McHenry County Safety Action Plan: Implementation Guidelines

Introduction

Safe Travel for All is a regionwide initiative to eliminate traffic fatalities and serious injuries in northeastern Illinois. The Chicago Metropolitan Agency for Planning (CMAP), the Illinois Department of Transportation, and six counties in northeastern Illinois (Cook, DuPage, Kane, Lake, McHenry, and Will) were awarded nearly $4 million from the federal Safe Streets and Roads for All grant to develop countywide safety actions plans based on a regional traffic safety framework for northeastern Illinois.

The countywide safety action plans have been adopted by CMAP's Metropolitan Planning Organization Policy Committee and counties are now moving into implementing traffic safety recommendations. The plans are roadmaps for improving traffic safety by reducing the risk of death and serious injury on roadways throughout the region, particularly for people walking and biking, and for communities with disproportionately excessive crash rates.

This document serves as an addendum to the McHenry County Safety Action Plan, to describe implementation guidelines for the identified priority projects.

Priority Projects Overview

Five intersections were identified as priority projects in the McHenry County Safety Action Plan resulting from a combination of stakeholder and community input, crash data, safety impact, feasibility, and multimodality.

The priority intersections include:

- Illinois Route 31 and Crystal Lake Avenue
- Illinois Route 31 and Three Oaks Road
- James R. Rakow Road and McHenry Avenue
- U.S. Route 14 and Teckler Boulevard
- U.S. Route 14 and West Main Street

Safety and operational improvements to address the five priority intersections are outlined below.

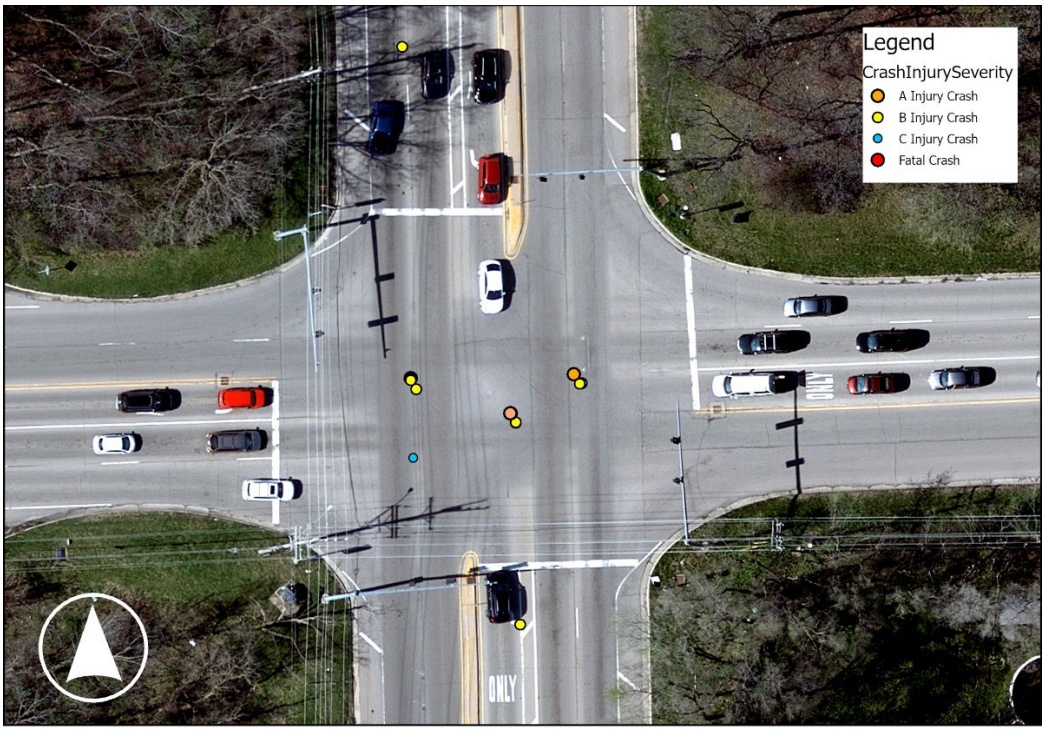
Illinois Route 31 and Crystal Lake Avenue

Total Crashes (A-Injury crashes)	106 (6)
Total Pedestrian Crashes (Pedestrian A-Injury)	0 (0)
Total Bicycle Crashes (Bicycle A-Injury)	0 (0)
Top Crash Type	Turning (49.1%)
2nd Most Common Crash Type	Front to Rear (32.1%)
3rd Most Common Crash Type	Sideswipe Same Direction (6.6%)
Top Cause of Crashes	Failing to Yield Right of Way (39.6%)
2nd Most Common Crash Cause	Failing to Reduce Speed to Avoid Crash (25.5%)
3rd Most Common Crash Cause	Disregarding Traffic Signals (8.5%)

Data source: IDOT crash data, 2018-2024. There were no fatal crashes at this intersection during this time.

This intersection is located in Nunda Township. Illinois Route 31 is under IDOT's jurisdiction, while Crystal Lake Avenue is under Nunda Township's jurisdiction.

This is a high-crash intersection that received community support for safety improvements. Turning and Front to Rear make up 81% of the crashes indicating speeding may be prevalent.



Short-term improvements:

- No right turn on red
- Left turn on arrow only signs
- Lagging green left turn arrow
- Trailer mounted Speed Feedback Signs
- Reduce turning radii with temporary paint and posts

Long-term improvements:

- Permanent Dynamic Speed Feedback Signs
- Road diet (E/W – reduce through lanes to one lane per direction). ADT is 10,000, which is below the 20,000 threshold used by FHWA for road diets.
- Reduce turning radii
- Automated speed enforcement
- Full intersection lighting
- Dedicated right turn lanes
- Evaluate the costs and benefits of a restricted left turn intersection with median U-Turns
- High-friction surface treatment
- Evaluate crashes and benefits of eliminating David Lane access to IL 31

- Conduct speed study to determine if the current 40mph speed limit is the most appropriate.
- Adjust signal timing on IL 31 to set up a green wave for speed compliance
- Pedestrian and bicycle accommodations (to be installed after facilities on any leg is installed)
    - High-visibility crosswalks
    - ADA curb ramps
    - Leading pedestrian interval
    - Pedestrian signals
    - Sidepath
    - Pedestrian refuge islands (N/S)

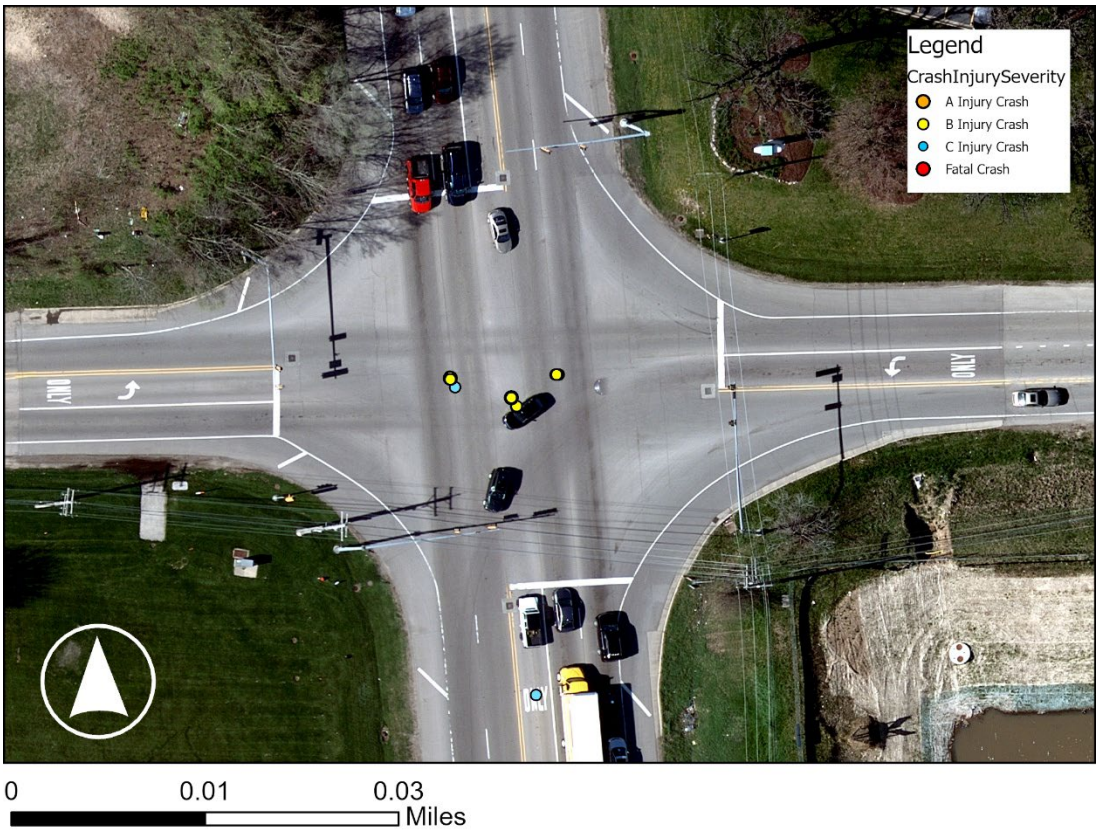
Illinois Route 31 and Three Oaks Road

Total Crashes (A-Injury crashes)	125 (5)
Total Pedestrian Crashes (Pedestrian A-Injury)	1 (1)
Total Bicycle Crashes (Bicycle A-Injury)	1 (1)
Top Crash Type	Front to Rear (40.8%)
2nd Most Common Crash Type	Turning (37.6%)
3rd Most Common Crash Type	Sideswipe Same Direction (4.8%)
Top Cause of Crashes	Failing to Reduce Speed to Avoid Crash (44.8%)
2nd Most Common Crash Cause	Failing to Yield Right of Way (25.6%)
3rd Most Common Crash Cause	Disregarding Traffic Signals (6.4%)

Data source: IDOT crash data, 2018-2024. There were no fatal crashes at this intersection during this time.

This intersection is located in Crystal Lake. Illinois Route 31 is under IDOT's jurisdiction, while Three Oaks Road is under the City of Crystal Lake's jurisdiction.

This is a high-crash intersection that received community support for safety improvements. Turning and Front to Rear make up 78% of the crashes indicating speeding may be prevalent.



Short-term improvements:

- No right turn on red
- Modify to protected-only left turns
- Trailer mounted speed feedback sign
- Reduce turning radii with temporary paint and posts

Long-term improvements:

- Permanent Dynamic Speed Feedback Signs
- Dual left turn lane (E/W)
- Reduce turning radii
- Right in/right out at nearby businesses
- Consolidate driveways
- Automated speed enforcement
- Full intersection lighting

- Dedicated right turn lanes
- Evaluate the costs and benefits of a restricted left turn intersection with median U-Turns
- Evaluate the costs and benefits of a multilane roundabout
- High-friction surface treatment
- Adjust signal timing on IL 31 to set up a green wave for speed compliance
- Pedestrian and bicycle accommodations (to be installed after facilities on any leg is installed)
    - High-visibility crosswalks (S)
    - ADA curb ramps (S)
    - Leading pedestrian interval (S)
    - Pedestrian signals (S)
    - Pedestrian refuge islands (N/S)
    - Move stop bars to be parallel with perpendicular shoulder

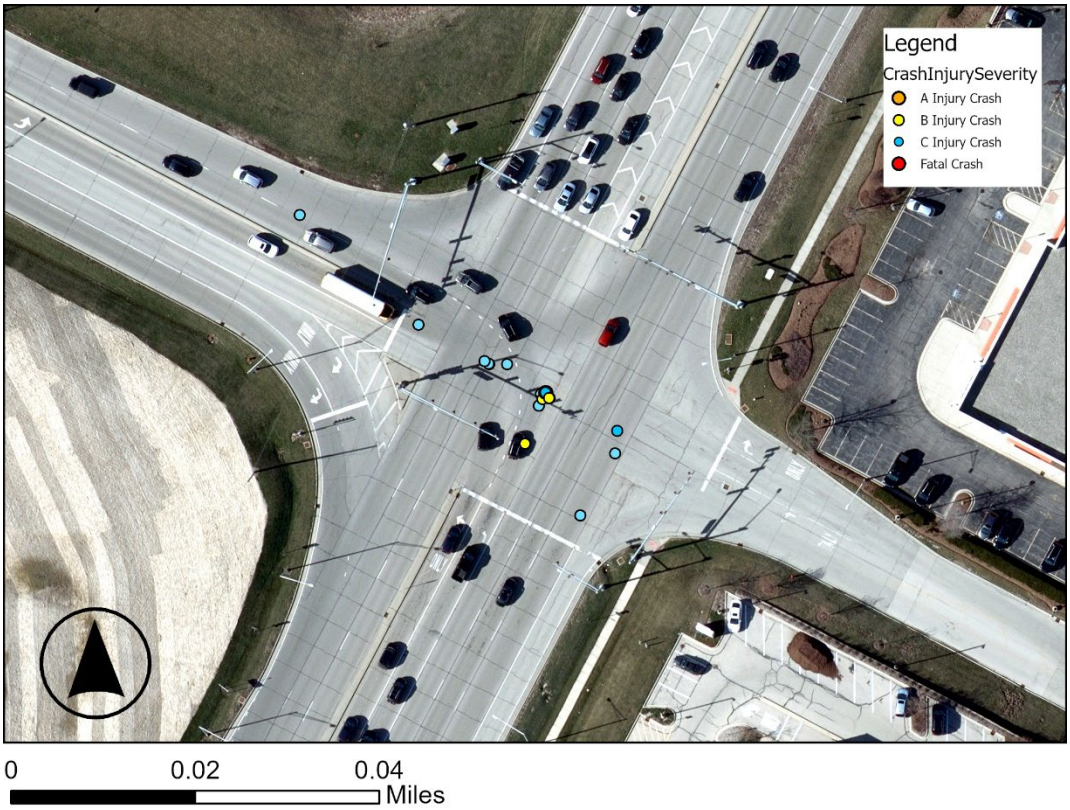
James R. Rakow Road and McHenry Avenue

Total Crashes (A-Injury crashes)	162 (2)
Total Pedestrian Crashes (Pedestrian A-Injury)	0 (0)
Total Bicycle Crashes (Bicycle A-Injury)	0 (0)
Top Crash Type	Front to Rear (38.3%)
2nd Most Common Crash Type	Turning (30.2%)
3rd Most Common Crash Type	Sideswipe Same Direction (8.0%)
Top Cause of Crashes	Failing to Reduce Speed to Avoid Crash (58.6%)
2nd Most Common Crash Cause	Disregarding Traffic Signals (6.2%)
3rd Most Common Crash Cause	Improper Lane Usage (6.2%)

Data source: IDOT crash data, 2018-2024. There were no fatal crashes at this intersection during this time.

This intersection is located in Crystal Lake. James R. Rakow Road is under MCDOT's jurisdiction, while McHenry Avenue is under the City of Crystal Lake's jurisdiction.

This is a high-crash intersection. Turning and Front to Rear make up 68% of the crashes indicating speeding may be prevalent. There is a lack of bicycle and pedestrian access across Randall Road, despite being located near a school (Crystal Lake South High School) and there being a bus stop on the northeast corner for Pace Route 550.



Short-term improvements:

- No right turn on red
- Lagging green left turn arrow on Rakow Road
- Trailer mounted speed feedback sign
- Reduce turning radii with temporary paint and posts

Long-term improvements:

- Permanent Dynamic Speed Feedback Signs
- Reduce turning radii
- Conduct speed study to determine if the current 50mph speed limit is the most appropriate.
- Automated speed enforcement
- High-friction surface treatment

- Adjust signal timing on Randall Road and Rakow Road to set up a green wave for speed compliance
- Pedestrian and bicycle accommodations (to be installed after facilities on any leg is installed)
    - High-visibility crosswalks (S)
    - ADA curb ramps (S)
    - Leading pedestrian interval (S)
    - Pedestrian signals (S)
    - Pedestrian refuge islands (S)

U.S. Route 14 and Teckler Boulevard

Total Crashes (A-Injury crashes)	22 (2)
Total Pedestrian Crashes (Pedestrian A-Injury)	1 (1)
Total Bicycle Crashes (Bicycle A-Injury)	1 (0)
Top Crash Type	Turning (40.9%)
2nd Most Common Crash Type	Front to Rear (27.3%)
3rd Most Common Crash Type	Angle (9.1%); Sideswipe from Same Direction (9.1%)
Top Cause of Crashes	Failing to Reduce Speed to Avoid Crash (27.3%)
2nd Most Common Crash Cause	Failing to Yield Right of Way (27.3%)
3rd Most Common Crash Cause	Disregarding Traffic Signals (13.6%)

Data source: IDOT crash data, 2018-2024. There were no fatal crashes at this intersection during this time.

This intersection is located in Crystal Lake. U.S. Route 14 is under IDOT's jurisdiction, while Teckler Boulevard is under the City of Crystal Lake's jurisdiction.

Turning and Front to Rear make up 68% of the crashes indicating speeding may be prevalent. Both A-injury crashes were a pedestrian and a bicyclist. Pace Bus Route 550 is a pedestrian generator. In anticipation of the connection of Teckler Boulevard and Congress Parkway across the Union Pacific railroad, Teckler Boulevard could potentially see an increase in traffic.

Short-term improvements:

- No right turn on red
- Left turn hardening – extend median
- Left turn on arrow only signs
- Lagging green left turn arrow
- Trailer mounted speed feedback sign

Long-term improvements:

- Permanent Dynamic Speed Feedback Signs
- Automated speed enforcement
- High-friction surface treatment
- Adjust signal timing on US 14 to set up a green wave for speed compliance
- Add curb ramps and high-visibility crosswalks on south and west legs
- Leading pedestrian interval
- Right in/right out at driveway north of intersection
- Far side bus shelter and pad with sidewalk leading up to it
- Consolidate driveways

- Eliminate N/S right turn lanes to reduce pedestrian crossing distance
- Bump out NB/SB curbs
- Widen a sidewalk on one side of US 14 to create a shared use path

U.S. Route 14 and West Main Street

Total Crashes (A-Injury crashes)	118 (9)
Total Pedestrian Crashes (Pedestrian A-Injury)	1 (0)
Total Bicycle Crashes (Bicycle A-Injury)	1 (1)
Top Crash Type	Angle (19.7%)
2nd Most Common Crash Type	Front to Front (17.9%)
3rd Most Common Crash Type	Sideswipe Same Direction (14.5%)
Top Cause of Crashes	Disregarding Traffic Signals (50.8%)
2nd Most Common Crash Cause	Improper Lane Usage (18.6%)
3rd Most Common Crash Cause	Failing to Reduce Speed to Avoid Crash (12.7%)

Data source: IDOT crash data, 2018-2024. There were no fatal crashes at this intersection during this time.

This intersection is located in Cary. U.S. Route 14 is under IDOT's jurisdiction, while West Main Street is under the Village of Cary's jurisdiction.

This intersection sees a high number of crashes, as it is skewed in an unconventional manner where the predominant flow of traffic on U.S. Route 14 is through two slight "turn lanes" and a confusing "through" lane to Main Street that acts as a turn lane but looks like a through lane. This intersection also received the highest number of comments on the interactive map for the McHenry County Safety Action Plan.

Short-term improvements:

- Lane designation signs
- Trailer mounted speed feedback sign

Long-term improvements:

- Permanent Dynamic Speed Feedback Signs
- Automated speed enforcement
- High-friction surface treatment
- Adjust signal timing on US 14 to set up a green wave for speed compliance
- Re-paint crosswalks to be high-visibility crosswalks across slip lane and north leg
- Pedestrian gates at railroad tracks
- Pedestrian bridge across US 14 (E)
- Raised crosswalk on right turn slip lane onto Main Street
- Close through lane from westbound US 14 to westbound Main Street

Recommended Procedures

Recommendation #1*: Apply for the* Safe Streets and Roads for All (SS4A) *program.*

The Infrastructure Investment and Jobs Act (IIJA) established the SS4A competitive grant program with $5 billion in appropriated funds over 5 years. The program is currently funded through 2026 with the rest of the IIJA which will need to be extended or replaced in 2026.

The purpose of the Safe Streets and Roads for All (SS4A) program is to improve roadway safety for all users by reducing and eliminating serious injuries and fatalities.

1. *Eligible Applicants and Requirements*

Any local agency, including cities, villages, towns, counties, and special districts, is eligible to apply for SS4A funding. A foundational requirement for implementation funding is the existence of a comprehensive safety action plan. The McHenry County Safety Action Plan meets this eligibility requirement. In general, the requirements of the SS4A program are less stringent than the HSIP program, which requires a cost/benefit analysis.

2. *Grant Types*

The program offers two grant types, one for planning and demonstration, and one for implementation. Applicants may only apply for one type per funding cycle. Planning and demonstrations grants are designed to develop, update, or complete a safety action plan. They are also used for carrying out demonstration activities, such as pilot programs or tactical urbanism, to inform plan development. Implementation grants fund the execution of roadway safety strategies and projects identified in the McHenry County Safety Action Plan. These projects must be infrastructural, behavioral, or operational and directly address the safety problems identified in McHenry County.

3. *Construction and Supplemental Planning*

For implementation grants, projects must implement strategies or projects from the McHenry County Safety Action Plan. Projects need to be constructed within five years. Both the planning and demonstration and implementation grant types include provisions for supplemental safety planning and safety demonstration activities. These activities are encouraged to support or enhance the McHenry County Safety Action Plan. These supplemental activities can be utilized if a project cannot be completed within the five-year window.

***Recommendation #2**: Apply for Highway Safety Improvement Program (HSIP) funds.*

The Illinois Highway Safety Improvement Program (HSIP) intends to be consistent with the Federal Highway Administration's (FHWA) regulatory safety requirements, aiming to produce a measurable and significant reduction in crashes resulting in fatalities and serious injuries on Illinois' roadways. HSIP funds are intended for projects where a known solution exists outside normal design standards or funding policy and can produce a measurable and significant reduction in fatalities or serious injuries. Strategies should also incorporate improvements targeting vulnerable road users (VRUs). While priority is usually

given to projects that address a higher total number of fatalities and serious injuries, projects with low or no fatalities and serious injuries are still eligible for funding if they incorporate safety countermeasures that target specified features known to result in fatal and serious injury crashes.

1. Identifying Candidate Intersections

The process for identifying potential intersection projects relies heavily on data and specific initiatives provided by the Bureau of Safety Programs and Engineering (BSPE). IDOT classifies locations, including intersections, using Safety Tiers (High, Medium, or Low) based on crash data and potential for safety improvement. The Safety Tiers include Crash Characteristics Overrepresentation Flags (CCOF), which indicate if crash types, such as angle and turning crashes, are statistically overrepresented at a location. If an intersection is flagged for overrepresented angle and turning crashes, it implies a severe crash may occur if countermeasures are not implemented. Both districts and local agencies should use at least five years of historic crash data to identify crash patterns and trends. This data is compiled from the Crash Information System (CIS) and the Illinois Roadway Inventory System (IRIS).

2. Project Development and Analysis

Once a location is identified, the project must be developed with a focus on cost-effective, data-driven solutions. At the state level, each District is required to establish a District Safety Committee, which evaluates and screens guidance tools provided by the BSPE and documents their short-term and long-term recommendations. Districts must analyze candidate projects to determine the appropriateness and feasibility of an engineering solution and are encouraged to work with local and state law enforcement to get more context on a location. The focus must be on applying a full range of countermeasures proven effective in reducing crashes and targeting the location's fatal and severe injury crash contributing factors. Effective countermeasures can be found using FHWA's Proven Safety Countermeasures. All candidate projects must be evaluated for cost-effectiveness using the methodology in IDOT's Excel-based Benefit-to-Cost (B/C) Tool. This tool incorporates site-specific crash information, fatality/injury data, Crash Modification Factors (CMFs) for the proposed countermeasures, and the countermeasure's service life. Only studies rated 3 or higher on the CMF star rating are considered in the analysis. Both districts and local agencies can request a Road Safety Assessment (RSA) or Road Safety Review (RSR) from the BSPE for assistance in identifying appropriate countermeasures.

3. Submission Process

The procedures for submittal differ slightly between state and local agencies. Once the District Safety Committee selects a candidate project, they must complete the IDOT B/C Tool and submit a completed HSIP Application (BSPE-HS1). State HSIP projects may be submitted continually and are reviewed monthly. Local agencies submit projects annually through a solicitation coordinated by the Bureau of Local Roads and Streets (BLRS) and BSPE. They must submit the completed IDOT B/C spreadsheet and the required forms to their IDOT District Local Roads contact, who then submits it to the HSIP Site.

All submissions must include:

- The completed BSPE-HS1 form.
- A location map.
- A cost estimate of the work using HSIP funds.
- A B/C summary using the IDOT B/C tool.
- Additional documentation, such as pictures displaying crash contributing factors, crash data organized for specific analysis, and documentation supporting the selection of the CMF.

4. Review and Approval

The HSIP Committee, overseen by the BPSE, reviews and approves projects based on their potential impact on severe crashes. Approval is based on projects that propose improvements and countermeasures which specifically target the location's fatal and severe injury crashes. Projects with a B/C ratio greater than 1 are preferred, though not strictly required, especially for systemic projects that may lack substantial crash data. Projects may be denied if the suggested improvements do not properly address fatal and severe injury crashes, the improvements should be paid for by other funding sources (like operations or maintenance), or the chosen CMFs are not applicable to the location or crashes. If a district or local agency disagrees with a denial, they may request a meeting with the HSIP Committee for reconsideration.

***Recommendation #3**: For IDOT-owned locations, do research on the location and write a letter to IDOT with detailed information to increase the likelihood of action by IDOT. Research should follow procedures as outlined in HSIP and FHWA resources.*

Follow the format shown below for letters to IDOT when requesting further study:

1. Reference past conversations with IDOT about the intersection.

2. Provide background on past studies of the intersection that may have identified challenges with the location.
3. Provide community input that reflects challenges with the location. The more community input received improves chances of the project moving forward. Consider conducting a survey of the location or asking specific questions regarding the location in an ongoing plan or engagement effort.
4. Provide any unique qualities of your municipality that make this location a challenge, e.g., barrier for students or older adults.
5. Provide crash data that supports a need for improvement.
6. Summarize potential improvements - get ideas from McHenry County Safety Action Plan, IDOT HSIP, and FHWA sources.
7. Express your partnership in any future study.

Template for a Letter to IDOT, Request for Study

Dear [CONTACT],

Thank you for the opportunity to speak with you about the [LOCATION] during the recent [MEETING OR LAST TIME LOCATION WAS DISCUSSED]. This letter provides background on past studies, community input, and crash data. It outlines the [MUNICIPALITY]'s request for modifications to the roadway geometry [OR DESCRIBE CHALLENGE].

[MUNICIPALITY] has participated in [NUMBER] recent transportation studies—the McHenry County Safety Action Plan and [LIST ADDITIONAL STUDIES/PLANS HERE]—that highlighted challenges [DESCRIBE CHALLENGE/LOCATION HERE]. Public engagement conducted as part of these studies revealed several concerns, including [DESCRIBE PUBLIC CONCERNS]. Residents expressed particular interest in [LINK CHALLENGE WITH PUBLIC CONCERN]. One unique quality of [MUNICIPALITY] is that all our residents live within [NUMBER] miles of our [COMMUNITY DESTINATION], eliminating the distance barrier to walking and biking, yet most of our residents are driving to [COMMUNITY DESTINATION] and cite [LOCATION] as one of the barriers to feeling comfortable enough to walk or bike.

The crash analysis from the McHenry County Safety Action Plan emphasizes the urgent need for roadway improvements at [LOCATION]. Between 2018 and 2022, the intersection experienced [NUMBER] crashes, including [NUMBER] injury crashes and [NUMBER] property damage-only crashes. Of the [NUMBER] injury crashes, several involved incapacitating injuries, including both "A" injuries (severe and life-altering) and "B" injuries (non-incapacitating but requiring medical attention). The most common collision types were [CRASH TYPE #1] and [CRASH TYPE #2], often caused by [CRASH CAUSE #1], [CRASH CAUSE #2], or [CRASH CAUSE #3]. Several of these crashes resulted in incapacitating or non-incapacitating injuries, highlighting the severity of the incidents. Contributing factors included [CONTRIBUTING FACTOR #1], [CONTRIBUTING FACTOR #2], and [CONTRIBUTING FACTOR #3]. [DESCRIBE IMPROVEMENTS] at this location could address these issues by [REASON #1], [REASON #2], and [REASON #3].

As part of the CMAP-led McHenry County Safety Action Plan, an online interactive map was publicly available during the study to gather feedback on safety and accessibility improvements for roads, intersections, sidewalks and crossings, and bike paths in McHenry County. [DESCRIBE TAKEAWAYS FROM COMMENTS ABOUT LOCATION OR FROM OTHER COMMUNITY ENGAGEMENT].

Based on these studies, [ADD OTHER PAST STUDIES OR HISTORICAL CONTEXT REGARDING THE LOCATION], crash data, and public input, we respectfully request that IDOT initiate a corridor study of [LOCATION] to evaluate the feasibility and benefits of

[DESCRIBE IMPROVEMENTS]. While [BLANK] was warranted in a [YEAR] study, we believe a [DESCRIBE IMPROVEMENTS] offers significant additional benefits, including [BENEFIT #1], [BENEFIT #2], and [BENEFIT #3]. [IMPROVEMENT TO LOCATION] would also enhance accommodations for bicyclists and pedestrians, support active transportation goals, and provide economic development opportunities by creating a gateway to [MUNICIPALITY OR LOCATION] that promotes a sense of place and slower traffic speeds.

[MUNICIPALITY] is committed to being an active partner in this study and in identifying solutions that improve safety and access for all road users. We would appreciate the opportunity to discuss this request further and collaborate with IDOT to initiate the study. Please contact [INSERT CONTACT INFORMATION] to coordinate next steps or if you require additional information.

Thank you for your consideration, and we look forward to working together to enhance the safety of our community.

***Recommendation #4**: Incorporate and apply the Safe System Intersections procedures into safety improvements and designs.*

The SSI methodology provides an objective, data-driven approach to characterize the extent to which an intersection design alternative aligns with Safe System principles, specifically aiming to reduce fatalities and serious injuries. This method is typically integrated into the Intersection Control Evaluation alternatives screening process during the scoping phase of project development.

The Safe System Approach represents a paradigm shift in road safety management, aiming for zero fatalities and serious injuries. The core philosophy is that human beings make mistakes, but the consequences of those mistakes should not result in a fatality or serious injury. The SSI methodology directly incorporates Safe System Approach principles, including focusing on kinetic energy management, addressing human error, and using a whole-system approach.

The SSI method relies on analyzing potential intersection alternatives at the conflict point level, considering the characteristics of different movements for both motorized and nonmotorized users.

1. Identification and Data Acquisition

The process begins with gathering project data and identifying crash vulnerability. Identify and classify conflict points on a movement basis (as opposed to lane-by-lane). Conflict points are defined as locations where user paths coincide and are categorized as crossing,

merging, diverging, or nonmotorized. The analysis uses typically available project data, including posted speed limit, average annual daily traffic (AADT) volumes, and the number of through lanes.

2. Calculating Safety Performance Metrics

The SSI method produces multiple measures of effectiveness (MOEs) by calculating three key components for each conflict point, including exposure, conflict point severity, and movement complexity. The likelihood of a crash is accounted for by the Exposure Index, which is estimated for each conflict point by calculating the product of the daily conflicting traffic flows (vehicle or nonmotorized user volumes) passing through that point. Conflict point severity estimates the probability of at least one fatality or serious injury occurring as a result of a crash at that point. This estimation is based on the estimated vehicle speed at impact and the crash angle between the conflicting vehicles. Movement complexity addresses user workload and human factors. Complexity is quantified using conflicting traffic and nonmotorized movement factors.

3. Scoring and Decision Making

The SSI score is calculated by combining the exposure, severity, and complexity components for all conflict points. The resulting score (0 to 100) characterizes the intersection alternative's alignment with Safe System principles, with higher scores indicating better performance. The SSI scores and MOEs serve as additional safety metrics alongside traditional crash-based metrics to help screen alternatives and identify a solution that maintains or enhances safety performance.