

# Town of Ware

## Safety Action Plan

Prepared for  
**Town of Ware**

Prepared by  
**Howard Stein Hudson**

**April 2024**



**HOWARD STEIN HUDSON**

Engineers + Planners



# Acknowledgements

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The development of the Ware Safety Action Plan would not have been possible without the collaborative efforts of Town of Ware staff, Town of Ware Police Department, Howard Stein Hudson, and members of the community. We would like to express our sincere gratitude to all those who contributed to this important initiative.

We also extend our appreciation to the Ware Town Manager, Stuart Beckley, and Ware Grants Administrator, Jay Mooney, for their leadership and support throughout the planning process. Their commitment to prioritizing safety will be instrumental in bringing this plan to fruition.

Lastly, we would like to thank the Ware Safety Action Plan Taskforce for their commitment to improving transportation safety in the Ware community. The Taskforce members are instrumental in the on-going monitoring, vision, and implementation of this plan.



## TOWN OF WARE

**Town Manager**

126 Main Street  
Ware, MA 01082  
413-967-9648 x100

**January 15, 2025**

### **Ware Safety Action Plan Commitment**

Whereas the Town of Ware has several intersections and walkways of concern based on MassDOT crash data; and

Whereas, the Town has multiple Environmental Justice areas in which crashes and accidents have occurred causing bodily and property damage; and

Whereas, the Town working with engineer Howard Stein Hudson conducted a survey of residents to identify areas of concern beyond crash data and to prioritize improvements; and

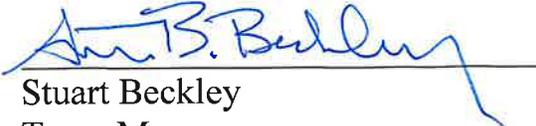
Whereas, in April, 2024, Howard Stein Hudson completed the Town of Ware Safety Action Plan following a public hearing, and

Whereas, the Town through its Selectboard, the Executive Town office, adopted the Safety Action Plan in August, 2024 and established the priorities set in the plan for action,

The Town now therefore commits to the implementation of the Safety Action Plan through available local, State and Federal resources, and

The Town sets the goal of achieving zero roadway fatalities and serious accidents by the end of calendar year 2030.

Committed this day of January 15, 2025.

  
Stuart Beckley  
Town Manager



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# Introduction

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The Town of Ware, Massachusetts, has developed this comprehensive Safety Action Plan to address traffic safety concerns and improve the overall transportation experience for all road users. This effort is guided by the Federal Highway Administration's (FHWA's) Safe Streets and Roads for All (SS4A) program, which provides funding opportunities for local communities to develop and implement evidence-based strategies to reduce roadway fatalities and serious injuries.

Ware, located in Hampshire County, has a population of approximately 10,000 residents (2020 U.S. Census). The Town is situated at the intersection of multiple major roadways, including Route 9 and Route 32, which serve as important regional connectors. Ware's proximity to the Quabbin Reservoir also makes it an important regional recreational destination.

The Ware Safety Action Plan includes a detailed analysis of crash data, identification of high-risk locations and crash patterns, and a prioritized list of safety countermeasures and projects. The Plan outlines safety strategies that can be implemented in the Town, potential applications of these strategies at specific project locations, and objective metrics to prioritize these projects. To ensure the effective implementation of these safety improvements, the plan includes a prioritized project list, cost estimates, and a timeline for completion.

## Safe Systems Approach

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The Safe System Approach<sup>1</sup>, adopted by the U.S. Department of Transportation (DOT), represents a significant shift from traditional road safety practices. This approach recognizes that both human mistakes and vulnerability are inevitable, and thus aims to design a more forgiving transportation system that accommodates human errors and ensures crash forces do not exceed human tolerances. By acknowledging that all roadway safety interventions must work together to achieve the goal of zero fatalities, the Safe System Approach is inclusive of all road users and communities. The Safe System Approach incorporates the following key principles:

- Death and serious injuries are unacceptable.
  - The transportation system should be designed to prevent crashes that result in death or serious injuries.
- Humans make mistakes.

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<sup>1</sup> United States Department of Transportation, National Roadway Safety Strategy, January 2022



- People will inevitably make errors that can lead to crashes, so the transportation system must accommodate and manage human mistakes to avoid death and serious injuries.
- Humans are vulnerable.
  - The human body has limited tolerance for crash forces, so it is critical to design a transportation system that minimizes the risk of severe injuries and fatalities.
- Responsibility is shared.
  - All stakeholders, including government at all levels, industry, non-profit/advocacy, researchers, and the public, are vital to preventing serious injuries on our roadways.
- Safety is proactive.
  - Reactive tools should be used to identify and address safety issues in the transportation system proactively, rather than waiting for crashes to occur.
- Redundancy is crucial.
  - Reducing risks requires that all parts of the transportation system be strengthened so that if one part fails, the other parts still protect people.

By incorporating the Safe System Approach into the Ware Safety Action Plan, the Town can work towards creating a more forgiving, safer transportation system that proactively addresses safety concerns, accommodates human errors, and minimizes the severity of crashes. This approach will guide the selection and implementation of effective safety strategies and projects, ultimately working towards the goal of eliminating fatal and serious injury crashes in Ware.

## Vision and Goals

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The Town of Ware envisions a safe, equitable, and accessible transportation system for all road users. The Ware Town Manager, Stuart Beckley, and Chief of Police, Shawn Crevier, are committing to a Vision Zero of working to eliminate traffic fatalities and serious injury crashes within the Town. Through a data-driven and collaborative approach, Ware aims to significantly reduce all types of traffic crashes while promoting sustainable mobility options and enhancing the quality of life for residents and visitors alike. Ware aims to reach these aims via the following goals:

- Utilize data-driven analysis and community input to identify and prioritize high-crash locations and safety improvement projects.
  - Continue to collect, analyze, and report on crash data to track progress and inform decision-making.
  - Engage with community members and stakeholders to continue to understand local safety concerns and needs.



- Implement evidence-based safety countermeasures and infrastructure improvements to reduce crash frequency and severity.
  - Prioritize projects that address the most pressing safety issues and benefit the most vulnerable road users.
  - Seek varied funding sources and partnerships to support timely implementation of safety projects.
- Enhance safety for pedestrians, bicyclists, and other vulnerable road users through targeted interventions and complete streets design principles.
  - Expand and improve the pedestrian and bicycle network, with a focus on safe routes to schools and key destinations.
  - Implement traffic calming measures and speed management strategies to reduce speeding and improve safety.
- Ensure equitable implementation of safety strategies and projects, prioritizing underserved and disadvantaged communities.
  - Continue to analyze crash and socioeconomic data to identify and address disparities in traffic safety outcomes.
- Establish a framework for ongoing monitoring, evaluation, and updating of the Safety Action Plan.
  - Develop clear performance measures and regularly assess progress toward safety goals.
  - Adjust strategies and priorities as needed based on data, community feedback, and emerging best practices.

The Town of Ware will attempt to secure the necessary funding and resources to implement safety projects outlined in this report and will work closely with the community to ensure that the improvements meet the needs and expectations of all stakeholders.

By aligning with the SS4A program guidelines and leveraging available funding opportunities, Ware is committed to creating a safer, more accessible, and more equitable transportation system for all residents and visitors. The successful implementation of the Safety Action Plan will not only reduce the risk of crashes and injuries but also enhance the overall quality of life in the community.

The Ware Safety Action Plan should be considered a living document that will be regularly updated and refined based on ongoing crash data analysis, community feedback, and evaluation of implemented safety measures. By taking a proactive, data-driven approach to traffic safety, the Town of Ware aims to create a safer, more livable community for all.



## Task Force

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In developing, implementing, and monitoring this Safety Action Plan, the Town of Ware is establishing a Safety Action Plan Implementation Committee, consisting of the Town Manager, Town Planner, Department of Public Works (DPW) Director, Highway Superintendent, Police Chief, Quaboag Connector representative, and two local community representatives. The specific tasks carried out by this committee will be discussed further in the Plan, but they will meet regularly to review the progress of the plan, discuss the findings of the monitoring and evaluation process, and provide guidance on future actions and priorities.

## Existing Efforts

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There are several other regional and local transportation planning efforts in the region that include safety aspects. They are summarized in this section; the Ware Safety Action Plan will dovetail with these plans.

### Pioneer Valley Regional Transportation Plan

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The Pioneer Valley Regional Transportation Plan (RTP) outlines the direction of transportation planning for the Pioneer Valley through the year 2040. It is made with guidance from the Fixing America's Surface Transportation (FAST) Act along with Massachusetts Department of Transportation (MassDOT) recommendations. The FAST Act prioritizes addressing the safety, condition, congestion, and sustainability of the transportation infrastructure in the region, including the Town of Ware.

The RTP gathered data from all the communities within the region. From 2007-2016, Ware had 1,992 reported crashes, or 199 per year, which ranks on the higher side for the region regarding crashes per mile (1.70). Of the 16 bridges in Ware, there is an average Bridge Health Index (BHI) of 84.62, and three were found to be structurally deficient. The RTP outlines needs, strategies, and projects for the region and how they will be carried out through the year 2040, addressing the needs of Ware and the rest of the region.

### Pioneer Valley Safety Compass

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The Pioneer Valley Safety Commission (PVSC) performs a variety of studies to determine steps required to improve safety. The report summarizes the community-wide crash history, identifies top



crash locations within each community, and notes the severity of crashes and corresponding injuries. The PVSC identified crashes from 2012-2014 in each community.

The PVSC provides a detailed crash report for each community, which includes the manner of collision, severity, roadway condition, and crash location. Out of 581 total crashes, Ware saw two (2) fatal injuries from 2012-2014. The most crashes occurred at the intersection of Main Street and North Street, in the center of town. However, more than 64% of crashes occurred at locations other than intersections. Single vehicle crashes made up the largest percentage at 34%, followed by rear end (25%) and angle (22%). Approximately 10% of single vehicle crashes involved a distracted driver.

A later Pioneer Valley Safety Compass document details the same trends from 2015-2017. During this period, Ware saw 632 crashes reported, an uptick from the previous three-year period. There were two fatal crashes, and most collisions still involved a single vehicle.

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## Ware Complete Streets Prioritization Plan

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The Complete Streets Prioritization Plan (CSPP) allows Ware to access resources from Massachusetts' Complete Streets Funding program. This program can help build Complete Streets which encourage walking and biking by means of sidewalks, bike facilities, safe crossings, and other improvements. The Plan outlines a series of projects that can be done to improve pedestrian and cyclist safety with anticipated costs and construction time, as well as desired start dates. The projects range from a variety of improvements, including reconstruction of the busier centralized streets like Main Street, signal replacement and re-timing, and sidewalk construction. The plan also includes a series of road diets, crosswalk improvements, and bike lane installations.

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## Ware Bike and Pedestrian Network Plan

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The Ware Bike and Pedestrian Network Plan is a guide for the Town of Ware during the implementation of the CSPP. The goals for completing a biking and walking network in Ware are improving conditions for pedestrian safety, improving sidewalk access and design, completing the Ware River Trail, and improving conditions for bicyclists' safety and comfort. Along with each goal, the plan outlines a list of recommendations where certain locations may be lacking in quality. These recommendations are specific on location and necessary improvement, which coincides with the Complete Streets projects.



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## Main Street (Route 9) Road Safety Audit

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This Road Safety Audit (RSA) report examines safety issues and potential improvements for the Main Street (Route 9) corridor in Ware from West Street to Church Street/South Street, with a focus on the intersections of Main Street with West Street, North Street, and South Street/Church Street. The report identifies specific safety issues at each intersection related to factors such as ADA compliance, pedestrian safety, lane usage confusion, illegal turning movements, signal deficiencies, and truck turning conflicts. It also looks at overall bicycle accommodation along the corridor.

The crash data summary for the 2010-2014 analysis period shows a total of 68 crashes along the corridor, with 52 property-damage-only crashes and 15 injury crashes. Some key crash patterns include:

- 23 angle crashes (34%), many related to turning movement violations and failure to yield Right of Way (ROW);
- 25 rear-end crashes (37%), with some attributed to sudden stops, poor signal visibility, and following too closely;
- 3 crashes involving pedestrians, one each at the West Street, North Street, and Church Street intersections; and
- Over 75% of crashes occurred during daylight conditions and on dry roadway surfaces.

Short-term suggestions include improved signage and pavement markings, traffic signal timing adjustments, and minor curb and sidewalk modifications. Longer-term recommendations involve intersection reconfiguration, full traffic signal replacement, and comprehensive pedestrian and bicycle facility upgrades to meet ADA requirements. This RSA was used as a basis for a transportation improvement project at the RSA area that was constructed in 2020.



# Safety Data and Analysis

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The crash data utilized in this report consists of crash data from 2016-2020 supplied to the MassDOT IMPACT crash portal by the Ware Town Police. The year 2020 represents the latest available closed out year on the MassDOT crash portal at the time of this report. The Ware Town Police were consulted to ensure that their crash data was properly represented on MassDOT's IMPACT crash portal. Across the Town of Ware from 2016-2020 there were 806 recorded crashes in the Town, representing an average of approximately 161 crashes per year. **Table 1** shows a breakdown of the crashes by year, crash type, crash severity, age of drivers, and functional classification of the roadways for the town-wide crashes. The table also compares these to statewide trends to determine whether certain aspects are overrepresented. The underlying crash data and graphs representing the categories are included in **Appendix A**.

## YEARLY CRASH TRENDS

Over the five-year period from 2016 to 2020, the number of crashes in Ware remained relatively consistent, ranging from a low of 136 crashes in 2017 to a high of 176 crashes in 2019. The years 2016, 2019, and 2020 each accounted for approximately 22% of the total crashes during this period, while 2017 and 2018 saw slightly lower percentages at 17% and 19%, respectively. In 2020, Ware had 6% more crashes occur than the statewide trends.

## CRASH TYPE

Single-vehicle crashes were the most common crash type in Ware, accounting for 31% of all crashes from 2016 to 2020. Angle and rear-end crashes each accounted for 23% of all crashes, followed by sideswipe crashes at 13%. Head-on crashes made up 3% of all crashes, while the remaining 7% were categorized as unknown or other crash types. Compared to statewide crash trends, Ware experienced an 8% higher incidence of single-vehicle crashes. Incidences of these types of crashes may indicate issues with roadway geometry, such as sharp curves or poor sight distances, or driver behavior factors like distraction, impairment, or speeding.



Table 1. MassDOT Crash Data Summary

Scenario	Town of Ware	% Total	Comparison to Statewide
<b>Year</b>			
2016	174	22%	0%
2017	136	17%	-5%
2018	151	19%	-2%
2019	176	22%	+1%
2020	169	21%	+6%
<b>Total</b>	<b>806</b>	<b>100%</b>	<b>-</b>
<b>Type</b>			
Single Vehicle	251	31%	+8%
Angle	187	23%	-5%
Rear-end	182	23%	-7%
Sideswipe	105	13%	-1%
Unknown/Other	54	7%	+5%
Head-on	26	3%	0%
<b>Total</b>	<b>806</b>	<b>100%</b>	<b>-</b>
<b>Severity</b>			
Property Damage	595	74%	+4%
Personal injury	166	21%	-3%
Fatality	3	<1%	0%
Unknown	42	5%	-1%
<b>Total</b>	<b>806</b>	<b>100%</b>	<b>-</b>
<b>Age of Drivers</b>			
16-34	504	37%	-
35-54	397	29%	-
55-84	416	31%	-
Unknown	44	3%	-
<b>Total</b>	<b>1,361<sup>2</sup></b>	<b>100%</b>	<b>-</b>
<b>Functional Class</b>			
Local	158	20%	-1%
Minor/Major Collector	111	14%	+4%
Minor Arterial	81	10%	-19%
Principal Arterial	456	57%	+23%
<b>Total</b>	<b>806</b>	<b>100%</b>	<b>-</b>

1. Source: Ware Police Department and MassDOT IMPACT Portal, crash data from 2016 through 2020.
2. Total # of drivers involved in the crashes, adds up to different total than others.



## CRASH SEVERITY

From 2016 to 2020, a total of 806 crashes occurred in Ware. Most crashes (74%) resulted in property damage only, while 21% of crashes involved personal injury. Three fatal crashes occurred during this period, accounting for less than 1% of all crashes. 16 of the crashes within the Town involved pedestrians or bicyclists. These types of crashes with vulnerable users will be given special attention within this Safety Action Plan and the strategies/projects to address safety issues will prioritize these kinds of crashes. The pedestrian and bicycle crashes occurring in Ware are mapped in **Figure 1**. These crash patterns and trends provide insight into the types of crashes occurring in Ware and can help guide the development of targeted countermeasures to improve road safety. Further analysis of locations with a high number of crashes and contributing factors will be necessary to identify specific strategies for reducing crashes and improving overall road safety in the Town.

## DRIVER AGE

The 16 to 34 age range comprised 37% of drivers involved in crashes in the data from 2016 to 2020. Drivers in the 35- to 54-year-old age range represented 29% of drivers, and 55 to 84 and older represented 31% of drivers involved in crashes. No particular age range stands out as overly represented in the crash data; further analysis of the demographics of licensed drivers could be done to determine if this is the case.

## FUNCTIONAL CLASSIFICATION

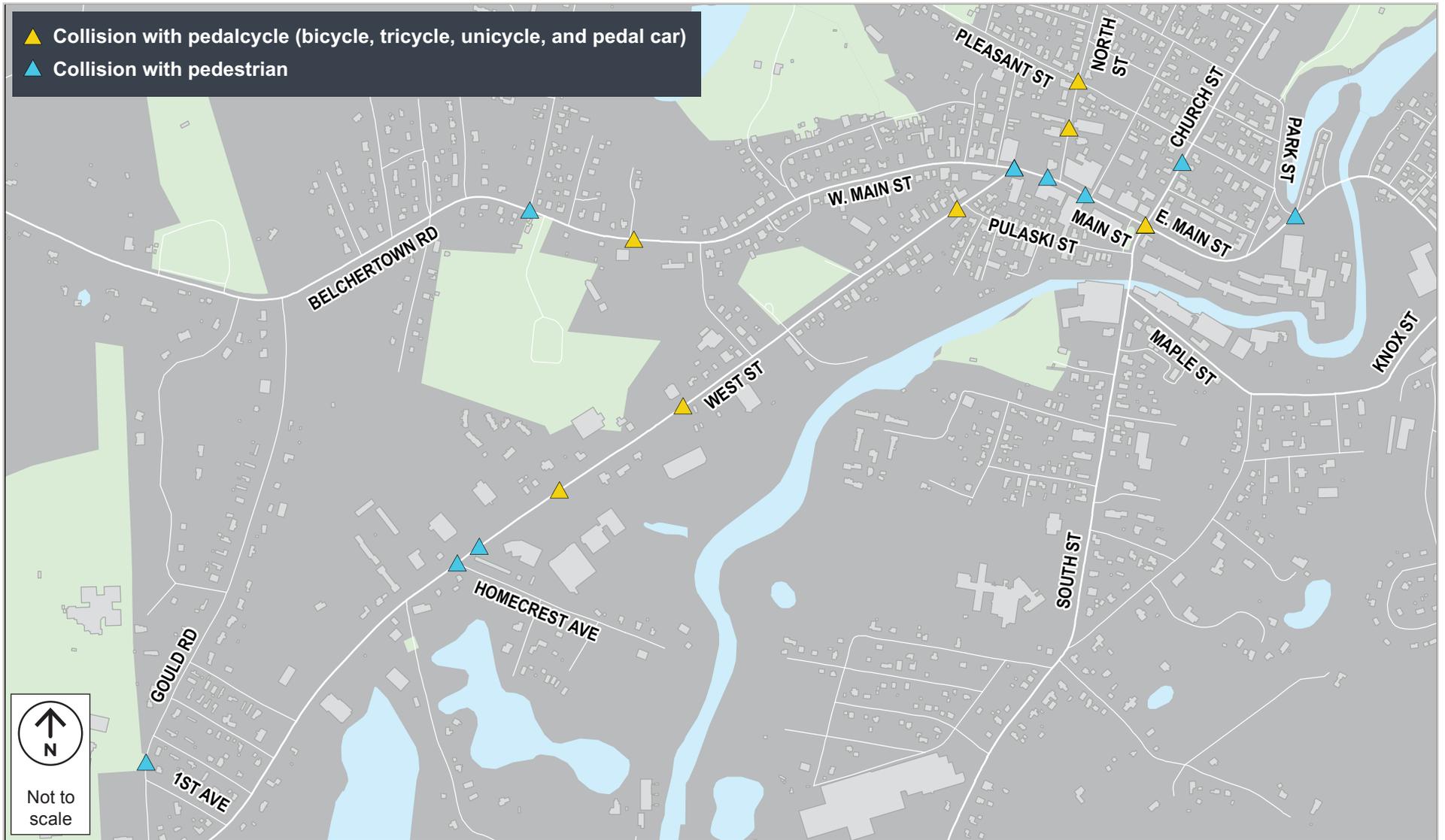
According to the crash data breakdown by functional classification, most crashes in Ware occurred on principal arterials, accounting for 57% of all crashes. Principal arterials are typically high-capacity roads that serve major centers of metropolitan areas and provide a high degree of mobility. The high proportion of crashes on these roads may be attributed to higher traffic volumes and higher speeds. Two major roadways in Ware that are considered principal arterials are Route 9 and Route 32. Local roads, which are characterized by their low mobility and high accessibility, accounted for 20% of all crashes in Ware.

Minor and major collectors, which provide a balance between mobility and access, were responsible for 14% of all crashes. These roads typically connect local roads to arterials and serve shorter trips within the community. Some roadways in Ware that serve as collectors include Gould Road, Eagle Street, Greenwich Road, Old Belchertown Road, and North Street.

Minor arterials accounted for the lowest proportion of crashes at 10%. These roads serve trips of moderate length and offer connectivity to principal arterials. The lower crash rate on minor arterials in Ware is likely due to only Church Street, South Street, and Maple Street being classified as this in the Town.



Figure 1. *Pedestrian and Bicycle Crashes*





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## MassDOT Crash Cluster Assessment

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The MassDOT Traffic and Safety Section utilizes police crash reports to identify and analyze crash clusters using a comprehensive method based on crash severity weighting. The method involves a fixed search distance around each crash to locate and merge nearby crashes into clusters. These clusters are then ranked by the number of Equivalent Property Damage Only (EPDO) crashes, with injury crashes weighted 21 times higher than property-damage-only crashes. The analysis identifies the Top 200 intersection clusters across the Commonwealth, as well as the Top 5% of clusters within each Metropolitan Planning Organization (MPO) and municipality. For pedestrian and bicycle crashes, a larger search distance is used, and the analysis considers the most recent ten-year period due to the relatively small number of reported crashes involving these vulnerable users. Highway Safety Improvement Plan (HSIP) eligible locations involve those that rank in the top 5% within each MPO. None of these clusters appear in the Town of Ware, likely due to the relative volume of traffic the Town experiences compared with the rest of Massachusetts.

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## MassDOT Network Assessment

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MassDOT employs a data-driven network screening methodology to identify and prioritize roadway segments with high potential for safety improvements. This approach involves developing Safety Performance Functions (SPFs), which are statistical models that predict the average crash frequency for a specific roadway type based on its characteristics. The SPFs are used to estimate the expected number of total and fatal/injury crashes on each segment, which is then combined with the observed crash history using the Empirical Bayes method to identify locations where the actual crash frequency significantly exceeds the predicted average.

Roadway segments are ranked based on the excess crashes, representing the difference between the expected and predicted crash frequency. This prioritization process allows MassDOT to identify the top candidates for further investigation and potential safety enhancements at both the statewide and regional levels. The crash- and risk-based network screening roadway segments that were identified in the Town of Ware are discussed in the following section.

### CRASH-BASED

- Top 5% Crash Locations – Fatal and Injury
  - Palmer Road
    - Juniper Hill Road to Dugan Road
    - Longview Avenue
    - West of Anderson Avenue
  - West Street



- Homecrest Avenue to Vernon Street
- Top 5% Crash Locations – All Crashes
  - Palmer Road
    - Juniper Hill Road to Dugan Road
    - Longview Avenue
    - West of Anderson Avenue
  - West Street
    - Homecrest Avenue to Vernon Street
    - Near Pulaski Street

## RISK-BASED

- Roadway Departure
  - Babcock Tavern Road
- Distracted Driver Safety
  - Belchertown Road (Route 9)
  - Gould Road
  - Greenwich Road
  - Babcock Tavern Road
  - Old Belchertown Road
- Impaired Driver Safety Risk
  - Gould Road
  - Greenwich Road
  - Anderson Road
  - Belchertown Road
- Speeding/Aggressive Driving Risk
  - East Main Street
  - West Main Street

These crash- and risk-based locations highlight areas where targeted safety improvements may be most effective in reducing crash frequency and severity. The crash-based locations, such as Palmer Road and West Street, have experienced a higher-than-expected number of crashes, including fatal and injury crashes, indicating a need for further investigation and potential interventions.

The risk-based locations, such as Babcock Tavern Road, Belchertown Road, and Gould Road, have been identified as having a higher risk for specific crash types, such as roadway departure, distracted driving, or impaired driving crashes. These locations may benefit from targeted countermeasures, such as improved signage, pavement markings, or enhanced enforcement efforts.



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## High Crash Locations

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While the overall MassDOT network analysis does not yield specific high crash locations, we can still assess the overall number of crashes by intersection to identify areas within Ware that experience the greatest number of crashes. To determine the high crash locations within Ware, the crashes were mapped onto a heat map. As shown in **Figure 2**, we can see a concentration of crashes around the downtown Ware area along East Main Street. It should be noted that there was a significant Transportation Improvement Program (TIP) project that happened in this area since the crash data was collected for this time period. As a result, the East Main Street area where the project occurred will not be a major focus of this Safety Action Plan. A commitment will be made by the Town of Ware's Safety Action Plan Taskforce to continue to monitor safety data in this area to ensure that the improvements properly addressed the existing safety issues and to suggest additional changes if they have not.

Because of this, an additional heat map was created with the crashes inside the TIP project limits along East Main Street removed. That heat map is shown in **Figure 3**. The severity of the heat spot around East Main Street is reduced, but it still exists, indicating that some surrounding intersections to the downtown (notably those along Pleasant Street, Church Street, and North Street) are still significant crash locations. To plot out the high-injury network locations, a crash heat map with just the fatal and injury crashes was shown in **Figure 4** and **Figure 5** (without the TIP location). These crashes are the most severe and will be the target of this Safety Action Plan to address the most.



Figure 2. *Crash Heat Map*

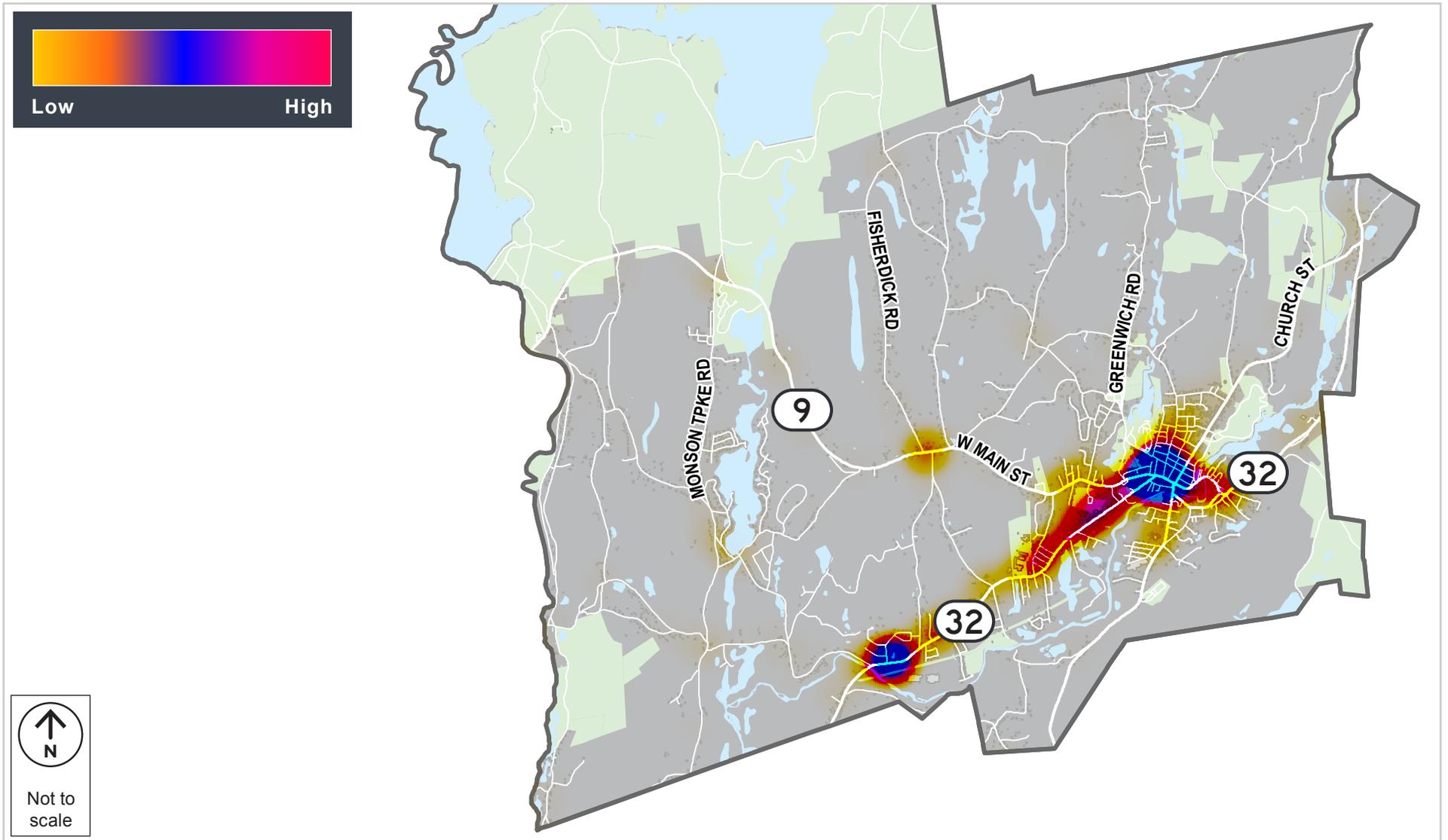




Figure 3. *Crash Heat Map without TIP Location*

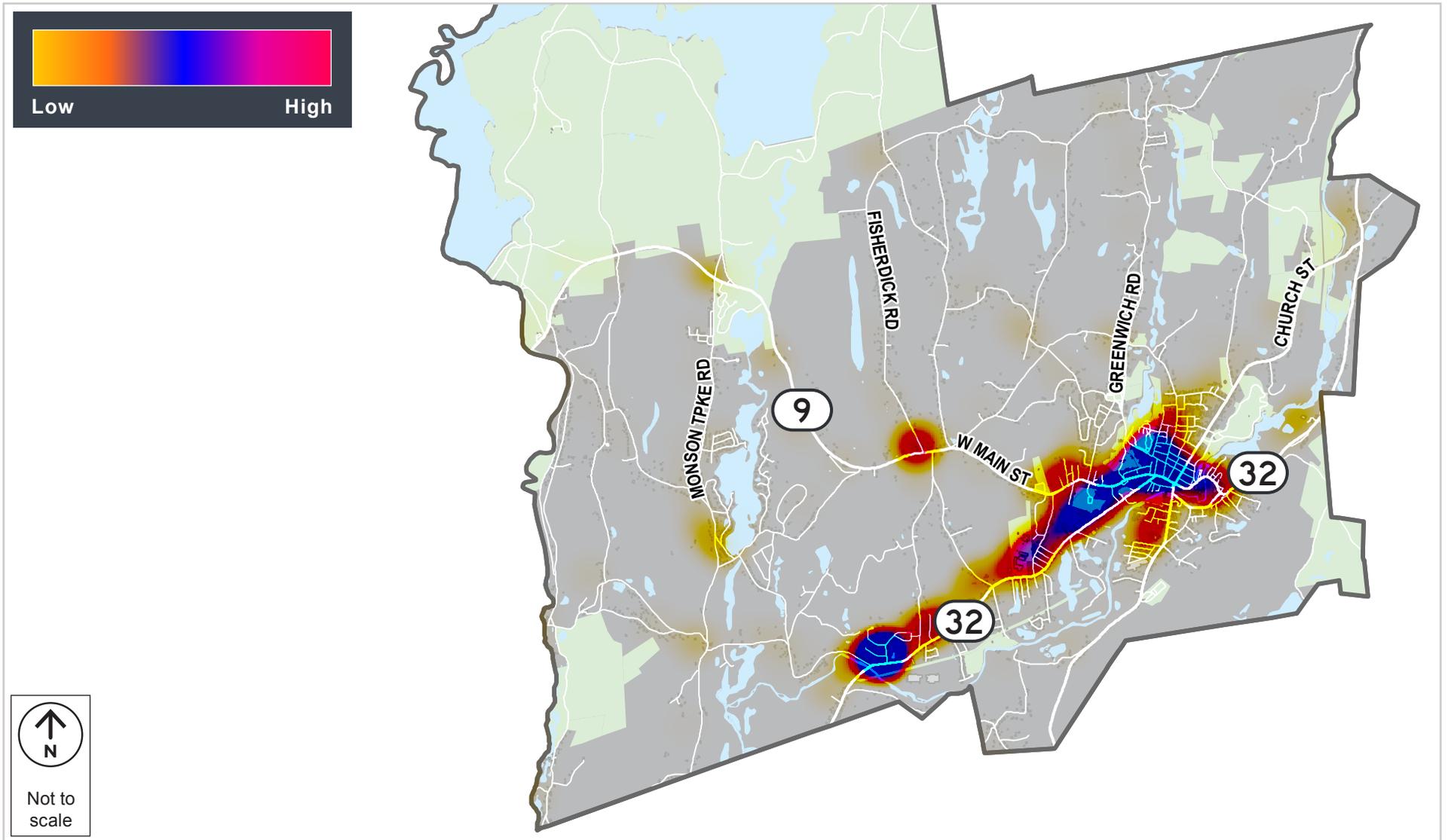




Figure 4. *Crash Heat Map - Injuries/Fatalities*

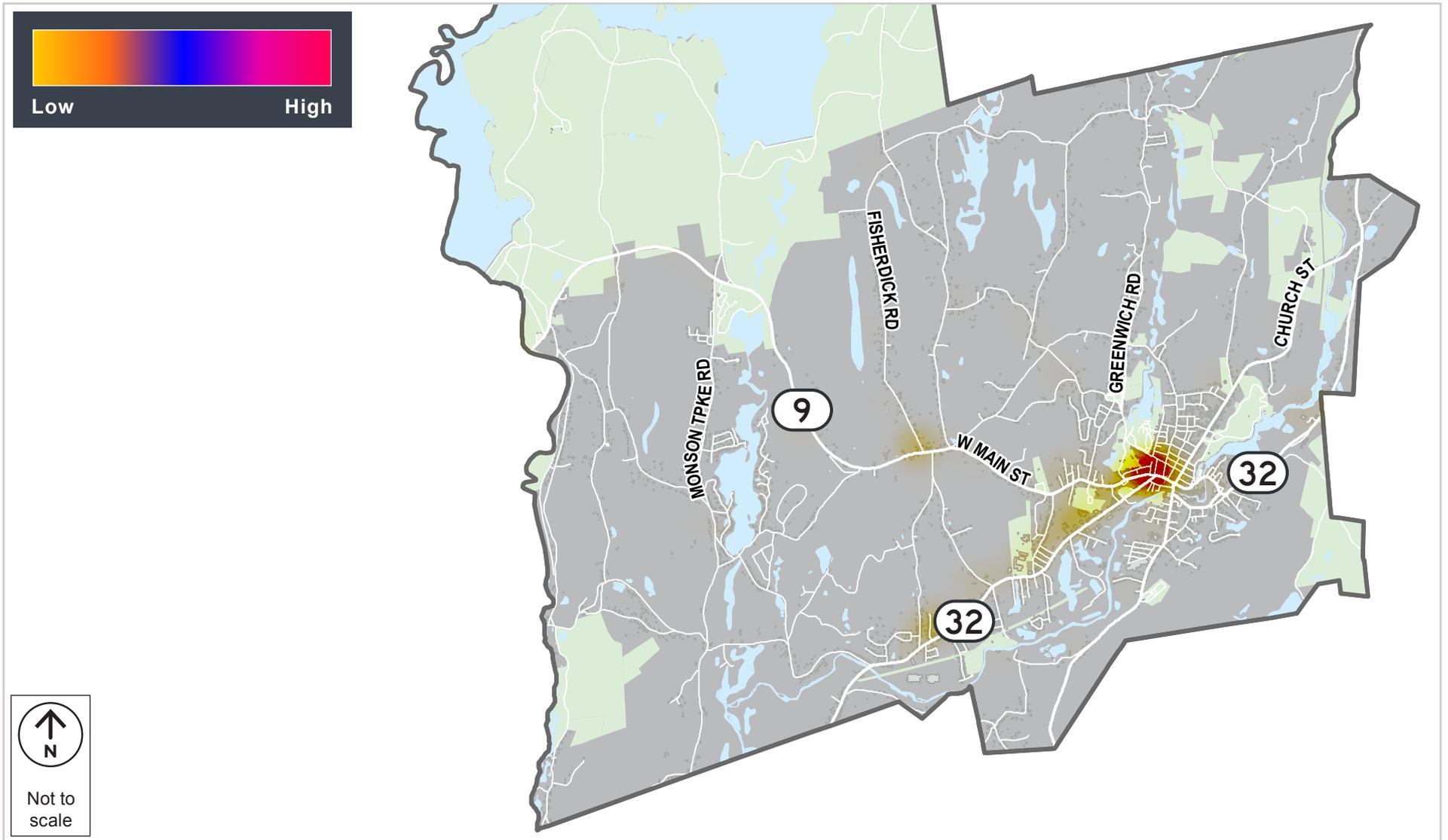
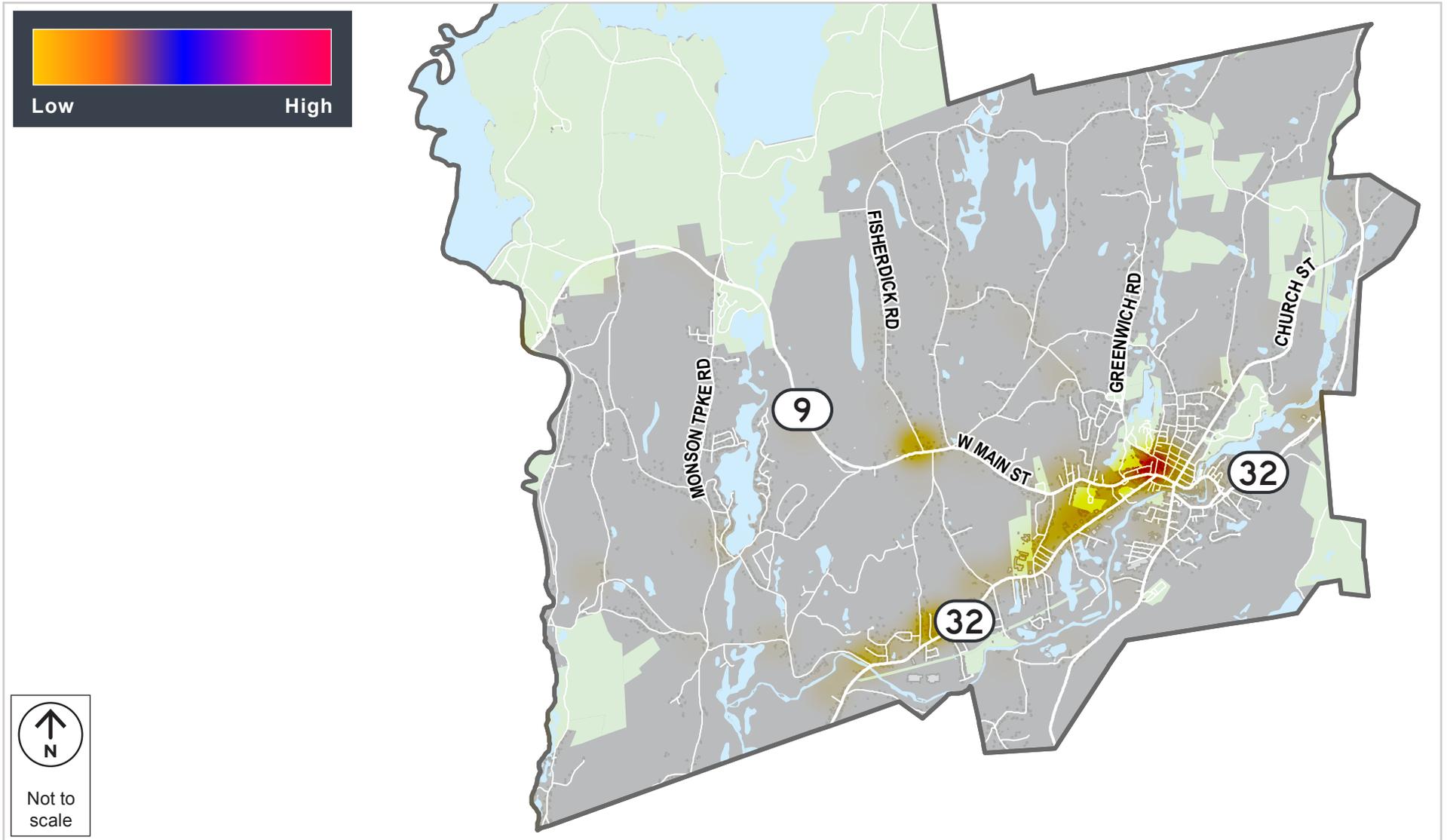




Figure 5. *Crash Heat Map - Injuries/Fatalities without TIP Location*





The following outlines some of the major crash hotspots as well as the specific crash trends at those locations:

### **WEST STREET COMMERCIAL CORRIDOR (VERNON STREET TO HOMECREST AVENUE)**

The corridor on West Street between Vernon Street and Homecrest Avenue experienced 70 crashes from 2016-2020, of which 16 involved injuries including four with pedestrians/bicycles. Of the notable crash trends, 26 were rear-end collisions and 20 were angle collisions. The area is a commercial corridor with many driveways, unsignalized crossings, and a two-way left-turn lane; all of which could be contributing to the crash experience.

### **MAIN STREET AT WEST STREET/MAIN STREET AT NORTH STREET/MAIN STREET AT CHURCH STREET**

As previously discussed, these locations are where the 2015 RSA was conducted as well as a TIP project in 2020. The crash data within this study indicates 74 crashes occurring from 2016-2020 including five involving pedestrians. This location should continue to be monitored for future changes in crash trends; however, since there was a recent project that was constructed here, these locations will not be a focus of this study.

### **PALMER ROAD AT WALMART DRIVEWAY**

The intersection of Palmer Road/Walmart Driveway experienced 65 crashes from 2016-2020, of which two resulted in injuries. Of the notable crash trends, 23 were angle collisions, 12 were rear-ends, and 12 were sideswipes. Many of the rear-ends and sideswipes occurred in the eastbound direction in the vicinity of the pocket right-turn lane, indicating potential issues with storage length being exceeded and vehicles attempting to pass the queue.

### **PLEASANT STREET AT CHURCH STREET**

The intersection of Pleasant Street/Church Street experienced 16 crashes from 2016-2020. Of which four resulted in injuries. Of these, 12 (75%) were angle collisions, indicating issues with visibility of vehicles turning from the stop-controlled Pleasant Street onto Church Street. Church Street has a steep grade in the southbound direction, and this can result in vehicles traveling faster than the speed limit and not being able to react to vehicles on Church Street.

### **PLEASANT STREET AT NORTH STREET**

The intersection of Pleasant Street/North Street experienced 21 crashes from 2016-2020, of which five resulted in injuries. It is located close to Pleasant Street/Church Street and experiences very similar issues to that intersection with 15 (71%) of its crashes being angle collisions. Again, similar issues are experienced here with poor visibility from Pleasant Street and steep grades on North Street resulting in these angle collisions.



## BELCHERTOWN ROAD AT ANDERSON ROAD

The intersection of Belchertown Road and Anderson Road experienced 16 crashes from 2016-2020, of which seven resulted in injuries. Of the notable crash trends, eight were angle collisions and six were single-vehicle crashes. The high proportion of angle collisions suggests potential issues with visibility for vehicles turning from the stop-controlled Anderson Road onto Belchertown Road. The single-vehicle crashes may be indicative of speeding or loss of control along Belchertown Road, possibly due to factors such as steep grades, poor pavement conditions, or limited sight distances.

## Historical Crash Trends

In the Townwide data from the five years prior to the data assessed in this report (2011-2015), there were 804 crashes reported within Ware, which is like the number reported over the 5-year period from 2016-2020. **Table 2** shows the historical crash trends from 2006-2020, highlighting the changing crash trends per year as well as the total fatal crashes over this period. Overall, the crash trends show a small but steady growth in crashes from the period of 2006-2010 to 2016-2020; fortunately, there was no increase in the number of fatal crashes.

*Table 2. Historical Crash Trends*

Metric	Crashes by Year	Fatal Crashes	5-Year Period
2006	128	0	724
2007	141	2	
2008	130	0	
2009	157	2	
2010	168	0	
2011	190	1	804
2012	161	0	
2013	153	1	
2014	160	1	
2015	140	0	
2016	174	1	806
2017	136	1	
2018	151	0	
2019	176	0	
2020	169	1	



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## Crash Data Monitoring

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To evaluate the effectiveness of implemented safety countermeasures and track progress towards the Town of Ware's safety goals, it is essential to establish a crash data monitoring program. This program will involve the collection, analysis, and reporting of crash data to identify trends, prioritize future improvements, and assess the impact of completed projects. The Safety Action Plan Committee will be responsible for this monitoring effort and will collaborate with the Ware Police Department to help track performance measures such as total number of crashes, number of serious crashes, and reduction in crashes at locations with safety treatments. The Safety Action Plan Committee will produce a memorandum every two years reporting on the specific outcomes of these performance measures to help track progress.

## Equity Assessment

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### Environmental Justice (EJ) Guidance

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The following Massachusetts and FHWA EJ regulations and guidance were consulted to design an appropriate equity assessment:

#### AN ACT CREATING A NEXT-GENERATION ROADMAP FOR MASSACHUSETTS CLIMATE POLICY

From 2021 Mass. Acts Chapter 8 § 56:

*“Environmental justice population’, a neighborhood that meets 1 or more of the following criteria:*

- 1) *The annual median household income is not more than 65 per cent of the statewide annual median household income;*
- 2) *Minorities comprise 40 percent or more of the population;*
- 3) *25 percent or more of households lack English language proficiency; or*
- 4) *Minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.”<sup>2</sup>*

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<sup>2</sup> An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, 2021 Mass. Acts Chapter 8 § 56 (2021).  
<https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8>



## EXECUTIVE ORDER 12898

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Areas*, directs agencies to determine low-income and minority populations within a project area and conduct a cost-benefits analysis that includes disproportionately high and adverse effects of the project on vulnerable populations.<sup>3</sup>

## FHWA GUIDANCE ON ENVIRONMENTAL JUSTICE AND NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

The FHWA released a memorandum entitled “Guidance on Environmental Justice and NEPA” in December 2011. Expanding on the guidance provided in EO 12898, the memorandum outlines a systemic process for environmental assessments:

- (i) “Identifying existing minority and low-income populations;”
- (ii) Explaining “coordination, access to information, and participation;”
- (iii) “Identifying disproportionately high and adverse effects;”
- (iv) Determining how to proceed if disproportionately high and adverse effects are found.<sup>4</sup>

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## Environmental Justice Neighborhoods

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Data from the Census Bureau’s 2022 American Community Survey and 2020 Decennial Census and resources provided by the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) was used to determine EJ neighborhoods as defined in 2021 Mass. Acts Chapter 8 § 56 (see prior reference).<sup>5</sup>

EJ neighborhoods in Ware exist in the southeast portion of the Town, visualized in **Figure 6**. East of MA Route 32, and north of Main Street, the EJ block groups also have the highest concentration of residents and businesses throughout the Town, increasing potential for unsafe conflicts and crashes between road users. Three block groups have been identified as populations who meet the criteria for income-based EJ populations; one block group meets the criteria for minority and income EJ populations.

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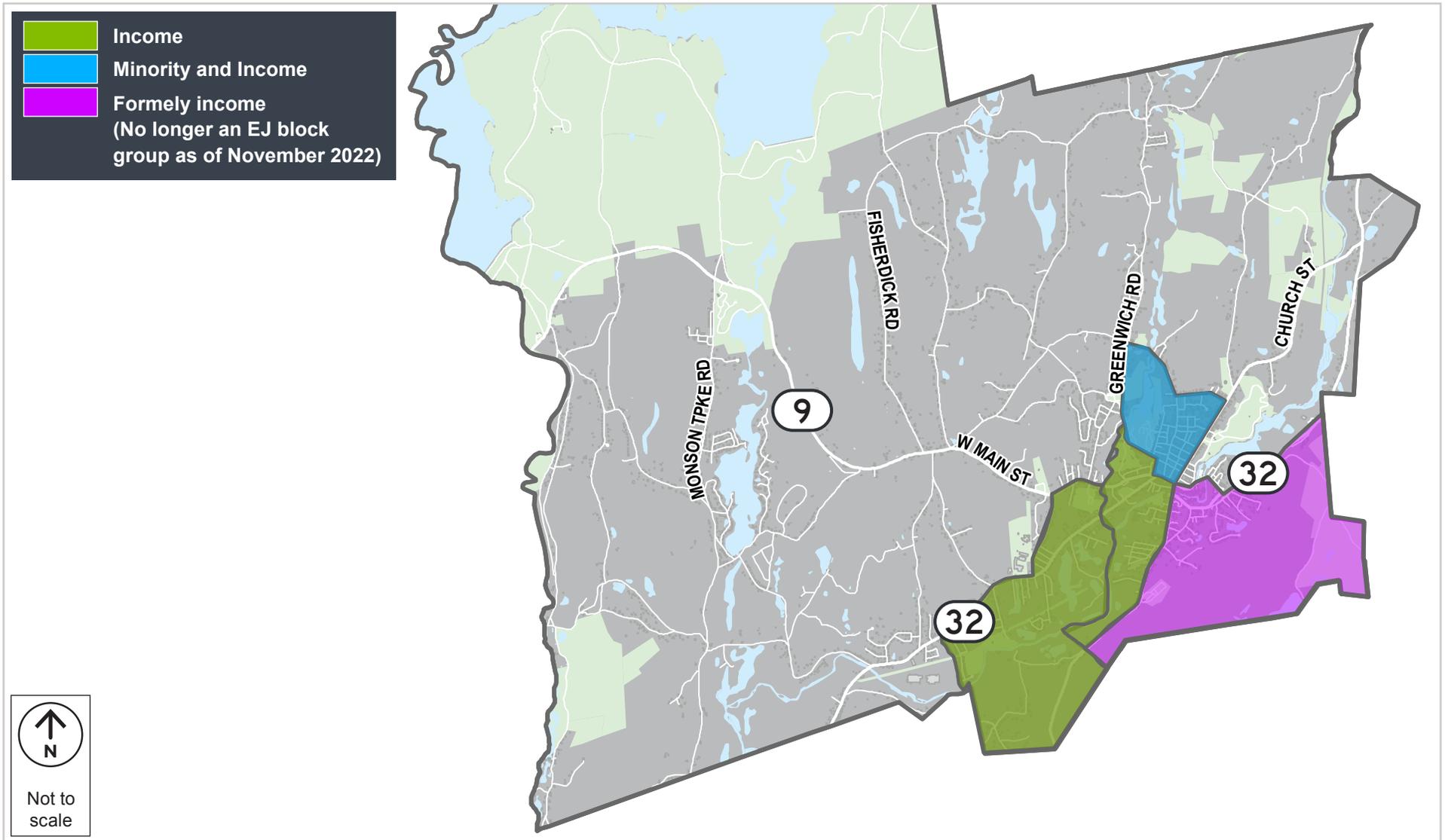
<sup>3</sup> Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, Executive Order No. 12898 59 F.R. 7629 (1994). [https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice#:~:text=Executive%20Order%20\(E.O.\),Clinton%20in%201994](https://www.epa.gov/laws-regulations/summary-executive-order-12898-federal-actions-address-environmental-justice#:~:text=Executive%20Order%20(E.O.),Clinton%20in%201994).

<sup>4</sup> Shepard, G. M. (2011, December 16). Guidance on Environmental Justice Review and NEPA [Memorandum]. U.S. Department of Transportation, Federal Highway Division. [https://www.environment.fhwa.dot.gov/env\\_topics/ej/guidance\\_ejustice-nepa.aspx](https://www.environment.fhwa.dot.gov/env_topics/ej/guidance_ejustice-nepa.aspx)

<sup>5</sup> <https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=dffdbf9c109647fc9601f7524c1fd9f4&center=-8046071.6888%2C5203264.8192%2C102100&scale=288895.277144>



Figure 6. *Environmental Justice Census Block Groups*





Median household income can be found in **Table 3**, which indicates that incomes across the EJ block groups range from \$24,000 to \$81,000. Due to a November 2022 update to the census data, Block Group 1 Census Tract 8201.02 no longer qualifies as an income-based EJ population.

**Table 3. Environmental Justice Census Block Groups in Ware**

Town/Census Tract	Population <sup>6</sup>	Minority population <sup>7</sup>	Median household income <sup>8</sup>
Ware	10,066	12.95%	\$66,250
Block Group 3, Census Tract 8201.01	1,023	13.9%	\$67,301
Block Group 1, Census Tract 8201.02	751	15%	\$81,354
Block Group 2, Census Tract 8201.02	1,066	19.1%	\$24,139
Block Group 3, Census Tract 8201.02	1,954	24.5%	\$37,042

## Community Engagement

On October 19, 2023, the Town of Ware hosted a hybrid public meeting at the Ware Town Hall and virtually on Zoom to discuss initial safety comments on the Wikimap for the Safety Action Plan. The Town of Ware held a second public meeting on February 8, 2024, to discuss the project background, conceptual projects, and project prioritization.

### WIKIMAPS

To provide more inclusive public comment and feedback tools, the Town provided a Wikimap for users to comment on. Wikimaps is an online crowdsourcing tool for feedback related to geographic locations. The tool allows users to pinpoint specific locations across Ware and provide comments. The use of Wikimap provided a more convenient way to highlight their transportation concerns and ideas throughout Ware. Typically, people would need to attend a public meeting to comment on a project, but the Wikimap allows people who are unable to attend the meeting to provide feedback over an extended period of time. The Wikimap is a good resource for those whose work or family obligations

<sup>6</sup> U.S. Census Bureau. (2020). HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE. *Decennial Census, DEC Redistricting Data (PL 94-171), Table P2*. Retrieved March 20, 2024, from <https://data.census.gov/table/DECENNIALPL2020.P2?q=P2&g=040XX00US25>.

<sup>7</sup> U.S. Census Bureau. (2020). HISPANIC OR LATINO, AND NOT HISPANIC OR LATINO BY RACE. *Decennial Census, DEC Redistricting Data (PL 94-171), Table P2*. Retrieved March 20, 2024, from <https://data.census.gov/table/DECENNIALPL2020.P2?q=P2&g=040XX00US25>.

<sup>8</sup> U.S. Census Bureau. (2022). Median Household Income in the Past 12 Months (in 2022 Inflation-Adjusted Dollars). American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B19013. Retrieved March 20, 2024, from [https://data.census.gov/table/ACSDT5Y2022.B19013?q=B19013&g=060XX00US2501572880\\_E600000US2501572880](https://data.census.gov/table/ACSDT5Y2022.B19013?q=B19013&g=060XX00US2501572880_E600000US2501572880).



make it difficult to attend a traditional public meeting. Over the course of a month, an additional 70 comments were gathered with the use of Wikimap. A mapped overview of the comments is shown in **Figure 7** and the full public comments are included in **Appendix B**.

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## Community Impacts

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The Ware Safety Action Plan aims to address the transportation needs of EJ communities by prioritizing areas for improvements that provide safer connections throughout Ware, an increase potential for future funding of safety-related projects. To factor this into decision making, proximity to EJ neighborhoods or other vulnerable populations such as children or seniors is a consideration for the criteria in ranking the potential safety projects discussed in the next section. Through factoring this into the rankings, projects in these areas will have additional priority for safety improvements.

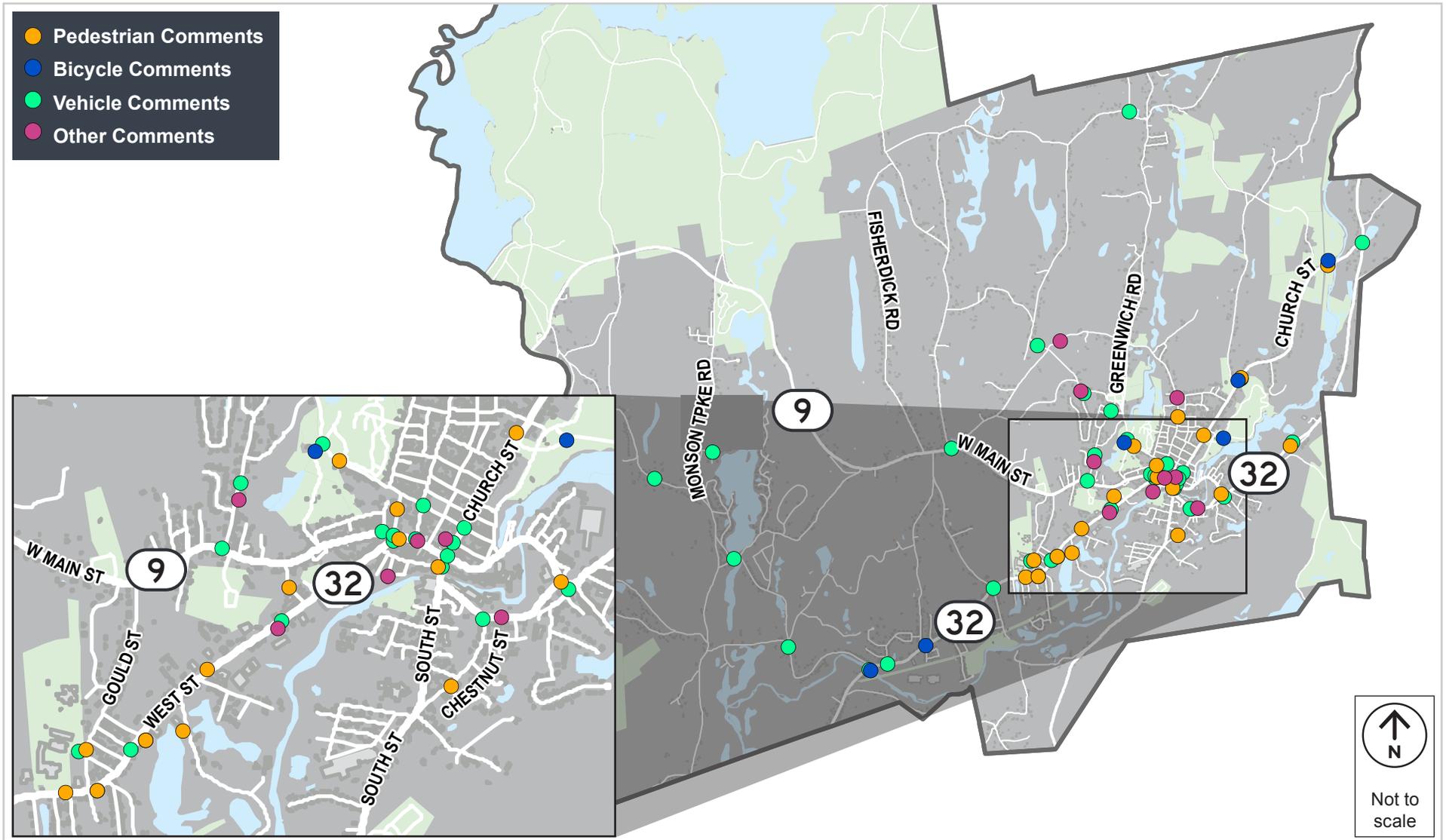
## Policy and Process Changes

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Over the next two years, the Town of Ware will evaluate policies and processes that can be implemented to improve Townwide safety. In 2018, a Townwide 25 mile per hour (mph) speed limit was voted down by residents. The Town of Ware will evaluate bringing forward this measure again and educating residents on the safety benefits of a lower Townwide speed limit. Through the Ware Safety Action Plan Taskforce, the Town will improve their safety data collection and reporting process to regularly assess new crash data and identify emerging trends.



Figure 7. *Wikimap*





# Safety Strategies and Projects

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To address the identified safety concerns and improve overall traffic safety in Ware, the Safety Action Plan recommends implementing a range of countermeasures that align with the FHWA's guidelines for SS4A Implementation Grants. These countermeasures are designed to mitigate crash risk factors, improve safety for all road users, and enhance the overall transportation experience in the community. The following is an overview of potential safety countermeasures that could be considered for implementation in Ware, categorized according to the eligible activities under the SS4A Implementation Grants.

## LOW-COST SAFETY TREATMENTS

- Install left- and right-turn lanes at intersections to reduce potential conflicts;
- Implement centerline and shoulder rumble strips or high visibility pavement markings to alert drivers of lane departures;
- Apply wider edge lines to improve visibility and delineation of the roadway;
- Use high-friction surface treatments to reduce skidding and improve traction on high-crash urban and rural corridors;
- Implement road diets with low-cost/temporary materials such as paint or flex posts to reallocate space for other uses; and
- Enhance delineation of curves through better signage along high-crash urban and rural corridors.

## COMPLETE STREETS AND PEDESTRIAN SAFETY ENHANCEMENTS

- Construct or improve sidewalks, particularly near schools, senior centers, and other high-pedestrian areas;
- Install dedicated bicycle lanes or shared-use paths to provide safe spaces for bicyclists;
- Improve pedestrian and bicycle crossings with features like crosswalks, signage, and signals; and
- Implement pedestrian safety features, such as high-visibility crosswalks, pedestrian refuge islands, and curb extensions.

## INTERSECTION IMPROVEMENTS

- Install or upgrade traffic signals, stop signs, and warning signs;
- Improve intersection geometry, such as realigning skewed intersections or adding turn lanes;
- Enhance visibility by removing obstructions, installing mirrors, or improving lighting; and
- Implement innovative design changes and improved delineation to address identified safety issues.



## SPEED MANAGEMENT

- Implement traffic calming measures, such as road diets or narrower travel lanes, to reduce vehicle speeds and improve safety for all users;
- Review and adjust speed limits as appropriate, considering factors like land use, pedestrian activity, and crash history;
- Implement speed feedback displays to alert drivers of their speeds and encourage compliance with speed limits; and
- Increase speed enforcement efforts in high-risk areas or during peak travel times.

## ROADWAY DEPARTURE REDUCTION

- Install shoulder rumble strips and widening to reduce roadway departure crashes; and
- Implement roadside safety improvements, such as installing guardrails or removing fixed objects from the clear zone.

## NETWORK RISK REDUCTION

- Install shoulder rumble strips and widen shoulders to reduce roadway departure crashes.

## EDUCATION INITIATIVES

- Develop and implement public education campaigns to promote safe driving, walking, and bicycling behaviors;
- Engage with schools, senior centers, and community organizations to provide targeted safety education and resources; and
- Collaborate with local law enforcement to raise awareness about traffic safety issues and enforce traffic laws.

By selecting and implementing appropriate countermeasures that align with the SS4A Implementation Grant guidelines, Ware can work towards creating a safer, more equitable, and more livable community for all residents and visitors. The specific countermeasures implemented will depend on the unique needs and priorities of each location, as well as available resources and feasibility.

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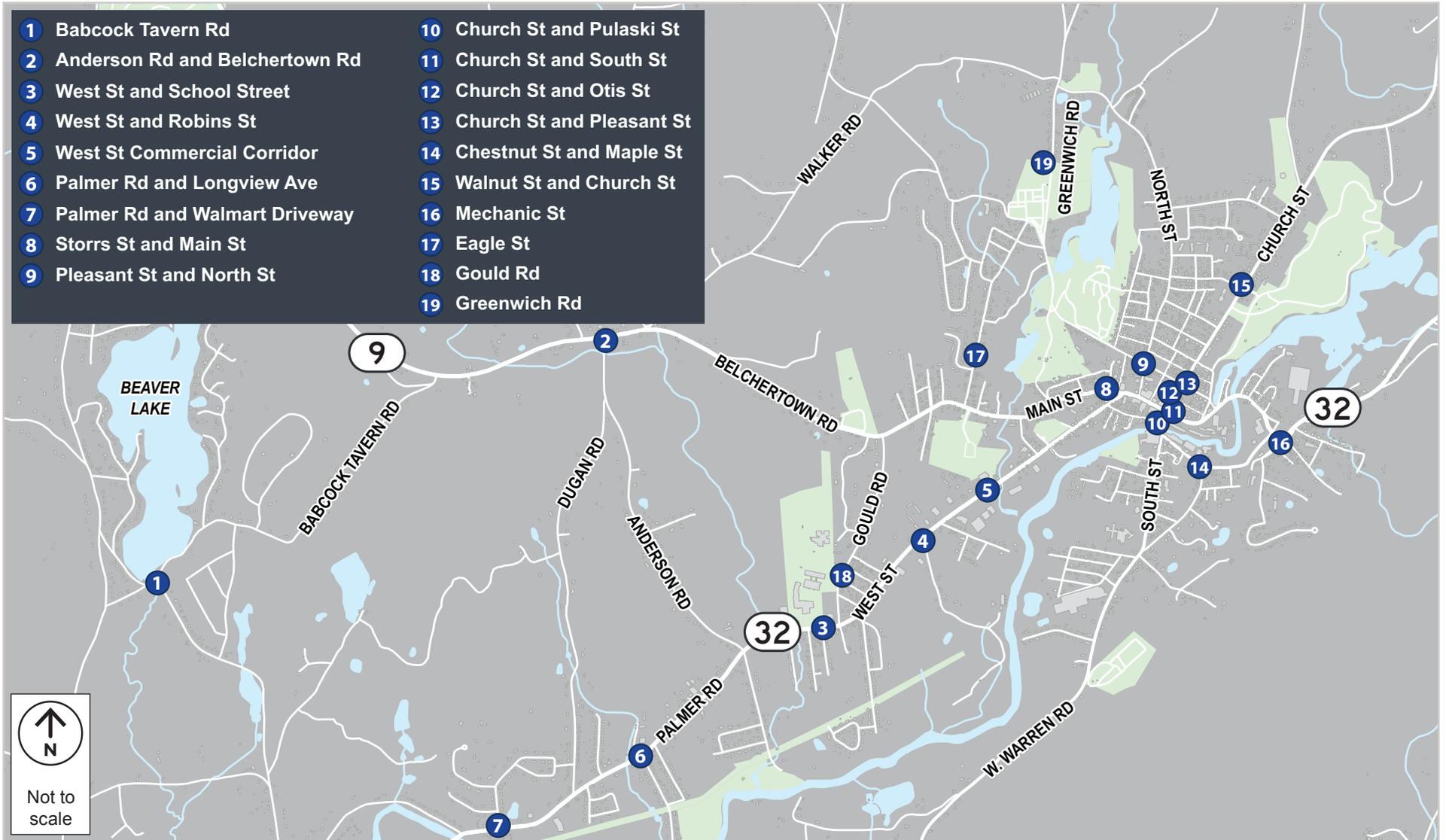
## Potential Projects

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The following discussion outlines specific projects at various locations predominantly on the high injury network throughout Ware. At each location there is a brief discussion of the specific issues identified, the suggested potential projects, and what category for SS4A Implementation Grants this type of project would meet. It should be noted that the projects within this plan are high level conceptual suggestions. More detailed location-specific engineering will need to be conducted for each potential project before they are constructed. The potential projects are mapped in **Figure 8**.



Figure 8. *Potential Projects*





## BABCOCK TAVERN ROAD (NEAR BEAVER LAKE ROAD AND MINER ROAD)

**Issues:** Babcock Tavern Road, particularly in the winding section to the west near Beaver Lake Road and Miner Road, has been identified as a high-risk area due to multiple single-vehicle crashes involving embankments. The poor visibility along this stretch of road contributes to the increased likelihood of crashes.

**Suggestions:** To address this safety concern, it is recommended that signage be installed to warn drivers of the winding road and tight turns ahead. Sight distance and curve radii should be checked and compared to the speed limit to consider if advisory speed postings are needed. This proactive measure will alert motorists to the upcoming road conditions, encouraging them to reduce their speed and navigate the area with heightened caution. Enhanced delineation treatments such as new shoulder pavement markings, shoulder rumble strips, or guard rail could also be considered.

**Eligible Implementation Grant Category:** Roadway Departure Reduction

## BELCHERTOWN ROAD AT ANDERSON ROAD

**Issues:** The intersection of Belchertown Road and Anderson Road has experienced a high number of single vehicle and angle crashes, with many occurring during inclement weather conditions such as rain or snow. The steep grade of the eastbound approach on Belchertown Road likely contributes to the problem, as drivers may struggle to slow down sufficiently to safely execute turns onto Anderson Road. A large proportion of the crashes (44%) at this intersection have resulted in injury, underscoring the need for safety improvements.

**Suggestions:** Implement downhill speed management measures to help drivers reduce their speed and navigate turns more safely. This could include elements such as advance warning signs and reallocation of roadway space. Sight distance issues should be evaluated and advance warning signs, particularly on the downhill eastbound approach, could be considered to alert drivers of the intersection and to reduce speeds. The Belchertown Road (Route 9) westbound approach presently provides two lanes for a short distance which serve as passing lanes. Consideration should be given to removing the westbound passing lane and reallocating the roadway space to include an eastbound right-turn lane onto Anderson Road to properly signal to and allow vehicles to slow down heading into the turn.

**Eligible Implementation Grant Category:** Low-Cost Safety Treatments



## PLEASANT STREET AT NORTH STREET

**Issues:** The intersection of Pleasant Street and North Street experiences several safety challenges. Poor visibility due to obstructing walls and buildings, poor yielding behavior, and double or illegal parking, has contributed to a high proportion of angle crashes at this location.

**Suggestions:** To improve safety at this intersection, several geometric and traffic control modifications are suggested. Evaluate the feasibility of implementing an all-way stop control (AWSC) at this intersection. By requiring all approaches to stop, yielding behavior at the crosswalks can be improved, particularly for those crosswalks that are not currently stop-controlled. AWSC can also help reduce confusion and potential conflicts between vehicles and pedestrians. If AWSC is not feasible due to traffic volume demand, a traffic signal could also be evaluated to resolve angle crashes and pedestrian conflicts. Additional measures that could be evaluated to improve visibility include traffic mirrors to allow drivers on Pleasant Street to better see vehicles approaching on North Street or curb extensions on North Street to allow the stop lines on the stop-controlled Pleasant Street approaches to be moved forward. This location is close to Ware’s downtown and is an area that pedestrians frequently walk through; pedestrian safety and accessibility enhancements such as ADA-compliant curb ramps should be considered.

**Eligible Implementation Grant Category:** Intersection Improvements

## PLEASANT STREET AT CHURCH STREET

**Issues:** The intersection of Pleasant Street and Church Street faces many of the same issues as Pleasant Street at North Street including poor visibility caused by obstructing walls, poor yielding to pedestrians, and speeding, all contributing to a high proportion of angle crashes.

**Suggestions:** Evaluating the feasibility of traffic control modifications is suggested at this location as well. If volume demands allow the intersection to be converted to AWSC, that would be a low-cost measure that could improve the safety issues seen at the intersection. If AWSC is not feasible due to traffic volume demand, a traffic signal could also be evaluated to resolve angle crashes and pedestrian conflicts. Further speed control measures should be considered along Church Street on both sides of the intersection, but AWSC can help address speeding at this location.

**Eligible Implementation Grant Category:** Intersection Improvements

## MAIN STREET AT STORRS STREET

**Issues:** The intersection of Main Street and Storrs Street experiences safety concerns from the community from limited visibility and difficulty for vehicles pulling out from Storrs Street onto Main Street due to the building and presence of parked cars on the westbound approach of Main Street.



The building and parked cars can obstruct sightlines and make it challenging for drivers on Storrs Street to assess oncoming traffic and find safe gaps to enter the intersection.

**Suggestions:** To address these issues and improve safety at this intersection, a low-cost option would be restricting parking along Main Street near Storrs Street. A sight distance evaluation should be conducted to determine how many parking spaces along Main Street would need to be removed. Depending on the sight distance results, a consideration could be made for putting a right-turn only restriction on Storrs Street. A medium-cost option would be to install a curb extension on the westbound far side of Main Street, aligning it with the existing on-street parking. By extending the curb line, the stop line on Storrs Street can be moved forward, improving visibility for stopped vehicles and reducing the obstruction caused by parked cars on Main Street. This will allow drivers on Storrs Street to better assess oncoming traffic and potential conflicts before proceeding through the intersection. Signage and pavement marking improvements should also be considered at this location to properly alert drivers along Main Street to the possibility of vehicles turning from Storrs Street.

**Eligible Implementation Grant Category:** Intersection Improvements

## CHURCH STREET PEDESTRIAN CROSSING AT OTIS AVENUE

**Issues:** The pedestrian crossing on Church Street, located at Otis Avenue, has experienced a fatal pedestrian crash, highlighting the need for significant safety improvements. The current crossing is a mid-block location lacking adequate signage and ADA-compliant ramps. The steep grades on the approaching roadway sections contribute to the safety concerns, as they may encourage higher vehicle speeds and reduce driver awareness of the crossing.

**Suggestions:** Any treatments considered should be evaluated based on FHWA's Safe Transportation for Every Pedestrian (STEP) Guide. To address the identified safety issues and improve pedestrian safety at the Church Street crossing at Otis Avenue, it is suggested to implement parking restrictions on the crosswalk approaches, improved nighttime lighting levels, ADA-compliant curb ramps on both sides of the crossing, and advanced warning signs on the approaches to the crossing to alert drivers of the upcoming pedestrian crossing and the potential need to stop.

**Eligible Implementation Grant Category:** Pedestrian Safety Enhancements

## CHURCH STREET AT MAIN STREET/EAST MAIN STREET

**Issues:** The intersection of Church Street and Main Street/East Main Street has been identified as a problematic location based on public comments and crash data. Red-light running, possibly attributed to vehicles speeding downhill on Church Street, has been reported as a significant



concern. Additionally, the intersection has experienced three pedestrian/bicycle crashes and a high number of rear-end crashes (13), indicating a need for safety improvements.

**Suggestions:** While this location was part of the previous TIP project on Main Street, public comment still indicates issues that exist here. The first recommendation is to re-evaluate the existing traffic signal clearance intervals at this intersection. Optimizing the signal clearance timings to ensure adequate yellow and all-red clearance intervals, providing sufficient time for vehicles to safely clear the intersection before the conflicting movements receive a green indication. This can help reduce the risk of red-light running and potential rear-end collisions. After evaluation and monitoring of the results from signal clearance timing changes, additional traffic calming measures should be given consideration.

**Eligible Implementation Grant Category:** Intersection Improvements

## WEST STREET COMMERCIAL CORRIDOR

**Issues:** West Street, particularly between Vernon Street and Homecrest Avenue, experiences a high density of driveways and access points, a two-way left-turn lane, and poorly marked pedestrian crossings. These factors contribute to poor yielding behavior, wide lanes, and an overall challenging environment for pedestrians. Specific areas of concern include:

- The pedestrian crossing at 117 West Street, where wide lanes, lack of signage, and poor yielding behavior create safety risks for pedestrians.
- The pedestrian crossing located between Country Bank and Monson Savings, which features significant conflict from multiple adjacent driveways.
- The signalized driveway near Walgreens and Dollar Tree, where the pedestrian signal is not functioning properly, and only the West Street crossing appears to have pedestrian signals.

**Suggestions:** To address these issues and improve pedestrian safety along the West Street commercial corridor, STEP guidance should be referred to for pedestrian design. The following improvements are some that could be considered:

- Consider measures that improve pedestrian visibility and safety which could include Rectangular Rapid Flashing Beacons (RRFBs), curb extensions, and signage to encourage better yielding behavior from drivers.
- Relocate the pedestrian crossing between Country Bank and Monson Savings to a location with fewer conflicts, and work with property owners to consolidate driveway access points, particularly at Dollar General, Moulton Insurance Agency, and Swift River Valley Auto Wash.



- At the signalized driveway near Walgreens and Dollar Tree, add pedestrian signals with accessible pedestrian signals (APS) pushbuttons, accessible pedestrian curb ramps, and high-visibility crosswalks on all approaches to improve pedestrian safety and accessibility. Consider installing a pedestrian crossing on the east side of the signal and relocating the unsignalized crossing located 200 feet to the east to a more appropriate location.

In addition to these site-specific improvements, consider implementing a corridor-wide access management plan to consolidate driveways, reduce conflict points, and create a safer, more predictable environment for all road users. This may involve working with property owners to develop shared access agreements, encouraging cross-access between adjacent properties, and implementing design standards that prioritize pedestrian safety and accessibility.

**Eligible Implementation Grant Category:** Pedestrian Safety Enhancements

### WEST STREET AT ROBBINS ROAD

**Issues:** The intersection of West Street and Robbins Road exhibits poor pedestrian crossing conditions, with wide lanes that increase pedestrian crossing distances and exposure to vehicular traffic. Additionally, the lack of a sidewalk along Robbins Road leading from the Senior Center poses a safety risk for pedestrians, particularly seniors, who may need to walk along the roadway.

**Suggestions:** To improve pedestrian safety at this intersection, STEP guidance should be evaluated. Some potential suggestions include installing a wider and more visible crosswalk, ADA-compliant ramps, and considering curb extensions or a pedestrian refuge island. The curb extensions or pedestrian refuge island will serve to shorten the crossing distance, reducing the time pedestrians spend exposed to vehicular traffic. Furthermore, the installation of an RRFB could be considered to enhance driver awareness of pedestrians at the crossing. To address the lack of pedestrian infrastructure along Robbins Road, a sidewalk leading from the Senior Center should be considered. A sidewalk would provide a safer condition and dedicated path for pedestrians, especially seniors, to walk along the roadway without having to share the same space as vehicles.

**Eligible Implementation Grant Category:** Pedestrian Safety Enhancements, Complete Streets

### WEST STREET AT SCHOOL ROAD/TOWNE STREET

**Issues:** The intersection of West Street and School Road/Towne Street, located near the Ware Junior/Senior High School, has been identified as a problematic area for pedestrian safety. Poor yielding behavior by drivers has been observed, putting pedestrians at risk when attempting to cross the street. Additionally, the lack of sidewalks and ADA-compliant ramps on one side of the street creates accessibility challenges and forces pedestrians to navigate an unsafe environment.



**Suggestions:** To improve pedestrian safety at the intersection of West Street and Robbins Road, several key improvements are suggested. These include installing ADA-compliant curb ramps at all corners, high-visibility crosswalk markings, curb extensions, and constructing sidewalks on the southern side of West Street. If this area along West Street is considered a designated school zone, school zone signage should also be considered. Additional consideration should be given to an RRFB to provide additional pedestrian visibility and create a safer environment for all road users, particularly students walking to and from the nearby junior/senior high school.

**Eligible Implementation Grant Category:** Safe Routes to School, Pedestrian Safety Enhancement

## EAGLE STREET

**Issues:** Eagle Street, a residential street with a posted speed limit of 30 mph, has been identified as a problematic area due to excessive speeding. The street's very straight alignment may contribute to drivers feeling more comfortable traveling at higher speeds. Additionally, Eagle Street connects West Main Street and Greenwich Road, potentially leading to its use as a neighborhood cut-through route.

**Suggestions:** To address the speeding and issues on Eagle Street, consider implementing traffic calming measures such as speed humps, median islands, chicanes, or narrower lane widths to reduce vehicle speeds and discourage aggressive driving, speed feedback signs to alert drivers of their current speed and remind them of the posted speed limit, and signage to reinforce the residential nature of the street. After pursuing traffic calming measures, it is suggested to update the posted speed limit on Eagle Street and conduct a speed study to determine the appropriate speed limit for the street based on the new observed traffic speeds. Lowering the speed limit will help reinforce Eagle Street as a residential area where slower speeds are expected and required.

**Eligible Implementation Grant Category:** Speed Management

## CHURCH STREET AT WALNUT STREET

**Issues:** The intersection of Church Street and Walnut Street has been identified as a concern due to the lack of adequate signage and warnings to alert drivers to the presence of a pedestrian crossing. This pedestrian crossing is located at an access point to Grenville Park, which likely experiences higher pedestrian activity as people enter and exit the park. The absence of proper signage and warnings can lead to drivers failing to yield to pedestrians, creating a dangerous situation for those attempting to cross the street.

**Suggestions:** To address the safety concerns at the intersection of Church Street and Walnut Street, STEP guidance should be consulted but it is suggested to install high-visibility crosswalk markings, and pedestrian crossing warning signs (W11-2) on both approaches to the pedestrian



crossing, to alert drivers to slow down and yield to pedestrians. To further enhance safety, ensure that the intersection has adequate lighting to maintain visibility during low-light conditions and accessible pedestrian curb-ramps.

**Eligible Implementation Grant Category:** Pedestrian Safety Enhancement

### **EAST STREET AROUND THE BEND NEAR MECHANIC STREET**

**Issues:** The section of East Street near Mechanic Street has been identified as a safety concern due to a sharp bend in the road and poor visibility. The combination of these factors can create a dangerous situation for drivers, as they may not have sufficient time to react to the changing road geometry or oncoming traffic. This can lead to an increased risk of crashes, particularly if drivers are traveling at high speeds or are unfamiliar with the area.

**Suggestions:** To address the safety issues associated with the sharp bend and poor visibility on East Street near Mechanic Street, the primary suggestion is to install warning signage to alert drivers of the upcoming roadway condition. The warning signage should be placed in advance of the bend, providing drivers with ample time to reduce their speed and prepare for the change in road geometry. Additional treatments could include chevron alignment signs, reflective pavement markers, high-friction surface treatment, and possibly guardrails.

**Eligible Implementation Grant Category:** Roadway Departure

### **MAPLE STREET AT CHESTNUT STREET**

**Issues:** The intersection of Maple Street and Chestnut Street has been identified as a potentially confusing location. The current configuration of the intersection may make it unclear to drivers traveling east on Maple Street that they need to slow down around the sweeping right-turn corner ahead of the pedestrian crossing across Chestnut Street. This confusion can result in unsafe driving behaviors and increase the risk of crashes.

**Suggestions:** To address the identified issues and improve navigation at this intersection, consider restriping the pavement markings and adding clarifying signage. Redesigning the intersection through either a low-cost restriping or more permanent geometric modifications can help define the proper travel paths by realigning the intersection to a proper “T” geometry to slow vehicles turning onto Chestnut Street. Pedestrian safety enhancements should also be considered at this intersection.

**Eligible Implementation Grant Category:** Intersection Improvements, Pedestrian Safety Enhancements



## GREENWICH ROAD

**Issues:** Greenwich Road has been identified as a problematic area due to reported speeding and visibility issues. Speeding vehicles pose a significant safety risk to all road users and result in higher severity collisions. Poor visibility along the roadway can exacerbate the dangers associated with speeding, as drivers may have less time to react to potential hazards or conflicts.

**Suggestions:** To address the speeding and visibility issues on Greenwich Road, consider implementing a combination of traffic calming measures and sight distance improvements. Specific measures that could be taken include physical traffic calming measures such as speed humps, chicanes, or narrower lane widths to reduce vehicle speeds and discourage aggressive driving, speed feedback signs to alert drivers of their current speed and remind them of the posted speed limit, and sight distance improvements along the roadway. Once some roadway treatments have been implemented, a speed zoning study should be conducted to set an appropriate speed limit for Greenwich Road.

**Eligible Implementation Grant Category:** Speed Management

## GOULD ROAD

**Issues:** Gould Road has been identified as a high-priority area for pedestrian safety improvements due to the lack of sidewalks and ADA accommodation near the Ware schools. The absence of dedicated pedestrian infrastructure creates an unsafe environment for students and other pedestrians who use this street to access the school. The occurrence of a pedestrian crash further highlights the need for immediate action to address these safety concerns.

**Suggestions:** Addressing the lack of sidewalks and ADA accommodations on Gould Road should be a top priority for the Town of Ware. Installing continuous sidewalks on both sides of Gould Road and ADA-compliant curb ramps/high-visibility crosswalks should be the basis of this project. Enhanced signage along Gould Road to alert drivers to the presence of pedestrians and the school zone should also be considered. Use pavement markings, such as "SCHOOL XING" or "SLOW SCHOOL ZONE," to reinforce the message and remind drivers to exercise caution.

**Eligible Implementation Grant Category:** Safe Routes to School, Complete Street, Pedestrian Safety Enhancement

## CHURCH STREET AT PULASKI STREET

**Issues:** The intersection of Church Street and Pulaski Street has been identified as a problematic location due to poor sight lines for vehicles on Pulaski Street looking over the bridge. Drivers attempting to turn onto Church Street may have difficulty seeing oncoming traffic, increasing the risk of collisions. Additionally, the existing pedestrian crossing at this intersection is not ADA-



compliant, creating accessibility challenges and safety concerns for pedestrians, particularly those with mobility impairments.

**Suggestions:** To address the safety issues at the Church Street and Pulaski Street intersection, a comprehensive assessment of the sight lines should be conducted. Based on the findings, installing a traffic mirror on the bridge can help alleviate the sightline issues by providing drivers on Pulaski Street with a better view of oncoming traffic on Church Street. This will allow them to make safer turning decisions and reduce the risk of collisions. Pedestrian curb ramps that meet ADA standards will enhance accessibility and safety for all pedestrians. Upgrading the existing crosswalk with high-visibility markings and signage will increase driver awareness of the pedestrian crossing and improve visibility.

**Eligible Implementation Grant Category:** Intersection Improvements, Pedestrian Safety Enhancements

## PALMER ROAD AT LONGVIEW AVENUE

**Issues:** The intersection of Palmer Road and Longview Avenue has been identified as a high-risk location due to a high rate of injury crashes. Speeding along Palmer Road is a significant contributing factor to these crashes, as vehicles traveling at excessive speeds have less time to react to potential conflicts and are more likely to cause severe injuries in the event of a collision. Additionally, there is a busy restaurant located at this intersection, and the low-visibility driveway access creates a dangerous situation for vehicles entering and exiting the establishment.

**Suggestions:** Implementing traffic calming measures along Palmer Road will help reduce vehicle speeds and improve safety for all road users. These measures may include chicanes or lane narrowing, which encourage drivers to slow down and navigate the area with greater caution. Furthermore, a comprehensive evaluation of the restaurant's driveway access and the visibility to and from it should be conducted. Based on the findings, improvements such as driveway consolidation, relocation, or the installation of warning signs and pavement markings can be considered to enhance safety and reduce the risk of crashes involving vehicles accessing the restaurant.

**Eligible Implementation Grant Category:** Speed Management

## PALMER ROAD AT WALMART DRIVEWAY

**Issues:** The intersection of Palmer Road and the Walmart Driveway has experienced many crashes, including a high proportion of angle collisions and sideswipes. Angle collisions suggest potential issues with traffic signal phasing or inadequate clearance intervals, which may lead to conflicting movements and increased risk of crashes. Sideswipe crashes, particularly those involving vehicles



traveling in the same direction, indicate possible problems with turn lane storage lengths or driver confusion regarding lane assignments.

**Suggestions:** To improve safety at the Palmer Road and Walmart Driveway intersection, a comprehensive evaluation of the traffic signal phasing and clearance timings should be conducted. This evaluation should ensure that the signal phasing provides adequate time for vehicles to clear the intersection safely and minimizes the potential for conflicting movements. Adjusting the yellow and all-red clearance intervals based on the intersection's size and traffic characteristics can help reduce the risk of angle collisions. Additionally, an assessment of the turn lane storage lengths, particularly for the Palmer Road eastbound approach where many of the sideswipe crashes have occurred should be undertaken. If the evaluation reveals insufficient storage capacity, consider extending the turn lanes. These improvements will help minimize driver confusion, reduce the risk of sideswipe crashes, and improve overall intersection safety.

**Eligible Implementation Grant Category:** Intersection Improvements

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## Project Prioritization

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To prioritize the potential projects identified in the Ware Safety Action Plan, scoring criteria were developed to assess each project based on six key categories: crash history, crash risk factors, pedestrian and bicycle safety, equity, community priority, and cost and feasibility. This scoring system ensures that projects are evaluated objectively and align with the Plan's goals of improving traffic safety for all community members, especially those in underserved or disadvantaged areas. The scoring criteria is as follows:

- **Crash History (0-5 points)** This category assesses the project location's crash history, with higher points assigned to areas with a greater number of crashes or more severe crashes.
  - 0 points: No reported crashes
  - 1-2 points: Low number of crashes with no fatalities or serious injuries
  - 3-4 points: Moderate number of crashes or presence of serious injuries
  - 5 points: High number of crashes or presence of fatalities
- **Crash Risk Factors (0-5 points)** This category evaluates the presence of crash risk factors at the project location, such as visibility, geometry, and volume.
  - 0 points: No identified risk factors
  - 1-2 points: Low presence of risk factors (e.g., low traffic volume, good visibility)
  - 3-4 points: Moderate presence of risk factors (e.g., medium traffic volume, some visibility issues)



- 5 points: High presence of risk factors (e.g., high traffic volume, poor visibility, speeding)
- Pedestrian and Bicycle Safety (0-3 points) This category assesses the level of pedestrian and bicycle activity at the project location and the presence of vulnerable users.
  - 0 points: No pedestrian or bicycle activity
  - 1 point: Low pedestrian or bicycle activity
  - 2 points: Moderate pedestrian or bicycle activity
  - 3 points: High pedestrian or bicycle activity or presence of vulnerable users (e.g., children, seniors)
- Equity (0-3 points) This category evaluates the project’s potential to serve underserved or disadvantaged communities, promoting equitable distribution of traffic safety improvements.
  - 0 points: Project does not serve an underserved or disadvantaged community
  - 1 point: Project partially serves an underserved or disadvantaged community
  - 2 points: Project mostly serves an underserved or disadvantaged community
  - 3 points: Project directly serves an underserved or disadvantaged community
- Community Priority (0-3 points) This category assesses the level of community interest and priority for the project, as expressed by residents and stakeholders.
  - 0 points: Not identified as a community priority
  - 1 point: Low community priority
  - 2 points: Moderate community priority
  - 3 points: High community priority
- Cost and Feasibility (0-3 points) This category evaluates the project’s anticipated cost and feasibility of implementation.
  - 0 points: Extreme cost and/or not feasible
  - 1 points: High cost and/or low feasibility
  - 2 point: Moderate cost and/or moderate feasibility
  - 3 points: Low cost and/or high feasibility

Projects will be scored across all six categories, with a maximum possible score of 22 points. Higher-scoring projects will be considered a higher priority for implementation. This scoring criteria allows for a transparent and data-driven approach to project prioritization, ensuring that the Ware Safety Action Plan effectively addresses the community’s traffic safety needs and promotes equity in its implementation.

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## Project Scores

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As discussed in the previous section a scoring system was developed, considering various factors such as crash history, crash risk factors, pedestrian and bicycle safety, equity, community priority,



and cost and feasibility to score each of the potential projects. Each project location was evaluated based on these criteria and assigned a score, with higher scores indicating higher priority for implementation.

**Table 4** presents the scores for each project location, sorted from highest to lowest score. The detailed scoring matrix used to assess each project can be found in **Appendix C**. This matrix provides a transparent and data-driven approach to project prioritization, ensuring that the Ware Safety Action Plan effectively addresses the community's most pressing traffic safety needs in an equitable manner.

By ranking these projects, the Town of Ware can make informed decisions about allocating resources and pursuing funding opportunities to implement safety improvements strategically. It is important to note that this prioritization is a dynamic process and should be regularly reviewed and updated as new data becomes available, community priorities shift, or as projects are completed. The Ware Safety Action Plan is intended to be a living document that adapts to the evolving needs of the community and promotes continuous improvement in traffic safety for all road users.

*Table 4. Project Scores*

Location	Description	Score	Rank
Pleasant Street/North Street	Intersection visibility and safety upgrades to address angle collisions.	22	1
Gould Road	Sidewalk construction and ADA pedestrian enhancements in proximity to school zone.	21	2
Pleasant Street/Church Street	Intersection visibility and safety upgrades to address angle collisions.	20	3
West Street Commercial Corridor	Series of access management and pedestrian safety improvements.	18	4
Church Street Pedestrian Crossing at Otis Street	Pedestrian crossing visibility enhancements to address a fatal crash occurring there.	17	5
West Street/School Road/Towne Street	Pedestrian crossing and ADA upgrades in proximity to school zone.	15	6
Babcock Tavern Road (near Beaver Lake Road/Miner Road)	Roadway edging and signage enhancements designed to address frequent roadway departure crashes in the area.	14	7
Belchertown Road at Anderson Road	Downhill speed management treatments and intersection visibility enhancements.	14	8



Location	Description	Score	Rank
West Street/Robbins Road	Pedestrian crossing safety, visibility, and ADA upgrades across West Street, Robbins Road sidewalk construction leading from Senior Center.	13	9
Church Street at Walnut Street	Pedestrian crossing visibility and ADA accessibility enhancements at access to public park.	13	10
East Street near Mechanic Street	Signage, visibility improvements, and traffic calming to address crashes around sharp roadway bend.	13	11
Main Street at Storrs Street	Visibility enhancements, curb extension, and moving stop line along Storrs Street to improve safety turning onto Main Street.	12	12
Chestnut Street at Maple Street	Intersection pavement marking enhancements/redesign to make travel paths clear and obvious to drivers. Pedestrian enhancements as well.	12	13
Greenwich Road	Traffic calming enhancements.	12	14
Church Street/Pulaski Street	Sight distance enhancements and ADA pedestrian upgrades.	12	15
Church Street/Main Street	Signal clearance interval evaluation.	12	16
Eagle Street	Traffic calming enhancements.	11	17
Palmer Road/Longview Avenue	Sight distance improvements/driveway evaluation.	11	18
Palmer Road/Walmart Driveway	Traffic signal phasing evaluation, storage lane length assessment.	9	19

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## Top 10 Project Estimates and Timelines

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This section presents the top 10 safety improvement projects identified through the comprehensive scoring process, along with their estimated costs and proposed implementation timeline. **Table 5** provides the estimated cost and the anticipated construction timeline for each project. These cost estimates are based on preliminary assessments and may be subject to change as projects progress through the design and engineering phases. The conceptual estimates were conducted through the Massachusetts State Aid Reimbursable Projects Estimating Tool (SARPET) and the individual project reports are included in **Appendix D**.



**Table 5. Top 10 Project Estimates and Timelines**

Project	Cost	Timeline
Pleasant St/North St	\$80,000	Medium-term – Involves build out of curb extensions to improve visibility and reconstructing curb ramps as well as four-way stop control consideration.
Pleasant St/Church St	\$40,000	Short-term – Quicker build that involves implementing a four-way stop control and reconstructing curb ramps.
Gould Rd Sidewalk Construction	\$2,100,000	Long-term – The cost and timeline involve full sidewalk on both sides of the length of Gould Street. Project could be split up to multiple segments.
West St Commercial Corridor	\$2,400,000	Long-term – Large redesign of the corridor involving improvements to pedestrian crossings, intersections, and access management.
Church St Ped Crossing	\$90,000	Medium-term – Curb ramps, curb extensions, and signage.
West St at School Rd/Towne St	\$620,000	Long-term – Includes larger sidewalk connectivity improvement which increases overall cost. Shorter term enhancements for crosswalk should be considered in the interim.
Babcock Tavern Rd (near Beaver Lake Rd/Miner Rd) Signage and Edging Improvements	\$25,000	Short-term – Upgrades to warn drivers of winding roads and implement measures to reduce vehicles leaving roadway could be made quickly and cost-effectively.
Belchertown Rd/Anderson Rd Signage Improvements and Lane Reallocation	\$23,000 (Approx. \$3,000 for just signage improvements)	Short-term – Signage improvements could be made quickly, design and implementation for lane reallocation would not require significant survey.
West St/Robbins Rd	\$270,000	Medium-term – Installation of RRFB and sidewalks from Senior Center to connect to West Street.
Walnut St/Church St	\$97,000	Medium-term – Installation of curb ramps, high-visibility crosswalk, signage, and lighting improvements.

The implementation timeline gives a high-level estimate for how long it would take for a project to be designed and constructed. Short-term improvements could be designed and implemented within less than a year, medium-term improvements could be designed and implemented in one to three years, and long-term improvements would be large-scale projects taking longer than three years to design and implement due to cost and level of effort. Changes in availability of resources, funding, and shifting priorities or new data could change these timelines. The Town of Ware will work closely with



relevant agencies, stakeholders, and community members to refine these timelines and work towards delivering safe and effective projects.

While these 10 projects have been identified as the highest priorities, the Ware Safety Action Plan is a comprehensive and ongoing effort to improve traffic safety throughout the community. As new data becomes available, the Town will continue to evaluate and prioritize additional improvements to address emerging needs and ensure continuous progress towards creating a safer transportation network for all users.

## Progress and Transparency

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The Ware Safety Action Plan represents a significant step forward in the Town of Ware's efforts to improve traffic safety and protect the lives of all road users. By leveraging a combination of crash data analysis, community input, and best practices in road safety, this plan provides a clear roadmap for addressing the Town's most pressing safety concerns and implementing effective solutions.

The prioritized safety improvements outlined in this plan will work together to create a safer, more accessible, and more livable community. Through sustained commitment by the Safety Action Plan Implementation Committee and engagement with other relevant stakeholders, the Town of Ware will continue to implement safety treatments as resources become available. By focusing on data-driven decision-making and community collaboration, the Town of Ware will work to achieve its goal of eliminating traffic fatalities and serious injuries.



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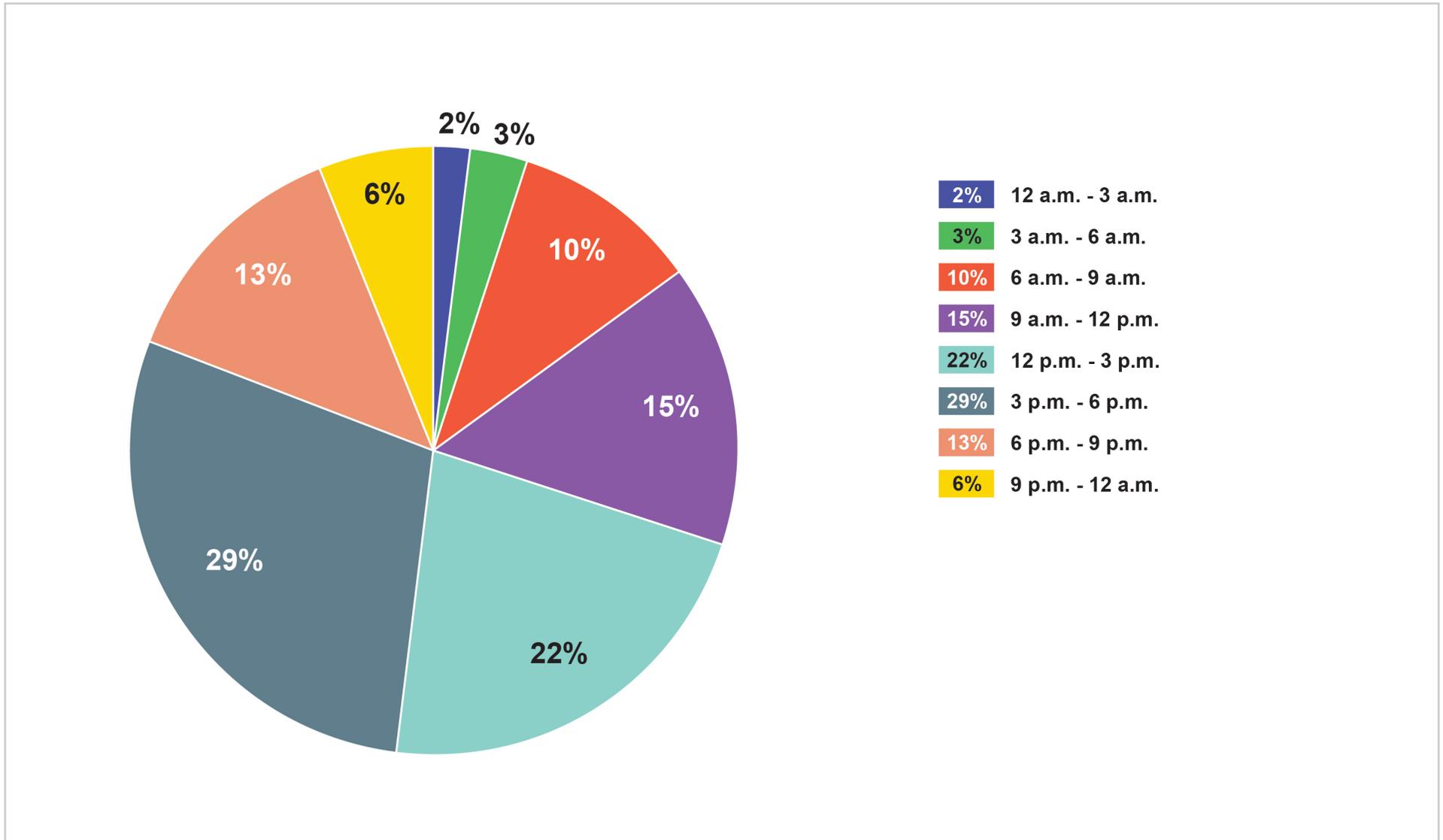
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# Appendix A

## Crash Data

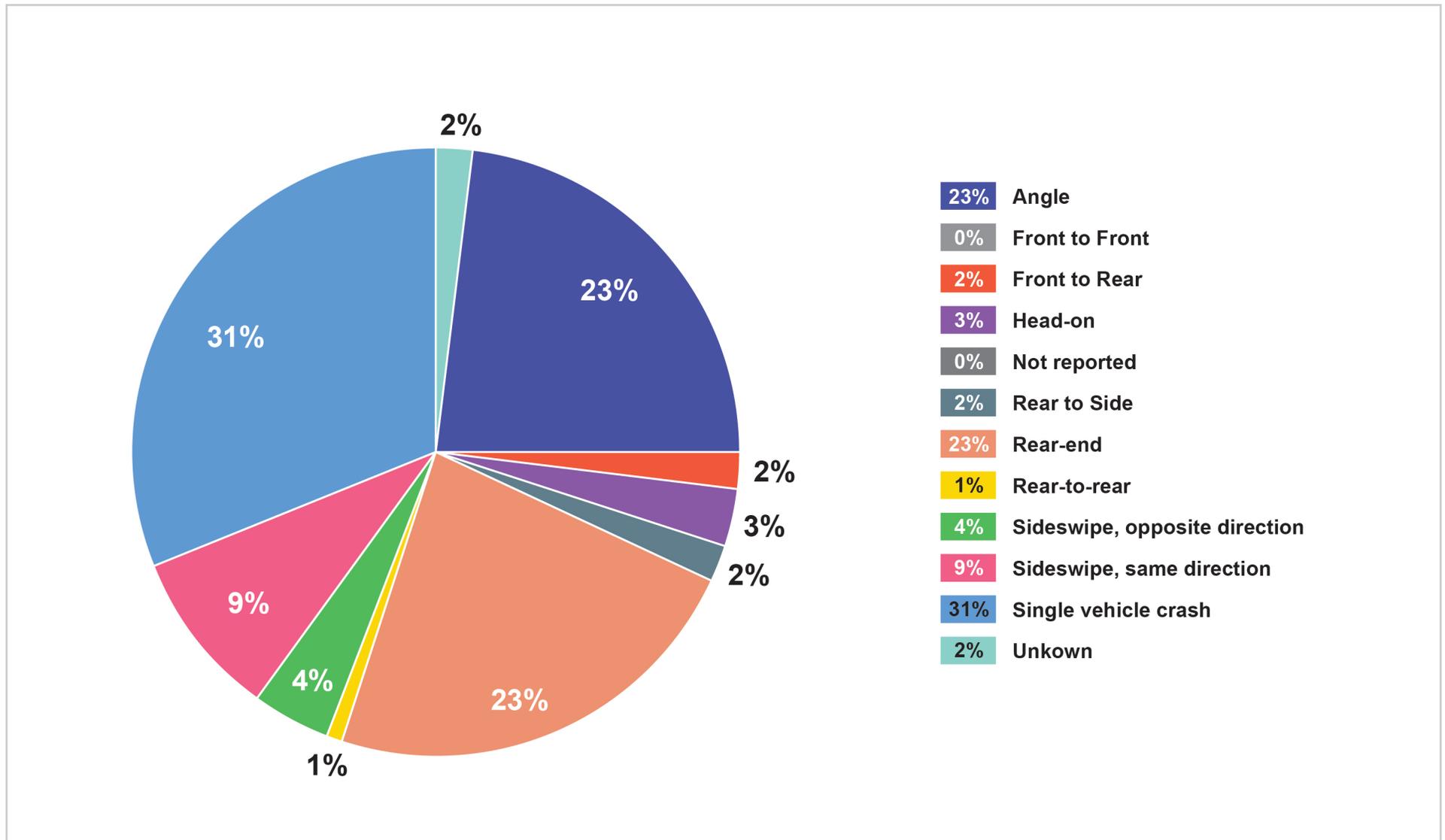


Appendix A. *Crashes by Time of Day*



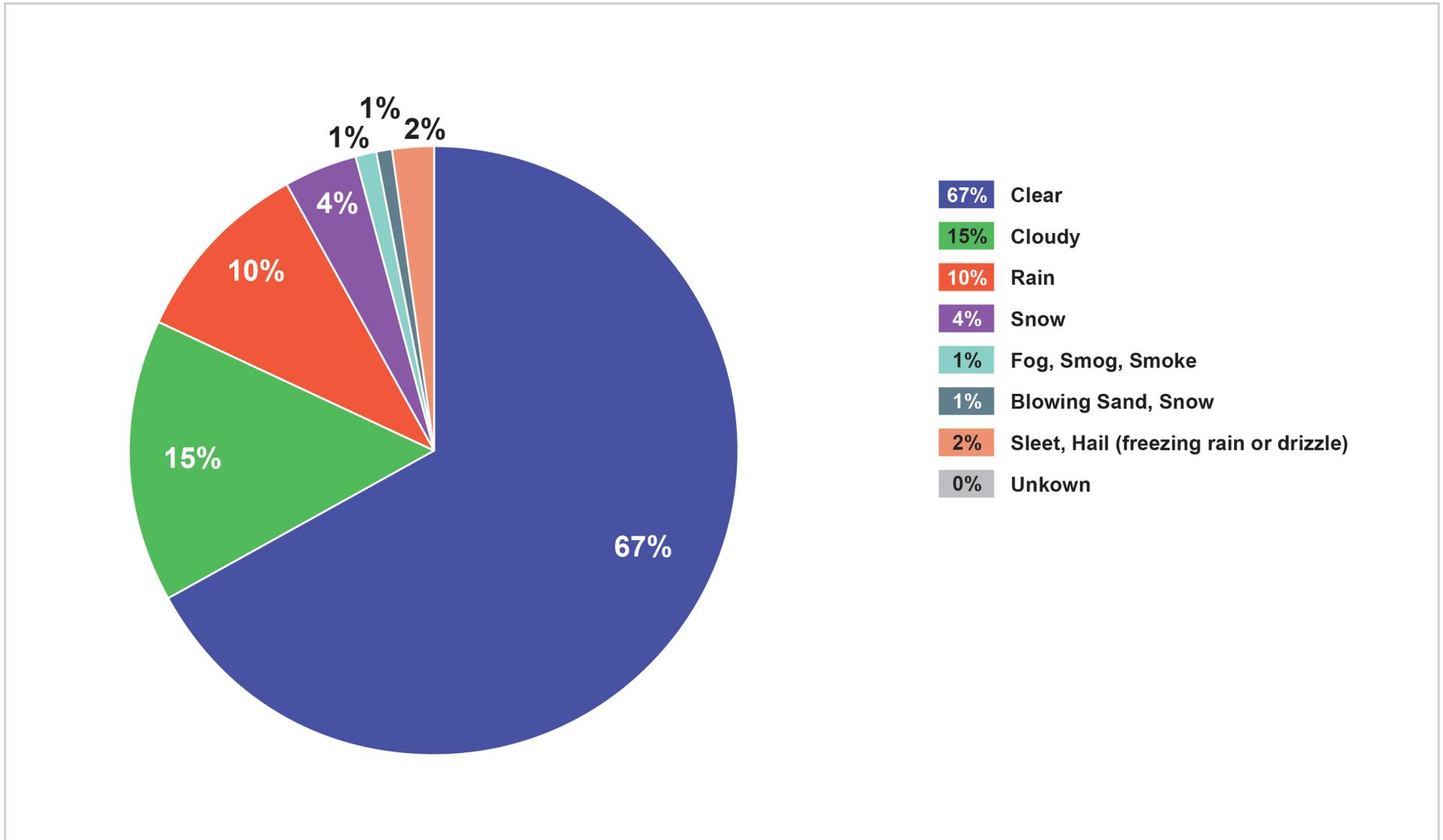


Appendix A. *Crashes by Manner of Collision*



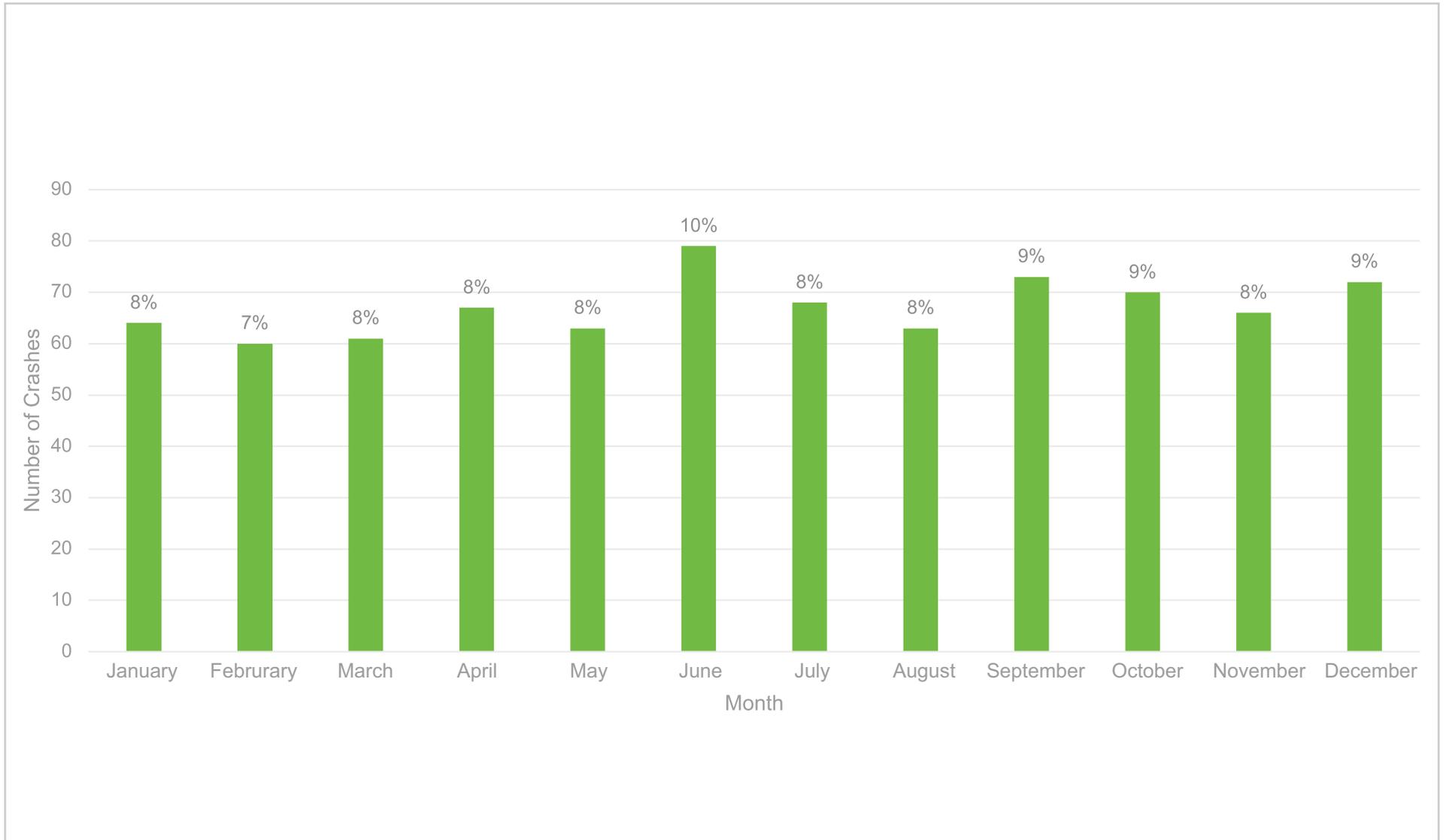


Appendix A. *Crashes by Weather Conditions*



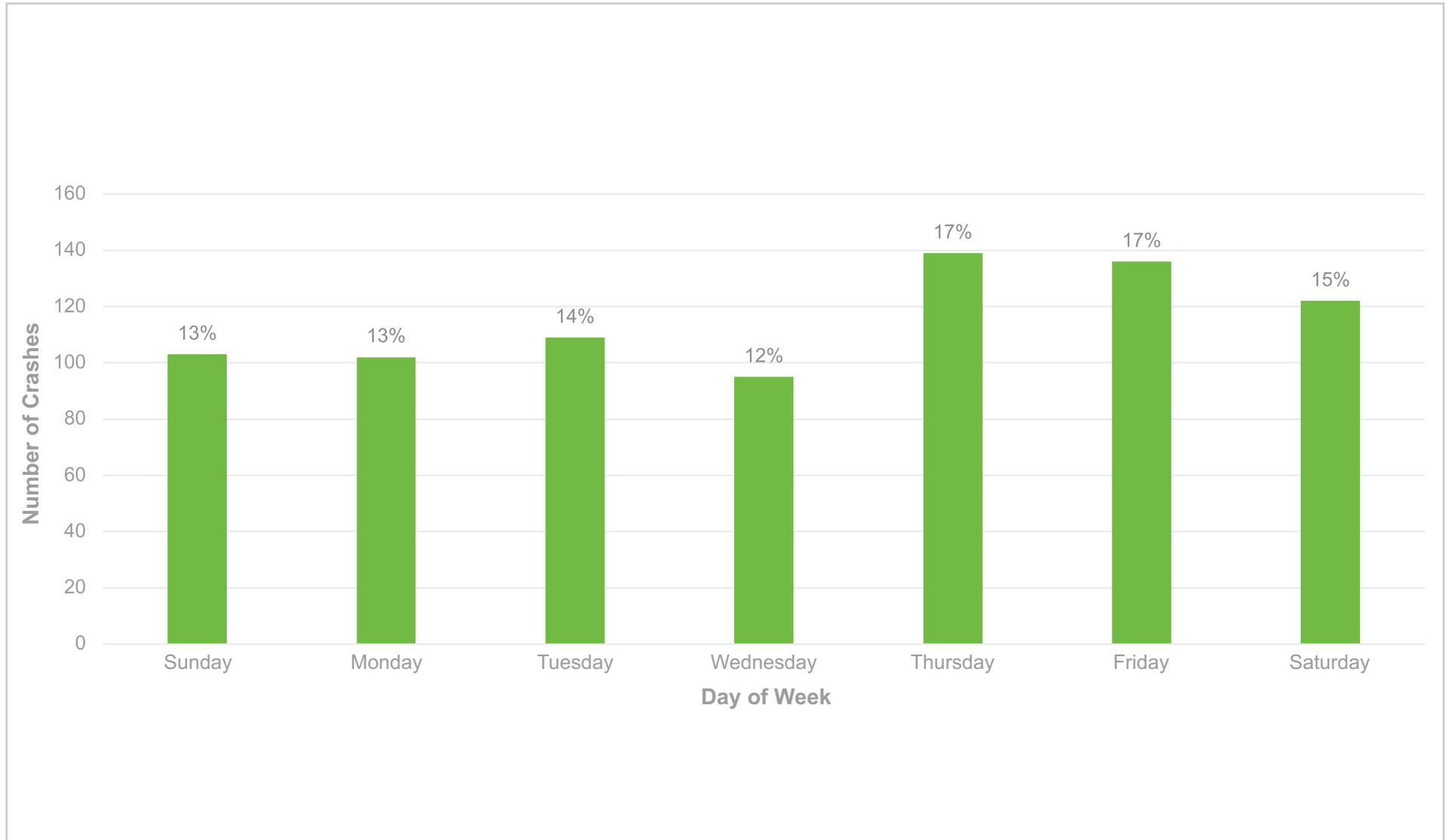


Appendix A. *Crashes by Month*





Appendix A. *Crashes by Day*





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## Appendix B

### Project Scoring Matrix

Location	Comments on issues	Identified based on	Crash History	Crash Risk Factors	Ped/Bike Safety	Community Priority	Feasibility/Cost	Equity	TOTAL
Pleasant St at North St	poor visibility around walls, poor yielding, double/illegal parking, high proportion of angle crashes	crashes (20) and public comments	5	5	3	3	3	3	22
Gould St	Lack of Sidewalks/ADA accommodations in proximity to School	public comment, SRTS children, pedestrian crash	5	5	3	3	2	3	21
Pleasant St at Church St	poor visibility around walls, poor yielding, speeding, high proportion of angle crashes	crashes (16) and public comment	4	5	3	3	2	3	20
West St Commercial Corridor	poor yielding, too many access points, multiple poorly marked pedestrian crossings	public comment and street evaluation (wide lanes)	5	5	3	3	1	1	18
Church Street Ped crossing (between E Main St and Pleasant St at Otis Ave)	one fatal ped crash (might be north of crossing and not at the crossing), mid-block crossing with no signage or ADA ramps	crash severity	5	3	3	2	3	1	17
West Street at School Road/Towne Street	poor yielding to peds, missing sidewalks and ramps on one side of street (near junior/senior high school)	public comment and street evaluation	1	5	3	3	2	1	15
Babcock Tavern Rd (near Beaver Lake Rd and Miner Rd)	many single vehicle crashes with embankment (from winding section to east where visibility is poor)	crashes (4-5) and public comment	3	5	0	3	3	0	14
Belchertown Rd at Anderson Rd	many angle crashes, many under wet/rain/snow/sleet conditions, steep road traveling in EB, makes it hard to slow down safely for turns onto Anderson Rd	crashes (14)	5	5	0	1	3	0	14
East Street around the bend near Mechanic Street	sharp bend, poor visibility	public comment and occasional crashes	3	4	1	2	3	0	13
West Street at Robbins Road	poor crosswalk conditions	street evaluation (wide lanes)	1	3	3	3	2	1	13
Church Street at Walnut Street	few signage/warning to suggest a crosswalk is present, crosswalk is also at an access point to the Grenville Park	public comment	1	3	3	2	2	2	13
Main St at Storrs St	tough to pull out, particularly when there are cars parked on WB approach	public comment	1	2	2	1	3	3	12
Maple Street at Chestnut Street	unable to see streetview but from aerial it looks like it's confusing as to which is the through path and which intersects, probably leads to confusing on yielding/ROW	public comment	1	3	1	2	2	3	12
Greenwich Road	Speeding and visibility issues	public comment	2	3	2	2	3	0	12
Church St/Pulaski St	Visibility issues, non-ada compliant	Field observation	1	2	3	1	2	3	12
Church Street at Main Street/E Main Street	public comment identified red light running (could be speeding vehicles headed downhill on Church - steep), ped/bike crashes (3), high amount of rear-end crashes (13)	crashes (21) and public comments	4	2	1	0	2	3	12
Eagle Street	speeding (residential street) - posted limit is 30mph, very straight alignment, road also appears to connection W Main St and Greenwich corridors therefore could be used as a neighborhood cut through (check traffic data)	public comment and one speeding related crash	2	4	1	2	2	0	11
Palmer Rd/Longview Ave	Road slightly bends making it tough to see vehicles exiting the restaurant. Speeding appears to contribute to the incidences of injury crashes	High rate of injury crashes, public comment on speeding/driveway access	5	3	0	1	2	0	11
Palmer Rd/Walmart Driveway	High number of angle crashes and sideswipes for a signalized intersection	Large overall # of crashes	5	3	0	0	1	0	9



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## Appendix C

### Public Presentations/Comments

lat	lng	Additional Comments	Feature ID	Feature Type	Created(DD/MM/YYYY)	Inputter ID	Inputter	Check All That Apply - People don't yield to pedestrians in crosswalks	Check All That Apply - People don't yield while turning	Check All That Apply - People park illegally/ double park their vehicles	Check All That Apply - People run red lights / stop signs	Check All That Apply - People speed	Check All That Apply - Its hard to see / low visibility/ view obstructed	Check All That Apply - Other	Comment:
42.242943	-72.274504		454791	point	9/13/2023	263210	Guest		People don't yield while turning			People speed			poor entry way to this well frequented business
42.256822	-72.249581		454709	point	9/7/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning			People speed			
42.26101	-72.238758		454710	point	9/7/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.264189	-72.222476		454731	point	9/11/2023	366081	Guest		People don't yield while turning			People speed			
42.258357	-72.232418		454732	point	9/11/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning		People run red lights / stop signs	People speed			
42.259251	-72.240066	Stop sign from Putaski St. onto South St. is not complied with by drivers. They do not stop!! Their needs to be a stop light there. They barely slow down and then cut out in front of drivers coming from Main St and South St. to "beat" them. Very dangerous. by Guest on 10/12/2023   Agree by Guest on 10/16/2023	454733	point	9/11/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning		People run red lights / stop signs	People speed			
42.264674	-72.247196		454742	point	9/11/2023	366081	Guest		People don't yield while turning			People speed			
42.250899	-72.306441		454778	point	9/12/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.26788	-72.249628		455634	point	9/24/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.263484	-72.273715		455635	point	9/24/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.269776	-72.253856		455662	point	9/28/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.242713	-72.273648		455665	point	9/28/2023	366081	Guest		People don't yield while turning			People speed			
42.238612	-72.285812		455666	point	9/28/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed		Other	
42.262869	-72.309846		455667	point	9/28/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.250936	-72.261591		455740	point	10/11/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning	People park illegally/ double park their vehicles		People speed			
42.251095	-72.258501		455741	point	10/11/2023	366081	Guest					People speed			
42.259964	-72.253101		455742	point	10/11/2023	366081	Guest				People run red lights / stop signs	People speed			tag sale signs in the view on the hill
42.259771	-72.239742	Agree by Guest on 10/16/2023	455754	point	10/12/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.260454	-72.241599		455755	point	10/12/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning		People run red lights / stop signs	People speed			
42.260303	-72.239331		455901	point	10/18/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning	People park illegally/ double park their vehicles	People run red lights / stop signs	People speed			
42.259765	-72.318569		455906	point	10/19/2023	366081	Guest		People don't yield while turning			People speed			bad road
42.260417	-72.242868		455908	point	10/19/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning	People park illegally/ double park their vehicles	People run red lights / stop signs	People speed			
42.261969	-72.241198	Can't see because of the wall by Guest on 10/19/2023	455910	point	10/19/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning	People park illegally/ double park their vehicles	People run red lights / stop signs	People speed			can't see with walls
42.271631	-72.230103		455911	point	10/19/2023	366081	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning			People speed			no crosswalk/ sidewalks
42.286976	-72.211907		455915	point	10/19/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.275154	-72.260822		455923	point	10/20/2023	366081	Guest			People park illegally/ double park their vehicles		People speed			lots of junk along side of road
42.301472	-72.247238		455925	point	10/20/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.241089	-72.298059		455926	point	10/20/2023	366081	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.262895	-72.252045		455645	point	9/26/2023	367501	Guest					People speed			
42.256995	-72.237497	Agree by Guest on 10/12/2023	455722	point	10/6/2023	368126	Guest		People don't yield while turning		People run red lights / stop signs	People speed			
42.247852	-72.267208		455723	point	10/6/2023	368126	Guest		People don't yield while turning			People speed			
42.249233	-72.260492		455726	point	10/6/2023	368126	Guest	People don't yield to pedestrians in crosswalks	People don't yield while turning		People run red lights / stop signs	People speed			
42.239235	-72.283077		456015	point	10/25/2023	368126	Guest		People don't yield while turning	People park illegally/ double park their vehicles		People speed		Other	traffic blocks access to juniper hill
42.260775	-72.243633	CORRECTION: It is dangerous pulling out of Storrs St. by Guest on 10/17/2023	455895	point	10/16/2023	368845	Guest								It is very dangerous pulling out of Eddy St when there are cars parked in front of the laundry mat. Your view is blocked because of the cars parked in front of the laundry mat.
42.260609	-72.2429		455920	point	10/20/2023	369134	Guest						Other		People keep using the bike lane in front of Brusoc's as a turning lane. It's dangerous for cyclists and people turning at the light.

Lat	Long	Additional Comments	Feature ID	Feature Type	Feature Description	Created(DD/MM/YYYY)	Inputter ID	Inputter	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements	the "WALK" signal is too short	Check All That Apply - People are not given enough time to cross the street	Check All That Apply - People cross away from the sidewalks	Check All That Apply - People have to cross too many lanes / too far	hard to see / low visibility / view obstructed	Check All That Apply - Vehicles don't yield to pedestrians in crosswalks	Check All That Apply - Pedestrian signal desired	Check All That Apply - Pedestrian signal not working	Check All That Apply - Other	Comment:
42.25187	-72.2554		454698	point		9/5/2023	263210	Guest	Sidewalks/ramps/crosswalks don't exist											Sidewalk to connect senior center to Rail Trail
42.25149	-72.2576	We could use sidewalks up to Anderson Road and Malboeuf Road. This section gets very busy with traffic, wish we could get a traffic light for this area. by Guest on 09/19/2023	454792	point		9/13/2023	263210	Guest		Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks		Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired		Other		There are not ample crosswalks on this Rte 32 corridor especially in the locations of businesses both sides of street
42.25149	-72.2576		454793	point		9/13/2023	263210	Guest		Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks		Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired		Other		There are not ample crosswalks on this Rte 32 corridor especially in the locations of businesses both sides of street
42.26521	-72.2357		454801	point		9/13/2023	263210	Guest					People cross away from the sidewalks					Other		Church St. has speeders and very few signs to indicate a crosswalk suggest a flashing light sign where a crosswalk is present
42.25399	-72.2394		455757	point		10/12/2023	263210	Guest		Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks							large number of walkers and they will walk in the street because the sidewalks are so bad. Safety concerns as many speeders on this street.
42.26723	-72.2396		455635	point		9/24/2023	366081	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements					Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired	Pedestrian signal not working			
42.26305	-72.2426		455837	point		9/24/2023	366081	Guest			The wait for the "WALK" signal	People are not given enough time to cross the street	People cross away from the sidewalks	People have to cross too many lanes /	Vehicles don't yield to pedestrians in crosswalks		Pedestrian signal not working			
42.26439	-72.2171		455710	point		10/4/2023	366081	Guest		Sidewalks/ramps need/crosswalks improvements					Vehicles don't yield to pedestrians in crosswalks			Other	dumpster on sidewalk	
42.26176	-72.2427		455907	point		10/19/2023	366081	Guest					People cross away from the sidewalks		Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.27171	-72.23		455913	point		10/19/2023	366081	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks		Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.26412	-72.2225		455916	point		10/19/2023	366081	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks	People have to cross too many lanes /	Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.25964	-72.2329		455917	point		10/19/2023	366081	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks	People have to cross too many lanes /	Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.24914	-72.2823		455927	point		10/20/2023	366081	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks	People have to cross too many lanes /	Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.2546	-72.2539		454729	point		9/8/2023	366174	Guest							Vehicles don't yield to pedestrians in crosswalks				Pedestrian signal not working	
42.25925	-72.2403		455706	point		10/3/2023	367970	Guest							Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.26395	-72.2462		455707	point		10/3/2023	367970	Guest	Sidewalks/ramps/crosswalks don't exist									Other		lack of sidewalks and sidewalks in disrepair
42.2583	-72.2491		455708	point		10/3/2023	367970	Guest	Sidewalks/ramps/crosswalks don't exist											lack of lighting and sidewalks on the curve
42.25101	-72.2611		455724	point		10/6/2023	368126	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements			People cross away from the sidewalks		Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				
42.24923	-72.2605		455726	point		10/6/2023	368126	Guest	Sidewalks/ramps/crosswalks don't exist	Sidewalks/ramps need/crosswalks improvements		People are not given enough time to cross the street	People cross away from the sidewalks	People have to cross too many lanes /	Vehicles don't yield to pedestrians in crosswalks	Pedestrian signal desired				Pedestrian signal not working

lat	lng	Additional Comments	Feature ID	Feature Type	Feature Description	Created(DD/MM/YYYY)	Inputter ID	Inputter	Check All That Apply - Related to biking	Check All That Apply - Related to driving	Check All That Apply - Related to walking	Check All That Apply - Related to accessibility	Check All That Apply - Related to transit	Check All That Apply - Related to wildlife	Check All That Apply - Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)	Check All That Apply - Other	Comment:
		Flood pump not operational leaving area of town vulnerable by Guest on 09/19/2023 Ware pump is serious and will increase insurance rates on homes and cars if property in Ware is															
42.25884	-72.24326	flooded in Ware by Guest on 09/27/2023	454734	point		9/11/2023	366081	Guest				Related to accessibility			Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)		
42.27001	-72.25422		455663	point		9/28/2023	366081	Guest		Related to driving						Other	icy in winter
42.26941	-72.23969		455736	point		10/10/2023	366081	Guest	Related to biking	Related to driving	Related to walking				Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)		
42.26048	-72.23981		455902	point		10/18/2023	366081	Guest		Related to driving		Related to accessibility	Related to transit		Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)		Director does not do his job!
42.25709	-72.23644		455905	point		10/19/2023	366081	Guest	Related to biking		Related to walking	Related to accessibility			Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)		bad sidewalks, brush on fence
42.26043	-72.24144		455909	point		10/19/2023	366081	Guest		Related to driving		Related to accessibility			Facility maintenance needed (ex: cracked pavement, pot holes, faded pavement markings, broken lights, etc.)		no parking
42.27566	-72.25739		455924	point		10/20/2023	366081	Guest						Related to wildlife			lots of junk/trash dumped along side of road
42.26217	-72.25217		455646	point		9/26/2023	367501	Guest		Related to driving							extremely loud motorcycles and vehicles
42.25646	-72.24971		456016	point		10/25/2023	368126	Guest		Related to driving							cars revving engines and burning out

lat	lng	Additional Comments	Feature ID	Feature Type	Feature Description	Created(DD/MM/YYYY)	Inputter ID	Inputter	Check All That Apply - Bike facilities d	Check All That Apply - Bike facilities n	Check All That Apply - Drivers don't sh	Check All That Apply - Turning conflict
42.26491	-72.2327		455664	point		9/28/2023	366081	Guest			Drivers don't share the road	Turning conflicts with vehicles
42.23853	-72.2856		455709	point		10/4/2023	366081	Guest	Bike facilities don't exist	Bike facilities need improvement	Drivers don't share the road	Turning conflicts with vehicles
42.24137	-72.2773		455721	point		10/5/2023	366081	Guest	Bike facilities don't exist	Bike facilities need improvement	Drivers don't share the road	Turning conflicts with vehicles
42.2716	-72.2301		455912	point		10/19/2023	366081	Guest		Bike facilities need improvement	Drivers don't share the road	Turning conflicts with vehicles
42.2845	-72.2171		455914	point		10/19/2023	366081	Guest	Bike facilities don't exist	Bike facilities need improvement	Drivers don't share the road	Turning conflicts with vehicles
42.26433	-72.2476		456017	point		10/25/2023	368126	Guest	Bike facilities don't exist	Bike facilities need improvement	Drivers don't share the road	Turning conflicts with vehicles

# Ware Safety Action Plan

*Presented by*

**Howard Stein Hudson**

*Presented to*

**Town of Ware**

**February 8, 2024**



**HOWARD STEIN HUDSON**

Engineers + Planners

# Agenda

Engineers + Planners

- **Project Background**
- **Conceptual Projects**
- **Prioritization**
- **Q&A / Feedback**



HOWARD STEIN HUDSON

# Safe Streets and Roads for All Grant Program

Engineers + Planners

## ■ SS4A Grant Program



- <https://www.transportation.gov/grants/SS4A>
- Established by Bipartisan Infrastructure Law (BIL)
- \$5 Billion in safety funds 2022-2026
  - *Planning and Demonstration Grants*
    - *Safety Action Plan*
  - *Implementation Grants*



HOWARD STEIN HUDSON

# Scope of Work

Engineers + Planners

- **Compile Existing Data and Studies**
- **Data Collection and Analysis**
  - Crash Maps
  - Bike/Pedestrian Network Maps
  - Equity Assessment Maps
  - WikiMap
- **Safety Action Plan Report**
- **Meetings/Site Visits**



# Safety Action Plan

Engineers + Planners

- **Identifies potential safety improvement projects throughout Ware**
- **Prioritize projects**
- **Develop a Top 10 improvement project list**
  - Conceptual Cost Estimate (SARPET)
  - Construction Timeline



# Crash Data

Engineers + Planners

## ■ Crash Data Collected 2016-2020

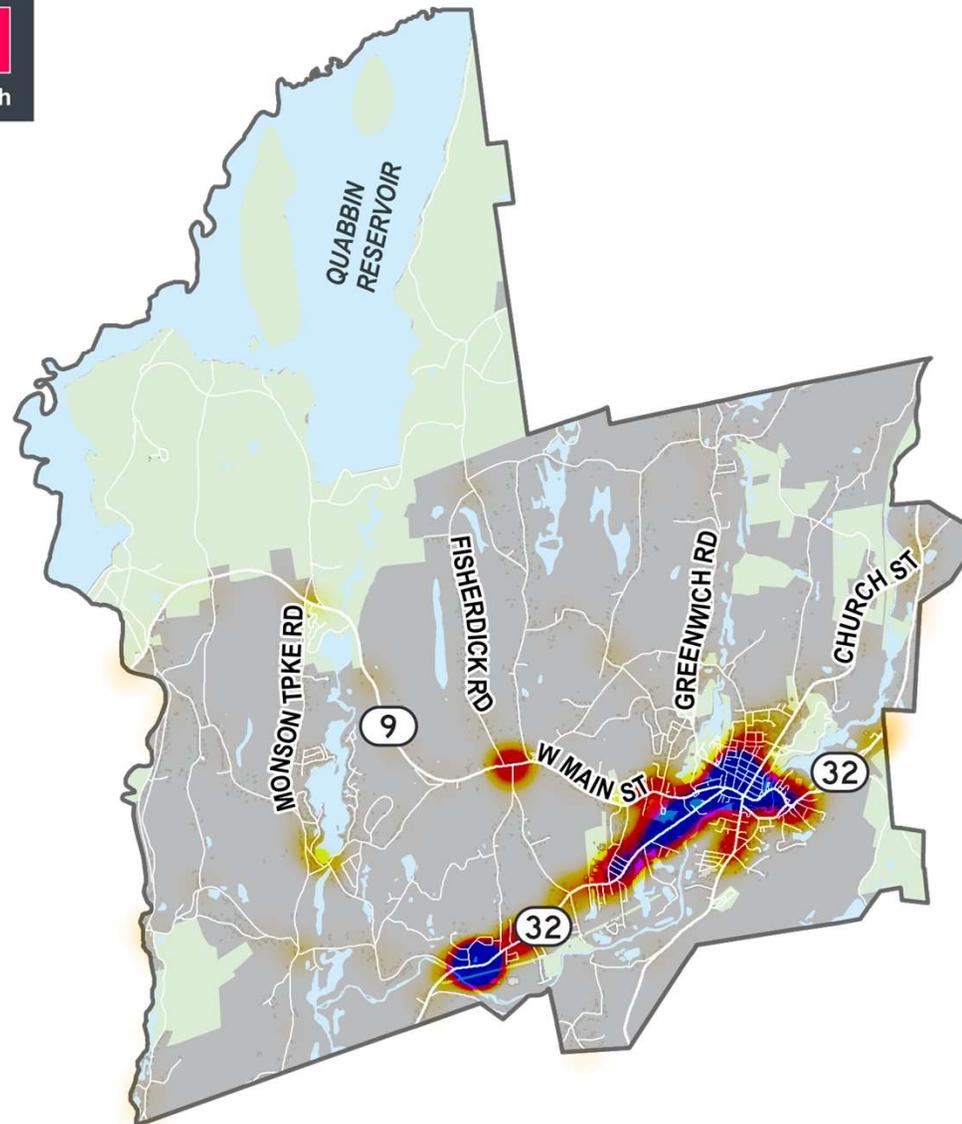
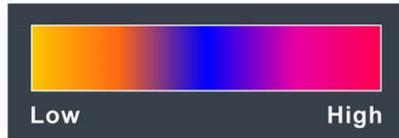
- 806 Crashes (~161 per year)
  - 3 *fatalities*
    - 6/27/16
    - 7/20/17
    - 10/11/20
  - 166 *injuries*
  - 637 *property damage only*



HOWARD STEIN HUDSON

# Crash Heat Maps

Engineers + Planners



HOWARD STEIN HUDSON

# Crash Maps – Pedestrians/Bicycles

Engineers + Planners

- ▲ Collision with pedalcycle (bicycle, tricycle, unicycle, and pedal car)
- ▲ Collision with pedestrian



# WikiMap

Engineers + Planners



**Ware, MA**  
*Somewhere Worth Seeing*

## WARE SAFETY ACTION PLAN

Use the ADD POINTS button below to add to the map. Add as many points as you would like.

Ware Safety Action Plan About & Help ADD POINTS

Map Satellite

+ abbin Park Cemetery

-

Q

Associated Contractors

Canadian Tree Expert

Letendre Farm Eggs

Belchertown Rd

Greenwich Rd

W Main St

Bleafe Wellness Centre

Curaleaf MA Ware Adult-Use

Packaging Distribution

Janine's Fro...

Guzik Motor Sales Inc Jeep

Grenville Park

Rock F...

# Potential Projects

Engineers + Planners

- |                                             |                              |
|---------------------------------------------|------------------------------|
| 1 Babcock Tavern Rd                         | 10 Church St and Pulaski St  |
| 2 Anderson Rd and Belchertown Rd            | 11 Church St and South St    |
| 3 West St and School Street                 | 12 Church St and Otis St     |
| 4 West St and Robins St                     | 13 Church St and Pleasant St |
| 5 West St at Walgreens Driveway             | 14 Chestnut St and Maple St  |
| 6 West St Pedestrian Crossing               | 15 Walnut St and Church St   |
| 7 West St Pedestrian Crossing at McDonald's | 16 Mechanic St               |
| 8 Storrs St and Main St                     | — Eagle St                   |
| 9 Pleasant St and North St                  |                              |



# Belchertown Road/Anderson Street

Engineers + Planners



*Belchertown Road looking EB near Anderson Street*

## ■ Issue

- Crashes resulting from turning too quickly onto Anderson Road
- Speeding

## ■ Solutions

- Downhill speed management
- Traffic Calming
- Clearer signage



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# Eagle Street

Engineers + Planners



*View down Eagle Street near Dora Street*

## ■ Issues

- Speeding
- Straight roadway alignment
- Neighborhood cut thru

## ■ Solutions

- Speed humps
- Speed feedback signage
- Other traffic calming/speed control measures



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# South Street at Pulaski Street

Engineers + Planners



*Crosswalk from Pulaski Street to  
South Street*

## ■ Issues

- Poor Sight lines at Pulaski St
- Non-compliant Crosswalks

## ■ Solutions

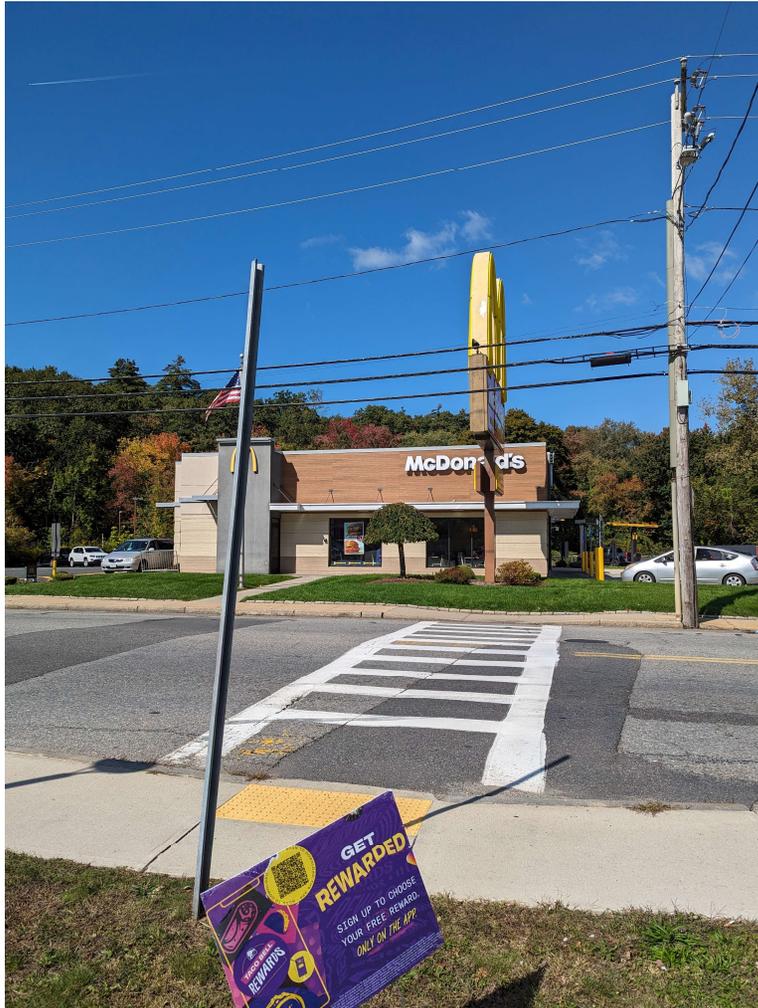
- ADA Compliant Crosswalk Upgrades
- Sight line improvements for Pulaski St approach



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# West St – McDonald's to Walgreens (Multiple Locations)

Engineers + Planners



*Crosswalk across West St near McDonald's*

## ■ Issues

- Wide road
- Poor crossing visibility
- Too many driveways

## ■ Solutions

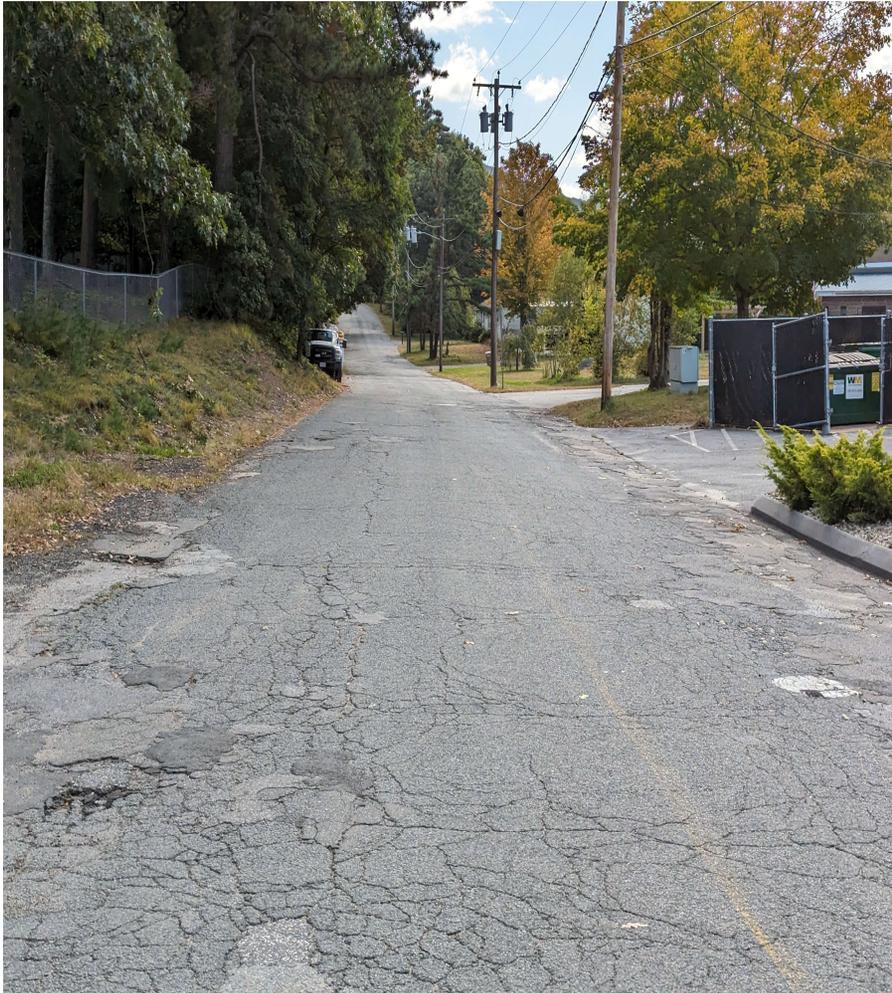
- Signage & marking improvements for crossings
- Consider Driveway Consolidation
- Potential RRFBs at unsignalized crossings



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# West St at Robbins Road

Engineers + Planners



View down Robbins Road from West Street

## ■ Issues

- No Crosswalks
- Poor pavement condition
- Poor crossing treatment across West St

## ■ Solutions

- Sidewalk added on Robbins Road from Senior Center
- Evaluation of crossing location on West St
  - *Remove or consider RRFB*



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# West St at School Road/Towne Road

Engineers + Planners



*Crosswalk across West Street to  
School Road*

## ■ Issues

- No sidewalk on south side
- Pavement marking issues

## ■ Solutions

- ADA Compliant Crosswalk Upgrades
- Sidewalks on south side of street
- Consider RRFB
- Consider SRTS Funding



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# Church St – Approaching Main

Engineers + Planners



*Looking up Church St from Main St*

## ■ Issues

- Downhill speeding
- Poorly marked ped crossing where fatality occurred

## ■ Solutions

- Consider RRFB and signage at Ped Crossing
- Downhill speed management such as speed humps



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# Church St/Walnut St

Engineers + Planners



*Looking down Church St near Walnut St*

## ■ Issues

- Little warning signage for crosswalk
- Access to Grenville Park

## ■ Solutions

- Consider RRFB
- Advanced Warning Signage



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# Open Discussion

Engineers + Planners

- **Other projects or areas you would like to see included?**
- **What should the town prioritize?**



HOWARD STEIN HUDSON

# Questions?

Contact: Andrew Fabiszewski  
[SafetyActionPlan@hshassoc.com](mailto:SafetyActionPlan@hshassoc.com)



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Engineers + Planners

# Ware Safety Action Plan

*Presented by*

**Howard Stein Hudson**

*Presented to*

**Town of Ware**

**October 19, 2023**



**HOWARD STEIN HUDSON**

Engineers + Planners

# Agenda

Engineers + Planners

- **Project Background**
- **Existing Data**
- **Wikimap  
Demonstration**
- **Q&A / Feedback**



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# Safe Streets and Roads for All Grant Program

Engineers + Planners

## ■ SS4A Grant Program



U.S. Department of Transportation

- <https://www.transportation.gov/grants/SS4A>
- Established by Bipartisan Infrastructure Law (BIL)
- \$5 Billion in safety funds 2022-2026
  - *Planning and Demonstration Grants*
    - *Safety Action Plan*
  - *Implementation Grants*



HOWARD STEIN HUDSON

# Scope of Work

Engineers + Planners

- **Compile Existing Data and Studies**
- **Data Collection and Analysis**
  - Crash Maps
  - Bike/Pedestrian Network Maps
  - Equity Assessment Maps
  - WikiMap
- **Safety Action Plan Report**
- **Meetings/Site Visits**



# Safety Action Plan

Engineers + Planners

- **Will identify potential safety improvement projects throughout Ware**
- **Meet again in a couple months to present potential projects and receive feedback**
- **Develop a Top 10 improvement project list**
  - Conceptual Cost Estimate (SARPET)
  - Construction Timeline



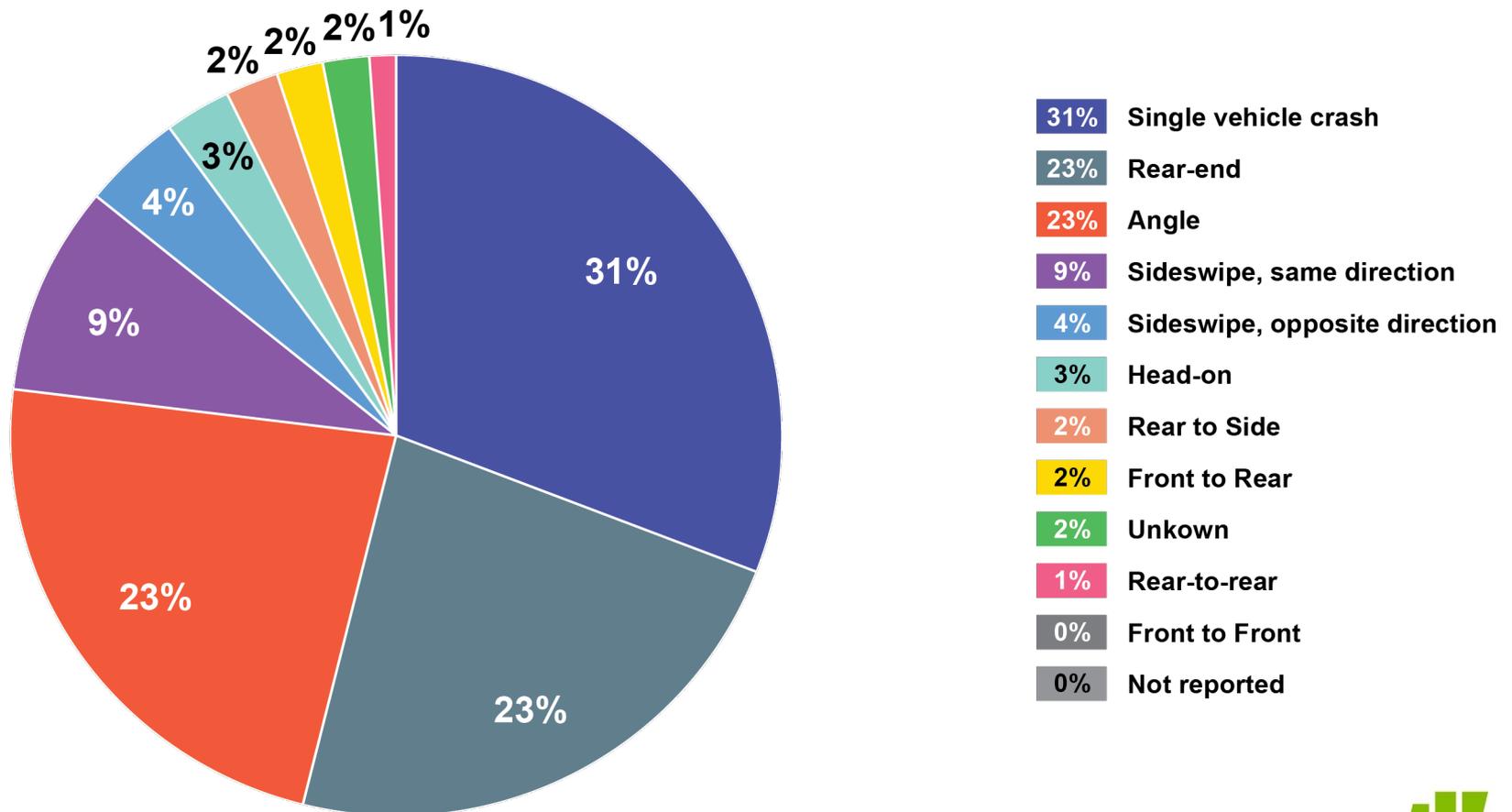
# Crash Data

## ■ Crash Data Collected 2016-2020

- 806 Crashes (~161 per year)
  - 3 *fatalities*
    - 6/27/16
    - 7/20/17
    - 10/11/20
  - 166 *injuries*
  - 637 *property damage only*



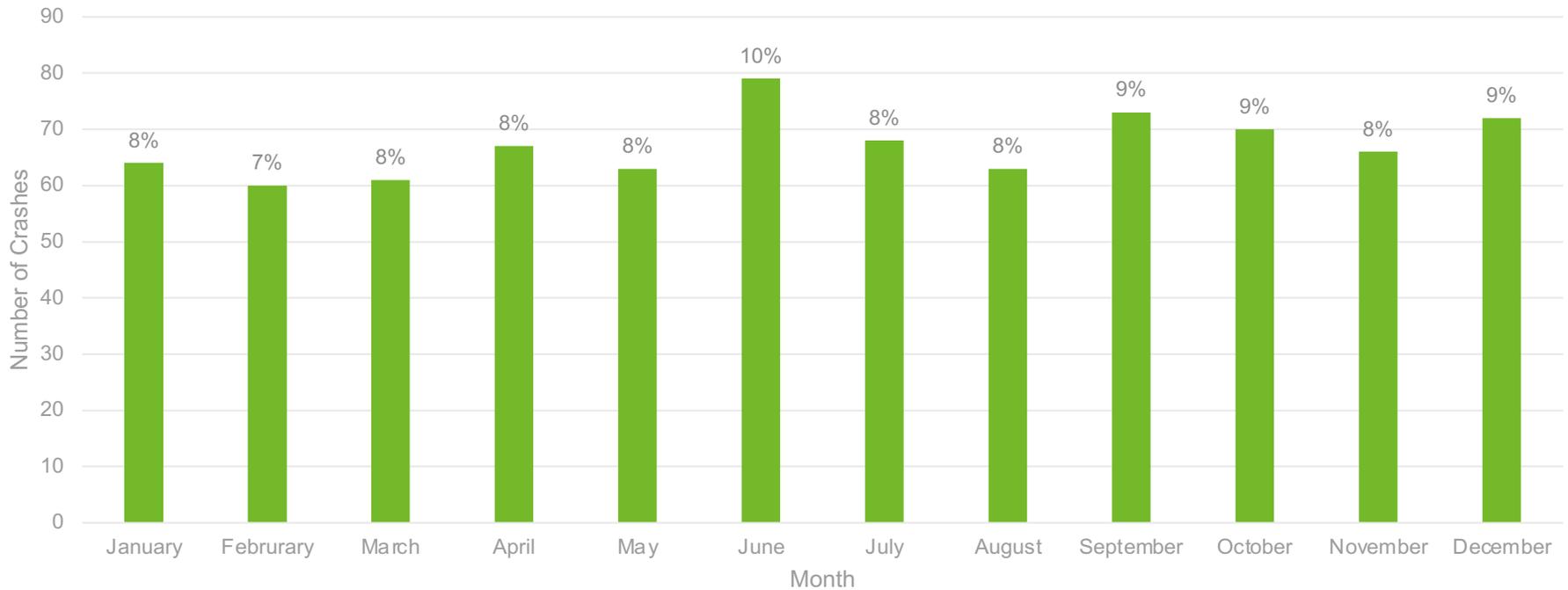
# Manner of Collision



# Crashes by Month

Engineers + Planners

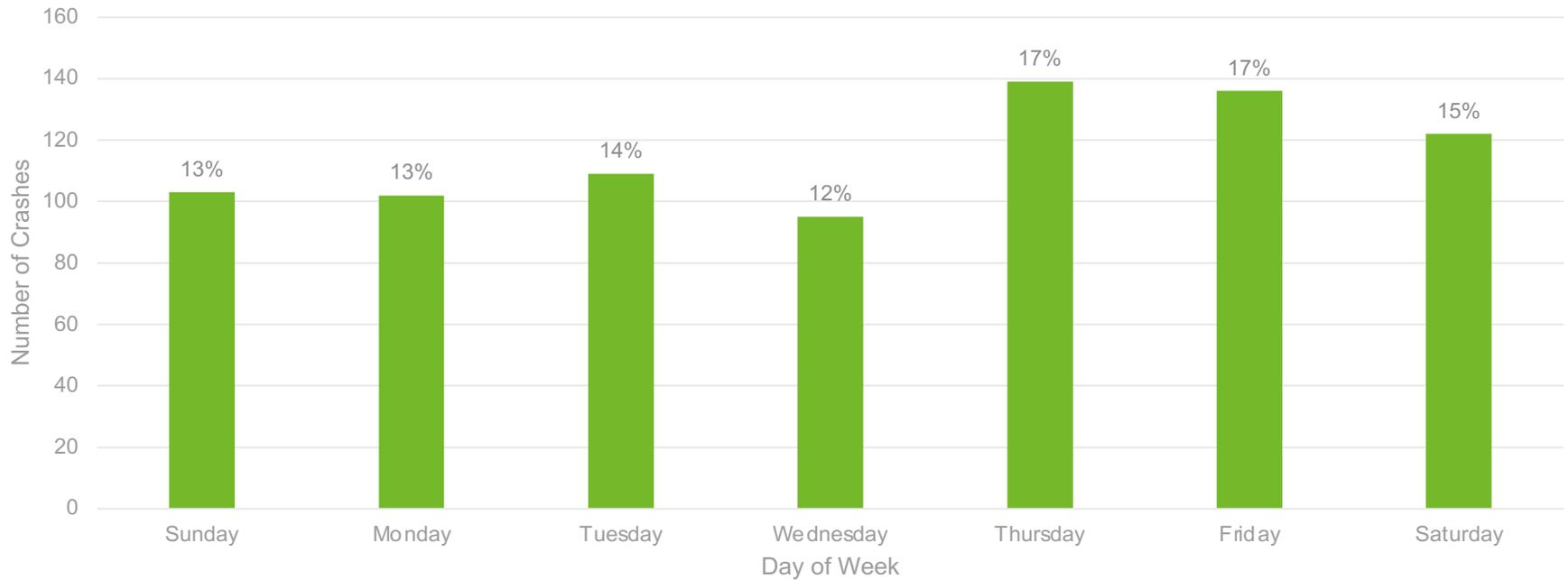
## Crashes by Month



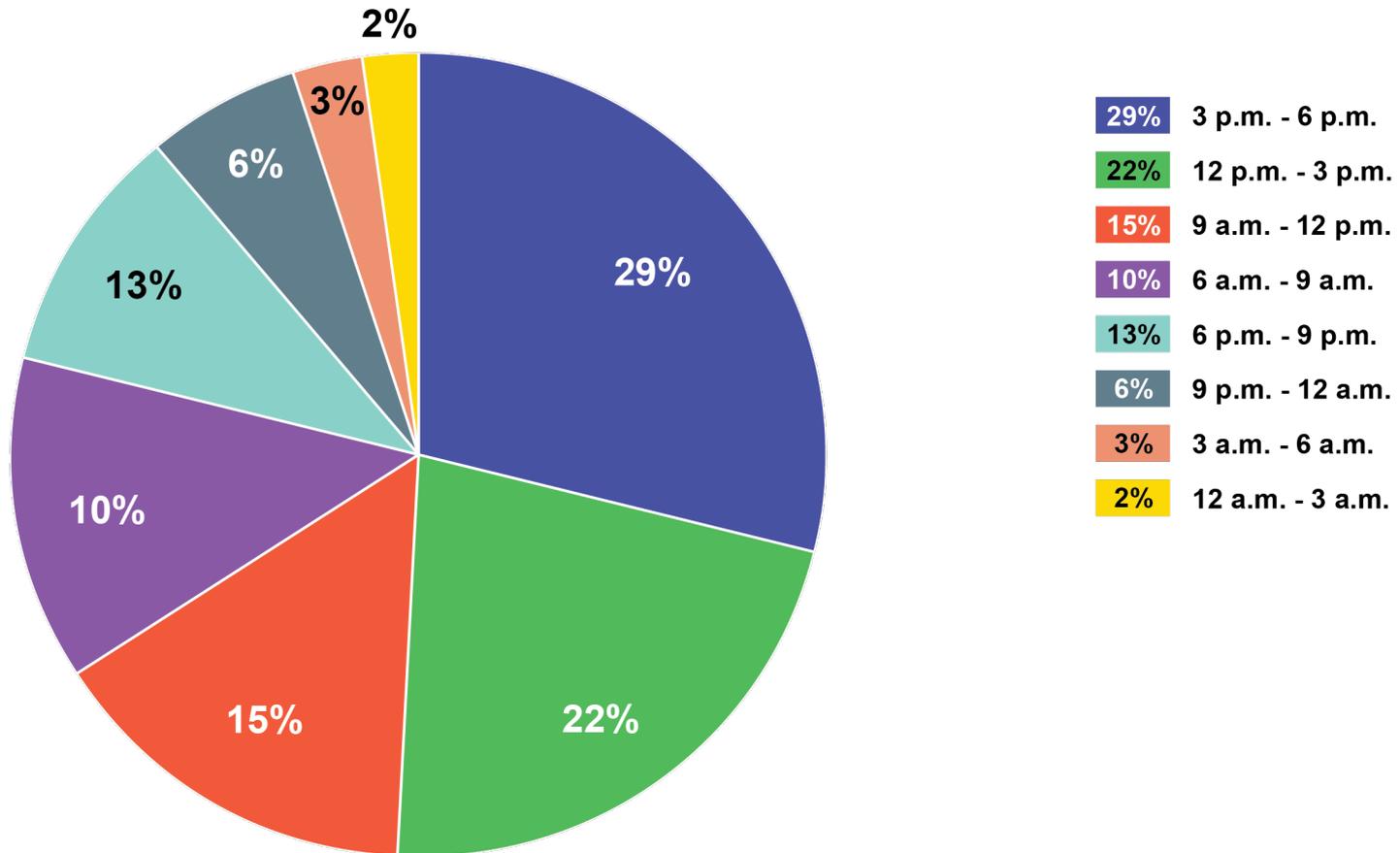
# Crashes by Day

Engineers + Planners

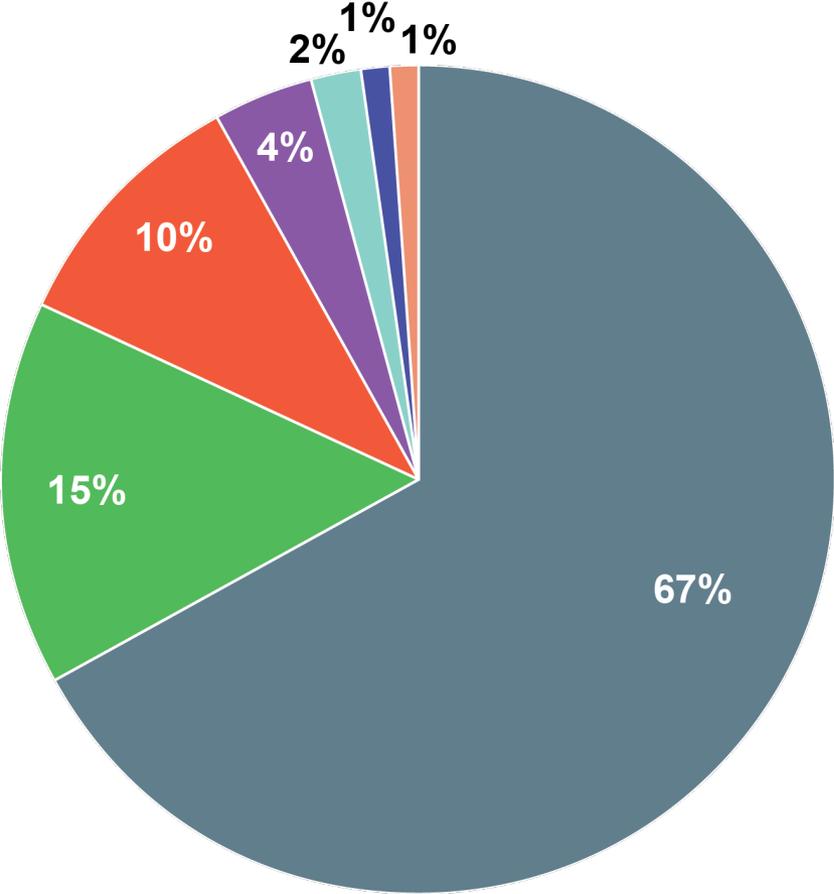
## Crashes by Day of Week



# Crashes by Time of Day



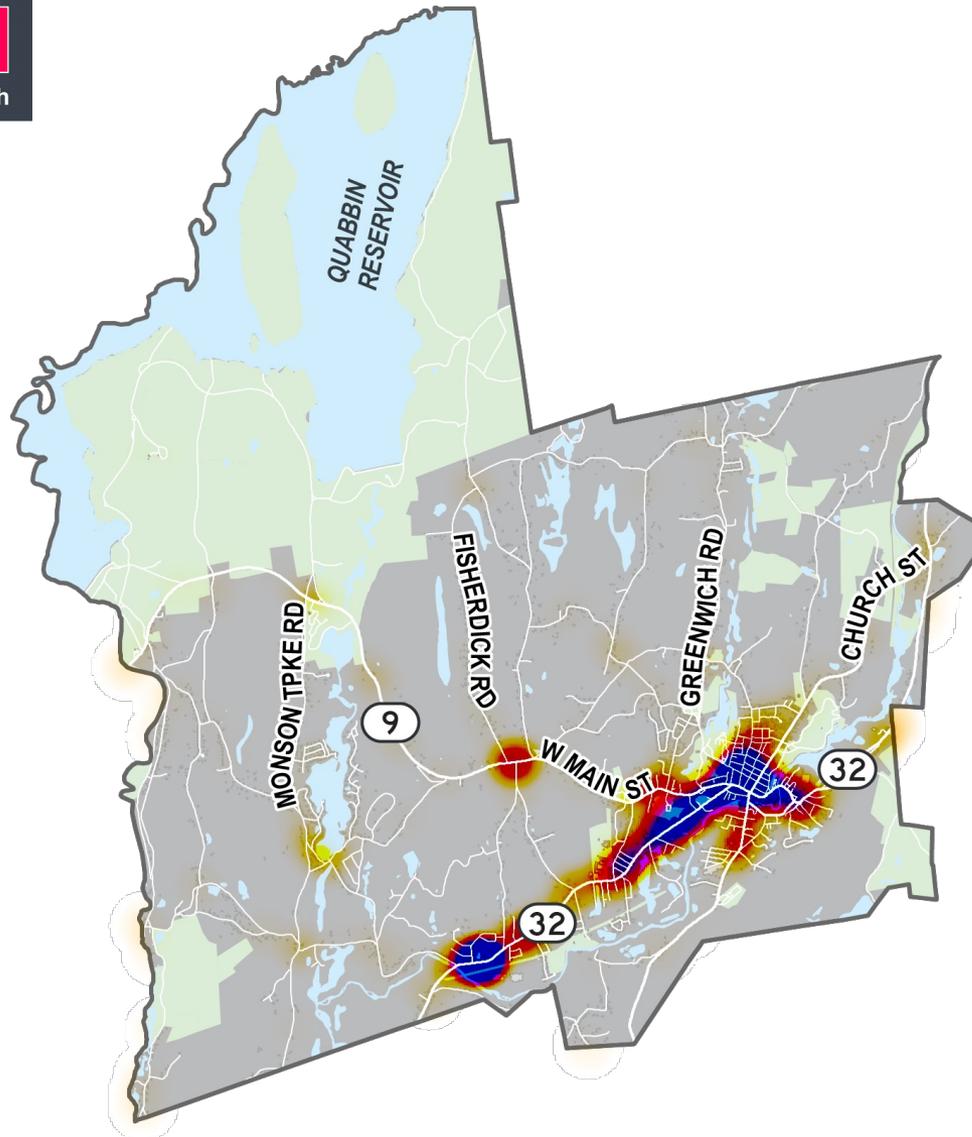
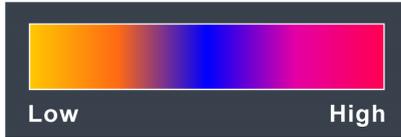
# Weather Conditions



- 67% Clear
- 15% Cloudy
- 10% Rain
- 4% Snow
- 2% Sleet, Hail (freezing rain or drizzle)
- 1% Blowing Sand, Snow
- 1% Fog, Smog, Smoke
- 0% Unknwn



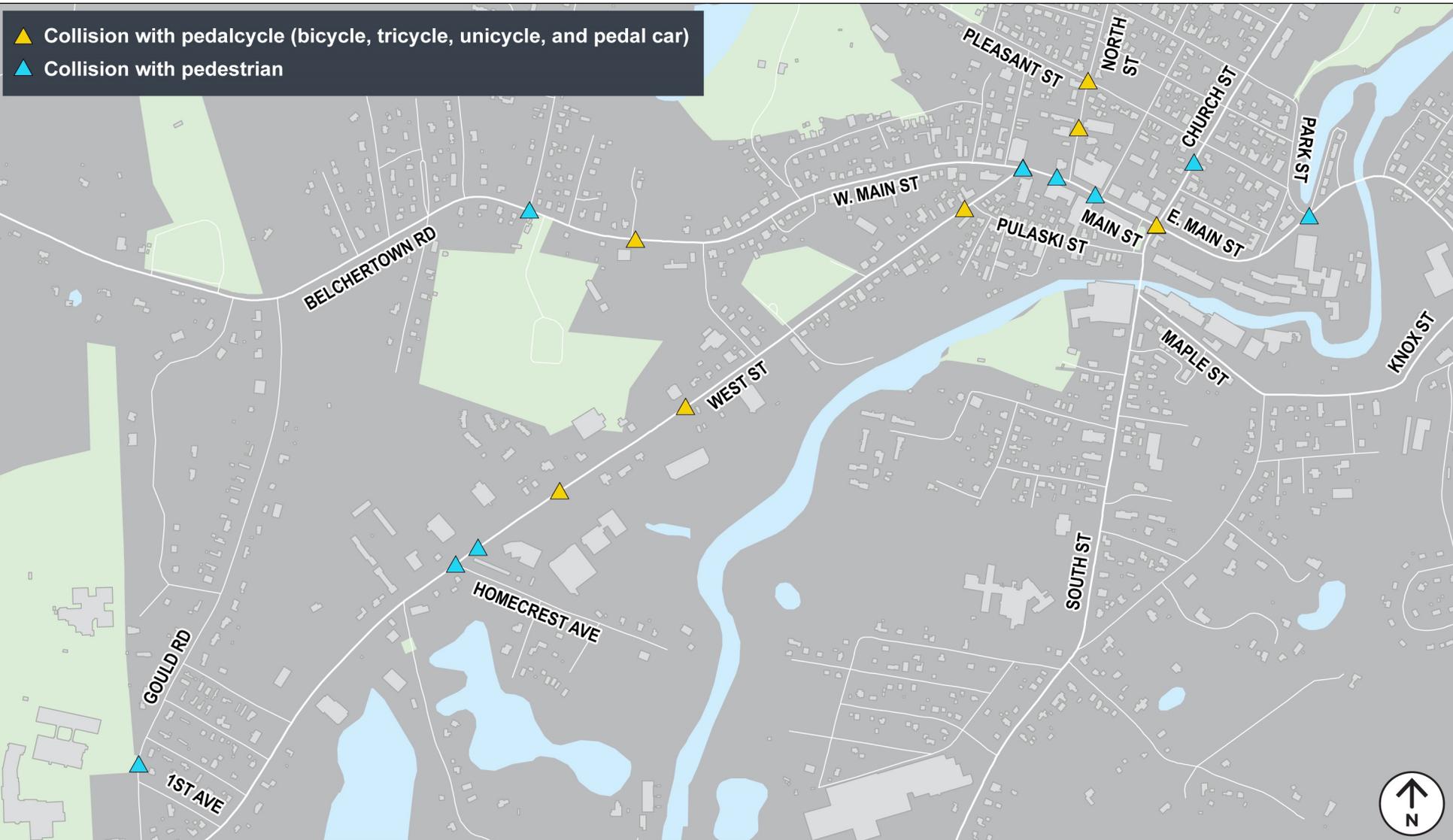
# Crash Heat Maps



# Crash Maps – Pedestrians/Bicycles

Engineers + Planners

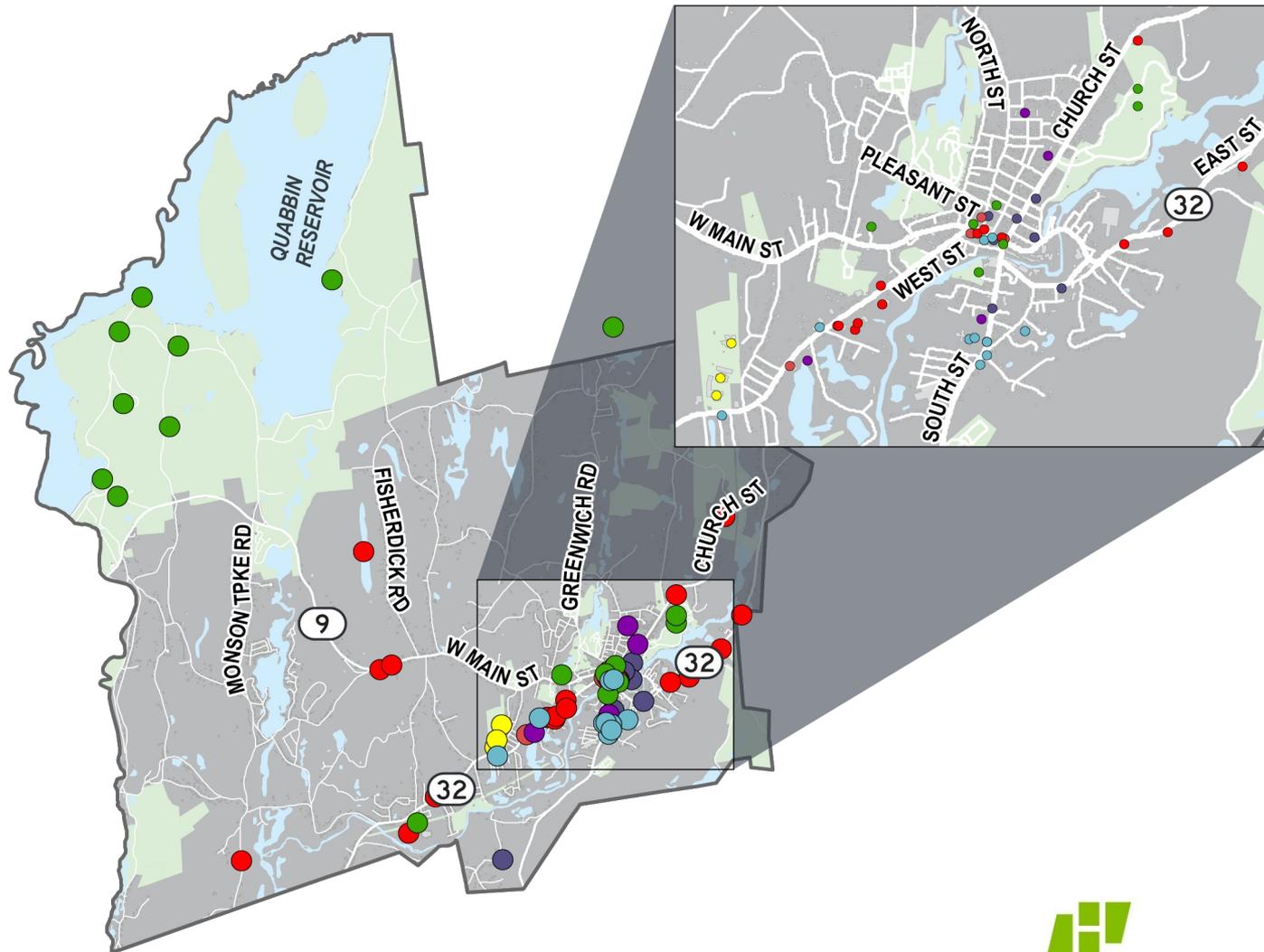
- ▲ Collision with pedalcycle (bicycle, tricycle, unicycle, and pedal car)
- ▲ Collision with pedestrian



# Crash Maps – Pedestrians/Bicycles

Engineers + Planners

- Food and Restaurants
- Health Services
- Municipality Services
- Open Space
- Places of Worship
- Schools
- Senior Destinations



# South Street at Pulaski Street

Engineers + Planners



*Crosswalk from Pulaski Street to South Street*



*South Street looking south*



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# Eagle Street at Warebrook Drive

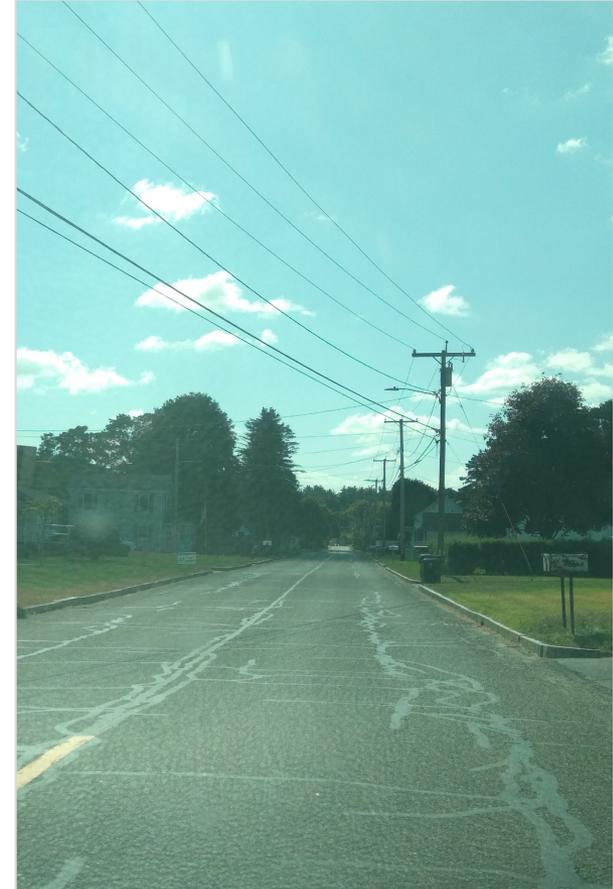
Engineers + Planners



*Crosswalk across Warebrook Drive at Eagle Street*



*Crosswalk across Eagle Street at Warebrook Drive*



*Eagle Street looking south*



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# Beaver Lake Road at Babcock Tavern Road

Engineers + Planners



*Beaver Lake Road looking north*



*Babcock Tavern Road  
looking east*



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# Barnes Street at Pleasant Street

Engineers + Planners



*Barnes Street looking north up  
Pleasant Street*



*Barnes Street looking south up  
Pleasant Street*



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# Greenwich Plains Road at Route 9

Engineers + Planners



*Route 9 looking east*



*Route 9 looking west*



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# Quabbin Park Cemetery Trail off Route 9

Engineers + Planners



*Parking area along Route 9  
looking west*



*Parking area along Route 9  
looking east*



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# Demonstration

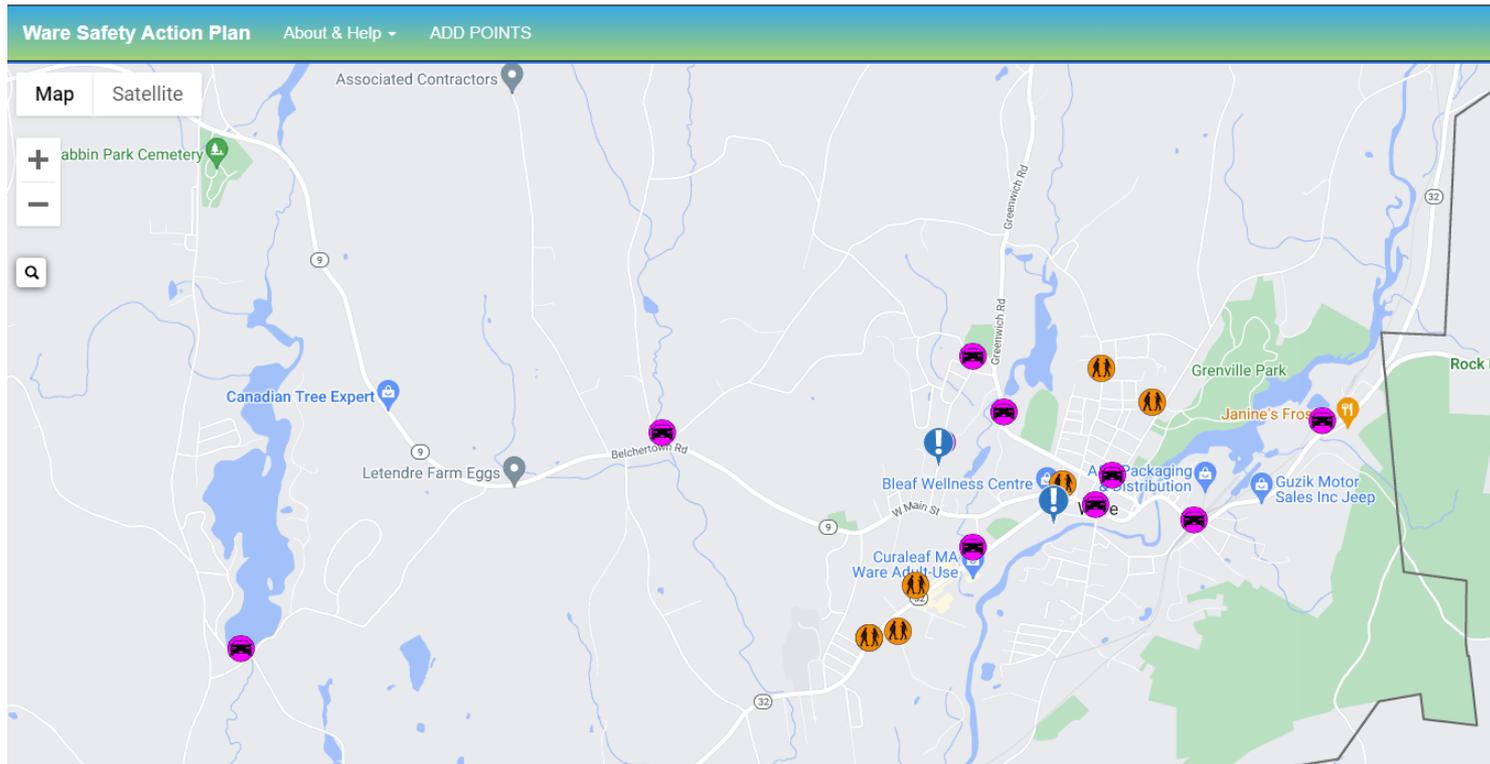
## ■ Wiki Map

- <https://wikimapping.com/Ware-Safety-Action.html>



## WARE SAFETY ACTION PLAN

Use the ADD POINTS button below to add to the map. Add as many points as you would like.



# Safety Countermeasures

OFFICE OF SAFETY

## Proven Safety Countermeasures

### SPEED MANAGEMENT



**Speed Safety Cameras**



**Variable Speed Limits**



**Appropriate Speed Limits for All Road Users**

### ROADWAY DEPARTURE



**Wider Edge Lines**



**SafetyEdge<sup>SM</sup>**



**Longitudinal Rumble Strips and Stripes on Two-Lane Roads**



**Enhanced Delineation for Horizontal Curves**



**Roadside Design Improvements at Curves**



**Median Barriers**

### CROSSCUTTING



**Pavement Friction Management**



**Road Safety Audit**



**Lighting**



**Local Road Safety Plans**

### INTERSECTIONS



**Backplates with Retroreflective Borders**



**Corridor Access Management**



**Reduced Left-Turn Conflict Intersections**



**Roundabouts**



**Yellow Change Intervals**



**Dedicated Left- and Right-Turn Lanes at Intersections**



**Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections**

### PEDESTRIANS/BICYCLES



**Crosswalk Visibility Enhancements**



**Leading Pedestrian Interval**



**Road Diets (Roadway Reconfiguration)**



**Rectangular Rapid Flashing Beacons (RRFB)**



**Bicycle Lanes**



**Medians and Pedestrian Refuge Islands in Urban and Suburban Areas**



**Walkways**



**Pedestrian Hybrid Beacons**

# Questions?

Contact: Andrew Fabiszewski  
[SafetyActionPlan@hshassoc.com](mailto:SafetyActionPlan@hshassoc.com)



**HOWARD STEIN HUDSON**

Engineers + Planners



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# Appendix D

## Project Estimates

# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	Babcock Tavern Rd/Miner Rd
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 850 ft	Civil/Drainage/Edging Costs	\$11,180.00
# Segments: 1		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 0	Traffic/Signal Costs	\$2,520.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$0.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$13,700.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$959.00
	20%      CONTINGENCY	\$2,740.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$17,399.00</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$19,000.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Spot Survey Only	SURVEY COST	\$2,500.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$2,740.00
	<b>PROJECT TOTAL</b>	<b>\$24,200.00</b>

Pricing based on MassDOT bid prices exported on 12/07/2023

# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	Belchertown Road/Anderson Road
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 1,050 ft	Civil/Drainage/Edging Costs	\$1,460.00
# Segments: 2		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 0	Traffic/Signal Costs	\$9,690.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$0.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$11,150.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$780.50
	20%      CONTINGENCY	\$2,230.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$14,160.50</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$15,460.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Spot Survey Only	SURVEY COST	\$5,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$2,230.00
	<b>PROJECT TOTAL</b>	<b>\$22,700.00</b>

Pricing based on MassDOT bid prices exported on 12/07/2023

# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	Church Street Pedestrian Crossing (North of E. Main Street)
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 60 ft	Civil/Drainage/Edging Costs	\$50,890.00
# Segments: 1		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 0	Traffic/Signal Costs	\$2,310.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$0.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$53,200.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$3,724.00
	20%      CONTINGENCY	\$10,640.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$67,564.00</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$73,780.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$5,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$10,640.00
	<b>PROJECT TOTAL</b>	<b>\$89,420.00</b>

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# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	Gould Rd Sidewalk Construction
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 3,480 ft	Civil/Drainage/Edging Costs	\$1,186,210.00
# Segments: 1		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 0	Traffic/Signal Costs	\$10,340.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$114,980.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$1,311,530.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$91,807.10
	20%      CONTINGENCY	\$262,306.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$1,665,643.10</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$1,818,920.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$50,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$209,840.00
	<b>PROJECT TOTAL</b>	<b>\$2,078,760.00</b>

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# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	Pleasant St/North St
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 100 ft	Civil/Drainage/Edging Costs	\$42,840.00
# Segments: 2		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 0	Traffic/Signal Costs	\$3,100.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$1,500.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$47,440.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$3,320.80
	20%      CONTINGENCY	\$9,488.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$60,248.80</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$65,790.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$5,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$9,190.00
	<b>PROJECT TOTAL</b>	<b>\$79,980.00</b>

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# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	West Street/Robbins Road - Pedestrian Crossing and Sidewalk Construction
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 265 ft	Civil/Drainage/Edging Costs	\$139,530.00
# Segments: 1		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 1	Traffic/Signal Costs	\$25,590.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$2,100.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$167,220.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$11,705.40
	20%      CONTINGENCY	\$33,444.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$212,369.40</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$231,910.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$5,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$33,440.00
	<b>PROJECT TOTAL</b>	<b>\$270,350.00</b>

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# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	West Street/School Road/Towne Street - School Zone Pedestrian Crossing
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 1,050 ft	Civil/Drainage/Edging Costs	\$351,130.00
# Segments: 2		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 1	Traffic/Signal Costs	\$27,870.00
# Intersections: 0		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$4,200.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$383,200.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$26,824.00
	20%      CONTINGENCY	\$76,640.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$486,664.00</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$531,450.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$7,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$76,640.00
	<b>PROJECT TOTAL</b>	<b>\$615,090.00</b>

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# State Aid Reimbursable Program Estimating Tool (SARPET)

## PROJECT COST SUMMARY

<b>Project Name:</b>	West Street Commercial Corridor Safety Improvements
<b>Project Location:</b>	Ware

PRIMARY INPUT CATEGORY	CALC TABS	ESTIMATED PRICE
<u>Roadway &amp; Multimodal</u> Length: 2,490 ft	Civil/Drainage/Edging Costs	\$1,321,640.00
# Segments: 1		
<u>Pavement</u>	Pavement Repair Costs	\$0.00
<u>Traffic Control</u> # midblocks: 1	Traffic/Signal Costs	\$82,830.00
# Intersections: 1		
<u>Lighting &amp; Amenities</u>	Ped/Roadway Lighting/Amenities Costs	\$57,490.00
<u>Other</u>	Miscellaneous User-Inputted Costs	\$0.00
	<b>SUBTOTAL</b>	<b>\$1,461,960.00</b>
<b>CONSTRUCTION COST</b>		
<u>Temporary Traffic Control</u>	7%      TTCP COST	\$102,337.20
	20%      CONTINGENCY	\$292,392.00
	<b>CONSTRUCTION COST (WITHOUT ESCALATION)</b>	<b>\$1,856,689.20</b> **
<u>Cost Escalation</u>	Construction Year: 2026	
	Assumed Inflation: 4.5%	
	<b>CONSTRUCTION TOTAL</b>	<b>\$2,027,550.00</b>
<i>Assumed 4.5% increase in costs per year; assumes current year if none entered on Basic Project Data</i>		
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>		
<b>NON-CONSTRUCTION COSTS (NOT ESCALATED)</b>		
<u>Survey</u> Full Topographical Survey Assumed	SURVEY COST	\$60,000.00
<u>Design</u> Estimated design fee based on construction cost	DESIGN COST	\$300,000.00
	<b>PROJECT TOTAL</b>	<b>\$2,387,550.00</b>

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