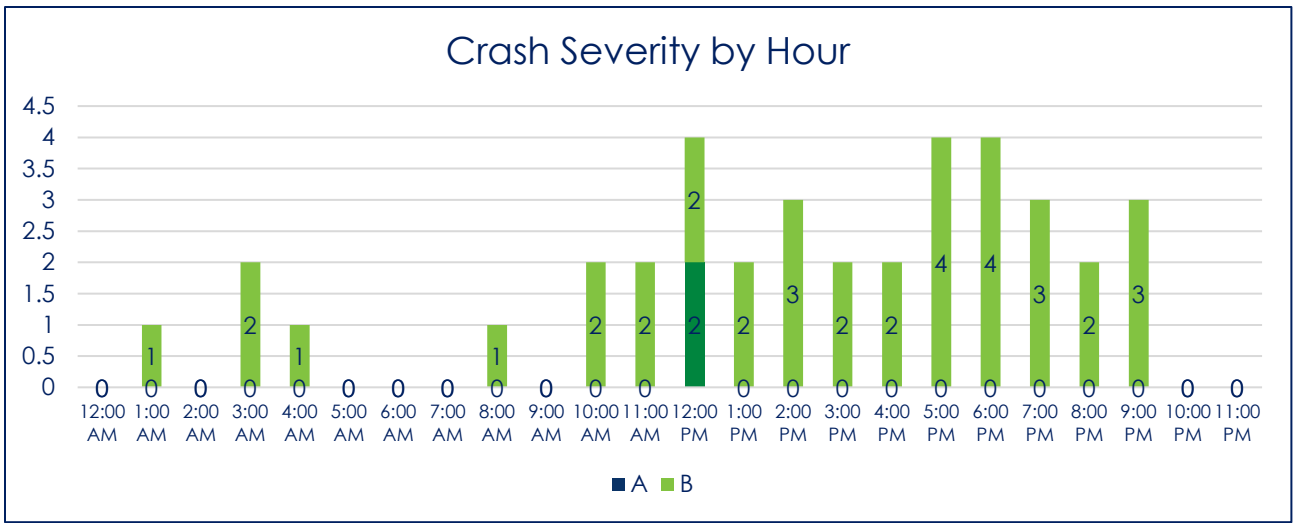

Figure 10: Russell Avenue Crashes by Severity and Hour

A summary of crashes along Russell Avenue by severity and type of collision is presented in Table 6 and Figure 11. From the figure, most of the serious- and minor-injury crashes are attributed to head-on left-turn, single-vehicle, and straight-movement angle crashes.

Table 6: Russell Avenue Crashes by Severity and Collision Type

Collision	A	B	C	PD	ABC Total
Opposite Dir Both Left Turn	0	0	0	2	0
Opposite-Direction Sideswipe	0	0	0	4	0
Same-Dir Rear End Right Turn	0	0	0	2	0
Same-Direction Left Turn	0	0	0	2	0
Unknown	0	0	0	1	0
Angle Meets Left Head On	0	0	1	0	1
Same-Direction Right Turn	0	0	1	2	1
Angle Meets Left Turn	0	0	2	3	2
Same-Direction Sideswipe	0	0	2	8	2
Same-Dir Rear End	0	0	8	16	8
Head On	0	1	0	1	1
Same-Dir Rear End Left Turn	0	1	0	3	1
Angle Meets Right Turn	0	1	1	3	2
Other	0	1	2	8	3
Straight Movement Angle	1	6	13	31	20
Single Vehicle	0	8	3	14	11
Head On Left Turn	1	18	10	41	29

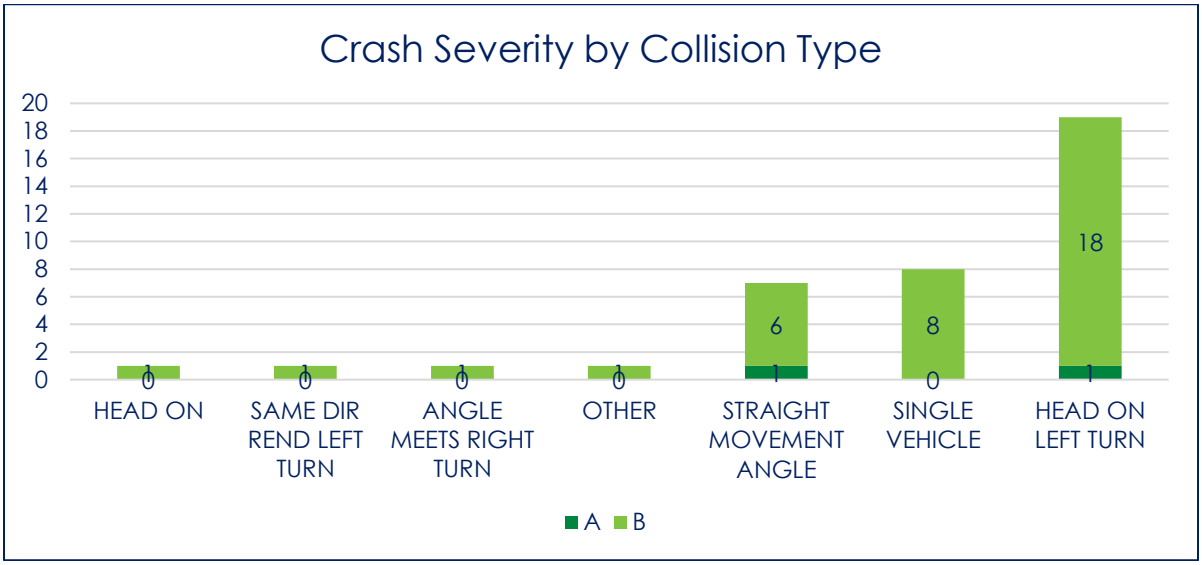

Figure 11: Russell Avenue Crashes by Severity and Collision Type

A summary of crashes involving pedestrians and bicyclists is presented in Table 7 and Figure 12. As shown, one crash involved a pedestrian with minor injury.

Table 7: Russell Avenue Pedestrian and Bicycle Crashes

	B	C	PD	Total
BICYCLIST	0	0	1	1
PEDESTRIAN	1	2	0	3

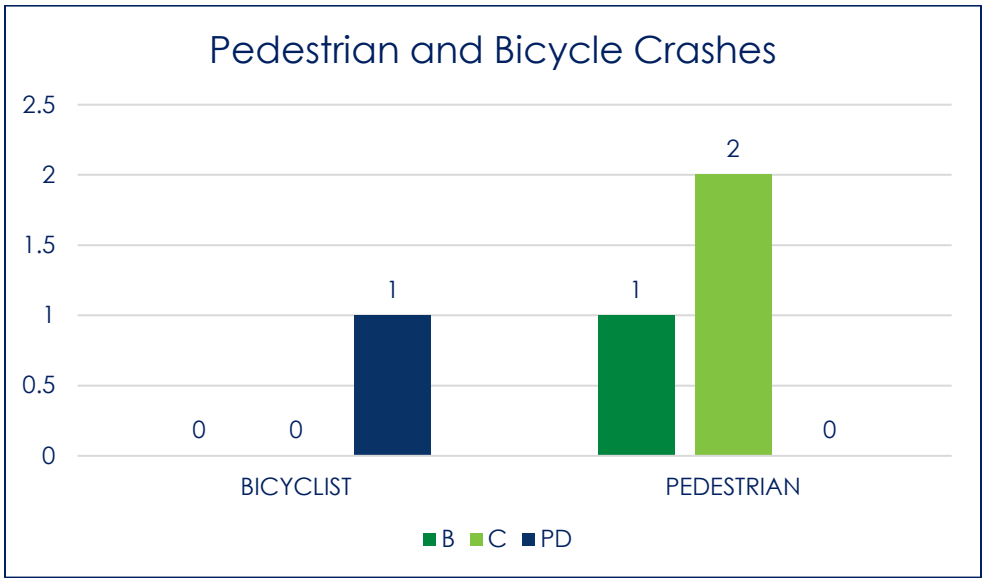

Figure 12: Russell Avenue Bicycle and Pedestrian Crashes

A summary of crashes by junction type is presented in Table 8 and Figure 13. As shown, the majority of the serious- and minor-injury crashes occurred at an intersection.

Table 8: Russell Avenue Junction Related Crashes

Junction	A	B	C	PD
Commercial Driveway	0	1	2	10
Crossover Related	0	0	0	1
Interchange Related	0	0	0	2
Intersection	2	24	27	93
Intersection Related	0	1	6	11
Non-Intersection	0	6	4	13
Other	0	1	0	1

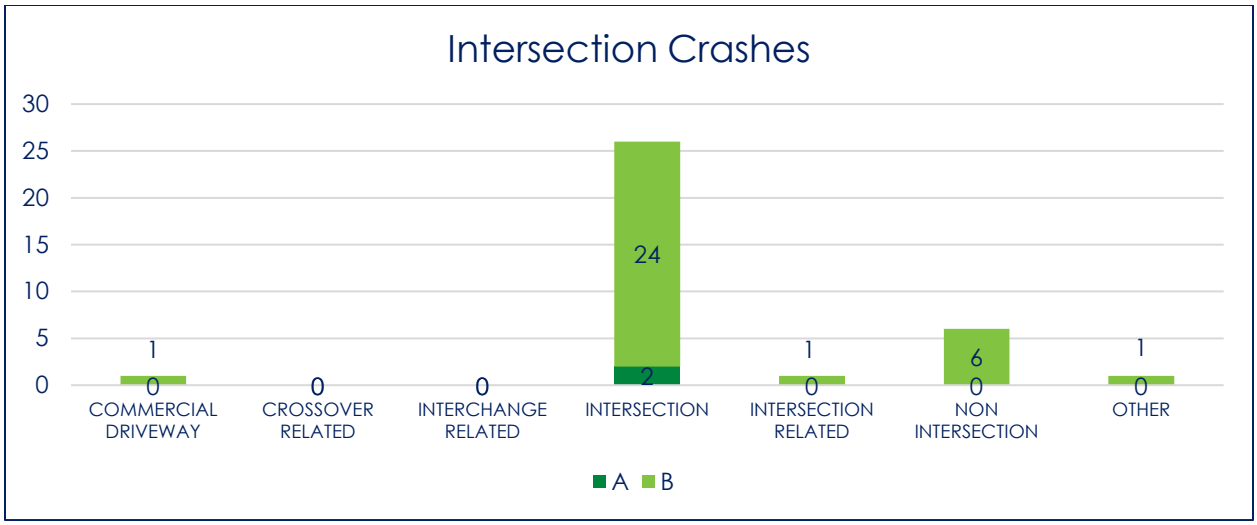

Figure 13: Russell Avenue Junction Related Crashes

A summary of crashes by severity and weather is presented in Table 9 and Figure 14. As shown, the majority of the serious- and minor-injury crashes occurred during clear weather periods.

Table 9: Russell Avenue Crash Severity by Weather

Weather	A	B	C	PD
Clear	2	27	31	85
Cloudy	0	3	8	19
Raining	0	3	2	27
Snow	0	1	0	0

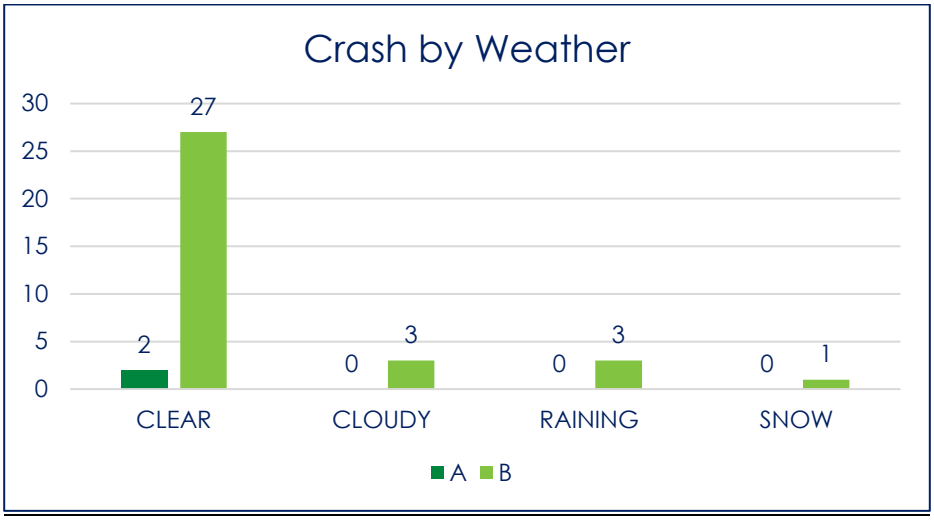

Figure 14: Russell Avenue Crash by Weather

A summary of crashes by severity and pavement surface condition is presented in Table 10 and Figure 15. As shown, the majority of the serious- and minor-injury crashes occurred during a dry pavement surface. About 5 crashes and 1 crash with minor injury occurred on a wet and snowy pavement surface respectively.

Table 10: Russell Avenue Crashes by Surface Condition

Surface Condition	A	B	C	PD
Dry	2	27	38	102
Ice	0	0	0	1
Snow	0	1	0	0
Unknown	0	0	0	1
Wet	0	5	4	34

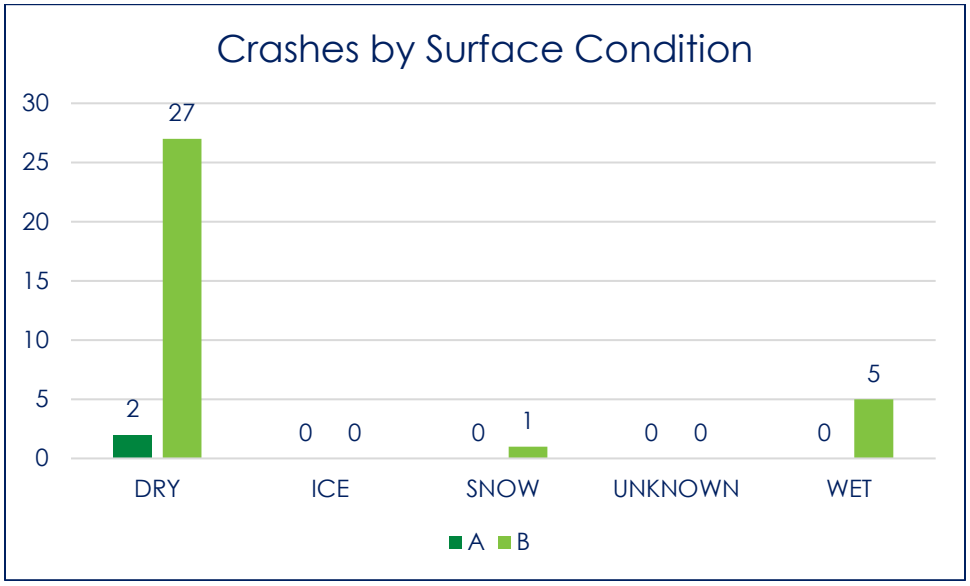

Figure 15: Russell Avenue Crashes by Surface Condition

Table 11: Summary of Key Locations and Recommended improvements along Russell Avenue

No.	Key Locations	Control type	Improvement recommendations	Link
1	Intersection of Russell Avenue and Watkins Mill Road	Minor-road stop control	• High-visibility raised crosswalk with ADA-compliant ramps • Conduct a signal warrant analysis • Conduct a PHB warrant analysis • Conduct an RRFB warrant analysis • Install pavement markings with lane configurations	Map
2	Intersection of Russell Avenue and Christopher Avenue	Signalized	• Install ADA-compliant ramps • Restrict RTOR (all approaches) • Install pavement markings with lane configurations • Remove channelized right turn to tighten the curves and force slower speed for turning vehicles.	Map
3	Intersection of Russell Avenue and Montgomery Village Avenue	Signalized	• Restrict RTOR (all approaches) • Install pavement markings with lane configurations • Overall signage improvements and backplates	Map
4	Intersection of Russell Avenue and Lake Forest Boulevard	Signalized	• High-visibility raised crosswalk with ADA-compliant ramps • Restrict RTOR (all approaches) • Install pedestrian refuge in the median • Install APS on pedestrian refuge island • Install pavement markings with lane configurations • Tighten right-turn curves	Map
5	Intersection of Russell Avenue and Odendhal Avenue	Signalized	• High-visibility raised crosswalks with ADA-compliant ramps • Remove right-turn channels and tighten right-turn curves • Restrict RTOR (all approaches) • Install pavement markings with lane re-configuration and improved signage • Extend left-turn storage lane on the southbound Russell Avenue • Median extensions to reduce speed of turning vehicles	Map
6	Intersection of Russell Avenue and E Diamond Avenue	Minor-road stop control	• High-visibility raised crosswalk with ADA-compliant ramps • Conduct a signal, PHB and RRFB warrant analysis • Overall signage improvement • Conduct an AWS warrant analysis	Map

			• Conduct an RRFB warrant analysis • Install pavement marking with lane configuration	

3. KENTLANDS BOULEVARD (FROM QUINCE ORCHARD ROAD TO GREAT SENECA HIGHWAY)

The location of the Kentlands Boulevard corridor can be seen in Figure 16.

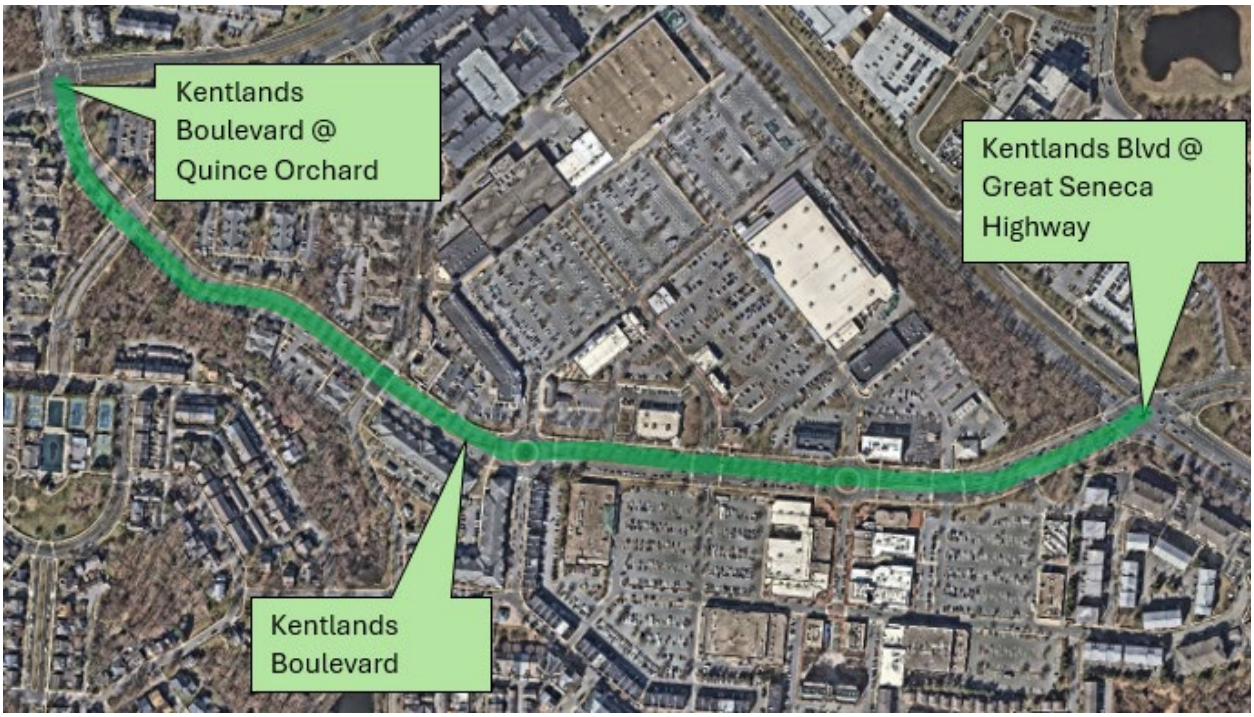

Figure 16: Kentlands Boulevard Corridor

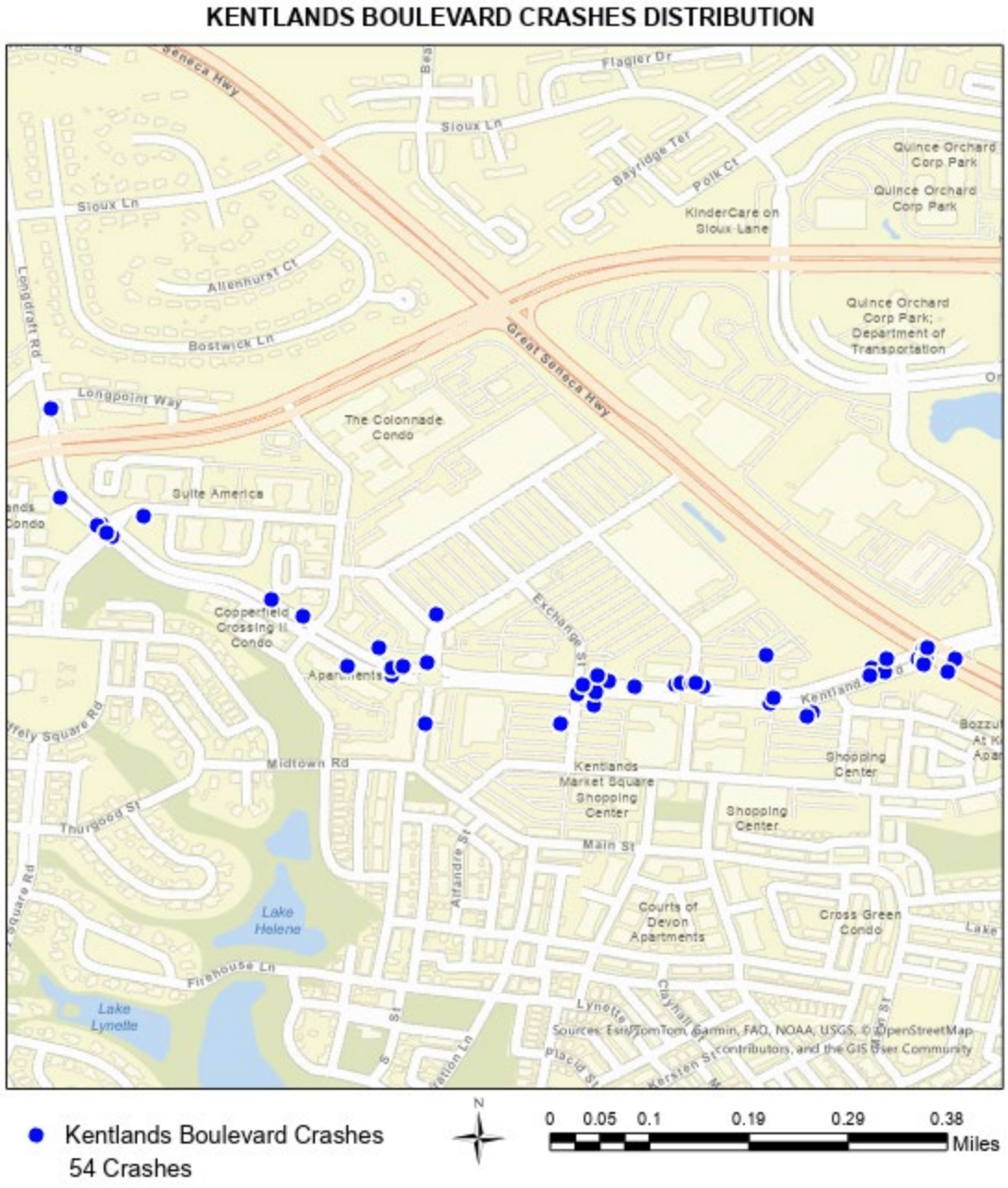

Figure 17: Crash Distribution along Kentlands Boulevard

A geospatial distribution of crashes along Kentlands Boulevard can be seen in Figure 17. A heat map indicating the key locations can be found in Figure 18. The figure also shows the locations of the serious- and minor-injury crashes along Kentlands Boulevard.

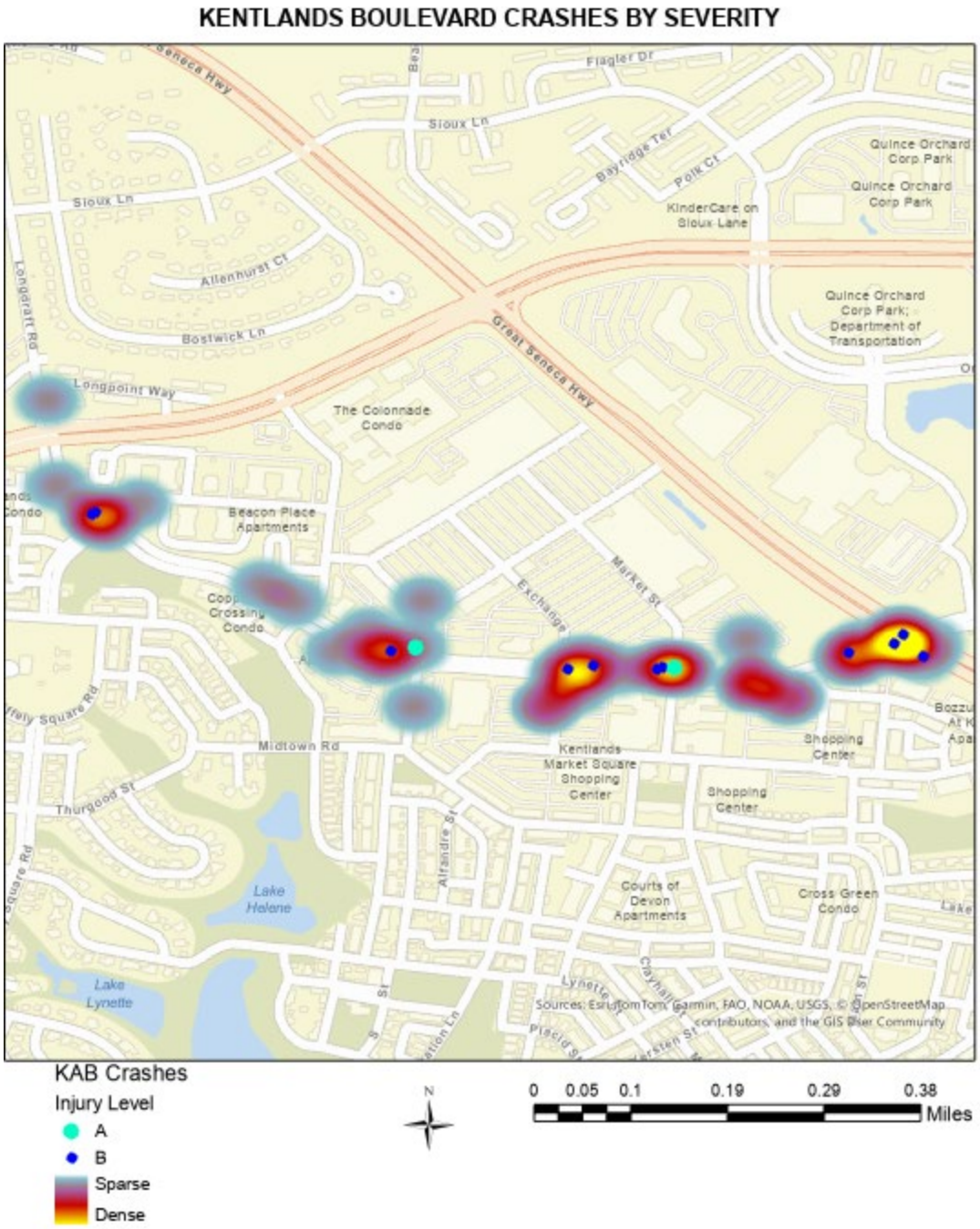

Figure 18: Crash Heat Map along Kentlands Boulevard

A summary of crashes along Kentlands Boulevard by severity and year of occurrence is presented in Table 12 and Figure 19. The figure depicts a random pattern of serious- and minor-injury crash events over this period.

Table 12: Kentlands Boulevard Crashes by Severity and Year

Year	A	B	C	PD
2015	0	2	2	4
2016	0	3	0	3
2017	1	0	2	6
2018	0	0	1	1
2019	0	1	1	2
2020	0	2	2	0
2021	1	1	1	4
2022	0	1	0	8
2023	0	1	0	4

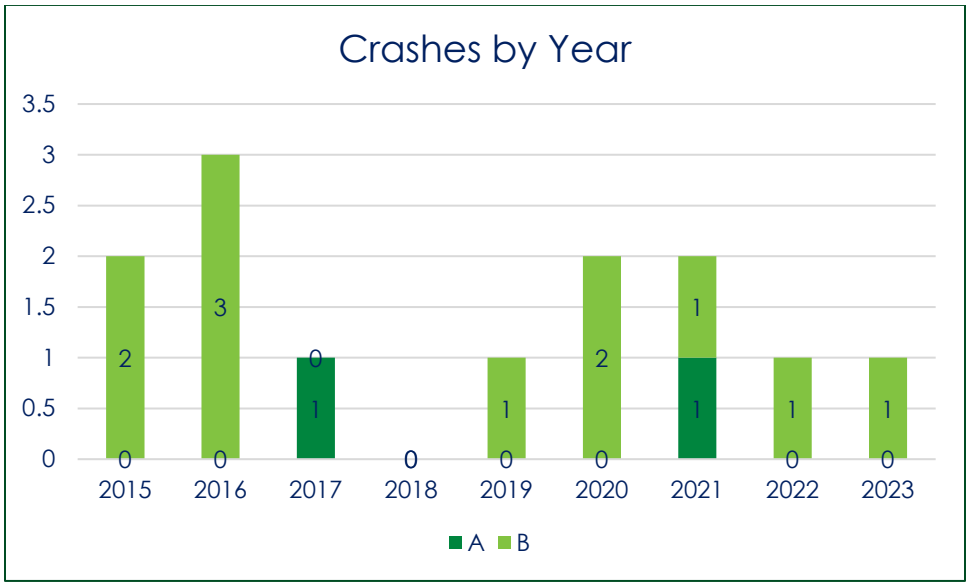

Figure 19: Kentlands Boulevard Crashes by Severity and Year

A summary of crashes along Kentlands Boulevard by severity and month of occurrence is presented in Table 13 and Figure 20. The figure depicts a random pattern of serious- and minor-injury crash events from month to month.

Table 13: Kentlands Boulevard Crashes by Severity and Month

Month	A	B	C	PD
Jan	0	4	2	1
Feb	0	0	0	3
March	0	3	2	2
April	0	0	0	5
May	0	0	0	1
June	0	1	1	2
July	1	0	0	2
Aug	0	3	0	3
Sept	0	0	1	1
Oct	0	0	0	5
Nov	1	0	1	3
Dec	0	0	2	4

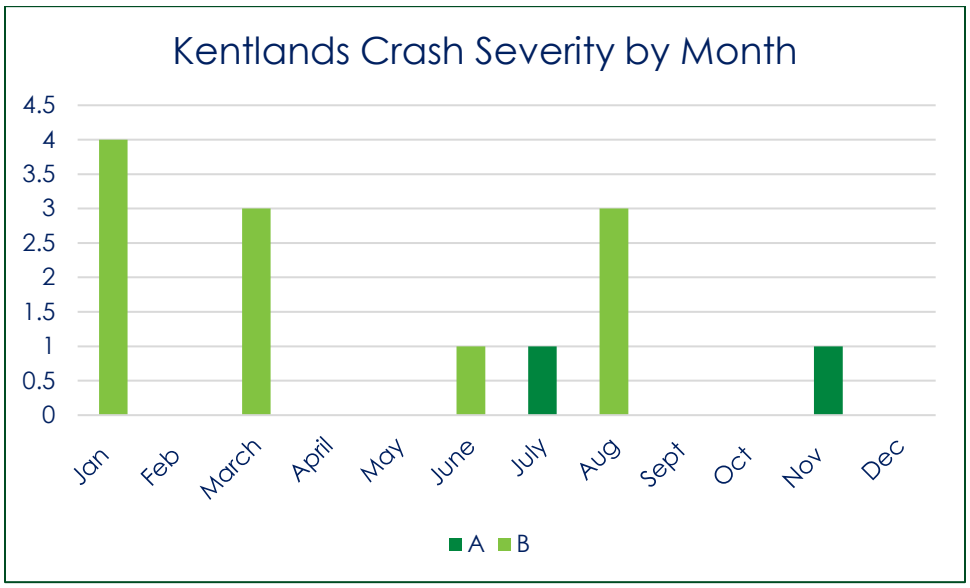

Figure 20: Kentlands Boulevard Crashes by Severity and Month

A summary of crashes along Kentlands Boulevard by severity and day of the week of occurrence is presented in Table 14 and Figure 21. From the figure, the crash occurrence by day of the week is generally a random event.

Table 14: Kentlands Boulevard Crashes by Severity and Day of Week

Day	A	B	C	PD
Monday	0	2	0	1
Tuesday	0	3	2	5
Wednesday	1	2	1	2
Thursday	0	0	3	8
Friday	0	2	2	5
Saturday	0	2	0	6
Sunday	1	0	1	5

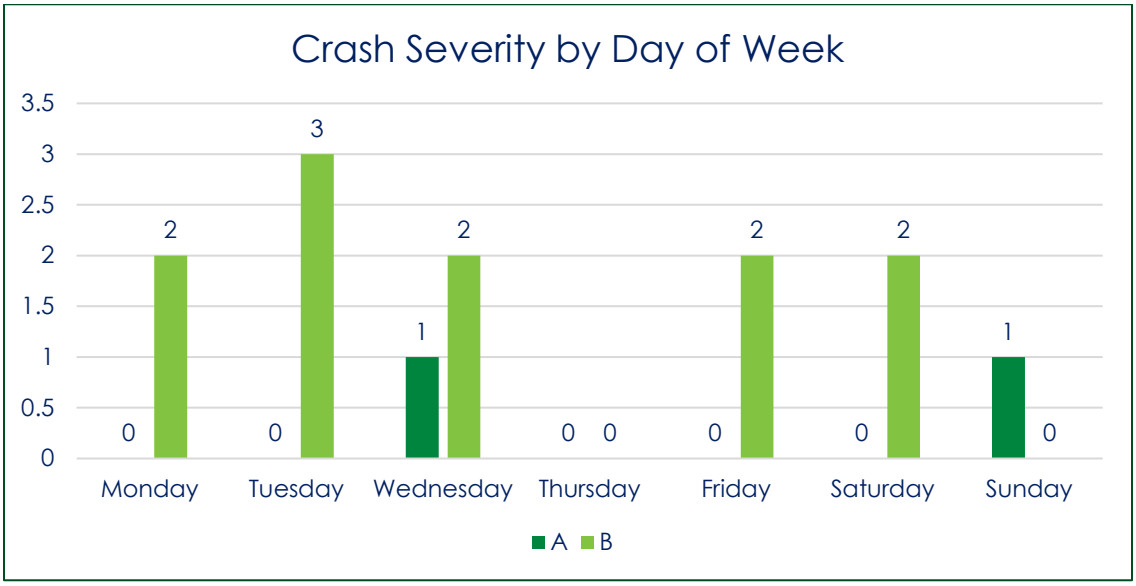

Figure 21: Kentlands Boulevard Crashes by Severity and Day of Week

A summary of crashes along Kentlands Boulevard by severity and time of occurrence is presented in Table 15 and Figure 22. The figure depicts a pattern in which most of the serious- and minor-injury crashes occur during midday peak and PM peak periods.

Table 15: Kentlands Boulevard Crashes by Severity and Hour

Hour	A	B	C	PD
12:00 AM	0	0	0	0
1:00 AM	0	0	0	0
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	0	0
6:00 AM	0	0	0	0
7:00 AM	0	0	0	1
8:00 AM	0	1	1	0
9:00 AM	0	0	0	1
10:00 AM	0	0	0	1
11:00 AM	0	0	0	2
12:00 PM	0	2	0	1
1:00 PM	1	0	0	2
2:00 PM	0	1	3	2
3:00 PM	0	1	1	0
4:00 PM	0	1	1	3
5:00 PM	0	0	0	6
6:00 PM	0	3	3	7
7:00 PM	1	0	0	2
8:00 PM	0	2	0	2
9:00 PM	0	0	0	2
10:00 PM	0	0	0	0
11:00 PM	0	0	0	0

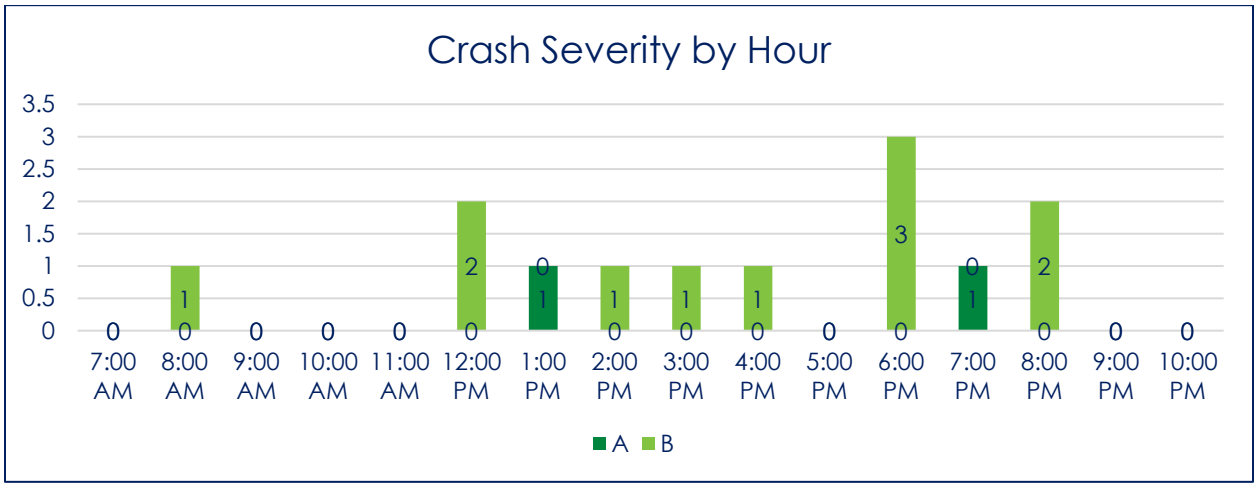

Figure 22: Kentlands Boulevard Crashes by Severity and Hour

A summary of crashes along Kentlands Boulevard by severity and type of collision is presented in Table 16 and Figure 23. From the figure, most of the serious- and minor-injury crashes are attributed to straight-movement angle, single-vehicle, and same-direction rear-end crashes.

Table 16:Kentlands Boulevard Crashes by Severity and Collision Type

Collision	A	B	C	PD	KAB Total
Angle Meets Left Turn	0	0	0	1	0
Same-Direction Right Turn	0	0	0	3	0
Head On Left Turn	0	1	1	8	1
Same-Direction Sideswipe	0	1	0	2	1
Other	1	1	0	2	2
Same-Dir Rear End	0	2	2	7	2
Single Vehicle	1	1	1	1	2
Straight Movement Angle	0	5	4	8	5

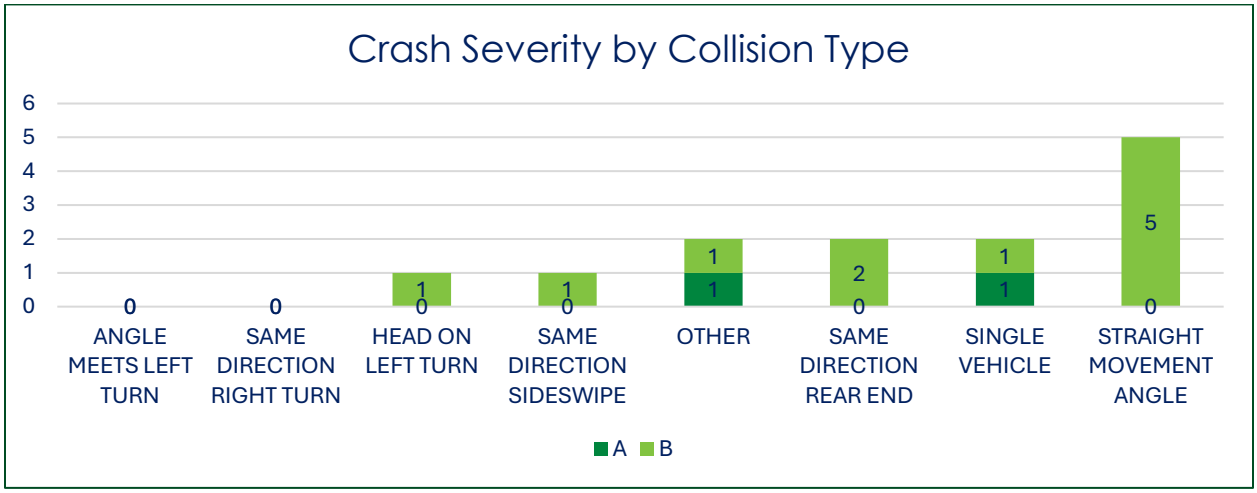

Figure 23: Kentlands Boulevard Crashes by Severity and Collision Type

A summary of crashes involving pedestrians and bicyclists is presented in Table 17 and Figure 24. As shown, there was one severe injury involving a bicyclist and three minor-injury crashes involving two pedestrians and one bicyclist.

Table 17: Pedestrian and Bicycles Crashes along Kentlands Boulevard

	A	B	C	PD	Total
BICYCLIST	1	1	0	0	1
PEDESTRIAN	0	2	2	0	4

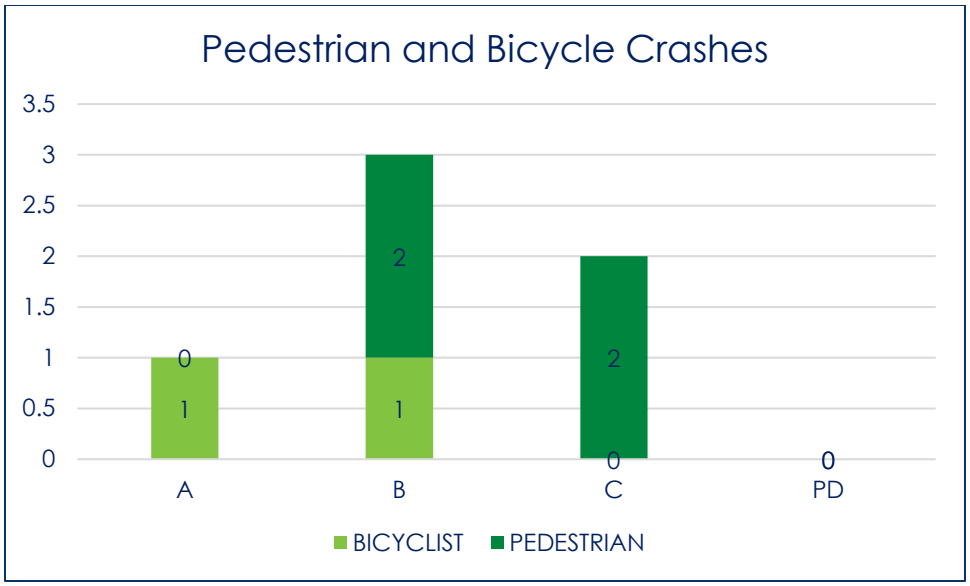

Figure 24: Pedestrian and Bicycles Crashes along Kentlands Boulevard

A summary of crashes by junction type is presented in Table 18 and Figure 25. As shown, the majority of the serious- and minor-injury crashes occurred at an intersection.

Table 18: Junction Crashes along Kentlands Boulevard

Junction	A	B	C	PD
Intersection	2	8	5	21
Intersection Related	0	1	3	2
Non-Intersection	0	2	0	3
Other	0	0	0	4

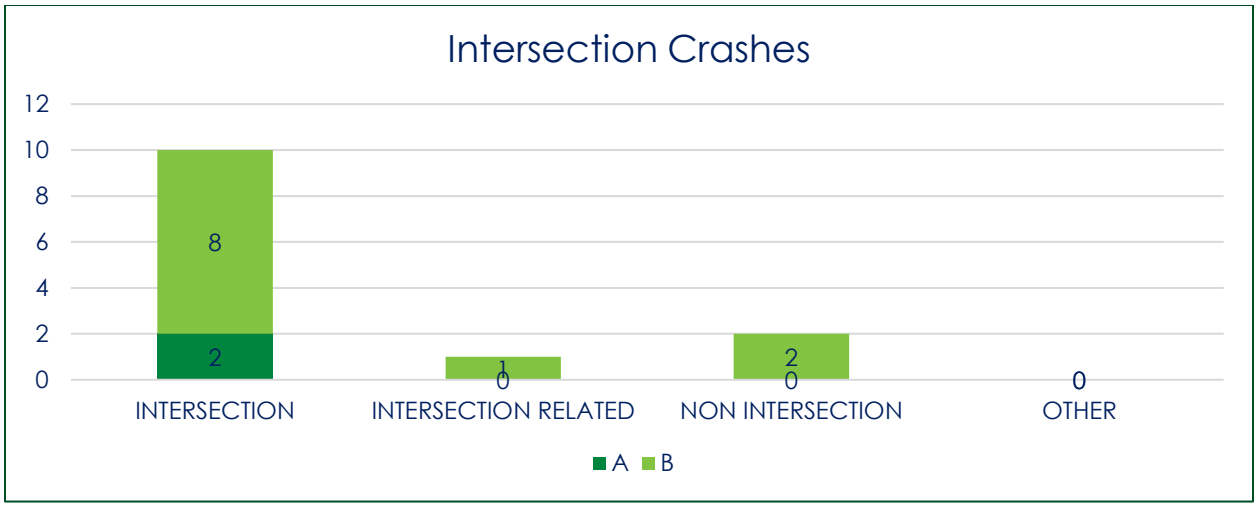

Figure 25: Junction Crashes long Kentlands Boulevard

A summary of crashes by severity and weather is presented in Table 19 and Figure 26. As shown, the majority of the serious- and minor-injury crashes occurred during clear weather periods.

Table 19: Crashes by Weather along Kentlands Boulevard

Weather	A	B	C	PD
Clear	1	7	5	19
Cloudy	0	1	1	2
Raining	1	2	1	4

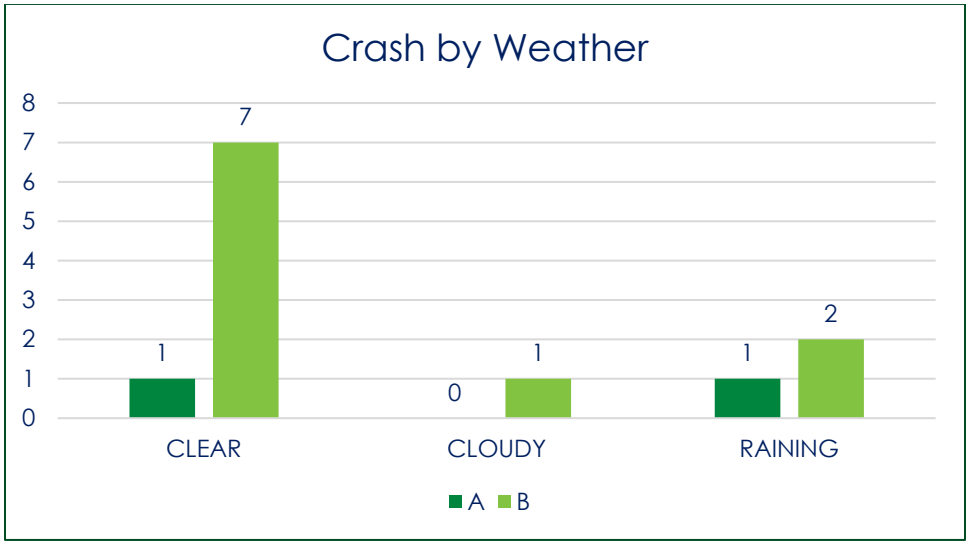

Figure 26: Crashes by Weather along Kentlands Boulevard

A summary of crashes by severity and pavement surface condition is presented in Table 20 and Figure 27. As shown, about 69% of serious- and minor-injury crashes occurred during a dry pavement surface condition with the rest occurring during wet pavement surface condition.

Table 20: Crashes by Surface Condition along Kentlands Boulevard

Surface Condition	A	B	C	PD
Dry	1	8	7	26
Wet	1	3	2	4

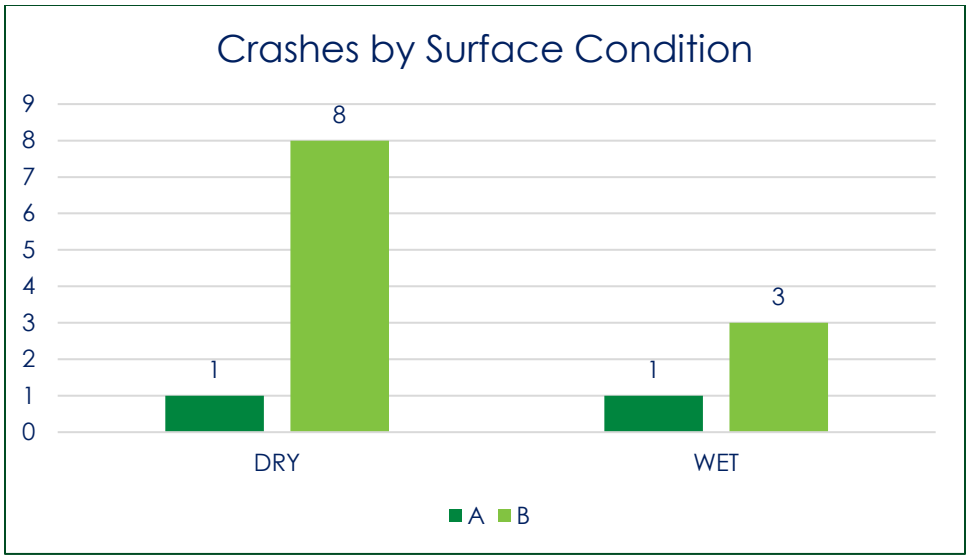

Figure 27: Crashes by Surface Condition along Kentlands Boulevard

Table 21: Summary of Key Locations and Improvement recommendations along Kentlands Boulevard

No.	Key Locations	Control Type	Improvement recommendations	Link
1	Intersection of Kentlands Boulevard and Beacon Square Court/Tschiffely Square Road	All-way stop control	• Conduct a warrant analysis for PHB and RRFB installation • Overall signage improvement • Install ADA-compliant ramps at all existing crosswalks	Map
2	Roundabout of Kentlands Boulevard and Main Street	Roundabout	• Overall signage improvement with advance warning signs for roundabout at all approaches • Install ADA-compliant ramps at all existing crosswalks • Conduct a warrant analysis for PHB and RRFB • General pavement marking improvement with lane configuration	Map
3	Intersection of Kentlands Boulevard and Kentlands Place	All-way stop control	• Overall signage improvement • Conduct a warrant analysis for signal, PHB and RRFB • Improvement pavement markings with lane configurations	Map
4	Roundabout of Kentlands Boulevard and Market Street	Roundabout	• Overall signage improvement with advance warning signs for roundabout at all approaches • Install ADA-compliant ramps at all existing crosswalks • Conduct a warrant analysis for PHB and RRFB	Map
5	Intersection of Kentlands Boulevard and Orchard Ridge Drive/Great Seneca Highway	Signalized	• Install ADA-compliant ramps • Restrict RTOR (all approaches) • Install pavement markings with lane configurations	Map

4. East Diamond Avenue (from Chestnut Street to Washington Grove Lane/Railroad Street

The location of the East Diamond Avenue corridor can be seen in Figure 28.

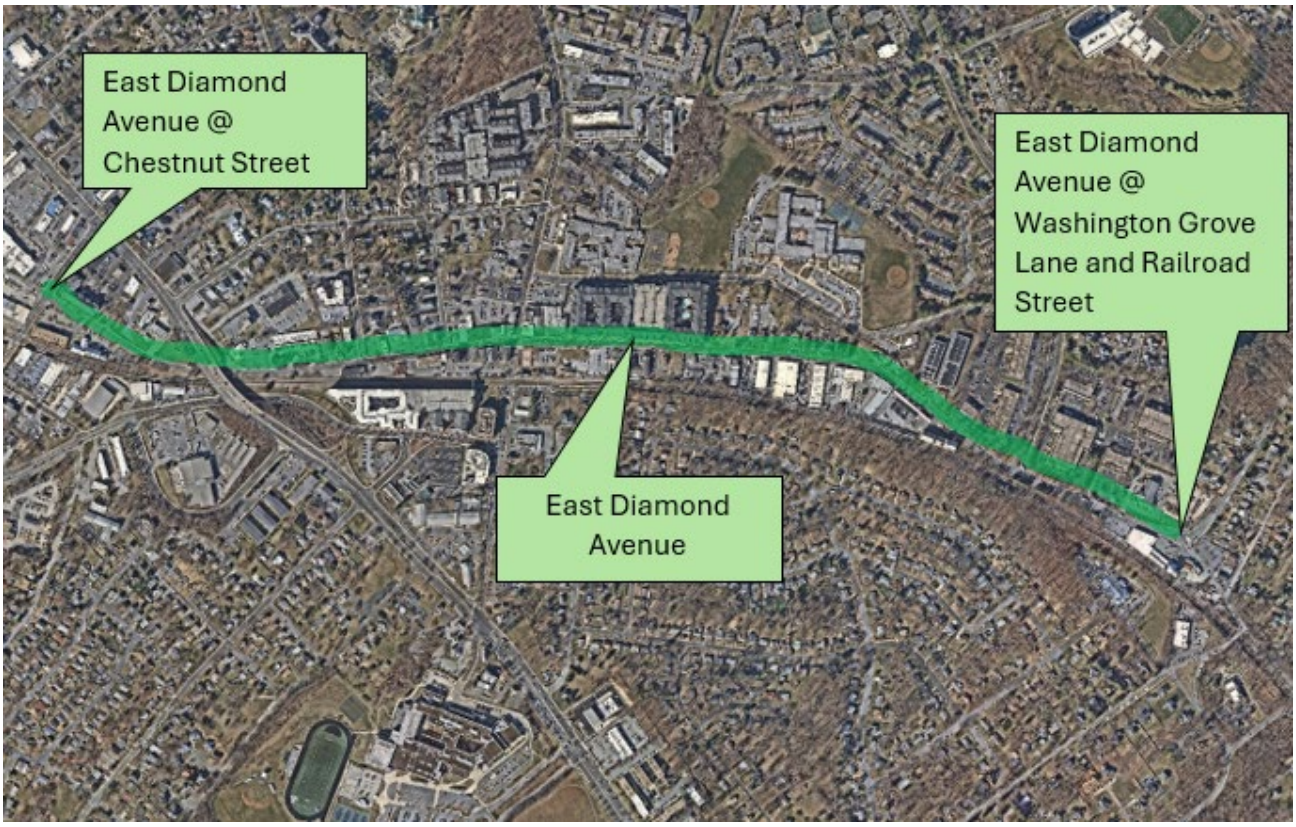

Figure 28: East Diamond Avenue Corridor

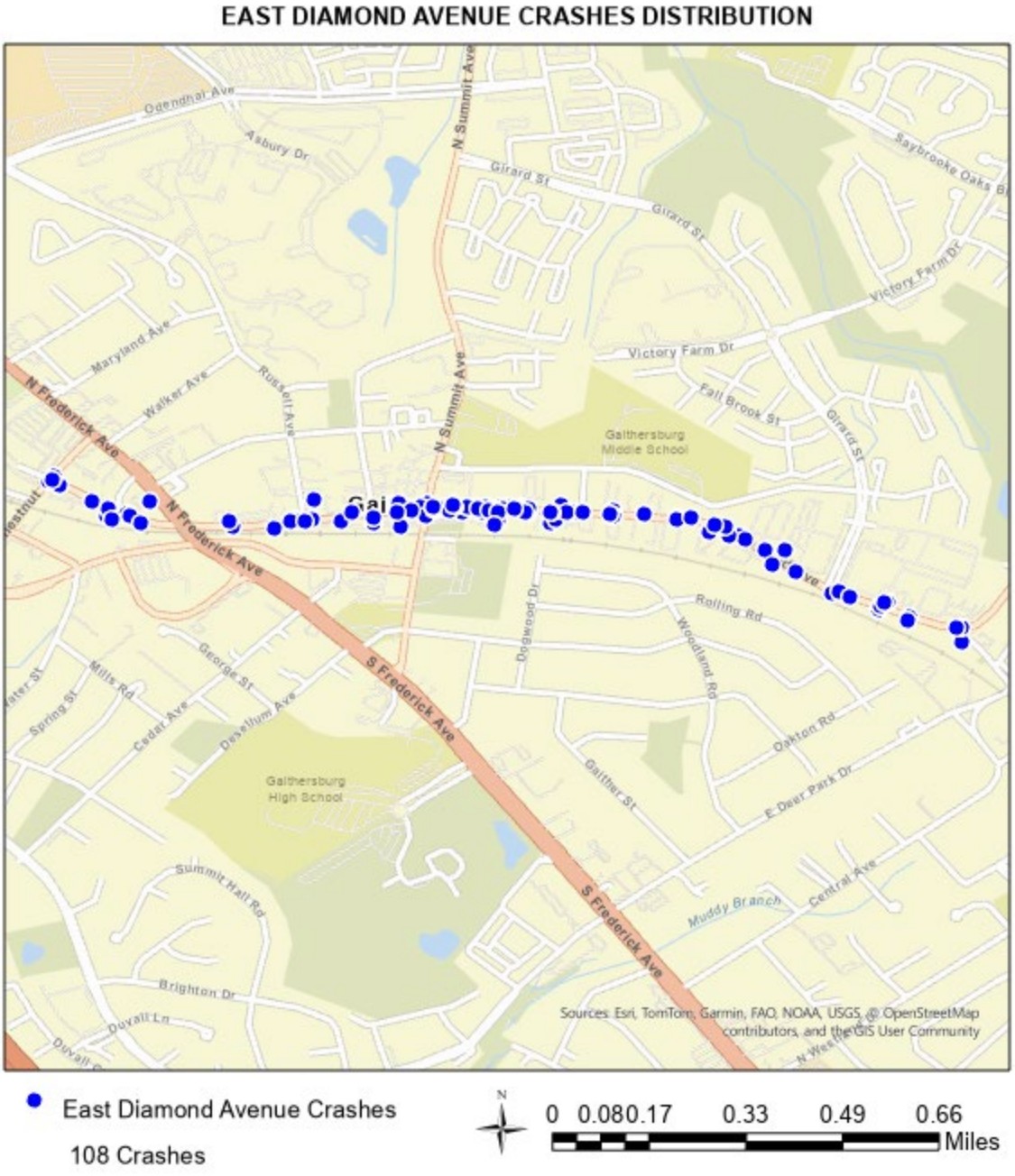

Figure 29: Crash Distribution along East Diamond Avenue

A geospatial distribution of crashes along East Diamond Avenue can be seen in Figure 29. A heat map indicating the key locations can be found in Figure 30. The figure also shows the locations of the serious- and minor-injury crashes.

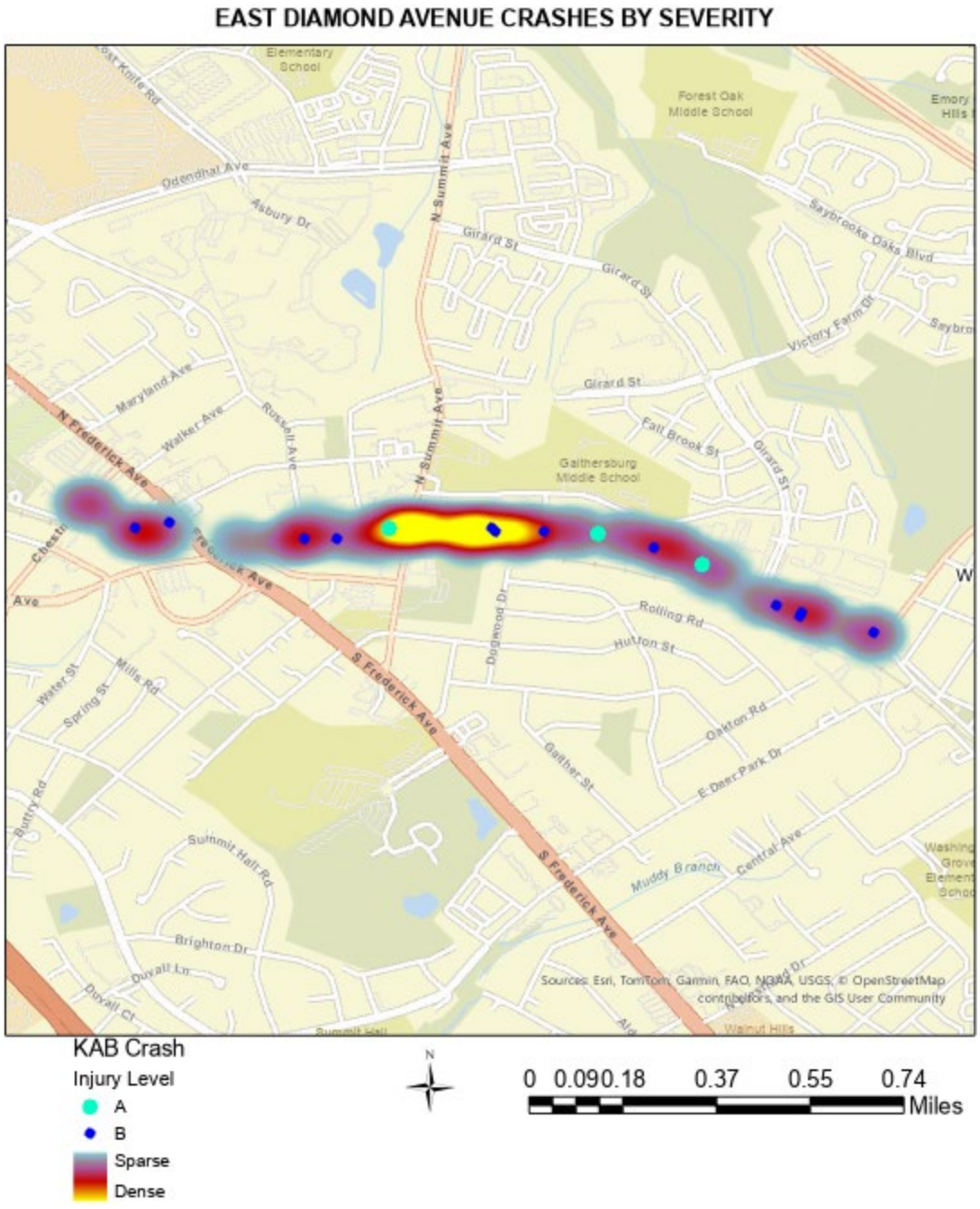

Figure 30: Crash Heat Map along East Diamond Avenue

A summary of crashes along East Diamond Avenue by severity and year of occurrence is presented in Table 22 and Figure 31. The figure shows a general decline in serious- and minor-injury crashes from 2017 to 2021.

Table 22: East Diamond Avenue Crashes by Severity and Year

Year	A	B	C	PD
2015	0	0	1	8
2016	0	3	2	9
2017	0	4	4	7
2018	0	2	4	11
2019	0	1	2	6
2020	0	1	0	11
2021	1	0	0	7
2022	1	1	2	9
2023	2	0	5	4

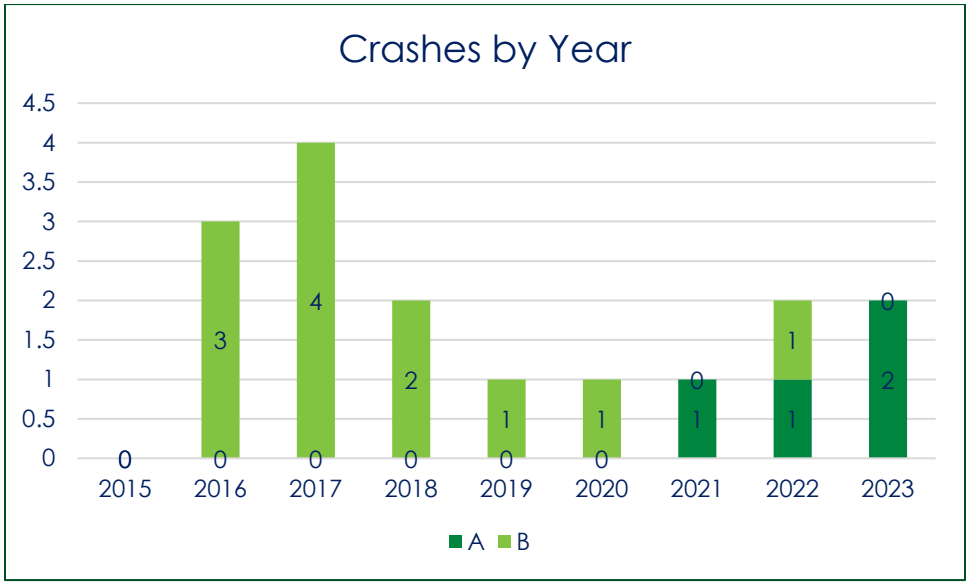

Figure 31: East Diamond Avenue Crashes by Severity and Year

A summary of crashes along East Diamond Avenue by severity and month of occurrence is presented in Table 23 and Figure 32. The figure shows a general seasonal pattern in which most of the serious- and minor-injury crashes occur in the months of July through October.

Table 23: East Diamond Avenue Crashes by Severity and Month

Month	A	B	C	PD
Jan	1	0	2	4
Feb	0	0	2	5
March	1	0	1	7
April	0	1	0	11
May	0	2	2	8
June	1	0	3	3
July	1	2	3	6
Aug	0	1	1	7
Sept	0	2	2	1
Oct	0	3	2	8
Nov	0	1	0	6
Dec	0	0	2	6

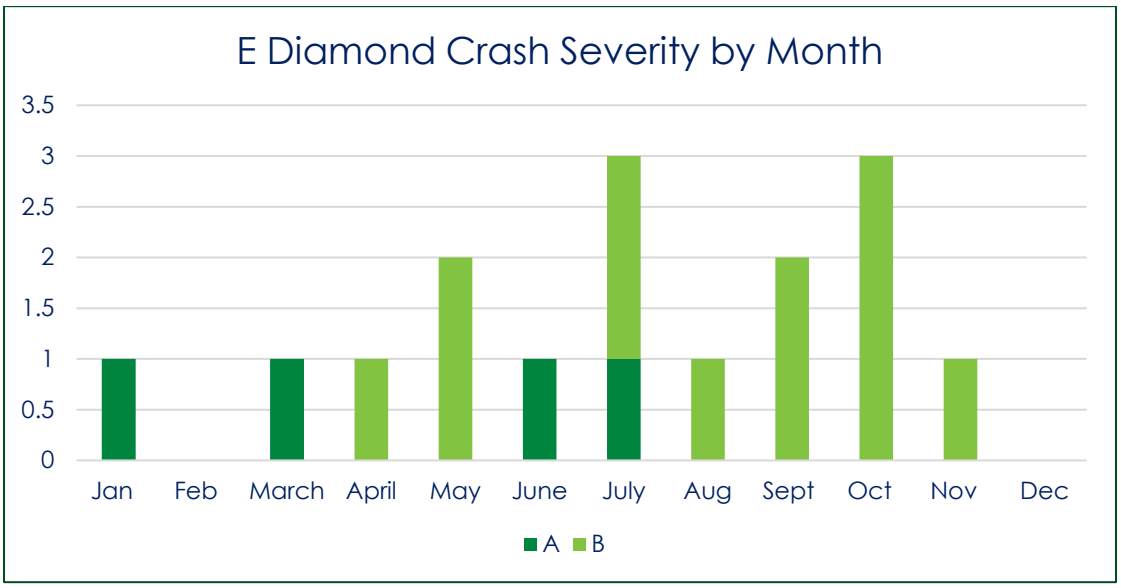

Figure 32: East Diamond Avenue Crashes by Severity and Month

A summary of crashes along East Diamond Avenue by severity and day of the week of occurrence is presented in Table 24 and Figure 33. Even though most of the minor-injury crashes occurred on Friday and Tuesday, all serious-injury crashes occurred during the weekend.

Table 24: East Diamond Avenue Crashes by Severity and Day of Week

Day	A	B	C	PD
Monday	0	1	6	8
Tuesday	0	4	4	12
Wednesday	0	0	2	7
Thursday	0	1	2	15
Friday	2	3	2	13
Saturday	0	2	3	10
Sunday	2	1	1	7

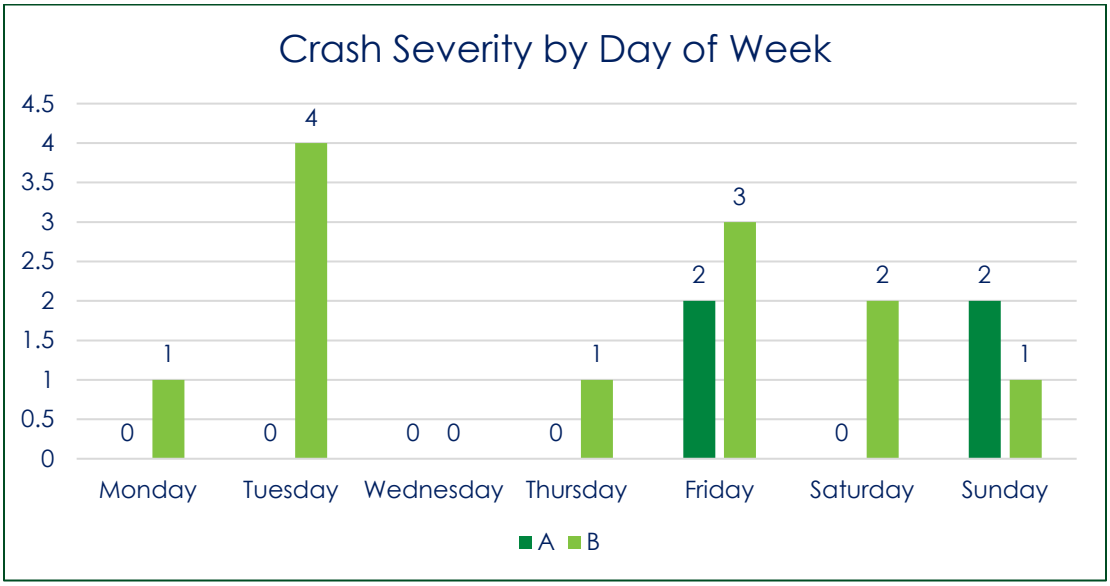

Figure 33: East Diamond Avenue Crashes by Severity and Day of Week

A summary of crashes along East Diamond Avenue by severity and time of occurrence is presented in Table 25 and Figure 34. The figure depicts a random pattern of the serious- and minor-injury crashes events.

Table 25: East Diamond Avenue Crashes by Severity and Hour

Hour	A	B	C	PD
12:00 AM	0	2	0	0
1:00 AM	0	0	0	4
2:00 AM	1	0	0	2
3:00 AM	0	0	0	1
4:00 AM	0	0	0	0
5:00 AM	0	0	0	1
6:00 AM	0	0	1	1
7:00 AM	0	0	1	1
8:00 AM	0	2	1	4
9:00 AM	0	0	0	1
10:00 AM	0	0	1	2
11:00 AM	0	0	0	2
12:00 PM	0	1	3	3
1:00 PM	0	0	3	6
2:00 PM	0	3	2	6
3:00 PM	0	1	2	9
4:00 PM	0	1	0	4
5:00 PM	1	1	0	11
6:00 PM	1	0	1	4
7:00 PM	0	1	3	1
8:00 PM	0	0	0	3
9:00 PM	1	0	2	3
10:00 PM	0	0	0	0
11:00 PM	0	0	0	3

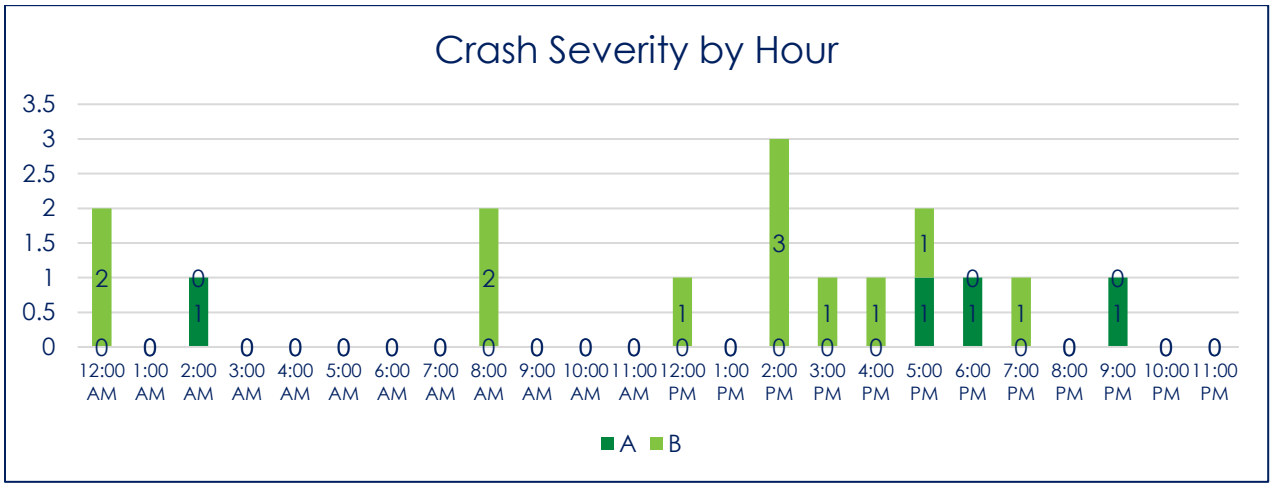

Figure 34: East Diamond Avenue Crashes by Severity and Hour

A summary of crashes along East Diamond Avenue by severity and type of collision is presented in Table 26 and Figure 35. From the figure, most of the serious- and minor-injury crashes are attributed to single-vehicle, same-direction rear-end, and opposite-direction sideswipe crashes.

Table 26: East Diamond Avenue Crashes by Severity and Collision Type

Collision	A	B	C	PD	KAB Total
Angle Meets Right Turn	0	0	0	1	0
Head On	0	0	2	1	0
Same-Dir Rear End Left Turn	0	0	0	1	0
Same-Direction Left Turn	0	0	0	2	0
Same-Direction Right Turn	0	0	0	2	0
Unknown	0	0	0	1	0
Head On Left Turn	0	1	5	4	1
Same-Direction Sideswipe	0	1	1	7	1
Straight Movement Angle	0	1	2	5	1
Opposite-Direction Sideswipe	0	2	0	3	2
Other	2	1	2	19	3
Same-Dir Rear End	0	4	6	16	4
Single Vehicle	2	2	2	9	4

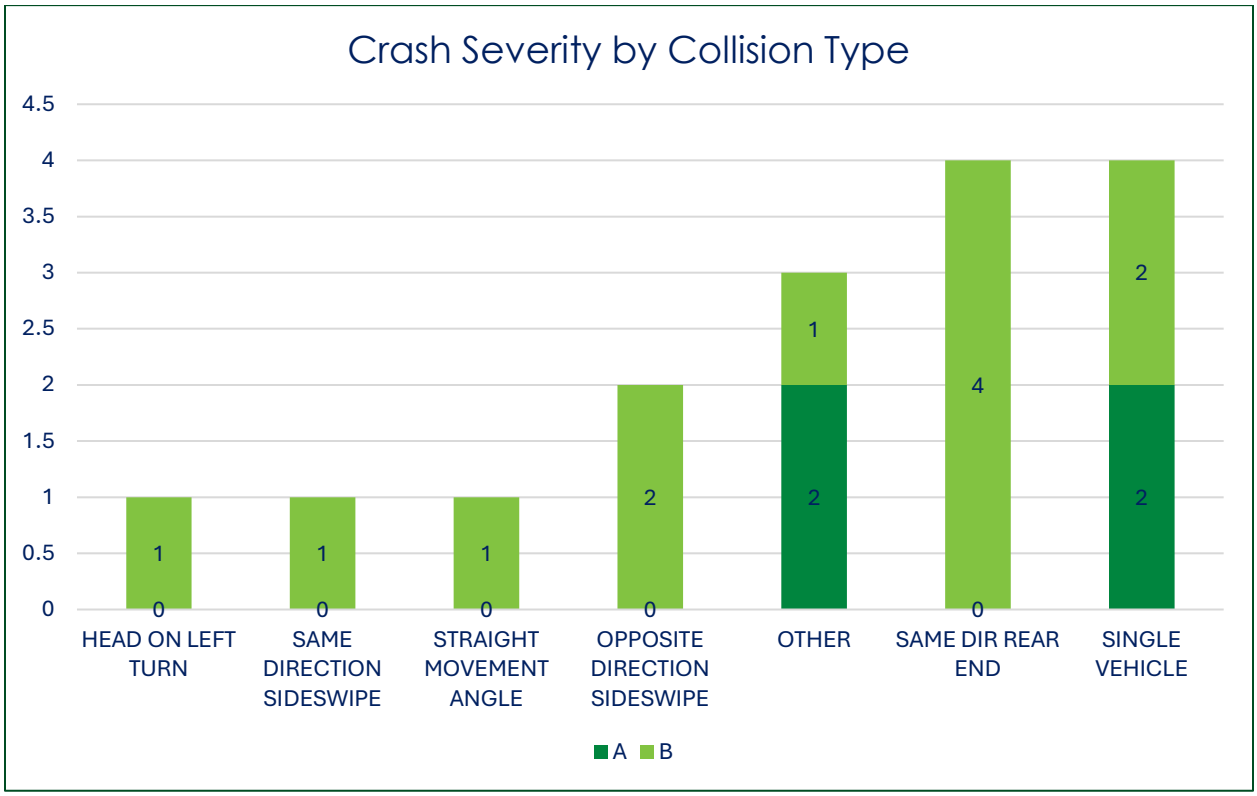

Figure 35: East Diamond Avenue Crashes by Severity and Collision Type

A summary of crashes involving pedestrians and bicyclists is presented in Table 27 and Figure 36. As shown, there were three serious-injury crashes and one minor-injury crash that involved pedestrians.

Table 27: Pedestrian and Bicycle Crashes along East Diamond Avenue

	A	B	C	PD	Total
BICYCLIST	0	0	1	0	0
PEDESTRIAN	3	1	0	1	4

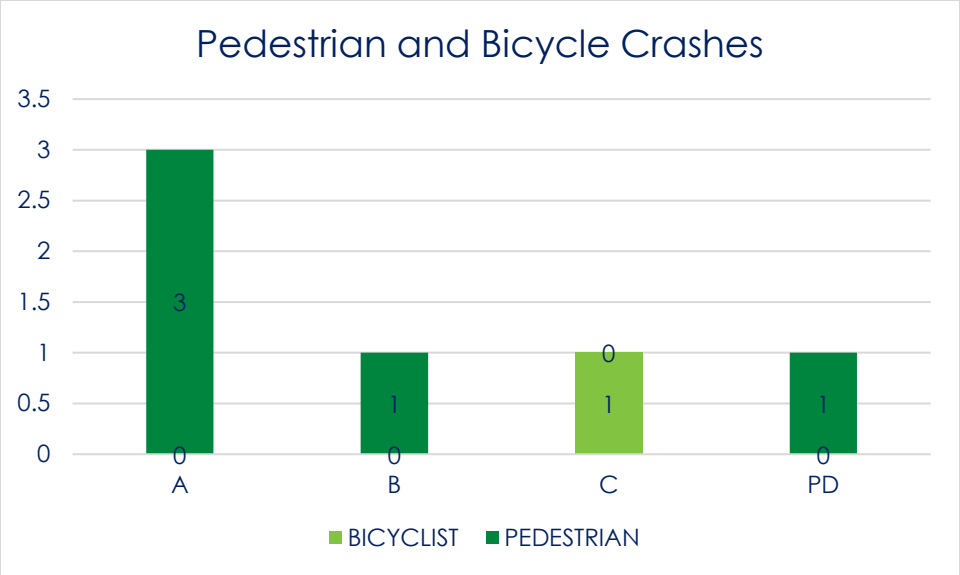

Figure 36: Pedestrian and Bicycle Crashes along East Diamond Avenue

A summary of crashes by junction type is presented in Table 28 and Figure 37. As shown, the majority of the serious- and minor-injury crashes occurred at sites that were not an intersection.

Table 28: Crashes by Junction Type along East Diamond Avenue

Junction	A	B	C	PD	Total KAB
Commercial Driveway	0	2	0	5	2
Interchange Related	1	0	0	0	1
Intersection	0	2	10	14	2
Intersection Related	0	3	4	5	3
Non-Intersection	2	4	4	30	6
Other	0	0	0	3	0
Other Driveway	0	0	1	1	0

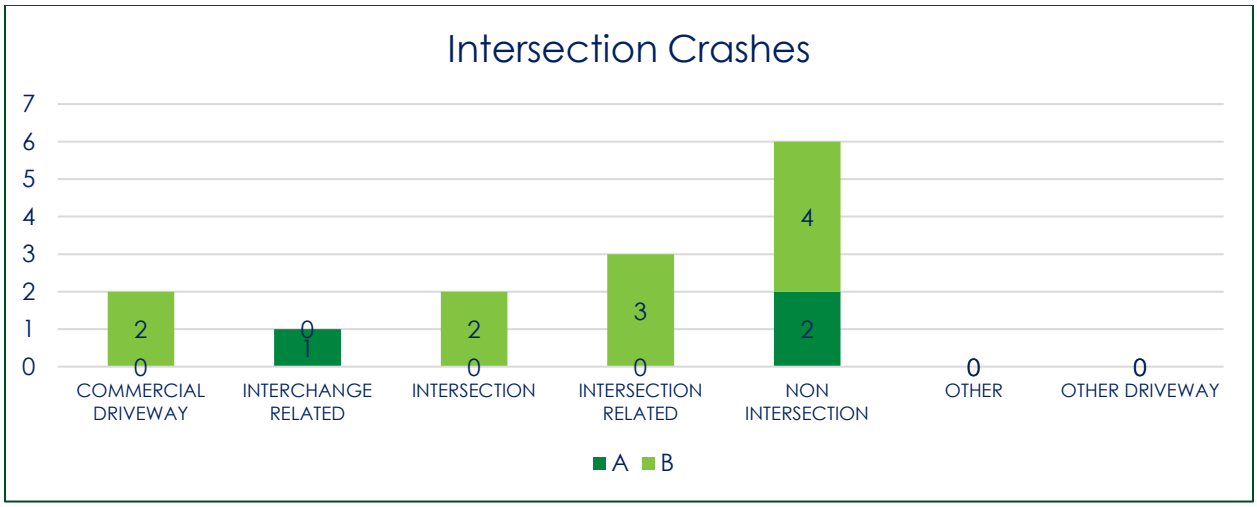

Figure 37: Crashes by Junction Type along East Diamond Avenue

A summary of crashes by severity and weather is presented in Table 29 and Figure 38. As shown, the majority of the serious- and minor-injury crashes occurred during clear weather periods.

Table 29: Crashes by Weather along East Diamond Avenue

Weather	A	B	C	PD	Total KAB
Clear	3	4	10	41	7
Cloudy	0	3	3	10	3
Raining	1	1	5	13	2
Snow	0	0	1	0	0
Unknown	0	0	0	1	0

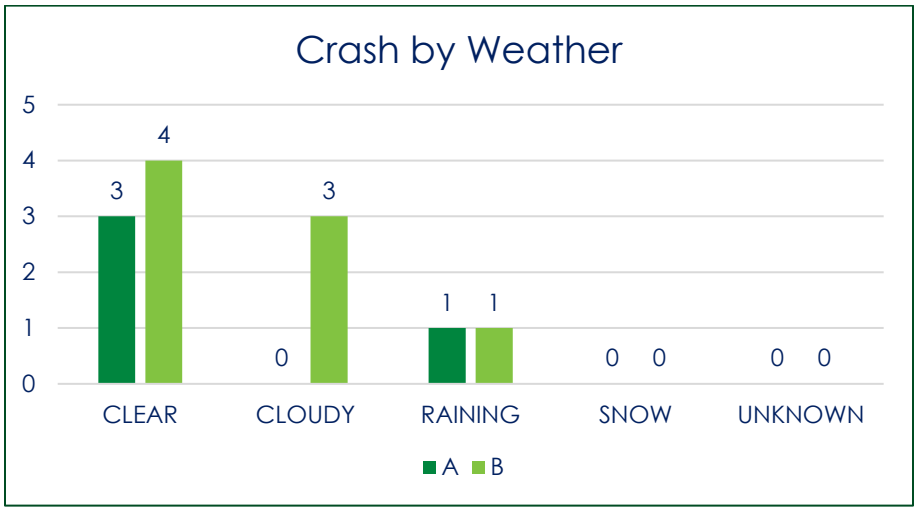

Figure 38: Crashes by Weather along East Diamond Avenue

A summary of crashes by severity and pavement surface condition is presented in Table 30 and Figure 39. As shown, the majority of the serious- and minor-injury crashes occurred on a dry pavement surface. Only 1 serious-injury crash and 3 minor-injury crashes occurred on a wet pavement surface condition.

Table 30: Crashes by Surface Condition along East Diamond Avenue

Surface Condition	A	B	C	PD
Dry	3	9	13	49
Snow	0	0	1	0
Wet	1	3	6	17

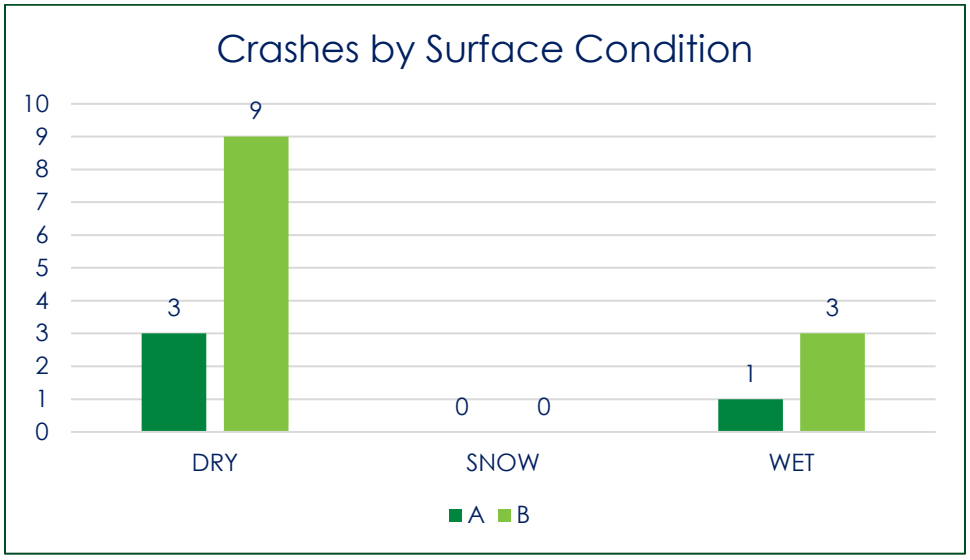

Figure 39: Crashes by Surface Condition along East Diamond Avenue

Table 31: Summary of Key Locations and Improvement recommendations along East Diamond Avenue

No.	Key Locations	Control Type	Improvement recommendations	Link
1	Intersection of Russell Avenue and E Diamond Avenue	Minor-road stop control	• High-visibility crosswalk with ADA-compliant ramps • Conduct a signal, PHB and RRFB warrant analysis • Overall signage improvement • Conduct an AWS warrant analysis • Conduct an RRFB warrant analysis • Install pavement marking with lane configuration	Map
2	Intersection of E Diamond Avenue and S Summit Avenue/N Summit Avenue	Signalized	• Overall signage improvement • Install ADA-compliant ramps on all crosswalks • Pavement surface improvement with pavement markings and lane configurations	Map
3	Intersection of E Diamond Avenue and Melvin Street	Minor-road stop control	• Install high-visibility pedestrian crosswalk on E Diamond Avenue with ADA-compliant ramps • Overall pavement marking improvement with lane configuration • Overall signage improvement • Conduct a PHB and RRFB warrant analysis	Map
4	Segment from intersection of East Diamond Avenue and S Summit Avenue/N Summit Avenue to intersection of East Diamond Avenue and Girard Street	Segment	• Improve daylighting • Install parking restrictions near crosswalks. • Evaluate for lane tightening to reduce speed • Overall signage improvement	Map

5. S and N Summit Avenue (from MD 355 to Park Avenue)

The location of the S and N Summit Avenue corridor can be seen in Figure 40.

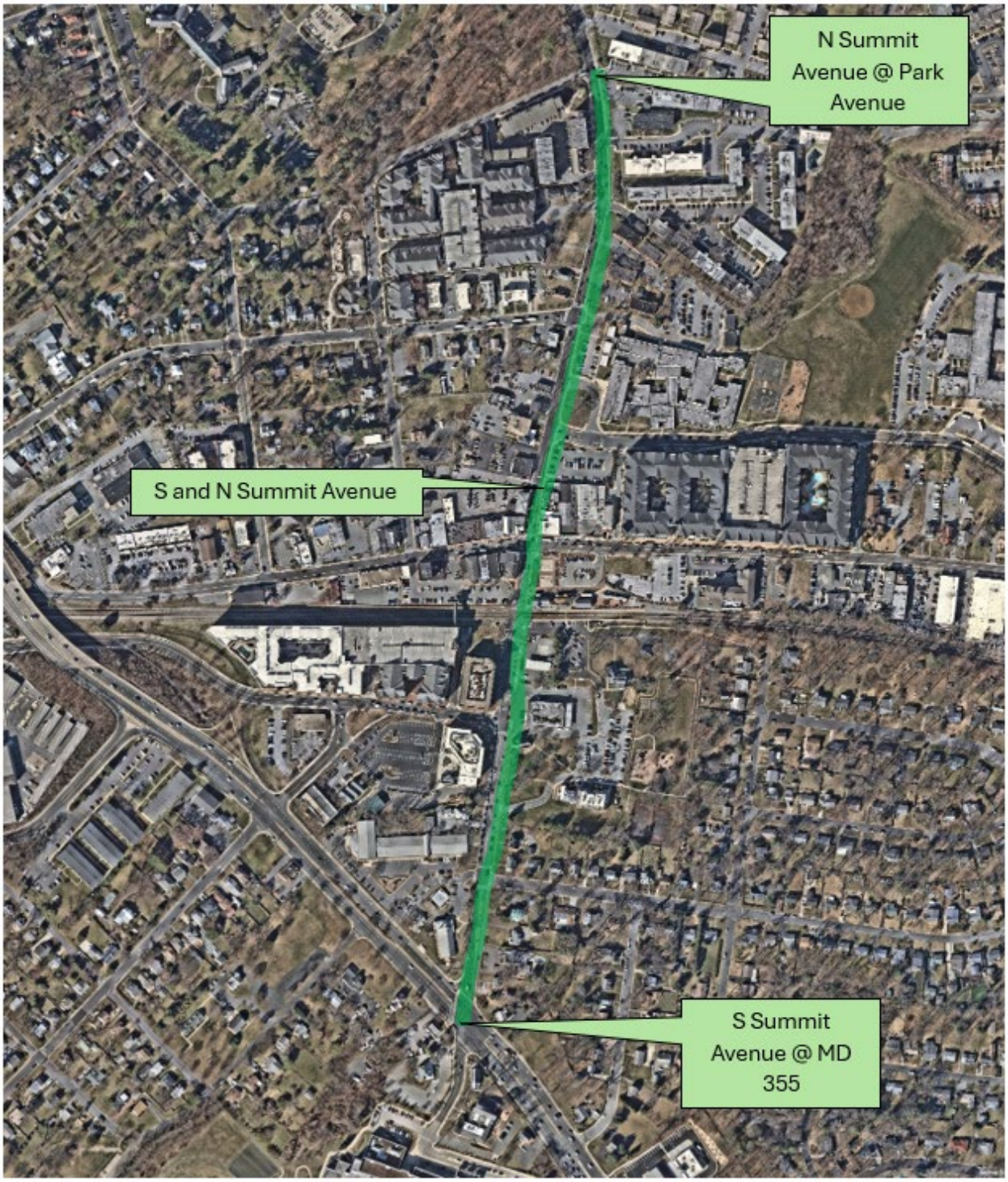

Figure 40: S and N Summit Avenue Corridor

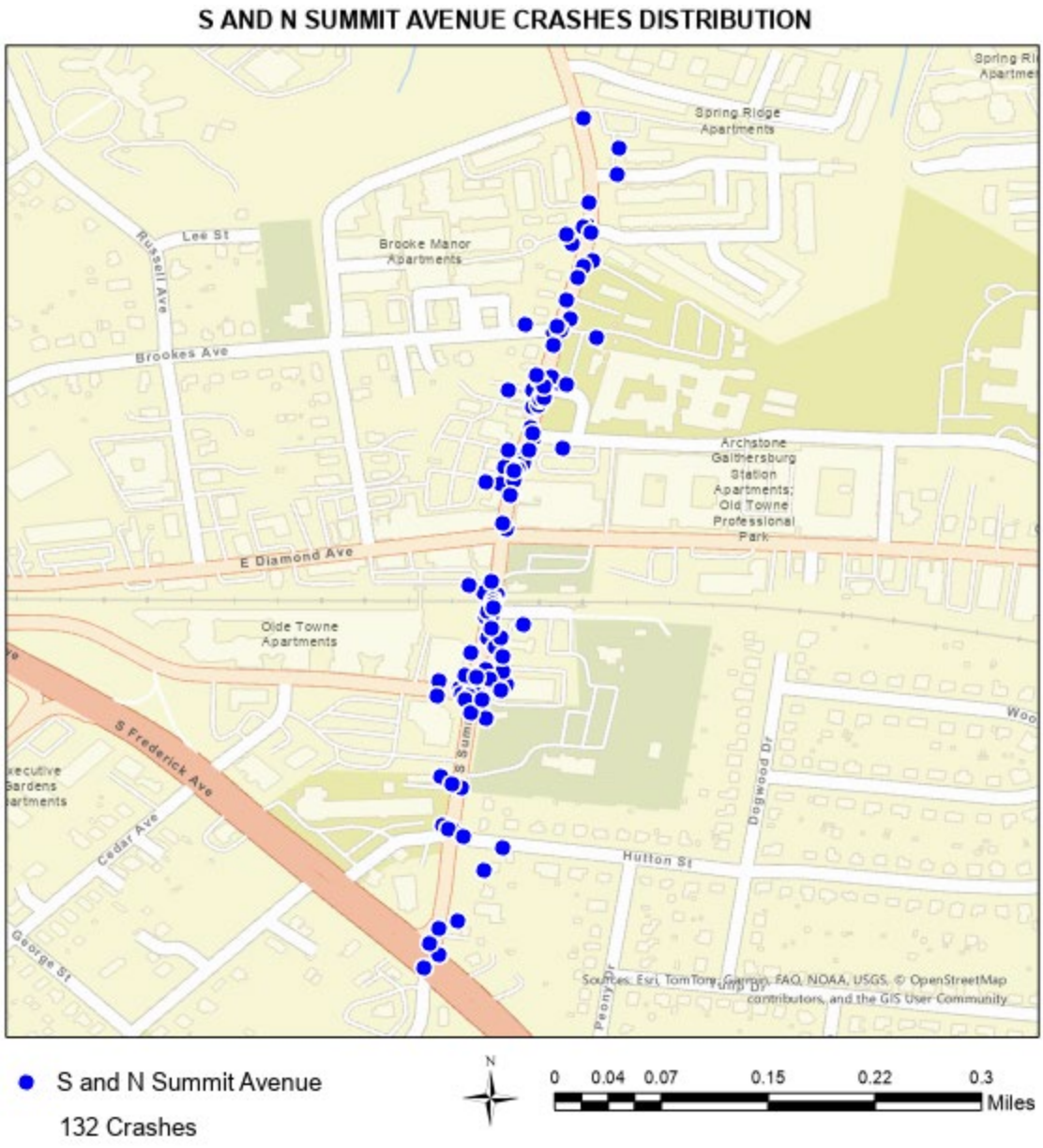

Figure 41: Crash Distribution along S and N Summit Avenue

A geospatial distribution of crashes along S and N Summit Avenue can be seen in Figure 41. A heat map indicating the key locations can be found in Figure 42. The figure also shows the locations of the serious- and minor-injury crashes.

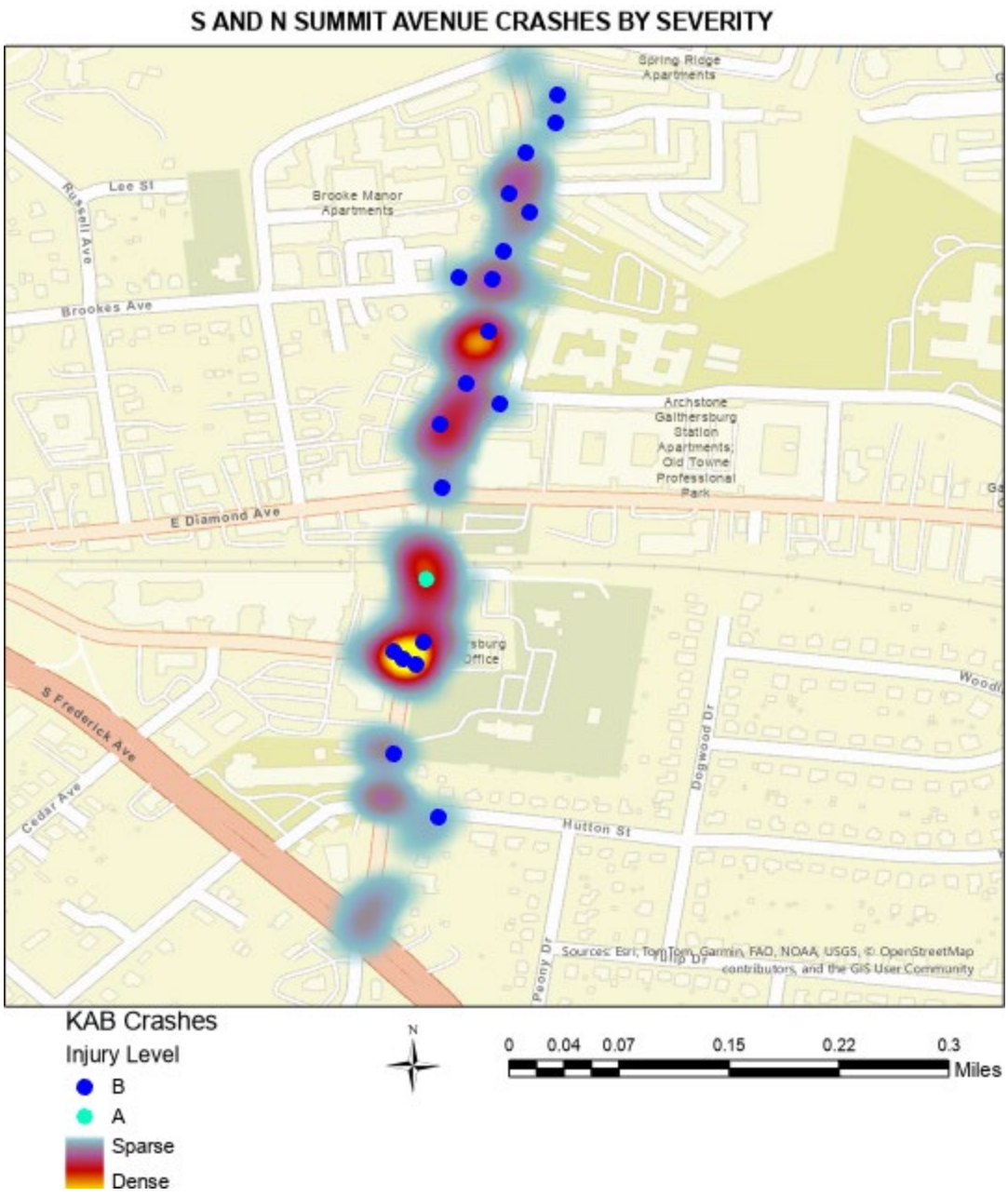

Figure 42: Crash Heat Map along S and N Summit Avenue

A summary of crashes along S and N Summit Avenue by severity and year of occurrence is presented in Table 32 and Figure 43. The figure shows a generally random pattern of serious- and minor-injury crash events.

Table 32: S and N Summit Avenue Crashes by Severity and Year

Year	K	B	C	PD
2015	0	9	0	9
2016	0	3	0	15
2017	0	1	2	12
2018	1	2	2	9
2019	0	1	6	10
2020	0	1	1	7
2021	0	1	1	7
2022	0	1	4	9
2023	0	2	2	14

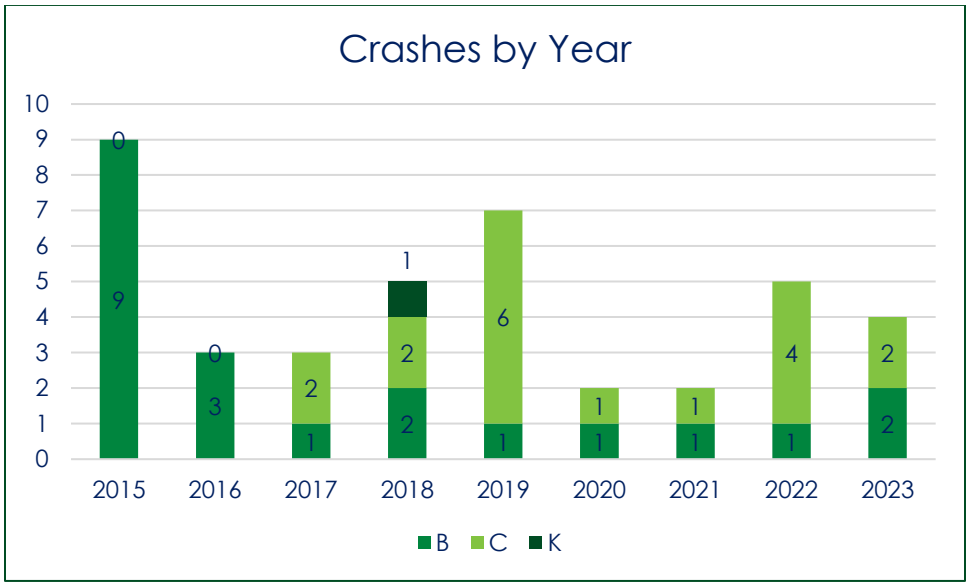

Figure 43: S and N Summit Avenue Crashes by Severity and Year

A summary of crashes along S and N Summit Avenue by severity and month of occurrence is presented in Table 33 and Figure 44.

Table 33: S and N Summit Avenue Crashes by Severity and Month

Month	K	B	C	PD
Jan	0	2	1	10
Feb	0	1	2	10
March	0	1	2	7
April	0	1	2	5
May	0	3	1	8
June	0	1	3	8
July	0	1	0	14
Aug	0	3	3	7
Sept	0	2	0	7
Oct	0	0	3	9
Nov	1	1	0	3
Dec	0	5	1	4

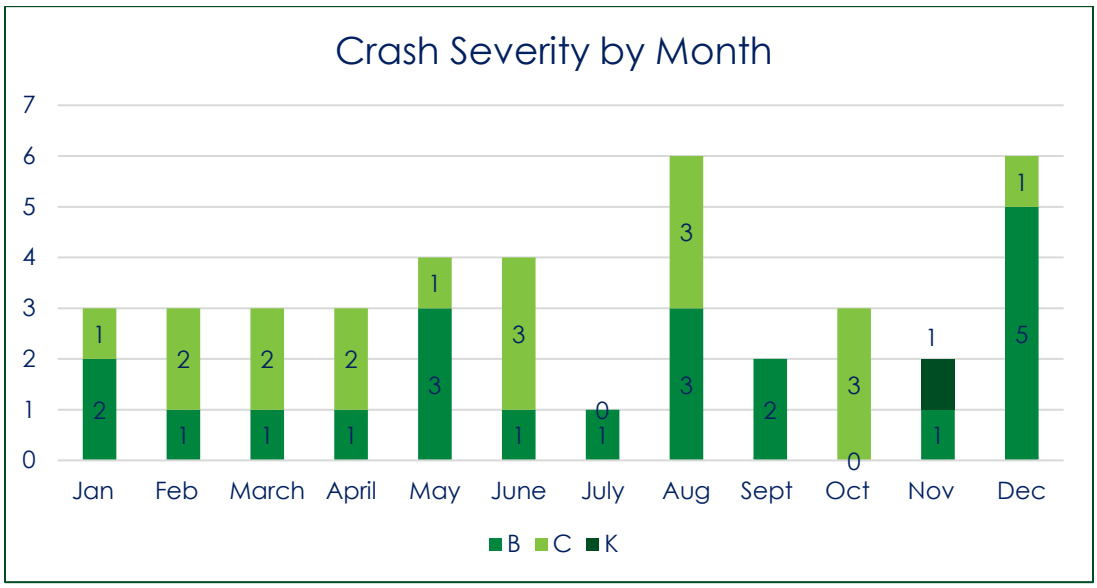

Figure 44: S and N Summit Avenue Crashes by Severity and Month

A summary of crashes along Russell Avenue by severity and day of the week of occurrence is presented in Table 34 and Figure 45. The figure shows the most serious- and minor-injury crashes occurring in the middle of the week. There were fewer crashes occurring during the weekend.

Table 34: S and N Summit Avenue Crashes by Severity and Day of Week

Day	K	B	C	PD
Monday	0	3	2	14
Tuesday	1	2	2	19
Wednesday	0	4	4	12
Thursday	0	6	5	21
Friday	0	1	2	6
Saturday	0	3	3	8
Sunday	0	2	0	12

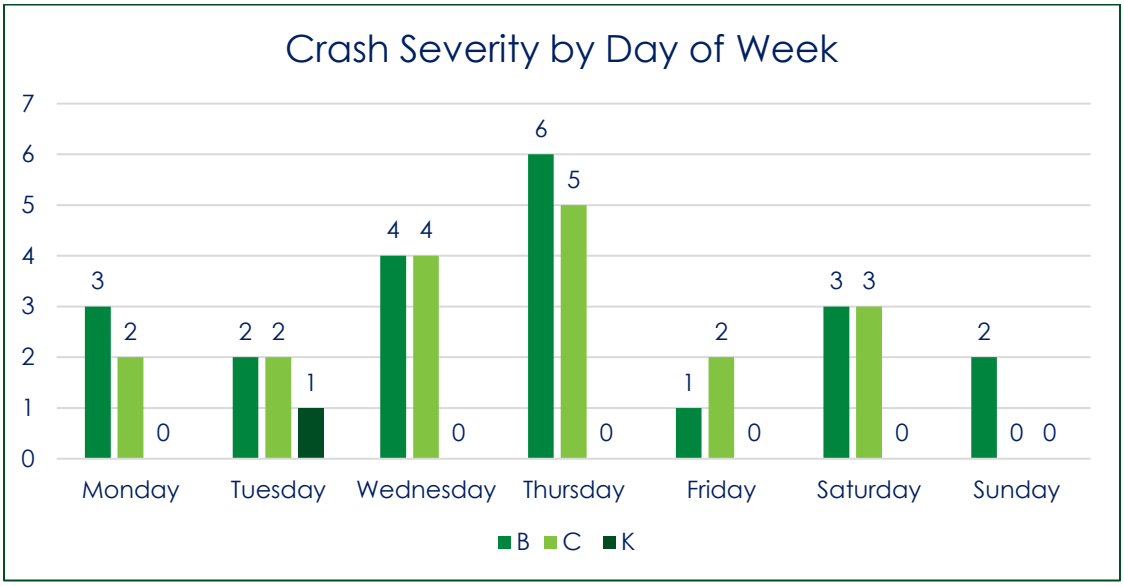

Figure 45: S and N Summit Avenue Crashes by Severity and Day of Week

A summary of crashes along S and N Summit Avenue by severity and time of occurrence is presented in Table 35 and Figure 46. The figure shows that the most serious- and minor-injury crashes occur during the afternoon.

Table 35: S and N Summit Avenue Crashes by Severity and Hour

Hour	K	B	C	PD
12:00 AM	0	0	1	3
1:00 AM	0	0	0	3
2:00 AM	0	0	0	0
3:00 AM	0	0	0	0
4:00 AM	0	0	0	0
5:00 AM	0	0	1	1
6:00 AM	1	0	1	3
7:00 AM	0	2	0	5
8:00 AM	0	0	0	7
9:00 AM	0	2	0	7
10:00 AM	0	0	1	6
11:00 AM	0	2	1	3
12:00 PM	0	2	0	5
1:00 PM	0	3	1	7
2:00 PM	0	0	1	5
3:00 PM	0	2	1	4
4:00 PM	0	2	2	7
5:00 PM	0	1	3	7
6:00 PM	0	3	4	4
7:00 PM	0	0	1	4
8:00 PM	0	1	0	6
9:00 PM	0	0	0	3
10:00 PM	0	1	0	0
11:00 PM	0	0	0	2

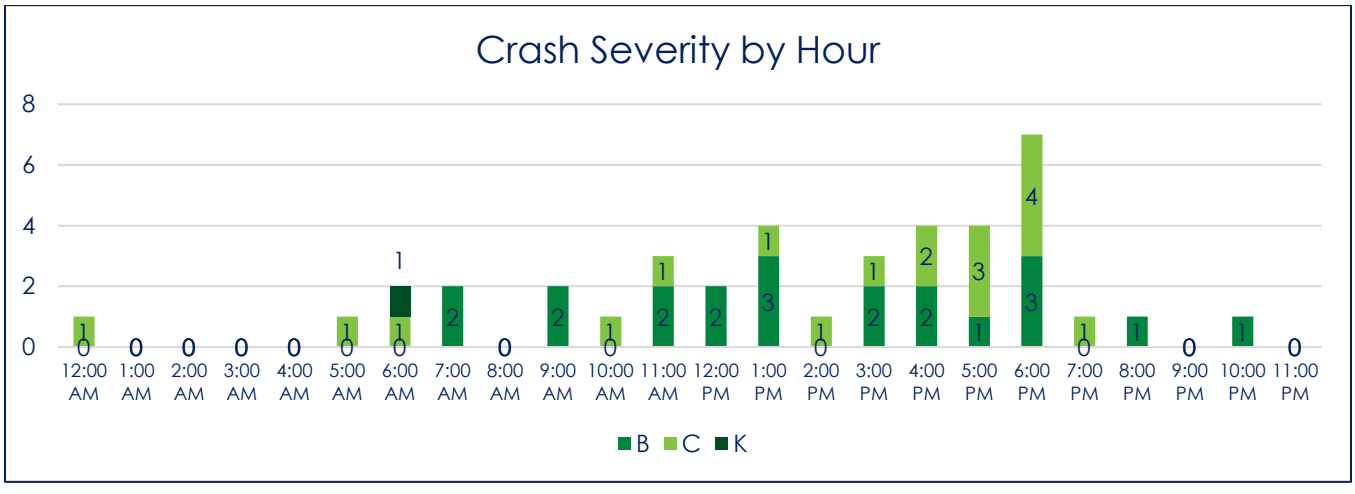

Figure 46: S and N Summit Avenue Crashes by Severity and Hour

A summary of crashes along S and N Summit Avenue by severity and type of collision is presented in Table 36 and Figure 47. From the figure, most of the serious- and minor-injury crashes are attributed to same-direction rear-end, single-vehicle, head-on left-turn, and straight-movement angle crashes.

Table 36: S and N Summit Avenue Crashes by Severity and Collision Type

Collision	K	B	C	PD	KAB Total
Angle Meets Left Turn	0	0	0	1	0
Opposite-Direction Sideswipe	0	0	0	1	0
Same-Dir Rear End Left Turn	0	0	0	1	0
Same-Dir Rear End Right Turn	0	0	0	1	0
Same-Direction Sideswipe	0	0	0	13	0
Unknown	0	0	0	1	0
Angle Meets Left Head On	0	0	1	1	1
Angle Meets Right Turn	0	0	1	3	1
Same-Direction Left Turn	0	1	0	2	1
Same-Direction Right Turn	0	0	1	3	1
Other	1	2	1	5	4
Head On Left Turn	0	4	1	7	5
Single Vehicle	0	5	0	7	5
Straight Movement Angle	0	3	6	22	9
Same-Dir Rear End	0	6	7	24	13

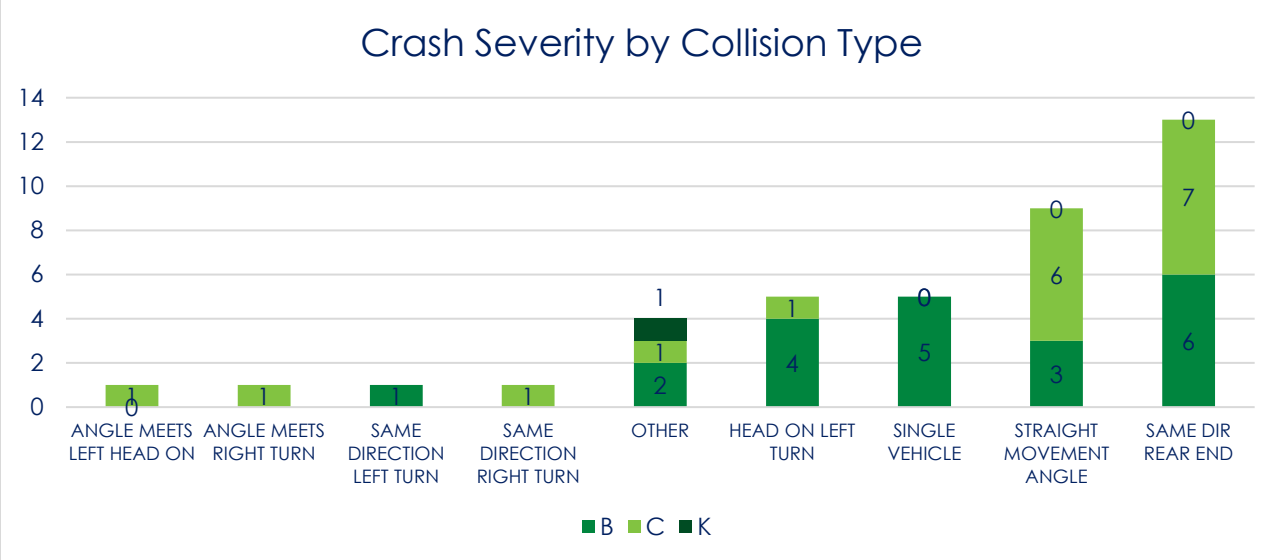

Figure 47: S and N Summit Avenue Crashes by Severity and Collision Type

A summary of crashes involving pedestrians and bicyclists is presented in Table 37 and Figure 48. As shown, one fatal crash and seven minor-injury crashes involved pedestrians.

Table 37: Pedestrian and Bicycle Crashes along S and N Summit Avenue

	K	B	C	PD	Total
BICYCLIST	0	0	0	0	0
PEDESTRIAN	1	7	0	0	8

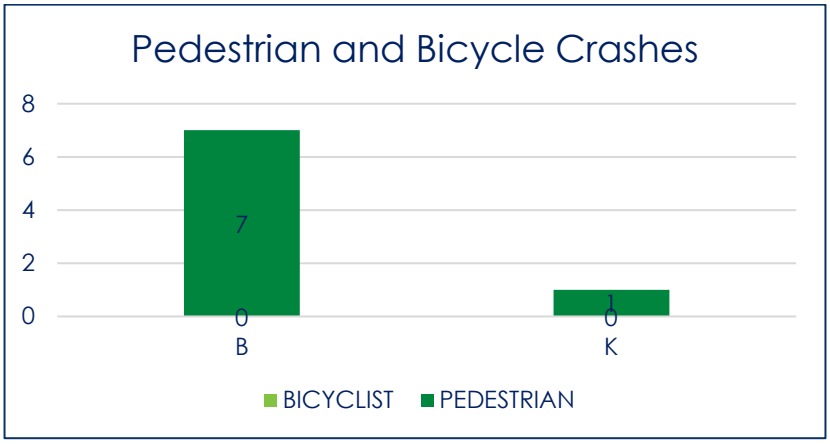

Figure 48: Pedestrian and Bicycle Crashes along S and N Summit Avenue

A summary of crashes by junction type is presented in Table 38 and Figure 49. As shown, the majority of the serious- and minor-injury crashes occurred at an intersection.

Table 38: Crashes by Junction Type along S and N Summit Avenue

Junction	K	B	C	PD	Total KAB
Crossover Related	0	0	0	1	0
Commercial Driveway	0	1	1	8	2
Interchange Related	0	1	0	0	1
Intersection	0	9	8	34	17
Intersection Related	1	4	3	8	8
Non-Intersection	0	5	4	20	9
Other	0	0	1	2	1
Other Driveway	0	1	0	2	1
Railway Grade Crossing	0	0	0	6	0
Residential Driveway	0	0	0	1	0
Unknown	0	0	0	1	0

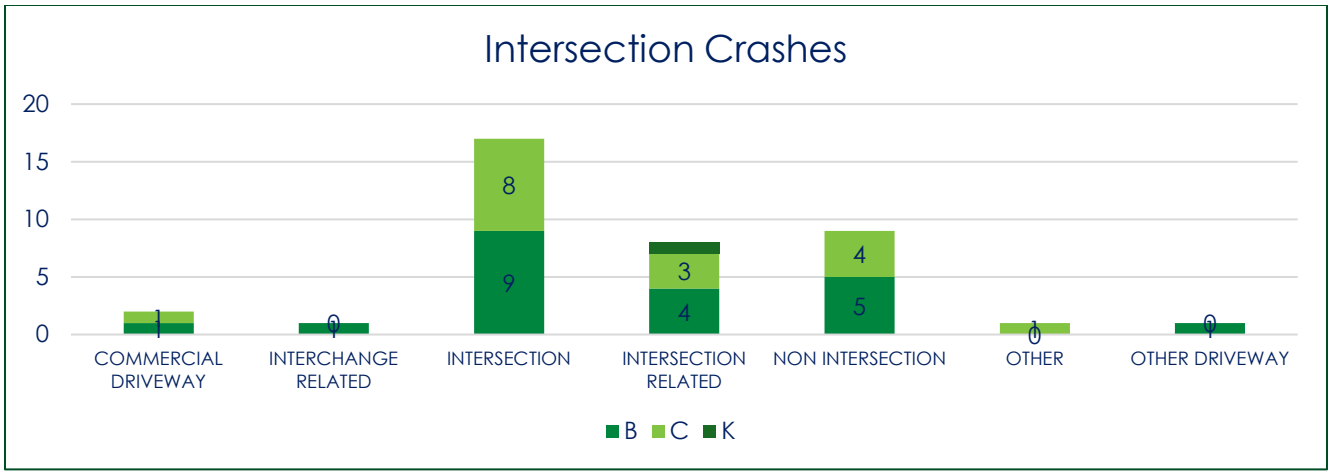

Figure 49: Crashes by Junction Type along S and N Summit Avenue

A summary of crashes by severity and weather is presented in Table 39 and Figure 50. As shown, the majority of the serious- and minor-injury crashes occurred during clear weather periods.

Table 39: Crashes by Weather along S and N Summit Avenue

Weather	K	B	C	PD	Total KAB
Clear	1	9	9	67	19
Cloudy	0	3	3	8	6
Foggy	0	0	0	1	0
Other	0	1	0	0	1
Raining	0	3	1	6	4
Snow	0	2	0	2	2

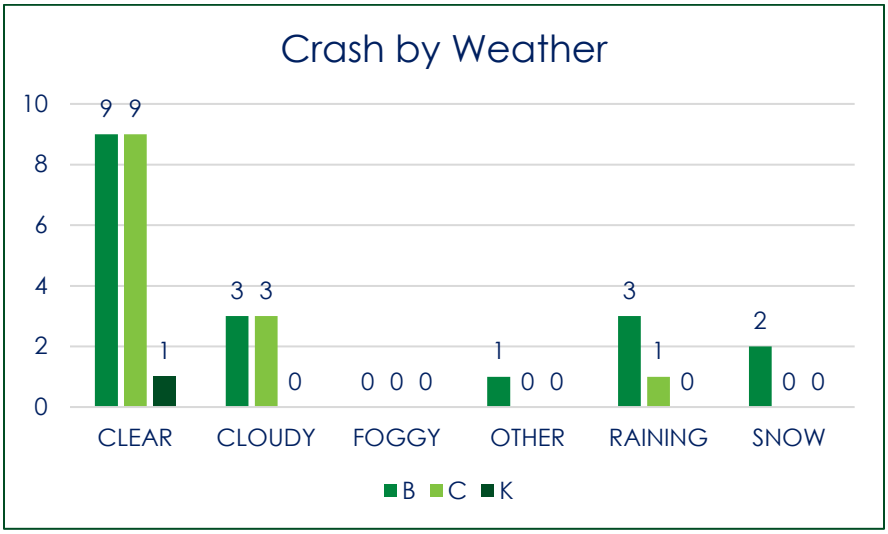

Figure 50: Crashes by Weather along S and N Summit Avenue

A summary of crashes by severity and pavement surface condition is presented in Table 40 and Figure 51. As shown, the majority of the serious- and minor-injury crashes occurred during a dry pavement surface condition. With the rest occurring during wet pavement surface condition.

Table 40: Crashes by Surface Condition along S and N Summit Avenue

Surface Condition	B	C	PD	KAB Total
Dry	13	15	70	28
Ice	0	0	1	0
Wet	7	2	14	9

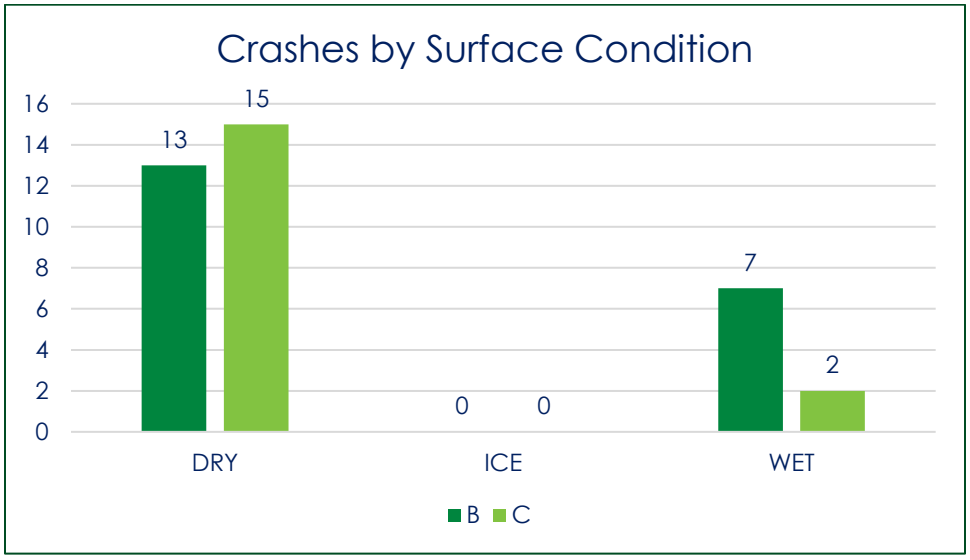

Figure 51: Crashes by Surface Condition along S and N Summit Avenue

Table 41: Summary of Key Locations and Improvement recommendations along S and N Summit Avenue

No.	Key Locations	Control Type	Improvement recommendations	Link
1	Intersection of S Summit Avenue and Olde Towne Avenue	Minor-road stop control	• Overall signage improvement • Install high-visibility crosswalk on all approaches with ADA-compliant ramps • Overall signage improvement • Improve pavement marking with lane configuration • Conduct a warrant analysis for signal, PHB or RRFB installation	Map
2	Intersection of S Summit Avenue and At-grade Rail crossing	Signalized	• Overall Signage improvement with advance warning signs • Improvement pavement marking with lane configuration	Map
3	Infront of Gaithersburg Elementary School	N/A	• Conduct a warrant analysis for PHB and RRFB • Conduct a feasibility for installation of high-visibility midblock crosswalk with ADA-compliant ramps • Overall signage improvement with advance school zone signs • Evaluate feasibility of a road diet to tighten lanes and widen sidewalk.	Map
4	Segment along N Summit Avenue from Intersection of N Summit Avenue and E Diamond Avenue to intersection of N Summit Avenue and Brookes Avenue	Segment	• Overall signage improvement • Pavement marking improvement with lane tightening to reduce speed	Map

Local Road Safety Plan

Strategy Toolbox

CITY OF GAITHERSBURG

Summer 2024

CITY OF GAITHERSBURG

Local Road Safety Plan
Strategy Toolbox

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CITY OF GAITHERSBURG

Local Road Safety Plan Strategy Toolbox

Action Area 1: Safe Streets

Action Area Objective: *Use safe system approach to upgrade roadways, sidewalks, and bike paths to prevent crashes with serious and fatal injuries.*

Strategy 1.1: High Injury Network Projects

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.1.1	Speed Limit Reductions	Public Works; MDOT SHA; MCDOT	Locations, miles treated	Residential/ core streets or where warranted	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	☆☆☆☆	*NHTSA Countermeasures That Work (Lower Speed Limits); Montgomery County Vision Zero | 2030 Action Plan*
1.1.2	Road Safety Audits	Public Works; MDOT SHA; MCDOT	Locations analyzed	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA; MWCOG Regional Roadway Safety Program	N/A	*FHWA PSC (Road Safety Audits); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.2: Intersection Redesign

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.2.1	Install Continental or Ladder Crosswalks	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	0.63	*Montgomery County Vision Zero | 2030 Action Plan*
1.2.2	Install protected intersections and roundabouts	Public Works; MDOT SHA; MCDOT	Locations treated	Arterials	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	0.37-0.70; 0.18-0.22	*FHWA PSC (Roundabouts); Montgomery County Vision Zero | 2030 Action Plan*
1.2.3	Extend physical median beyond crosswalks	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted and feasible	☆☆☆☆	Operating budget; MCDOT; MDOT SHA		*Montgomery County Vision Zero | 2030 Action Plan*
1.2.4	Convert minor-road stop control to all-way stop control	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	Varies	*Montgomery County Vision Zero | 2030 Action Plan*
1.2.5	Install raised pedestrian crosswalks	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	0.55-0.7	*Montgomery County Vision Zero | 2030 Action Plan*
1.2.6	Removal or redesign of right-turn channelizations	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.2.7	Improve pedestrian signage	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.2.8	Hardened centerlines and median islands	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted and feasible	☆☆☆	Operating budget; MCDOT; MDOT SHA		*Montgomery County Vision Zero | 2030 Action Plan*
1.2.9	Install speed humps or raised intersections	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where there is no better alternative	☆☆	Operating budget; MCDOT; MDOT SHA		*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.3: Protected Crossings

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.3.1	Extend physical median beyond crosswalk	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, where feasible	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.3.2	Install supplemental push button in medians	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, areas with slow or long crossings	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.3.3	Install pedestrian hybrid beacon traffic signals or RRFBs where full signals are not justified	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, locations with high pedestrian volumes where full signals are not warranted	☆ (High Injury Network, areas wth infrequent crossing opportunities)	Operating budget; MCDOT; MDOT SHA	0.453 – 0.849	*FHWA PSC (Pedestrian Hybrid Beacons); Montgomery County Vision Zero | 2030 Action Plan*
1.3.4	Implement exclusive pedestrian phases	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, locations where LPI is not appropriate	☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.3.5	Install new traffic signals	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted	☆	Operating budget; MCDOT; MDOT SHA	Varies	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.4: Signal Timing and Phasing

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.4.1	Remove nighttime flashing signal operation	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.4.2	Leading Pedestrian Interval (LPI)	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	0.87	*FHWA PSC (Leading Pedestrian Interval); Montgomery County Vision Zero | 2030 Action Plan*
1.4.3	Vehicular detection to shorten cycle lengths, reduce wasted time, and reduce pedestrian wait time	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; except for major arterials in peak hours	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.4.4	Flashing red/yellow arrows for exclusive turn lanes	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, where warranted	☆☆☆	Operating budget; MCDOT; MDOT SHA	0.53-0.75	*Montgomery County Vision Zero | 2030 Action Plan*
1.4.5	Passive pedestrian & bike detection to extend clearance intervals and call pedestrian phases	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, where warranted	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.4.6	Prohibit right turn on red	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, where warranted	☆☆	Operating budget; MCDOT; MDOT SHA	Varies	*Montgomery County Vision Zero | 2030 Action Plan*
1.4.7	Pedestrian signal phase recall	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, where warranted	☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.5: Corridor Access Management

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.5.1	Consolidate existing driveways and minimize new driveways for new developments	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	0.75	*FHWA PSC (Corridor Access Management); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.6: Roadway Departure

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.6.1	Re-evaluate speed limits when reconstructing roadways	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	☆☆☆☆	*NHTSA Countermeasures That Work (Lower Speed Limits)*
1.6.2	Install or widen retroreflective pavement markings on centerlines and edgelines.	Public Works; MDOT SHA; MCDOT	Miles of roadway treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	Wider Edgelines (4in to 6in): 0.635	*FHWA PSC (Wider Edge Lines); Montgomery County Vision Zero | 2030 Action Plan*
1.6.3	Curve signage & delineation	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	Chevron Signs: 0.75 – 0.852 Pavement Markings: 0.615 – 0.652	*FHWA PSC (Enhanced Delineation for Horizontal Curves); Montgomery County Vision Zero | 2030 Action Plan*
1.6.4	High-friction surface treatments	Public Works; MDOT SHA; MCDOT	Miles of HFST added	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	0.365 – 0.799	*FHWA PSC (Pavement Friction Management); Montgomery County Vision Zero | 2030 Action Plan*

Action Number	Action	Proposed Lead Agency (*and partners)*	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.6.5	Install centerline and shoulder rumble strips	Public Works; MDOT SHA; MCDOT	Miles of rumble strip added	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	Centerline: 0.36 – 0.56 Shoulder: 0.49 – 0.87	*FHWA PSC (Longitudinal Rumble Strips and Stripes on Two-Lane Roads); Montgomery County Vision Zero | 2030 Action Plan*
1.6.6	Widen shoulders	Public Works; MDOT SHA; MCDOT	Miles of shoulder widened	Citywide	☆☆	Operating budget; MCDOT; MDOT SHA	Varies	*FHWA PSC (Roadside Design Improvements at Curves); Montgomery County Vision Zero | 2030 Action Plan*
1.6.7	Install guardrail	Public Works; MDOT SHA; MCDOT	Locations, miles treated	Citywide; where feasible	☆☆	Operating budget; MCDOT; MDOT SHA	0.53-1.15	*Montgomery County Vision Zero | 2030 Action Plan*
1.6.8	Removal of fixed objects to improve clear zone	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where feasible	☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.7: Separated, Low-Stress Bicycle Facilities

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.7.1	Green bike lanes & bike boxes	Public Works; MDOT SHA; MCDOT	Miles of green bike lane added	Citywide; where off-road paths are not feasible, especially in densest areas	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.7.2	Install separated bicycle lanes	Public Works; MDOT SHA; MCDOT	Miles of protected bicycle lane added	Citywide; where off-road paths are not feasible, especially in densest areas	☆☆	Operating budget; MCDOT; MDOT SHA	Convert traditional or flush bike lanes to separated bike lanes with Flexi-Posts: 0.468	*FHWA PSC (Bicycle lanes); Montgomery County Vision Zero | 2030 Action Plan*
1.7.3	In-lane floating bus stops	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where off-road paths are not feasible, especially in densest areas	☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.7.4	Install protected intersections	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where off-road paths are not feasible, especially in densest areas	☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.7.5	Upgrade sidewalk to shared-use path	Public Works; MDOT SHA; MCDOT	Mileage of sidewalk upgraded	Citywide; where warranted and feasible	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.8: Safe Trail Crossings

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.8.1	Install Continental or Ladder Crosswalks	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT; MDOT SHA	0.63	*Montgomery County Vision Zero | 2030 Action Plan*
1.8.2	Install bulb-outs	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.8.3	Lane width reduction	Public Works; MDOT SHA; MCDOT	Locations, miles treated	Citywide	☆☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.8.4	Rectangular Rapid Flashing Beacons (RRFB)	Public Works; MDOT SHA; MCDOT	Number installed	Citywide; where warranted	☆☆☆ (Multilane crossings with speed limits less than 40 mph)	Operating budget; MCDOT; MDOT SHA	0.526	*FHWA PSC (Rectangular Rapid Flashing Beacons); Montgomery County Vision Zero | 2030 Action Plan*
1.8.5	Improve pedestrian signage	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.8.6	Install pedestrian hybrid beacon traffic signals where full signals are not justified	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide, locations with high pedestrian volumes where full signals are not warranted	☆ (High Injury Network, areas with infrequent crossing opportunities)	Operating budget; MCDOT; MDOT SHA	0.453 – 0.849	*FHWA PSC (Pedestrian Hybrid Beacons); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.9: Safe Routes to School Engineering Projects

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.9.1	Study and implement Safe Routes to School	Public Works; MDOT SHA; MCDOT; MCPS	Schools studied	Citywide; where warranted	☆☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	☆☆☆	*NHTSA Countermeasures That Work; Montgomery County Vision Zero | 2030 Action Plan*
1.9.2	Install raised, continental, and ladder crosswalks	Public Works; MDOT SHA; MCDOT; MCPS	Locations Treated	Citywide; where warranted	☆☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	0.63	*Montgomery County Vision Zero | 2030 Action Plan*
1.9.3	Rectangular Rapid Flashing Beacons (RRFB)	Public Works; MDOT SHA; MCDOT; MCPS	Number installed	Citywide; where warranted	☆☆☆☆ (Multilane crossings with speed limits less than 40 mph)	Operating budget; MCDOT; MDOT SHA; MHSO	0.526	*FHWA PSC (Rectangular Rapid Flashing Beacons); Montgomery County Vision Zero | 2030 Action Plan*
1.9.4	Remove parking on approaches to mid-block crossings and intersections	Public Works; MDOT SHA; MCDOT; MCPS	Locations Treated	Citywide; where warranted	☆☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.9.5	Upgrade sidewalk to shared-use path	Public Works; MDOT SHA; MCDOT; MCPS	Mileage of sidewalk upgraded	Citywide; where warranted and feasible	☆☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.9.6	Install midblock crosswalks	Public Works; MDOT SHA; MCDOT; MCPS	Number installed	Citywide; where warranted	☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	0.82	*Montgomery County Vision Zero | 2030 Action Plan; FHWA PSC*
1.9.7	Improve pedestrian signage	Public Works; MDOT SHA; MCDOT; MCPS	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.9.8	Convert minor-road stop control to all-way stop control	Public Works; MDOT SHA; MCDOT; MCPS	Locations treated	Citywide; where warranted	☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO	Varies	*Montgomery County Vision Zero | 2030 Action Plan*
1.9.9	Install speed humps or raised intersections	Public Works; MDOT SHA; MCDOT; MCPS	Locations treated	Citywide; where there is no better alternative	☆☆☆	Operating budget; MCDOT; MDOT SHA; MHSO		*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.10: Provide Safety Upgrades During Routine Maintenance

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.10.1	Conduct vegetation maintenance	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA		*Montgomery County Vision Zero | 2030 Action Plan*
1.10.2	Install or widen retroreflective pavement markings on centerlines and edgelines.	Public Works; MDOT SHA; MCDOT	Miles of roadway treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA	Wider Edgelines (4in to 6in): 0.635	*FHWA PSC (Wider Edge Lines); Montgomery County Vision Zero | 2030 Action Plan*
1.10.3	Conduct street maintenance	Public Works; MDOT SHA; MCDOT	Miles of roadway treated	Citywide	☆☆☆	Operating budget; MCDOT; MDOT SHA		*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.11: Improved Lighting

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.11.1	Improve Lighting along roadways	Public Works; Utility companies	Locations treated	Citywide; primarily under larger projects	☆☆☆	Operating budget; MCDOT; MDOT SHA	Intersection: 0.58 – 0.67 Highway: 0.72	*FHWA PSC (Lighting); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.12: Sidewalk Repair and Clearance

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.12.1	Conduct routine maintenance	Public Works	Miles of sidewalk repaired	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.13: Sidewalk Construction and Upgrades

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.13.1	Upgrade sidewalk to shared-use path	Public Works; MDOT SHA; MCDOT	Mileage of sidewalk upgraded	Citywide; where warranted and feasible	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.13.2	Install sidewalk	Public Works; MDOT SHA; MCDOT	Mileage of sidewalk installed	Citywide; where warranted and feasible	☆☆☆	Operating budget; MCDOT; MDOT SHA	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
1.13.3	Widen shoulders	Public Works; MDOT SHA; MCDOT	Miles of shoulder widened	Citywide (in undeveloped corridors or areas with no pedestrian generators)	☆	Operating budget; MCDOT; MDOT SHA	Varies	*FHWA PSC (Roadside Design Improvements at Curves); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.14: High Visibility Equipment and Markings

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.14.1	Install Continental or Ladder Crosswalks	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆☆	Operating budget; MCDOT	0.63	*Montgomery County Vision Zero | 2030 Action Plan*
1.14.2	Implement low-cost countermeasures at stop-controlled intersections such as advance warning signage, retroreflective sheeting, reflective strips on signposts, or enhanced pavement markings.	Public Works; MDOT SHA; MCDOT	Implement x low-cost countermeasures per year.	Citywide	☆☆☆☆ (High Injury Network)	Operating budget; MCDOT	0.73-0.90	*FHWA PSC (Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections); Montgomery County Vision Zero | 2030 Action Plan*

Strategy 1.15: Shared Streets

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.15.1	Rethink how public right-of-way is used that can prioritize non-motorist travel and provide benefits to businesses and residents	Public Works; Planning	Conduct analysis	Citywide	☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 1.16: Data Informed Decisions

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.16.1	Implement updated refresher training for Sergeants approving reports.	Police	Conduct training	Citywide	☆☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.2	Update the Pedestrian Safety Impact Statement for CIP projects to alignment with safety plan.	Public Works	Complete update	Citywide	☆☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.3	Complete predictive safety analysis that identifies corridors and intersections with the highest potential for certain crash types.	Public Works	Conduct analysis	Citywide	☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.4	Create fatal and serious crash dashboard on Vision Zero website to provide regular updates to the public.	Public Works	Develop dashboard	Citywide	☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.5	Develop staff training for developing standardized estimates for a project's safety impact.	Public Works	Develop training materials	Citywide	☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.6	Provide past crash history and expected crash reduction for CIP projects.	Public Works	Conduct analysis	Citywide	☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
1.16.7	Explore changes to current asset management system to allow for easier tracking of changes to the network and interoperability between divisions.	Public Works	Conduct analysis	Citywide	☆☆☆	Operating budget; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 1.17: Equitable Project Intake and Selection

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
1.17.1	Review minor sidewalk projects program intake process to ensure resources are based on equity, safety, need, and data.	Public Works	Conduct review	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
1.17.2	Review requests to Public Works to ensure resources are based on equity, safety, need, and data.	Public Works	Conduct review	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
1.17.3	Review minor bicycle projects program intake process to ensure resources are based on equity, safety, need, and data.	Public Works	Conduct review	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Action Area 2 – Safe Speeds

Action Area Objective: *Use planned projects to align the recommended safe speed limit for the roadway and land use context with the design of the roadway*

Strategy 2.1: Examine Speed Limit on Transportation Projects

Action Number	**Action**	**Proposed Lead Agency (*and partners)***	**Activity Performance Metric**	**Application**	**Priority**	**Potential Funding Source(s)**	**Crash Modification Factor / Star Rating**	**Source of Countermeasure**
2.1.1	Speed Limit Reductions	Public Works; MDOT SHA; MCDOT	Locations treated	Residential/core streets or where warranted	☆☆☆☆☆	MD SHA; MCDOT; Operating budget	☆☆☆☆	*NHTSA Countermeasures That Work (Lower Speed Limits); Montgomery County Vision Zero | 2030 Action Plan*
2.1.2	Lane width reduction	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide	☆☆☆☆	MD SHA; MCDOT; Operating budget	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 2.2: Speed Management Policy

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
2.2.1	Update internal policies for reviewing and setting speed limits and use tools such as USLIMITS2 and safe system to determine appropriate and context-sensitive speeds.	Public Works; MDOT SHA; MCDOT	Update policies	Citywide	☆☆☆☆☆	MD SHA; MCDOT; Operating budget	0.75	*Montgomery County Vision Zero 2030 Plan; FHWA Proven Safety Countermeasures*
2.2.2	Review and update City, County, and State laws and policies to allow setting speeds as recommended.	Public Works; MDOT SHA; MCDOT	Review policies	Citywide	☆☆☆☆☆	MD SHA; MCDOT; Operating budget	0.75	*Montgomery County Vision Zero 2030 Plan; FHWA Proven Safety Countermeasures*

Strategy 2.3: Enforcement of Speed Limits

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
2.3.1	Automated enforcement of speed, red-light running, and STOP-sign running	Public Works; Police	N/A	Citywide; where alternatives are not feasible	☆☆☆☆	MD SHA; MCDOT; MHSO; Operating budget	☆☆☆☆☆	*Montgomery County Vision Zero 2030 Plan*
2.3.2	Conduct High Visibility speed enforcement	Public Works; Police	Hours logged	Citywide	☆☆☆	MHSO	☆☆	*NHTSA Countermeasures That Work*
2.3.3	Conduct High Visibility saturation patrols for impaired driving.	Public Works; Police	Hours logged	Citywide	☆☆☆	MHSO	☆☆☆☆	*NHTSA Countermeasures That Work*
2.3.4	Install radar speed feedback signs	Public Works; Police	Locations treated	Citywide; where warranted	☆☆☆	Operating budget	☆☆☆☆☆	*Montgomery County Vision Zero 2030 Plan*

Action Area 3 – Safe Multimodal Transportation

Action Area Objective: *Improve safe multimodal access to transit, schools, businesses, and homes.*

Strategy 3.1: Pedestrian and Bicycle Infrastructure Improvements Along New Transportation Projects

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.1.1	Upgrade sidewalk to shared-use path	Public Works; MDOT SHA; MCDOT	Mileage of sidewalk upgraded	Citywide; where warranted and feasible	☆☆☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
3.1.2	Rail grade crossing improvements	Public Works; MDOT SHA; MCDOT	Locations treated	At at-grade crossings	☆☆☆☆	Operating budget; MDOT SHA; MCDOT	0.50	*Montgomery County Vision Zero | 2030 Action Plan*
3.1.3	Install protected intersections	Public Works; MDOT SHA; MCDOT	Locations treated	Citywide; where warranted and feasible	☆☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero | 2030 Action Plan*
3.1.4	Install separated bicycle lanes	Public Works; MDOT SHA; MCDOT	Miles of protected bicycle lane added	Citywide; where off-road paths are not feasible; especially in densest areas	☆☆☆	Operating budget; MDOT SHA; MCDOT	Convert traditional or flush bike lanes to separated bike lanes with Flexi-Posts: 0.468	*FHWA PSC (Bicycle lanes); Montgomery County Vision Zero | 2030 Action Plan*
3.1.5	Green bike lanes & bike boxes	Public Works; MDOT SHA; MCDOT	Miles of green bike lane added	Citywide; where off-road paths are not feasible; especially in densest areas	☆☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero | 2030 Action Plan*

Strategy 3.2: Transit Stop Safety

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.2.1	Audit transit stops and implement audit recommendations.	MCDOT; WMATA	Conduct audit	Citywide	☆☆	MCDOT; WMATA; Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.3: School Bus Stop Safety

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.3.1	Examine sidewalk gaps where there are bus routes surrounding public school buildings.	Public Works	Conduct review	Citywide	☆☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*
3.3.2	Review bus stops along major roadways and move them to nearby local streets where possible.	Public Works; MDOT SHA; MCDOT; MCPS	Conduct review	Citywide	☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.4: Eliminate Sidewalk Obstructions

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.4.1	Pilot Projects along residential properties with no space to place receptacles outside of sidewalk	Public Works; MDOT SHA	Conduct pilot project	Citywide	☆☆	MDOT	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.5: Maintenance of Travel (MOT) During Sidewalk and Road Closures

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.5.1	Develop model regulations for construction and utility closures that accounts for maintenance of all travel modes where applicable.	Public Works	Develop regulations	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
3.5.2	Use MC Department of Permitting Services and other data sources to provide real-time notifications on an online map	Public Works; County	Develop map	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.6: Bike and Micromobility Parking

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.6.1	Install micromobility corrals, with priority in major activity centers, to provide safe and convenient parking for bikes and other micromobility devices.	Public Works	Number of installations	Citywide	☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.7: Curbside Management

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.7.1	Pilot projects that reduce conflict amongst road users; creating and expanding pick up/drop off zones, unloading, and short-term parking close to building entrances.	Public Works	Conduct pilot project	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.8: Snow Removal from Bike Facilities, Sidewalks, and Transit Stops

Action Number	Action	Proposed Lead Agency (*and partners)*	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.8.1	Explore code modifications and other legal avenues needed to expand street snow removal procedures to minimize snow blockage of curb cuts, bus shelters, and transit stops as appropriate and applicable.	Public Works	Conduct analysis	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
3.8.2	Procure additional equipment or contractor service if needed to ensure protected bike lanes can be cleared.	Public Works	Procure equipment	Citywide	☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 3.9: Safety Audit of City-Owned Parking Lots and Garages

Action Number	Action	Proposed Lead Agency (*and partners)*	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
3.9.1	Conduct a safety analysis of existing City-owned lots and garages to prioritize properties that may need modifications.	Public Works	Conduct analysis	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Action Area 4 – Safe and Sustainable Communities

Action Area Objective: *Integrate safe system approach into master planning for community, transportation demand management programs, and roadway design guidelines*

Strategy 4.1: Transportation and Land Use Planning

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
4.1.1	Integrate safe system approach into functional and area master plans, development review, and subdivision staging.	Planning	Integrate policy	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Action Area 5 – Safe Vehicles

Action Area Objective: *Improve vehicle technology*

Strategy 5.1: Safer City Vehicle Fleet

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
5.1.1	As vehicles are replaced, purchase vehicles meeting minimum safety packages	City Manager	Apply policy	Citywide	☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 5.2: Prepare for Autonomous Vehicles

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
5.2.1	Participate in connected infrastructure pilot and participation on Maryland Connected and Automated Vehicles Working Group.	County	Participation in group	N/A	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
5.2.2	Engage in Future Technology Task Force to plan for connected autonomous vehicles, the increase in personal conveyances, and future uses for private and commercial drones.	County	Participation in group	N/A	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Action Area 6 – Safe People

Action Area Objective: *Improve communication and collaboration with communities most impacted by serious traffic crashes and empower communities to speak up for safety*

Strategy 6.1: Outreach and Education to the Community

Action Number	Action	Proposed Lead Agency (*and partners)*	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.1.1	Coordinate safety campaigns with regional, state, and federal agencies and continue seeking grant funding to support efforts.	Public Works; Vision Zero Coordinator; Communication & Public Engagement	Number of campaigns	Citywide	☆☆☆☆	MHSO	☆☆	*Montgomery County Vision Zero 2030 Plan*
6.1.2	Conduct education campaigns, events, trainings, and social media messaging on topics such as safety belt use, impaired driving, zero tolerance laws, distracted driving, speeding, motorcycle safety, "move over" law, older adult safety, and other highway safety issues.	Public Works; Vision Zero Coordinator; Communication & Public Engagement	Number of campaigns	Citywide	☆☆☆	MHSO	☆☆	*Montgomery County Vision Zero 2030 Plan*
6.1.3	Develop updated communication and outreach strategy for safety projects and campaigns.	Public Works; Vision Zero Coordinator; Communication & Public Engagement	Number of campaigns	Citywide	☆☆☆	MHSO	☆☆	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.2: Collaboration with Community Partners and Ambassadors

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.2.1	Partner with regional and national groups to create older driver and pedestrian campaigns to raise awareness of vulnerability at different ages, changes in reaction times, how to navigate new infrastructure such as protected bike lanes, and transit options for older residents.	Public Works	Number of campaigns	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.2.2	Reach out to local driving schools and provide materials about Vision Zero and sharing the road.	Public Works; MHSO	Number of driving schools engaged	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.2.3	Work with MCPS to add safety materials for students applying for school parking permits.	Public Works; MCPS	Number of materials developed	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.2.4	Work with summer camps and AAA Patrol Camp for safety outreach.	Public Works	Number of programs engaged	Citywide	☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.2.5	Identify and recruit local groups (HOAs, PTAs, Condo Associations, etc.) that can be engaged in traffic safety messaging in diverse and underserved communities.	Public Works	Number of groups engaged	Citywide	☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.3: Coordination of Campaigns

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.3.1	Create corridor project plans that account for education, outreach, and enforcement to bookend engineering projects.	Public Works	Establishing criteria to be used	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.4: Ending Impaired Driving Deaths

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.4.1	Promote and increase number of joint operations with municipal and State Police as part of high-visibility enforcement campaigns focused on Interstates and major arterials.	Police; MHSO	Number of operations	Citywide	☆☆☆	MHSO	☆☆☆	*Montgomery County Vision Zero 2030 Plan*
6.4.2	Bring together stakeholders to develop an action plan focused on ending impaired driving deaths.	Police; MHSO	Number of stakeholders engaged	Citywide	☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.4.3	Expand driving under the influence of drugs (DUID) and advanced roadside impaired driving enforcement (ARIDE) training for all cadets at the academy.	Police; MHSO	Number of trained officers	Citywide	☆☆	MHSO	☆☆☆	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.5: Expansion of Automated Enforcement

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.5.1	Expand deployment of red light and speed cameras to areas with known high crash risk and where allowed under State law.	Public Works; Police; County	Number of installations	Citywide	☆☆☆☆	MHSO; County; Operating budget	☆☆☆☆☆	*Montgomery County Vision Zero 2030 Plan*
6.5.2	Support State legislation to expand location qualifications for automated speed enforcement to include areas identified as high crash risk and documented speeding problems and remove time limits for ATE around school zones.	Public Works; Police; County	Participation in discussions	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
6.5.3	Support State legislation to expand automated enforcement for additional violations such as bus lanes, distraction, move over law, occupant protection, over height vehicles, and block the box if the technology has been proven effective, equitable, and protects drivers from unnecessary surveillance.	Public Works; Police; County	Participation in discussions	Citywide	☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.6: Focused Enforcement Efforts

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.6.1	Roll out "focus on the five" high-visibility enforcement (HVE) program in coordination with outreach. Develop a short explainer document on importance of "focus on the five" and equitable traffic enforcement and assess the initiative's impact on racial equity and social justice.	Police; County	Develop document	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.6.2	Work with State and County legislators, State's Attorney Office to provide alternatives to fines such as community service or attending classes to offset the financial impact of enforcement.	Police; County	Facilitate discussion	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.7: Expand Safe Routes to School

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.7.1	Initiate targeted education and engineering projects to improve the pedestrian environment and encourage more students to walk or bike to their school.	Public Works	Number of campaigns	Citywide	☆☆☆☆	MHSO	☆☆☆	*Montgomery County Vision Zero 2030 Plan*
6.7.2	Develop virtual outreach training to expand train-the-trainer program.	Public Works	Development of training	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.7.3	Partner with additional PTA and Community Associations to increase engagements to parents.	Public Works	Number of groups engaged	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*
6.7.4	Explore opportunities for expanding staff or contractors to support Safe Routes to School outreach focused on outreach to limited-English families.	Public Works	Number of participants engaged	Citywide	☆☆☆	MHSO	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.8: Bike Riding and Safety Courses

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.8.1	Expand multi-lingual outreach for adult training programs.	Public Works	Number of programs	Citywide	☆☆☆	MHSO	☆☆	*Montgomery County Vision Zero 2030 Plan*
6.8.2	Host bicycle rodeos at different schools.	Public Works; MCPS	Five bicycle rodeos per year	Citywide	☆☆☆	MHSO	☆	*Montgomery County Vision Zero 2030 Plan*
6.8.3	Implement on-bike education pilot program in City schools.	Public Works; MCPS	Conduct pilot program	Citywide	☆☆☆	MHSO	☆☆	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.9: City Employees using Fleet Vehicles

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.9.1	For departments with driver training, include in practical driving training and tests information about limiting distractions, seat belt use, and safe speeds similar to current program.	Public Works, Human Resources	Number of employees engaged	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
6.9.2	Implement a collision review committee to review crashes involving City vehicles and resulting in injuries for departments currently without a review committee.	Public Works	Institute committee	Citywide	☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 6.10: Conspicuity for City Employee Uniforms

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
6.10.1	Identify all City positions that require field work and work with City unions to upgrade uniform policies to include high visibility outer wear.	Human Resources	Identify all positions	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*
6.10.2	As uniforms are replaced or purchased for new employees, provide high-visibility gear.	Human Resources	Institute uniform policy	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Action Area 7 – Safe Post-Crash Response and Care

Action Area Objective: *Empower and protect public safety employees through safe, timely responses and on-scene traffic management*

Strategy 7.1: Prompt Medical Service

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
7.1.1	Maintain time-to-scene and time-to-hospital response times that meet or exceed department standards.	Coordination with Fire/Rescue	Response time	Citywide	☆☆☆☆	Operating budget	N/A	*Montgomery County Vision Zero 2030 Plan*

Strategy 7.2: Planning and Coordination for Safe Traffic Incident Management

Action Number	Action	Proposed Lead Agency (*and partners*)	Activity Performance Metric	Application	Priority	Potential Funding Source(s)	Crash Modification Factor / Star Rating	Source of Countermeasure
7.2.1	Pilot project for temporary traffic control devices (e.g. truck mounted attenuators or arrow boards) and tow trucks similar to State Highway Administration's CHART program on the interstates.	Public Works	Pilot project completion	Pilot project in City	☆☆☆☆	Operating budget; MDOT SHA; MCDOT	N/A	*Montgomery County Vision Zero 2030 Plan*