



4 Strategies, Action Items, and Project Selection

The CORPO Safety Action Plan was developed based on data and relevant best practices and guided by the community needs and goals identified through stakeholder and public input. The strategies and action items identified in this chapter were developed with stakeholder input with the primary purpose of reducing fatalities and serious injuries on the region's roadways. They are meant to be implemented through collaboration amongst CORPO area communities and partners. Additionally, this chapter provides insight into using this Plan as a framework for developing projects that align with the strategies and action items and move toward creating a safer transportation system for all road users.

4.1 Strategies and Action Items

The six strategies guiding the Safety Action Plan were developed to align with the elements of the Safe System Approach, and are a result of the data analysis, stakeholder guidance, and public input that informed the development of the Safety Action Plan. Each strategy includes corresponding action items that represent steps toward implementing each strategy. The action items are listed in this section with the corresponding strategies. *Technical Memo A: Action Plan* is a consolidated summary of the strategies and action items and includes progress measures, timeframes, as well as lead agencies and partners identified to carry out each action item.

1 – SAFE ROADS

Create a transportation system that encourages safe behavior, accommodates human mistakes, reduces the severity of crashes, and facilitates safe travel for all road users.

Roadways in Central Ohio outside of the metropolitan areas pose unique challenges because of features such as narrow lanes, minimal shoulders, sharp curves, lack of dedicated facilities for walking and bicycling, and intersections with challenging geometries. These factors all contribute as risk factors in crashes and crash severity. Improving roadway design in these areas can help to mitigate those risks, but also mitigate road user behavior that also contributes to crashes and crash severity such as aggressive driving or speeding.

Narrow roadways, challenging geometries or terrain, uncontrolled intersections, and lack of multimodal facilities were roadway design challenges identified by stakeholders in almost every CORPO county. During the public input survey, over 75% of survey respondents listed improving the design of roadways and intersections as one of their top three strategies to improve roadway safety. Additionally, around 50% of survey respondents indicated that building more infrastructure for walking and cycling is one of their top three priorities to improve safety.

Several ways to improve roadway safety relate to the implementation of [proven safety countermeasures](#), which are data-driven solutions, known to reduce crashes and mitigate fatal and serious injury. Many of these countermeasures are low-cost and easy to fit within existing budgets, offering the potential for quick, but significant improvements to safety

SAFE ROADS ACTION ITEMS

Action Items pertaining to the Safe Roads strategy focus on improving roadway facilities by identifying opportunities to implement proven safety countermeasures, filling critical gaps in multimodal infrastructure, and identifying locations where infrastructure improvements or additions can contribute to an overall safer transportation system. The action items related to the Safe Roads strategy go hand-in-hand with the implementation of roadway infrastructure projects, so this chapter also includes a guide to project selection, planning and development, and prioritization to create roadways that are safer for all users.

ID	Action Item
1-1	Conduct Road Safety Audits (RSA) at priority safety locations to identify proven safety countermeasures for implementation.
1-2	Identify CORPO Transportation Plan projects that overlap with priority safety locations and explore opportunities to incorporate proven safety countermeasures into project design/development.
1-3	Identify critical gaps in the existing pedestrian and bicycle infrastructure networks, including the regional trail network, and prioritize implementation of those connections.
1-4	Utilize the ORDC Rail Crossing Community Impact Index and priority safety locations to prioritize at-grade rail crossings in need of safety improvements and pursue opportunities to eliminate or improve those crossings.
1-5	Identify opportunities to incorporate proven safety countermeasures into standard roadway maintenance procedures.
1-6	Implement low-cost, quick-build safety improvements at strategic priority safety locations to pilot solutions for permanent construction.
1-7	Pursue funding opportunities to implement safety projects at priority safety locations.
1-8	Identify corridors that have frequent slow-moving vehicles and determine if/where safety improvements might be needed to accommodate those vehicles.

2 - SAFE VEHICLES

Explore opportunities for education, research, and deployment of vehicle systems, features, and other technologies that help to prevent and mitigate the severity of crashes.

FWHA defines “safe vehicles” as vehicles that are designed and regulated to minimize the occurrence and severity of collisions using safety measures that incorporate the latest technology¹. The advancement of vehicle design and manufacturing over the past few decades has incorporated improved safety features and technologies such as seat belts, airbags, antilock brakes, and systems or modules such as back-up cameras, lane assist technology, blind-spot alerts, and semiautonomous elements. In the public survey conducted, over 64% of survey respondents indicated that the primary vehicle they drive has active safety features.

Rural areas, such as those throughout the CORPO region, however, tend to have more unpaved roads, fewer or less visible pavement markings, and less communications or broadband infrastructure, which can all affect the operability of vehicle safety systems and features. Over 55% of the public survey respondents identified ‘poor roadway maintenance’ in their top-five roadway safety concerns and many open-ended responses cited needs for lane line improvements, concerns about gravel roads and potholes, and the need for measures such as rumble strips or reflectors, underscoring the prevalence of roadway condition concerns in rural areas. Regular vehicle maintenance, including maintaining quality tires, can be an important safety measure in rural areas where roadway conditions are a concern. Over 90% of respondents indicated that the primary vehicle they drive is regularly maintained or serviced, which is a positive indicator of a habit that should be sustained and encouraged.

In addition to emerging in-vehicle safety features, ITS technologies are being developed to improve vehicle safety. Some of these emerging ITS technologies include vehicle to vehicle (V2V) and vehicle to everything (V2X) information sharing. The National Highway Traffic Safety Administration (NHTSA) describes V2V as a crash avoidance technology that relies on communication of information between nearby vehicles to potentially warn drivers about dangerous situations that could lead to a crash². V2X takes this a step further and includes vehicles sharing information from their sensors, cameras, and internal instruments with other nearby vehicles, nearby pedestrians, road infrastructure, and other smart systems using wireless data connectivity. Within the CORPO region, these systems and other vehicle safety systems are already being tested on major travel corridors such as US-33, referred to as the 33 Smart Mobility Corridor³.

¹ FHWA Office of Safety, The Safe System Approach, https://safety.fhwa.dot.gov/zerodeaths/docs/FHWA_SafeSystem_Brochure_V9_508_200717.pdf

² NHTSA, Vehicle to Vehicle Communication Technology, https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/v2v_fact_sheet_101414_v2a.pdf

³ The BETA District, The 33 Smart Mobility Corridor, <https://www.thebetadistrict.com/us-33-smart-mobility-corridor/>

SAFE VEHICLES ACTION ITEMS

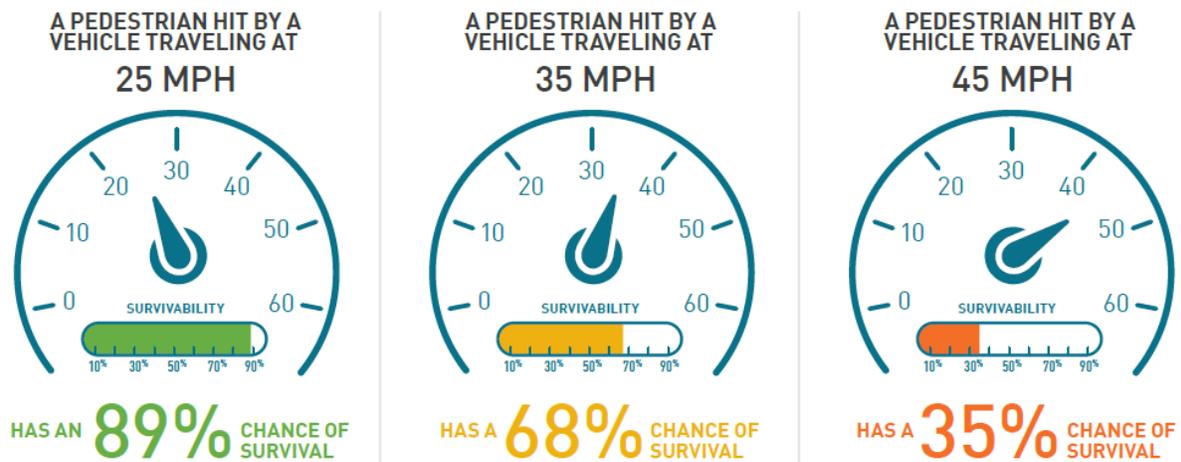
Action items related to the safe vehicles strategy center on improving ITS technologies, vehicle safety features and technologies, vehicle maintenance, and training on safe vehicle operations.

ID	Action Item
2-1	Explore opportunities to implement Intelligent Transportation System (ITS) technologies to improve vehicle safety.
2-2	Identify opportunities to improve the function of emerging vehicle safety features (e.g., lane departure warnings, etc.) through regular roadway maintenance practices (e.g., enhanced pavement markings, etc.).
2-3	Collaborate with partners to pilot emerging vehicle and safety technologies.
2-4	Provide regular training on safe operation of work vehicles to all employees using agency/organizational fleet vehicles.
2-5	Explore opportunities to update fleet vehicles with the latest safety technologies.
2-6	Explore opportunities to provide and/or promote regular vehicle maintenance to ensure that vehicles on our roadways are operating safely.

3- SAFE SPEEDS

Promote safe speeds on all streets through targeted and context-sensitive infrastructure and policy changes.

Speed plays a significant role in crash risk, largely due to the impacts on a driver's field of vision and the associated time required to stop before striking another vehicle, object, or human in their path. Additionally, speed has an exponential impact on the level of severity of a crash when one does occur. The correlation between speed and crash severity is especially significant in crashes involving vulnerable road users, such as pedestrians and bicyclists. This concept is illustrated by the image in Figure 4.1 below.



Tefft, B. C. *Impact speed and a pedestrian's risk of severe injury or death.* *Accident Analysis & Prevention* 50 (2013) 871-878.

FIGURE 4.1 – IMPACT OF SPEED ON CRASH SURVIVABILITY FOR PEDESTRIANS⁴

Between 2018 and 2022, nearly 60% of all fatal and serious injury crashes in the CORPO region occurred on roadways with posted speed limits of 55 MPH. At those speeds, it is highly unlikely that a person struck by a vehicle while walking or bicycling will walk away from the crash without serious injury. In the public survey that was conducted, over 80% of survey respondents agreed that aggressive driving or excessive speeding has increased in recent years and aggressive driving was the most common top-five safety concern among respondents. Over 40% of respondents ranked reducing the speeds people travel on roadways in their top three strategies for improving roadway safety.

⁴ *Walk.Bike.Ohio, Existing Conditions Summary Report, 2020, ODOT*
www.transportation.ohio.gov/programs/walkbikeohio/existing-future-conditions-analysis/wbo-draft-summary-existing-conditions

SAFE SPEEDS ACTION ITEMS

Action items targeting safe speeds focus on reviewing posted speeds and improving processes that set speed limits.

ID	Action Item
3-1	Collaborate with ODOT on potential improvements to the Speed Zone Study process that emphasize identified safety priorities.
3-2	Assess speeds in strategic priority safety locations to review posted speed limits and implement safety projects that encourage safe and appropriate travel speeds.
3-3	Identify opportunities to address safety conflicts along high-speed roadways that transition into community centers or residential districts.
3-4	Identify opportunities to incorporate speed management strategies and self-enforcing roadway design into project development.

4- SAFE ROAD USERS

Encourage safe and responsible behavior for all road users through roadway design, education, and enforcement that prioritizes safety.

Roadway owners must consider the safety of all road users -- who vary in age, experience, physical abilities, etc. -- and all modes of transportation, including freight, transit, motorcycles, pedestrians, bicyclists, slow-moving vehicles, and more. For example, between 2018 and 2022, people over the age of 65 experienced the highest number of serious injuries and fatalities resulting from crashes in the CORPO region, and people ages 21-25, likely less experienced road users, accounted for the second highest number. Additionally, nearly 70% of all crash fatalities during the same period were male, and more than 60% were vehicle occupants not using a proper restraint or seat belt.

In the public survey conducted, more than 80% of respondents noted that they sensed an increase in aggressive and distracted driving in recent years. Nearly 60% of survey respondents listed aggressive driving as one of their top-five greatest safety concerns. Additionally, over 82% of survey respondents noted that they encounter slow-moving vehicles frequently on CORPO roadways, including farm equipment, horse and buggy, and other similar vehicles. Education, consideration for all road users, and designing for human mistakes and limitations need to be done in harmony for the region to reach zero fatalities and serious injuries.

SAFE ROAD USERS ACTION ITEMS

Action items that correspond to the Safe Road Users strategy focus on encouraging safe road user habits, and behaviors.

ID	Action Item
4-1	Develop locally tailored "Countermeasures that Work" guidebooks using the NHTSA online toolkit. Identify specific countermeasures for implementation locally based on identified safety priorities.
4-2	Collaborate with local law enforcement to conduct strategic, high-visibility enforcement events based on identified safety priorities at identified priority safety locations.
4-3	Collaborate with partners to increase access to programs and services that provide mobility options for community members who cannot or choose not to drive – particularly older adults.
4-4	Identify opportunities to conduct CarFit events more regularly at locations throughout the CORPO region. These events should emphasize older road user safety but provide safety education to and for everyone.
4-5	Prioritize and improve upon education and outreach efforts focused on the identified safety priorities and target audiences.

5- POST-CRASH CARE

Enhance the survivability of crashes by improving incident response systems as well as management practices that help to prevent secondary crashes.

Nationally, in 2020, 66% of drivers killed in rural areas died at the scene of the crash. Of all drivers who were transported to hospitals and died enroute, 57% were in rural areas⁵. In more rural areas, emergency responders, access to trauma centers, the time it takes for volunteer and other responders to reach a scene, as well as communications infrastructure alerting responders or in use by responders can all be factors that influence the survivability of a crash. Additionally, rural road conditions such as narrow shoulders or limited sight lines can be a challenge for on-scene responders, decreasing the safety of responders and increasing the likelihood of secondary incidents or crashes.

POST-CRASH CARE ACTION ITEMS

Action items implementing the post-crash care strategy focus on best practices for incident response and management, as well as exploring opportunities for incorporating emerging technology to improve emergency response.

ID	Action Item
5-1	Promote and raise awareness of “Move Over” law and safe driving tips regarding behavior around crashes.
5-2	Evaluate current procedures for traffic incident management and any needs or potential for improvement.
5-3	Leverage transportation rights-of-way in expanding broadband and communications networks to improve response and emergency communications as well as deployment of ITS technologies.
5-4	Implement or enhance traffic signal pre-emption at key locations and ensure relevant emergency vehicles are equipped with appropriate technology to utilize these features.

⁵ TR News, Number 347 (September-December 2023): Transportation in Rural America
Through a Rural Lens, Applying the Safe System Approach

6- SAFE SYSTEM

Collaborate across the Safe System Approach elements to identify and implement solutions that will reduce fatalities and serious injuries throughout Central Ohio.

The Safe System Approach emphasizes a holistic approach to addressing fatalities and serious injuries, sharing responsibility across the system designers, stewards, and users. To achieve the ultimate goal of zero fatal and serious injury crashes across the CORPO region, it will be critical to continue to identify opportunities to collaborate across the safe system elements with partners throughout the CORPO region.

SAFE SYSTEM ACTION ITEMS

Action items related to safe systems encourage establishing commitments to reducing fatalities and serious injuries across the CORPO region, improving data collection, identifying and improving opportunities for collaboration with partners, and pursuing opportunities to support partners in carrying out the regional safety goal and reaching targets.

ID	Action Item
6-1	Establish commitments to reach the goal of zero fatalities and serious injuries in local CORPO jurisdictions.
6-2	Incorporate targets from the Safety Action Plan to reduce fatalities and serious injuries into the CORPO Transportation Plan to emphasize that safety is a regional priority.
6-3	Collect new data and improve existing data needed to conduct relevant safety analyses throughout the CORPO planning area.
6-4	Collaborate with partners to identify new opportunities for implementing innovative approaches to mitigating severe crashes.
6-5	Host and share opportunities for partners to engage in relevant trainings, education, etc. to develop regional knowledge of the Safe System Approach and related resources.
6-6	Build upon existing partnerships for regular post-crash reviews to integrate the Safe System Approach and expand the recommendations for action.
6-7	Pursue opportunities for training and supporting local police forces to improve crash reporting processes and data accuracy.
6-8	Review local transportation plans, comprehensive plans, land use plans, zoning codes, as well as local policies and procedures, etc. for opportunities to incorporate best practices related to roadway design and transportation safety planning.

4.2 Project Identification and Prioritization

CORPO, regional partners, and local agencies can use the following process, guided by the Safe System principles, to identify and prioritize safety improvements through the CORPO Transportation Plan, the Transportation Improvement Program, local active transportation plans, Safe Routes to School Plans, safety plans, and other efforts to develop and implement transportation projects throughout the region. Following is an overview of a recommended process on how to use the Safety Action Plan resources to identify and prioritize safety improvement projects or initiatives. This generally includes reviewing the identified priority safety locations, establishing a “project” study area, conducting safety audits or studies as necessary, funding and implementing the project, and then evaluating the results.

Review Priority Safety Locations

The first step in the project identification process should be to review the interactive web map discussed in *Chapter 3. Regional Safety Priorities*. This web map contains key data related to transportation safety, including the CORPO High Injury Networks and ODOT Priority Corridors that comprise the CORPO Priority Safety Locations. A viewer can zoom into the map to find their community and review the data specific to that area. The individual data layers can be toggled on and off as needed from the sidebar on the left side of the page, and individual data points can be selected within the map to view more information.

As an example, zooming into the City of Marion within Marion County, we see the image included in Figure 4.2. We can see that there appears to be a high number of fatal and serious injury crashes involving non-motorized users throughout the city. If we turn on only the layers associated with those crash types, we can start to identify potential locations to prioritize for safety improvements. This includes the following data layers, as illustrated by the screenshot in Figure 4.3: Schools, Severe Non-Motorized Crashes, CORPO Pedestrian High Injury Network (HIN), CORPO Bicyclist High Injury Network (HIN), and ODOT Highway Safety Improvement Program (HSIP) Pedestrian Safety Priority Corridors.

From there, we can begin to identify specific corridors in need of improvements for non-motorized users. For example, we can see that there were three severe non-motorized crashes within the extents of Main Street (SR-423) between Columbia Street and Copeland Avenue. Two of those crashes involved pedestrians, and one involved a bicyclist. Much of this corridor is identified on either the Pedestrian HIN or the Bicyclist HIN as a score of three or higher, indicating a high frequency and severity of these crash types. Additionally, the entirety of this corridor is identified on the ODOT HSIP Pedestrian Safety Priority Corridors as “High” or “Critical” priority. This indicates that pedestrian and bicyclist safety is a significant challenge and priority for improvement along this corridor.

At this point, a few key questions should be asked to understand if and how this corridor should be addressed:

- Have these issues already been addressed through a recent project?
- If not, are their current projects or initiatives underway in this area? Or are there any projects or initiatives currently planned in this area?

If the answer to these questions is “No,” then the next step should be followed to identify a potential “project” study area and scope of work.

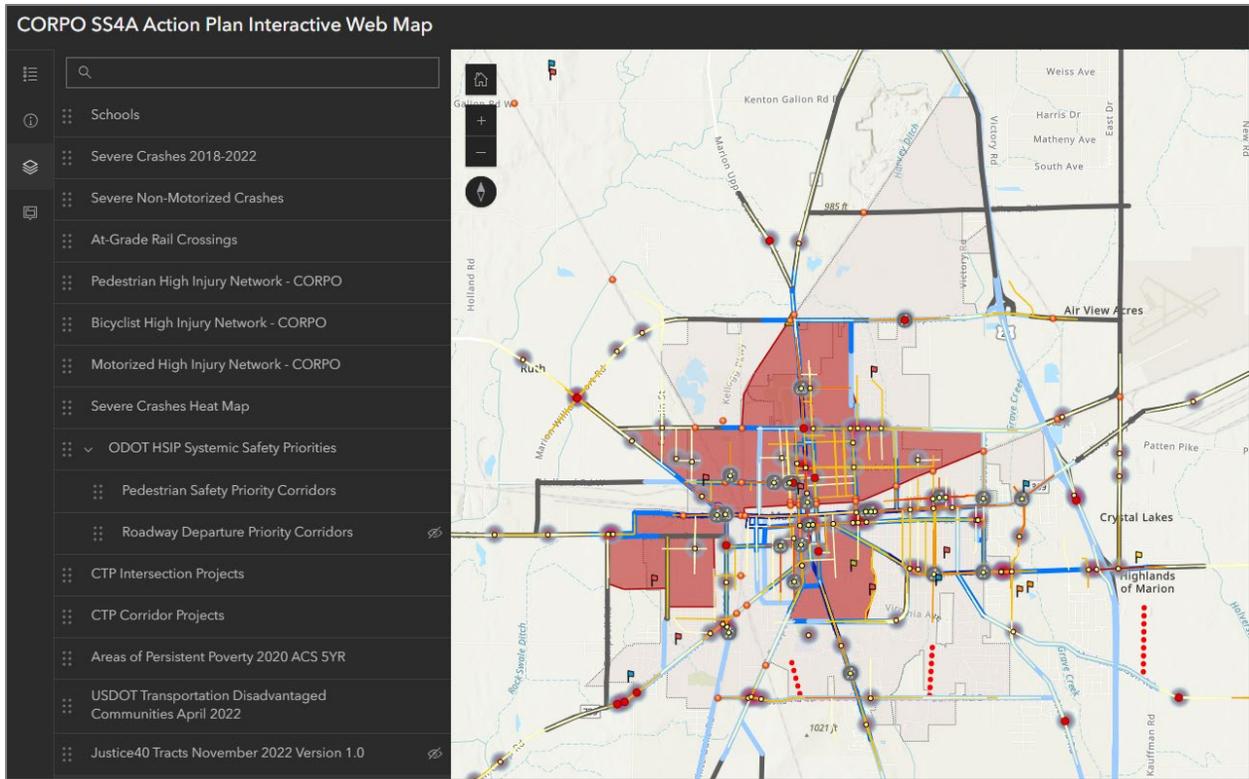


FIGURE 4.2 - SCREENSHOT OF WEB MAP HIGHLIGHTING DATA FOR CITY OF MARION

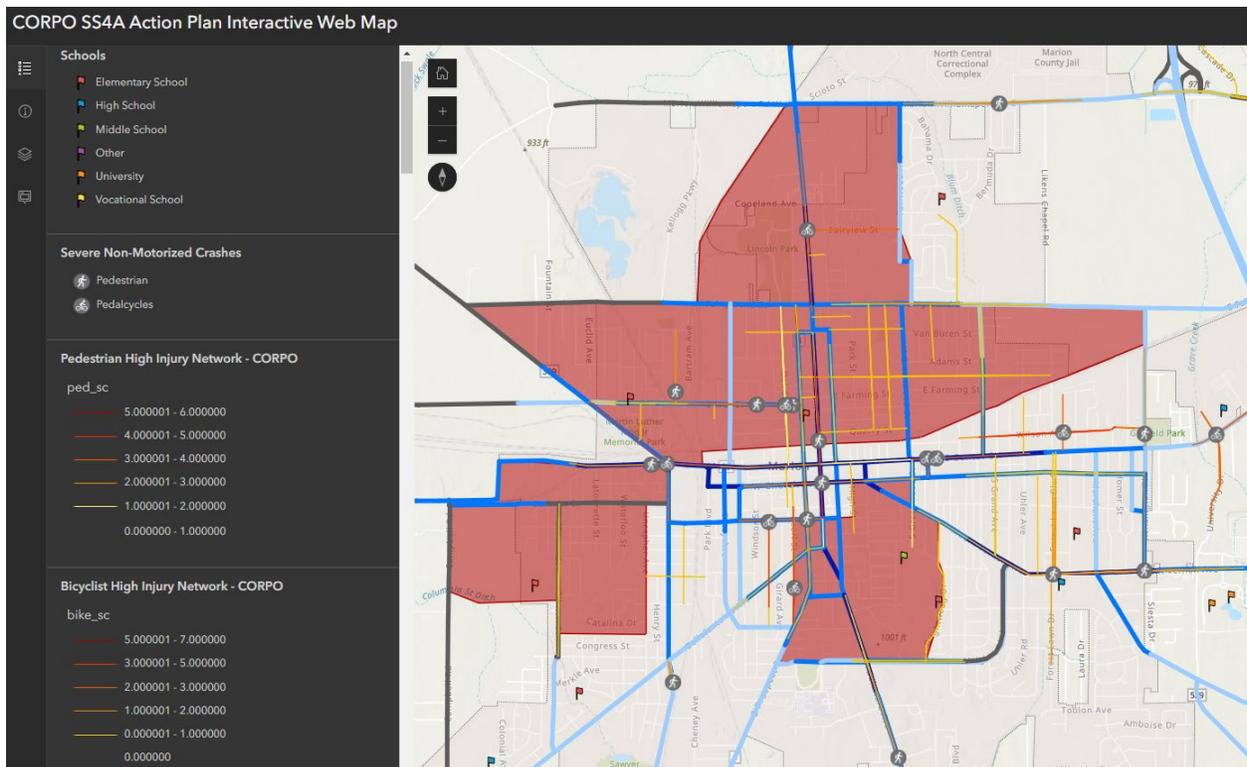


FIGURE 4.3 - SCREENSHOT OF WEB MAP HIGHLIGHTING NON-MOTORIZED DATA IN MARION

Identify “Project” Study Area

Following the first step to identify a priority location for further study, the next step toward implementation is to identify the project study area and scope of work. There are two potential approaches to identifying the project study area and scope of work: a **site-specific approach** or a **systemic approach**.

- **Site-specific approach:** A site-specific approach reactively identifies a project location based on historical safety performance or crash history. Using the site-specific approach identifies and addresses priority safety locations as individual intersections or roadway/corridor segments.
- **Systemic approach:** A systemic approach more proactively identifies sites based on risks, rather than entirely on crash history. Using the systemic approach focuses on crash types and identifying common factors that contribute to crash types across the network. This approach typically involves multiple sites per project.

Continuing with our example from the City of Marion, we know from viewing the data in the web map that these severe non-motorized crashes have occurred throughout the roadway network in Marion, and the priority safety locations data indicates that many corridors and locations throughout the city are a high priority to address safety for non-motorized users. This means that either approach could be taken in this case. A site-specific approach could be used to address the Main Street corridor specifically, or a systemic approach could be used to identify smaller scale and lower cost proven safety countermeasures at strategic locations throughout the city. For this example, we will follow the site-specific approach to address the Main Street corridor specifically. The systemic approach would require a network screening to identify locations on the identified priority corridors that are in need of the same low-cost countermeasures citywide.

As noted previously, much of the Main Street (SR-423/SR-4) corridor between Columbia Street and Copeland Avenue is identified as a high priority on the various priority corridor data layers. As such, the potential study area for a project could include the entirety of this corridor, or smaller segments within these boundaries. The project study area could depend on jurisdictional boundaries, existing roadway configurations or contexts, community needs, equity considerations, local priorities, budget, other recent or planned projects, etc.

For the purpose of this example, a few criteria could inform the study area for the Main Street corridor. Several census tracts within the City of Marion have been identified by the USDOT as Areas of Persistent Poverty. These neighborhoods could significantly benefit from this type of investment. The character and function of the Main Street corridor is relatively consistent between Copeland Avenue and Hill Street/Gurley Avenue. The Copeland Avenue intersection is the effective northern edge of the City of Marion jurisdiction along the Main Street corridor, and the roadway configuration and function change significantly to the north of that intersection. The configuration and function also change significantly to the south of the Hill Street/Gurley Avenue intersection, as the Main Street corridor splits into two separate corridors: a more local residential Main Street and a continuation of SR-423 as Delaware Avenue.

Conduct Safety Audits or Studies

The next step in the process is to conduct some manner of Data-Driven Safety Analysis (DDSA) for the identified study area to further assess the existing safety problems and identify appropriate countermeasures. This could include the following, depending on the scope and scale of the project:

- Full Safety Study
- Pedestrian and Bicyclist RSA
- Road Safety Audit (RSA)
- Walk Audit

A full safety study should follow the guidelines and requirements established by ODOT in the [Safety Analysis Guidelines](#). ODOT currently offers application-based technical assistance services from on-call consultants to conduct safety studies in collaboration with local agencies. This could be one approach to conducting further study in the identified study area. Local engineering staff could also conduct their own safety study or road safety audit if the local agency has the resources and expertise to do so. A formal road safety audit should follow the [FHWA Road Safety Audit Guidelines](#) and/or the [Pedestrian and Bicyclist Road Safety Audit Guide and Prompt List](#). Additional information about road safety audits can be found on the FHWA website. A walk audit is a much less in-depth version of a road safety audit that could be used for smaller projects or as a method of community engagement in the project. Many different resources are available for conducting walk audits.

The purpose of conducting these detailed studies is to identify the specific safety challenges within the identified study area and then recommend potential improvements to address those challenges. The process of conducting these studies should ideally engage stakeholders and partners across the spectrum of safe system elements in order to identify recommendations from a variety of perspectives to address the safety challenges more holistically. At a minimum, these studies should result in recommendations for implementation of [Proven Safety Countermeasures](#) that specifically address the identified safety challenges. The FHWA has identified 28 Proven Safety Countermeasures (PSCs) to reduce fatal and serious injury crashes that are applicable to a range of contexts and roadway types. A specific guide from FHWA is available on specific PSCs for use in rural areas, [Proven Safety Countermeasures In Rural Communities](#), which includes additional considerations, crash reduction effectiveness, as well as case studies and other resources.

Fund and Implement Project

Once the specific safety challenges (e.g. crash patterns, contributing factors, risk factors, etc.) have been identified and recommendations have been established for mitigating those challenges, the relevant agency (and relevant partners) should work to prioritize implementation of those recommendations. For our Main Street example, the City of Marion would be the agency responsible for infrastructure improvements along the corridor and would have to prioritize the recommended improvements within their Capital Improvement Program (CIP). This could be based on any number of factors, primarily including available budget for these types of infrastructure investments, the total cost of the recommended improvements, other planned projects, and the priority level of this project in comparison to those other projects.

Additionally, the City of Marion could apply for funding assistance through various grant programs available for this type of infrastructure project. Potential sources for this type of funding are identified in *Chapter 5. Implementation and Monitoring*. Because Main Street is identified as a priority on the CORPO High Injury Networks as well as the ODOT HSIP Priority Corridors, safety improvements on Main Street would be considered eligible for and likely receive a higher score for safety funding through HSIP. The City would also want to submit the project(s) for inclusion in the CORPO Transportation Plan (CTP), which would make it eligible for CORPO Dedicated Funds.

Evaluate Results

The final step in the process should be completed in tandem with project implementation. Before any improvements are implemented, sufficient data should be collected regarding the current conditions of the study area. This could include, but is not limited to:

- Traffic Volumes
- Non-Motorized User Volumes
- Total Crashes (and related performance measures)
- Vehicle Speeds
- Traffic Citations
- Near-Miss Events (if available)

Collecting this data can help local agencies and partners understand the benefits of specific safety countermeasures and inform future decision-making for similar infrastructure investments. Additionally, if the evaluation indicates that the implemented improvements are not functioning as intended, then there is opportunity to remedy the situation.