



**SAUK RAPIDS-RICE  
SCHOOL DISTRICT**

# MAYHEW LAKE ROAD

## CORRIDOR ACCESS AND SAFETY STUDY

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JANUARY 2023

Prepared for:  
St. Cloud Area Planning Organization  
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WSB PROJECT NO. 20113-00



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Exhibit 2: Public Open House #2 Summary

Exhibit 3: Elected Officials Presentation



## Executive Summary

The *Mayhew Lake Road Corridor Access and Safety Study* (study) was initiated in the spring of 2022 to examine County State Aid Highway (CSAH) 1/Mayhew Lake Road between Trunk Highway (TH) 23 in the south and CSAH 29/35th Street NE in the north. The planning team for this study included the Saint Cloud Area Planning Organization (St. Cloud APO), Benton County, the City of Sauk Rapids, and the Sauk Rapids-Rice School District. Representatives of these organizations met a total of six times throughout the study process as part of a Technical Advisory Committee (TAC).

The study aimed to improve the safety and access and to develop a long-term vision for the Mayhew Lake Road corridor that accommodates future travelers, and adjacent land uses. Major tasks included in the study included: an existing conditions analysis, a traffic and safety analysis, development and evaluation of cross-section concepts, development and evaluation of two corridor concept alignments, development of planning-level cost estimates, and recommendations for a long-term Mayhew Lake Road corridor vision.

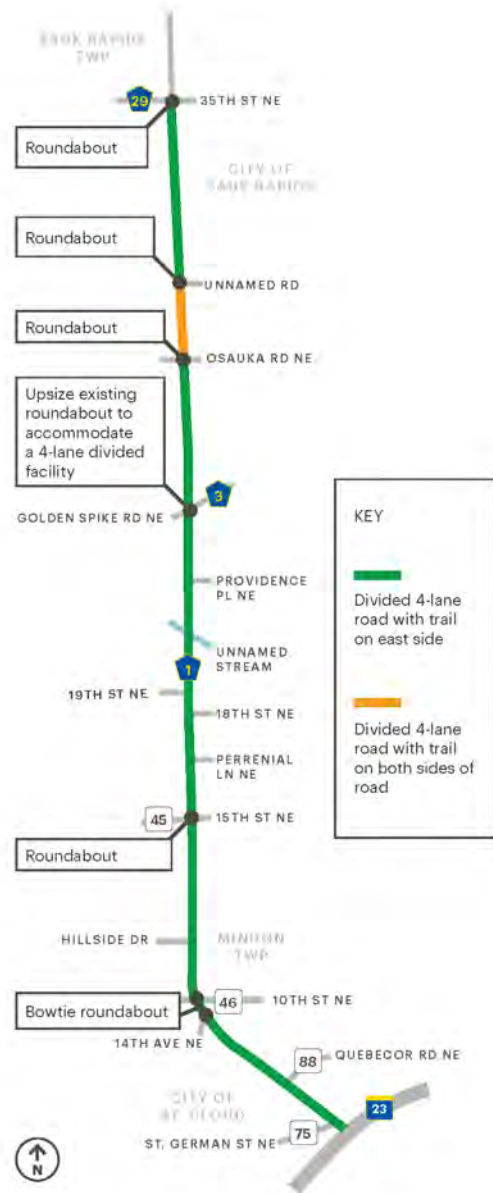
Public and stakeholder engagement sessions were conducted throughout the study to inform and elicit feedback from the community. Engagement activities included two public open house meetings, one pop-up meeting, and a presentation to elected officials. A study webpage also included corridor information, online surveys, and online interactive comment maps.

### A. ROADWAY GEOMETRY CONSIDERATIONS AND RECOMMENDATIONS

Six cross-section concepts were developed and evaluated. Each of these concepts included a 10-foot trail on the east side separated from the roadway with a boulevard, and travel lane widths ranging from 16 feet in the 2-lane concepts to 12 feet in the 4-lane concepts.

An evaluation of cross-section concepts and input received at an October 2022 public meeting led the TAC to recommend that the two, 4-lane divided roadway concepts be carried forward for additional development and evaluation (see **Figure ES 2** and **Figure ES 3**). Both of these concepts would address existing safety issues, as well as accommodate existing and anticipated transportation needs. The primary difference between the two recommended roadway cross-sections is that one includes curb and gutter on both sides of the roadway while the other includes curb and gutter on one side and a rural ditch on the other side.

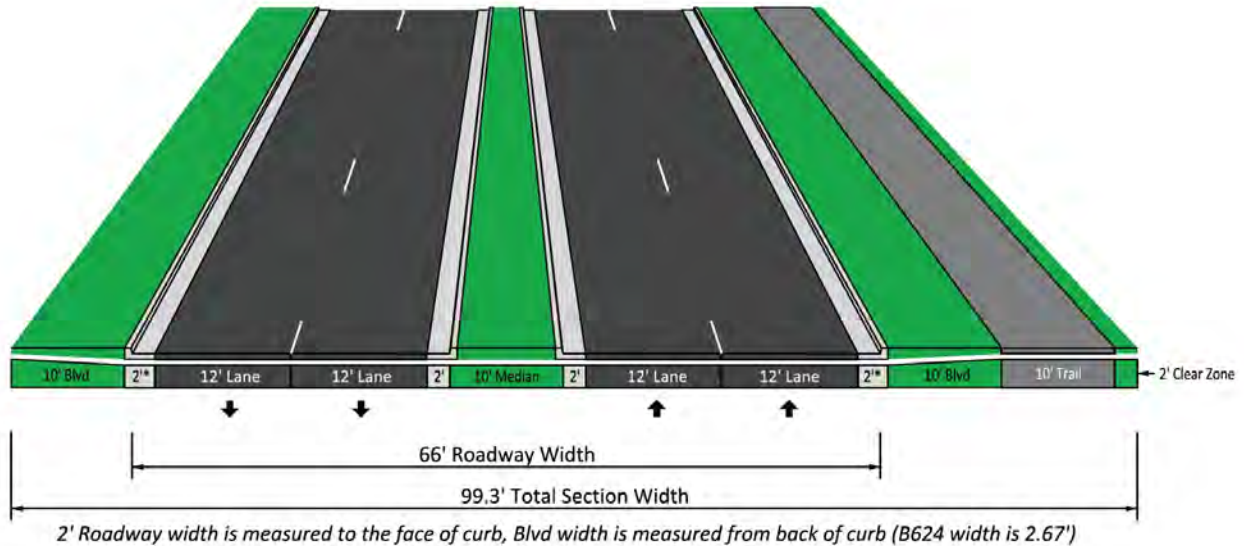
Figure ES 1 – All Recommended Intersection and Corridor Improvements



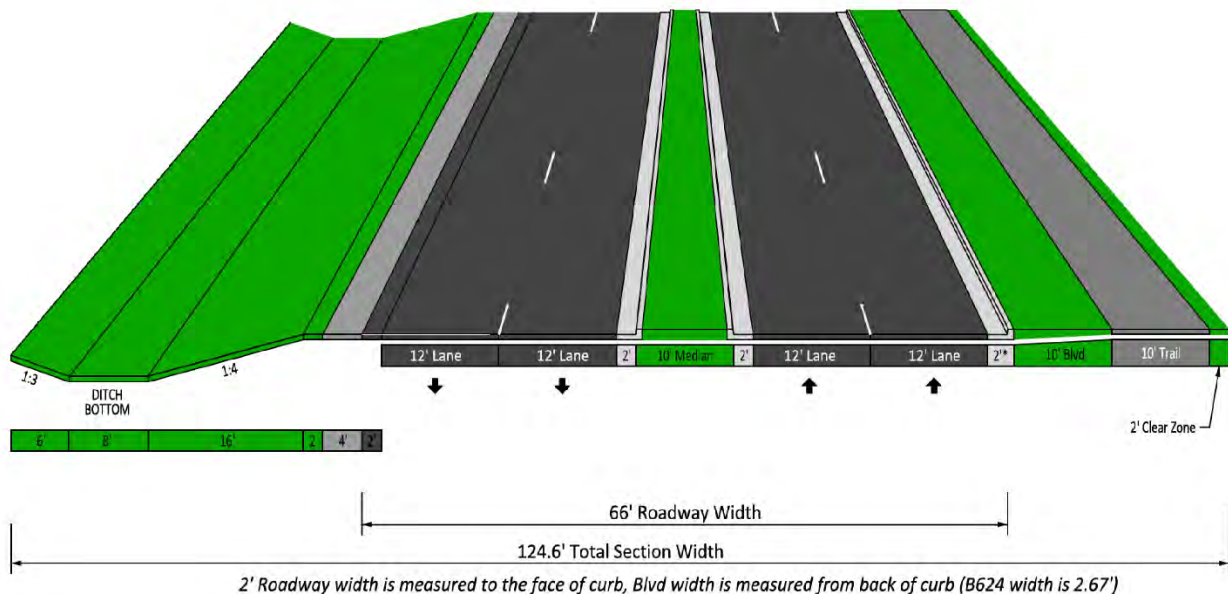
The study's TAC recommended that ultimate decisions about which 4-lane, divided cross-section is appropriate for various sections of Mayhew Lake Road be determined during the preliminary engineering stage of project development. This will allow for consideration of existing and future land uses, as well as environmental constraints, including natural areas and wetlands.

In addition to recommending a multi-use trail along the entire eastside of Mayhew Lake Road, the TAC recommended a trail on the west-side of Mayhew Lake Road between Osauka Road and the Sauk Rapids-Rice High School access. This recommendation is intended to enhance safety, mobility, and access for non-motorists. See **Figure ES 1** for details regarding specific corridor recommendations.

**Figure ES 2 - Recommended 4-Lane Divided Urban Cross Section (Concept E)**



**Figure ES 3 - Recommended 4-Lane Divided Rural Cross Section (Concept F)**





## B. INTERSECTION TREATMENT CONSIDERATIONS AND RECOMMENDATIONS

Safety and traffic operations at intersections along Mayhew Lake Road were considered as part of this study. Based on the results of these analyses, roundabouts were recommended at the locations listed below, both to address existing safety issues and to meet long-term traffic demands.

- Mayhew Lake Road & 35th Street
- Mayhew Lake Road & High School Entrance
- Mayhew Lake Road & Osauka Road
- Mayhew Lake Road & Golden Spike Road (Note: There is currently a roundabout at this intersection; this would need to be expanded to accommodate 4-lanes of traffic)
- Mayhew Lake Road & 15th Street
- Mayhew Lake Road & 10th Street/14th Avenue (a bowtie roundabout is recommended at this location)

These locations are shown on **Figure ES 3**. Images of both a roundabout and a bowtie roundabout are provided below in **Image ES 1** and **Image ES 2**.

**Image ES 1 - Example Roundabout (Existing Roundabout at Golden Spike Road)**



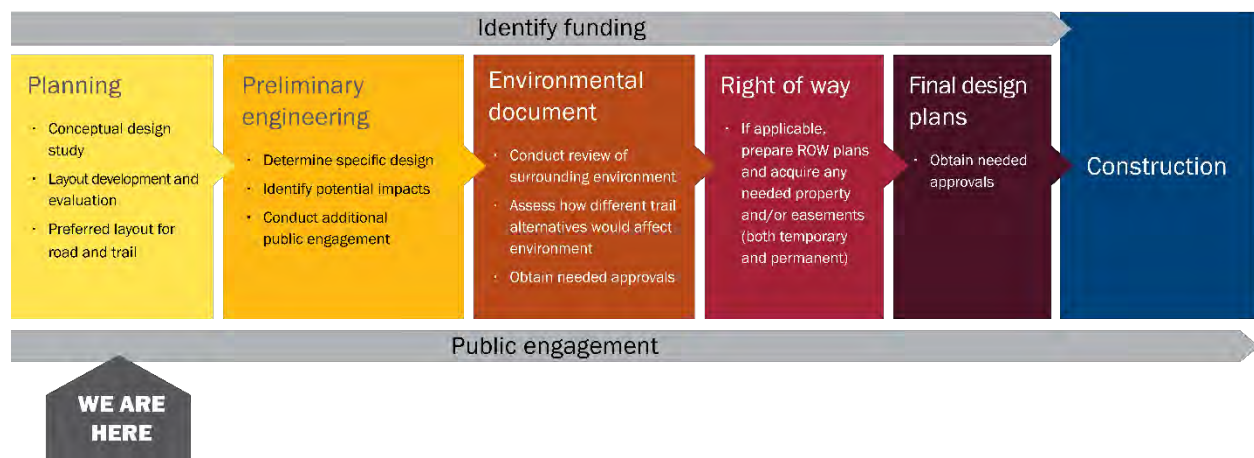
**Image ES 2 – Example Bowtie Roundabout (Existing Bowtie Roundabout in City of Sauk Rapids)**



**C. MAYHEW LAKE ROAD PROJECT: COSTS & PHASING**

The study was completed in the fall of 2022 and is the first step towards constructing a future Mayhew Lake Road project. As shown in **Image ES 3**, there are several major steps in the project development process that must occur prior to a project is constructed.

**Image ES 3 – Project Progress**





Total construction cost of the entire Mayhew Lake Road future vision is anticipated to cost between \$14 - \$16 million in 2022 dollars. Additional costs can be anticipated that were not included, such as right of way and easement, preliminary and final design, and construction engineering.

While this study developed a complete corridor vision, the total reconstruction of Mayhew Lake Road is not planned for the near term. Benton County does not have funding identified for any portion of the Mayhew Lake Road study corridor. Given the size and cost of the Mayhew Lake Road corridor, the county is prepared to implement the corridor vision through a series of projects rather than one, large construction project.

The phases listed below recommend how the Mayhew Lake Road corridor could be prioritized and delivered in a series of projects. This phasing is intended to address the highest corridor transportation needs first. However, this phasing could change if opportunities to construct portions of the Mayhew Lake Road corridor became available earlier.

- **Phase 1** would reconstruct the intersection at CSAH 29/35th Street with a roundabout to address the intersection with the highest crash rate in the study.
- **Phase 2** includes reconstruction of the Mayhew Lake Road between Osauka Road and Water Tower Road near Sauk Rapids-Rice High School, to address safety issues as well as accommodate bicyclists and pedestrians.
- **Phase 3** reconstruction would implement a bowtie roundabout at CR 46/10th Street and CR74/14th Avenue. Both of these Mayhew Lake Road intersections have crash issues. The bowtie concept here would improve safety and traffic operations, while not requiring as much additional right-of-way as some other intersection improvements.
- **Expansion to 4-Lanes and Trail** future development along Mayhew Lake Road will be a driver of expansion from 2- to 4-lanes. Additional development and traffic associated with this development could serve as the impetus to expand the roadway.

The St. Cloud APO, Benton County, the City of Sauk Rapids, and the Sauk Rapids-Rice School District will continue to coordinate throughout implementation of the recommended for Mayhew Lake Road improvements. This interagency collaboration will help prioritize projects based on future development, secure permitting of land use changes, and secure project funding.

# 1. Introduction

The St. Cloud APO, in partnership with Benton County, the City of Sauk Rapids, and the Sauk Rapids-Rice School District, initiated the study of CSAH 1/Mayhew Lake Road in the spring 2022. The study area is the portion of Mayhew Lake Road/CSAH 1 from TH 23 to 35th Street NE, all located in Sauk Rapids in Benton County (see **Figure 1** and **Figure 2**).

Mayhew Lake Road is transitioning from a rural to a more suburban/urban area as more residential and business development occurs on the corridor. There are safety issues at several intersections along Mayhew Lake Road, including in the vicinity of the Sauk Rapids-Rice High School. There are also no continuous trails or sidewalks for bicyclists or pedestrians to use along or across Mayhew Lake Road. This study explored these existing and future transportation needs on this corridor. An array of corridor cross-sections and alignments were identified and evaluated. The study recommends roadway and intersection improvements aimed at addressing safety and meeting long-term transportation needs. The study process included community engagement with community members, including are residents living along and using the Mayhew Lake Road corridor.

## 1.1 Study Purpose

This study was completed to establish a conceptual planning level design vision for Mayhew Lake Road to address:

- Corridor safety issues
- Existing and future traffic issues based on current and future development
- The roadway type, including intersection treatments, that will best accommodate existing and future traffic
- Transportation needs of all users, including pedestrians and bicyclists
- Phasing construction projects
- Potential funding sources for construction projects

## 1.2 Report Purpose

This report documents the results and findings of the study, including summaries of the existing conditions analysis, traffic and safety analyses, concept development and evaluation, study recommendations, planning level cost estimates, potential project phasing, potential funding sources, and public and stakeholder engagement activities. Technical memos were completed during this study contain in-depth information than summarized in applicable sections and included in this report as attachments.







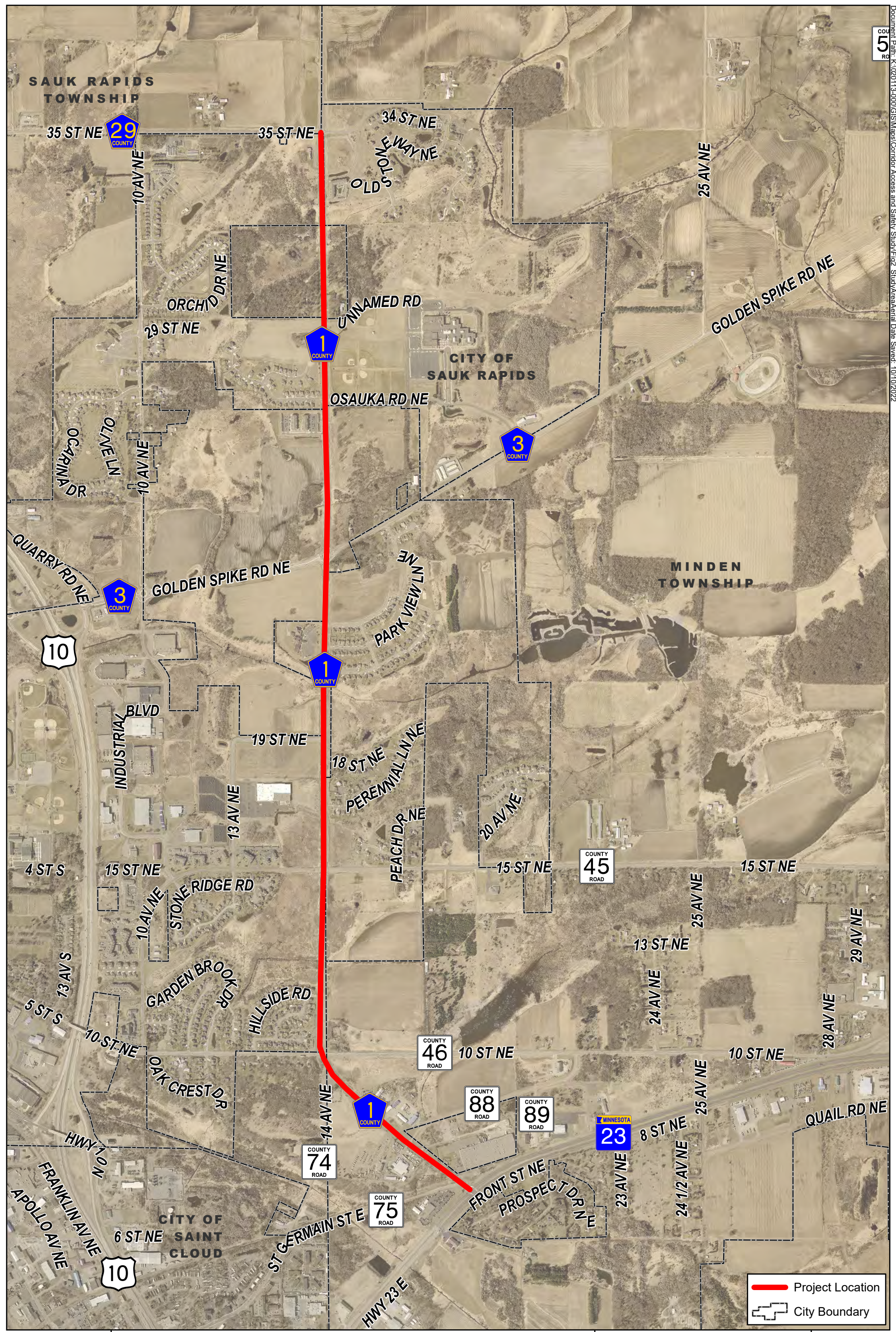


Figure 2 - Study Area Aerial

Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota





## 2 Study Area Background

This section summarizes existing and anticipated future conditions along Mayhew Lake Road, including corridor characteristics and land uses. The Existing Conditions Memorandum, provided as **Attachment A**, includes detailed information on corridor characteristics.

### 2.1 Mayhew Lake Road Corridor Characteristics

The 3.1-mile-long Mayhew Lake Road study corridor – between TH 23 and CSAH 29/35th Street – is located on the eastern side of Sauk Rapids. It is a 2-lane, two-way roadway with one 12-foot travel lane in each direction, paved shoulders ranging between 10' and 12', and a rural cross-section (ditch and swale drainage). The posted speed limit is 55-mph speed limit; there is a 40-mph school speed zone near the Sauk Rapids-Rice High School. The road classified as a “Minor Arterial” and is under the jurisdiction of Benton County. Key roadway information is provided in **Table 1**. **Figure 3** depicts the existing typical sections along with corresponding locations on the corridor.

**Table 1 - Corridor Characteristics Summary**

Characteristic	Data
Corridor length (mi.)	3.1
Speed Limit (mph)	Posted 50-55; 40 near high school at beginning & end of day
Existing Right of Way	Approx. 142 – 162 ft.
Annual Average Daily Traffic (AADT) <sup>1</sup>	3,300–5,800
Functional Classification	Minor Arterial
Road Geometry	- 2-lane, two-way with paved shoulders - Rural cross-section
Parking	None
Existing Non-motorized facilities	Limited trail
Drainage	Largely ditch and swale drainage

<sup>1</sup>Minnesota Department of Transportation (MnDOT) AADT data from 2015-2019

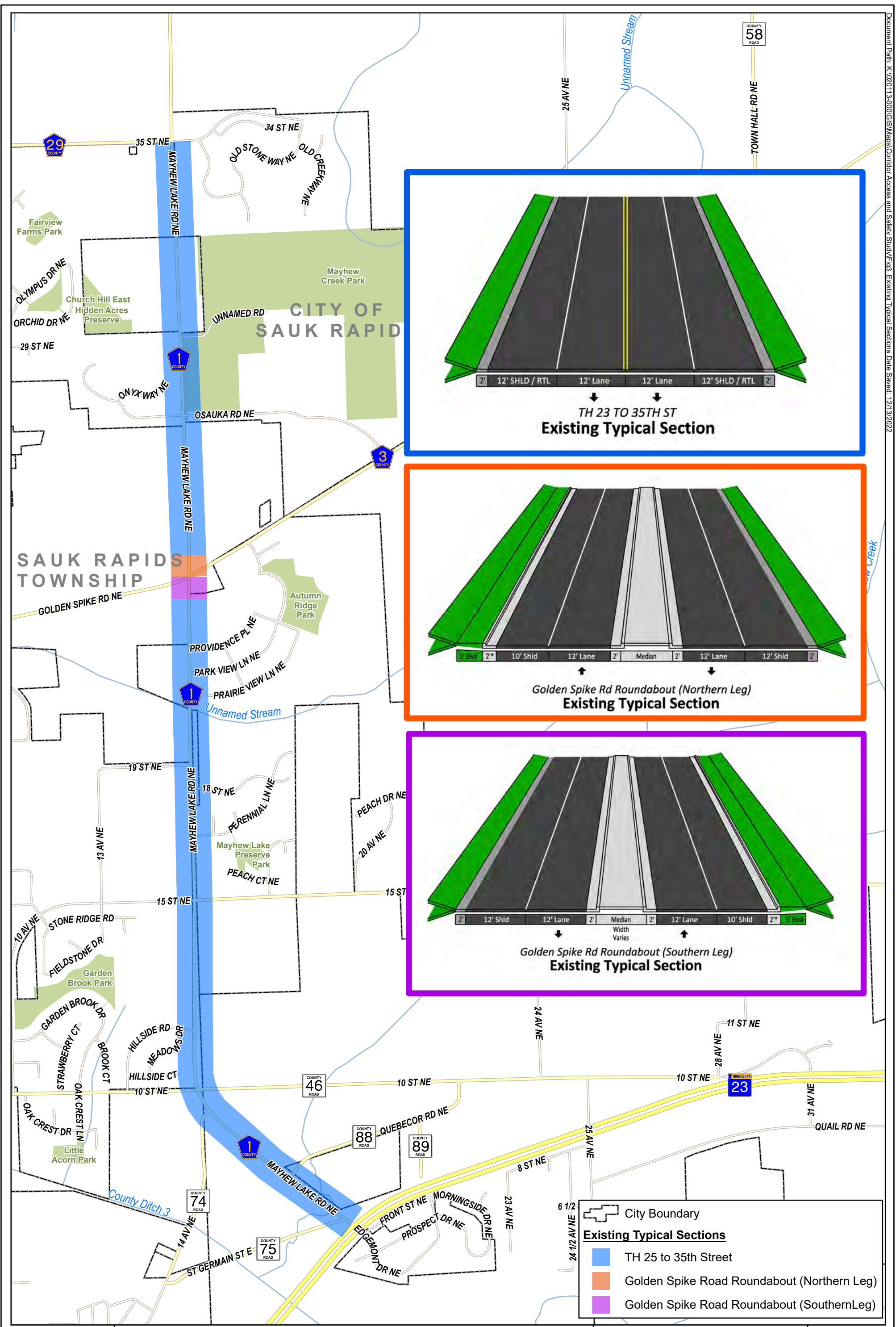
### 2.2 Non-motorized Transportation Facilities

There are limited bicycle and pedestrian facilities along and near Mayhew Lake Road, shown on **Figure 4**. There is a multiuse trail on the east side of Mayhew Lake Road between Golden Spike Road NE and Osauka Road NE. There are shoulders along much of the corridor, but these typically drop at intersections when turn lanes are present. Most shoulders along the corridor are 10' in width. People do use these shoulders for walking and biking. **Figure 4** shows the existing and planned nonmotorized transportation network in the study area.

In addition to planned/programmed trail facilities along and adjacent to the corridor, trails are being built within residential developments as these are constructed in Sauk Rapids. These trails generally serve neighborhoods and are located on city easement. The City of Sauk Rapids intends for these neighborhood trails to be connected to one another as residential developments continue to be constructed.

There is no transit service along or across this Mayhew Lake Road. In the St. Cloud APO's 2022 Regional Active Transportation Plan, Golden Spike Road between 10th Avenue and Osauka Road is identified as a planned transit route.

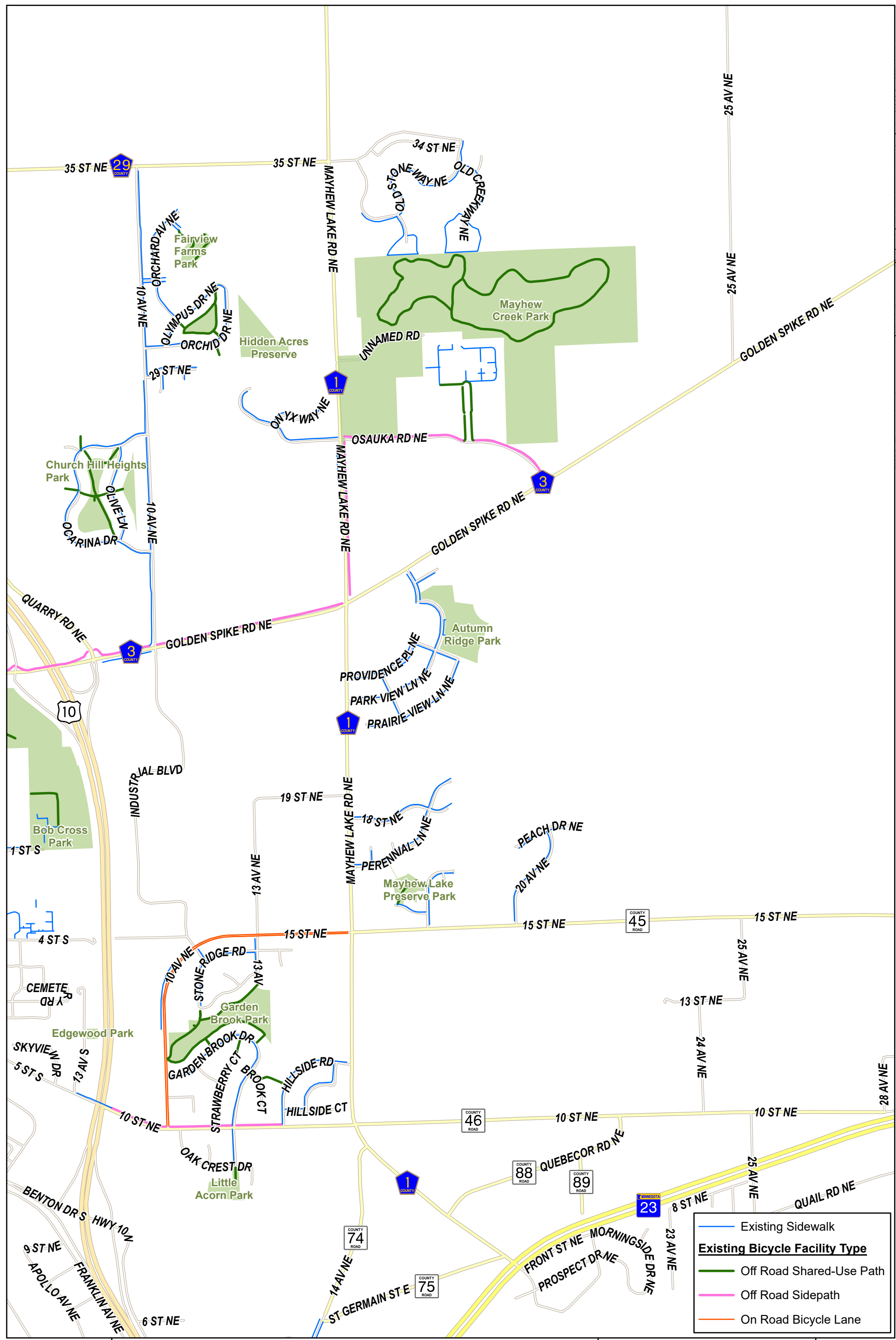




**Figure 3 - Existing Typical Sections**

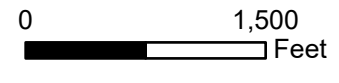
Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota





**Figure 4 - Existing Nonmotorized Transportation Network**

Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota



## 2.3 Land Uses

This section provides information on current and future land uses and potential growth areas along Mayhew Lake Road. Understanding existing and future land uses along and adjacent to the corridor helps to provide insight on future needs relative to today's existing conditions.

## 2.4 Existing Land Uses

Existing land uses, along with the location of parks and schools in the study area are shown on **Figure 5**. Land uses along Mayhew Lake Road include single family or rural residences, commercial and industrial businesses, agriculture, parks/open space, some vacant lands, and institutional land uses. Several industrial buildings are located at the very south end of the corridor between 10th Street NE and TH 23. The Sauk Rapids-Rice High School is located near the north end of the corridor on the east side of Mayhew Lake Road. Trinity Lutheran Church is located just south of Golden Spike Road NE on the west of Mayhew Lake Road.

Parklands in the study area include ballfields north of Osauka Road NE and east of Mayhew Lake Road, and a large natural area north of the high school with walking trails near Mayhew Creek. Hidden Acres Preserve Park, located west of Mayhew Lake Road near Orchid Drive NE, includes a portion of natural wetland. Autumn Ridge Park, located south of Golden Spike Road NE east of Mayhew Lake Road, offers a playground and splash pad. The Mayhew Lake Preserve Park is another natural area located east of Mayhew Lake Road and north of 15th Street NE between Peach Drive NE and Perennial Lane NE.

## 2.5 Future Land Uses

Planned, future land use along the study corridor is shown on **Figure 6**. This information is from the City of Sauk Rapids' draft future land use map, which was in development as this study was underway. Future land uses along the study corridor include:

- Areas of high density residential along the west side of Mayhew Lake Road, south of Osauka Road NE, north of 15th Street NE and south of 10th Street NE.
- Park/open space and public/semi-public lands at the north end of the corridor at the Sauk Rapids High School and Mayhew Creek Park, which the City of Sauk Rapids is in the process of developing.
- Industrial development on the east side of Mayhew Lake Road between TH 23 and CR 46/10th Street as well as near the business park.
- Mixed use, neighborhood commercial, and business park are planned near the intersection of Mayhew Lake Road and Golden Spike Road NE.
- Low density residential development along much of the east side of Mayhew Lake Road.

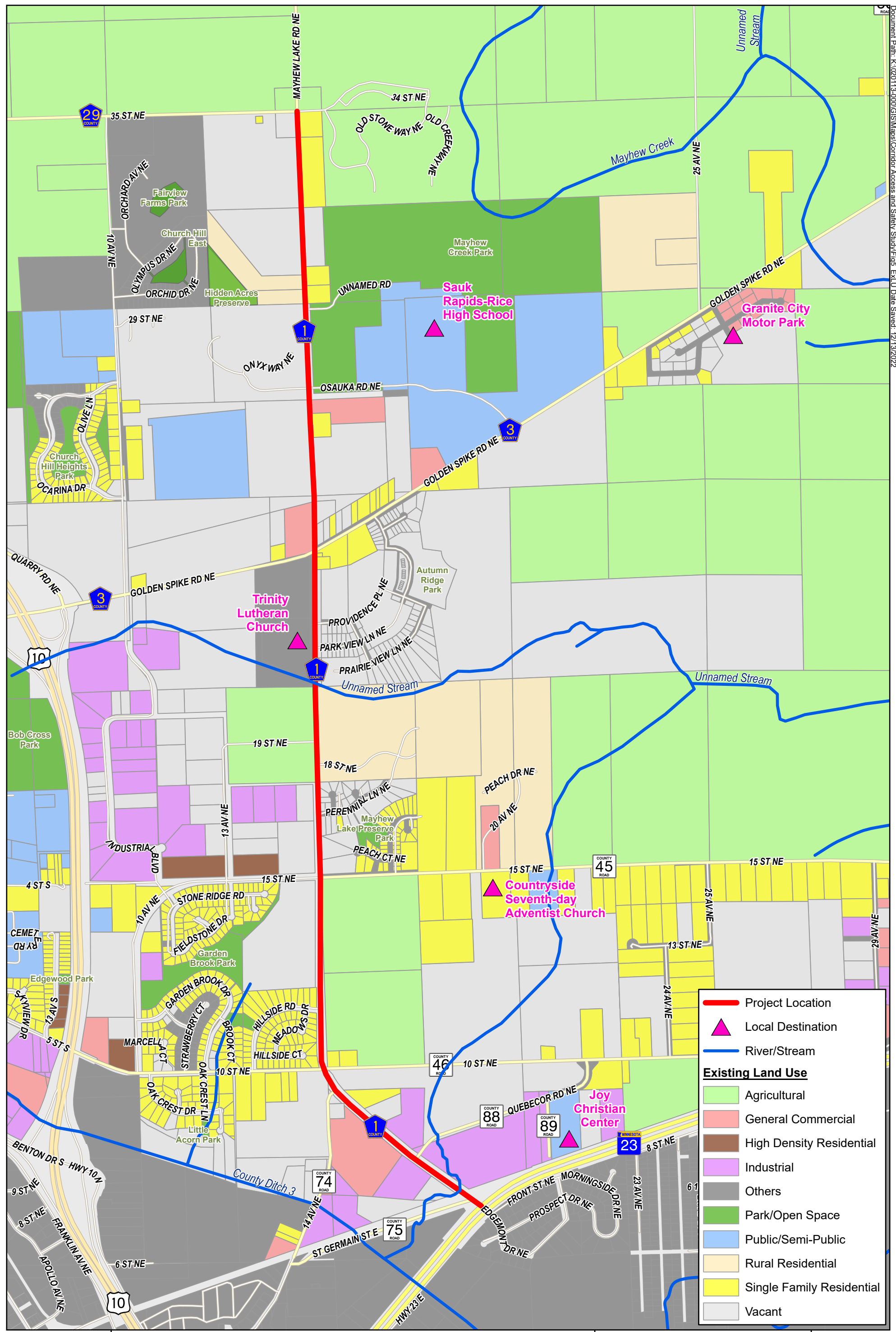
## 2.6 Other Corridor Features

**Attachment A** provides details on other resources that were reviewed in the process of developing the project team's understanding of the corridor. Some of these resources are documented below.

### 2.6.1 Utilities

Utilities along the Mayhew Lake Road include overhead power, buried gas, communications, watermain, sanitary sewer, and storm sewer (see **Figure 7**). East Central Energy and Xcel Energy maintain overhead power with underbuilt communication lines throughout the project corridor. Northern Natural Gas maintains high pressure gas main heading east from their facility at 14th Avenue and Mayhew Lake Road and crossing Mayhew Lake Road before turning north and crossing 10th Street. Public utilities in the project area are owned by the City of St. Cloud, City of Sauk Rapids, Benton County, and Sauk Rapids-Rice School District. A variety of communication lines exist and are owned by Arvig, Benton Co-op, Lumen, and TDS.





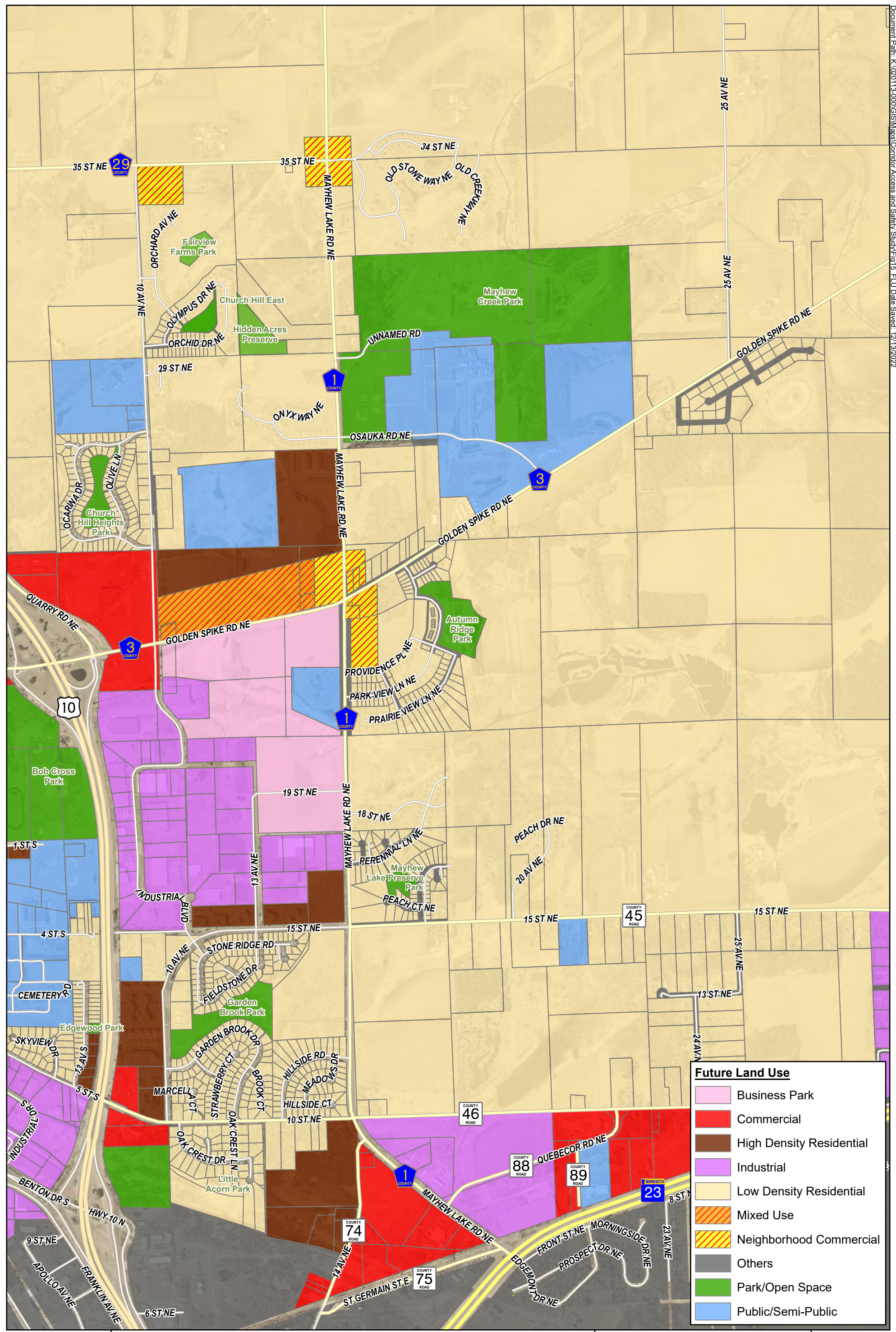
**Figure 5 - Existing Land Use**

Mayhew Lake Road Corridor Access and Safety Study  
 St. Cloud Area Planning Organization (APO), Minnesota

Source: City of Sauk Rapids





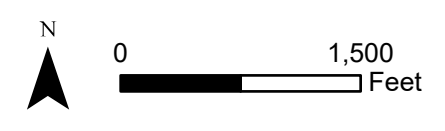


Future Land Use	
	Business Park
	Commercial
	High Density Residential
	Industrial
	Low Density Residential
	Mixed Use
	Neighborhood Commercial
	Others
	Park/Open Space
	Public/Semi-Public

**Figure 6 - Future Land Use**

Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota

Source: City of Sauk Rapids





## 2.6.2 Environmental Features

### WETLANDS

National Wetland Inventory (NWI) mapped wetlands adjacent to Mayhew Lake Road are shown on **Figure 8**. Larger wetland areas in the study area include:

- South of 35th Street NE near the Sauk Rapids-Rice High School, on both sides of Mayhew Lake Road and in Mayhew Creek Park.
- Just north of Golden Spike Road NE, on both sides of Mayhew Lake Road.
- South of Park View Lane NE along a tributary to Mayhew Creek on both sides of Mayhew Lake Road.
- All quadrants of the intersection of Mayhew Lake Road and 15th Street NE, extending north and south along Mayhew Lake Road.
- South of 10th Street NE.
- Along County Ditch 3 just northwest of TH 23.

### FLOODPLAIN

There are no areas of mapped floodplain directly along the study corridor. Nearby floodplains are shown on **Figure 8**.

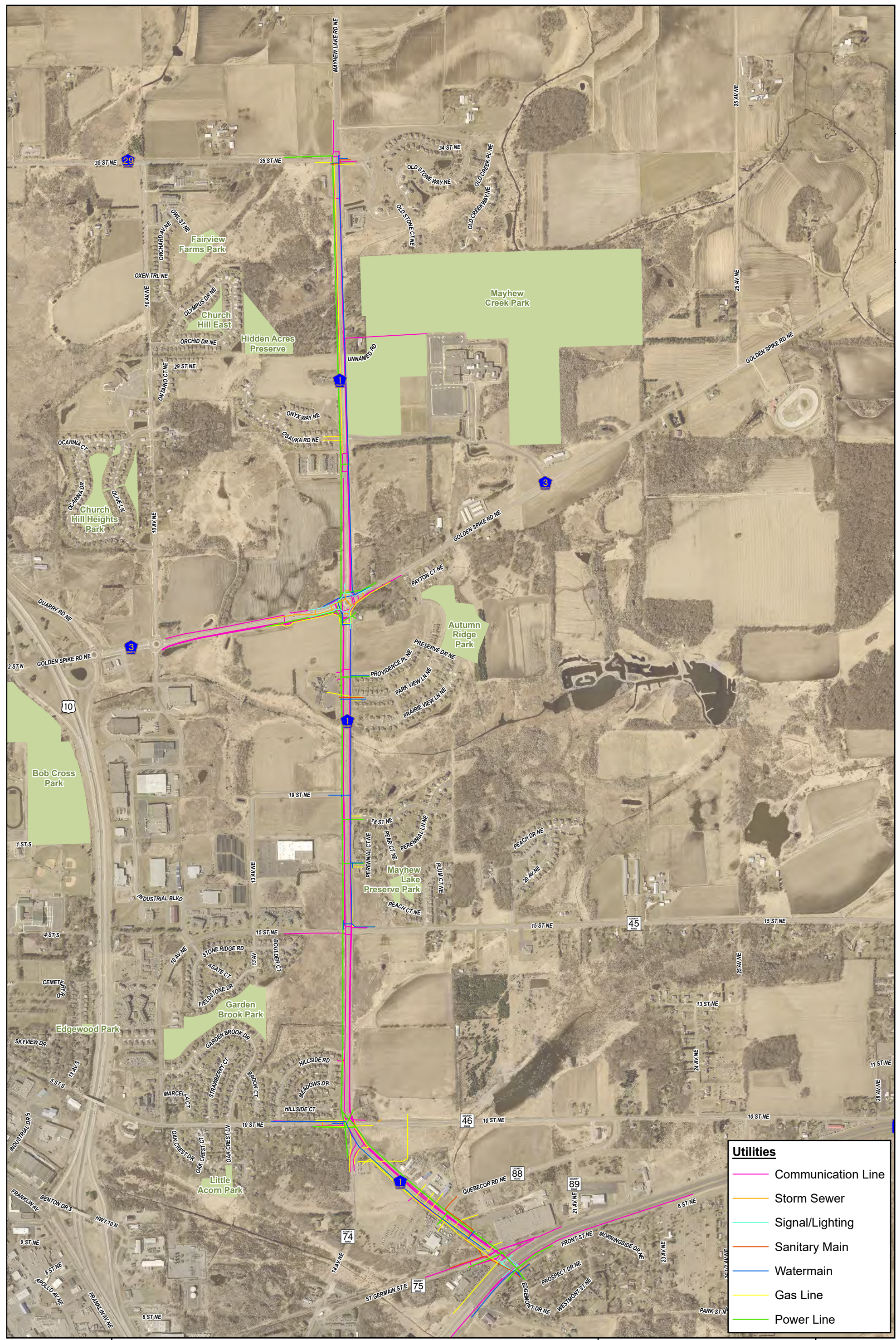
### NATURAL AREAS

The DNR data on Sites of Biodiversity Significance was reviewed to determine the presence of these sites near the study area. There is one site of moderate significance, Pattison Prairie, located near the north end of the corridor west of Mayhew Lake Road across from Mayhew Creek Park. An additional moderate site, Pull Meadow, is mapped at the large wetland complex between Quarry Road NE and 10th Avenue NE. **Figure 9** maps these features that are present along and near Mayhew Lake Road.

## 2.7 Planned and Programmed Projects

This section outlines planned and programmed transportation related projects within and adjacent to the study corridor. Projects identified below were obtained through review of relevant St. Cloud APO, Benton County, and City of Sauk Rapid's plans/studies, along with information collected during discussions with stakeholders.





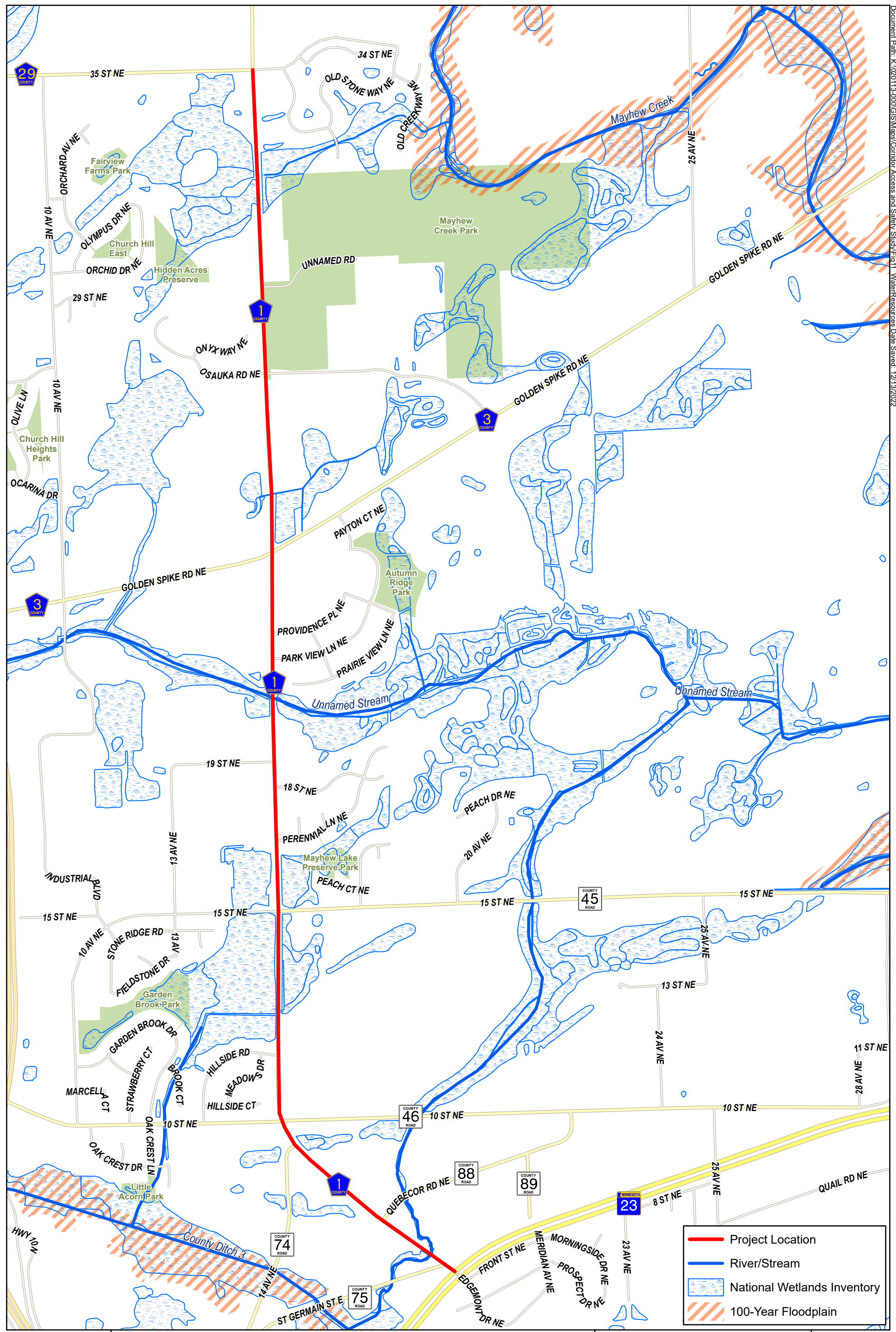
Utilities	
	Communication Line
	Storm Sewer
	Signal/Lighting
	Sanitary Main
	Watermain
	Gas Line
	Power Line

**Figure 7 - Existing Utilities**

Mayhew Lake Road Corridor Access and Safety Study  
 St. Cloud Area Planning Organization (APO), Minnesota





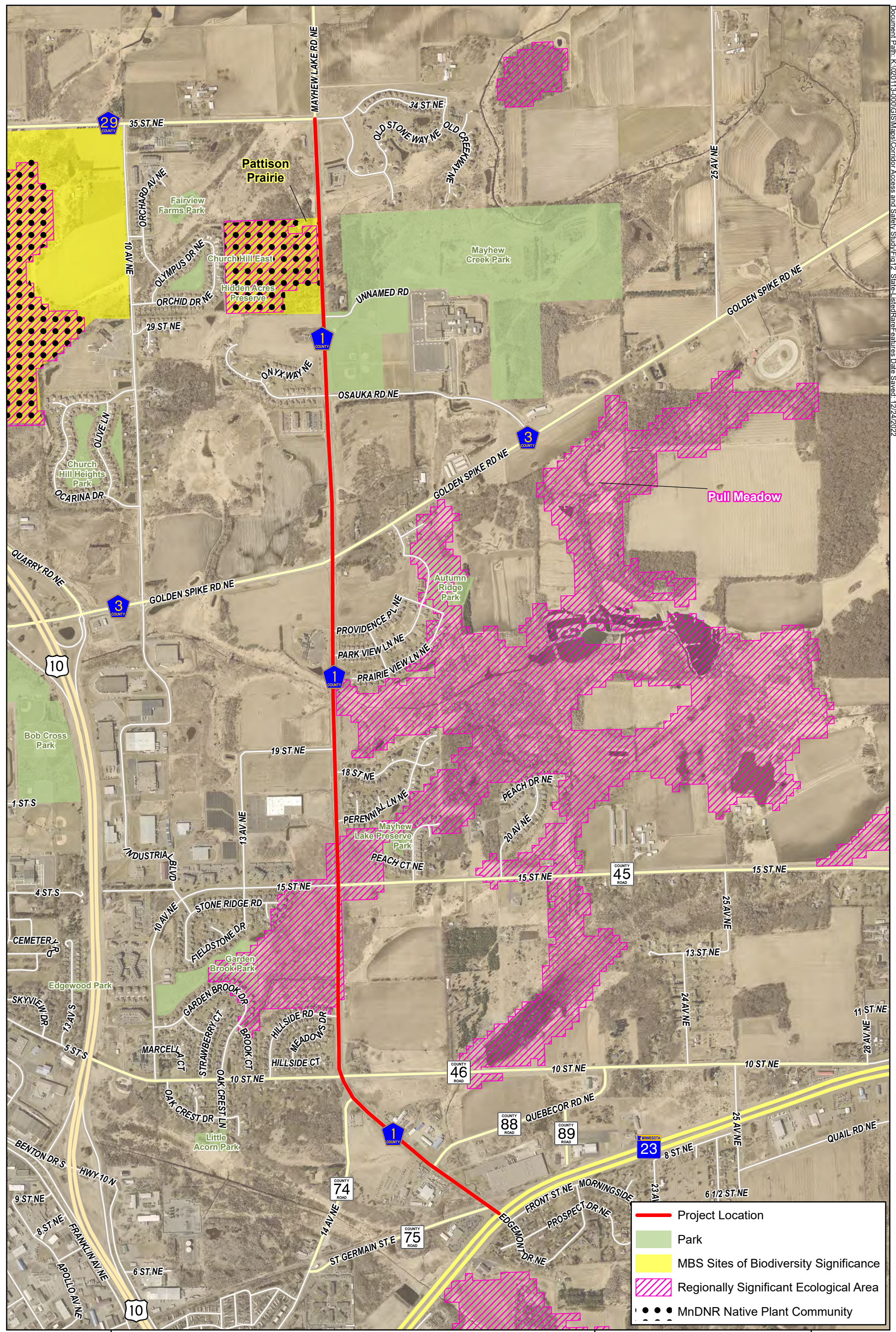


**Figure 8 - Water Resources**

Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota







- Project Location
- Park
- MBS Sites of Biodiversity Significance
- Regionally Significant Ecological Area
- MnDNR Native Plant Community

**Figure 9 - State-Listed Rare Features**

Mayhew Lake Road Corridor Access and Safety Study  
St. Cloud Area Planning Organization (APO), Minnesota

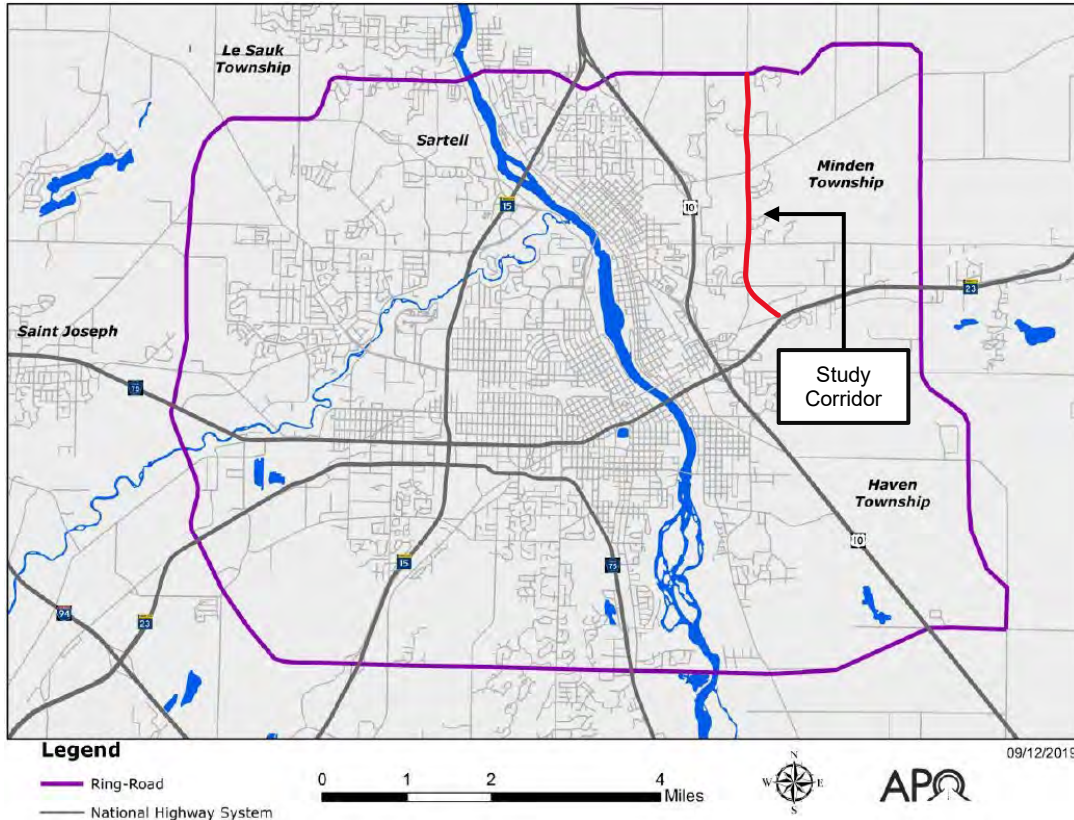




### 2.7.1 Roadway Improvements

Review of the Benton County or City of Sauk Rapid’s capital improvements plans (CIPs) revealed that there is no county- or city-programmed transportation projects along or near the study corridor. However, Benton County is actively leading efforts to implement a circumferential loop (also known as a ring road or a beltline) around the urban areas within the cities of Saint Cloud, Sartell, and Sauk Rapids. This beltline corridor and its proximity to the Mayhew Lake Road study corridor, are shown in **Image 1**. The proposed beltline would serve as an alternative route that would improve the movement of good and people and continue to promote roadway safety and mobility within Benton County’s transportation system. The St. Cloud APO has completed a series of studies in partnership with the associated local and regional agencies to implement the beltline.

**Image 1 – Urban Beltline Corridor**



As reflected in **Image 1**, the northeast quadrant of the beltline loop would intersect with Mayhew Lake Road at the intersection of Mayhew Lake Road and CSAH 29/35th Street. Benton County has an approved Environmental Assessment for the northeast section of the beltline loop. The county has acquired right of way for this northeastern segment of the beltline. All traffic analyses and concepts developed for this study assumed implementation of this future ring road.

### 2.7.2 Bicycle & Pedestrian Facilities

There are several planned bicycle and pedestrian facilities in the study area. Several city and county plans identify planned bike lanes along Mayhew Lake Road in the study area, including the *City of Sauk Rapids Comprehensive Plan* and *Mapping 2045*, the St. Cloud APO’s Metropolitan Transportation Plan; no additional planned nonmotorized facilities were noted in the St. Cloud APO’s 2022 Regional Active Transportation Plan. There are also planned facilities on cross streets that would intersect the future bike lanes along Mayhew and enhance the nonmotorized transportation network (see **Figure 4**). **Table 2** lists planned nonmotorized facilities identified in relevant plans reviewed.

**Table 2 – Planned Nonmotorized Facilities**

Plan Name	On/Along Mayhew Lake Road	On/Along Intersecting Streets
City of Sauk Rapids Comprehensive Plan	<ul style="list-style-type: none"> <li>Planned bike lanes</li> <li>Recommend expanding roadway shoulders</li> </ul>	<ul style="list-style-type: none"> <li>Planned bike lanes along Golden Spike Rd NE</li> <li>Planned bike lanes along 15th St NE and 10th St NE</li> <li>Trails crossing Mayhew Lake Rd at Mayhew Creek Park, near Trinity Lutheran Church, and near Golden Brook Park</li> <li>Planned parkway at 35th St NE</li> </ul>
St. Cloud APO Metropolitan Transportation Plan for 2045	<ul style="list-style-type: none"> <li>Opportunity for multimodal improvements equipped with ADA compliant features</li> </ul>	<ul style="list-style-type: none"> <li>CSAH 29 two lane alignment from CR 1 to Golden Spike Rd NE with opportunity for multimodal improvements equipped with ADA compliant features</li> </ul>
Benton County 2040 Comprehensive Plan		<ul style="list-style-type: none"> <li>Future master plan for Mayhew Lake Park including County trail system in unison with Active Transportation Plan recommendations</li> </ul>

### 2.7.3 Parks

The City of Sauk Rapids is planning future improvements to Mayhew Creek Park, which is located immediately north of the Sauk Rapids-Rice High School. The park improvements will include such baseball fields, multipurpose fields, practice fields, an ice-skating loop, a winter skating rink, an ice area, an aquatic center, trails within and around the park, and close to 600 parking stalls. **Image 2** shows some of improvements that are being considered for Mayhew Creek Park.

## 3 Mayhew Lake Road Safety

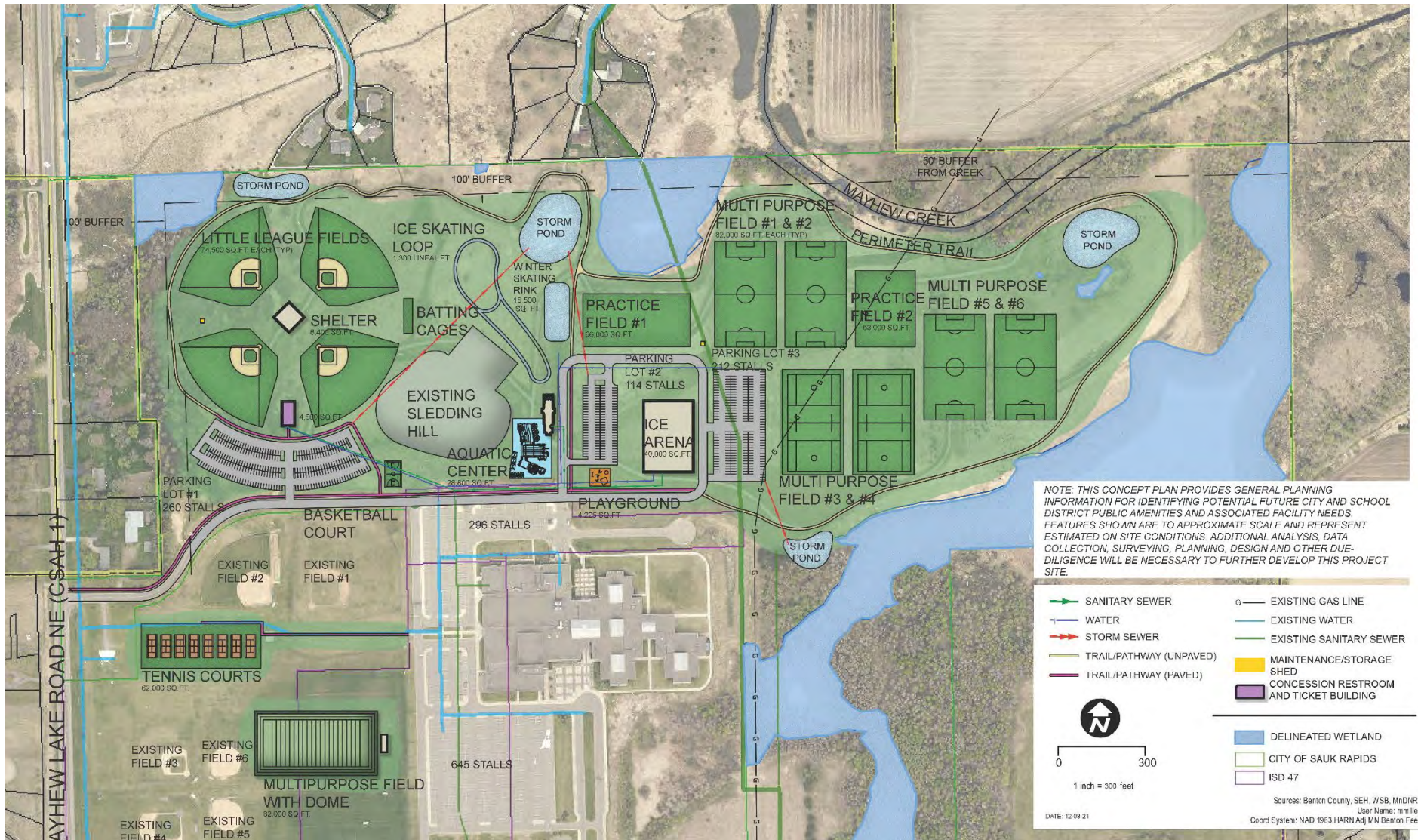
### 3.1 Mayhew Lake Road Segment Safety

A five-year crash rate and severity summary was completed for Mayhew Lake Road using the most recently available annual average daily traffic (AADT). The MnCMAT2<sup>1</sup> database indicates there have been a combined total of nine crashes along the corridor between 2017 and 2021, not including any intersection crashes. As shown on **Table 3**, of the three segments that make up the study corridor, the only segment with an above average calculated crash rate for a rural 2-lane section was the southernmost part of Mayhew Lake Road, between TH 23 and 15th Street. No fatal or serious injury crashes were reported on Mayhew Lake Road segments; however, one minor injury crash was reported between TH 23 and 15th Street. The most frequent crash types on segments of Mayhew Lake Road are Rear Ends (4) and Single Vehicle/Other (4).

<sup>1</sup> Minnesota Crash Mapping Analysis Tool (MnCMAT2) is software that enables users to analyze crashes based on various crash attributes which include but not limited to locations, segments, intersections, date ranges, etc. This tool allows users to collect crash data and analyze them to better understand safety conditions and needs.



Image 2 - Mayhew Creek Park Plan



Source: City of Sauk Rapids

**Table 3 - Mayhew Lake Road Corridor Segment Crash Rates, 2017-2021**

Mayhew Lake Road Segments	No. of Crashes	Daily Entering Vehicles <sup>1</sup>	Calculated Crash Rate <sup>2</sup>	Average Crash Rate for Intersection Type	Critical Crash Rate
CSAH 29/35th St to CSAH 3/Golden Spike Rd	5	3,300	0.29	0.33	0.87
CSAH 3/Golden Spike Rd to CR 45/15th St	2	5,800	0.22	0.33	0.88
CR 45/15th St to TH 23	2	4,800	0.54	0.33	0.96
<b>TOTAL</b>	<b>9</b>				
	Calculated crash rate above the average crash rate for comparable intersections.				

<sup>1</sup>2015/2019 AADT from MnDOT.

<sup>2</sup>Segment crash rates are expressed in crashes per million entering vehicles per mile.

### 3.2 Mayhew Lake Road Intersection Safety

A crash rate and severity summary for the most recent five years of available intersection crash data (January 2017- December 2021) is provided in **Table 4**. Minnesota Department of Transportation (MnDOT)'s MnCMAT2 database indicates there have been a combined total of 100 crashes at eight intersections on the study corridor between 2017 and 2021. Five of the intersections have crash rates higher than the critical rate for a rural thru-stop intersection; two intersections are below the critical crash rate but above the average crash rate.<sup>2</sup> identifies these intersections.

**Table 4 - Mayhew Lake Road Corridor Intersection Crash Rates, 2017-2021**

Mayhew Lake Road Intersection Cross Streets	No. of Crashes	Daily Entering Vehicles <sup>1</sup>	Calculated Crash Rate <sup>2</sup>	Average Crash Rate for Intersection Type	Critical Crash Rate
CSAH 29/35th St <sup>3</sup>	11	5,308	1.14	0.10	0.41
High School Entrance (Unnamed Rd) <sup>3</sup>	2	3,400	0.32	0.10	0.47
Osauka Rd <sup>3</sup>	4	3,985	0.55	0.10	0.47
CSAH 3/Golden Spike Rd	9	8,125	0.61	0.94	1.62
CR 45/15th St	15	7,200	1.14	0.10	0.36
CR 46/10th St	15	7,185	1.14	0.10	0.36
CR 74/14th Ave	7	5,675	0.68	0.10	0.40
TH 23	37	22,250	0.91	0.59	0.91
<b>TOTAL</b>	<b>100</b>				
	Calculated crash rate above the critical crash rate.				
	Calculated crash rate above the average crash rate for comparable intersections.				

<sup>1</sup>2015/2019 AADTs from MnDOT.

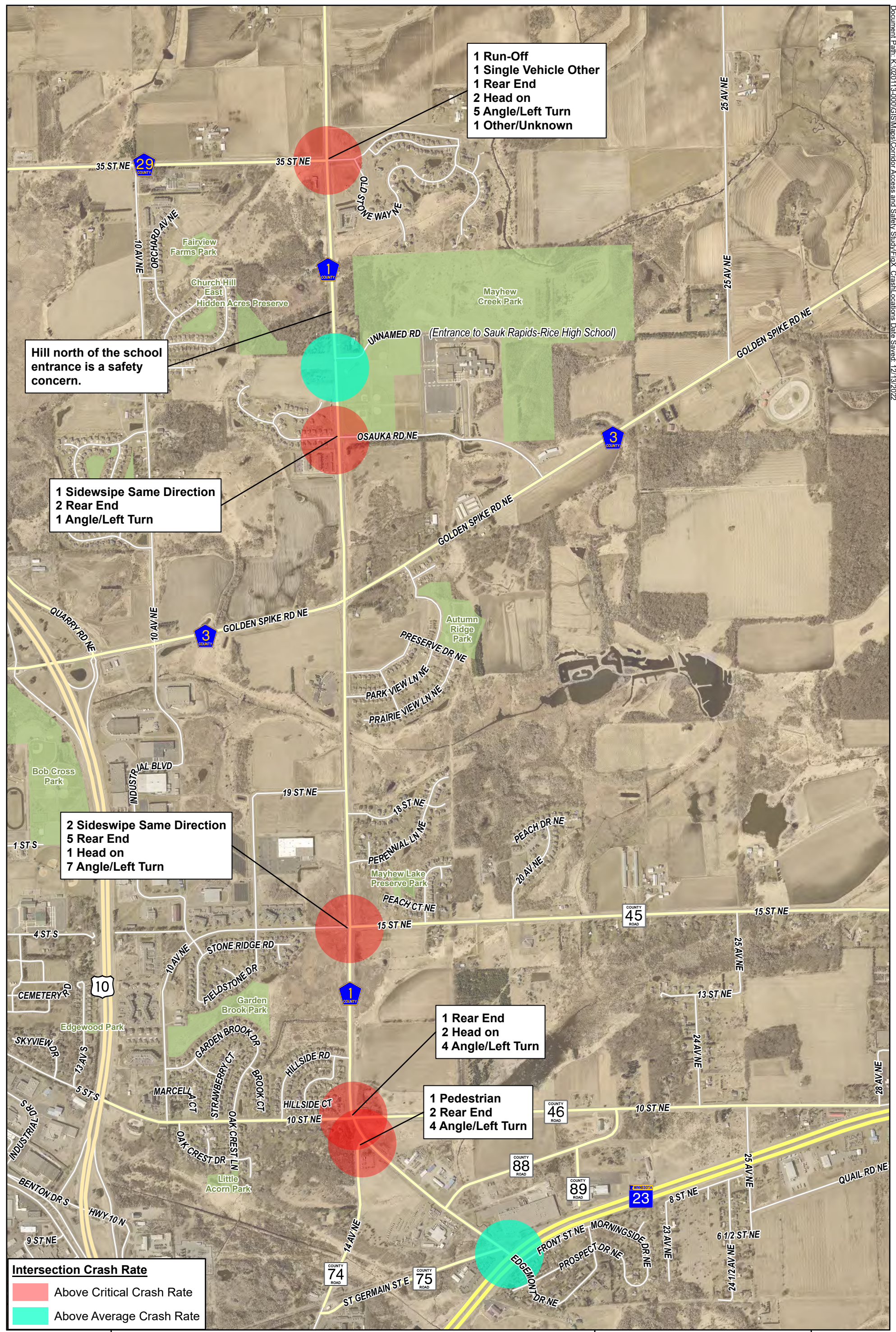
<sup>2</sup>Intersection crash rates are expressed in crashes per million entering vehicles.

<sup>3</sup>At least one minor leg ADT based on 2022 traffic counts.

The intersections of Mayhew Lake Road with CSAH 29/35th Street, CR 45/15th Street, and CR 46/10th Street have the highest crash rate, at two to three times over the critical rate. The Mayhew Lake Road intersection with CSAH 3/Golden Spike Road was the only intersection with a below average crash rate.

<sup>2</sup> Critical crash rate is a statistically adjusted crash rate to account for random nature of crashes that helps identify safety issues at roadways segments and intersections.





**Figure 10 - Areas of Safety Concern Along the Corridor**

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The most frequent crash types are angle/left-turn (41) crashes and rear ends (35). At the minor-approach stop-controlled intersections, nearly half of all crashes are angle/left-turn. Rear end crashes make up the majority of crashes at the signalized intersection and run-off-road crashes are the majority at the roundabout intersection at CSAH 3/Golden Spike Road.

No fatalities were reported within the 2017-2021 time period at intersections or road segments. Two incapacitating injuries were reported at the intersection of Mayhew Lake Road and CSAH 29/35th Street, and one minor injury crash was reported between TH 23 and 15th Street. One crash involving a pedestrian was reported at the intersection of Mayhew Lake Road and 14th Avenue. Complete information, including documentation of analysis methodologies and detailed results of traffic analysis are available in **Attachment B** (Mayhew Lake Road Traffic Operations and Safety Memorandum, August 2022).

## 4 Traffic

This section summarizes existing and forecasted future traffic information, including traffic volumes, operations, and capacity.

### 4.1 Existing Traffic Volumes

According to MnDOT data from 2015 and 2019, the Annual Average Daily Traffic (AADT) on the Mayhew Lake Road study corridor ranged from 3,300 to 5,800 vehicles per day (see **Figure 11** and **Table 5** for traffic volumes by segment).

**Table 5 – Mayhew Lake Road Existing AADT**

Corridor Location	Existing AADT
Corridor-wide	3,300 – 5,800
CSAH 29/35th St to CSAH 3/Golden Spike Rd	3,300
CSAH 3/Golden Spike Rd to Park View Ln	5,800
Park View Ln to CR 45/15th St	4,800
CR 45/15th St to CR 46/10th St	4,800
CR 46/10th St to CR 74/14th Ave	4,800
CR 74/14th Ave to TH 23	4,800

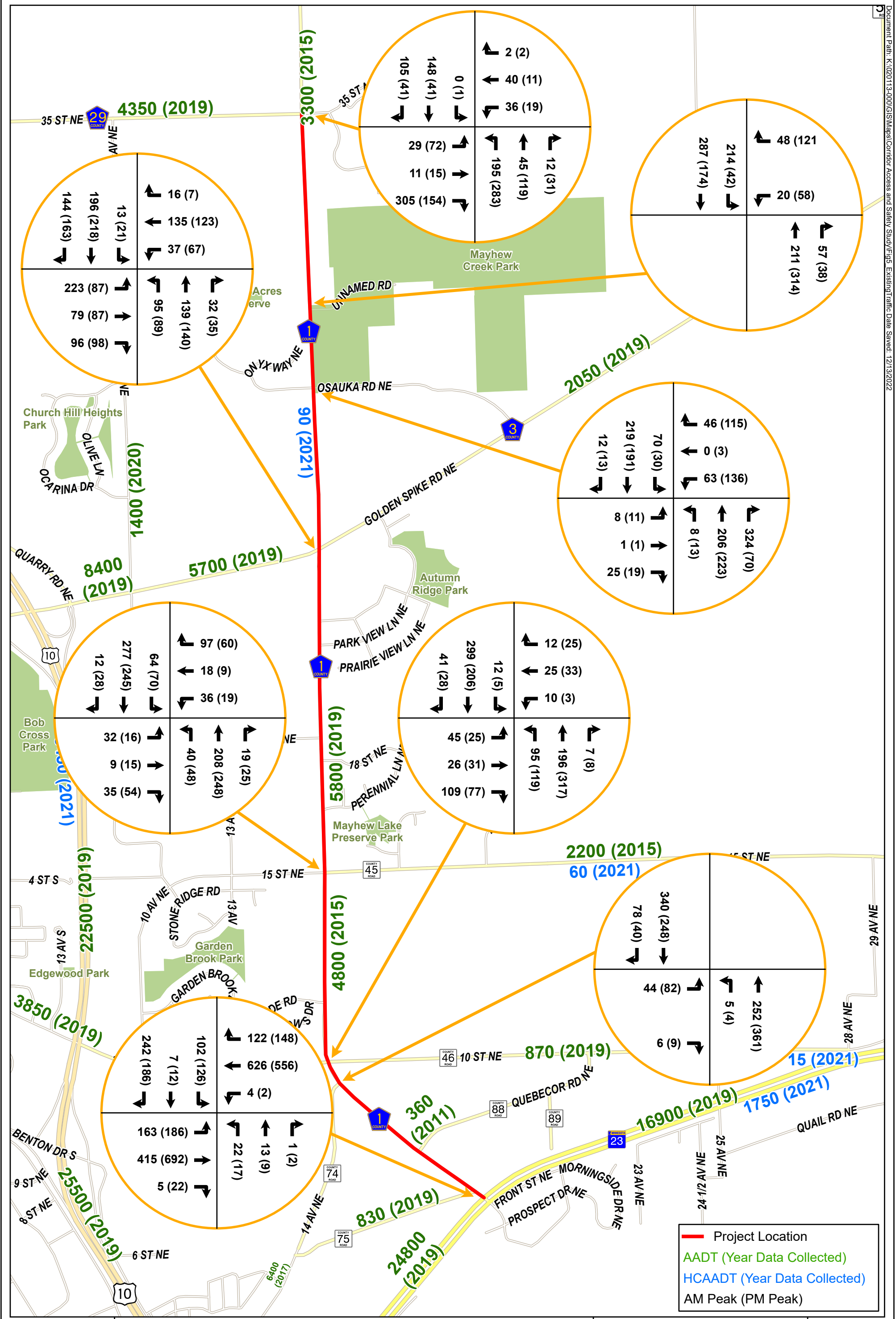
Source: MnDOT

Based on these traffic volumes, there are currently no major traffic operation issues on the mainline of Mayhew Lake Road. These volumes are under the daily capacity range for a 2-lane undivided rural roadway. However, conversations with stakeholders (i.e., county, city, and school staff members, residents living along the corridor, and parents of students at the Sauk Rapids-Rice High School) revealed that there are large delays during peak school hours, drop off and pick-up times at intersections north of Golden Spike Road.

Traffic counts were then collected at eight key intersections along the corridor on Tuesday, April 26, 2022, from 6:00 a.m. to 7:00 p.m. This was done to identify peak hours as well as to collect the data needed to complete an all-way stop and signal warrant analysis, and to calculate existing traffic operations. Data was collected at the eight intersections listed below:

- Mayhew Lake Road & 35th Street
- Mayhew Lake Road & Sauk Rapids-Rice High School
- Mayhew Lake Road & Osauka Road
- Mayhew Lake Road & Golden Spike Road
- Mayhew Lake Road & 15th Street
- Mayhew Lake Road & 10th Street
- Mayhew Lake Road & 14th Avenue
- Mayhew Lake Road & TH 23





**Figure 11 - Existing Traffic and Peak Hour Volume**

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## 4.2 Existing Traffic Operations and Capacity

Data from the 2022 existing traffic operations analysis completed for the Mayhew Lake Road study area revealed that there are no major issues related to roadway segment operations, except for a slight movement delay for left and through traffic at Mayhew Lake Road and TH 23 during AM and PM peak hours. This analysis also showed that existing intersections along the roadway currently operate at an acceptable level during peak hours<sup>3</sup>. The results of the existing condition intersection operations analysis are summarized in **Table 6**. All intersections operate at LOS B or better, though some specific intersection movements operate as low as LOS D. See **Attachment B** for detailed analysis.

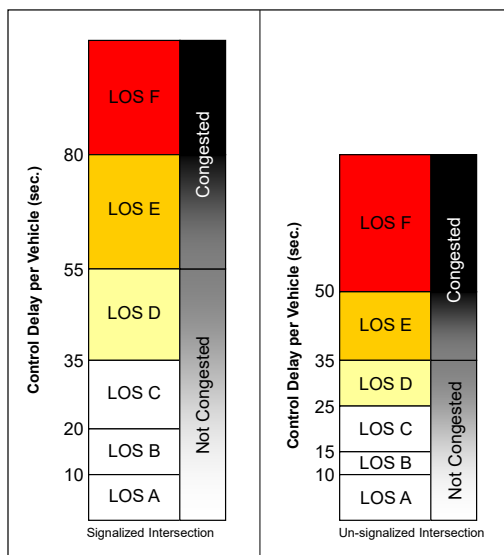
**Table 6 – 2022 Existing Mayhew Lake Road Intersection Operations Summary**

Intersection Control	Mayhew Lake Road Intersections	AM Peak Intersection Delay <sup>1</sup> and Level of Service (x)	PM Peak Intersection Delay <sup>1</sup> and Level of Service (x)
Thru-Stop	CSAH 29/35th St	6 (A)	4 (A)
Thru-Stop	High School Access/Unnamed Rd	4 (A)	3 (A)
Thru-Stop	Osauka Rd	3 (A)	
Roundabout	CSAH 3/Golden Spike Rd	9 (A)	7 (A)
Thru-Stop	CR 45/15th St	4 (A)	4 (A)
Thru-Stop	CR 46/10th St	4 (A)	4 (A)
Thru-Stop	CR 74/14th Ave	2 (A)	3 (A)
Signalized	TH 23	18 (B)	17 (B)

<sup>1</sup>Delay measured in seconds per vehicle

Source: SimTraffic and Highway Capacity Software 7 (HCS7) analysis.

**Image 3 – Level of Service (LOS) Guidelines**



Intersection operations are evaluated in terms of average seconds of delay per vehicle. The average number of seconds of delay is broken into six ranges assigned letter grades A through F defining each level of service (LOS) as shown in **Image 3**. The delay ranges for unsignalized intersections are narrower than for signalized intersections because of intangible factors like driver discomfort and frustration. Drivers tend to perceive a one-minute delay at a red light as more tolerable than one minute waiting for a gap in traffic at a stop sign. LOS D is generally the lowest acceptable LOS for urban intersections. LOS letter grades for an unsignalized intersection cannot be applied to roundabouts because roundabout queues are rolling and drivers tend to be more accepting of higher delays if the queue is constantly moving.

<sup>3</sup> The Mayhew Lake Road corridor was simulated in Synchro/SimTraffic for both the AM and PM peak hours using the collected (2022) traffic volumes. The intersection of Mayhew Lake Road and Golden Spike Road was analyzed in HCS7.



### 4.3 Future Traffic Volumes, Capacity, & Operations Analysis

#### 4.3.1 Future Traffic Volumes & Capacity – Roadway Segments

Existing traffic volumes were used as a starting point for developing future traffic volumes for the Mayhew Lake Road study corridor. Year 2015 traffic volumes and year 2045 traffic volumes were extracted from the Ring Road scenario in the St. Cloud APO’s Travel Demand Model. The St. Cloud APO’s model showed 2045 forecasts on Mayhew Lake Road range from 16,000 to 32,000 vehicles per day.

The City of Sauk Rapids’ proposed land uses within Transportation Analysis Zones (TAZ) along Mayhew Lake Road were reviewed to determine if adjustments should be made to account for revised land uses.

**Image 4** shows these TAZs.<sup>4</sup>

Traffic growth factors were generated using the revised land uses along Mayhew Lake Road and connecting roadways. Based on these forecasted volumes, the annual growth expected based on the models and trip generation is 10-15 percent on the south end of the corridor and 15-20 percent on the north end of the corridor. Annual growth rates were turned into 23-year growth factors and applied to the 2022 turning movement volumes to forecast 2045 turning movement volumes (see **Figure 12** and **Table 7**).

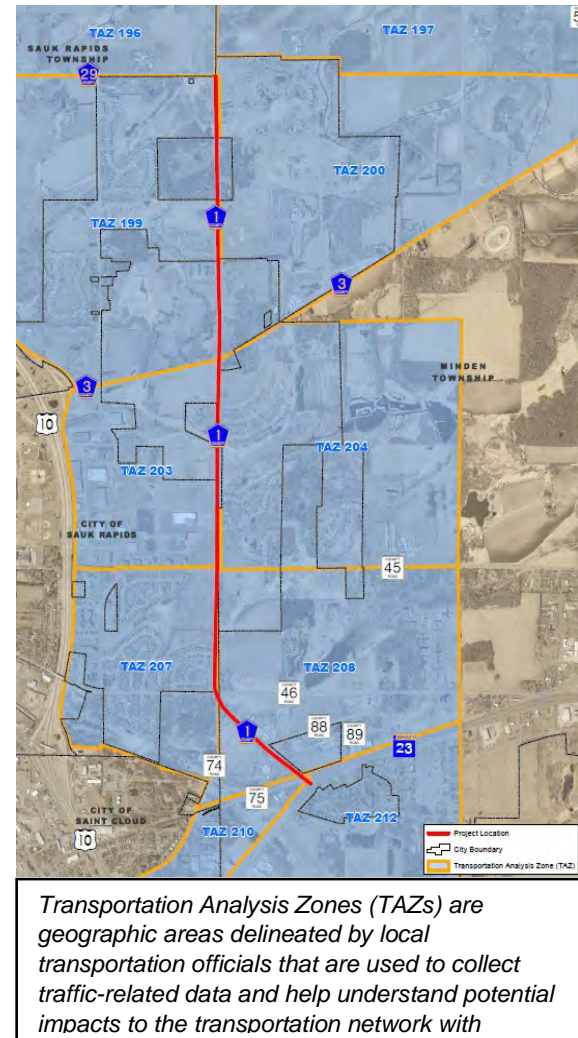
**Table 8** shows the levels of traffic that a range of roadway facility types can accommodate. Anticipated future traffic levels on Mayhew Lake Road – 26,000 – 33,000 vehicles per day – will require a 4-lane facility to accommodate future traffic.

**Table 7 – Mayhew Lake Road Future ADT Based on City of Sauk Rapids Anticipated Land Uses**

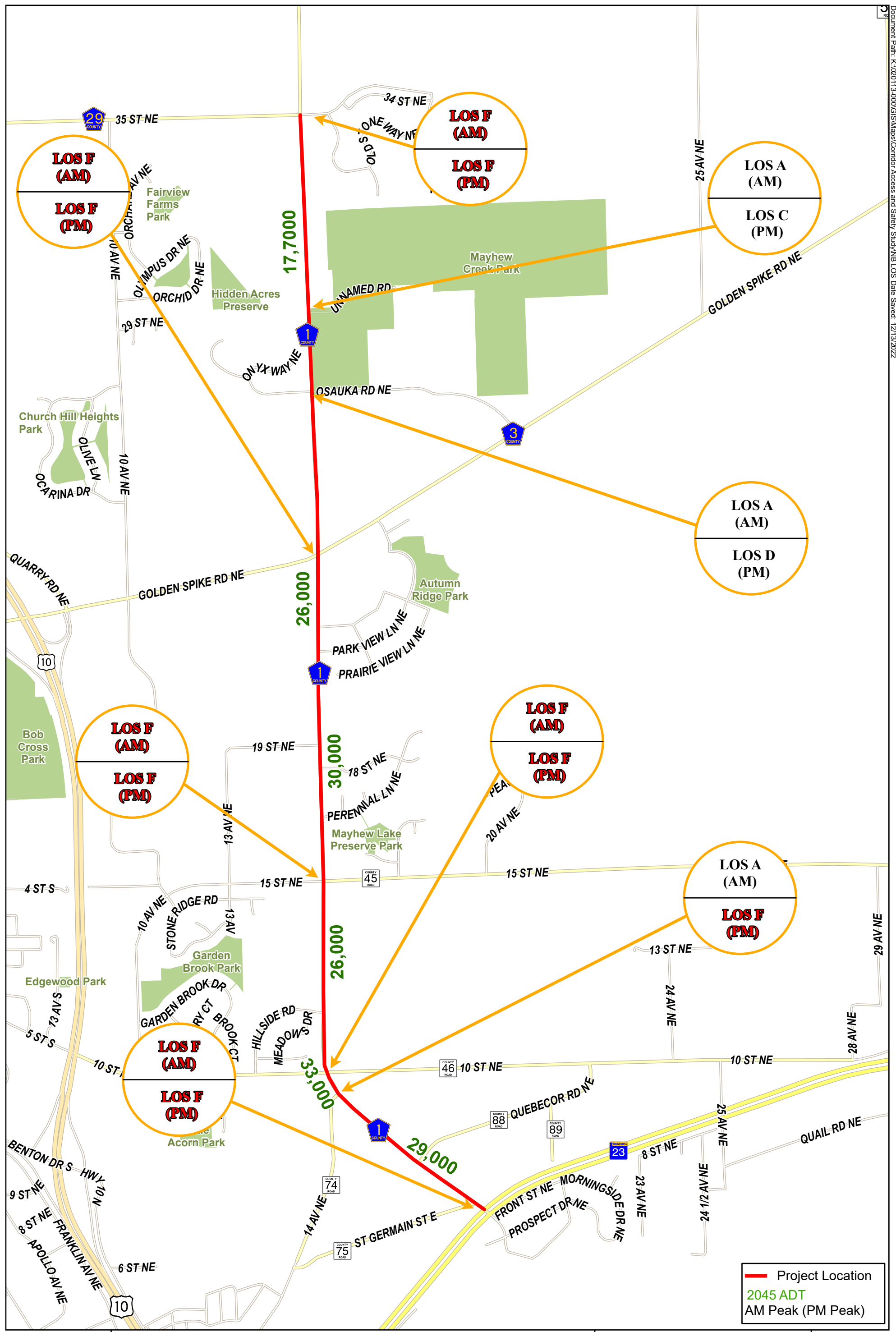
Corridor Location	2045 ADT with Ring Road
Corridor-wide	17,700 – 33,000
CSAH 29/35th St to CSAH 3/Golden Spike Rd	17,700
CSAH 3/Golden Spike Rd to Park View Ln	26,000
Park View Ln to CR 45/15th St	30,000
CR 45/15th St to CR 46/10th St	26,000
CR 46/10th St to CR 74/14th Ave	33,000
CR 74/14th Ave to TH 23	29,000

Source: ITE Trip Generation based analysis using the City of Sauk Rapids’ Planned Land Use and Developments

**Image 4 - Transportation Analysis Zones**



<sup>4</sup> Future developments and land uses provided by the City of Sauk Rapids were part of the city’s draft Comprehensive Plan at the time the future traffic forecasts were being completed.



**Figure 12 - 2045 ADT and No Build Intersection LOS**

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**Table 8 – Planning Level Roadway Capacity Thresholds**

Facility Type	Daily Capacity Range, Annual Daily Traffic (ADT)
2-lane undivided urban	8,000 – 10,000
2-lane undivided rural	14,000 – 15,000
2-lane divided urban (three-lane urban)	14,000 – 17,000
4-lane divided urban	28,000 – 32,000
4-lane expressway rural	40,000 – 45,000
4-lane freeway	60,000 – 80,000

Source: MnDOT

#### 4.3.2 Future Traffic Operations & Capacity – Intersections

A traffic operations analysis was completed to determine year 2045 level of service at intersections along Mayhew Lake Road. This analysis assumed no intersection improvements and used existing lane geometry, access, and traffic control. The results of this intersection traffic operations analysis are shown in **Table 9**.

**Table 9 – 2045 No-Build Mayhew Lake Road Intersection Operations Summary**

Intersection Control	Mayhew Lake Road Intersections	AM Peak Intersection Delay <sup>1</sup> and Level of Service (x)	PM Peak Intersection Delay <sup>1</sup> and Level of Service (x)
Thru-Stop	CSAH 29/35th St	>100 (F)	>100 (F)
Thru-Stop	High School Access/Unnamed Rd	8 (A)	18 (C)
Thru-Stop	Osauka Rd	5 (A)	26 (D)
Roundabout	CSAH 3/Golden Spike Rd	>100 (F)	>100 (F)
Thru-Stop	CR 45/15th St	>100 (F)	>100 (F)
Thru-Stop	CR 46/10th St	>100 (F)	>100 (F)
Thru-Stop	CR 74/14th Ave	6 (A)	>100 (F)
Signalized	TH 23	>100 (F)	>100 (F)

<sup>1</sup>Delay measured in seconds per vehicle

Source: SimTraffic and HCS7 analysis.

The analysis shows that several Mayhew Lake Road intersections will not operate at an acceptable level in 2045 under the no build conditions. Many intersections are expected to fail and vehicles on side streets attempting to access Mayhew Lake Road will experience several minutes of delay.

#### 4.4 Multimodal Needs

Mayhew Lake Road between Golden Spike Road NE and Osauka Road NE is the only segment of the corridor with an existing multiuse trail (on the east side). With more residential developments anticipated along both sides of the corridor, the new Mayhew Creek Park, and an existing high school, there is a need to enhance safety, mobility, and accessibility for non-motorists; currently, non-motorists use the shoulders along the corridor.

### 5 Roadway Concept Development & Evaluation

A 4-lane facility with enhanced intersection traffic control will be needed to meet the forecasted future traffic demands on the corridor, as described in **Section 4**. This section documents cross-sections and corridor alignments that were developed and evaluated to meet future transportation needs on Mayhew Lake Road.

## 5.1 Design Standards, Considerations and Best Practices

As a CSAH, Mayhew Lake Road falls under the jurisdiction of Benton County and is subject to State Aid Standards for roadway and adjacent trail design. MnDOT State Aid design standards that would be applicable the preliminary cross-sections under consideration for Mayhew Lake Road include:

- 8820.9995 Minimum Off-Road and Shared Use Path Standards.
- 8820.9936 Minimum Design Standards, Urban; New or Reconstruction Projects.
- 8820.9920 Minimum Design Standards; Rural and Suburban Undivided; New or Reconstruction Projects.

All future project designs along with the final constructed project will comply with all applicable ADA standards.

## 5.2 Cross-section Development and Evaluation

This section discusses six cross-sections (labeled A through F) that were developed to meet the 2045 travel demands forecasts developed for this study. All six of these cross-sections would ultimately be 4-lane roadways, which is what is anticipated to be needed to meet 2045 traffic levels. All cross-section concepts considered for this study are shown on **Figure 13**.

The cross-section concepts were then evaluated on how well each concept would meet transportation needs. Recommendations regarding which cross-sections meet evaluation criteria and should be further considered are also provided.

### 5.2.1 Cross-Section Concepts

This section documents the cross-section concepts developed for the Mayhew Lake Road Corridor. Each of these cross-sections is intended to meet future traffic needs. These cross sections, shown on **Figure 13**, include proposed dimensions for motor vehicle travel lanes, pedestrian and bicycle facilities, boulevards, and clear zones. The total required right of way is also shown. Public right of way along this stretch of Mayhew Lake Road varies from 142 feet wide to 162 feet wide. To reduce the likelihood of needing to acquire public property for the development of the new facilities, a total width of 142 feet was used as the maximum acceptable dimension for the concepts developed by the study.

#### **Expandable 2-Lane Cross-section Concepts (Figures 13.1 and 13.2)**

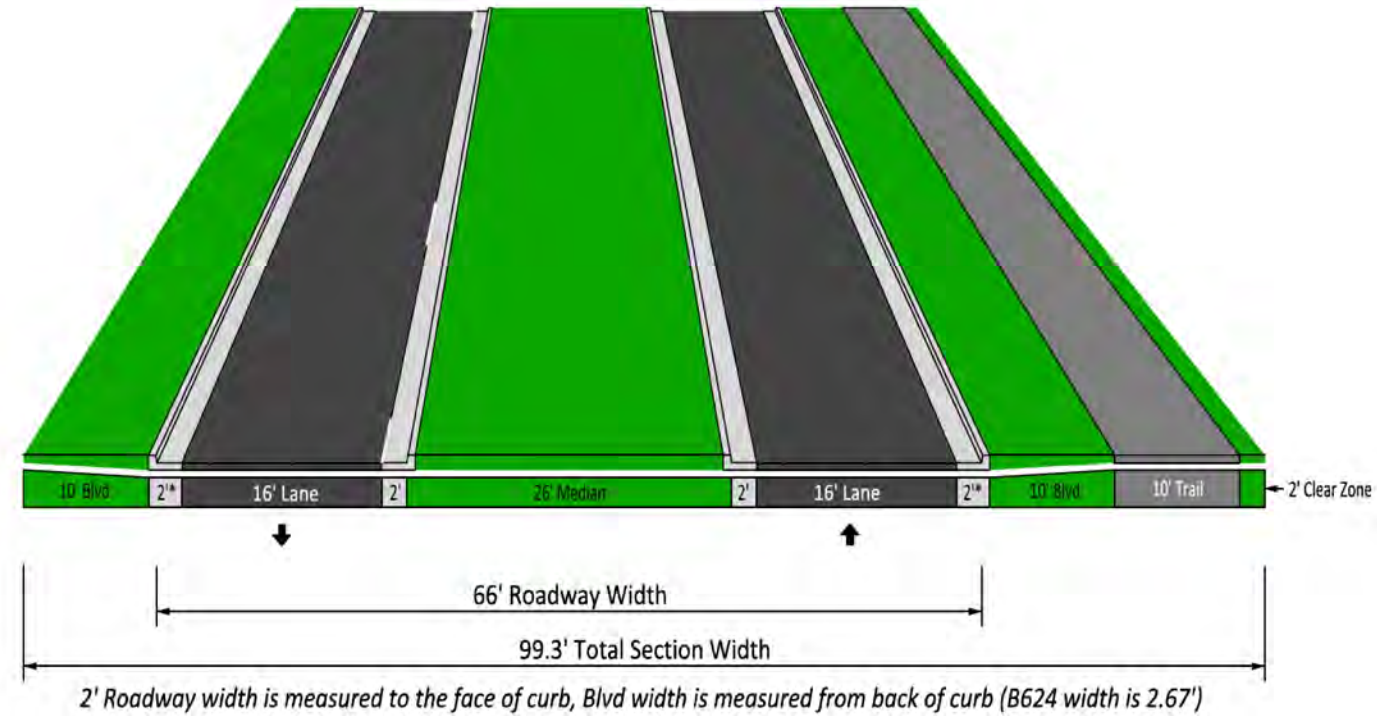
- **Concept A:** Urban 2-lane Divided Section with Trail (Expandable to Inside)
- **Concept B:** Urban 2-lane Divided Section with Trail (Expandable to Outside)
- **Concept C:** Urban/Rural 2-lane Divided Section with Trail (Expandable to Inside)

These three concepts all initially included a 2-lane Mayhew Lake Road with a median divider between the opposing travel lanes, and a trail adjacent to the east side of the roadway. These concepts were developed with the intention of expanding to 2-lane in each direction when needed in the future to meet future traffic demands. Differences among these concepts are noted below and shown on **Figure 13**.

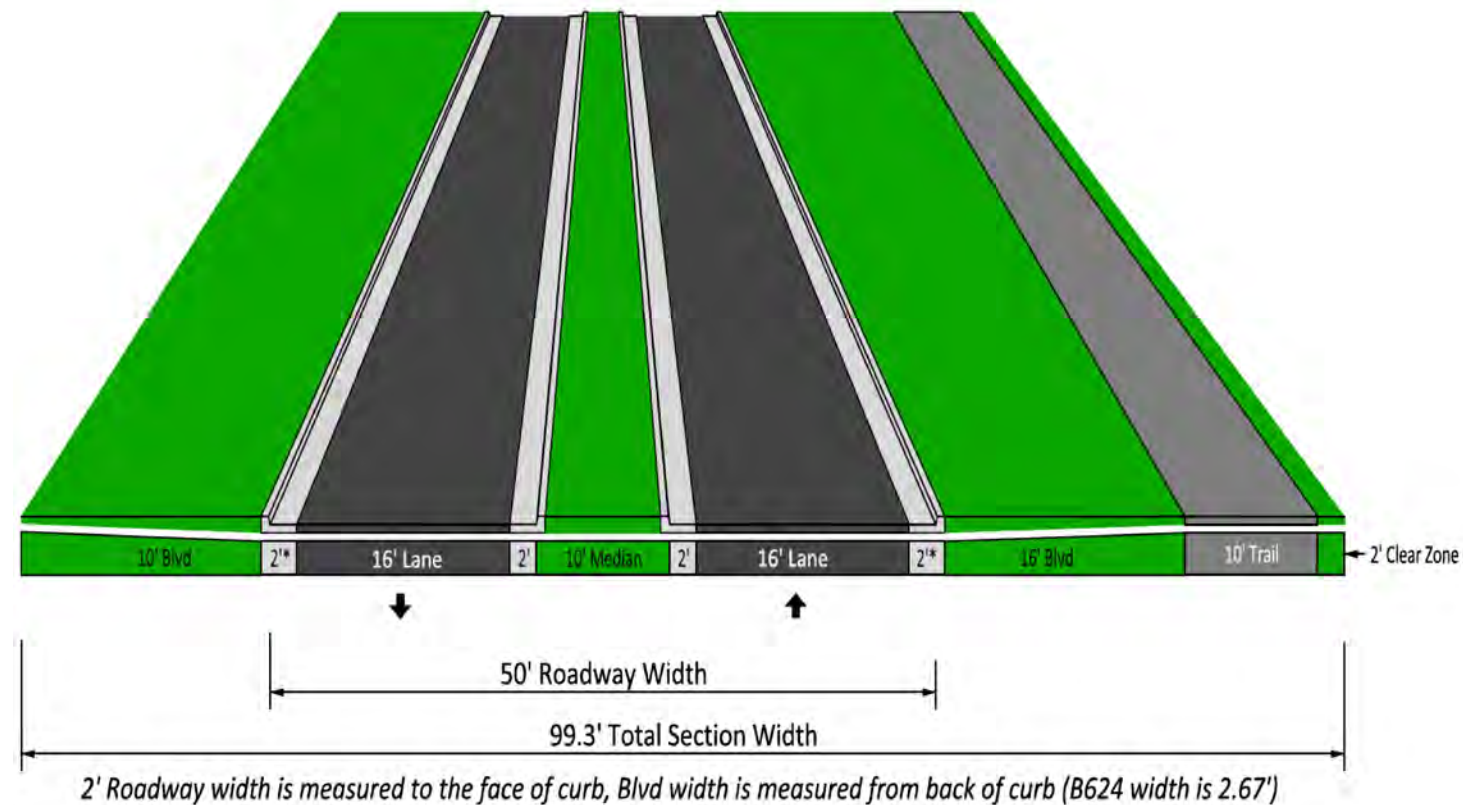
1. **Drainage Type Differences:** Concepts A and B are both urban cross-sections with curb and gutter drainage features on both sides of the road. Concept C includes both urban and rural cross-sections with a ditch to the west and curb and gutter improvement to the east.



### Concept A: Urban 2-lane Divided Section with Trail (Expandable to Inside)



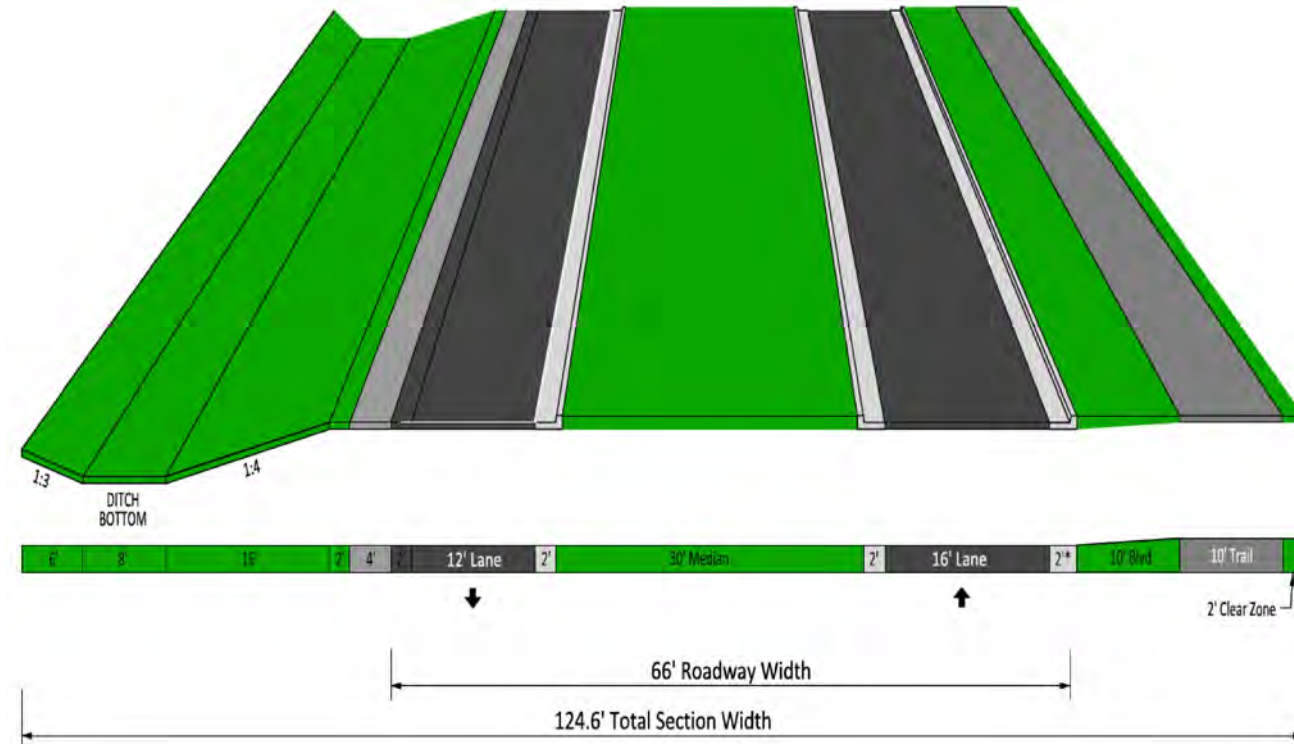
### Concept B: Urban 2-lane Divided Section with Trail (Expandable to Outside)



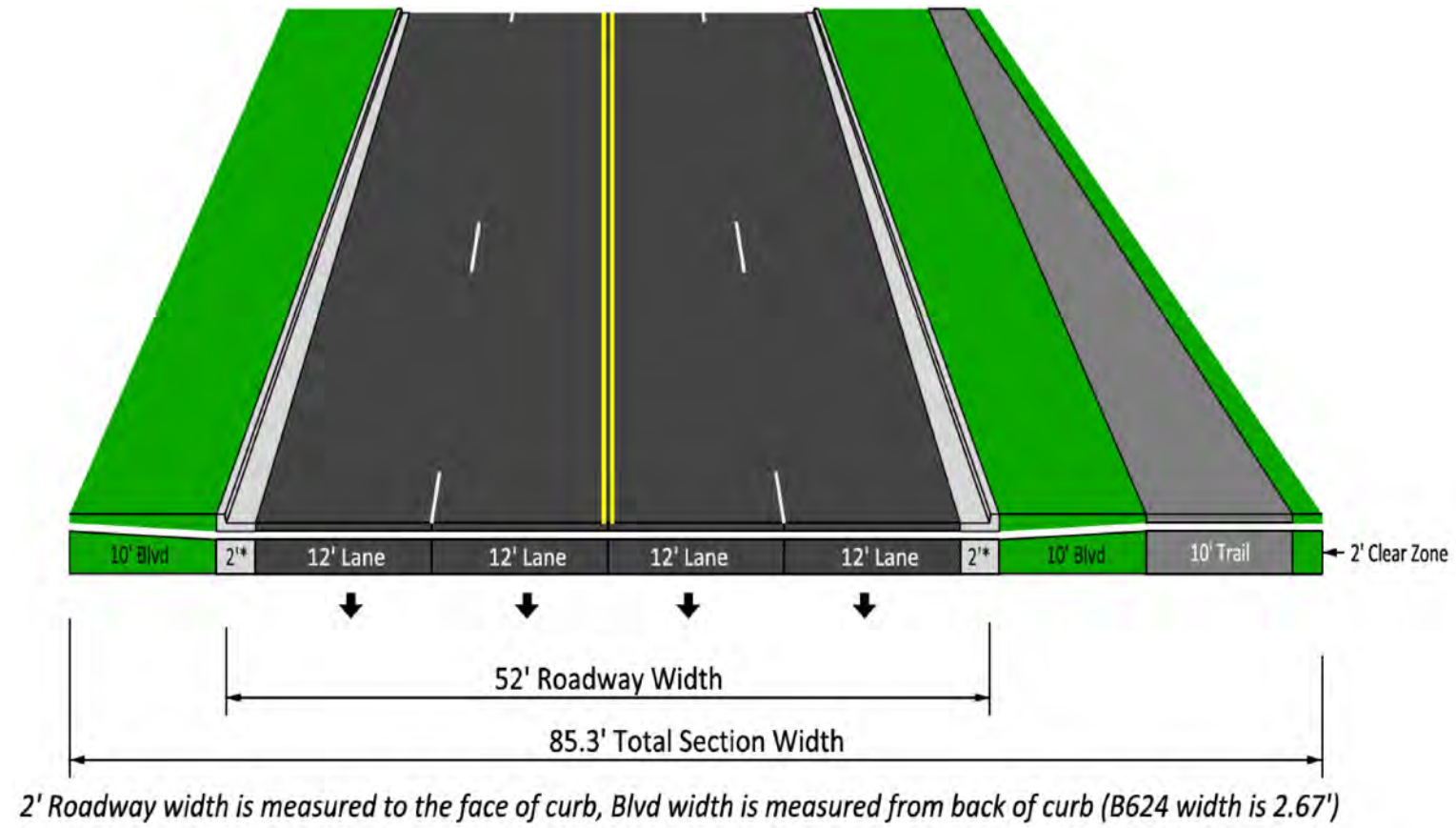
**Figure 13.1 - Cross-Section Concepts Developed**

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### Concept C: Urban/Rural 2-lane Divided Section with Trail (Expandable to Inside)



### Concept D: Urban 4-lane Undivided Section with Trail, All Urban

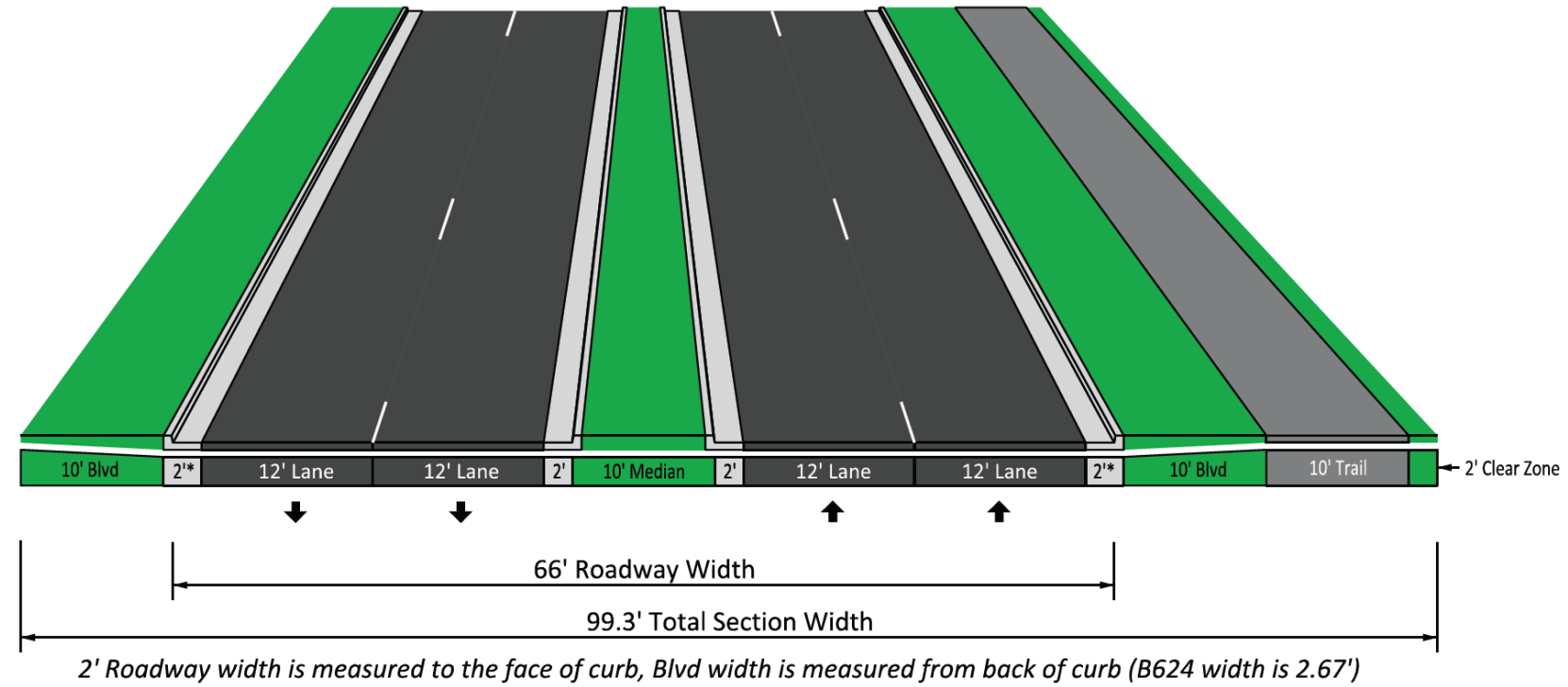


**Figure 13.2 - Cross-Section Concepts Developed**

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### Concept E: Urban 4-lane Divided Section with Trail



### Concept F: Urban/Rural 4-lane Divided Section with Trail, Urban on Trail Side, Rural on Other Side

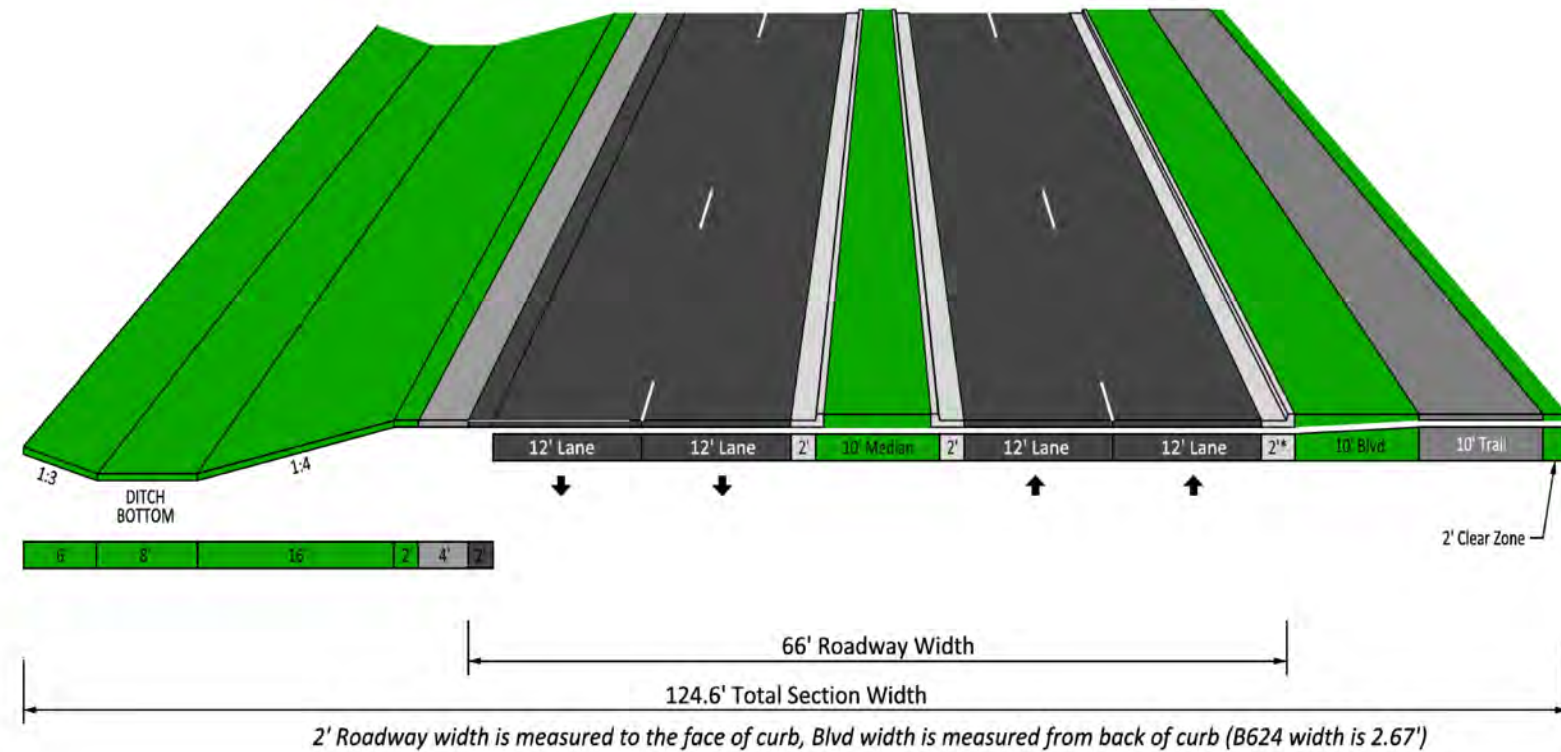


Figure 13.3 - Cross-Section Concepts Developed

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2. **Lane Expansion Areas:** Concepts A and C have wide medians lying inside the travel lanes that could be expanded to the inside, median of the roadway. Concept B includes a wide boulevard outside of the travel lanes that could be expanded to the outside.

#### **4-lane Cross-section Concepts (Figure 13.2 and 13.3)**

4-lane cross-section concepts developed for this study include:

- **Concept D:** Urban 4-lane Undivided Section with Trail, All Urban
- **Concept E:** Urban 4-lane Divided Section with Trail
- **Concept F:** Urban/Rural 4-lane Divided Section with Trail, Urban on Trail Side, Rural on Other Side

These three concepts all initially included a 2-lane Mayhew Lake Road with a median divider between the opposing travel lanes, and a trail adjacent to the east side of the roadway. Differences among these concepts are noted below and shown on .

1. **Drainage Type Differences:** two concepts - D and E - include urban cross-sections with curbs and gutters on both sides of the road. Concept F has an urban cross-section with curb and gutter on the east side, and a rural cross-sections with a ditch on the west side.
2. **Median Areas:** Concept D includes a 4-lane cross-section with no median. Concepts E and F both include a 4-lane with median cross-section.

#### **5.2.2 Cross-Section Evaluation Process and Results**

These cross-sections were analyzed at a high level based on characteristics that would remove the concepts from further consideration because of not addressing the transportation needs identified along Mayhew Lake Road. Cross-section concepts were evaluated on these criteria:

- Accommodates future traffic volumes
- Would not require additional, future expansion
- Conforms with roadway safety best practices
- Consistent with corridor vision
- Provides continuous pedestrian and bicycle amenities
- Meets needs of all corridor user abilities.

The results of the cross-section screening are shown in **Table 10**.

It is notable that all of the preliminary cross-section concepts would:

- Improve safety for people walking and biking along Mayhew Lake Road.
- Meet State Aid Design Standards, consistent with Mayhew Lake Road's status as a CSAH.
- Not be anticipated to result in social, environmental, or economic impacts that could not be avoided, minimized, or mitigated.
- Fit within the existing right of way.

Based on the preliminary cross-section screening outcomes, these two concepts that received positive marks for all evaluation criteria included in **Table 10**:

**Build Concept E:** A 4-lane, divided roadway featuring an urban (curb and gutter) cross-section to the east and west.

**Build Concept F:** A 4-lane, divided roadway featuring an urban (curb and gutter) cross-section to the east and a rural (ditch) cross-section to the west.

The remainder of the cross-section concepts were removed from further consideration for not meeting at least one of the transportation needs screening criteria.



**Table 10 – Mayhew Lake Road Screening of Cross-section Concepts**

Concepts	Type	Accommodates Future Traffic Volumes	Does not require additional future expansion	Conforms with Roadway Safety Best Practices	Consistent with corridor vision	Provides Continuous Pedestrian & Bicycle Amenities	Meets Needs of All Abilities	Fits within Existing ROW (Existing ROW, in Feet)
<b>Concept A:</b> 2-Lane Divided, Expandable to Inside	Urban: Curb and Gutter on Both Sides	No	No	Yes	Yes	Yes	Yes	Yes (100')
<b>Concept B:</b> 2-Lane Divided, Expandable to Outside	Urban: Curb and Gutter on Both Sides	No	No	Yes	Yes	Yes	Yes	Yes (100')
<b>Concept C:</b> 2-Lane Divided, Expandable to Inside	Mix: Curb and Gutter on side with trail; Ditch on other side	No	No	Yes	Yes	Yes	Yes	Yes (125')
<b>Concept D:</b> 4-Lane Undivided	Urban: Curb and Gutter on Both Sides	Yes	Yes	No	No	Yes	No – Does not provide Median Refuge for Crossings	Yes (86')
<b>Concept E:</b> 4-Lane Divided	Urban: Curb and Gutter on Both Sides	Yes	Yes	Yes	Yes	Yes	Yes	Yes (100')
<b>Concept F:</b> 4-Lane Divided	Mix: Curb and Gutter on side with trail; Ditch on other side	Yes	Yes	Yes	Yes	Yes	Yes	Yes (125')

## 5.3 Corridor Alignment Concept Development and Evaluation

Cross-section concepts E and F were carried forward. Corridor alignment concepts were developed for cross-sections concepts E and F. These concepts were then subjected to a more in-depth screening on their ability to meet project needs and minimize impacts to social, economic, and environmental impacts. The criteria used to compare the two, 4-lane alignment concepts still under consideration, as well as a no build condition are shown in **Table 11**. This table also summarizes the key differences between these alternatives.

In summary, the no build alternative would not address any of the existing or anticipated future transportation needs along Mayhew Lake Road while both 4-lane, divided concepts would. Conversely, the no build alternative would not result in any impacts to environmental or community impacts. The build alternatives result in some impacts to environmental and community resources. These would be impacts typically associated with roadway expansion projects.

The primary difference between the two build alternatives is that the concept with both urban and rural cross areas is expected to result in more wetland impacts, because of a larger footprint needed to accommodate this roadway type. Aside from that resource, impacts from constructing these two concepts are expected to be comparable. More precise details related to impacts would be identified during future phases of study and engineering. Several potential impacts not evaluated at this early stage of design will require future investigation. For example, impacts to trees would occur by constructing a trail on either the west side or on the east side of Mayhew Lake Road. The extent of these impacts, and impacts to other resource categories, will be quantified in the future.

### 5.3.1 Corridor Alignment Recommendations

Rather than recommending either one of the corridor concepts evaluated above, the study's TAC recommended leaving the future corridor design to be determined during preliminary engineering. This recommendation is meant to allow for ultimate design decisions to be made based on future land uses and environmental constraints. Generally, the TAC recommends an urban 4-lane divided cross-section in areas with large residential developments and where heavy foot and bicycle traffic are anticipated. A rural 4-lane divided facility is recommended in areas that anticipate industrial uses and development may be restricted due to existing natural resources such as wetlands.

While a multi-use trail is recommended along the entire eastside of Mayhew Lake Road, the TAC noted that the segment between Osauka Road and the high school access should include a trail on both sides of the roadway. New low-density residential development planned immediately across from the high school as well as a new regional park, Mayhew Creek Park, just north of the high school are anticipated to generate considerable foot and bicycle traffic. Construction of a trail on both sides of Mayhew Lake Road in this area will enhance safety, mobility, and access for non-motorists.

## 5.4 Intersection Concept Development and Evaluation

An array of enhanced intersection traffic controls was developed and evaluated address safety and mobility issues identified at several intersection on Mayhew Lake Road. This section summarizes concepts considered at select intersections on Mayhew Lake Road as well as the evaluation process used to identify recommendations.



**Table 11 – Key Differences Summarized Between Divided 4-lane Concepts E and F and A No Build Alternative**

	Criteria	Measure	No Build Alternative	Build Concept A: 4-Lane, Divided with Urban Cross-section on Both Sides	Build Concept B: 4-Lane, Divided with Urban Cross-section on East Side and Rural Cross-section West Side
<b>Project Needs</b>	<b>Safety</b>	Potential to reduce the number and severity of motor vehicle crashes	No corridor improvements mean existing safety conditions would not improve.		
		Potential to reduce conflicts between pedestrians and bicyclists	No corridor improvements mean existing safety conditions would not improve.	Providing a trail alongside Mayhew Lake Road for pedestrians and bicyclists would improve safety.	Providing a trail alongside Mayhew Lake Road for pedestrians and bicyclists would improve safety.
	<b>Traffic</b>	Ability to meet traffic demand generated by anticipated future development	Forecasted traffic volumes for 2045 show the existing, 2-lane road over capacity and not operating at an acceptable level. Most intersections would fail, and side streets would experience a considerable delay.	A 4-lane road with enhanced intersection traffic control would meet forecasted, future traffic demands.	A 4-lane road with enhanced intersection traffic control would meet forecasted future, traffic demands.
		Ability to maintain or improve vehicle mobility on Mayhew Lake Road and adjacent roadways	No changes to the current roadway geometry.	Expanded roadway with improved intersections would improve vehicle mobility on Mayhew Lake Road and intersecting roadways.	Expanded roadway with improved intersections would improve vehicle mobility on Mayhew Lake Road and intersecting roadways.
	<b>Bicycle and Pedestrian Mobility and Connectivity</b>	Ability to provide a direct nonmotorized connection to key destinations along Mayhew Lake Road	No new bicycle or pedestrian facilities would be constructed.	The trail on the east side of Mayhew Lake Road would provide access to the High School, Mayhew Creek Park, and other neighborhood parks.	The trail on the east side of Mayhew Lake Road would provide access to the High School, Mayhew Creek Park, and other neighborhood parks.
		Potential to result in an increase in local and regional nonmotorized connections	No new nonmotorized connections would be created.	The proposed trail would connect to existing and planned/programmed trails that are being built as residential development occurs in neighborhoods adjacent to Mayhew Lake Road.	The proposed trail would connect to existing and planned/programmed trails that are being built as residential development occurs in neighborhoods adjacent to Mayhew Lake Road.
<b>Social, Economic, and Environmental Impacts</b>	<b>Wetlands</b>	Potential to impact wetlands areas	No new impacts.	Full urban section will allow for easier avoidance of existing wetlands.	Potential for impact but allows for further mitigation measures with the construction of a ditch.
	<b>Utilities</b>	Potential to impact existing utilities	No new impacts.	Could impact underground utilities with excavation required. Overhead power could remain in place with urban section.	Could impact underground utilities with excavation required. Overhead power at risk of relocation with potential for the ditch to be constructed.
	<b>Above Ground Structures</b>	Likelihood to require the relocation of existing mailboxes and/or roadway signage	No new impacts.	A wider section would result in structures near the current edge of the roadway being impacted.	A wider section would result in structures near the current edge of the roadway being impacted.
	<b>Drainage</b>	Potential to impact the amount of impervious surface in the corridor (Acres of additional impervious surface created)	No new impacts.	Increased potential for ponding would be needed with full urban section.	Similar impervious to Concept A, but ditch would allow for reduced storm sewer measures.
	<b>Right of Way Impacts</b>	Likelihood to have permanent right of way impacts or require permanent easements (Number of parcels impacted)	No new impacts.	Largest impacts would occur at intersections with construction of the roundabout. With no ditching, further ponding may need to be created requiring further right of way.	Largest impacts would occur at intersections with construction of the roundabout. Rural section traditionally has wider limits that may require further right of way.
	<b>Temporary Property Impacts/Easements</b>	Likelihood of parcels having temporary impacts during construction (Number of parcels impacted)	No new impacts.	Largest impacts would occur at intersections with construction of a roundabout.	Largest impacts would occur at intersections with construction of a roundabout. Rural sections have wider limits that may require further right of way.
	<b>Maintenance and Operations</b>	Potential to impact maintenance and operations practices compared to the existing roadway	No new impacts.	A larger roadway would increase maintenance activities. Additional maintenance activities will be required to ensure the trail remains safe and clear of debris.	A larger roadway would increase maintenance activities. Additional maintenance activities will be required to ensure the trail remains safe and clear of debris.
<b>Additional Considerations</b>	<b>Planning-Level Construction Cost</b>	High-level construction cost	No construction in the project in the study area means no new construction costs.		

More Impacts OR Does Not Meet Need

Fewer or No Impacts OR Meets Need

### 5.4.1 Intersection Concepts

As detailed in **Sections 4.2**, and **4.3**, safety and mobility issues at intersections along Mayhew Lake Road as both existing and future issues. The traffic operations and safety memo (**Attachment B**) documents a traffic control analysis was also completed to determine if signal warrants and all-way stop warrants are met for Mayhew Lake Road intersections.

The traffic signal and all-way stop warrant analyses were based on Minnesota Manual on Uniform Traffic Control Devices (MN MUTCD) guidelines. The manual contains information about highway traffic signals, including traffic-signal warrants that define the minimum conditions under which installing a traffic signal is justified. These traffic signal warrants have been developed as national guidelines to promote continuity of traffic control devices and to ensure that traffic signals are installed at intersections that benefit from their operations. The traffic signal warrant analysis concluded that only Golden Spike Road, 10th Street, and TH 23 intersections would meet signal warrants. Given that Golden Spike Road has already been converted to a roundabout and the intersection of Mayhew Lake Road and TH 23 has been dismissed from the study, 10th Street was the only location where a traffic signal concept was considered.

Additionally, an all-way stop warrant analysis contains information pertaining to the all-way stop control with criteria relating to vehicular volumes and crash history that define the minimum conditions under which installing an all-way stop could be justified. The all-way stop analysis concluded that based on crashes, minimum traffic volume, left-turn conflicts, high-pedestrian volume, sight lines, and similar design standards, none of the intersections would meet an all-way stop warrant.

Based on existing and future traffic operations and safety analysis, concepts were developed for six intersections along the corridor. Public input and discussions held with study stakeholders – city, county, and school district staff—were considered when developing concepts. Each alternative was developed to address identified safety and mobility issues. The following intersection options were considered:

- Mayhew Lake Road & 35th Street
  - Roundabout
- Mayhew Lake Road & High School Access
  - Roundabout
  - Right-In-Right-Out (RIRO)
- Mayhew Lake Road & Osauka Road
  - Roundabout
  - RIRO
- Mayhew Lake Road & Golden Spike Road
  - Upsize to a 2x1 from the current roundabout<sup>5</sup>
- Mayhew Lake Road & 15th Street
  - Roundabout
- Mayhew Lake Road & 10th Street
  - Roundabout
  - Bowtie (with 14th Avenue)
  - Signal
- Mayhew Lake Road & 14th Avenue
  - Roundabout
  - Bowtie (with 14th Avenue)
  - RIRO

**Attachment D** shows all the concepts considered at each of the intersections.

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<sup>5</sup> The current roundabout at Mayhew Lake Road and Golden Spike Road is a single lane roundabout. As traffic volumes increase, multi-lane roundabouts should be considered to meet capacity. With traffic anticipated to increase along Mayhew Lake Road, the existing single roundabout would have to be upsized to a multi-lane roundabout (2x1) to meet future traffic operation needs.



## 5.4.2 Intersection Evaluation Process and Results

### Evaluation Criteria: Mobility

Intersection concepts considered at specific locations were evaluated on how well the concept would address identified safety and mobility issues. Highway Capacity Software 7 was used to analyze LOS for all future roundabout concepts being considered at each respective intersection along the corridor.

**Tables 12** and **13** display the forecasted operating LOS under different intersection improvement concepts during AM and PM peak hours.

Roundabouts were proposed at the locations listed in **Table 12** to help address mobility needs, in response to the anticipated LOS at these six intersections will fail (LOS F) during the AM and/or PM peak hours under the forecasted 2045 forecasted traffic volumes without any improvements (**Figure 12**).

**Table 12 – 2045 Forecasted LOS of Roundabouts at All Intersection Locations**

Intersection Location	Control Type	AM Peak Intersection Delay <sup>1</sup> (LOS)	PM Peak Intersection Delay <sup>1</sup> (LOS)
Mayhew Lake Road & 35th St	Roundabout	28 (D)	31 (D)
Mayhew Lake Road & High School Access	Roundabout	11 (B)	12 (B)
Mayhew Lake Road & Osauka Rd	Roundabout	11 (B)	11 (B)
Mayhew Lake Road & Golden Spike Rd <sup>2</sup>	Roundabout	32 (D)	18 (C)
Mayhew Lake Road & 15th St	Roundabout	20 (C)	21 (C)
Mayhew Lake Road & 10th St	Roundabout	28 (D)	22 (C)
	Bowtie Roundabout (with 14th Ave)	30 (D)	23 (D)
Mayhew Lake Road & 14th Ave	Roundabout	10 (B)	11 (B)
	Bowtie Roundabout (with 10th St)	10 (B)	11 (B)

<sup>1</sup>Delay measured in seconds per vehicle

<sup>2</sup>The existing roundabout is being proposed to be upsized to a 2x1 to accommodate the proposed 4-lane divided facility.

Roundabouts are designed to handle large volumes of traffic with minimal delay compared to a traditional thru-stop or signalized intersection given that vehicles do not have to come to a complete stop. The natural integration of a horizontal curve at roundabout legs creates an environment that allows for drivers to slow down as they enter and exit the roundabout in a safe and efficient manner. As detailed in **Image 3** and **Section 4.2**, generally LOS D is the lowest acceptable LOS for urban intersections. All roundabout concepts, including the proposed bowtie concept between 10th Street and 14th Avenue, have a LOS D or better (see **Table 12**).

In addition to the roundabout concepts, these additional concepts were considered at four of the following intersections:

- Mayhew Lake Road & High School Access – Right-in Right-out (Thru-stop)
- Mayhew Lake Road & Osauka Road – Right-in Right-out (Thru-stop)
- Mayhew Lake Road & 10th Street – Signalized
- Mayhew Lake Road & 14th Avenue – Right-in Right-out (Thru-stop)

The anticipated LOSs for these non-roundabout concepts are shown in **Table 13**. **Table 13** also includes intersection operations at 35th Street and Osauka Road to show how RIRO alternatives at the high

school access and Osauka Roads would impact intersection operations at the two roundabout intersections.

**Table 13 – 2045 Forecasted LOS for Non-Roundabout Intersection Alternatives**

Control Type	Intersection Location	AM Peak Intersection Delay <sup>1</sup> (LOS)	PM Peak Intersection Delay <sup>1</sup> (LOS)
Roundabout <sup>2</sup>	Mayhew Lake Road & 35th St	37 (E)	74 (F)
Thru-Stop (RIRO)	Mayhew Lake Road & High School Access	3 (A)	6 (A)
Thru-Stop (RIRO)	Mayhew Lake Road & Osauka Rd	4 (A)	9 (A)
Roundabout <sup>2</sup>	Mayhew Lake Road & Golden Spike Rd	54 (F)	31 (D)
Signalized	Mayhew Lake Road & 10th St	27 (C)	17 (B)
Thru-Stop (RIRO)	Mayhew Lake Road & 14th Ave	5 (A)	6 (A)

<sup>1</sup>Delay measured in seconds per vehicle

<sup>2</sup>These intersections have been included in this table to show how RIRO alternatives at the High School access and Osauka Roads would impact intersection operations at the two roundabout intersections.

While the operating LOS are acceptable at intersections where non-roundabouts are being proposed, these non-roundabout intersection treatments will contribute to failing operations at the intersections of Mayhew Lake Road & 35th Street and Mayhew Lake Road & Golden Spike Road.

Under these RIROs on the 4-lane divided facility, motorists will be restricted to only making right-turns at the High School access, Osauka Road, and 14th Avenue. The roundabouts at 35<sup>th</sup> Street and Golden Spike Road would need to be used by travelers forced to go right, but wanting to go left, to make a U-turn to travel in their desired direction. The intersections at 35<sup>th</sup> Street and Golden Spike Road would experience increase traffic and poor LOS because of this additional traffic.

Mobility: Poor Intersection Operations at Bookended Roundabouts

Southbound vehicles exiting the high school access and Osauka Road will have to travel north to the 35th Street/CSAH 29 roundabout to make a U-turn while southbound traffic on Mayhew Lake Road will have to travel south and U-turn at Golden Spike Road to access the school and the future Mayhew Creek Park. This influx of traffic during school peak hours (morning drop-off and afternoon pick-up) overlaps with normal traffic AM and PM peak hours, resulting in poor LOS at 35th Street and Golden Spike Road. **Table 13** shows how LOS at the two roundabouts at 35th Street and Golden Spike Road would be impacted if RIROs are proposed at the high school access and Osauka Road.

Unlike the LOS impacts of a RIRO at the high school access and Osauka Road at their bookend roundabouts, a signal at Mayhew Lake Road & 10th Street and a RIRO at Mayhew Lake Road and 14th Avenue are forecasted to operate at acceptable LOS as shown in **Table 13**. However, under the proposed 4-lane divided cross-section, motorists will be restricted from making a left-turn onto northbound Mayhew Lake Road. Without a roundabout or a safe location on the southern limit of Mayhew Lake Road for vehicles to make a U-turn, motorists at 14th Avenue will have to find other routes to travel northbound. Roundabout options – individual roundabouts and a joint bowtie – at 10th Street and 14th Avenue will allow vehicles at 14th Avenue full-movement.

Evaluation Criteria: Safety

Intersection safety analysis summarized in **Section 3.2** shows that several of the corridor intersections have calculated crash rates higher than critical crash rates (see **Figure 10** and **Table 4**); a detailed safety analysis of the corridor is available in **Attachment B**. The 2017 study of the Traffic Safety at Roundabouts in Minnesota published by MnDOT shows that roundabouts can help reduce fatal crash



rates by 86 percent and a 42 percent overall reduction in injury crash rate can be achieved at intersections with all types of roundabouts.

**Table 15** shows the expected number of crashes based on the type of intersection improvements. This information on crash modification factor (CMF) was obtained from the CMF Clearinghouse website.<sup>6</sup> CMFs are frequently implemented to make assumptions on how a proposed concept could improve safety. Based on the CMF for converting an existing minor approach, stop-controlled intersection to a modern roundabout, all intersections where a roundabout is proposed can expect to see a decrease in the average number of crashes per year. Although a specific CMF does not exist for a RIRO on a divided facility, it can be assumed that converting the existing minor approach stop-controlled intersection (high school access and Osauka Road) to a RIRO on a divided facility would eliminate angle/left-turn crashes.

### 5.4.3 Intersection Improvement Recommendations

This section summarizes the evaluation results and recommended concepts that will be proposed under this study. These recommendations were based on the evaluation process and public input collected at project open houses. Overall, roundabouts are recommended at all corridor intersections, including a bowtie roundabout at 10th Street and 14th Avenue. **Table 16** summarizes intersection alternatives evaluation results.

Roundabouts are recommended over other alternatives due to better safety and mobility benefits. As noted in **Section 5.4.2**, RIROs at the high school access road and Osauka Road would operate at acceptable LOS. However, this would impact operations at 35th Street and Golden Spike Road due to vehicles using the roundabouts to make U-turns. The school district also expressed concerns related to school bus delays due to restricted left-turns and poor operations at the two bookended roundabouts. Additionally, a bowtie roundabout at 10th Street and 14th Avenue is recommended over the individual roundabout due to cost. By combining the two roundabouts together, the County can reduce project cost due to less pavement required to connect the distance between the two intersections.

### 5.4.4 Intersection Recommendation Costs

A high-level planning cost-estimates are provided each of the intersection alternatives in **Table 14**.

**Table 14 – Cost-Estimates for Intersection Alternatives**

Intersection	Traffic Control Type	Dollars Range (Millions)
Mayhew Lake Road & 35th St	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & High School Ent	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & Osauka Rd	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & Golden Spike Rd*	Roundabout	\$1.0 - \$1.3
Mayhew Lake Road & 15th St	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & 10th St/14 <sup>th</sup> Ave	Bowtie Roundabouts	\$2.6 - \$3.0

<sup>6</sup> The Crash Modification Factors Clearing House site provides a searchable database, guidance, and resources on using CMFs. The site is funded by the U.S. Department of Transportation Federal Highway Administration and maintained by the University of North Carolina Highway Safety Research Center.

**Table 15 – Mayhew Lake Road Intersection Crash Modification Factors**

Intersection	Existing			Crash Modification Factors 1		Crash Modification Factors 2	
	Traffic Control Type	No. Crashes (5-year)	Avg. no. Crashes per year	Convert intersection with minor road stop-control to modern roundabout (CMF = 0.56; CMF ID: 227)	Expected no. crashes per year with CMF	Install a traffic signal and left turn lanes (CMF =0.57; CMF ID: 7967)	Expected no. crashes per year with CMF
Mayhew Lake Road & 35th St	Minor Approach Stop-Controlled	11	2.2	Yes	1.2	N/A	N/A
Mayhew Lake Road & High School Ent	Minor Approach Stop-Controlled	2	0.4	Yes	0.2	N/A	N/A
Mayhew Lake Road & Osauka Rd	Minor Approach Stop-Controlled	4	0.8	Yes	0.4	N/A	N/A
Mayhew Lake Road & Golden Spike Rd <sup>1</sup>	Roundabout	9	1.8	No	N/A	N/A	N/A
Mayhew Lake Road & 15th St	Minor Approach Stop-Controlled	15	3.0	Yes	1.7	N/A	N/A
Mayhew Lake Road & 10th St	Minor Approach Stop-Controlled	15	3.0	Yes	1.7	Yes	1.7
Mayhew Lake Road & 14th Ave	Minor Approach Stop-Controlled	7	1.4	Yes	0.8	N/A	N/A
Mayhew Lake Road & TH 23 <sup>2</sup>	Traffic Signal	37	7.4	No	N/A	N/A	N/A

<sup>1</sup>Existing roundabout where no intersection improvements are proposed

<sup>2</sup>No intersection improvements proposed under this study given that TH 23 is under MnDOT jurisdiction and was not included as part of this project. Therefore, while the intersection was analyzed but no improvements are proposed for this location.

Source: The Crash Modification Factors Clearing House



Table 16 – Intersection Alternatives Evaluation Results Summary

	Criteria	Measure	Intersections Alternatives																			
			35th St		High School Access			Osauka Rd			Golden Spike Rd		15th St		10th St				14th Ave			
			Existing	RAB	Existing	RAB	RIRO	Existing	RAB	RIRO <sup>1</sup>	Existing	Upsized RAB	Existing	RAB	Existing	RAB	Bowtie	Signal	Existing	RAB	Bowtie	RIRO
Project Needs	Mobility	Improve forecasted vehicle mobility and operations?	No	Yes	Yes	Yes	No <sup>1</sup>	Yes	Yes	No <sup>1</sup>	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	No <sup>1</sup>
	Safety	Improve bicycle and pedestrian crashes and safety?	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
		Improve motor vehicle crashes and safety?	No	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Social, Economic, and Environmental Impacts	Utilities	Likely to impact overhead power lines?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	Above Ground Structures	Likely to require relocation of mailboxes and/or roadway signage?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	Drainage	Increases amount of impervious surface in corridor?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	Right of Way Impacts	Permanent right of way or easement impacts likely?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	Temporary Property Impacts	Temporary construction impacts likely?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
	Maintenance and Operations	Impact maintenance and operations practices compared to the existing roadway likely?	No	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Add'l Consid.	Planning-Level Construction Cost	High-level construction cost	NA	High	NA	High	Low	NA	High	Low	NA	Medium	NA	High	NA	High	Medium	Low	NA	High	Medium	Low

<sup>1</sup>RIRO at these locations would either impact LOS at adjacent intersections or require long detours. Thus, considered not meeting mobility measures. Additional explanation is provided under Section 5.4.2

Note: RAB = Roundabout

## 6 Mayhew Lake Road Recommended Concept, Costs, and Next Steps

### 6.1 Recommended Mayhew Lake Road Concept

Conceptual layouts for the following two recommended cross-sections and recommended intersection treatments are shown in **Figure 14**. This concept reflects:

- Corridor Improvements
  - An Urban (curb and gutter) 4-lane divided section with trail on both sides between Golden Spike Road and high school access (by the water tower)
  - A combination of urban (curb and gutter on both sides)/rural (curb and gutter on the east side and ditch on the west side) 4-lane divided section with a trail along Mayhew Lake Road that is not between Golden Spike Road and high school access (by the water tower). The decision of whether the roadway will be an urban or rural section will be determined during future phases of project development, based on consideration of environmental constraints and development needs.
  
- Intersection Improvements
  - Mayhew Lake Road & 35th Street
    - Roundabout
  - Mayhew Lake Road & High School Access
    - Roundabout
  - Mayhew Lake Road & Osauka Road
    - Roundabout
  - Mayhew Lake Road & Golden Spike Road
    - Upsize to a 2x1 from the current roundabout
  - Mayhew Lake Road & 15th Street
    - Roundabout
  - Mayhew Lake Road & 10th Street
    - Bowtie Roundabout (with 14th Avenue)
  - Mayhew Lake Road & 14th Avenue
    - Bowtie Roundabout (with 10th Avenue)
  
- Other considerations
  - Development driven intersection improvement at Mayhew Lake Road and 19th Street – The project team acknowledged that this area of the corridor is likely to attract future developments and may require a roundabout to accommodate traffic.
  
  - Potential underpass for non-motorist by the Mayhew Lake Road/High School access intersection – Given the high foot and bicycle traffic anticipated to be generated by land uses in this area – including the to be improved Mayhew Creek Park, residential homes on the west side of the corridor, and the high school – the TAC expressed interested in a potential underpass to enhance safety for non-motorists. Engineering feasibility of an underpass was not included as part of this study.

Renderings (**Image 5 – 9**) at select locations along the corridor have been developed to provide views of what the proposed improvements would look like at ground level. These renderings are preliminary graphics developed for visualization purposes and do not reflect any permanency of the improvements identified. The main purpose of the renderings is to provide visual representations of what roadway users may experience and anticipate once improvements are implemented.



**Image 5 – Rendering of Corridor Just North of Perennial Lane (facing north)**



**Image 6 - Rendering of Corridor Just North of 18th Street by Planned Industrial/Business Park (facing north)**





**Image 7 – Rendering of Corridor Just South of Osauka Road by Mayhew Apartments (facing north)**



**Image 8 – Rendering of Potential Underpass Adjacent to the High School and Planned Mayhew Creek Park (facing north)**





**Image 9 - Rendering of At-Grade Pedestrian/Bicyclist Crossing and Roundabout at the High School and Planned Mayhew Creek Park (facing north)**



## 6.2 Planning Level Cost Estimates

Planning level cost estimates were developed for both of the “full concepts” presented in **Sections 5.4.2** and **5.3.1**— one with a trail on the west side, and one with a trail on the east side. The planning-level cost estimates for the two concepts are similar. The planning level cost estimate for constructing either a trail on the west side of Mayhew Lake Road or the east side of Mayhew Lake Road is approximately \$3 million in current (2022) dollars. **Table 17** lists the anticipated improvement costs for the entire corridor.

**Table 17 – Mayhew Lake Road Construction Cost**

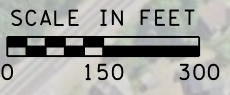
Project Element	Facility Type	Dollars Range (Millions)
Mayhew Lake Road & 35th St	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & High School Ent	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & Osauka Rd	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & Golden Spike Rd*	Roundabout	\$1.0 - \$1.3
Mayhew Lake Road & 15th St	Roundabout	\$1.3 - \$1.5
Mayhew Lake Road & 10th St/14th Ave	Bowtie Roundabouts	\$2.6 - \$3.0
Corridor between Intersections	4-Lane Divided Section with trail	\$5.2 - \$5.7
<b>Total Construction Cost (2022)</b>		<b>\$14 - \$16</b>

Total construction cost of the ‘full concept’ is provided as a range between \$14 - \$16 million. Additional costs can be anticipated that were not included, such as right of way and easement, preliminary and final design, and construction engineering.

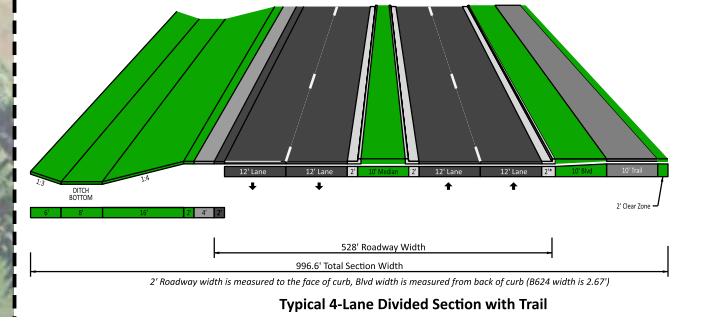
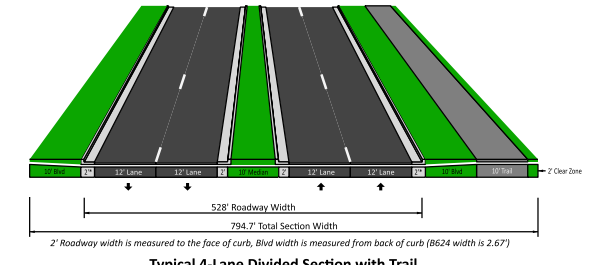


# Mayhew Lake Road Corridor Study

City of Sauk Rapids, Benton County, Minnesota

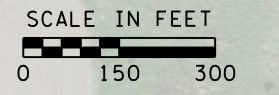


## Typical Sections



Legend	
	ROADWAY
	CURB
	TRUCK APRON
	SIDEWALK / TRAIL
	LANDSCAPING / BOULEVARD
	DRIVEWAY











wsb



PROPOSED 76 UNIT  
APARTMENT BUILDING

FUTURE INTERSECTION  
MODIFICATION







Legend	
	ROADWAY
	CURB
	TRUCK APRON
	SIDEWALK / TRAIL
	LANDSCAPING / BOULEVARD
	DRIVEWAY









Legend	
	ROADWAY
	CURB
	TRUCK APRON
	SIDEWALK / TRAIL
	LANDSCAPING / BOULEVARD
	DRIVEWAY



## 7 Implementation Plan

While this study developed a complete corridor vision, the total reconstruction of Mayhew Lake Road is not planned for the near term. Benton County does not have funding identified any construction projects. Given the size and cost of the Mayhew Lake Road corridor, the county is prepared to implement the corridor vision through a series of projects, rather than one, large construction project. Below are a series of phases identified by the study's TAC. This phasing was developed to address the highest corridor transportation needs first. This recommended phasing could change if opportunities to construct portions of the Mayhew Lake Road corridor became available earlier.

- **Phase 1** would reconstruct the intersection at CSAH 29/35th Street with a roundabout. This intersection has the highest crash rate on the study corridor – at two to three times over the critical rate.
- **Phase 2** includes reconstruction of Mayhew Lake Road between Osauka Road and Water Tower Road near Sauk Rapids-Rice High School. Stakeholders shared numerous safety, mobility, and accessibility concerns related to this portion of road, including high school students driving, biking, and walking to/from the Sauk Rapids-Rice High School. This part of Sauk Rapids is seeing new residential development and the city is planning major improvements to Mayhew Creek Park. All of these factors will generate considerable bicycle and pedestrian traffic.
- **Phase 3** reconstruction would involve the implementation of the proposed bowtie roundabout at CR 46/10th Street and CR 74/14th Avenue. Both of these intersections on Mayhew Lake Road have crash rates that are higher than the critical rate for a rural thru-stop intersection. The bowtie concept here would improve traffic operations at both intersections to LOS D or better.
- **Expansion to 4-Lanes and Trail** future development along the corridor will also be a significant driver of implementation of the 4-lane portions of Mayhew Lake Road. Future developments will ultimately help determine the appropriate alignment roadway cross-section.

An initial access spacing review was completed based on existing access points along the study corridor (see **Attachment D**). The county should continue to apply access management guidelines to meet access density and spacing along the corridor. With developments anticipated on both sides of the corridor, consolidation of existing and future accesses should be considered when possible.

As new residential developments are constructed in Sauk Rapids, the city should coordinate with Benton County on opportunities to link portions of residential trail to the trail improvements recommended along Mayhew Lake Road.

The St. Cloud APO, Benton County, the City of Sauk Rapids, and the Sauk Rapids-Rice School District will continue to coordinate throughout implementation of the recommended for Mayhew Lake Road improvements. This interagency collaboration will help prioritize projects based on transportation needs and future development, secure permitting of land use changes, and secure project funding.

## 8 Potential Funding Mayhew Lake Road Project Sources

The anticipated cost to construct the project is estimated to be between \$14 and \$16 million, with additional expenses required for engineering or necessary right-of-way acquisition. Benton County and the City of Sauk Rapids are pursuing state and federal bonding funds for both Mayhew Lake Road and Urban Beltline projects.

There are also numerous state and federal discretionary funding opportunities that may provide sources of funding that could be used to implement all or a portion of the Mayhew Lake Road recommendations. Some of these funding sources study partners may consider applying for include:



- **Infrastructure Investment and Jobs Act (IIJA):** also known as the “Bipartisan Infrastructure Law,” this program is intended to fund highway projects through a variety of federal, discretionary programs.
- **Highway Safety Improvement Program (HSIP):** Funding available to improve roadway safety; this source should especially be considered for intersection safety improvements at locations with documented crash issues.
- **Transportation Alternatives:** Funding opportunities for local and regional agencies for pedestrian and bicycle facilities.
- **MnDOT Safe Routes to School Infrastructure Grants:** Funds to support the construction of sidewalks, trails, crossings, or other improvements to help students walk or bike to school; these funds may be considered to improve connections from neighborhoods in Sauk Rapids to the high school.
- **DNR Local Trail Connections Program:** Funding opportunity for trails that connect to significant regional recreation destinations.
- **DNR Federal Recreational Trails Program:** Funding opportunity for construction of new or relocated recreational trails.

Completion of this plan documents will make funding applications to these or other discretionary funding programs more competitive by demonstrating that a planning process has been completed, that local agencies are working in partnership towards a common vision for Mayhew Lake Road, and that these recommendations included in the plan have been developed using a process that includes public engagement.

## 9 Public and Stakeholder Engagement

Stakeholder engagement was an integral element to identifying recommendations for the Mayhew Lake Road Corridor. This section documents engagement activities used throughout this study. Additional information is available in **Attachment E**.

### 9.1 Technical Advisory Committee

The TAC was established at the beginning of the Mayhew Lake Road Study to provide high-level direction to the project team by reviewing study approaches and deliverables from the perspective of each participating organization. Members of the TAC and their organization are shown in **Table 18**.

**Table 18 – TAC Members**

TAC Members	Affiliation
Brian Gibson	St. Cloud APO
Steve Heinen	Benton County
Jared Gapinski	Benton County
Chris Byrd	Benton County
Todd Schultz	City of Sauk Rapids
Ross Olson	City of Sauk Rapids
Brad Bergstrom	Sauk Rapids-Rice Independent School District (ISD)

The TAC met a total of six times throughout the study – including both in person and online meetings. four times over the course of the project:

- **May 4, 2022 (in person meeting)** – consultant team introduced the study area, study purpose, schedule, and existing conditions. The TAC discussed corridor needs and opportunities, current and future developments, and stakeholder engagement strategies.
- **June 28, 2022 (in person meeting)** – the TAC discussed feedback received from community engagement opportunities. These opportunities included the first public open house held on June



13 at the Sauk Rapids Government Center, a community pop-up event on June 25 at River Fest, and an interactive map on the study website. The TAC also discussed the traffic forecasting efforts and safety concerns at the high school.

- **August 30, 2022 (in person meeting)** – the consultant team presented traffic forecast information, draft cross-section concepts, and intersection treatment considerations.
- **October 13, 2022 (in person meeting)** – plans for the second open house on October 25 were discussed. The group also reviewed existing and future land uses, future traffic forecasts, cross-section concepts, and intersection evaluation efforts to date.
- **November 22, 2022 (virtual meeting)** – discussed study recommendations and plans for final engagement activities. The TAC concluded that a presentation to elected officials would be most beneficial.
- **December 2, 2022 (virtual meeting)** – discussed plans for a presentation to elected officials on December 12, 2022.

## 9.2 Public Engagement Activities

Over the course of the study, two public open-house meetings and one community pop-up event were held to share study information and to collect public feedback. Materials included at both of the open houses included informational boards, comment cards, and an aerial map on which attendees could mark up comments and concerns.

Materials shared at public open houses and the presentation to elected officials are included in **Attachment E**. These open house activities are summarized below:

### Open House #1:

The first public engagement meeting was held on June 13, 2022, from 5 p.m. – 7 p.m. at the Sauk Rapids Government Center. The study team received input on the corridor issues and needs from people living along and traveling on Mayhew Lake Road.

Feedback from the first public open house, both from the comment cards and the map comments, largely focused on unsafe corridor conditions. Meeting participants wanted to see more trails and sidewalks, safe crossings across Mayhew Lake Road, roundabouts at many intersections, elimination of bypass lanes, and vehicles travelling at slower speeds.

### Open House #2:

The second public engagement meeting took place on October 25, 2022, from 5 p.m. – 7 p.m. at the Sauk Rapids Government Center. This meeting focused on obtaining community feedback on cross-sections concepts. A total of twenty-two people signed in at the open house. Based on staff discussions, most attendees lived close to the study corridor. Feedback from the second public open house primarily concerned addressing unsafe corridor conditions while driving, walking, or biking. Residents were concerned with getting a multi-use path along Mayhew Lake Road, along with safe crossings, improved sight lines at intersections, and slower vehicle speeds.

### Elected Officials Presentation:

On December 12, 2022, the consultant team presented to elected officials from agencies represented on the TAC. Meeting attendees included Sauk Rapids City Council members, Benton County Commissioners and staff, school board members from the Sauk Rapids-Rice School District, and interested members of the public. This presentation provided a broad overview of the study process as well as study recommendations for the future of Mayhew Lake Road.



### **Community Pop-Up Event**

A community pop-up event was held on Saturday, June 25, 2022, from 12 p.m. – 4 p.m. at Rapids River Days, an annual, three-day summer festival held in Sauk Rapids the fourth weekend in June. At the event, consultant team members had a table that used games and activities to inform and engage event participants about the project's background and proposed concepts. Common themes heard from the community during this event included the use of turn lanes to pass along the corridor and traffic from the high school.