



City Council Work Session

Tuesday, December 5, 2023 at 6:00 PM

(An optional tour of the Riverchase Apartments (110 Riverchase Court) will take place prior to the start of the meeting at 5:00 p.m.)

Public Meeting Room

AGENDA

1. Call to Order

2. Items for Discussion

- A. Review Staff Recommendations for Ground-Mounted Solar at the Public Works Facility
- B. Infrastructure Customizable Lighting Guidance Policy
- C. Review of CSAH 45/Willow Street/17th Street SW Corridor Study

3. Future Discussion

4. Adjournment

(The Council may meet as a group for dinner)

Please contact the City Administrator's Office if you need special accommodations while attending this meeting



Council Work Session Memorandum

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: David Wanberg, Community and Economic Development Director
MEETING DATE: December 5, 2023
SUBJECT: Review Staff Recommendations for Ground-Mounted Solar at the Public Works Facility

Discussion:

At its July 18, 2023, work session, the City Council recommended the release of a Request for Proposals (RFP) for a proposed ground-mounted solar array at the City's Public Works Facility (1200 Belview Trail). The RFP outlined the City's expectations for the solar array, but it allowed contractors to design the array and propose a financing package. It also required the contractors to install pollinator-friendly groundcover and fencing, and propose a plan for the array's end-of-life. The City received eight proposals from five contractors and interviewed three contractors.

The proposed purchase options include the following:

- **Direct-buy.** The City purchases the installed solar array and owns all equipment and power generated by the system. The City would arrange for operations and maintenance and end-of-life. Final payment is due once the system is up and running.
- **30-year Long-term Lease.** The City provides a lump-sum payment on a long-term equipment lease, and owns all power generated by the system for 30 years. A third party will own and maintain the equipment.
- **Modified Power Purchase Agreement (PPA).** The City owns the system and all electricity produced but makes fixed monthly payments to a third party for 20 years. Payments escalate annually and are intended to be cashflow-positive from year one. After 20 years, the City no longer makes payments and would need to arrange for operations and maintenance.
- **Traditional PPA.** The City makes an upfront payment, purchases power generated by the system at a discounted rate for 10 or 20 years, makes a final termination payment, and then owns the system and all power produced.

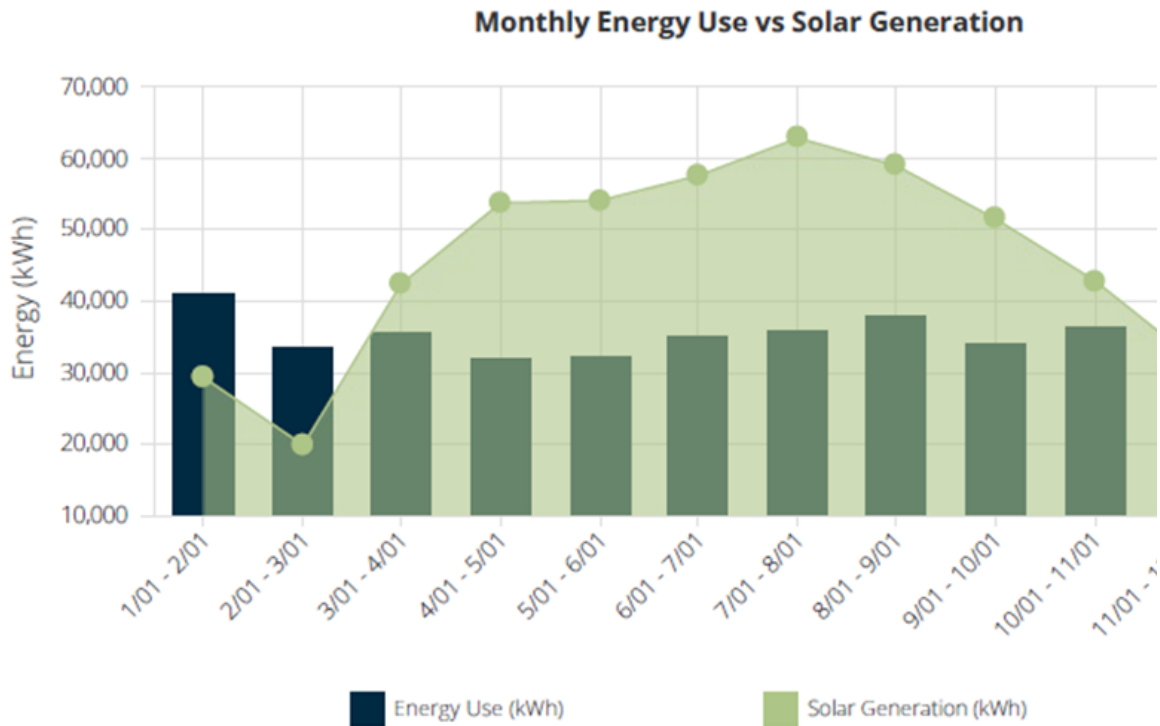
Recommendation:

Based on the long-term value of the array, contractor experience, and anticipated maintenance costs, City Staff recommends that the City Council enter into an agreement with iSolar. With an upfront City investment of \$500,000, iSolar (and its partner, Three Rivers Contracting) will enter into a 30-year lease with the City. iSolar will lease City land at the Public Works Facility and construct, own, and maintain a 405 DC kW array. All electricity generated by the array will cover the Public Works Facility's anticipated annual electricity cost, which was roughly \$60,000 last year. It will take the City roughly seven to eight years to receive its return on investment. However, in 30 years, the City anticipates a net savings of roughly \$1.76 million in energy, as shown in the table below.

Year	Net Present Value
1	\$(500,000)
7.9	\$0
20	\$347,485
30	\$599,661
Total Cash Flow - 30 years	\$1,764,654

iSolar will provide an insurance policy to ensure the solar array functions over the 30-year lease period, regardless of labor and equipment costs, storm damage, and the status of iSolar. iSolar will operate and maintain all equipment and respond to outages within 24 hours. iSolar will seed the disturbed site with a low-maintenance pollinator seed mix, and the City will be responsible for periodic mowing of pollinator plantings as desired. Near the end of the 30-year lease, the City and iSolar will negotiate the next phase of the array, which may include removal, continuation, or improvements as necessary.

The chart shown below shows the projected monthly energy use compared to the projected solar generation.



Alternative:

The alternative option is the direct purchase of a 325 kW DC solar system constructed by iDeal Energies. The City would purchase this system for a price of \$618,294. This purchase would qualify for a 30% federal direct payment of \$185,488, paid to the City by the federal government to offset the cost of the system. The City would own the system and all power generated. iDeal Energies would provide operations and maintenance based on a fee-for-service model, covering all workmanship for the first five years. The City would be responsible for all equipment at the end of its useful life and grounds maintenance. This option is also projected to break even in roughly seven to eight years and return \$1.8 million over 30 years. While this option provides a projected higher cash flow, operation and maintenance costs are not included in the cash flow. It also assumes a higher rate of utility price increase than iSolar's projections. So, this option may ultimately have a lower cash flow than projected.

Year	Net Present Value
1	\$(618,294)
7 - 8	\$0
20	\$306,951
30	\$602,179
Total Cash Flow - 30 years	\$1,840,797

Financing and Next Steps:

The City can finance the proposed solar array through various funds, including those used to pay the Public Works Facility's electric bill. Overall

savings will reduce the City's operating costs and benefit the community.

Presuming the City Council agrees with City Staff's recommendation to go with a 30-year lease through iSolar, Staff will prepare a contract and present it for Council action in January.

Attachments:

1. Proposed_Ground_Mount_Solar_Location

Proposed Ground Mount Solar Location





Council Work Session Memorandum

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Mark DuChene, City Engineer
MEETING DATE: December 5, 2023
SUBJECT: Infrastructure Customizable Lighting Guidance Policy

Discussion:

The City has been notified by the water tower contractor and their subcontractors that the decorative/colored LED lighting on the water tower will be ready to be put in operation sometime the week of December 4th. The proposed LED lighting is color changing and programmable and, as such, the City is likely to receive requests from various parties to have the tower lighting done in certain colors and/or patterns to recognize specific occasions. This is similar to other structures (bridges, towers, buildings) around the area and the state that have similar lighting systems. With that said, it is good practice to have a Council-adopted policy in place to lay out a process for these requests as well as have a policy dictating how these requests may be honored and handled.

After reviewing other public entities' policies on similar structure lighting systems, City staff have developed the attached draft policy for Council consideration. Staff is looking for feedback on the policy from the Council so that a final policy can be drafted for approval at the December 12, 2023, City Council Meeting. Note the lighting contractor will be onsite Dec. 4th and 5th to train staff on the lighting system and fully explain the lighting system options that can be programmed, including a full list of color and sequencing options. City staff will update the draft policy as needed based on the training next week.

Attachments:

1. DRAFT 2023 Infrastructure Lighting Guidance



208 NW 1st Avenue
Faribault, MN 55021
507-334-2222

Customizable Lighting Guidance

Position Statement

This guidance document applies to City of Faribault's infrastructure (water tower, buildings, bridges, etc.) equipped with customizable lighting systems and addresses external requests for special lighting.

The City will generally approve requests from organizations to commemorate widely recognized or historical events or annual celebrations; to enhance awareness efforts; or to recognize a specific occasion, event or person of statewide or national significance.

The City reserves the right to deny requests, including those of a private nature such as for birthdays or wedding anniversaries. The City will also deny any requests that aim to promote any political candidate or individual running for office or that violate the Minnesota Human Rights Act.

The City provides this opportunity as a public service. Special lightings do not imply an endorsement of any organization or topic by the City. On dates not included in the regular lighting schedule below, or on dates without a request from outside organizations, the tower will be illuminated in blue or as directed by the City Council. The City may also choose to highlight other days it deems appropriate.

Application Process

- A. An applicant must submit their request for customizable lighting in writing to the City of Faribault via its online form available at <https://www.ci.faribault.mn.us/FormCenter/General-4/Customizable-Lighting-Requests-103>.

The application must include the following information:

1. Organization name
2. Website, if applicable
3. Address
4. Individual requestor's name
5. Phone
6. Email
7. Detailed description of the event you would like to recognize
8. Event date
9. Structure to be illuminated
10. Specific colors requested (RGB #s)



- B. A request must be submitted to the City at least 30 days in advance of the date for which the lighting request is made. The City may waive this requirement when it is not practical but reserves the right to deny any requests made with less than 30 days' notice.

Approval Process

- A. The City will review each application. An application that meets the criteria detailed in the above Position Statement and Application Process will be approved to the first requester on that date.
- B. The City will inform the requester whether their request has been approved or denied within 10 business days after receiving the application.
 - a. Approved requests will be granted for one night only, unless approved otherwise in the City's sole discretion.
 - b. Only one special lighting request will be granted for each requester annually, unless approved otherwise in the City's sole discretion.
 - c. Infrastructure lightings will generally begin 30 minutes before sunset and end 30 minutes after sunrise.
- C. The City will work with appropriate staff to program the infrastructure lighting accordingly.
- D. Once a request is approved, the requesting organization is free to share information about the customizable lighting in accordance with the language of their request, but may not use the lighting for fiscal gain.
- E. The City reserves the right to share information publicly about approved lightings at the City's discretion, though maintains no obligation, commitment or responsibility to provide photographs of infrastructure lighting to a requester or take any action to promote an approved infrastructure lighting.
- F. The City reserves the right to revoke a prior approval if it becomes aware after the approval was issued that the terms of this guidance have not been met or for other compelling reasons in the City's sole discretion.
- G. The City reserves the right to remove a requester from the infrastructure lighting program for up to 24 months if City finds that the requester has provided false or misleading information in the application process.



* THE BELOW SCHEDULE IS A DRAFT SCHEDULE SUBJECT TO CHANGE BASED ON FEEDBACK AND
TRAINING FROM LIGHTING MANUFACTURER *



208 NW 1st Avenue
Faribault, MN 55021
507-334-2222

Regular Lighting Schedule

The below schedule includes the dates the customizable infrastructure will be lit yearly. It does not include special event lighting that has been requested for a particular date.

DATE – HOLIDAY	COLOR USED FOR LIGHTING
January 1 - New Year's Day	Red, white and blue
January 16 – Martin Luther King Jr. Day	Red, white and blue
February 20 – Presidents Day	Red, white and blue
May 29 - Memorial Day	Red, white and blue
June 19 - Juneteenth	Red, white and blue
July 4 - Independence Day	Red, white and blue
September 4 - Labor Day	Red, white and blue
October 9 – Indigenous Peoples Day	Red, white and blue
November 11 - Veterans Day	Red, white and blue
November 23 – Thanksgiving Day	Red, white and blue
December 25 - Christmas Day	Red and green





Council Work Session Memorandum

TO: Mayor and City Council
THROUGH: Tim Murray, City Administrator
FROM: Mark DuChene, City Engineer
MEETING DATE: December 5, 2023
SUBJECT: Review of CSAH 45/Willow Street/17th Street SW Corridor Study

Discussion:

As part of the development review process for the Faribault Apartments project at the intersection of 17th Street SW and CSAH 45/Willow Street, the City and Rice County agreed to share 50/50 in the costs of completing a corridor study for the area to address traffic concerns raised during the review process. Attached is a copy of the final draft of the corridor study completed by SRF consultants. The study looks at present conditions, 2033 and 2043 conditions. The traffic forecasting assumptions account for current known development (Faribault Apartments, DMCS School) and future conditions assume a build-out rate for vacant land based on the City's comprehensive plan and historical trends. The mitigation summary for proposed road improvements starts on page 21 of the report and the summary findings are on page 25.

City Staff will review the study results at the work session and answer any questions from the Council.

Attachments:

1. Final CSAH45 Corridor Study



Memorandum

SRF No. 16051

To: Mark DuChene
City of Faribault

From: Tom Sachi, PE, Project Manager
Zach Toberna, PE, Engineer III

Date: November 14, 2023

Subject: CSAH 45 Corridor Study; Faribault, Minnesota

Introduction

As requested, SRF has completed a traffic study for the proposed corridor study along CSAH 45 in the City of Faribault, MN (see Figure 1: Project Location). The main objectives of the study are to review the existing operations and safety within the study area, identify any transportation impacts associated with future land use development within the study area, and recommend improvements to address any issues, if necessary. The following information provides the assumptions, analysis, and recommendations offered for consideration.

Existing Conditions

Existing conditions were reviewed to establish a baseline to identify any future impacts associated with projected growth in the City of Faribault. The evaluation of existing conditions includes a review of traffic volumes, roadway characteristics, crash analysis, and an intersection capacity analysis, which are summarized in the following sections.

Data Collection

Weekday a.m. and p.m. peak period vehicular turning movement and pedestrian/bicyclist counts were collected by SRF during the week of May 8, 2023. The following study intersections were collected:

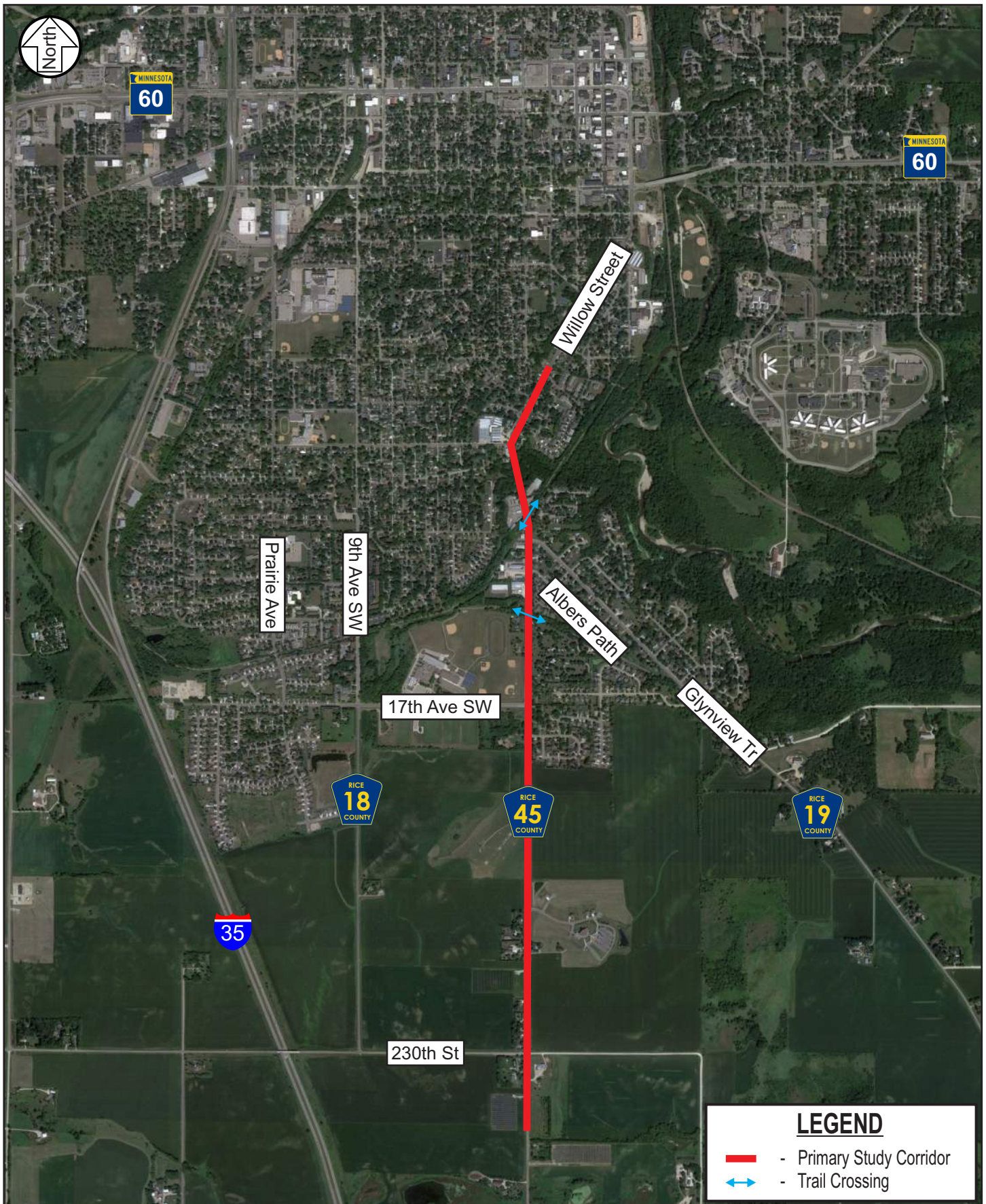
- Willow Street/10th Street SW
- CSAH 45/230th Street (CSAH 39)
- CSAH 45/Glynview Trail (CSAH 19)
- 17th Street SW/9th Avenue SW/CR 18
- CSAH 45/Albers Path
- 17th Street SW/Prairie Avenue
- CSAH 45/17th Street SW

Additionally, 15 hours of pedestrian/bicyclist counts were collected by SRF during the week of May 8, 2023 at both trail crossings for the Straight River Trail across CSAH 45.

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Roadway Characteristics

A field assessment was completed to identify various roadway characteristics within the transportation system study area, such as functional classification, general configuration, and posted speed limit. A summary of these roadway characteristics is shown in Table 1. Note that these are general characteristics and that there are some deviations within the area or segments of the roadways.

Table 1. Existing Roadway Characteristics

Roadway	Functional Classification ⁽¹⁾	General Configuration	Posted Speed Limit (mph)
Willow Street/ CSAH 45 ⁽²⁾	Minor Arterial (North of Glynview Trail) Major Collector (South of Glynview Trail)	3-lane divided with TWLTL	30 to 55 mph
10th Street SW	Major Collector	2-lane undivided	30
Glynview Trail (CSAH 19)	Major Collector	2-lane undivided	30
Albers Path	Local Road	2-lane undivided	30
17th Street SW	Minor Collector (East of Prairie Avenue) Local Road (West of Prairie Avenue)	2-lane undivided	30
230th Street (CSAH 39)	Minor Collector (West of CSAH 45) Local Road (East of CSAH 45)	2-lane undivided	55
9th Avenue SW/ CR 18 ⁽³⁾	Major Collector (North of 17th Street SW) Minor Collector (South of 17th Street SW)	2-lane undivided	30
Prairie Avenue	Major Collector (North of 17th Street SW) Local Road (South of 17th Street SW)	2-lane undivided	30

(1) Functional Classification based on the MnDOT's *Roadway Classification GIS*.

(2) Willow Street is a 30 mph, 3-lane divided roadway with two-way left turn lanes (TWLTL) north of Glynview Trail and a 40 mph, CSAH 45 is a 2-lane undivided roadway south of Glynview Trail. Note that the speed limit changes from 40 mph to 55 mph and the road name changes from Willow Street to Albers Avenue approximately 350 feet south of Allen Path (Faribault City border).

(3) 9th Avenue SW changes to Base Line Road/CR 18 south of 220th Street.

Speed data was collected at two (2) locations along the study corridor using radar detection. These locations were along CSAH 45, north of 17th Street SW and at approximately Allen Path. These locations were chosen to determine the change in speed near the speed limit change along CSAH 45 from 55 mph to 40 mph just south of Allen Path. Based on the collected data, vehicle speeds are generally the same in both locations, with an average travel speed of 39 mph and an 85th percentile speed of 43 to 44 mph. This indicates that the majority of vehicles are slowing down from 55 mph to near the posted speed of 40 mph. It should be noted that there has been significant perceived speeding concerns from the public in these segments of CSAH 45. While the majority speeds were not found to be significantly over the speed limit, there are still a portion of drivers who are traveling at a high rate of speed that cause safety and operational concerns for both vehicles and pedestrians crossing CSAH 45. These speeds will be reviewed as potential alternatives are developed for the study area.

From a traffic control perspective, the Willow Street/10th Street SW and 17th Street SW/9th Avenue SW/CR 18 intersections are all-way stop controlled, while the remaining study intersections are unsignalized with side-street stop control. Existing geometrics, traffic controls, and traffic volumes in the study area are shown in Figure 2.

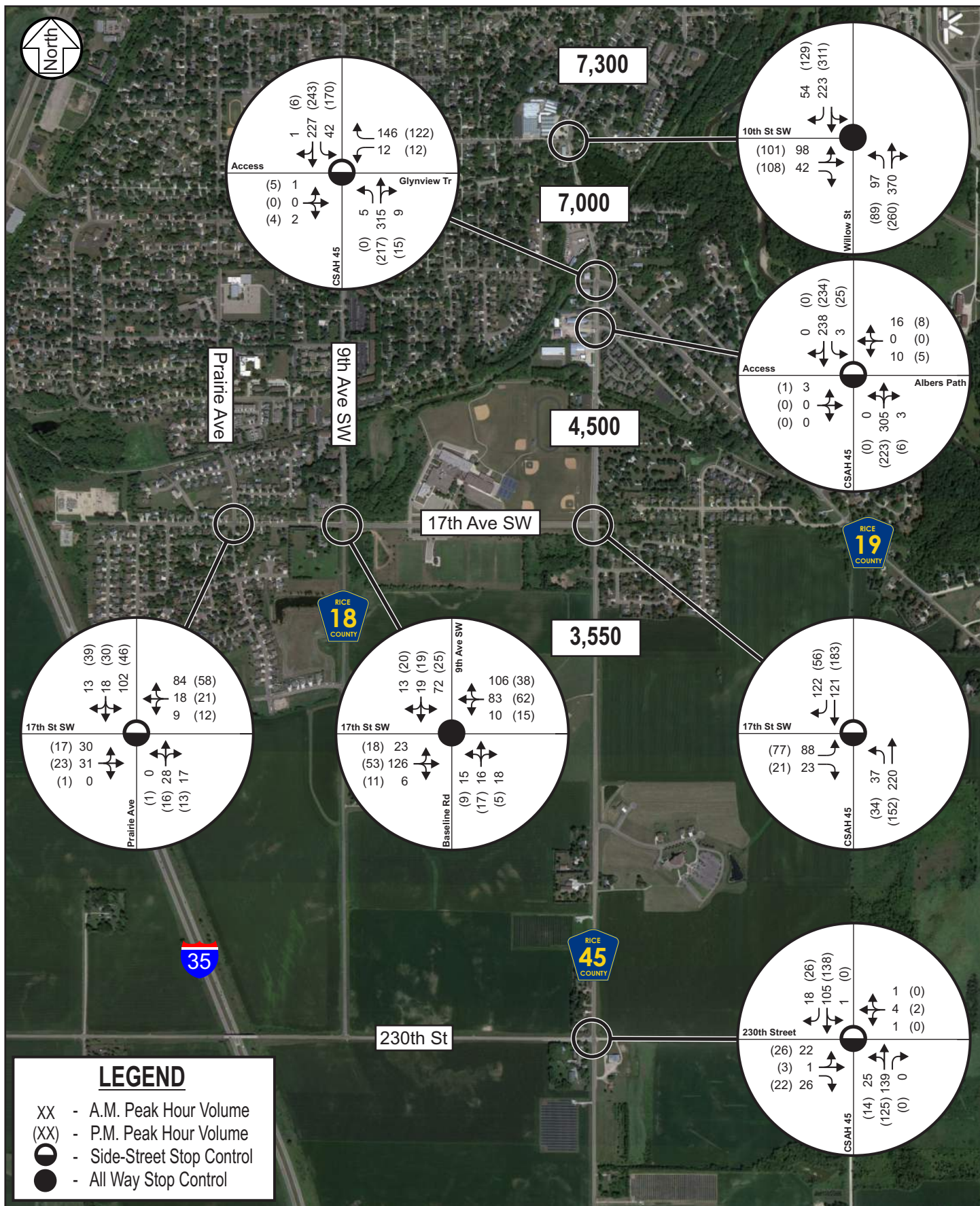
Crash Analysis

A review of historical crashes was performed at the study intersections based on the most recent five-years (2018 to 2022) of reported crashes using MnDOT's Crash Mapping Analysis Tool (MnCMAT). Based on this data, there were a total of 10 crashes reported over the analysis period at the study area intersections. A summary of the crash types by intersection is shown in Table 2. Note, there were two (2) pedestrian/bicycle crashes at the 17th Street SW and 9th Avenue SW intersection and the current crosswalk is observed to be faded at the intersection. Additionally, both trail crossings along CSAH 45 were reviewed and neither location had a reported crash in the analysis period.

Table 2. Crash Summary (2018-2023)

Intersection	Bike	Ped	Left Turn/ Angle	Rear End	Side Swipe	Other	Total
Willow Street/10th Street SW	-	-	-	-	-	-	0
CSAH 45 and Glynview Trail (CSAH 19)	-	-	-	2	1	-	3
CSAH 45 and Albers Path	-	-	-	-	-	-	0
CSAH 45 and 17th Street SW	-	-	1	-	1	-	2
CSAH 45 and 230th Street	-	-	-	-	-	-	0
17th Street SW and 9th Avenue SW/CR 18	1	1	-	-	-	-	2
17th Street SW and Prairie Avenue	-	-	1	1	-	1	3
Total	1	1	2	3	2	1	10

In addition to reviewing the specific crash types that occurred within the study area, overall intersection crash and severity rates were calculated. The overall intersection crash and severity rates were compared to average rates for intersections with similar characteristics. The average crash and severity rates published by MnDOT (2020 intersection Green Sheets) were used for comparison purposes. A higher-than-average rate does not necessarily indicate a significant crash problem. Therefore, the critical rates were calculated to determine the statistical significance of the above average rates. If the actual rates are below the critical rates, crashes that occurred are typically due to the random nature of crashes and not necessarily a geometric design or traffic control issue.



Results of the crash and severity rate analysis, shown in Table 3, indicate that none of the intersections are above the critical crash rate, indicating that there is not a statistically significant crash problem at the intersections. While three (3) of the four (4) intersections are above the average crash rate, the intersections currently have a minimal amount of crashes. Therefore, mitigation is not expected to be necessary based on a crash rate issue. It should be noted that at the CSAH 45 and Glynview Trail (CSAH 19) intersection, there was a Serious Injury type crash. This injury crash puts the intersection over the critical severity rate. However, the crash occurred during construction conditions when a flagger was stopping northbound traffic. Typically, the northbound approach would be free-flow movements, which likely caused a northbound vehicle to rear end another northbound vehicle, causing the injury. Given this unique situation, no mitigation is recommended at this time.

Table 3. Crash and Severity Rate Analysis

Intersection	Crash Rate			Severity Rate		
	Average	Actual	Critical	Average	Actual	Critical
CSAH 45 and Glynview Trail (CSAH 19)	0.128	0.188	0.390	0.311	6.277	5.240
CSAH 45 and 17th Street SW	0.128	0.170	0.440	0.311	0.0	6.650
17th Street SW and 9th Avenue SW/CR 18	0.267	0.236	0.780	0.221	0.0	8.210
17th Street SW and Prairie Avenue	0.128	0.460	0.570	0.311	0.00	10.770

Although not over either a critical crash or severity rate, both crashes at the 17th Street SW and 9th Avenue SW intersection were pedestrian/bicycle related. Both crashes resulted in a Minor Injury crash. One (1) crash involved a school student riding a skateboard across the north approach and another involved a child riding a bicycle and crossing the north approach. Although this crossing is marked, the markings appear to be currently faded. Additionally, the intersection lighting is offset from the crossing. In order to mitigate potential future crashes, it is recommended to upgrade the crossing markings to continental crosswalk markings on the north approach and improve the lighting of the crosswalk. Both crashes were noted a failure to yield right-of-way due to drivers not seeing the pedestrian/bicyclist. As residential development increases to the south and additional recreation facilities are built to the south, there is an opportunity for additional crossings at the intersection, which may require further mitigation if/when sidewalk connections are made.

Intersection Capacity Analysis

An intersection capacity analysis was completed using Synchro/SimTraffic software to establish a baseline condition to which future traffic operations could be compared. Capacity analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are graded from LOS A through LOS F. The LOS results are based on average delay per vehicle, which correspond to the delay threshold values shown in Table 4. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. Overall intersection LOS A through LOS D is generally considered acceptable based on MnDOT guidelines.

Table 4. Level of Service Criteria for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Delay/Vehicle (seconds)	Unsignalized Intersection Average Delay/Vehicle (seconds)
A	≤ 10	≤ 10
B	> 10 - 20	> 10 - 15
C	> 20 - 35	> 15 - 25
D	> 35 - 55	> 25 - 35
E	> 55 - 80	> 35 - 50
F	> 80	> 50

For side-street stop/yield-controlled intersections, special emphasis is given to providing an estimate for the level of service of the side-street approach. Traffic operations at an unsignalized intersection with side-street stop/yield control can be described in two ways. First, consideration is given to the overall intersection level of service. This takes into account the total number of vehicles entering the intersection and the capability of the intersection to support these volumes.

Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, the majority of delay is attributed to the side-street approaches. It is typical of intersections with higher mainline traffic volumes to experience high-levels of delay (i.e. poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during peak hour conditions.

Results of the existing capacity analysis, shown in Table 5, indicate that all study intersections currently operate at an acceptable overall LOS C or better during the a.m. peak hour, and an acceptable overall LOS B or better during the p.m. peak hours, with the existing geometric layout and traffic controls. No significant side-street stop delays or queuing issues were identified. Note, there may be peak five (5) to 10 minute periods before and after school when operations degrade and have higher delays at the CSAH 45/Willow Street/17th Street intersection, however, over the course of the entire peak hour, no issues are expected.

Table 5. Existing Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
Willow Street/10th Street SW ⁽¹⁾	C	18 sec.	B	13 sec.
CSAH 45/Glynview Trail (CSAH 19) ^{(2) (3)}	A/B	14 sec.	A/B	12 sec.
CSAH 45/Albers Path ⁽²⁾	A/C	17 sec.	A/B	14 sec.
CSAH 45/17th Street SW/Willow Street ⁽²⁾	A/B	14 sec.	A/B	12 sec.
CSAH 45/230th Street (CSAH 39) ⁽²⁾	A/B	12 sec.	A/B	11 sec.
17th Street SW/9th Avenue SW/CR 18 ⁽¹⁾	B	10 sec.	A	8 sec.
17th Street SW and Prairie Avenue ⁽²⁾	A/B	13 sec.	A/B	10 sec.

(1) Indicates an unsignalized intersection with an all-way stop control where the overall LOS and delay is shown.

(2) Indicates an unsignalized intersection with side-street stop control, where the overall LOS is shown followed by the worst side-street approach LOS. The delay shown represents the worst side-street approach delay.

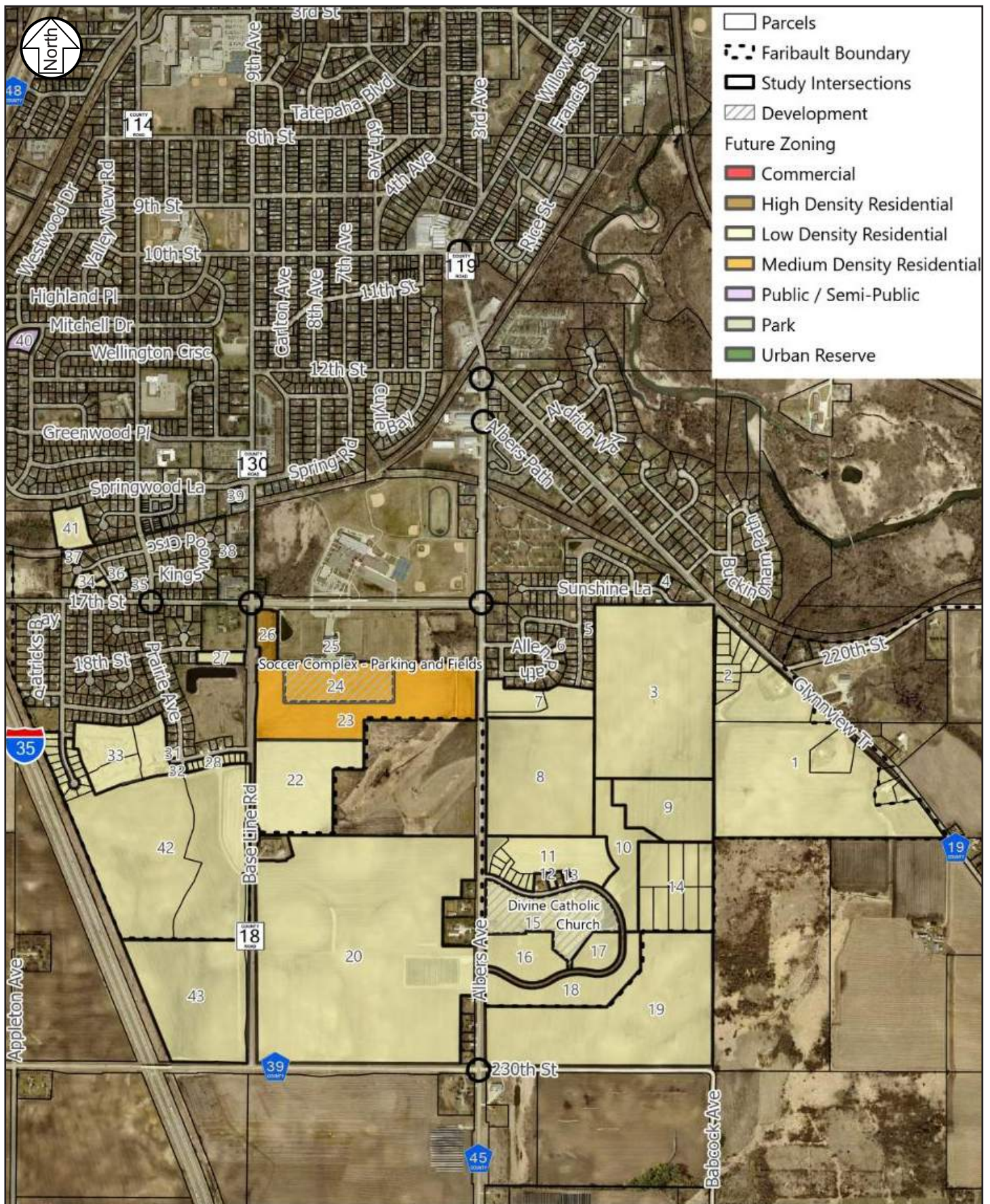
(3) Delay is shown for westbound CSAH 19

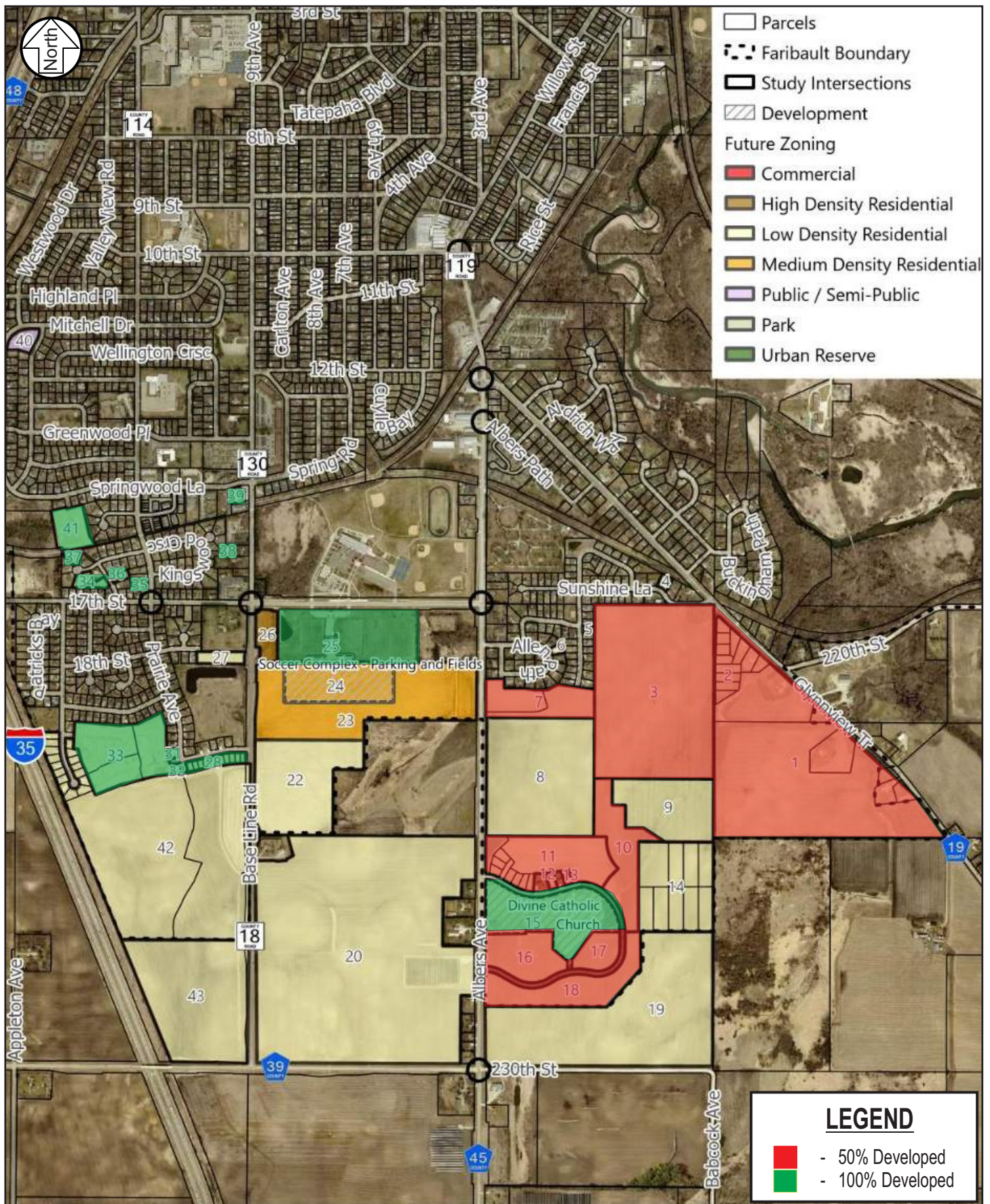
Proposed Future Land Use Development

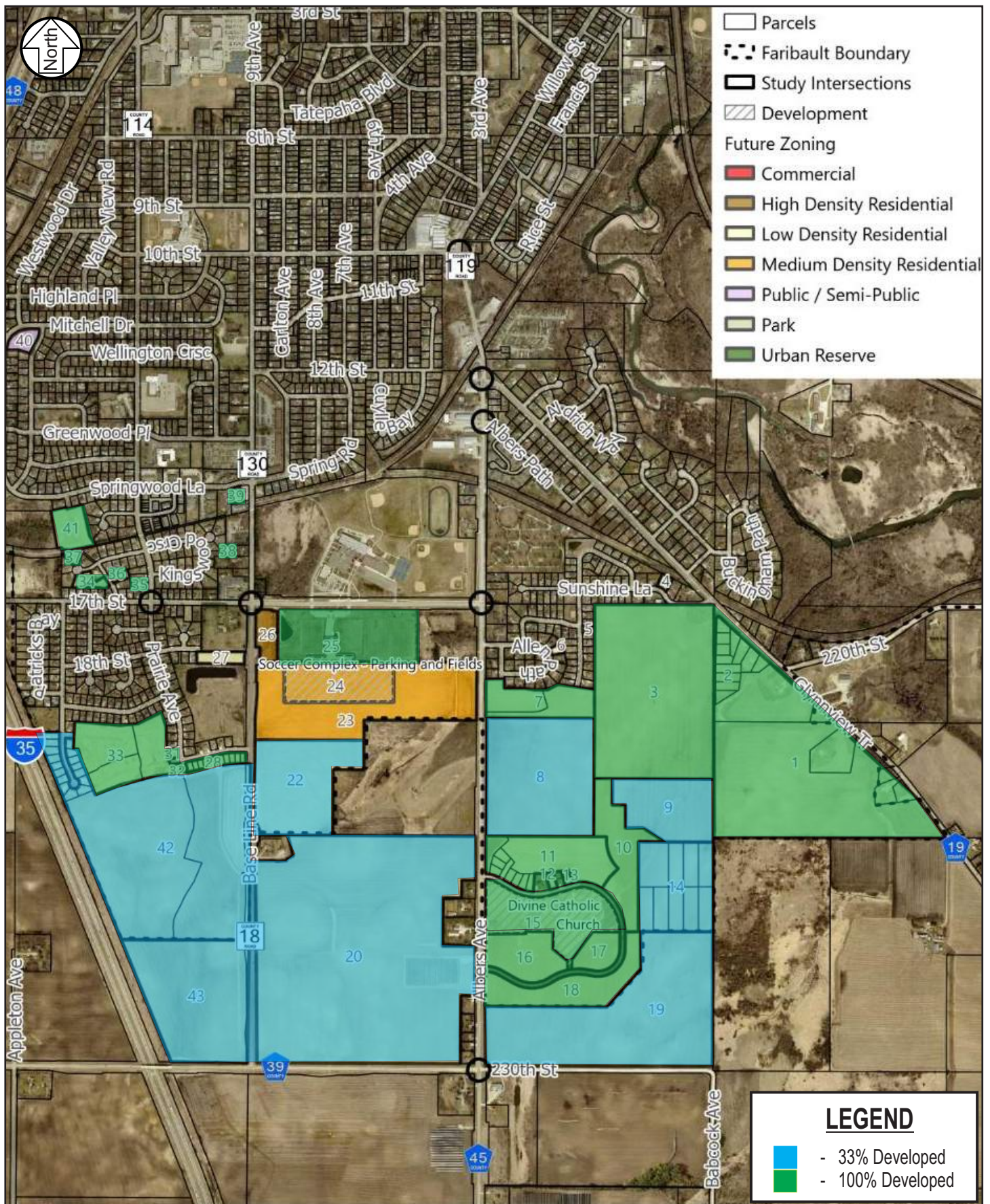
The City of Faribault currently has developed a future land use plan for the city, as shown in Figure 3. The majority of these parcels are generally bounded by I-35 to the west, 17th Avenue to the north, CSAH 19 to the east, and 230th Street to the south, with the remaining parcels spread throughout the already developed portion of the City. The land use plan shown in Figure 3 represents the full future long-term growth of the City that could be recognized in the next 40 to 50 years. It is expected that development will occur incrementally over time and as such, development assumptions were made for year 2033 and 2043.

As shown in Figure 4, there are a number of parcels that are expected to develop by year 2033. This includes expansion of the Faribault Soccer Complex with a recreational community center, additional student enrollment at Divine Mercy Catholic School, an apartment development that SRF previously studied in the southwest quadrant of CSAH 45 and 17th Street, and residential developments of mostly low density housing. As shown in Figure 4, residential developments between CSAH 45 and CSAH 19 are assumed to be approximately 50 percent developed. By year 2043, it is assumed that a number of parcels would be expected to be 100 percent developed, with the remaining parcels approximately 33 percent developed. These parcel assumptions are shown in Figure 5.

In total, the current land use plan provided by the City consists of 1,039 single-family detached housing units, 490 single-family attached housing units, and 475 low-rise multi-family units. Based on the assumptions listed above, it is estimated that approximately 25 percent of the potential parcel development would occur by year 2033, and approximately 50 percent of total potential parcel development is accounted for by year 2043. Further review of the parcel data collection is completed in the following sections for the approximate development percentages.







Traffic Forecasts

To identify potential impacts associated with the proposed development, traffic forecasts for year 2033 and 2043 conditions were developed. The year 2033 and 2043 traffic forecasts take into account growth from the land uses identified within the Faribault Land Use Plan and the development level assumptions previously discussed.

Background Traffic Growth

To account for general background growth in the area not associated with the parcel developments, an annual growth rate of one (1) percent was applied to the existing peak hour traffic volumes to develop year 2033 and 2043 background forecasts. This growth rate was developed using a combination of historical average daily traffic (ADT) volumes published by MnDOT, the *Faribault Apartment Traffic Study* from 2022, and engineering judgment. It is meant to help represent a conservative estimate of the potential area growth.

Land Use Growth Trip Generation

To account for traffic impacts associated with the undeveloped parcel growth, trip generation estimates for the proposed land uses were developed for the a.m. and p.m. peak hours and a daily basis for both year 2033 and year 2043 land use growth assumptions. These estimates, shown in Table 6 and Table 7, were developed using the *ITE Trip Generation Manual, 11th Edition*. Note that no multi-use or pass-by reductions were applied due to the residential nature of the majority of the proposed land use growth. As previously noted, it was assumed that development would generally develop starting in the northern portions of the study area before moving to the southern part of the study area, and that the recreational community center and school expansion would be fully completed by year 2033.

Table 6. Proposed Development Trip Generation Estimate – Year 2033

Land Use Type (ITE Code)	Size	A.M. Peak Hour		P.M. Peak Hour		Daily Trips
		In	Out	In	Out	
Single-Family Detached Housing (210)	251 DU	44	132	149	87	2,367
Low-Rise Multi-Family (220)	150 DU	14	46	48	28	1,011
Mid Rise Multi Family (221) ⁽¹⁾	186 DU	16	53	44	29	844
Recreational Community Center (495)	50,000 SF	63	33	59	66	1,441
Elementary School (520)	150 Students	60	51	11	13	341
Total		197	315	311	223	6,004

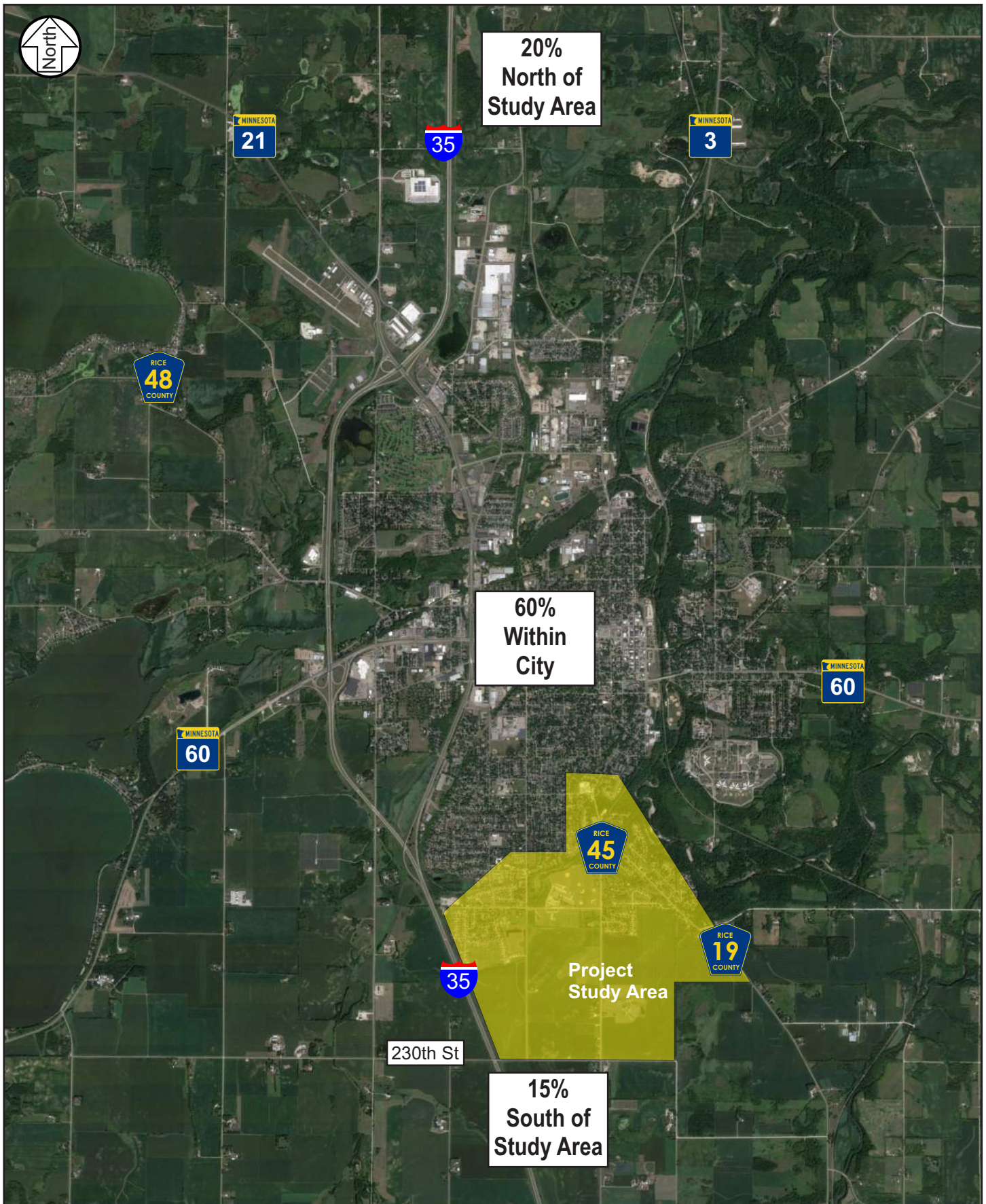
(1) From the Faribault Apartments Traffic Study

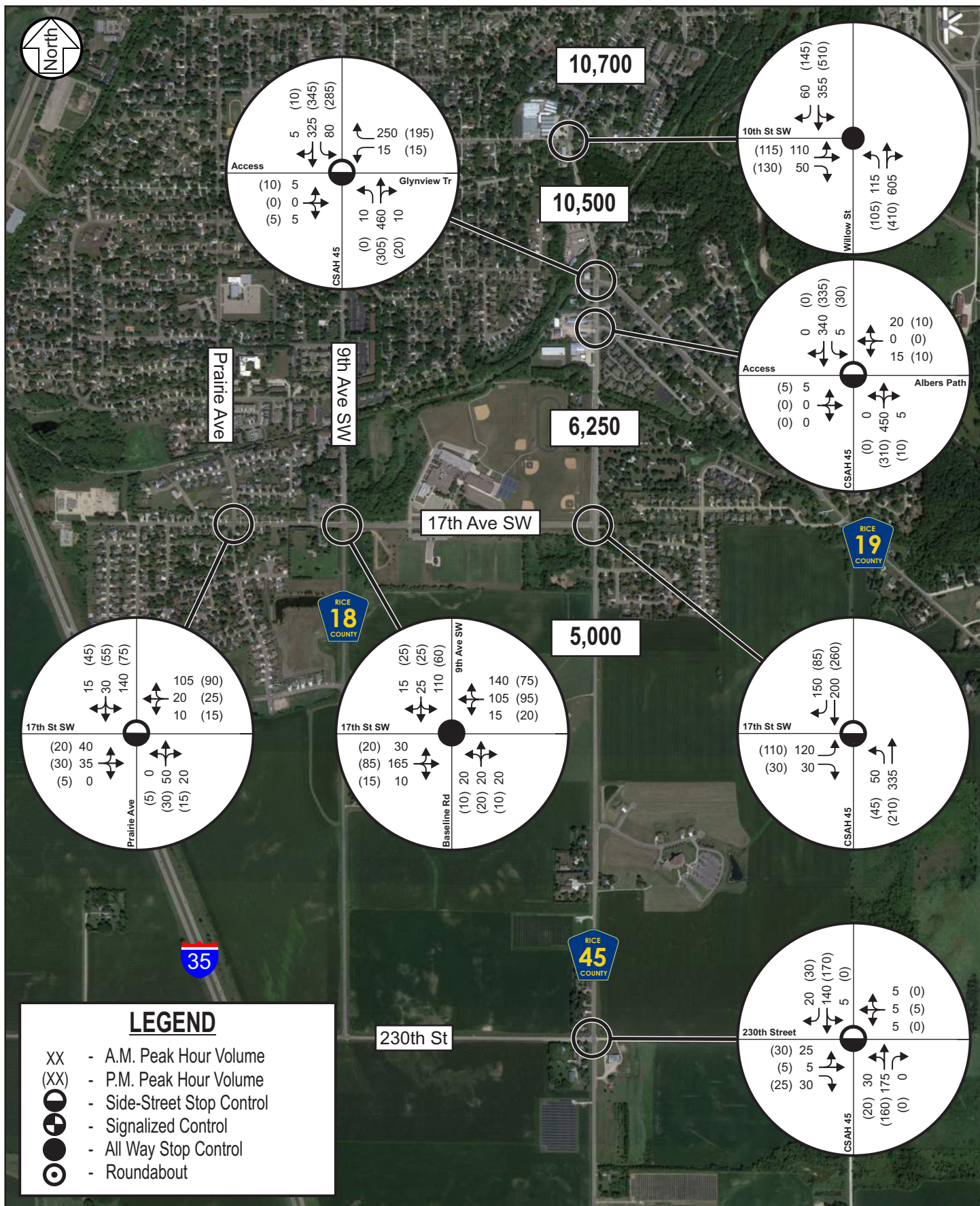
Table 7. Proposed Development Trip Generation Estimate – Year 2043

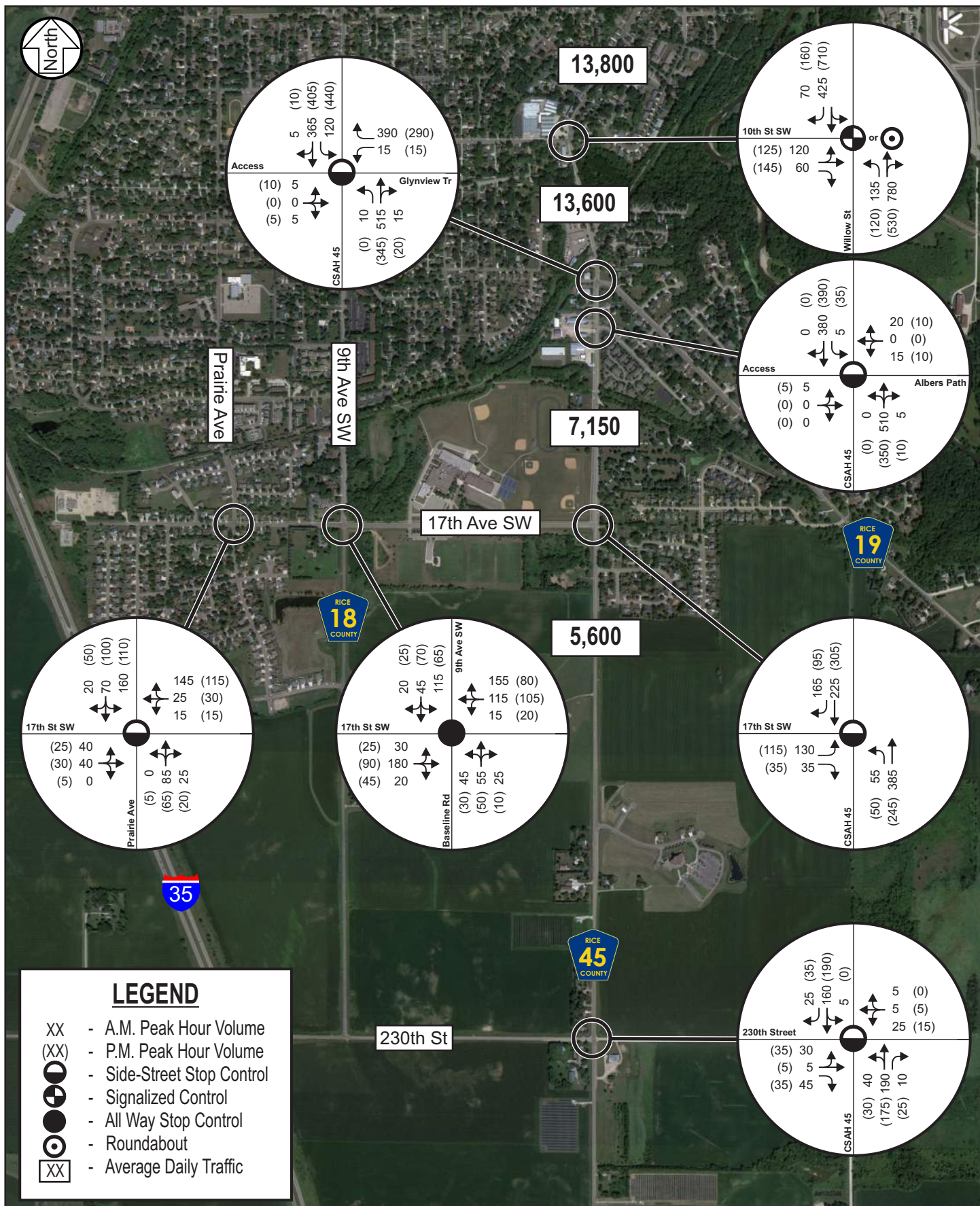
Land Use Type (ITE Code)	Size	A.M. Peak Hour		P.M. Peak Hour		Daily Trips
		In	Out	In	Out	
Single-Family Detached Housing (210)	650 DU	114	341	385	226	6,130
Single-Family Attached Housing (215)	163 DU	20	59	55	38	1,174
Low-Rise Multi-family (220)	358 DU	34	109	115	68	2,413
Mid Rise Multi Family (221) ⁽¹⁾	186 DU	16	53	44	29	844
Recreational Community Center (495)	50,000 SF	63	33	59	66	1,441
Elementary School (520)	150 Students	60	51	11	13	341
Total		307	646	669	440	12,343

(1) From the Faribault Apartments Traffic Study

Results of the 2033 trip generation estimate indicate that the land use growth is expected to generate approximately 512 a.m. peak hour, 534 p.m. peak hour, and 6,004 daily trips. The trips generated were distributed throughout the area based on the directional distribution shown in Figure 6, which was developed based on existing travel patterns, the *Faribault Apartment Traffic Study* and engineering judgement. By year 2043, the land use growth is expected to comprise of 953 a.m. peak hour, 1,108 p.m. peak hour, and 12,343 daily trips. Similarly, these trips were distributed throughout the network based on the distribution shown in Figure 6. The resultant year 2033 and 2043 traffic forecasts, which include general area background growth and trips generated by the land use growth, are shown in Figure 7 and Figure 8, respectively.







Year 2033 Build Conditions

To determine how the study intersections will operate under a shorter-term, year 2033 conditions, an intersection capacity analysis was completed using Synchro/SimTraffic software. Results of the analysis, summarized in Table 8, indicate that all study intersections are expected to continue to operate at an acceptable overall LOS B or better during the weekday a.m. and p.m. peak hours, except the Willow Street and 10th Street SW intersection, which is expected to operate at an unacceptable overall LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. This level of delay will likely cause the need for traffic control modification or lane modifications. The intersection is currently all-way stop controlled and has two (2) lanes on each approach. Given the existing control and geometry, it is expected that the intersection will need to be modified to traffic signal control or a roundabout. Note, it is expected that the intersection will begin to degrade in LOS once daily traffic volumes along Willow Street reach approximately 9,000 to 9,500 vehicles per day (vpd).

Table 8. 2033 Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
Willow Street/10th Street SW ⁽¹⁾	F	57 sec.	E	37 sec.
CSAH 45/Glynview Trail (CSAH 19) ⁽²⁾⁽³⁾	A/C	19 sec.	A/C	15 sec.
CSAH 45/Albers Path ⁽²⁾	A/C	21 sec.	A/B	18 sec.
CSAH 45/17th Street SW/Willow Street ⁽²⁾	A/C	18 sec.	A/B	15 sec.
CSAH 45/230th Street (CSAH 39) ⁽²⁾	A/B	14 sec.	A/B	12 sec.
17th Street SW/9th Avenue SW/CR 18 ⁽¹⁾	B	10 sec.	A	9 sec.
17th Street SW and Prairie Avenue ⁽²⁾	A/B	14 sec.	A/B	12 sec.

(1) Indicates an unsignalized intersection with an all-way stop control where the overall LOS and delay is shown.

(2) Indicates an unsignalized intersection with side-street stop control, where the overall LOS is shown followed by the worst side-street approach LOS. The delay shown represents the worst side-street approach delay.

(3) Note, approach delay is for westbound CSAH 19.

Improvement Conditions

Based on the expected delays at the Willow Street and 10th Street SW intersection, a traffic control change is expected to be needed by year 2033 or once daily volumes reach approximately 9,000 to 9,500 vpd. Therefore, operations analysis was completed to determine the potential operations of two (2) alternatives, a traffic signal and a single lane roundabout. Note, geometric improvements (i.e. additional lanes) were not considered at this location given the existing turn lanes already in place. Note, a potential roundabout construction would likely have significant right-of-way impacts. Any additional turn lanes or thru lanes at the existing all-way stop would likely result in driver confusion about which motorist has the right-of-way to proceed and a traffic control change would likely be needed to mitigate the driver confusion issues. With a roadway expansion it is expected that there would be significant right-of-way (i.e. land acquisition) impacts given then adjacent housing and commercial space.

Additionally, based on the volumes, expanding CSAH 45 to a four-lane facility is not expected to be necessarily from a corridor perspective with daily volumes of approximately 10,500 to 10,700 north and south of the intersection.

An operations analysis was completed to identify the change in operations with the proposed traffic control modification options. Results of the operations analysis for the alternatives are shown in Table 9. Note, the traffic signal was assumed to be analyzed with the existing geometry of the intersection, while the roundabout is assumed to be a single lane roundabout. Both traffic control alternatives are expected to yield acceptable overall LOS B or better during the peak hours. Further review of the potential roundabout size and land needs would need to be completed to determine which alternative would be most feasible for this location.

Table 9. 2033 Build Intersection Capacity Analysis – With Improvements

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
Willow Street/10th Street SW – Traffic Signal	A	8 sec.	A	9 sec.
Willow Street/10th Street SW – Roundabout	B	10 sec.	B	10 sec.

Other Considerations

Although not needed from an intersection operations perspective, there could be consideration of a single lane roundabout at the CSAH 45 and 17th Street intersection. A roundabout can serve as a gateway type treatment where the roadway transitions from a rural high speed roadway to an urban, lower speed type facility. Note, the speed limit transitions from 55 mph to 40 mph south of 17th Street, however, there can be a perception of vehicles traveling at a higher rate of speed heading north into the main part of Faribault. Additionally, this intersection serves as a key pedestrian crossing location with several trails, recreation facilities, and schools nearby. With a desire for calmer traffic, a roundabout can reduce area travel speeds and offer a gateway type transition into the City. This improvement should be considered long-term, and would be expected to operate acceptably. Note, while not specifically studied at the CSAH 45 and 17th Street intersection, it has been noted that during the after school peak hour, the current side-street stop control can experience high levels of delay for 15 minutes after school dismissal. A roundabout control would be expected to mitigate the short-duration queueing and delay issues.

Year 2043 Build Conditions

To determine how the study intersections will operate under long-term, under year 2043 conditions, an intersection capacity analysis was once again completed using Synchro/SimTraffic software. These results will assist in long-term planning for improvements for the area. Note, results for the Willow Street and 10th Street SW intersection are shown for both a traffic signal and single lane roundabout, given the potential improvements previously recommended from the year 2033 analysis. Results of the analysis, summarized in Table 10, indicate that all study intersections are expected to operate at an acceptable overall LOS C or better during the weekday a.m. and p.m. peak hours.

Table 10. 2043 Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
Willow Street/10th Street SW – Traffic Signal	A	9 sec.	B	10 sec.
Willow Street/10th Street SW – Roundabout	C	19 sec.	C	16 sec.
CSAH 45/Glynview Trail (CSAH 19) ^{(1) (2)}	C/E	47 sec.	B/C	23 sec.
CSAH 45/Albers Path ⁽¹⁾	A/C	24 sec.	A/C	20 sec.
CSAH 45/17th Street SW/Willow Street ⁽¹⁾	A/C	22 sec.	A/C	18 sec.
CSAH 45/230th Street (CSAH 39) ⁽¹⁾	A/B	14 sec.	A/B	14 sec.
17th Street SW/9th Avenue SW/CR 18 ⁽³⁾	B	12 sec.	B	10 sec.
17th Street SW and Prairie Avenue ⁽¹⁾	B/C	20 sec.	A/C	15 sec.

(1) Indicates an unsignalized intersection with side-street stop control, where the overall LOS is shown followed by the worst side-street approach LOS. The delay shown represents the worst side-street approach delay.

(2) Note, approach delay is for westbound CSAH 19.

(3) Indicates an unsignalized intersection with an all-way stop control where the overall LOS and delay is shown.

While overall operations are expected to be acceptable, there are a few movements at intersections where delays are expected to reach unacceptable levels. In particular, the westbound left-turn at the CSAH 45 and Glynview Trail (CSAH 19) intersection is expected to have delays that exceed 40 seconds during the a.m. peak hour and over 150 seconds during the p.m. peak hour. These delays could result in 95th percentile queues of approximately 10 vehicles. While not shown in the table with the primary focus on operations for CSAH 19, the private commercial business on the eastbound approach of the CSAH 45 and Glynview Trail (CSAH 19) intersection is expected to have delays that exceed over three (3) minutes during the a.m. and p.m. peak hours. While the number of vehicles is expected to be low, delays of this magnitude can lead to unsafe/risky maneuvers and cause safety issues at the intersection. Given the potential side-street delays and safety issues, mitigation for the intersection should be considered. Note, the intersection currently has mainline left-turn lanes along CSAH 45, along with a dedicated westbound right and left-turn lane. Therefore, the following mitigations are offered for consideration:

- Willow Street Roadway Expansion from three (3) lanes to four (4) lanes between Albers Path and 10th Street
 - Forecasted traffic volumes (approaching 14,000 vpd) are expected to be on the higher end of the existing three (3) lane roadway capacity.
 - Pedestrian crossings become less safe and a multi-lane threat is developed
 - Potential for no dedicated turn lanes due to right-of-way constraints
 - If the roadway is kept as a three (3) lane facility, there is potential some north/south traffic along CSAH 45 may divert to an adjacent parallel route (likely 9th Avenue SW)

- Any potential interchange additions along I-35 were not considered within this study and would likely impact traffic forecasts along CSAH 45.
- Install a traffic signal with current geometry
- Construct a single lane roundabout
 - A roundabout will likely have significant impacts to adjacent commercial properties.

An operations analysis was completed to identify the change in operations with the proposed traffic control modification options at the CSAH 45 and Glynview Trail (CSAH 19) intersection. Results of the operations analysis for the alternatives are shown in Table 11. Note, the traffic signal was assumed to be analyzed with the existing geometry of the intersection, while the roundabout is assumed to be a single lane roundabout. Both traffic control alternatives are expected to yield acceptable overall LOS B during the peak hours without additional lane geometry. Further review of the potential roundabout size and land needs would need to be completed to determine which alternative would be most feasible for this location.

Table 11. 2033 Build Intersection Capacity Analysis – With Improvements

CSAH 45/Glynview Trail (CSAH 19) Intersection Alternatives	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 45/Willow Street 4 Lanes	A/C	20 sec. ⁽¹⁾	A/C	20 sec. ⁽¹⁾
Traffic Signal	B	11 sec.	B	14 sec.
Roundabout	B	11 sec.	B	120 sec.

(1) Note, approach delay is for westbound CSAH 19.

While the four-lane section along CSAH 45 would improve some operations at the intersection, it is still expected that the small number of vehicles on the eastbound approach would have delays over three (3) minutes. Additionally, while the westbound right-turn delay would have significant improvement, the westbound left-turn is still expected to have delays between 40 to 150 seconds during the peak hours, which is similar to the existing configuration of the intersection. Therefore, the additional lane expansion is not expected to have a significant positive impact on the intersection operations. Note, it is expected that with a four-lane section of CSAH 45/Willow Street, the 10th Street intersection would not be able to operate acceptably with the current all-way stop control and would still be expected to need a traffic control change. Given the significant impacts of a roadway expansion and the potential that traffic control changes may be necessary at both CSAH 45/Willow Street intersections with 10th Street SW and Glynview Trail (CSAH 19), the roadway expansion option may not be desirable.

Mitigation Summary

The following mitigation summary is offered for consideration for the potential traffic control and roadway geometric modifications for year 2033 and year 2043 conditions.

Existing

17th Street SW and 9th Avenue SW/CR 18

1. Improve the crosswalk on the north side to a continental crosswalk and improve lighting of the crosswalk on the north approach.

2033

Willow Street and 10th Street SW

2. Install a traffic signal with existing geometry
3. Construct a single lane roundabout
 - Both options expected to allow for acceptable operations.
 - A roundabout may require obtaining right-of-way and impacting several businesses access and frontage.
 - A roundabout may offer an opportunity to consolidate access near the intersection, however, it may also require access restrictions.

CSAH 45 and 17th Street SW

4. Construct a single lane roundabout
 - Not needed from an operations perspective, however, it will allow for acceptable operations and it is expected to improve before/after school operations.
 - Would provide a gateway effect as vehicles enter/exit the main part of Faribault
 - Would reduce travel speeds along CSAH 45.
 - Slower speeds, combined with potential crosswalk enhancements should provide for safer pedestrian crossings at the intersection.

2043

CSAH 45/Willow Street from Albers Path to 10th Street

5. Consider a roadway expansion from three (3) lanes to four (4) lanes based on forecasted traffic volumes (approaching 14,000 vpd).

- Northern Termini – North of 10th Street
- Southern Termini – Could be constructed to expand between Albers Path and Glynview Trail (CSAH 19) or could be constructed as a free westbound right-turn add lane from Glynview Trail (CSAH 19) to the north and a trapped southbound left-turn from CSAH 45 to Glynview Trail (CSAH 19).
- A roadway expansion would have significant impacts to commercial and residential access on the corridor.
- Even with a corridor roadway expansion, there is still a need for traffic control improvement at the Willow Street and 10th Street intersection and potentially the CSAH 45 and Glynview Lane (CSAH 19) intersection as some movements would be expected to have significant delays.
- Pedestrian crossings become less safe and a multi-lane threat is developed.
- Potential for no dedicated turn lanes due to right-of-way constraints.
- If the roadway is kept as a three (3) lane facility, there is potential some north/south traffic along CSAH 45 may divert to an adjacent parallel route (likely 9th Avenue SW).
- Any potential interchange additions along I-35 were not considered within this study and would likely impact traffic forecasts along CSAH 45.

CSAH 45 and Glynview Lane (CSAH 19)

6. Install a traffic signal with existing geometry
7. Construct a single lane roundabout
 - Both options expected to allow for acceptable operations
 - A roundabout may require obtaining right-of-way and impacting several businesses.
 - A roundabout may offer an opportunity to consolidate access near the intersection, however, it may also require access restrictions.

Trail Crossing Review

A review of the two (2) trail crossings along CSAH 45 within the study area at the North and South Branches of the Straight River Trail, which is a city-operated trail (herein referred to as the North Trail and South Trail), was completed to identify any issues and recommend potential improvements for consideration. The trail crossings were reviewed to determine if any potential enhancements are recommended for safe crossings. The study followed guidance from the Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations from the Federal Highway Administration (FHWA STEP Guide) and Dakota County. Both sets of guidelines are attached in the Appendix.

Based on counts completed, there were 122 and 99 trail users crossing CSAH 45 using the North Trail and South Trail, respectively. The North Trail crosses a three-lane section of CSAH 45 that has a speed limit of 30 mph, while the South Trail crosses a two-lane section of CSAH 45 that has a speed limit of 40 mph. Note, vehicle speeds near the south trail were observed to have 85th percentile speeds of 43 mph. Approximate existing daily traffic volumes are 7,000 vpd near the North Trail and 4,500 vpd near the South Trail.

Both trail crossings currently feature continental crosswalk striping, along with combined bicycle/pedestrian (W11-15) warning signs with fluorescent yellow-green backgrounds in both the northbound and southbound directions. The W11-15 signs are also used in conjunction with a trail crossing (W11-15P) plaque and a diagonal downward pointing arrow (W16-7P) plaque. Both crossings also feature advanced warning signs (W11-15/W11-15P) in both directions. Note that only the North Trail crossing has lighting.

Currently, the City of Faribault does not have pedestrian crossing guidelines, therefore a review of the FHWA STEP Guide was completed. The guidelines provide the most up-to date research and experiences and are constantly being updated to adapt to changing technologies and outcomes of pedestrian crossing studies and are attached to this report for reference. Based on the guidelines, the following pedestrian crossing treatments should be considered:

- **North Trail:** For three-lane roadways without a raised median and a posted speed limit less than or equal to 30 mph:
 - High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs should always be considered, but not mandated or required, based upon engineering judgement at a marked uncontrolled crossing location.
 - Raised crosswalks, advance yield here to (stop here for) pedestrians signs and yield (stop) lines, in-street pedestrian crossing signs, curb extensions, raised crosswalks, pedestrian refuge islands, Rectangular rapid-flashing beacons (RRFB) and pedestrian hybrid beacons (PHB) are candidate treatments at a marked uncontrolled crossing location.

- **South Trail:** For two-lane roadways with a posted speed limit greater than or equal to 40 mph:
 - High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs should always occur in conjunction with other identified countermeasures.
 - Curb extensions and pedestrian refuge islands are candidate treatments at marked uncontrolled crossing locations.
 - Rectangular rapid-flashing beacons (RRFB) and pedestrian hybrid beacons (PHB) should always be considered, but not mandated or required, based upon engineering judgement at a marked uncontrolled crossing location.

In addition to the FHWA STEP Guide, SRF recently developed Pedestrian Crossing Guidelines for Dakota County to capture a more detailed review of crossing enhancements. Based on existing volumes, both crossing locations have an AADT between 4,000 and 9,000. Following the Dakota County Crossing Guidelines, the following recommendations for enhancements were determined for both crossings:

- **North Trail:** For three-lane roadways without a raised median and a posted speed limit less than or equal to 30 mph:
 - M&S1: High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs.
- **South Trail:** For two-lane roadways with a posted speed limit greater than or equal to 40 mph:
 - M&S1: High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs.

Based on a review of both the FHWA and Dakota County guidelines, the North Trail crossing is currently adequately marked and signed along with having existing lighting. There is not an opportunity for a geometric enhancement such as curb extensions or a median refuge, without removing the southbound left-turn lane in the residential roadway to the east. If the southbound left-turn lane was eliminated, a median refuge area could be considered.

At the South Trail crossing, there is adequate signing and striping in place, however, there is an opportunity for improved lighting at the crossing. Additionally, given the wide shoulders and likely lack of need for on-street parking, the City or County could consider constructing curb extensions for the crossing to provide enhancement visibility for pedestrians/bicyclists. Curb extensions could be constructed with minimal impact to the current roadway.

Based on the findings from the guidance review and the current volume levels along the corridor, rectangular rapid flashing beacons (RRFB) is not currently recommended at either crossing location as sufficient gaps for pedestrians currently exist. As corridor volumes increase into the future, further evaluation of the crossings should be completed.

Summary and Conclusions

The following study conclusions and recommendations are offered for consideration:

- 1) There were a total of 10 crashes reported over the analysis period at the study area intersections
- 2) There were two (2) pedestrian/bicycle crashes at the 17th Street SW and 9th Avenue SW intersection and the current crosswalk is observed to be faded at the intersection
 - a. In order to mitigate potential future crashes, it is recommended to upgrade the crossing markings to continental crosswalk markings on the north approach and improve the lighting of the crosswalk.
- 3) None of the intersections are above the critical crash rate, indicating that there is not a statistically significant crash problem at the intersections
- 4) Results of the existing intersection capacity analysis indicate that the study intersections currently operate at an acceptable overall LOS C or better during the a.m. and p.m. peak hours with the existing geometric layout and traffic controls. No significant side-street delays or queueing issues were identified.
- 5) The current land use plan provided by the City consists of 1,039 single-family detached housing units, 490 single-family attached housing units, and 475 low-rise multi-family units. Along with residential development, there is planned to be construction of a recreation center and a school expansion within the study area.
- 6) Based on the assumptions listed above, it is estimated that approximately 25 percent of the potential parcel development would occur by year 2033, and approximately 50 percent of total potential parcel development is accounted for by year 2043
- 7) Results of the 2033 trip generation estimate indicate that the land use growth is expected to generate approximately 512 a.m. peak hour, 534 p.m. peak hour, and 6,004 daily trips.
- 8) By year 2043, the land use growth is expected to comprise of 953 a.m. peak hour, 1,108 p.m. peak hour, and 12,343 daily trips
- 9) Results of the analysis indicate that all study intersections are expected to continue to operate at an acceptable overall LOS B or better during the weekday a.m. and p.m. peak hours, except the Willow Street and 10th Street SW intersection, which is expected to operate at an unacceptable overall LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. This level of delay will likely cause the need for traffic control modification or lane modifications.
 - a. Given the existing control and geometry, it is expected that the intersection will need to be modified to traffic signal control or a roundabout.
 - b. Both traffic control alternatives are expected to yield acceptable overall LOS B or better during the peak hours. Further review of the potential roundabout size and land needs would need to be completed to determine which alternative would be most feasible for this location.

- 10) Although not needed from an intersection operations perspective, there could be consideration of a single lane roundabout at the CSAH 45 and 17th Street intersection.
 - a. A roundabout can serve as a gateway type treatment where the roadway transitions from a rural high speed roadway to an urban, lower speed type facility.
 - b. Note, the speed limit transitions from 55 mph to 40 mph south of 17th Street, however, there can be a perception of vehicles traveling at a higher rate of speed heading north into the main part of Faribault.
 - c. Additionally, this intersection serves as a key pedestrian crossing location with several trails, recreation facilities, and schools nearby. With a desire for calmer traffic, a roundabout can reduce area travel speeds and offer a gateway type transition into the City.
- 11) Results of the year 2043 conditions analysis indicate that all study intersections are expected to operate at an acceptable overall LOS C or better during the weekday a.m. and p.m. peak hours.
 - a. While overall operations are expected to be acceptable, there are a few movements at intersections where delays are expected to reach unacceptable levels. In particular, the westbound left-turn at the CSAH 45 and Glynview Trail (CSAH 19) intersection is expected to have delays that exceed 40 seconds during the a.m. peak hour and over 150 seconds during the p.m. peak hour.
 - b. These delays could result in 95th percentile queues of approximately 10 vehicles
 - c. The private commercial business on the eastbound approach of the CSAH 45 and Glynview Trail (CSAH 19) intersection is expected to have delays that exceed over three (3) minutes during the a.m. and p.m. peak hours.
 - d. While the number of vehicles is expected to be low, delays of this magnitude can lead to unsafe/risky maneuvers and cause safety issues at the intersection.
 - e. Given the potential side-street delays and safety issues, mitigation for the intersection should be considered.
- 12) A roadway expansion from three (3) lanes to four (4) lanes or a modification to a traffic signal or roundabout was considered for the CSAH 45 and Glynview Trail (CSAH 19) intersection.
 - a. Both traffic control alternatives are expected to yield acceptable overall LOS B during the peak hours without additional lane geometry
 - b. While the four-lane section along CSAH 45 would improve operations at the intersection, it is still expected that the small number of vehicles on the eastbound approach would have delays over three (3) minutes. Additionally, the while westbound right-turn delay would have significant improvement, the westbound left-turn is still expected to have delays between 40 to 150 seconds during the peak hours, which is similar to the existing configuration of the intersection. The additional lane expansion is therefore expected to have minimal impact on the intersection operations.

- 13) A detailed mitigation summary, with discussion of each alternative is presented in the Mitigation Summary section, which describes the needs for existing, year 2033, and year 2043 conditions.
- 14) Based on a review of both the FHWA and Dakota County guidelines, the following trail crossing improvements are offered for consideration along CSAH 45:
 - a. North Trail crossing is currently adequately marked and signed along with having existing lighting. There is not an opportunity for a geometric enhancement such as curb extensions or a median refuge, without removing the southbound left-turn lane in the residential roadway to the east. If the southbound left-turn lane was eliminated, a median refuge area could be considered.
 - b. At the South Trail crossing, there is adequate signing and striping in place, however, there is an opportunity for improved lighting at the crossing.
 - i. Given the wide shoulders and likely lack of need for on-street parking, the City or County could consider constructing curb extensions for the crossing to provide enhancement visibility for pedestrians/bicyclists. Curb extensions could be constructed with minimal impact to the current roadway.
 - c. Based on the findings from the guidance review and the current volume levels along the corridor, rectangular rapid flashing beacons (RRFB) is not currently recommended at either crossing location as sufficient gaps for pedestrians currently exist. As corridor volumes increase into the future, further evaluation of the crossings should be completed.