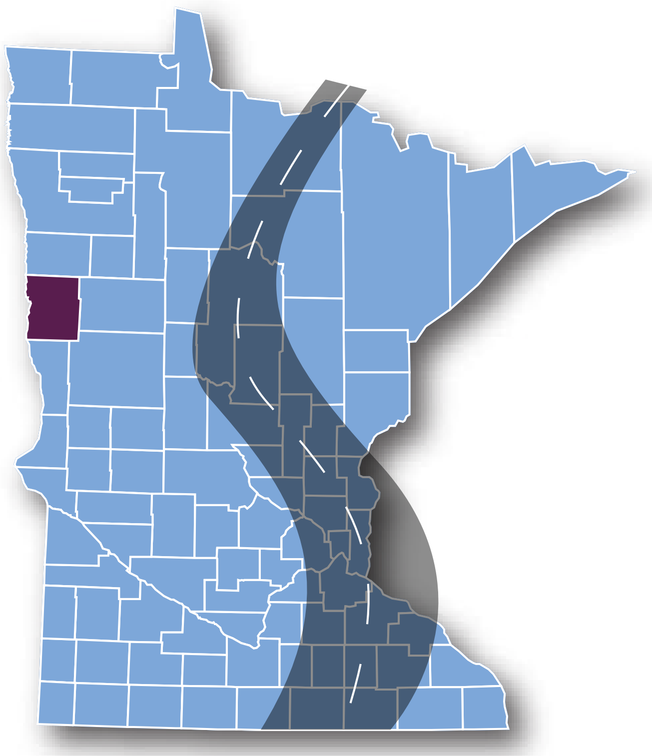
Clay County

COUNTY ROADWAY



Safety

PLAN

Moving Toward ZERO Deaths

March 2023

DEPARTMENT OF TRANSPORTATION

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Executive Summary

This Safety Plan for Clay County was prepared as part of the County Road Safety Plan update process (CRSP 2). It aligns with the state's Strategic Highway Safety Plan (SHSP) and supports the state's Towards Zero Deaths (TZD) program. This safety plan was developed in a collaborative effort with county safety stakeholders to reduce severe crashes or those involving fatalities and serious injuries. This plan process utilizes a data-driven approach, documents at-risk locations, identifies effective and proven safety improvement strategies, and recommends safety projects to better position the county to compete for available federal safety funds in the Highway Safety Improvement Program (HSIP).

The first round of the County Roadway Safety Plans (CRSP 1) began in 2009 and was completed in 2014. Increased investments in local safety projects and implementation of these low-cost and high-impact safety strategies have contributed to a 22 percent reduction in the number of fatal crashes on the county system while at the same period the state system showed a 3 percent reduction in fatal crashes.

To date, nearly 85 percent of Minnesota counties have participated in HSIP with more than $86 million in safety improvements deployed across the county system. Since the completion of Clay County's initial safety plan, the County secured approximately $0.72 million in HSIP funding to support the implementation of 9 safety projects at roadway segments and intersections such as shoulder improvements, striping, shoulder rumble strips, and lighting to improve the visibility of intersections.

This Clay County Safety Plan includes:

- Description of Safety Focus Areas (Section 3.1)
- Identification of a short list of high-priority low-cost strategies (Section 3.3)
- Candidate location for highway safety funds, which are considered at-risk location (Appendix D)
- Development of $4.7 million recommended safety projects – these projects are actual application for HSIP funds (Appendix F)

This information is provided to Clay County to reduce the number of severe crashes on their highway system and it is understood that the final decision to implement any of the recommended projects resides with the Clay County Engineer. The County is encouraged to coordinate with MnDOT to pursue a partnership that identifies a path toward implementation for projects that involve State trunk highways and/or right-of-way. This Plan does NOT set requirements or mandates, is NOT a standard and is neither intended to be, NOR does it establish, a legal standard of care.

In an effort to help reduce the potential exposure to claims of negligence associated with motor vehicle crashes on Clay County's highway system, three key points should be considered:

1. Federal law (23 U.S.C. Section 409) established that information generated as part of the statewide safety planning process is considered privileged and unavailable to the public. The privileged status includes crash data, where value/detail has been added by analysts

during the safety planning process (for example; computation of crash rates, disaggregation of crashes by type or severity, documentation of contributing factors), the lists of at-risk locations, and information supporting the development and evaluation of potential safety projects. The federal law and the privileged status of the safety information was upheld by the U. S. Supreme Court in the case of Pierce County (Washington) v. Guillen.

2. Minnesota tort law provides for discretionary immunity for decisions made by agency officials when there is documentation of the decision and evidence of consideration of social, economic, and political issues. To help establish immunity for decisions relative to moving forward with development of recommended safety improvement projects, the County Engineer is encouraged to prepare a memorandum/plan of action for the County Board. This document would identify the projects selected for implementation and those they choose to dismiss and why.
3. Minnesota tort law also provides for official immunity for decisions made by agency staff where there is written documentation of the thought process supporting project development and implementation.

As with any transportation plan, the expected shelf life of this document is not infinite. The distribution of crashes can change over time as well as roadway and traffic conditions that can contribute to the occurrence of crashes. This Plan contains $4.7 million of potential safety projects, which could provide Clay County with a sufficient backlog of projects for approximately 5 years. As a result, Clay County is encouraged to consider periodically updating this Safety Plan to continue to reduce fatalities and serious injuries on Minnesota roadways.

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Acronyms and Abbreviations

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ADT	average daily traffic
ATP	Area Transportation Partnership
CR	County Road
CRSP	County Roadway Safety Plan
CSAH	county state aid highway
EV	entering vehicles
FAST	Fixing America's Surface Transportation Act
FHWA	U.S. Federal Highway Administration
HSIP	Highway Safety Improvement Program
LED	light-emitting diode
MAP-21	Moving Ahead for Progress in the 21st Century Act
MnDOT	Minnesota Department of Transportation
mph	miles per hour
MVMT	million vehicle miles traveled
NCHRP	National Cooperative Highway Research Program
NV	no value
RE + SSSD	rear end and sideswipe same direction
RRFB	rectangular rapid flash beacon
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SHSP	Strategic Highway Safety Plan
TZD	Toward Zero Deaths
vpd	vehicle(s) per day

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This CRSP 2 was developed in collaboration with FHWA, MnDOT Office of State Aid and Office of Traffic Engineering.

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1.0 Introduction

County safety stakeholders and the Minnesota Department of Transportation (MnDOT) have collaborated to reduce fatalities and serious injuries on local roadways to achieve Minnesota's vision of zero roadway fatalities. The first major initiative was the development of County Roadway Safety Plans (known as CRSP 1), which began in 2009 and was completed in 2014 (CH2M HILL and SRF Consulting Group, Inc., 2014). Counties began implementing the CRSP 1 recommended safety projects in 2013 and have made significant progress.

MnDOT Highway Safety Improvement Program (HSIP) managers indicated local agency participation in the HSIP program has specifically increased due to:

- CRSP 1 development and resulting safety projects
- Dedicated safety funding for safety strategies
- Technical assistance

Emphasis on local roadways and CRSP as a planning and implementation tool, have become integral to the statewide safety program. In 2016, County engineers and MnDOT initiated an update of the CRSPs (known as CRSP 2) to further reduce fatalities and serious injuries on Minnesota local roadways. CRSP 2 is more collaborative, utilizes the most current safety data, and provides a refreshed list of HSIP eligible safety projects. This CRSP 2 document outlines results of a comprehensive safety analysis that used crash data and roadway characteristics to identify the most crucial County transportation safety planning needs and associated safety treatments to reduce fatal and serious injury related crashes.

As part of this CRSP 2 development, the following tasks were completed.

- Review of all county road segments, curves, and intersections
- Data-driven review of crashes on county roadways
- Summary of safety focus areas and priority crash types
- List of recommended high priority safety strategies
- Prioritized list of locations that are most at-risk for severe crashes
- Prioritized list of recommended safety projects – specific strategies at specific locations

1.1 Background

Efforts to reduce statewide traffic fatalities and achieve Minnesota's long-term zero fatality vision requires increasing local agency involvement in the State's safety program. Local agencies are responsible for more than 90 percent of the State's roadway miles and approximately 60 percent of severe crashes (those involving a fatality or serious injury) occur on local Minnesota roads. As a result, the Minnesota's 2007 *Strategic Highway Safety Plan* (SHSP) (MnDOT, 2007) and the current 2020 SHSP identified the need to fully engage local road authorities in statewide highway safety program.

MnDOT, the U.S. Federal Highway Administration (FHWA), and Minnesota's county engineers partnered to establish the CRSP 1 initiative that developed CRSPs for all 87 Minnesota counties. This multiagency effort had two key components:

1. MnDOT dedicated approximately 50 percent of HSIP funds to support implementation of safety projects along the county roadway system. Prior to this, virtually all safety funds were used for projects along State trunk highways.
2. MnDOT provided technical assistance to all 87 counties to analyze and document the outcome of a systemwide systemic risk assessment, prioritize each county's roadway facilities, and share a list of recommended, high priority safety projects for at-risk locations.

Counties have implemented safety treatments using a variety of methods and funding sources. To date, nearly 85 percent of Minnesota counties have participated in HSIP with more than $123 million in safety improvements deployed across the county system. The most common types of safety projects implemented were relatively low-cost and highly effective in reducing severe crashes. Examples of these countermeasures include:

- Shoulder improvements and striping along rural segments
- Chevrons on curves
- Upgraded traffic signs and intersection markings and street lighting at intersections

A further breakdown of typical safety projects implemented by Minnesota counties between 2008-2020 is shown in Table 1-1.

Table 1-1. County Implemented Safety Projects

HSIP Approved 2008-2020	No of Projects	HSIP Funding
Segments		
Edgeline Improvement	6	$1,140,000
Shoulder Improvement	108	$26,433,000
Signing	4	$399,000
Miscellaneous Improvements	1	$630,000
Rumble Strip	29	$2,478,000
Striping	218	$25,872,000
Guardrail	2	$220,000
Rumble StripE	13	$1,779,000
Lane Reassignment	1	$245,000
Clear Zone	2	$298,000
Total Segments	***384***	***$59.5 million***
Intersections		
Geometrics	24	$11,188,000
Lighting	59	$5,100,000
Signing	31	$1,741,000
Roundabout	20	$16,513,000
Miscellaneous Improvements	28	$14,161,000
Signal System	27	$6,178,000
RICWS	11	$1,743,000
Pavement Markings	2	$274,000
Intersections Totals	***202***	***$56.9 million***
Curves		
Chevrons	51	$3,780,000
Geometrics	1	$424,000
Shoulder Improvement	5	$1,291,000
High Friction Surface Treatment	2	$952,000
Guardrail	1	$130,000
Total Curves	***56***	***$6.6 million***
Totals	***646***	***$123 million***

Note:

[a] Geometrics refers to geometric improvements or changes such as changing a stop-controlled intersection to a roundabout or change of curve horizontal or vertical curvature.

The impact of the increased investment in local safety projects has been dramatic. While the number of fatal crashes has increased nationally, the fatal crashes in Minnesota continue to steadily decline until 2019. Since 2013, there has been an approximate 3 percent reduction of fatal crashes on the State system and a 22 percent reduction in the number of fatal crashes on the county system (Figure 1-1). This time period coincides with the completion of CRSP 1 plans and the implementation of the associated safety projects. However, since 2020 the state has shown a steep increase in fatal crashes. This County Road Safety Plan coupled with strategic investment in traffic safety using available state and federal HSIP funds, will be instrumental in achieving continued declines in fatal and serious injury crashes.

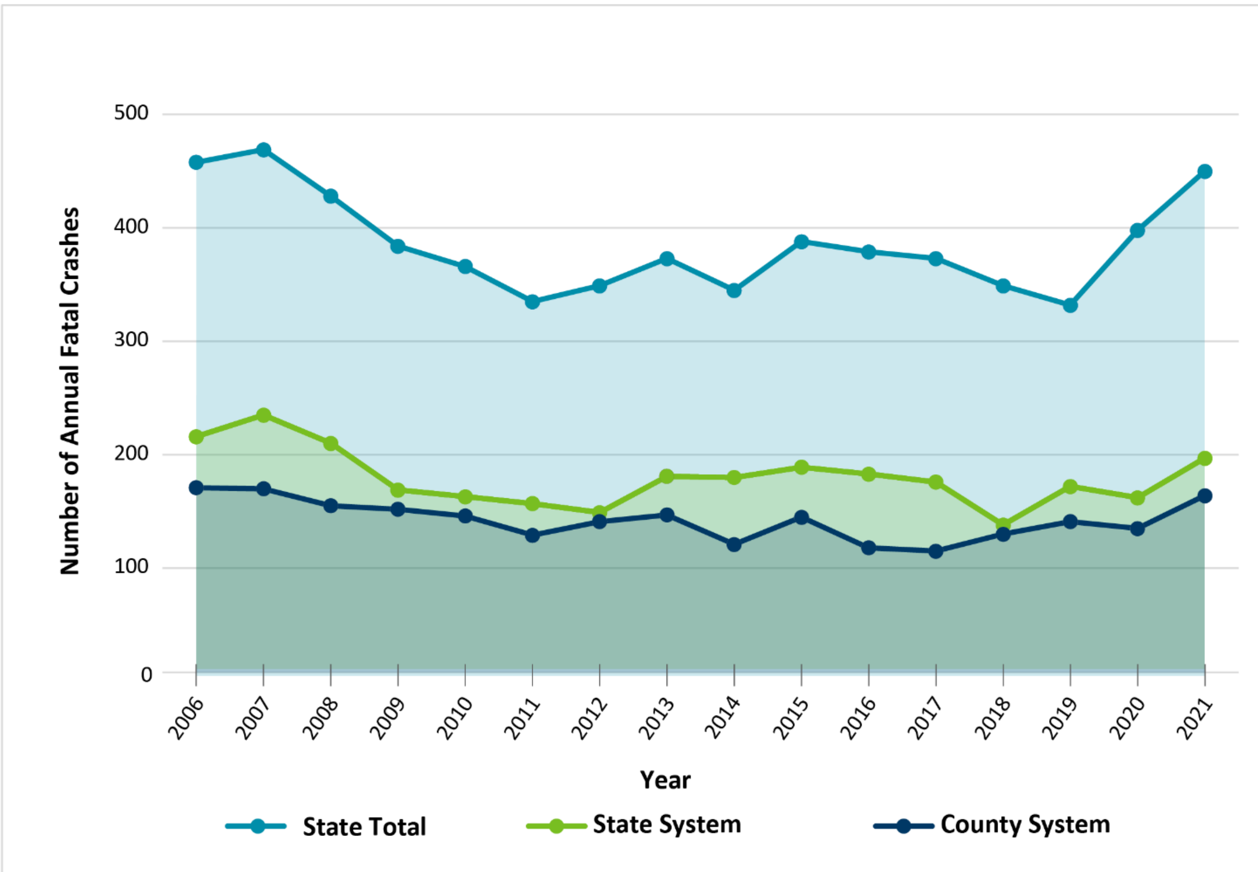

Figure 1-1. Fatal Crashes along Minnesota Roads

1.2 National Context

The HSIP is a core federal-aid program that began in 2005 with the authorization of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users or SAFETEA-LU. SAFETEA-LU required all States to develop data-driven, multidisciplinary SHSPs focused on reducing fatalities and serious injuries on all public roadways. Subsequent transportation legislation, the Moving Ahead for Progress in the 21st Century Act (MAP-21), the Fixing America's Surface Transportation Act (FAST) and the Infrastructure Investment and Jobs Act (IIJA) or the Bipartisan Infrastructure Law (BIL) signed in 2021 extends through 2026, continued to focus transportation funding on improving safety for all public roadways. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance.

The trendline of fatalities throughout the United States and in Minnesota (Figure 1-2), indicates HSIP investments have resulted in lives saved and injuries prevented since 2005. However, traffic crashes still pose a major public health issue in the United States. In 2021, approximately 42,000 people were killed in traffic crashes; an average of 115 people killed every day (FARS, 2021).

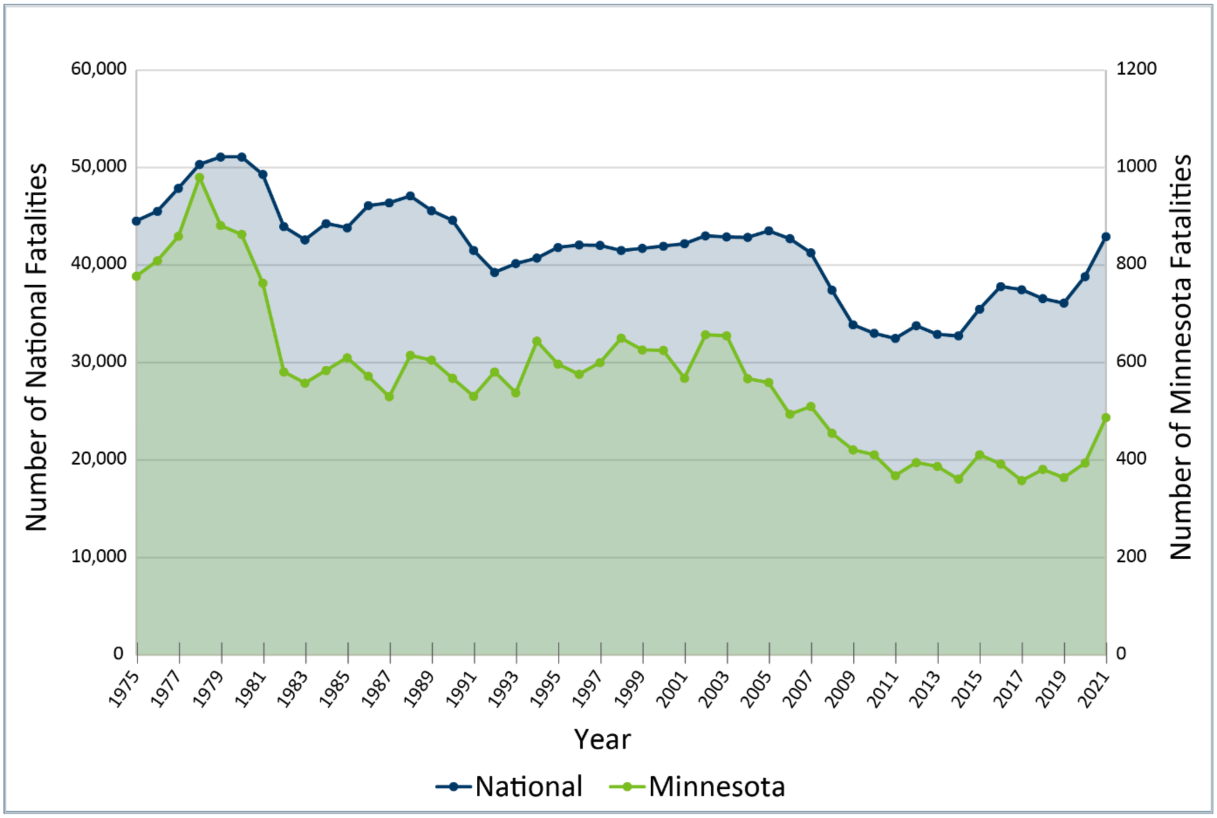

Figure 1-2. Trend in Traffic Fatalities in United States and Minnesota

Achieving greater results and realizing the vision of zero fatalities requires continuous improvements to transportation safety planning and program management. Each state may allocate their transportation and HSIP funding in a manner that addresses their unique needs. The legislative requirement to address safety on all roads is founded on two key facts:

1. Nationally, local governments own and operate almost 76 percent of all public roads (FHWA, 2019) and approximately 35 percent of traffic fatalities occur along these roads (FARS, 2017).
2. Historically, state departments of transportation manage the statewide safety programs, and, in most states, the majority of safety funding has been dedicated to improvements along the state highway system.

States can only achieve significant severe crash reductions if safety on local roads is an integral part of each state's safety planning and investment efforts. In response to federal legislation, all states have accepted an oversite role for safety across all roads in the state and a number of states have dedicated a portion of their HSIP funds to local system improvements. However, only a few states have successfully integrated local agencies into statewide safety planning efforts, Minnesota being one of them.

1.3 State Context

Starting in 2007, Minnesota's SHSP highlighted the need to improve safety of all public roads, including local roads. The current SHSP (2020) continues to emphasize local roads and the plan identified 16 focus areas based on data analysis and stakeholder outreach. The top four focus areas include:

- Intersections (47 percent of severe crashes)
- Lane Departure (31 percent of severe crashes)
- Impairment (25 percent of severe crashes)
- Speed (20 percent of severe crashes)

Total severe crash percentages will be greater than 100 percent because crashes may have multiple contributing factors. For example, an impaired driver may run off the road resulting in a severe injury. In this situation, the crash would be counted as both Lane Departure and Impaired Roadway User focus areas. The SHSP also identified Minnesota's high priority infrastructure-based safety strategies and countermeasures, including:

- Lane Departure
  - Center and edge rumble strips
  - Enhanced pavement markings (6-inch edgelines and embedded markings)
  - Center buffers
  - Wider/paved shoulders
  - Maintain clear zones
- Intersections
  - Enhanced traffic signs and markings
  - Street lights
  - Alternative Intersections (i.e. Roundabouts)
  - Pedestrian/Bicycle strategies (i.e. Pedestrian leading intervals, intersection design)
  - Red light running enforcement assistance (confirmation lights)
  - Restricted/channelized intersections (along divided roadways)

1.4 Clay County – Local System Description

There are approximately 139,000 miles of roadways in Minnesota. Counties own and operate almost 45,000 miles (32 percent) of those roadways. Approximately 32,000 of these roadway miles are paved (70 percent) and the remaining 13,000 miles have a gravel surface. Statewide analysis of County roads indicated a majority of the severe crashes occurred on paved rather than gravel roadways, 90 percent and 10 percent, respectively. As a result, the focus of CRSP 2 is on paved County roads.

Figure 1-3 shows Clay County roads that were analyzed as part of this project (does not include gravel roads) and county boundary. The Clay County Highway Department in Minnesota is responsible for maintenance and management of a system that includes:

- 738 total miles of county roads
- 403 miles of county state-aid highways (CSAH) roadways, which are eligible for direct State Trunk Highway funding
- 335 miles of county roads
- 919 miles of unorganized township roads
- 325 bridges in the County and township system
- 55 horizontal curves

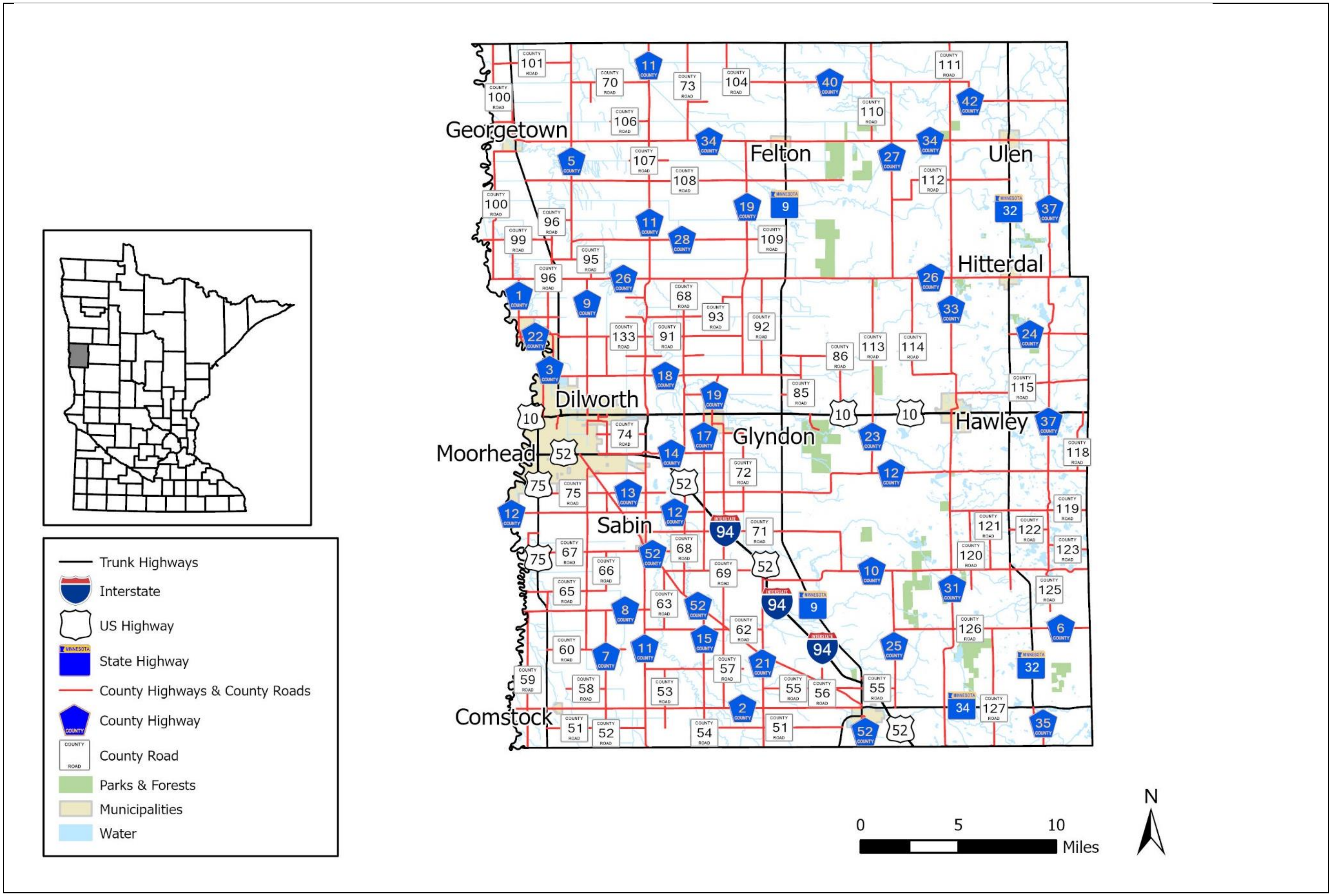

Figure 1-3. Clay County Map

Between the years 2008-2020, Clay County secured approximately $0.72 million in HSIP funding to support the implementation of 9 safety projects at roadway segments and intersections (Table 1-2). These safety projects included shoulder improvements, striping, shoulder rumble strips, and lighting to improve the visibility of intersections.

Table 1-2. Clay County Highway Safety Improvement Program Overview

Project Description	No. of Projects	Project Cost
Segments		
Shoulder Improvement	1	$159,000
Striping	5	$405,000
Rumble Strip	1	$35,000
Total Segments	*7*	*$0.60 million*
Intersections		
Lighting	2	$122,000
Total Intersections	*2*	*$0.12 million*
Total Projects	***9***	***$0.72 million***

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2.0 Approach

CRSP 2 aligns with the Minnesota SHSP and supports the TZD statewide target of fewer than 225 traffic fatalities and 980 serious injuries by the year 2025.

In recognition of the TZD Program, Clay County identified the following goals for this update:

- Provide the basis for a shared understanding of the approach used to analyze and address safety on Clay County's roadway system
- Provide improved understanding of the effectiveness (at reducing crashes) of safety and maintenance strategies
- Document a prioritized list of HSIP-eligible projects and safety-related maintenance activities
- Document safety issues in Clay County's small cities and townships
- Provide information to increase understanding of pedestrian safety issues
- Conduct a data-driven safety analysis of the county's roadway system
- Identify and prioritize candidate locations for safety investment
- Develop safety projects – with specific strategies at specific locations

The CRSP 1 and CRSP 2 approach has been to work closely with county safety stakeholders to establish program goals and develop a collaborative, data-driven plan along with safety treatments at appropriate locations to direct the local safety program. This was accomplished through data analysis, identification of safety emphasis areas, development of a comprehensive list of safety strategies, coordination with safety stakeholders through meetings and workshops, narrow the list of strategies to county specific strategies, identify safety projects and develop the safety plan. Workshop and meeting summaries can be found in Appendix B. This section of the plan discusses the project approach in more detail.

2.1 Proactive Systemic Safety Analysis

From the beginning of the Federal highway safety program in the 1970s, the primary method for conducting a safety analysis largely involved a reactive approach by searching along highway systems for high-crash locations. A corridor segment or intersection is generally considered a high-crash location if the severe crash rate exceeds the severe critical crash rate. Using this methodology was a barrier to local systems participating in the statewide safety program because no locations along the local roadway systems met the high-crash definition. As a result, almost all safety investments were made along the state's system of trunk highways.

Minnesota's 2007 SHSP prioritized increasing the level of local highway agency involvement in statewide safety planning efforts (MnDOT, 2007). Following adoption of the SHSP, MnDOT and Minnesota's county engineers developed a new safety analysis process to supplement the high-crash location search. This systemic risk assessment, which uses a data-driven process, looked at crash patterns to determine high-risk locations that would be safety investment candidates. The five key steps in the CRSP systemic process include:

1. Conduct a crash analysis that includes reviewing each of the approximate 2,500 statewide locations along the county roadway system where severe (fatal + serious injury) crashes occurred during a 5-year study period.
2. Identify roadway and traffic characteristics common at locations with severe crashes.
3. Adopt a list of risk factors that show locations with a specific risk factor and a higher density (number of severe crashes per mile, curve, or intersection per year) of crashes rather than locations that don't contain this risk factor.
4. Conduct a census of each county system of roadway segments, curves, and intersections and record the number of risk factors at each location.
5. Prioritize the county roadway system for safety investment based on the number of risk factors at each location. The greater the number of risk factors, the greater the risk of a severe crash and, therefore, the higher the priority the candidate location is for safety investment.

This systemic risk analysis was conducted across all 87 counties as part of the CRSP 1 efforts. At the end of that project, a final review concluded that the new process was successful. More than $300 million in low-cost safety improvements along the county system were identified and over $123 million of HSIP-funded CRSP safety projects were implemented in CRSP programs.

Successful CRSP project implementation led the FHWA to approve and adopt this systemic risk analysis technique as a model for their own, national, data-driven safety analysis initiative. Most significantly, the systemic approach allowed agencies to move from a reactive approach of addressing severe crashes to a proactive approach of deploying safety projects at high priority at-risk locations.

Based on success in the CRSP 1 effort, this CRSP 2 systemic risk analysis follows the same five key steps used in the CRSP 1 effort.

2.2 Safety Workshop

In addition to the technical analysis, an integral part of CRSP 2 included holding a safety workshop. Clay County's workshop was held on October 31, 2018 at the Clay County Law Enforcement Center (refer to Appendix C for details). This workshop was attended by 19 of the county's safety partners representing engineering, enforcement, education, and emergency response as well as the County's elected officials.

The CRSP Project Team's primary workshop goals included creating a shared understanding of the technical approach to updating the CRSP, having participants identify what they considered important themes to advance road safety in Clay County, and providing feedback to help the County prioritize infrastructure safety strategies. Figure 2-1 shows participants at the Clay County Safety Workshop.

Figure 2-1. Clay County Safety Workshop

During the workshop, the CRSP 2 Project Team outlined the technical approach and described key parts of the data-driven analytical process, including the proactive systemic risk evaluation, and provided an overview of the Clay County system crash data. Participants in the workshop identified a wide range of safety concerns, such as:

- The importance of local input on infrastructure and non-infrastructure safety improvements: for example, are farmers' concerns representing agriculture beyond beet farms being considered?
- Safety concerns surrounding beet trucks:
    - High-speed motorists recklessly passing beet tractors
    - Increased safety risk due to licensing concerns such as no driver's license nor CDL required; first haul operation beet drivers can be as young as 16; drivers operating with a revoked driver's license thereby increasing crash risk
    - The potential for driver fatigue; the first haul is about 12 hours of work

- The value of community partnerships to promote strengthened drivers' education and parental involvement
- Challenges of the County's grant supported TZD Coalition and aligning state grant requirements with local needs
- Access management and better coordination among jurisdictions when applying/approving permits
- Minnesota's overall seatbelt use rate is 93%, however, observational surveys reflect a rural seatbelt use percentage in the low 60s
- Growing concerns of bicycle and pedestrian safety from Farmville to Moorhead

In addition to the County highlighting implemented safety projects, the Project Team offered a discussion of featured infrastructure safety strategies for Clay County's consideration such as thru-stop to all-way stop/yield signs, transverse rumbles, skew removal, dynamic speed feedback sign, Rectangular Rapid Flash Beacon (RRFB), LED stop signs, Rural Intersection Crossing Warning System (RICWS) and roundabouts.

The safety workshop concluded with a discussion on two priority site locations:

1) Intersection of CSAH 12 and CSAH 52
2) Intersection of CSAH 10 and CSAH 31

For each location, workshop participants discussed an overview of the site; their safety concerns and observed trends; crash facts; County-installed safety improvements; and discussed alternative safety strategies. Potential safety recommendations included advanced stop ahead pavement markings and stop bars on all four stops with consideration using embedded stop bars. Recent MnDOT research data showed RICWS provides little to no benefit. As such RICWS will not be an eligible safety strategy for federal HSIP grants.

3.0 Crash Analysis

The CRSP 2 is based on a data-driven analytical process to identify optimal safety investment candidates. A data-driven process is necessary, so all crash types and roadway facilities are not mistakenly considered equal candidates for safety projects. However, prior studies show that while crashes involving fatalities and serious injuries are widely scattered across Minnesota's local system of roads (an average of 0.006 severe crashes per mile per year), these crashes are neither uniformly nor randomly scattered. As a result, analysis of crash data and roadway system characteristics are necessary to support prioritization, which is an integral part of the strategic safety planning process.

The level of statewide safety funding is not sufficient to support wide deployment of projects that address all crash types. Therefore, states are encouraged to adopt a short list of safety focus areas among the categories that include the greatest number of severe crashes. Focusing safety investment on the top-ranked focus areas is likely to result in the greatest opportunity for crash reduction derived from a data-driven analytical process. This process involved three steps:

1. Disaggregate crash types into categories (focus areas) defined by FHWA, then rank each category based on the number of crashes that involve fatalities and serious injuries (severe crashes).
2. Identify the types of roadway facilities at which the priority crash types occur in the greatest numbers.
3. Identify high priority safety countermeasures/strategies linked to the specific crash types.

3.1 Safety Focus Areas

Consistent with FHWA guidance, Minnesota adopted the number of fatal and serious injury (severe crashes) vehicle related crashes as the safety performance measure underlying development of the CRSP 2. Crash data from the 5-year period 2016 through 2020 were assembled, analyzed, and disaggregated into 16 safety focus areas, which are shown in Table 3-1. In addition to disaggregating by safety focus area, severe crashes were also disaggregated by state highways versus county roadways. This 2011 to 2015 timeframe was selected as the study period since Minnesota's new crash records system was not populated with enough years of more recent data at the onset of this update effort to support a 5-year study period.

Based on statewide data analysis, the most frequent contributing factors for severe crashes are given priority in Minnesota's SHSP (MnDOT, 2020) as Safety Focus Areas, which are shown in Figure 3-1. The colors of the groups also correspond with the colors in Table 3-1, which will be discussed shortly.

Figure 3-1. Focus Area Priorities

The analysis reviewed statewide crash data across all systems. Crashes that occurred along the County jurisdiction were disaggregated by the state, Area Transportation Partnership (ATP) and county levels also including Greater Minnesota Area and Metro areas. Table 3-1 shows crashes at the statewide level and within the Greater Minnesota Area and Metro areas for all systems and county system only. Table 3-2 shows the same crashes but for ATP 4 and for Clay County.

Assigning crashes to the safety focus areas often involves double or triple counting because the number of severe crashes documented is greater than the actual number of crashes across the state and county systems. Multiple counting is the result from a crash potentially having many contributing factors. An example could be a single severe crash involving an unbelted, older driver at an intersection. This crash would include driver behavior of unbelted and the older driver safety focus areas. Therefore, the actual number of crashes across the state and county systems may be lower than the total number of crashes when broken down by safety focus areas. In addition, the data sets used to develop the focus area tables and the crash trees in section 3.2 are different and occasionally may result in the total numbers of severe crashes at the county level being different than the sum of crashes in the individual sections.

Figure 3-2 shows the various ATPs throughout the state. The analysis relied on statewide and district level crash trends because in most cases, the total number of severe crashes that occur in a 5-year timeframe within a single county is too small and would not be considered statistically reliable. To have a statistically reliable dataset at any level, a minimum of 500 crashes is required (Minnesota Local Road Research Board, 1998).

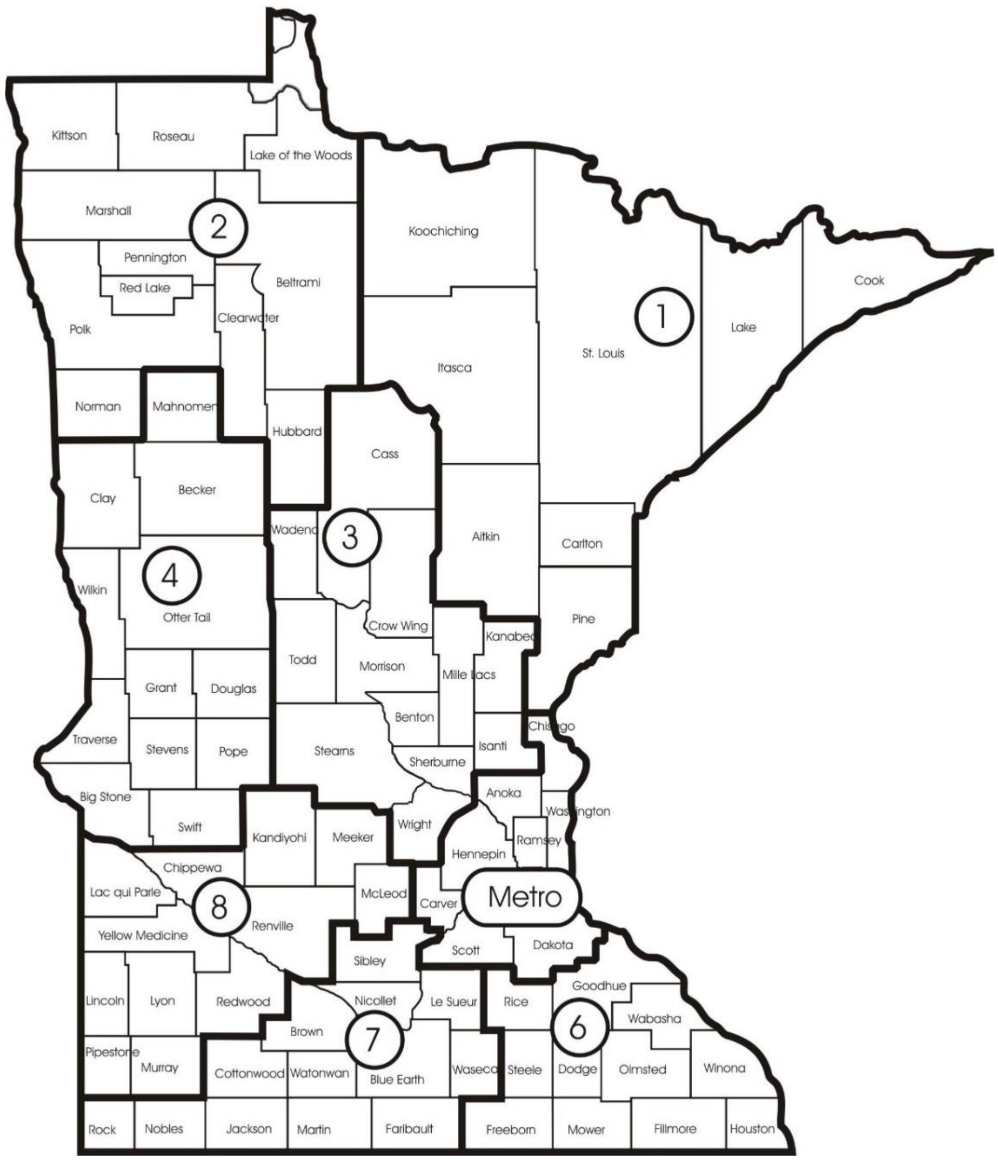

Figure 3-2. Minnesota's Eight Area Transportation Partnerships

Results of the analysis were consistent among Greater Minnesota, ATP 4, and Clay County and support adoption of the following infrastructure-based safety focus areas:

- Lane Departure (run-off-road and head-on)
- Intersections
- Non-motorized (pedestrians/bicyclists)

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Table 3-1. Minnesota Crash Focus Areas (2016-2020)

		Statewide				Greater Minnesota				Metro			
		All Systems		County System		All Systems		County System		All Systems		County System	
Total Severe Crashes		**8960**	**100%**	**3388**	**100%**	**4859**	**100%**	**1962**	**100%**	**4100**	**100%**	**1426**	**100%**
Core Areas	Intersection	4358	49%	1583	47%	1991	41%	721	37%	2367	58%	862	60%
	Lane Departure	3852	43%	1639	48%	2465	51%	1132	58%	1387	34%	507	36%
	Run-Off-Road	2850	32%	1238	37%	1890	39%	929	47%	960	23%	309	22%
	Head-On	1002	11%	401	12%	575	12%	203	10%	427	10%	198	14%
	Impaired	2449	27%	963	28%	1429	29%	618	31%	1020	25%	345	24%
	Speed	2012	22%	693	20%	1132	23%	437	22%	880	21%	256	18%
	Unbelted	1362	15%	507	15%	955	20%	380	19%	407	10%	127	9%
	Inattentive	904	10%	365	11%	537	11%	230	12%	367	9%	135	9%
Strategic	Older Driver	1609	18%	600	18%	969	20%	339	17%	640	16%	261	18%
	Motorcycle	1502	17%	659	19%	851	18%	404	21%	651	16%	255	18%
	Younger Driver	1422	16%	531	16%	819	17%	321	16%	603	15%	210	15%
	Non-motorist	1445	16%	383	11%	477	10%	110	6%	968	24%	273	19%
	Pedestrian	1104	12%	273	8%	369	8%	74	4%	735	18%	199	14%
	Bicyclist	343	4%	110	3%	109	2%	36	2%	234	6%	74	5%
	Commercial Vehicles	794	9%	237	7%	521	11%	149	8%	273	7%	88	6%
	Work Zone	202	2%	58	2%	85	2%	24	1%	117	3%	34	2%
Connected	Unlicensed	1572	18%	559	16%	792	16%	322	16%	780	19%	237	17%
	Trains	23	0%	5	0%	21	0%	5	0%	2	0%	0	0%
	Deer/Animal	176	2%	109	3%	156	3%	98	5%	20	0%	11	1%
	Winter Weather	1066	12%	358	11%	668	14%	236	12%	398	10%	122	9%

a. Focus Area definitions consistent with the 2020-2024 Minnesota Strategic Highway Safety Plan unless otherwise noted.
b. County System via crash report attribute ‘Route System’ values CSAH (4) and County Road (7)
c. Head-on here includes sideswipe opposite direction (per SHSP) but omits Deer/Animal Crashes.

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Table 3-2. Clay County Crash Focus Areas (2016-2020)

		Clay County				ATP 4			
		All Systems		County System		All Systems		County System	
	Total Severe Crashes	**58**	**100%**	**15**	**100%**	**533**	**100%**	**225**	**100%**
Core Areas	Intersection	27	47%	8	53%	208	39%	81	36%
Core Areas	Lane Departure	28	48%	8	53%	285	53%	128	57%
Core Areas	*Run-Off-Road*	22	38%	7	47%	234	44%	110	49%
Core Areas	*Head-On*	6	10%	1	7%	51	10%	18	8%
Core Areas	Impaired	16	28%	5	33%	180	34%	77	34%
Core Areas	Speed	19	33%	7	47%	141	26%	63	28%
Core Areas	Unbelted	16	28%	6	40%	149	28%	59	26%
Core Areas	Inattentive	4	7%	3	20%	55	10%	30	13%
Strategic	Older Driver	13	22%	4	27%	104	20%	38	17%
Strategic	Motorcycle	6	10%	2	13%	84	16%	44	20%
Strategic	Younger Driver	8	14%	0	0%	80	15%	37	16%
Strategic	Non-motorist	4	7%	0	0%	40	8%	12	5%
Strategic	*Pedestrian*	3	5%	0	0%	32	6%	9	4%
Strategic	*Bicyclist*	1	2%	0	0%	9	2%	3	1%
Strategic	Commercial Vehicles	11	19%	4	27%	61	11%	20	9%
Strategic	Work Zone	1	2%	1	7%	5	1%	3	1%
Connected	Unlicensed	14	24%	6	40%	97	18%	39	17%
Connected	Trains	0	0%	0	0%	4	1%	0	0%
Connected	Deer/Animal	0	0%	0	0%	24	5%	15	7%
Connected	Winter Weather	9	16%	2	13%	72	14%	33	15%

a. Focus Area definitions consistent with the 2020-2024 Minnesota Strategic Highway Safety Plan unless otherwise noted.
b. County System via crash report attribute 'Route System' values CSAH (4) and County Road (7)
c. Head-on here includes sideswipe opposite direction (per SHSP) but omits Deer/Animal Crashes.

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3.2 Roadway Facilities

As part of the data-driven prioritization process, crash trees were developed using statewide (Figure 3-3) and Clay County (Figure 3-4) data to document a disaggregation by state versus local systems, by rural versus urban areas, and by roadway segment versus intersection related crashes.

A statewide crash tree was developed because the results would not meet the threshold to be considered statistically significant since there were three severe crashes per year on Clay County only roadways. The percentages associated with the various disaggregation between statewide and county values varied slightly, the key takeaways were the same and suggest the following priorities for Clay County:

- Rural roadways (80 percent of severe crashes)
- Lane Departure crashes along segments (83 percent), including both single-vehicle run-off-road (80 percent) and multi-vehicle head-on (20 percent)
- Lane Departure crashes in curves (40 percent)
- Right-angle crashes at through/stop controlled rural Intersections

The four bullets above are shown visually in Clay County's rural crash tree. Eighty percent of the severe crashes in a rural environment is found in the fourth row, first box from the left, titled Rural. Following the tree down to the segment box shows 50 percent of severe crashes and stepping down twice below the Lane Departure box shows that "Run-Off-Road" severe crashes comprise 80 percent of Lane Departure and the other 20 percent were identified in the Head-On box. For Lane Departure crashes in curves, the 40 percent is calculated by adding up severe crashes in the Curvature Characteristics boxes for horizontal and/or vertical curvature related divided by the total number of Lane Departure crashes.

Additional analysis of severe crashes was conducted to help focus attention on the portion of county roadway system at higher risk. This analysis concluded that paved county roadways across the state account for approximately 70 percent of roadway miles but around 94 percent of severe crashes. Paved county roadways also have a crash density (0.02 severe crashes per mile per year) that is 10 times higher than the crash density on gravel roads. This information supports the focus of the analytical process on paved county roadways. The severe crash over-representation along paved county roads also has been documented in North Dakota, South Dakota, and Iowa. The proportion of paved versus gravel roads and the distribution of severe crashes varies from state to state, but the trend is the same in each case, with severe crashes overrepresented along paved county roadways.

Detailed analysis of severe crashes was also extended to rural county roadway intersections. Based on a sample of over 11,000 rural intersections (all Phase 1 counties), county roadway intersections with state highways and other county roadways accounted for 36 percent of intersections but 72 percent of severe crashes. County roadway intersections with township roads accounted for 64 percent of intersections but only 28 percent of severe crashes. County roadway intersections with state highways and other county roadways also have a crash density (0.03 severe crashes per intersection per year) that is 5 times higher than at county roadway intersections with township roads. This information supports the decision to focus the remainder of the analytical process on county roadway intersections with state highways and other county roadways.

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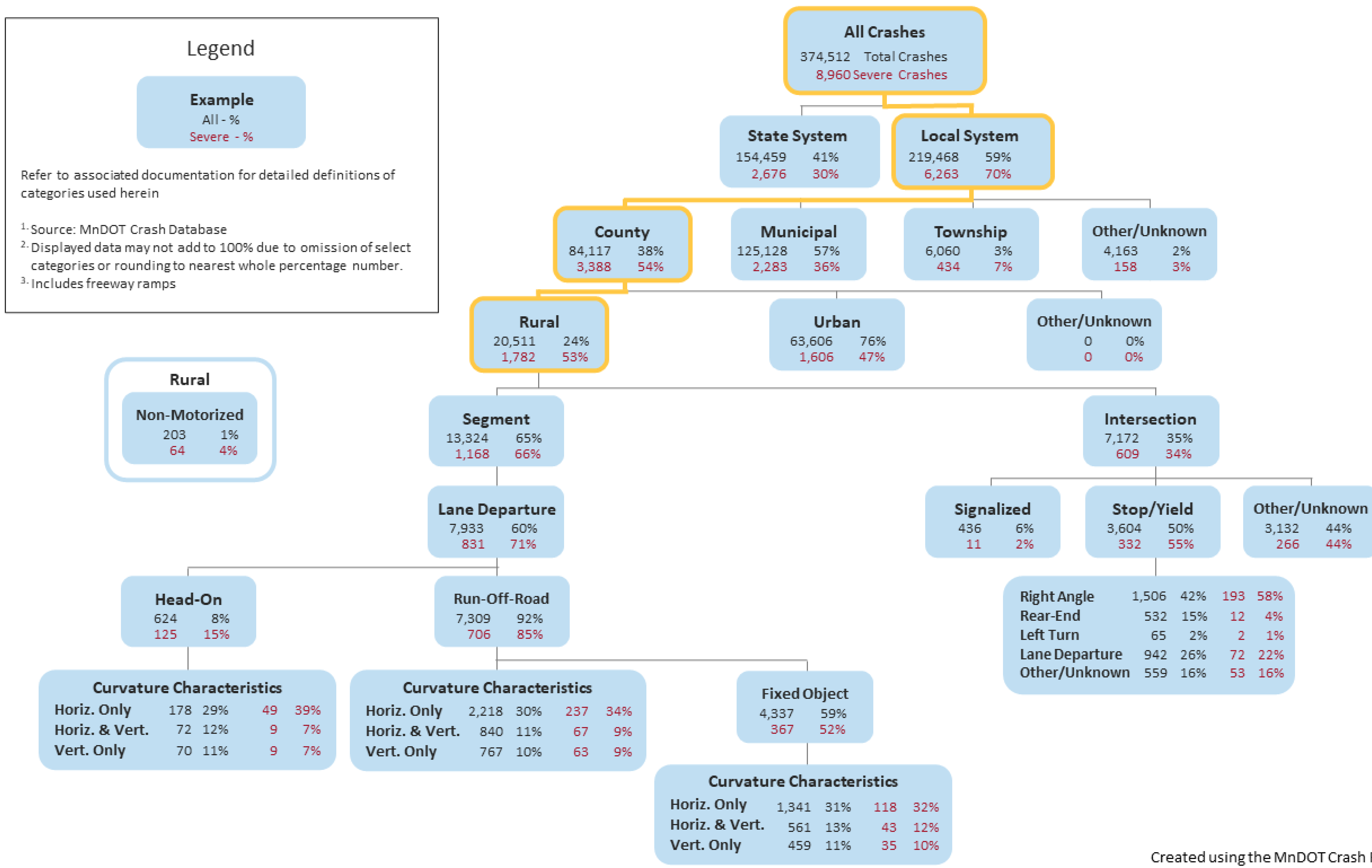

Created using the MnDOT Crash Report Tool on 12/14/2022.

Figure 3-3. Minnesota Statewide Crash Tree - County Rural System (2016-2020)

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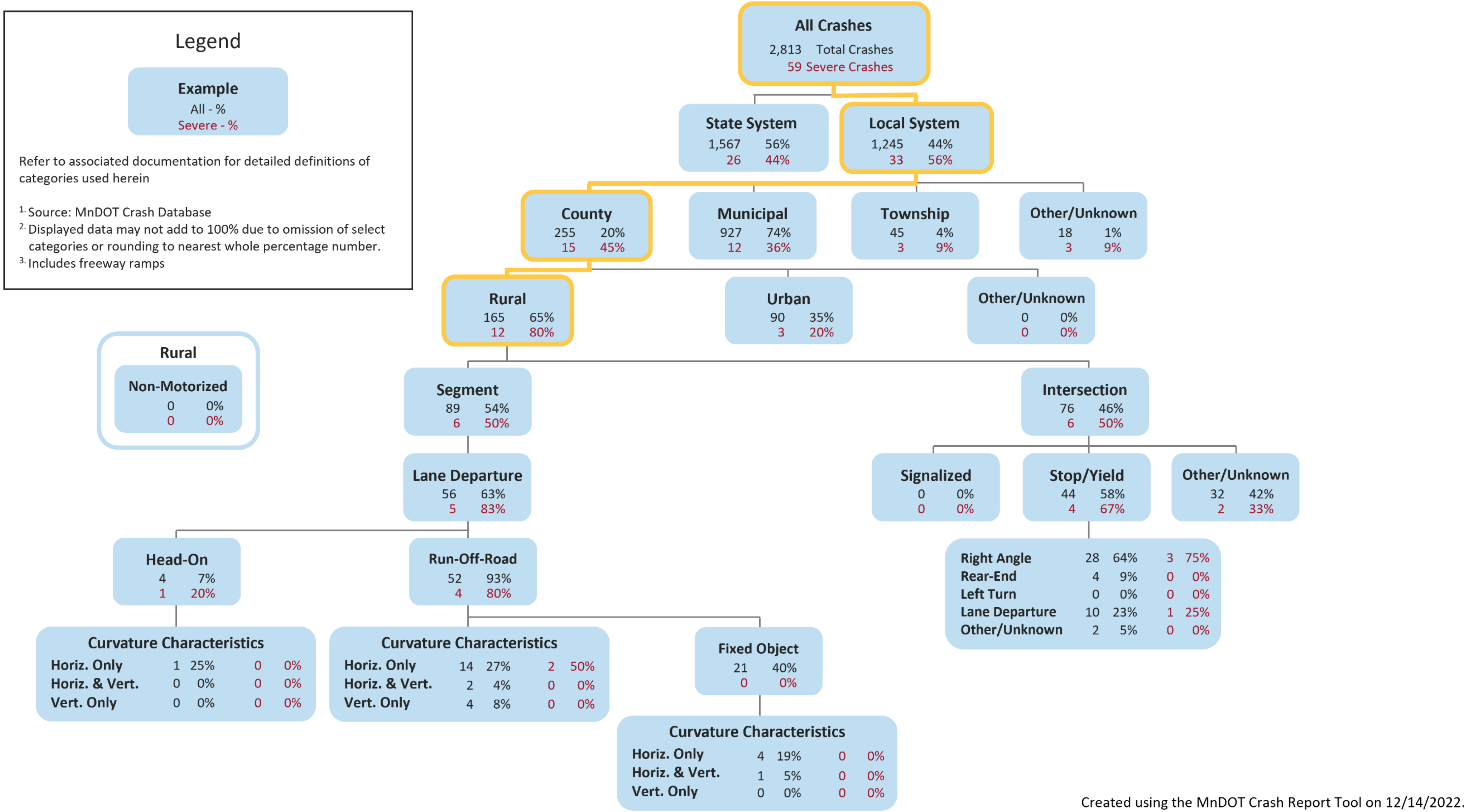

Figure 3-4. Clay County Crash Tree – County Rural System (2016-2020)

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3.3 Safety Strategies and Countermeasures

Adoption of the Lane Departure, Intersections, and Non-motorized safety focus areas began the process for determining appropriate safety strategies. Several safety research reports were reviewed, including:

- National Cooperative Highway Research Program's (NCHRP's) Report 500 Series (2003-2009)
- FHWA's Crash Modification Factor Clearinghouse (2014)
- American Association of State Highway and Transportation Officials' (AASHTO's) Highway Safety Manual (2010)

Following the review, priority was given to adopted safety focus areas to reduce the number of potential infrastructure-related safety strategies from more than 100 to around 60. From there, Clay County screened the list of strategies based on factors such as proven effectiveness (to reduce severe crashes), implementation cost, consistency with Minnesota's SHSP priorities, probability of being supported by HSIP funding, prior experience and acceptance in Clay County, and safety partner input. This process resulted in selection of the 52 priority safety strategies listed below for use in the subsequent safety project development exercise.

- Rural Segments
  - Center Rumble Strips (Including New Mumble Design)
  - Shoulder/Edge Rumble Strips
  - Center Buffer Areas
  - Safety Edge (Figure 3-5)
  - Enhanced Edgeline (6" & 8")
  - Shoulder Paving (2', 4', 6') (Figure 3-6)
  - Clear Zone Enhancements
  - Ditch/Embankment Improvements
  - Separated Bike Trail/Path
- Rural Curves
  - Curve Warning Sign, Speed Advisory & Chevrons or Arrow Board (Figure 3-7)
  - Delineators
  - High-Friction Surface Treatment (HFST)
  - Dynamic Curve Signing
  - Lighting
  - Clear Zone /Enhancements
  - Reconstruct TT to a Single T
- Rural Intersections
  - Upgrade Signs and Pavement Markings
  - Street Lights (Figure 3-8)
  - Thru-Stop to All-Way Stop/Yield
  - J-Turn

- Rural Intersection Conflict Warning System (RICWS)
- Off-set T-Intersection
- Roundabout
- Turn Lanes (Offset, Channelized)
- Continuous Green T
- Mainline Dynamic Warning System
- Median Acceleration Lanes (MALs)
- LED Stop Signs (Figure 3-9)
- Remove Skew / Realign Intersections

- Urban Segments
  - Roadway configuration (convert to 3-lane)
  - ¾-Intersection
  - Divided 2-lane or 4-lane Roadway
  - Access Management
  - Bike Lane/Boulevard (Figure 3-10)
  - Urbanization (make it feel urban)
  - Vehicle Speed Feedback Sign (Figure 3-11)
  - Sidewalks
- Urban Intersections
  - Echelon
  - Continuous Flow Intersection (CFI)
  - Signalized J-Turn Intersection
  - Confirmation Lights
  - Pedestrian Countdown Timers
  - Leading Pedestrian Interval
  - Curb Extensions
  - Median Refuge Island (Figure 3-12)
  - Roundabout (Figure 3-13)
  - Mini Roundabout
  - Urbanization (make it feel urban)
  - Rectangular Rapid Flash Beacon (RRFB) (Figure 3-14)
  - Flashing Yellow Arrow (FYA)
  - Reflective Street Light Backplate
  - Turn Lanes (Offset, Channelized)
  - Zig Zag Pavement Markings
  - Pedestrian Education/Visibility

After reducing the number of safety strategies to these shown, data analysis of the roadway network continued to identify the prioritized locations and correlate the appropriate treatments to develop effective recommended projects.

Figure 3-5. Safety Edge

Figure 3-6. Shoulder Paving

Figure 3-7. Chevrons

Figure 3-8. Street Light

Figure 3-9. LED Stop Sign

Figure 3-10. Bike Lane/Boulevard

Figure 3-11. Vehicle Speed Feedback Sign

Figure 3-12. Median Refuge Island

Figure 3-13. Roundabout

Figure 3-14. Rectangular Rapid Flash Beacon (RRFB)

4.0 System Evaluation

The analytical approach that underlies CRSP 2 is a proactive systemic safety evaluation that identifies, evaluates, and prioritizes roadway safety deficiencies based on crash risk.

Prior to undertaking Minnesota CRSPs, the traditional method supporting safety project development for HSIP in Minnesota involved searching across the state's highway system for intersections and roadway segments with multiple crashes – considered high-crash locations. Around the time that MnDOT adopted increasing local agency involvement in the HSIP, they also recognized that reliance on the high-crash method of analysis presented two major problems. First, the method was entirely reactive – crashes had to occur before any safety investments could be made. This resulted in the public asking agencies after a severe crash occurred – "How many people have to die before something is done?" Under this high-crash analytical method, crashes had to occur and be counted prior to making safety improvements.

Experience suggested that when using the high-crash methodology there were only a few locations across Minnesota's expansive local system that would qualify as a high-crash location. Relying on this method alone was a barrier to deploying safety improvement projects along local systems.

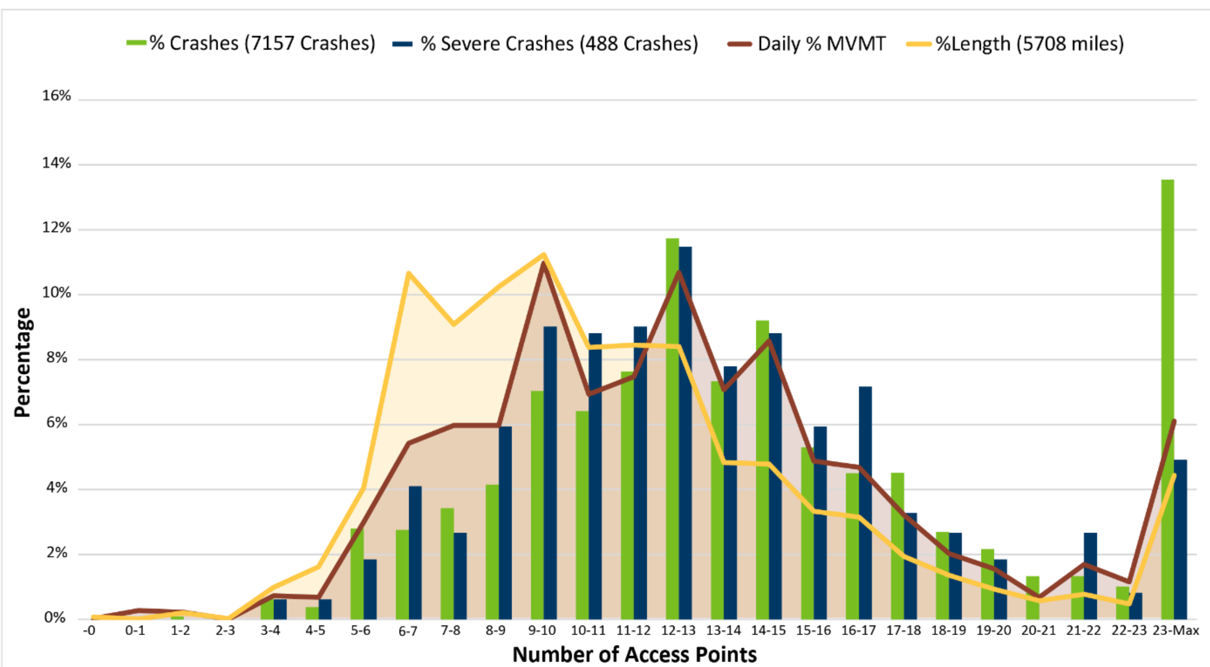
The solution to these problems was the development of a new safety analysis approach – the proactive systemic method that resulted from collaboration between MnDOT and the counties. The underlying premise for this systemic process is that severe crashes along the county roadway system are infrequent and widely scattered – 0.01 severe crashes per year per mile across the 45,000-mile county system. However, the expectation was that these severe crashes were neither uniformly nor randomly scattered and that a set of roadway characteristics could be found at severe crash locations that could help predict where crashes were most likely to occur at future locations.

The systemic process used for CRSP 2 was refined from the CRSP 1 effort. While both analyses consisted of reviewing basic roadway and traffic characteristics along the county system that documented severe crashes, CRSP 2 increased the total number of data elements collected as well as expanded the detail of prior data elements across segments, intersections and curves. For example, the data element "Alignment Skew" in CRSP 1 had a binary option (yes/no) however data analysts for CRSP 2 data collection efforts measured the actual angle of skew to the nearest five degrees. In total, there were 79 unique data elements collected for the CRSP 1 effort for segments, intersections, and curves in rural and urban areas. There was an approximate 50 percent increase (117) in the total number of data elements that were collected for CRSP 2. This additional detail resulted in the generation of more risk factors through a crash frequency analysis leading to a more comprehensive prioritization effort. The following sections describe in more detail how risk factors were identified and the subsequent prioritization process.

4.1 Risk Factor Identification

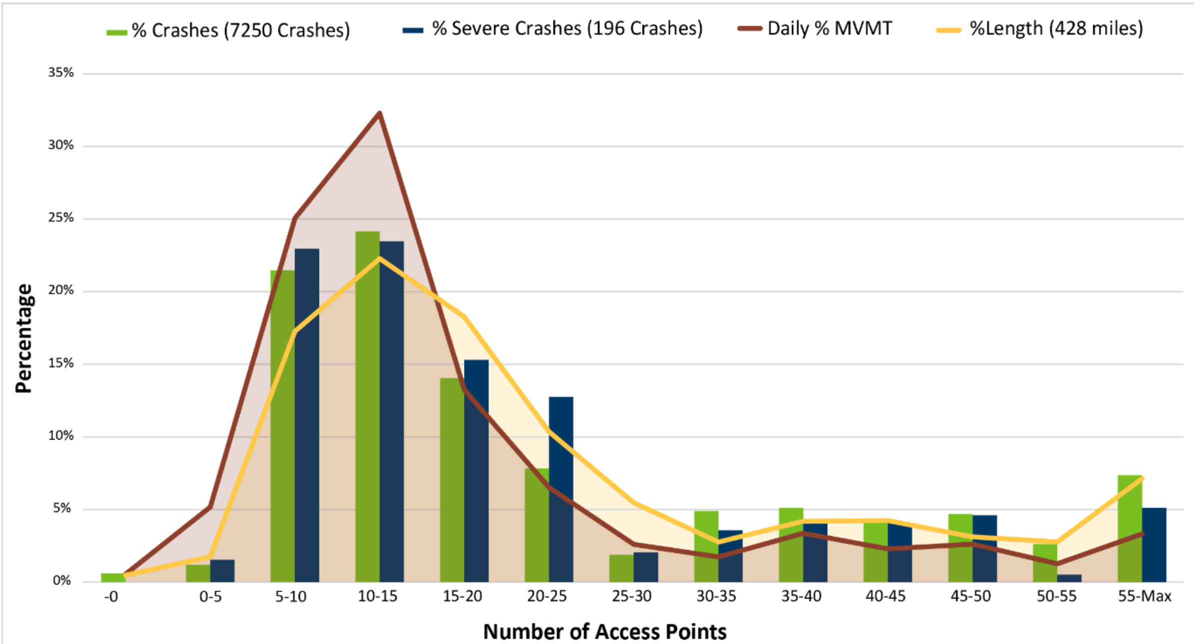
The process of identifying risk factors for CRPS 2 followed a similar process to that of CRSP 1; review the locations with severe crashes, note the roadway and traffic characteristics, and test for over-representation. Examples of the results of the testing for over-representation include:

- Rural Segments: Segments where access density (field entrances + private driveways + public road intersections/mile of roadway) is between 7 and 18 per mile accounted for 80 percent of all severe crashes and 85 percent of severe Lane Departure crashes versus 73 percent of rural roadway miles (Figure 4--1).
- Urban Segments: Segments where access density is between 15 and 25 per mile accounted for 28 percent of all severe crashes and 18 percent of severe rear-end plus sideswipe same direction crashes versus 29 percent of urban roadway miles in Greater Minnesota (Figure 4-2).
- Rural Intersections: Intersections with total entering traffic volumes exceeding 2,000 vehicles per day accounted for 67 percent of all severe crashes and 70 percent of severe right-angle crashes versus 31 percent of all rural intersections (Figure 4-3).
- Urban Intersections: Intersections with total entering traffic volumes exceeding 12,000 vehicles per day accounted for 63 percent of all severe crashes and 59 percent of severe right-angle crashes versus 40 percent of all rural intersections (Figure 4-4).



Note: MVMT = million vehicle miles traveled

Figure 4-1. Systemic Risk Factor Rural Segment Access Density



Notes: MVMT = million vehicle miles traveled

Figure 4-2. Systemic Risk Factor Urban Segment Access Density

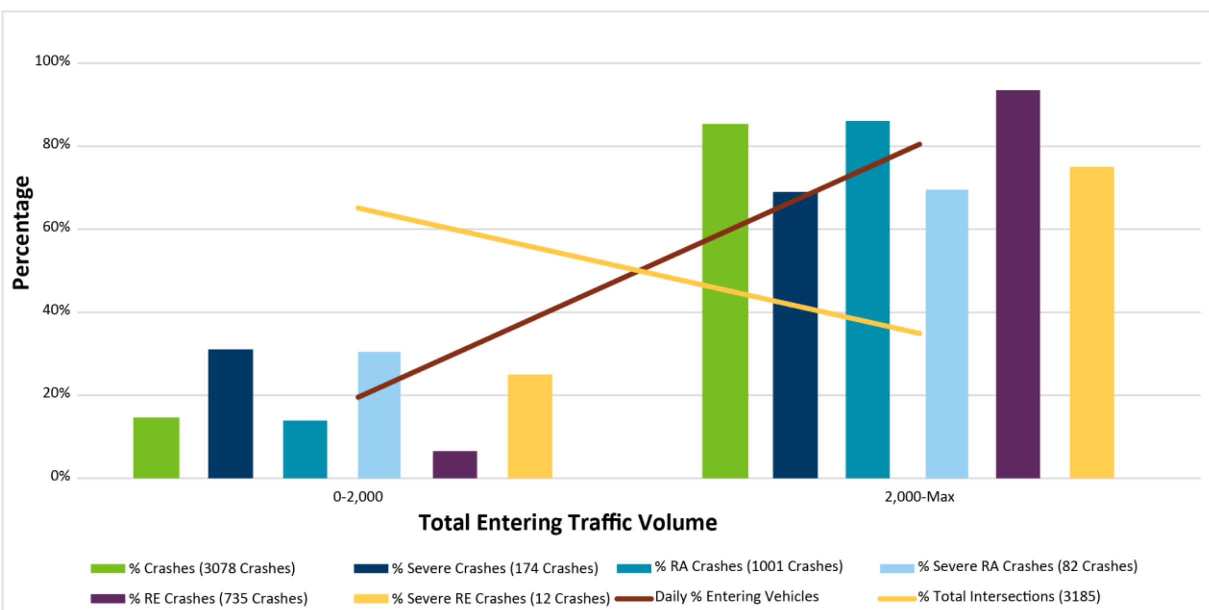


Figure 4-3. Systemic Risk Factor Rural Intersection Total Entering Traffic Volume

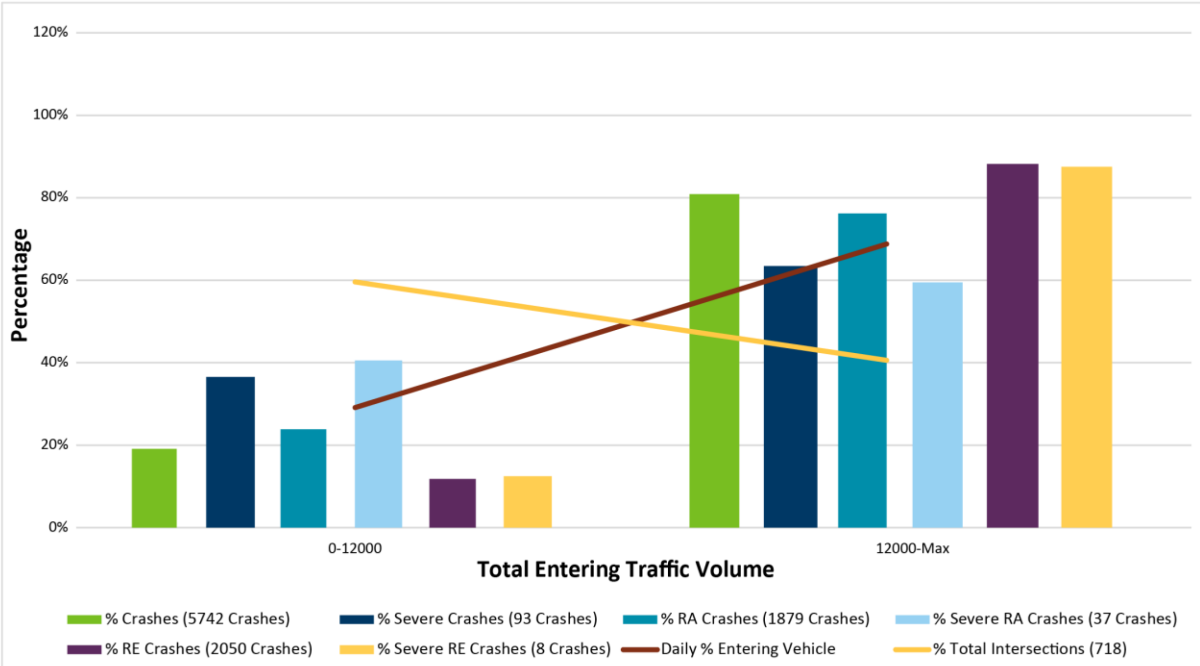


Figure 4-4. Systemic Risk Factor Urban Intersection Vehicle Related Total Entering Vehicles

In addition to testing each risk factor for over-representation, tests were also conducted to demonstrate that increasing numbers of risk factors were associated with greater risk, as measured by the density of crashes. Examples of the testing results for increased crash density include:

- Rural Intersections: Intersections with 5 risk factors present had a severe crash density that were twice the average for all rural intersections and the severe crash density for intersections with 6 or more risk factors were at least four times higher than the average (Figure 4-5).
- Rural Curves: Curves with 6 to 8 risk factors present had severe crash densities and severe Lane Departure crash densities as much as six times higher than the average for all rural curves (Figure 4-6).

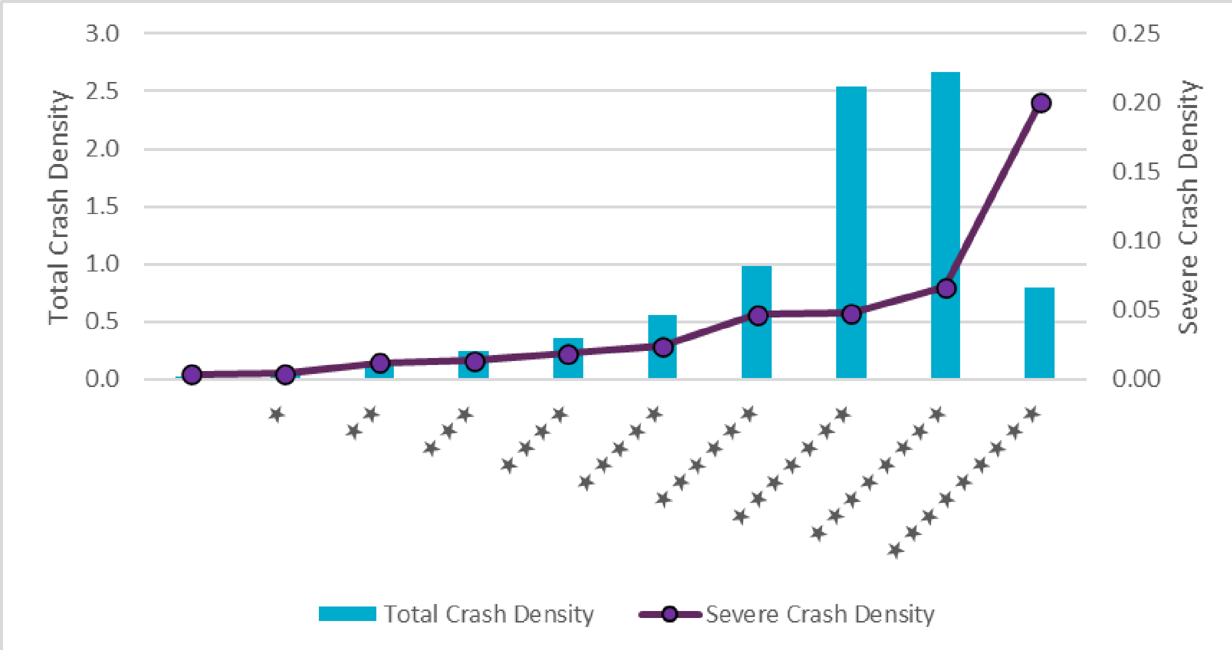


Figure 4-5. Rural Intersection Crash Density Distribution Versus Systemic Risk Rating

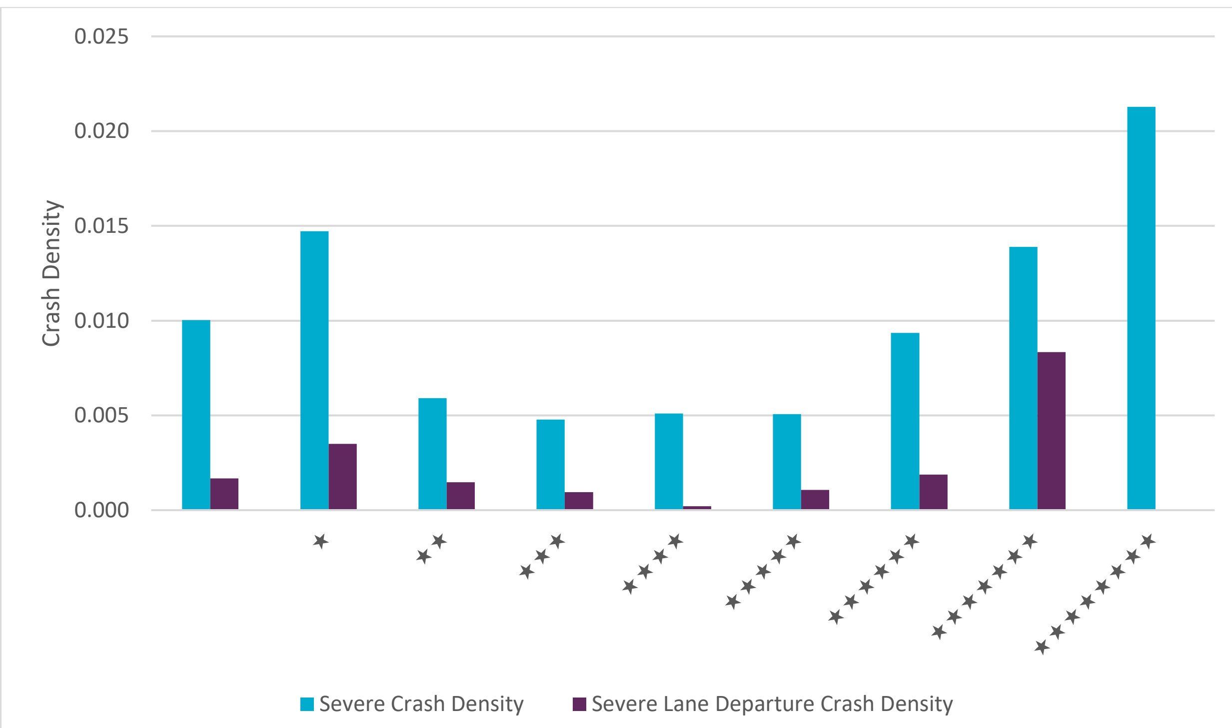


Figure 4-6. Rural Curve Severe Crash Density Distribution Versus Systemic Risk Rating

The results of over-representation testing and severe crash distribution along with additional data recommended the use of an expanded list of risk factors for Clay County. The adopted risk factors for rural segments, curves and intersections plus urban segments and intersections in Clay County are documented in Tables 4-1 through 4-6.

Table 4-1. Rural Segment Risk Factors

Risk Factor	**Risk Factor Criteria**
Speed Limit	55 miles per hour or greater
ADT Single Vehicle[1]	500 to 2,000 vehicles per day
ADT Multi-Vehicle[2]	1,250 vehicles per day and greater
Access Density	More than 7 accesses per mile (driveways, field entrances, and public streets), but less than 18 per mile
Curve Density	.6 or more curves per mile
Edge Risk	2S with no shoulder or steep slopes or 3 deficiencies (no shoulder, steep slope, or fixed objects)

[1]Risk factor intended to address severe crashes involving single vehicles
[2]Risk factor intended to address severe crashes involving multiple vehicles

Table 4-2. Curves Risk Factors

Risk Factor	**Risk Factor Criteria**
Radius	500 feet to 1,400 feet
Traffic Volume	200 to 800 vehicles per day
Lane Width	Less than 12 feet
Shoulder Type	None, gravel, composite
Total Cross Section Width	28 to 34 feet
Adjacent Intersection	Roadway or railroad crossing
Visual Trap	Present
Outside Edge Risk	2S or 3 deficiencies (no shoulder, steep slope, or fixed objects)

Table 4-3. Rural Intersection Risk Factors

Risk Factor	**Risk Factor Criteria**
Context Zone	Commercial, industrial, mixed use, or residential
Total Entering ADT *OR* *ADT Cross Product*	Volume ≥2,000 vehicles per day OR Greater than 1,000,000 vehicles per day
Leg Configuration	4
Alignment Skew	Greater than 10 degrees
Adjacent Railroad Crossing	Present
Adjacent Curve	Horizontal, vertical, or both
Adjacent Commercial Development	Present
Previous STOP	Greater than 5 miles
Major Approach Speed Limit	60 miles per hour or greater on either major approach
Major Approach Turn Lane Configuration	Left/through/through/right, and turn/bypass on either major approach

Table 4-4. Urban Segment Risk Factors

Risk Factor	**Risk Factor Criteria**
Context Zone	Commercial and mixed use
Speed Limit	50 and above miles per hour
Lane Width	10 to 11.5 feet
Edgeline Striping	None
Parking	Present
ADT	4,000 to 14,000 vehicles per day
Access Density	Greater than 15 accesses per mile (driveways, field entrances and public streets), but less than 25 per mile
Cross Section	Multi-lane
Edge Risk	3 deficiencies (no shoulder, steep slope, or fixed objects)
Shoulder Width	Less than 3 feet

Table 4-5. Urban Intersection Risk Factors/Vehicle Related Crashes

Risk Factor	**Risk Factor Criteria**
Context Zone	Commercial
Traffic Control Device	Signal
Total Entering ADT *OR* *ADT Cross Product*	Greater than 12,000 vehicles per day OR Greater than 20,000,000 vehicles per day
Leg Configuration	4
Major Division Type	Divided
Alignment Skew	Greater than 10 degrees
Adjacent Commercial Development	Present
Major Approach Speed Limit *OR* *Minor Approach Speed Limit*	40 miles per hour and greater OR 35 miles per hour and greater
Major Approach Left Turn Phasing	Any type of permitted operation
Major Approach Turn Lane Configuration.	2 left turn lanes OR 2 or more through lanes

Table 4-6. Urban Intersection Risk Factors/Pedestrian/Bike Related Crashes

Risk Factor	**Risk Factor Criteria**
Traffic Signal	Present
Total Entering ADT	12,000 and greater
Adjacent Development	Present
Number of Lanes Crossed	4 or more
Presence of Sidewalk	Some or none
Crossing Type	Markings only

4.2 Prioritization of Candidate Locations

The analytical process applied the adopted risk factors to Clay County's roadway segments, curves, and intersections to generate a priority listing – the greater the number of locational risk factors, the higher the candidate priority for safety project development. The overall objective was to use the risk factors to identify a minority of the county system that contained the majority of severe crashes and designate these locations as high priority candidates.

The number of risk factors varies by facility type, from a low of three risk factors for urban intersections related to Pedestrian/Bike crashes to a high of twelve risk factors for urban intersections related to Vehicle crashes. The distribution of severe crashes by risk factors also varies by facility type. As a result, the threshold for designating locations as high priority also varied, from a low of two for urban segments to a high of six for Vehicle Related urban intersections. However, across all counties, the sliding scale of risk factors generally resulted in between 20 percent and 50 percent of the system designated as high priority for safety project development. This was considered a reasonable fraction of the county system based on factors such as the amount of HSIP funding available, the typical cost of safety projects, the extraordinarily low density of severe crashes, and the goal of widely deploying safety projects across the county system.

Results of the prioritization process in Clay County include identifying the following high priority candidate locations for safety project development. Tables 4-7 through 4-12 show an example (first 10 projects) of the full project lists included in Appendix D:

- Rural Segments:
  - 73 segments (272 miles) evaluated
  - 37 segments (198 miles) designated as high priority (3 or more risk factors)
- Rural Curves:
  - 55 curves evaluated
  - 20 curves designated as high priority (3 or more risk factors)
- Rural Intersections:
  - 153 intersections evaluated
  - 50 intersections designated as high priority (3 or more risk factors)
- Urban Segments:
  - 8 segments (12 miles) evaluated
  - 2 segments (4.4 miles) designated as high priority (3 or more risk factors)
- Urban Intersections (Vehicle Related):
  - 17 intersections evaluated
  - 8 intersections designated as high priority (3 or more risk factors)
- Urban Intersections (Pedestrian/Bike Related):
  - 17 intersections evaluated
  - 8 intersections designated as high priority (2 or more risk factors)

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Table 4-7. Rural Segment Prioritization – Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length (Miles)	ADT [vpd]	Speed Limit	ADT Single-Vehicle	ADT Multi-Vehicle	Access Density	Curve Density	Edge Risk	Total Stars
1	1	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	3.28	1303	★	★	★	★	★	★	★★★★★★
14	2	11.004	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	0.60	1800	★	★	★	★	★		★★★★★
23	3	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	3.00	1375	★	★	★	★	★		★★★★★
66	4	6.001	CSAH	6	Intersection of CSAH6/MN 32 and 120th Ave S	Intersection of CSAH 6 and 300th St S	2.98	1350	★	★	★	★		★	★★★★★
2	5	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	6.97	1800	★	★	★	★			★★★★
4	6	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	14.84	2100	★		★	★	★		★★★★
8	7	100.005	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	5.26	60	★			★	★	★	★★★★
13	8	11.003	CSAH	11	Intersection of CSAH11/1st Ave E and King Trail Rd N	593 ft South of Intersection of 70th St S and I-94	4.36	1055	★	★		★		★	★★★★
15	9	11.005	CSAH	11	3103 ft North of Intersection of CSAH11/US 10 and 70th St S	Intersection of 28th Ave N and 70th St N	1.42	1800	★	★	★	★			★★★★
16	10	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	5.06	1200	★	★		★	★		★★★★

See Appendix D for complete table of prioritized locations

Notes: ADT = average daily traffic

CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Segment

Table 4-8. Rural Curve Prioritization - Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Radius [Feet]	ADT [vpd]	Lane Width [Feet]	High Side Shoulder Type	Total Cross Section Width [Feet]	Adjacent Intersection	Visual Trap	Outside Edge Risk	Total Stars
52	1	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	★	★		★		★	★	★	★★★★★★
31	2	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★	★			★	★		★	★★★★★
32	3	31.002	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★	★			★	★	★		★★★★★
41	4	35.002	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	★	★			★	★		★	★★★★★
48	5	100.001	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102			★	★		★	★	★	★★★★★
24	6	19.001	CSAH	19	Intersection of CSAH19/1st St NE and 11th St N	Intersection of 110th St N and 28th Ave N	★	★			★			★	★★★★
42	7	35.003	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	★	★			★			★	★★★★
49	8	100.002	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	★		★	★				★	★★★★
54	9	96.003	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5		★	★	★				★	★★★★
55	10	96.004	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5		★	★	★				★	★★★★

See Appendix D for complete table of prioritized locations.

Notes: CR = County Road; mph = mile(s) per hour;

CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Curve

Table 4-9. Rural Intersection Prioritization - Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Context Zone	Total Entering ADT or Cross Product[a]	Leg Configuration	Alignment Skew [Degrees]	Adjacent Railroad Crossing	Adjacent Curve	Adjacent Commercial Development	Previous STOP [> 5 Miles]	Major Approach Speed Limit	Major Approach Turn Lane Configuration	Total Stars
127	1	5.001	CSAH	5	US 75	CSAH 5 (100th Ave N)		★	★	★	★	★			★		★★★★★★
10	2	10.008	CSAH	10	MN 9	CSAH 10 (90th Ave S)	★	★	★	★				★	★		★★★★★★
75	3	2.002	CSAH	2	US 75 (14th St S)	CSAH 2 (160th Ave S)	★	★	★					★	★		★★★★★
3	4	10.001	CSAH	10	CSAH 52	CSAH 10 (90th Ave S)		★	★	★	★			★			★★★★★
17	5	10.015	CSAH	10	MN 32	CSAH 10 (90th Ave S)		★	★	★				★	★		★★★★★
89	6	23.001	CSAH	23	US 10	CSAH 23 (190th St S)		★	★					★	★	★	★★★★★
92	7	26.003	CSAH	26	US 75	CSAH 26 (90th Ave N)		★	★		★			★	★		★★★★★
101	8	26.012	CSAH	26	MN 32	CSAH 26 (Front St)	★	★	★		★			★			★★★★★
110	9	31.004	CSAH	31	US 10	CSAH 31 (230th St)	★	★	★					★		★	★★★★★
115	10	34.001	CSAH	34	US 75	CSAH 34	★	★	★					★	★		★★★★★

See Appendix D for complete table of prioritized locations.

Notes:[a] Units of measure differ. Entering ADT is vpd, cross product is vpd^2

CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Intersection

Table 4-10. Urban Segment Prioritization - Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [Miles]	ADT [vpd]	Context Zone	Speed Limit	Lane Width	Edgeline Striping	Parking	ADT	Access Density	Cross Section	Edge Risk	Shoulder Width	Total Stars
3	1	3.001	CSAH	3	Intersection of CSAH3/US 10 and 11th St N	Intersection of 11th St N and 2nd Ave N	0.14	4600	★	★				★				★	★★★★
1	2	3.002	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	4.30	5583					★	★				★	★★★
2	3	9.001	CSAH	9	Intersection of CSAH9/US 10 Frontage Rd and CSAH 9	Intersection of 28th Ave N and 40th St N	2.00	1540		★					★				★★
6	4	78.003	CR	78	Intersection of CR78 and CSAH 72	Intersection of 2nd Ave SE and Main St S	1.30	330		★					★				★★
7	5	20.001	CSAH	20	Intersection of CSAH20/47th Ave NW and 70th Ave NW	.16 Miles West of Intersection of 9th St N and 70th Ave N	0.86	340		★		★							★★
8	6	52.008	CSAH	52	738 ft North of Intersection of CSAH52/34th Ave S and CSAH 52	Intersection of I-94 and CSAH 52	0.68	6000		★				★					★★
4	7	7.002	CSAH	7	.06 Miles South of Intersection of CSAH7/41st Ave S and 40th St S	Intersection of MN 52 and 40th St S	0.52	1950		★									★
5	8	22.001	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	2.17	4333						★					★

See Appendix D for complete table of prioritized locations.

Note: CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Segment

Table 4-11. Urban Intersection Prioritization Vehicle Related - Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Context Zone	Traffic Control Device	Total Entering ADT or Cross Product[a]	Leg Configuration	Major Division Type	Alignment Skew [Degrees]	Adjacent Commercial Development	Major/Minor Approach Speed Limit	Major Approach Left Turn Lane Phasing	Major Approach Turn Lane Configuration	Total Stars
3	1	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★	★	★	★	★				★	★	★★★★★★★
2	2	3.001	CSAH	3	US 10	CSAH 3	★	★	★	★					★	★	★★★★★★
14	3	9.001	CSAH	9	US 10	CSAH 9			★	★	★		★	★		★	★★★★★★
10	4	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52		★	★	★	★				★	★	★★★★★★
7	5	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)		★	★	★					★	★	★★★★★
1	6	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)				★		★		★			★★★
9	7	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)				★		★		★			★★★
15	8	75.001	CR	75	US 75 (8th St S)	MSAS 146 (50th Ave S)	★			★				★			★★★
5	9	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)			★	★							★★
6	10	3.006	CSAH	3	CSAH 3 (11th St N)	CSAH 18 (28th Ave N)						★		★			★★

See Appendix D for complete table of prioritized locations.

Notes: [a] Units of measure differ. Entering ADT is vpd, cross product is vpd^2.

CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Intersection

Table 4-12. Urban Intersection Prioritization Pedestrian/Bike Related - Example Table

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Traffic Control Device	Total Entering ADT	Adjacent Commercial Development	Max Number of Lanes Crossed	Presence of Sidewalk	Pedestrian Crossing Type	Total Stars
2	1	3.001	CSAH	3	US 10	CSAH 3	★	★		★	★	★	★★★★★
7	2	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)	★	★		★		★	★★★★
3	3	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★	★		★		★	★★★★
14	4	9.001	CSAH	9	US 10	CSAH 9		★	★	★	★		★★★★
10	5	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52	★			★	★	★	★★★★
8	6	45.002	CSAH	45	US 10 (Center Ave E)	CSAH 45 (7th St SE)				★	★		★★
12	7	7.009	CSAH	7	CSAH 7 (40th St S)	MSAS 138 (40th Ave S)				★	★		★★
5	8	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)		★			★		★★
1	9	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)					★		★
9	10	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)					★		★

See Appendix D for complete table of prioritized locations.

Note: CRSP 2 ID Example: 1.001: 1 = Route Number 1; 001 = First Intersection

5.0 Beyond Infrastructure – County Highway Collaboration to Improve Local Road Safety

The focus of CRSP is to identify recommended priority safety projects at priority site locations within the County highway department's area of responsibility—namely, roadway infrastructure or engineering. However, the CRSP 2 process and this Plan recognize that severe traffic crashes are often largely due to poor driving behavior such as willful disregard for traffic laws and traffic control devices (e.g., texting while driving, not stopping at stop signs, red-light-running, speeding). Consequently, infrastructure safety improvements (e.g., rumble strips, improved intersection signing, etc.) are enhanced when deployed as part of a comprehensive and community-wide traffic safety approach. This section of the Plan looks beyond infrastructure safety improvements to guide county engineering staff to further engage with Regional TZD efforts through interdisciplinary collaboration to improve safety on county roads.

Traffic crashes are complex occurrences that often have multiple crash contributors. Traffic crashes may result from any combination of overlapping crash factors including the roadway or driving environment, the vehicle, and driver behavior. Figure 5-1 illustrates the complex interrelationship among these three crash contributors.

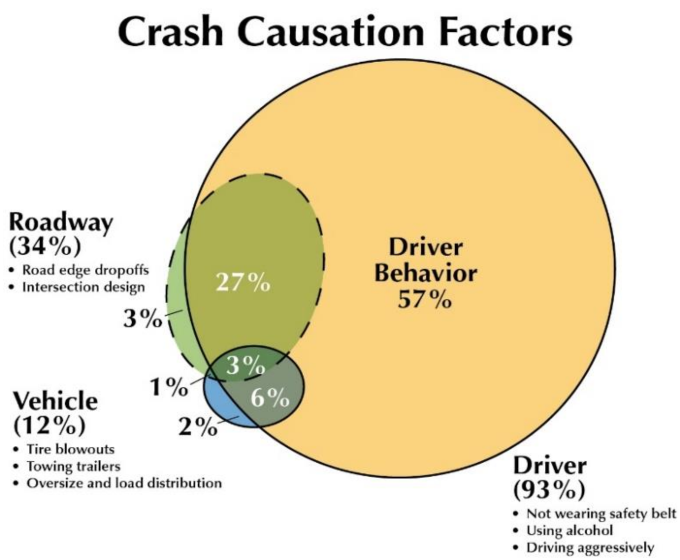

Figure 5-1. Crash Causation Factors[1]

Source: Human Factors and Highway Safety, FHWA Office of Safety Programs

[1] Figure 5-1 indicates the percentage of crashes influenced by each factor alone represented by non-overlapping sections (driver behavior is yellow, roadway is green, and vehicle is blue) while those sections that do overlap with other crash factors indicate the complex occurrence where multiple factors contribute to a crash. The percentages in the parentheses indicate the total influence a crash factor has to all crashes, whether exclusive or contributing with other factors.

These crash causation factors indicate that 93 percent of traffic crashes are due, in part, to driver behavior. Research supports, and CRSP 2 workshop participants across the state observed, that driver inattention/distractions, driver decision errors/poor judgment, and poor driver performance are primary factors contributing to traffic crashes (NHTSA, 2015a).

Minnesota statewide crash data from 2016 through 2020 was reviewed during CRSP 2 and revealed the following crash factors for the county road system.

- 48 percent Lane Departure while operating a motor vehicle
- 47 percent Intersection Related
- 15 percent Unbelted Motorists
- 28 percent Impaired Driver
- 11 percent Inattentive/Distracted Driver
- 20 percent Speed Related

The risk factors and their percentages, when added together, exceed 100 percent because severe crashes typically involve multiple overlapping factors working in unison to contribute to the crash (e.g., an impaired driver who was driving too fast and departed his lane). In addition to infrastructure safety needs, CRSP 2 workshop participants discussed common themes and expressed concern about the growing number of drivers who:

- Use their smartphone
- Drive under the influence of alcohol and drugs
- Are/have unbelted motorists
- Drive at unsafe speeds
- Fail to stop or yield at stop-through intersections

Minnesota's county highway staff recognizes that engineering and infrastructure investments alone will not eliminate all fatal and severe crashes until motorists also make safer choices. Therefore, county road safety efforts must reach beyond infrastructure or engineering safety strategies and actively support a comprehensive, multi-disciplinary approach to road safety. This approach includes, but is not limited to, effective local traffic law enforcement, public education that touts the risks associated with poor driving choices, and emergency medical responses to effectively treat and transfer crash victims to the appropriate level of hospital care. Leveraging local infrastructure strategies with driver behavior-related safety strategies strengthens the safety impact of county efforts to reduce severe crashes.

5.1 County Highway Engineering Coordination with Minnesota Toward Zero Deaths Program

To foster interdisciplinary cooperation and engagement at the state, regional, and local level, the statewide Minnesota TZD Program employs an integrated approach of engineering, enforcement, education, emergency medical and trauma services, and more (e.g., supportive and informed judicial staff and strong traffic safety legislation) to move Minnesota toward its zero fatality vision. In addition to the statewide TZD Program efforts, regional partnerships created in eight Minnesota geographic areas promote local-level TZD efforts. Each Regional TZD partnership has a local steering committee, co-led by MnDOT and State Patrol District personnel, to foster cooperation, establish safety priorities and initiatives, and leverage resources.

Minnesota's 87 counties are encouraged to collaborate with local driver-behavior safety partners and with the county's Regional TZD Program Coordinator to improve safety on local roadways. See Appendix E for Regional TZD Coordinator contact information.

5.2 Collaborations to Strengthen Local Road Safety

The following are a few examples of infrastructure-based safety strategies enhanced through interdisciplinary TZD collaboration.

- **Cooperatively conduct county road safety presentations with the assistance of local law enforcement and local safety coalition members**. Extend invitations to local law enforcement and safety coalition members to cooperatively participate in road safety presentations for county board or other public meetings on crash-causation and trends, effective safety countermeasures, and local support needed. Safety presentations that include behavioral safety partners reinforce awareness that preventing roadway deaths cannot be achieved through infrastructure improvements alone but require a comprehensive, interdisciplinary approach.
- **Deploy Lane Departure infrastructure safety strategies coupled with enhanced enforcement and public outreach**. To maximize the expected safety benefit of the Lane Departure safety strategies – such as centerline and edgeline rumble or mumble strips, high visibility pavement markings, and adding or widening edgelines – integrate increased enforcement presence at targeted, high-risk locations and timeframes. Coupling infrastructure strategies with additional enforcement, along with public media outreach about the problem/risk, infrastructure deployment and the added enforcement, will improve safety and reduce risky driver behavior by strengthening the public's perceived risk of being stopped.
- **Cooperatively deploy roving vehicle speed display signs, with extra enforcement, to reduce speed**. Speed is a persistent contributor to traffic deaths on Minnesota roads and reductions in speed related crashes have proven difficult. Roving dynamic speed display signs are changeable message signs activated by radar, or other speed-sensing devices, that display an approaching driver's traveling speed. This driver feedback in conjunction with visible enforcement puts the driver on notice to slow down. Deployment of dynamic speed display signs to reduce speed requires the cooperative effort of highway agencies and law enforcement as well as local media to inform the public.
- **Support the expanded use of red light running confirmation lights coupled with enhanced enforcement**. To reduce the most common type of serious crash at signalized intersections (right-angle crashes), an innovative, low-cost red light running confirmation enforcement light enables one officer to monitor an intersection from a downstream location to directly observe red light running violations and issue citations more effectively and safely without requiring pursuit through the intersection. Red light running confirmation lights require only one officer and, because the confirmation lights come on the same instant as the red light of the signal, officers spend less time in court. Red light running confirmation lights require

strong collaboration between county engineering and local law enforcement. In addition, public education and media outreach about the red light running confirmation lights, with supporting enforcement, deters drivers from high-risk red light running.

- **Consider the use of road safety audits and other crash analysis approaches to gain post-crash perspectives of severe crash causation and potential safety improvements**. Although a cornerstone of the CRSP 2 process is the systemic analyses of roadway risk factors contributing to severe crashes and to proactively apply a safety treatment to priority locations to prevent a severe crash, if a fatal or serious injury crash occurs, consider engaging a multi-disciplinary safety team to share perspectives. Local safety stakeholders representing engineering, enforcement, education, and education outreach or local TZD Safe Road Coalition members can offer valuable insight to both the roadway and driver behavior components of a severe crash, its causation, and interdisciplinary approaches to improving the roadway safety and maximizing the impact of infrastructure safety strategies.

Although the focus of the CRSPs is to identify priority infrastructure safety investments at high-risk locations, county highway staff recognize the importance of reaching beyond infrastructure and implementing a collaborative, multi-disciplinary approach to improving road safety, an approach that aligns with the statewide Minnesota TZD Program and the Minnesota SHSP.

6.0 Safety Project Development and Recommended Projects

This CRSP document is developed with a focus on proven effective strategies that can be widely implemented at low-cost and at several locations with a higher probability of risk of severe crashes. A systemic deployment of strategies is implemented to address risk of potential for severe crashes where the crash densities are too low to warrant a spot analysis. In Minnesota, the crash densities are approximately 0.01 severe crashes per mile per year across the county roadway system, which is not statistically significant when observed individually. In the CRSP 2 approach, the presence of a crash is viewed as complimentary to the risk analysis rather than a sole influencer. Additionally, since HSIP provides limited funding, low-cost strategies allow for wider deployment and treatment of more at-risk locations on the county system.

6.1 Safety Project Development Technical Process

The first step in the safety project development process involved documenting existing roadway and traffic volume characteristics of each candidate location and then working through a checklist that considers how these features influence selection of a particular recommended strategy. After the initial check, the second step is developing a **decision tree** for candidate locations. Multiple iterations and refinement went into the development of the six unique decision trees for CRSP 2 that helped guide safety strategies for:

- Rural Segments (See Figure 6-1)
- Rural Curves (See Figure 6-2)
- Rural Intersections (See Figure 6-3)
- Urban Segments (See Figure 6-4)
- Urban Intersections – Vehicle Related (See Figure 6-5)
- Urban Intersections – Ped/Bike Related (See Figure 6-6)

The final step in the technical process of updating the Clay CRSP involves developing a list of recommended safety projects – a specific infrastructure-based safety strategy for each of the identified high priority locations. The updating process for CRSP 2 is more complex and comprehensive than CRSP 1 because Clay County has already implemented many of the recommended safety projects identified in CRSP 1. Additionally, CRSP 2 has a large number of strategies that are eligible to compete for HSIP funding.

The process for safety project development utilizes a technical approach to limit subjectivity that could be exhibited when making countermeasure recommendations. Collaboration with County staff was also necessary so that the final lists of recommended projects will be the most impactful and reduce the associated risk and/or address prior crash history at high priority locations. Key points associated with the individual crash trees are described in the following paragraphs and illustrated in the accompanying figures.

6.2 Rural Segments

Preventing Lane Departure crashes, both single vehicle run-off the road and cross center head-on collisions, is the primary focus of safety project development along rural segments. Crash data indicates that single-vehicle crashes are over-represented where traffic volumes are between 500 and 2,000 vehicles per day and multiple Vehicle crashes are over-represented where traffic volumes are 1,250 vehicles per day and greater. This suggests, for single-vehicle related crashes, implementing road edge improvements such as enhanced edgelines or edge/shoulder rumble strips along lower volume segments would be the most beneficial to address the associated risk. As for multi-vehicle related crashes, a combination of edge and centerline improvements such as center rumble strips or center buffers should be implemented along higher volume segments.

Other factors considered include lane width and the presence of noise sensitive receivers (residences, schools, etc.). Implementation of edge rumble strips results in the perception that the width of the road has been narrowed which can increase complaints about vehicle noise in a more residentially dense area. One experimental countermeasure that can improve road edge safety as well as reduce the noise from vehicles striking rumble strips is a newer technology called sinusoidal rumble strips, or mumble strips. Since this is still an experimental strategy and not widely deployed, further research and performance evaluation should be considered before wide deployment. If lane widths are 12 feet, edge rumble strips are recommended. However, if lane widths are less than 12 feet, then enhanced edgelines are recommended, which can consist of, for example, 6-inch edgelines or embedded wet-reflective pavement markings.

Project implementation typically focuses lower cost strategies (enhanced edgelines) on roadways with less volume where crash densities are low and the highest cost strategies (center buffers) are reserved for application along only the highest volume roadways.

6.3 Rural Curves

Preventing Lane Departure crashes is the primary focus of rural curve safety project development. Safety literature and Minnesota’s crash data indicates that the risk of a Lane Departure crash in curves decreases with increasing length of curve radius. However, reconstructing curves to increase their radius typically costs between $500,000 and $1,000,000 per curve. There are approximately 30,000 curves along Minnesota’s county road system; therefore, reconstruction was not considered a feasible strategy to implement statewide due to limited funding. Instead, a number of lower cost safety strategies for curves were identified and include enhanced warning signs to improve navigation through curves, address slippery surfaces in curves with a history of crashes related to adverse pavement conditions, clear zone maintenance to reduce the severity of crashes when vehicles run off the road, and convert curves with multiple-T intersections to single-T intersections.

When deciding on a package of enhanced warning signs, the primary factor considered is the speed differential between the posted speed limit on the curve approach and either the posted advisory speed in the curve or an inferred advisory speed computed using a formula that accounts for curve radius, super-elevation, and pavement friction. A speed differential of 5 miles per hour typically results in use of an advanced curve warning sign (if not already in-place), 10 miles per hour suggests the use of an advanced sign plus a speed advisory, and a 15 mile per hour differential suggests the use of an advanced sign, a speed advisory, and chevrons.

If the curve has a radius in the critical range and has a visual trap, chevrons would be recommended regardless of the speed differential.

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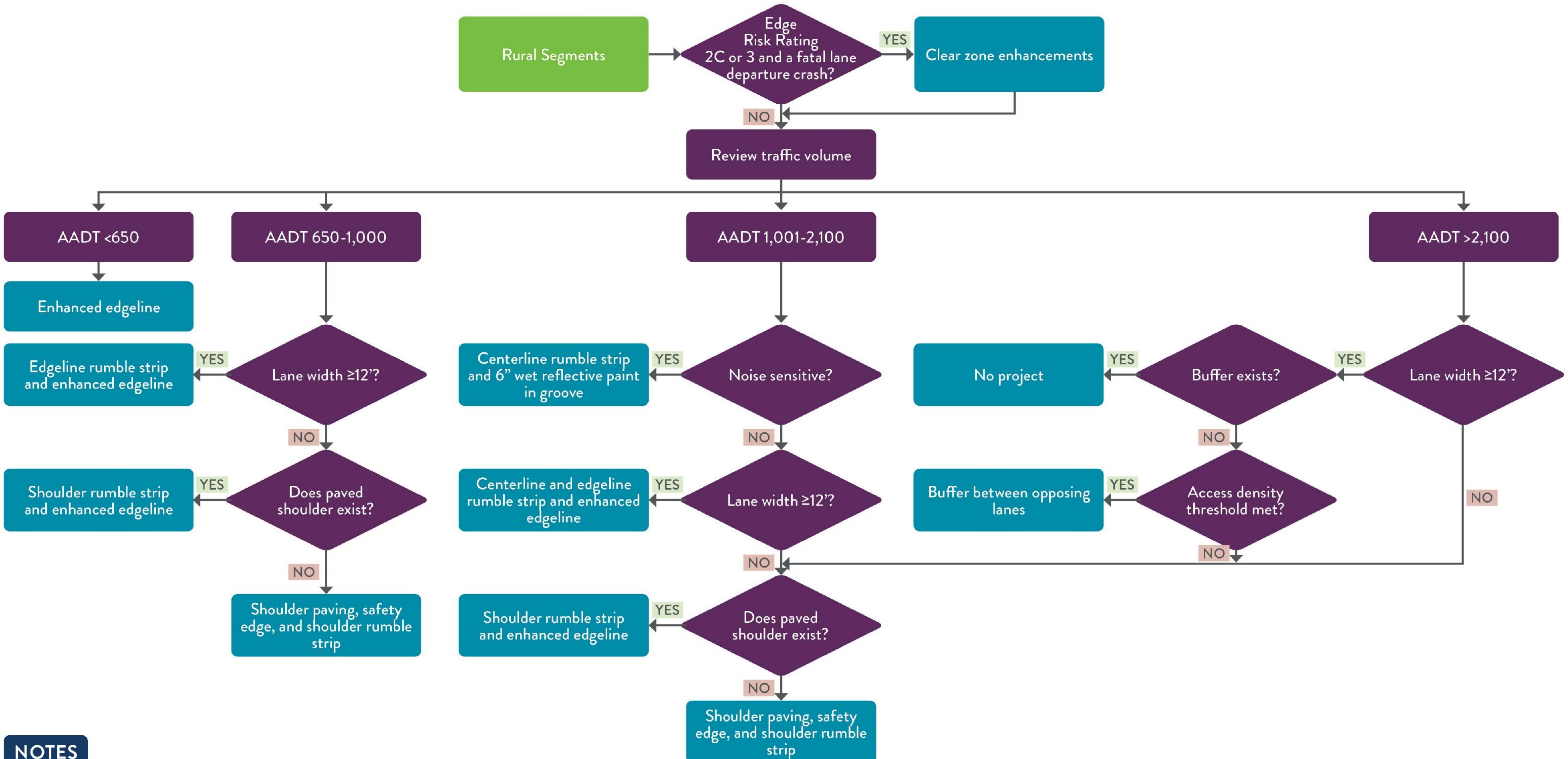


NOTES

Edge Risk Rating 2C: Usable shoulder, roadside with fixed objects

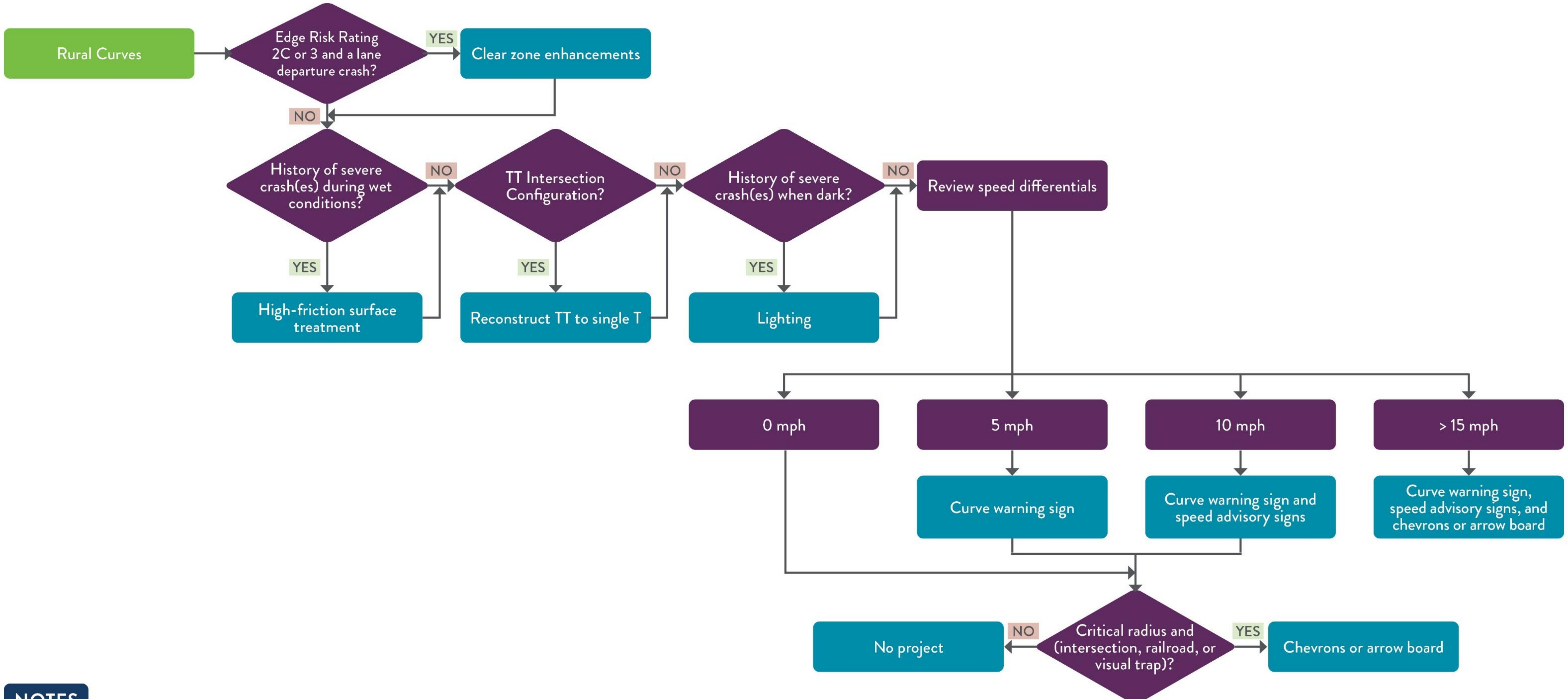
Edge Risk Rating 3: No usable shoulder, roadside with fixed objects

Clear Zone Enhancements: The project includes flattening of slopes, clearing, grubbing, right-of-way, entrance approaches and perhaps utility poles relocated. It does not include clear zone maintenance.

Noise Sensitive: Determined as residential areas, recreational, etc.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

Figure 6-1. Rural Segment Safety Project Decision Tree



NOTES

Edge Risk Rating 2C: Usable shoulder, roadside with fixed objects

Edge Risk Rating 3: No usable shoulder, roadside with fixed objects

Clear Zone Enhancements: The project includes flattening of slopes, clearing, grubbing, right-of-way, entrance approaches and perhaps utility poles relocated. It does not include clear zone maintenance.

TT Intersection Configuration: A closely spaced intersection to a curve with skewed approaches to the major road creating conflicting movements, with both vehicles turning at the intersections and vehicles maneuvering through the curve.

Speed Differential: Difference between the speed limit and the advisory speed.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

Figure 6-2. Rural Curve Safety Project Decision Tree

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6.4 Rural Intersections

In Minnesota, a right-angle collision is the most common type of severe crash at rural intersections. County-selected strategies for this collision type have been very effective at mitigating these crashes. Strategies have included enhancing intersection related traffic signs and pavement markings, adding street lights, providing a dynamic warning system, and geometric upgrades (turning lanes, J-Turn intersections, and roundabouts). Implementing these strategies range from a few thousand dollars for upgraded traffic signs and pavement markings to around $1 million for J-Turn intersections and roundabouts. The volume of traffic through the intersection and the roadway geometry were key factors considered when assigning a particular strategy to a specific intersection.

The crash analysis indicated that rural intersections with lower traffic volumes have fewer severe crashes than comparable intersections with higher volumes. Therefore, projects with lower costs were focused on for at-risk intersections with a variety of traffic volumes while projects of medium to higher costs were focused on for at-risk intersections with higher traffic volumes.

The cross section and geometry of the major roadway were also considered during project development. Since J-Turn intersections are most appropriately applied at intersections where the mainline has a divided cross section, they were only considered at locations where county roadways intersect with four-lane divided state highways. Application of rural roundabouts were only considered at intersections where the volume cross product (multiplication of major approaching volume with minor approaching volume) was equal to or exceeded 40 million. In other words, if an existing STOP controlled intersection met or exceeded the traffic volume that warrants a traffic signal, the project team recommended implementing a roundabout.

The occurrence of a prior severe crash was a prerequisite for suggesting higher cost strategies as a way of limiting the number of candidate locations consistent with the limitations in available safety funding. Additionally, to recommend a feasible number of projects with an appropriate associated cost, higher cost strategies were reserved for unique situations due to the limited amount of transportation safety funding available.

6.5 Urban Segments

The most common type of severe crashes along urban roadway segments are two-vehicle, rear-end and head-on crashes. The most commonly recommended project involves separating opposing traffic lanes and using this space to accommodate left-turning vehicles by converting wide two-lane or four-lane undivided roadways to either three-lane or five-lane cross sections. Key factors that were developed through the analysis that were considered during project development included roadway cross section, the volume of traffic, and access density.

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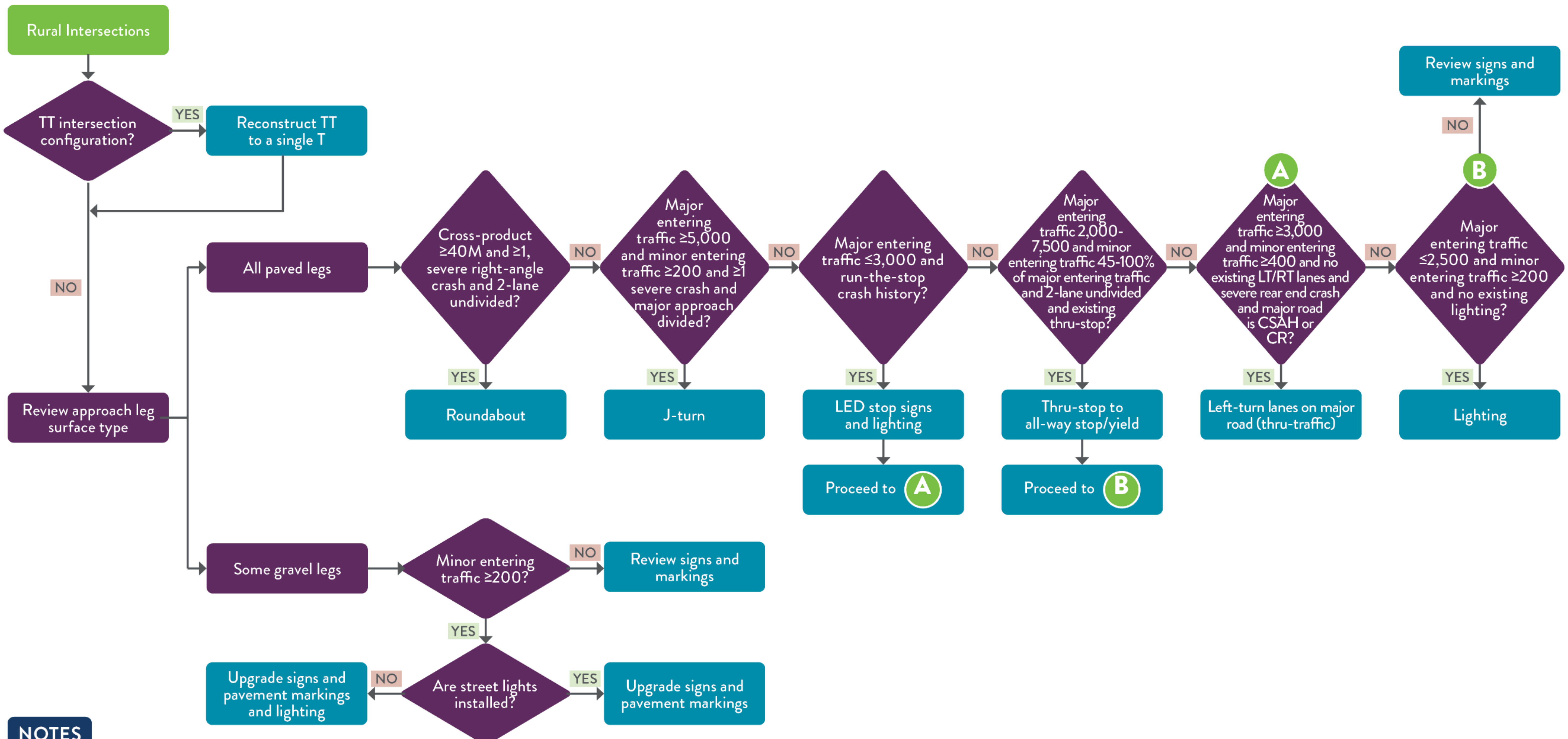

NOTES

Cross-Product: The product of the major entering traffic and minor entering traffic.

Entering Traffic:

- *Total Entering Traffic.* The sum of AADT on all approaches divided by 2.
- *Major or Minor Entering Traffic.* The sum of AADT for the Major or Minor approaches divided by 2. If a 5-leg intersection, the sum of three Major or Minor approaches is divided by 2.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

TT Intersection Configuration: A closely spaced intersection to a curve with skewed approaches to the major road creating conflicting movements, with both vehicles turning at the intersections and vehicles maneuvering through the curve.

Figure 6-3. Rural Intersection Safety Project Decision Tree

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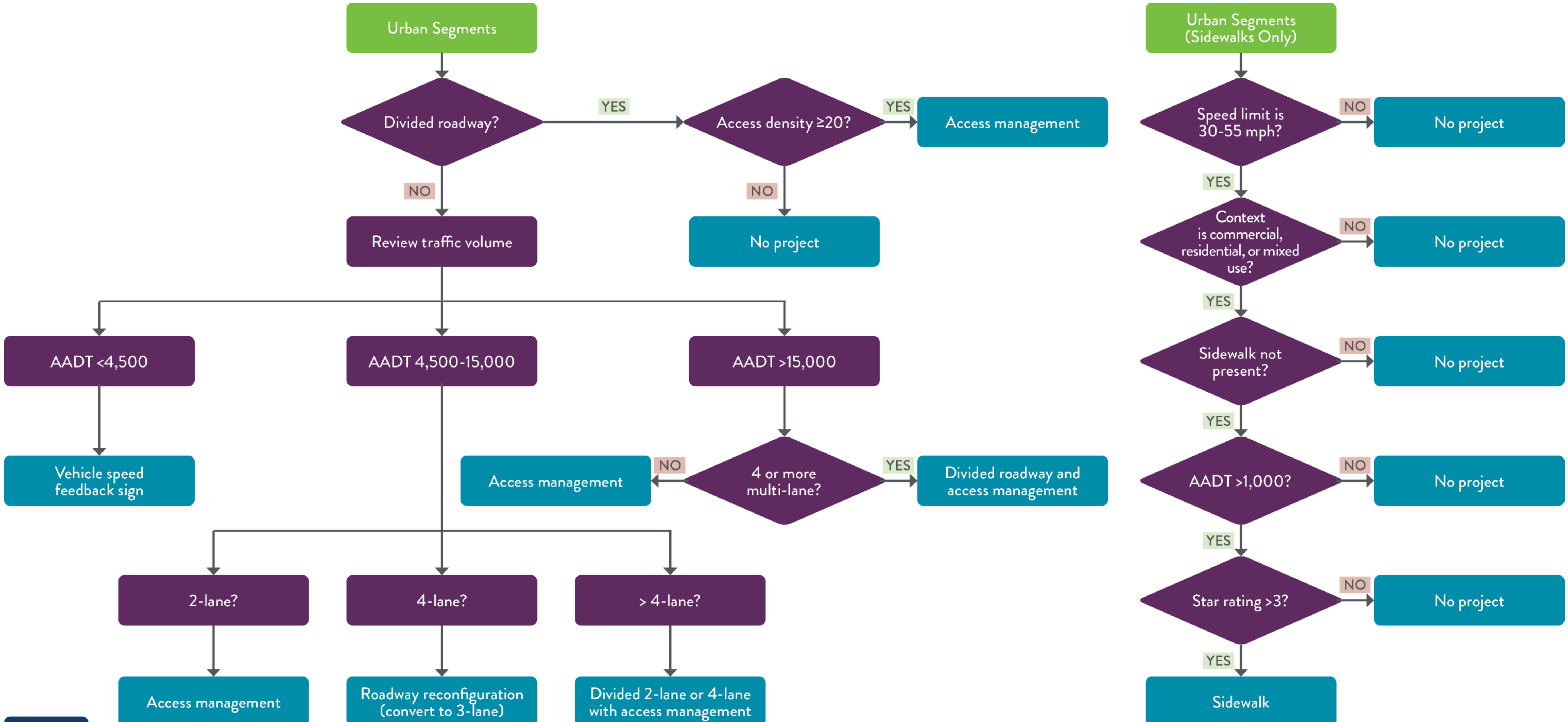

NOTES

Access Management: The planning, design, and **implementation of land use and transportation strategies to maintain a safe flow of traffic while accommodating the access needs of adjacent** development. Projects include limiting access points along the roadway and conflicts at driveways and intersections and increasing the distance between conflict points, so vehicles don't turn and cross in a chaotic way.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

Figure 6-4. Urban Segment Safety Project Decision Tree

6.6 Urban Intersections - Vehicle Related Crashes

In Minnesota, a right-angle collision between two vehicles is the most common type of severe crash at urban intersections. County-selected safety strategies at urban intersections include improving intersection geometry at unsignalized locations since installing traffic signals is not a safety strategy, adding confirmation lights to assist law enforcement to more efficiently address red light running, upgrading signal hardware, and converting to signalized J-Turn at locations already controlled by traffic signals.

Key considerations include the current type of intersection control, the volume of traffic through the intersection, the cross section of the major roadway, and the presence of a prior severe crash.

6.7 Urban Intersections - Pedestrian/Bike Related Crashes

In urban areas, the majority of severe pedestrian/bike related crashes occur at intersections and the majority of these occur at intersections controlled by traffic signals. This suggests that traffic signals by themselves are not a safety strategy for pedestrians and bicyclists. Primary objectives for this type of project development include:

- Avoiding the addition of traffic signals at unsignalized intersections and instead focusing on reducing the crossing distance that pedestrians and bicyclists must traverse by adding curb extensions or median refuge islands.
- Adding pedestrian activated devices such as rectangular rapid flash beacons and high intensity activated crosswalk beacons.
- Adding proven effective strategies at already signalized intersections, such as countdown timers and a leading pedestrian interval, which provides pedestrians with a 3 to 5 second head start before providing vehicles with a green light.

Key factors considered during the project development process include intersection control, the traffic volume, and the roadway cross section.

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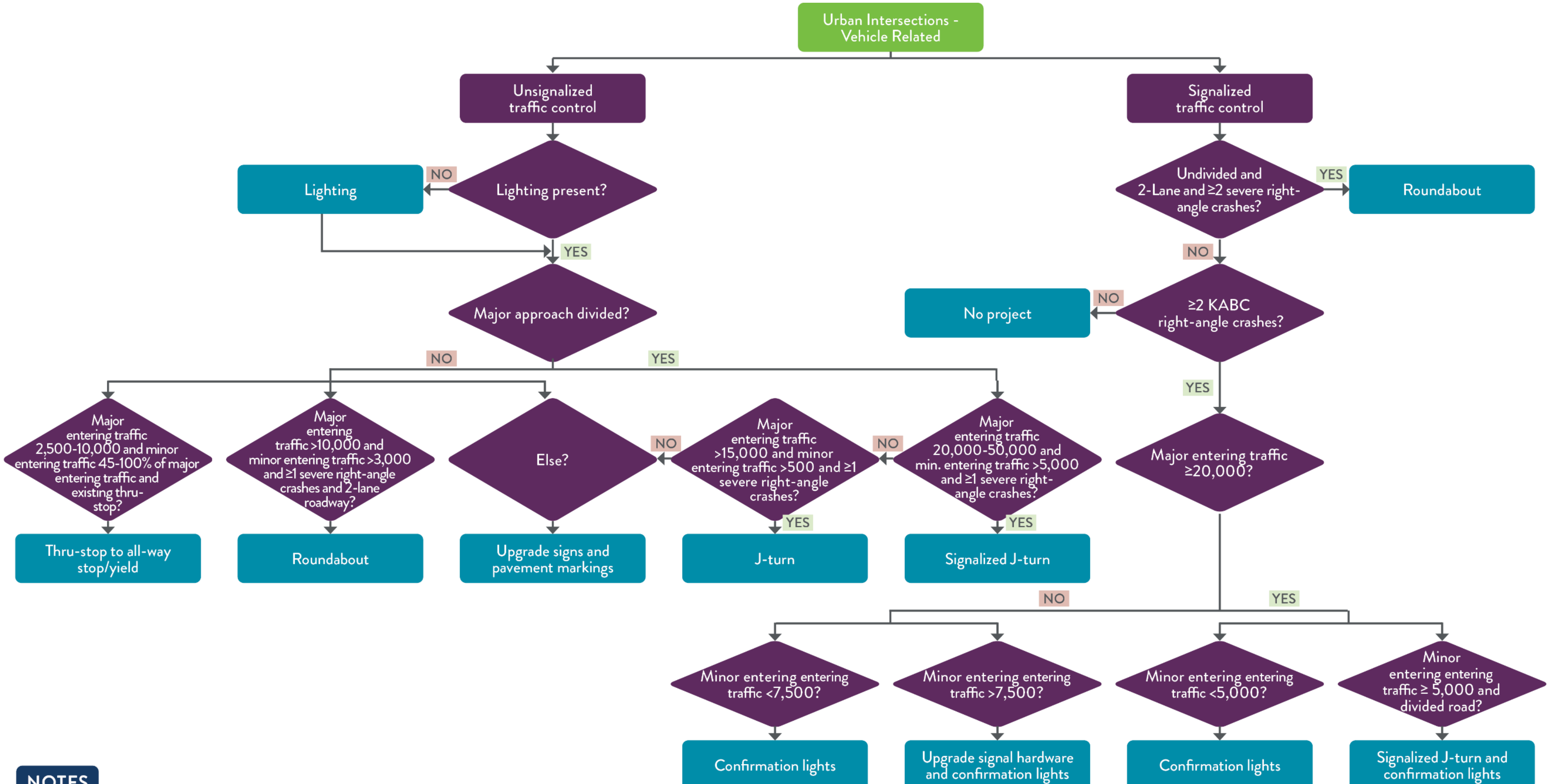

NOTES

Entering Traffic:

- *Total Entering Traffic.* The sum of AADT on all approaches divided by 2.
- *Major or Minor Entering Traffic.* The sum of AADT for the Major or Minor approaches divided by 2. If a 5-leg intersection, the sum of three Major or Minor approaches is divided by 2.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

Upgrade Signal Hardware: Includes projects such as pedestrian countdown timers, pedestrian push buttons, leading pedestrian intervals.

Figure 6-5. Urban Intersections – Vehicle Related Safety Project Decision Tree

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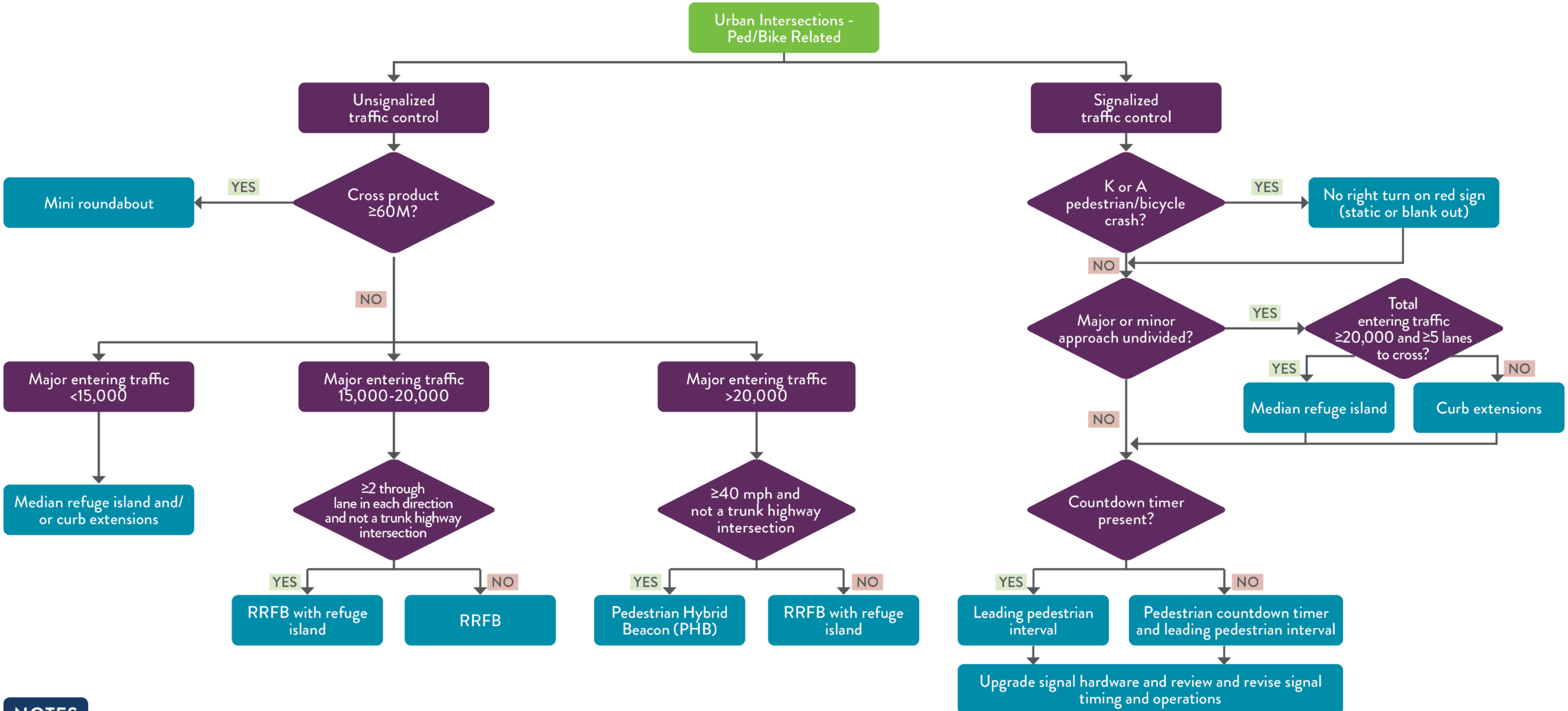

NOTES

Cross-Product: The product of the major entering traffic and minor entering traffic.

Entering Traffic:

- *Total Entering Traffic.* The sum of AADT on all approaches divided by 2.
- *Major or Minor Entering Traffic.* The sum of AADT for the Major or Minor approaches divided by 2. If a 5-leg intersection, the sum of three Major or Minor approaches is divided by 2.

Manual Project Assignment: Locations that do not satisfy any case explicitly in the decision trees are not automatically assigned a project and are separately considered for manual project assignment.

RRFB: Rectangular Rapid Flashing Beacon

Review and Revise Signal Timing and Operations: Includes recommendations to slow the walk phase to 3 ft/sec, eliminate flashing yellow on pedestrian push-button activation, etc.

Upgrade Signal Hardware: Includes projects such as pedestrian countdown timers, pedestrian push buttons, leading pedestrian intervals.

Figure 6-6. Urban Intersections – Pedestrian/Bike-Related Safety Project Decision Tree

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6.8 Recommended Safety Project Overview

The systemic risk assessment process identified at-risk locations that were considered priorities for safety project development and decision trees document the process that considered roadway features, traffic volumes, and the presence of prior crashes. This resulted in identification of a recommended safety project(s). An overview of the recommended projects is provided in the following paragraphs and summarized in Table 6-1. The full list of recommended projects can be found in Appendix F and the corresponding maps with project locations can be found in Appendix G.

- Rural Segments: 76 projects/$1,675,500
  - Buffer Between Opposing Lanes
  - Shoulder Paving and Safety Edge
  - Centerline Rumble Strip
  - Edgeline Rumble Strip
  - Shoulder Rumble Strip
  - Enhanced Edgeline
- Rural Curves: 7 projects/$109,000
  - Clear Zone Enhancements
  - Curve Warning Sign
  - Speed Advisory Signs
  - Chevrons or Arrow Board
- Rural Intersections: 55 projects/$1,191,000
  - Review Signs and Markings
  - Thru-stop to all way stop/yield
  - Lighting
  - LED Stop Signs
  - J-Turn
- Urban Segments: 1 project/$1,549,500
  - Access Management
- Urban Intersections (Vehicle Related): 6 projects/$30,500
  - Confirmation Lights
  - Lighting
  - Upgrade Signs and Pavement Markings
- Urban Intersections (pedestrian/bike related): 17 projects/$161,000

- Median Refuge Island
- Curb Extensions
- Pedestrian Countdown Timer
- Leading Pedestrian Interval
- Upgrade Signal Hardware and review and revise signal timing and operations

Table 6-1. Summary of Clay County Recommended Safety Projects

Project Type Category	Number of Projects	Estimated Cost
Rural		
Segments	76	$1,675,500
Curves	7	$109,000
Intersections	55	$1,191,000
Total Rural	*138*	*$3.0 million*
Urban		
Segments	1	$1,549,500
Intersections (Vehicle)	6	$30,500
Intersections (Ped/Bike)	17	$161,000
Total Urban	*24*	*$1.7 million*
Total	***162***	***$4.7 million***

One additional task that was completed as part of the overall safety project development process for Clay County was compiling project information in a single sheet in order to streamline the process for counties applying for HSIP funding. The HSIP submission form (Figure 6-7) includes a description of the location, crash history, a summary of the systemic risk factors, a list of alternative strategies considered, identification of the recommended project, and estimated project cost. HSIP Submission forms for every recommended project can be found in Appendix H.

Rural Segment Project on CSAH 1

Roadway Information

Segment Start:	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW
Segment End:	Intersection of 90th Ave NW and Broadway St NW
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	1
Facility Type:	2-Lane
Segment Length (mile):	3.28
Traffic Volume (vpd):	1303
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	4

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.12	0	0.06	0
Rate (per MVM):	0.26	0	0.13	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1303	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1303	xx ≥ 1,250	★
Curve Density (cur per mile):	0.91	xx ≥ 0.6	★
Access Density (access per mile):	11.58	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★★★

Priority Location √

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$9,846.08
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$9,846.08
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$8,861.47
				Total Estimated Project Cost	$28,553.63

Systemic Project √

Project Page #: 1
Segment ID: 1.001
Date: 3/29/2023

Figure 6-7. Sample Highway Safety Improvement Program Submission Form

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7.0 References

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Appendix A – List of Analyzed Locations

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Rural Segment List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No	CRSP 2 ID	Route System	Route No.	Start Description	End Description	Length [Miles]	Context Zone	Edge Risk	ADT [vpd]	Lane Width [Feet]	Access Density [access per mile]	Total Lane Departure Crashes	Fatal Lane Departure Crashes	Total HO+SSO Crashes	Severe HO+SSO Crashes
1	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	3.28	Agriculture	2S	1,303	12	11.6	1	0	0	0
2	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	6.97	Agriculture	1	1,800	12	8.5	4	0	1	0
3	10.002	CSAH	10	.35 Miles West of Intersection of CSAH10/MN 9 and CSAH 10	1386 ft East of Intersection of MN 9 and CSAH 10	0.62	Residential	1	3,300	12	56.7	0	0	0	0
4	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	14.84	Agriculture	1	2,100	12	9.4	14	0	0	0
5	100.002	CR	100	Intersection of CR100 and Bridge St	Intersection of US 75 and 160th Ave NW	0.10	Residential	2S	182	12	107.2	0	0	0	0
6	100.003	CR	100	Intersection of CR100/Main St and Probstfield	Intersection of Main St and Bridge St	0.07	Residential	1	105	12	71.1	0	0	0	0
7	100.004	CR	100	Intersection of CR100/Main St and Probstfield	528 ft North of Intersection of Howard St and Probstfield St	0.17	Residential	2S	105	12	69.9	0	0	0	0
8	100.005	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	5.26	Agriculture	2S	60	10.5	7.2	0	0	0	0
9	108.002	CR	108	Intersection of CR108/MN 9 and CR 108	1.04 Miles East of Intersection of 150th St N and 140th Ave N	2.06	Agriculture	2S	290	12	8.2	0	0	0	0
10	108.003	CR	108	1.04 Miles East of Intersection of CR108/150th St N and 140th Ave N	Intersection of 170th St N and 140th Ave N	0.88	Agriculture	2S	290	12	9.0	0	0	0	0
11	11.001	CSAH	11	Intersection of CSAH11/CSAH 50 and CSAH 3	704 ft South of Intersection of 1st St S and CSAH 11	10.09	Agriculture	1	430	12	11.4	2	0	1	0
12	11.002	CSAH	11	704 ft South of Intersection of CSAH11/1st St S and CSAH 11	Intersection of CSAH 11 and 1st Ave E	0.59	Residential	1	985	12	78.1	0	0	0	0
13	11.003	CSAH	11	Intersection of CSAH11/1st Ave E and King Trail Rd N	593 ft South of Intersection of 70th St S and I-94	4.36	Agriculture	2S	1,055	11	12.6	0	0	0	0
14	11.004	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	0.60	Agriculture	1	1,800	12	10.1	0	0	0	0
15	11.005	CSAH	11	3103 ft North of Intersection of CSAH11/US 10 and 70th St S	Intersection of 28th Ave N and 70th St N	1.42	Agriculture	1	1,800	12	9.1	0	0	0	0
16	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	5.06	Agriculture	1	1,200	12	11.3	5	0	0	0
17	11.007	CSAH	11	Intersection of CSAH11/90th Ave N and CSAH 11	Intersection of 70th St N and 100th Ave	12.04	Agriculture	1	648	12	6.9	2	0	0	0
18	114.001	CR	114	431 ft West of Intersection of CR114/28th Ave N and 225th St N	Intersection of 230th St N and 28th Ave N	0.71	Agriculture	2S	175	12	22.4	0	0	0	0
19	12.001	CSAH	12	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74	Intersection of US 75 and 60th Ave S	1.36	Agriculture	1	6,500	12	8.8	2	0	1	0
20	12.002	CSAH	12	Intersection of CSAH12/US 75 and 60th Ave S	.19 Miles West of 80th St S and 60th Ave S	6.30	Agriculture	1	1,360	12	7.3	1	0	0	0
21	12.004	CSAH	12	Intersection of CSAH12/100th St S and 50th Ave S	Intersection of MN 9 and 50th Ave S	3.98	Agriculture	1	325	12	9.5	0	0	0	0
22	13.001	CSAH	13	Intersection of CSAH13/CSAH 52 and 50th Ave S	Intersection of 70th St S and 50th Ave S	1.91	Agriculture	1	340	12	11.5	0	0	0	0
23	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	3.00	Agriculture	1	1,375	12	10.7	1	0	0	0
24	17.001	CSAH	17	Intersection of CSAH17/90th Ave s and 100th St S	Intersection of US 10 and 100th St S	8.00	Agriculture	1	293	12	12.0	5	0	0	0
25	18.001	CSAH	18	Intersection of CSAH18/MN 3 and CSAH 18	463 ft East of Intersection of US 75 and CSAH 18	0.85	Agriculture	1	890	12	18.9	1	0	0	0
26	18.002	CSAH	18	466 ft East of Intersection of CSAH18/US 75 and CSAH 18	Intersection of MN 9 and 28th Ave N	11.31	Agriculture	1	1,125	12	8.0	7	1	0	0
27	19.001	CSAH	19	Intersection of CSAH19/100th St S and Parke Ave S	283 ft North of Intersection of 7th St SE and Parke Ave S	0.41	Recreational	1	850	12	143.1	1	0	0	0
28	19.002	CSAH	19	283 ft North of Intersection of CSAH19/7th St SE and Parke Ave S	Intersection of Parke Ave S and 4th St SE	0.72	Campus	2S	1,800	12	15.2	0	0	0	0
29	19.003	CSAH	19	Intersection of CSAH19/Parke Ave S and 4th St SE	Intersection of Parke Ave N and 1st St NE	0.43	Mixed Use	2S	1,142	12	112.4	3	0	1	0
30	19.004	CSAH	19	Intersection of CSAH19/1th St NE and 11th St N	Intersection of 110th St N and 28th Ave N	1.89	Agriculture	2S	455	12	9.5	1	0	0	0
31	19.006	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19	0.80	Agriculture	2S	50	11	28.9	0	0	0	0
32	2.001	CSAH	2	.85 Miles West of Intersection of CSAH2/160th Ave SW and 3rd St S	1208 ft East of Intersection of US 75 and CSAH 2	2.07	Agriculture	1	835	12	9.2	0	0	0	0
33	2.002	CSAH	2	1208 ft East of Intersection of CSAH2/US 75 and CSAH 2	.29 Miles West of Intersection of 160th Ave S and 28th St S	0.49	Residential	1	820	12	87.3	0	0	0	0
34	2.003	CSAH	2	Intersection of CSAH3/160th Ave S and US 75	Intersection of MN 9 and 160th Ave S	15.37	Agriculture	1	765	12	7.7	2	0	1	0
35	20.002	CSAH	20	.16 Miles West of Intersection of CSAH20/9th St N and 70th Ave N	Intersection of US 75 and 70th Ave N	1.16	Agriculture	2S	300	12	9.5	0	0	0	0
36	21.002	CSAH	21	Intersection of CSAH21/160th Ave S and 130 th St S	Intersection of 90th Ave S and 130th Ave S	6.60	Agriculture	1	220	12	11.07	1	0	1	0
37	23.001	CSAH	23	Intersection of CSAH23/40th Ave S and 190th St S	Intersection of US 10 and 190th St S	2.98	Agriculture	1	1,350	12	13.4	1	0	0	0
38	26.001	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N	13.04	Agriculture	1	2,675	12	9.0	4	1	1	1
39	26.002	CSAH	26	Intersection of CSAH26/120th St N and 90th Ave N	Intersection of 1247 ft West of MN 32	13.27	Agriculture	1	1,950	12	7.1	2	0	0	0
40	26.003	CSAH	26	1254 ft West of Intersection of CSAH26/MN 32 and Front St	Intersection of MN 32 and Front St	0.24	Residential	1	1,000	12	75.6	0	0	0	0
41	26.004	CSAH	26	Intersection of CSAH26/MN 32 and Front St	.50 Miles West of Intersection of 110 Ave and 90th Ave N	4.02	Agriculture	1	663	12	11.2	1	0	0	0
42	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	17.21	Agriculture	2S	565	11.5	6.8	3	0	0	0
43	31.002	CSAH	31	227 ft South of Intersection of CSAH31/Roger St and CSAH 31	Intersection of US 10 and CSAH 31	0.32	Industrial	1	1,350	12	44.1	0	0	0	0
44	33.001	CSAH	33	Intersection of CSAH33/US 10 and CSAH 31	Intersection of 120 ft South of 4th St and CSAH 33	0.90	Residential	1	1,450	12	78.7	3	0	2	0
45	33.002	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	6.45	Agriculture	1	1,025	12	10.4	1	0	0	0
46	33.003	CSAH	33	Intersection of CSAH33/90 Ave N and 230th St N	Intersection of 160Ave N and 230th St N	7.00	Agriculture	2S	455	12	7.1	0	0	0	0
47	34.001	CSAH	34	Intersection of CSAH34/US 75 and 160th Ave N	3183 ft West of Intersection of MN 9 and 7th St	13.20	Agriculture	1	452	12	8.9	4	0	1	1
48	34.002	CSAH	34	3183 ft West of Intersection of CSAH34/MN 9 and 7th St	Intersection of MN 9 and 7th St	0.61	Recreational	1	785	12	55.8	0	0	0	0
49	34.003	CSAH	34	Intersection of CSAH34/MN 9 and CSAH 34	Intersection of 5th St W and 160th Ave N	11.10	Agriculture	1	800	12	7.2	1	0	0	0
50	34.004	CSAH	34	Intersection of CSAH34/5th St NW and 160th Ave N	332 ft East of Intersection of 4th St SE and CSAH 34	0.61	Residential	1	933	12	76.8	3	0	1	0
51	34.005	CSAH	34	1695 ft East of Intersection of CSAH34/MN 32 and 160th Ave N	Intersection of 160th Ave N and 100 Ave	2.73	Agriculture	1	770	12	10.3	0	0	0	0
52	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	2.37	Agriculture	2S	265	12	11.4	1	0	0	0
53	36.001	CSAH	36	Intersection of CSAH36/170th Ave NW and State Limits	Intersection of US 75 and 170th Ave NW	1.08	Agriculture	2S	135	12	9.2	0	0	0	0
54	43.001	CSAH	43	Intersection of CSAH43/MN 9 and Front St	35 ft East of Intersection of 2nd St NE and Main Ave E	0.08	Residential	1	730	12	118.2	0	0	0	0
55	43.002	CSAH	43	Intersection of CSAH43/Front St S and 5th Ave SE	Intersection of Main Ave E and 2nd St SE	0.48	Residential	1	390	12	56.6	1	0	1	0
56	44.001	CSAH	44	Intersection of CSAH44/164th St S and CSAH 44	Intersection of US 10 and CSAH 44	0.30	Natural	1	230	12	33.6	0	0	0	0
57	44.002	CSAH	44	Intersection of CSAH44/164th St S and CSAH 44	.70 Miles South of Intersection of 164th St S and CSAH 44	0.75	Cabins	3	230	11.5	8.0	0	0	0	0
58	45.001	CSAH	45	Intersection of CSAH45/US 10 and Main St N	Intersection of US 10 and 7th St NE	0.68	Residential	1	632	12	56.1	2	0	2	0
59	52.001	CSAH	52	Intersection of CSAH52/180th Ave S and CSAH 52	65 ft South of Intersection of 9th Ave SE	1.02	Agriculture	1	860	12	17.7	0	0	0	0
60	52.002	CSAH	52	65 ft South of Intersection of CSAH52/9th Ave SE and Front St S	Intersection of CSAH 52 and 5th Ave SE	0.31	Residential	1	1,900	12	54.0	0	0	0	0
61	52.003	CSAH	52	Intersection of CSAH52/5th Ave SE and CSAH 52	Intersection of MN 9 and Main Ave E	0.29	Residential	1	3,300	12	62.0	1	0	1	0
62	52.004	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	12.32	Agriculture	1	1,400	12	6.0	4	0	0	0
63	52.005	CSAH	52	Intersection of CSAH52/CSAH 10 and CSAH 52	152 ft South of Main St and CSAH 52	1.49	Agriculture	1	4,200	12	13.4	1	0	0	0
64	52.006	CSAH	52	152 ft South of Main St and CSAH 52	402 ft North of Intersection of 4th St N and CSAH 52	0.39	Residential	1	4,200	12	53.7	0	0	0	0
65	52.007	CSAH	52	402 ft North of Intersection of CSAH52 and 4th St N	738 ft North of 34th Ave S and CSAH 52	4.83	Agriculture	1	4,200	12	6.8	2	0	1	0
66	6.001	CSAH	6	Intersection of CSAH6/MN 32 and 120th Ave S	Intersection of CSAH 6 and 300th St S	2.98	Agriculture	2S	1,350	12	12.7	1	0	0	0
67	67.002	CR	67	90 ft West of Intersection of CR67/4th Ave W and 1st St S	Intersection of Holloway Ave S and 1st St S	0.56	Residential	3	120	12	55.7	0	0	0	0
68	71.001	CR	71	Intersection of CR71/Parke Ave S and 7th St SW	468 ft East of Intersection of Lund Ave S and 7th St SE	0.30	Residential	3	420	12	49.3	0	0	0	0
69	75.002	CR	75	Intersection of CR75/70th St S and CSAH 75	3275 ft East of Intersection of CSAH 11 and 50th Ave S	0.60	Residential	2S	440	10	25.1	0	0	0	0
70	77.002	CR	77	1623 ft West of Intersection of CR77/70th St S and CSAH 14	Intersection of 70th St S and CSAH 14	0.32	Agriculture	1	45	12	15.5	1	0	0	0
71	8.001	CSAH	8	288 ft East of Intersection of CSAH8/112th Ave S and 5th St S	Intersection of 70th St S and 110th Ave S	6.25	Agriculture	2S	218	12	7.8	0	0	0	0
72	86.001	CR	86	Intersection of CR86/US 10 and CSAH 86	238 ft North of Intersection of 15th Ave N and 170th St N	1.06	Agriculture	1	400	11	18.9	0	0	0	0
73	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	3.97	Agriculture	2S	457	11	12.8	2	0	0	0
					Total	271.92						92	2	16	2

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Curve List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	CRSP 2 ID	Route System	Route No.	Start Description	End Description	Speed Limit [mph]	Radius [feet]	Area Type	ADT [vpd]	Lane Width [feet]	Shoulder Type	Outside Shoulder Width [feet]	Total Cross Section Width [feet]	Adjacent Intersection	Visual Trap	Lighting	Outside Edge Risk
1	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	55	578	Rural	2,250	12	Paved	8	32	None	None	None	1
2	1.002	CSAH	1	North of Intersection of Wall St Ave NW / Broadway st NW	Intersection of Wall St Ave NW / Broadway st NW	55	841	Rural	920	12	Paved	0	32	Intersection	None	None	1
3	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	55	1030	Rural	1,100	12	Paved	8	38	None	None	None	1
4	10.002	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	1147	Rural	3,300	12	Paved	6	40	Intersection	None	None	1
5	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	1170	Rural	3,300	12	Paved	6	40	Intersection	None	None	1
6	10.004	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	2944	Rural	3,300	12	Paved	0	40	None	None	None	2C
7	10.006	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	1291	Rural	2100	12	Paved	0	40	Intersection	None	None	2C
8	10.007	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	2877	Rural	2,100	12	Paved	0	40	None	None	None	1
9	10.008	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	1022	Rural	2,100	12	Paved	0	40	None	None	None	2C
10	10.009	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	831	Rural	2,100	12	Paved	0	40	None	None	None	1
11	10.010	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	55	806	Rural	2,100	12	Paved	0	40	None	Present	None	1
12	11.001	CSAH	11	Intersection of CSAH11/CSAH 50 and CSAH 3	704 ft South of Intersection of 1st St S and CSAH 11	55	1140	Rural	25	12	Paved	8	44	Intersection	None	None	1
13	11.002	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	55	1874	Rural	1,800	12	Paved	10	58	Intersection	None	None	1
14	11.003	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	55	1838	Rural	1,800	12	Paved	10	58	None	None	None	1
15	11.004	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	2601	Rural	1,200	12	Paved	6	36	None	None	None	1
16	11.005	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	1125	Rural	55	12	Paved	12	36	Intersection	None	None	1
17	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	1872	Rural	1,200	12	Paved	5	36	None	None	None	1
18	11.007	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	1834	Rural	1,200	12	Paved	5	36	None	None	None	1
19	11.008	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	1154	Rural	1,200	12	Paved	5	36	None	None	None	1
20	11.009	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	55	1127	Rural	1,200	12	Paved	5	36	None	None	None	1
21	12.001	CSAH	12	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74	Intersection of US 75 and 60th Ave S	55	2976	Rural	6,500	12	Paved	8	38	Intersection	None	None	1
22	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	55	500	Rural	1,350	12	Paved	12	44	Intersection	None	None	1
23	14.002	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	55	973	Rural	1,350	12	Paved	10	44	None	None	None	1
24	19.001	CSAH	19	Intersection of CSAH19/1th St NE and 11th St N	Intersection of 110th St N and 28th Ave N	55	1221	Rural	455	12	Paved	4	32	None	None	None	2S
25	19.002	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19	55	1503	Rural	50	11	None	0	22	None	None	None	2S
26	22.001	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	55	1197	Rural	4,650	12	Paved	8	40	Intersection	None	None	1
27	22.002	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	55	860	Rural	4,650	12	Paved	12	40	None	None	None	1
28	26.001	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N	55	1722	Rural	2,850	12	Paved	9	44	Intersection	None	None	1
29	26.002	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N	55	2416	Rural	2,850	12	Paved	9	44	None	None	None	1
30	3.001	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	40	1169	Rural	2,900	12	Paved	0	24	Intersection	None	None	1
31	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	806	Rural	300	12	Paved	4	32	Intersection	None	None	2S
32	31.002	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	959	Rural	470	12	Paved	6	32	Intersection	Present	None	1
33	31.003	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	952	Rural	470	12	Paved	6	32	None	None	None	1
34	31.004	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	2032	Rural	970	12	Paved	6	32	None	None	None	1
35	31.005	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	1042	Rural	970	12	Paved	6	32	Railroad	None	None	2C
36	31.006	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	55	1230	Rural	970	12	Paved	6	32	Railroad	None	None	2C
37	33.001	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	55	956	Rural	1,000	12	Paved	10	44	Intersection	None	None	1
38	33.002	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	55	975	Rural	1,000	12	Paved	10	44	Intersection	None	None	1
39	34.001	CSAH	34	Intersection of CSAH34/US 75 and 160th Ave N	3183 ft West of Intersection of MN 9 and 7th St	55	2218	Rural	325	12	Paved	8	40	None	None	None	1
40	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	55	1841	Rural	265	12	Paved	4	32	None	None	None	2S
41	35.002	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	55	832	Rural	265	12	Paved	4	32	Intersection	None	None	2S
42	35.003	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	55	823	Rural	265	12	Paved	4	32	None	None	None	2S
43	52.001	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	55	1184	Rural	1,350	12	Gravel	5	34	None	None	None	1
44	52.002	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	55	4638	Rural	1,350	12	Gravel	6	34	None	None	None	1
45	52.003	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	55	5879	Rural	1,450	12	Paved	5	34	None	None	None	1
46	52.004	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	55	4474	Rural	1,450	12	Paved	5	34	Intersection	None	None	1
47	52.005	CSAH	52	402 ft North of Intersection of CSAH52 and 4th St N	738 ft North of 34th Ave S and CSAH 52	55	2392	Rural	4,200	12	Paved	8	40	Intersection	Present	None	1
48	100.001	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	55	404	Rural	60	10	None	0	20	Intersection	Present	None	2S
49	100.002	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	55	663	Rural	60	10	None	0	20	None	None	None	2S
50	100.003	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	55	1910	Rural	60	10	None	0	20	None	None	None	2S
51	100.004	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	55	1829	Rural	60	10	None	0	20	None	None	None	2S
52	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	55	821	Rural	590	12	None	0	24	Intersection	Present	None	2S
53	96.002	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	55	1685	Rural	3,000	12	Composite	3	24	Intersection	None	None	2S
54	96.003	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	55	2093	Rural	540	11	Gravel	1	22	None	None	None	2S
55	96.004	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	55	2119	Rural	540	11	Gravel	1	22	None	None	None	2S

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Rural Intersection List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.2	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Area Type	Context Zone	Total Entering ADT [vpd]	Volume Cross Product [vpd^2]	Leg Configuration	Alignment Skew [Degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Development	Previous STOP (>5 mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	K	A	B	C	PDO	Crash Cost
1	1.002	CSAH	1	CSAH 1 (Broadway St NW)	T 111 (70th Ave N)	Rural	Agriculture	1018	155625	X	0	None	None	None	<5	55	T	0	0	0	1	0	$120,000
2	1.003	CSAH	1	CSAH 26 (90th Ave N)	CSAH 1 (Broadway St NW)	Rural	Agriculture	4870	5610000	T	0	None	None	None	<5	55	TR	0	0	0	0	1	$13,000
3	10.001	CSAH	10	CSAH 52	CSAH 10 (90th Ave S)	Rural	Agriculture	3410	1652625	X	45	Present	None	None	>5	55	TR	0	0	0	0	1	$13,000
4	10.002	CSAH	10	CSAH 10 (90th Ave S)	CR 68 (90th St S)	Rural	Agriculture	1115	16500	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
5	10.003	CSAH	10	CSAH 10 (90th Ave S)	CSAH 17 (100th St S)	Rural	Agriculture	1185	93500	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
6	10.004	CSAH	10	CSAH 10 (90th Ave S)	CR 69 (110th St S)	Rural	Agriculture	1155	60500	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
7	10.005	CSAH	10	CSAH 10 (90th Ave S)	CSAH 21 (130th St S)	Rural	Agriculture	1210	121000	T	10	None	None	None	<5	55	T	0	0	0	0	0	$0
8	10.006	CSAH	10	CSAH 10 (90th Ave S)	I-94 (Ramp)	Rural	Agriculture	1880	858000	X	5	None	None	None	<5	55	T	0	0	0	0	1	$13,000
9	10.007	CSAH	10	CSAH 10 (90th Ave S)	I-94 (Ramp)	Rural	Agriculture	2782	1768500	X	10	None	None	None	<5	55	T	0	0	0	0	1	$13,000
10	10.008	CSAH	10	MN 9	CSAH 10 (90th Ave S)	Small Town	Residential	3880	2842000	X	40	None	None	None	>5	60	TR	0	0	2	0	0	$460,000
11	10.009	CSAH	10	CSAH 10 (90th Ave S)	CR 71 (70th Ave S)	Rural	Agriculture	3358	189750	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
12	10.010	CSAH	10	CSAH 10	CSAH 25 (200th St S)	Rural	Agriculture	3382	272250	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
13	10.011	CSAH	10	CSAH 10 (90th Ave S)	CSAH 31 (230th St S)	Rural	Agriculture	3842	1790250	X	0	None	None	None	>5	55	T	0	0	1	0	0	$230,000
14	10.012	CSAH	10	CSAH 10 (90th Ave S)	CR 120 (240th St S)	Rural	Agriculture	3330	99000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
15	10.013	CSAH	10	CSAH 10 (90th Ave S)	CR 121 (250th St S)	Rural	Agriculture	3335	115500	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
16	10.014	CSAH	10	CSAH 10 (90th Ave S)	CR 124 (260th St S)	Rural	Agriculture	3350	165000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
17	10.015	CSAH	10	MN 32	CSAH 10 (90th Ave S)	Rural	Agriculture	3570	2349000	X	45	None	None	None	>5	60	T	0	0	0	0	1	$13,000
18	10.016	CSAH	10	CSAH 10 (90th Ave S)	CSAH 37 (280th St S)	Rural	Agriculture	2200	210000	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
19	11.001	CSAH	11	CSAH 11	CR 50	Rural	Agriculture	322	3875	T	0	None	Horizontal	None	<5	55	T	0	0	0	0	0	$0
20	11.002	CSAH	11	CSAH 11 (70th St S)	CR 51 (170th AVE S)	Rural	Agriculture	345	10850	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
21	11.003	CSAH	11	CSAH 11 (70th St S)	CR 57 (140th Ave S)	Rural	Agriculture	595	24750	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
22	11.004	CSAH	11	CSAH 11 (70th St S)	CR 62 (120th Ave S)	Rural	Agriculture	590	22000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
23	11.005	CSAH	11	CSAH 11 (70th St S)	CR 67 (1st St S)	Small Town	Residential	1320	144000	X	0	None	None	None	<5	30	T	0	0	0	0	0	$0
24	11.006	CSAH	11	CSAH 11 (Main St)	CSAH 52 (Holloway St)	Small Town	Residential	5185	4137000	X	0	None	None	None	>5	30	T	0	0	0	0	0	$0
25	11.007	CSAH	11	CSAH 11 (70th St S)	CR 69 (70th Ave S)	Rural	Residential	745	37950	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
26	11.008	CSAH	11	CSAH 11 (70th St S)	CSAH 12 (60th Ave S)	Rural	Agriculture	1970	829600	X	0	None	None	None	<5	55	T	0	0	0	0	1	$13,000
27	11.009	CSAH	11	CSAH 11 (70th St S)	CSAH 13 (50th Ave S)	Rural	Agriculture	1445	411450	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
28	11.010	CSAH	11	CSAH 11 (70th St S)	CR 76 (40th Ave S)	Rural	Agriculture	1552	78750	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
29	11.011	CSAH	11	CSAH 11	TH 94 Off-Ramp (South)	Rural	Agriculture	11235	27008750	T	0	None	Horizontal	None	<5	55	TR	0	0	1	0	0	$230,000
30	11.012	CSAH	12	CSAH 11	US 10 Off-Ramp (North)	Rural	Agriculture	5550	6750000	T	0	None	Horizontal	None	<5	55	LT	0	0	0	0	0	$0
31	11.013	CSAH	11	CSAH 11 (70th St N)	CSAH 18 (28th Ave N)	Rural	Agriculture	3000	2160000	X	0	None	None	None	>5	55	TR	0	0	1	0	1	$243,000
32	11.014	CSAH	11	CSAH 11 (70th St N)	CR 89 (43rd Ave N)	Rural	Agriculture	1845	81000	X	0	None	None	None	<5	55	TR	0	0	0	0	0	$0
33	11.015	CSAH	11	CSAH 11 (70th St N)	CR 91 (57th Ave N)	Rural	Agriculture	1578	116250	X	0	None	None	None	<5	55	TR	0	0	0	0	0	$0
34	11.016	CSAH	11	CSAH 11 (70th St N)	CR 93 (70th Ave N)	Rural	Agriculture	1230	36000	T	0	None	Horizontal	None	<5	55	T	0	0	0	0	0	$0
35	11.017	CSAH	11	CSAH 11 (70th St N)	CR 93 (70th Ave N)	Rural	Agriculture	1228	33000	T	0	None	None	None	<5	55	TR	0	0	0	0	0	$0
36	11.018	CSAH	11	CSAH 11 (70th St N)	CR 94 (80th Ave N)	Rural	Agriculture	1232	39000	X	0	None	None	None	<5	55	TR	0	0	0	0	0	$0
37	11.019	CSAH	11	CSAH 11 (70th St N)	CSAH 26 (90th Ave N)	Rural	Agriculture	3540	2600000	X	0	None	None	None	>5	55	TR	0	0	0	0	1	$13,000
38	11.020	CSAH	11	CSAH 11 (70th St N)	CSAH 28 (110th Ave N)	Rural	Agriculture	960	70400	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
39	11.021	CSAH	11	CSAH 11 (70th St N)	CR 108 (140th Ave N)	Rural	Agriculture	980	88000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
40	11.022	CSAH	11	CSAH 11 (70th St N)	CR 107 (150th Ave N)	Rural	Agriculture	895	13200	X	0	None	None	None	<5	55	T	0	0	1	0	0	$230,000
41	11.023	CSAH	11	CSAH 11 (70th St N)	CSAH 34 (60th St N)	Rural	Agriculture	1100	292994	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
42	11.024	CSAH	11	CSAH 11 (70th St N)	CR 106 (170th Ave N)	Rural	Agriculture	448	13488	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
43	11.025	CSAH	11	CSAH 11 (70th St N)	CR 70 (190th Ave N)	Rural	Agriculture	425	4150	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
44	12.001	CSAH	12	US 75 (8th Rabt S)	CSAH 12 (60th Ave S)	Rural	Agriculture	8900	19800000	X	0	None	None	None	<5	60	T	0	0	1	0	7	$321,000
45	12.002	CSAH	12	CSAH 12 (60th Ave S)	CR 78 (50th St S)	Rural	Agriculture	2350	115000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
46	12.003	CSAH	12	CSAH 12 (60th Ave S)	CSAH 52	Rural	Agriculture	6500	9660000	X	45	Present	None	None	<5	55	TR	0	0	2	0	8	$564,000
47	12.005	CSAH	12	CSAH 17 (100th St S)	CSAH 12 (60th Ave S)	Rural	Agriculture	412	42525	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
48	12.006	CSAH	12	CSAH 17 (100th St S)	CSAH 12 (50th Ave S)	Rural	Agriculture	465	51800	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
49	12.007	CSAH	12	CSAH 12 (50th Ave S)	CR 71 (110th St S)	Rural	Agriculture	420	30875	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
50	12.008	CSAH	12	CSAH 12 (50th ST S)	CR 72 (120th St S)	Rural	Agriculture	535	68250	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
51	12.009	CSAH	12	MN 9 (140th St S)	CSAH 12	Rural	Agriculture	1218	205538	X	0	None	None	None	>5	60	TR	0	0	0	0	0	$0
52	12.010	CSAH	12	CSAH 23 (190th St S)	CSAH 12 (40th Ave S)	Rural	Agriculture	778	55800	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
53	12.011	CSAH	12	CSAH 12 (40th Ave S)	CSAH 31 (230th St S)	Rural	Agriculture	910	66400	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
54	13.001	CSAH	13	CSAH 13 (50th Ave S)	CSAH 52	Rural	Agriculture	4370	714000	T	0	Present	None	None	<5	55	TR	0	0	0	0	0	$0
55	14.001	CSAH	14	MN 336 (70th St S)	CSAH 14 (28th Ave S)	Rural	Agriculture	13248	8753625	X	0	None	Horizontal	None	<5	55	LTTR	0	0	0	0	1	$13,000
56	14.002	CSAH	14	CSAH 14 (28th Ave S)	CR 68 (90th St S)	Rural	Agriculture	1432	45500	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
57	14.003	CSAH	14	CSAH 14 (28th Ave S)	CSAH 17 (100th St S)	Rural	Agriculture	1182	303888	X	0	None	None	None	<5	55	T	0	0	0	0	1	$13,000
58	15.003	CSAH	15	CSAH 52	CSAH 15 (100th St S)	Rural	Agriculture	1482	47125	X	0	Present	None	None	<5	55	T	0	0	1	0	0	$230,000
59	17.001	CSAH	17	CSAH 17 (100th St S)	CR 69 (70th Ave S)	Rural	Agriculture	180	6875	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
60	17.004	CSAH	17	CSAH 17 (100th St S)	CSAH 19 (12th St)	Rural	Agriculture	922	212562	X	0	None	None	None	<5	55	T	0	0	0	0	1	$13,000
61	17.005	CSAH	17	US 10	CSAH 17 (100th St S)	Small Town	Industrial	15578	3982680	X	0	None	None	None	<5	30	LTTR	0	0	0	0	1	$13,000
62	18.001	CSAH	18	US 75	CSAH 18 (28th Ave N)	Rural	Agriculture	4895	4023250	X	0	Present	None	None	<5	60	LTR	0	1	0	1	2	$896,000
63	18.002	CSAH	18	CSAH 18 (28th Ave N)	CR 90 (50th St N)	Rural	Agriculture	1268	81000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
64	18.003	CSAH	18	CSAH 18 (28th Ave N)	CR 68 (90th St N)	Rural	Agriculture	1260	72000	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
65	18.004	CSAH	18	CSAH 18 (28th Ave N)	CSAH 19 (110th St N)	Rural	Agriculture	1352	255938	T	15	None	None	None	<5	55	T	0	0	0	0	0	$0
66	18.005	CSAH	18	CSAH 18 (28th Ave N)	CSAH 19 (120th St N)	Rural	Agriculture	1098	49875	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
67	18.006	CSAH	18	CSAH 18 (28th Ave N)	CR 92 (130th St N)	Rural	Agriculture	1088	39375	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
68	18.007	CSAH	18	MN 9 (140th ST N)	CSAH 18 (28th Ave N)	Rural	Agriculture	2460	1064000	X	0	None	None	None	>5	60	T	0	0	1	0	0	$230,000
69	19.001	CSAH	19	CSAH 19 (Parke Ave S)	CR 71 (7th St SE)	Small Town	Campus	2032	418500	X	0	None	None	None	<5	30	T	0	0	0	0	0	$0
70	19.002	CSAH	19	US 10 (State St)	CSAH 19 (Parke Ave S)	Small Town	Commercial	16460	17500815	X	0	None	None	None	<5	30	LTTR	0	0	0	1	4	$172,000
71	19.004	CSAH	19	CSAH 19 (110th St N)	CR 84 (15th Ave N)	Rural	Agriculture	490	15925	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
72	19.007	CSAH	19	CSAH 26 (90th Ave N)	CSAH 19 (120th St N)	Rural	Agriculture	2475	121250	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0

Rural Intersection List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.2	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Area Type	Context Zone	Total Entering ADT [vpd]	Volume Cross Product [vpd^2]	Leg Configuration	Alignment Skew [Degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Development	Previous STOP (>5 mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	K	A	B	C	PDO	Crash Cost
73	19.010	CSAH	19	CSAH 34 (160th Ave N)	CSAH 19 (120th St N)	Rural	Agriculture	710	33000	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
74	2.001	CSAH	2	CSAH 2 (160th Ave S)	CR 59 (3rd St S)	Rural	Agriculture	875	21250	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
75	2.002	CSAH	2	US 75 (14th St S)	CSAH 2 (160th Ave S)	Rural	Industrial	2185	1127250	X	0	None	None	None	>5	60	TR	0	0	0	0	0	$0
76	2.003	CSAH	2	CSAH 2 (160th Ave S)	CSAH 7 (50th ST S)	Rural	Agriculture	818	29250	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
77	2.004	CSAH	2	CSAH 2 (160th Ave S)	CSAH 11 (70th St S)	Rural	Agriculture	1140	305300	X	0	None	None	None	>5	55	T	0	1	0	0	2	$776,000
78	2.005	CSAH	2	CSAH 2 (160th Ave S)	CSAH 15 (100th St S)	Rural	Agriculture	682	27200	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
79	2.006	CSAH	2	CSAH 2 (160th Ave S)	CR 69 (110th St S)	Rural	Agriculture	668	17600	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
80	2.007	CSAH	2	CSAH 2 (160th Ave S)	CSAH 21 (130th St S)	Rural	Agriculture	782	91200	X	0	None	None	None	<5	55	T	0	0	0	1	0	$120,000
81	2.008	CSAH	2	CSAH 2 (160th Ave S)	CR 56 (160th St S)	Rural	Agriculture	648	4800	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
82	2.009	CSAH	2	MN 9 (Front St N)	MN 34 (160th Ave S)	Small Town	Residential	6020	8222875	X	0	None	None	None	>5	30	T	0	0	0	0	2	$26,000
83	20.001	CSAH	20	CSAH 20 (70th AVE N)	CR 96 (Oakport St N)	Rural	Agriculture	715	124500	X	0	None	None	None	<5	55	T	0	0	0	0	1	$13,000
84	20.002	CSAH	20	US 75	CSAH 20 (70th AVE N)	Rural	Agriculture	3152	457500	X	0	None	None	None	<5	60	TR	0	0	1	0	0	$230,000
85	21.002	CSAH	20	CSAH 21 (130th St S)	CR 55 (150th Ave S)	Rural	Agriculture	240	4400	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
86	21.003	CSAH	20	CSAH 21 (130th St S)	CSAH 52	Rural	Agriculture	1620	308000	X	25	Present	None	None	>5	55	TR	0	0	1	1	1	$363,000
87	21.004	CSAH	20	CSAH 21 (130th St S)	CR 62 (120th Ave S)	Rural	Agriculture	255	7700	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
88	22.001	CSAH	22	US 75	CSAH 22 (Wall Street Ave N)	Rural	Agriculture	5000	5394375	T	0	Present	None	None	<5	60	TB	0	0	0	0	2	$26,000
89	23.001	CSAH	23	US 10	CSAH 23 (190th St S)	Rural	Agriculture	15250	18765000	X	0	None	None	None	>5	65	LTTR	0	0	2	0	1	$473,000
90	26.001	CSAH	26	CSAH 26 (90th Ave N)	CR 98 (10th St NW)	Rural	Agriculture	3062	187500	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
91	26.002	CSAH	26	CSAH 26 (90th Ave N)	CR 96 (Oakport St N)	Rural	Agriculture	3240	1111500	X	5	None	None	None	<5	55	TR	0	1	0	0	0	$750,000
92	26.003	CSAH	26	US 75	CSAH 26 (90th Ave N)	Rural	Agriculture	5300	7006875	X	0	Present	None	None	>5	60	TR	1	0	0	0	4	$13,652,000
93	26.004	CSAH	26	CSAH 26 (90th Ave N)	CR 95 (40th St N)	Rural	Agriculture	2865	42750	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
94	26.005	CSAH	26	CSAH 26 (90th Ave N)	CR 68 (90th St N)	Rural	Agriculture	2180	64500	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
95	26.006	CSAH	26	CSAH 26 (90th Ave N)	CR 92 (130th St N)	Rural	Agriculture	2715	40500	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
96	26.007	CSAH	26	MN 9 (140th ST N)	CSAH 26 (90th Ave N)	Rural	Agriculture	4275	4512500	X	0	None	None	None	>5	60	TR	0	0	1	0	3	$269,000
97	26.008	CSAH	26	CSAH 26 (90th Ave N)	CR 113 (190th St N)	Rural	Agriculture	1665	141750	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
98	26.009	CSAH	26	CSAH 26 (90th Ave N)	CSAH 27 (200th St N)	Rural	Agriculture	1178	85250	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
99	26.010	CSAH	26	CSAH 26 (90th Ave N)	CR 114 (210th St N)	Rural	Agriculture	1142	46750	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
100	26.011	CSAH	26	CSAH 26 (90th Ave N)	CSAH 33 (230th St N)	Rural	Agriculture	1580	556500	X	0	None	None	None	>5	55	TR	0	0	0	1	0	$120,000
101	26.012	CSAH	26	MN 32	CSAH 26 (Front St)	Small Town	Commercial	2820	1748000	X	0	Present	None	None	>5	30	T	0	0	0	0	1	$13,000
102	26.013	CSAH	26	CSAH 26 (90th Ave N)	CSAH 37 (280th St N)	Rural	Agriculture	705	47250	T	0	None	None	None	>5	55	TR	0	0	0	0	0	$0
103	26.014	CSAH	26	CSAH 26 (90th Ave N)	CSAH 37 (280th St N)	Rural	Agriculture	602	15812	T	0	None	None	None	>5	55	T	0	0	0	0	0	$0
104	27.002	CSAH	27	CSAH 27 (200th St N)	CSAH 34 (160th Ave N)	Rural	Agriculture	780	36500	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
105	3.007	CSAH	3	CSAH 3 (Oakport St N)	MSAS 151 (43rd Ave N)	Rural	Agriculture	2922	65250	T	0	None	None	None	<5	55	T	0	0	0	0	0	$0
106	3.008	CSAH	3	CSAH 22 (Wall Street Ave N)	CSAH 3 (Oakport St N)	Rural	Agriculture	5645	6805500	X	45	None	None	None	<5	55	T	0	0	0	1	2	$146,000
107	31.001	CSAH	31	MN 34	CSAH 31 (230th St S)	Rural	Agriculture	2885	962500	X	0	None	None	None	>5	55	TR	0	0	0	0	0	$0
108	31.002	CSAH	31	CSAH 31 (230th St S)	CR 126 (120th Ave S)	Rural	Agriculture	498	28112	X	0	None	None	None	<5	55	T	1	0	0	0	0	$13,600,000
109	31.003	CSAH	31	CSAH 31 (230th St S)	CR 119 (60th Ave S)	Rural	Agriculture	750	41400	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
110	31.004	CSAH	31	US 10	CSAH 31 (230th St)	Small Town	Mixed Use	14750	19285000	X	0	None	None	None	>5	50	LTTR	0	1	1	1	12	$1,256,000
111	33.001	CSAH	33	CSAH 33 (5th St)	CR 115 (15th Ave N)	Rural	Agriculture	1075	51250	T	0	None	None	None	<5	50	T	0	0	0	0	0	$0
112	33.002	CSAH	33	CSAH 33 (230th St N)	CR 114 (28th Ave N)	Rural	Agriculture	1088	87500	T	5	None	None	None	<5	55	T	0	0	0	0	0	$0
113	33.003	CSAH	33	CSAH 33	CR 112 (140th Ave N)	Rural	Agriculture	515	27300	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
114	33.004	CSAH	33	CSAH 34 (160th Ave N)	CSAH 33 (230th St N)	Rural	Agriculture	1048	180525	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
115	34.001	CSAH	34	US 75	CSAH 34	Small Town	Industrial	2342	599625	X	0	None	None	None	>5	60	TR	0	0	0	0	0	$0
116	34.002	CSAH	34	CSAH 34 (160th Ave N)	CR 73 (90th St N)	Rural	Agriculture	615	20300	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
117	34.003	CSAH	34	MN 9 (Hwy 9 N)	CSAH 34 (7th St)	Small Town	Residential	2625	1508750	X	0	None	None	None	>5	60	TR	0	0	0	0	2	$26,000
118	34.004	CSAH	34	CSAH 34 (160th Ave N)	CR 110 (190th St N)	Rural	Agriculture	822	18000	T	0	None	None	None	>5	55	T	0	0	0	0	0	$0
119	34.005	CSAH	34	CSAH 34 (Northern Pacific Ave)	M 8 (1st St E)	Small Town	Commercial	1060	45675	X	0	Present	None	None	<5	30	T	0	0	0	0	0	$0
120	34.006	CSAH	34	CSAH 34 (160th Ave N)	CSAH 37 (280th St N)	Rural	Agriculture	820	38500	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
121	35.001	CSAH	35	MN 34 (160th Ave S)	MN 32 (270th St S)	Rural	Agriculture	2678	1006812	X	0	None	None	None	>5	55	TR	0	0	0	1	0	$120,000
122	36.001	CSAH	36	CSAH 36 (170th Ave NW)	CR 100 (10th ST NW)	Rural	Agriculture	195	8100	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
123	36.002	CSAH	36	US 75	CSAH 36 (170th Ave NW)	Rural	Agriculture	2065	177750	X	0	None	None	None	<5	60	TR	0	0	0	0	0	$0
124	43.001	CSAH	43	CSAH 52	CSAH 43 (Main Ave E)	Small Town	Commercial	5215	4571500	X	0	None	None	None	>5	30	T	0	0	0	0	1	$13,000
125	43.002	CSAH	43	CSAH 52 (Front St S)	CSAH 43 (5th Ave SE)	Small Town	Residential	2635	819000	T	0	None	None	None	<5	30	T	0	0	1	0	0	$230,000
126	44.001	CSAH	44	US 10	CSAH 44	Rural	Agriculture	14015	1598500	T	0	None	None	None	<5	65	LTTR	0	0	0	0	0	$0
127	5.001	CSAH	5	US 75	CSAH 5 (100th Ave N)	Rural	Agriculture	2422	763625	X	20	Present	Horizontal	None	<5	60	TR	0	0	0	0	1	$13,000
128	5.006	CSAH	5	CSAH 5 (30th St N)	CSAH 34 (160th Ave N)	Rural	Agriculture	390	21125	X	0	None	None	None	>5	55	T	0	0	0	0	0	$0
129	52.001	CSAH	52	MN 9	CSAH 52 (175th ST S)	Small Town	Industrial	3425	1856250	Y	30	None	None	None	>5	55	T	0	0	0	0	0	$0
130	52.002	CSAH	52	CSAH 52	CR 55 (150th Ave S)	Rural	Agriculture	1452	138375	X	35	Present	None	None	<5	55	T	0	0	0	0	0	$0
131	52.003	CSAH	52	CSAH 52	CR 56 (160th St S)	Rural	Agriculture	1365	20250	X	20	Present	None	None	<5	55	T	0	0	0	0	0	$0
132	52.004	CSAH	52	CSAH 52	CR 62 (120th Ave S)	Rural	Agriculture	1480	43500	X	45	Present	None	None	<5	55	T	0	0	0	0	0	$0
133	52.005	CSAH	52	CSAH 52	CR 69 (110th St S)	Rural	Agriculture	1505	79750	X	45	Present	None	None	<5	55	TR	0	0	0	0	0	$0
134	52.006	CSAH	52	CSAH 52	CR 68 (90th St S)	Rural	Agriculture	1480	43500	X	40	Present	None	None	<5	55	T	0	0	0	0	0	$0
135	52.007	CSAH	52	CSAH 52	CR 63 (80th St S)	Rural	Agriculture	4235	147000	X	45	Present	None	None	<5	55	TR	0	0	0	0	0	$0
136	52.008	CSAH	52	CSAH 52 (Holloway ST)	CR 67 (1st St S)	Small Town	Residential	4342	598500	5-Leg	45	Present	None	None	<5	55	T	0	0	0	0	0	$0
137	52.009	CSAH	52	CSAH 52	CR 69 (70th Ave S)	Rural	Agriculture	4250	210000	X	40	Present	None	None	<5	55	T	0	0	0	0	0	$0
138	52.010	CSAH	52	CSAH 52	CR 75 (50th Ave S)	Rural	Agriculture	4772	106875	Y	40	None	None	None	<5	55	T	0	0	0	0	0	$0
139	52.011	CSAH	52	CSAH 52	CR 78 (50th St S)	Rural	Agriculture	5350	265000	X	45	Present	None	None	<5	55	T	0	0	0	0	0	$0
140	6.001	CSAH	6	MN 32 (270th St S)	CSAH 6 (120th Ave S)	Rural	Natural	1348	452800	X	0	None	None	None	>5	60	T	0	0	0	0	0	$0
141	6.002	CSAH	6	CSAH 2 and CSAH 6	CR 128	Rural	Agriculture	902	46612	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
142	7.004	CSAH	7	CSAH 7 (40th ST S)	CSAH 8 (110th AVE S)	Rural	Agriculture	275	16650	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
143	7.007	CSAH	7	CSAH 7 (40th ST S)	CSAH 12 (60th Ave S)	Rural	Agriculture	2428	293250	X	0	None	None	None	<5	55	T	0	0	1	1	0	$350,000
144	8.001	CSAH	8	CSAH 8 (110th AVE S)	CR 59 (3rd St S)	Rural	Agriculture	285	8750	X	0	None	None	None	<5	55	TR	0	0	0	0	0	$0

Rural Intersection List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.2	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Area Type	Context Zone	Total Entering ADT [vpd]	Volume Cross Product [vpd^2]	Leg Configuration	Alignment Skew [Degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Development	Previous STOP (>5 mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	K	A	B	C	PDO	Crash Cost
145	8.002	CSAH	8	US 75 (14th St S)	CSAH 8 (110th AVE S)	Rural	Agriculture	1568	293625	X	0	None	None	None	<5	60	TR	0	0	0	0	0	$0
146	8.003	CSAH	8	CSAH 8 (110th AVE S)	CR 61 (50th St S)	Rural	Agriculture	192	1388	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
147	8.004	CSAH	8	CSAH 11 (70th St S)	CSAH 8 (110th Ave S)	Rural	Agriculture	985	96250	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
148	9.002	CSAH	9	CSAH 9 (40th St N)	CSAH 18 (28th Ave N)	Rural	Agriculture	1702	603000	X	0	None	None	None	<5	55	TR	0	0	0	0	0	$0
149	9.004	CSAH	9	CSAH 26 (90th Ave N)	CSAH 9 (40th St N)	Rural	Agriculture	2988	391875	T	0	None	None	None	<5	55	T	0	0	0	0	1	$13,000
150	100.001	CR	100	CSAH 26 (90th Ave N)	CR 100 (15th St NW)	Rural	Agriculture	3020	60000	T	0	None	None	None	>5	55	T	0	0	0	0	0	$0
151	100.003	CR	100	CR 100 (15th St NW)	CR 101 (200th Ave N)	Rural	Agriculture	90	1800	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
152	108.002	CR	108	MN 9 (140th ST N)	CR 108 (140th Ave N)	Rural	Agriculture	2095	370500	X	0	None	None	None	<5	60	TR	0	0	0	0	0	$0
153	74.001	CR	74	CR 74 (12th Ave S)	CR 78 (50th St S)	Rural	Agriculture	195	4250	X	0	None	None	None	<5	55	T	0	0	0	0	0	$0
																	Crash Summary	2	4	19	10	69	$36,667,000

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Urban Segment List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.2	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [miles]	ADT [vpd]	Context Zone	Cross Section	Design	Speed Limit [mph]	Sidewalk	Access Density [access per mile]	Total Crashes	Severe Crashes	Total HO+SSO Crashes	Severe HO+SSO Crashes
1	3.002	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	4.30	5583	Residential	2-Lane	Undivided	30	Both Sides	39.96	17	0	3	0
2	9.001	CSAH	9	Intersection of CSAH9/US 10 Frontagr Rd and CSAH 9	Intersection of 28th Ave N and 40th St N	2.00	1540	Residential	2-Lane	Undivided	55	None	22.95	15	0	2	0
3	3.001	CSAH	3	Intersection of CSAH3/US 10 and 11th St N	Intersection of 11th St N and 2nd Ave N	0.14	4600	Commercial	3-Lane	Undivided	55	Both Sides	136.34	21	1	4	1
4	7.002	CSAH	7	.06 Miles South of Intersection of CSAH7/41st Ave S and 40th St S	Intersection of MN 52 and 40th St S	0.52	1950	Residential	2-Lane	Undivided	55	None	26.73	2	0	0	0
5	22.001	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	2.17	4333	Residential	2-Lane	Undivided	40	None	26.78	14	1	2	0
6	78.003	CR	78	Intersection of CR78 and CSAH 72	Intersection of 2nd Ave SE and Main St S	1.30	330	Agriculture	2-Lane	Undivided	55	None	24.70	1	0	0	0
7	20.001	CSAH	20	Intersection of CSAH20/47th Ave NW and 70th Ave NW	.16 Miles West of Intersection of 9th St N and 70th Ave N	0.86	340	Residential	2-Lane	Undivided	55	None	25.58	0	0	0	0
8	52.008	CSAH	52	738 ft North of Intersection of CSAH52/34th Ave S and CSAH 52	Intersection of I-94 and CSAH 52	0.68	6000	Industrial	2-Lane	Divided	55	None	11.73	10	0	1	0
					Total Length (Miles)	11.98								80	2	12	1

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Urban Intersection List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.2	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Area Type	Context Zone	Traffic Control Device	Total Entering ADT [vpd]	Volume Cross Product [vpd^2]	Leg Configuration	Major Division Type	Alignment Skew (degrees)	Adjacent Development	Major Approach Speed Limit [mph]	Minor Approach Speed Limit [mph]	Major Approach Left Turn Phasing	Major Approach Turn Lane Configuration	Max Number of Lanes Crossed	Presence of Sidewalk	Pedestrian Crossing Type	K	A	B	C	PDO	Crash Cost
1	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)	Suburban	Residential	All-Way Stop	6510	7806125	X	Undivided	15	None	40	40	NA	TR	3	Some	None	0	0	0	0	0	$0
2	3.001	CSAH	3	US 10	CSAH 3	Urban	Commercial	Signal	13050	35945000	X	Undivided	0	None	30	30	Permitted/Protected	LTT	5	Some	Marking	0	0	0	1	3	$159,000
3	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	Urban	Commercial	Signal	16850	64855000	X	Curb	0	None	30	30	Permitted/Protected	LTT	5	Both Sides	Marking	0	0	3	2	10	$1,060,000
4	3.004	CSAH	3	CSAH 3 (11th St N)	N 9th Ave	Urban	Campus	Thru-Stop	5100	0	T	Undivided	0	None	30	30	NA	T	2	Both Sides	Marking	0	0	0	0	0	$0
5	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)	Urban	Recreational	All-Way Stop	12650	35055000	X	Undivided	0	None	30	30	NA	T	2	Some	None	0	0	2	1	2	$606,000
6	3.006	CSAH	3	CSAH 3 (11th St N)	CSAH 18 (28th Ave N)	Suburban	Residential	Thru-Stop	3345	1290500	T	Undivided	25	None	55	55	NA	T	3	None	None	0	0	0	0	0	$0
7	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)	Suburban	Residential	Signal	13842	5929500	X	Undivided	0	None	30	30	Permitted	TT	4	All	Marking	0	0	0	0	6	$78,000
8	45.002	CSAH	45	US 10 (Center AVE E)	CSAH 45 (7th St SE)	Suburban	Residential	Thru-Stop	8245	1960000	X	Undivided	0	None	30	30	NA	TTR	5	Some	None	0	0	0	1	5	$185,000
9	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)	Suburban	Residential	Thru-Stop	5602	1603250	X	Undivided	45	None	55	30	NA	TR	3	None	None	0	0	0	0	1	$13,000
10	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52	Suburban	Residential	Signal	11850	35100000	X	Curb	0	None	30	30	Permitted/Protected	LTTR	6	Some	Marking	0	0	1	1	5	$415,000
11	52.015	CSAH	52	CSAH 52	I 94 (Ramp)	Suburban	Residential	Thru-Stop	8400	11390000	T	Undivided	0	None	55	30	NA	T	2	None	None	0	0	0	0	7	$91,000
12	7.009	CSAH	7	CSAH 7 (40th ST S)	MSAS 138 (40th Ave S)	Suburban	Residential	Thru-Stop	2410	897000	X	Undivided	0	None	55	55	NA	TR	4	None	None	0	0	0	1	2	$146,000
13	7.010	CSAH	7	CSAH 52	CSAH 7 (34th Ave S)	Suburban	Agriculture	Thru-Stop	6298	5286750	X	Undivided	0	None	55	55	NA	T	3	None	None	0	0	0	1	0	$120,000
14	9.001	CSAH	9	US 10	CSAH 9	Suburban	Industrial	Thru-Stop	18000	36777500	X	Curb	0	Present	55	30	NA	LTTR	6	None	None	0	0	1	1	6	$428,000
15	75.001	CR	75	US 75 (8th St S)	MSAS 146 (50th Ave S)	Suburban	Commercial	Thru-Stop	7728	2423500	X	Undivided	0	None	60	30	NA	TR	3	None	None	0	0	0	0	0	$0
16	78.001	CR	78	CR 78 (4th AVE SE)	CR 81	Suburban	Agriculture	Thru-Stop	475	47850	T	Undivided	0	None	55	30	NA	T	2	None	None	0	0	0	0	0	$0
17	78.002	CR	78	CSAH 45 (Main St S)	CR 78 (Main St S)	Suburban	Residential	Thru-Stop	930	197319	X	Undivided	0	None	30	30	NA	T	2	None	None	0	0	0	0	0	$0
																					Crash Summary	0	0	7	9	47	$3,301,000

Appendix B – Meeting Minutes/Summaries

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MEETING SUMMARY

County Road Safety Plan Updates

Phase 2 Kickoff Meeting

PREPARED BY: Renae Kuehl/SRF

COUNTY: All

MEETING DATE: April 12, 2018

MEETING TIME: 11:00 AM – 2:00 PM

LOCATION: St. Cloud Training Center, Lewis North Conference Room – 3725 12th St. N St. Cloud, MN 56303

ATTENDEES:

Ryan Thilges, Blue Earth County
Dan McCormick, Carver
David Overbo, Clay County
Guy Kohlnhofer, Dodge County
Karin Grandia, Itasca County
Jeremy Pfeifer, Kandiyohi County
Sam Muntean, Lac qui Parle County
Aaron Vanmoer, Lyon County
Rich Sanders, Polk County
Keith Berndt, Redwood County
Dennis Luebbe, Rice County
Brian Ketring, Roseau County
Daryle Dahl, Roseau County
Craig Jenson, Scott County
Andrew Witter, Sherburne County
Dan Knapek, Sherburne County
Ryan Odden, Wadena County
Joe Gustafson, Washington County

Mark Vizecky, MnDOT
Derek Leuer, MnDOT
Howard Preston, Jacobs
Cheri Marti, Jacobs
Renae Kuehl, SRF

County Follow-up Action Items

- Review segmented maps and provide feedback – Due Thursday, April 26th.
  - See PPT slides 39, 40, and 41 for requested confirmation for segments, intersections and curves.
- Consider county-specific safety workshop goals/needs and plan to participate in up-coming All-Counties Webinar on alternative safety workshop formats and audiences. *Note: One-hour webinar dates are Tues., May 8 from 2-3 pm and Thurs., May 10th from 1-2 pm.*
- Begin planning for county safety workshop date and location. (T, W, or Th during Sept/Oct/early Nov)
- Provide feedback on preferred crash data set to use for crash analysis to Mark Vizecky @ mark.vizecky@state.mn.us or Derek Leuer @ derek.leuer@state.mn.us. Phase 2 counties will need to determine this as a whole.
- Provide contact information for county staff to be involved to Renae Kuehl at rkuehl@srfconsulting.com

Discussion Items

- First phase – Many projects had suggested 2-foot shoulder paving, but there is no room for it. We shouldn't suggest projects that are not possible. A lot of high priority projects were completed. Required to justify why the county was asking for lower priority project funding that were lower on the priority list.

- Sometimes the countermeasure might seem like a quick fix, but there is additional work that is needed to install the strategy (i.e. grading to pave shoulders)
- Do any of the Phase 1 agencies have policies that we are developing? Response: No, county policy development are not part of the project.
- Is there data on how to maintain the buffer lane with the plastic bollards? Response: The state maintenance staff thought it would be challenging, but it wasn't as bad as they anticipated. They plowed the lanes' right of way and used a skid steer to clean out around the bollards on the weekend. Also, note that bollards are NOT required.
- The phase 1 counties reviewed the list of strategies and most included the majority of the strategies in their Big Book of Ideas. However, some were removed due to specific strategies that won't work for their agency.
- Would like to see emphasis on corridor projects rather than individual locations because it's easier to plan for and build a corridor project rather than spot location projects. Response: CRSP update will recommend projects at locations, but the county is certainly free to coordinate locations to create a corridor project.
- Community members want to see reductions in fatal/crashes to justify the effort. Would like something that shows:
    - This is what our county has done.
    - This is what has been done statewide.
    - This is the impact its had.

  Response: CRSP update provides results of Phase 1 & 2 county-implemented projects for segments, intersections and curves including known crash reduction factors and the pool of applicable severe crashes by county, District and Greater MN Crashes.

- Everyone's board/community will have different needs and questions to answer.
    - Example: One county had a project canceled at the last minute after HSIP funding was secured because local farmers were not on board with the change. They ended up canceling the project and losing HSIP funds. It would have been helpful to educate the board members to help support the engineer's decisions.
- How much out-of-the-box thinking will we be doing? Is there new technology that we can implement? Response: New strategies have been implemented since the original CRSP. We will welcome any ideas. MN is a leader in safety and has done a lot of the proven strategies, we need to consider what can be done in addition to what has already been done.
- Will the plans be addressing ped/bike crashes? Response: Yes, if there is a concern in the county.
- Coordinate better to get more buy-in from MnDOT district staff for their recommendations and projects in the plan. Response: MnDOT District Staff is encouraged to participate in the Safety Workshop.
- SA design needs and integrating funding sources so that HSIP funds can be used on state aid projects. MnDOT Metro only allowed a 2-foot shoulder and rumbles.

- An active TZD group in Sherburne county, would like to see this group integrated into the plan development as well. Response: Depending on County workshop goals/objectives, Phase 2 counties are encouraged to invite TZD stakeholder groups to the county safety workshop. A number of Phase 1 CRSP Update counties invited their TZD coalitions.

Research Syntheses one pagers – Potential topics

- Access management
- Lighting rural intersections
- How to address requests for dynamic speed signs. What is a good system wide approach for deploying dynamic speed signs? Speed control? Curve warning?
- Intersection safety – treatment options to improve intersections. What is the biggest bang for your buck between options such as lighting, RICWS, etc.

2016-2017 crash data

- CRSP Update Phase 1 counties used 2011-2015 crash data. The 2016-2017 data set has only been available for three weeks. MnDOT is still working on trying to understand the data.
- The group needs to decide what crash data set to use as a whole. Either use 2011-2015 crash data or incorporate the 2016-2017 data set.
- Counties are to share feedback on what to want to move forward with, with Mark V and/or Derek at mark.vizecky@state.mn.us or Derek Leuer @ derek.leuer@state.mn.us.

Crash Data Overview

- Why is FHWA so slow to go to the systemic/data driven approach?
- Project implementation at the local level is not easy, challenging for other states and at the national level. MN has a large state aid staff and each county has an engineer and supporting staff. Many other states do not have this.
- Stronger data is needed to prove that a traffic signal is not a safety device. Refer to pages A-18, 19, 20 & 21 in the Traffic Safety Fundamentals Handbook.
- Do we have data on pedestrian crashes at roundabouts? Response: There are not enough crashes to document anything. The features in roundabouts are often the same characteristics of strategies used for pedestrian safety (one-way roads, median islands, lower speeds, etc). MnDOT looked at 140 roundabouts before/after study, which showed 3-4 crashes before and the same after, and all were at the same location.
- If an intersection with a signal isn't working, would you convert to a roundabout? Response: Yes, it would be a good option.
- The existing crash data system is not good at locating crashes at roundabouts due to issues with mapping the location of the crashes.

Roadway Network Assessment

- We are not reviewing crashes on gravel roads because Minnesota data shows that 95% of severe crashes along the county stem occur on paved roads – safety investments along paved roads represent the greatest opportunity for crash reduction. NACE has an initiative right now to review crashes and safety on gravel roads. There is a safety committee that is focusing on gravel and paved road safety. Good geometry is the number one characteristic of safer gravel roads.

- Simple and spiral curves with different superelevations. Does that matter? Do we need to know where they are? If you know, let us know.

CRSP Phase 2 – Individual County Meeting #1

COUNTY:	Clay County
MEETING DATE:	June 26, 2018
MEETING TIME:	9:00 am – 11:00 pm CST
LOCATION:	Clay County Highway Department, Moorhead, MN
PARTICIPANTS:	David Overbo, Erik Hove (Asst. County Engineer), Seth Pfeifer (Engineering Tech) Derek Leur, MnDOT and Cheri Marti, Jacobs

Summary of County Action Items:

Please submit all action items listed below to Renae Kuehl, SRF Consulting @ rkuehl@srfconsulting.com If questions, contact either Renae Kuehl or Cheri Marti, Jacobs @ cheri.f.marti@gmail.com

- ☑ **Confirm roadway network maps are final. (Target: ASAP for County data analysis to begin.)**
- ☑ **Determine/confirm county safety workshop date (T, W, or Th during Sept/Oct/Nov) and location. (Target: ASAP)**
- ☑ **Determine workshop needs, confirm preferred format (A. featured safety strategies presentation only, B) site discussion only, C) featured safety strategies + site discussion, D) Board presentation only, or E) Board + abbreviated stakeholder workshop) and key audience(s). (Target: August 1st)**
- ☑ **From the Master Big Book of Ideas, select all safety strategies to be considered for County's CRSP Update (Target Date: August 1, 2015).**
- ☑ **If including a featured strategy discussion during workshop, from the Master Big Book of Ideas, select featured safety strategies to present/discuss during the safety workshop. (Target Date: 4 weeks prior to County Safety Workshop).**
- ☑ **Review current list of CRSP Research Syntheses one-pagers and MnDOT District topic summaries and submit input for up to two potential new research syntheses topics. (Target: July 9, 2018)**
- ☑ **Provide contact information for additional key staff you would to include in CRSP Update emails/correspondence.**

Meeting Discussion Highlights

1. CRSP Update Project Progress: Phase 2 Schedule and Outreach Calendar
   a. Derek provided an overview of CRSP included its purpose and changes from the original CRSP
      i. County commented on the challenge of rural long, flat straight roads…people drive distracted, speed, etc.
2. County Roadway Network Assessment
   - Updated, final network maps distributed which incorporated county comments/edits.

   County Action: County to confirm network maps are final. (Target: ASAP for County data analysis to begin.)
2. County Highway Safety Improvement Program (HSIP) Project Implementation
   - CRSP staff explained that to summarize the impact of HSIP projects from the original CRSP, it is necessary to examine the collective impact of HSIP investments for all counties statewide versus each individual county. Each county has so few severe crashes, therefore, a larger sample size including hundreds of crashes is needed for credible or statistically relevant evaluation results.
     - Clay asked about impact of cabin median barrier; Derek provide a broad overview of their effectiveness.
   - In addition to a summary of HSIP investments statewide, each County will have an opportunity to highlight safety projects and the county's safety approach during its Safety Workshop.
     - Clay County new construction projects get 6" edgelines.
3. County Crash History (2011-2015): CRSP staff provided an brief overview of county crash trees and safety focus areas to help guide the selection of safety strategies and projects for the updated CRSP.
   - Focus Area Matrix – CRSP staff explained that severe injury numbers don't add up because it is a combination of contributing crash factors.
   - Crash data can help redirect board/stakeholder concerns and dispel misperceptions of severe crash causation (i.e., clear, dry pavement is a higher risk vs. winter driving; animal crashes are very infrequent vs. perceived risk of animal-related crashes).
4. CRSP Updated Plans: Similarly to the original CRSP, updated CRSP will include the following:
   a) Inventory of all county road segments, rural paved horizontal curves, and major intersections
   b) Crash Facts: Data-driven review of crashes on county roads over the last five years and summary of safety focus areas and crash types (e.g., lane departure)
   c) List of recommended high priority safety strategies
   d) Prioritized list of locations that are most at risk for severe crashes

e) Prioritized list of location-specific safety strategies to consider for county implementation

  - Plan had stars…based on crash data? Derek explained systemic risk factor analysis and the priorities set reflect high-risk characteristics as well as
  - Clay commented that having a CRSP helps to prioritize the project and

Note: Although the CRSP focus is infrastructure safety strategies and projects, the plan will describe the role of driver behavior in crashes and Minnesota's TZD regional safety implementation approach to help local communities to address high-risk driver behaviors.

5. What do you hope happens/doesn't happen as part of your CRSP Update?

   - Clay is concerned that there may not be enough to do in Clay County because they may not have high-risk items.
     - Response: Derek said to explain that County has done a lot of good safety projects, can move down the list.
     - Would guardrail be a candidate? Local Road Improvement program may be a better funding source.
     - Building 2 foot shoulder; milling and Rumble Strip project could be a potential
   - Rumble stripe with fog line over the top; residents didn't like.
   - Debunk safety myths. For example, traffic signals are not safety devices; Lowering speeds -- people drive to the road environment and not a posted speed limit; Installing crosswalks alone are not sufficient for pedestrian safety.

6. County Safety Workshop:

   - Clay County Workshop Date: Wednesday, October 31, 2018; Clay County Joint Maintenance Facility, 2951 41 1/2 Street South, Moorhead MN 56560
   - Goals/Workshop Needs: Erik and Seth will discuss further with David to determine workshop needs/approach.
   - Expected audience: Diverse Safety Stakeholders (Enforcement, EMT, Schools, City, etc.) and Board members.
     - Highway Tracking Sub-committee members would likely attend the workshop including 2 Board members, County Administrator, and the Board Chair.
     - Will bring map to Board Highway Tracking Sub-committee meeting and the County Tech and Maintenance to get input on site locations.
   - Format preference: Site Location Discussion + Featured Strategies' Discussion
     - County received a call…solar powered edged stop signs…got a call, didn't stop because wasn't blinking!
     - RICWS: Is it best that the light always be on? Having the system off until an approaching car is being tested.

- Possible site locations for workshop discussion:

    A. Hwy 10 and CSAH 31 – mini roundabout an option?
    B. CR2 & Hwy 11
    C. Hwy 12 and Hwy 52 – skewed intersection; top 10% of volume – geometrics are challenging

County Actions:

- **Determine/confirm county safety workshop date (T, W, or Th during Sept/Oct/Nov) and location. (Target: ASAP)**
- **Determine workshop needs, confirm preferred format (A. featured safety strategies presentation only, B) site discussion only, C) featured safety strategies + site discussion, D) Board presentation only, or E) Board + abbreviated stakeholder workshop) and key audience(s). (Target: August 1st)**

7. Big Book of Ideas

- CRSP staff explained the opportunity to tailor strategies listed in the Master Big Book of Ideas to reflect strategies to be considered for CRSP Update.

  Clay County initial areas of interest:

  - Skewed intersections will be important
  - Appropriate application of strategies…not a magic bullet for
  - LED stop signs

County Actions:

- **From the Master Big Book of Ideas, select all safety strategies to be considered for County's CRSP Update (Target Date: August 1, 2015).**
- **If including a featured strategy discussion during workshop, from the Master Big Book of Ideas, select a more limited set of featured safety strategies to present/discuss during the safety workshop. (Target Date: 4 weeks prior to County Safety Workshop).**

8. Research Synthesis Topic

  - County interested - Access Management; possibly attach to permit application.

County Action: Review current list of CRSP Research Syntheses one-pagers and MnDOT District topic summaries and submit input for up to two potential new research syntheses topics. (Target: July 9, 2018)

Phase 2: MN County Road Safety Plan Updates

KICK-OFF WEBINAR MEETING

MARCH 9, 2018

Agenda

- Welcome & Introductions
- CRSP Update Goals
- Phase 1 & Phase 2 Counties
- MnDOT and Consultant Team
- What is different from original CRSP?
- CRSP Phase 2 - Process Schedule/Overview
- Roadway Network Development
- Questions?
- Next Steps

Questions? Please ask at any time.

Introductions

- MnDOT
- Counties – Phase 2
  - Blue Earth
  - Carver
  - Clay
  - Dodge
  - Itasca
  - Kandiyohi
  - Lac Qui Parle
  - Lyon
  - Polk
  - Redwood
  - Rice
  - Roseau
  - Scott
  - Sherburne
  - Wadena
  - Washington
- CH2M Team

CRSP Update Goals

- Produce Updated County Road Safety Plans:
  - Customized approach
  - Updated crash data
  - Individual outreach and engagement plans
  - Additional safety practices
- Provide technical support for county implementation of HSIP-funded safety projects
- Focus on reducing Fatal and Incapacitating Injury crashes – build on prior results and continue to bend the trendline

Counties included in Phase 2

Blue Earth – Ryan Thilges

Carver- Lyndon Robjent/Dan McCormick

Clay- David Overbo

Dodge- Guy Kohlnhofer

Itasca- Karin Grandia

Kandiyohi- Mel Odens

Lac qui Parle- Sam Muntean

Lyon- Aaron Vanmoer

Polk- Rich Sanders

Redwood- Keith Berndt

Rice- Dennis Luebbe

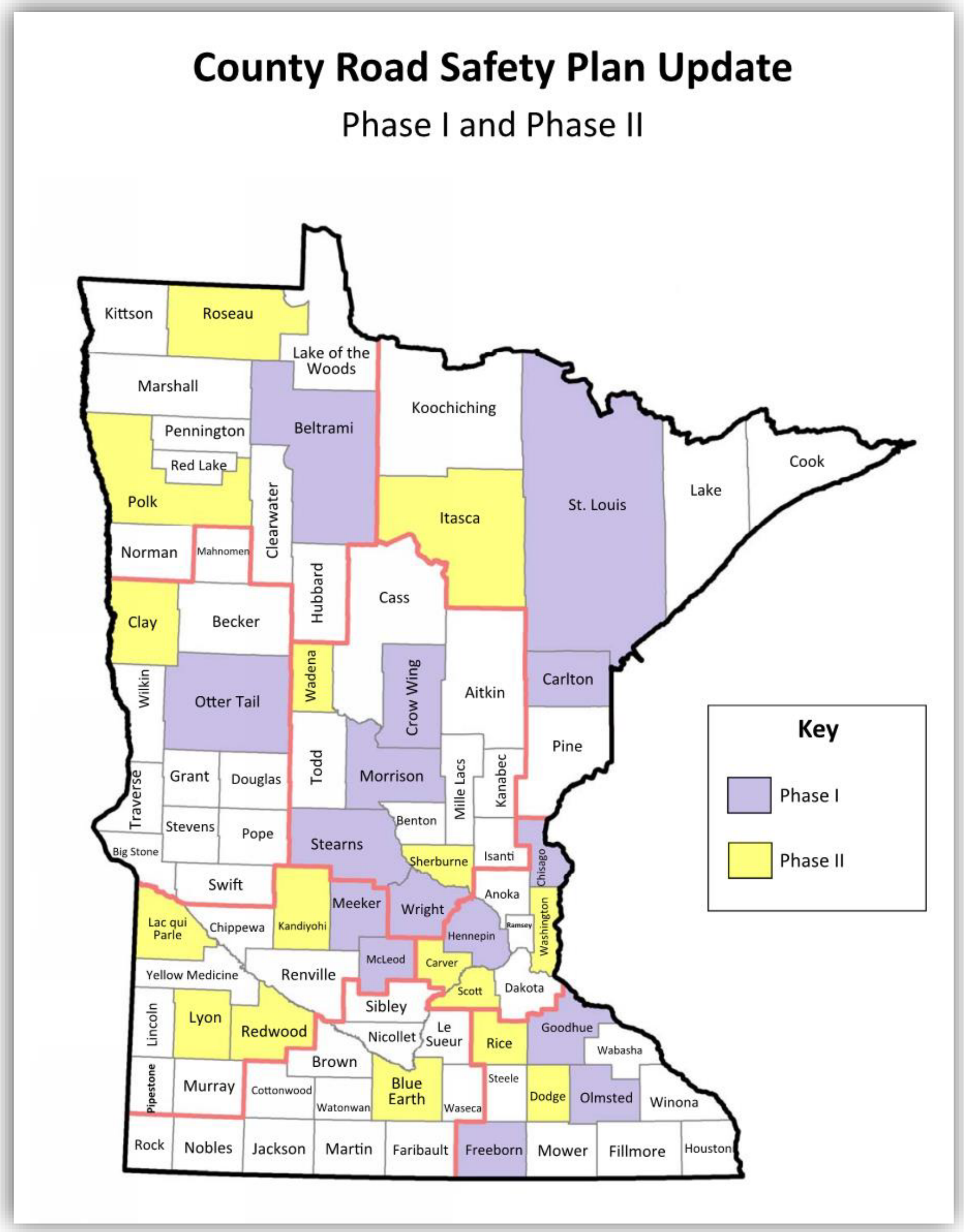
Roseau- Brian Ketring

Scott- Tony Winiecki/Craig Jenson

Sherburne- Andrew Witter

Wadena- Ryan Odden

Washington- Wayne Sandberg/Joe Gustafson

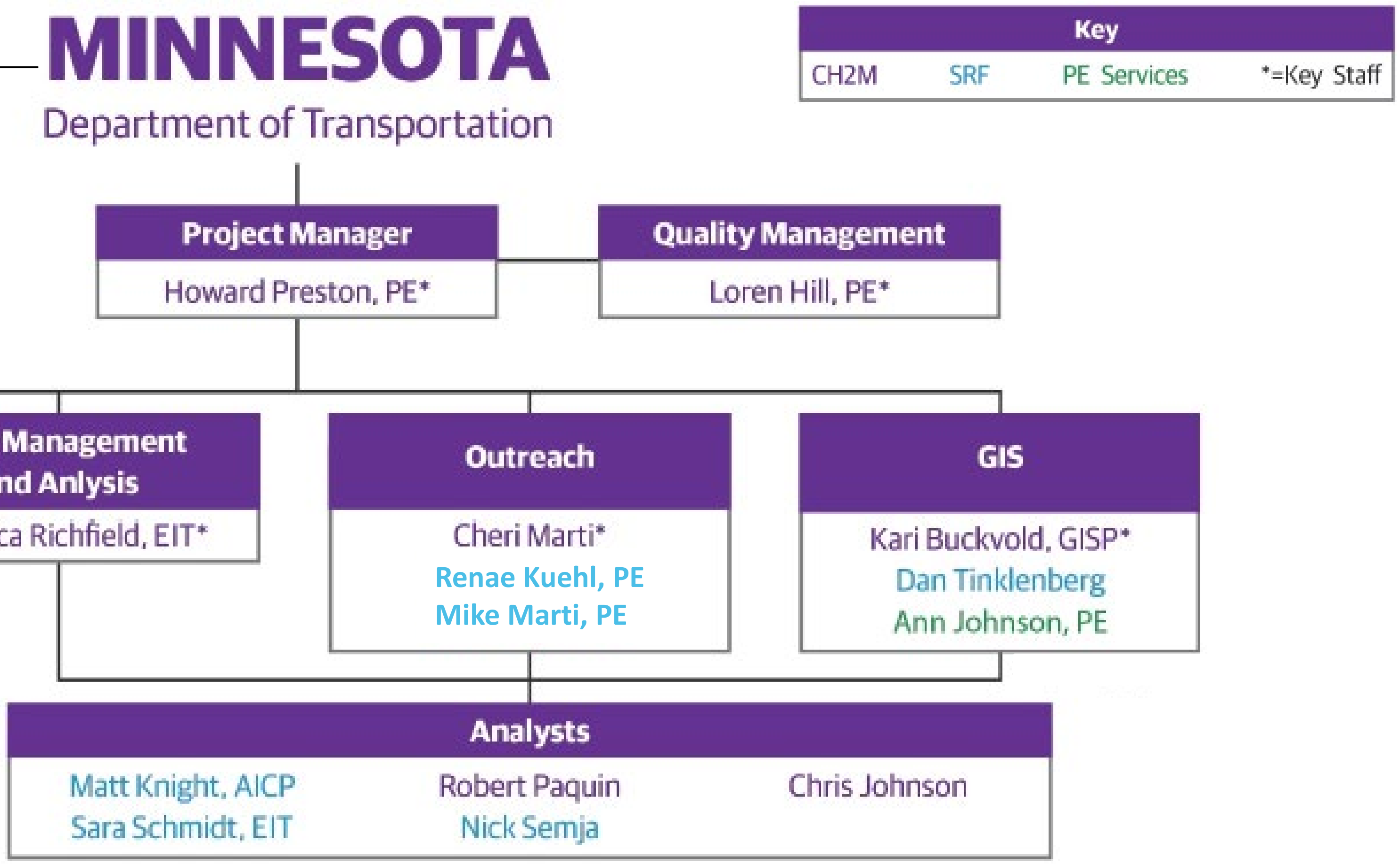


The Team

MnDOT

MnDOT State Aid
Mark Vizecky – Project Manager

MnDOT Office of Traffic, Safety and Technology
Derek Leuer
Brad Estochen



Contact information on next slide

CH2M Team Contact Information

Role	Name	Phone	Email
Project Manager	Howard Preston	(651) 365-8514	howard.preston@ch2m.com
Outreach	Cheri Marti	(612) 616-4280	cheri.f.marti@gmail.com
	Renae Kuehl	(763) 249-6783	rkuehl@srfconsulting.com
Data Collection	Ann Johnson	(612) 275-8190	ann.johnson@peservicesmn.com
Data Management & Analysis	Veronica Richfield	(651) 365-8523	veronica.richfield@ch2m.com
	Robert Paquin	(651) 365-8542	robert.paquin@ch2m.com
	Matt Knight	(763) 452-4729	mknight@srfconsulting.com
Document Production	Carol Sersland	(651) 365-8545	carol.sersland@ch2m.com
GIS	Kari Buckvold	(773) 458-2895	kariann.buckvold@ch2m.com
	Dan Tinklenberg	(763) 452-4749	dtinklenberg@srfconsulting.com

What is different from the original CRSP?

- Customized plans based on County's needs
- Individual outreach/engagement plans: individual meetings, group meetings, county specific workshop
- Expanded list of safety strategies: additional strategies, medium and higher cost countermeasures, maintain focus on effectiveness (crash reduction)
- Added emphasis on electronic deliverables: map showing all K + A crashes in each county (all systems), .kmz maps of all suggested safety projects
- Long timeframe for each Phase (18 months versus 9 months in original effort)
- Comprehensive analytical approach: High Crash + High Risk (Systemic)
- Preparation of a comprehensive database
- Research One-Pagers

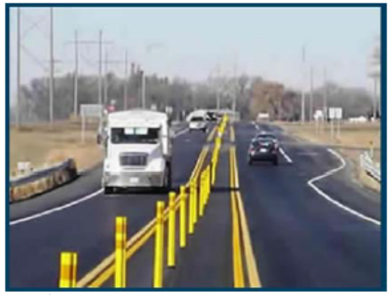
Safety Countermeasures: Big Book of Ideas

Rural Segments

Strategy	Crash Reduction Factor*	Typical Installation Costs
Centerline Rumble Strip	40% head-on/sideswipe crashes	$3,600 per mile
Buffers Between Opposing Lanes	50% for all crashes & 100% for head-on crashes [based on TH 5 in Lake Elmo, MN]	$150,000 to $500,000 per mile
Shoulder/Edgeline Rumble Strip	20% run off road crashes	$5,850 per mile
Safety Edge	5% to 10%§ ; 8% to 16%**	
Enhanced Edgeline (6" & 8")	10% to 45% all rural serious crashes (6")	$1,980 per mile
Shoulder Paving (2', 4', 6')	20% to 30% run-off-the-road crashes (with shoulder rumble) (2' only)	$54,000 per mile +$5,850 per mile (for Edge Rumble)
Clear Zone Maintenance/Enhancements		
Ditch/Embankment Improvements		$500,000 to $1M per mile

Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research
§ - For all crashes
** - ISU – SPR RBI 3-014, August 2016

Centerline Rumble Strips
Source: Mitigation Strategies for Design Exceptions (FHWA, FHWA-SA-07-011)



Buffers Between Opposing Lanes
TH 14 in District 7
Source: MnDOT Presentation @ 2014 TZD Conference

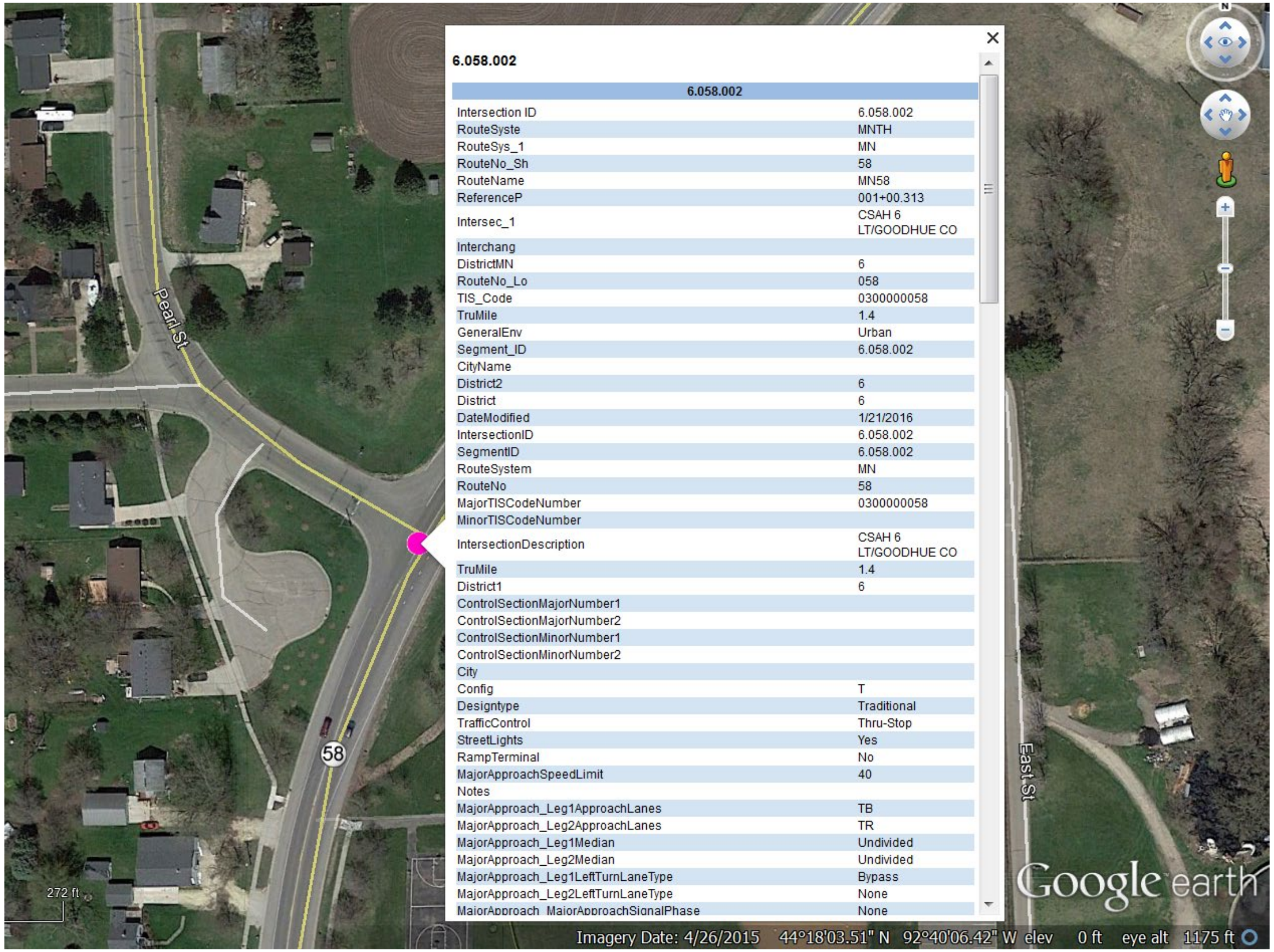
Urban Intersections

Strategy	Crash Reduction Factor*	Typical Installation Costs
Echelon		
Continuous Flow Intersection (CFI)		
Signalized RCUT		
Confirmation Lights	25% to 84% reduction in violations	$1,200 per two approaches
Traffic Enforcement Cameras (D3 Example)		
Pedestrian Countdown Times	25% vehicle/pedestrian crashes	$12,000 per intersection
Leading Pedestrian Intervals	Up to 60% pedestrian/ vehicle crashes	$600 per intersection
Curb Extensions	Increase in vehicles yielding to pedestrians	$36,000 per corner
Center Island Medians	46% in vehicle/pedestrian crashes	$24,000 per approach
Roundabout (including Mini Roundabout)	20% to 50% all crashes/ 60% to 90% right-angle crashes	$4,200,000 per intersection
Urbanization (make it feel urban)		
Rectangular Rapid Flash Beacon (RRFB)	75% of drivers yield to pedestrians	$15,000
High-Intensity Activated crossWalk Beacon (HAWK)	69% Vehicle/Pedestrian	$50,000 to $120,000
Flashing Yellow Arrow (FYA) --> Note: Permitted to FYA	19.4% left turn crashes	
Turn Lanes (Offset, Channelized)	27%	$150,000 to $500,000

Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research

Google Earth Maps

KMZ Maps of Roadway Facilities and Crashes with Popup Information



Research One-Pagers

Enhanced Edge Lines

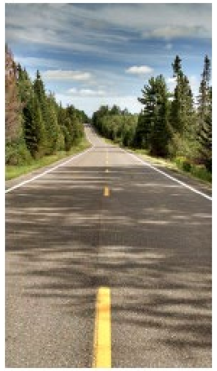
What are enhanced edge lines?

Enhanced edge lines refer to pavement markings that are either wider than typical or provide other enhancements such as recessing the marking or using an alternative material.

Along roadways with edge lines installed, most agencies have traditionally used a 4-inch-wide latex (water-based paint) line placed on the surface of the road, consistent with the guidelines in the Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD). Section 3A.6 (functions, widths and patterns of longitudinal pavement markings) of the MN MUTCD states that "the width of the line indicates the degree of emphasis."[1] The chosen width, or degree of emphasis, can be based on a combination of agency judgment and practice, economic benefit, and safety need.

The three most common techniques for providing enhanced edge lines include:

- Using a wider 6-inch line for heightened visibility of the line and road edge
- Using a special paint that provides benefits such as higher levels of retroreflectivity (a wet-reflective material that contains larger glass beads) or increased durability
- Recessing the markings in a shallow trough to protect from snow plow damage



What is the purpose of enhanced edge lines?

Both nationally and in Minnesota, road departure crashes account for more fatalities and serious injuries than any other type of crash. A first step in efforts to mitigate these crashes is attempting to keep vehicles on the roadway by focusing on improvements to the road edge. This further suggests that if the reduction of these kinds of crashes is desired, agencies should improve road edge delineation by using enhanced edge lines along key roadway segments that are identified as being the most at-risk for road departure crashes.

How effective are enhanced edge lines?

Two studies[2,4] documented the effects of providing non-recessed enhanced edge lines along approximately 3,800 miles of two-lane rural roads in Michigan and Minnesota. Both studies found that replacing 4-inch edge lines with 6-inch edge lines was an effective countermeasure for reducing run-off-road crashes. Crash reduction factors include:

- Total crashes were reduced by 16 to 18 percent (statistically significant).
- Severe crashes were reduced by 10 to 18 percent (not statistically significant).
- Total run-off-road right crashes were reduced by 34 percent (statistically significant).
- Severe run-off-road right crashes were reduced by around 85 percent (not statistically significant).

Pavement Markings on Challenging Surfaces

What is the issue?

Seal coating and micro surfacing present a challenge for the performance and maintenance of pavement markings. Seal coating is a widely used pavement resurfacing technique that consists of applying a thin layer of liquid asphalt, followed by a cover layer of stone chips. Micro surface treatments involve a machine laid combination of crushed aggregate, asphalt emulsion, mineral filler (such as Portland cement), and water that is spread as a relatively thin layer over an existing pavement surface. Seal coats and micro surfaces provide excellent traction for drivers, even under wet pavement conditions. However, both treatments produce a coarse pavement surface with relatively large gaps between the aggregate which provides a way for paint to sink below the surface where it is not visible to motorists. This problem is magnified during adverse conditions, such as low light and wet pavement. Even when the lane markings are new, they are seen as faded or non-existent.

Typical Seal Coat (Chip Seal)

Typical Micro Surface

What are potential solutions?

The two most common materials for marking edge and center lines in Minnesota include latex paint and epoxy.[2] There is a long history of agencies using latex paint because it is inexpensive, can be easily painted over, and provides reasonable levels of retro-reflectivity on roadways that have traditional, smoother surfaces. Pavement markings wear out due to the volume of roadway traffic, harsh weather, and loss of material from winter maintenance activities. These conditions result in a typical service life of 1 to 2 years for latex paint. Epoxy has a slightly longer service life, usually 3 to 5 years, but lower unit costs and ease of application result in most agencies opting to continue using latex paint.

In response to these issues, research was conducted that focused on identifying the performance of a variety of potential solutions, including: latex paint, latex over a primer coat, epoxy, and a combination of a layer of latex applied immediately following the chip seal followed by epoxy the next year.[1]

How effective are these solutions?

For chip seals, the research[1] found:

- A thick layer (high-build) of either latex or epoxy performed well.
- The combination of striping with latex over the seal coat immediately after resurfacing followed by applying epoxy the following year performed very well, with observed service lives of 2 to 3 years.

The research concluded that the most cost-effective and easy to implement solution was the combination of applying a thin coat of latex immediately after the chip seal followed by a layer of epoxy the following year. In contrast to applying thick layers of paint, using standard layers of latex and epoxy is consistent with MnDOT guidelines for all road surfaces[2]. The material can be ordered using MnDOT's materials specification, requires no installation adjustments and performed well on the research test deck.

For mirco surfaces, the research[1] found:

- Thin layers of latex markings by themselves, with and without primer coatings, performed poorly and needed repainting less than 1 year after installation.
- Thin layers of epoxy performed well, even after 2 years.

Enhanced Crosswalks

What are enhanced crosswalks?

Enhanced crosswalks are pedestrian crossing countermeasures used in addition to the pavement markings typically used at pedestrian crossings not controlled by a traffic signal or STOP sign. The most common examples of enhanced crosswalks include:

- Median refuge islands
- Curb extensions
- Street lights
- Rectangular Rapid Flashing Beacons (RRFBs)
- High-Intensity Activated CrossWalK beacon (HAWK beacon)

Curb Extensions

High-Intensity Activated Crosswalk Beacon

Rectangular Rapid Flashing Beacon

Why are enhanced crosswalks needed?

Research consistently conveys that marked crosswalks alone do NOT reduce the number or rate of pedestrian-vehicle crashes.[5] Since only marking a crosswalk is unlikely to improve pedestrian safety, the use of enhanced crossing countermeasures is suggested to improve crosswalk safety.

Although definitive rationale is not available as to why marked crosswalks alone are ineffective, theories include:

- False sense of security on the part of the pedestrians and inconsistent driving behaviors
- Distracted drivers and pedestrians
- Reduced effectiveness as a result of either overuse or warning of conditions that drivers rarely encounter

How effective are enhanced crosswalks?

Curb Extensions and Median Refuge Islands are countermeasures that reduce crossing distances. In the case of median refuge islands, allow for pedestrians to cross one direction of travel at a time. These improvements are PROVEN effective with crash reductions in the range of 40 to 45 percent.[2]

Street Lighting at isolated locations in rural areas is considered PROVEN effective, with a crash reduction in the range of 30 to 40 percent. Limited research is available on the effectiveness of pedestrian-related crashes in urban areas.

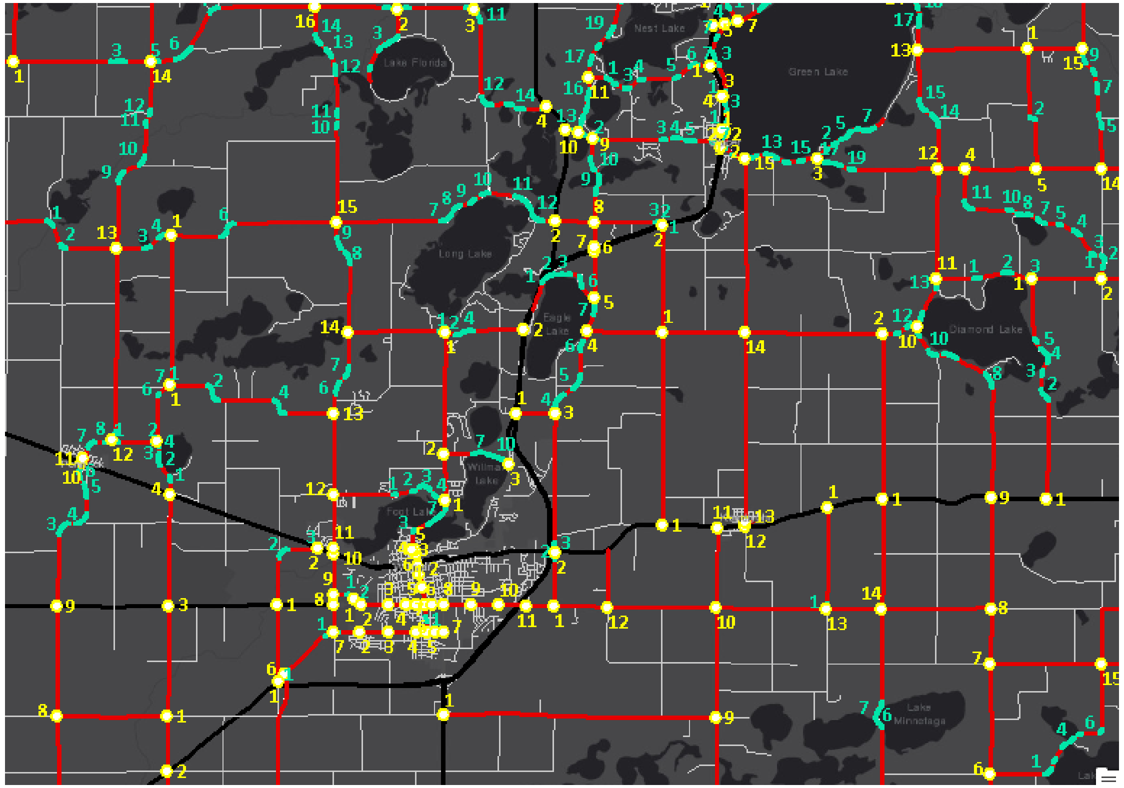
HAWK Beacons and RRBFs are relatively new technologies with promising initial research. HAWK beacons and RRFBs have crash reductions over 50 percent[4], and RRFBs have documented high yielding rates to pedestrians in excess of 80 percent.[4]

Roadway Network Development

Goal: Develop a map with identified segments, intersections and curves for each county by the April 12th meeting

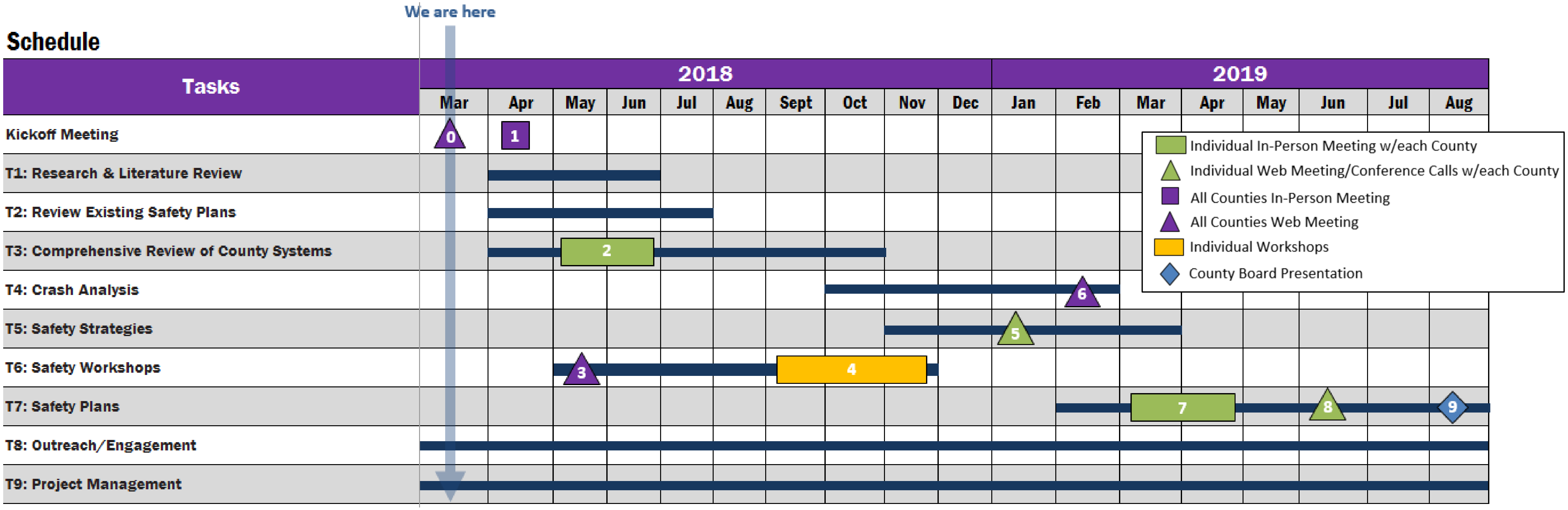
Approach:

- We will segment your roadway network for you
- You provide feedback on the completed segmentation



Example Map: Kandiyohi County

Schedule


We are here
Schedule
Tasks
2018
2019
Mar
Apr
May
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Nov
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Kickoff Meeting
T1: Research & Literature Review
T2: Review Existing Safety Plans
T3: Comprehensive Review of County Systems
T4: Crash Analysis
T5: Safety Strategies
T6: Safety Workshops
T7: Safety Plans
T8: Outreach/Engagement
T9: Project Management
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9
Individual In-Person Meeting w/each County
Individual Web Meeting/Conference Calls w/each County
All Counties In-Person Meeting
All Counties Web Meeting
Individual Workshops
County Board Presentation

Outreach and Engagement

Goal: To further reduce K+A's by fostering stronger collaboration through a more individualized approach with each county.

Meetings:

- All county meetings
  - One meeting in person
  - Three meetings via webinar
- Individual county meetings
  - Two meetings in person
  - One Workshop
  - Two meetings via webinar/conf call
  - One optional County Board Presentation

April 12th – Kick-Off Meeting

11am-2pm (lunch provided)

MnDOT St. Cloud Training Center

Additional Discussion Items:

- Facilitated Discussion: What you hope happens/doesn't happen in the CRSP update process?
- Highlights of Lessons Learned from Phase 1
- Results of Research Synthesis survey
- Crash Data Analytical Approach and Analyses of Results
- Summary of Phase 1 CRSP Safety Projects
- Discussion of Roadway Network Assessment

Next Steps

Next Meeting:

April 12, 2018* (11:00am-2:00pm) *at the MnDOT Training Center in St. Cloud

We need from each county:

- Review segmented maps and provide feedback
- Begin planning for county Workshop date and location. (T,W,Th during Sept/Oct/early Nov.)
- Provide contact information for staff you would like involved to Renae Kuehl at rkuehl@srfconsulting.com

Questions?

- Mark Vizecky – MnDOT State Aid

  Mark.vizecky@state.mn.us   651-366-3839

- Howard Preston – CH2M

  howard.preston@ch2m.com 651-365-8514

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COUNTY ROADWAY **Safety Plan** Toward ZERO Deaths

Phase 2 CRSP Updates

County Safety Workshop Overview Webinar

May 8, 2018

Skype

Outreach and Engagement

Goal:

To further reduce K+A’s by fostering stronger county collaboration through a more individualized approach with each county.

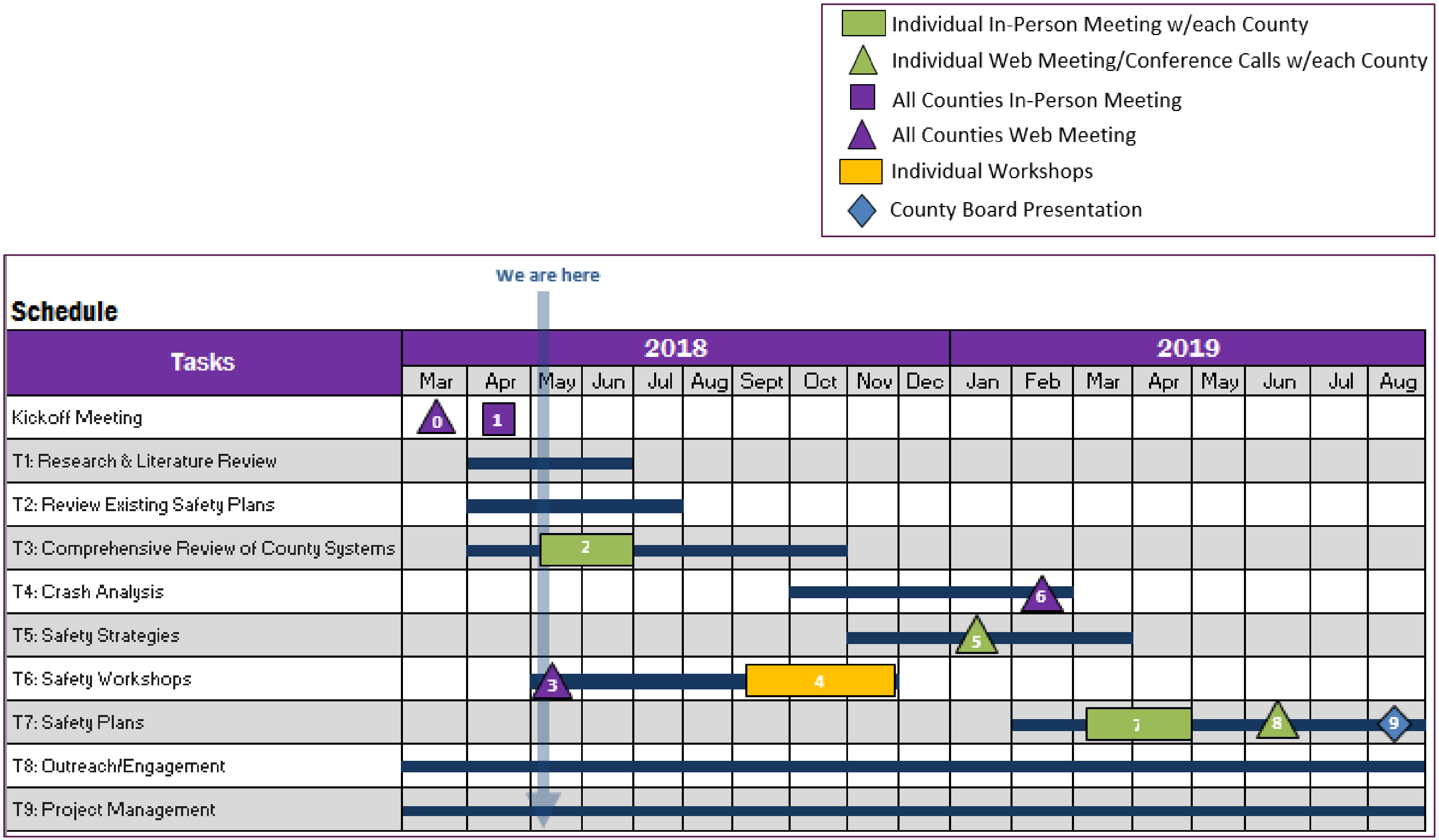
- All county meetings
  - One in-person meeting
  - Three webinar meetings
- Individual county meetings
  - Two in-person meetings
  - One safety workshop
  - Two meetings via webinar or conf. call
  - One optional county board presentation

Outreach and Engagement

		Phase 2	
	MEETING TITLE	MEETING FORMAT	TOPICS
0	PRE-KICKOFF MEETING	All Counties Web Meeting	• Goals • Process • Schedule • Needs
1	KICK-OFF MEETING	All Counties In-Person Meeting	• CRSP update Review • What are you looking for from project? • P1 Lessons Learned, approach, results and projects - P2 Roadway Network Assessment
2	ROADWAY NETWORK REVIEW	Individual County In-Person Meeting	• Segments • Intersections • Curves • Missing data needed from county
3	WORKSHOP OVERVIEW	All Counties Web Meeting	• Overview of workshop goals • Phase 1 workshops review • Workshop options • Planning approach and schedule
4	WORKSHOP	Individual County Workshop	• Present crash analysis findings • Present systematic and high crash location analysis process • Review high priority locations identified • Review safety strategies being considered
5	STRATEGIES REVIEW	Individual County Web Meeting	• Review preferred strategies to include, with each county
6	RISK FACTORS REVIEW	All Counties Web Meeting	• Present identified risk factors for systematic analysis
7	PROPOSED PROJECTS REVIEW	Individual County In-Person Meeting	• Proposed projects for each segment, intersection and curve • Desired changes to projects
8	DRAFT PLAN REVIEW	Individual County Web Meeting	• Review content for the draft County Road Safety Plan • Discuss edits needed
9	COUNTY BOARD PRESENTATION *(optional)*	Individual County (16) Board Meeting	• Present CRSP approach and results to county board

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Schedule



Individual In-Person Meeting w/each County
Individual Web Meeting/Conference Calls w/each County
All Counties In-Person Meeting
All Counties Web Meeting
Individual Workshops
County Board Presentation
We are here
Schedule
Tasks
2018
2019
Mar Apr May Jun Jul Aug Sept Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug
Kickoff Meeting
T1: Research & Literature Review
T2: Review Existing Safety Plans
T3: Comprehensive Review of County Systems
T4: Crash Analysis
T5: Safety Strategies
T6: Safety Workshops
T7: Safety Plans
T8: Outreach/Engagement
T9: Project Management
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County Road Safety Workshop: Alternative Formats and Audiences

Formats…choose one:

a) Featured Safety Strategy Presentation/Discussion
b) Site Locations Working Session
c) Featured Safety Strategy Presentation/Discussion + Site Locations Working Session
d) Board Presentation (pre- or post-CRSP Plan Development)
e) Board Presentation + safety stakeholders

General audiences:

- Safety stakeholders + county staff
- County staff only
- County board members

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Potential Workshop Topics

- Workshop Goals and Introductions
- County Road Safety Plan Update and Safety Strategies Overview
  - Overview of CRSP, MN TZA, Statewide Performance Measures, Data Driven Safety Analysis
  - Proactive Systemic Safety Approach
  - Implemented Safety Projects and County Implementation Approach
  - County Crash Data Overview and Focus Areas
- Group Discussion: *What is important to advance road safety in the County?*
- Featured Infrastructure Safety Strategies Presentation & Discussion
- Priority Site Location Discussions
- Next Steps

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Example Agenda: *McLeod County*
A) Featured Strategy Presentation/Discussion

9:00	Welcome, Introductions, and Workshop Goals
9:10	Intro to CRSP/MN TZD Goals
	Data Driven Safety Analysis
	Discussion: What is important to advance road safety in the county?
	Overview of Proactive Systemic Safety Approach
10:45	Implemented Safety Projects
11:00	County Crash Data Overview and Focus Areas
11:20	Featured Infrastructure Safety Strategies Discussion
2:00	Adjourn

(Excludes Site Locations Working Session)

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Example Agenda: *Chisago County*
B) Site Locations Working Session

9:00	Welcome, Introductions, and Workshop Goals
9:10	Intro to CRSP/MN TZD Goals
	Data Driven Safety Analysis
	Discussion: What is important to advance road safety in the county?
	Overview of Proactive Systemic Safety Approach
10:00	Implemented Safety Projects
10:20	County Crash Data Overview and Focus Areas
10:50	Priority Site Locations (2 Intersections, 2 segments)
2:30	Adjourn

(Excludes featured presentation of safety strategies.)

Example Agenda: *Chisago County*
B) Site Locations Working Session

Priority Site Location Discussion Format:

- County Site Overview [10 min.]
- Site Crash Facts [5 min.]
- Alternative Safety Strategy Discussion [20 min.]
- Summary [5 min.]

Locations:

1. **Intersection** of *CSAH 25/292nd Ave, City of Lindstrom (at the High School)*
2. **Intersection** of *CSAH 1/CSAH 39, Rush City*
3. **Segment** of *CSAH 7 from CSAH 39 (Fairfield Ave) to CSAH 30 (Forest Blvd), Rush City*
4. **Segment** of *CSAH 30 from 360th St to 420th St, North Branch*

Example Agenda: *Wright County*
C) Featured Strategy Presentation/Discussion + Site Locations Working Session

9:00	Welcome, Introductions, and Workshop Goals
9:10	Intro to CRSP/MN TZD Goals
	Data Driven Safety Analysis
	Discussion: What is important to advance road safety in the county?
	Overview of Proactive Systemic Safety Approach
	County Crash Data Overview and Focus Areas
10:55	Featured Infrastructure Safety Strategies Discussion
12:30	Priority Site Locations ((1 segment, 2 intersections)
3:30	Adjourn

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Example Agenda: Otter Tail County
D and E) AM Board Meeting & Safety Stakeholder Workshop

Board Meeting	
9:35	Welcome, Introductions, and Workshop Goals
9:40	Intro to CRSP/MN TZD Goals
	Overview of Proactive Systemic Safety Approach
	County Crash Data Overview and Focus Areas
10:10	Featured Infrastructure Safety Strategies and Discussion
11:00	Adjourn
Safety Workshop	
1:00	Welcome, Introductions, and Workshop Goals
1:10	Intro to CRSP/MN TZD Goals
	Discussion: What is important to advance road safety in the county?
	Overview of Proactive Systemic Safety Approach
2:10	Implemented Safety Projects
2:55	Featured Infrastructure Safety Strategies and Discussion
4:00	Adjourn

Condenses Workshop agenda. Excludes the Site Location Discussion

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Phase 1 Workshop Format Summary

Presentation/Discussion Only
Presentation/Discussion + Site Location
Site Locations Only
Board Presentation
Board Presentation + Coalition member discussion

	Intro to CRSP/MN TZD Goals	Crash Data/Focus Areas	Data Driven Safety Analysis	Implemented Safety Projects	Discussion: What is important to advan	Proactive Systemic Analytical Process	Infrastructure Safety Strategies Discus	Site Discussion and Alternative Strategi	Site-specific locations				
	Presentation Topics								# of Locations	Length	# of	Audience	Notes
Beltrami	X	X	X	X	X	X			None	6 hours	24	County Staff, County commissioners; MnDOT, Schools, State Patrol, TZD,	Included a voting exercise
Carlton	X	X	X	X	X	X	X		None	5 Hours	32	County; MnDOT; Health; City; Township; TZD; Tribal; Fire	
McLeod	X	X	X	X	X	X	X		None	5 Hours	28	County Board, Dept. Heads, School Superintendents, RDC planner, 4 E's, Community advocates, City engineers, City administrators, Twp	
Freeborn	X	X	X	X	X		X	X	1.) CSAH 13 & 18 2.) CSAH 46 & 26 3.) I-35 & East Main Street (Truck Stop Region) 4.) I-90 & MN 13	6.5	29	AM: MnDOT, County, City, Driver Ed, Law Enforcement, Health, Commissioners, Administrator, TZD PM: elected officials from the county, city, townships	
Goodhue	X	X	X	X	X	X	X	X	1.) CR 7 from TH 61 to TH 19 2.) CR 18/ TH 61	6.5 Hours	26	County Staff and Commissioners, School Districts, Transportation-related businesses, City Councils & staff, Township	Emphasis on Motorcycle safety strategies
Hennepin	X	X	X	X	X	X		X	1.) CSAH 19 & CR 117 2.) Minnetonka Blvd & Dakota Ave 3.) CSAH 81 & Elm Creek Blvd	5.5	35	Hennepin County Public Works staff, Public Affairs, and County Administration, city staff,	
Morrison	X	X	X	X	X	X	X	X	1.) TH 10/CSAH 14	5 Hours - AM Safety Stakeholders 2 Hours - PM County Staff	28	MnDOT; Commissioners; Township: Mayor; City Staff; County Staf; Law Enforcement	Site location discussion with county staff only
Olmsted	X	X	X	X	X	X	X	X	1.) CSAH 36 (Marion Rd) 2.) CSAH 1 & TH 30	4.5	16	county engineer/staff, large and small city engineers/consultants, MnDOT D6 traffic staff, law	

Phase 1 Workshop Format Summary

Purple	Presentation /Discussion Only
Green	Presentation/Discussion + Site Location
Yellow	Site Locations Only
Blue	Board Presentation
Orange	Board Presentation + Coalition member discussion

	Presentation Topics: Intro to CRSP/MN TZD Goals	Crash Data/Focus Areas	Data Driven Safety Analysis	Implemented Safety Projects	Discussion: What is important to advance road	Proactive Systemic Analytical Process	Infrastructure Safety Strategies Discussion	Site Discussion and Alternative Strategies	# of Locations: Site-specific locations	Length	# of Attendees	Audience	Notes
St. Louis	X	X		X	X	X		X	1.) CSAH 13 & CSAH 45 2.) CSAH 146 & US-53 3.) MNTH-37 & CSAH 7 4.) US 53 & MNTH 1/CSAH 115 5.) MNTH 37 & CSAH 25 East	6	13	Site specific reps ARDC MIC Safe Communities coalition State Patrol SLC Sheriff Major city police	Hosted a separate County Board Meeting Oct 17th 9:30-10:30
Stearns	X	X	X	X	X	X	X	X	1.) CSAH 2 & Minnesota Street	5.5	13	MnDOT, County, Law Enforcement, EMS,	
Wright	X	X	X	X	X	X	X	X	1. CSAH 39 Corridor 2. CSAH 39 & Gillard Avenue Intersection 3. CSAH 39 & CSAH 19 Intersection	6.5	18	County Commissioners; Law Enforcement; Emergency Responders; Media; Safe Communities BOD; County Staff; City Staff	
Chisago	X	X	X	X	X	X		X	1.) CSAH 25/292nd Ave 2.) CSAH 1/CSAH 39 3.) CSAH 7 from CSAH 39 to CSAH 30 4.) CSAH 30 form 360th ST to 420th St	5.5	24	MnDOT. County, City staff, TZD, FHWA, Schools, Law Enforcement, EMS,	
Meeker	X	X	X	X		X	X		None	2 Hours	13	County Board of Commissioner, TZD Meeker Safe Roads Coalition	
Crow Wing	X				X	X	X	X	1.) CSAH 3/CSAH 11	1 Hour - AM Board 1 Hour - PM Stakeholders	9 19	AM - County commissioners + press PM - Safety Coalition Committee	
Otter Tail	X	X	X	X	X	X	X		None.	1.5 Hour - AM Board 3 Hours - PM Stakeholders	12 20	AM - Board Meeting County commissioners PM - Safety Stakeholder Workshop	

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Potential Workshop Objectives

1. Create a shared understanding of the County Road Safety Plan update process and its importance.
2. Create a shared understanding of the County's roadway safety approach.
3. Solicit and share safety stakeholder perspectives to reduce severe crashes in the County.
4. Develop a more comprehensive understanding of featured infrastructure safety strategies to reduce severe crashes in the County.
5. Collaboratively explore infrastructure safety strategies for priority site locations.

Workshop Audience: Example Invite List

- County engineers and maintenance staff
- County Administrator
- County Commissioners
- Safe Roads Coalition
- Regional TZD representative
- City reps including Consulting engineer acting as city engineer
- Law enforcement (MSP, Police, Sheriff)
- Emergency medical response
- Tribal governments (if applicable)
- MnDOT District staff, DSAE, traffic engineering and planning
- FHWA Safety Engineer Will Stein

Next Steps:
County Safety Workshop Planning

- ✓Determine workshop location and date
  - T, W, Th in September/October/November
- ✓Identify County's preferred workshop objectives.
  - Key messages important to communicate?
- ✓Determine workshop audience and invitees
  - County sends invitation and cc. Renae/Cheri
- ✓Confirm featured infrastructure safety strategies:
  - For plan consideration
  - To feature in workshop

Your decisions are part of the critical path!

Questions?

- Mark Vizecky – MnDOT State Aid
  Mark.vizecky@state.mn.us 651-366-3839

- Cheri Marti
  Cheri.f.marti@gmail.com 612-616-4280

- Renae Kuehl
  RKuehl@srfconsulting.com 763-249-6783

THANK YOU!

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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Appendix C – Workshop Material

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WORKSHOP AGENDA

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Clay County Roadway Safety Workshop

WORKSHOP DATE:	Wednesday, October 31, 2018
MEETING TIME:	8:15 Registration; 8:30 AM – 2:00 PM Workshop (lunch provided)
LOCATION:	Clay County Law Enforcement Center Larson Rm. 1013 911 11th St. N., Moorhead, MN

Workshop Agenda

8:15	Registration and Refreshments	
8:30	**Welcome, Introductions and Workshop Goals** • Create a shared understanding of CRSP and Clay County's infrastructure roadway safety approach • Share safety stakeholder perspectives to reduce severe crashes • Develop understanding of and collaboratively explore featured, proven infrastructure strategies for CRSP plan consideration.	Cheri Marti, Jacobs/ Dave Overbo County Engineer
8:40	**County Roadway Safety Plan (CRSP) Background** • Overview of CRSP & Data-Driven Safety Analysis Video • **Discussion:** *What is important to advance road safety in the county?* • Overview of Proactive Systemic Safety Approach	MnDOT All Howard Preston, Jacobs
9:45	Break (15 Min.)	
10:00	• Implemented Safety Projects & Clay County Safety Approach	Howard Preston/ Dave Overbo
10:20	• Clay County Crash Data Overview & Safety Focus Areas	Howard Preston
10:40	Featured Infrastructure Safety Strategies Discussion	
11:45	Lunch (30 Min.)	
12:15	**Priority Site Location Discussions** *(approx. times)* • County Site Overview [10 min.] • Site Crash Facts [5 min.] • Alternative Safety Strategy Discussion [20 min.] • Summary [5 min.]	Dave Overbo & Safety Stakeholders Howard All
12:20	1.) Intersection – CSAH 12 & CSAH 52	
1:05	2.) Intersection – CSAH 10 and CSAH 31	
1:50	**Wrap Up:** Closing Comments + Workshop Evaluation	
2:00	Adjourn	

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Clay County
County Roadway Safety Plan Workshop

October 31, 2018

County Roadway Safety Plan Updates

Discussion Goals and Agenda Review

Goals:

- Create a shared understanding of CRSP and Washington County's infrastructure roadway safety approach
- Share safety stakeholder perspectives to reduce severe crashes.
- Develop understanding of and collaboratively explore proven infrastructure strategies for CRSP plan consideration.

Agenda Review

2

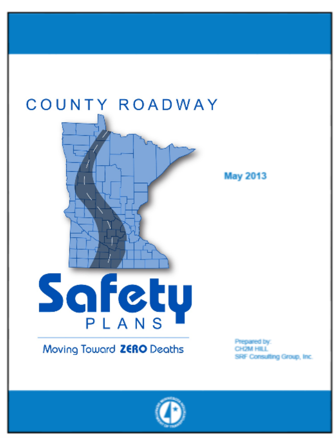
Handouts Review

- Agenda
- PPT Slides
- County Rural Crash Tree
- County Urban Crash Tree
- Statewide/County Focus Area Tables
- Big Book of Ideas
- Site Location Packets
- Evaluation Form
- CRSP One-pager
- Research/Strategy One-pagers
- TZD One-pager
- Data-Driven Safety Analysis (DDSA) One-pager (FHWA)

3

What is a County Roadway Safety Plan or "CRSP?"

- **Switching from a reactive to a proactive approach**
- CRSP Identifies priority location-specific safety concerns and suggested priority infrastructure improvements.
  - o County segments, curves, & intersections
  - o Locations that are most at risk
  - o Proven safety strategies
- In 2014, initial CRSP plan created for all 87 MN counties in partnership with MnDOT and the Federal Highway Administration.
- The "CRSP Update" is an effort to continue to advance safety on county roadways.



4

Data-Driven Safety Analysis: Minnesota Case Study Video

Why the need for County Roadway Safety Plans?

- 60% of severe crashes (fatality or serious injury) occur on local roadways; **most severe are on county roads**.
- Local agencies are responsible for more than 90% of the state's roadway miles.
- The majority of roadway safety investments have been made on the state system.

"It will be impossible to achieve Minnesota's long-term goal of zero fatalities if minimal investment is made to address safety on local roadways" Mitch Rasmussen, Assistant Commissioner State Aid Division

What is the goal of County Road Safety Plans or CRSP ?

To support the statewide initiative of moving **Minnesota Toward Zero Deaths Program** through **continued reduction** of **fatalities and serious injuries** on county roadways.

- Minnesota TZD Program:
  - Even one traffic death is unacceptable
  - Interdisciplinary approach: Engineering, Enforcement, Education, Emergency medical and trauma services
  - Partnership with community safety stakeholders
- CRSP aligns with the Minnesota Strategic Highway Safety Plan (SHSP)
- Support TZD Goal of fewer than 300 fatalities and 850 serious injuries by 2020

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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CRSP Funding

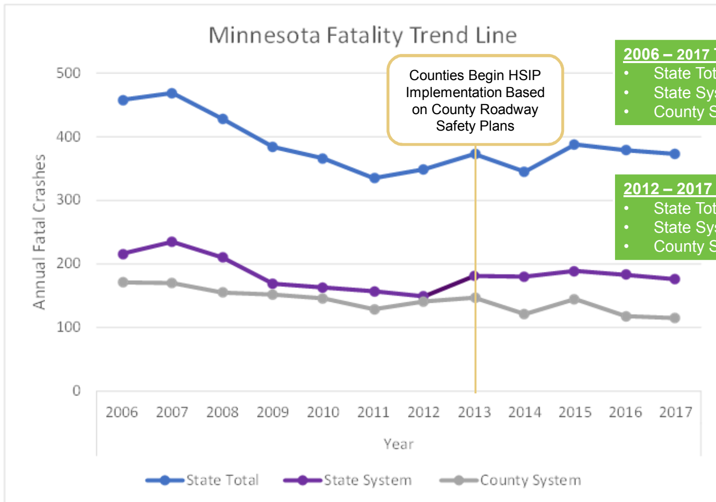
- Every Year, Minnesota receives ~$30 Million Federal Highway safety funding
- Highway Safety Improvements Program (HSIP)
- Minnesota shares HSIP funding with the local governing agencies (about 50%)

10/29/2018

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

8

What are the initial results of county road safety improvements?



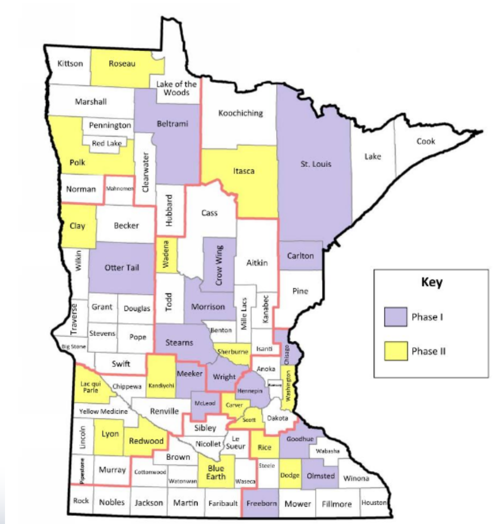
2006 – 2017 Trends
- State Total - Down 19%
- State System - Down 19%
- County System - Down 33%

2012 – 2017 Trends
- State Total - No Change
- State System - Down 3%
- County System - Down 22%

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

9

CRSP Update - Phase 2 (16 Counties)

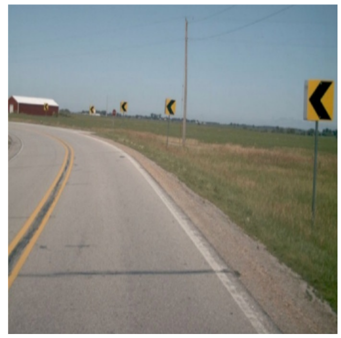


COUNTY ROADWAY Safety Plan Toward ZERO Deaths

10

Data Analysis Goals

- Conducting a **data-driven** safety analysis of the county roadway system
- Identifying and **prioritizing candidate locations** for safety investment
- Developing **safety projects** – specific strategies at specific locations



COUNTY ROADWAY Safety Plan Toward ZERO Deaths

11

Your thoughts...

What is important to advance road safety in the county?

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

12

COUNTY ROADWAY
Safety Plan
Toward ZERO Deaths

Overview of Proactive Systemic Safety Approach

County Roadway Safety Plan Updates

Why Proactive Systemic Safety Approach?

Traditional method: **"high crash" locations**

- Concern: no locations met the high crash designation

The solution for local system safety analyses =

Proactive Systemic Risk Analysis

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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What is a Systemic Risk Analysis?

- **Analytical approach** identifies and prioritizes safety deficiencies on roads based on risk of crash
- **Identifies risk factors** based on roadway and traffic characteristics
- **Prioritizes the road system for safety investment** by documenting the number of risk factors present at each location.

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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What is the benefit of a systemic process?

- It works
- It leads to implementation
- It allows agencies to proactively deploy safety projects on at-risk locations.

With the systemic process, the answer to "*How many people have to die before you do something?"* – is Zero!

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

16

Risk Factor Identification

Segments:

- Density of Road Departure
- Traffic Volume
- Critical Curve Radius
- Access Density
- Edge Risk Assessment

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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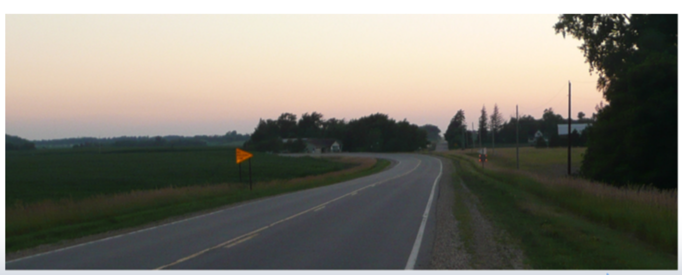
Risk Factor Identification

Curves:

- ADT Range
- Radius Range
- Severe Crash on Curve
- Intersection on Curve
- Visual Trap on Curve



COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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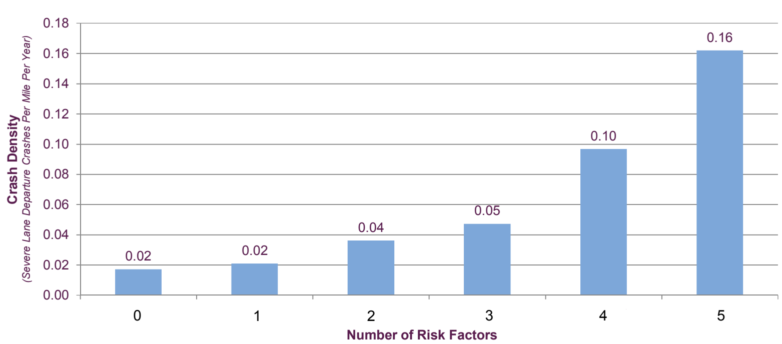
Risk Factor Identification

Intersections

- Skewed Approach
- On/near curve
- Volume
- Proximity to railroad crossing
- Proximity to last STOP sign
- Intersection related crashes
- Commercial Development in Quadrant

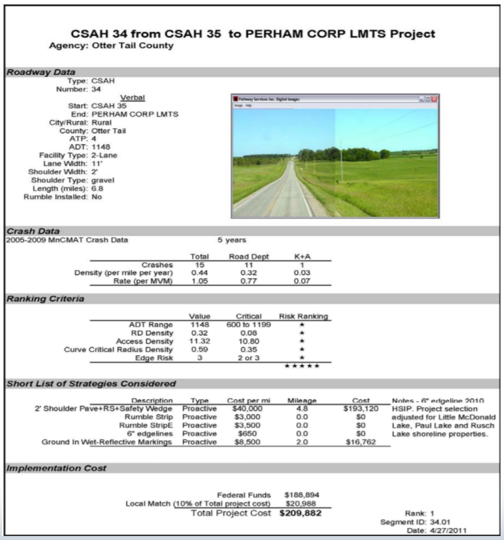
Systemic Safety Approach Works!

***Higher* priority segments have *higher* crash densities**



Low Priority → **High Priority**

Project Form & Impact of Having a Safety Plan



CSAH 34 from CSAH 35 to PERHAM CORP LMTS Project
Agency: Otter Tail County

Roadway Data

Type: CSAH
Number: 34
Verbal
Start: CSAH 35
End: PERHAM CORP LMTS
City/Rural: Rural
County: Otter Tail
ATP: 4
ADT: 1148
Facility Type: 2-Lane
Lane Width: 11'
Shoulder Width: 2'
Shoulder Type: gravel
Length (miles): 6.8
Rumble Installed: No

Crash Data

2005-2009 MnCMAT Crash Data — 5 years

	Total	Road Dept	K+A
Crashes	15	11	1
Density (per mile per year)	0.44	0.32	0.03
Rate (per MVM)	1.05	0.77	0.07

Ranking Criteria

	Value	Critical	Risk Ranking
ADT Range	1148	600 to 1199	★
RD Density	0.32	0.08	★
Access Density	11.32	10.80	★
Curve Critical Radius Density	0.59	0.35	★
Edge Risk	3	2 or 3	★
			★★★★★

Short List of Strategies Considered

Description	Type	Cost per mi	Mileage	Cost
2' Shoulder Pave+RS+Safety Wedge	Proactive	$40,000	4.8	$193,120
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" edgelines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	2.0	$16,762

Notes - 6" edgeline 2010 HSIP. Project selection adjusted for Little McDonald Lake, Paul Lake and Rusch Lake shoreline properties.

Implementation Cost

Federal Funds	$188,894
Local Match (10% of Total project cost)	$20,988
Total Project Cost	**$209,882**

Rank: 1
Segment ID: 34.01
Date: 4/27/2011

Over a 4-year period:

- **Over 85% of Minnesota counties** secured HSIP funding for at least one project.
- More than **$60M of HSIP funds** were directed to supporting the implementation of safety projects on the county system.

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Implemented Safety Projects and County Implementation Approach

County Roadway Safety Plan Updates

ATP 4 Implemented Safety Projects

Project Description	Number of projects	Suggested HSIP Award
Segments		
Total Edgeline Striping	22	$6,591,821.40
Total Narrow Shoulder	13	$3,219,910.90
Total Rumble Strips	0	$0.00
Total Sign Installation	0	$0.00
Subtotal Lane Departure Projects	**35**	**$9,811,732.30**
Curves		
Total Chevron Projects	8	$356,914.80
Total Geometric Improvements	1	$800,000.00
Total Curve Projects	**9**	**$1,156,914.80**
Intersections		
Intersection Signing	2	$205,515.00
Interseciton Lighting	4	$1,233,790.00
Intersection Geometric Improvements	1	$856,000.00
Total Intersection Projects	**7**	**$2,295,305.00**
Total Projects	**51**	**$13,263,952.10**

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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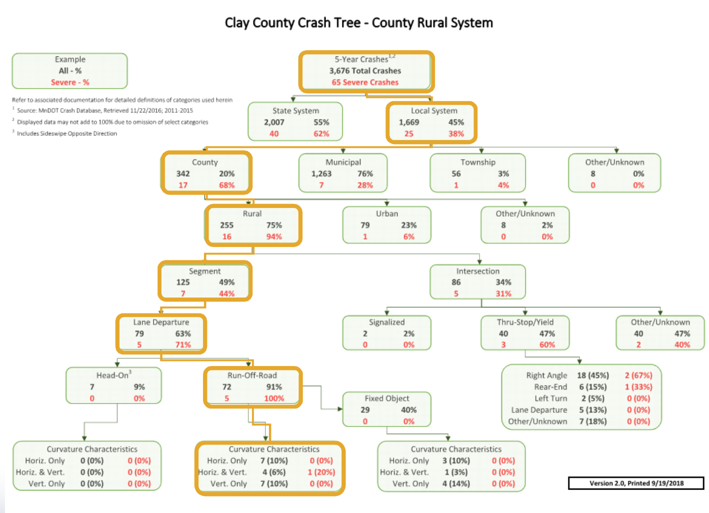
COUNTY ROADWAY Safety Plan Toward ZERO Deaths

Clay County Crash Data Overview

County Roadway Safety Plan Updates

Clay County Crash Tree – Rural



10/29/2018

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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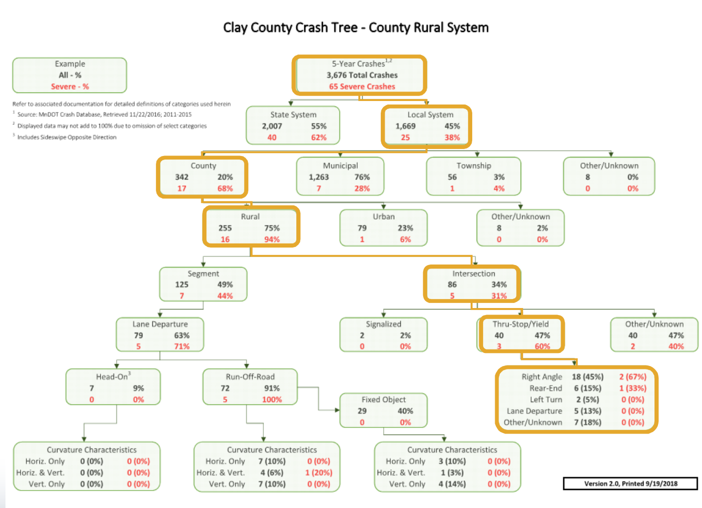
Clay County Crash Tree – Rural



10/29/2018

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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County Versus State Crash Data - Rural

Clay County Crash Summary - Rural

Crash Statistics (Severe Crashes)	Statewide Greater Minnesota	Clay County
State vs. Local System	38% vs 62%	62% vs. 38%
On County System	63%	68%
Rural vs. Urban	57% vs. 42%	94% vs. 6%
Segment Related	63%	44%
Lane Departure	71%	71%
Head - On	17%	0%
Run-off-Road	83%	100%
Curve Related	47%	20%
Intersection Related	31%	31%
Thru - STOP	54%	60%
Right Angle	43%	67%

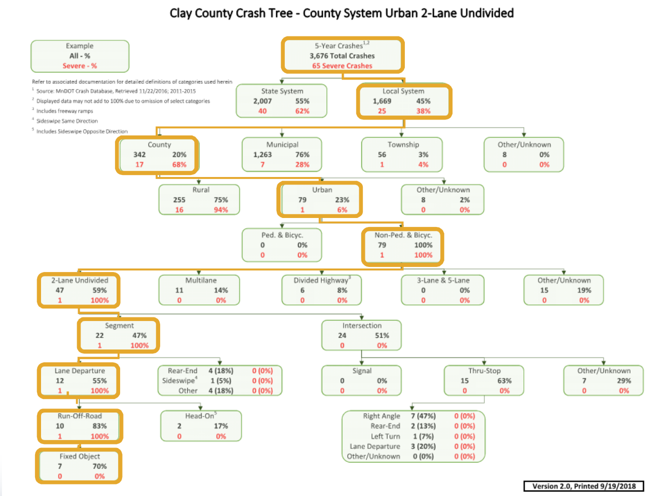
COUNTY ROADWAY Safety Plan Toward ZERO Deaths 27

Clay County Crash Tree – Rural Key Takeaways

- Focus on supporting safety initiatives on local systems especially on county roadways
- Primary focus on Rural County Roadways
- Primary focus on Lane Departure Crashes along Rural Road segments and horizontal curves
- Secondary focus on Angle Crashes at Rural Thru-STOP controlled intersections

10/29/2018 COUNTY ROADWAY Safety Plan Toward ZERO Deaths 28

Clay County Crash Tree - Urban



County Versus State Crash Data - Urban

Clay County Crash Summary - Urban

Crash Statistics (Severe Crashes)	Statewide Greater Minnesota	Clay County
State vs. Local System	38% vs. 62%	62% vs. 38%
On County System	45%	68%
Rural vs. Urban	57% vs. 42%	94% vs. 6%
2-Lane Undivided	40%	100%
Segment Related	58%	100%
Single vs. Multi Vehicle	33% vs. 57%	100% vs. 0%
Head-On vs. Rear End	33% vs 7%	0% vs. 0%
Multi-Lane & Divided	49%	0%
Intersection Related	75%	0%
Signal Control	66%	0%
Right Angle Collision	44%	0%
Pedestrian & Bicycle Crashes	25%	0%
2 - Lane Undivided	25%	0%
Segment vs. Intersection	48% vs. 46%	0%
Signal Control	33%	0%
Speed Limit - 30mph	45%	0%
Multi-Lane & Divided	63%	0%
Segment vs. Intersection	27% vs. 67%	0%
Signal Control	73%	0%
Speed Limit - 30mph	58%	0%

Clay County Crash Tree–
Urban Key Takeaways

- Too few severe urban crashes to identify statistically reliable trends
  - -Need to also consider statewide values
- Need to focus on BOTH 2-Lane Undivided and Multilane/Divided facilities
- On 2-Lane undivided facilities, the majority of crashes are segment related involving multiple vehicles and the most common type of crash is a Head-On
- On Multi-Lane Divided facilities, the majority of crashes are intersection related with traffic signal control and the most common type of crash is a Right Angle collision
- The majority of Pedestrian/Bicycle crashes occur on Multi-Lane/ Divided facilities at intersections with traffic signal control with a 30 MPH speed limit

COUNTY ROADWAY Safety Plan Toward ZERO Deaths 31

Clay County
Infrastructure Safety Strategies

County Roadway Safety Plan Updates

Big Book of Ideas

DEPARTMENT OF TRANSPORTATION

County Roadway Safety Plan Updates

The Big Book of Ideas

Prepared for:
Clay county

October 2018
Version 1.1

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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Rural Intersections

10/29/2018

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All-Way Stop/Yield

Crash Reduction Factor

- Not Available

Typical Installation Costs

- $1,000 per intersection

Rural Intersection Conflict Warning System (RICWS)

Crash Reduction Factor

- 50% all crashes
- 75% severe right angle crashes

Typical Installation Costs

- $75,000 to $125,000 per intersection

Roundabout

Crash Reduction Factor
- 20% to 50% all crashes
- 60% to 90% right-angle crashes

Typical Installation Costs
- $1,000,000 per intersection

Turn Lanes (Offset, Channelized)

Crash Reduction Factor
- Create positive offset left turn lanes ~35% (all + severe crashes)
- Channelize right turn lanes 43% - 60% (all crash severities)

Typical Installation Costs
- $75,000 - $250,000

LED Stop Signs

Crash Reduction Factor

- Angle crashes: 0% to 71%

Typical Installation Costs

- $2,000 to $6,000 per intersection

Remove Skew

Crash Reduction Factor

- 0% to 33%

Typical Installation Costs

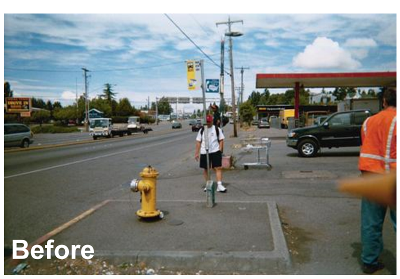
- $150,000 - $300,000 per intersection

Urban Segments

Access Management

Crash Reduction Factor
- 5% to 31%

Typical Installation Costs
- $360,000 per mile



Dynamic Speed Feedback Sign

Crash Reduction Factor
- 5% - 7% all crashes

Typical Installation Costs
- $30,000 per location

Urban Intersections

Rectangular Rapid Flash Beacon (RRFB)

Crash Reduction Factor

- 75% of drivers yield to pedestrians

Typical Installation Costs

- $15,000

Michael Frederick, City of St. Petersburg, FL

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Clay County
Site Location Discussions

County Roadway Safety Plan Updates

Site Location Discussions

For each Site:

- County Overview (10 Mins)
- Crash Facts (5 Mins)
- Alternative Safety Strategies (30 Mins)
  - Short Term Strategies
  - Long Term Strategies
- Summary (5 Mins)

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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Wrap-Up

Next Steps:

- Complete systemic roadway risk-factors and high-crash data analyses
- Develop safety recommendations for priority crash locations
- Develop County Road Safety Plan draft report

Thank you for your participation and input!

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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Questions?

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tara.olds@state.mn.us 651-366-3830

COUNTY ROADWAY Safety Plan Toward ZERO Deaths

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DEPARTMENT OF TRANSPORTATION

County Roadway Safety Plan Updates

The Big Book of Ideas

Prepared for:

Clay county

October 2018

Version 1.1

List of Strategies

Rural Segments

- Safety Edge
- Enhanced Edgeline (6" & 8")
- Shoulder Paving (2', 4', 6')
- Clear Zone Maintenance/Enhancements
- Ditch/embankment Improvements
- Separated Bike Trail/Path

Rural Curves

- Chevrons
- Delineators
- High Friction Surface Treatment (HFST)
- Dynamic Curve Signing
- Lighting
- Clear Zone Maintenance/Enhancements
- Reconstruct [TT to a Single T intersection]

Rural Intersections

- Upgrade Signs and Pavement Markings
- Streetlights (and approaches)
- All-Way Stop/Yield
- Restricted Crossing U-Turn (RCUT) Intersection
- Rural Intersection Conflict Warning System (RICWS)
- Offset T-Intersection
- Roundabout
- Turn Lanes (Offset, Channelized)
- Continuous Green T
- Mainline Dynamic Warning System
- Median Acceleration Lanes (MALs)
- LED Stop Signs

- Remove Skew / Realign Intersections

Urban Segments

- Road diet [3- & 5-Lane Conversions]
- ¾-Intersection
- Divided Roadway
- Access Management
- Bike Lane/Boulevard
- Urbanization (make it feel urban)
- Dynamic Speed Feedback Sign
- Sidewalks

Urban Intersections

- Echelon
- Continuous Flow Intersection (CFI)
- Signalized RCUT
- Confirmation Lights
- Pedestrian Countdown Timers
- Leading Pedestrian Intervals
- Curb Extensions
- Center Island Medians
- Roundabout
- Mini Roundabout
- Urbanization (make it feel urban)
- Rectangular Rapid Flash Beacon (RRFB)
- High-Intensity Activated crossWalk Beacon (HAWK)
- Flashing Yellow Arrow (FYA)
- Reflective Streetlight Backplate
- Turn Lanes (Offset, Channelized)
- Zig Zag Pavement Markings
- Pedestrian Education/Visibility

Rural Segments

Strategy	Crash Reduction Factor*	Typical Installation Costs
Safety Edge	5% to 10%§	$10,000 to $20,000 per mile
Enhanced Edgeline (6" & 8")	10% to 45% all rural serious crashes (6”)	$2,000 per mile
Shoulder Paving (2', 4', 6')	20% to 30% run-off-the-road crashes (with shoulder rumble) (2’ only)	$54,000 per mile + $5,850 per mile (for Edge Rumble)
Clear Zone Maintenance/Enhancements	Fatal, Serious & Minor Injury Crashes: Increase of 28% to Decrease of 18%	$50,000 to $500,000 per mile
Ditch/Embankment Improvements	32% to 41% (Adding new guardrail to embankments – Run off road crashes)	$500,000 to $1M per mile
Bike Paths/Trails	Not Available	$50,000 to $150,000 per mile
Notes: * - Crash reduction factors based on review of CMF Clearinghouse and other published research § - For all crashes		

Safety Edge
Source: FHWA Public Roads (Sept/Oct 2014; Vol. 78 No. 2)

Enhanced Edgeline
Source: Low-Cost Treatments for Horizontal Curve Safety (FHWA, FHWA-SA-07-002)

Enhanced Edgeline
Source: Low-Cost Treatments for Horizontal Curve Safety (FHWA, FHWA-SA-07-002)

Shoulder Paving
Source:https://mntransportationresearch.files.wordpress.com/2014/06/dsc_8665nv.jpg?w=672&h=372&crop=1

Clear Zone Maintenance

Source:https://nativeengineering.files.wordpress.com/2016/12/3.jpg?w=300&h=204

Ditch/Embankment Improvements

Source: http://www.roadex.org/wp-content/uploads/elearning/drainage/5/521.jpg

Separated Bike Path

Source: http://www.bikethebyways.org/lakes-to-locks-passage/rouses-point-keeseville/

Rural Curves

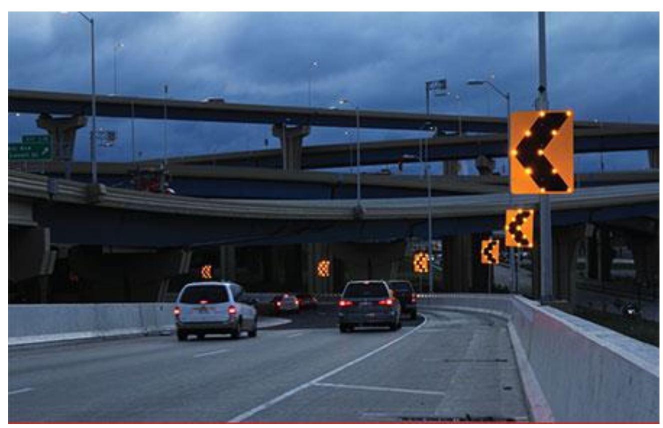
Strategy	Crash Reduction Factor*	Typical Installation Costs
Chevrons	20% to 30%	$3,960 per curve
Delineators	18% to 34%†	$500 per curve
High Friction Surface Treatment (HFST)	All Crash Types - 24% Wet Road Crash Type – 52%	$25 to $35 per square yard
Dynamic Curve Signing	Not Available	$50,000 per curve
Lighting	See Rural Intersections	See Rural Intersections
Clear Zone Maintenance/Enhancements	Fatal, Serious & Minor Injury Crashes: Increase of 28% to Decrease of 18%	$10,000 - $250,000 per curve
Reconstruct → TT to Single T Intersection	Not Available	$150,000 - $300,000 per curve

Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research
† - Non-intersection, head-on, run-off-road, sideswipe, Nighttime crash types

Chevrons
Source: Low Cost Traffic Engineering Improvements: A Primer (FHWA, FHWA-OP-03-078)

Delineators
Source: Low-Cost Treatments for Horizontal Curve Safety (FHWA, FHWA-SA-07-002)

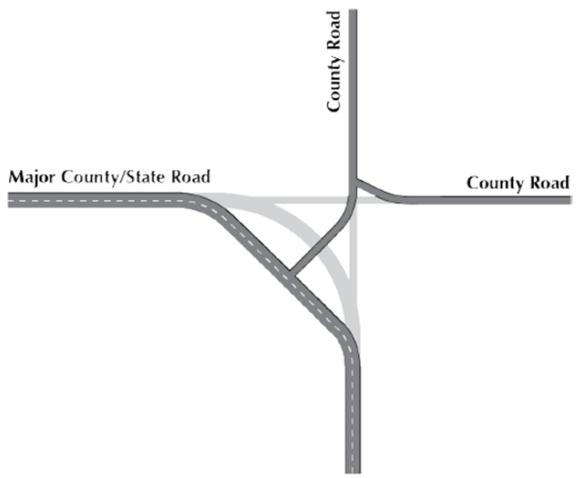
High Friction Surface Treatment
Source: Minnesota LTAP Technology Exchange (Fall 2014, Vo. 22 No. 4)



Dynamic Curve Signing
Source: FHWA, Sequential Dynamic Curve Warning System: Product Safety Performance Evaluation (2011)

Street Lights
Source: Mitigation Strategies for Design Exceptions (FHWA, FHWA-SA-07-011)

Clear Zone Maintenance
Source:https://nativeengineering.files.wordpress.com/2016/12/3.jpg?w=300&h=204

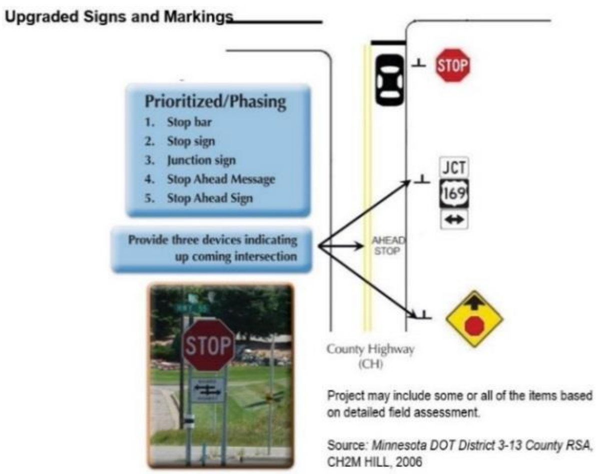


TT to T Intersection Reconstruction
Source: MnDOT 2015 Traffic Safety Fundamentals Handbook

Rural Intersection

Strategy	Crash Reduction Factor*	Typical Installation Costs
Upgrade Signs and Pavement Markings	40% upgrade of all signs and pavement markings/ 15% for STOP AHEAD pavement marking	$2,640 per approach†
Streetlights (and approaches)	25% to 40% of nighttime crashes	$6,000 per light
All-Way Stop/Yield	Not Available	$1,000 per intersection
Restricted Crossing U-Turn (RCUT) Intersection	17% all crashes/ 100% angle crashes	$750,000 per intersection
Rural Intersection Conflict Warning System (RICWS)	50% all crashes/ 75% severe right angle crashes	$75,000 to $125,000 per intersection
Offset T-Intersection (Convert 4-legged intersection to 2 3-legged intersection)	All Crash Types & Severities 53%	$150,000 - $300,000 per intersection
Roundabout	20% to 50% all crashes/ 60% to 90% right-angle crashes	$1,000,000 per intersection
Turn Lanes (Offset, Channelized)	Create Positive Offset Left Turn Lanes - ~35% (All + Severe Crashes) Channelize Right Turn Lanes – 43% - 60% (All crash severities)	$75,000 - $250,000
Continuous Green T (Signalized) §	Angle Crashes – 96.8% Injury Crashes – 70% Total Crashes – 60%	$300,000 per intersection
Mainline Dynamic Warning System@	Angle Crashes – 67% All Crashes – 54% to 70%	$150,000 (estimated)
Median Acceleration Lanes (MALs) ^	Angle: increased 57% Rear End: decreased 40%	$115,000 for 1,500 feet with a 12 feet wide lane
LED Stop Signs δ	Angle Crashes: 0% to 71%	$2,000 to $6,000 per intersection
Remove Skew	0% to 33%	$150,000 - $300,000 per intersection

Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research
† - Includes $540 per STOP sign, $540 per junction sign assembly, $600 per STOP AHEAD sign, $600 per STOP AHEAD pavement marking message, and $360 per stop bar
§ - Source: https://safety.fhwa.dot.gov/intersection/innovative/others/casestudies/fhwasa09016/fhwasa09016.pdf
@ - 2-star quality studies only
^ - http://www.dot.state.mn.us/trafficeng/safety/medianaccelerationlanestudy.pdf
δ – Source: http://www.its.umn.edu/Publications/ResearchReports/reportdetail.html?id=2330



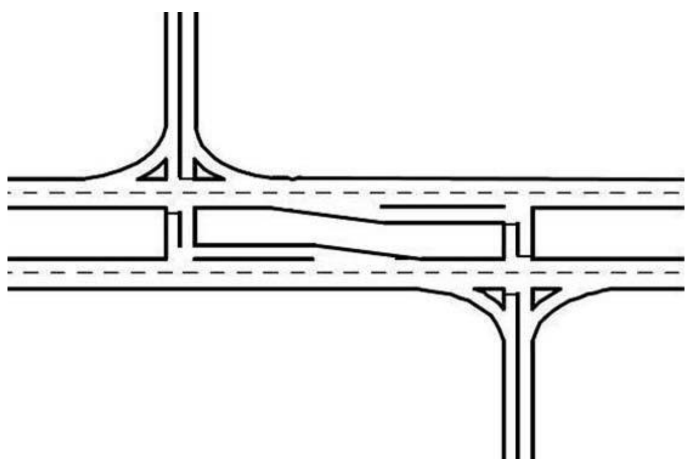
Upgrade Signs and Pavement Markings
Source: Minnesota CRSP

Street Lights
Source: Mitigation Strategies for Design Exceptions (FHWA, FHWA-SA-07-011)

All-Way Stop Controled intersection
Source: http://www.ite.org/uiig/images/type/clip_image010.jpg

Restricted Crossing U-Turn Intersections
Source: Bolton and Menk

Rural Intersection Conflict Warning System
Source: MnDOT Traffic Engineering
(http://www.dot.state.mn.us/trafficeng /signals /conflictwarning.html)



Offset T-Intersection
Source: Alternative Intersections/Interchanges: Informational Report (FHWA, FHWA-HRT-09-060)

Roundabout
Source: Innovative Intersection Safety Improvement Strategies and Management Practices: A Domestic Scan (FHWA, FHWA-SA-06-016)

Offset Right Turn Lane
Source: Review of Iowa's Rural Intersection Crashes: Application of Methodology for Identifying Intersections for IDS (MnDOT, MN/RC 2007-27)

Continuous Green T Intersection
Source: St. Louis County, Minnesota

Mainline Dynamic Warning System
Source: Google Earth – US 169 & Mille Lacs County Road 11

Median Acceleration Lane (MAL)
Source: Google Earth - US 169 & MNTH 68 Mankato MN

LED Stop Sign
Source: MnDOT – MNTH 95 & Chisago County State Aide Highway 9

Before

After

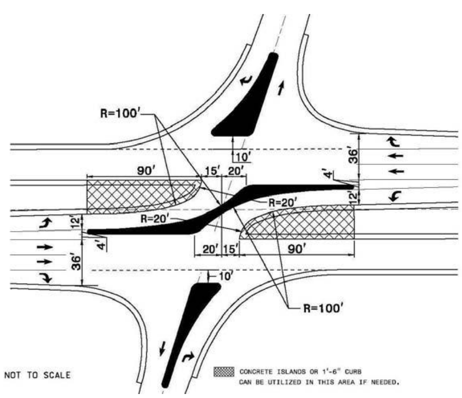
Remove Skew
Source: Google Earth

Urban Segments

Strategy	Crash Reduction Factor*	Typical Installation Costs
Road Diet [3- & 5-Lane Conversions]	30% to 50%	$48,000 per mile [three-lane] $54,000 per mile [five-lane]+$36,000 per signalized intersection for updates (for example, loop and signal head placement)
¾-Intersection	25%	$150,000 per location
Divided Roadway	22% (HSM §13.4.2.6)	$5M to $10M per mile
Access Mgmt (Access Mgmt Plan)	5% to 31%	$360,000 per mile§
Bike Lane/Boulevard	Approximately 60% (Some studies have noted increases)	Repurposing existing road ~$5,000 per mile New Construction of Separated Boulevard ~ $500,000 per mile
Urbanization (make it feel urban)	Not Available	$500,000 - $1,000,000 per mile
Dynamic Speed Feedback Sign	All crashes 5% - 7%	$30,000 per location
Sidewalks	Not Available	$5 to $10 per square foot

Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research
§ - For management of unsignalized intersection movements within a corridor that has a divided median. Typical project may include minor street diverters, signed turn restrictions, and median closings.

Road Diet
Source: Bike Walk Twin Cities



¾ Intersection
Source: Alternative Intersections/Interchanges: Informational Report (FHWA, FHWA-HRT-09-060)

Divided Roadway
Source: Flexibility in Design (FHWA)

Before

After

Access Management
Source: Mitigation Strategies for Design Exceptions (FHWA, FHWA-SA-07-011)

Bicycle Boulevard
Source: Minnesota's Best Practices for Pedestrian/Bicycle Safety (MnDOT, Report 2013-22)

Bike Lane
Source: Minnesota's Best Practices for Pedestrian/Bicycle Safety (MnDOT, Report 2013-22)

Rural Design - TH 2 Approaching Floodwood, MN

Urban Design - TH 2 in Floodwood, MN

Urbanization
Source: Google Street View

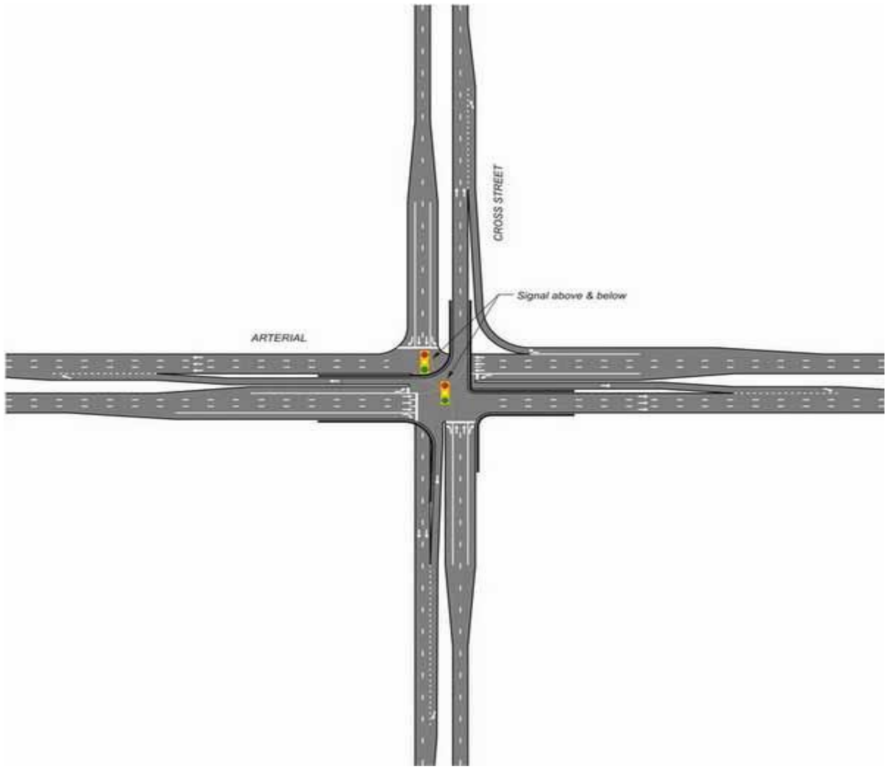
Dynamic Speed Feedback Sign
Source: http://1x57.com/wp-content/uploads/2011/06/25-mph-regulatory-speed-limit-sign-with-radar-sign1-173x300.jpg

Sidewalk
Source: http://locallygrownnorthfield.org/post/tag/sidewalks

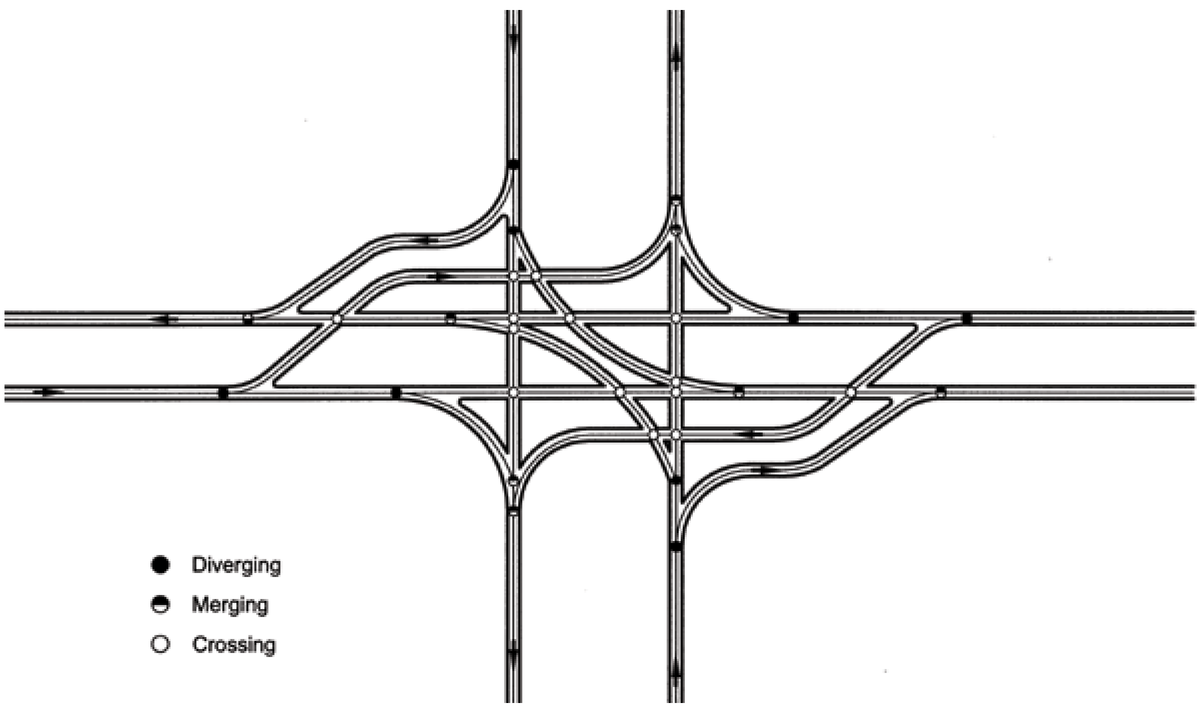
Urban Intersections

Strategy	Crash Reduction Factor*	Typical Installation Costs
Echelon	Not Available	$10 - $15 million
Continuous Flow Intersection (CFI)	Not Available	$4-$7 million
Signalized RCUT	Not Available	$1 to $5 million
Confirmation Lights	25% to 84% reduction in violations	$1,200 per two approaches
Pedestrian Countdown Times	25% vehicle/pedestrian crashes	$12,000 per intersection
Leading Pedestrian Intervals	Up to 60% pedestrian/ vehicle crashes	$600 per intersection
Curb Extensions	Increase in vehicles yielding to pedestrians	$36,000 per corner
Center Island Medians	46% in vehicle/pedestrian crashes	$24,000 per approach
Roundabout	20% to 50% all crashes/ 60% to 90% right-angle crashes	$4,200,000 per intersection
Mini Roundabout	20% to 50% all crashes/ 60% to 90% right-angle crashes	$40,000 to 500,000 per intersection
Urbanization (make it feel urban)	Not Available	$250,000 - $500,000 per intersection
Rectangular Rapid Flash Beacon (RRFB)	75% of drivers yield to pedestrians	$15,000
High-Intensity Activated crossWalk Beacon (HAWK)	69% Vehicle/Pedestrian	$50,000 to $120,000
Flashing Yellow Arrow (FYA) --> Note: Permitted to FYA	19.4% left turn crashes	
Reflective Streetlight Backplate	15% reduction in claims	$2500 per intersection
Turn Lanes (Offset, Channelized)	27%	$150,000 to $500,000
Zig Zag Pavement Markings[a]	Not available	$91,000[a]
Pedestrian Education/Visibility	Not Available	Not Available

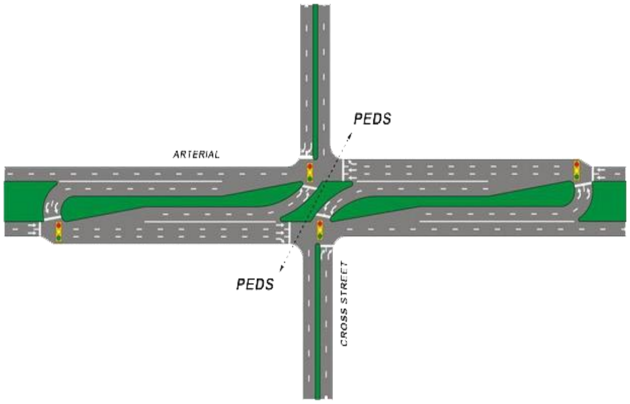
Notes:
* - Crash reduction factors based on review of CMF Clearinghouse and other published research
a – Virginia DOT Report: https://www.railstotrails.org/resourcehandler.ashx?id=4063



Echelon Intersection
Source: http://www.fhwa.dot.gov/publications/research/safety/09060/images/09060_img_222.jpg



Continuous Flow Intersection
Source: http://www.fhwa.dot.gov/publications/research/safety/04091/images/fig096.gif



Signalized RCUT
Source: Kentucky Transportation Cabinet; Congestion Toolbox

Confirmation Lights
Source: MnDOT 2015 Traffic Safety Fundamentals Handbook

Pedestrian Countdown Timer
Source: Oakland MTC: Bicycle/Pedestrian Safety Toolbox

Leading Pedestiran Interval
Source: https://bikeuptowndotorg.files.wordpress.com/2012/04/2012-04-15-09-56-491.jpg

Curb Extensions
Source: http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/images/fig205.jpg

Center Island Medians
Source:http://safety.fhwa.dot.gov/provencountermeasures/images/sa12_011.jpg

Roundabout
Source: Innovative Intersection Safety Improvement Strategies and Management Practices: A Domestic Scan (FHWA, FHWA-SA-06-016)

Mini Roundabout
Source:

Urbanization
Source: Google Earth Street View

Rectangular Rapid Flash Beacon
Source: http://www.fhwa.dot.gov/publications/publicroads/11mayjun /images/do1.jpg

Urbanization
Source: Google Earth Street View

HAWK
Source: http://www.fhwa.dot.gov/publications/research/safety/10045/images/hawk_027.jpg

Flashing Yellow Arrow and Reflective Backplate
Source: http://safety.fhwa.dot.gov/newsletter/safetycompass/2012/winter/images/rrb.png

Channelized Right Turn Lane
Source:http://www.ops.fhwa.dot.gov/publications/fhwahop12004/images/c4b.jpg

Zig Zag Pavement Markings
Source: VDOT https://www.railstotrails.org/resourcehandler.ashx?id=4063

Pedestrian Education/ Visibility
Source: http://exchange.aaa.com/safety/pedestrian-safety/tips-pedestrian-safety/

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WORKSHOP MEETING SUMMARY

Clay County Safety Workshop

WORKSHOP DATE: Wednesday, October 31, 2018

MEETING TIME: 8:15 AM Registration;
8:30 AM – 2:30PM Safety Stakeholder Workshop;

LOCATION: Clay County Law Enforcement Center
911 11th Street North, Moorhead, MN
Larson Room 1013

Attendees

- Anna Pierce, FM Metro COG
- Bob Zimmerman, City of Moorhead
- Bryan Green, Clay County
- Chris Ellingson, Hawley Elementary School
- Chuck Backes, MN State Patrol
- David Overbo, Clay County
- Deric Swenson, Moorhead Police Department
- Erik Hove, Clay County
- Frank Gross, Clay County Commissioner
- George Peters, Cromwell Township
- Jenny Morgan, Clay County
- Luke Champa, FM Metro COG
- Mark Empting, Clay county Sheriff's Office
- Mary Safgren, MnDOT
- Nathan Gannon, MnDOT SA
- Stephen Larson, Clay County
- Tom Trowbridge, City of Moorhead
- Trudy Kordosky, MnDOT
- Wayne Lepper, Highland Grove Township

Consultant Team

- Tara Olds, MnDOT
- Girma Feyissa, MnDOT
- Howard Preston, CH2M
- Cheri Marti, CH2M
- Nicole Buehne, SRF

Workshop Goals

Welcome, Introductions, and Workshop Goals

- Create a shared understanding of CRSP and Clay County's infrastructure roadway safety approach
- Share safety stakeholder perspectives to reduce severe crashes
- Develop understanding of and collaboratively explore featured, proven infrastructure strategies for CRSP plan consideration.

County Roadway Safety Plan (CRSP) Updates

County Roadway Safety Plan (CRSP) Background

- Tara gave an overview of CRSP's

Overview of CRSP & Data-Driven Safety Analysis Video

- Tara gave an overview of the CRSP
- Of the 50%, how is the funding prioritized among Minnesota counties?
    - Solicitation period opens. MnDOT aggregates based on crashes in each of the region. Distribution of funds to the proportion of crashes. If all the money is not used in other regions than it is disaggregated.
    - In District 4:
        - 12 Counties
        - Received approximately $1.2 million
- Assume that these numbers on the trend line consider more vehicles on the road and population increase.

Discussion: What is important to advance road safety in the county?

- Local input on what improvements could be made, whether infrastructure or not.
- Farmers concerns are not represented (Beets, Corn, etc. Not just Beet farms, we must consider all agriculture.)
- Receive multiple calls from locals on beet trucks. There are two sides to each.
- Beet trucks and enforcement – overweight
    - Consider the beet hauling requirements and the drivers. People drive so fast around these tractors that cannot run the road speed, which cause safety concerns. Commercial vehicles require CDL, but beet truckers do not require it. First haul operation for beet truckers can be as young as 16. It also does not require a license even though it's the same weight. This also brings up the concern that beet haulers may be driving with a revoked license because additional licensing is not required (like a CDL). The first haul is around 12 hours of work.
- Specific industries and their impact on roadways.
- Share the road.
- TZD Coalition – Grants were dropped because the office of traffic safety did not support local county messages. A new coalition was created because the funding was too specific (roadway safety, farming safety, etc.). They preferred seatbelt, roadway safety, but very specific.
    - Surveyed EMS and first responders received specific roads, but this wasn't supported by TZD Coalition. You are not provided pamphlets or other supportive materials funded by the grant money.
- Access Management and better coordination among jurisdictions.
    - Becoming more and more of an issue at the county planning level. Whenever there is an access on the state system, there seems to be a disconnect between the county applying and the state. How do you consider what everyone wants before these permits are approved?
- Rural areas' seatbelt use is low. The state shows 93% seat belt use. However, surveys show they are in the low 60's.
    - Not a lot of businesses are enforcing seatbelt in the office.
    - Field to field – no seatbelt requirements. No statute exists requiring what a "field to field" means. Some are 15 miles away.
- Distracted Driving

- Speed – Hasn't been a large factor in the County. Funds were reduced to the county since it is not within the top 13 counties with speed related crashes.
- Continuing education. What they learn now is quite extensive, however continuing education would be effective. Educators are through the school district. There is only a 30-hour requirement and that's it. Partnership between driver's education programs and enforcement would be great to send a positive message.
    - Moorhead and Clay County sponsors a parent/student requirement to help with the education. Parents must attend a 3-hour course in Minnesota.
- Stop signs versus yield signs. Yield signs on CR 2 - West of Buffalo River. Why is this just a yield sign? Traffic is barreling though.
- Severe crashes vs. other crashes
- Bike/Ped from Farmville to Moorhead

Overview of proactive Systemic Safety Approach

- Howard gave an overview of the proactive safety approach

Implemented Safety Projects & Kandiyohi Safety Approach

- Mumble Strips
    - 9 locations
- 6-inch-wide edgeline
    - The County is deciding whether to implement this throughout the County.
- Paved shoulders south of Glyndon on CR 14.
    - Tie these projects to paving the mainline
- Targeted intersection with crashes. For example, using lighting (8 alone this year)
- Stop Signs – One of the topics we should discuss today. Call from a caller that said the stop sign didn't blink, so they didn't think they had to stop. Drivers are now assuming that ALL stop signs should blink.
- Many rural roads do not have turn lanes.

Clay County Crash Data Overview & Safety Focus Areas

- Howard gave an overview of the crash data and safety focus areas.
    - Rural versus urban is based on law enforcement and what it is written on the reports, not the 5,000 population.

Featured Infrastructure Safety Strategies Discussion

- All-Way Stop/Yield
    - Not an overall crash reduction. Increasing levels of intersection control will not increase safety.
    - All-way stops work best at high volumes.
    - Fewer than 15% of people stop
    - Low volume gravel roads on CR 19 may need a yield versus a stop sign.
    - The County installed yields at heavily traveled summer roads (CR 2) in Lakes County.
        - Consistency would best in application of signage
- Rural Intersection Conflict Warning System (RICWS)

  - CR72/TH9 – a major intersection. For a while, MnDOT installed a flashing sign. MnDOT does not use the RICWS because it has a 6000 ADT threshold. Virtually all expressways have larger volumes so MnDOT tends to not install them.
  - This began as a warning for the mainline. Later, the use expanded to include the minor line. However, the minor line warning may be more complex.
  - What is the point of the illuminated text on the diamond?
    - There are different design options.
- Roundabout
  - Requires a 40M volume cross section and a previous right angle crash
- Mini Roundabout (added) – Less cost and an alternative depending on thresholds.
- LED stop signs
  - Requests from elected officials and the public.
  - Many assume that if you have run the stops then LED stops will help.
  - Public really likes this, but County would like a checklist of where to put this and when.
- Transverse Rumbles
  - For every research that you can find that says they are effectives, another report will say they aren't.
- Remove a Skew
- Access Management
- Dynamic Speed Feedback Sign
  - The County would consider this on the rural to urban transitions.
- Rectangular Rapid Flash Beacon (RRFB)
  - Marking and signing crosswalks at uncontrolled intersections is not safe.
  - Few locations to convert 4-lanes to 3-lanes with middle turn lane.
  - Moorhead completed a few. There's been mixed feelings towards it.

Intersection – CSAH 12 and CSAH 52

- Existing Condition
  - Heavy traffic intersection.
  - Gravel pits on the east side.
  - Large trucks drive along it.
  - Visibility is poor due to skew
  - Vertical curve on CSAH 52 (east)
  - RR track on CSAH 52 (east)
  - CSAH 52 has as a lot of bikers. There are locations where the shoulder is not conducive to bikers. So, they are riding out into the lane.
  - Traffic
    - CSAH 52 may be the most heavily driven in the County. Over 5000. Heavier commuter traffic, too, from drivers coming from Moorhead on Hwy 10.
    - East/West traffic coming from the lakes on the weekends.However, during the week CSAH 52 is congested.
  - Crash 3-4 years.
  - Law Enforcement: Speed is always an issue. When traveling westbound there are two stop signs. Stop for the RR and the intersection, so it gets a little confusing.

- County Installed
    - Overhead lighting - 3-4 years ago
    - Yield is eastbound.
    - (No rumbles exist)
- Recommendations
    - Stop bars at two locations (after RR stop sign)
    - Do railroads require stop signs or could you either install a yield or stop sign?

Intersection – 2 and 11

- Also interested in LED Stop Signs due to a crash.

Intersection – CSAH 10 and CSAH 31

- Existing Condition
    - A lot of traffic. Main lake roads, so commuter traffic.
    - Visibility is a concern.
    - Extremely rural.
    - East -West bound through traffic has the most run the stop signs.
    - Many drivers blow through the stop signs.
    - Deputies also find this area a concern. More people are running the stop sign going all directions.
    - There's law enforcement, but no compliance.
    - One summer evening, coming off the interstate past to 280 (3-5 miles), counted 120 cars (43 were from North Dakota).
    - 4 miles away the intersection is also skewed with a stop sign.
    - When trees are leafed out then the visibility is less poor.
    - Law enforcement is working on driving an unmarked vehicle up CSAH 10 to help.
    - Motorcycle traffic is also heavy on this road.
    - Common excuses are that they didn't see anyone coming. Last crash was alcohol related.
    - Shortly after two deaths, the intersection was a four-way stop.
    - Concerns with larger haulers or school buses who are trying to turn on the roads (east-west) and can't accelerate as fast.
- County installed
    - Overhead lighting (2).
    - LED stop signs. Put up a 4 way stop sign.
- Recommendations
    - Consider making it look more like an intersection.
    - Major/Minor should have a similar volume for it to be an all-way stop.
    - Advanced stop ahead pavement markings.
    - Stop bars have more of a positive effect than transverse rumbles. Stop bars on all four may help.
    - Consider an embedded stop bar.

Wrap Up: Closing Comments + Workshop Evaluation

- Blowing and drifting snow on rural areas – MnDOT looking at snow fence locations on County road that also experience this. CR 26 (North of Hawley).
- Note that HSIP is not funding snow fencing

- One of the main reasons why the County wanted to hold this project was to figure out what else is out there/understand what else can we do.

Appendix D – List of Prioritized Locations

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Rural Segment Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [miles]	ADT [vpd]	Speed Limit	ADT Single-Vehicle	ADT Multi-Vehicle	Access Density	Curve Density	Edge Risk	Total Stars
1	1	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	3.28	1303	★	★	★	★	★	★	★★★★★★
14	2	11.004	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	0.60	1800	★	★	★	★	★		★★★★★
23	3	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	3.00	1375	★	★	★	★	★		★★★★★
66	4	6.001	CSAH	6	Intersection of CSAH6/MN 32 and 120th Ave S	Intersection of CSAH 6 and 300th St S	2.98	1350	★	★	★	★		★	★★★★★
2	5	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	6.97	1800	★	★	★	★			★★★★
4	6	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	14.84	2100	★		★	★	★		★★★★
8	7	100.005	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	5.26	60	★			★	★	★	★★★★
13	8	11.003	CSAH	11	Intersection of CSAH11/1st Ave E and King Trail Rd N	593 ft South of Intersection of 70th St S and I-94	4.36	1055	★	★		★		★	★★★★
15	9	11.005	CSAH	11	3103 ft North of Intersection of CSAH11/US 10 and 70th St S	Intersection of 28th Ave N and 70th St N	1.42	1800	★	★	★	★			★★★★
16	10	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	5.06	1200	★	★		★	★		★★★★
19	11	12.001	CSAH	12	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74	Intersection of US 75 and 60th Ave S	1.36	6500	★		★	★	★		★★★★
20	12	12.002	CSAH	12	Intersection of CSAH12/US 75 and 60th Ave S	.19 Miles West of 80th St S and 60th Ave S	6.30	1360	★	★	★	★			★★★★
28	13	19.002	CSAH	19	283 ft North of Intersection of CSAH19/7th St SE and Parke Ave S	Intersection of Parke Ave S and 4th St SE	0.72	1800		★	★	★		★	★★★★
37	14	23.001	CSAH	23	Intersection of CSAH23/40th Ave S and 190th St S	Intersection of US 10 and 190th St S	2.98	1350	★	★	★	★			★★★★
39	15	26.002	CSAH	26	Intersection of CSAH26/120th St N and 90th Ave N	Intersection of 1247 ft West of MN 32	13.27	1950	★	★	★	★			★★★★
52	16	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	2.37	265	★			★	★	★	★★★★
73	17	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	3.97	457	★			★	★	★	★★★★
9	18	108.002	CR	108	Intersection of CR108/MN 9 and CR 108	1.04 Miles East of Intersection of 150th St N and 140th Ave N	2.06	290	★			★		★	★★★
10	19	108.003	CR	108	1.04 Miles East of Intersection of CR108/150th St N and 140th Ave N	Intersection of 170th St N and 140th Ave N	0.88	290	★			★		★	★★★
26	20	18.002	CSAH	18	466 ft East of Intersection of CSAH18/US 75 and CSAH 18	Intersection of MN 9 and 28th Ave N	11.31	1125	★	★		★			★★★
30	21	19.004	CSAH	19	Intersection of CSAH19/1th St NE and 11th St N	Intersection of 110th St N and 28th Ave N	1.89	455	★			★		★	★★★
31	22	19.006	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19	0.80	50	★				★	★	★★★
32	23	2.001	CSAH	2	.85 Miles West of Intersection of CSAH2/160th Ave SW and 3rd St S	1208 ft East of Intersection of US 75 and CSAH 2	2.07	835	★	★		★			★★★
34	24	2.003	CSAH	2	Intersection of CSAH3/160th Ave S and US 75	Intersection of MN 9 and 160th Ave S	15.37	765	★	★		★			★★★
35	25	20.002	CSAH	20	.16 Miles West of Intersection of CSAH20/9th St N and 70th Ave N	Intersection of US 75 and 70th Ave N	1.16	300	★			★		★	★★★
38	26	26.001	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N	13.04	2675	★		★	★			★★★
41	27	26.004	CSAH	26	Intersection of CSAH26/MN 32 and Front St	.50 Miles West of Intersection of 110 Ave and 90th Ave N	4.02	663	★	★		★			★★★
42	28	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 31	229 ft South of Intersection of Roger St and 230th St	17.21	565	★	★				★	★★★
45	29	33.002	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	6.45	1025	★	★		★			★★★
46	30	33.003	CSAH	33	Intersection of CSAH33/90 Ave N and 230th St N	Intersection of 160Ave N and 230th St N	7.00	455	★			★		★	★★★
49	31	34.003	CSAH	34	Intersection of CSAH34/MN 9 and CSAH 34	Intersection of 5th St W and 160th Ave N	11.10	800	★	★		★			★★★
51	32	34.005	CSAH	34	1695 ft East of Intersection of CSAH34/MN 32 and 160th Ave N	Intersection of 160th Ave N and 100 Ave	2.73	770	★	★		★			★★★
53	33	36.001	CSAH	36	Intersection of CSAH36/170th Ave NW and State Limits	Intersection of US 75 and 170th Ave NW	1.08	135	★			★		★	★★★
59	34	52.001	CSAH	52	Intersection of CSAH52/180th Ave S and CSAH 52	65 ft South of Intersection of 9th Ave SE	1.02	860	★	★		★			★★★
62	35	52.004	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	12.32	1400	★	★	★				★★★
63	36	52.005	CSAH	52	Intersection of CSAH52/CSAH 10 and CSAH 52	152 ft South of Main St and CSAH 52	1.49	4200	★		★	★			★★★
71	37	8.001	CSAH	8	288 ft East of Intersection of CSAH8/112th Ave S and 5th St S	Intersection of 70th St S and 110th Ave S	6.25	218	★			★		★	★★★
11	38	11.001	CSAH	11	Intersection of CSAH11/CSAH 50 and CSAH 3	704 ft South of Intersection of 1st St S and CSAH 11	10.09	430	★			★			★★
17	39	11.007	CSAH	11	Intersection of CSAH11/90th Ave N and CSAH 11	Intersection of 70th St N and 100th Ave	12.04	648	★	★					★★
18	40	114.001	CR	114	431 ft West of Intersection of CR114/28th Ave N and 225th St N	Intersection of 230th St N and 28th Ave N	0.71	175	★					★	★★
21	41	12.004	CSAH	12	Intersection of CSAH12/100th St S and 50th Ave S	Intersection of MN 9 and 50th Ave S	3.98	325	★			★			★★
22	42	13.001	CSAH	13	Intersection of CSAH13/CSAH 52 and 50th Ave S	Intersection of 70th St S and 50th Ave S	1.91	340	★			★			★★
24	43	17.001	CSAH	17	Intersection of CSAH17/90th Ave s and 100th St S	Intersection of US 10 and 100th St S	8.00	293	★			★			★★
25	44	18.001	CSAH	18	Intersection of CSAH18/MN 3 and CSAH 18	463 ft East of Intersection of US 75 and CSAH 18	0.85	890	★	★					★★
29	45	19.003	CSAH	19	Intersection of CSAH19/Parke Ave S and 4th St SE	Intersection of Parke Ave N and 1st St NE	0.43	1142		★				★	★★
33	46	2.002	CSAH	2	1208 ft East of Intersection of CSAH2/US 75 and CSAH 2	.29 Miles West of Intersection of 160th Ave S and 28th St S	0.49	820	★	★					★★
36	47	21.002	CSAH	21	Intersection of CSAH21/160th Ave S and 130 th St S	Intersection of 90th Ave S and 130th Ave S	6.60	220	★			★			★★
43	48	31.002	CSAH	31	227 ft South of Intersection of CSAH31/Roger St and CSAH 31	Intersection of US 10 and CSAH 31	0.32	1350		★	★				★★
44	49	33.001	CSAH	33	Intersection of CSAH33/US 10 and CSAH 31	Intersection of 120 ft South of 4th St and CSAH 33	0.90	1450		★	★				★★
47	50	34.001	CSAH	34	Intersection of CSAH34/US 75 and 160th Ave N	3183 ft West of Intersection of MN 9 and 7th St	13.20	452	★			★			★★
57	51	44.002	CSAH	44	Intersection of CSAH44/164th St S and CSAH 44	.70 Miles South of Intersection of 164th St S and CSAH 44	0.75	230				★		★	★★
60	52	52.002	CSAH	52	65 ft South of Intersection of CSAH52/9th Ave SE and Front St S	Intersection of CSAH 52 and 5th Ave SE	0.31	1900		★	★				★★
65	53	52.007	CSAH	52	402 ft North of Intersection of CSAH52 and 4th St N	738 ft North of 34th Ave S and CSAH 52	4.83	4200	★		★				★★
70	54	77.002	CR	77	1623 ft West of Intersection of CR77/70th St S and CSAH 14	Intersection of 70th St S and CSAH 14	0.32	45	★			★			★★
3	55	10.002	CSAH	10	.35 Miles West of Intersection of CSAH10/MN 9 and CSAH 10	1386 ft East of Intersection of MN 9 and CSAH 10	0.62	3300			★				★
5	56	100.002	CR	100	Intersection of CR100 and Bridge St	Intersection of US 75 and 160th Ave NW	0.10	182						★	★
7	57	100.004	CR	100	Intersection of CR100/Main St and Probstfield	528 ft North of Intersection of Howard St and Probstfield St	0.17	105						★	★
12	58	11.002	CSAH	11	704 ft South of Intersection of CSAH11/1st St S and CSAH 11	Intersection of CSAH 11 and 1st Ave E	0.59	985		★					★
27	59	19.001	CSAH	19	Intersection of CSAH19/100th St S and Parke Ave S	283 ft North of Intersection of 7th St SE and Parke Ave S	0.41	850		★					★
40	60	26.003	CSAH	26	1254 ft West of Intersection of CSAH26/MN 32 and Front St	Intersection of MN 32 and Front St	0.24	1000		★					★
48	61	34.002	CSAH	34	3183 ft West of Intersection of CSAH34/MN 9 and 7th St	Intersection of MN 9 and 7th St	0.61	785		★					★
50	62	34.004	CSAH	34	Intersection of CSAH34/5th St NW and 160th Ave N	332 ft East of Intersection of 4th St SE and CSAH 34	0.61	933		★					★
54	63	43.001	CSAH	43	Intersection of CSAH43/MN 9 and Front St	35 ft East of Intersection of 2nd St NE and Main Ave E	0.08	730		★					★
56	64	44.001	CSAH	44	Intersection of CSAH44/164th St S and CSAH 44	Intersection of US 10 and CSAH 44	0.30	230	★						★
58	65	45.001	CSAH	45	Intersection of CSAH45/US 10 and Main St N	Intersection of US 10 and 7th St NE	0.68	632		★					★
61	66	52.003	CSAH	52	Intersection of CSAH52/5th Ave SE and CSAH 52	Intersection of MN 9 and Main Ave E	0.29	3300			★				★
64	67	52.006	CSAH	52	152 ft South of Main St and CSAH 52	402 ft North of Intersection of 4th St N and CSAH 52	0.39	4200			★				★
67	68	67.002	CR	67	90 ft West of Intersection of CR67/4th Ave W and 1st St S	Intersection of Holloway Ave S and 1st St S	0.56	120						★	★
68	69	71.001	CR	71	Intersection of CR71/Parke Ave S and 7th St SW	468 ft East of Intersection of Lund Ave S and 7th St SE	0.30	420						★	★
69	70	75.002	CR	75	Intersection of CR75/70th St S and CSAH 75	3275 ft East of Intersection of CSAH 11 and 50th Ave S	0.60	440						★	★
72	71	86.001	CR	86	Intersection of CR86/US 10 and CSAH 86	238 ft North of Intersection of 15th Ave N and 170th St N	1.06	400	★						★
6	72	100.003	CR	100	Intersection of CR100/Main St and Probstfield	Intersection of Main St and Bridge St	0.07	105							
55	73	43.002	CSAH	43	Intersection of CSAH43/Front St S and 5th Ave SE	Intersection of Main Ave E and 2nd St SE	0.48	390							
						Total Length (Miles)	271.92								
			Count	Percent			Count of Stars --		50	36	22	42	10	24	

Rural Segment Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [miles]	ADT [vpd]	Speed Limit	ADT Single-Vehicle	ADT Multi-Vehicle	Access Density	Curve Density	Edge Risk	Total Stars
★★★★★★			1	1%			Percent of Stars --		68%	49%	30%	58%	14%	33%	
★★★★★			3	4%											
★★★★			13	18%											
★★★			20	27%											
★★			17	23%											
★			17	23%											
			2	3%											
			73	100%											

Curve Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Radius [feet]	ADT [vpd]	Lane Width [feet]	High Side Shoulder Type	Total Cross Section Width [feet]	Adjacent Intersection	Visual Tral	Outside Edge Risk	Total Stars
52	1	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	★	★		★		★	★	★	★★★★★★
31	2	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★	★			★	★		★	★★★★★
32	3	31.002	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★	★			★	★	★		★★★★★
41	4	35.002	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	★	★			★	★		★	★★★★★
48	5	100.001	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102			★	★		★	★	★	★★★★★
24	6	19.001	CSAH	19	Intersection of CSAH19/1th St NE and 11th St N	Intersection of 110th St N and 28th Ave N	★	★			★			★	★★★★
42	7	35.003	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	★	★			★			★	★★★★
49	8	100.002	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	★		★	★				★	★★★★
54	9	96.003	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5		★	★	★				★	★★★★
55	10	96.004	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5		★	★	★				★	★★★★
2	11	1.002	CSAH	1	North of Intersection of Wall St Ave NW / Broadway st NW	Intersection of Wall St Ave NW / Broadway st NW	★				★	★			★★★
25	12	19.002	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19			★	★				★	★★★
33	13	31.003	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★	★			★				★★★
35	14	31.005	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★				★	★			★★★
36	15	31.006	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	★				★	★			★★★
40	16	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S		★			★			★	★★★
43	17	52.001	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	★			★	★				★★★
50	18	100.003	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102			★	★				★	★★★
51	19	100.004	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102			★	★				★	★★★
53	20	96.002	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5				★		★		★	★★★
1	21	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	★				★				★★
4	22	10.002	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★					★			★★
5	23	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★					★			★★
7	24	10.006	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★					★			★★
11	25	10.010	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★						★		★★
12	26	11.001	CSAH	11	Intersection of CSAH11/CSAH 50 and CSAH 3	704 ft South of Intersection of 1st St S and CSAH 11	★					★			★★
16	27	11.005	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	★					★			★★
22	28	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	★					★			★★
26	29	22.001	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	★					★			★★
30	30	3.001	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	★					★			★★
37	31	33.001	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	★					★			★★
38	32	33.002	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	★					★			★★
44	33	52.002	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52				★	★				★★
46	34	52.004	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52					★	★			★★
47	35	52.005	CSAH	52	402 ft North of Intersection of CSAH52 and 4th St N	738 ft North of 34th Ave S and CSAH 52						★	★		★★
3	36	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	★								★
9	37	10.008	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★								★
10	38	10.009	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	★								★
13	39	11.002	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S						★			★
19	40	11.008	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	★								★
20	41	11.009	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	★								★
21	42	12.001	CSAH	12	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74	Intersection of US 75 and 60th Ave S						★			★
23	43	14.002	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	★								★
27	44	22.002	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	★								★
28	45	26.001	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N						★			★
34	46	31.004	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St					★				★
39	47	34.001	CSAH	34	Intersection of CSAH34/US 75 and 160th Ave N	3183 ft West of Intersection of MN 9 and 7th St		★							★
45	48	52.003	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52					★				★
6	49	10.004	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave									
8	50	10.007	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave									
14	51	11.003	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S									
15	52	11.004	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N									
17	53	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N									
18	54	11.007	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N									
29	55	26.002	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N									
						Count of Stars --	31	11	7	11	16	24	5	14	
						Percent of Stars --	56%	20%	13%	20%	29%	44%	9%	25%	

Stars	Count	Percent
★★★★★★★★	0	0%
★★★★★★★	0	0%
★★★★★★	1	2%
★★★★★	4	7%
★★★★	5	9%
★★★	10	18%
★★	15	27%
★	13	24%
	7	13%
Total	55	100%

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Rural Intersection Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Context Zone	Total Entering ADT or Cross Product	Leg Configuration	Alignment Skew [degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Commercial Development	Previous Stop (>5 Mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	Total Stars
127	1	5.001	CSAH	5	US 75	CSAH 5 (100th Ave N)		★	★	★	★	★			★		★★★★★★
10	2	10.008	CSAH	10	MN 9	CSAH 10 (90th Ave S)	★	★	★	★				★	★		★★★★★★
75	3	2.002	CSAH	2	US 75 (14th St S)	CSAH 2 (160th Ave S)	★	★	★					★	★		★★★★★
3	4	10.001	CSAH	10	CSAH 52	CSAH 10 (90th Ave S)		★	★	★	★			★			★★★★★
17	5	10.015	CSAH	10	MN 32	CSAH 10 (90th Ave S)		★	★	★				★	★		★★★★★
89	6	23.001	CSAH	23	US 10	CSAH 23 (190th St S)		★	★					★	★	★	★★★★★
92	7	26.003	CSAH	26	US 75	CSAH 26 (90th Ave N)		★	★		★			★	★		★★★★★
101	8	26.012	CSAH	26	MN 32	CSAH 26 (Front St)	★	★	★		★			★			★★★★★
110	9	31.004	CSAH	31	US 10	CSAH 31 (230th St)	★	★	★					★		★	★★★★★
115	10	34.001	CSAH	34	US 75	CSAH 34	★	★	★					★	★		★★★★★
117	11	34.003	CSAH	34	MN 9 (Hwy 9 N)	CSAH 34 (7th St)	★	★	★					★	★		★★★★★
82	12	2.009	CSAH	2	MN 9 (Front St N)	MN 34 (160th Ave S)	★	★	★					★			★★★★
24	13	11.006	CSAH	11	CSAH 11 (Main St)	CSAH 52 (Holloway St)	★	★	★					★			★★★★
46	14	12.003	CSAH	12	CSAH 12 (60th Ave S)	CSAH 52		★	★	★	★						★★★★
55	15	14.001	CSAH	14	MN 336 (70th St S)	CSAH 14 (28th Ave S)		★	★			★				★	★★★★
61	16	17.005	CSAH	17	US 10	CSAH 17 (100th St S)	★	★	★							★	★★★★
62	17	18.001	CSAH	18	US 75	CSAH 18 (28th Ave N)		★	★		★				★		★★★★
68	18	18.007	CSAH	18	MN 9 (140th ST N)	CSAH 18 (28th Ave N)		★	★					★	★		★★★★
70	19	19.002	CSAH	19	US 10 (State St)	CSAH 19 (Parke Ave S)	★	★	★							★	★★★★
86	20	21.003	CSAH	20	CSAH 21 (130th St S)	CSAH 52			★	★	★			★			★★★★
88	21	22.001	CSAH	22	US 75	CSAH 22 (Wall Street Ave N)		★			★				★	★	★★★★
96	22	26.007	CSAH	26	MN 9 (140th ST N)	CSAH 26 (90th Ave N)		★	★					★	★		★★★★
124	23	43.001	CSAH	43	CSAH 52	CSAH 43 (Main Ave E)	★	★	★					★			★★★★
129	24	52.001	CSAH	52	MN 9	CSAH 52 (175th ST S)	★	★		★				★			★★★★
135	25	52.007	CSAH	52	CSAH 52	CR 63 (80th St S)		★	★	★	★						★★★★
136	26	52.008	CSAH	52	CSAH 52 (Holloway ST)	CR 67 (1st St S)	★	★		★	★						★★★★
137	27	52.009	CSAH	52	CSAH 52	CR 69 (70th Ave S)		★	★	★	★						★★★★
139	28	52.011	CSAH	52	CSAH 52	CR 78 (50th St S)		★	★	★	★						★★★★
106	29	3.008	CSAH	3	CSAH 22 (Wall Street Ave N)	CSAH 3 (Oakport St N)		★	★	★							★★★
140	30	6.001	CSAH	6	MN 32 (270th St S)	CSAH 6 (120th Ave S)			★					★	★		★★★
12	31	10.010	CSAH	10	CSAH 10	CSAH 25 (200th St S)		★	★					★			★★★
13	32	10.011	CSAH	10	CSAH 10 (90th Ave S)	CSAH 31 (230th St S)		★	★					★			★★★
18	33	10.016	CSAH	10	CSAH 10 (90th Ave S)	CSAH 37 (280th St S)		★	★					★			★★★
44	34	12.001	CSAH	12	US 75 (8th Rabt S)	CSAH 12 (60th Ave S)		★	★						★		★★★
51	35	12.009	CSAH	12	MN 9 (140th St S)	CSAH 12			★					★	★		★★★
72	36	19.007	CSAH	19	CSAH 26 (90th Ave N)	CSAH 19 (120th St N)		★	★					★			★★★
107	37	31.001	CSAH	31	MN 34	CSAH 31 (230th St S)		★	★					★			★★★
119	38	34.005	CSAH	34	CSAH 34 (Northern Pacific Ave)	M 8 (1st St E)	★		★		★						★★★
121	39	35.001	CSAH	35	MN 34 (160th Ave S)	MN 32 (270th St S)		★	★					★			★★★
123	40	36.002	CSAH	36	US 75	CSAH 36 (170th Ave NW)		★	★						★		★★★
126	41	44.001	CSAH	44	US 10	CSAH 44		★							★	★	★★★
130	42	52.002	CSAH	52	CSAH 52	CR 55 (150th Ave S)			★	★	★						★★★
131	43	52.003	CSAH	52	CSAH 52	CR 56 (160th St S)			★	★	★						★★★
132	44	52.004	CSAH	52	CSAH 52	CR 62 (120th Ave S)			★	★	★						★★★
133	45	52.005	CSAH	52	CSAH 52	CR 69 (110th St S)			★	★	★						★★★
134	46	52.006	CSAH	52	CSAH 52	CR 68 (90th St S)			★	★	★						★★★
31	47	11.013	CSAH	11	CSAH 11 (70th St N)	CSAH 18 (28th Ave N)		★	★					★			★★★
37	48	11.019	CSAH	11	CSAH 11 (70th St N)	CSAH 26 (90th Ave N)		★	★					★			★★★
84	49	20.002	CSAH	20	US 75	CSAH 20 (70th AVE N)		★	★						★		★★★
152	50	108.002	CR	108	MN 9 (140th ST N)	CR 108 (140th Ave N)		★	★						★		★★★
77	51	2.004	CSAH	2	CSAH 2 (160th Ave S)	CSAH 11 (70th St S)			★					★			★★
128	52	5.006	CSAH	5	CSAH 5 (30th St N)	CSAH 34 (160th Ave N)			★					★			★★
143	53	7.007	CSAH	7	CSAH 7 (40th ST S)	CSAH 12 (60th Ave S)		★	★								★★
145	54	8.002	CSAH	8	US 75 (14th St S)	CSAH 8 (110th AVE S)			★						★		★★
5	55	10.003	CSAH	10	CSAH 10 (90th Ave S)	CSAH 17 (100th St S)			★					★			★★
9	56	10.007	CSAH	10	CSAH 10 (90th Ave S)	I-94 (Ramp)		★	★								★★
11	57	10.009	CSAH	10	CSAH 10 (90th Ave S)	CR 71 (70th Ave S)		★	★								★★
14	58	10.012	CSAH	10	CSAH 10 (90th Ave S)	CR 120 (240th St S)		★	★								★★
15	59	10.013	CSAH	10	CSAH 10 (90th Ave S)	CR 121 (250th St S)		★	★								★★
16	60	10.014	CSAH	10	CSAH 10 (90th Ave S)	CR 124 (260th St S)		★	★								★★
20	61	11.002	CSAH	11	CSAH 11 (70th St S)	CR 51 (170th AVE S)			★					★			★★
23	62	11.005	CSAH	11	CSAH 11 (70th St S)	CR 67 (1st St S)	★		★								★★

Rural Intersection Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Context Zone	Total Entering ADT or Cross Product	Leg Configuration	Alignment Skew [degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Commercial Development	Previous Stop (>5 Mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	Total Stars
25	63	11.007	CSAH	11	CSAH 11 (70th St S)	CR 69 (70th Ave S)	★		★								★★
45	64	12.002	CSAH	12	CSAH 12 (60th Ave S)	CR 78 (50th St S)		★	★								★★
54	65	13.001	CSAH	13	CSAH 13 (50th Ave S)	CSAH 52		★			★						★★
58	66	15.003	CSAH	15	CSAH 52	CSAH 15 (100th St S)			★		★						★★
69	67	19.001	CSAH	19	CSAH 19 (Parke Ave S)	CR 71 (7th St SE)		★	★								★★
73	68	19.010	CSAH	19	CSAH 34 (160th Ave N)	CSAH 19 (120th St N)			★					★			★★
91	69	26.002	CSAH	26	CSAH 26 (90th Ave N)	CR 96 (Oakport St N)		★	★								★★
97	70	26.008	CSAH	26	CSAH 26 (90th Ave N)	CR 113 (190th St N)			★					★			★★
98	71	26.009	CSAH	26	CSAH 26 (90th Ave N)	CSAH 27 (200th St N)			★					★			★★
100	72	26.011	CSAH	26	CSAH 26 (90th Ave N)	CSAH 33 (230th St N)			★					★			★★
104	73	27.002	CSAH	27	CSAH 27 (200th St N)	CSAH 34 (160th Ave N)			★					★			★★
114	74	33.004	CSAH	33	CSAH 34 (160th Ave N)	CSAH 33 (230th St N)			★					★			★★
120	75	34.006	CSAH	34	CSAH 34 (160th Ave N)	CSAH 37 (280th St N)			★					★			★★
125	76	43.002	CSAH	43	CSAH 52 (Front St S)	CSAH 43 (5th Ave SE)	★	★									★★
138	77	52.010	CSAH	52	CSAH 52	CR 75 (50th Ave S)		★		★							★★
30	78	11.012	CSAH	12	CSAH 11	US 10 Off-Ramp (North)		★				★					★★
41	79	11.023	CSAH	11	CSAH 11 (70th St N)	CSAH 34 (60th St N)			★					★			★★
29	80	11.011	CSAH	11	CSAH 11	TH 94 Off-Ramp (South)		★				★					★★
150	81	100.001	CR	100	CSAH 26 (90th Ave N)	CR 100 (15th St NW)		★						★			★★
1	82	1.002	CSAH	1	CSAH 1 (Broadway St NW)	T 111 (70th Ave N)			★								★
2	83	1.003	CSAH	1	CSAH 26 (90th Ave N)	CSAH 1 (Broadway St NW)		★									★
74	84	2.001	CSAH	2	CSAH 2 (160th Ave S)	CR 59 (3rd St S)			★								★
76	85	2.003	CSAH	2	CSAH 2 (160th Ave S)	CSAH 7 (50th ST S)			★								★
78	86	2.005	CSAH	2	CSAH 2 (160th Ave S)	CSAH 15 (100th St S)			★								★
80	87	2.007	CSAH	2	CSAH 2 (160th Ave S)	CSAH 21 (130th St S)			★								★
105	88	3.007	CSAH	3	CSAH 3 (Oakport St N)	MSAS 151 (43rd Ave N)		★									★
142	89	7.004	CSAH	7	CSAH 7 (40th ST S)	CSAH 8 (110th AVE S)			★								★
141	90	6.002	CSAH	6	CSAH 2 and CSAH 6	CR 128			★								★
144	91	8.001	CSAH	8	CSAH 8 (110th AVE S)	CR 59 (3rd St S)			★								★
146	92	8.003	CSAH	8	CSAH 8 (110th AVE S)	CR 61 (50th St S)			★								★
147	93	8.004	CSAH	8	CSAH 11 (70th St S)	CSAH 8 (110th Ave S)			★								★
148	94	9.002	CSAH	9	CSAH 9 (40th St N)	CSAH 18 (28th Ave N)			★								★
4	95	10.002	CSAH	10	CSAH 10 (90th Ave S)	CR 68 (90th St S)			★								★
6	96	10.004	CSAH	10	CSAH 10 (90th Ave S)	CR 69 (110th St S)			★								★
8	97	10.006	CSAH	10	CSAH 10 (90th Ave S)	I-94 (Ramp)			★								★
21	98	11.003	CSAH	11	CSAH 11 (70th St S)	CR 57 (140th Ave S)			★								★
22	99	11.004	CSAH	11	CSAH 11 (70th St S)	CR 62 (120th Ave S)			★								★
26	100	11.008	CSAH	11	CSAH 11 (70th St S)	CSAH 12 (60th Ave S)			★								★
27	101	11.009	CSAH	11	CSAH 11 (70th St S)	CSAH 13 (50th Ave S)			★								★
28	102	11.010	CSAH	11	CSAH 11 (70th St S)	CR 76 (40th Ave S)			★								★
48	103	12.006	CSAH	12	CSAH 17 (100th St S)	CSAH 12 (50th Ave S)			★								★
49	104	12.007	CSAH	12	CSAH 12 (50th Ave S)	CR 71 (110th St S)			★								★
50	105	12.008	CSAH	12	CSAH 12 (50th ST S)	CR 72 (120th St S)			★								★
52	106	12.010	CSAH	12	CSAH 23 (190th St S)	CSAH 12 (40th Ave S)			★								★
53	107	12.011	CSAH	12	CSAH 12 (40th Ave S)	CSAH 31 (230th St S)			★								★
56	108	14.002	CSAH	14	CSAH 14 (28th Ave S)	CR 68 (90th St S)			★								★
57	109	14.003	CSAH	14	CSAH 14 (28th Ave S)	CSAH 17 (100th St S)			★								★
153	110	74.001	CR	74	CR 74 (12th Ave S)	CR 78 (50th St S)			★								★
59	111	17.001	CSAH	17	CSAH 17 (100th St S)	CR 69 (70th Ave S)			★								★
60	112	17.004	CSAH	17	CSAH 17 (100th St S)	CSAH 19 (12th St)			★								★
63	113	18.002	CSAH	18	CSAH 18 (28th Ave N)	CR 90 (50th St N)			★								★
64	114	18.003	CSAH	18	CSAH 18 (28th Ave N)	CR 68 (90th St N)			★								★
65	115	18.004	CSAH	18	CSAH 18 (28th Ave N)	CSAH 19 (110th St N)				★							★
66	116	18.005	CSAH	18	CSAH 18 (28th Ave N)	CSAH 19 (120th St N)			★								★
67	117	18.006	CSAH	18	CSAH 18 (28th Ave N)	CR 92 (130th St N)			★								★
71	118	19.004	CSAH	19	CSAH 19 (110th St N)	CR 84 (15th Ave N)			★								★
87	119	21.004	CSAH	20	CSAH 21 (130th St S)	CR 62 (120th Ave S)			★								★
90	120	26.001	CSAH	26	CSAH 26 (90th Ave N)	CR 98 (10th St NW)		★									★
149	121	9.004	CSAH	9	CSAH 26 (90th Ave N)	CSAH 9 (40th St N)		★									★
93	122	26.004	CSAH	26	CSAH 26 (90th Ave N)	CR 95 (40th St N)		★									★
94	123	26.005	CSAH	26	CSAH 26 (90th Ave N)	CR 68 (90th St N)		★									★
95	124	26.006	CSAH	26	CSAH 26 (90th Ave N)	CR 92 (130th St N)		★									★

Rural Intersection Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach	Minor Approach	Context Zone	Total Entering ADT or Cross Product	Leg Configuration	Alignment Skew [degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Commercial Development	Previous Stop (>5 Mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration	Total Stars
99	125	26.010	CSAH	26	CSAH 26 (90th Ave N)	CR 114 (210th St N)			★								★
102	126	26.013	CSAH	26	CSAH 26 (90th Ave N)	CSAH 37 (280th St N)								★			★
103	127	26.014	CSAH	26	CSAH 26 (90th Ave N)	CSAH 37 (280th St N)								★			★
108	128	31.002	CSAH	31	CSAH 31 (230th St S)	CR 126 (120th Ave S)			★								★
109	129	31.003	CSAH	31	CSAH 31 (230th St S)	CR 119 (60th Ave S)			★								★
113	130	33.003	CSAH	33	CSAH 33	CR 112 (140th Ave N)			★								★
116	131	34.002	CSAH	34	CSAH 34 (160th Ave N)	CR 73 (90th St N)			★								★
118	132	34.004	CSAH	34	CSAH 34 (160th Ave N)	CR 110 (190th St N)								★			★
122	133	36.001	CSAH	36	CSAH 36 (170th Ave NW)	CR 100 (10th ST NW)			★								★
32	134	11.014	CSAH	11	CSAH 11 (70th St N)	CR 89 (43rd Ave N)			★								★
33	135	11.015	CSAH	11	CSAH 11 (70th St N)	CR 91 (57th Ave N)			★								★
34	136	11.016	CSAH	11	CSAH 11 (70th St N)	CR 93 (70th Ave N)						★					★
36	137	11.018	CSAH	11	CSAH 11 (70th St N)	CR 94 (80th Ave N)			★								★
38	138	11.020	CSAH	11	CSAH 11 (70th St N)	CSAH 28 (110th Ave N)			★								★
39	139	11.021	CSAH	11	CSAH 11 (70th St N)	CR 108 (140th Ave N)			★								★
40	140	11.022	CSAH	11	CSAH 11 (70th St N)	CR 107 (150th Ave N)			★								★
42	141	11.024	CSAH	11	CSAH 11 (70th St N)	CR 106 (170th Ave N)			★								★
83	142	20.001	CSAH	20	CSAH 20 (70th AVE N)	CR 96 (Oakport St N)			★								★
151	143	100.003	CR	100	CR 100 (15th St NW)	CR 101 (200th Ave N)			★								★
19	144	11.001	CSAH	11	CSAH 11	CR 50						★					★
79	145	2.006	CSAH	2	CSAH 2 (160th Ave S)	CR 69 (110th St S)											
81	146	2.008	CSAH	2	CSAH 2 (160th Ave S)	CR 56 (160th St S)											
7	147	10.005	CSAH	10	CSAH 10 (90th Ave S)	CSAH 21 (130th St S)											
47	148	12.005	CSAH	12	CSAH 17 (100th St S)	CSAH 12 (60th Ave S)											
85	149	21.002	CSAH	20	CSAH 21 (130th St S)	CR 55 (150th Ave S)											
111	150	33.001	CSAH	33	CSAH 33 (5th St)	CR 115 (15th Ave N)											
112	151	33.002	CSAH	33	CSAH 33 (230th St N)	CR 114 (28th Ave N)											
35	152	11.017	CSAH	11	CSAH 11 (70th St N)	CR 93 (70th Ave N)											
43	153	11.025	CSAH	11	CSAH 11 (70th St N)	CR 70 (190th Ave N)											

Stars	Count	Percent
★★★★★★★★★★	0	0%
★★★★★★★★★	0	0%
★★★★★★★★	0	0%
★★★★★★★	0	0%
★★★★★★	2	1%
★★★★★	9	6%
★★★★	17	11%
★★★	22	14%
★★	31	20%
★	63	41%
	9	6%
Total	153	100%

	Context Zone	Total Entering ADT or Cross Product	Leg Configuration	Alignment Skew [degrees]	Adjacent RR Crossing	Adjacent Curve	Adjacent Commercial Development	Previous Stop (>5 Mi)	Major Approach Speed Limit	Major Approach Turn Lane Configuration
Count of Stars --	17	63	121	19	20	6	0	43	20	7
Percent of Stars --	11%	41%	79%	12%	13%	4%	0%	28%	13%	5%

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Urban Segment Prioritization for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.2	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [miles]	ADT [vpd]	Context Zone	Speed Limit	Lane Width	Edgeline Striping	Parking	ADT	Access Density	Cross Section	Edge Risk	Shoulder Width	Total Stars
3	1	3.001	CSAH	3	Intersection of CSAH3/US 10 and 11th St N	Intersection of 11th St N and 2nd Ave N	0.14	4600	★	★				★				★	★★★★
1	2	3.002	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	4.30	5583					★	★				★	★★★
2	3	9.001	CSAH	9	Intersection of CSAH9/US 10 Frontagr Rd and CSAH 9	Intersection of 28th Ave N and 40th St N	2.00	1540		★					★				★★
6	4	78.003	CR	78	Intersection of CR78 and CSAH 72	Intersection of 2nd Ave SE and Main St S	1.30	330		★					★				★★
7	5	20.001	CSAH	20	Intersection of CSAH20/47th Ave NW and 70th Ave NW	.16 Miles West of Intersection of 9th St N and 70th Ave N	0.86	340		★		★							★★
8	6	52.008	CSAH	52	738 ft North of Intersection of CSAH52/34th Ave S and CSAH 52	Intersection of I-94 and CSAH 52	0.68	6000		★				★					★★
4	7	7.002	CSAH	7	.06 Miles South of Intersection of CSAH7/41st Ave S and 40th St S	Intersection of MN 52 and 40th St S	0.52	1950		★									★
5	8	22.001	CSAH	22	.20 Miles West of Intersection of CSAH22/4th St NW and MN 22	Intersection of US 75 and MN 22	2.17	4333						★					★
						Total Length (Miles)	11.98												
						Count of Stars --			1	6	0	1	1	4	2	0	0	2	
						Percent of Stars --			13%	75%	0%	13%	13%	50%	25%	0%	0%	25%	

Stars	Count	Percent
★★★★★★★★	0	0%
★★★★★★★	0	0%
★★★★★★	0	0%
★★★★★	0	0%
★★★★	1	13%
★★★	1	13%
★★	4	50%
★	2	25%
	0	0%
Total	8	100%

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Urban Intersection Prioritization for Clay County - Vehicle Related

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Context Zone	Traffic Control Device	Total Entering ADT or Cross Product	Leg Configuration	Major Division Type	Alignment Skew [degrees]	Adjacent Commercial Development	Major/Minor Approach Speed Limit	Major Approach Left Turn Lane Phasing	Major Approach Turn Lane Configuration	Total Stars
3	1	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★	★	★	★	★				★	★	★★★★★★★
2	2	3.001	CSAH	3	US 10	CSAH 3	★	★	★	★					★	★	★★★★★★
14	3	9.001	CSAH	9	US 10	CSAH 9			★	★	★		★	★		★	★★★★★★
10	4	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52		★	★	★	★				★	★	★★★★★★
7	5	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)		★	★	★					★	★	★★★★★
1	6	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)				★		★		★			★★★
9	7	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)				★		★		★			★★★
15	8	75.001	CR	75	US 75 (8th St S)	MSAS 146 (50th Ave S)	★			★				★			★★★
5	9	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)			★	★							★★
6	10	3.006	CSAH	3	CSAH 3 (11th St N)	CSAH 18 (28th Ave N)						★		★			★★
12	11	7.009	CSAH	7	CSAH 7 (40th ST S)	MSAS 138 (40th Ave S)				★				★			★★
13	12	7.010	CSAH	7	CSAH 52	CSAH 7 (34th Ave S)				★				★			★★
8	13	45.002	CSAH	45	US 10 (Center AVE E)	CSAH 45 (7th St SE)				★						★	★★
11	14	52.015	CSAH	52	CSAH 52	I 94 (Ramp)								★			★
16	15	78.001	CR	78	CR 78 (4th AVE SE)	CR 81								★			★
17	16	78.002	CR	78	CSAH 45 (Main St S)	CR 78 (Main St S)				★							★
4	17	3.004	CSAH	3	CSAH 3 (11th St N)	N 9th Ave											
						Count of Stars --	3	4	6	13	3	3	1	9	4	6	
						Percent of Stars --	18%	24%	35%	76%	18%	18%	6%	53%	24%	35%	

Stars	Count	Percent
★★★★★★★★★★	0	0%
★★★★★★★★★	0	0%
★★★★★★★★	0	0%
★★★★★★★	1	6%
★★★★★★	3	18%
★★★★★	1	6%
★★★★	0	0%
★★★	3	18%
★★	5	29%
★	3	18%
	1	6%
Total	17	100%

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Urban Intersection Prioritization for Clay County - Pedestrian/Bike Related

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Traffic Control Device	Total Entering ADT	Adjacent Commercial Development	Max Number of Lanes Crossed	Presence of Sidewalk	Pedestrian Crossing Type	Total Stars
2	1	3.001	CSAH	3	US 10	CSAH 3	★	★		★	★	★	★★★★★
7	2	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)	★	★		★		★	★★★★
3	3	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★	★		★		★	★★★★
14	4	9.001	CSAH	9	US 10	CSAH 9		★	★	★	★		★★★★
10	5	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52	★			★	★	★	★★★★
8	6	45.002	CSAH	45	US 10 (Center AVE E)	CSAH 45 (7th St SE)				★	★		★★
12	7	7.009	CSAH	7	CSAH 7 (40th ST S)	MSAS 138 (40th Ave S)				★	★		★★
5	8	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)		★			★		★★
1	9	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)					★		★
9	10	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)					★		★
16	11	78.001	CR	78	CR 78 (4th AVE SE)	CR 81					★		★
11	12	52.015	CSAH	52	CSAH 52	I 94 (Ramp)					★		★
4	13	3.004	CSAH	3	CSAH 3 (11th St N)	N 9th Ave						★	★
17	14	78.002	CR	78	CSAH 45 (Main St S)	CR 78 (Main St S)					★		★
15	15	75.001	CR	75	US 75 (8th St S)	MSAS 146 (50th Ave S)					★		★
6	16	3.006	CSAH	3	CSAH 3 (11th St N)	CSAH 18 (28th Ave N)					★		★
13	17	7.010	CSAH	7	CSAH 52	CSAH 7 (34th Ave S)					★		★

Stars	Count	Percent
★★★★★★	0	0%
★★★★★	1	6%
★★★★	4	24%
★★★	0	0%
★★	3	18%
★	9	53%
	0	0%
Total	17	100%

	Traffic Control Device	Total Entering ADT	Adjacent Commercial Development	Max Number of Lanes Crossed	Presence of Sidewalk	Pedestrian Crossing Type
Count of Stars --	4	5	1	7	14	5
Percent of Stars --	24%	29%	6%	41%	82%	29%

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Appendix E – Regional TZD Coordinator Contact

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Contact MN TZD[1]

For more information about TZD, or for program-related questions:

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[1] List taken from http://www.minnesotatzd.org/whatistzd/mntzd/contact/

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COUNTY ROADWAY
Safety Plan
Toward ZERO Deaths

Appendix F – List of Recommended Projects

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Rural Segment Project List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [Miles]	Total Stars	Buffer between Opposing Lanes	Clear Zone Enhancements	Six Inch Wet Reflective Paint in Groove	Shoulder Paving and Safety Edge	Centerline Rumble Strip	Edgeline Rumble Strip	Shoulder Rumble Strip	Enhanced Edgeline	Cost
1	1	1.001	CSAH	1	.15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW	Intersection of 90th Ave NW and Broadway St NW	3.28	★★★★★★	0	0	0	0	1	1	0	1	$28,553.63
14	2	11.004	CSAH	11	Intersection of CSAH11/US 10 and 70th St N	3103 ft North of Intersection of US 10 and 70th St S	0.60	★★★★★	0	0	0	0	1	1	0	1	$5,187.85
23	3	14.001	CSAH	14	Intersection of CSAH14/70th St S and 28th Ave S	Intersection of 100th St S and 28th Ave S	3.00	★★★★★	0	0	0	0	1	1	0	1	$26,118.54
66	4	6.001	CSAH	6	Intersection of CSAH6/MN 32 and 120th Ave S	Intersection of CSAH 6 and 300th St S	2.98	★★★★★	0	0	0	0	1	1	0	1	$25,965.28
2	5	10.001	CSAH	10	Intersection of CSAH10/MN 52 and 90th Ave S	.35 Miles West of Intersection of MN 9 and CSAH 10	6.97	★★★★	0	0	0	0	1	1	0	1	$60,603.69
4	6	10.003	CSAH	10	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10	Intersection of CSAH 10 and 110 Ave	14.84	★★★★	0	0	0	0	1	1	0	1	$129,078.23
13	8	11.003	CSAH	11	Intersection of CSAH11/1st Ave E and King Trail Rd N	593 ft South of Intersection of 70th St S and I-94	4.36	★★★★	0	0	0	1	0	0	1	0	$231,302.71
8	7	100.005	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	5.26	★★★★	0	0	0	0	0	0	0	1	$14,209.55
15	9	11.005	CSAH	11	3103 ft North of Intersection of CSAH11/US 10 and 70th St S	Intersection of 28th Ave N and 70th St N	1.42	★★★★	0	0	0	0	1	1	0	1	$12,394.01
16	10	11.006	CSAH	11	Intersection of CSAH11/70th St N and 28th Ave N	Intersection of 70th St N and 90th Ave N	5.06	★★★★	0	0	0	0	1	1	0	1	$44,015.81
19	11	12.001	CSAH	12	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74	Intersection of US 75 and 60th Ave S	1.36	★★★★	0	0	0	0	0	0	1	1	$7,771.45
20	12	12.002	CSAH	12	Intersection of CSAH12/US 75 and 60th Ave S	.19 Miles West of 80th St S and 60th Ave S	6.30	★★★★	0	0	0	0	1	1	0	1	$54,813.45
28	13	19.002	CSAH	19	283 ft North of Intersection of CSAH19/7th St SE and Parke Ave S	Intersection of Parke Ave S and 4th St SE	0.72	★★★★	0	0	0	0	1	1	0	1	$6,280.51
37	14	23.001	CSAH	23	Intersection of CSAH23/40th Ave S and 190th St S	Intersection of US 10 and 190th St S	2.98	★★★★	0	0	0	0	1	1	0	1	$25,953.66
39	15	26.002	CSAH	26	Intersection of CSAH26/120th St N and 90th Ave N	Intersection of 1247 ft West of MN 32	13.27	★★★★	0	0	0	0	1	1	0	1	$115,427.69
52	16	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	2.37	★★★★	0	0	0	0	0	0	0	1	$6,390.43
73	17	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	3.97	★★★★	0	0	0	0	0	0	0	1	$10,720.51
9	18	108.002	CR	108	Intersection of CR108/MN 9 and CR 108	1.04 Miles East of Intersection of 150th St N and 140th Ave N	2.06	★★★	0	0	0	0	0	0	0	1	$5,571.23
10	19	108.003	CR	108	1.04 Miles East of Intersection of CR108/150th St N and 140th Ave N	Intersection of 170th St N and 140th Ave N	0.88	★★★	0	0	0	0	0	0	0	1	$2,386.84
26	20	18.002	CSAH	18	466 ft East of Intersection of CSAH18/US 75 and CSAH 18	Intersection of MN 9 and 28th Ave N	11.31	★★★	0	0	0	0	1	1	0	1	$98,436.82
30	21	19.004	CSAH	19	Intersection of CSAH19/1th St NE and 11tth St N	Intersection of 110th St N and 28th Ave N	1.89	★★★	0	0	0	0	0	0	0	1	$5,097.75
31	22	19.006	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19	0.80	★★★	0	0	0	0	0	0	0	1	$2,147.96
32	23	2.001	CSAH	2	.85 Miles West of Intersection of CSAH2/160th Ave SW and 3rd St S	1208 ft East of Intersection of US 75 and CSAH 2	2.07	★★★	0	0	0	0	0	1	0	1	$11,815.23
34	24	2.003	CSAH	2	Intersection of CSAH3/160th Ave S and US 75	Intersection of MN 9 and 160th Ave S	15.37	★★★	0	0	0	0	0	1	0	1	$87,612.15
35	25	20.002	CSAH	20	.16 Miles West of Intersection of CSAH20/9th St N and 70th Ave N	Intersection of US 75 and 70th Ave N	1.16	★★★	0	0	0	0	0	0	0	1	$3,137.24
38	26	26.001	CSAH	26	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW	Intersection of 90th Ave N and 120 St N	13.04	★★★	0	0	0	0	0	0	1	1	$74,332.05
41	27	26.004	CSAH	26	Intersection of CSAH26/MN 32 and Front St	.50 Miles West of Intersection of 110 Ave and 90th Ave N	4.02	★★★	0	0	0	0	0	1	0	1	$22,893.62
42	28	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	17.21	★★★	0	0	0	0	0	0	0	1	$46,472.79
45	29	33.002	CSAH	33	120 ft South of Intersection of CSAH33/4th St and CSAH 33	Intersection of 90th Ave N and 230th St N	6.45	★★★	0	0	0	0	1	1	0	1	$56,129.83
46	30	33.003	CSAH	33	Intersection of CSAH33/90 Ave N and 230th St N	Intersection of 160Ave N and 230th St N	7.00	★★★	0	0	0	0	0	0	0	1	$18,909.60
49	31	34.003	CSAH	34	Intersection of CSAH34/MN 9 and CSAH 34	Intersection of 5th St W and 160th Ave N	11.10	★★★	0	0	0	0	0	1	0	1	$63,287.39
51	32	34.005	CSAH	34	1695 ft East of Intersection of CSAH34/MN 32 and 160th Ave N	Intersection of 160th Ave N and 100 Ave	2.73	★★★	0	0	0	0	0	1	0	1	$15,551.42
53	33	36.001	CSAH	36	Intersection of CSAH36/170th Ave NW and State Limits	Intersection of US 75 and 170th Ave NW	1.08	★★★	0	0	0	0	0	0	0	1	$2,919.20
59	34	52.001	CSAH	52	Intersection of CSAH52/180th Ave S and CSAH 52	65 ft South of Intersection of 9th Ave SE	1.02	★★★	0	0	0	0	0	1	0	1	$5,812.97
62	35	52.004	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	12.32	★★★	0	0	0	0	1	1	0	1	$107,188.69
63	36	52.005	CSAH	52	Intersection of CSAH52/CSAH 10 and CSAH 52	152 ft South of Main St and CSAH 52	1.49	★★★	1	0	0	0	0	0	0	0	$224,126.24
71	37	8.001	CSAH	8	288 ft East of Intersection of CSAH8/112th Ave S and 5th St S	Intersection of 70th St S and 110th Ave S	6.25	★★★	0	0	0	0	0	0	0	1	$16,875.72
						Total Length (Miles)	198.02504		1	0	0	1	15	21	3	35	$1,675,491.71

Curve Project List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [Miles]	Total Stars	Clear Zone Enhancements	High Friction Surface Treatment	Reconstruct TT Intersection to T Intersection	Lighting	Curve Warning Sign	Speed Advisory Sign	Chevrons or Arrow Board	Cost
52	1	96.001	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	0.10	★★★★★★	0	0	0	0	County Completed	0	County Completed	No Project - Previously Completed
31	2	31.001	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	0.25	★★★★★	0	0	0	0	County Completed	0	County Completed	No Project - Previously Completed
32	3	31.002	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	0.29	★★★★★	0	0	0	0	0	0	County Completed	No Project - Previously Completed
41	4	35.002	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	0.27	★★★★★	0	0	0	0	County Completed	0	County Completed	No Project - Previously Completed
48	5	100.001	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	0.13	★★★★★	0	0	0	0	1	1	1	$4,500.00
24	6	19.001	CSAH	19	Intersection of CSAH19/1th St NE and 11tth St N	Intersection of 110th St N and 28th Ave N	0.08	★★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
42	7	35.003	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	0.25	★★★★	0	0	0	0	County Completed	0	0	No Project - Previously Completed
49	8	100.002	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	0.11	★★★★	0	0	0	0	1	1	0	$2,000.00
54	9	96.003	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	0.08	★★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
55	10	96.004	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	0.11	★★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
2	11	1.002	CSAH	1	North of Intersection of Wall St Ave NW / Broadway st NW	Intersection of Wall St Ave NW / Broadway st NW	0.06	★★★	0	0	0	0	County Completed	0	1	$2,500.00
25	12	19.002	CSAH	19	1040 ft North of 80th Ave N and CSAH 19	Intersection of 90th Ave N and CSAH 19	0.07	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
33	13	31.003	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	0.29	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
35	14	31.005	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	0.08	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
36	15	31.006	CSAH	31	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19	229 ft South of Intersection of Roger St and 230th St	0.06	★★★	1	0	0	0	0	0	0	$100,000.00
40	16	35.001	CSAH	35	Intersection of CSAH35/180th Ave S and 275th St S	Intersection of MN 34 and 270th St S	0.08	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
43	17	52.001	CSAH	52	Intersection of CSAH52/CSAH 52 and CSAH 10	Intersection of MN 9 and CSAH 52	0.10	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
50	18	100.003	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	0.18	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
51	19	100.004	CR	100	528 ft North of Intersection of CR100/Howard St and CR 100	Intersection of CR 100 and CR 102	0.12	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
53	20	96.002	CR	96	Intersection of CR96/MN 22 and CSAH 96	Intersection of US 75 and CSAH 5	0.09	★★★	0	0	0	0	0	0	0	No Project - Criteria Not Met
						Total Length (miles)	2.79		1	0	0	0	2	2	2	$109,000.00

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Rural Intersection Project List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No. 1	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Total Stars	Reconstruct TT to Single T	Roundabout	J Turn	LED Stop Sign	Thru-Stop to All-Way Stop/Yield	Left Turn Lanes on Major Roads (Thru-Traffic)	Lighting	Review Signs and Markings	Upgrade Signs and Pavement Markings	Cost
127	1	5.001	CSAH	5	US 75	CSAH 5 (100th Ave N)	★★★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
10	2	10.008	CSAH	10	MN 9	CSAH 10 (90th Ave S)	★★★★★★	0	0	0	0	0	0	1	0	0	$15,000
75	3	2.002	CSAH	2	US 75 (14th St S)	CSAH 2 (160th Ave S)	★★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
3	4	10.001	CSAH	10	CSAH 52	CSAH 10 (90th Ave S)	★★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
17	5	10.015	CSAH	10	MN 32	CSAH 10 (90th Ave S)	★★★★★	0	0	0	1	0	0	1	0	0	$17,000
89	6	23.001	CSAH	23	US 10	CSAH 23 (190th St S)	★★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
92	7	26.003	CSAH	26	US 75	CSAH 26 (90th Ave N)	★★★★★	0	0	0	1	0	0	1	0	0	$17,000
101	8	26.012	CSAH	26	MN 32	CSAH 26 (Front St)	★★★★★	0	0	0	1	0	0	1	0	0	$17,000
110	9	31.004	CSAH	31	US 10	CSAH 31 (230th St)	★★★★★	0	0	1	0	0	0	0	0	0	$1,000,000
115	10	34.001	CSAH	34	US 75	CSAH 34	★★★★★	0	0	0	0	0	0	1	0	0	$15,000
117	11	34.003	CSAH	34	MN 9 (Hwy 9 N)	CSAH 34 (7th St)	★★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
82	12	2.009	CSAH	2	MN 9 (Front St N)	MN 34 (160th Ave S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
24	13	11.006	CSAH	11	CSAH 11 (Main St)	CSAH 52 (Holloway St)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
46	14	12.003	CSAH	12	CSAH 12 (60th Ave S)	CSAH 52	★★★★	0	0	0	0	0	0	1	0	0	$15,000
55	15	14.001	CSAH	14	MN 336 (70th St S)	CSAH 14 (28th Ave S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
61	16	17.005	CSAH	17	US 10	CSAH 17 (100th St S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
62	17	18.001	CSAH	18	US 75	CSAH 18 (28th Ave N)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
68	18	18.007	CSAH	18	MN 9 (140th ST N)	CSAH 18 (28th Ave N)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
70	19	19.002	CSAH	19	US 10 (State St)	CSAH 19 (Parke Ave S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
86	20	21.003	CSAH	20	CSAH 21 (130th St S)	CSAH 52	★★★★	0	0	0	0	0	0	1	0	0	$15,000
88	21	22.001	CSAH	22	US 75	CSAH 22 (Wall Street Ave N)	★★★★	0	0	0	0	1	0	0	1	0	$3,000
96	22	26.007	CSAH	26	MN 9 (140th ST N)	CSAH 26 (90th Ave N)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
124	23	43.001	CSAH	43	CSAH 52	CSAH 43 (Main Ave E)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
129	24	52.001	CSAH	52	MN 9	CSAH 52 (175th ST S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
135	25	52.007	CSAH	52	CSAH 52	CR 63 (80th St S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
136	26	52.008	CSAH	52	CSAH 52 (Holloway ST)	CR 67 (1st St S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
137	27	52.009	CSAH	52	CSAH 52	CR 69 (70th Ave S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
139	28	52.011	CSAH	52	CSAH 52	CR 78 (50th St S)	★★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
106	29	3.008	CSAH	3	CSAH 22 (Wall Street Ave N)	CSAH 3 (Oakport St N)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
140	30	6.001	CSAH	6	MN 32 (270th St S)	CSAH 6 (120th Ave S)	★★★	0	0	0	0	0	0	1	0	0	$15,000
12	31	10.010	CSAH	10	CSAH 10	CSAH 25 (200th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
13	32	10.011	CSAH	10	CSAH 10 (90th Ave S)	CSAH 31 (230th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
18	33	10.016	CSAH	10	CSAH 10 (90th Ave S)	CSAH 37 (280th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
44	34	12.001	CSAH	12	US 75 (8th Rabt S)	CSAH 12 (60th Ave S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
51	35	12.009	CSAH	12	MN 9 (140th St S)	CSAH 12	★★★	0	0	0	0	0	0	1	0	0	$15,000
72	36	19.007	CSAH	19	CSAH 26 (90th Ave N)	CSAH 19 (120th St N)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
107	37	31.001	CSAH	31	MN 34	CSAH 31 (230th St S)	★★★	0	0	0	0	0	0	1	0	0	$15,000
119	38	34.005	CSAH	34	CSAH 34 (Northern Pacific Ave)	M 8 (1st St E)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
121	39	35.001	CSAH	35	MN 34 (160th Ave S)	MN 32 (270th St S)	★★★	0	0	0	0	0	0	1	0	0	$15,000
123	40	36.002	CSAH	36	US 75	CSAH 36 (170th Ave NW)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
126	41	44.001	CSAH	44	US 10	CSAH 44	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
130	42	52.002	CSAH	52	CSAH 52	CR 55 (150th Ave S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
131	43	52.003	CSAH	52	CSAH 52	CR 56 (160th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
132	44	52.004	CSAH	52	CSAH 52	CR 62 (120th Ave S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
133	45	52.005	CSAH	52	CSAH 52	CR 69 (110th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
134	46	52.006	CSAH	52	CSAH 52	CR 68 (90th St S)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
31	47	11.013	CSAH	11	CSAH 11 (70th St N)	CSAH 18 (28th Ave N)	★★★	0	0	0	1	0	0	1	0	0	$17,000
37	48	11.019	CSAH	11	CSAH 11 (70th St N)	CSAH 26 (90th Ave N)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
84	49	20.002	CSAH	20	US 75	CSAH 20 (70th AVE N)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
152	50	108.002	CR	108	MN 9 (140th ST N)	CR 108 (140th Ave N)	★★★	0	0	0	0	0	0	0	1	0	No Project - Criteria Not Met
								0	0	1	4	1	0	12	37	0	$1,191,000

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Urban Segment Project List for Clay County

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.2	CRSP 2 ID	Route System	Route No.	Segment Start Description	Segment End Description	Length [miles]	Total Stars	Divided Roadway	Access Management	Road Diet	Vehicle Speed Feedback Signs	Sidewalk	Cost
3	1	3.001	CSAH	3	Intersection of CSAH3/US 10 and 11th St N	Intersection of 11th St N and 2nd Ave N	0.14	★★★★	0	0	0	0	0	No Project - Criteria Not Met
1	2	3.002	CSAH	3	Intersection of CSAH3/11th St N and 2nd Ave N	Intersection of CSAH 96 and MN 22	4.30	★★★	0	1	0	0	0	$1,549,493.31
						Total Length (Miles)	4.44		0	1	0	0	0	$1,549,493.31

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Urban Intersection Project List for Clay County - Vehicle Related

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Total Stars	Lighting	Roundabout	J Turn	Signalized J Turn	Thru-Stop to All-Way Stop/Yield	Upgrade Signs and Pavement Markings	Confirmation Lights	Upgrade Signal Hardware	Cost
3	1	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★★★★★★★	0	0	0	0	0	0	1	0	$1,500
2	2	3.001	CSAH	3	US 10	CSAH 3	★★★★★★	0	0	0	0	0	0	0	0	No Project - Criteria Not Met
10	4	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52	★★★★★★	0	0	0	0	0	0	0	0	No Project - Criteria Not Met
14	3	9.001	CSAH	9	US 10	CSAH 9	★★★★★★	0	0	0	0	0	1	0	0	$3,500
7	5	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)	★★★★★	0	0	0	0	0	0	0	0	No Project - Criteria Not Met
1	6	1.001	CSAH	1	CSAH 1 (Broadway St NW)	CSAH 22 (Wall Street Ave N)	★★★	0	0	0	0	0	1	0	0	$3,500
9	7	52.012	CSAH	52	CSAH 52	MSAS 138 (40th Ave S)	★★★	1	0	0	0	0	1	0	0	$18,500
15	8	75.001	CR	75	US 75 (8th St S)	MSAS 146 (50th Ave S)	★★★	0	0	0	0	0	1	0	0	$3,500
							Total Projects	1	0	0	0	0	4	1	0	$30,500

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Urban Intersection Project List for Clay County - Pedestrian/Bike Related

CRSP2 ID Example: 1.001: 1= Route Number, 001 = First Segment

List No.	Project Page No.	CRSP 2 ID	Route System	Route No.	Major Approach Name	Minor Approach Name	Total Stars	Mini Roundabout	Median Refuge Island	RRFB	RRFB with Refuge Island	Pedestrian Hybrid Beacon	No Right Turn on Red Sign (static or blank out)	Curb Extensions	Leading Pedestrian Interval	Pedestrian Countdown Timer	Upgrade Signal Hardware and Review and Revise Signal Timing and Operations	Cost
2	1	3.001	CSAH	3	US 10	CSAH 3	★★★★★	0	0	0	0	0	0	1	1	0	1	$16,000
3	3	3.002	CSAH	3	MSAS 115 (1st Ave N)	CSAH 3 (11th St N)	★★★★	0	0	0	0	0	0	0	1	0	1	$6,000
7	2	45.001	CSAH	45	US 10 (Center Ave W)	CSAH 45 (Main St S)	★★★★	0	0	0	0	0	0	1	1	1	1	$28,000
10	5	52.013	CSAH	52	MSAS 128 (30th Ave S)	CSAH 52	★★★★	0	0	0	0	0	0	0	1	0	1	$6,000
14	4	9.001	CSAH	9	US 10	CSAH 9	★★★★	0	0	0	0	0	0	0	0	0	0	No Project - Criteria Not Met
5	8	3.005	CSAH	3	CSAH 3 (11th St N)	MSAS 129 (15th Ave N)	★★	0	1	0	0	0	0	1	0	0	0	$35,000
8	6	45.002	CSAH	45	US 10 (Center AVE E)	CSAH 45 (7th St SE)	★★	0	1	0	0	0	0	1	0	0	0	$35,000
12	7	7.009	CSAH	7	CSAH 7 (40th ST S)	MSAS 138 (40th Ave S)	★★	0	1	0	0	0	0	1	0	0	0	$35,000
							Total Projects	0	3	0	0	0	0	5	4	1	4	$161,000

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COUNTY ROADWAY
Safety Plan
Toward ZERO Deaths

Appendix G – Recommended Project Maps

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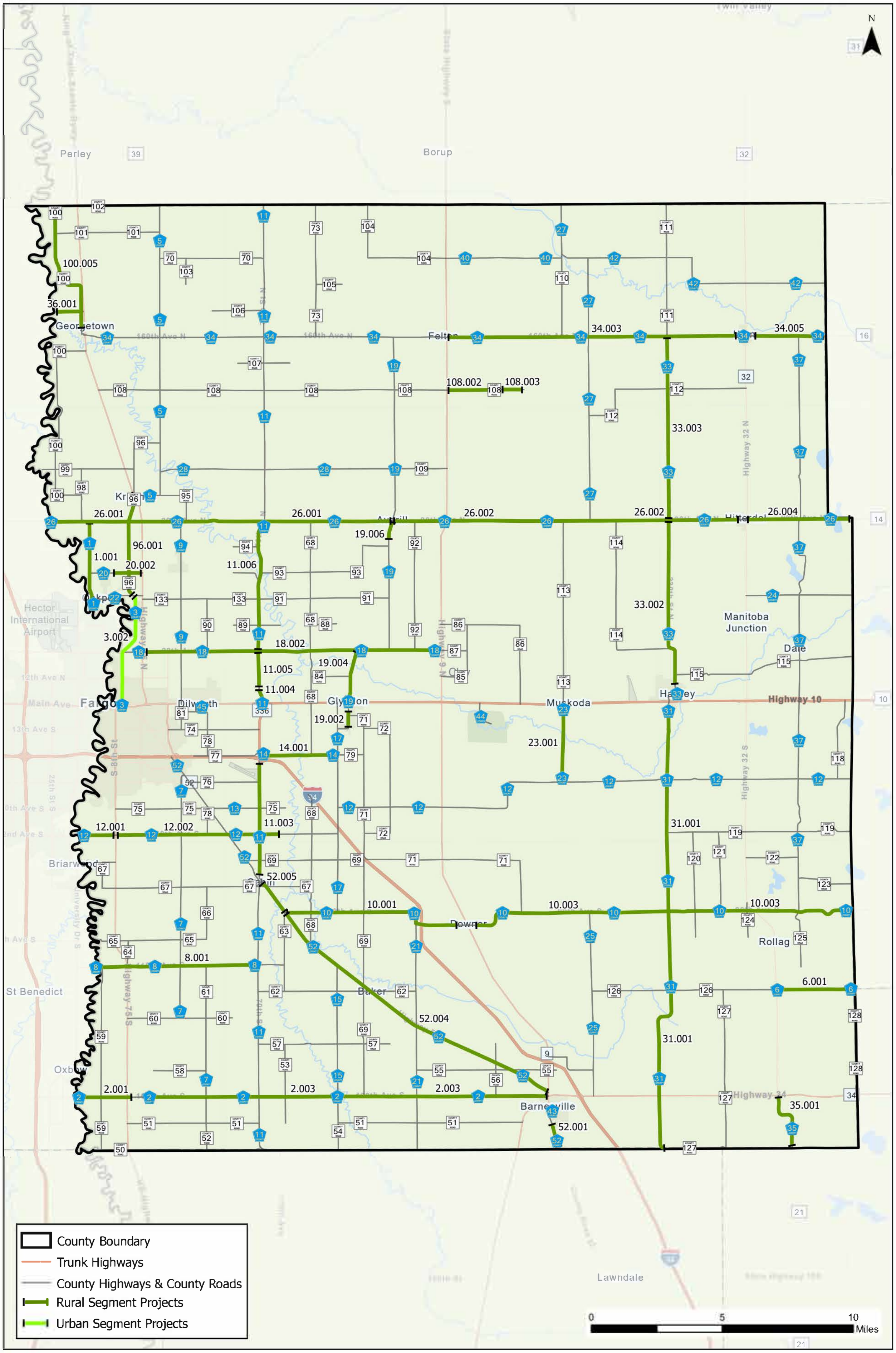
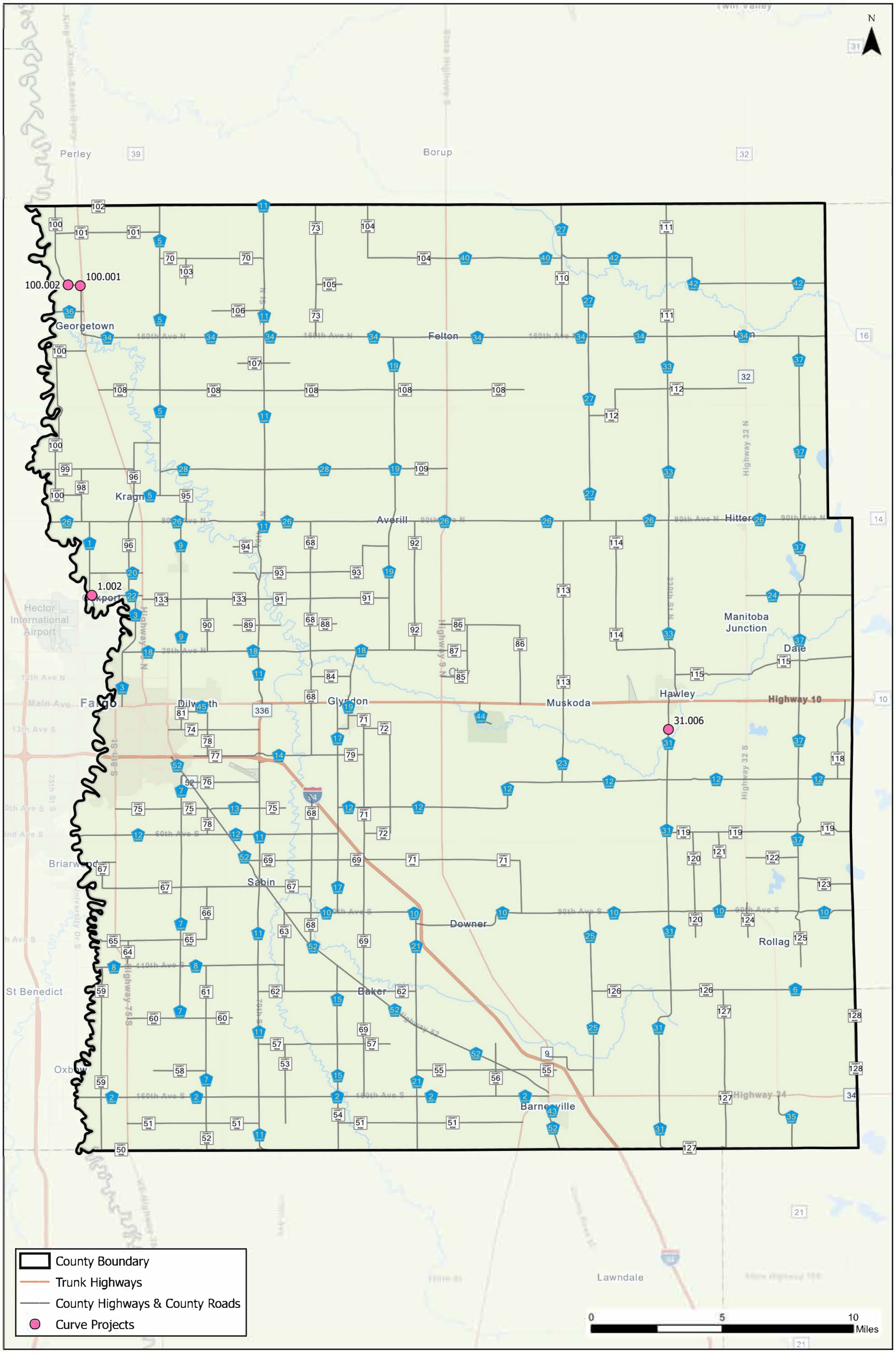


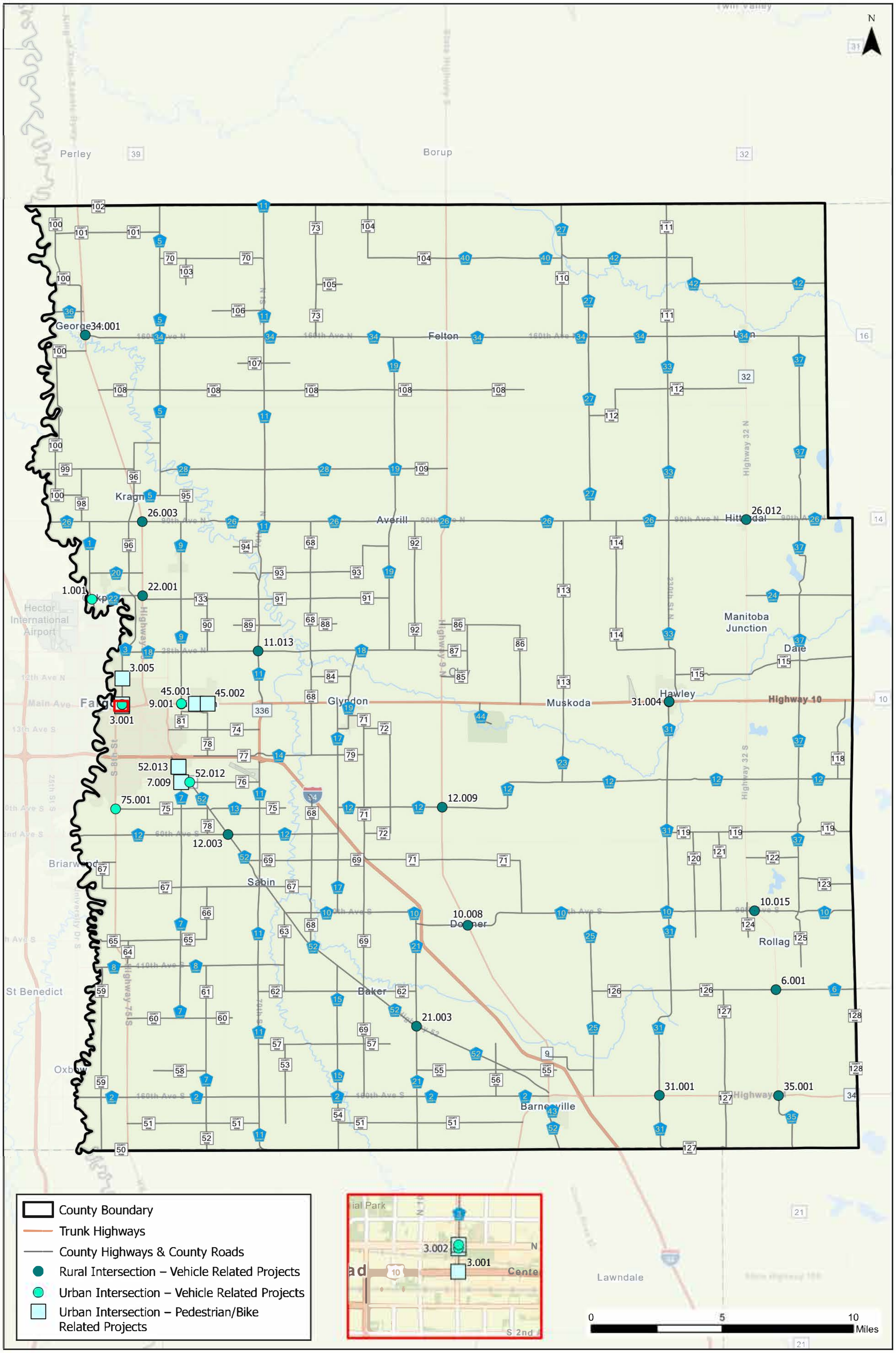
Clay County - Segment Projects

Created on 3/21/2023



Clay County - Curve Projects

Created on 3/21/2023



Clay County - Intersection Projects

Created on 3/23/2023

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Appendix H – HSIP Submission Forms

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Rural Segment Project on CSAH 1

Roadway Information

Segment Start: .15 Miles South of Intersection of CSAH1/54th Ave NW and 4th St NW

Segment End: Intersection of 90th Ave NW and Broadway St NW

Area Type: Rural

County: Clay

Context Zone: Agriculture

Segment Route System: CSAH

Segment Route No: 1

Facility Type: 2-Lane

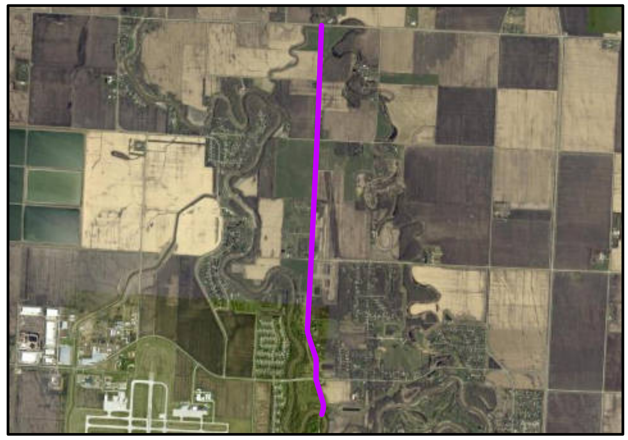
Segment Length (mile): 3.28

Traffic Volume (vpd): 1303

Lane Width (ft): 12

Shoulder Type: Paved

Shoulder Width (ft): 4



[Click to View in Google Maps]

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.12	0	0.06	0
Rate (per MVM):	0.26	0	0.13	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1303	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1303	xx ≥ 1,250	★
Curve Density (cur per mile):	0.91	xx ≥ 0.6	★
Access Density (access per mile):	11.58	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$9,846.08
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$9,846.08
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$8,861.47
				Total Estimated Project Cost	$28,553.63

Systemic Project	√

Project Page #: 1

Segment ID: 1.001

Date: 3/29/2023

Rural Segment Project on CSAH 2

Roadway Information

Segment Start:	.85 Miles West of Intersection of CSAH2/160th Ave SW and 3rd St S
Segment End:	1208 ft East of Intersection of US 75 and CSAH 2
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	2
Facility Type:	2-Lane
Segment Length (mile):	2.07
Traffic Volume (vpd):	835
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	9

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	835	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	835	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	9.17	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$6,218.54
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$5,596.69
				Total Estimated Project Cost	$11,815.23

Systemic Project	√

Rural Segment Project on CSAH 2

Roadway Information

Segment Start:	Intersection of CSAH3/160th Ave S and US 75
Segment End:	Intersection of MN 9 and 160th Ave S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	2
Facility Type:	2-Lane
Segment Length (mile):	15.37
Traffic Volume (vpd):	765
Lane Width (ft):	12
Shoulder Type:	Curb & Gutter
Shoulder Width (ft):	0

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	6	0	2	0
Density (per mile per yr):	0.08	0	0.03	0
Rate (per MVM):	0.28	0	0.09	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	765	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	765	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.74	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$46,111.66
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$41,500.49
				Total Estimated Project Cost	$87,612.15

Systemic Project	√

Project Page #: 24
Segment ID: 2.003
Date: 3/29/2023

Rural Segment Project on CSAH 6

Roadway Information

Segment Start:	Intersection of CSAH6/MN 32 and 120th Ave S
Segment End:	Intersection of CSAH 6 and 300th St S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	6
Facility Type:	2-Lane
Segment Length (mile):	2.98
Traffic Volume (vpd):	1350
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.07	0	0.07	0
Rate (per MVM):	0.14	0	0.14	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1350	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1350	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	12.73	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$8,953.54
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$8,953.54
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$8,058.19
				Total Estimated Project Cost	$25,965.28

Systemic Project	√

Project Page #:	4
Segment ID:	6.001
Date:	3/29/2023

Rural Segment Project on CSAH 8

Roadway Information

Segment Start:	288 ft East of Intersection of CSAH8/112th Ave S and 5th St S
Segment End:	Intersection of 70th St S and 110th Ave S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	8
Facility Type:	2-Lane
Segment Length (mile):	6.25
Traffic Volume (vpd):	218
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	6

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	1	0	0	0
Density (per mile per yr):	0.03	0	0	0
Rate (per MVM):	0.4	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	218	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	218	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.84	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$16,875.72
				Total Estimated Project Cost	$16,875.72

Systemic Project	√

Project Page #: 37
Segment ID: 8.001
Date: 3/29/2023

Rural Segment Project on CSAH 10

Roadway Information

Segment Start:	Intersection of CSAH10/MN 52 and 90th Ave S
Segment End:	.35 Miles West of Intersection of MN 9 and CSAH 10
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	10
Facility Type:	2-Lane
Segment Length (mile):	6.97
Traffic Volume (vpd):	1800
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	7

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	7	1	4	1
Density (per mile per yr):	0.2	0.03	0.11	0.03
Rate (per MVM):	0.31	0.04	0.17	0.04

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1800	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1800	xx ≥ 1,250	★
Curve Density (cur per mile):	0.14	xx ≥ 0.6	-
Access Density (access per mile):	8.47	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$20,897.83
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$20,897.83
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$18,808.04
				Total Estimated Project Cost	$60,603.69

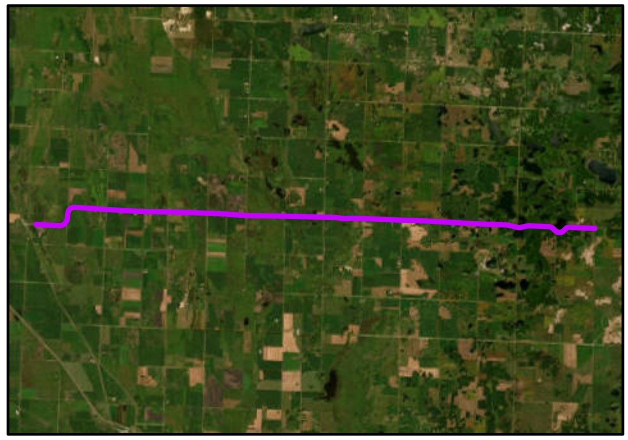
Systemic Project	√

Project Page #: 5
Segment ID: 10.001
Date: 3/29/2023

Rural Segment Project on CSAH 10

Roadway Information

Segment Start:	1396 ft East of Intersection of CSAH10/MN 9 and CSAH 10
Segment End:	Intersection of CSAH 10 and 110 Ave
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	10
Facility Type:	2-Lane
Segment Length (mile):	14.84
Traffic Volume (vpd):	2100
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8



Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	20	2	14	2
Density (per mile per yr):	0.27	0.03	0.19	0.03
Rate (per MVM):	0.35	0.04	0.25	0.04

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	2100	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	2100	xx ≥ 1,250	★
Curve Density (cur per mile):	0.61	xx ≥ 0.6	★
Access Density (access per mile):	9.44	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$44,509.73
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$44,509.73
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$40,058.76
				Total Estimated Project Cost	$129,078.23

Systemic Project	√

Project Page #:	6
Segment ID:	10.003
Date:	3/29/2023

Rural Segment Project on CSAH 11

Roadway Information

Segment Start:	Intersection of CSAH11/1st Ave E and King Trail Rd N
Segment End:	593 ft South of Intersection of 70th St S and I-94
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	11
Facility Type:	2-Lane
Segment Length (mile):	4.36
Traffic Volume (vpd):	1055
Lane Width (ft):	11
Shoulder Type:	Gravel
Shoulder Width (ft):	3

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	0	0
Density (per mile per yr):	0.09	0	0	0
Rate (per MVM):	0.24	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1055	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1055	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	12.6	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	1	$218,210.1
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	1	$13,092.61
Enhanced Edgeline:	Proactive	$2,700	per mile	0	$0
				Total Estimated Project Cost	$231,302.71

Systemic Project	√

Project Page #: 8

Segment ID: 11.003

Date: 3/29/2023

Rural Segment Project on CSAH 11

Roadway Information

Segment Start:	Intersection of CSAH11/US 10 and 70th St N
Segment End:	3103 ft North of Intersection of US 10 and 70th St S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	11
Facility Type:	2-Lane
Segment Length (mile):	0.6
Traffic Volume (vpd):	1800
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	10

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	1	1	0	0
Density (per mile per yr):	0.34	0.34	0	0
Rate (per MVM):	0.51	0.51	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1800	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1800	xx ≥ 1,250	★
Curve Density (cur per mile):	3.35	xx ≥ 0.6	★
Access Density (access per mile):	10.06	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$1,788.91
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$1,788.91
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$1,610.02
				Total Estimated Project Cost	$5,187.85

Systemic Project	√

Project Page #: 2

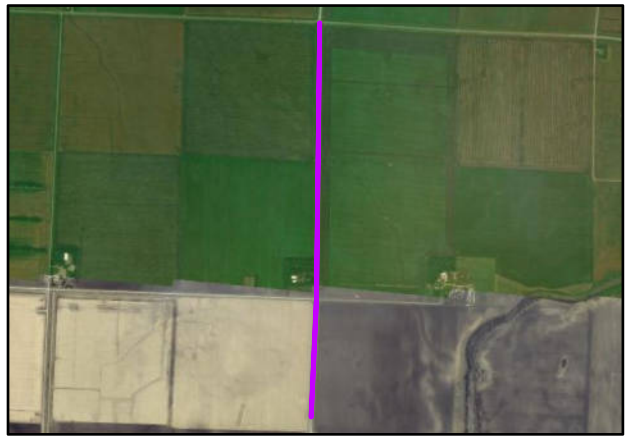
Segment ID: 11.004

Date: 3/29/2023

Rural Segment Project on CSAH 11

Roadway Information

Segment Start:	3103 ft North of Intersection of CSAH11/US 10 and 70th St S
Segment End:	Intersection of 28th Ave N and 70th St N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	11
Facility Type:	2-Lane
Segment Length (mile):	1.42
Traffic Volume (vpd):	1800
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	10



Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1800	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1800	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	9.13	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$4,273.8
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$4,273.8
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$3,846.42
				Total Estimated Project Cost	$12,394.01

Systemic Project	√

Project Page #: 9

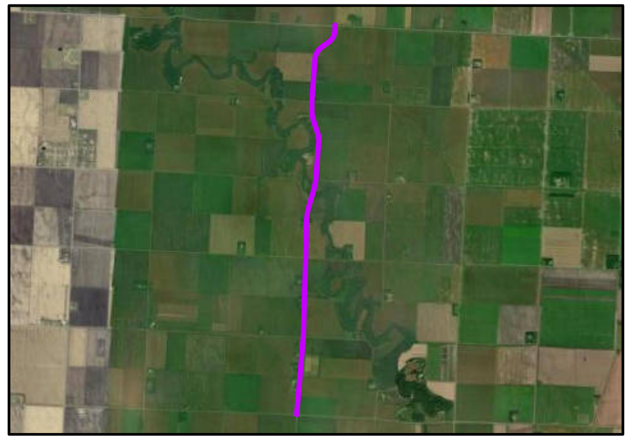
Segment ID: 11.005

Date: 3/29/2023

Rural Segment Project on CSAH 11

Roadway Information

Segment Start:	Intersection of CSAH11/70th St N and 28th Ave N
Segment End:	Intersection of 70th St N and 90th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	11
Facility Type:	2-Lane
Segment Length (mile):	5.06
Traffic Volume (vpd):	1200
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	6



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	7	1	5	1
Density (per mile per yr):	0.28	0.04	0.2	0.04
Rate (per MVM):	0.63	0.09	0.45	0.09

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1200	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1200	xx ≥ 1,250	-
Curve Density (cur per mile):	0.99	xx ≥ 0.6	★
Access Density (access per mile):	11.27	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$15,177.86
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$15,177.86
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$13,660.08
				Total Estimated Project Cost	$44,015.81

Systemic Project	√

Project Page #: 10

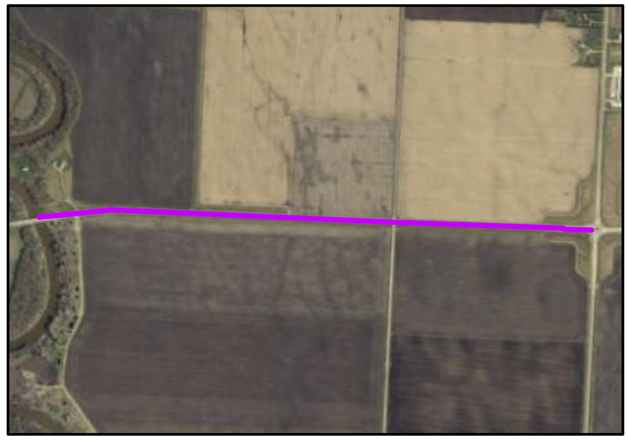
Segment ID: 11.006

Date: 3/29/2023

Rural Segment Project on CSAH 12

Roadway Information

Segment Start:	.08 Miles West of Intersection of CSAH12/7th St SW and CSAH 74
Segment End:	Intersection of US 75 and 60th Ave S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	12
Facility Type:	2-Lane
Segment Length (mile):	1.36
Traffic Volume (vpd):	6500
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	7



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	9	0	2	0
Density (per mile per yr):	1.32	0	0.29	0
Rate (per MVM):	0.56	0	0.12	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	6500	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	6500	xx ≥ 1,250	★
Curve Density (cur per mile):	0.73	xx ≥ 0.6	★
Access Density (access per mile):	8.8	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	1	$4,090.24
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$3,681.21
				Total Estimated Project Cost	$7,771.45

Systemic Project	√

Project Page #: 11

Segment ID: 12.001

Date: 3/29/2023

Rural Segment Project on CSAH 12

Roadway Information

Segment Start:	Intersection of CSAH12/US 75 and 60th Ave S
Segment End:	.19 Miles West of 80th St S and 60th Ave S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	12
Facility Type:	2-Lane
Segment Length (mile):	6.3
Traffic Volume (vpd):	1360
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	9	0	1	0
Density (per mile per yr):	0.29	0	0.03	0
Rate (per MVM):	0.58	0	0.06	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1360	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1360	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.3	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$18,901.19
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$18,901.19
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$17,011.07
				Total Estimated Project Cost	$54,813.45

Systemic Project	√

Project Page #: 12
Segment ID: 12.002
Date: 3/29/2023

Rural Segment Project on CSAH 14

Roadway Information

Segment Start:	Intersection of CSAH14/70th St S and 28th Ave S
Segment End:	Intersection of 100th St S and 28th Ave S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	14
Facility Type:	2-Lane
Segment Length (mile):	3
Traffic Volume (vpd):	1375
Lane Width (ft):	12
Shoulder Type:	Composite
Shoulder Width (ft):	10

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	4	0	1	0
Density (per mile per yr):	0.27	0	0.07	0
Rate (per MVM):	0.53	0	0.13	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1375	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1375	xx ≥ 1,250	★
Curve Density (cur per mile):	0.67	xx ≥ 0.6	★
Access Density (access per mile):	10.66	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$9,006.39
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$9,006.39
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$8,105.75
				Total Estimated Project Cost	$26,118.54

Systemic Project	√

Project Page #:	3
Segment ID:	14.001
Date:	3/29/2023

Rural Segment Project on CSAH 18

Roadway Information

Segment Start:	466 ft East of Intersection of CSAH18/US 75 and CSAH 18
Segment End:	Intersection of MN 9 and 28th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	18
Facility Type:	2-Lane
Segment Length (mile):	11.31
Traffic Volume (vpd):	1125
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	7

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	15	2	7	1
Density (per mile per yr):	0.27	0.04	0.12	0.02
Rate (per MVM):	0.65	0.09	0.3	0.04

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1125	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1125	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	8.04	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$33,943.73
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$33,943.73
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$30,549.36
				Total Estimated Project Cost	$98,436.82

Systemic Project	√

Segment ID: 18.002
Date: 3/29/2023

Rural Segment Project on CSAH 19

Roadway Information

Segment Start:	283 ft North of Intersection of CSAH19/7th St SE and Parke Ave S
Segment End:	Intersection of Parke Ave S and 4th St SE
Area Type:	Small Town
County:	Clay
Context Zone:	Campus
Segment Route System:	CSAH
Segment Route No:	19
Facility Type:	2-Lane
Segment Length (mile):	0.72
Traffic Volume (vpd):	1800
Lane Width (ft):	12
Shoulder Type:	Curb & Gutter
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	30	≥ 55	-
ADT-RS (Rural Single-veh) (vpd):	1800	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1800	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	15.24	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$2,165.69
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$2,165.69
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$1,949.12
				Total Estimated Project Cost	$6,280.51

Systemic Project	√

Project Page #:	13
Segment ID:	19.002
Date:	3/29/2023

Rural Segment Project on CSAH 19

Roadway Information

Segment Start:	Intersection of CSAH19/1th St NE and 11tth St N
Segment End:	Intersection of 110th St N and 28th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	19
Facility Type:	2-Lane
Segment Length (mile):	1.89
Traffic Volume (vpd):	455
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	4

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.11	0	0.11	0
Rate (per MVM):	0.64	0	0.64	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	455	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	455	xx ≥ 1,250	-
Curve Density (cur per mile):	0.53	xx ≥ 0.6	-
Access Density (access per mile):	9.53	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$5,097.75
				Total Estimated Project Cost	$5,097.75

Systemic Project	√

Project Page #: 21

Segment ID: 19.004

Date: 3/29/2023

Rural Segment Project on CSAH 19

Roadway Information

Segment Start:	1040 ft North of 80th Ave N and CSAH 19
Segment End:	Intersection of 90th Ave N and CSAH 19
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	19
Facility Type:	2-Lane
Segment Length (mile):	0.8
Traffic Volume (vpd):	50
Lane Width (ft):	11
Shoulder Type:	None
Shoulder Width (ft):	0

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	50	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	50	xx ≥ 1,250	-
Curve Density (cur per mile):	1.26	xx ≥ 0.6	★
Access Density (access per mile):	28.91	7 ≤ xx ≤ 18	-
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$2,147.96
				Total Estimated Project Cost	$2,147.96

Systemic Project	√

Project Page #: 22

Segment ID: 19.006

Date: 3/29/2023

Rural Segment Project on CSAH 20

Roadway Information

Segment Start:	.16 Miles West of Intersection of CSAH20/9th St N and 70th Ave N
Segment End:	Intersection of US 75 and 70th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	20
Facility Type:	2-Lane
Segment Length (mile):	1.16
Traffic Volume (vpd):	300
Lane Width (ft):	12
Shoulder Type:	None
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	300	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	300	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	9.47	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

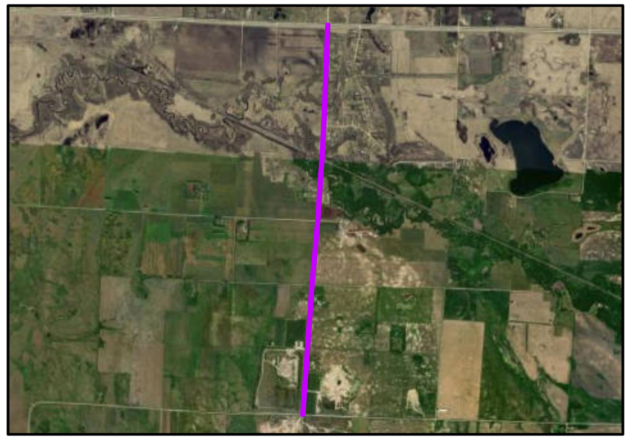
	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$3,137.24
				Total Estimated Project Cost	$3,137.24

Systemic Project	√

Rural Segment Project on CSAH 23

Roadway Information

Segment Start:	Intersection of CSAH23/40th Ave S and 190th St S
Segment End:	Intersection of US 10 and 190th St S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	23
Facility Type:	2-Lane
Segment Length (mile):	2.98
Traffic Volume (vpd):	1350
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.13	0	0.07	0
Rate (per MVM):	0.27	0	0.14	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1350	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1350	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	13.41	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$8,949.54
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$8,949.54
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$8,054.58
				Total Estimated Project Cost	$25,953.66

Systemic Project	√

Project Page #: 14

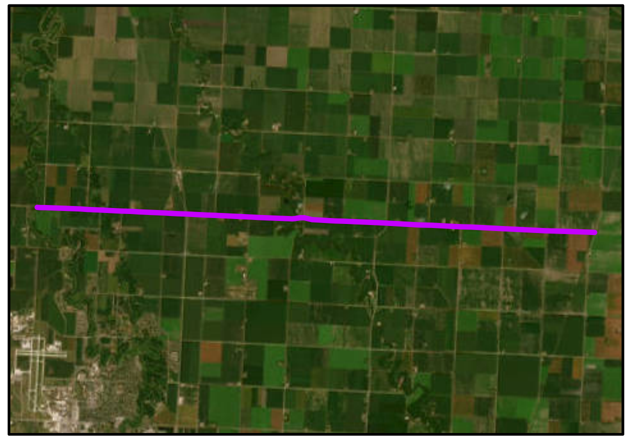
Segment ID: 23.001

Date: 3/29/2023

Rural Segment Project on CSAH 26

Roadway Information

Segment Start:	.10 Miles West of Intersection of CSAH26/15th St SW and 90th Ave NW
Segment End:	Intersection of 90th Ave N and 120 St N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	26
Facility Type:	2-Lane
Segment Length (mile):	13.04
Traffic Volume (vpd):	2675
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	10



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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	9	1	4	1
Density (per mile per yr):	0.14	0.02	0.06	0.02
Rate (per MVM):	0.14	0.02	0.06	0.02

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	2675	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	2675	xx ≥ 1,250	★
Curve Density (cur per mile):	0.23	xx ≥ 0.6	-
Access Density (access per mile):	8.97	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	1	$39,122.13
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$35,209.92
				Total Estimated Project Cost	$74,332.05

Systemic Project	√

Project Page #: 26

Segment ID: 26.001

Date: 3/29/2023

Rural Segment Project on CSAH 26

Roadway Information

Segment Start:	Intersection of CSAH26/120th St N and 90th Ave N
Segment End:	Intersection of 1247 ft West of MN 32
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	26
Facility Type:	2-Lane
Segment Length (mile):	13.27
Traffic Volume (vpd):	1950
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	6

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	6	0	2	0
Density (per mile per yr):	0.09	0	0.03	0
Rate (per MVM):	0.13	0	0.04	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1950	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1950	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.08	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$39,802.65
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$39,802.65
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$35,822.39
				Total Estimated Project Cost	$115,427.69

Systemic Project	√

Project Page #:	15
Segment ID:	26.002
Date:	3/29/2023

Rural Segment Project on CSAH 26

Roadway Information

Segment Start:	Intersection of CSAH26/MN 32 and Front St
Segment End:	.50 Miles West of Intersection of 110 Ave and 90th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	26
Facility Type:	2-Lane
Segment Length (mile):	4.02
Traffic Volume (vpd):	663
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	3	0	1	0
Density (per mile per yr):	0.15	0	0.05	0
Rate (per MVM):	0.62	0	0.21	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	663	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	663	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	11.2	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$12,049.27
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$10,844.35
				Total Estimated Project Cost	$22,893.62

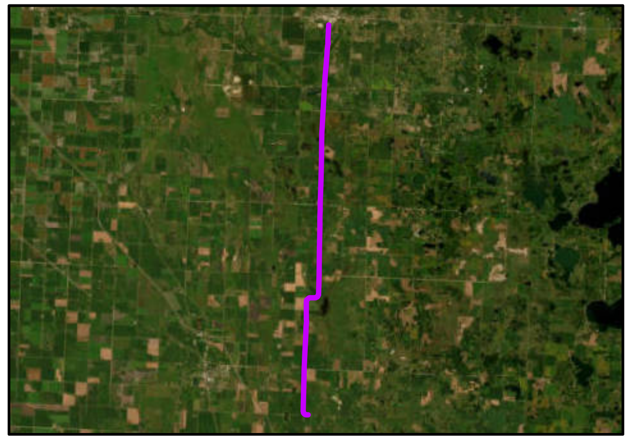
Systemic Project	√

Project Page #: 27
Segment ID: 26.004
Date: 3/29/2023

Rural Segment Project on CSAH 31

Roadway Information

Segment Start:	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19
Segment End:	229 ft South of Intersection of Roger St and 230th St
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	31
Facility Type:	2-Lane
Segment Length (mile):	17.21
Traffic Volume (vpd):	565
Lane Width (ft):	11.5
Shoulder Type:	Paved
Shoulder Width (ft):	4



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	6	0	3	0
Density (per mile per yr):	0.07	0	0.03	0
Rate (per MVM):	0.34	0	0.17	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	565	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	565	xx ≥ 1,250	-
Curve Density (cur per mile):	0.35	xx ≥ 0.6	-
Access Density (access per mile):	6.8	7 ≤ xx ≤ 18	-
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$46,472.79
				Total Estimated Project Cost	$46,472.79

Systemic Project	√

Project Page #: 28

Segment ID: 31.001

Date: 3/29/2023

Rural Segment Project on CSAH 33

Roadway Information

Segment Start:	120 ft South of Intersection of CSAH33/4th St and CSAH 33
Segment End:	Intersection of 90th Ave N and 230th St N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	33
Facility Type:	2-Lane
Segment Length (mile):	6.45
Traffic Volume (vpd):	1025
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	10

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	3	0	1	0
Density (per mile per yr):	0.09	0	0.03	0
Rate (per MVM):	0.25	0	0.08	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1025	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1025	xx ≥ 1,250	-
Curve Density (cur per mile):	0.31	xx ≥ 0.6	-
Access Density (access per mile):	10.38	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$19,355.11
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$19,355.11
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$17,419.6
				Total Estimated Project Cost	$56,129.83

Systemic Project	√

Project Page #: 29

Segment ID: 33.002

Date: 3/29/2023

Rural Segment Project on CSAH 33

Roadway Information

Segment Start:	Intersection of CSAH33/90 Ave N and 230th St N
Segment End:	Intersection of 160Ave N and 230th St N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	33
Facility Type:	2-Lane
Segment Length (mile):	7
Traffic Volume (vpd):	455
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	2

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	0	0
Density (per mile per yr):	0.06	0	0	0
Rate (per MVM):	0.34	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	455	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	455	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.14	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$18,909.6
				Total Estimated Project Cost	$18,909.6

Systemic Project	√

Project Page #: 30

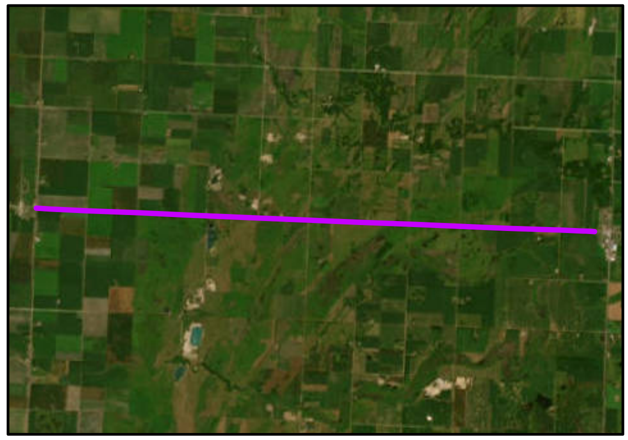
Segment ID: 33.003

Date: 3/29/2023

Rural Segment Project on CSAH 34

Roadway Information

Segment Start:	Intersection of CSAH34/MN 9 and CSAH 34
Segment End:	Intersection of 5th St W and 160th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	34
Facility Type:	2-Lane
Segment Length (mile):	11.1
Traffic Volume (vpd):	800
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.04	0	0.02	0
Rate (per MVM):	0.12	0	0.06	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	800	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	800	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	7.21	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$33,309.15
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$29,978.24
				Total Estimated Project Cost	$63,287.39

Systemic Project	√

Project Page #: 31
Segment ID: 34.003
Date: 3/29/2023

Rural Segment Project on CSAH 34

Roadway Information

Segment Start:	1695 ft East of Intersection of CSAH34/MN 32 and 160th Ave N
Segment End:	Intersection of 160th Ave N and 100 Ave
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	34
Facility Type:	2-Lane
Segment Length (mile):	2.73
Traffic Volume (vpd):	770
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	8

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	770	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	770	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	10.26	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$8,184.96
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$7,366.46
				Total Estimated Project Cost	$15,551.42

Systemic Project	√

Project Page #: 32

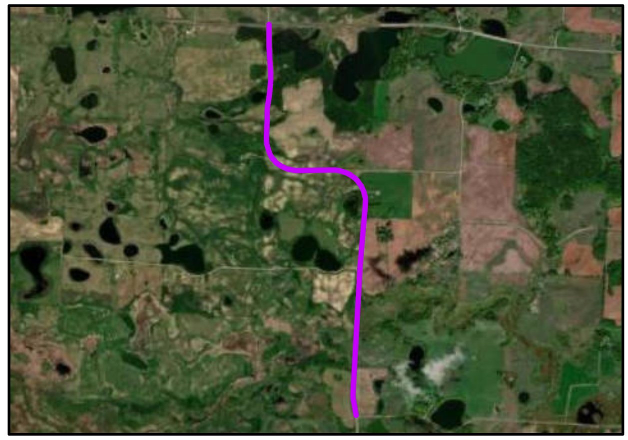
Segment ID: 34.005

Date: 3/29/2023

Rural Segment Project on CSAH 35

Roadway Information

Segment Start:	Intersection of CSAH35/180th Ave S and 275th St S
Segment End:	Intersection of MN 34 and 270th St S
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	35
Facility Type:	2-Lane
Segment Length (mile):	2.37
Traffic Volume (vpd):	265
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	4



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.17	0	0.08	0
Rate (per MVM):	1.75	0	0.87	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	265	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	265	xx ≥ 1,250	-
Curve Density (cur per mile):	1.27	xx ≥ 0.6	★
Access Density (access per mile):	11.41	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$6,390.43
				Total Estimated Project Cost	$6,390.43

Systemic Project	√

Project Page #: 16
Segment ID: 35.001
Date: 3/29/2023

Rural Segment Project on CSAH 36

Roadway Information

Segment Start:	Intersection of CSAH36/170th Ave NW and State Limits
Segment End:	Intersection of US 75 and 170th Ave NW
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	36
Facility Type:	2-Lane
Segment Length (mile):	1.08
Traffic Volume (vpd):	135
Lane Width (ft):	12
Shoulder Type:	Gravel
Shoulder Width (ft):	3

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	135	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	135	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	9.25	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$2,919.2
				Total Estimated Project Cost	$2,919.2

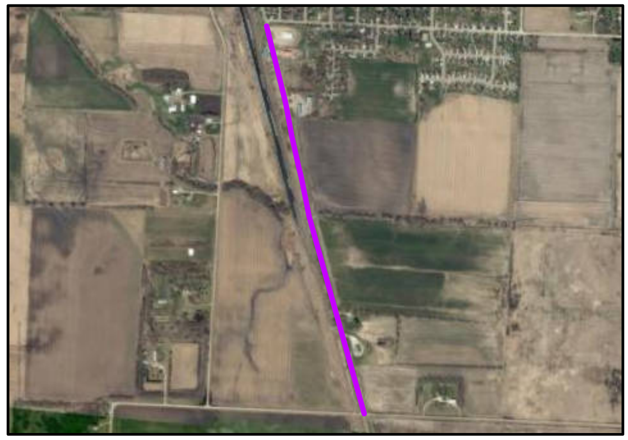
Systemic Project	√

Project Page #: 33
Segment ID: 36.001
Date: 3/29/2023

Rural Segment Project on CSAH 52

Roadway Information

Segment Start:	Intersection of CSAH52/180th Ave S and CSAH 52
Segment End:	65 ft South of Intersection of 9th Ave SE
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	52
Facility Type:	2-Lane
Segment Length (mile):	1.02
Traffic Volume (vpd):	860
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	4



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	1	0	0	0
Density (per mile per yr):	0.2	0	0	0
Rate (per MVM):	0.62	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	860	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	860	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	17.65	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$3,059.46
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$2,753.51
				Total Estimated Project Cost	$5,812.97

Systemic Project	√

Project Page #: 34
Segment ID: 52.001
Date: 3/29/2023

Rural Segment Project on CSAH 52

Roadway Information

Segment Start:	Intersection of CSAH52/CSAH 52 and CSAH 10
Segment End:	Intersection of MN 9 and CSAH 52
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	52
Facility Type:	2-Lane
Segment Length (mile):	12.32
Traffic Volume (vpd):	1400
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	5

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	9	0	4	0
Density (per mile per yr):	0.15	0	0.06	0
Rate (per MVM):	0.29	0	0.13	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	1400	500 ≤ xx ≤ 2,000	★
ADT-RM (Rural Multi-veh) (vpd):	1400	xx ≥ 1,250	★
Curve Density (cur per mile):	0.32	xx ≥ 0.6	-
Access Density (access per mile):	6.01	7 ≤ xx ≤ 18	-
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	1	$36,961.62
Edgeline Rumble Strip:	Proactive	$3,000	per mile	1	$36,961.62
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$33,265.45
				Total Estimated Project Cost	$107,188.69

Systemic Project	√

Project Page #: 35

Segment ID: 52.004

Date: 3/29/2023

Rural Segment Project on CSAH 52

Roadway Information

Segment Start:	Intersection of CSAH52/CSAH 10 and CSAH 52
Segment End:	152 ft South of Main St and CSAH 52
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	52
Facility Type:	2-Lane
Segment Length (mile):	1.49
Traffic Volume (vpd):	4200
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	6

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	1	0
Density (per mile per yr):	0.27	0	0.13	0
Rate (per MVM):	0.17	0	0.09	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	4200	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	4200	xx ≥ 1,250	★
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	13.39	7 ≤ xx ≤ 18	★
Outside Edge Risk:	1	2S or 3	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	1	$224,126.24
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	0	$0
				Total Estimated Project Cost	$224,126.24

Systemic Project	√

Project Page #: 36

Segment ID: 52.005

Date: 3/29/2023

Rural Segment Project on CR 96

Roadway Information

Segment Start:	Intersection of CR96/MN 22 and CSAH 96
Segment End:	Intersection of US 75 and CSAH 5
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	96
Facility Type:	2-Lane
Segment Length (mile):	3.97
Traffic Volume (vpd):	457
Lane Width (ft):	11
Shoulder Type:	None
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	6	2	2	1
Density (per mile per yr):	0.3	0.1	0.1	0.05
Rate (per MVM):	1.81	0.6	0.6	0.3

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	457	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	457	xx ≥ 1,250	-
Curve Density (cur per mile):	0.76	xx ≥ 0.6	★
Access Density (access per mile):	12.84	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$10,720.51
				Total Estimated Project Cost	$10,720.51

Systemic Project	√

Project Page #:	17
Segment ID:	96.001
Date:	3/29/2023

Rural Segment Project on CR 100

Roadway Information

Segment Start:	528 ft North of Intersection of CR100/Howard St and CR 100
Segment End:	Intersection of CR 100 and CR 102
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	100
Facility Type:	2-Lane
Segment Length (mile):	5.26
Traffic Volume (vpd):	60
Lane Width (ft):	10.5
Shoulder Type:	None
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	60	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	60	xx ≥ 1,250	-
Curve Density (cur per mile):	0.76	xx ≥ 0.6	★
Access Density (access per mile):	7.22	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$14,209.55
				Total Estimated Project Cost	$14,209.55

Systemic Project	√

Project Page #:	7
Segment ID:	100.005
Date:	3/29/2023

Rural Segment Project on CR 108

Roadway Information

Segment Start:	Intersection of CR108/MN 9 and CR 108
Segment End:	1.04 Miles East of Intersection of 150th St N and 140th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	108
Facility Type:	2-Lane
Segment Length (mile):	2.06
Traffic Volume (vpd):	290
Lane Width (ft):	12
Shoulder Type:	Gravel
Shoulder Width (ft):	6

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	290	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	290	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	8.24	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$5,571.23
				Total Estimated Project Cost	$5,571.23

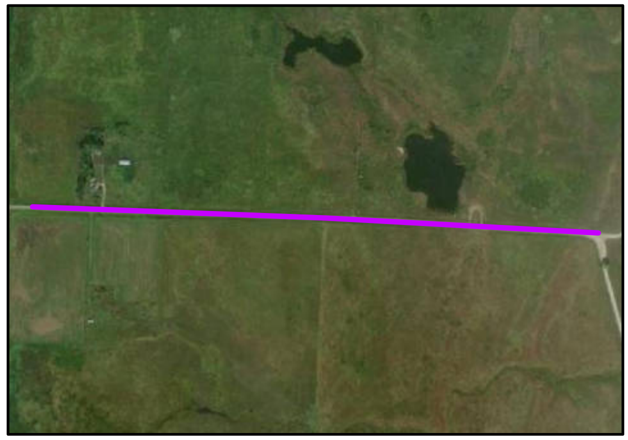
Systemic Project	√

Project Page #:	18
Segment ID:	108.002
Date:	3/29/2023

Rural Segment Project on CR 108

Roadway Information

Segment Start:	1.04 Miles East of Intersection of CR108/150th St N and 140th Ave N
Segment End:	Intersection of 170th St N and 140th Ave N
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	108
Facility Type:	2-Lane
Segment Length (mile):	0.88
Traffic Volume (vpd):	290
Lane Width (ft):	12
Shoulder Type:	None
Shoulder Width (ft):	0



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	55	≥ 55	★
ADT-RS (Rural Single-veh) (vpd):	290	500 ≤ xx ≤ 2,000	-
ADT-RM (Rural Multi-veh) (vpd):	290	xx ≥ 1,250	-
Curve Density (cur per mile):	0	xx ≥ 0.6	-
Access Density (access per mile):	9.05	7 ≤ xx ≤ 18	★
Outside Edge Risk:	2S	2S or 3	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Buffer Between Opposing Lanes:	Proactive	$150,000	per mile	0	$0
Clear Zone Enhancements:	Proactive	$100,000	per mile	0	$0
6" Wet Reflective Paint in Groove:	Proactive	$2,700	per mile	0	$0
Shoulder Paving, Safety Edge:	Proactive	$50,000	per mile	0	$0
Centerline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Edgeline Rumble Strip:	Proactive	$3,000	per mile	0	$0
Shoulder Rumble Strip:	Proactive	$3,000	per mile	0	$0
Enhanced Edgeline:	Proactive	$2,700	per mile	1	$2,386.84
				Total Estimated Project Cost	$2,386.84

Systemic Project	√

Project Page #: 19

Segment ID: 108.003

Date: 3/29/2023

Curve along CSAH 1 / Broadway St NW

Roadway Information

Segment Start:	North of Intersection of Wall St Ave NW / Broadway st NW
Segment End:	Intersection of Wall St Ave NW / Broadway st NW
Area Type:	Rural
County:	Clay
Context Zone:	Residential
Segment Route System:	CSAH
Segment Route No:	1
Curve Length (ft):	334.65
Curve Radius (ft):	256.2
Traffic Volume (vpd):	920
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Radius (ft):	256.2	500 ≤ xx < 1400	★
ADT (vpd):	920	200 ≤ xx < 800	-
Lane Width (ft):	12	< 12	-
Shoulder Type:	Paved	None, Gravel, Composite	-
Total Cross Section Width (ft)	32	28 ≤ xx < 34	★
Adjacent Intersection:	Intersection	Roadway or Railroad Crossing	★
Visual Trap:	None	Present	-
Outside Edge Risk:	1	2S or 3 deficiencies	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Clear Zone Enhancements:	Proactive	$100,000	Per curve	0	$0
High Friction Surface Treatment:	Proactive	$30/sq yd	Per sq yd	0	$0
Reconstruct TT to Single T:	Proactive	$400,000	Per curve	0	$0
Lighting:	Proactive	$15,000	Per light/curve	0	$0
Curve Warning Sign:	Proactive	$1,000	Per curve	0	$0
Speed Advisory Signs:	Proactive	$1,000	Per curve	0	$0
Chevrons/Arrow Board:	Proactive	$2,500	Per curve	1	$2,500
				Total Estimated Project Cost:	$2,500

Systemic Project	√

County Completed - Curve Warning Sign

Curve along CSAH 31 /230th St S

Roadway Information

Segment Start:	.08 Miles North of Intersection of CSAH31/CR 127 and CSAH 19
Segment End:	229 ft South of Intersection of Roger St and 230th St
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	31
Curve Length (ft):	321.44
Curve Radius (ft):	374.84
Traffic Volume (vpd):	970
Lane Width (ft):	12
Shoulder Type:	Paved
Shoulder Width (ft):	6

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	2	0	2	0
Density (per mile per yr):	0.4	0	0.4	0
Rate (per MVM):	1.13	0	1.13	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Radius (ft):	374.84	500 ≤ xx < 1400	★
ADT (vpd):	970	200 ≤ xx < 800	-
Lane Width (ft):	12	< 12	-
Shoulder Type:	Paved	None, Gravel, Composite	-
Total Cross Section Width (ft)	32	28 ≤ xx < 34	★
Adjacent Intersection:	Railroad	Roadway or Railroad Crossing	★
Visual Trap:	None	Present	-
Outside Edge Risk:	2C	2S or 3 deficiencies	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Clear Zone Enhancements:	Proactive	$100,000	Per curve	1	$100,000
High Friction Surface Treatment:	Proactive	$30/sq yd	Per sq yd	0	$0
Reconstruct TT to Single T:	Proactive	$400,000	Per curve	0	$0
Lighting:	Proactive	$15,000	Per light/curve	0	$0
Curve Warning Sign:	Proactive	$1,000	Per curve	0	$0
Speed Advisory Signs:	Proactive	$1,000	Per curve	0	$0
Chevrons/Arrow Board:	Proactive	$2,500	Per curve	0	$0
				Total Estimated Project Cost:	$100,000

Systemic Project	√

Project Page #: 15
Segment ID: 31.006
Date: 3/30/2023

Curve along CR 100 /15th St NW

Roadway Information

Segment Start:	528 ft North of Intersection of CR100/Howard St and CR 100
Segment End:	Intersection of CR 100 and CR 102
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	100
Curve Length (ft):	666.66
Curve Radius (ft):	123.26
Traffic Volume (vpd):	60
Lane Width (ft):	10
Shoulder Type:	None
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Radius (ft):	123.26	500 ≤ xx < 1400	-
ADT (vpd):	60	200 ≤ xx < 800	-
Lane Width (ft):	10	< 12	★
Shoulder Type:	None	None, Gravel, Composite	★
Total Cross Section Width (ft)	20	28 ≤ xx < 34	-
Adjacent Intersection:	Intersection	Roadway or Railroad Crossing	★
Visual Trap:	Present	Present	★
Outside Edge Risk:	2S	2S or 3 deficiencies	★
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Clear Zone Enhancements:	Proactive	$100,000	Per curve	0	$0
High Friction Surface Treatment:	Proactive	$30/sq yd	Per sq yd	0	$0
Reconstruct TT to Single T:	Proactive	$400,000	Per curve	0	$0
Lighting:	Proactive	$15,000	Per light/curve	0	$0
Curve Warning Sign:	Proactive	$1,000	Per curve	1	$1,000
Speed Advisory Signs:	Proactive	$1,000	Per curve	1	$1,000
Chevrons/Arrow Board:	Proactive	$2,500	Per curve	1	$2,500
				Total Estimated Project Cost:	$4,500

Systemic Project	√

Curve along CR 100 /15th St NW

Roadway Information

Segment Start:	528 ft North of Intersection of CR100/Howard St and CR 100
Segment End:	Intersection of CR 100 and CR 102
Area Type:	Rural
County:	Clay
Context Zone:	Agriculture
Segment Route System:	CR
Segment Route No:	100
Curve Length (ft):	558.4
Curve Radius (ft):	201.98
Traffic Volume (vpd):	60
Lane Width (ft):	10
Shoulder Type:	None
Shoulder Width (ft):	0

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Crash Information

5-year Crash History (2016 - 2020)	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Radius (ft):	201.98	500 ≤ xx < 1400	★
ADT (vpd):	60	200 ≤ xx < 800	-
Lane Width (ft):	10	< 12	★
Shoulder Type:	None	None, Gravel, Composite	★
Total Cross Section Width (ft)	20	28 ≤ xx < 34	-
Adjacent Intersection:	None	Roadway or Railroad Crossing	-
Visual Trap:	None	Present	-
Outside Edge Risk:	2S	2S or 3 deficiencies	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Clear Zone Enhancements:	Proactive	$100,000	Per curve	0	$0
High Friction Surface Treatment:	Proactive	$30/sq yd	Per sq yd	0	$0
Reconstruct TT to Single T:	Proactive	$400,000	Per curve	0	$0
Lighting:	Proactive	$15,000	Per light/curve	0	$0
Curve Warning Sign:	Proactive	$1,000	Per curve	1	$1,000
Speed Advisory Signs:	Proactive	$1,000	Per curve	1	$1,000
Chevrons/Arrow Board:	Proactive	$2,500	Per curve	0	$0
				Total Estimated Project Cost:	$2,000

Systemic Project	√

Rural Intersection on MN 32 (270th St S)

Roadway Information

Description:	MN 32 (270th St S) & CSAH 6 (120th Ave S)
County:	Clay
Area Type:	Rural
Context Zone:	Natural
Segment Route System:	CSAH
Segment Route No:	6
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	640
Minor ADT:	708
Total Entering ADT:	1,348

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Natural	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	1,348	≥2,000	-
OR Traffic Volume Cross Product:	453,120	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	0	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	0	LTTR or TB	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

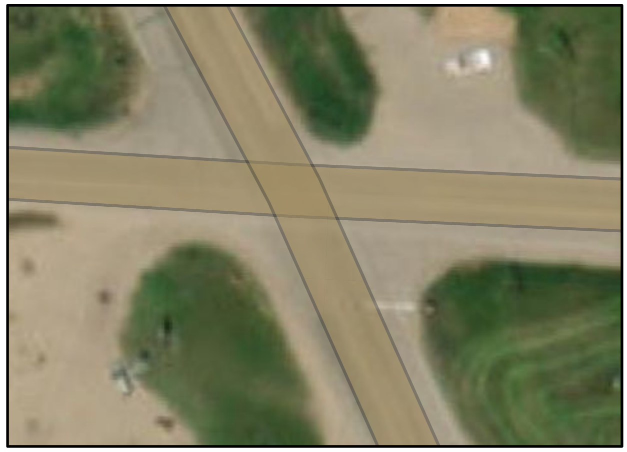
	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on MN 9

Roadway Information

Description:	MN 9 & CSAH 10 (90th Ave S)
County:	Clay
Area Type:	Small Town
Context Zone:	Residential
Segment Route System:	CSAH
Segment Route No:	10
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	980
Minor ADT:	2,900
Total Entering ADT:	3,880



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	2	0	2	0
Density (per mile per yr):	0.4	0	0.4	0
Rate (per MVM):	0.3	0	0.3	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Residential	Commercial, Industrial, Mixed Use, Residential	★
Entering ADT(vpd):	3,880	≥2,000	★
OR Traffic Volume Cross Product:	2,842,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	40	≥10	★
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	2	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	2	LTTR or TB	-
		Total Stars:	★★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on MN 32

Roadway Information

Description:	MN 32 & CSAH 10 (90th Ave S)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	10
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	870
Minor ADT:	2,700
Total Entering ADT:	3,570

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.2	0	0.2	0
Rate (per MVM):	0.2	0	0.2	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	3,570	≥2,000	★
OR Traffic Volume Cross Product:	2,349,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	45	≥10	★
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	1	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	1	LTTR or TB	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	1	$2,000
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$17,000

Systemic Project	√

Project Page #:	5
Segment ID:	10.015
Date:	3/31/2023

Rural Intersection on CSAH 11 (70th St N)

Roadway Information

Description:	CSAH 11 (70th St N) & CSAH 18 (28th Ave N)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	11
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	All-Way Stop
Street Lights:	Present
Flasher:	None
Major ADT:	1,800
Minor ADT:	1,200
Total Entering ADT:	3,000

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	2	0	0	0
Density (per mile per yr):	0.4	0	0	0
Rate (per MVM):	0.4	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	55	≥60	-
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	3,000	≥2,000	★
OR Traffic Volume Cross Product:	2,160,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	2	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	2	LTTR or TB	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

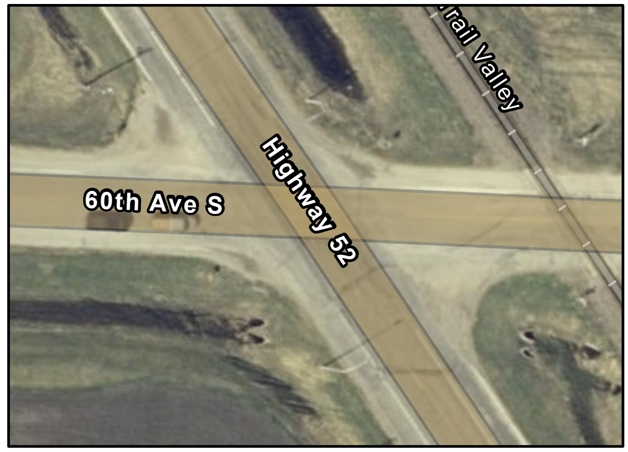
	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	1	$2,000
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$17,000

Systemic Project	√

Rural Intersection on CSAH 12 (60th Ave S)

Roadway Information

Description:	CSAH 12 (60th Ave S) & CSAH 52
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	12
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	2,300
Minor ADT:	4,200
Total Entering ADT:	6,500



Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	10	0	6	0
Density (per mile per yr):	2	0	1.2	0
Rate (per MVM):	0.8	0	0.5	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	55	≥60	-
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	6,500	≥2,000	★
OR Traffic Volume Cross Product:	9,660,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	45	≥10	★
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	10	Present	★
Previous Stop:	<5	> 5 Miles	-
1st Major Approach Turn Lane Configuration:	10	LTTR or TB	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on MN 9 (140th St S)

Roadway Information

Description:	MN 9 (140th St S) & CSAH 12
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	12
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	1,015
Minor ADT:	202
Total Entering ADT:	1,218

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	1,218	≥2,000	-
OR Traffic Volume Cross Product:	205,030	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	0	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	0	LTTR or TB	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on CSAH 21 (130th St S)

Roadway Information

Description:	CSAH 21 (130th St S) & CSAH 52
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	20
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	220
Minor ADT:	1,400
Total Entering ADT:	1,620

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	3	0	3	0
Density (per mile per yr):	0.6	0	0.6	0
Rate (per MVM):	1	0	1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	55	≥60	-
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	1,620	≥2,000	-
OR Traffic Volume Cross Product:	308,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	25	≥10	★
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	3	Present	★
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	3	LTTR or TB	-
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
			Total Estimated Project Cost		$15,000

Systemic Project	√

Rural Intersection on US 75

Roadway Information

Description:	US 75 & CSAH 22 (Wall Street Ave N)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	22
Design Type:	Traditional
Configuration:	T
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	3,425
Minor ADT:	1,575
Total Entering ADT:	5,000

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	2	0	0	0
Density (per mile per yr):	0.4	0	0	0
Rate (per MVM):	0.2	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	5,000	≥2,000	★
OR Traffic Volume Cross Product:	5,394,375	≥1,000,000	
Leg Configuration:	T	X	-
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	2	Present	★
Previous Stop:	<5	> 5 Miles	-
1st Major Approach Turn Lane Configuration:	2	LTTR or TB	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	1	$3,000
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	0	$0
Review Signs and Markings:	Proactive	$0	Per Intersection	1	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
			Total Estimated Project Cost		$3,000

Systemic Project	√

Project Page #:	21
Segment ID:	22.001
Date:	3/31/2023

Rural Intersection on US 75

Roadway Information

Description:	US 75 & CSAH 26 (90th Ave N)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	26
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	2,525
Minor ADT:	2,775
Total Entering ADT:	5,300

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	5	1	2	0
Density (per mile per yr):	1	0.2	0.4	0
Rate (per MVM):	0.5	0.1	0.2	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	5,300	≥2,000	★
OR Traffic Volume Cross Product:	7,006,875	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	5	Present	★
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	5	LTTR or TB	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	1	$2,000
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$17,000

Systemic Project	√

Rural Intersection on MN 32

Roadway Information

Description:	MN 32 & CSAH 26 (Front St)
County:	Clay
Area Type:	Small Town
Context Zone:	Commercial
Segment Route System:	CSAH
Segment Route No:	26
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	1,900
Minor ADT:	920
Total Entering ADT:	2,820

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.2	0	0.2	0
Rate (per MVM):	0.2	0	0.2	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	30	≥60	-
Context Zone:	Commercial	Commercial, Industrial, Mixed Use, Residential	★
Entering ADT(vpd):	2,820	≥2,000	★
OR Traffic Volume Cross Product:	1,748,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	1	Present	★
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	1	LTTR or TB	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	1	$2,000
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
			Total Estimated Project Cost		$17,000

Systemic Project	√

Project Page #:	8
Segment ID:	26.012
Date:	3/31/2023

Rural Intersection on MN 34

Roadway Information

Description:	MN 34 & CSAH 31 (230th St S)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	31
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	2,500
Minor ADT:	385
Total Entering ADT:	2,885

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	55	≥60	-
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	2,885	≥2,000	★
OR Traffic Volume Cross Product:	962,500	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	0	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	0	LTTR or TB	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

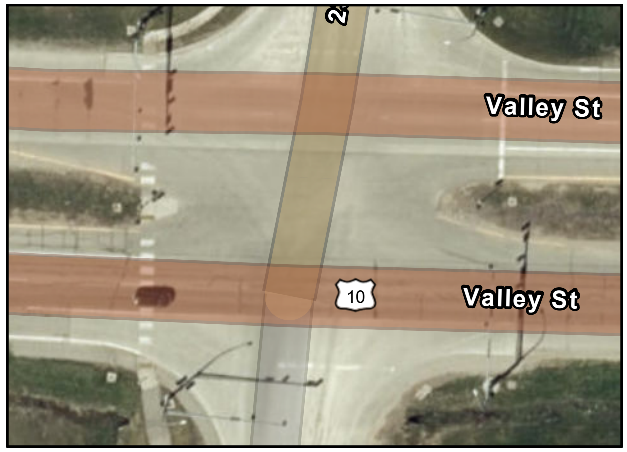
	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on US 10

Roadway Information

Description:	US 10 & CSAH 31 (230th St)
County:	Clay
Area Type:	Small Town
Context Zone:	Mixed Use
Segment Route System:	CSAH
Segment Route No:	31
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Signal
Street Lights:	Present
Flasher:	Overhead
Major ADT:	13,300
Minor ADT:	1,450
Total Entering ADT:	14,750



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	15	1	4	0
Density (per mile per yr):	3	0.2	0.8	0
Rate (per MVM):	0.6	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	50	≥60	-
Context Zone:	Mixed Use	Commercial, Industrial, Mixed Use, Residential	★
Entering ADT(vpd):	14,750	≥2,000	★
OR Traffic Volume Cross Product:	19,285,000	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	15	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	15	LTTR or TB	★
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	1	$1,000,000
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	0	$0
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$1,000,000

Systemic Project	√

Project Page #:	9
Segment ID:	31.004
Date:	3/31/2023

Rural Intersection on US 75

Roadway Information

Description:	US 75 & CSAH 34
County:	Clay
Area Type:	Small Town
Context Zone:	Industrial
Segment Route System:	CSAH
Segment Route No:	34
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	Overhead
Major ADT:	2,050
Minor ADT:	292
Total Entering ADT:	2,342

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	60	≥60	★
Context Zone:	Industrial	Commercial, Industrial, Mixed Use, Residential	★
Entering ADT(vpd):	2,342	≥2,000	★
OR Traffic Volume Cross Product:	598,600	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	0	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	0	LTTR or TB	-
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
				Total Estimated Project Cost	$15,000

Systemic Project	√

Rural Intersection on MN 34 (160th Ave S)

Roadway Information

Description:	MN 34 (160th Ave S) & MN 32 (270th St S)
County:	Clay
Area Type:	Rural
Context Zone:	Agriculture
Segment Route System:	CSAH
Segment Route No:	35
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	2,225
Minor ADT:	452
Total Entering ADT:	2,678

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.2	0	0.2	0
Rate (per MVM):	0.2	0	0.2	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Major Approach Speed Limit (mph):	55	≥60	-
Context Zone:	Agriculture	Commercial, Industrial, Mixed Use, Residential	-
Entering ADT(vpd):	2,678	≥2,000	★
OR Traffic Volume Cross Product:	1,005,700	≥1,000,000	
Leg Configuration:	X	X	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Curve:	None	Horizontal, Vertical, Both	-
Adjacent Development:	None	Present	-
Adjacent RR Crossing:	1	Present	-
Previous Stop:	>5	> 5 Miles	★
1st Major Approach Turn Lane Configuration:	1	LTTR or TB	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Reconstruct TT to Single T:	Proactive	$400,000	Per Intersection	0	$0
Roundabout:	Proactive	$2,500,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
LED Stop Sign:	Proactive	$2,000-6,000	Each	0	$0
Thru-Stop to All Way Stop/Yield:	Proactive	$3,000	Per Intersection	0	$0
Left-Turn Lanes on Major Road:	Proactive	$250,000	Each	0	$0
Lighting:	Proactive	$15,000	Each	1	$15,000
Review Signs and Markings:	Proactive	$0	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$1,500	Per Intersection	0	$0
			Total Estimated Project Cost		$15,000

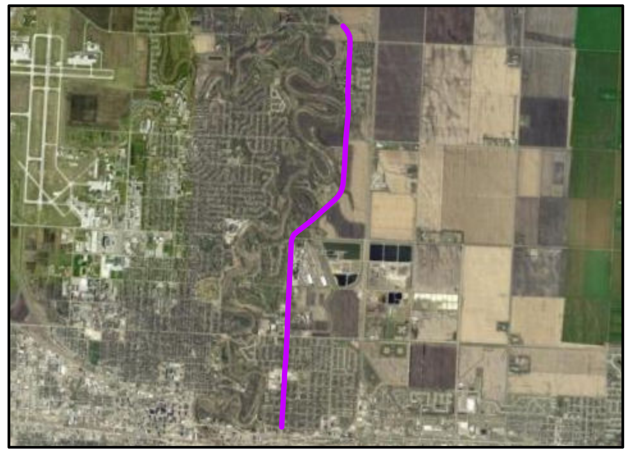
Systemic Project	√

Project Page #:	39
Segment ID:	35.001
Date:	3/31/2023

Urban Segment Project on CSAH 3

Roadway Information

Segment Start:	Intersection of CSAH3/11th St N and 2nd Ave N
Segment End:	Intersection of CSAH 96 and MN 22
Area Type:	Suburban
County:	Clay
Context Zone:	Residential
Segment Route System:	CSAH
Segment Route No:	3
Facility Type:	2-Lane
Segment Length (mile):	4.3
Traffic Volume (vpd):	5583
Lane Width (ft):	12
Shoulder Type:	Curb & Gutter
Shoulder Width (ft):	0



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe Crash Count	Total Lane Departure	Severe Lane Departure
Crash Frequency:	17	0	4	4
Density (per mile per yr):	0.79	0	0.19	0
Rate (per MVM):	0.39	0	0.09	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Speed Limit (mph):	30	≥ 50	-
Traffic Volume (vpd):	5583	4,000 ≥ xx ≤ 14,000	★
Access Density (access per mile):	39.96	15 ≥ xx ≤ 25	-
Context Zone:	Residential	Commercial, Mixed Use	-
Edgeline Striping:	Present	None	-
Lane Width (ft):	12	10 - 11.5 feet	-
Parking:	Both Sides Parallel	Present	★
Cross Section and Design:	2-Lane	Multi-lane	-
Edge Risk:	2C	3 Deficiencies	-
Shoulder Width (ft):	0	< 3 Feet	★
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Divided Roadway:	Proactive	$5,000,000	per mile	0	$0
Access Management:	Proactive	$360,000	per mile	1	$1,549,493.31
Road Diet:	Proactive	$25,000 - 40,000	per mile	0	$0
Vehicle Speed Feedback Signs:	Proactive	$30,000	per segment	0	$0
Sidewalk:	Proactive	$80,000	per mile	0	$0
				Total Estimated Project Cost	$1,549,493.31

Systemic Project	√

Project Page #:	2
Segment ID:	3.002
Date:	3/31/2023

Urban (Vehicle) Intersection on CSAH 1 (Broadway St NW)

Roadway Information

Description: CSAH 1 (Broadway St NW) & CSAH 22 (Wall Street Ave N)

County: Clay

Area Type: Suburban

Context Zone: Residential

Segment Route System: CSAH

Segment Route No: 1

Design Type: Traditional

Configuration: X

Traffic Control Device: All-Way Stop

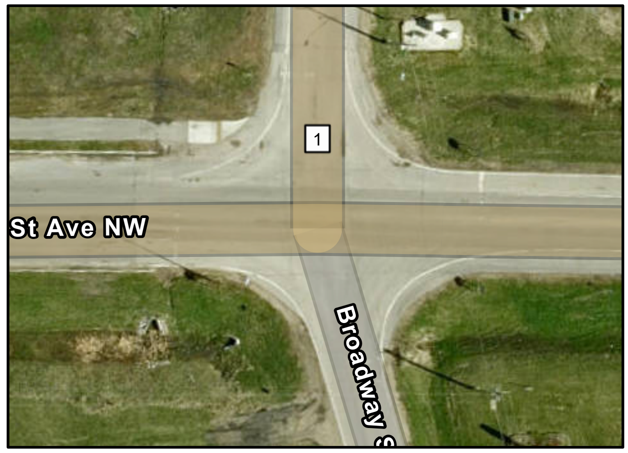
Street Lights: Present

Flasher: None

Major ADT: 1,585

Minor ADT: 4,925

Total Entering ADT: 6,510



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Context Zone:	Residential	Commercial	-
Traffic Control Device:	All-Way Stop	Signal	-
Entering ADT(vpd):	6,510	≥12,000	-
OR Total Traffic Cross Product:	7,806,125	> 20,000,000	
Leg Configuration:	X	X	★
Major Division Type:	Undivided	Divided	-
Alignment Skew(degrees):	15	≥10	★
Adjacent Development:	None	Present	-
Major Approach Speed Limit (mph):	40	≥40	★
OR Minor Approach Speed Limit (mph):	40	≥35	
Major Approach Left Turn Lane Phasing:	NA	Permitted, Permitted/Protected	-
1st Major Approach Turn Lane Configuration:	TR	≥2 Left Turn, ≥2 Thru Lane	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Lighting:	Proactive	$15,000	Each	0	$0
Roundabout:	Proactive	$3,000,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
Signalized J-Turn:	Proactive	$1,500,000	Per Intersection	0	$0
Thru-Stop to All-Way Stop/Yield:	Proactive	$7,500	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$3,500	Per Intersection	1	$3,500
Confirmation Lights:	Proactive	$1,500	Per Intersection	0	$0
Upgrade Signal Hardware:	Proactive	$50,000	Per Intersection	0	$0
				Total Estimated Project Cost	$3,500

Systemic Project	√

Urban (Vehicle) Intersection on MSAS 115 (1st Ave N)

Roadway Information

Description:	MSAS 115 (1st Ave N) & CSAH 3 (11th St N)
County:	Clay
Area Type:	Urban
Context Zone:	Commercial
Segment Route System:	CSAH
Segment Route No:	3
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Signal
Street Lights:	Present
Flasher:	Overhead
Major ADT:	10,900
Minor ADT:	5,950
Total Entering ADT:	16,850

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	15	0	10	0
Density (per mile per yr):	3	0	2	0
Rate (per MVM):	0.5	0	0.3	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Context Zone:	Commercial	Commercial	★
Traffic Control Device:	Signal	Signal	★
Entering ADT(vpd):	16,850	≥12,000	★
OR Total Traffic Cross Product:	64,855,000	> 20,000,000	
Leg Configuration:	X	X	
Major Division Type:	Curb	Divided	★
Alignment Skew(degrees):	0	≥10	★
Adjacent Development:	None	Present	-
Major Approach Speed Limit (mph):	30	≥40	-
OR Minor Approach Speed Limit (mph):	30	≥35	-
Major Approach Left Turn Lane Phasing:	Permitted/Protected	Permitted, Permitted/Protected	★
1st Major Approach Turn Lane Configuration:	LTT	≥2 Left Turn, ≥2 Thru Lane	★
Total Stars:			★★★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Lighting:	Proactive	$15,000	Each	0	$0
Roundabout:	Proactive	$3,000,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
Signalized J-Turn:	Proactive	$1,500,000	Per Intersection	0	$0
Thru-Stop to All-Way Stop/Yield:	Proactive	$7,500	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$3,500	Per Intersection	0	$0
Confirmation Lights:	Proactive	$1,500	Per Intersection	1	$1,500
Upgrade Signal Hardware:	Proactive	$50,000	Per Intersection	0	$0
				Total Estimated Project Cost	$1,500

Systemic Project	√

Project Page #:	1
Segment ID:	3.002
Date:	3/30/2023

Urban (Vehicle) Intersection on US 10

Roadway Information

Description:	US 10 & CSAH 9
County:	Clay
Area Type:	Suburban
Context Zone:	Industrial
Segment Route System:	CSAH
Segment Route No:	9
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	15,650
Minor ADT:	2,350
Total Entering ADT:	18,000

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	8	0	3	0
Density (per mile per yr):	1.6	0	0.6	0
Rate (per MVM):	0.2	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Context Zone:	Industrial	Commercial	-
Traffic Control Device:	Thru-Stop	Signal	-
Entering ADT(vpd):	18,000	≥12,000	★
OR Total Traffic Cross Product:	36,777,500	> 20,000,000	
Leg Configuration:	X	X	★
Major Division Type:	Curb	Divided	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Development:	Present	Present	★
Major Approach Speed Limit (mph):	55	≥40	★
OR Minor Approach Speed Limit (mph):	30	≥35	
Major Approach Left Turn Lane Phasing:	NA	Permitted, Permitted/Protected	-
1st Major Approach Turn Lane Configuration:	LTTR	≥2 Left Turn, ≥2 Thru Lane	★
		Total Stars:	★★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Lighting:	Proactive	$15,000	Each	0	$0
Roundabout:	Proactive	$3,000,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
Signalized J-Turn:	Proactive	$1,500,000	Per Intersection	0	$0
Thru-Stop to All-Way Stop/Yield:	Proactive	$7,500	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$3,500	Per Intersection	1	$3,500
Confirmation Lights:	Proactive	$1,500	Per Intersection	0	$0
Upgrade Signal Hardware:	Proactive	$50,000	Per Intersection	0	$0
				Total Estimated Project Cost	$3,500

Systemic Project	√

Project Page #:	3
Segment ID:	9.001
Date:	3/30/2023

Urban (Vehicle) Intersection on CSAH 52

Roadway Information

Description:	CSAH 52 & MSAS 138 (40th Ave S)
County:	Clay
Area Type:	Suburban
Context Zone:	Residential
Segment Route System:	CSAH
Segment Route No:	52
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	None
Flasher:	None
Major ADT:	5,300
Minor ADT:	302
Total Entering ADT:	5,602

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	1	0	1	0
Density (per mile per yr):	0.2	0	0.2	0
Rate (per MVM):	0.1	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Context Zone:	Residential	Commercial	-
Traffic Control Device:	Thru-Stop	Signal	-
Entering ADT(vpd):	5,602	≥12,000	-
OR Total Traffic Cross Product:	1,600,600	> 20,000,000	
Leg Configuration:	X	X	★
Major Division Type:	Undivided	Divided	-
Alignment Skew(degrees):	45	≥10	★
Adjacent Development:	None	Present	-
Major Approach Speed Limit (mph):	55	≥40	★
OR Minor Approach Speed Limit (mph):	30	≥35	
Major Approach Left Turn Lane Phasing:	NA	Permitted, Permitted/Protected	-
1st Major Approach Turn Lane Configuration:	TR	≥2 Left Turn, ≥2 Thru Lane	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Lighting:	Proactive	$15,000	Each	1	$15,000
Roundabout:	Proactive	$3,000,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
Signalized J-Turn:	Proactive	$1,500,000	Per Intersection	0	$0
Thru-Stop to All-Way Stop/Yield:	Proactive	$7,500	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$3,500	Per Intersection	1	$3,500
Confirmation Lights:	Proactive	$1,500	Per Intersection	0	$0
Upgrade Signal Hardware:	Proactive	$50,000	Per Intersection	0	$0
				Total Estimated Project Cost	$18,500

Systemic Project	√

Project Page #: 7
Segment ID: 52.012
Date: 3/30/2023

Urban (Vehicle) Intersection on US 75 (8th St S)

Roadway Information

Description:	US 75 (8th St S) & MSAS 146 (50th Ave S)
County:	Clay
Area Type:	Suburban
Context Zone:	Commercial
Segment Route System:	CR
Segment Route No:	75
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	7,400
Minor ADT:	328
Total Entering ADT:	7,728

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	0	0	0	0
Density (per mile per yr):	0	0	0	0
Rate (per MVM):	0	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Context Zone:	Commercial	Commercial	★
Traffic Control Device:	Thru-Stop	Signal	-
Entering ADT(vpd):	7,728	≥12,000	-
OR Total Traffic Cross Product:	2,427,200	> 20,000,000	
Leg Configuration:	X	X	
Major Division Type:	Undivided	Divided	★
Alignment Skew(degrees):	0	≥10	-
Adjacent Development:	None	Present	-
Major Approach Speed Limit (mph):	60	≥40	-
OR Minor Approach Speed Limit (mph):	30	≥35	★
Major Approach Left Turn Lane Phasing:	NA	Permitted, Permitted/Protected	-
1st Major Approach Turn Lane Configuration:	TR	≥2 Left Turn, ≥2 Thru Lane	-
		Total Stars:	★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Lighting:	Proactive	$15,000	Each	0	$0
Roundabout:	Proactive	$3,000,000	Per Intersection	0	$0
J-Turn:	Proactive	$1,000,000	Per Intersection	0	$0
Signalized J-Turn:	Proactive	$1,500,000	Per Intersection	0	$0
Thru-Stop to All-Way Stop/Yield:	Proactive	$7,500	Per Intersection	0	$0
Upgrade Signs & Markings:	Proactive	$3,500	Per Intersection	1	$3,500
Confirmation Lights:	Proactive	$1,500	Per Intersection	0	$0
Upgrade Signal Hardware:	Proactive	$50,000	Per Intersection	0	$0
				Total Estimated Project Cost	$3,500

Systemic Project	√

Urban (Bike/Ped) Intersection on US 10

Roadway Information

Description:	US 10 & CSAH 3
County:	Clay
Area Type:	Urban
Context Zone:	Commercial
Segment Route System:	CSAH
Segment Route No:	3
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Signal
Street Lights:	Present
Flasher:	Overhead
Major ADT:	9,100
Minor ADT:	3,950
Total Entering ADT:	13,050

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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	4	0	3	0
Density (per mile per yr):	0.8	0	0.6	0
Rate (per MVM):	0.2	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Signal	Signal	★
Entering ADT(vpd):	13,050	≥12,000	★
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	5	≥4	★
Presence of Sidewalk:	Some	Some, None	★
Pedestrian Crossing Type:	Marking	Markings	★
		Total Stars:	★★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	0	$0
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	1	$10,000
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	1	$1,000
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	1	$5,000
				Total Estimated Project Cost	$16,000

Systemic Project	√

Project Page #:	1
Segment ID:	3.001
Date:	3/30/2023

Urban (Bike/Ped) Intersection on MSAS 115 (1st Ave N)

Roadway Information

Description: MSAS 115 (1st Ave N) & CSAH 3 (11th St N)
County: Clay
Area Type: Urban
Context Zone: Commercial
Segment Route System: CSAH
Segment Route No: 3
Design Type: Traditional
Configuration: X
Traffic Control Device: Signal
Street Lights: Present
Flasher: Overhead
Major ADT: 10,900
Minor ADT: 5,950
Total Entering ADT: 16,850

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	15	0	10	0
Density (per mile per yr):	3	0	2	0
Rate (per MVM):	0.5	0	0.3	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Signal	Signal	★
Entering ADT(vpd):	16,850	≥12,000	★
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	5	≥4	★
Presence of Sidewalk:	Both Sides	Some, None	-
Pedestrian Crossing Type:	Marking	Markings	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

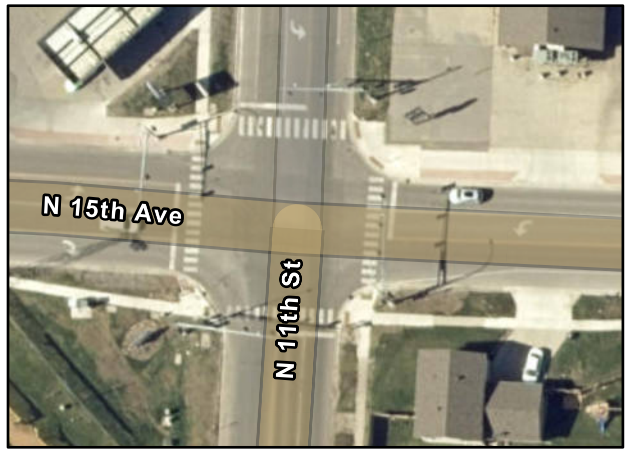
	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	0	$0
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	0	$0
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	1	$1,000
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	1	$5,000
				Total Estimated Project Cost	$6,000

Systemic Project	√

Urban (Bike/Ped) Intersection on CSAH 3 (11th St N)

Roadway Information

Description: CSAH 3 (11th St N) & MSAS 129 (15th Ave N)
County: Clay
Area Type: Urban
Context Zone: Recreational
Segment Route System: CSAH
Segment Route No: 3
Design Type: Traditional
Configuration: X
Traffic Control Device: All-Way Stop
Street Lights: Present
Flasher: None
Major ADT: 4,100
Minor ADT: 8,550
Total Entering ADT: 12,650



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	5	0	3	0
Density (per mile per yr):	1	0	0.6	0
Rate (per MVM):	0.2	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	All-Way Stop	Signal	-
Entering ADT(vpd):	12,650	≥12,000	★
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	2	≥4	-
Presence of Sidewalk:	Some	Some, None	★
Pedestrian Crossing Type:	None	Markings	-
		Total Stars:	★★

Priority Location	√

List of Strategies Considered

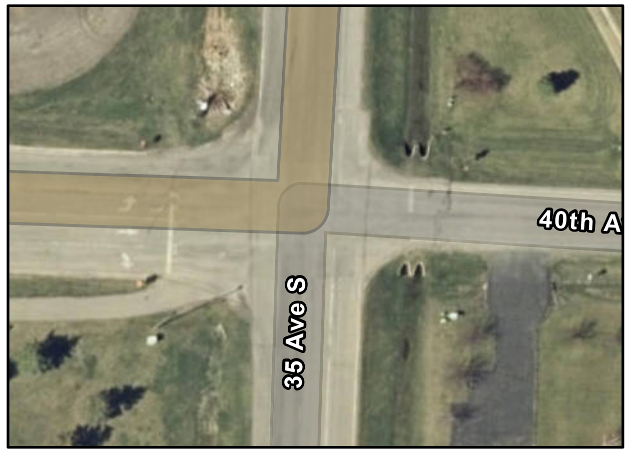
	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	1	$25,000
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	1	$10,000
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	0	$0
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	0	$0
				Total Estimated Project Cost	$35,000

Systemic Project	√

Urban (Bike/Ped) Intersection on CSAH 7 (40th ST S)

Roadway Information

Description:	CSAH 7 (40th ST S) & MSAS 138 (40th Ave S)
County:	Clay
Area Type:	Suburban
Context Zone:	Residential
Segment Route System:	CSAH
Segment Route No:	7
Design Type:	Traditional
Configuration:	X
Traffic Control Device:	Thru-Stop
Street Lights:	Present
Flasher:	None
Major ADT:	1,950
Minor ADT:	460
Total Entering ADT:	2,410



Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	3	0	2	0
Density (per mile per yr):	0.6	0	0.4	0
Rate (per MVM):	0.7	0	0.5	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Thru-Stop	Signal	-
Entering ADT(vpd):	2,410	≥12,000	-
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	4	≥4	★
Presence of Sidewalk:	None	Some, None	★
Pedestrian Crossing Type:	None	Markings	-
		Total Stars:	★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	1	$25,000
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	1	$10,000
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	0	$0
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	0	$0
				Total Estimated Project Cost	$35,000

Systemic Project	√

Project Page #:	7
Segment ID:	7.009
Date:	3/30/2023

Urban (Bike/Ped) Intersection on US 10 (Center Ave W)

Roadway Information

Description: US 10 (Center Ave W) & CSAH 45 (Main St S)
County: Clay
Area Type: Suburban
Context Zone: Residential
Segment Route System: CSAH
Segment Route No: 45
Design Type: Traditional
Configuration: X
Traffic Control Device: Signal
Street Lights: Present
Flasher: None
Major ADT: 13,400
Minor ADT: 442
Total Entering ADT: 13,842

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	6	0	2	0
Density (per mile per yr):	1.2	0	0.4	0
Rate (per MVM):	0.2	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Signal	Signal	★
Entering ADT(vpd):	13,842	≥12,000	★
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	4	≥4	★
Presence of Sidewalk:	All	Some, None	-
Pedestrian Crossing Type:	Marking	Markings	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	0	$0
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	1	$10,000
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	1	$1,000
Pedestrian Countdown Timers:	Proactive	$12,000	Each	1	$12,000
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	1	$5,000
				Total Estimated Project Cost	$28,000

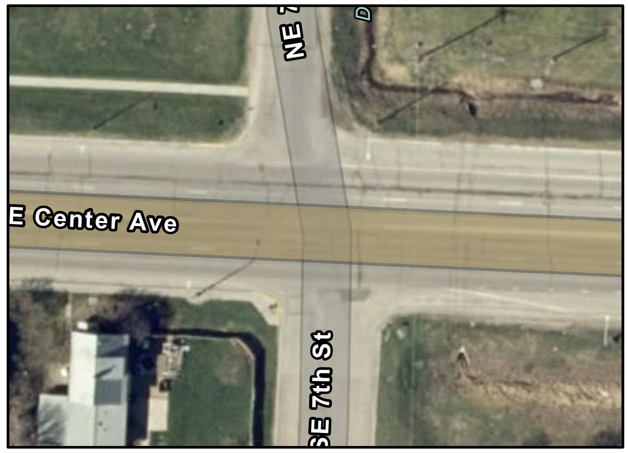
Systemic Project	√

Project Page #: 2
Segment ID: 45.001
Date: 3/30/2023

Urban (Bike/Ped) Intersection on US 10 (Center AVE E)

Roadway Information

Description: US 10 (Center AVE E) & CSAH 45 (7th St SE)
County: Clay
Area Type: Suburban
Context Zone: Residential
Segment Route System: CSAH
Segment Route No: 45
Design Type: Traditional
Configuration: X
Traffic Control Device: Thru-Stop
Street Lights: Present
Flasher: None
Major ADT: 8,000
Minor ADT: 245
Total Entering ADT: 8,245



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Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	6	0	1	0
Density (per mile per yr):	1.2	0	0.2	0
Rate (per MVM):	0.4	0	0.1	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Thru-Stop	Signal	-
Entering ADT(vpd):	8,245	≥12,000	-
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	5	≥4	★
Presence of Sidewalk:	Some	Some, None	★
Pedestrian Crossing Type:	None	Markings	-
		Total Stars:	★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	1	$25,000
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	1	$10,000
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	0	$0
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	0	$0
				Total Estimated Project Cost	$35,000

Systemic Project	√

Project Page #: 6
Segment ID: 45.002
Date: 3/30/2023

Urban (Bike/Ped) Intersection on MSAS 128 (30th Ave S)

Roadway Information

Description: MSAS 128 (30th Ave S) & CSAH 52
County: Clay
Area Type: Suburban
Context Zone: Residential
Segment Route System: CSAH
Segment Route No: 52
Design Type: Traditional
Configuration: X
Traffic Control Device: Signal
Street Lights: Present
Flasher: Overhead
Major ADT: 5,850
Minor ADT: 6,000
Total Entering ADT: 11,850

Click to View in Google Maps

Crash Information

5-year Crash History (2016 - 2020)

	Total	Severe	Total Right Angle	Severe Right Angle
Crash Frequency:	7	0	1	0
Density (per mile per yr):	1.4	0	0.2	0
Rate (per MVM):	0.3	0	0	0

Systemic Safety Risk Factors

	Value	Threshold	Star Assignment
Traffic Control Device:	Signal	Signal	★
Entering ADT(vpd):	11,850	≥12,000	-
Adjacent Development:	None	Present	-
Max Number of Lanes Crossed:	6	≥4	★
Presence of Sidewalk:	Some	Some, None	★
Pedestrian Crossing Type:	Marking	Markings	★
		Total Stars:	★★★★

Priority Location	√

List of Strategies Considered

	Type	Unit Cost	Unit	Quantity	Total Cost
Mini Roundabout:	Proactive	$500,000	Each	0	$0
Median Refuge Island:	Proactive	$25,000-50,000	Each	0	$0
RRFB:	Proactive	$60,000	Per Intersection	0	$0
RRFB w/ Refuge Island:	Proactive	$75,000	Each	0	$0
Pedestrian Hybrid Beacon:	Proactive	$120,000	Per Intersection	0	$0
No Right Turn on Red Sign (Static or Black out):	Proactive	$2,400	Per Intersection	0	$0
Curb Extension:	Proactive	$10,000	Per Intersection	0	$0
Leading Pedestrian Interval:	Proactive	$1,000	Per Intersection	1	$1,000
Pedestrian Countdown Timers:	Proactive	$12,000	Each	0	$0
Upgrade Signal Hardware and Review and Revise Signal Timing and Operations:	Proactive	$5,000	Each	1	$5,000
				Total Estimated Project Cost	$6,000

Systemic Project	√

Project Page #: 5
Segment ID: 52.013
Date: 3/30/2023