HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Final Report

December 31, 2020

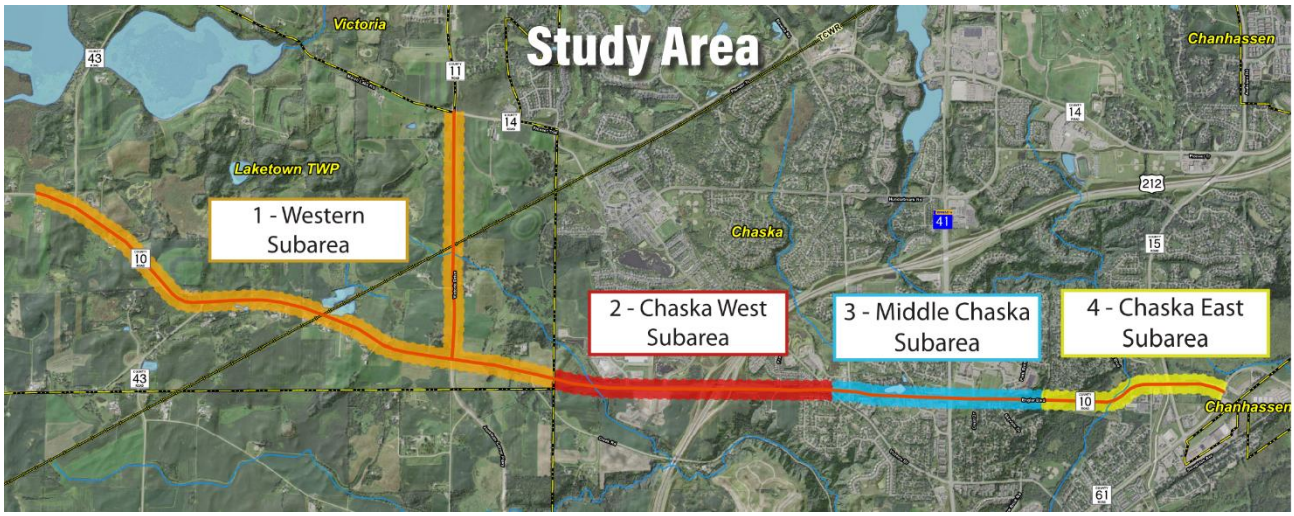
TABLE OF CONTENTS

FIGURES

TABLES

EXECUTIVE SUMMARY

Project Area Map



Carver County | MnDOT | City of Chaska | City of Victoria | Laketown Township

Overview of Corridors

Carver County in partnership with the Cities of Chaska and Victoria and the Minnesota Department of Transportation (MnDOT), worked together to identify transportation system improvements on County State Aid Highway (CSAH) 10 and CSAH 11. These corridors connect the southwest metro area and provide access and connectivity within the local communities they serve. Both are important corridors serving multiple modes of transportation including automobiles, freight, transit, bicycles and pedestrians. Carver County initiated this project to identify improvements that can be made to CSAH 10 and CSAH 11 over the next 20 years to reflect the transportation needs of the region and the communities they serve.

Carver County desired to identify future improvement needs on CSAH 10 from Victoria to Chaska The Highway 10 Corridor Study was initiated to identify and prioritize improvements to address existing issues, prepare for future growth, and establish a funding and implementation plan to improve the critical east-west corridor.

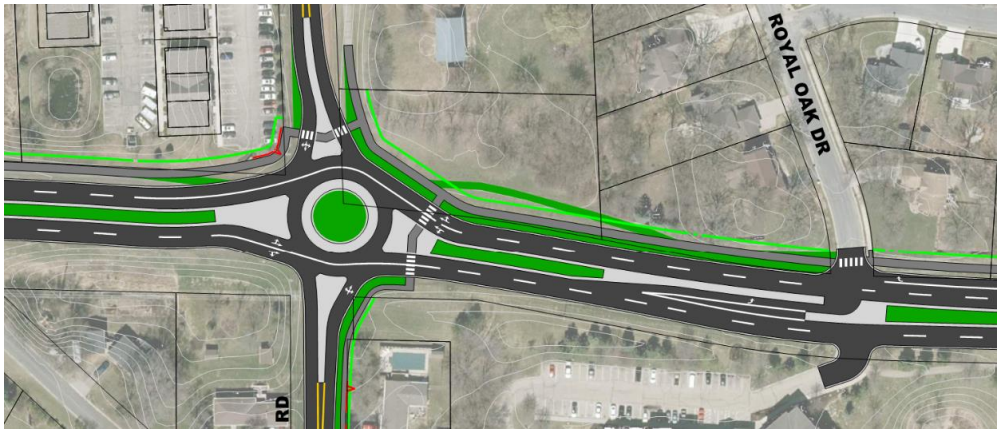
Project Objectives

The overall objective of this project was to identify future corridor improvements on both CSAH 10 and CSAH 11 to address the transportation needs of the region and the local communities these roadways serve. Partners worked to:

- Establish goals and objectives for the corridors
- Define issues and potential opportunities along the corridors
- Develop and evaluate improvement alternatives
- Reach consensus on recommendations
- Develop an implementation plan prioritizing projects over the next 20 years

Recommendations

Project partners developed recommended improvements for each of the project subareas. The recommendations created a shared vision for future improvements for CSAH 10 and CSAH 11 such as changes in the number of lanes, intersection control, access management and pedestrian/bicycle accommodations. An improvement layout similar to the example shown below, was developed for each recommendation along with estimated costs



Example of recommended improvement of CSAH 10.

Implementation Plan

Project partners put recommendations into implementation timeframes based on input from corridor stakeholders, the public and elected officials. The implementation plan describes individual projects, potential funding sources, lead agency, project costs (construction and right-of-way), and the anticipated timeframes for completion.

Additional design, studies and public input will be needed for each of the recommended improvements to move forward. The concepts developed as part of this study are high-level and will need additional refinement through preliminary and final design. Environmental review and permitting will also be required with exact requirements based on the scope of the project and the funding source.

The improvement options identified within this study and the projects prioritized as part of the implementation plan will help obtain a shared vision among project partners, stakeholders and the general public. Study partners must continue to work together to further plan, obtain funding, design, and implement the recommended improvement projects. All partners have an active role in implementing these improvements. All competitive funding sources should be considered. Agencies should also update their comprehensive and transportation plans to include these findings to better leverage funding sources.

I. HIGHWAY 10 CORRIDOR STUDY OVERVIEW

A. INTRODUCTION

Highway 10 provides a major connection in Carver County serving the cities of Chaska, Waconia and others in the County, along with Laketown Township, the growth area for the City of Victoria. Carver County, in collaboration with the cities of Chaska, Victoria and Laketown Township, as well as the Minnesota Department of Transportation (MnDOT) completed the Highway 10 Corridor Study to identify transportation system improvements on Highway 10 (**Figure 1**). This effort began in 2018 and was completed in 2020.

The Highway 10 Corridor Study guides future improvements to the Highway 10 corridor and establishes improvement recommendations that ensure it operates safely and efficiently into the future. Through this study, project staff:

- Defined issues and potential opportunities for both today and the future
- Developed and evaluated potential infrastructure improvement alternatives to address existing and projected issues and to guide future growth and development
- Established improvement recommendations
- Developed a long-term implementation plan that can be phased in over time.

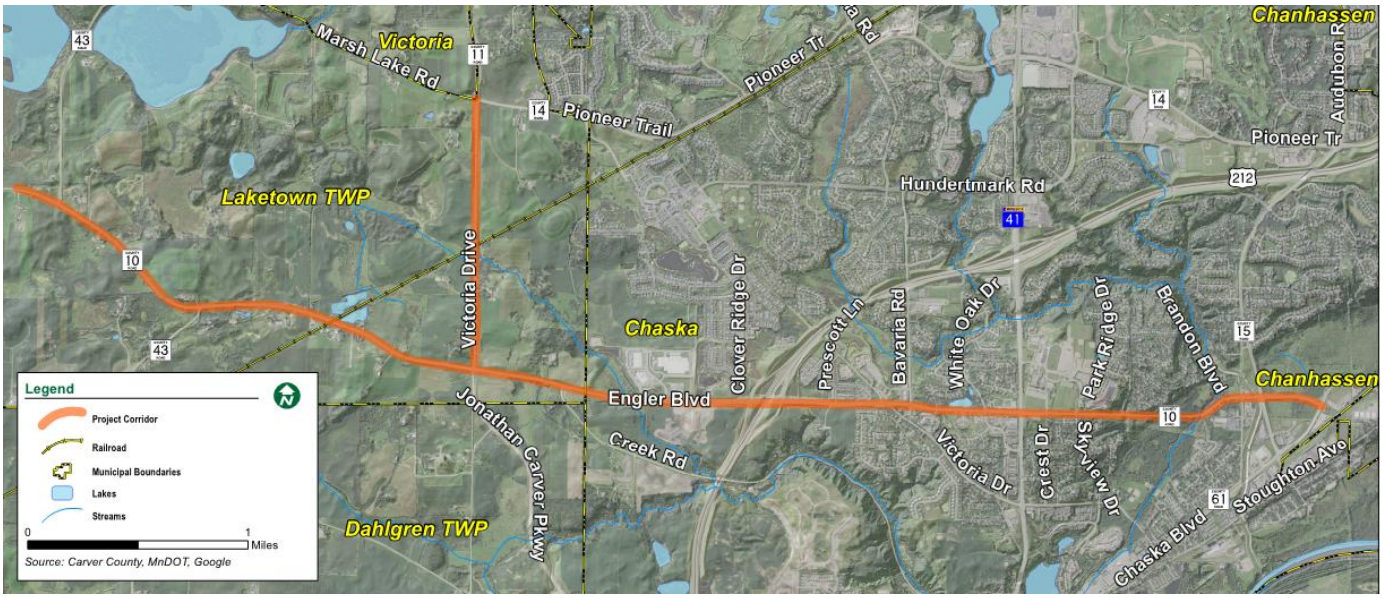


Figure 1. Study Area.

B. PUBLIC INVOLVEMENT

Agency coordination and public involvement were key components to the successful development of the Highway 10 Corridor Study. This required early and continuous involvement of all affected interests identified during the initial stages of the project. To document these different agencies, groups and interests and to define their roles and goals in the project, a Public Involvement Plan was developed. The Public Involvement Plan is included in **Appendix A**.

The study was led by a Project Management Team (PMT) and a Technical Advisory Committee (TAC). The PMT was comprised of staff from Carver County and Bolton & Menk and focused on study schedule, process and deliverables. The TAC was comprised of planning and engineering staff from Carver County, the City of Chaska, the City of Victoria, the City of Waconia, Laketown Township, MnDOT, and Bolton & Menk. The TAC typically met monthly over the course of the 2-year process to review technical analysis and provide recommendations to the Chaska and Victoria City Councils, the Laketown Township Board, and the Carver County Board. Public and agency input was vital to the study and is described in more detail within Parts II and III in respect to eastern and western area projects. Copies of meeting summaries are in **Appendix A. Figure 2** illustrates the decision-making flow of the study and how public and agency input was considered.

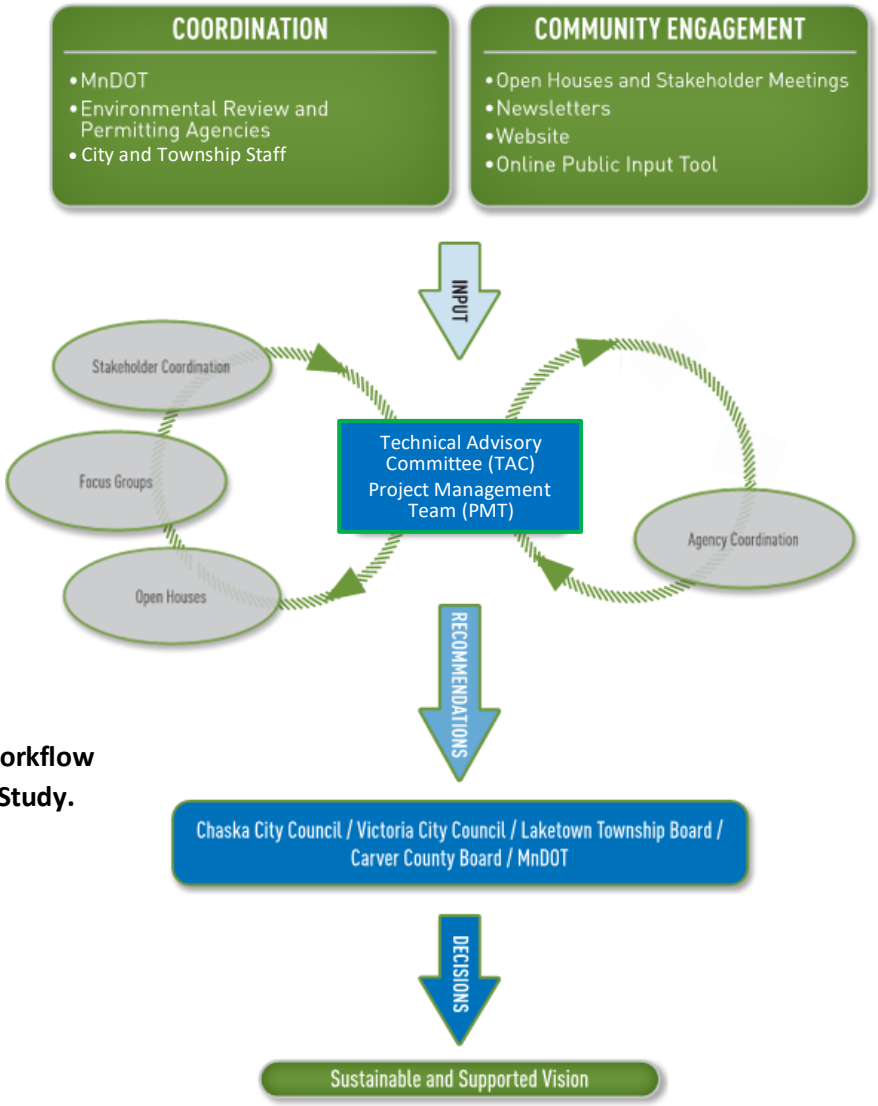


Figure 2. Decision-Making Workflow for the Highway 10 Corridor Study.

C. REPORT ORGANIZATION

EXISTING CONDITIONS ORGANIZATION

The first step in the study was to develop an Existing Conditions Memorandum to document existing deficiencies and needs and the future no-build condition. During the existing conditions process, the project area was divided into four parts as illustrated in **Figure 3** below. Conditions were documented for each subarea in the existing conditions memorandum included in **Appendix B**.

1. **Western Subarea:** Includes Highway 10 from approximately one-quarter of a mile west of its intersection with Highway 43 (W) to the Laketown Township/City of Chaska boundary. It also includes Highway 11 from its intersection with Highway 10 north to Highway 14 (Marsh Lake Road).
2. **Chaska West Subarea:** Includes Highway 10 from the Laketown Township/City of Chaska boundary to Victoria Drive in Chaska.
3. **Middle Chaska Subarea:** Includes Highway 10 from Victoria Drive to Ridge Lane in Chaska.
4. **Chaska East Subarea:** Includes Highway 10 from Ridge Lane to Highway 61 in Chaska.

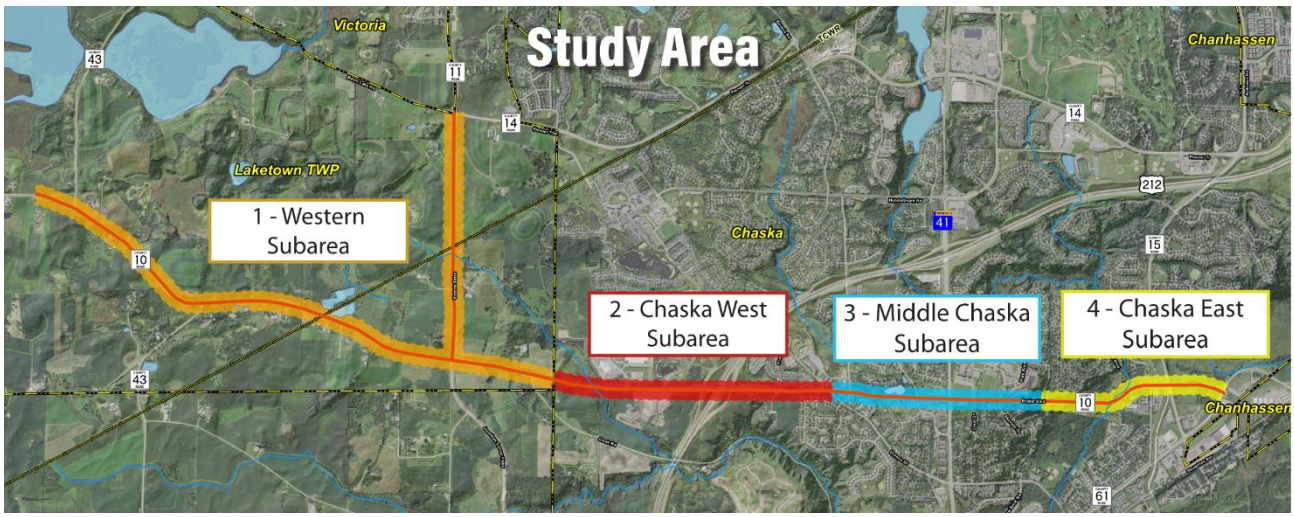


Figure 3. Project Subareas.

OVERALL STUDY ORGANIZATION

As the Study moved into the development and evaluation of improvement alternatives, the study area was split into two major areas, the Western Project Area (west of Highway 212) and the Eastern Project Area (east of Highway 212). The following sections include Part II. Eastern Project Area and Part III. Western Project Area.

D. PURPOSE AND NEED FRAMEWORK

Carver County, in collaboration with Chaska, Victoria and Laketown Township, initiated the Highway 10 Corridor Study – Victoria/Chaska Area, to identify transportation system

improvements on Highway 10 from Highway 43 in eastern Laketown Township to Highway 61 in the City of Chaska. The goal of the study is to identify long-term corridor improvements to support local and regional transportation needs.

PURPOSE

The purpose of proposed improvements is to:

- Effectively serve all users including passenger and freight vehicles, pedestrians, bicyclists, transit, and emergency services
- Accommodate anticipated development and increased traffic volumes on the corridor
- Plan for and maintain reasonable and convenient access to adjacent properties
- Improve the safety, reliability, and operations of the corridor for all users
- Support economic development and responsible growth in communities adjacent to Highway 10

BACKGROUND

Route Importance

Highway 10 is one of Carver County's most important roadways due to the connections made and traffic volumes served. The highway serves as a minor arterial roadway connecting Watertown, Waconia, Victoria/Laketown Township, and Chaska. It serves a diverse mix of personal vehicle, freight, transit and pedestrian/bicycle traffic. Trunk Highway (TH) 212, a principal arterial, intersects with Highway 10 in the central portion of the project area. Additional minor arterials (Highway 11, Highway 15, Highway 61), major collectors (Victoria Drive/Bavaria Road), and minor collectors (Clover Ridge Drive) intersect the corridor. Overall, existing local residential, commercial, industrial, and recreational uses and future growth areas in Chaska and Victoria depend on the successful function of Highway 10.

NEED

Study partners seek to address the following needs for Highway 10 and its supporting roadway network.

Consistency with State and Local Plans

Previous planning efforts for the study area emphasized the importance of the Highway 10 corridor for local and regional transportation, and the need to make improvements to address existing deficiencies and accommodate future growth. These studies include:

1. Highway 61/Highway 41 Improvements Project (2018)
2. Carver County 2040 Comprehensive Plan (2020)
3. Carver County – County Roadway Safety Plan (2013)
4. City of Chaska 2030 Comprehensive Plan (2008)
5. City of Chaska 2040 Comprehensive Plan (2019)

6. Highway 44 (Big Woods Boulevard) and TH 212 Interchange Design Project (2011)
7. Southwest Chaska Plan (2012)
8. Chaska Creek AUAR/EAW/Independent Traffic Analysis (2010)
9. City of Chaska Safe Routes to School Plan (2016)
10. City of Victoria 2040 Comprehensive Plan (2019)
11. City of Victoria – Victoria Worx Small Area Plan DRAFT (2020)

Proposed improvements identified through these studies include roadway expansion, roadway realignment and/or reconstruction, intersection reconfiguration, and pedestrian oriented safety improvements.

Previous planning efforts have also identified that Carver County and the study area communities are projected to realize significant growth within the next 20 years. **Table 1** shows the County is projected to grow from approximately 108,000 in 2020 to 161,000 by 2040, a 49 percent increase. Chaska is planning for a 35 percent increase and Victoria projects a doubling of their existing population for an increase of 54 percent. A large portion of Victoria's and Chaska's growth will occur near the Highway 10 study area. Specifically, near-term projects are planned for the properties in the northwest quadrant of the Highway 10/Highway 11 intersection as well as south of Highway 10 surrounding TH 212. Additional collector roadways will be needed to connect future development to Highway 10. Access spacing and supporting local roadway networks will be important to ensure mobility and safety on Highway 10.

TABLE 1. Population, Household, and Employment Forecasts (2010-2040)

	Chaska	Victoria	Laketown Township	Carver County
Population				
2010	23,770	7,345	2,243	91,042
2020	27,100	10,000	1,430	108,520
2030	32,000	12,600	640	135,960
2040	36,600	15,400	0	161,240
Change 20-40	35%	54%	n/a	49%
Households				
2010	8,816	2,435	660	32,891
2020	10,400	3,500	530	40,940
2030	12,300	4,570	260	52,180
2040	14,200	5,700	0	62,590
Change 20-40	37%	63%	n/a	53%
Employment				
2010	11,123	1,502	116	31,836
2020	13,600	2,100	170	42,190
2030	16,000	2,380	80	48,100
2040	17,600	2,600	0	54,738
Change 20-40	29%	24%	n/a	30%

Source: US Census, Metropolitan Council

Key Finding: Highway 10 traverses major development areas within the City of Victoria, City of Chaska, and Laketown Township. Substantial population, household and employment growth are expected to occur throughout the study area through 2040, adding demands to the roadway network. Supporting roadways, new accesses, and improvements to existing infrastructure will need to be carefully planned.

CAPACITY

Existing Operations

Highway 10 carries between 3,350 and 14,100 vehicles per day. **Table 2** shows that intersections along the corridor mostly operate at acceptable levels today with the exception of the Highway 10/Creek Road intersection which exhibits LOS E from certain approaches during peak traffic periods. Unacceptable turning movements and delays exist at the corridor's intersections with Highway 11, Creek Road, the TH 212 westbound ramp, Bavaria Road, Highway 41, and Highway 15.

TABLE 2. Existing Traffic Operations Analysis Results

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 10 & CSAH 43 West[1]	A/D	30 sec.	A/D	25 sec.
CSAH 43 East & CSAH 10[1]	A/C	15 sec.	A/C	24 sec.
CSAH 11 & CSAH 10[2]	D	50 sec.	C	30 sec.
Creek Rd & CSAH 10[1]	B/E	45 sec.	A/E	43 sec.
Clover Ridge Dr & CSAH 10	B	14 sec.	A	9 sec.
TH 212 WB Ramp & CSAH 10	B	12 sec.	B	16 sec.
TH 212 EB Ramp & CSAH 10	B	12 sec.	A	9 sec.
CSAH 10 & Prescott Ln[1]	A/B	11 sec.	A/C	15 sec.
CSAH 10 & Victoria Dr[1]	A/B	12 sec.	A/B	11 sec.
Bavaria Rd & CSAH 10	B	14 sec.	B	12 sec.
White Oak Dr & CSAH 10[1]	A/C	20 sec.	A/C	23 sec.
TH 41 & CSAH 10[3]	C	29 sec.	D	36 sec.
Crest Dr & CSAH 10[1]	A/C	15 sec.	A/B	11 sec.
Park Ridge Dr & CSAH 10[1]	A/B	11 sec.	B/C	15 sec.
CSAH 15 & CSAH 10	C	20 sec.	C	20 sec.

1) Indicates an unsignalized intersection with side-street stop/yield control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach delay.
2) Queues exceed 975 feet on the eastbound approach during the a.m. peakhour.
3) Queues exceed 600 feet on the southbound approach during the p.m. peakhour.

2040 No-Build Operations

Traffic volumes along the corridor are anticipated to nearly double as planned growth in the City of Victoria/Laketown Township, Chaska and areas to the west is realized. Without improvements, extended vehicle queuing is drastically increased along the corridor, particularly along the EB and WB approaches to Highway 11. Various intersections along the corridor are anticipated to be over capacity, exhibiting LOS F in AM, PM, or both peak hour periods as shown in **Table 3**. These intersections include Highway 10 with Highway 43 (east and west intersections), Highway 11, Creek Road, Prescott Lane, Victoria Drive, Bavaria Road, White Oak Drive, Highway 41, Crest Drive, and Park Ridge Drive. Almost all intersections exhibit unacceptable traffic delays by movement.

TABLE 3. No-Build Traffic Operations Analysis Results

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 10 & CSAH 43 West[1]	F/F	> 2 min.	A/F	87 sec.
CSAH 43 East & CSAH 10[1]	F/F	> 2 min.	F/F	> 2 min.
CSAH 11 & CSAH 10[2]	F	> 2 min.	F	> 2 min.
Creek Rd & CSAH 10[1]	F/F	> 2 min.	F/F	> 2 min.
Clover Ridge Dr & CSAH 10	D	43 sec.	D	37 sec.
TH 212 WB Ramp & CSAH 10	D	45 sec.	E	61 sec.
TH 212 EB Ramp & CSAH 10	C	16 sec.	B	12 sec.
CSAH 10 & Prescott Ln[1]	D/F	> 2 min.	A/D	28 sec.
CSAH 10 & Victoria Dr[1]	F/F	> 2 min.	A/C	29 sec.
Bavaria Rd & CSAH 10[3]	F	56 sec.	F	86 sec.
White Oak Dr & CSAH 10[1]	B/F	57 sec.	E/F	> 2 min.
TH 41 & CSAH 10[4]	D	41 sec.	F	112 sec.
Crest Dr & CSAH 10[1]	A/C	22 sec.	D/F	> 2 min.
Park Ridge Dr & CSAH 10[1]	B/C	18 sec.	E/F	65 sec.
CSAH 15 & CSAH 10	C	29 sec.	D	49 sec.

1) Indicates an unsignalized intersection with side-street stop/yield control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach delay.
2) Queues exceed 3,100 feet on the eastbound approach, 2,000 feet on the northbound approach, and 1/2 mile on the southbound approach during the a.m. peakhour. Queues exceed 3/4 miles on the westbound approach during the p.m. peak hour.
3) Queues exceed 1/2 miles on the eastbound approach during the a.m. peakhour and 2,500 feet on the westbound approach during the p.m. peak hour.
4) Queues exceed 2/3 miles on the southbound approach and 1,000 feet on the westbound approach during the p.m. peakhour.

Key Finding: Traffic volumes are anticipated to nearly double in the study area causing many intersections to exceed capacity and significant traffic delays to develop along the corridor. Roadway capacity improvements will be essential for future roadway efficiency.

SAFETY

Highway 10 is experiencing crash issues. **Tables 4** and **5** show crash counts are above expected range at Highway 11 and Bavaria Road and are nearing levels above the expected range at Highway 41 and Park Ridge Drive. The segment of Highway 10 between CSAH 43 W and Creek Road also observes crash counts above the expected range. Six pedestrian crashes have occurred at the Highway 10/Highway 41 intersection which is near Chaska's Middle Schools, Elementary School, and Community Center. The Highway 41/61 Corridor Study identified possible solutions for improving pedestrian crossings at this intersection that will need further consideration.

Access to neighborhoods such as the White Oak Drive neighborhood can be problematic as residents experience difficulties exiting the neighborhood onto Highway 10 eastbound. This neighborhood is served by only one access onto Highway 10 which exacerbates the issue in peak traffic times. In addition, this access is located approximately 800 feet from the Highway 41/Highway 10 signalized intersection which leads to traffic stacking at the signal through the White Oak Drive intersection.

TABLE 4. Intersection Crash Summary (January 1, 2013-December 31, 2017)

Intersection	Total Crashes	Severe Crashes (K + A)	Actual Crash Rate	Statewide Average	Critical Rate	Critical Index
CSAH 10 & CSAH 43	5	0	0.22	0.25	0.54	0.41
CSAH 43 & CSAH 10	7	0	.34	0.25	.56	0.61
CSAH 11 & CSAH 10	27	2	0.95	0.40	0.72	**1.32**
Creek Rd & CSAH 10	4	0	0.14	0.25	0.52	0.27
Clover Ridge Dr & CSAH 10	9	0	0.39	0.40	0.76	0.51
TH 212 WB Ramp & CSAH 10	8	1	0.31	0.40	0.74	0.42
TH 212 EB Ramp & CSAH 10	2	0	0.12	0.40	0.82	0.15
CSAH 10 & Prescott Ln	0	0	0.00	0.18	0.51	0.00
CSAH 10 & Victoria Dr	2	0	0.14	0.18	0.51	0.27
Bavaria Rd & CSAH 10	19	0	0.81	0.35	0.69	**1.17**
White Oak Dr & CSAH 10	8	0	0.38	0.25	0.56	0.68
TH 41 & CSAH 10	53	0	0.98	0.70	1.00	0.98
Crest Dr & CSAH 10	0	0	0.00	0.18	0.51	0.00
Park Ridge Dr & CSAH 10	9	0	0.58	0.25	0.61	0.95
CSAH 15 & CSAH 10	5	0	0.22	0.52	0.92	0.24

TABLE 5. Segment Crash Summary (January 1, 2013-December 31, 2017)						
Segment	**Total Crashes (Segment)**	**Severe Crashes (K + A)**	**Actual Crash Rate**	**Statewide Average**	**Critical Rate**	**Critical Index**
CSAH 10 – CSAH 43 to Creek Road	53	0	1.22	0.77	1.12	1.09
CSAH 10 – Creek Road to Prescott Lane	27	1	2.74	2.77	4.19	0.65
CSAH 10 – Prescott Lane to CSAH 15	61	0	2.95	2.13	2.98	0.99

Key Finding: The corridor exhibits high crash counts at various intersections including areas of high pedestrian traffic surrounding schools. Safety improvements including safe routes to school infrastructure will need to be incorporated into study recommendations.

PEDESTRIAN AND BICYCLE

Gaps exist in the pedestrian/bicycle network throughout the western project subarea and from Ridge Lane to Old Audubon Road in the eastern subarea. Carver County plans to incorporate a linking trail to complete the missing segments for a more complete system. Children have been observed walking along the shoulders of corridor on their way to area schools. Regional trails are planned along the corridor from the Southwest Regional Trail in the east to points west and also along the Twin Cities Western Railroad (TCWR) rail line. An existing regional trail exists along Highway 11 south of the corridor. Highway 11, Highway 10, and Highway 41 are designated as Tier 2 Alignments on the Regional Bicycle Transportation Network (RBTN). Highway 11 and new roads extending through the Southwest Chaska Growth Area are designated as Tier 2 Corridors on the RBTN as well.

There is an uncontrolled pedestrian crossing at the intersection of Highway 10 with the East Chaska Creek Trail. This crossing is located in a 50 mile per hour zone at the beginning of a curve in the roadway in which there is a warning sign.

Key Finding: Pedestrian and bicycle facilities are present along and across the corridor including off-street trails and regional trail connections, however, the system is incomplete and lacks safe connections to area schools. Completing pedestrian and bicycle connections along the corridor will be essential for vehicle and pedestrian/bicyclist safety as traffic volumes increase and growth occurs.

ENVIRONMENTAL CONSIDERATIONS

There are various Social, Economic, and Environmental (SEE) resources in proximity to the study area that need to be considered that include prime farmland resources, threatened & endangered species, contaminated locations, Section 4(f) and 6(f) properties, and potential environmental justice populations. The East Chaska Creek is a Section 6(f) resource that crosses the corridor in the Chaska East Subarea. The Brandondale Mobile Home Park is a low-income housing development

likely containing environmental justice populations. **Table 6** provides a summary of the initial environmental screening.

TABLE 6. Environmental Screening Summary		
Topic	**Considerations**	**Existing and Planned Conditions**
Social and Community	Access and compatibility considerations	Social and institutional resources are located east of TH 212 and include parks, churches, the Chaska Middle School and the Community Center.
Environmental Justice	Avoid/mitigate disproportionate impacts to low income and minority populations	The Brandondale Mobile Home Park is a large manufactured housing development in the Chaska East Subarea and has high potential for housing environmental justice populations.
Section 4(f) and 6(f) Resources	Special evaluation, coordination, and documentation, and possible mitigation	Meadow Park, Community Center Park, and Lion's Park are potential Section 4(f) resources in the study area. The East Chaska Creek Trails is a Section 6(f) resource.
Traffic Noise	Identify noise receptors and comply with federal and state requirements	There are various potential noise receptors adjacent to the study corridor, primarily residential neighborhoods but also including parks, trails, and schools.
Farmland	Farmland conservation policies	Land adjacent to the corridor, west of TH 212 is agricultural and much is designated prime farmland. Improvements will need to comply with applicable regional and local farmland conservation policies.
Historic/Archaeological	Special evaluation, coordination, and documentation, as well as possible mitigation	No listed historic sites were identified in the vicinity of the project that have potential to be impacted from improvements.
Soils/Erosion	Compatibility with construction/drainage design	Soils data does not indicate soils in the study area are highly susceptible to erosion. Geotechnical analysis will be needed for suitability and correction.
Utilities	Conflicts with utilities may increase schedule and cost requirements	Overhead and buried power lines, sanitary sewer, as well as storm sewer are located along the corridor and will need to be considered in improvement design.
Water Resources	Impacts need to be avoided/limited per regulatory requirements	National Wetland Inventory (NWI) wetland areas, calcareous fens, and FEMA 100-year floodplains have been identified. Considerations will need to be addressed in corridor planning and design particularly near the Seminary Fen Wetland Complex in the Chaska East Subarea.
Drainage	Existing drainage systems, sensitive	The western half of the project has rural section design with drainage conveyed via ditches. The

TABLE 6. Environmental Screening Summary		
Topic	**Considerations**	**Existing and Planned Conditions**
	waters and regulatory requirements	urban sections are primarily associated with the crossings at TH 212, TH 41, and Highway 15. Drainage generally runs to the Minnesota River from the corridor which is an impaired waterway.
Contaminated Properties	Potential construction delays/costs and potential cleanup liability	The Minnesota Pollution Control Agency (MPCA) identifies one known fuel spill site associated with Chaska Middle School West, but this was addressed and administratively closed by MPCA in 2004. The spill would have been well off the study corridor. No other sites of concern were identified.
Fisheries	Trout streams, fish migrations, spawning runs, and unique habitat conditions	There are no trout streams within a mile of the project corridors or known unique fisheries considerations.
Vegetation	Native plant communities, landscape vegetation, functional vegetation, high value vegetation, and hazard trees	Land adjacent to the corridor is generally agricultural, residential, commercial, or institutional/civic. There are regionally significant ecological areas as defined by the MnDNR in or adjacent to the Seminary Fen area, within Lions Park south of CSAH 10 at the east end of the corridor, and adjacent to CSAH 10 on the north side at the railroad crossing in Laketown Township.
Protected Species	Federal and state designations, coordination and review requirements, potential mitigation	There are three federally protected species known to be in Carver County: northern long-eared bat, Minnesota dwarf trout lily, and rusty-patched bumble bee. The Natural Heritage Information System (NHIS) shows no occurrences of state-protected species or habitat within ¼ mile of the corridor.

Key Finding: Roadway design options will need to carefully consider sensitive social, environmental, and economic resources and environmental justice populations. It is possible that mitigation may be necessary in the case of direct impacts.

E. GOALS, OBJECTIVES, AND PERFORMANCE MEASURES

Table 7 outlines the goals and objectives for the Highway 10 Corridor Study. The goals and objectives are intended to align with state and local transportation plans as much as possible. They build off the existing conditions, issues and needs outlined in the Purpose and Need Framework and define desired results or outcomes. Multiple objectives for each goal exist to provide additional details on how the goal can be achieved. The goals and objectives were used as the framework to guide the identification and evaluation of improvement alternatives throughout the study process.

Appendix C provides a full listing of goals, objectives and performance measures for the study as well as an indication of which subarea they apply.

COMPATIBILITY WITH PARTNER GOALS

Goals, objectives and performance measures were measured for compatibility with partner agency goals. **Appendix C** also includes a matrix showing the relationship between CSAH 10 Corridor Study

Table 7. Highway 10 Corridor Study Goals and Objectives	
Goal	**Objective**
GOAL A: Provide efficient and reliable vehicle mobility.	Provide acceptable system reliability serving planned growth.
	Provide acceptable travel times.
	Understand and plan for freight needs.
	Manage access consistent with roadway function and access spacing guidelines when applicable.
	Provide a connected transportation system that accommodates trips consistent with roadway function.
	Plan for future transportation modes and technological changes.
	Accommodate future transit plans and needs.
	Understand and plan for roadway expansion needs.
Goal B: Safely accommodate all system users.	Reduce crash and severity rates below statewide averages for comparable facilities.
	Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.
	Accommodate reasonable access.
	Maintain community connections and local access for all modes.
	Address intersection visibility and site line issues.
	Provide safe vehicle and pedestrian crossings of railroad facilities.
GOAL C: Provide a comprehensive transportation network that supports existing and future land development.	Safely and efficiently accommodate vehicle access to and through existing and future development.
	Safely accommodate pedestrian and bicycle access to and through existing and future development.
GOAL D: Provide infrastructure improvements compatible with the environment.	Avoid, minimize, and mitigate impacts to historic properties.
	Avoid, minimize, and mitigate impacts to cultural resources.
	Avoid, minimize, and mitigate impacts to the built environment.
	Avoid, minimize, and mitigate impacts to sensitive environmental resources.
	Meet stormwater management requirements.
	Provide context sensitivity.
	Provide opportunities for environmental enhancements.
	Meet air quality requirements.
	Meet noise impacts requirements.
GOAL E: Develop a financially responsible implementation plan.	Right-size improvements to address needs yet maximize use of existing infrastructure where possible.
	Develop project priorities that meet schedule and funding constraints and maximize opportunities.
	Develop a supported funding model to clearly identify agency responsibilities.
	Seek federal and state grants to leverage projects while minimizing local costs.

Table 7. Highway 10 Corridor Study Goals and Objectives

goals and the adopted goals of partner agencies (identified by agency and source). This demonstrates consistency between project goals and broader goals previously approved by the partners.

II. EASTERN PROJECT AREA

A. EASTERN PROJECT AREA OVERVIEW

The Eastern Project Area includes Highway 10 from TH 212 to Highway 61 in Chaska. Highway 10 is a minor arterial roadway in this segment carrying a range of 3,750 to 10,800 vehicles per day and is mostly a two-lane section. Portions of the roadway are four-lane including the section extending from Prescott Lane west to W Creek Lane in the Western Project Area and from Old Audubon Road east to Highway 61.

Highway 10 through the Eastern Project Area provides access to several residential neighborhoods containing hundreds of residences, Chaska Middle Schools and the La Academia Elementary School, the Chaska Community Center, Chaska Municipal Services, and Chaska Fire Department. It also serves as a connection to Highway 41, a major freight corridor in the region.

Traffic is anticipated to grow significantly in this section, doubling in some segments. The no-build scenario for 2040 indicates major delays and disruption to traffic operations in this section as 2040 volumes are realized. Most intersections are anticipated to exhibit unacceptable delays and backups extending the entire distance between intersections. Some contributing factors to the expected growth in the area includes growth in the nearby cities of Victoria and Waconia as well as the Chaska Big Woods development planned for the south side of the highway which will include additional access from Highway 10. **Figure 4** illustrates the Eastern Project Area Design Considerations showing existing conditions and projected condition considerations.

Concepts considered for the Eastern Project Area included both full movement and partial movement intersection treatments and additional traffic lanes.

B. CONCEPT EVALUATION

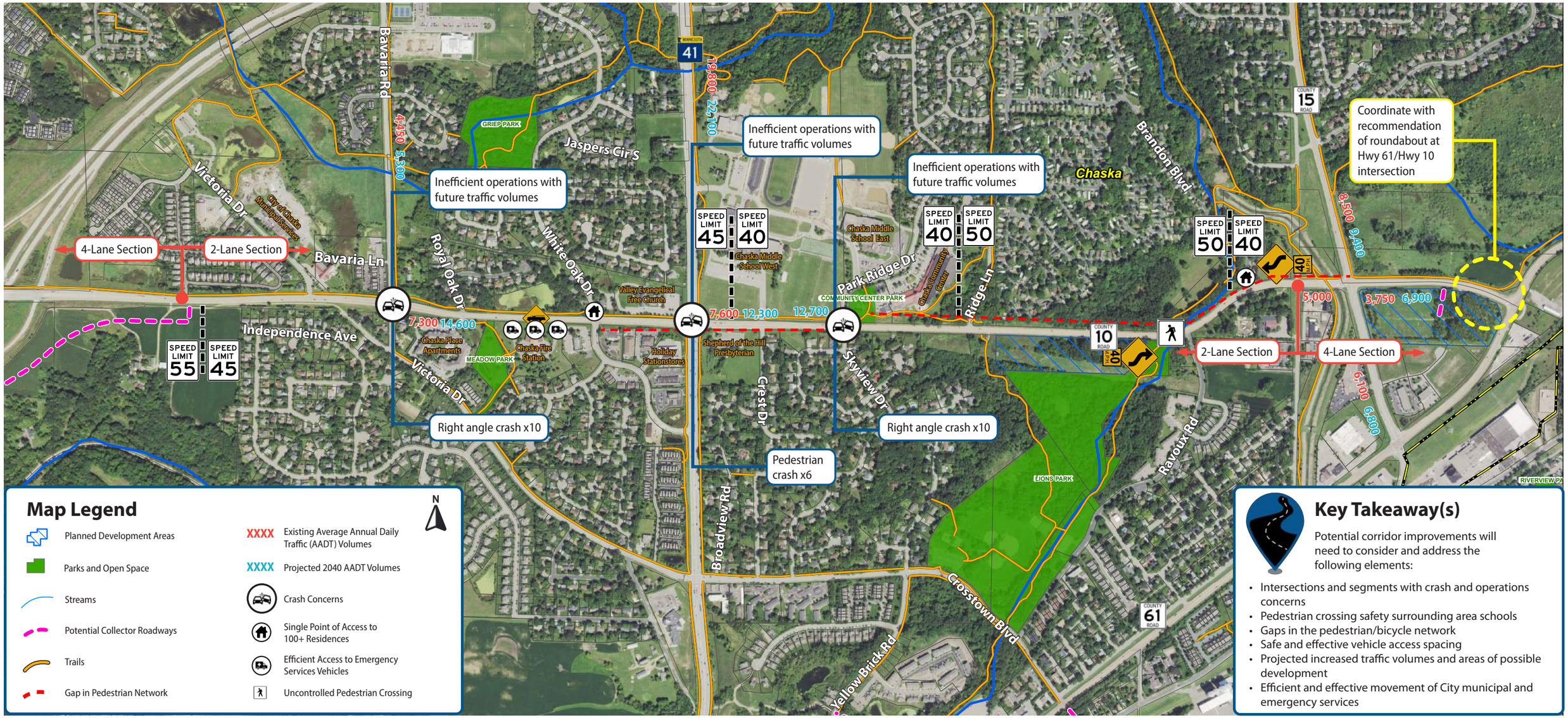
TIER 1 FATAL FLAW CONCEPT SCREENING

Based on technical analysis and input from the TAC, elected officials and the public, a Tier 1 screening was completed to identify fatal flaws and discuss concepts that do not meet the purpose and need framework or the study's goals. The Tier 1 screening generally dismissed concepts that did not meet safety and operations, mobility and access, and financial responsibility goals. **Table 8** identifies concepts from the Tier 1 Screening that were not recommended to be carried forward into the detailed Tier 2 evaluation.

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

CARVER COUNTY · DEPARTMENT OF TRANSPORTATION · VICTORIA Cities of Lakes & Parks · CITY OF Chaska MINNESOTA

Design Considerations Overview - East



Map Legend

N

- Planned Development Areas
- Parks and Open Space
- Streams
- Potential Collector Roadways
- Trails
- Gap in Pedestrian Network
- XXXX Existing Average Annual Daily Traffic (AADT) Volumes
- XXXX Projected 2040 AADT Volumes
- Crash Concerns
- Single Point of Access to 100+ Residences
- Efficient Access to Emergency Services Vehicles
- Uncontrolled Pedestrian Crossing

Key Takeaway(s)

Potential corridor improvements will need to consider and address the following elements:

- Intersections and segments with crash and operations concerns
- Pedestrian crossing safety surrounding area schools
- Gaps in the pedestrian/bicycle network
- Safe and effective vehicle access spacing
- Projected increased traffic volumes and areas of possible development
- Efficient and effective movement of City municipal and emergency services

Dismissed Concepts

The table below represents results from the initial fatal flaw screening which compared improvement concepts to the study's goals and objectives to identify inconsistencies and reasons for dismissal. The concepts identified below were not recommended to be carried forward into the detailed evaluation.

Table 8. Fatal Flaw Screening		
Dismissed Concepts	**Conflicting Goals**	**Reason Dismissed**
Highway 10 at White Oak Drive		
1. 2x1 Roundabout	*Environment, Safety, Mobility*	a) High potential for significant ROW impacts, including multiple full property acquisitions b) Large fluctuations in traffic may create queues backing into TH 41 and vice-versa, creating safety concerns
2. Connection to TH 41 or Bavaria Road	*Environment*	a) No support from MnDOT Traffic b) Would require 2-3 property acquisitions depending on connection location c) Potentially expensive due to grades, Chaska Creek and wetland impacts
Highway 10 at Highway 41		
3. Two-Lane Roundabout with Right-Turn Bypass Lanes	*Mobility, Safety, Ped/Bike Network, Environment*	a) Does not provide adequate traffic operations. Long delay for most movements. b) Safety could be a concern for pedestrians/bicycles with free right-turn bypass lanes c) Network could be confusing/stressful for pedestrians and bikes to navigate d) High potential for significant ROW impacts due to right-turn bypass lanes
Highway 10 – East of Park Ridge Dr to Audubon Road		
1. Four-Lane Roadway	*Mobility, Environment*	a) Does not provide significant capacity/traffic operations benefit compared to two-lane road b) High potential for ROW, wetland impacts depending on typical section
Highway 10 – East of Highway 212 to Audubon Road		
1. Rural Divided Section	*Mobility, Environment*	a) Does not easily allow for access management or intersection modifications as operations or safety concerns arise b) Does not fit the characteristics of the surrounding area c) High potential for ROW, wetland impacts depending on trails and walks added
2. Three-Lane Roadway	*Mobility*	a) Does not easily allow for access management or intersection modifications as operations or safety concerns arise b) Various sections over capacity under forecasted traffic volumes

Table 8. Fatal Flaw Screening.

RANGE OF CONCEPTS FOR TIER 2 EVALUATION

This section documents the Tier 2 evaluation process, technical analysis, recommendations, and stakeholder/public involvement leading to the ultimate selection of a locally preferred vision for the Highway 10 corridor within the Eastern Project Area. Following the Tier 1 Screening described in the section above, the remaining concepts were refined to further develop roadway typical sections, access management, and traffic control needs at intersections. The technical Tier 2 Evaluation was based on how each address the Goals and Measures previously discussed and how the impacts of each concept compared. The following section summarizes the comparison for the Eastern Project Area.

The following tables provide the comprehensive list of all Tier 2 concepts evaluated for the Eastern Project Area in the Highway 10 Corridor Study.

Table 9. Typical Section Concept Evaluation

TH 212 to Bavaria Road	Bavaria Road to Park Ridge Drive	East of Park Ridge Drive
• 2040 No-Build • 2-Lane Divided Urban • 4-Lane Divided Urban	• 2040 No-Build • 2-Lane Divided Urban • 4-Lane Divided Urban	• 2040 No-Build • 2-Lane Divided Urban • 4-Lane Divided Urban

Table 10. Intersection Concept Evaluation

CSAH 10 Bavaria Road	CSAH 10 and White Oak Drive	CSAH 10 and TH 41	Skyview Drive /Park Ridge Drive	CSAH 10 and CSAH 15
• 2040 No-Build • Traffic Signal • Single-Lane Roundabout (Expandable to 2x1)	• Two-Way Stop Controlled 2-Lane Divided • Two-Way Stop Controlled 4-Lane Divided • Restricted Access • Traffic Signal	• 2040 No-Build • Partial-Build Traffic Signal • Full Build Traffic Signal • 2-Lane Roundabout	• 2040 No-Build • Traffic Signal • Single-Lane Roundabout	• Improved Traffic Signal • Single-Lane Roundabout

GUIDING FRAMEWORK FOR CONCEPTS

Design considerations are summarized in **Figure 4** and the text that follows that influenced the range of concepts developed for the Eastern Project Area. These topics emerged through existing and no-build conditions review, early discussion with the TAC, and meetings with focus groups and stakeholders.

TH 212 to Bavaria Road

Highway 10 is currently a four-lane section from TH 212 to Prescott Lane and a two-lane section from Prescott lane to Bavaria Road. This section contains the intersections of Prescott Lane, Victoria Drive, and Bavaria Road and carries 7,300 vehicles per day. Traffic volumes are anticipated to double to 14,600 by 2040.

Figure 5. Highway 10 from TH 212 to Bavaria Road.

The study explored converting the roadway section from two- to four-lanes as well as alternatives for access consolidation and intersection control to alleviate traffic issues. This included reducing access at both Prescott Lane and Victoria Drive to right-in/right-out which would eliminate left-turning traffic onto Highway 10 for increased traffic safety and mobility. Reducing access at these local roads was not supported.

First, Prescott Lane is a private road providing access to many residential properties. For one to travel east on Highway 10, motorists would need to travel west and perform a U-turn movement at the TH 212 ramps which is not ideal. Victoria Drive provides access to the City of Chaska Municipal Services building which houses Chaska Public Works and serves the Chaska Fire Department who require full access for truck maintenance. Both Chaska Public Works and Chaska Fire opposed limiting access at Victoria Drive as limitations would hinder effective day-to-day operations. There was some discussion regarding the use of Bavaria Lane as a potential secondary access to counteract proposed reduced access at Victoria Drive. However, Bavaria Lane is currently very narrow and fire trucks and other large vehicles would have a difficult time accessing the public works facility without significant improvement to that roadway. Ultimately, this was not supported in the

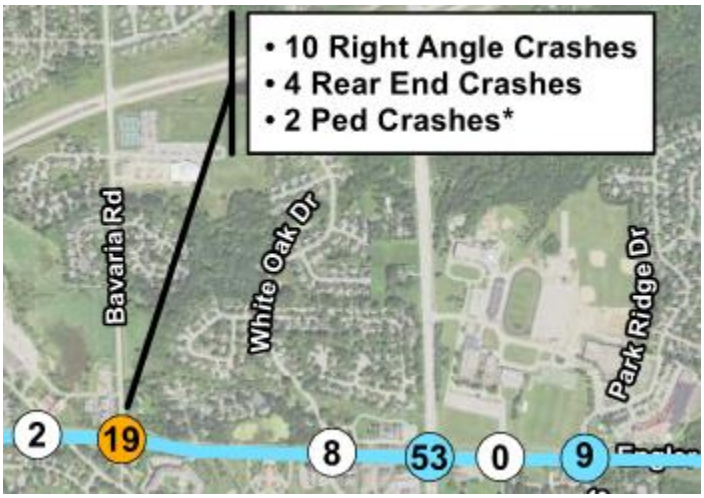


Figure 6. Crash occurrences at Bavaria Road (2013-2017).

near-term. City of Chaska staff should continue to monitor further access management needs and corridor improvements to Highway 10, Bavaria Road, and Bavaria Lane as traffic volumes increase in the future. The long-term vision for the corridor may require additional improvements to Bavaria Lane if concerns develop with entering sidestreet traffic related to safety, delays, and queuing.

The Highway 10/Bavaria Road intersection exhibited 19 crashes over a five-year period from 2013 to 2017 which is above the expected range for similar intersections. Many of these were right-angle crashes and some were rear end. Two pedestrian crashes also occurred in the past. This intersection is anticipated to exhibit a LOS F for both AM and PM peak hour traffic periods by 2040. Many participants in the public process expressed concern over leaving this as a four-way stop controlled intersection due to safety. The Existing Conditions Memorandum in **Appendix B** shows crash occurrences in this section.

Bavaria Road to Park Ridge Drive

Highway 10 from Bavaria Road to Park Ridge Drive has been characterized as heavily congested at times with limited ability for traffic entering from side streets to find gaps. This section carries a range of 7,300 to 10,800 vehicles per day which is anticipated to nearly double by 2040. There are various elements contributing to roadway congestion in this section including limited access to surrounding neighborhoods, heavy vehicle and freight traffic on TH 41, and traffic entering and existing the Chaska Middle Schools, La Academia, and the Chaska Community Center.

Figure 7. Highway 10 from Bavaria Road to Park Ridge Dr.

White Oak Drive

The White Oak Drive intersection has challenging existing condition aspects that were incorporated in the improvement evaluation. This intersection is close to the Highway 41 intersection and access to the Chaska Fire Department, both posing different barriers to improvements to this segment of roadway. This access serves as the sole exit/entry access for nearly 150 residences north of the highway. Neighborhood residents noted significant delays while attempting to turn left (eastbound) onto Highway 10 at this intersection. Several intersection control options were reviewed and evaluated in this study to alleviate

delays experienced by residents in this location. Some options were dismissed early in the process as they had fatal flaws preventing them from full evaluation. These included two-way stop control with existing 2-lanes on Highway 10, a single-lane roundabout, alternate full access connections, and restricted access.

Alternative access locations were also explored for the White Oak Drive neighborhood, however, there are significant challenges including agency access restrictions and resident opposition to new access preventing additional access to the neighborhood from adjacent roadways. **Figure 8** depicts a modified Green-T intersection reviewed and dismissed on TH 41.

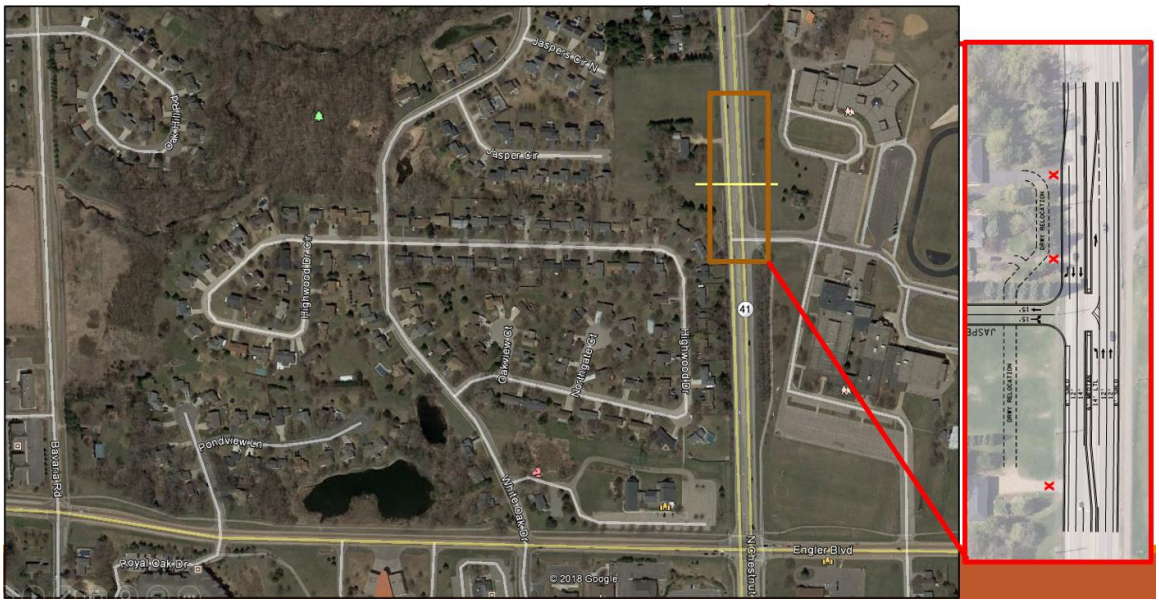


Figure 8. White Oak Drive – TH 41 Access Alternative

Figure 9 provides a summary of alternative connections reviewed and dismissed with the study.

Interim Improvements including minimal roadway widening, signing, and striping were also reviewed to provide a near-term solution to the operations and safety concerns noted at public meetings. The alternative shown in **Figure 10** provides an additional southbound lane of approach to separate thru/left and right turn movements. This would allow residents to complete a southbound right turn at the intersection, travel westbound to the fire station entrance, and complete a U-turn to travel eastbound on CSAH 10.

Figure 9.White Oak Drive Access Review

HIGHWAY 10 STUDY

Highway 10 Corridor Study - Victoria Chaska

Carver County

Neighborhood Access - White Oak Drive

September 2019

BOLTON & MENK
Real People. Real Solutions.

• Existing Off-Street Trail (Paved Trail could be alongside new street)
• City ROW
• Provides an alternative access to White Oak Drive at Highway 10.
• Alternative southern route would require ROW
• Stream and topography may be costly

• Provides access to Pondview Lane
• Impacts to small pond imminent
• May divert traffic to access Highway 10 at Roayl Oak Drive instead of White Oak.
• Requires ROW acquisition

• Existing Off-Street Trail (Paved Trail could be alongside new street)
• City ROW
• Could Align with Canyon Road/ Already full access, signalized intersection.
• Would provide residents signalized access to TH 41 reducing left turning traffic from the CSAH 10 access.
• Stream and topography may be costly

• In line with Jaspers Circle N
• Would require ROW acquisition from Jasper Property
• Would require new access on TH 41
• May provide residents access to TH 41 reducing left turning traffic from the CSAH 10 access.
• Maintiains 1/8 mile access spacing for Secondary intersection on Minor Arterials in Urban/Urbanizing area

• Could Align with rerouted school access (requires realignment of school property access)
• Would require ROW acquisition from Jasper Property
• Would require new access on TH 41
• Would provide residents access to TH 41 reducing left turning traffic from the CSAH 10 access.
• Maintiains 1/8 mile access spacing for Secondary intersection on Minor Arterials in Urban/Urbanizing area

Bavaria Rd
White Oak Dr
Engler Blvd
Skyview

Legend

- WhiteOak
- Regionally Significant Ecological Areas (2011 MLCCS)
- National Wetland Inventory - NWI
- 2-Foot Contours
- Railroad
- Lakes
- Streams
- Parcels

0 1,000 Feet

Source: Carver County, MnDOT, Google

CARVER COUNTY

Map Document: \\arcserver1\gis\CACO\T44117142\ESRI\Maps\NeighborhoodAccess_WhiteOak.mxd | Date Saved: 9/24/2019 4:13:53 PM

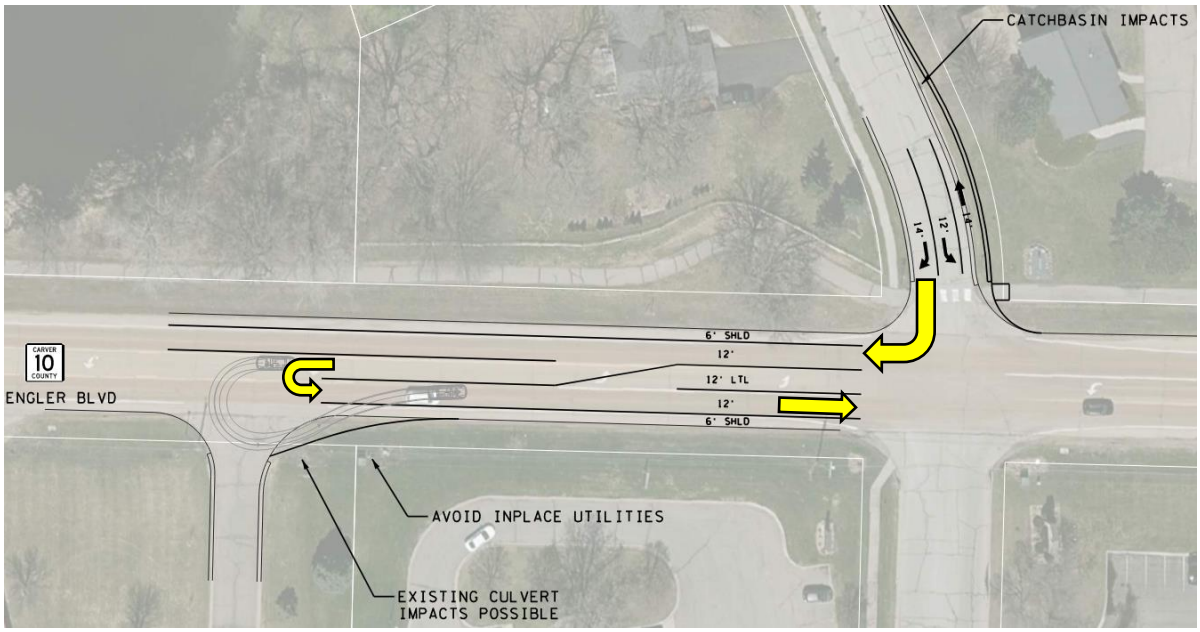


Figure 10. White Oak Drive Interim Improvements

Highway 41 Operations and Grade Separated Pedestrian Crossings

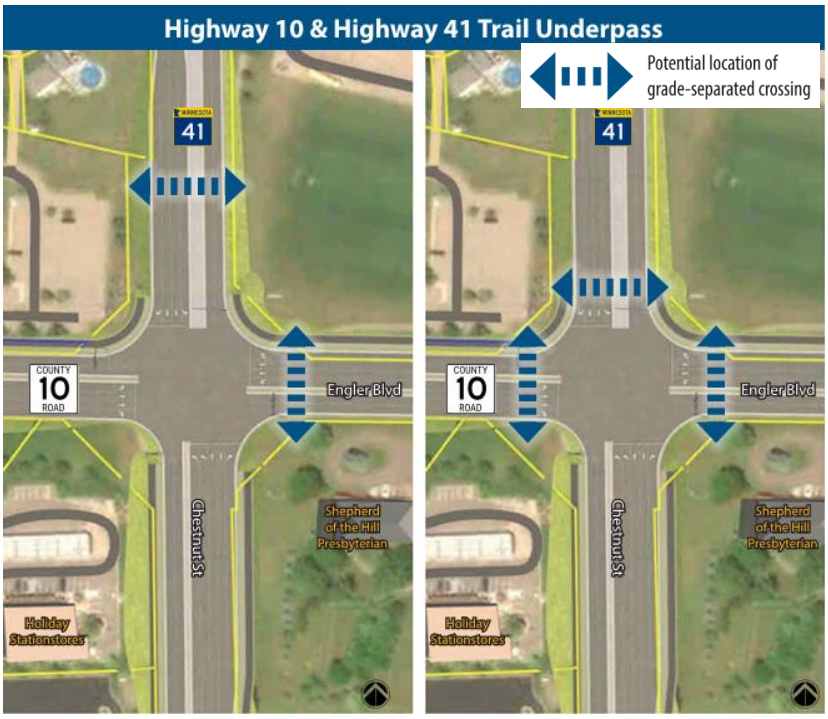


Figure 11. Grade separated crossing considerations from Open House #2.

The Highway 41 intersection exhibits significant vehicle queuing during peak hour traffic causing delays for traffic on Highway 10 and entering the corridor from side streets. Daily traffic volumes through the intersection range from 7,300 to 10,800 along Highway 10 (anticipated to nearly double) and nearly 20,000 north south (anticipated to increase to over 22,000 per day). Crashes at the intersection are approaching an above expected range and include 6 pedestrian crashes within the ten-year period from 2008 to 2017. Pedestrian crashes are always of great concern; however, this intersection poses even greater concern given its proximity to Chaska Schools and the Community Center.

There was significant feedback received through public outreach in support of grade-separated pedestrian crossing facilities. Parent surveys were distributed to parents of students at the Chaska Middle Schools and the La Academia Elementary School in search of feedback to support a funding application for Safe Routes to School through the Regional Solicitation. Results indicated that traffic volumes, safety of intersections, and speed of traffic deter parents from allowing children to walk/bike to school. The majority of respondents (65% - 75%) said they'd let kids walk/bike if issues were remedied. Similar feedback from the third open house indicates that the majority of participants feel that grade-separated facilities are important, and they would use them to access the schools and Community Center if constructed. The range of grade-separated crossing connections reviewed with the public at Open House #2 are shown in **Figure 11**. Grade-separated facilities are recommended to cross TH 41 – north of CSAH 10 and CSAH 10 – east of TH 41.

While grade-separated facilities are planned for the TH 41 and CSAH 10 intersection, discussions with the City of Chaska, MnDOT, and Carver County were held to establish a recommendation for pedestrian facilities to accompany the at-grade intersection improvements. A range of at-grade pedestrian facility alternatives were reviewed with several being dismissed due to an array of reasons stemming from being too restrictive to those providing redundant movements. **Figure 12** provides a visual of the pedestrian connections and accommodations to be carried forward to subsequent project phases. The dashed lines indicate the proposed pedestrian connections.

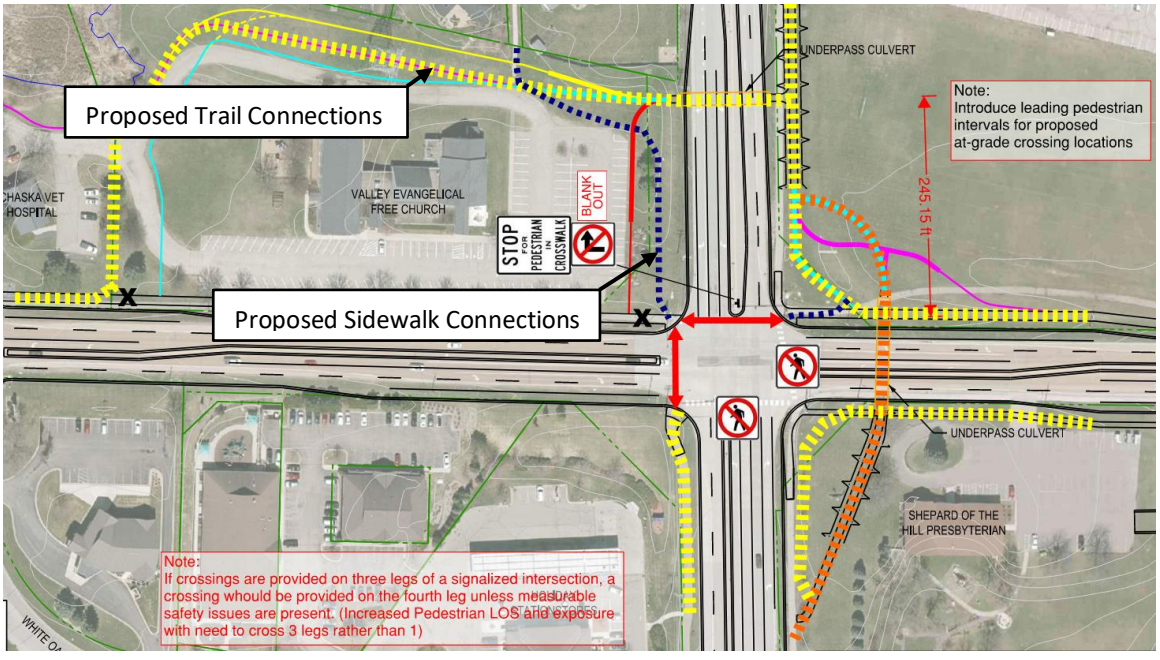


Figure 12. TH 41/CSAH 10 Pedestrian Facilities Review

Discussions to-date have brought to light a difference in opinion with the perspective of City and MnDOT staff. City of Chaska staff is a proponent of limiting at-grade pedestrian

crossings to promote use of the underpasses to every extent possible. MnDOT staff shared input that while it is understood that grade-separated crossings are the safer alternative, at-grade crossings should be provided for those still interested in crossing at the intersection. Additional discussion will be necessary when re-introduced in preliminary design to confirm direction with MnDOT, City of Chaska, Carver County, and ISD #112 staff.

Crest Drive and Park Ridge/Skyview Drive

While the majority of Highway 10 in the eastern project area will be converted to a four-lane section, the corridor will become a two-lane divided section from the Crest Drive intersection east to Old Audubon Road. Highway 10 is expected to carry 12,700 vehicles daily through the Crest Drive and Park Ridge Drive intersections.

Improvements were considered at Crest Drive to limit access at that intersection to right-in/right-out or ¾-access to limit left turns onto Highway 10 and improve mobility. The intersection's proximity to the Highway 41 intersection contributes to mobility issues along Highway 10. This intersection serves over 100 residences and a church to the south while also serving as the primary access to the Chaska Middle School West to the north. Independent School District (ISD) 112 expressed that this is a critical access for the school and full access is needed for buses turning left onto Highway 10 from the location with the current site plan. ISD 112 site planning is necessary to develop alternatives that improve connectivity and lessen the priority of left-turn movements onto Highway 10. A long-term vision for the Highway 10 corridor includes a ¾-access to improve safety and accessibility if movements exiting the school site become problematic in the future.

Park Ridge Drive serves as the primary entrance to the Chaska Middle School East and Chaska Community Center properties as well as a large residential neighborhood. The intersection exhibits crash levels approaching above expected. Many participants in the public process voiced concerns for the safety of children crossing at this intersection due to traffic failing to stop.

ISD #112 Site Review

With no turnaround location nearby and a local network not supportive of additional vehicle traffic, a clear alternative was not identified to mitigate concerns associated with access restrictions for the site on Highway 10. Alternatives discussed include options for rerouting onsite circulation on the school property, something ISD 112 will need to incorporate into long-term planning efforts.

Coordination meetings were held with representatives from Independent School District (ISD) #112 in November 2019, June 2020, and August of 2020. The intent of these discussions was to understand existing and future site operations and needs as well as review site impacts stemming from the recommended concept design. Feedback from these discussions can be seen with the full access maintained at Crest Drive in the near-

and mid-term while further site improvements can be identified to mitigate the need and priority of this intersection. It is a recommendation of this plan for a school site master plan to be developed that will identify options to prohibit movements at the Crest Drive access. Details of site recommendations established with the study are provided in **Figure 13**.

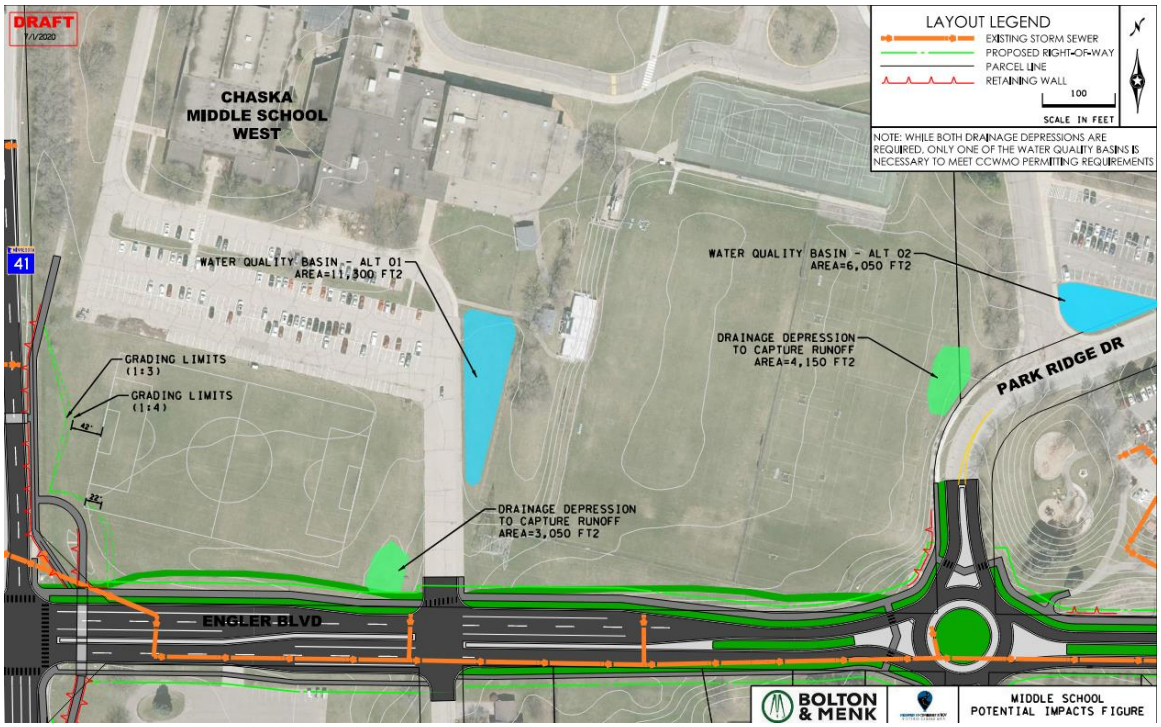


Figure 13. ISD #112 Site Improvements

Efforts and discussions from this study will be carried forward as part of a separate evaluation and/or the preliminary design phase of the project. The following items require further attention in subsequent phases of the project:

- An earthen berm or temporary fence could be reviewed to provide separation between the athletic fields and underpass location to prevent balls from continuously going down the hill.
- The trail segment adjacent to TH 41 may be able to be relocated further to the east to minimize retaining wall needs.
- School District preference is to minimize any stormwater and maintenance improvements on-site. The drainage depression between Park Ridge Dr. and the athletic fields is not preferred. Site improvements completed as part of the project will be further reviewed with the School District.
- Traffic operations are expected to become difficult entering/exiting the ISD #112 driveway at Crest Drive from CSAH 10 in the future. Near- and mid-term planning is needed to identify opportunities for site improvements to lessen the importance of this intersection.
    - The City, County and School District all agree a partnership to establish future site improvements is in the best interest of both agencies. This will be coordinated following completion of the current study phase.
    - Other School District staff, such as the Principals of schools, should be involved in

these discussions as well.

- Additional details regarding stormwater recommendations noted in Figure 13 can be found in **Appendix F**. In addition to the findings noted in the memo, a third alternative should be reviewed as a potential water quality basin. The triangular area bordered by Highway 10 to the south, underpass grading to the west, and southern extents of the soccer field may provide an opportunity for stormwater treatment that minimizes impacts to the site. Drainage area depressions identified are indicative of locations where stormwater pipe may be necessary to capture surface drainage on-site water within the proposed pipe network.

East of Park Ridge Drive to Highway 61

As Highway 10 moves east toward Highway 61, traffic volumes begin to decrease, and the area is less developed. This section carries a range of 7,600 vehicles per day in the west to 3,350 vehicles per day in the east. This section is currently a two-lane undivided section from Park Ridge Drive to Old Audubon Road where it continues as a four-lane section to Highway 61.

With proposed improvements from Park Ridge Drive to the west, this section of roadway and the Highway 10/Highway 15 intersection are anticipated to operate at acceptable levels. Options for transitioning the two-lane undivided section to a two-lane divided and four-lane divided section were explored through the evaluation process. Also, options for the Highway 10/Highway 15 intersection were also explored.

This roadway segment contains the intersections of Highway 10 and Ridge Lane, Ravoux Road, Brandon Boulevard, Highway 15 (Audubon Road) and Highway 61. Brandon Boulevard provides the sole access to Brandondale Manufactured Home Park which contains nearly 500 homes.

Figure 14. Highway 10 east of Park Ridge Drive to Highway 61.

A large portion of this section lacks pedestrian facilities other than a few trails that cross Highway 10 near Ridge Lane and near Old Audubon Road. Trail facilities are provided along Highway 10 from Highway 15 to Highway 61. Carver County has designated Highway 10 as a future home to a County Linking Trail. Pedestrians and bicyclists, including children accessing Chaska schools, who currently use the roadway shoulder will have an opportunity to use a safer, off-road path through this section when trail connections are implemented.

Other areas along the roadway received consideration as well that were not considered in the evaluation process. These locations were discussed among project partners as potential future projects to solve other issues anticipated to arise in the future. These are as follows:

Highway 10 Trail Connection – Ridge Lane to Ravoux Road

The City of Chaska has identified the need for a near- to mid-term improvement to construct an off-road trail to accommodate pedestrians on a facility other than the roadway shoulder. The overall roadway improvement project in this area is not anticipated to occur until the long-term so an exercise was completed to review feasibility of a standalone improvement. A connection on the north side of Highway 10 from Ridge Lane to Ravoux Road was found to be feasible although to meet clear zone requirements, either a suburban section (curb and gutter with urban drainage) or retaining walls is expected to be necessary. Either component is expected to require considerable project costs. A standalone feasibility study utilizing a collected field topographic survey to understand the implications of design variations is recommended when City and/or County staff is prepared to advance the work. An interim connection on the south side was also reviewed and should be incorporated as part of the future feasibility study.

Ravoux Road Trail Underpass

An at-grade crossing exists near the Highway 10/Ravoux Road intersection where the East Creek trail crosses Highway 10. The recommended concept for this subarea includes a two-stage crossing with an overhead Rectangular Rapid Flashing Beacon (RRFB) system. Upon further discussion with project partners, project partners agreed grade-separated facilities at this location should be explored as a long-term solution to ensure pedestrian safety at that intersection in the future. The recommended trail underpass shown in **Figure 15** serves as a necessary long-term option that is supported by project partners. Additional design and review will be necessary in subsequent project phases to establish a recommended design utilizing collected field topographic survey.

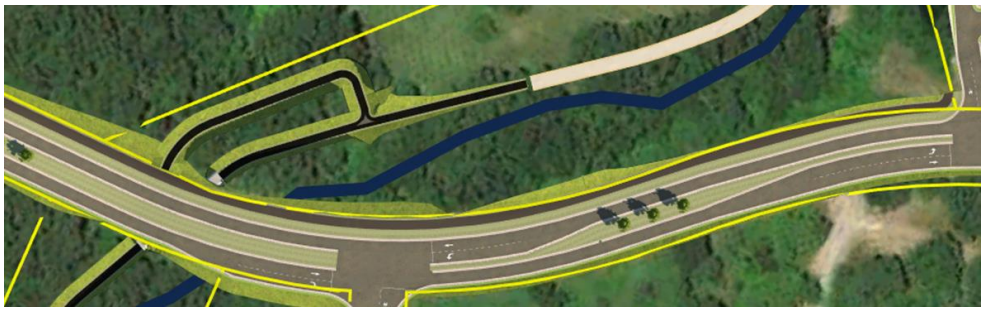


Figure 15. Ravoux Road Trail Underpass

Highway 10 Roadway Alignments

Due to the constraints in the area, 40mph curves are provided on the segment of Highway 10 near Ravoux Road and Old Audubon Road that is signed as 50 mph. Design alternatives

shown in **Figure 16** were reviewed to evaluate if modifications could be made to improve the design speed of Highway 10 through this area. It was determined that modifications to increase the design speed of the existing roadway would result in significant impacts to the adjacent development and environment. Therefore, the current alignment is maintained for the recommended alternative.

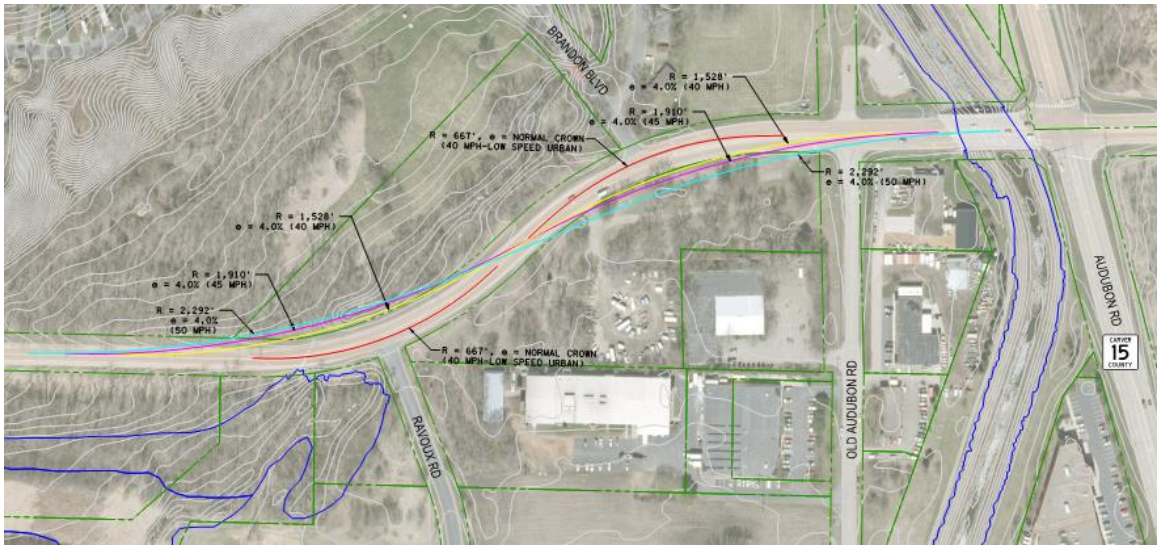


Figure 16. Highway 10 Alignment Review – Eastern Subarea

Additional Access to Brandondale Manufactured Housing Park

The Brandondale Manufactured Housing Park is home to nearly 500 homes and is considered an environmental justice population. Project staff reached out to Park owners and management during the process to understand issues with access to the neighborhood, understanding that Brandon Boulevard provides the only access to the park at this time. Participants in the public process expressed concern that the neighborhood doesn't have sufficient access for the number of residences. Project partners discussed alternate access to Ridge Lane to alleviate pressures for the current access to serve all neighborhood traffic as volumes continue to grow on Highway 10 in the future. Additional coordination with Carver County, City of Chaska, and Brandondale is needed to identify potential future access roads. A connection to Ridge Lane should be reviewed as part of future efforts.

Chaska Local Roads (Old Audubon Road/Brandon Blvd/Ravoux Road Realignment)

The study explored options for realigning Old Audubon Road with Brandon Boulevard to consolidate access along the corridor in this section. Accesses are closely spaced in this section and roadway curvature poses sightline barriers. While options were considered for realigning Old Audubon Road to Brandon Boulevard and connecting it to Ravoux Road south of Highway 10 for better area circulation, project partners agreed that the need for

these improvements isn't clear at this time and these options should only be considered as potential future projects for consideration.

Highway 10 in this area of the corridor is classified as a Minor Arterial Roadway with a posted speed limit of 50mph. Carver County access management practices recommend ¼-mile access for primary intersections and 1/8-mile spacing for secondary intersections. Current spacing between intersections is 1/12-mile from Highway 15 (Audubon Road) to Old Audubon Street, 1/12-mile from Old Audubon Street to Brandon Boulevard, and 1/8-mile between Brandon Boulevard and Ravoux Road. By eliminating or reducing access at Old Audubon Street, this segment of Highway 10 would better align with County practices. Options 1, 2, and 3 as shown in **Figure 17** include the following:

- **Option #1**: Re-align Old Audubon Road to align with Brandon Blvd and sever connection from curvature point to Highway 10
- **Option #2**: Establish connection between Old Audubon Road and Ravoux Road via the Arbor Drive alignment. The current Highway 10/Old Audubon Road intersection is converted to a right-in/right-out. Traffic traveling westbound from Old Audubon Road does so via the proposed Arbor Drive connection.
- **Option #3**: Existing access management is maintained. Old Audubon Road is converted to a right-in/right-out or ¾-access intersection. A roundabout is constructed at Highway 15 to allow traffic traveling westbound from Old Audubon Road to do so via a u-turn at the roundabout.

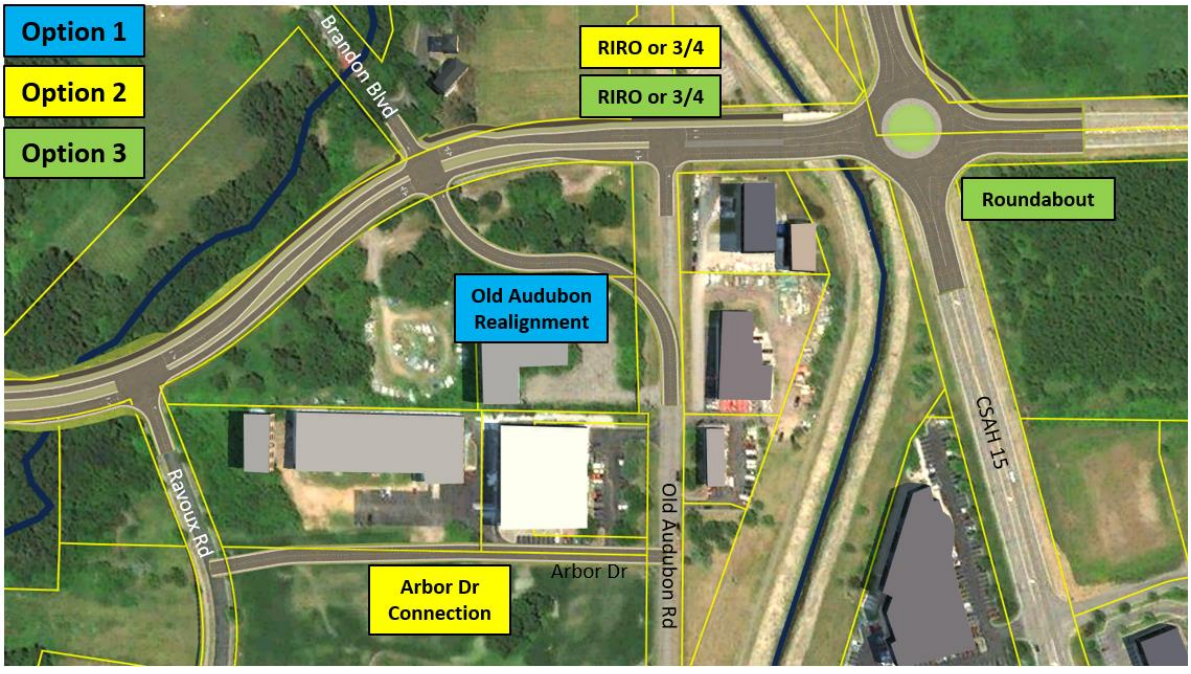


Figure 17. Chaska Local Roads Alternatives

TIER 2 DETAILED EVALUATION RESULTS

The evaluation was presented in a matrix format to facilitate the comparison across roadway typical section and intersection improvement concepts and to identify agency supported concepts to further develop and present for public input. **Table 11** below shows a summarized list of evaluation criteria found to differentiate among improvement concepts.

Table 11. Concept Evaluation Criteria	
Project Goals	**Performance Measures**
Goal A: Provide efficient and reliable vehicle mobility	Volume to capacity ratio
	Support future land use plans
	Vehicle delay/level of service
	Side street delay accessing or crossing major corridors
	Intersection delay for forecasted growth scenarios
	Average mainline speeds and travel times
	Roadway design standards
	Proposed access locations, spacing and treatments
	Planned roadway capacity and forecasted volumes
	Potential to accommodate future modes
	Potential to accommodate future transit routes and facilities
	Roadway design and potential for right-of-way acquisition
Goal B: Safely accommodate all System users	Forecasted crash and severity rates
	Vehicle to vehicle conflict points
	Intersection and roadway design accommodations for pedestrians and bicyclists
	Vehicle to pedestrian conflict points
	Proposed access spacing compared to county and state guidelines
	Business access and connectivity
	Chaska Middle School/Community Center connectivity
	Residential neighborhood access and circulation
	Pedestrian and bicycle access and connectivity.
	Intersection and roadway design
	Adequacy of gates/signals at railroad crossings
	Pedestrian crossing safety mechanisms at railroad crossings
	Grade separation at railroad crossings
Goal C: Provide a comprehensive transportation network that supports existing and future land development	Effectiveness of intersection design to accommodate forecasted vehicle/freight capacity demands for existing and future development
	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development
	Safe and accessible connections to area transit and school bus routes
	Safe pedestrian crossing facilities from existing and future development at controlled intersections
Goal D: Provide infrastructure improvements that respect the environment.	Impacts to historic resources
	Impacts to cultural resources
	Acquisition of property
	Impacts to natural and protected resources
	Effectiveness of stormwater management features to meet WMO standards
	Impacts on existing environmental and historic resources
	Existing and forecasted congestion
	Impacts on noise receptors
Goal E: Develop a financially responsible implementation plan.	Cost of improvements – capital costs and right-of-way
	Funding eligibility and availability
	Agency support for implementation plan
	Screen potential projects for federal and state grants

Table 11. Concept Evaluation Criteria.

Tables 12 and **13** illustrate the summarized evaluation results at of the Eastern Project Area. The detailed evaluation matrix is included in **Appendix D.**

Highway 10 Corridor Study

Eastern Project Area Concept Evaluation

Typical Section Concept Evaluation

November 2019

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Goals	TH 212 to Bavaria Road			Bavaria Road to Park Ridge Drive			East of Park Ridge Drive		
	2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided
GOAL A: Provide efficient and reliable vehicle mobility.	-	+	++	-	+	++	-	+	++
GOAL B: Safely accommodate all system users.	0	++	+	0	++	++	0	++	+
GOAL C: Provide a comprehensive network for pedestrians and bicyclists.	0	++	++	0	++	++	-	++	++
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	++	++	N/A	++	+	N/A	++	+
GOAL E: Develop a financially responsible implementation plan.	N/A	++	+	N/A	++	+	N/A	++	0
Total	-	++	++	-	++	++	-	++	+

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

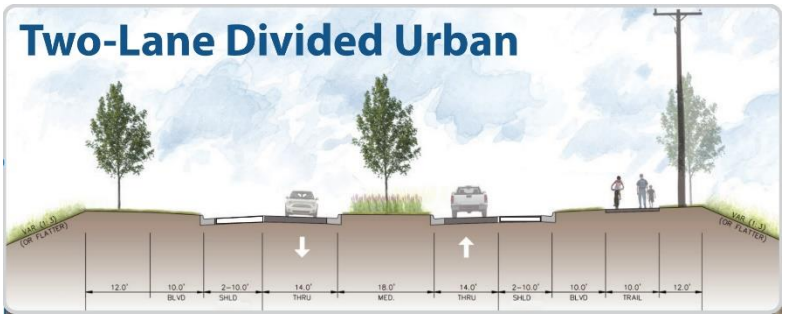
HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study
Eastern Project Area Concept Evaluation
Intersection Concept Evaluation
November 2019

Goals	CSAH 10 and Bavaria Road			CSAH 10 and TH 41 (N Chestnut Street)				Skyview Drive/Park Ridge Drive			CSAH 10 and CSAH 15 Audubon Road			CSAH 10 and White Oak Drive					
	2040 No-Build	Traffic Signal	Single-Lane Roundabout (Expandable to 2x1)	2040 No-Build	Partial Build Traffic Signal	Full Build Traffic Signal	2-Lane Roundabout	2040 No-Build	Traffic Signal	Single-Lane Roundabout	2040 No-Build	Improved Traffic Signal	Single Lane Roundabout	2040 No-Build	TWSC 2-Lane Divided	TWSC 4-Lane Divided	Restricted Access	Traffic Signal	Unbalanced (2x1) Roundabout
GOAL A: Provide efficient and reliable vehicle mobility.	-	+	++	-	+	++	0	-	+	++	0	++	++	-	0	++	+	++	0
GOAL B: Safely accommodate all system users.	-	+	++	0	+	+	+	-	+	++	0	++	++	-	0	0	+	++	++
GOAL C: Provide a comprehensive network for pedestrians and bicyclists.	-	++	++	-	+	+	0	-	+	++	0	++	++	-	0	0	-	++	+
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	++	+	N/A	++	+	0	N/A	++	+	N/A	++	+	N/A	++	+	++	+	0
GOAL E: Develop a financially responsible implementation plan.	N/A	++	+	N/A	+	++	0	N/A	+	+	N/A	++	+	N/A	+	+	++	++	0
Total	-	++	+	-	+	+	0	-	+	+	0	++	+	-	0	+	+	++	0

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

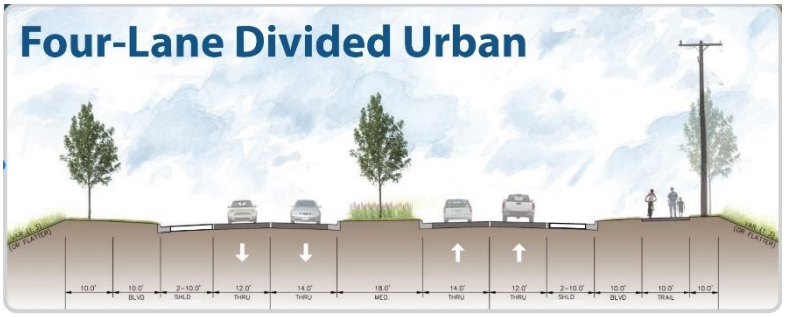
Tables 14 and **15** provide a snapshot of each concept evaluated and a brief summary of its operational characteristics and its pros/cons. It also notes those improvement concepts dismissed through the process by collective agreement with the TAC, Chaska City Council, and the Carver County Board.

Table 14. Eastern Project Area – Typical Section Alternatives		
Concept	**Characteristics**	**Summary of Evaluation Differences – Pros/Cons**
		

Highway 212 to Bavaria Road
 	
Dismissed
	• Currently 4-lane divided urban through TH 212 Interchange
	• Includes conversion of Highway 10 from 2-lane undivided urban to 2-lane divided urban section from `500 ft west of Prescott Lane to Bavaria Road
	• Primary access spacing is not ideal
	This option was dismissed by the TAC who opted for the 4-lane section
		Pros:
		• Safer than 4-lane divided:
		  • Lower forecasted crash and severity
		  • Less vehicle to vehicle conflict
		• Less property acquisitions
		• Lower cost of typical section options
		Cons:
		• Forecasted traffic volumes exceed design capacity
		• Not supported by the public

Bavaria Road to Park Ridge Drive
 	
Dismissed
	• Highway 10/Highway 41 intersection would be 4-lane divided in this section
	• Includes conversion of Highway 10 from 2-lane undivided to 2-lane divided from Bavaria Road to west of White Oak Drive and from Crest Drive to Park Ridge Drive
	• Primary access spacing is not ideal
	This option was dismissed by the TAC who opted for the 4-lane section
		Pros:
		• Safer than four-lane divided:
		  • Lower forecasted crash and severity
		  • Less vehicle to vehicle conflict
		• Less property acquisitions
		• Lower cost of typical section options
		Cons:
		• Forecasted traffic volumes exceed design capacity
		• Delay increases
		• Not supported by the public

East of Park Ridge Drive
 	
Recommended
	• Includes conversion of Highway 10 from 2-lane undivided to 2-lane divided from Park Ridge Drive to Highway 15
	This option was recommended for implementation by the TAC
		Pros:
		• Safer than four-lane divided:
		  • Lower forecasted crash and severity
		  • Less vehicle to vehicle conflict
		• Lower cost of typical section options
		• Agency Support
		• Supported by the public

		Cons: • Forecasted traffic volumes are approaching design capacity
		

Highway 212 to Bavaria Road
 	
Recommended
	• Currently 4-lane divided urban through TH 212 Interchange
	• Includes conversion of Highway 10 from 2-lane undivided urban to 4-lane divided urban section from `500 ft west of Prescott Lane to Bavaria Road
	• Primary access spacing is not ideal
	This option was recommended for implementation by the TAC
		Pros:
		• Design capacity accommodates forecasted traffic volumes
		• Delay decreases
		• Supported by the public
		Cons:
		• Not as safe as two-lane divided:
		  • Higher forecasted crash and severity
		  • More vehicle to vehicle conflict
		• More right-of-way needs
		• Higher cost of typical section options

Bavaria Road to Park Ridge Drive
 	
Recommended
	• Highway 10/Highway 41 intersection would be 4-lane divided in this section
	• Includes conversion of Highway 10 from 2-lane undivided to 2-lane divided from Bavaria Road to west of White Oak Drive and from Crest Drive to Park Ridge Drive
	• Primary access spacing is not ideal
	This option was recommended for implementation by the TAC
		Pros:
		• Design capacity accommodates forecasted traffic volumes
		• Delay decreases
		• Supported by the public
		Cons:
		• Not as safe as two-lane divided:
		  • Higher forecasted crash and severity
		  • More vehicle to vehicle conflict
		• More right-of-way needs
		• Higher cost of typical section options

East of Park Ridge Drive **Dismissed**	• Includes conversion of Highway 10 from 2-lane undivided to 2-lane divided from Park Ridge Drive to Highway 15 **This option was dismissed by the TAC who opted for the 4-lane section**	*Pros:* • Design capacity accommodates forecasted traffic volumes • Supported by the public *Cons:* • Not as safe as two-lane divided: • Higher forecasted crash and severity

		• More vehicle to vehicle conflict • Higher cost of typical section options

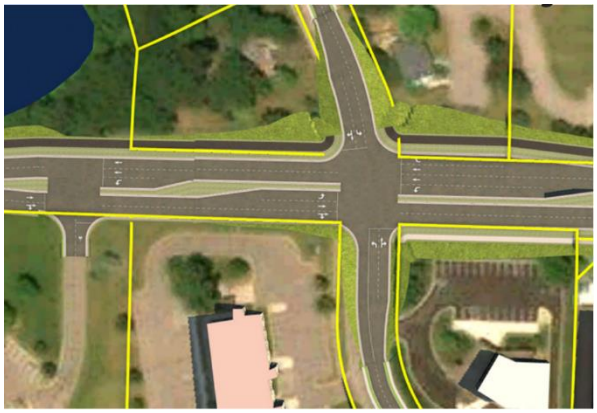
Table 15. Eastern Project Area – Intersection Alternatives	
Concept	**Summary of Evaluation Differences – Pros/Cons**
BAVARIA ROAD	

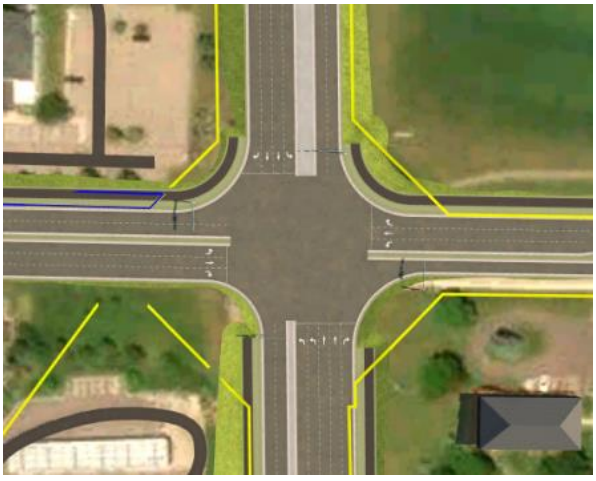
Traffic Signal
 
This option was dismissed by the study.
	• Includes conversion of four-way stop control to traffic signal
	Pros:
	• Less property acquisitions
	• Lower cost than roundabout
	Cons:
	• Side street delays
	• Not as safe as single-lane roundabout:
	  • Higher forecasted crash and severity
	  • More vehicle to vehicle conflicts
	  • More vehicle to pedestrian conflicts
	• Not supported by the public

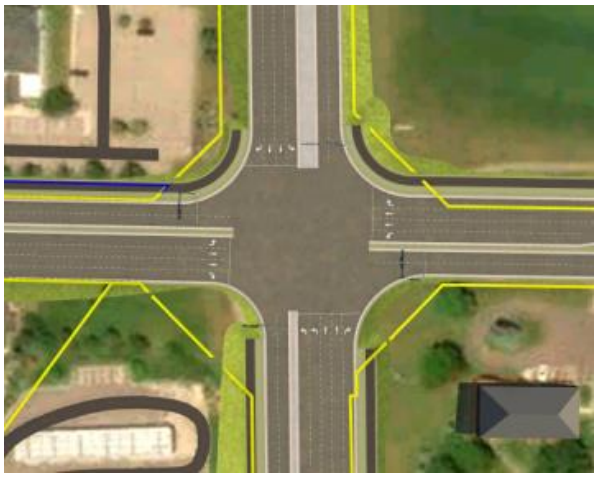
Single-Lane Roundabout (Expandable to 2x1)
 
This option was recommended by the study.
	• Includes conversion of four-way stop control to single-lane roundabout that is easily convertible to a 2x1 roundabout in the future as traffic needs dictate
	Pros:
	• Decreases side street delays
	• Safer than traffic signal
	  • Lower forecasted crash and severity
	  • Less vehicle to vehicle conflicts
	  • Less vehicle to pedestrian conflicts
	  • Supported by the public
	Cons:
	• More property acquisitions
	• Higher cost than signal

White Oak Drive	
TWSC 2-Lane Divided *****Image Not Available***** **This option was dismissed by the study.**	• Includes two-way side street stop control on a two-lane divided Highway 10 *Pros:* • Least environmental impacts • Low cost option *Cons:* • Minimally accommodates efficient and reliable mobility • Among the least safe options • Least supportive of development • Lacks agency support • Least likely to leverage federal and state grants • Not supported by the public

TWSC 4-Lane Divided  **This option was recommended for *short-term* implementation by the study.**	• Includes two-way side street stop control on a four-lane divided Highway 10 *Pros:* • Similar to traffic signal option for providing the most efficient and reliable vehicle mobility • Among the most effective options for accommodating vehicle freight demands for development • Among the low-cost options • Agency supported • Potential candidate for federal and state grants • Second most supported alternative by the public *Cons:* • Among the least safe options in terms of forecasted crash and severity rates, vehicle to vehicle conflicts and vehicle to pedestrian conflicts • Wider roadway footprint has greater environmental impacts •
Restricted Access  **This option was dismissed by the study.**	• Includes a two-way stop-controlled intersection along a four-lane divided Highway 10 with restricted left turns onto Highway 10 from side streets *Pros:* • Among the best options for accommodating future traffic capacity, reducing vehicle delay, and improving traffic speed and travel times • Among the best options for reducing crash occurrences and severity and for reducing vehicle to vehicle conflicts • Among the best options for business access and connectivity • Has less anticipated environmental impacts • Among the low-cost options • Has agency support • Likely to be optimal for leveraging funding *Cons:* • Does not support traffic growth or vehicle/freight capacity demands • Worsens neighborhood access and connectivity • Not supported by the public

Traffic Signal  **This option was recommended for implementation by the study as a long-term treatment.**	• Includes a traffic signal on a four-lane divided Highway 10 *Pros:* • Similar to TWSC for 4-lane divided option for providing the most efficient and reliable vehicle mobility • Similar to a roundabout as the safest options • Best supports existing and future land development • Among low-cost options • Agency supported • Potential candidate for federal and state grants • Supported by the public *Cons:* • Some minimal environmental impacts
HIGHWAY 41	

Partial-Build Traffic Signal
 
This option was dismissed by the study who opted for the full-build traffic signal.
	• Includes a traffic signal accommodating an additional southbound thru lane and northbound left-turn lane along with a two-lane divided Highway 10
	Pros:
	• Provides more efficiency and reliable vehicle mobility than a roundabout overall
	• Better accommodates pedestrians
	Cons:
	• Not as safe as roundabout
	  • Higher forecasted crash and severity
	  • Higher vehicle to vehicle conflicts
	  • Higher vehicle to pedestrian conflicts
	• Not as effective for accommodating vehicle freight demands for development
	• Lack of agency support
	• Not supported by the public

Full-Build Traffic Signal
 
This option was recommended for implementation by the study.
	• Includes a traffic signal that accommodates additional thru lanes on the southbound, eastbound, and westbound legs (four-lane divided all directions) and a northbound left-turn lane
	• *Pros:*
	• Provides more efficiency and reliable vehicle mobility than a roundabout overall
	• Most effective for accommodating vehicle freight demands for development
	• Has agency support
	• Supported by the public
	Cons:
	• Not as safe as roundabout
	  • Higher forecasted crash and severity
	  • Higher vehicle to vehicle conflicts
	  • Higher vehicle to pedestrian conflicts

Two-Lane Roundabout
*****Image Not Available*****
This option was dismissed by the study which opted for the full-build traffic signal.
	• Includes a two-lane roundabout that accommodates additional thru lanes on the southbound, eastbound, and westbound legs (four-lane divided all directions)
	• *Pros:*
	• Safer than signals:
	  • Lower forecasted crash and severity
	  • Less vehicle to vehicle conflicts
	  • Less vehicle to pedestrian conflicts
	Cons:
	• Significant delays and increased travel times
	• Least effective for accommodating vehicle freight demands for development
	• Requires more property acquisitions
	• Has the most impacts environmentally
	• Lacks agency support

Park Ridge Drive/Skyview Drive	

Traffic Signal
 
This option was dismissed by the study which opted for the single-lane roundabout.
	• Includes a traffic signal to replace the existing four-way stop control scenario
	Pros:
	• Smaller footprint has less environmental impacts
	• Lower Cost
	Cons:
	• More side street delay
	• Close access spacing with Highway 41 signal and full access at Crest Drive
	• Not as safe as roundabout
	  • Higher forecasted crash and severity
	  • Higher vehicle to vehicle conflicts
	  • Higher vehicle to pedestrian conflicts
	• Not as effective for accommodating vehicle freight demands for development
	• Not supported by the public

Single-Lane Roundabout
 
This option was recommended by the study.
	• Includes a single-lane roundabout to replace a four-way stop control scenario
	Pros:
	• Provides more efficiency and reliable vehicle mobility that a traffic signal overall
	• Safer than signals:
	  • Lower forecasted crash and severity
	  • Less vehicle to vehicle conflicts
	  • Less vehicle to pedestrian conflicts
	• Most effective for accommodating vehicle freight demands for development
	• Supported by the public
	Cons:
	  • More environmental impacts
	  • Higher Cost

Highway 15 Audubon Road

Improved Traffic Signal  **This option was recommended for implementation by the study.**	• Includes improvements to the existing traffic signal including flashing yellow left-turn arrows and improved pedestrian facilities *Pros:* • Less property acquisitions • Less environmental impacts • Lower Cost • Supported by the public
Single-Lane Roundabout  **This option is recommended for long-term consideration by the study but the full-build traffic signal was recommended at this time.**	• Includes a single-lane roundabout to replace the existing traffic signal *Pros:* • Received similar level of support to the Improved Traffic Signal *Cons:* • More environmental impacts • Higher Cost

C. PUBLIC AND AGENCY INPUT – EASTERN PROJECT AREA

Agency coordination and public involvement were key components to the successful development of the Highway 10 Corridor Study. This required early and continuous involvement of all affected interests identified during the initial stages of the project, A Public Involvement Plan was developed early to organize and plan for meetings with targeted agencies, groups and interests and to define their roles and goals in the project. The Public Involvement Plan is included in **Appendix A**.

The following methods were used to promote public involvement during the study (See meeting summaries in **Appendix A**).

FOCUS GROUP MEETINGS

The project team invited various interest groups to attend focus group meetings during the project. Representatives from emergency services, the school district, parks/trails, transit providers, and water resources stakeholders provided input on corridor issues and needs.

TARGETED STAKEHOLDER MEETINGS

Project staff met with several neighborhood groups, property owners, and agency representatives in a small group or individual setting to discuss potential impacts corridor improvement options may have on neighborhoods/properties. Neighborhood meetings included the White Oak Drive neighborhood, the Crest Drive neighborhood, and the Brandondale neighborhood. Property owners included the Valley Evangelical Church, the Chaska Vet Hospital, and the Shepherd of the Hill Presbyterian Church. Agency representatives included the Chaska Fire Dept., Chaska Public Works, and Independent School District (ISD) 112. Another specialty group was the Lodge Senior Center at the Chaska Community Center.

PUBLIC OPEN HOUSES

Three public open houses occurred during the project. The first occurred on August 21, 2019, in the early phases of the study, to introduce the project and solicit input on issues, needs, and opportunities along the corridor. The second open house was held on December 19, 2019 to solicit input on a range of improvement options under consideration for Highway 10. The third open house occurred online from April 20th through May 6th due to restrictions on public gathering during the COVID-19 pandemic. Open house materials were posted online along with a survey to solicit input on all corridor improvement recommendations and proposed implementation.

The mailing area for open houses included over 2,400 properties covering a broad area of potential stakeholders surrounding the highway.

TECHNICAL ADVISORY COMMITTEE (TAC)/AGENCY MEETINGS

Consulting staff met consistently with staff from the Cities of Chaska, Victoria, and Waconia as well as Carver County staff, and representatives from Laketown Township and MnDOT throughout the study duration. Meetings were focused on understanding each agency's vision for the study corridor where they intersect each jurisdiction in order to provide recommendations tailored to specific needs.

CITY COUNCIL UPDATES

Elected officials from the cities of Chaska and Victoria received updates during the project at key milestones, as desired.

PROJECT WEBSITE AND FACEBOOK

A project website and Facebook page were maintained by Carver County Public Works throughout the duration of the project. Notices and meeting materials were posted on these media for review

and comment by all as another means of communicating study progress and upcoming meetings to the public.

INPUTID

An online comment map was used to collect community input on issues during key periods in the study process. Participants were able to see input provided by others and provide responses to comments.

D. HIGHWAY 10 IMPROVEMENT RECOMMENDATIONS FOR IMPLEMENTATION

The process for identifying improvement recommendations for Highway 10 concluded in June/July of 2020. Improvement recommendations provide a vision for Highway 10 that is supported by both the City of Chaska City Council and the Carver County Board. The following summarizes the TAC recommended improvements.

TH 212 TO BAVARIA ROAD

Figure 18. Prescott Lane and Victoria Drive full access intersections.

Improvements identified for this section include conversion of the roadway to a four-lane divided urban section and implementation of a roundabout at the Highway 10/Bavaria Road Intersection. Four-lane conversion is being recommended in this section as it accommodates forecasted traffic volumes better than the two-lane option.

The intersections of Highway 10 with Prescott Lane and Victoria Drive will remain full access intersections for the near-term. At Bavaria Road, two traffic control options were explored including a traffic signal and a roundabout. Both were viable options, however, the roundabout scored best from enhanced vehicle mobility and safety perspectives. To support the effectiveness

of a roundabout at the Bavaria Road intersection, Royal Oak Drive will be limited to three-quarter access. Residents from Royal Oak Drive that wish to travel eastbound on Highway 10 will do so by turning right onto the corridor and using the roundabout to circle back to the eastbound lanes. Access to Chaska Place Apartments will be limited to right-in/right-out or right-out only. This combination of access treatments is expected to effectively alleviate future traffic volume concerns in this segment.

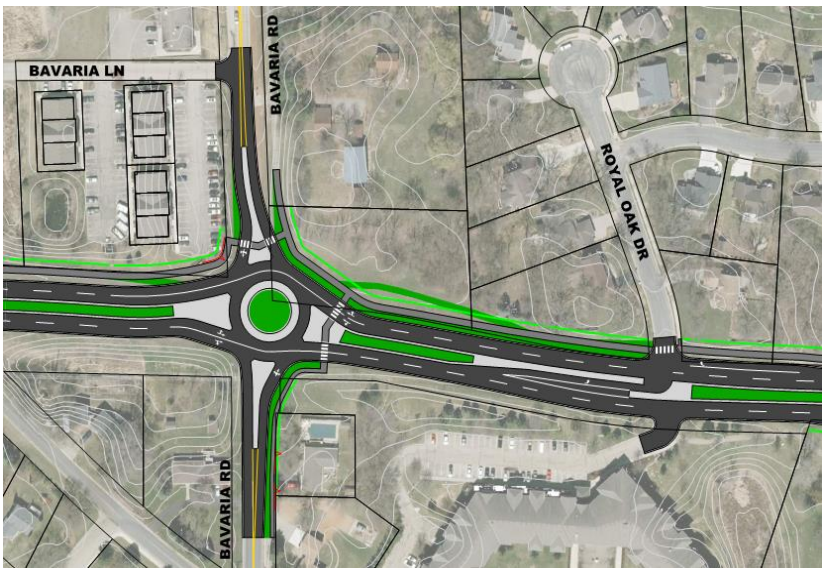


Figure 19. Proposed Roundabout at Bavaria Road and Three-Quarter access at Roval Oak Drive.

BAVARIA ROAD TO PARK RIDGE DRIVE

The section from Bavaria Road to Park Ridge Drive will be converted to a four-lane divided urban section to accommodate forecasted traffic volumes, which exceed the capacity of the two-lane option, and decrease delays. The following outlines recommended intersection improvements for this section from west to east.

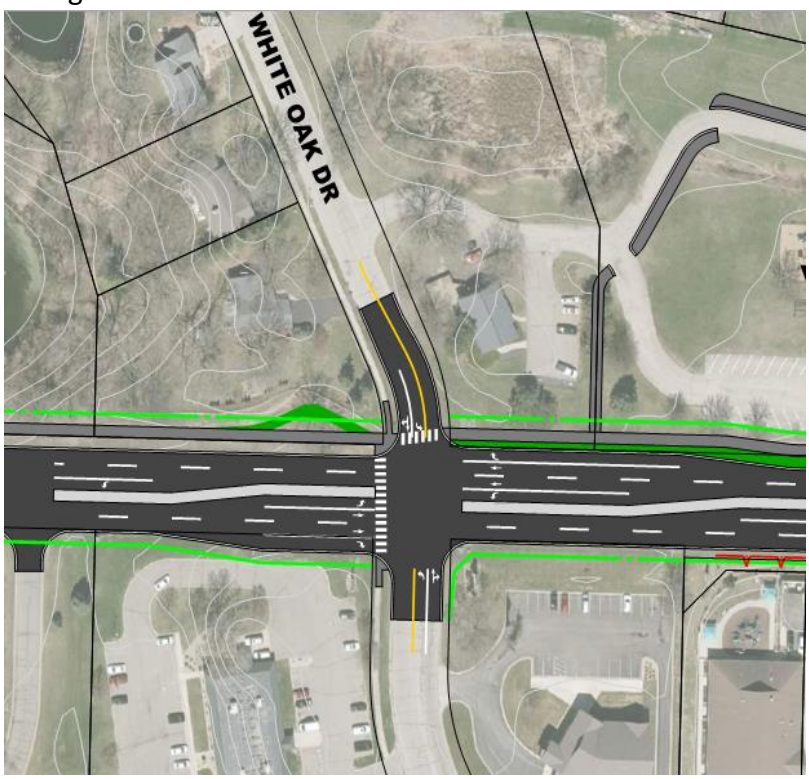


Figure 20. Proposed improvements to the Highway 10/White Oak Drive intersection. The same lane configuration will work for both short-term full access improvements as well as the long-term traffic signal option. Note: The traffic signal will be considered in the short-term if funding becomes available.

Highway 10 and White Oak Drive

Recommendations for the White Oak Drive intersection include a phased approach that will apply short-term improvements to the intersection while preparing it for optimal long-term improvements. Near-term improvements include adding a dedicated right-turn lane on Highway 10 into White Oak Drive along with a dedicated left-turn lane on White Oak Drive for turning traffic traveling eastbound on Highway 10. Intersection geometrics implemented as part of

any near-term improvements will be completed to accommodate signalization without substantial rework. Implementation and timing of the traffic signal will be determined with a subsequent phase of the project.

Long-term improvements for White Oak Drive include adding a traffic signal to the intersection. Adding a traffic signal to this location will require synchronized timing with the Highway 10/Highway 41 traffic signal to ensure mobility along the corridor and avoid delay. Both long- and short-term improvements include conversion of Highway 10 to a four-lane section. Short-term improvements to the intersection would be constructed to easily accommodate the long-term traffic signal option.

Highway 10 and Highway 41

Three options were reviewed for the Highway 41 intersection including a two-lane roundabout, a partial signal build and a full signal build. The full-build signal provided the most vehicle efficiency, mobility and the safety for vehicles and pedestrians and is the recommended option for implementation. This alternative includes a traffic signal that accommodates additional thru lanes on the southbound, eastbound, and westbound legs (four-lane divided all directions) and a northbound left-turn lane. The two-lane roundabout was dismissed early in the process due to major flaws in its ability to accommodate future traffic volumes.

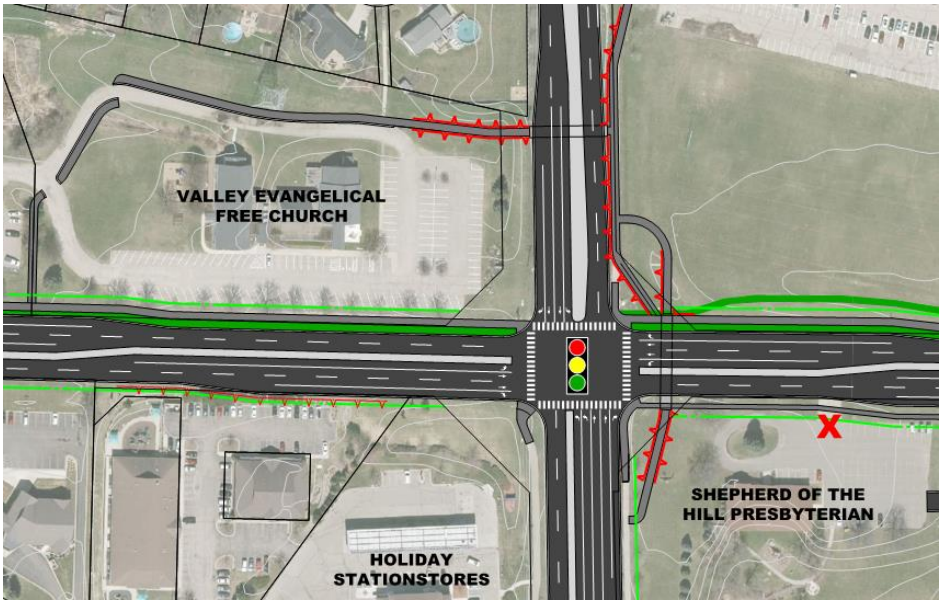


Figure 21. Proposed improvements to the Highway 10/Highway 41 intersection including pedestrian underpasses on the north and east legs of the intersection.

Improved at-grade and grade separated pedestrian crossing treatments are also planned for the intersection on the north and east legs. While alternatives do include some improvements to at-grade pedestrian crossing facilities, project partners agreed that adding grade-separated facilities at the east and north legs of the intersection was the ultimate treatment for long-term pedestrian and bicyclist safety at the intersection. Planning for grade-separated facilities required careful coordination with adjacent property owners including the Valley Evangelical-Free Church, Chaska Vet, Shepherd of the Hill Presbyterian Church, and ISD 112. Consensus was achieved among these groups to work with project partners to implement grade-separated facilities.

Highway 10 and Park Ridge Drive/Skyview Drive

Park Ridge Drive Two options were reviewed including a roundabout and a traffic signal. A traffic signal was not recommended due to operations and safety issues and proximity to the Highway 41 intersection traffic signal. A single-lane roundabout was the best option for increasing mobility and safety of the intersection for vehicles and pedestrians.

Figure 22. Proposed Roundabout at the Highway 10/Park Ridge Drive/Skyview Drive intersection.

EAST OF PARK RIDGE DRIVE/SKYVIEW DRIVE

The existing two-lane undivided rural section east of the Highway 10/Park Ridge Drive/Skyview Drive intersection will be converted to a two-lane divided urban section. The two-lane option will provide a safer environment than a four-lane with less vehicle-to-vehicle conflicts. The two-lane option is also a lower cost option than the four-lane.

Turn lanes will be added at the intersections of Highway 10 with Ridge Lane and Ravoux Road, while the westbound left-turn lane at Highway 10 and Brandon Boulevard will be removed. This segment will also include completion of the trail on the north side of Highway 10 and improvements to the grade-separated trail crossing at Ridge Lane and the addition of a new grade-separated trail crossing at Ravoux Road.

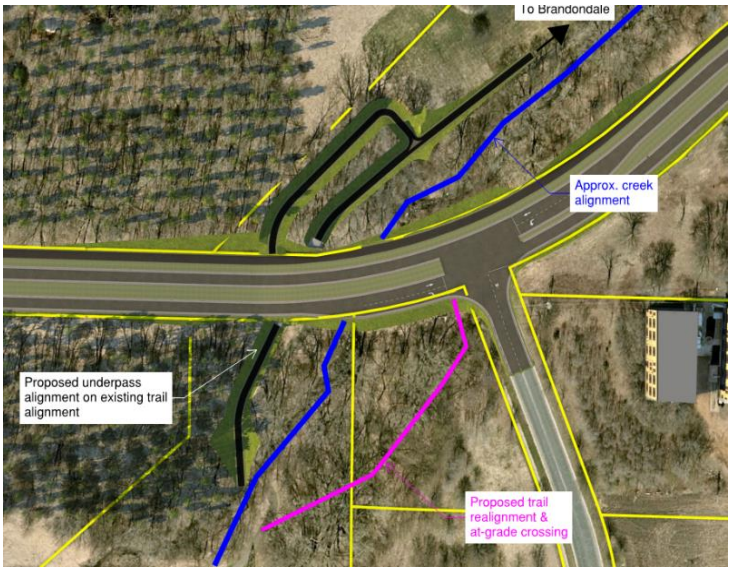


Figure 23. Proposed Trail Underpass near the Highway 10/Ravoux Road intersection.

Two options were explored for the Highway 10/Highway 15 intersection including a single-lane roundabout and improvements to the existing traffic signal. The roundabout alternative would be a higher cost option but will be considered as a long-term improvement. The existing signal would serve future traffic needs appropriately with some improvement. Improvements to the traffic signal include flashing yellow left-turn arrows and improved pedestrian facilities.

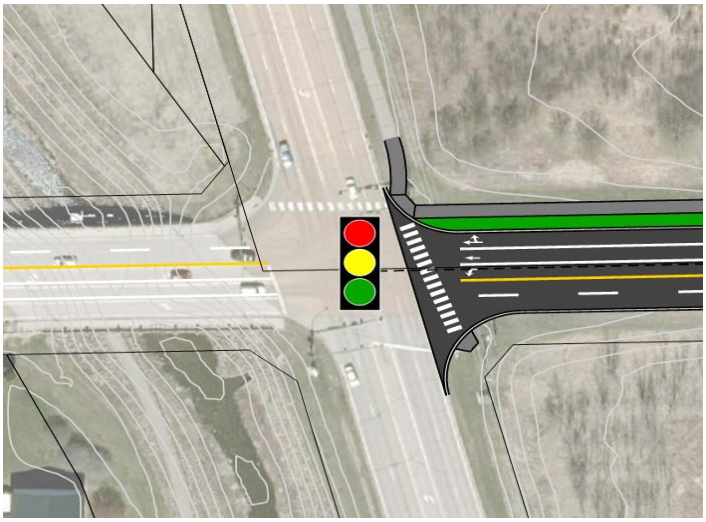


Figure 24. Proposed Highway 10/Highway 15 intersection improvements.

E. IMPLEMENTATION PLAN

An implementation plan was developed to breakdown recommended improvements into potential projects for final design and construction. Information provided in **Figure 25** identifies phases with estimated construction costs and timeframes based on need, priority, and available funding opportunities. The full project implementation plan is included in **Appendix E** and includes a detailed cost breakdown for project implementation.

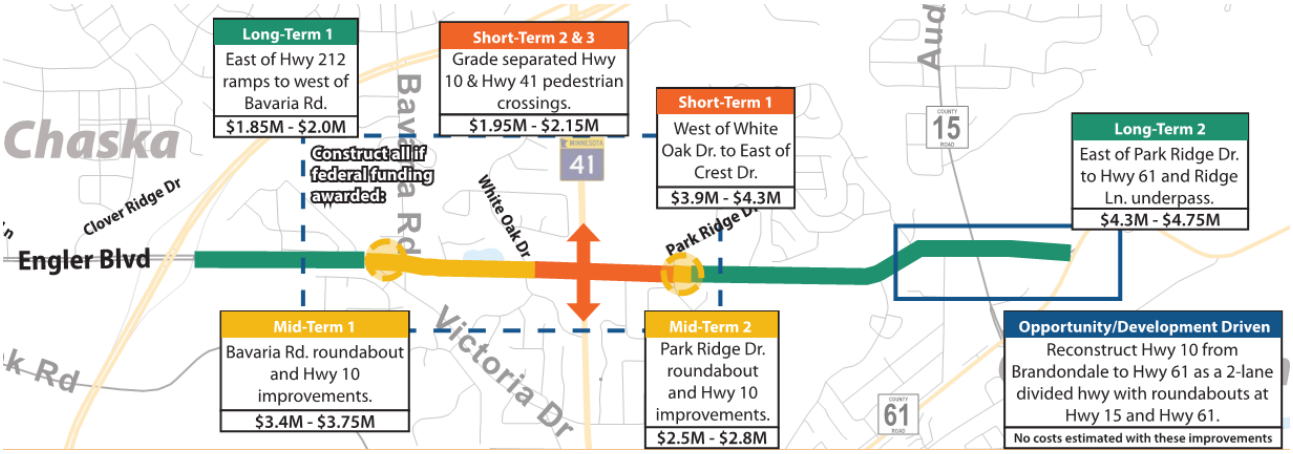


Figure 25. Highway 10 Implementation. Implementation timing is dependent on funding availability. (Construction Costs Only Shown in Figure)

SHORT-TERM PROJECTS: 2 – 6 YEARS

Short-term projects are those that serve an immediate need where issues of greatest concern are present along the corridor today. The highest priority should be given to allocating funding to these projects as soon as possible to ensure existing issues are remedied prior to increased traffic volumes. The following projects have been prioritized for completion within four to six years.

1. *Reconstruction from west of White Oak Drive to east of Crest Drive:* **$6.3M to $6.9M**

Includes conversion of Highway 10 to a four-lane divided urban section along with improvements to the intersections of Highway 10 with White Oak Drive and Highway 41.

2. *Grade-Separated Pedestrian Crossings at the Highway 10/Highway 41 Intersection (North and East Legs):* **$3.1M to $3.4M**

   Includes a grade-separated pedestrian crossing on Highway 41, just north of the intersection, along with a grade-separated crossing on Highway 10 just east of the intersection. At-grade facilities will remain on the east and south legs of the intersection and will be improved for increased safety.

3. *Reconstruction and roundabout at Highway 10 and Bavaria Road intersection:* **$3.7M to $4.1M**

   Includes conversion of the Highway 10/Bavaria Road intersection from a four-way stop to a roundabout (expandable to 2x1).

4. *Reconstruction from Bavaria Road to White Oak Drive:* **$1.8M to $2M**

   Includes conversion of Highway 10 from Bavaria Road to White Oak Drive to a four-lane section. This includes limiting Royal Oak Drive to a three-quarter access and including a center turn-lane in front of the Chaska Fire Department.

5. *Highway 10 Reconstruction and Park Ridge Drive Improvements:* **$4M to $4.5M**

   This includes reconstruction of Highway 10 to a four-lane divided section on the west leg, tapering to a two-lane section through a single-lane roundabout at the Highway 10/Park Ridge Drive/Skyview Drive intersection. The roundabout will replace a four-way stop controlled intersection at Park Ridge Drive/Skyview Drive.

   Note on Funding Availability: *Short-term implementation projects include full reconstruction of Highway 10 from west of Bavaria Road to east of Park Ridge Drive/Skyview Drive with funding becomes available through grant funding solicitations. This area is identified in the dashed, blue box in* ***Figure 25****.*

LONG-TERM PROJECTS: 12 – 20 YEARS

Long-Term projects, while still essential to the success of future traffic operations, include projects that can wait longer for implementation for lack of immediate need. The following projects have been prioritized for completion within 12 to 20 years:

1. *Reconstruction from east of Highway 212 ramps to west of Bavaria Road:* **$1.85M to $2.0M**

   Includes conversion of Highway 10 to a four-lane section with the intersections of Prescott Lane and Victoria Drive remaining full access intersections.

2. *Reconstruction from east of Park Ridge Drive/Skyview Drive to Highway 61 and Ridge Lane Underpass:* **$4.3M to $4.75M**

III. WESTERN PROJECT AREA

A. WESTERN PROJECT AREA OVERVIEW

The Western Project Area includes Highway 10 from Highway 43 West in Laketown Township to Highway 212 in Chaska. Highway 10 is a minor arterial roadway in this segment carrying a range of 11,300 to 14,000 vehicles per day and is mostly a two-lane rural section. Portions of the roadway are four-lane including the urban section extending from west of West Creek Lane through the Highway 212 Interchange Ramps.

Highway 10 through the Western Project Area provides access to several residential neighborhoods containing hundreds of residences, Highways 11 and 43 which serve as key routes for Victoria to the north and Carver to the south, Creek Road which serves as a supporting roadway to the City of Chaska, and to Highway 212 which is a key mobility and freight corridor to all of southwest Minnesota. Carver County identifies Highway 10 as a Regional corridor from Highway 212 through the western study limits in regard to Access Spacing Guidance. This designation is accompanied by access recommendations of 1-mile full intersection spacing and ½ mile secondary intersection spacing.

Traffic is anticipated to grow significantly in this section, doubling in some segments. The no-build scenario for 2040 indicates major delays and disruption to traffic operations in this section as 2040 volumes are realized. Most intersections are anticipated to exhibit unacceptable delays and backups with extensive side street queuing due to the lack of gaps available to vehicles entering and crossing the uncontrolled movements on Highway 10. Some contributing factors to the expected growth in the area includes growth in the nearby cities of Victoria and Waconia as well as the Chaska Big Woods development planned for the south side of the highway which will include additional access from Highway 10. **Figure 26** illustrates the Western Project Area Design Considerations.

Concepts considered for the Western Project Area included both full movement and partial movement intersection treatments and additional traffic lanes.

B. CONCEPT EVALUATION

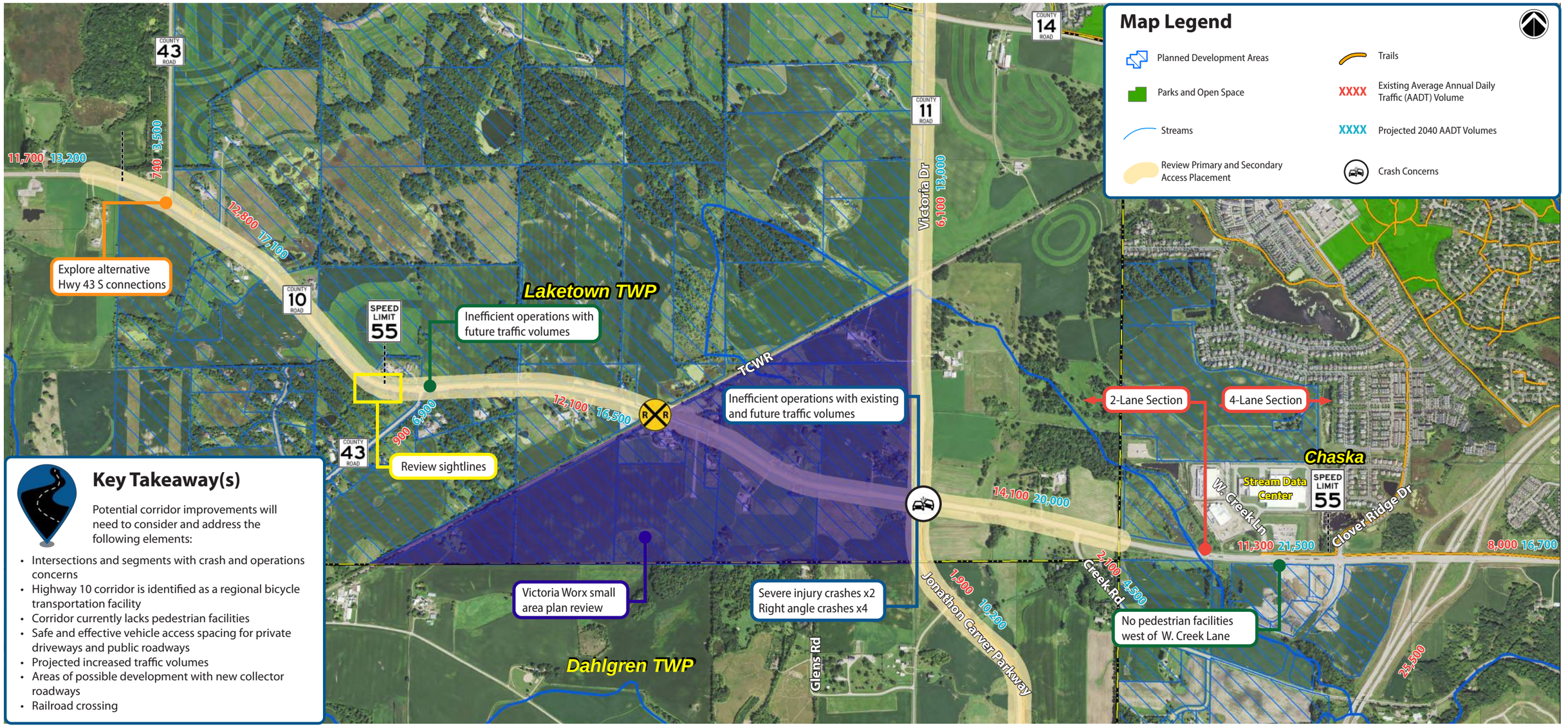
TIER 1 FATAL FLAW CONCEPT SCREENING

Based on technical analysis and input from the TAC, elected officials and the public, a Tier 1 screening was completed to identify fatal flaws and discuss concepts that do not meet the purpose and need framework or the study's goals. The Tier 1 screening generally dismissed concepts that did not meet safety and operations, mobility and access, and financial responsibility goals. **Table 8** identifies concepts from the Tier 1 Screening that were not recommended to be carried forward into the detailed Tier 2 evaluation.

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

CARVER COUNTY · DEPARTMENT OF TRANSPORTATION · CITY OF Chaska MINNESOTA

Design Considerations Overview - West



Key Takeaway(s)

Potential corridor improvements will need to consider and address the following elements:

- Intersections and segments with crash and operations concerns
- Highway 10 corridor is identified as a regional bicycle transportation facility
- Corridor currently lacks pedestrian facilities
- Safe and effective vehicle access spacing for private driveways and public roadways
- Projected increased traffic volumes
- Areas of possible development with new collector roadways
- Railroad crossing

Dismissed Concepts

The table below represents results from the initial fatal flaw screening which compared improvement concepts to the study's goals and objectives to identify inconsistencies and reasons for dismissal. The concepts identified below were not recommended to be carried forward into the detailed evaluation.

Table 16. Fatal Flaw Screening

Dismissed Concepts	Conflicting Goals	Reason Dismissed
Highway 10 Intersection Traffic Control – Primary Intersections		
1. **Side Street Stop Control**	*Mobility*	a) Does not provide adequate traffic operations for side street movements. Long delays and queuing due to significant increases in thru traffic on Highway 10.
Highway 10 Typical Section		
1. **Two-Lane Urban/Rural Section**	*Mobility*	a) Does not accommodate existing and future traffic needs
2. **Undivided Section**	*Access*	a) Does not easily allow for access management or intersection modifications as operations or safety concerns arise

RANGE OF CONCEPTS FOR TIER 2 EVALUATION

This section documents the Tier 2 evaluation process, technical analysis, recommendations, and stakeholder/public involvement leading to the ultimate selection of a locally preferred vision for the Highway 10 corridor within the Western Project Area. Following the Tier 1 Screening described in the section above, the remaining concepts were refined to further develop roadway typical sections, access management, and traffic control needs at intersections. The technical Tier 2 Evaluation was based on how each address the Goals and Measures previously discussed and how the impacts of each concept compared. The following section summarizes the comparison for the Western Project Area.

The following tables provide the comprehensive list of all Tier 2 concepts evaluated for the Western Project Area in the Highway 10 Corridor Study.

Table 17. Typical Section Concept Evaluation

CSAH 43W to RR Xing	RR Xing to West of Creek Lane
• 2040 No-Build • 4-Lane Divided Urban • 4-Lane Divided Rural	• 2040 No-Build • 4-Lane Divided Urban • 4-Lane Divided Rural

Table 18. Intersection Concept Evaluation

CSAH 10 and CSAH 43W	CSAH 10 and CSAH 43E	CSAH 10 and CSAH 11	CSAH 10 and Creek Road
• 2040 No-Build • Green T • Reduced Conflict Intersection	• 2040 No-Build • Green T • Reduced Conflict Intersection	• 2040 No-Build • Reduced Conflict Intersection • Traffic Signal	• 2040 No-Build • Green T • Reduced Conflict Intersection

• Traffic Signal • Unbalanced Roundabout	• Traffic Signal • Unbalanced Roundabout	• 2-Lane Roundabout	• Traffic Signal • Unbalanced Roundabout

GUIDING FRAMEWORK FOR CONCEPTS

Design considerations are summarized in **Figure 26** and the text that follows that influenced the range of concepts developed for the Western Project Area. These topics emerged through existing and no-build conditions review, early discussion with the TAC, and meetings with focus groups and stakeholders.

Access Inventory and Recommendations

Access management guidelines provide a means for transportation engineers and planners to balance private property concerns with the need to provide for a safe and efficient transportation system. Carver County has identified Highway 10, west of TH 212 as a rural minor arterial roadway that functions as a Regional Corridor for greater Carver County. Access spacing recommendations for a regional priority corridor are ½-mile for secondary access and 1-mile for primary access. Highway 10 will reference this direction, but recommendations from this study will serve as guidance for agencies to follow as improvements are implemented. The Existing Conditions Memorandum in **Appendix B** shows existing public and private accesses within the Western Subarea. The Guided Access Control recommendation is documented in **Figure 27** provides an overview of primary, secondary, and development-driven secondary accesses within the project subarea. Access recommendations are as follows:

- Primary Access: CSAH 43W, CSAH 43E, CSAH 11, Victoria Worx Development Access (Highway 11), Clover Ridge Drive, W TH 212 Ramp Intersection, and E TH 212 Ramp Intersection
- Secondary Access: collector roadway connections between CSAH 43E and CSAH 43W and between the TC&W Railroad Tracks and CSAH 11, Creek Road, and West Creek Lane
- Development-Driven Secondary Access: West of CSAH 11

Private driveways and Laketown Township cartways will be evaluated as future development and City of Victoria collector roadways are established along the Highway 10 corridor, west of Highway 11.

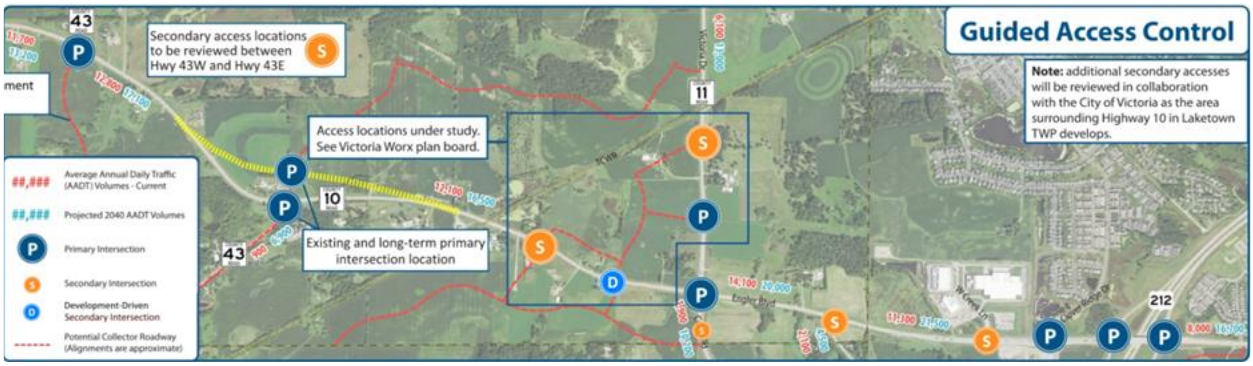


Figure 27. Highway 10 Guided Access Recommendations

CSAH 43 West to Twin Cities & Western (TC&W) Railroad

Figure 28. Highway 10 from Highway 43 West to TC&W Railroad Crossing

Highway 10 is currently a two-lane undivided section from CSAH 43 West to the TC&W Railroad tracks. This section contains the intersections of Highway 43 West, Highway 43 East, Laketown Township cartways, and several private driveways. Private driveways provide access to a range of uses including private business and area residents. Existing daily traffic volumes range from 11,700 to 12,800 vehicles per day and are anticipated to increase to 13,200 to 17,100 vehicles per day by 2040.

The study explored converting the roadway section from two- to four-lanes as well as alternatives for access restrictions and intersection control to alleviate traffic issues. This included reducing access for private driveways to right-in/right-out which would eliminate left-turning traffic to and from Highway 10 for increased traffic safety and mobility.

The Highway 10/CSAH 43 West intersection exhibited five crashes over a five-year period from 2013 to 2017 which is within the expected range for similar intersections. The majority of these were vehicle-deer crashes with the remaining being right angle (one) and run of road (one) crashes. This intersection exhibits a LOS D for the southbound left turn movement under current conditions and is anticipated to exhibit a LOS F for both AM and PM peak hour traffic periods by 2040. Many participants in the public process expressed

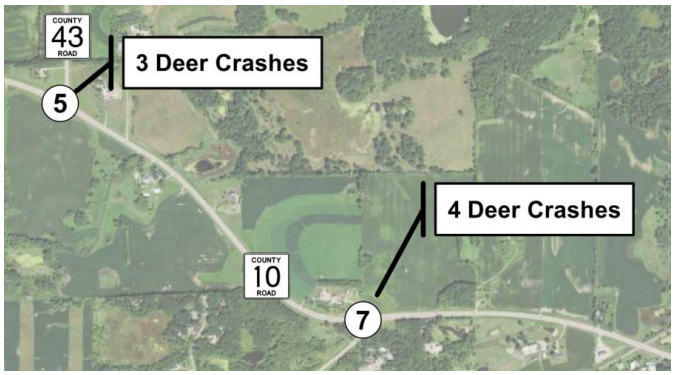


Figure 29. Crash occurrences west of TC&W Railroad tracks (2013-2017).

concern over the difficulty to enter onto Highway 10 from Highway 43W which spurred requests ranging from diverting traffic to other highways and installation of a traffic signal. The Existing Conditions Memorandum in **Appendix B** shows crash occurrences in this section.

The Highway 10/CSAH 43 East intersection exhibited seven crashes over a five-year period from 2013 to 2017 which is within the expected range for similar intersections. The majority of these were vehicle-deer crashes with the remaining being right angle (one), rear end (one) and head on (one) crashes. This intersection exhibits a LOS C for the northbound left turn movement under current conditions and is anticipated to exhibit a LOS F for both AM and PM peak hour traffic periods by 2040. Many participants in the public process expressed concern over the poor sightlines when turning onto Highway 10 from Highway 43 East. The Existing Conditions Memorandum in **Appendix B** shows crash occurrences in this section.

Highway Alignment Review

A review of the existing roadway alignments for both Highway 43 and Highway 10 was completed in this segment of the western subarea to improve safety and ensure the vision for the corridor accommodates possible development initiatives in the future.

Highway 10 Re-alignment

Existing site conditions at the intersection of Highway 10 and Highway 43 East have raised concerns from the public over poor sightlines when entering onto Highway 10 from the stop-controlled side street approach. Curvature in the alignment immediately west of the intersection is border line non-compliant with the 1,120' radius curve requiring a 6% superelevation to maintain acceptable design standards for 55mph. Carver County general practice is for superelevation to remain at 4% or below so this is not an ideal design.

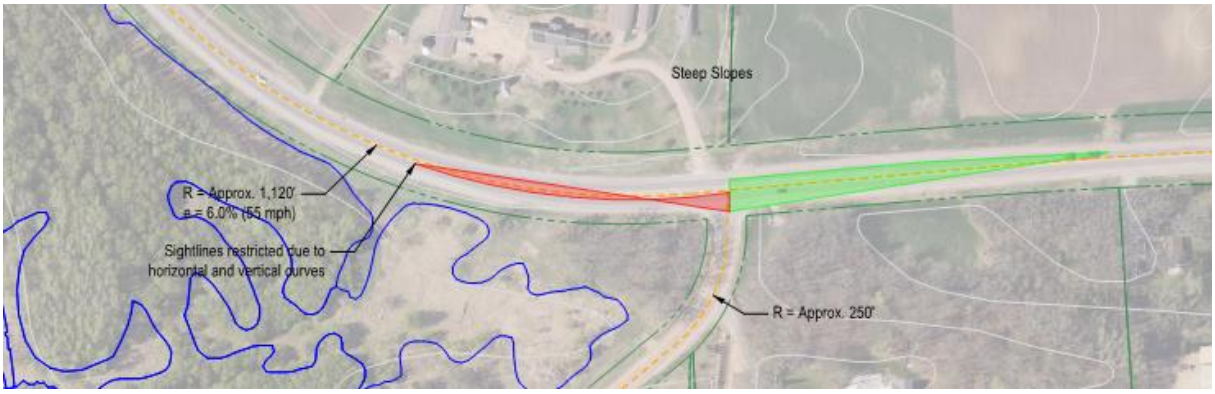


Figure 30. Existing site conditions at Highway 10 and Highway 43 East

Traffic forecasts in the area are also anticipated to increase significantly which places an added emphasis to the functionality of the intersection. The south leg of the intersection is expected to increase from 900vpd today to approximately 6,900vpd in the future with expected development occurring north of Carver. The City of Victoria is also planning to extend a collector roadway north of the intersection to serve future development plans for residential growth in the area. The desire to expand the intersection to a four-legged full movement intersection paired with existing safety concerns and future growth in the area on Highway 10, Highway 43E, and the proposed collector road are all drivers for the review of a re-alignment alternative for Highway 10.

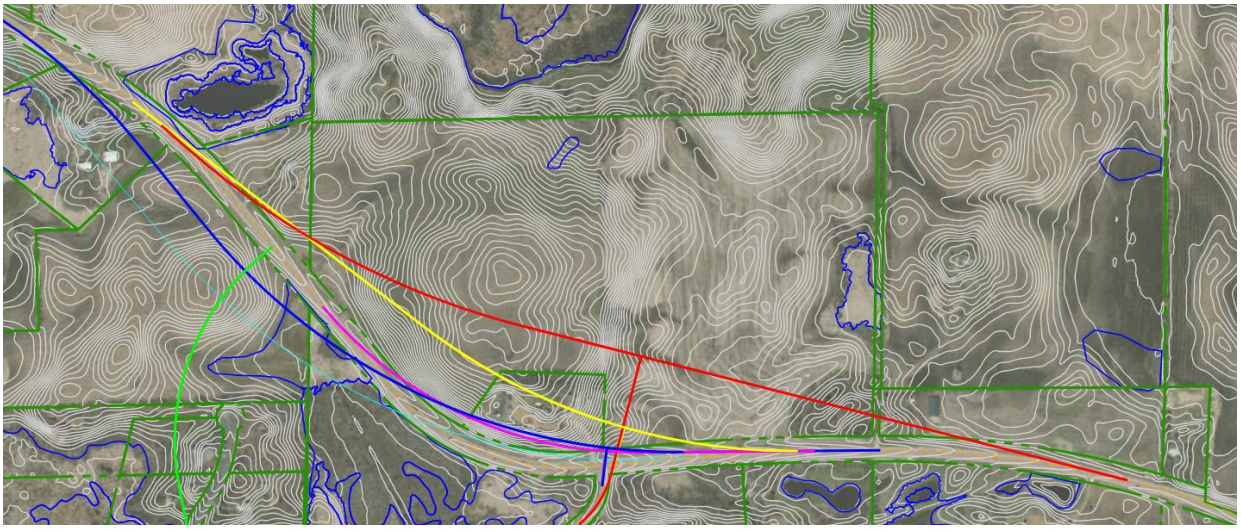


Figure 31. Highway 10 Alignment Review

Discussion with Carver County and the City of Victoria led to a recommendation to move forward with the **RED** alignment identified in **Figure 31**. A variety of alternatives were reviewed with varying levels of long-term effectiveness. The proposed alignment minimizes environmental impacts, improves on design standards, maximizes development potential, and allows for the connection of a future collector roadway to the north. The proposed alignment will be incorporated in Carver County's 20-year planning documents. County and City will work towards this alignment through right-of-way preservation as development occurs in the area.

Highway 43 Realignment

While the existing Highway 43 alignment is perpetuated in the above alignment review, an alternative is also proposed as an improvement to consider looking beyond the 20-year plan. The **PINK** alignment identified in **Figure 32** re-aligns Highway 43 East to intersection Highway 10 opposite of Highway 43 West. The alignment would

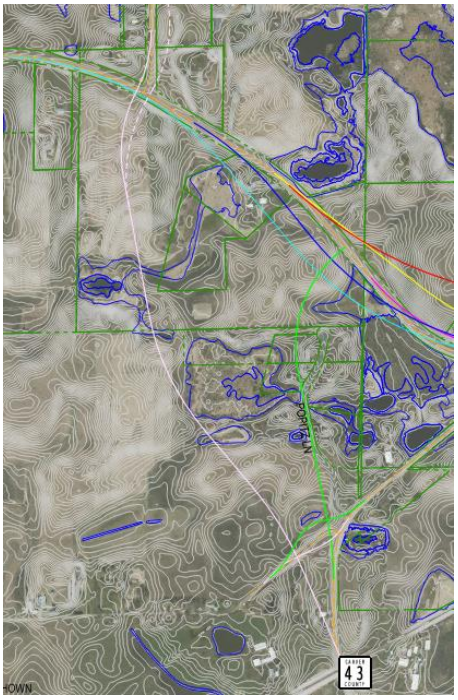


Figure 32. Highway 43 Alignment Review

require substantial property acquisition and significant funding to complete the connection. The alignment will be documented and considered in the future when development plans and traffic forecasts are realized along the corridor.

TC&W Railroad Tracks to West of West Creek Lane

Figure 33. Highway 10 from TC&W Railroad Tracks to ¼-mile west of West Creek Lane

Highway 10 is currently a two-lane undivided section from TC&W Railroad tracks to approximately ¼-mile west of West Creek Lane. At this point, the typical section transitions to a 4-lane divided urban section to provide the necessary capacity through the Clover Ridge Drive/Chaska Creek Way and TH 212 ramp intersections. This section contains the intersections of Highway 11, Creek Road, West Creek Lane, and several private driveways. Existing daily traffic volumes range from 11,300 to 14,100 vehicles per day and are anticipated to increase to 20,000 to 21,500 vehicles per day by 2040.

The study explored perpetuating the existing 4-lane divided section east beginning near West Creek Lane to provide additional capacity for the roadway and provide improved access management in the subarea. This included reducing access for private driveways to right-in/right-out which would eliminate left-turning traffic to and from Highway 10 for increased traffic safety and mobility.

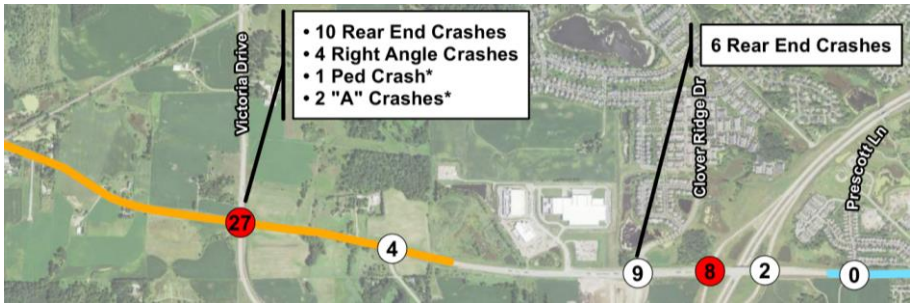


Figure 34. Crash occurrences east of TC&W Railroad tracks (2013-2017).

The Highway 10/CSAH 11 intersection exhibited 27 crashes over a five-year period from 2013 to 2017 which is above the expected range for similar intersections. The most common crash type at the intersection was rear end crashes on Highway 10 with the remaining being right angle, head on, run off road, sideswipe passing, and deer-vehicle. This intersection exhibits a LOS D in the AM peak hour with several movements being LOS E under current conditions. Extensive queuing is also observed on Highway 10 during both the

AM and PM peak hours for the southbound left turn movement under current conditions and is anticipated to exhibit a LOS F for both AM and PM peak hour traffic periods by 2040. Many participants in the public process requested that a traffic signal or roundabout be reviewed as well as additional and longer turn lanes on both Highway 10 and Highway 11. The Existing Conditions Memorandum in **Appendix B** shows crash occurrences in this section.

The Highway 10/Creek Road intersection exhibited four crashes over a five-year period from 2013 to 2017 which is within the expected range for similar intersections. The majority of these were rear end crashes with the remaining being right angle (one) and run off road (one). This intersection exhibits a LOS E and F for the northbound left turn movement under current conditions and is anticipated to exhibit a LOS F for both AM and PM peak hour traffic periods in 2040. Many participants in the public process expressed concern over difficulties turning onto Highway 10 from Creek Road during the peak hours and overall safety at the intersection. It was requested that a roundabout be reviewed for the intersection. The Existing Conditions Memorandum in **Appendix B** shows crash occurrences in this section.

TIER 2 DETAILED EVALUATION RESULTS

The evaluation was presented in a matrix format to facilitate the comparison across roadway typical section and intersection improvement concepts and to identify agency supported concepts to further develop and present for public input. The criteria reviewed in the Western subarea is consistent with that explored in the Eastern Subarea noted previously in **Table 11.**

Table 19 illustrates the summarized evaluation results at of the Western Project Area. The detailed evaluation matrix is included in **Appendix D.**

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

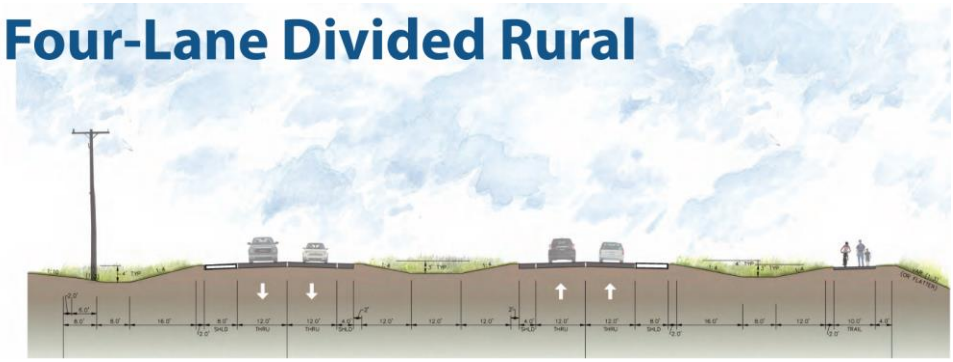
Highway 10 Corridor Study
Western Project Area Recommended Alternative Matrix
January 2020

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Criteria		Intersection Concept Overview															Typical Sections & Access Considerations			
		CSAH 43W				CSAH 43E				CSAH 11			Creek Road				CSAH 43W to RR Xing		RR Xing to East of Creek Road	
		Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	Reduced Conflict Intersection	Traffic Signal	Two-Lane Roundabout	Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	4-Lane Divided Rural	4-Lane Divided Urban	4-Lane Divided Rural	4-Lane Divided Urban
Existing Conditions/Issues		• Operational concerns with traffic growth				• Operational concerns with traffic growth				• Crash concerns • Operational concerns with traffic growth			• Operational concerns with traffic growth				• Lack of pedestrian facilities		• Lack of pedestrian facilities • Victoria Worx planning area	
Evaluation Matrix Goals	**Operations**	++	++	++	+	++	+	++	+	0	++	0	++	++	+	+	++	++	++	++
	Safety	+	++	+	++	+	++	+	++	++	++	++	++	++	+	++	+	+	+	+
	Pedestrian/Bike Mobility	+	++	++	++	+	+	++	++	+	++	+	++	++	++	++	++	++	++	++
	Environmental Impacts	++	++	++	+	++	++	++	+	++	++	+	++	++	++	+	+	++	+	++
	Cost	++	++	+	+	++	++	++	+	++	++	+	++	++	+	+	++	+	++	+
Overall Matrix Score		+	++	+	+	+	+	++	+	+	++	+	++	++	+	+	++	++	++	++
OH 2 Scoring	**Total Votes**	31 Total Votes; 10% Neutral				30 Total Votes; 13% Neutral				31 Total Votes; 3% Neutral			35 Total Votes; 11% Neutral				29 Total Votes; 10% Neutral		57 Total Votes; 16% Neutral	
	# Votes (%)	3 (10%)	3 (10%)	9 (29%)	13 (42%)	2 (7%)	0 (0%)	12 (40%)	12 (40%)	1 (3%)	20 (65%)	9 (29%)	10 (29%)	4 (11%)	6 (18%)	11 (31%)	13 (45%)	13 (45%)	13 (23%)	35 (61%)
Public/Focus Group Feedback		• Traffic volumes seem high; divert traffic to other highways • Left turns from Highway 43 onto Highway 10 eastbound are diffcult due to traffic. • Vehicles observed using shoulder to pass during periods of congestion. • Consider installing traffc signal				• Sight lines poor when turning onto Highway 10 from Highway 43 (East).				• Highway 10 approaching Highway 11 intersection feels like a launch pad • Add traffic signal or roundabout • Diffcult to turn left onto Highway 11 • Consider longer or additional turn-lanes at intersection for westbound traffic • Consider a right turn lane onto Highway 10 from northbound to eastbound.			• Turning eastbound onto Highway 10 from Creek Road is diffcult during peak hour traffic. • Safety concern for traffc turning left onto Highway 10. • Right turn lane from Highway 10 onto Creek Road is too short. • Consider a roundabout				• Bicyclists prefer Highway 10 to travel between Waconia and Chaska due to its large shoulders. • Add landscaping along Highway 10		• Some concerned with many access locations shown in Guided Access Control • Expand to 4 lanes from the Stream Data Center to Highway 11. • Add landscaping along Highway 10	
Agency Input		• Exploring realignments to better connect Highway 43				• Exploring Highway 10 realignments to reduce roadway curvature • Exploring realignments to better connect Highway 43											• Carver Couty interested in options Highway 43 S connections • Horizontal curves impede sightlines		• Victoria Worx Plan not finalized; access locations not firm • Carver County desires for access spacing to meet guidelines	
BMI Preliminary Observations/Recommendations																				
Agency Support		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

Tables 20 and **21** provide a snapshot of each concept evaluated and a brief summary of its operational characteristics and its pros/cons. It also notes those improvement concepts dismissed through the process by collective agreement with the TAC, City of Victoria, City of Chaska, and Laketown Township.

Table 20. Western Project Area – Typical Section Alternatives

Concept	Characteristics	Summary of Evaluation Differences – Pros/Cons
		
Highway 43 West to TC&W Railroad Tracks **Recommended**	• Currently 2-lane undivided rural from CSAH 43 West to TC&W Railroad Tracks • Includes conversion of Highway 10 from 2-lane undivided rural to 4-lane divided urban section • Requires driveway relocation on future collector roadways with development **This option was recommended for implementation by the study.**	*Pros:* • Higher roadway capacity of typical section options – both expected to accommodate 20-year forecast • Lesser maintenance of typical section options • Lower cost of typical section options • Supported by the public *Cons:* • More right-of-way needs • More impacts to natural environment
TC&W Railroad Tracks to West of West Creek Lane **Recommended as feasible option for consideration in future project phase**	• Currently 4-lane divided urban from West of West Creek Lane through TH 212 Interchange • Includes conversion of Highway 10 from 2-lane undivided rural to 4-lane divided urban section from TC&W Railroad Tracks to west of West Creek Lane • Requires driveway relocation on future collector roadways with development	*Pros:* • Higher roadway capacity of typical section options – both expected to accommodate 20-year forecast • Better accommodates Creek Road recommended intersection alternative • Lesser maintenance of typical section options • Lower cost of typical section options • Supported by the public *Cons:* • More right-of-way needs • More impacts to natural environment • Does not fit aesthetic with City of Victoria Development near Highway 11

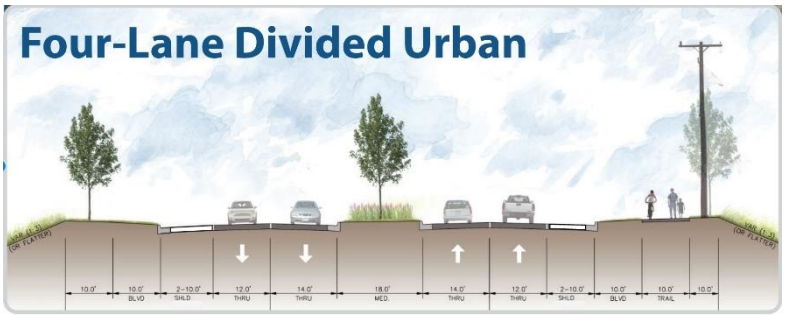
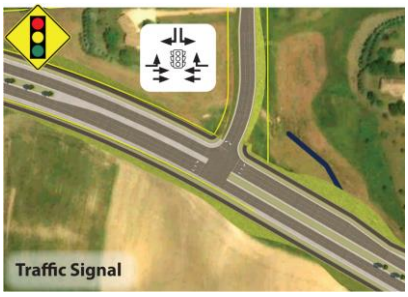
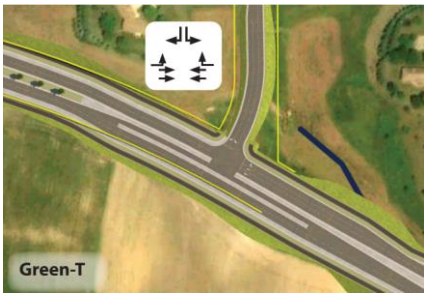
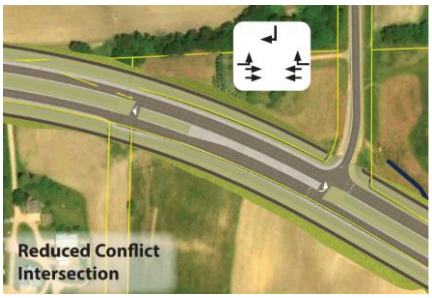
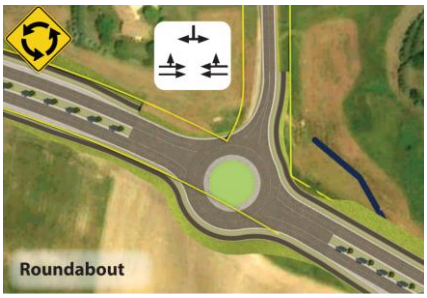
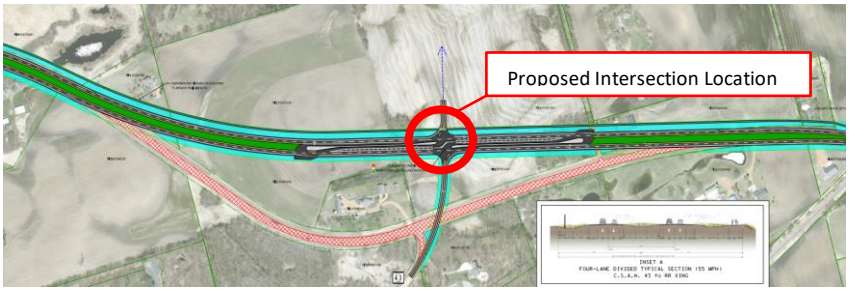
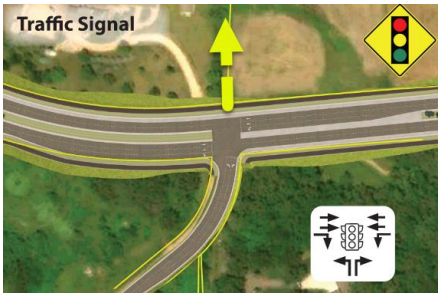
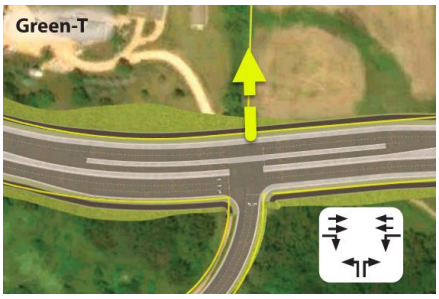
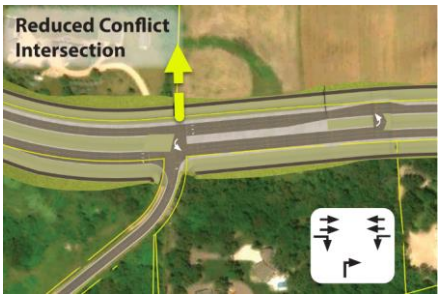
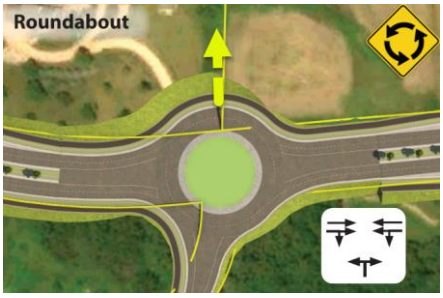
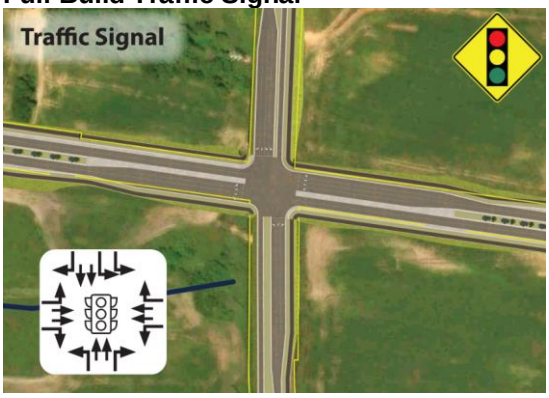
		
Highway 43 West to TC&W Railroad Tracks **Dismissed**	• Currently 4-lane divided urban from West of West Creek Lane through TH 212 Interchange • Includes conversion of Highway 10 from 2-lane undivided rural to 4-lane divided urban section from CSAH 43 West to west of West Creek Lane • Requires driveway relocation on future collector roadways with development **This option was dismissed by the study which opted for the 4-lane rural section**	*Pros:* • Less property acquisitions • Improved pedestrian crossings with two-stage crossing *Cons:* • Lower roadway capacity of typical section options – both expected to accommodate 20-year forecast • More maintenance of typical section options • Higher cost of typical section options • Not supported by the public
TC&W Railroad Tracks to West of West Creek Lane **Recommended as feasible option for consideration in future project phase**	• Currently 4-lane divided urban from West of West Creek Lane through TH 212 Interchange – Alternative would perpetuate the existing typical section west of the Highway 11 intersection • Includes conversion of Highway 10 from 2-lane undivided rural to 4-lane divided urban section from TC&W Railroad Tracks to west of West Creek Lane • Requires driveway relocation on future collector roadways with development	*Pros:* • Accommodates 20-year traffic forecasts • Improved pedestrian crossings with two-stage crossing • Provides desired aesthetic with City of Victoria Development near Highway 11 • Less right-of-way and environmental impacts of typical section options • Supported by the public *Cons:* • Lower roadway capacity of typical section options – both expected to accommodate 20-year forecast • More maintenance of typical section options • Higher cost of typical section options

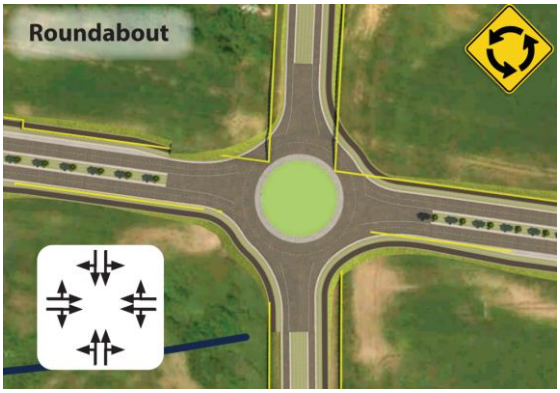
Table21. Western Project Area – Intersection Alternatives	
Concept	**Summary of Evaluation Differences – Pros/Cons**
HIGHWAY 43 WEST Each of the intersection alternatives reviewed and identified below are expected to accommodate vehicle and pedestrian traffic safely and efficiently under existing and future conditions. Each has trade-offs, as identified, and a recommendation has been made based upon overall benefit to the corridor and greater transportation system.	
Traffic Signal  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes two-way side street stop control to a four-lane divided Highway 10 with a traffic signal *Pros:* • Decreases peak hour side street delays • Provides dedicated movement to all intersection (pedestrian and vehicle) movements • Provides capacity for traffic volumes in excess of 2040 forecasts • Lower cost than roundabout *Cons:* • Increases travel times for Hwy 10 movements • Among the least safe options in terms of forecasted crash and severity rates, vehicle to vehicle conflicts and vehicle to pedestrian conflicts • Most ongoing maintenance needs of options reviewed
Green-T Intersection  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of two-lane side street stop control to a four-lane unsignalized Green-T intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Lowest forecasted crash and severity rates • Provides best opportunity for future funding opportunities *Cons:* • Does not accommodate future CSAH 43 connection of the south leg • Least accommodating for bicycle and pedestrian crossing movements • Maintains potential for severe injury crashes
Reduced Conflict Intersection  	• Includes conversion of side street stop control to a reduced conflict U-turn intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Provides best opportunity for future funding opportunities • Lowest forecasted crash and severity rates *Cons:* • Lower capacity for side street movements with forecasted volumes • Lesser pedestrian crossing facilities of options reviewed

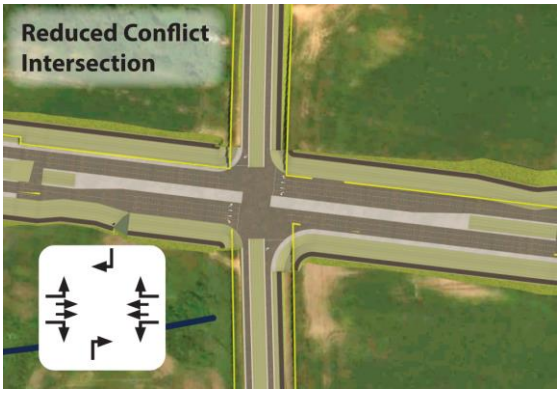
This option was recommended for implementation by the study.	
Unbalanced Roundabout (2x1)  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of side street stop control to a 2x1 roundabout *Pros:* • Decreases side street delays • Minimizes potential for severe injury crashes • Most supported by the public *Cons:* • Approaches capacity with forecasted growth scenario • Increases travel times and reduces mainline speeds for Hwy 10 movements • Largest project costs of options reviewed • Largest right-of-way footprint
HIGHWAY 43 EAST	
 	All CSAH 43E options reviewed include the re-alignment of Highway 10 to the recommend location depicted at left.
Traffic Signal (RCI or Conventional Intersection)  **This option was dismissed by the study for the 2040 build condition which opted for the reduced conflict intersection.** **This option was recommended by the study if warranted with future development and growth in the region**	• Includes two-way side street stop control to a four-lane divided Highway 10 with a traffic signal *Pros:* • Decreases peak hour side street delays • Provides dedicated movement to all intersection (pedestrian and vehicle) movements • Provides capacity for traffic volumes in excess of 2040 forecasts • Best accommodates future north collector roadway • Lower cost than roundabout • Most supported by the public *Cons:* • Increases travel times for Hwy 10 movements • Among the least safe options in terms of forecasted crash and severity rates, vehicle to vehicle conflicts and vehicle to pedestrian conflicts • Most ongoing maintenance needs of options reviewed

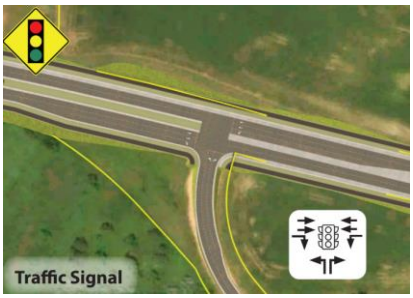
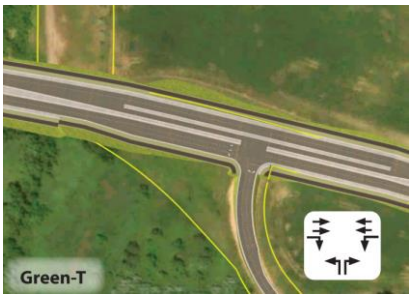
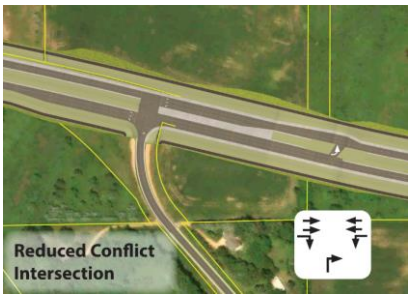
Green-T Intersection  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of two-lane side street stop control to a four-lane unsignalized Green-T intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Lowest forecasted crash and severity rates • Provides best opportunity for future funding opportunities *Cons:* • Does not accommodate future north collector roadway • Least accommodating for bicycle and pedestrian crossing movements • Maintains potential for severe injury crashes
Reduced Conflict Intersection  **This option was recommended for implementation by the study.**	• Includes conversion of side street stop control to a reduced conflict U-turn intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Provides best opportunity for future funding opportunities • Lowest forecasted crash and severity rates • Potential to be expanded to a traffic signal, if warranted, in the future *Cons:* • Lower capacity for side street movements with forecasted volumes • Lesser pedestrian crossing facilities of options reviewed
Unbalanced Roundabout (2x1)  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of side street stop control to a 2x1 roundabout *Pros:* • Decreases side street delays • Minimizes potential for severe injury crashes • Most supported by the public *Cons:* • Approaches capacity with forecasted growth scenario • Increases travel times and reduces mainline speeds for Hwy 10 movements • Largest project costs of options reviewed • Largest right-of-way footprint

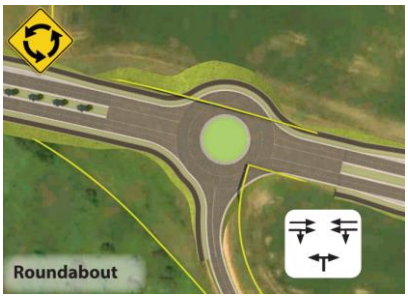
HIGHWAY 11	

Full Build Traffic Signal
 
 	
This option was recommended for implementation by the study.
	• Includes a traffic signal that accommodates additional thru lanes and turn lanes on all approaches
	Pros:
	• Provides more efficiency and reliable vehicle mobility than a roundabout overall
	• Most effective for accommodating vehicle freight demands for development
	• Has agency support
	• Most supported by the public
	Cons:
	• Not as safe as roundabout
	  • Higher forecasted crash and severity
	  • Higher vehicle to vehicle conflicts
	• Higher number of lanes crossed by pedestrians

Multi-Lane Roundabout (2x2)
 
 	
This option was dismissed by the study which opted for the full-build traffic signal
	• Includes a two-lane roundabout that accommodates additional thru lanes on the southbound, eastbound, and westbound legs (four-lane divided all directions)
	Pros:
	• Safer than signals:
	  • Lower forecasted crash and severity
	  • Less vehicle to vehicle conflicts
	  • Less vehicle to pedestrian conflicts
	Cons:
	• Significant delays and increased travel times in forecasted traffic years
	• Least effective for accommodating vehicle freight demands for development
	• Requires more property acquisitions
	• Has the most impacts environmentally
	• Lacks agency support

Reduced Conflict Intersection  **This option was dismissed by the study which opted for the full-build traffic signal.**	• Includes conversion of existing traffic signal to a reduced conflict U-turn intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays during off-peak conditions • Lowest forecasted crash and severity rates • Potential to be signalized if warranted as traffic volumes increase *Cons:* • Lower capacity than other alternatives reviewed – fails to adequately accommodate full build traffic volumes • Lesser pedestrian crossing facilities of options reviewed • Larger intersection footprint than the traffic signal • Least supported by the public

Creek Road	
Traffic Signal  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes two-way side street stop control to a four-lane divided Highway 10 with a traffic signal *Pros:* • Decreases peak hour side street delays • Provides dedicated movement to all intersection (pedestrian and vehicle) movements • Provides capacity for traffic volumes in excess of 2040 forecasts • Accommodates future north collector roadway • Lower cost than roundabout *Cons:* • Increases travel times for Hwy 10 movements • Among the least safe options in terms of forecasted crash and severity rates, vehicle to vehicle conflicts and vehicle to pedestrian conflicts
Green-T Intersection  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of two-lane side street stop control to a four-lane unsignalized Green-T intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Lowest forecasted crash and severity rates • Provides best opportunity for future funding opportunities *Cons:* • Does not accommodate future north collector roadway • Least accommodating for bicycle and pedestrian crossing movements
Reduced Conflict Intersection  **This option was recommended for implementation by the study.**	• Includes conversion of side street stop control to a reduced conflict U-turn intersection *Pros:* • Provides free-flow movement for Hwy 10 thru traffic • Decreases side street delays • Provides best opportunity for future funding opportunities • Lowest forecasted crash and severity rates • Accommodates future north collector roadway *Cons:* • Lower capacity for side street movements with forecasted volumes • Lesser pedestrian crossing facilities of options reviewed

Unbalanced Roundabout (2x1)  **This option was dismissed by the study which opted for the reduced conflict intersection.**	• Includes conversion of side street stop control to a 2x1 roundabout *Pros:* • Decreases side street delays • Minimizes potential for severe injury crashes • Most supported by the public *Cons:* • Approaches capacity with forecasted growth scenario • Increases travel times and reduces mainline speeds for Hwy 10 movements • Largest project costs of options reviewed • Largest right-of-way footprint

C. PUBLIC AND AGENCY INPUT – WESTERN PROJECT AREA

Agency coordination and public involvement were key components to the successful development of the Highway 10 Corridor Study. Public engagement and agency coordination efforts in the western project area were completed in conjunction with that described previously for the Eastern Project Area. In addition to these activities, stakeholder meetings were held with the Laketown Township Board and City of Victoria Staff for decisions impacting only the Western Project Area. The Public Involvement Plan is included in **Appendix A**.

The following methods were used to promote public involvement during the study (See meeting summaries in **Appendix A**).

D. HIGHWAY 10 IMPROVEMENT RECOMMENDATIONS FOR IMPLEMENTATION

The process for identifying improvement recommendations for Highway 10 concluded in October of 2020. Improvement recommendations provide a vision for Highway 10 that is supported by both the City of Chaska and Carver County Board. The following summarized the TAC recommended improvements.

HIGHWAY 43W TO EAST OF RAILROAD TRACKS

Improvements identified for this section include conversion of the roadway to a four-lane divided rural section and implementation of reduced conflict intersection geometries at the Highway 43 West and Highway 43 East intersections. The RCI geometry is recommended for the Highway 43 West intersection as it best provides improvement to local movements with decreased impact to through traffic on Highway 10. The RCI geometry can also be easily reconfigured to provide a fourth leg. The long-term vision of a realigned Highway 43 East connecting to Highway 43 West at its intersection with Highway 10 is noted. The intersection control for this new intersection should be evaluated prior to implementation.

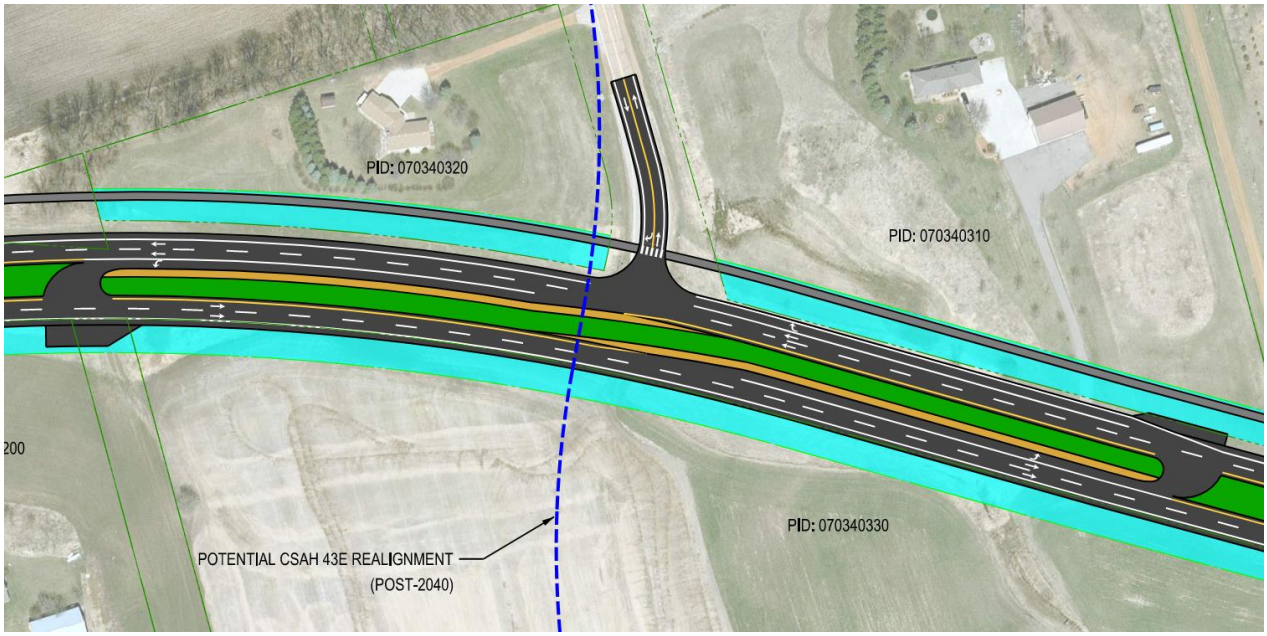


Figure 35. CSAH 43 West at CSAH 10 Reduced Conflict Intersection.

The realignment of Highway 10 at the Highway 43 East intersection is recommended to better provide adequate horizontal curve design and intersection sight distance. The proposed reduced conflict intersection is anticipated to provide improved safety and operations, prioritizing regional mobility on Highway 10, and allows the opportunity for constructing a north leg to provide connection to a collector network developed by the City of Victoria to accommodate the forecasted area development. The intersection may be signalized if Highway 43 East and collector network volumes reach levels warranting signalization. The long-term realignment of CSAH 10 is expected to be pursued only with future City of Victoria development needs.

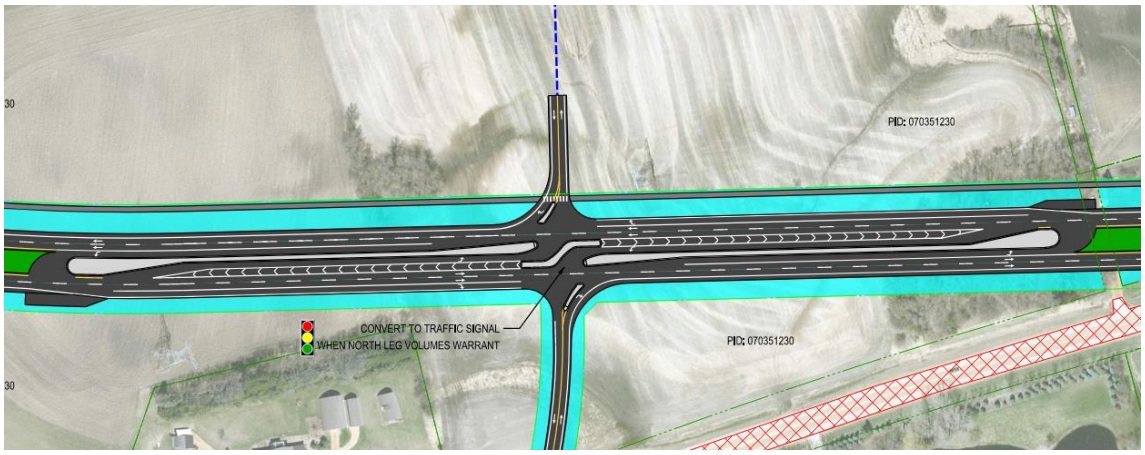


Figure 36. Highway 43 East at Highway 10 Reduced Conflict Intersection.

RAILROAD TRACKS TO WEST CREEK LANE

The section from east of the railroad tracks to Creek Lane will be converted to a four-lane divided section to accommodate forecasted traffic volumes, which exceed the capacity of a two-lane roadway, and decrease delays. Both an urban and rural section were evaluated as feasible typical sections. The following outlines recommended intersection improvements for this section from west to east.

Highway 10 and Highway 11

Recommendations for the Highway 11 intersection include the construction of dual left turn lanes on three approaches and improving the storage capacity of all turn lanes to better provide for forecasted operations. Of the intersection control measures considered, a traffic signal is the recommended control as it provides good regional mobility while serving Highway 11 and pedestrian traffic. Right-of-way preservation is recommended if long-term forecast volumes are realized, and a grade separated interchange is needed to efficiently serve traffic. The near-term improvements to the signalized intersection can be made as part of one improvement if funding is available or split as improvements to Highways 10 and 11 separately.

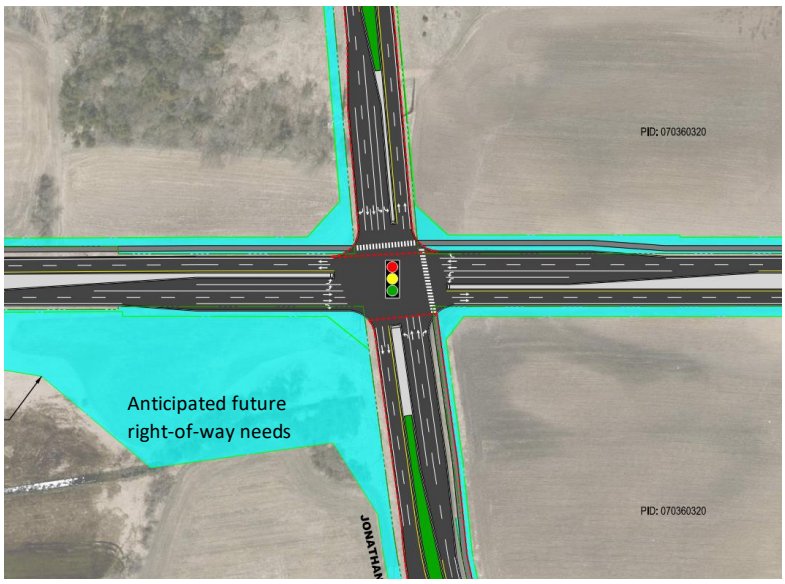


Figure 37. Proposed Highway 10/11 Intersection Improvements

Highway 10 and Creek Road

Like the other intersections within the Western Subarea, analysis of the Creek Road intersection considered several traditional and alternative intersection controls. The recommended reduced conflict intersection geometry is shown to best provide regional mobility while improving localized safety and operations for all entering traffic. If Creek Road is closed south of the project area in the future, the RCI will adequately serve the low volumes while having little impact on the operations of Highway 10 traffic. This intersection control type can also accommodate both rural and urban sections, allowing for design flexibility in Highway 10 section type in this area.

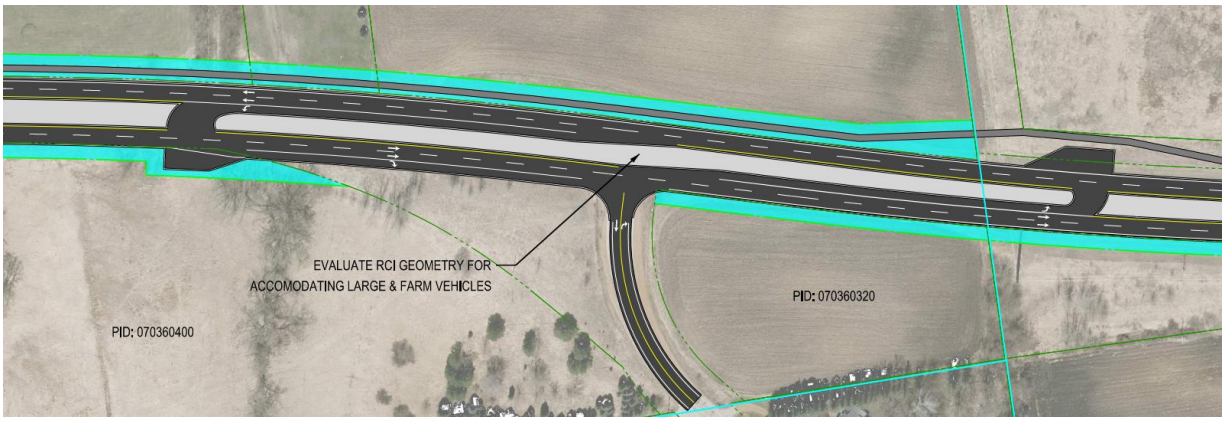


Figure 38. Proposed Highway 10 at Creek Road reduced conflict intersection.

E. LONG-RANGE CORRIDOR PLANNING

TRAFFIC FORECASTS

Year 2040 forecasts were obtained from Carver County with the baseline volumes taken from the Scenario 3.5 forecast planning from the County Comprehensive Plan. These forecast volumes were used to determine growth rates for each road segment and intersection in the study area. Additional details regarding traffic forecasting is provided in the Future Conditions Traffic Memorandum found in **Appendix G**.

A sensitivity analysis was conducted using an alternative forecasting scenario provided by Carver County, Scenario 4. This scenario reflects the 'highest growth scenario' with the expectation of full build out of the developable areas within Carver County and is evaluated as a Post-2040 condition to understand potential future corridor needs. **Figure 39** depicts the forecasted traffic volumes for Highway 10 and the adjoining cross-streets under both Scenario 3.5 and Scenario 4. Substantial increases in traffic levels are anticipated with Scenario 4 therefore a sensitivity analysis and high-level corridor planning exercise were completed to understand future intersection needs if Scenario 4 traffic volumes are realized.

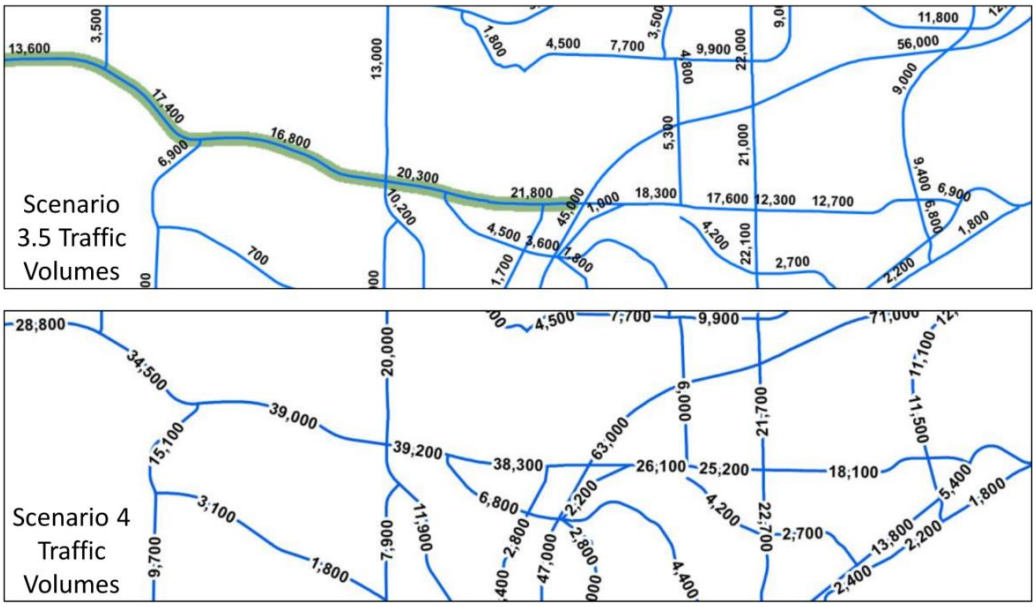


Figure 39. Scenario 3.5 and 4 Traffic Forecast Scenarios

HIGHWAY 10 AND HIGHWAY 11 POST-2040 PLANNING

An analysis of the CSAH 11 intersection was conducted, as it is the key intersection in the area serving the cities of Victoria and Carver. Planning level and preliminary operations screening of various intersection geometries and peak hour volumes was performed using the Capacity Analysis of Planning of Junctions (CAP-X) software developed by the FHWA. This tool was used as a starting point to determine appropriate intersection geometry to provide a volume-to-capacity ratio of less than 1.0 for both peak hours under forecasted volumes. A ratio greater than 1.0 indicates that the intersection may experience significant delays under the forecasted volumes and intersection geometry

Volumes considered included the turning movement counts associated with Scenarios 3.5 and 4, as well as the average values between the two scenarios. Geometries considered include conventional and displaced left, with several variations of which legs have displaced left geometry as well as the number of lanes on CSAH 10 and CSAH 11. The average v/c ratios between the peak hours for the considered volumes and geometries are summarized below in **Table 22**.

CSAH 10 Section	Intersection Type	Direction	Volume Scenario		
			Scenario 3.5	Scenario 3.5 + 50%	Scenario 4.0
			Volume to Capacity Ratio		
4-Lane	Conventional*	Full	0.70	1.01	1.46
	Partial Displaced LT*	N-S	0.66	0.98	1.22
		E-W	0.68	0.99	1.32
	Displaced LT*	Full	0.55	0.81	1.10
6-Lane	Conventional*	Full	0.65	0.81	1.18
	Conventional (CSAH 11 4-Lane)	Full	0.56	0.80	0.93

*Scenario considers a 2-lane section on CSAH 11 and a Dual SB LTL

Table 22. CSAH 11 CAP-X Analysis

In addition to the at-grade scenarios outlined above, several other intersection treatments were evaluated to understand high-level right-of-way needs as well as the benefits and deficiencies associated with various intersection. A summary of these alternatives is outlined in **Figure 40**. The assumed right-of-way footprint for these alternatives can be found in **Figure 41** and are described below:

- *Six-Lane At-Grade Intersection* – A modified six-lane typical section for Highway 10 was developed that minimizes right-of-way needs with a 212' wide typical section compared to the 244' noted in the Carver County Comprehensive Plan. The typical section is depicted in **Figure 42**, below, and is expected to provide adequate capacity for Scenario 4 traffic forecast with the expansion of Highway 11 to a 4-lane section.

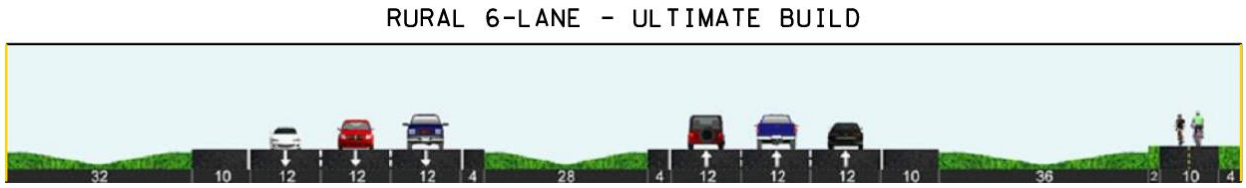


Figure 42. Six-Lane Highway 10 Typical Section

- *Displaced Left Turn At-Grade Intersection* – A partial and full displaced left-turn intersection was reviewed as a treatment to provide capacity beyond the Highway 10 4-lane conventional intersection alternative. The improvement is anticipated to extend the life of the at-grade intersection but is not expected to provide sufficient capacity to fully accommodate Scenario 4 traffic forecasts.
- *Grade Separated Alternatives* – To ensure adequate capacity and uninterrupted traffic flow on Highway 10, grade separated alternatives were reviewed at the intersection of Highway 10 and Highway 11. Alternatives included a tight diamond and partial cloverleaf interchange. Assumed right-of-way footprints for each are noted in **Figure 41**. Further analysis and design are required if either alternative is to be advanced beyond the initial planning efforts completed to establish a high-level right-of-way footprint for long-term planning purposes. Visual depictions of these alternatives are shown in **Figure 43**, below.

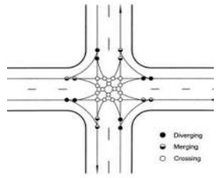
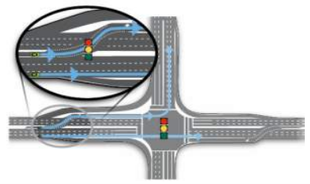
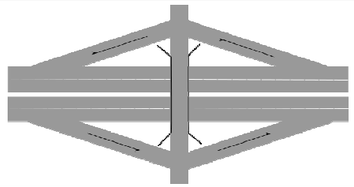
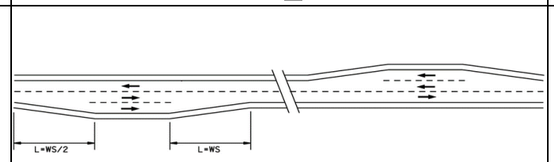
Figure 43. Grade Separated Alternatives: Tight Diamond Interchange (left) and Partial Cloverleaf (right)

- *Turbo Roundabout* – As the 10/11 intersection project advances to preliminary design, investigation of additional innovative intersection ideas is recommended based on the latest designs available at the time. This may include turbo roundabouts. Turbo roundabout capacities range from 3,500 to 4,500 pcu/h based on FHWA guidance. Scenario 4 traffic forecasts estimate a peak hour entering volume exceeding 6,000 pcu/h if full build out is realized in Carver County. If pursued, additional review and research are necessary to identify design variations to the turbo roundabout to accommodate the potential traffic volumes.

TC&W GRADE-SEPARATED RAILROAD CROSSINGS

At-grade crossings are currently present for the TC&W Railroad on Highway 10 and Highway 11 within the Western Project Subarea. Carver County has expressed interest in reviewing grade-separated alternatives at both crossings to minimize stoppages, reduce delays, and improve safety as traffic increases along two of the County's critical transportation corridors. Discussions with representatives from TC&W Railroad revealed a mutual interest for grade separation between the County highways and railroads. Tie-down points for potential grade-separation are outlined on the respective corridor layouts. Additional coordination will be necessary between Carver County, City of Victoria, TC&W Railroad, and the MnDOT Rail Office when pursued in the future.

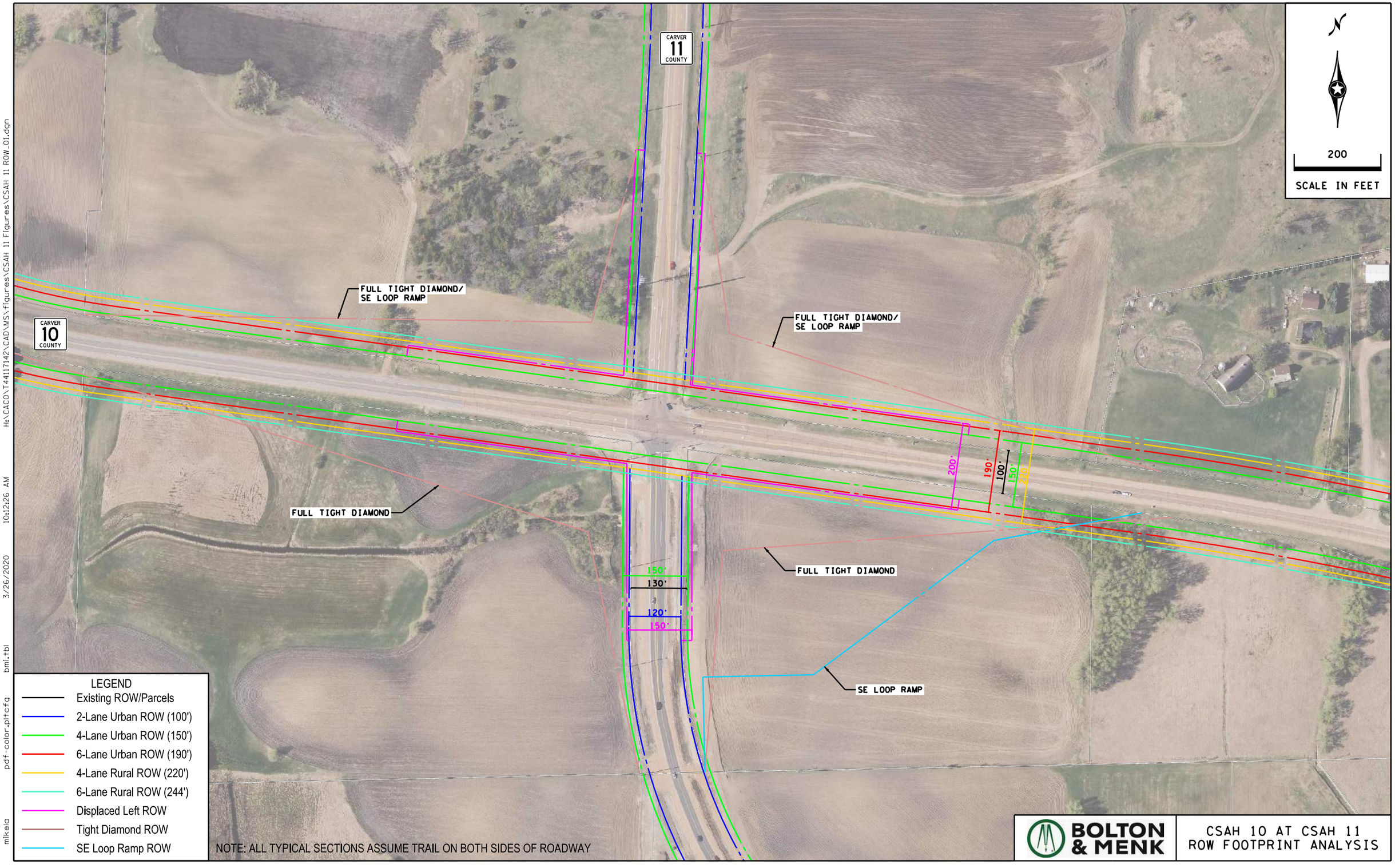
Figure 40. CSAH 10 and CSAH 11 Intersection Evaluation

Intersection/Typical Section Treatment	Description	Image	Scenario 3.5 Volume-Capacity Ratio - CSAH 11	Scenario 4 Volume-Capacity Ratio		Cost	Pros	Cons	Additional Information
				CSAH 11	CSAH 43E				
Conventional Intersections	At Grade traditional signalized intersections (4-lane section)		0.7	1.2	1.05	$	•Low Cost •Low/Moderate ROW required depending on capacity needs •Allows more flexibility in corridor access spacing •User familiarity	•May limit corridor operations for high-end forecast volumes •Little/no safety benefit, high number of conflict points	•$1M per intersection
	At Grade traditional signalized intersections (6-lane section)		0.65	0.93	0.78	$	•Low Cost •Moderate ROW required •Allows more flexibility in corridor access spacing •User familiarity	•High number of conflict points, vehicle and pedestrian safety concerns	
Reduced Conflict Intersection (RCI)	At grade intersection with signalized RCI intersection and WB U-Turn intersection		0.63	1.43 (4-lane) 1.09 (6-lane)	1.07 (4-lane) 0.80 (6-lane)	$ $$	•Increased capacity from conventional intersection •Shows significant reduction in serious injury crashes •Lower cost and easier construction than interchanged •May operate as unsignalized until volumes warrant signalization •Several implementations currently in Carver County	•Increased travel times for minor street through and left turn movements •Intimidating for peds/bikes especially if unsignalized, 2-stage crossings	•$1M per intersection
Displacted Left Intersection	At grade intersection with signalized displaced left turn lanes on all legs (or minimum of CSAH 11 legs)		0.55 (Full) 0.66 (N-S)	1.06 (Full, 4-lane) 0.78 (Full, 6-lane)	N/A	$	•Allows more flexibility in corridor access spacing •Uincreased capacity from conventional intersection •Show reduction in serious injury crashes	•Larger footprint required than conventional intersection •Unconventional intersection/user unfamiliarity •Little reduction in vehicle conflict points •Difficult for transit (stops should be outide of intersection functional area) •Complex to maintain signal system •Intimidating for peds/bikes, 2-stage crossings	•$1M - $3M per intersection •No implementations in Midwest
Interchanges	Grade separated intersection conventional diamond layout, CSAH 10 uncontrolled		0.54	0.61	0.3	$$$	•High capacity can accommodate volumes will into the future •Provides high level of safety for mainline •Highest possible level of east-west operations •Flexibility in intersection control options of ramp intersections	•Large ROW footprint required •High cost due to required collector network •Reqires restrictive access spacing standards throughout corridor (1/2 mile spacing between ramps, other intersections) which may require an extensive frontage/collector road network for area mobility and high number of private access closures/relocactions	•$7M -$12M per interchange (conventional diamond) + $4M per mile of 4-lane highway
Super-2 Highway	Two-lane highway with restrictve access control, allows grade separated interchanges only and can be a divided or undivided section		0.54	0.61	0.3	$$$	•High capacity can accommodate volumes will into the future •Provides high level of safety •Highest possible level of east-west operations •Small ROW footprint between intersections	•Large ROW footprint required at intersections •High cost due to required collector network •Reqires restrictive access spacing standards throughout corridor (1/2 mile spacing between ramps, other intersections) which may require an extensive frontage/collector road network for area mobility and high number of private access closures/relocactions	•$7M -$12M per interchange (conventional diamond) + $1.5M per mile of 2-lane highway •See TH12 from Wayzata to Maple Plain

- Construct a new 2-lane undivided road – about $2 million to $3 million per mile in rural areas, about $3 million to $5 million in urban areas.
- Construct a new 4-lane highway — $4 million to $6 million per mile in rural and suburban areas, $8 million to $10 million per mile in urban areas.
- Construct a new 6-lane Interstate highway – about $7 million per mile in rural areas, $11 million or more per mile in urban areas.
- Mill and resurface a 4-lane road – about $1.25 million per mile.
- Expand an Interstate Highway from four lanes to six lanes – about $4 million per mile.

https://www.artba.org/about/faq/
American Road & Transportation Builders Association

Figure 41. CSAH 10 and CSAH 11 Right-of-Way Footprint Analysis



F. IMPLEMENTATION PLAN

An implementation plan was developed to breakdown recommended improvements into potential projects for final design and construction. Phases are identified with estimated construction, right-of-way, and project development and delivery costs and timeframes based on need, priority, and available funding opportunities. The full project implementation plan is included in **Appendix E** and includes a detailed cost breakdown for project implementation.

MID-TERM PROJECTS: 6 – 10 YEARS

Short-term projects are those that serve an immediate need where issues of greatest concern along the corridor today. The highest priority should be given to allocating funding to these projects immediately to ensure existing issues are remedied prior to increased traffic volumes. The following projects have been prioritized for completion within four to six years.

1. *Highway 10/11 Intersection:* **$5.7M to $6.2M**

   Includes reconstruction of Highway 10 & Highway 11 intersection, expanding Highway 11 to a four-lane divided urban section with trail facilities, widening Highway 10 to provide improved turn lanes, and new traffic control signal system.

2. *Highway 10 Reconstruction (East of Railroad Tracks to Creek Lane):* **$13.8M to $15.2M**

   Includes reconstruction of Highway 10 to a four-lane divided section with trail facilities, realignment of Highway 10 west of Highway 11, improved turn lanes at Highway 11 intersection, and construction of reduced conflict intersection at Creek Road.

LONG-TERM PROJECTS: 12 – 20 YEARS

Long-Term projects, while still essential to the success of future traffic operations, include projects that can wait longer for implementation for lack of immediate need. The following projects have been prioritized for completion within 12 to 20 years:

1. *Highway 10 Reconstruction (Highway 43 West to Railroad Tracks):* **$21.5M to $24.0M**

   Includes reconstruction of Highway 10 to a four-lane divided rural section with realignment of Highway 10 at the Highway 43 East intersection. Also includes construction of reduced conflict intersections at Highway 43 East and West intersections and improved Railroad Crossing Flasher System for at-grade rail crossing of Twin Cities Western line.

Appendix A.1 – Public Involvement Plan

Appendix A.2 – Meeting Summaries

Appendix B – Existing Conditions Memorandum

Appendix C – Goals, Objectives, and Performance Measures

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Goals, Objectives and Performance Measures

Final

PURPOSE

The purpose of this document is to outline the Highway 10 Corridor Study goals and objectives for the four project subareas illustrated in the project area map below. The goals and objectives will guide the development and evaluation of improvement options. They are intended to align with state and local transportation plans and build off the existing conditions, issues, needs and concerns outlined in the Existing Conditions Memorandum. Multiple objectives are identified supporting each goal and provide additional details on how the goal can be achieved. Performance measures are also tied to the objectives and will be used during the concept evaluation process to assess and compare improvement options. The goals, objectives, and performance measures defined below are not ranked in order of priority. Project partners will balance goals and objectives equally as improvement alternatives are developed and evaluated.

Not all objectives and performance measures are applicable to all sections of the corridor given varying contexts. The subarea map below illustrates project subareas and corresponds with the "Applicable Subareas" column in the tables on the following pages to identify which subareas the objectives and performance measures apply to.

CORRIDOR GOALS, OBJECTIVES AND PERFORMANCE MEASURES

GOAL A: Provide efficient and reliable vehicle mobility.

Objectives	*Performance Measures*	*Applicable Subarea(s)*			
Provide acceptable system reliability serving planned growth.	Volume to capacity ratio	1	2	3	4
	Support future land use plans	1	2	3	4
Provide acceptable travel times.	Vehicle delay/level of service	1	2	3	4
	Side street delay accessing or crossing major corridors	1	2	3	4
	Intersection delay for forecasted growth scenarios	1	2	3	4
	Average mainline speeds and travel times	1	2	3	4
Understand and plan for freight needs.	Roadway design standards	1	2	3	4
Manage access consistent with roadway function and access spacing guidelines when applicable.	Proposed access locations, spacing and treatments	1	2	3	4
Provide a connected transportation system that accommodates trips consistent with roadway function.	Planned roadway capacity and forecasted volumes	1	2	3	4
Plan for future transportation modes and technological changes.	Potential to accommodate future modes	1	2	3	4
Accommodate future transit plans and needs.	Potential to accommodate future transit routes and facilities	1	2	3	4
Understand and plan for roadway expansion needs.	Roadway design and potential for right-of-way acquisition	1	2	3	4

GOAL B: Safely accommodate all system users.

Objectives	*Performance Measures*	*Applicable Subarea(s)*			
Reduce crash and severity rates below statewide averages for comparable facilities.	Forecasted crash and severity rates	1	2	3	4
	Vehicle to vehicle conflict points	1	2	3	4
Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.	Intersection and roadway design accommodations for pedestrians and bicyclists	1	2	3	4
		1	2	3	4
	Vehicle to pedestrian conflict points	1	2	3	4
Accommodate reasonable access.	Proposed access spacing compared to county and state guidelines	1	2	3	4

Maintain community connections and local access for all modes.	Business access and connectivity	1	2	3	4
	Chaska Middle School/Community Center connectivity		2	3	
	Residential neighborhood access and circulation		2	3	4
	Pedestrian and bicycle access and connectivity.	1	2	3	4
Address intersection visibility and site line issues.	Intersection and roadway design	1	2	3	4
Provide safe vehicle and pedestrian crossings of railroad facilities.	Adequacy of gates/signals at railroad crossings	1			
	Pedestrian crossing safety mechanisms at railroad crossings	1			
	Grade separation at railroad crossings	1			

GOAL C: Provide a comprehensive transportation network that supports existing and future land development.

Objectives	***Performance Measures***	***Applicable Subarea(s)***			
Safely and efficiently accommodate vehicle access to and through existing and future development.	Effectiveness of intersection design to accommodate forecasted vehicle/freight capacity demands for existing and future development	1	2	3	4
Safely accommodate pedestrian and bicycle access to and through existing and future development.	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development	1	2	3	4
	Safe and accessible connections to area transit and school bus routes	1	2	3	4
	Safe pedestrian crossing facilities from existing and future development at controlled intersections	1	2	3	4

GOAL D: Provide infrastructure improvements compatible with the environment.

Objectives	*Performance Measures*	*Applicable Subarea(s)*			
Avoid, minimize, and mitigate impacts to historic properties.	Impacts to historic resources	1	2	3	4
Avoid, minimize, and mitigate impacts to cultural resources.	Impacts to cultural resources	1	2	3	4
Avoid, minimize, and mitigate impacts to the built environment.	Acquisition of property	1	2	3	4
Avoid, minimize, and mitigate impacts to sensitive environmental resources.	Impacts to natural and protected resources	1	2	3	4
Meet stormwater management requirements.	Effectiveness of stormwater management features to meet WMO standards	1	2	3	4
Provide context sensitivity.	Impacts on existing environmental and historic resources	1	2	3	4
Provide opportunities for environmental enhancements.		1	2	3	4
Meet air quality requirements.	Existing and forecasted congestion	1	2	3	4
Meet noise impacts requirements.	Impacts on noise receptors	1	2	3	4

GOAL E: Develop a financially responsible implementation plan.

Objectives	*Performance Measures*	*Applicable Subarea(s)*			
Right-size improvements to address needs yet maximize use of existing infrastructure where possible.	Cost of improvements – capital costs and right-of-way	1	2	3	4
Develop project priorities that meet schedule and funding constraints and maximize opportunities.	Funding eligibility and availability	1	2	3	4
Develop a supported funding model to clearly identify agency responsibilities.	Agency support for implementation plan	1	2	3	4
Seek federal and state grants to leverage projects while minimizing local costs.	Screen potential projects for federal and state grants	1	2	3	4

COMPATIBILITY WITH PARTNER GOALS

The following matrix shows the relationship between CSAH 10 Corridor Study goals (labeled A-E) and the adopted goals of partner agencies (identified by agency and source). This demonstrates consistency between project goals and broader goals previously approved by the partners.

Partner Goals	**A**	**B**	**C**	**D**	**E**
MnDOT (Source: *MnDOT Minnesota Go Vision*)					
Connect Minnesota's primary assets – the people, natural resources and businesses within the state - to each other and to markets and resources outside the state and country.	X	X	X	X	X
Provide safe, convenient, efficient and effective movement of people and goods.	X	X	X		X
Is flexible and nimble enough to adapt to changes in society, technology, the environment and the economy.	X		X	X	X
Carver County (Source: *Carver County Strategic Plan*)					
Communities: Create and maintain safe, healthy, and livable communities.		X	X	X	
Culture: Provide an organizational culture which fosters individual accountability to achieve goals and sustain public trust and confidence in County government.					X
Connections: Develop strong public partnerships and connect people to services and information.					X
Finances: Improve the County's financial health and economic profile.			X		X
Growth: Manage the challenges and opportunities resulting from growth and development.	X		X		
City of Victoria (Source: Our Victoria Tomorrow)					
Preservation of open space and natural resources				X	
Coordinated and efficient growth management	X		X		
Focus on quality design and preserving the sense of community	X			X	
Balancing new growth with preservation of the existing community and neighborhoods	X		X	X	
Excellent trails, parks, and recreational opportunities			X		
An efficient multimodal transportation system	X		X		
Economic and fiscal strength			X		X
Quality of life in neighborhoods and districts		X	X	X	
An accessible, connected community		X	X		
City of Chaska (Source: *Chaska Strategic Objectives*)					
Create and promote an environment to allow for the attraction of a large number of high-quality jobs.	X		X		
Maintain and enhance high-quality recreational opportunities.			X		
Embrace a diverse, life-cycle community.	X				
Preserve historic downtown Chaska while promoting and revitalizing it as a vibrant commercial district that is "The" Twin Cities destination.		X			
Provide exceptional "core" city services.			X		X
Foster engaged, leading edge, progressive, and focused leadership.					X

Appendix D – Concept Evaluation Matrices

Appendix D.1 – Evaluation Matrix – East Subarea

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study Eastern Project Area Concept Evaluation

Intersection Concept Evaluation

November 2019

	Objectives	Performance Measure	TH 212 to Bavaria Road			Bavaria Road to Park Ridge Drive			East of Park Ridge Drive			Scoring	Notes (shaded gray if seems unlikely to be a differentiator in scoring)
			2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided		
Goal A: Provide efficient and reliable vehicle mobility	**Provide acceptable system reliability serving the planned growth.**	Volume to capacity ratio	-	-	++	-	-	++	-	+	++	4= V/C <=.85 2= V/C >.85, <=1.0 0 = V/C >1.0	
		Support future land use plans	-	+	++	-	+	++	-	+	++	4= Supports Traffic Growth 2= Minimally Supports Traffic Growth 0= Does Not Support Traffic Growth	• Observed locations of new development/redevelopment in relation to added capacity (additional lanes/movement) of intersection improvements. • Option advanced one scoring level if a lane or turning movement was added, or if capacity/mobility on Highway 10 was improved.
	Provide acceptable travel times.	Vehicle delay/level of service	-	++	++	-	+	++	-	+	++	4= Reduces Vehicle Delay/LOS 2= Maintains Vehicle Delay/LOS 0= Worsens Delay	
		Side street delay accessing or crossing major corridors	-	++	++	-	++	++	-	++	++	4= Reduces Side Street Delay 2= Maintains Side Street Delay 0= Worsens Delay	
		Intersection delay for forecasted growth scenarios	-	++	++	-	++	++	-	++	++	4= Reduces Intersection Delay 2= Maintains Intersection Delay 0= Worsens Delay	
		Average mainline speeds and travel times	-	++	++	-	++	++	-	++	++	4= Reduces Segment Delay 2= Maintain Segment Delay 0= Worsens Delay	
	Understand and plan for freight needs.	Roadway design standards	Not Applicable									4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	The roadway will need to be designed to handle trucks, this is not a differentiator.
	Manage access consistent with roadway function and access spacing guidelines when applicable.	Proposed access locations, spacing and treatments	Not Applicable									4= Exceeds Guidelines 2= Meets Guidelines 0= Does Not Meet Guidelines	• Access locations do not change; Not a differentiator • South leg of Prescott Drive intersection is the only additional access added; spacing guidance would allow this to become full access/primary intersection
	Provide a connected transportation system that accommodates trips consistent with roadway function.	Planned roadway capacity and forecasted volumes	-	++	++	-	++	++	-	++	++	4= Volume Meets Capacity Range for Section Type 2= Volume is Below Capacity Range for Section Type 0= Volume Exceeds Capacity Range for Section Type	
	Plan for future transportation modes and technological changes.	Potential to accommodate future modes	Not Applicable									4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	Not a Differentiator
	Accommodate future transit plans and needs.	Potential to accommodate future transit routes and facilities	Not Applicable									4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	Not a Differentiator
	Understand and plan for roadway expansion needs.	Roadway design and potential for right-of-way acquisition	Not Applicable									4= Does Not Require ROW Acquisition 2= Requires ROW Acquisition 0= Requires Significant ROW Acquisition	See Property Acquisition in Goal D
	Goal A Summary		-	+	++	-	+	++	-	+	++		
Goal B: Safely accommodate all System users	**Reduce crash and severity rates below statewide averages for comparable facilities.**	Forecasted crash and severity rates	+	++	+	+	++	+	+	++	+	4= Improves Forecasted Crashes and Severity 2= Maintains Forecasted Crashes and Severity 0= Worsens Forecasted Crashes and Severity	
		Vehicle to vehicle conflict points	+	++	+	+	++	+	+	++	+	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts	
	Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.	Intersection and roadway design accommodations for pedestrians and bicyclists	Not Applicable									4= Accommodates Additional Modes 2= Somewhat Accommodates Additional Modes 0= Does Not Accommodate Additional Modes	See "Pedestrian perceived level of comfort" below
		Vehicle to pedestrian conflict points	+	++	++	+	++	++	+	++	++	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts	
	Accommodate reasonable access.	Proposed access spacing compared to county and state guidelines	Not Applicable									4= Meets Guidelines 2= Partially Meets Guidelines 0= Worsens Spacing	Repeat from Goal A
	Maintain community connections and local access for all modes.	Business access and connectivity	-	++	++	-	++	++	-	++	++	4= Maximizes Access and Connectivity 2= Minimally Improves Access and Connectivity 0= Maintains Access and Connectivity	TH 212 to Bavaria: • 2-lane section: Thru/turn-lane with bypass converted to designated left turn-lane and designated thru-lane. Provides better access to business on Victoria • 4-lane section: sections expanded to four lanes and improved access at Victoria Bavaria to Park Ridge Drive: • 2-lane section; Improvements to the intersections of White Oak Drive, TH 41, and Park Ridge Drive; Conversion from 2 to 4-lane section from White Oak to 41; • 4-lane section: 4-lane conversion to most of the corridor and intersection improvements at all intersections East of Park Ridge Drive: • 2-lane section: Very similar to existing; • 4-lane section: Added RB and four lane configuration at 10/15 intersection
		Chaska Middle School/Community Center connectivity	Not Applicable			-	+	++	Not Applicable			4= Improves Connectivity and Circulation 2= Minimally Improves Connectivity and Circulation 0= Maintains Connectivity and Circulation	212 to Bavaria: Not a differentiator Bavaria to Park Ridge: • 2-lane: Added lane to Park Ridge Leg with dedicated left turn; Added capacity at the TH 41 intersection • 4-lane: RB at Park Ridge; Added capacity at TH 41 intersection East of Park Ridge: Not a differentiator Note: Changed from : 4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity
		Residential neighborhood access and circulation	-	++	++	-	++	++	-	++	++	4= Improves Access and Connectivity 2= Minimally Improves Access and Connectivity 0= Maintains Access and Connectivity	212 to Bavaria: • 2-lane: Improvements to Prescott intersection including added south leg; • 4-lane: 4-lane conversion, Prescott improvements Bavaria to Park Ridge: • 2-lane; White Oak intersection improvements; 4-lane seciton from White Oak to 41; • 4-lane: 4-lane conversion thorughout; White Oak improvements; Skyview access improvements with RB East of Park Ridge: • 2-lane: Ridge Ln, Ravoux Rd, and Brandon Blvd improvements
		Pedestrian and bicycle access and connectivity.	Not Applicable									4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity	See "Pedestrian perceived level of comfort" below
	Address intersection visibility and site line issues.	Intersection and roadway design	+	+	+	+	+	+	+	+	+	4= Improves Visibility and Sightlines 2= Maintains Visibility and Sightlines 0= Worsens Visibility and Sightlines	
	Provide safe vehicle and pedestrian crossings of railroad facilities.	Adequacy of gates/signals at railroad crossings	Not Applicable									4= Substantially Improves RR Gates/Signals 2= Somewhat Improves RR Gates/Signals 0= Maintains RR Gates/Signals	Not a Factor in this evaluation
		Pedestrian crossing safety mechanisms at railroad crossings	Not Applicable									4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety	Not a Factor in this evaluation
		Grade separation at railroad crossings	Not Applicable									4= Provides Grade Separated RR Crossing 0= Maintains At-Grade RR Crossing	Not a Factor in this evaluation
	Goal B Summary		0	++	+	0	++	++	0	++	+		
Goal C: Provide a comprehensive transportation network that supports existing and future land development	**Safely and efficiently accommodate vehicle access to and through existing and future development.**	Effectiveness of intersection design to accommodate forecasted vehicle/freight capacity demands for existing and future development	+	++	++	+	++	++	+	++	++	4= Accommodates Additional/Future Demand 2= Accommodates Existing Demand 0= Does Not Accommodate Existing Demand	The plan is to accommodate trail regardless; Not a differentiator
	Safely accommodate pedestrian and bicycle access to and through existing and future development.	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development	+	++	++	0	++	++	-	++	++	4= Improves Connections 2= Maintains Connections 0= Worsens Connections	See "Pedestrian perceived level of comfort" below
		Safe and accessible connections to area transit and school bus routes	+	++	++	0	++	++	-	++	++	4= Improves Connections 2= Maintains Connections 0= Worsens Connections	See "Pedestrian perceived level of comfort" below
		Safe pedestrian crossing facilities from existing and future development at controlled intersections	-	++	++	-	++	++	-	++	++	4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety	Pedestrian perceived level of comfort
	Goal C Summary		0	++	++	0	++	++	-	++	++		
Goal D: Provide infrastructure improvements that respect the environment.	**Avoid, minimize, and mitigate impacts to historic properties.**	Impacts to historic resources	Not Applicable									4= Least Impacts 2= Some Impacts 0= Most Impacts	Not a Differentiator
	Avoid, minimize, and mitigate impacts to cultural resources.	Impacts to cultural resources	N/A	++	++	N/A	++	++	N/A	++	++	4= Least Impacts 2= Some Impacts 0= Most Impacts	• RB impacts that go beyond ROW are common.
	Avoid, minimize, and mitigate impacts to the built environment.	Acquisition of property	N/A	++	++	N/A	++	+	N/A	++	+	4= No Property Impacts 3= <25% of 1-2 Properties Taken 2= <25% of 3-4 Adjacent Properties Taken 1= 1 Full Property Taken (>25%) and Possibly Fragments of Others (<25%) 0= 2 or More Properties Taken (>25%) and Fragments of Others (<25%)	4= No Property Impacts 3= <25% of 1-2 Properties Taken 2= <25% of 3-4 Adjacent Properties Taken 1= 1 Full Property Taken (>25%) and Possibly Fragments of Others (<25%) 0= 2 or More Properties Taken (>25%) and Fragments of Others (<25%)
	Avoid, minimize, and mitigate impacts to sensitive environmental resources.	Impacts to natural and protected resources	Not Applicable									4= Least Impacts 2= Some Impacts 0= Most Impacts	Not a Differentiator
	Meet stormwater management requirements.	Effectiveness of stormwater management features to meet WMO standards	Not Applicable									4= Meets Standards 0= Does Not Meet Standards	Not a Differentiator
	Provide context sensitivity.	Impacts on existing environmental and historic resources	N/A	++	+	N/A	++	+	N/A	++	+	4= Fully Addresses Context 2= Somewhat Addresses Context 0= Does Not Address Conflicts	• Opportunities exist with each concept to include streetscaping and features that provide context sensitivity. However, this level of detail is unavailable at this time.
	Provide opportunities for environmental enhancements.		Not Applicable									4= Most Enhancements 2= Some Enhancements 0= No Enhancements	• Opportunities exist with each concept to enhance the environment surrounding improvements. However, this level of detail is unavailable at this time.
	Meet air quality requirements.	Existing and forecasted congestion	N/A	++	++	N/A	++	++	N/A	++	++	4= Meets Standards 0= Does Not Meet Standards	
	Meet noise impact requirements.	Impacts on noise receptors	Not Applicable									4= Meets Standards 0= Does Not Meet Standards	Not a differentiator
	Goal D Summary		N/A	++	++	N/A	++	+	N/A	++	+		
Goal E: Develop a financially responsible implementation plan.	**Right-size improvements to address needs yet maximize use of existing infrastructure where possible.**	Cost of improvements – capital costs and right-of-way	N/A	++	+	N/A	++	0	N/A	++	0	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	
	Develop project phases that meet schedule and funding constraints and maximize opportunities.	Funding eligibility and availability	Not Applicable									4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	Not a differentiator
	Develop a supported funding model to clearly identify agency responsibilities.	Agency support for implementation plan	N/A	++	++	N/A	++	++	N/A	++	0	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	
	Seek federal and state grants to leverage projects while minimizing local costs.	Screen potential projects for federal and state grants	N/A	++	++	N/A	++	++	N/A	++	++	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	
	Goal E Summary		N/A	++	+	N/A	++	+	N/A	++	0		

Highway 10 Corridor Study

Eastern Project Area Concept Evaluation

Typical Section Concept Evaluation

November 2019

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Goals	TH 212 to Bavaria Road			Bavaria Road to Park Ridge Drive			East of Park Ridge Drive		
	2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided	2040 No-Build	2-Lane Divided	4-Lane Divided
GOAL A: Provide efficient and reliable vehicle mobility.	-	+	++	-	+	++	-	+	++
GOAL B: Safely accommodate all system users.	0	++	+	0	++	++	0	++	+
GOAL C: Provide a comprehensive network for pedestrians and bicyclists.	0	++	++	0	++	++	-	++	++
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	++	++	N/A	++	+	N/A	++	+
GOAL E: Develop a financially responsible implementation plan.	N/A	++	+	N/A	++	+	N/A	++	0
Total	-	++	++	-	++	++	-	++	+

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study Eastern Project Area Concept Evaluation

Intersection Concept Evaluation

November 2019

	Objectives	Performance Measure	CSAH 10 and Bavaria Road			CSAH 10 and TH 41 (N Chestnut Street)				Skyview Drive/Park Ridge Drive			CSAH 10 and CSAH 15 Audubon Road			CSAH 10 and White Oak Drive						Scoring	Notes (shaded gray if seems unlikely to be a differentiator in scoring)
			2040 No-Build	Traffic Signal	Single-Lane Roundabout (Expandable to 2x1)	2040 No-Build	Partial Build Traffic Signal	Full Build Traffic Signal	2-Lane Roundabout	2040 No-Build	Traffic Signal	Single-Lane Roundabout	2040 No-Build	Improved Traffic Signal	Single Lane Roundabout	2040 No-Build	TWSC 2-Lane Divided	TWSC 4-Lane Divided	Restricted Access	Traffic Signal	Unbalanced (2x1) Roundabout		
Goal A: Provide efficient and reliable vehicle mobility	**Provide acceptable system reliability serving the planned growth.**	Volume to capacity ratio	-	++	++	-	++	++	-	-	++	++	-	++	++	-	-	++	++	++	+	4= V/C <=.85 2= V/C >.85, <=1.0 0 = V/C >1.0	
		Support future land use plans	-	++	++	-	++	++	+	-	+	++	-	++	++	-	+	++	0	++	+	4= Supports Traffic Growth 2= Minimally Supports Traffic Growth 0= Does Not Support Traffic Growth	• Observed locations of new development/redevelopment in relation to added capacity (additional lanes/movement) of intersection improvements. • Option advanced one scoring level if a lane or turning movement was added, or if capacity/mobility on Highway 10 was improved. • This measure cannot be completed without considering vehicle delay/level of service for supporting traffic growth. Those measures were considered during this evaluation
	Provide acceptable travel times.	Vehicle delay/level of service	-	++	++	-	++	++	0	0	++	++	+	++	++	0	0	++		++	+	4= Reduces Vehicle Delay/LOS 2= Maintains Vehicle Delay/LOS 0= Worsens Delay	
		Side street delay accessing or crossing major corridors	-	0	++	-	++	++	0	0	+	++	+	++	++	0	0	++	++	++	++	4= Reduces Side Street Delay 2= Maintains Side Street Delay 0= Worsens Delay	
		Intersection delay for forecasted growth scenarios	-	++	++	-	+	++	0	0	++	++	+	++	++	0	+	+	++	++	+	4= Reduces Intersection Delay 2= Maintains Intersection Delay 0= Worsens Delay	
		Average mainline speeds and travel times	-	++	++	-	++	++	0	-	++	++	+	++	++	+	+	++	++	0	0	4= Reduces Segment Delay 2= Maintain Segment Delay 0= Worsens Delay	
	Understand and plan for freight needs.	Roadway design standards	Not Applicable																			4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	The roadway will need to be designed to handle trucks, this is not a differentiator.
	Manage access consistent with roadway function and access spacing guidelines when applicable.	Proposed access locations, spacing and treatments	0	0	++	Not Applicable				0	0	++	Not Applicable									4= Exceeds Guidelines 2= Meets Guidelines 0= Does Not Meet Guidelines	Not a differentiator - Access locations and/or primary/secondary designations don't change
	Provide a connected transportation system that accommodates trips consistent with roadway function.	Planned roadway capacity and forecasted volumes	-	++	++	-	++	++	+	0	++	++	+	++	++	0	+	+	0	++	-	4= Volume Meets Capacity Range for Section Type 2= Volume is Below Capacity Range for Section Type 0= Volume Exceeds Capacity Range for Section Type	
	Plan for future transportation modes and technological changes.	Potential to accommodate future modes	-	0	0	Not Applicable				0	0	0	Not Applicable									4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	
	Accommodate future transit plans and needs.	Potential to accommodate future transit routes and facilities	-	+	+	Not Applicable				-	+	+	Not Applicable									4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate	
	Understand and plan for roadway expansion needs.	Roadway design and potential for right-of-way acquisition	-	++	++	++	++	++	+	++	++	+	Not Applicable									4= Does Not Require ROW Acquisition 2= Requires ROW Acquisition 0= Requires Significant ROW Acquisition	See Property Acquisition in Goal D
	Goal A Summary		-	+	++	-	+	++	0	-	+	++	0	++	++	-	0	++	+	++	0		
Goal B: Safely accommodate all System users	**Reduce crash and severity rates below statewide averages for comparable facilities.**	Forecasted crash and severity rates	-	0	++	+	+	+	++	-	0	++	++	++	++	-	+	0	++	++	++	4= Improves Forecasted Crashes and Severity 2= Maintains Forecasted Crashes and Severity 0= Worsens Forecasted Crashes and Severity	
		Vehicle to vehicle conflict points	-	+	++	+	+	+	++	-	+	++	++	++	++	-	+	0	++	+	++	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts	
	Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.	Intersection and roadway design accommodations for pedestrians and bicyclists	-	++	++	++	++	++	0	-	++	++	Not Applicable									4= Crossings are Clear and Easy to Use 2= Crossings are Somewhat Clear and Easy to Use 0= Crossings are Perceived as Unsafe or Challenging	Safe Pedestrian Crossings CSAH 10/15 Intersection: • Intersection has a ramp on the southeast leading to no where which might be confusing to some people • Crossing signals but no crossing facilities on three legs. White Oak: • Existing does not accommodate crossings of 10
		Vehicle to pedestrian conflict points	-	+	++	+	+	+	++	-	+	++	++	++	++	-	+	0	+	++	+	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts	
	Accommodate reasonable access.	Proposed access spacing compared to county and state guidelines	-	+	++	Not Applicable				-	+	++	Not Applicable									4= Meets Guidelines 2= Partially Meets Guidelines 0= Worsens Spacing	Ability of Intersection to allow for minimizing access at nearby intersections
	Maintain community connections and local access for all modes.	Business access and connectivity	-	++	++	-	++	++	++	-	++	++	-	++	++	-	0	++	++	++	++	4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity	• Added Lanes to and from business locations • Improves mobility/function of intersection; reduces problematic movements • LOS for concept considered also
		Chaska Middle School/Community Center connectivity	Not Applicable			-	+	++	+	-	++	++	Not Applicable									4= Improves Connectivity and Circulation 2= Maintains Connectivity and Circulation 0= Worsens Connectivity and Circulation	• Added Lanes/Improved Access to the School/CC Property • Improves mobility/function of intersection; reduces problematic movements • Bavaria - Not a differentiator • CSAH 15 - Not a differentiator • White Oak Drive - Not a differentiator
		Residential neighborhood access and circulation	-	++	++	Not Applicable				-	++	++	Not Applicable			-	0	+	-	++	++	4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity	• Added Lanes to and from business locations • Improves mobility/function of intersection; reduces problematic movements • TH 41 - Not a differentiator • CSAH 15 - Not a differentiator
		Pedestrian and bicycle access and connectivity.	Not Applicable																			4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity	
	Address intersection visibility and site line issues.	Intersection and roadway design	-	++	++	Not Applicable				-	++	++	Not Applicable									4= Improves Visibility and Sightlines 2= Slightly Improves Visibility and Sightlines 0= Maintains Visibility and Sightlines	Bavaria - Visibility of intersection a current concern
	Provide safe vehicle and pedestrian crossings of railroad facilities.	Adequacy of gates/signals at railroad crossings	Not Applicable																			4= Substantially Improves RR Gates/Signals 2= Somewhat Improves RR Gates/Signals 0= Maintains RR Gates/Signals	Not a Factor in this evaluation
		Pedestrian crossing safety mechanisms at railroad crossings	Not Applicable																			4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety	Not a Factor in this evaluation
		Grade separation at railroad crossings	Not Applicable																			4= Provides Grade Separated RR Crossing 0= Maintains At-Grade RR Crossing	Not a Factor in this evaluation
	Goal B Summary		-	+	++	0	+	+	+	-	+	++	0	++	++	-	0	0	+	++	++		

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study Eastern Project Area Concept Evaluation

Intersection Concept Evaluation

November 2019

Objectives	Performance Measure	CSAH 10 and Bavaria Road			CSAH 10 and TH 41 (N Chestnut Street)				Skyview Drive/Park Ridge Drive			CSAH 10 and CSAH 15 Audubon Road			CSAH 10 and White Oak Drive						Scoring	Notes (shaded gray if seems unlikely to be a differentiator in scoring)
		2040 No-Build	Traffic Signal	Single-Lane Roundabout (Expandable to 2x1)	2040 No-Build	Partial Build Traffic Signal	Full Build Traffic Signal	2-Lane Roundabout	2040 No-Build	Traffic Signal	Single-Lane Roundabout	2040 No-Build	Improved Traffic Signal	Single Lane Roundabout	2040 No-Build	TWSC 2-Lane Divided	TWSC 4-Lane Divided	Restricted Access	Traffic Signal	Unbalanced (2x1) Roundabout		
Goal C: Provide a comprehensive transportation network that supports existing and future land development	**Safely and efficiently accommodate vehicle access to and through existing and future development.**	Effectiveness of intersection design to accommodate forecasted vehicle/freight capacity demands for existing and future development	-	++	++	-	+	++	+	-	+	++	+	++	++	0	+	++	-	++	+	4= Accommodates Additional/Future Demand 2= Accommodates Existing Demand 0= Does Not Accommodate Existing Demand	See the following performance measures in Goal A above: • Support future land use plans • Vehicle delay/level of service • Intersection delay for forecasted growth scenarios
	Safely accommodate pedestrian and bicycle access to and through existing and future development.	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development	Not Applicable																			4= Improves Connections 2= Maintains Connections 0= Worsens Connections	See "Pedestrian percieved level of comfort" below
		Safe and accessible connections to area transit and school bus routes	Not Applicable																			4= Improves Connections 2= Maintains Connections 0= Worsens Connections	See "Pedestrian percieved level of comfort" below
		Safe pedestrian crossing facilities from existing and future development at controlled intersections	-	++	++	-	+	+	-	-	++	++	-	++	++	-	-	-	0	++	+	4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety	Pedestrian percieved level of comfort • Assuming any build scenario will have some improvements to ped level of comfort.
	Goal C Summary	-	++	++	-	+	+	0	-	+	++	0	++	++	-	0	0	-	++	+		
Goal D: Provide infrastructure improvements that respect the environment.	**Avoid, minimize, and mitigate impacts to historic properties.**	Impacts to historic resources	Not Applicable																			4= Least Impacts 2= Some Impacts 0= Most Impacts	Not a differentiator
	Avoid, minimize, and mitigate impacts to cultural resources.	Impacts to cultural resources	Not Applicable			N/A	++	++	+	N/A	++	+	Not Applicable			N/A	++	+	++	++	-	4= Least Impacts 2= Some Impacts 0= Most Impacts	• Bavaria - Not a differentiator • CSAH 10 at CSAH 15 - Not a differentiator
	Avoid, minimize, and mitigate impacts to the built environment.	Acquisition of property	N/A	++	+	N/A	++	++	0	N/A	++	+	N/A	++	+	N/A	++	++	++	+	0	4= No Property Impacts 3= <25% of 1-2 Properties Taken 2= <25% of 3-4 Adjacent Properties Taken 1= 1 Full Property Taken (>25%) and Possibly Fragments of Others (<25%) 0= 2 or More Properties Taken (>25%) and Fragments of Others (<25%)	
	Avoid, minimize, and mitigate impacts to sensitive environmental resources.	Impacts to natural and protected resources	Not Applicable										++	+	Not Applicable							4= Least Impacts 2= Some Impacts 0= Most Impacts	• Bavaria - Not a differentiator
	Meet stormwater management requirements.	Effectiveness of stormwater management features to meet WMO standards	Not Applicable																			4= Meets Standards 0= Does Not Meet Standards	Not a differentiator
	Provide context sensitivity.	Impacts on existing environmental and historic resources	N/A	++	+	N/A	++	++	0	N/A	++	+	N/A	++	0	N/A	++	+	++	++	0	4= Fully Addresses Context 2= Somewhat Addresses Context 0= Does Not Address Context	• Opportunities exist with each concept to include streetscaping and features that provide context sensitivity.
	Provide opportunities for environmental enhancements.		Not Applicable																			4= Most Enhancements 2= Some Enhancements 0= No Enhancements	• Opportunities exist with each concept to enhance the environment surrounding improvements. However, this level of detail is unavailable at this time.
	Meet air quality requirements.	Existing and forecasted congestion	N/A	++	++	N/A	++	++	+	N/A	++	++	N/A	++	++	N/A	++	++	++	++	++	4= Meets Standards 0= Does Not Meet Standards	
	Meet noise impact requirements.	Impacts on noise receptors	N/A	++	++	N/A	+	+	+	N/A	++	++	N/A	++	++	N/A	++	++	++	+	++	4= Meets Standards 0= Does Not Meet Standards	
	Goal D Summary		N/A	++	+	N/A	++	+	0	N/A	++	+	N/A	++	+	N/A	++	+	++	+	0		
Goal E: Develop a financially responsible implementation plan.	**Right-size improvements to address needs yet maximize use of existing infrastructure where possible.**	Cost of improvements – capital costs and right-of-way	N/A	++	+	N/A	++	++	+	N/A	++	+	N/A	++	+	N/A	++	+	++	++	0	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	
	Develop project phases that meet schedule and funding constraints and maximize opportunities.	Funding eligibility and availability	Not Applicable																			4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	Likely not a differentiator
	Develop a supported funding model to clearly identify agency responsibilities.	Agency support for implementation plan	N/A	++	++	N/A	+	++	0	N/A	++	++	N/A	++	++	N/A	0	++	+	++	+	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	Need Agency Input
	Seek federal and state grants to leverage projects while minimizing local costs.	Screen potential projects for federal and state grants	N/A	+	+	N/A	+	++	0	N/A	0	0	N/A	+	+	N/A	0	++	++	++	+	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible	
	Goal E Summary		N/A	++	+	N/A	+	++	0	N/A	+	+	N/A	++	+	N/A	+	+	++	++	0		

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study
Eastern Project Area Concept Evaluation
Intersection Concept Evaluation
November 2019

Goals	CSAH 10 and Bavaria Road			CSAH 10 and TH 41 (N Chestnut Street)				Skyview Drive/Park Ridge Drive			CSAH 10 and CSAH 15 Audubon Road			CSAH 10 and White Oak Drive					
	2040 No-Build	Traffic Signal	Single-Lane Roundabout (Expandable to 2x1)	2040 No-Build	Partial Build Traffic Signal	Full Build Traffic Signal	2-Lane Roundabout	2040 No-Build	Traffic Signal	Single-Lane Roundabout	2040 No-Build	Improved Traffic Signal	Single Lane Roundabout	2040 No-Build	TWSC 2-Lane Divided	TWSC 4-Lane Divided	Restricted Access	Traffic Signal	Unbalanced (2x1) Roundabout
GOAL A: Provide efficient and reliable vehicle mobility.	-	+	++	-	+	++	0	-	+	++	0	++	++	-	0	++	+	++	0
GOAL B: Safely accommodate all system users.	-	+	++	0	+	+	+	-	+	++	0	++	++	-	0	0	+	++	++
GOAL C: Provide a comprehensive network for pedestrians and bicyclists.	-	++	++	-	+	+	0	-	+	++	0	++	++	-	0	0	-	++	+
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	++	+	N/A	++	+	0	N/A	++	+	N/A	++	+	N/A	++	+	++	+	0
GOAL E: Develop a financially responsible implementation plan.	N/A	++	+	N/A	+	++	0	N/A	+	+	N/A	++	+	N/A	+	+	++	++	0
Total	-	++	+	-	+	+	0	-	+	+	0	++	+	-	0	+	+	++	0

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Appendix D.2 – Evaluation Matrix – West Subarea

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study
Western Project Area Recommended Alternative Matrix
January 2020

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Criteria		Intersection Concept Overview															Typical Sections & Access Considerations			
		CSAH 43W				CSAH 43E				CSAH 11			Creek Road				CSAH 43W to RR Xing		RR Xing to East of Creek Road	
		Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	Reduced Conflict Intersection	Traffic Signal	Two-Lane Roundabout	Green T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	4-Lane Divided Rural	4-Lane Divided Urban	4-Lane Divided Rural	4-Lane Divided Urban
Existing Conditions/Issues		• Operational concerns with traffic growth				• Operational concerns with traffic growth				• Crash concerns • Operational concerns with traffic growth			• Operational concerns with traffic growth				• Lack of pedestrian facilities		• Lack of pedestrian facilities • Victoria Worx planning area	
Evaluation Matrix Goals	**Operations**	++	++	++	+	++	+	++	+	0	++	0	++	++	+	+	++	++	++	++
	Safety	+	++	+	++	+	++	+	++	++	++	++	++	++	+	++	+	+	+	+
	Pedestrian/Bike Mobility	+	++	++	++	+	+	++	++	+	++	+	++	++	++	++	++	++	++	++
	Environmental Impacts	++	++	++	+	++	++	++	+	++	++	+	++	++	++	+	+	++	+	++
	Cost	++	++	+	+	++	++	++	+	++	++	+	++	++	+	+	++	+	++	+
Overall Matrix Score		+	++	+	+	+	+	++	+	+	++	+	++	++	+	+	++	++	++	++
OH 2 Scoring	**Total Votes**	31 Total Votes; 10% Neutral				30 Total Votes; 13% Neutral				31 Total Votes; 3% Neutral			35 Total Votes; 11% Neutral				29 Total Votes; 10% Neutral		57 Total Votes; 16% Neutral	
	# Votes (%)	3 (10%)	3 (10%)	9 (29%)	13 (42%)	2 (7%)	0 (0%)	12 (40%)	12 (40%)	1 (3%)	20 (65%)	9 (29%)	10 (29%)	4 (11%)	6 (18%)	11 (31%)	13 (45%)	13 (45%)	13 (23%)	35 (61%)
Public/Focus Group Feedback		• Traffic volumes seem high; divert traffic to other highways • Left turns from Highway 43 onto Highway 10 eastbound are diffcult due to traffic. • Vehicles observed using shoulder to pass during periods of congestion. • Consider installing traffc signal				• Sight lines poor when turning onto Highway 10 from Highway 43 (East).				• Highway 10 approaching Highway 11 intersection feels like a launch pad • Add traffic signal or roundabout • Diffcult to turn left onto Highway 11 • Consider longer or additional turn-lanes at intersection for westbound traffic • Consider a right turn lane onto Highway 10 from northbound to eastbound.			• Turning eastbound onto Highway 10 from Creek Road is diffcult during peak hour traffic. • Safety concern for traffc turning left onto Highway 10. • Right turn lane from Highway 10 onto Creek Road is too short. • Consider a roundabout				• Bicyclists prefer Highway 10 to travel between Waconia and Chaska due to its large shoulders. • Add landscaping along Highway 10		• Some concerned with many access locations shown in Guided Access Control • Expand to 4 lanes from the Stream Data Center to Highway 11. • Add landscaping along Highway 10	
Agency Input		• Exploring realignments to better connect Highway 43				• Exploring Highway 10 realignments to reduce roadway curvature • Exploring realignments to better connect Highway 43											• Carver Couty interested in options Highway 43 S connections • Horizontal curves impede sightlines		• Victoria Worx Plan not finalized; access locations not firm • Carver County desires for access spacing to meet guidelines	
BMI Preliminary Observations/Recommendations																				
Agency Support		□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□	□

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study Western Project Area Concept Evaluation

Intersection Concept Evaluation

November 2019

	Objectives	Performance Measure	CSAH 10 and CSAH 43W					CSAH 10 and CSAH 43E					CSAH 10 and CSAH 11				CSAH 10 and Creek Road					Scoring
			2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Reduced Conflict Intersection	Traffic Signal	Two-Lane Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	
Goal A: Provide efficient and reliable vehicle mobility	**Provide acceptable system reliability serving the planned growth.**	Volume to capacity ratio	-	++	++	++	++	-	++	++	++	++	-	0	++	+	-	++	++	++	+	4= V/C <=.85 2= V/C >.85, <=1.0 0 = V/C >1.0
		Support future land use plans	-	++	++	++	++	-	++	++	++	++	-	0	++	+	-	++	++	+	++	4= Supports Traffic Growth 2= Minimally Supports Traffic Growth 0= Does Not Support Traffic Growth
	Provide acceptable travel times.	Vehicle delay/level of service	-	++	++	++	++	-	++	++	++	++	-	+	++	+	-	++	++	++	++	4= Reduces Vehicle Delay/LOS 2= Maintains Vehicle Delay/LOS 0= Worsens Delay
		Side street delay accessing or crossing major corridors	-	++	++	++	++	-	++	0	++	++	-	+	++	+	-	++	++	++	++	4= Reduces Side Street Delay 2= Maintains Side Street Delay 0= Worsens Delay
		Intersection delay for forecasted growth scenarios	-	++	++	++	0	-	++	++	++	++	-	+	++	+	-	++	++	+	++	4= Reduces Intersection Delay 2= Maintains Intersection Delay 0= Worsens Delay
		Average mainline speeds and travel times	-	++	++	+	0	-	++	++	++	0	-	++	++	+	-	++	++	+	+	4= Reduces Segment Delay 2= Maintain Segment Delay 0= Worsens Delay
	Understand and plan for freight needs.	Roadway design standards	Not Applicable																			4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Manage access consistent with roadway function and access spacing guidelines when applicable.	Proposed access locations, spacing and treatments	-	0	++	++	++	-	0	++	++	++	-	++	++	+	-	0	++	++	++	4= Exceeds Guidelines 2= Meets Guidelines 0= Does Not Meet Guidelines
	Provide a connected transportation system that accommodates trips consistent with roadway function.	Planned roadway capacity and forecasted volumes	-	++	++	++	++	-	+	++	++	+	-	0	++	+	-	++	++	++	++	4= Volume Meets Capacity Range for Section Type 2= Volume is Below Capacity Range for Section Type 0= Volume Exceeds Capacity Range for Section Type
	Plan for future transportation modes and technological changes.	Potential to accommodate future modes	-	++	++	++	+	-	++	++	++	+	-	0	++	+	-	++	++	++	+	4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Accommodate future transit plans and needs.	Potential to accommodate future transit routes and facilities	-	+	+	+	+	-	+	+	+	+	-	++	++	++	-	++	+	++	++	4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Understand and plan for roadway expansion needs.	Roadway design and potential for right-of-way acquisition	-	++	+	++	0	-	++	+	++	0	-	0	++	-	-	++	++	++	0	4= Does Not Require ROW Acquisition 2= Requires ROW Acquisition 0= Requires Significant ROW Acquisition
	Goal A Summary		-	++	++	++	+	-	++	+	++	+	-	0	++	0	-	++	++	+	+	
Goal B: Safely accommodate all System users	**Reduce crash and severity rates below statewide averages for comparable facilities.**	Forecasted crash and severity rates	-	++	++	+	+	-	++	++	+	+	-	++	++	+	-	++	++	+	++	4= Improves Forecasted Crashes and Severity 2= Maintains Forecasted Crashes and Severity 0= Worsens Forecasted Crashes and Severity
		Vehicle to vehicle conflict points	-	++	++	+	++	-	++	++	+	++	-	++	+	++	+	++	++	+	++	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts
	Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.	Intersection and roadway design accommodations for pedestrians and bicyclists	-	0	+	++	++	-	0	+	++	++	-	+	++	++	-	++	++	++	++	4= Crossings are Clear and Easy to Use 2= Crossings are Somewhat Clear and Easy to Use 0= Crossings are Perceived as Unsafe or Challenging
		Vehicle to pedestrian conflict points	-	+	++	0	++	-	+	++	+	++	-	+	+	++	-	+	++	+	++	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts
	Accommodate reasonable access.	Proposed access spacing compared to county and state guidelines	-	+	++	++	++	-	+	++	++	++	-	++	++	++	-	++	++	++	++	4= Meets Guidelines 2= Partially Meets Guidelines 0= Worsens Spacing
	Maintain community connections and local access for all modes.	Business access and connectivity	-	++	++	++	++	-	++	++	++	++	-	++	++	++	-	++	++	++	++	4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity
		Chaska Middle School/Community Center connectivity	Not Applicable					Not Applicable					Not Applicable				Not Applicable					4= Improves Connectivity and Circulation 2= Maintains Connectivity and Circulation 0= Worsens Connectivity and Circulation
		Residential neighborhood access and circulation	Not Applicable					Not Applicable					Not Applicable				Not Applicable					4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity
		Pedestrian and bicycle access and connectivity.	-	0	+	++	++	-	0	+	++	++	-	+	++	++	-	++	+	++	++	4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity
	Address intersection visibility and sight line issues.	Intersection and roadway design	-	++	++	++	++	-	++	++	++	++	-	++	++	++	-	++	++	++	++	4= Improves Visibility and Sightlines 2= Slightly Improves Visibility and Sightlines 0= Maintains Visibility and Sightlines
	Provide safe vehicle and pedestrian crossings of railroad facilities.	Adequacy of gates/signals at railroad crossings	Not Applicable																			4= Substantially Improves RR Gates/Signals 2= Somewhat Improves RR Gates/Signals 0= Maintains RR Gates/Signals
		Pedestrian crossing safety mechanisms at railroad crossings	Not Applicable																			4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety
		Grade separation at railroad crossings	Not Applicable																			4= Provides Grade Separated RR Crossing 0= Maintains At-Grade RR Crossing
	Goal B Summary		-	+	++	+	++	-	+	++	+	++	-	++	++	++	-	++	++	+	++	

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			2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Reduced Conflict Intersection	Traffic Signal	Two-Lane Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	
Goal C: Provide a comprehensive transportation network that supports existing and future land development	**Safely and efficiently accommodate vehicle access to and through existing and future development.**	Effectiveness of intersection design to accommodate forecasted vehicle/freight capacity demands for existing and future development	-	++	++	++	++	-	++	++	++	++	-	+	++	+	-	++	++	++	++	4= Accommodates Additional/Future Demand 2= Accommodates Existing Demand 0= Does Not Accommodate Existing Demand
	Safely accommodate pedestrian and bicycle access to and through existing and future development.	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development	**Not Applicable**																			4= Improves Connections 2= Maintains Connections 0= Worsens Connections
		Safe and accessible connections to area transit and school bus routes	**Not Applicable**																			4= Improves Connections 2= Maintains Connections 0= Worsens Connections
		Safe pedestrian crossing facilities from existing and future development at controlled intersections	-	+	+	++	++	-	+	+	++	++	-	+	++	++	-	++	++	++	++	4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety
	Goal C Summary		-	+	++	++	++	-	+	+	++	++	-	+	++	+	-	++	++	++	++	
Goal D: Provide infrastructure improvements that respect the environment.	**Avoid, minimize, and mitigate impacts to historic properties.**	Impacts to historic resources	**Not Applicable**																			4= Least Impacts 2= Some Impacts 0= Most Impacts
	Avoid, minimize, and mitigate impacts to cultural resources.	Impacts to cultural resources	N/A	++	++	++	++	N/A	++	++	++	++	N/A	++	++	+	N/A	++	++	++	++	4= Least Impacts 2= Some Impacts 0= Most Impacts
	Avoid, minimize, and mitigate impacts to the built environment.	Acquisition of property	N/A	++	++	++	+	N/A	++	++	++	+	N/A	++	++	0	N/A	++	+	++	+	4= No Property Impacts 3= <25% of 1-2 Properties Taken 2= <25% of 3-4 Adjacent Properties Taken 1= 1 Full Property Taken (>25%) and Possibly Fragments of Others (<25%) 0= 2 or More Properties Taken (>25%) and Fragments of Others (<25%)
	Avoid, minimize, and mitigate impacts to sensitive environmental resources.	Impacts to natural and protected resources	N/A	++	++	++	++	N/A	++	++	++	++	N/A	++	++	+	N/A	++	++	++	++	4= Least Impacts 2= Some Impacts 0= Most Impacts
	Meet stormwater management requirements.	Effectiveness of stormwater management features to meet WMO standards	**Not Applicable**																			4= Meets Standards 0= Does Not Meet Standards
	Provide context sensitivity.	Impacts on existing environmental and historic resources	N/A	++	++	++	++	N/A	++	++	++	++	N/A	++	+	++	N/A	++	++	++	++	4= Fully Addresses Context 2= Somewhat Addresses Context 0= Does Not Address Context
	Provide opportunities for environmental enhancements.		**Not Applicable**																			4= Most Enhancements 2= Some Enhancements 0= No Enhancements
	Meet air quality requirements.	Existing and forecasted congestion	N/A	++	++	++	+	N/A	++	++	++	+	N/A	++	++	++	N/A	++	++	++	++	4= Meets Standards 0= Does Not Meet Standards
	Meet noise impact requirements.	Impacts on noise receptors	N/A	++	++	++	++	N/A	++	++	++	++	N/A				N/A	++	++	++	++	4= Meets Standards 0= Does Not Meet Standards
	Goal D Summary		N/A	++	++	++	+	N/A	++	++	++	+	N/A	++	++	+	N/A	++	++	++	+	
Goal E: Develop a financially responsible implementation plan.	**Right-size improvements to address needs yet maximize use of existing infrastructure where possible.**	Cost of improvements – capital costs and right-of-way	N/A	++	++	++	+	N/A	++	++	++	+	N/A	++	++	++	N/A	++	++	++	++	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Develop project phases that meet schedule and funding constraints and maximize opportunities.	Funding eligibility and availability	**Not Applicable**																			4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Develop a supported funding model to clearly identify agency responsibilities.	Agency support for implementation plan	N/A	++	++	+	+	N/A	++	++	++	+	N/A	++	++	+	N/A	++	++	+	+	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Seek federal and state grants to leverage projects while minimizing local costs.	Screen potential projects for federal and state grants	N/A	++	++	+	+	N/A	++	+	++	+	N/A	++	++	+	N/A	++	++	+	+	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Goal E Summary		N/A	++	++	+	+	N/A	++	++	++	+	N/A	++	++	+	N/A	++	++	+	+	

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Highway 10 Corridor Study
Western Project Area Concept Evaluation
Intersection Concept Evaluation
November 2019

Goals	CSAH 10 and CSAH 43W					CSAH 10 and CSAH 43E					CSAH 10 and CSAH 11				CSAH 10 and Creek Road				
	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout	2040 No-Build	Reduced Conflict Intersection	Traffic Signal	Two-Lane Roundabout	2040 No-Build	Green-T	Reduced Conflict Intersection	Traffic Signal	Unbalanced Roundabout
GOAL A: Provide efficient and reliable vehicle mobility.	-	++	++	++	+	-	++	+	++	+	-	0	++	0	-	++	++	+	+
GOAL B: Safely accommodate all system users.	-	+	++	+	++	-	+	++	+	++	-	++	++	++	-	++	++	+	++
Goal C: Provide a comprehensive transportation network that supports existing and future land development	-	+	++	++	++	-	+	+	++	++	-	+	++	+	-	++	++	++	++
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	++	++	++	+	N/A	++	++	++	+	N/A	++	++	+	N/A	++	++	++	+
GOAL E: Develop a financially responsible implementation plan.	N/A	++	++	+	+	N/A	++	++	++	+	N/A	++	++	+	N/A	++	++	+	+
Total	-	+	++	+	+	-	+	+	++	+	-	+	++	+	0	++	++	+	+

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Highway 10 Corridor Study

Western Project Area Recommended Alternative Matrix

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Typical Section Concept Evaluation

January 2020

Criteria		CSAH 43W to RR Xing		RR Xing to East of Creek Road	
		4-Lane Divided Rural	4-Lane Divided Urban	4-Lane Divided Rural	4-Lane Divided Urban
Existing Issues/Notes		• Lack of pedestrian facilities		• Lack of pedestrian facilities • Victoria Worx planning area	
Evaluation Matrix Goals	Operations	++	++	++	++
	Safety	+	+	+	+
	Pedestrian/Bike Mobility	++	++	++	++
	Environmental Impacts	+	++	+	++
	Cost	++	+	++	+
Overall Matrix Score		++	++	++	++
Public Support/Feedback					
Agency Support		☐	☐	☐	☐

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Highway 10 Corridor Study
Western Project Area Concept Evaluation
Typical Section Concept Evaluation
November 2019

HIGHWAY 10 CORRIDOR STUDY
VICTORIA-CHASKA AREA

Goals	CSAH 43W to RR Xing			RR Xing to East of Creek Road		
	2040 No-Build	4-Lane Divided Rural	4-Lane Divided Urban	2040 No-Build	4-Lane Divided Rural	4-Lane Divided Urban
GOAL A: Provide efficient and reliable vehicle mobility.	-	++	++	-	++	++
GOAL B: Safely accommodate all system users.	-	+	+	-	+	+
Goal C: Provide a comprehensive transportation network that supports existing and future land development	-	++	++	-	++	++
GOAL D: Provide infrastructure improvements that respect the environment.	N/A	+	++	N/A	+	++
GOAL E: Develop a financially responsible implementation plan.	N/A	++	+	N/A	++	+
Total	-	++	++	-	++	++

Legend			
-	0	+	++
Does Not Meet Measure	Minimally Meets Measure	Meets Measure	Exceeds Measure

Highway 10 Corridor Study Western Project Area Concept Evaluation

Intersection Concept Evaluation

November 2019

	Objectives	Performance Measure	CSAH 43W to RR Xing			RR Xing to East of Creek Road			Scoring
			2040 No-Build	4-Lane Divided Rural	4-Lane Divided Urban	2040 No-Build	4-Lane Divided Rural	4-Lane Divided Urban	
Goal A: Provide efficient and reliable vehicle mobility	**Provide acceptable system reliability serving the planned growth.**	Volume to capacity ratio	-	++	++	-	++	++	4= V/C <=.85 2= V/C >.85, <=1.0 0 = V/C >1.0
		Support future land use plans	-	++	++	-	++	++	4= Supports Traffic Growth 2= Minimally Supports Traffic Growth 0= Does Not Support Traffic Growth
	Provide acceptable travel times.	Vehicle delay/level of service	-	++	++	-	++	++	4= Reduces Vehicle Delay/LOS 2= Maintains Vehicle Delay/LOS 0= Worsens Delay
		Side street delay accessing or crossing major corridors	-	++	++	-	++	++	4= Reduces Side Street Delay 2= Maintains Side Street Delay 0= Worsens Delay
		Intersection delay for forecasted growth scenarios	-	++	++	-	++	++	4= Reduces Intersection Delay 2= Maintains Intersection Delay 0= Worsens Delay
		Average mainline speeds and travel times	-	++	++	-	++	++	4= Reduces Segment Delay 2= Maintain Segment Delay 0= Worsens Delay
	Understand and plan for freight needs.	Roadway design standards	Not Applicable						4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Manage access consistent with roadway function and access spacing guidelines when applicable.	Proposed access locations, spacing and treatments	Not Applicable						4= Exceeds Guidelines 2= Meets Guidelines 0= Does Not Meet Guidelines
	Provide a connected transportation system that accommodates trips consistent with roadway function.	Planned roadway capacity and forecasted volumes	-	++	++	-	++	++	4= Volume Meets Capacity Range for Section Type 2= Volume is Below Capacity Range for Section Type 0= Volume Exceeds Capacity Range for Section Type
	Plan for future transportation modes and technological changes.	Potential to accommodate future modes	Not Applicable						4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Accommodate future transit plans and needs.	Potential to accommodate future transit routes and facilities	Not Applicable						4= Fully Accommodates 2= Somewhat Accommodates 0= Does Not Accommodate
	Understand and plan for roadway expansion needs.	Roadway design and potential for right-of-way acquisition	Not Applicable						4= Does Not Require ROW Acquisition 2= Requires ROW Acquisition 0= Requires Significant ROW Acquisition
	Goal A Summary		-	++	++	-	++	++	
Goal B: Safely accommodate all System users	**Reduce crash and severity rates below statewide averages for comparable facilities.**	Forecasted crash and severity rates	+	++	++	+	++	++	4= Improves Forecasted Crashes and Severity 2= Maintains Forecasted Crashes and Severity 0= Worsens Forecasted Crashes and Severity
		Vehicle to vehicle conflict points		+	+		+	+	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts
	Provide safe pedestrian and bicycle travel along and across roadways, to area schools, and to regional destinations.	Intersection and roadway design accommodations for pedestrians and bicyclists	0	+	++	0	+	++	4= Accommodates Additional Modes 2= Somewhat Accommodates Additional Modes 0= Does Not Accommodate Additional Modes
		Vehicle to pedestrian conflict points	+	+	+	+	+	+	4= Decreases Conflicts 2= Maintains Conflicts 0= Increases Conflicts
	Accommodate reasonable access.	Proposed access spacing compared to county and state guidelines	Not Applicable						4= Meets Guidelines 2= Partially Meets Guidelines 0= Worsens Spacing
	Maintain community connections and local access for all modes.	Business access and connectivity	-	++	++	-	++	++	4= Maximizes Access and Connectivity 2= Minimally Improves Access and Connectivity 0= Maintains Access and Connectivity
		Chaska Middle School/Community Center connectivity	Not Applicable						
		Residential neighborhood access and circulation	Not Applicable						
		Pedestrian and bicycle access and connectivity.	Not Applicable						4= Improves Access and Connectivity 2= Maintains Access and Connectivity 0= Worsens Access and Connectivity
	Address intersection visibility and site line issues.	Intersection and roadway design	-	++	++	-	++	++	4= Improves Visibility and Sightlines 2= Maintains Visibility and Sightlines 0= Worsens Visibility and Sightlines
	Provide safe vehicle and pedestrian crossings of railroad facilities.	Adequacy of gates/signals at railroad crossings	-	+	++	-	+	++	4= Substantially Improves RR Gates/Signals 2= Somewhat Improves RR Gates/Signals 0= Maintains RR Gates/Signals
		Pedestrian crossing safety mechanisms at railroad crossings	-	+	++	-	+	++	4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety
		Grade separation at railroad crossings	-	-	-	-	-	-	4= Provides Grade Separated RR Crossing 0= Maintains At-Grade RR Crossing
	Goal B Summary		-	+	+	-	+	+	
Goal C: Provide a comprehensive transportation network that supports existing and future land development	**Safely and efficiently accommodate vehicle access to and through existing and future development.**	Effectiveness of roadway section to accommodate forecasted vehicle/freight capacity demands for existing and future development	-	++	++	-	++	++	4= Accommodates Additional/Future Demand 2= Accommodates Existing Demand 0= Does Not Accommodate Existing Demand
	Safely accommodate pedestrian and bicycle access to and through existing and future development.	Connectedness of CSAH 10 (Engler Boulevard) sidewalks and trails to existing and future development	Not Applicable						4= Improves Connections 2= Maintains Connections 0= Worsens Connections
		Safe and accessible connections to area transit and school bus routes	Not Applicable						4= Improves Connections 2= Maintains Connections 0= Worsens Connections
		Safe pedestrian crossing facilities from existing and future development at controlled intersections	-	++	++	-	++	++	4= Substantially Improves Pedestrian Crossing Safety 2= Somewhat Improves Pedestrian Crossing Safety 0= Maintains Pedestrian Crossing Safety
	Goal C Summary		-	++	++	-	++	++	
Goal D: Provide infrastructure improvements that respect the environment.	**Avoid, minimize, and mitigate impacts to historic properties.**	Impacts to historic resources	Not Applicable						4= Least Impacts 2= Some Impacts 0= Most Impacts
	Avoid, minimize, and mitigate impacts to cultural resources.	Impacts to cultural resources	N/A	+	++	N/A	+	++	4= Least Impacts 2= Some Impacts 0= Most Impacts
	Avoid, minimize, and mitigate impacts to the built environment.	Acquisition of property	N/A	+	++	N/A	+	++	4= No Property Impacts 3= <25% of 1-2 Properties Taken 2= <25% of 3-4 Adjacent Properties Taken 1= 1 Full Property Taken (>25%) and Possibly Fragments of Others (<25%) 0= 2 or More Properties Taken (>25%) and Fragments of Others (<25%)
	Avoid, minimize, and mitigate impacts to sensitive environmental resources.	Impacts to natural and protected resources	Not Applicable						4= Least Impacts 2= Some Impacts 0= Most Impacts
	Meet stormwater management requirements.	Effectiveness of stormwater management features to meet WMO standards	Not Applicable						4= Meets Standards 0= Does Not Meet Standards
	Provide context sensitivity.	Impacts on existing environmental and historic resources	Not Applicable						4= Fully Addresses Context 2= Somewhat Addresses Context 0= Does Not Address Conflicts
	Provide opportunities for environmental enhancements.		Not Applicable						4= Most Enhancements 2= Some Enhancements 0= No Enhancements
	Meet air quality requirements.	Existing and forecasted congestion	N/A	++	++	N/A	++	++	4= Meets Standards 0= Does Not Meet Standards
	Meet noise impact requirements.	Impacts on noise receptors	Not Applicable						4= Meets Standards 0= Does Not Meet Standards
	Goal D Summary		N/A	+	++	N/A	+	++	
Goal E: Develop a financially responsible implementation plan.	**Right-size improvements to address needs yet maximize use of existing infrastructure where possible.**	Cost of improvements – capital costs and right-of-way	N/A	++	+	N/A	++	+	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Develop project phases that meet schedule and funding constraints and maximize opportunities.	Funding eligibility and availability	Not Applicable						4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Develop a supported funding model to clearly identify agency responsibilities.	Agency support for implementation plan	N/A	++	++	N/A	++	++	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Seek federal and state grants to leverage projects while minimizing local costs.	Screen potential projects for federal and state grants	N/A	++	++	N/A	++	++	4= Most Feasible 3= Feasible 2= Feasible But Challenging 0= Not Feasible
	Goal E Summary		N/A	++	+	N/A	++	+	

Appendix E – Implementation Plan

Appendix F – Water Resources Report

Appendix G – Existing and Future Conditions Traffic Memo