Action Transmittal

Transportation Advisory Board

METROPOLITAN COUNCIL

Committee meeting date: October 16, 2025 **Date:** October 9, 2025

Action Transmittal: 2025-30

Scope Change Request – Carver County CSAH 40 HSIP Project

To: TAC Funding and Programming Committee

Prepared by: Robbie King, Senior Planner, 651-602-1380

Requested action

Carver County requests a scope change to reduce the length of its CSAH 40 improvements with full retention of federal funds.

Recommended motion

That the Technical Advisory Committee recommend approval of Carver County's scope change request to reduce the length of its CSAH 40 improvement project.

Background and purpose

In 2022, Carver County was awarded $2,000,000 in Highway Safety Improvement Program (HSIP) funding to widen shoulders, provide a safety edge, and provide signing and pavement markings on County State Aid Highway (CSAH) 40 from CSAH 52 to CSAH 50 (SP# 010-640-017). The local match funding for this project is $3,401,440 or 63% of a total project cost of $5,401,440. The program year for this project is 2027.

The project currently is in preliminary design phase and through this work the county has identified issues north of Bevens Creek Bridge No. 10545 and south of CSAH 50 that has precipitated this request. In this area of the project, the following issues are present:

1. Presence of cultural and environmental elements
   - Prehistoric mound
   - Endangered butternut trees
   - A high potential zone for the endangered rusty patch bumble bee
2. Residential driveway connections requiring regrading may encroach on septic fields
   - In the area nearest the intersection of CSAH 50 and CSAH 40, residential driveway connections are steep in the existing condition and improvements would make those connections steeper.
   - Regrading is required to lessen the driveway grade, which may result in encroaching on existing septic drain fields in the area.
3. A 2022 study has identified a need to potentially realign CSAH 40 north of the Bevens Creek bridge to accommodate future corridor needs.

Carver County requests retention of its full federal funding amount to maintain project feasibility.

Relationship to regional policy

Projects that receive funding through the Regional Solicitation and HSIP Solicitation processes are subject to the regional scope change policy. The purpose of this policy is to ensure that the project is designed and constructed according to the plans and intent described in the original application. The Scope Change Policy allows project sponsors to adjust their projects as needed while still providing substantially the same benefits described in their original project applications.

Staff analysis

Approval/Denial of the Scope Change

Scoring and Ranking: The Scope Change Policy directs the TAC Funding & Programming Committee to consider whether an HSIP project would have scored fewer points than the highest-scoring unfunded project. There are elements being added and removed from the scope in this request. However, added elements do not represent a significant improvement in the proposed scope. The highest-scoring unfunded project in the 2022 HSIP Proactive Category was awarded 385 points representing a 73-point gap between this unfunded project and the original Carver County CSAH 40 project scope. While staff interpret the removal of an intersection from this safety project to represent a minor reduction in score, the reduction would likely be far less than the 73-point gap. Staff does not see a rationale to deny the request based on scoring.

Table 1: Scoring Analysis

Measure	Max Score	Original Score	Scope Change	Notes
Connection to SHSP	100	90	0	
Cost per Exposure	300	20	0	
Correctable F&A Crashes	100	0	0	
Crash Modification Factor	200	138	0	
Part of a Plan	200	200	0	
Ped and Bike Safety	100	10	0	
Total	**1000**	**458**	**-**	

* 0 = no change
\+ = small improvement, ++ = moderate improvement, +++ = large improvement
\- = small diminishment, -- = moderate diminishment, --- = large diminishment

Options for Funding

The original application budget is displayed in Table 2a below. Table 2b and table 2c provide two options to be considered for funding.

Table 2a: Original Application Funding

Funding Source	Total
2027 HSIP Award (Proactive Category)	$2,000,000
Local Match	$3,401,440
Total	**$5,401,440**

Table 2b: Requested Scope Change Funding with Full Federal Funding Retained

Funding Source	Total
2027 HSIP Award (Proactive Category)	$2,000,000
Original Local Match Funding	$3,401,440
Local Match Cost Increase for new elements*	$242,560
Total	**$5,644,000**

*Carver County's request includes new elements and results in an increase of $242,560 covered by Carver County's local match.

Table 2c: Scope Change Funding with Federal Funding Reduction

Funding Source	Total
2027 HSIP Award (Proactive Category)	$2,000,000
Federal Funds Returned*	($280,000)
Original Local Match Funding	$3,401,440
Local Match Cost Increase for new elements^	$242,560
Total	**$5,364.000**

*Removed elements are valued at $751,000 (2022 dollars) and represent 14% of the original project cost. Therefore, the federal funds recommended to be returned represent 14% of $2M – the original federal fund award.

^ Carver County's request includes new elements and results in an increase of $242,560 covered by Carver County's local match.

Analysis of Funding Options

Carver County requests retention of its federal funding. Scope Change Policy directs the TAC Funding & Programming Committee to ensure that HSIP projects continue to maintain at least a 10% non-federal match. Table 2b shows funding with full federal funding retained and in this scenario Carver County's local match is 60% which is well above the 10% requirement.

Additionally, the Scope Change Policy directs the TAC Funding & Programming Committee to allow new eligible elements to be added to a project scope. However, federal funds cannot be shifted from removed elements to new project elements unless those removed elements are being done as part of some other programmed project. The elements removed in this scope change request are projected to be a part of a project within the next 15 years but are not yet programmed. Therefore, it can be argued that federal funds be removed proportional to the value of the removed elements as a percentage of the entire project. The value of the removed elements is estimated at $751,000 or 14% of the total project cost, therefore the applicant may be directed to return $280,000 (or 14% of $2,000,000).

Given these two components, staff presents the following two options for discussion:

1. Retention of all federal funding because the applicant is overmatched.

2. The applicant return $280,000 of the federal funds, which represents 14% of the original federal fund award. The return of 14% of the federal fund award is proportionate to the value of the removed elements.

Routing

To	Action Requested	Date Completed *(Date Scheduled)*
TAC Funding & Programming Committee	Review and recommend	*October 16, 2025*
Technical Advisory Committee	Review and recommend	*November 5, 2025*
Transportation Advisory Board	Review and adopt	*November 19, 2025*

Carver County
Public Works
Carver County Public Works
11360 US-212 • Cologne, MN 55322
Office: (952) 466-5200 • www.carvercountymn.gov/departments/public-works

September 19th, 2025

Jim Kosluchar
Chair, TAC Funding and Programing Committee
Metropolitan Council
390 Robert Street North
Saint Paul, MN 55101-1805

Re: Scope Change Request to: S.P. 010-640-017 – CSAH 40 between CSAH 52 and CSAH 50

Dear Mr. Kosluchar,

Carver County respectfully requests that the Funding and Programing Committee consider the attached Scope Change request for the above referenced project.

In 2022, Carver County was awarded Highway Safety Improvement Program (HSIP) federal funding to widen shoulders, provide a safety edge, signing and pavement markings on County State Aid Highway (CSAH) 40 from CSAH 52 to CSAH 50. The 2024 – 2027 State Transportation Improvement Program (STIP) identifies $2,000,000 in federal funding and $3,401,440 in local match funding for a total of $5,401,440. The program year for this project is 2027.

The project is currently completing the preliminary design phase and will begin final design in the Fall of 2025 and construction to begin in 2027.

This project has conducted efforts to document cultural and environmental elements in the project area. As of the time of writing this request, a prehistoric mound, endangered butternut trees and the high potential zone for the endangered rusty patch bumble bee are present North of Bevens Creek Bridge No. 10545.

The preliminary design conducted on the project has identified challenges, in the area where CSAH 40 approaches the CSAH 50 intersection, residential driveway connections are steep in the existing condition and would be made more steep to accommodate proposed improvements. These regrading efforts would result in potential encroachment on existing residential septic drain fields in the area.

In 2022 Carver County completed a study on CSAH 40, the study reviewed the corridor from Trunk Highway (TH) 25 to CSAH 11. The study reviewed, among other items, the realignment of CSAH 40 from North of Bevens Creek Bridge No. 10545 to beyond the CSAH 50 intersection. Land North of the CSAH 40 & CSAH 50 intersection has recently began administrative efforts to develop the farmland into a residential development, which will increase the AADT on the County network in this area. The realignment is expected to be completed within the next 15 years, though it has not programed at this time. If the realignment of CSAH 40 advances, this safety improvement project would address the safety concerns in this area while also avoiding undue impacts to the cultural, environmental and residential impacts listed above.

The remaining length of the CSAH 40 safety improvements are the primary components of the funding application, accounting for 87% of the project length. Those improvements will be completed in 2027. At this time, Carver County requests a scope change that would remove the planned improvements on CSAH 40 from Bevens Creek to CSAH 50. Those improvements are expected to be made redundant within the next 15 years and cause undue impacts to cultural, environmental and residential elements. Approval of this scope change request will allow for all portions of the project, as listed in the current project scope, to be completed for 2.9 miles of the originally scoped 3.3 mile corridor by the end of 2029, resulting in a safer corridor for motorists, cyclists and pedestrians.

The cost estimate as listed in the STIP is $5,401,440 for the improvements, with County participation percentage of 63%. Due to the addition of curb and gutter to reduce project limits and spot reconstruction needs identified in preliminary design, these additions total to and estimated $993,560. The cost estimate has been updated and is currently $5,644,000 for the segment from CSAH 52 to Bevens Creek Bridge No. 10545 alone. The County is requesting that the total cost listed in the STIP to be revised to $5,644,000 (Accounts for the removal of CSAH 40 from Bridge No. 10545 to CSAH 50. Value reflects costs in the year requested, 2022.). We are also requesting that the federal match remain unchanged in an effort to maintain project feasibility.

Summary:

- Carver County was awarded $2,000,000 for safety improvements to CSAH 40 in San Francisco Township.
- There are sensitive cultural elements North of Bevens Creek Bridge No. 10545 including but not limited to prehistoric mounds
- There are sensitive environmental elements North of Bevens Creek Bridge No. 10545 including but not limited to rusty patch bumblebee high potential zone and endangered trees.
- There are sensitive residential elements North of Bevens Creek Bridge No. 10545 including but not limited to steep driveways, septic sewer components near preliminary design limits.
- Carver County conducted a study on CSAH 40 which identified realignment alternatives, this realignment effort is expected to be completed within the next 15 years.
- There has been a new development proposed North of the intersection of CSAH 40 and CSAH 50 which will increase travel demand and increase the need for the realignment of CSAH 40.
- Carver County is requesting that the CSAH 40 components from Bridge No. 10545 to CSAH 50 be removed from the STIP.
- Carver County is requesting that the total construction amount in the STIP be revised to $5,644,000.
- Carver County is requesting that the federal funding amount remain as currently listed in the STIP.

Please contact me with any questions or concerns you have related to this request.

Sincerely,

Lucas Rubash, P.E.
Design Engineer

CC: Colleen Brown, MnDOT Metro State Aid
Lyndon Robjent, Carver County Public Works Division Director / County Engineer
Darin Milke, Carver County Assistant Public Works Director/Deputy County Engineer

FUNDING DATA FOR SCOPE CHANGE

Original Application:

Regional Solicitation Year	2022
Application Funding Category	HSIP
HSIP Solicitation	Yes
Application Total Project Cost	$5,401,440
Federal Award	$2,000,000
Application Federal Percentage of Total Project Cost	37%

Project Elements Being Removed	Original Application Cost
Widen shoulders, provide a safety edge, signing and pavement markings on CSAH 40 from Bridge No. 10545 to CSAH 50.	$751,000

New Project Elements	Cost (Based on Year of Costs in Original Application)
Provide curb and gutter in large cut area from STA 353+79 to STA 365+75 to reduce limits in large cut area. Reconstruct section of CSAH 40 from STA 313+00 TO STA 345+00, need determined with GPR data.	$993,560

Current Funding vs. Proposed Funding:

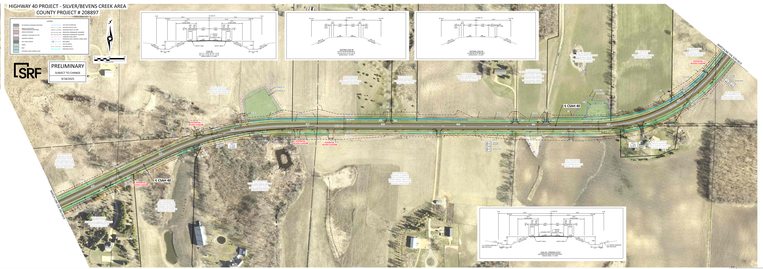
Federal	$2,000,000
Local Match	$3,644,000
Total Project Cost	$5,644,000
% Federal	35%
% Local	65%

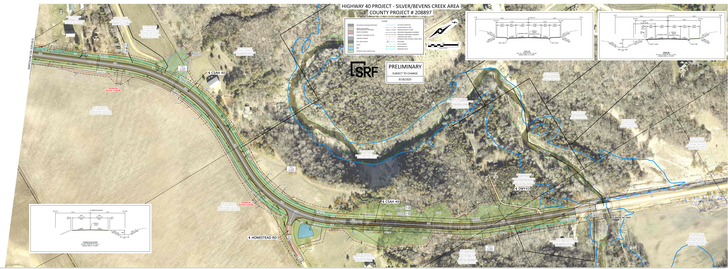
Note:
- Includes added scope needs identified in preliminary design.
  Spot reconstruction, storm water BMP, urban curb section to reduce project footprint.

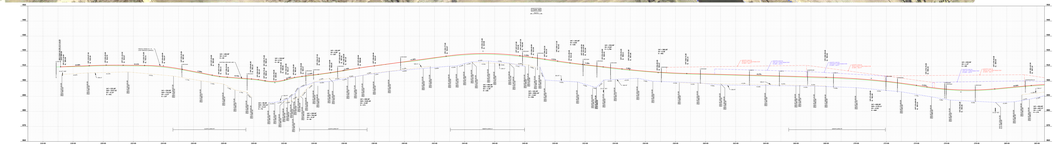
HIGHWAY 40 PROJECT - SILVER/BEVENS CREEK AREA
COUNTY PROJECT # 208897

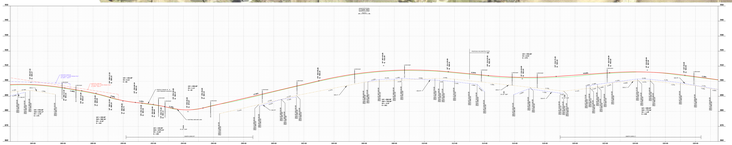
SRF
PRELIMINARY
PROPOSED TYPICAL SECTION
EXISTING TYPICAL SECTION

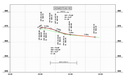
HIGHWAY 40 PROJECT - SILVER/BEVENS CREEK AREA
COUNTY PROJECT # 208897

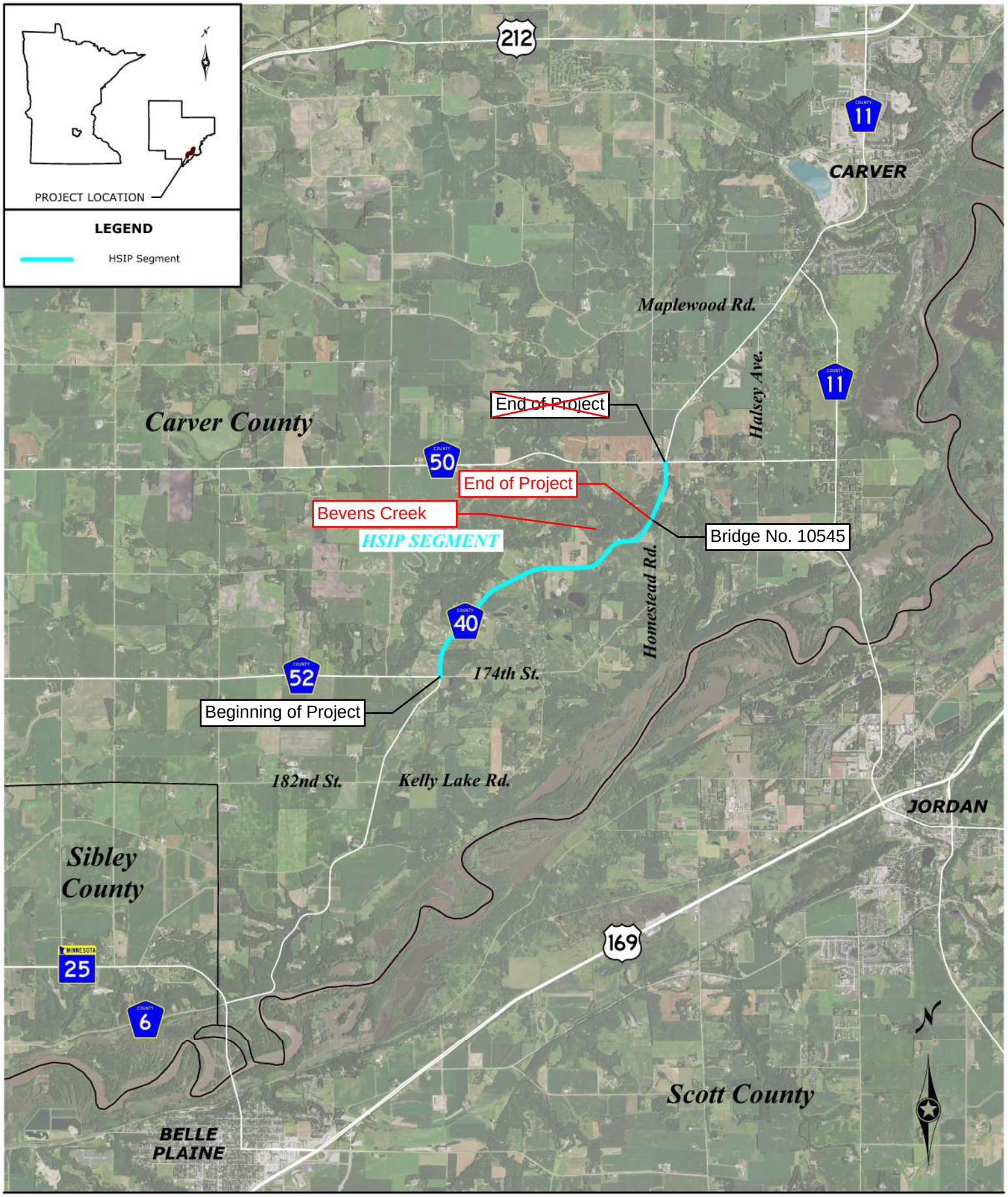








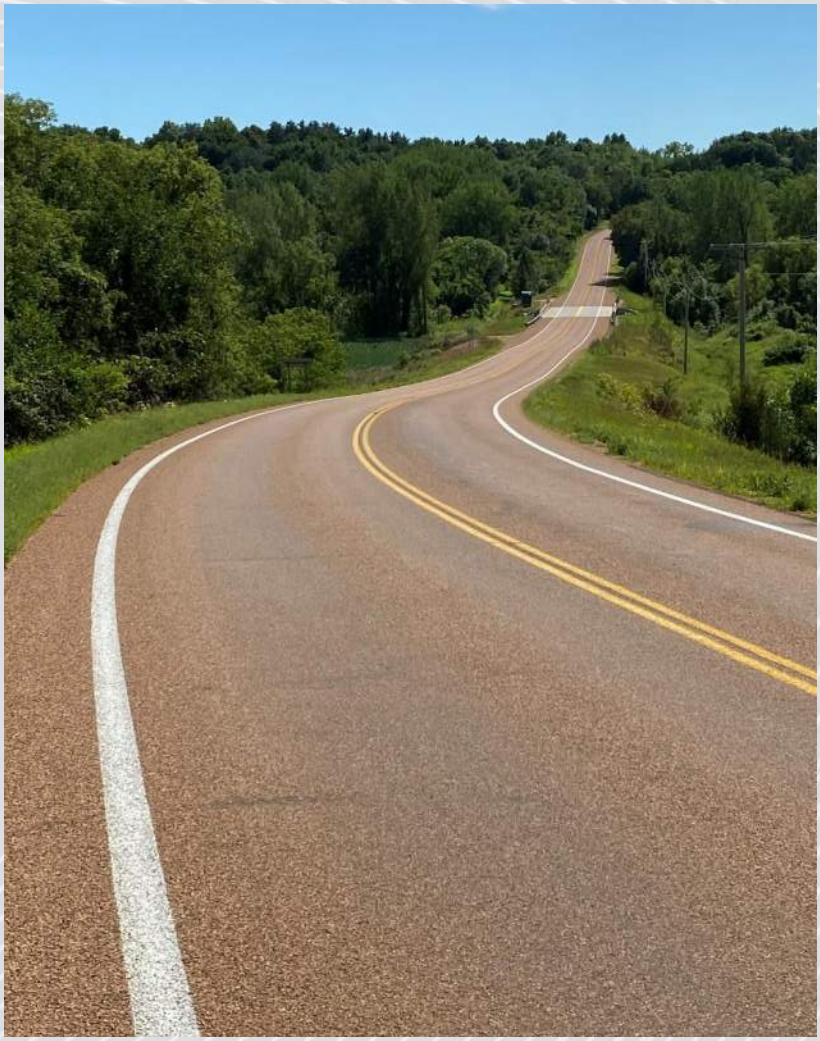




CSAH 40 - HSIP Application

Project Location

ALLIANT



Metro District Highway Safety Improvement Program (HSIP)

Proactive Application for State Fiscal Years 2026 and 2027

June 1, 2022

Applicant: Carver County

Project Name: CSAH 40 Segment Safety Improvements

Project Location: CSAH 40 between CSAH 52 and CSAH 50, Carver County

Federal HSIP Funding Application (Form 1)

INSTRUCTIONS: Complete and return completed application to Lars Impola, MnDOT, Metro District, 1500 West County Road B2, Roseville, Minnesota 55113. (651) 234-7820. **Applications must be received by 4:30 pm or postmarked on June 1, 2022.*Be sure to complete and attach the Project Information form.** (Form 2)

I. GENERAL INFORMATION

1. APPLICANT: Carver County

2. JURISDICTIONAL AGENCY (IF DIFFERENT): N/A

3. MAILING ADDRESS: 11360 Highway 212 West, Suite 1

CITY: Cologne	STATE: MN	ZIP CODE: 55322	4. COUNTY: Carver
5. CONTACT PERSON: Lyndon Robjent	TITLE: County Engineer		PHONE NO. (952) 466-5206

CONTACT E-MAIL ADDRESS: lrobjent@co.carver.mn.us

II. PROJECT INFORMATION

6. PROJECT NAME: CSAH 40 Segment Safety Improvements

7. BRIEF PROJECT DESCRIPTION – Safety improvements along CSAH 40 between CSAH 50 and CSAH 52 including shoulder widening, installing safety edge, curve realignment and curve warning system, and enhanced signing and pavement markings.

8. HSIP PROJECT CATEGORY – Circle which project grouping in which you wish your project to be scored.

☒ Proactive ☐ Reactive

III. PROJECT FUNDING

9. Are you applying or have you applied for funds from another source(s) to fund this project? Yes ☐ No ☒
If yes, please identify the source(s):

10. FEDERAL AMOUNT*: $2,000,000	13. MATCH % OF PROJECT TOTAL: 59%
11. MATCH AMOUNT: $2,910,400	14. SOURCE OF MATCH FUNDS: County Funds
12. PROJECT TOTAL: $4,910,400	15. REQUESTED PROGRAM YEAR(S) : SEE NOTE BELOW** ☐ 2026 ☐ 2027 ☒ Either Year
16. SIGNATURE:	17. TITLE: Public Works Director, County Engineer

***Would you accept a federal award that covers 80% of the total project cost if non-HSIP federal funds were awarded? YES**
****NOTE: If funding becomes available in 2023, 2024, or 2025 would this project be able to be advanced to meet this schedule? NO Which years would work? N/A**

PROJECT INFORMATION (Form 2)

(To be used to assign State Project Number after project is selected)

Please fill in the following information as it pertains to your proposed project. Items that do not apply to your project, please label N/A. **Do not send this form to the State Aid Office. For project solicitation package only.**

COUNTY, CITY, or LEAD AGENCY Carver County

FUNCTIONAL CLASS OF ROAD Minor Arterial

ROAD SYSTEM CSAH (TH, CSAH, MSAS, CO. RD., TWP. RD., CITY STREET)

NAME OF ROAD CSAH 40 (Example: 1st Street, Main Avenue)

ZIP CODE WHERE MAJORITY OF WORK IS BEING PERFORMED 55315, 56011

APPROXIMATE BEGIN CONSTRUCTION DATE (MO/YR) April 2026

APPROXIMATE END CONSTRUCTION DATE (MO/YR) October 2026

LOCATION: CSAH 40 from CSAH 52 to CSAH 50
(DO NOT INCLUDE LEGAL DESCRIPTION)

TYPE OF WORK GRADE, AGG. BASE, BIT. RESURF., SIGNING, STRIPING, GUARDRAIL, CULVERT REPLACEMENT

(Examples: GRADE, AGG BASE, BIT BASE, BIT SURF, SIDEWALK, CURB AND GUTTER, STORM SEWER, SIGNALS, LIGHTING, GUARDRAIL, BIKE PATH, PED RAMPS, BRIDGE, PARK AND RIDE, ETC)

Metro District Highway Safety Improvement Program (HSIP)

Proactive Application for State Fiscal Years 2026 and 2027

Applicant	Carver County
Project	CSAH 40 Segment Safety Improvements (CSAH 52 to CSAH 50)
Date	June 1, 2022

Introduction

The scenic river views, rustic rolling terrain, and abundant curvature along County State Aid Highway 40 (CSAH 40) draw vehicles, bicyclists, and motorcyclists from around the region to enjoy the corridor experience. Located in southern Carver County within San Francisco Township, the 3.30-mile segment is identified in Carver County's Roadway Safety Plan (CRSP) as a High Priority Segment due to the high frequency of crashes, narrow substandard gravel shoulders, and extensive curvature. Both the three-year crash rate and the critical crash rate index exceed the statewide average.

CSAH 40 is functionally connected on both ends to principal arterials – US 169 on the south and US 212 on the north. It serves traffic from three growing rural communitites – Belle Plaine, Jordan, and Carver. As a result, traffic volumes on CSAH 40 are expected to continue growing by approximately 2 percent annually, adding more urgency to this safety need. The project location is shown in **Attachment A**. CSAH 40 has varying speed limits between 35 and 55 miles per hour and a daily volume of 1,800 vehicles, shown in **Attachment B**.

Existing conditions photographed above. This segment of CSAH 40 is a High Priority Segment in the Carver County Road Safety Plan based on crash frequency, narrow substandard shoulders and extensive curvature.

The frequency of run off the road crashes underscores the relation of the crashes to geometric conditions of the roadway. Following a comprehensive segment safety evaluation and alternatives analysis, a package of improvements are proposed for this segment consistent with the CRSP recommendations.

Safety Problem

Over the three-year analysis period (2019-2021), 18 crashes were reported along the CSAH 40 segment between CSAH 50 and CSAH 52. Of the 18 total crashes, nine were collisions with deer. Deer crashes have been removed from the crash analysis. Of the remaining nine total crashes, four crashes were minor injury (Type B), and five crashes were property damage only (Type O). The corresponding segment crash rate and K/A rate are shown in the table below. MnCMAT data for the intersection (2019-2021) is located in **Attachment C**.

Carver CSAH 40 Segment Safety Analysis

Summary of Segment Crash Rates

Segment Crash Analysis (2019-2021)		Rate Category	Rate	
			Crash[5]	K/A[6]
Traffic Control	2-Lane Rural 1500 < ADT < 5000	Intersection	1.38	0.00
Total Crashes [1]	9	State Average [3]	0.44	2.61
Total VMT [2]	6,504,300	Critical [4]	1.19	18.42
K/A Crashes	0	Critical Index	1.17	0.00

1: Crash data obtained from MnCMAT2 and detailed crash narratives.

2: Calculated using AADT obtained from MnDOT's Traffic Mapping Application.

3: MnDOT's 2016-2020 Section Green Sheets were used to determine state average rates.

4: A confidence level of 99% was assumed for critical crash rate and 90% assumed for critical severity and K/A rates.

5: Crashes per million entering vehicles (crashes/MEV)

6: K/A crashes per 100 million entering vehicles (K/A crashes/100 MEV)

The observed three-year crash rate for the segment (1.38 crashes / MEV) is shown in red because it is higher than the statewide average for 2-Lane Rural roadways with ADT between 1,500 and 5,000 (0.44 crashes / MEV) as well as the critical crash rate (1.19 crashes / MEV), resulting in a critical crash rate index of 1.17. The critical crash rate index is shown in red if above 1.00, because a value exceeding 1.00 indicates that the intersection is operating outside of the statewide average and there may be a safety concern. No fatal (Type K) or serious injury (Type A) crashes occurred in the three-year analysis period. Therefore, the observed K/A crash rate is 0.00 crashes / 100 MEV resulting in a critical index of 0.00. One fatal (Type K) and one serious injury (Type A) crash occurred between 2012-2021.

All nine crashes reported in the 2019-2021 study period are classified as run-off-road crashes, with two crashes involving a motorcycle and one crash occurring at a curve. Previously, using MnCMAT data from 2007-2011, this segment was assigned a 3-star (out of 5) road departure risk ranking in the 2013 Carver County Road Safety Plan (CRSP), making it the sixth highest ranking segment in the county. The rural wooded landscape of this scenic byway continues to attract roadway users of different modes. However, the winding alignment, abundant curves, and substandard shoulder widths make this segment of CSAH 40 a safety hazard to its users. An excerpt from the CRSP is provided in **Attachment D.**

Proposed Improvements

Proposed safety improvements along this segment of CSAH 40 are part of a corridor-wide effort by Carver County. Safety funding has already been secured for a 4.1-mile segment of CSAH 40 immediately south of the subject segment, while funding is still being sought for the remainder of the segments. The following safety improvements are being proposed for this segment of CSAH 40:

- Install centerline and shoulder rumble strips
- Widen shoulder
- Install safety edge treatment
- Enhanced curve warning
- Enhanced signing and striping
- Improved superelevation on horizontal curves
- Flattening of sub-standard horizontal curves

See **Attachment E** for the proposed typical section including these features.

The range of proposed segment improvements are intended to cost-effectively reduce crashes, in particular the large number of run-off road crashes.

CMF Selection

Several Crash Modification Factors (CMFs) from the CMF Clearinghouse website were evaluated for applicability with the proposed CSAH 40 project. The following CMFs were selected:

- CMF ID 6371 for *Widen shoulders (paved) (0 to 8 ft)* (CMF = 0.92) – This CMF is applicable for run-off-road crash types resulting in Type K (fatal), Type A (serious injury) and Type B (Minor Injury) severities. CMF ID 6371 was found to be the most applicable CMF to quantify the safety benefit of shoulder widening for Type K, Type A, and Type B crashes based on the type of fix, roadway context, and AADT.
- CMF ID 6377 for *Widen shoulders (paved) (0 to 8 ft)* (CMF = 0.57) – This CMF comes from the same study as CMF ID 6371 and is applicable for run-off-road crashes resulting in Type O or property damage only (PDO). CMF ID 6377 was found to be the most applicable CMF to quantify the safety benefit of shoulder widening for Type O crashes based on the type of fix, roadway context, and AADT.
- CMF ID 9204 for *Install safety edge treatment* (CMF = 0.34) – This CMF is applicable for all crash types resulting in Type K (fatal), Type A (serious injury) and Type B (Minor Injury) severities. CMF ID 9204 was found to be the most applicable CMF to quantify the safety benefit of installing safety edge for Type K, Type A, and Type B crashes based on the type of fix, roadway context, and AADT.
- CMF ID 9266 for *Install safety edge treatment* (CMF = 0.87) – This CMF comes from the same study as CMF ID 9204 and is applicable for all crash types resulting in Type O or property damage only (PDO). CMF ID 9266 was found to be the most applicable CMF to quantify the safety benefit of installing safety edge for Type O crashes based on the type of fix, roadway context, and AADT.

Details on the selected CMFS can be found in **Attachment F**.

Benefit-Cost

A HSIP benefit-cost worksheet was completed for the proposed safety improvements along this 3.30-mile segment of CSAH 40 utilizing CMF ID 6371 and 6377 (for widen shoulder), as well as CMF ID 9204 and 9266 (for install safety edge treatment). The selected CMFs and high-level cost estimate result in a benefit-cost ratio of **1.10**. The benefit-cost worksheet can be found in **Attachment G**.

Policy and Standards Compliance

The proposed project will meet applicable policies, standards, and requirements as indicated below.

- Carver County adopted an ADA Transition Plan on February 18, 2014. The proposed project will comply with the Americans with Disabilities Act (ADA).
- The project applicant has sent written notification regarding the proposed project to all affected state and local units of government prior to submitting this application. Affected state and local units of government include:
    - San Francisco Township, sent May 13, 2022
- The proposed project will meet state aid standards.
- Rumble strips will be installed in accordance with Carver County's Rumble Strip Policy, located in **Attachment H**.

Summary: Alignment with Qualifying and Prioritization Criteria

This project meets the HSIP proactive qualifying and prioritization criteria, as summarized below.

Qualifying Criteria

Criteria	How CSAH 40 Segment (CSAH 52-CSAH 50) Meets Criteria
Project originates from a road safety plan	3-star road departure risk ranking in 2013 Carver County Road Safety Plan (CRSP) based on lane departure density, critical curve radius density and edge risk. **6th highest priority segment** in the County.
Low-cost solution to priority crash types	The proposed improvements address priority crash types using lower-cost solutions.
Cost-effective impacts at multiple locations or via corridor approach	The proposed improvements address issues on the 3.3-mile corridor segment, consistent with the understanding of the safety need. Carver County is also pursuing improvements on adjacent segments of the entire 10-mile CSAH 40 to accomplish a wholistic solution.
Project is included in list of types to be considered	The proposed project includes multiple components consistent with the example project types for proactive funding: rumble strips (centerline and shoulder); safety edge treatments; chevron signs, curve warning signs, and sequential flashing beacons; and shoulder widening.

Prioritization Criteria

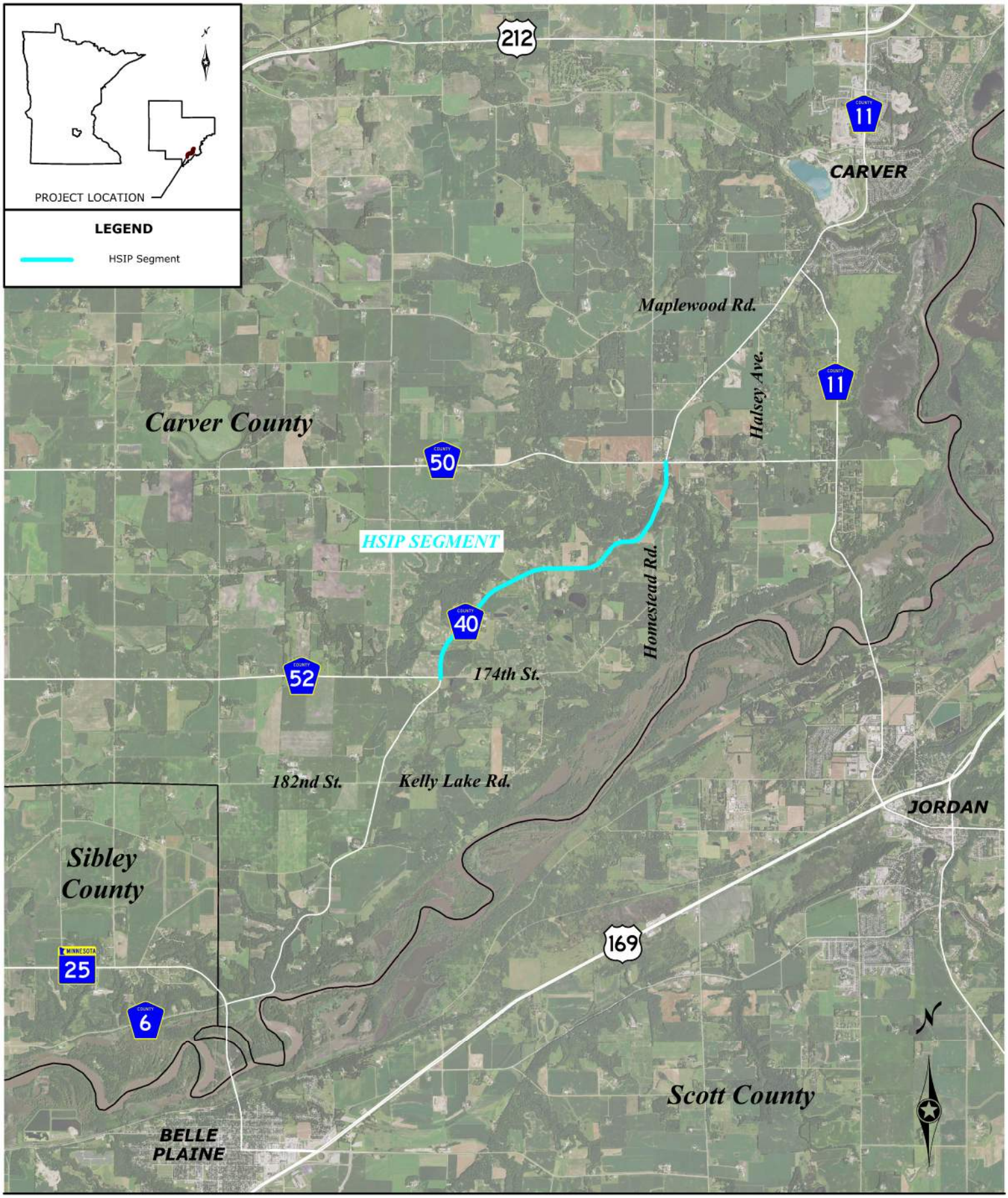
Criteria	How CSAH 40 Segment (CSAH 52-CSAH 50) Meets Criteria
Cost per user exposure	The proposed improvements will be applied to a 3.3-mile corridor with 1800 AADT and an estimated cost of $4,910,400.
Connection to 2020-2024 SHSP	The proposed improvements are intended to mitigate several issues that are a focus of the SHSP: • Lane departures (a Core Focus Area) – all 9 crashes were run off the road • Motorcycles (a Strategic Focus Area) – 2 crashes were motorcycles
Correctable Fatal and Serious Injury Crashes (2012-2021)	One Fatal (Type K) and one Serious Injury (Type A) were reported on the segment between 2012 and 2021. The proposed improvements are expected to improve safety as indicated by CMF, below.
Crash reduction factor for the specific strategy	The proposed project will include several safety improvements. The following features, identified by the corresponding Crash Modification Factors (CMFs) were utilized for the benefit-cost worksheet: • CMF ID 6371 for widen shoulders **(CMF = 0.92)** • CMF ID 6377 for widen shoulders **(CMF = 0.57)** • CMF ID 9204 for install safety edge treatment **(CMF = 0.34)** • CMF ID 9266 for install safety edge treatment **(CMF = 0.87)**
Part of a plan (safety plan or road safety audit)	Segment has a 3-star road departure risk ranking in 2013 Carver County Road Safety Plan (CRSP) based on lane departure density, critical curve radius density and edge risk. **6th highest priority segment** in the County.
Pedestrian and bicycle safety elements	The CSAH 40 roadway is identified in the Carver County Comprehensive Plan as a future regional bikeway connecting the southwest portion of the County to extensive biking networks (**Attachment I**). This represents the importance of this roadway connection for all users. An eight-foot shoulder with four-foot paved and four-foot gravel will meet the minimum guidance for an on-road bicycle facility and will greatly improve conditions for bicyclists along the CSAH 40 corridor.

Attachments

A. Project Location Map
B. Existing Conditions
C. 2019-2021 MnCMAT Data
D. County Road Safety Plan (CRSP) Excerpt
E. Proposed Typical Sections
F. Crash Modification Factors (CMFs)
G. HSIP Benefit-Cost Worksheet
H. Carver County Rumble Strip Policy
I. Carver County Comprehensive Plan Excerpt: Planned Bikeways

Attachment A:

Project Location Map



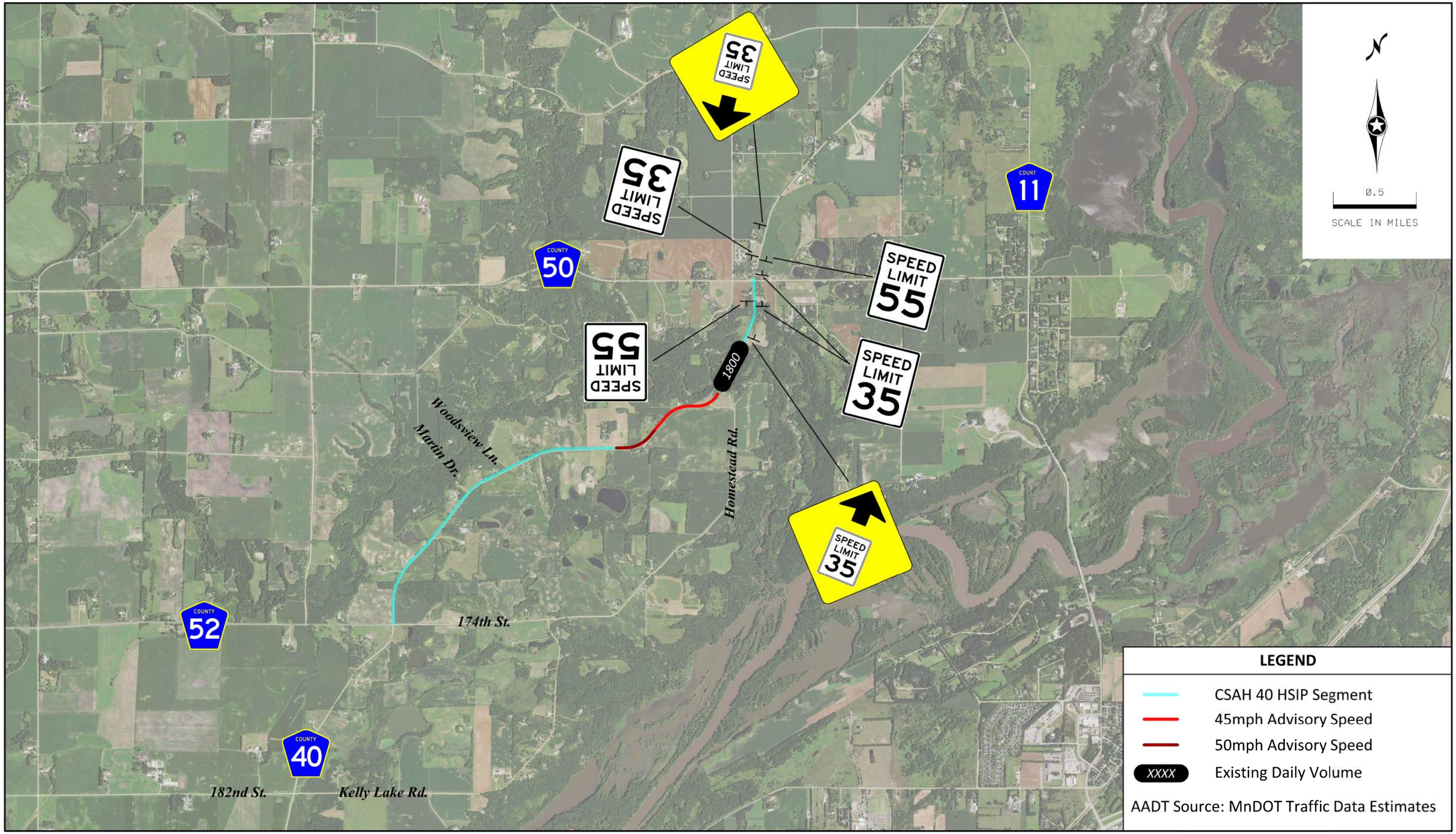
CSAH 40 - HSIP Application

Project Location

ALLIANT

Attachment B:

Existing Conditions



CSAH 40 - HSIP Application

Existing Conditions

ALLIANT

Attachment C:

2019-2021 MnCMAT Crash Data

INCIDENTID	RTESYSCODE	RTENUMBER	MEASURE	COUNTY_SPATIAL	CITY_NAME	TOWNSHIP_NAME	MNDOT_DISTRICT_SPATIAL	STATE_PATROL_DIST_SPATIAL	TRIBAL_GOVERNMENT_SPATIAL	LOCALID	ACCIDENT_NUMBER	CRASH_MONTH	CRASH_DAY	CRASH_YEAR	CRASH_DAYOFWEEK	CRASH_HOUR	DIVIDEDRDWYDIR	CRASHSEVERITY
819061	4	40	4.054	10		San Francisco	M	25		20019785	201930033	7	11	2020	Sat	13		3
723992	4	40	4.097	10		San Francisco	M	25		19015575	191530108	6	2	2019	Sun	19		3
835464	4	40	5.264	10		San Francisco	M	25		20023803	202280072	8	15	2020	Sat	0	98	5
836835	4	40	5.341	10		San Francisco	M	25		20024713	202360064	8	23	2020	Sun	0	98	5
841040	4	40	5.401	10		San Francisco	M	25		20027591	202600021	9	16	2020	Wed	9	98	3
861070	4	40	5.843	10		San Francisco	M	25		20032921	203080124	11	3	2020	Tue	18	98	5
703063	4	40	6.151	10		San Francisco	M	25		19009992	191000320	4	10	2019	Wed	13		5
841038	4	40	6.199	10		San Francisco	M	25		20027579	202600020	9	16	2020	Wed	6	98	5
910486	4	40	6.268	10		San Francisco	M	25		21014639	211510164	5	31	2021	Mon	21		3
798265	4	40	6.544	10		San Francisco	M	25		20004740	200480021	2	17	2020	Mon	7		5
860869	4	40	6.704	10		San Francisco	M	25		20032689	203070109	11	2	2020	Mon	4	98	5
744909	4	40	6.86	10		San Francisco	M	25		19026394	192470027	9	4	2019	Wed	10	98	5
697704	4	40	6.925	10		San Francisco	M	25		19007196	190730019	3	14	2019	Thu	6	98	5
758979	4	40	7.005	10		San Francisco	M	25		19032903	193060026	11	2	2019	Sat	7		3
902900	4	40	7.417	10		San Francisco	M	25		21011348	211190015	4	29	2021	Thu	8	98	4
733716	4	40	7.471	10		Dahlgren	M	25		19020498	191960151	7	15	2019	Mon	18	98	4
746665	4	52	8.043	10		San Francisco	M	25		19027329	192540184	9	11	2019	Wed	21	S	5
820334	8	127	0.002	10		San Francisco	M	25		20020635	202000030	7	18	2020	Sat	12	98	3

INCIDENTID	NUMBERKILLED	NUMBEROFVEHICLES	MANNEROFCOLLISION	FIRSTHARMFULEVENT	RELATIONTOINTERSECTION	LIGHTCONDITION	WEATHERPRIMARY	WEATHERSECONDARY	RDWYSURFACE	WORKZONETYPE	ROADWAY_NAME	INTERSECTION_NAME	ROUTE_ID	BASIC_TYPE	UNITTYPEU1	VEHICLETYPEU1	DIRECTIONU1
819061	0	1		48	2	1	2		1	98	CSAH 40		0400006594550040-I	3	2	31	1
723992	0	1		48	2	1	1		1	98	CSAH 40		0400006594550040-I	3	2	31	2
835464	0	1		69	2	6	2		1	98	CSAH 40		0400006594550040-I	3	1	2	1
836835	0	1		70	2	6	1		1	98	CSAH 40		0400006594550040-I	3	2	2	2
841040	0	1		49	16	1	2		1	98	CSAH 40		0400006594550040-I	3	2	2	2
861070	0	1		16	2	1	1		1	98	CSAH 40		0400006594550040-I	4	2	2	2
703063	0	1		67	2	1	4		3	98	CSAH 40		0400006594550040-I	3	2	2	1
841038	0	1		16	2	2	2		1	98	CSAH 40		0400006594550040-I	4	2	2	1
910486	0	1		16	2	3	1		1	98	CSAH 40		0400006594550040-I	4	2	31	1
798265	0	1		16	2	5	1		1	98	CSAH 40		0400006594550040-I	4	2	2	1
860869	0	1		16	2	6	1		1	98	CSAH 40		0400006594550040-I	4	2	2	2
744909	0	1		89	2	1	1		1	98	CSAH 40		0400006594550040-I	4	2	5	2
697704	0	1		69	2	6	6		6	98	CSAH 40		0400006594550040-I	3	2	2	1
758979	0	1		69	2	2	2		5	98	CSAH 40		0400006594550040-I	3	2	3	2
902900	0	2	5	10	3	1	1		1	98	CSAH 40		0400006594550040-I	10	2	4	1
733716	0	2	5	10	3	1	3		2	98	CSAH 40		0400006594550040-I	10	2	2	4
746665	0	1		16	4	6	3		2	98	CSAH 52		0400006594550052-I	4	2	4	2
820334	0	3	12	10	10	1	2		1	98	174TH ST		0800006594550127-I	7	2	4	2

INCIDENTID	PRECRASHMANEUVERU1	AGEU1	SEXU1	PHYSICALCONDITIONU1	CONTRIBFACTOR1U1	CONTRIBFACTOR2U1	NONMOTORISTMANEUVERU1	NONMOTORISTLOCATIONU1	RDWYDESIGNU1	TRAFFICCONTROLDEVICEU1	SPEEDLIMITU1	ALIGNMENTU1	GRADEU1	UNITTYPEU2	VEHICLETYPEU2	DIRECTIONU2	PRECRASHMANEUVERU2
819061	21	27	M	5	99				12	98	55	12	21				
723992	32	58	M	5	1				12	9	55	13	21				
835464	21								12	98	55	13	21				
836835	27	18	M	5	71				14	9	55	12	21				
841040	21	16	M	5	99				12	9	55	12	21				
861070	21	65	F	5	1				12	9		11	21				
703063	32	21	F	5	1				12	9	55	12	23				
841038	21	37	M	5	1				12	9	55	11	21				
910486	21	22	M	5	1				12	9	55	13	21				
798265	21	57	M	5	1				12	9	55	11	21				
860869	21	29	M	5	1				12	9	55	11	23				
744909	21	38	F	5	1				12	9	55	13	23				
697704	21	40	M	5	1				12	98	50	12	24				
758979	21	29	M	5	1				12	9	55	11	21				
902900	21	49	F	5	1				12	9	45	11	22	2	2	4	21
733716	21	21	M	5	65				12	20		11	21	2	2	4	21
746665	21	18	F	5	1				12	9	55	11	21				
820334	24	48	F	5	1				12	9	55	11	21	2	31	2	26

INCIDENTID	AGEU2	SEXU2	PHYSICALCONDITIONU2	CONTRIBFACTOR1U2	CONTRIBFACTOR2U2	NONMOTORISTMANEUVERU2	NONMOTORISTLOCATIONU2	RDWYDESIGNU2	TRAFFICCONTROLDEVICEU2	SPEEDLIMITU2	ALIGNMENTU2	GRADEU2	UNITTYPEU3	VEHICLETYPEU3	DIRECTIONU3	PRECRASHMANEUVERU3	AGEU3	SEXU3
819061																		
723992																		
835464																		
836835																		
841040																		
861070																		
703063																		
841038																		
910486																		
798265																		
860869																		
744909																		
697704																		
758979																		
902900	52	M	5	2				12	23	45	11	21						
733716	30	F	5	1				12	20		11	21						
746665																		
820334	42	M	5	1				12	9	55	11	21	2	31	2	26	49	M

INCIDENTID	PHYSICALCONDITIONU3	CONTRIBFACTOR1U3	CONTRIBFACTOR2U3	NONMOTORISTMANEUVERU3	NONMOTORISTLOCATIONU3	RDWYDESIGNU3	TRAFFICCONTROLDEVICEU3	SPEEDLIMITU3	ALIGNMENTU3	GRADEU3	UNITTYPEU4	VEHICLETYPEU4	DIRECTIONU4	PRECRASHMANEUVERU4	AGEU4	SEXU4	PHYSICALCONDITIONU4
819061																	
723992																	
835464																	
836835																	
841040																	
861070																	
703063																	
841038																	
910486																	
798265																	
860869																	
744909																	
697704																	
758979																	
902900																	
733716																	
746665																	
820334	5	4				12	9	55	11	21							

INCIDENTID	CONTRIBFACTOR1U4	CONTRIBFACTOR2U4	NONMOTORISTMANEUVERU4	NONMOTORISTLOCATIONU4	RDWYDESIGNU4	TRAFFICCONTROLDEVICEU4	SPEEDLIMITU4	ALIGNMENTU4	GRADEU4	UTMX	UTMY	LATITUDE	LONGITUDE	CRASH_DATE_TIME	STATUS	STATUS_NOTE	AGENCY_ORI
819061										442510.8379	4948463.679	44.68724823	-93.72548793	7/11/2020 13:46	Accepted	Reportable	MN0100000
723992										442516.372	4948531.824	44.6878621	-93.72542576	6/2/2019 19:00	Accepted	Reportable	MN0100000
835464										443533.6385	4949995.256	44.70111631	-93.71275088	8/15/2020 0:05	Accepted	Reportable	MN0100000
836835										443645.793	4950049.581	44.70161416	-93.71134131	8/23/2020 0:20	Accepted	Reportable	MN0100000
841040										443731.2163	4950092.056	44.70200322	-93.71026781	9/16/2020 9:45	Accepted	Reportable	MN0100000
861070										444415.6492	4950235.866	44.70335115	-93.70164475	11/3/2020 18:13	Accepted	Reportable	MN0100000
703063										444906.1902	4950270.868	44.70370411	-93.69545692	4/10/2019 13:15	Accepted	Reportable	MN0100000
841038										444969.0762	4950316.206	44.70411706	-93.69466805	9/16/2020 6:45	Accepted	Reportable	MN0100000
910486										445041.8925	4950398.579	44.70486414	-93.6937578	5/31/2021 21:15	Accepted	Reportable	MN0100000
798265										445392.7989	4950630.999	44.70698315	-93.68935337	2/17/2020 7:00	Accepted	Reportable	MN0100000
860869										445625.4039	4950711.063	44.70772155	-93.68642576	11/2/2020 4:32	Accepted	Reportable	MN0100000
744909										445766.6238	4950917.957	44.70959466	-93.6846651	9/4/2019 10:15	Accepted	Reportable	MN0100000
697704										445816.9871	4951009.449	44.71042206	-93.68403905	3/14/2019 6:55	Accepted	Reportable	MN0100000
758979										445870.283	4951126.753	44.71148202	-93.68337869	11/2/2019 7:25	Accepted	Reportable	MN0100000
902900										446013.544	4951764.19	44.71723087	-93.68163755	4/29/2021 8:42	Accepted	Reportable	MN0100000
733716										446012.0188	4951850.57	44.71800833	-93.68166594	7/15/2019 18:21	Accepted	Reportable	MN0100000
746665										442513.598	4948580.509	44.68830013	-93.72546623	9/11/2019 21:50	Accepted	Reportable	MN0100000
820334										442521.4744	4948580.466	44.68830037	-93.72536684	7/18/2020 12:30	Accepted	Reportable	MN0100000

INCIDENTID	AGENCY_ORI_GROUP	NARRATIVE
819061	Sheriff	Unit 1 was northbound on Co Rd 40, in a section of the road that curved left just south of 174th Street. The driver of Unit 1 lost control of the motorcycle and it ran off the road on the right side and flipped on to its side at the bottom of the ditch.
723992	Sheriff	Vehicle was going south on County road 40. Unit 1 was being driven by the driver but the vehicle was no his. Driver did not know how the cruise control on the motorcycle operated and had an issue turning it off while negotiating a turn. The driver then hit a patch of uneven dirt, and veered into the oncoming lane, and down a hill on the opposite shoulder. The driver was partially ejected in the process. The vehicle also flipped 180 degrees after hitting the shoulder. Ridgeview medical staff responded to the scene and transported the driver due to neck and wrist injuries. The extent of the injuries is unknown. Run number for Ridgeview is 6208. Unit 1 was towed by John's Mobile due to no one able to drive the vehicle away from the scene.
835464	Sheriff	I was dispatched to a single vehicle crash that a passerby located. Deputy Possert and I arrived on scene. There was no one around. Deputies extensively checked that are and were unable to locate anyone. The crash occurred at a residence and the residence was vacant and unoccupied. Deputies were unable to locate the driver of V1 and unable to make contact with the registered owner of the vehicle. I was unable to locate any vehicle insurance information. There were items in the vehicle which had the names of the RO and a female. It was unknown how many people were in V1 when it crashed. There was little to no blood inside or outside the vehicle. The drivers side air bag went off. V1 was towed from the scene to Shakopee Towing. There were no witnesses to the crash or anyone in the area.
836835	Sheriff	Unit 1 was traveling southbound on County Road 40 near Woodsview Ln in Carver County. Unit 1 swerved off the roadway to the right to avoid deer in the roadway. Unit 1 left the roadway, entered the ditch and crashed through private agricultural/farm fencing. Unit 1 sustained disabling damage. The driver of unit 1 sustained no apparent injuries.
841040	Sheriff	Vehicle was traveling southbound on County Road 40 when it ran off the road to the right, struck an driveway embankment, and rolled onto it's roof
861070	Sheriff	Vehicle 1 was traveling southbound Carver County Road 40 near 16625 County Road 40 in San Francisco County when it struck a deer. There were no injuries, and the vehicle drove away. There were no airbags deployed. The damage was moderate but functional.
703063	Sheriff	Unit 1 was driving NB on Co Rd 40, negotiating the "S" curves between Co Rd 52 and Co Rd 50, south of Homestead Rd. Unit 1 was following a second vehicle which quickly slowed for the turns. Unit 1 applied the break in response and began to veer off the road, running over an address post marker and mailbox. Unit 1 did not strike any other vehicles. There were no injuries to the driver of Unit 1. A private tow was called to impound the vehicle due to damage to the underside. The homeowners were not home, but I left my business card and case number for them to contact me. The mailbox and address post were removed from under Unit 1 and placed near the front door.
841038	Sheriff	Vehicle was traveling northbound on County Road 40 near Homestead Road when a deer ran across the road from the west. Vehicle struck deer but deer ran off. Damage done to the front driver's side of the vehicle.
910486	Sheriff	Unit 1 was traveling northbound on County Road 40 south of 16450 County Road 40 in San Francisco Township. Driver 1 stated that a deer ran across the roadway. Driver 1 was unable to avoid a collision with the deer. After striking the deer, Unit 1 ran off the roadway right. Driver 1 was picked up by a passerby. Driver 1 sustained moderate injuries and Unit 1 sustained moderate damage. No citations were issued.
798265	Sheriff	Unit 1 was northbound on CR 40, nearing Homestead Road, when according to its driver, a deer ran out from the right side ditch towards roadway. The deer struck the right side of Unit 1, damaging the front fender and front passenger door areas.
860869	Sheriff	Vehicle 1 was traveling Southbound Carver County Road 40 near Homestead Avenue, in San Francisco Township, when it ran into a deer. There was a considerable amount of damage to the front and driver side of the vehicle. No airbags were deployed, and driver was wearing his seat belt. Skelley towing out of Belle Plaine towed the vehicle away.
744909	Sheriff	Williams was traveling uphill on County Road 40 approaching Homestead Road when a male driver in possibly a white Ford Taurus, crossed the center lane into Williams lane. Williams said she drove into the ditch to avoid a head on collision. Williams was not injured and was able to drive her vehicle out of the ditch, but she did receive some damage to the right side of her van.
697704	Sheriff	Vehicle 1 was traveling northbound on County Road 40. The road is downhill with a slight left curve. Running water from melting snow was crossing the road causing Vehicle 1 to hydroplane off into the right shoulder of the road. Vehicle 1 then struck a tree down in the ditch.
758979	Sheriff	Unit 1 was southbound on Co Rd 40 and lost control when crossing the ice-covered overpass above a creek. Unit 1 swerved to the right, slid sideways down from the shoulder and rolled on to its roof up against several trees.
902900	Sheriff	Vehicle 1 was traveling northbound on County Road 40 going through the intersection. Driver of Vehicle 2 stated he stopped for the stop sign on County Road 50, looked both ways, then pulled out into the intersection. vehicle 1 struck vehicle 2 in the intersection as Vehicle 2 was crossing.
733716	Sheriff	Unit 1 was traveling West bound on CR 50 approaching the intersection at CR 40. Unit 2 Was headed southbound on CR 40 approaching the intersection at CR 50. Unit 1 had a stop sign and unit 2 did not. Unit 1 did not stop at the stop sign, striking unit 2 in a t-shaped manner. Unit 1 driver did not require medical attention. Unit 2 driver had a hurt hand, and minor face injuries, and was transported by a friend to the hospital after declining paramedic services. Unit 1 driver was cited for failure to stop at a stop sign and unit 2 driver was cited for driving with an expired status. Both vehicles were towed privately by Colony Plaza to an unknown destination. Neither vehicle was blocking. Both vehicles sustained heavy front end damage and were not able to be driven.
746665	Sheriff	At approximately 2150 hours on 09/11/2019, Emily Elizabeth Berger DOB: 09/09/2001, was driving a 2005 blue in color Chevy Equinox, MN REG 790RPM, southbound on County Road 40 in San Francisco Township in the County of Carver towards her home in Belle Plaine. Emily stated she was travelling between 50-55 mph southbound on County Road 40 and when she was near the intersection of County Road 40 and County Road 52 a deer appeared from the east side of County Road 40. Emily stated she was unable to slow down or avoid hitting the deer. Emily stated her vehicle hit the deer causing damage to the front on the passenger side. Emily explained the damage to her car as "totaled" but the vehicle was able to be driven and was driven from the accident scene.
820334	Sheriff	Vehicle 1 was stopped on County Road 40, waiting to make a left turn onto 174th St. Vehicle 2 was also slowed, or stopped, behind Vehicle 1. Vehicle 3 was the third vehicle in that line of vehicles. Vehicle 3 did not slow down in time and sideswiped Vehicle 2, then rear ending Vehicle 1.

Attachment D:

County Road Safety Plan (CRSP) Excerpt

Carver County

Rural Segment Listing

Analysis Years: 2007 - 2011

*High Priority Segments Project Sheet Page Number

Project Sheet Page*	Corridor	Route	#	Start	End	Length (miles)	Lane Departure Crashes	ADT	Lane Departure Density	Access Density	Curves w/ Critical Radius / Mile	Edge Risk Assesment
-	10.01	CSAH	10	CSAH-10 BEGINS, WRIGHT CO	WATERTOWN CORP LIMIT	0.4	0	1400	0.00	15.0	0.00	2
17	10.04	CSAH	10	WATERTOWN CORP LIMIT	MNTH-7	3.4	16	3850	0.94	11.2	1.76	1
7	10.05	CSAH	10	MNTH-7	66TH ST	1.6	10	4500	1.25	11.3	0.00	2
4	10.06	CSAH	10	66TH ST	MNTH-5	4.0	34	6290	1.70	13.5	0.75	1
CL-1	10.08	CSAH	10	CSAH-59	CHASKA CORP LIMIT	7.1	36	6570	1.01	10.4	0.28	1
-	11.02	CSAH	11	SAN FRANCISCO TWSP	SAN FRANCISCO TWSP	2.9	12	2643	0.83	6.2	1.03	1
1	11.03	CSAH	11	SAN FRANCISCO TWSP	CSAH-40 (SOUTH)	0.9	6	2150	1.33	16.7	2.22	3
15	11.04	CSAH	11	CSAH-40 (SOUTH)	CSAH-61	2.8	14	5803	1.00	10.7	1.07	1
-	11.05	CSAH	11	CSAH-61	CSAH-14	3.6	6	2170	0.33	15.0	0.00	3
8	11.07	CSAH	11	MNTH-5 (WEST)	MNTH-7, HENNEPIN CO	2.8	10	2250	0.71	9.6	1.79	2
-	20.01	CSAH	20	CSAH-20 BEGINS, MCLEOD CO	CSAH-33 (NORTH)	2.0	3	1000	0.30	9.0	0.00	1
5	20.02	CSAH	20	CSAH-33 (SOUTH)	MNTH-25	5.2	13	1025	0.50	11.5	0.00	3
18	20.04	CSAH	20	WATERTOWN CORP LIMIT	CSAH-20 ENDS, HENN CO	2.9	8	3350	0.55	14.1	0.34	1
-	21.01	CSAH	21	MNTH-7	CSAH-21 ENDS, WRIGHT CO	5.0	2	720	0.08	11.0	0.00	1
-	23.02	CSAH	23	58TH ST	MNTH-7	0.5	0	630	0.00	28.0	0.00	1
3	24.02	CSAH	24	DREAM LANE	CSAH-15	2.7	11	2800	0.81	13.7	0.74	2
-	27.02	CSAH	27	WATERTOWN CORP LIMIT	CSAH-27 ENDS, WRIGHT CO	1.1	6	1815	1.09	10.0	0.91	1
10	30.01	CSAH	30	CSAH-30 BEGINS, MCLEOD CO	CSAH-33 (SOUTH)	1.9	1	1050	0.11	11.6	0.53	2
-	30.03	CSAH	30	NEW GERMANY CORP LIMIT	MAYER CORP LIMIT	2.2	5	1705	0.45	7.3	0.00	2
-	30.05	CSAH	30	MNTH-25 (SOUTH)	CSAH-10	3.9	12	2450	0.62	10.5	0.26	3
-	31.01	CSAH	31	CSAH-31 BEGINS, SIBLEY CO	CSAH-50 (EAST)	1.0	0	310	0.00	10.0	0.00	1
-	31.02	CSAH	31	CSAH-50 (WEST)	CSAH-31	2.5	3	940	0.24	10.0	0.00	1
-	32.01	CSAH	32	CSAH-30	MNTH-25	5.5	4	647	0.15	11.8	0.36	1
-	32.02	CSAH	32	MNTH-25	CSAH-10	3.4	5	1375	0.29	14.4	0.00	2
-	33.01	CSAH	33	CSAH-33 BEGINS, CARVER CO	CSAH-50 (EAST)	1.0	2	390	0.40	13.0	0.00	1
2	33.02	CSAH	33	CSAH-50 (WEST)	NORWOOD/YOUNG AMER CL	2.5	6	600	0.48	12.4	0.80	3
-	33.05	CSAH	33	MNTH-25	NEW GERMANY CL	8.2	20	1388	0.49	10.4	0.61	1
-	33.07	CSAH	33	NEW GERMANY CL	CSAH-33 ENDS; WRIGHT CO	6.0	9	2013	0.30	8.8	0.17	1
-	34.01	CSAH	34	CSAH-34 BEGINS, MCLEOD CO	MNTH-25	4.7	0	528	0.00	11.5	0.00	0
11	36.02	CSAH	36	COLOGNE CORP LIMIT	USTH-212	1.3	5	870	0.77	8.5	0.77	2
6	40.01	CSAH	40	CSAH-40 BEGINS, SIBLEY CO	EAST UNION	7.2	45	983	1.25	9.3	1.39	3
9	40.03	CSAH	40	EAST UNION	CSAH-11 (SOUTH)	2.1	4	1550	0.32	15.2	0.48	2
-	41.01	CSAH	41	CSAH-52	CSAH-36	7.3	3	220	0.08	9.5	0.96	1
19	43.01	CSAH	43	CSAH-50	CSAH-10 (EAST)	6.6	19	1310	0.58	13.2	0.45	1
12	43.02	CSAH	43	CSAH-10 (WEST)	TELLERS RD	1.7	1	783	0.12	14.1	1.76	2
-	50.01	CSAH	50	CSAH-50 BEGINS, MCLEOD CO	HAMBURG CORP LIMIT	1.9	2	466	0.21	10.5	0.00	2
-	50.03	CSAH	50	HAMBURG CORP LIMIT	N JCT CSAH-51	5.2	7	727	0.27	10.2	0.38	1
-	50.04	CSAH	50	S JCT CSAH-51	EAST UNION	8.0	5	653	0.13	12.4	0.00	1
-	50.06	CSAH	50	EAST UNION	SAN FRANCISCO TWSP	0.7	1	1400	0.29	20.0	0.00	2
-	51.01	CSAH	51	CSAH-52	MNTH-5	9.0	8	734	0.18	10.7	0.00	1
-	52.01	CSAH	52	CSAH-52 BEGINS, SIBLEY CO	CSAH-40	8.0	1	323	0.03	11.9	0.00	1
-	53.01	CSAH	53	CSAH-53 BEGINS, SIBLEY CO	USTH-212	6.5	25	1770	0.77	8.2	0.15	3
16	92.01	CSAH	92	MNTH-5	CSAH-92 ENDS, HENN CO	2.5	9	5530	0.72	7.2	0.80	1
-	122.01	CNTY	122	CSAH-33	CR-123	5.9	9	963	0.31	12.5	0.00	1
13	123.01	CNTY	123	MNTH-7	CR-122	3.7	2	245	0.11	12.7	1.08	2
-	127.01	CNTY	127	CSAH-24	CSAH-20	1.7	0	275	0.00	15.9	0.00	2
-	131.01	CNTY	131	USTH-212	CSAH-34	1.7	0	185	0.00	11.8	0.00	2
-	133.01	CNTY	133	CSAH-20	CR-133 ENDS, WRIGHT CO	0.5	0	180	0.00	18.0	0.00	3
14	135.01	CNTY	135	CSAH-33	CSAH-32	3.7	1	244	0.05	12.7	0.81	2
-	140.01	CNTY	140	MNTH-284	CSAH-11 (WEST)	7.2	14	748	0.39	15.8	0.28	2
-	151.01	CNTY	151	CR-151 BEGINS, SIBLEY CO	CSAH-52	1.0	0	150	0.00	9.0	0.00	2
-	151.02	CNTY	151	MNTH-5	CSAH-32	2.1	0	665	0.00	11.4	0.00	2
-	152.01	CNTY	152	CSAH-51	CSAH-53	3.0	0	194	0.00	9.3	0.00	1
-	153.01	CNTY	153	CSAH-50	MNTH-284	7.0	4	201	0.10	10.0	0.14	2
-	155.01	CNTY	155	CSAH-92	MNTH-7	2.8	6	233	0.43	10.7	1.07	2
						200.0	425					

Edge Risk Legend

3 -- Risky' - NEITHER shoulder or good clear zone
2 -- Either a shoulder OR good clear zone
1 -- BOTH shoulder and a good clear zone

Critical ADT Range -Lane Departure

Min	3,000
Max	10,000,000

Critical % No Passing

	Access	Lane Departure	Critical Radius Curves
Total	2286	425	83
Total Mileage	200.0	200.0	200.0
Years		5	
Average Density (Total/Mile)	**11.4**	**0.43**	**0.42**

Carver County

Rural Segment Prioritization - Road Departure Priority

Analysis Years: 2007 - 2011

#	Corridor	Route	#	Start	End	Length	ADT	ADT Range	Lane Departure Density	Access Density	Curve Critical Radius Density	Edge Risk	Totals	Tiebreakers Edge Risk	Tiebreakers ADT
1	11.03	CSAH	11	SAN FRA	CSAH-40 (SOUTH)	0.9	2,150		★	★	★	★	★★★★	3	2150
2	33.02	CSAH	33	CSAH-50	NORWOOD/YOUNG AME	2.5	600		★	★	★	★	★★★★	3	600
3	24.02	CSAH	24	DREAM L	CSAH-15	2.7	2,800		★	★	★	★	★★★★	2	2800
4	10.06	CSAH	10	66TH ST	MNTH-5	4.0	6,290	★	★	★	★		★★★★	1	6290
5	20.02	CSAH	20	CSAH-33	MNTH-25	5.2	1,025		★	★		★	★★★	3	1025
6	40.01	CSAH	40	CSAH-40	EAST UNION	7.2	983		★		★	★	★★★	3	983
7	10.05	CSAH	10	MNTH-7	66TH ST	1.6	4,500	★	★			★	★★★	2	4500
8	11.07	CSAH	11	MNTH-5 (	MNTH-7, HENNEPIN CO	2.8	2,250		★		★	★	★★★	2	2250
9	40.03	CSAH	40	EAST UN	CSAH-11 (SOUTH)	2.1	1,550			★	★	★	★★★	2	1550
10	30.01	CSAH	30	CSAH-30	CSAH-33 (SOUTH)	1.9	1,050			★	★	★	★★★	2	1050
11	36.02	CSAH	36	COLOGN	USTH-212	1.3	870		★		★	★	★★★	2	870
12	43.02	CSAH	43	CSAH-10	TELLERS RD	1.7	783			★	★	★	★★★	2	783
13	123.01	CNTY	123	MNTH-7	CR-122	3.7	245			★	★	★	★★★	2	245
14	135.01	CNTY	135	CSAH-33	CSAH-32	3.7	244			★	★	★	★★★	2	244
15	11.04	CSAH	11	CSAH-40	CSAH-61	2.8	5,803	★	★		★		★★★	1	5803
16	92.01	CSAH	92	MNTH-5	CSAH-92 ENDS, HENN C	2.5	5,530	★	★		★		★★★	1	5530
17	10.04	CSAH	10	WATERT(	MNTH-7	3.4	3,850	★	★		★		★★★	1	3850
18	20.04	CSAH	20	WATERT(	CSAH-20 ENDS, HENN C	2.9	3,350	★	★	★			★★★	1	3350
19	43.01	CSAH	43	CSAH-50	CSAH-10 (EAST)	6.6	1,310		★	★	★		★★★	1	1310
20	30.05	CSAH	30	MNTH-25	CSAH-10	3.9	2,450		★			★	★★	3	2450
21	11.05	CSAH	11	CSAH-61	CSAH-14	3.6	2,170			★		★	★★	3	2170
22	53.01	CSAH	53	CSAH-53	USTH-212	6.5	1,770		★			★	★★	3	1770
23	133.01	CNTY	133	CSAH-20	CR-133 ENDS, WRIGHT (	0.5	180			★		★	★★	3	180
24	30.03	CSAH	30	NEW GEF	MAYER CORP LIMIT	2.2	1,705		★			★	★★	2	1705
25	10.01	CSAH	10	CSAH-10	WATERTOWN CORP LIM	0.4	1,400			★		★	★★	2	1400
26	50.06	CSAH	50	EAST UN	SAN FRANCISCO TWSP	0.7	1,400			★		★	★★	2	1400
27	32.02	CSAH	32	MNTH-25	CSAH-10	3.4	1,375			★		★	★★	2	1375
28	140.01	CNTY	140	MNTH-28	CSAH-11 (WEST)	7.2	748			★		★	★★	2	748
29	151.02	CNTY	151	MNTH-5	CSAH-32	2.1	665			★		★	★★	2	665
30	127.01	CNTY	127	CSAH-24	CSAH-20	1.7	275			★		★	★★	2	275
31	155.01	CNTY	155	CSAH-92	MNTH-7	2.8	233				★	★	★★	2	233
32	131.01	CNTY	131	USTH-21	CSAH-34	1.7	185			★		★	★★	2	185
33	10.08	CSAH	10	CSAH-59	CHASKA CORP LIMIT	7.1	6,570	★	★				★★	1	6570
34	11.02	CSAH	11	SAN FRA	SAN FRANCISCO TWSP	2.9	2,643		★		★		★★	1	2643
35	27.02	CSAH	27	WATERT(	CSAH-27 ENDS, WRIGHT	1.1	1,815		★		★		★★	1	1815
36	33.05	CSAH	33	MNTH-25	NEW GERMANY CL	8.2	1,388		★		★		★★	1	1388
37	50.01	CSAH	50	CSAH-50	HAMBURG CORP LIMIT	1.9	466					★	★	2	466
38	153.01	CNTY	153	CSAH-50	MNTH-284	7.0	201					★	★	2	201
39	151.01	CNTY	151	CR-151 B	CSAH-52	1.0	150					★	★	2	150
40	122.01	CNTY	122	CSAH-33	CR-123	5.9	963			★			★	1	963
41	50.04	CSAH	50	S JCT CS	EAST UNION	8.0	653			★			★	1	653
42	32.01	CSAH	32	CSAH-30	MNTH-25	5.5	647			★			★	1	647
43	23.02	CSAH	23	58TH ST	MNTH-7	0.5	630			★			★	1	630
44	33.01	CSAH	33	CSAH-33	CSAH-50 (EAST)	1.0	390			★			★	1	390
45	52.01	CSAH	52	CSAH-52	CSAH-40	8.0	323			★			★	1	323
46	41.01	CSAH	41	CSAH-52	CSAH-36	7.3	220				★		★	1	220
47	34.01	CSAH	34	CSAH-34	MNTH-25	4.7	528			★			★	0	528
48	33.07	CSAH	33	NEW GEF	CSAH-33 ENDS; WRIGHT	6.0	2,013							1	2013
49	20.01	CSAH	20	CSAH-20	CSAH-33 (NORTH)	2.0	1,000							1	1000
50	31.02	CSAH	31	CSAH-50	CSAH-31	2.5	940							1	940
51	51.01	CSAH	51	CSAH-52	MNTH-5	9.0	734							1	734
52	50.03	CSAH	50	HAMBUR N JCT	CSAH-51	5.2	727							1	727
53	21.01	CSAH	21	MNTH-7	CSAH-21 ENDS, WRIGHT	5.0	720							1	720
54	31.01	CSAH	31	CSAH-31	CSAH-50 (EAST)	1.0	310							1	310
55	152.01	CNTY	152	CSAH-51	CSAH-53	3.0	194							1	194
								Total Stars --	7	21	28	21	29		
								% That Gets Star --	13%	38%	51%	38%	53%		

	#	%	Mileage	%
★★★★★	0	0%	0.0	0%
★★★★	4	7%	10.1	5%
★★★	15	27%	49.4	25%
★★	17	31%	56.0	28%
★	11	20%	50.8	25%
	8	15%	33.7	17%
	55	100%	200.0	100%

	Stars
ADT Range -	If segment has an ADT in the range of most at risk ADT based on ATP totals. (> 3000)
Lane Departure Density	If segment has higher road departure density than the county average (0.43).
Access Density	If segment has access density greater than the county average (11.4).
Curve Critical Radius Density -	If segment has higher density of curves with critical radius than the county average (0.42).
Edge Risk Assessment -	Edge risk of 2 or 3, based on assessment of roadway edge and clear zone.

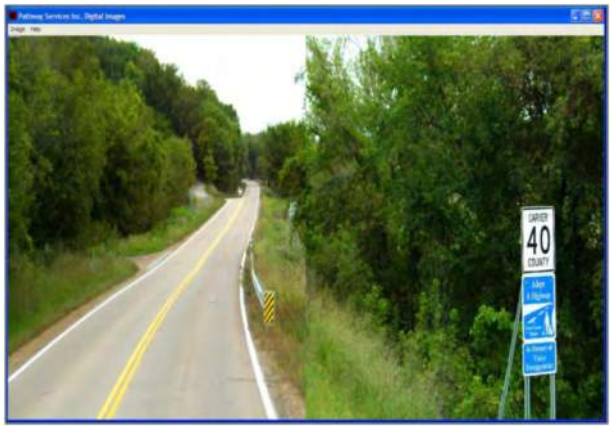
CSAH 40 from CSAH-40 BEGINS, SIBLEY CO to EAST UNION Project

Agency: Carver County

Roadway Data

Type: CSAH
Number: 40

	Verbal
Start:	CSAH-40 BEGINS, SIBLEY CO
End:	EAST UNION
City/Rural:	Rural
County:	Carver
ATP:	Metro
ADT:	983
Facility Type:	2-Lane
Lane Width:	12
Speed Limit:	55
Shoulder Width:	2-3'
Shoulder Type:	gravel
Length (miles):	7.2
Rumble Installed:	no



Crash Data

2007-2011 MnCMAT Crash Data 5 years

	Total	Lane Dept	K+A
Crashes	57	45	14
Density (per mile per year)	1.58	1.25	0.39
Rate (per MVM)	4.41	3.48	1.08

Ranking Criteria

	Value	Critical	Road Departure Risk Ranking
ADT Range	983	> 3,000	
Lane Departure Density	1.25	0.43	★
Access Density	9.3	11.40	
Curve Critical Radius Density	1.39	0.42	★
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	7.2	$288,000
Rumble Strip	Proactive	$3,000	0.0	$0
Rumble StripE	Proactive	$3,500	0.0	$0
6" Edge Lines	Proactive	$650	0.0	$0
Ground In Wet-Reflective Markings	Proactive	$8,500	0.0	$0
Center Line Rumble Strip	Proactive	$3,000	0.0	$0
4' Buffer w/Centerline Rumble Strips	Proactive	$150,000	0.0	$0
12' Painted Median w/Left Turn Lanes	Proactive	$500,000	0.0	$0

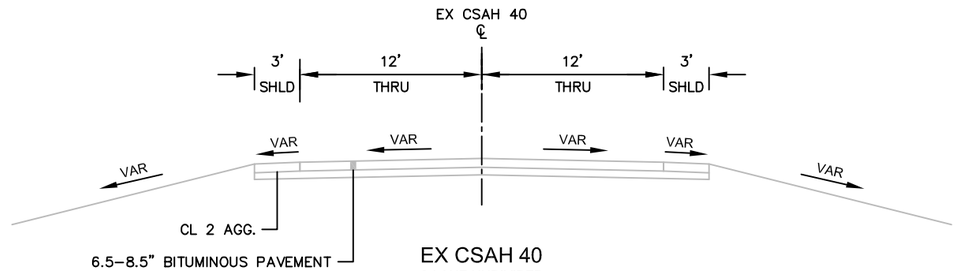
Notes - County preference to use 2' shoulder paving and rumble strips instead of rumble stripEs.

Implementation Cost

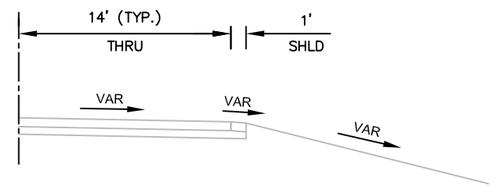
Federal Funds	$259,200
Local Match (10% of Total project cost)	$28,800
Total Project Cost	**$288,000**

Attachment E:

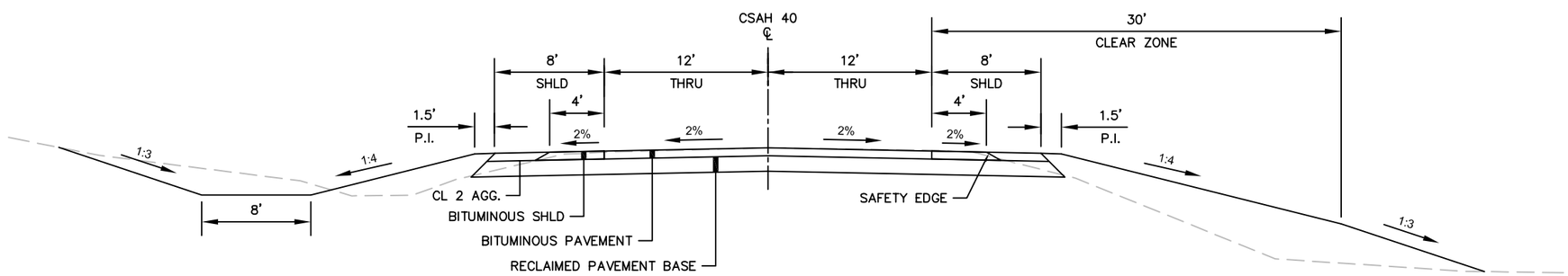
Proposed Typical Sections



EX CSAH 40
2-LANE UNDIVIDED



WIDENED LANE AT HORIZONTAL CURVE



PROPOSED CSAH 40
2-LANE UNDIVIDED

DRAFT 4/8/2021

Attachment F:

Crash Modification Factors (CMFs)

CMF / CRF Details

CMF ID: 6371

Widen shoulder (paved) (from 0 to 8 ft)

Description:

Prior Condition: No paved shoulder

Category: Shoulder treatments

Study: *Safety Effects of Shoulder Paving for Rural and Urban Interstate, Mulitlane, and Two-Lane Highways*, Li et al., 2013

Star Quality Rating:	[View score details]

Crash Modification Factor (CMF)	
Value:	0.92
Adjusted Standard Error:	
Unadjusted Standard Error:	0.01

Crash Reduction Factor (CRF)	
Value:	8 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	1

Applicability

Crash Type:	Fixed object,Head on,Run off road,Sideswipe
Crash Severity:	A (serious injury),B (minor injury),C (possible injury)
Roadway Types:	Not specified
Number of Lanes:	2
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	All

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2000 to 2006
Municipality:	
State:	IL
Country:	USA
Type of Methodology Used:	2

Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Mar-11-2015
Comments:	Crash type is "Run-off-road right, then head-on and sideswiped with a vehicle in the opposite direction; Run-off-road right, then sideswiped with a vehicle in the same direction of multilane highways; Run-off-road right, then collided with fixed object on the right; Run-off-road right, then collided with fixed object on the left; Run-off-road right, then overturned in road or roadside involving single vehicle; and Run-off-road right, then overturned in road or roadside involving multiple vehicles" The number of crashes in the after period were not reported in this study, however, they have been recorded as 300 to give 10 points as a beneift of doubt for one or more of the following: (1) number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3) reporting AADTs for the aggregate dataset but not for the disaggragate dataset used for CMF development.

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

The information contained in the Crash Modification Factors (CMF) Clearinghouse is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in the CMF Clearinghouse. The information contained in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

CMF / CRF Details

CMF ID: 6377

Widen shoulder (paved) (from 0 to 8 ft)

Description:

Prior Condition: No paved shoulder

Category: Shoulder treatments

Study: *Safety Effects of Shoulder Paving for Rural and Urban Interstate, Mulitlane, and Two-Lane Highways*, Li et al., 2013

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.57
Adjusted Standard Error:	
Unadjusted Standard Error:	0.03

Crash Reduction Factor (CRF)	
Value:	43 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	

Unadjusted Standard Error:	3

Applicability

Crash Type:	Fixed object,Head on,Run off road,Sideswipe
Crash Severity:	O (property damage only)
Roadway Types:	Not specified
Number of Lanes:	2
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	All
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2000 to 2006
Municipality:	
State:	IL

Country:	USA
Type of Methodology Used:	2
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Mar-11-2015
Comments:	Crash type is "Run-off-road right, then head-on and sideswiped with a vehicle in the opposite direction; Run-off-road right, then sideswiped with a vehicle in the same direction of multilane highways; Run-off-road right, then collided with fixed object on the right; Run-off-road right, then collided with fixed object on the left; Run-off-road right, then overturned in road or roadside involving single vehicle; and Run-off-road right, then overturned in road or roadside involving multiple vehicles" The number of crashes in the after period were not reported in this study, however, they have been recorded as 300 to give 10 points as a beneift of doubt for one or more of the following: (1) number of miles/sites in the reference/treatment group, (2) number of crashes in the references/treatment group, (3) reporting AADTs for the aggregate dataset but not for the disaggragate dataset used for CMF development.

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CMF / CRF Details

CMF ID: 9204

Install safety edge treatment

Description: The safety edge is a low-cost treatment that is implemented in conjunction with pavement resurfacing and is intended to help minimize drop-off-related crashes.

Prior Condition: Drop-off pavement edge

Category: Shoulder treatments

Study: *Development Of Crash Modification Factors For The Application Of The Safetyedge Treatment On Two-Lane Rural Roads*, Donnell et al., 2017

Star Quality Rating:	★★★★☆ [View score details]

Crash Modification Factor (CMF)	
Value:	0.343
Adjusted Standard Error:	
Unadjusted Standard Error:	0.091

Crash Reduction Factor (CRF)	
Value:	65.7 *(This value indicates a **decrease** in crashes)*

Adjusted Standard Error:	
Unadjusted Standard Error:	9.1

Applicability

Crash Type:	All
Crash Severity:	K (fatal),A (serious injury),B (minor injury)
Roadway Types:	Principal Arterial Other
Number of Lanes:	2
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	107 to 8368 *Annual Average Daily Traffic (AADT)*
Time of Day:	Not specified
If countermeasure is intersection-based	
Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2008 to 2014
Municipality:	

State:	PA
Country:	
Type of Methodology Used:	2
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jun-17-2018
Comments:	Excludes intersection-related crashes and animal-related crashes

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The information contained in the Crash Modification Factors (CMF) Clearinghouse is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The U.S. Government assumes no liability for the use of the information contained in the CMF Clearinghouse. The information contained in the CMF Clearinghouse does not constitute a standard, specification, or regulation, nor is it a substitute for sound engineering judgment.

CMF / CRF Details

CMF ID: 9226

Install safety edge treatment

Description: The safety edge is a low-cost treatment that is implemented in conjunction with pavement resurfacing and is intended to help minimize drop-off-related crashes.

Prior Condition: ***No Prior Condition(s)***

Category: Shoulder treatments

Study: *Development Of Crash Modification Factors For The Application Of The Safetyedge Treatment On Two-Lane Rural Roads*, Donnell et al., 2017

Star Quality Rating:	Stars [View score details]

Crash Modification Factor (CMF)	
Value:	0.866
Adjusted Standard Error:	
Unadjusted Standard Error:	0.066

Crash Reduction Factor (CRF)	
Value:	13.4 *(This value indicates a **decrease** in crashes)*
Adjusted Standard Error:	
Unadjusted Standard Error:	6.6

Applicability

Crash Type:	Run off road
Crash Severity:	All
Roadway Types:	Principal Arterial Other
Number of Lanes:	
Road Division Type:	
Speed Limit:	
Area Type:	Rural
Traffic Volume:	
Time of Day:	Not specified

If countermeasure is intersection-based

Intersection Type:	
Intersection Geometry:	
Traffic Control:	
Major Road Traffic Volume:	
Minor Road Traffic Volume:	

Development Details

Date Range of Data Used:	2005 to 2014
Municipality:	
State:	FL, IA, NC, OH, PA
Country:	

Type of Methodology Used:	2
Sample Size Used:	

Other Details

Included in Highway Safety Manual?	No
Date Added to Clearinghouse:	Jun-17-2018
Comments:	Excludes intersection-related crashes and animal-related crashes. Includes only right-side encroachments for IA, FL, NC, and OH, and encroachments for both sides of the road in PA. Only includes sites with a with travel lane surface width 16-20 ft.

This site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center

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Attachment G:

HSIP Benefit-Cost Worksheet

Traffic Safety Benefit-Cost Calculation

Highway Safety Improvement Program (HSIP) Reactive Project

DEPARTMENT OF TRANSPORTATION

A. Roadway Description

Route	CSAH 40	**District**	M	**County**	Carver
Begin RP	N/A	**End RP**	N/A	**Miles**	3.300
Location	Carver CSAH 40 from CSAH 52 to CSAH 50				

B. Project Description

Proposed Work	Widen shoulder, install safety edge treatment		
Project Cost*	$4,910,400	**Installation Year**	2026
Project Service Life	20 years	**Traffic Growth Factor**	2.0%

** exclude Right of Way from Project Cost*

C. Crash Modification Factor

0.92	**Fatal (K) Crashes**	**Reference**	CMF ID 6371 and 6377 for widen shoulders (paved) (0 to 8 ft)
0.92	**Serious Injury (A) Crashes**		
0.92	**Moderate Injury (B) Crashes**	**Crash Type**	Run-off-road crashes, ID 6371 for Type K, A, and B crashes and ID 6377 for O crashes
	Possible Injury (C) Crashes		
0.57	**Property Damage Only Crashes**		www.CMFclearinghouse.org

D. Crash Modification Factor (optional second CMF)

0.34	**Fatal (K) Crashes**	**Reference**	CMF ID 9204 and 9266 for install safety edge treatment
0.34	**Serious Injury (A) Crashes**		
0.34	**Moderate Injury (B) Crashes**	**Crash Type**	All crash types, ID 9204 for Type K, A, and B crashes and ID 9266 for all crash severities
0.87	**Possible Injury (C) Crashes**		
0.87	**Property Damage Only Crashes**		www.CMFclearinghouse.org

E. Crash Data

Begin Date	1/1/2019	**End Date**	12/31/2021	3 years
Data Source				

Crash Severity	CMF ID 6371, 6377	CMF ID 9204
K crashes		
A crashes		
B crashes	4	4
C crashes		
PDO crashes	5	5

F. Benefit-Cost Calculation

$5,396,865	**Benefit (present value)**	**B/C Ratio = 1.10**
$4,910,400	**Cost**	

Proposed project expected to reduce 2 crashes annually, 0 of which involving fatality or serious injury.

F. Analysis Assumptions

Crash Severity	Crash Cost
K crashes	$1,500,000
A crashes	$750,000
B crashes	$230,000
C crashes	$120,000
PDO crashes	$13,000

Link: mndot.gov/planning/program/appendix_a.html

Real Discount Rate:	0.7%	Default
Traffic Growth Rate:	2.0%	**Revised**
Project Service Life:	20 years	**Revised**

G. Annual Benefit

Crash Severity	Crash Reduction	Annual Reduction	Annual Benefit
K crashes	0.00	0.00	$0
A crashes	0.00	0.00	$0
B crashes	2.95	0.98	$226,013
C crashes	0.00	0.00	$0
PDO crashes	2.82	0.94	$12,220
			$238,233

H. Amortized Benefit

Year	Crash Benefits	Present Value
2026	$238,233	$238,233
2027	$242,998	$241,309
2028	$247,858	$244,424
2029	$252,815	$247,579
2030	$257,871	$250,776
2031	$263,029	$254,013
2032	$268,289	$257,292
2033	$273,655	$260,614
2034	$279,128	$263,978
2035	$284,711	$267,386
2036	$290,405	$270,838
2037	$296,213	$274,334
2038	$302,137	$277,876
2039	$308,180	$281,463
2040	$314,344	$285,097
2041	$320,631	$288,777
2042	$327,043	$292,505
2043	$333,584	$296,281
2044	$340,256	$300,106
2045	$347,061	$303,981
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0
0	$0	$0

Total = $5,396,865

NOTE:
This calculation relies on the real discount rate, which accounts

0	$0	$0	*for inflation. No further discounting is necessary.*
0	$0	$0	

Attachment H:

Carver County Rumble Strip Policy

Carver County
Division of Public Works

RUMBLE STRIP POLICY

Adopted by the Carver County Board of Commissioners on March 19, 2013.

PURPOSE

The following Policy has been established to provide uniformity and consistency in the application and installation of edge line and centerline rumble strips on Carver County's rural roadway system. This policy weighs the safety benefit with the noise nuisance associated with rumble strips, and defines when rumble strips will be used on the County roadway system.

BACKGROUND

In response to an overrepresentation of road departure and head-on crashes along the rural county highway system in Minnesota, Carver County completed a Roadway Safety Plan in 2013 which identifies a variety of potential mitigation strategies (as documented in the NCHRP 500 Series reports on implementation of AASHTO's ***Strategic Highway Safety Plan*** and in the Federal Highway Administration's Technical Memorandum on Consideration and Implementation of Proven Safety Countermeasures). Current safety-related guidance suggests that the first step in addressing road departure crashes and head-on crashes involves considering the deployment of techniques and features along road edges and centerlines that help keep vehicles on the roadway and in the appropriate lane. The techniques include enhancing pavement markings, enhancing delineation of highway curves, constructing wider or paved shoulders, providing a safety wedge as part of bituminous paving projects, installing median and barriers, and installing edge line and centerline rumble strips. Considering implementation costs and estimated effectiveness, the use of rumble strips has been selected as a targeted strategy for reducing the occurrence of road departure and head-on crashes along segments of rural county highways.

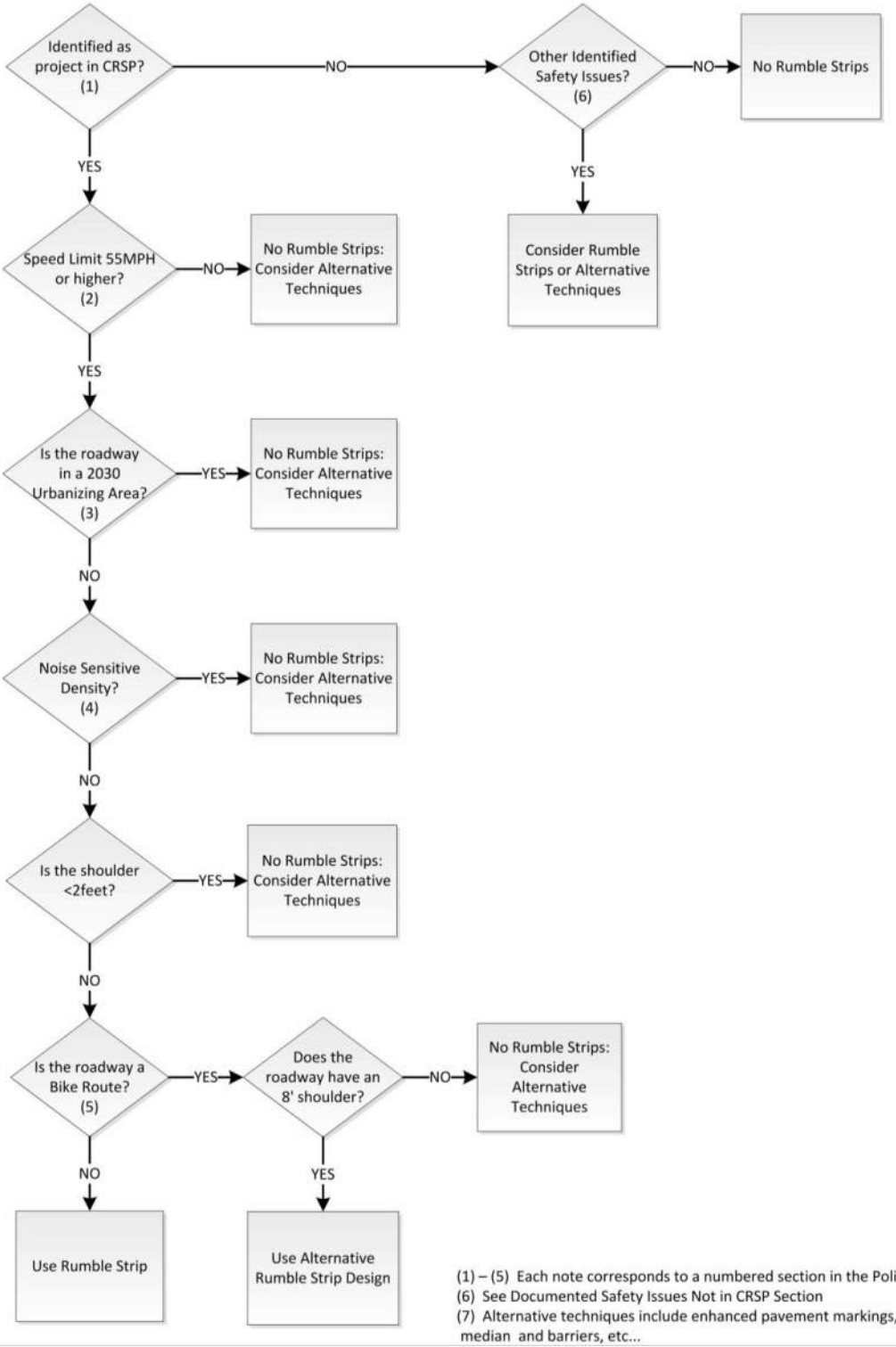
It is Carver County's long-term goal to reduce road departure and head-on crashes along all county highways utilizing the most appropriate technique. Given that the Carver County system includes approximately 270 miles of roadway, implementation costs are extremely high. This will require using a phased approach to construct and install the edge line and centerline improvements over several years, as funding permits.

POLICY

Carver County will periodically evaluate the rural county highway system, based on the County Road Safety Plan, traffic volumes, road departure crashes, bike use, shoulder characteristics, land use, and residential density, and will establish a priority for implementation of rumble strips consistent with the following flowchart and criteria.

Carver County
Division of Public Works

RUMBLE STRIP POLICY FLOW CHART



(1) – (5) Each note corresponds to a numbered section in the Policy Criteria
(6) See Documented Safety Issues Not in CRSP Section
(7) Alternative techniques include enhanced pavement markings, safety edge, median and barriers, etc...

Carver County's approach to implementing edge line enhancements will include two basic components:

1. Including safety strategies in traditional maintenance and regular construction projects.
2. Adding safety strategies by undertaking stand-alone projects that capitalize on securing state and federal highway safety improvement funds.

POLICY CRITERIA

Rumble strips in the travelled way have several potential pitfalls that should be considered carefully in any decision to implement them, including the following:

- Noise that may disturb nearby residents
- Potential loss-of-control problems for motorcyclists and bicyclists
- Difficulties created for snowplow operations
- Inappropriate driver responses, such as using the opposing travel lanes to drive around the rumble strips

With this policy Carver County is trying to balance the safety benefit of rumble strips with the noise nuisance for nearby residence utilizing the following criteria:

1. If the segment of roadway has been identified in the County Road Safety Plan as a candidate for rumble strip installation. These projects have been chosen based on roadway ADT, density of lane departure crashes, access density, curve critical radius density, and edge line risk.
2. Rumble strips will not be installed if the posted speed limit is less than 55mph.
3. Rumble strips will not be installed if the segment is within a 2030 urbanizing area as determined by the Carver County Comprehension Plan.
4. If rumble strips are considered for a roadway the design will allow for a break in the rumble strips within 650 feet of a residence (see Noise Sensitive Density Guidelines Section below). A segment of rumble strips will only be installed if it is at least a 1320 foot (1/4 mile) continuous segment. Each segment will be analyzed to determine if the allowable rumble strip installation areas are worthwhile for the segment.
5. If the segment falls within an actively used Bicycle route, it will then be analyzed for existing shoulder widths and a possible alternative rumble strip design will be chosen (see Bicycle Design Guidelines Section below).

BICYCLE DESIGN GUIDELINES

For locations designated as bike routes or routes with regular bike traffic, also consider:

- At locations with paved shoulder, moving the rumble to the outside edge of the paved shoulder to provide space for the bicyclist to move between the roadway lane and shoulder without having to run over the rumbles

- At locations without shoulders, consider bike-friendly designs (such as 48-foot grooves with a 12-foot skip) or adding a narrow paved shoulder, moving the edge line to 11 feet, and adding the rumbles to the outside edge of the shoulder.

NOISE SENSITIVE DENSITY GUIDELINES

The National Cooperative Highway Research Program (NCHRP) Report 641, Guidance for the Design and Application of Shoulder and Centerline Rumble Strips, states that terminating rumble strips 656 feet prior to a residential or urban area results in tolerable noise impacts. The report also states that a recent survey of residence show the majority of people find the external noise produced from centerline rumble strips to be acceptable or tolerable and that the potential driver safety outweighed the effect of the external noise.

DOCUMENTED SAFETY ISSUES NOT IN COUNTY ROAD SAFETY PLAN

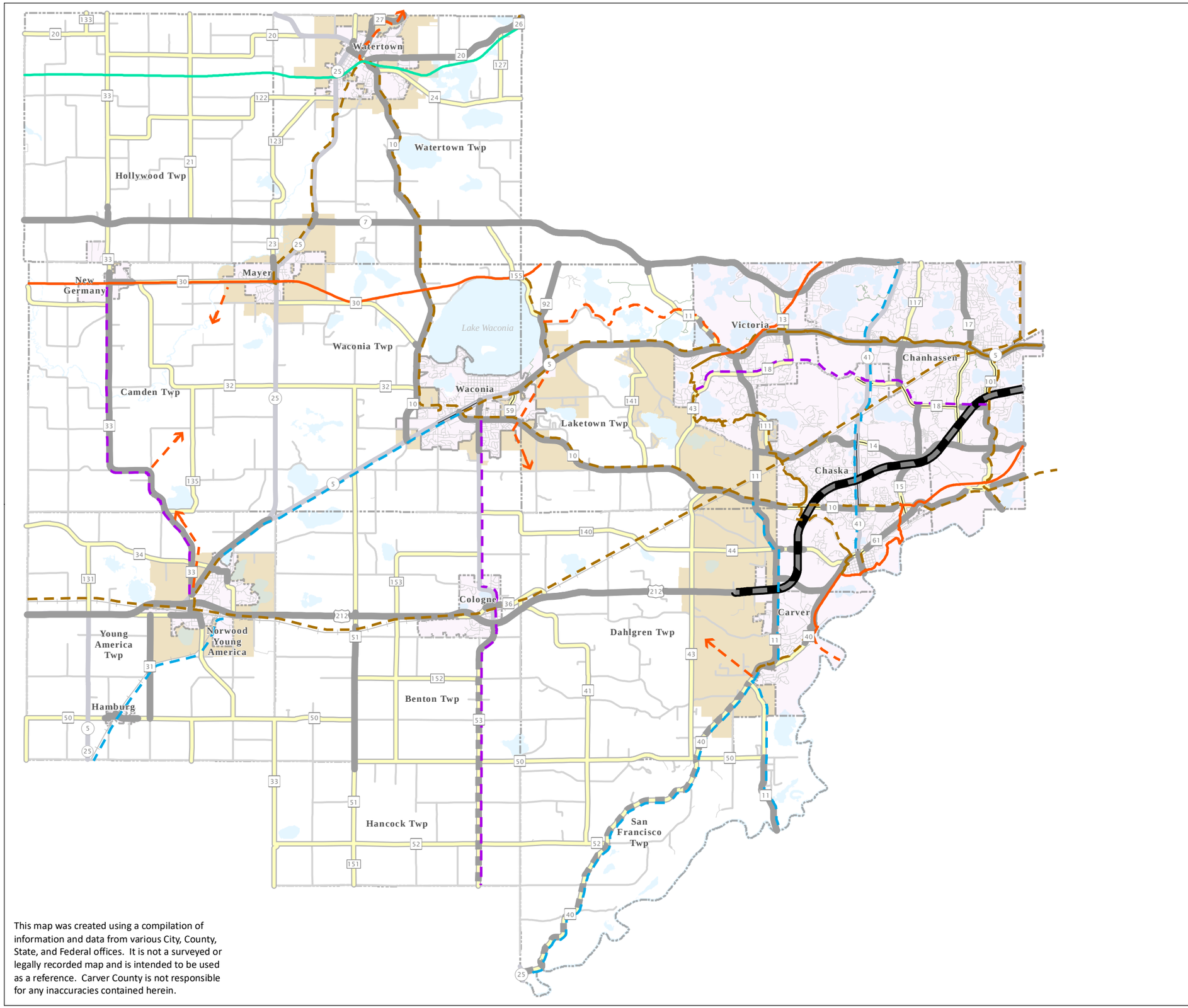
Carver County Public Works will also consider utilizing rumble strips along a segment of roadway if there is a documented safety problem. If this occurs, proper public involvement will be the main part of the project scope.

Attachment I:

Carver County Comprehensive Plan Excerpt: Planned Bikeways

Existing and Planned On or Off-Road Bike Facilities

Figure 4.23



Legend

Trails

- Existing Destination State Trail
- Existing Destination Regional Trail
- Existing Linking Regional Trail

Future Trails

- Future Destination Trail
- Future Linking Trail
- Future Local Trail
- Proposed Regional Linking Trail
- Bicycles Prohibited

Bicycle Facilities

- Paved Road Shoulders Greater Than 4 Feet
- Shoulder Widening Projects - Resulting in Paved Shoulder Greater Than 4 Feet

Existing Roadway Network

- 2 Lane County Road
- 4 Lane County Road
- 2 Lane Trunk Highway
- 4 Lane Trunk Highway

City/Township Boundary

- Existing City
- City Growth Areas 2040

0 1 2 4 Miles

CARVER COUNTY
Public Works Division
11360 Hwy 212, Suite 1
Cologne, MN 55322
(952) 466-5200
Created: 9/19/2019

This map was created using a compilation of information and data from various City, County, State, and Federal offices. It is not a surveyed or legally recorded map and is intended to be used as a reference. Carver County is not responsible for any inaccuracies contained herein.