

To: Justin Eilers, Vice President - Housing Development
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From: Matt Pacyna, PE, Principal
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Subject: Mankato Supportive Housing Development Traffic Study

INTRODUCTION

TC2 completed a traffic study for the proposed Supportive Housing Development in the City of Mankato. The subject site, shown in [Figure 1](#), is generally bound by Poplar Street to the west, Sibley Parkway to the north, Dewey Lane to the east, and Linder Avenue to the south. The main objectives of the study are to quantify existing traffic operations within the study area, evaluate potential impacts of the proposed development, and recommend improvements, if necessary, to ensure safe and efficient operations for all users. The following study assumptions, methodology, and findings are offered for consideration.

Figure 1 Subject Site



EXISTING CONDITIONS

Existing conditions were reviewed within the study area to establish current traffic conditions to help determine impacts associated with the proposed development. The evaluation of existing conditions included collecting traffic volumes, observing transportation characteristics, reviewing crash history, and analyzing intersection capacity, which are described in the following sections.

Traffic Volumes

Vehicular intersection turning movement and pedestrian / bicyclist counts were collected on Thursday February 13, 2025 from 7 to 9 a.m. and 3 to 6 p.m. at the following locations.

- Poplar Street and Sibley Parkway
- Poplar Street and Linder Avenue
- Riverfront Drive and Poplar Street
- Riverfront Drive and Stoltzman Road / CR 16
- Riverfront Drive and Marshall Street*
- Riverfront Drive and Sibley Parkway

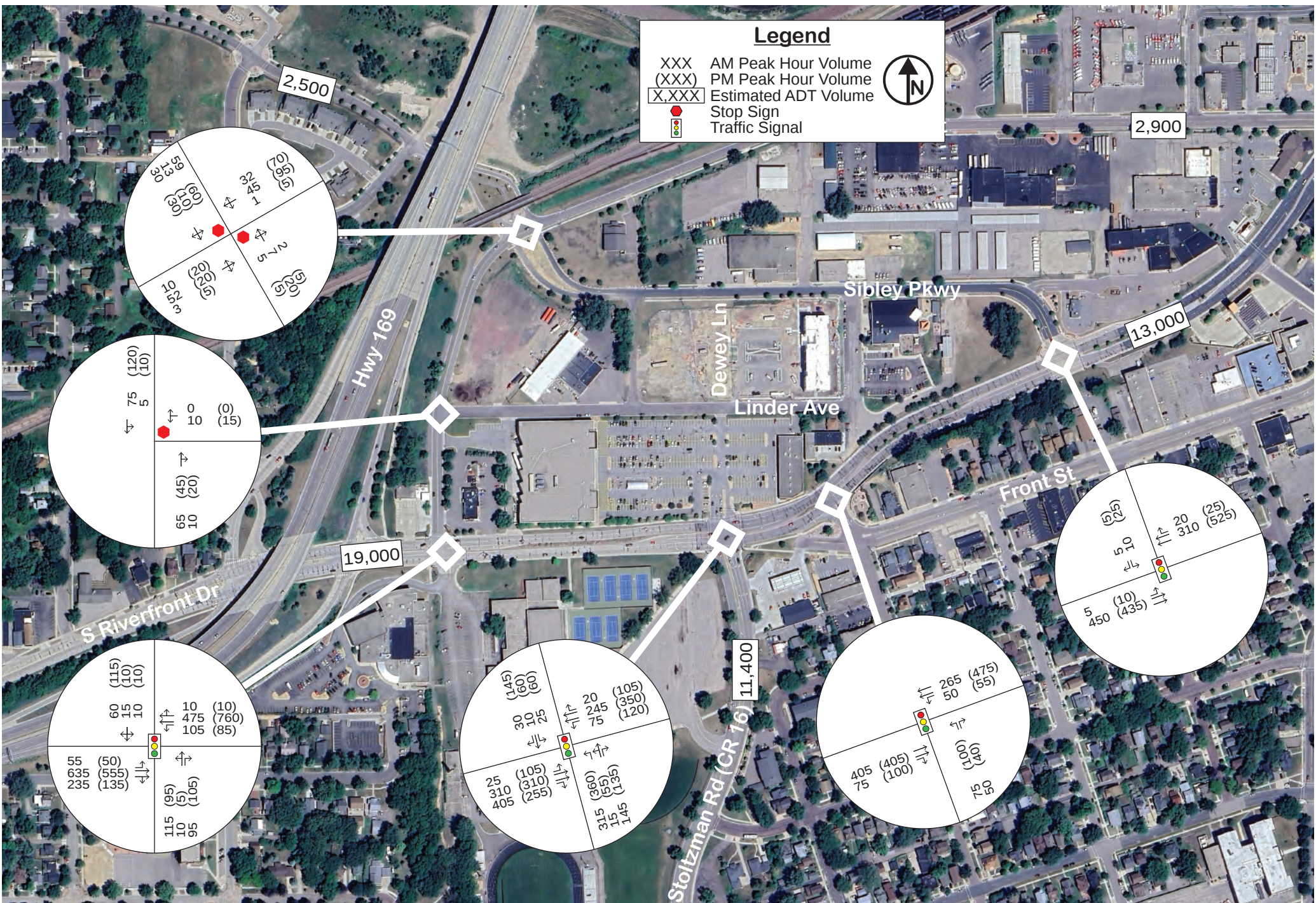
Note that the Marshall Street intersection was estimated based on the adjacent intersection counts and historical traffic data. The a.m. and p.m. peak hours within the study area represent 7:45 to 8:45 a.m. and 3:15 to 4:15 p.m. These time periods coincide with the start / end times associated with the adjacent Mankato West High School which has hours of operation from 8:40 a.m. to 3:35 p.m. Average daily traffic (ADT) volumes were provided by MnDOT or estimated based on the data collected.

Transportation Characteristics

Observations were conducted within the study area to identify various transportation characteristics such as roadway geometry, traffic controls, speed limits, and multimodal facilities. A general overview of key roadways within the study area is as follows:

- **S Riverfront Drive** – a 4-lane divided minor arterial roadway with left- and right-turn lanes at key intersections. There is sidewalk along both sides of the roadway and the speed limit is 30-mph.
- **Stoltzman Road (CR 16)** – a 4-lane undivided minor arterial roadway with left-turn lanes at key intersections. There is sidewalk along the east side of the roadway and the speed limit is 30-mph.
- **Poplar Street** – a 2-lane undivided local roadway with limited turn lanes. There is a multimodal facility (trail or sidewalk) on the west side of the roadway between S Riverfront Drive and Sibley Parkway. East of Sibley Parkway there are on-street bike lanes along both sides of the roadway and a sidewalk on the south side of the roadway. The speed limit is 30-mph.
- **Sibley Parkway** – a 2-lane undivided local roadway with limited turn lanes. There is sidewalk along both sides of the roadway, except a short gap near the proposed development; there is also a multiuse trail to the west of Poplar Street. The speed limit is 30-mph.
- **Linder Avenue** – a 2-lane undivided local roadway with no turn lanes. There is sidewalk along the north side of the roadway between Dewey Lane and Lamm Street. The speed limit is 30-mph.

All other study area roadways are local 2-lane facilities with sidewalk along at least one side of the roadway. The intersections along S Riverfront Drive at Poplar Street, Stoltzman Road (CR 16), Marshall Street, and Sibley Parkway are signalized, while all other study intersections have side-street stop control. Existing geometrics, traffic controls, and volumes within the study area are shown in [Figure 2](#).



Crash History

Five (5) years of crash history were reviewed from 2020 through 2024 using *MnDOT's Crash Mapping Analysis Tool (MnCMAT)*, which identified a total of 50 intersection related crashes within the study area. Most crashes occurred along S Riverfront Drive at Poplar Street (21 crashes), Stolzman Road / CR 16 (23 crashes), Marshall Street (4 crashes), or Sibley Parkway (1 crash); there was one (1) crash that occurred at the Poplar Street / Sibley Parkway intersection. The crash frequency at these intersections is similar to or less than intersections with similar characteristics. In addition, there were no fatal or serious injury crashes reported within the study area. Therefore, there does not appear to be any existing intersection crash issues in the study area. Note that there have been nine (9) crashes at the railroad bridge to the northwest of the Poplar Street / Sibley Parkway intersection.

Intersection Capacity

Intersection capacity was evaluated using Synchro / SimTraffic Software (version 11), which uses methods outlined in the *Highway Capacity Manual, 6th Edition*. The software is used to develop calibrated models that simulate observed traffic operations, account for peaking characteristics, and identify key metrics such as intersection Level of Service (LOS) and queues. These models incorporate collected traffic, pedestrian, and bicyclist volumes, traffic controls, heavy commercial vehicle activity (i.e., buses and trucks), and driver behavior factors. Level of Service (LOS) quantifies how an intersection is operating. Intersections are graded from LOS A to LOS F, which corresponds to the average delay per vehicle values shown. An overall intersection LOS A through LOS D is generally considered acceptable in the study area. LOS A indicates the best traffic operation, while LOS F indicates an intersection where demand exceeds capacity. Existing signal timing was provided by the City and used for the capacity analysis.

Level of Service	Average Delay / Vehicles	
	Stop, Yield, and Roundabout	Signalized Intersections
A	< 10 seconds	< 10 seconds
B	10 to 15 seconds	10 to 20 seconds
C	15 to 25 seconds	20 to 35 seconds
D	25 to 35 seconds	35 to 55 seconds
E	35 to 50 seconds	55 to 80 seconds
F	> 50 seconds	> 80 seconds

For side-street stop-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 control can be described in two ways. First, consideration is given to the overall intersection level of service, which accounts for the total number of vehicles entering the intersection and the capability of the intersection to support the volumes. Second, it is important to consider the delay on the minor approach. Since the mainline does not have to stop, most 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.

The existing intersection capacity analysis results, summarized in [Table 1](#), indicate that all study intersections and approaches operate at an acceptable LOS C or better during the typical weekday a.m. and p.m. peak hours. Existing queues are generally maintained within the turn lanes provided; queues along Stoltzman Road (CR 16) at S Riverfront Drive can extend approximately 200 to 250 feet during the peak period and occasionally impact the Kwik Trip driveways. However, these queues do not significantly impact operations and quickly dissipate. Thus, there are no significant existing operational issues from an intersection capacity perspective.

Table 1 Existing Intersection Capacity

Study Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Poplar Street and Sibley Parkway	SSS	A / A (6)	A / A (7)
Poplar Street and Linder Avenue	SSS	A / A (5)	A / A (5)
Riverfront Drive and Poplar Street	Signal	B (14)	B (12)
Riverfront Drive and Stoltzman Road / CR 16	Signal	B (17)	C (24)
Riverfront Drive and Marshall Street	Signal	A (5)	A (6)
Riverfront Drive and Sibley Parkway	Signal	A (2)	A (3)

SSS – Side-Street-Stop

PROPOSED DEVELOPMENT

The proposed development is generally bound by Poplar Street to the west, Sibley Parkway to the north, Dewey Lane to the east, and Linder Avenue to the south. As proposed, the 1.56 acre project includes a total of 40 multi-family supportive housing units, which includes a combination of studio, one-, and two-bedroom units. The site is currently vacant. For study purposes, the project was assumed to be open for residents in the year 2027.

The existing access along Linder Avenue, which is about 150 feet east of Poplar Street, will provide the only access to the proposed development. The existing access along Poplar Street will be closed as part of the project. A total of 34 parking spaces are proposed, as well as sidewalk along the south, west, and north sides of the property. There are no plans to provide a roundabout at the Poplar Street and Sibley Parkway intersection.



TRAFFIC FORECASTS

Traffic forecasts were developed for year 2028 build conditions, which represents one-year after opening. The traffic forecasts account for general background growth, known adjacent development(s), and trip generation from the proposed development. The following information summarizes the traffic forecast development process.

Background Growth

To account for general background growth in the study area, an annual growth rate of one (1) percent was applied to the existing traffic volumes to develop year 2028 background traffic forecasts. This growth rate is consistent with forecasted growth within the *MAPO 2045 Transportation Plan*. However, it should be noted that historical ADT volumes within the study area have been steady or decreasing over the last 10 years. Therefore, the assumed growth rate provides a relatively conservative estimate for analysis purposes.

Adjacent Developments

Discussion with City staff indicates there are multiple area projects in various planning / development stages. These adjacent projects include the 64-unit Lewis Lofts affordable senior housing development planned to open this spring, as well as approximately 105 townhome / multifamily units planned / under construction to the northwest of the Poplar Street and Sibley Parkway intersection. To account for these adjacent developments, trip generation estimates were developed, and their respective trips were distributed to the adjacent roadway network in a similar pattern as the proposed development. A summary of the adjacent development trip generation is included in [Table 2](#).

Development Trip Generation

Trip generation estimates for the proposed and adjacent developments were created using the *ITE Trip Generation Manual, 11th Edition* and includes trips for typical weekday a.m. and p.m. peak hours, as well as daily. The proposed development, shown in [Table 2](#), is estimated to generate 25 a.m. peak hour (7 in / 18 out), 27 p.m. peak hour (16 in / 11 out), and 290 daily (145 in / 145 out) trips. The adjacent developments are estimated to generate a total of 63 a.m. peak hour (17 in / 46 out), 76 p.m. peak hour (44 in / 32 out), and 960 daily (480 in / 480 out) trips. No modal reductions were applied to provide a more conservative estimate.

Table 2 Trip Generation Summary

Land Use Type (ITE Code)	Size	AM Peak Hour		PM Peak Hour		Daily
		In	Out	In	Out	
<u>Adjacent Developments</u>						
Lewis Lofts (252)	64 units	4	9	9	7	210
NW Area Developments (215)	105 units	13	37	35	25	750
Total Adjacent Development Trips		17	46	44	32	960
<u>Proposed Development</u>						
Affordable Housing (223)	40 units	7	18	16	11	290

Site generated trips for the proposed and adjacent developments were distributed throughout the study area using the directional distribution shown in [Figure 3](#), which is based on a combination of existing area travel patterns and engineering judgment. [Figure 3](#) also shows the proposed and adjacent development site trips at the study intersections. The resultant year 2028 build condition traffic forecasts are illustrated in [Figure 4](#).

YEAR 2028 CONDITIONS

To understand impacts associated with the proposed and adjacent developments, a future intersection capacity analysis was completed for year 2028 build conditions. Results of the year 2028 build capacity analysis shown in [Table 3](#) indicate that all study intersections and approaches are expected to continue to operate at an acceptable LOS C or better during the typical weekday a.m. and p.m. peak hours. Minimal change to intersection delays and queues are expected, which is a result of the relatively low trip generation of the developments, as well as the robust transportation network that provides multiple options for motorists to access the sites. Thus, no operational issues are expected as a result of the area developments from an intersection capacity perspective.

Table 3 Year 2028 Build Intersection Capacity

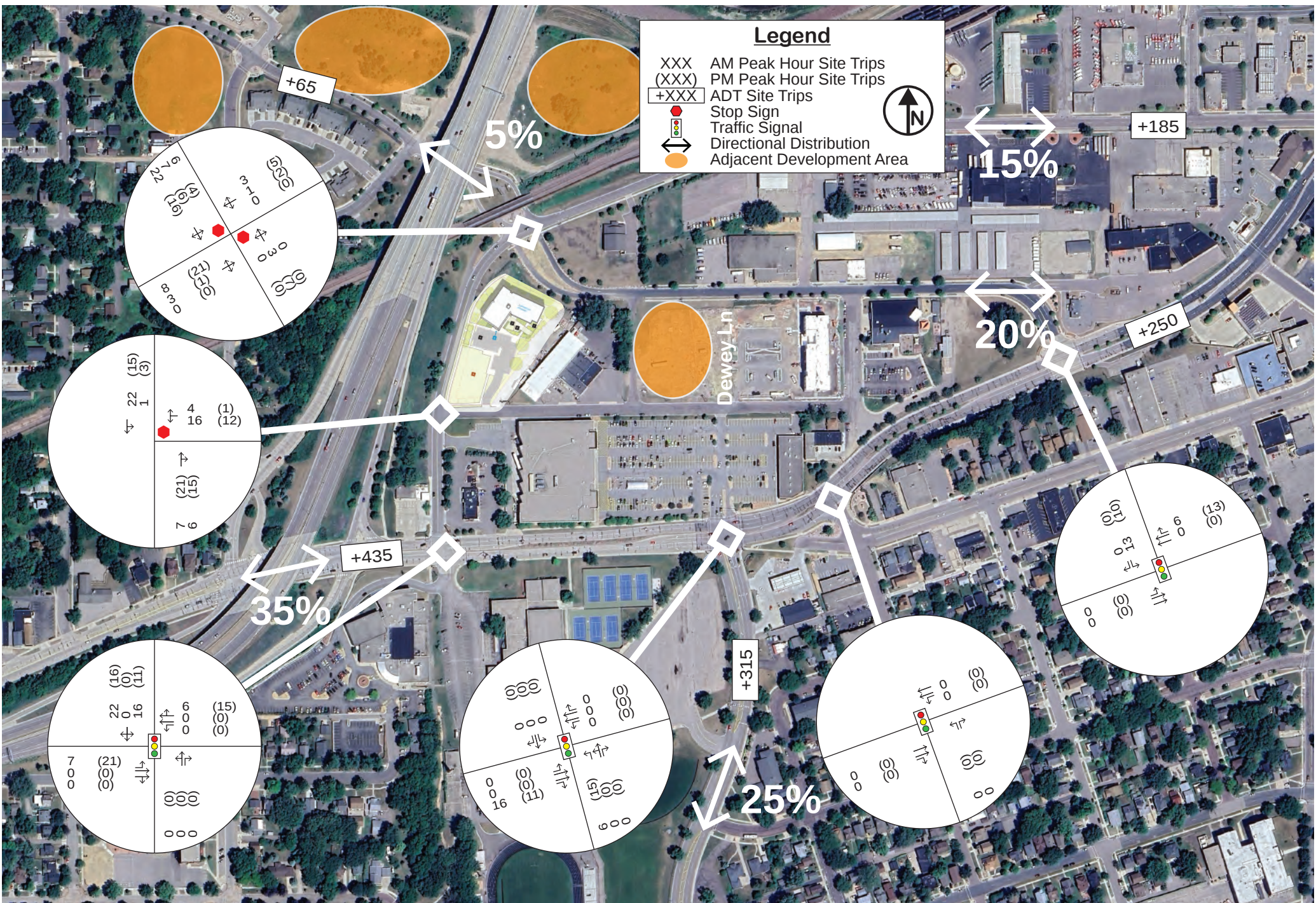
Study Intersection	Traffic Control	Level of Service (Delay)	
		AM Peak Hour	PM Peak Hour
Poplar Street and Sibley Parkway	SSS	A / A (6)	A / A (8)
Poplar Street and Linder Avenue	SSS	A / A (5)	A / A (6)
Riverfront Drive and Poplar Street	Signal	B (15)	B (12)
Riverfront Drive and Stoltzman Road / CR 16	Signal	B (18)	C (24)
Riverfront Drive and Marshall Street	Signal	A (6)	A (6)
Riverfront Drive and Sibley Parkway	Signal	A (3)	A (4)

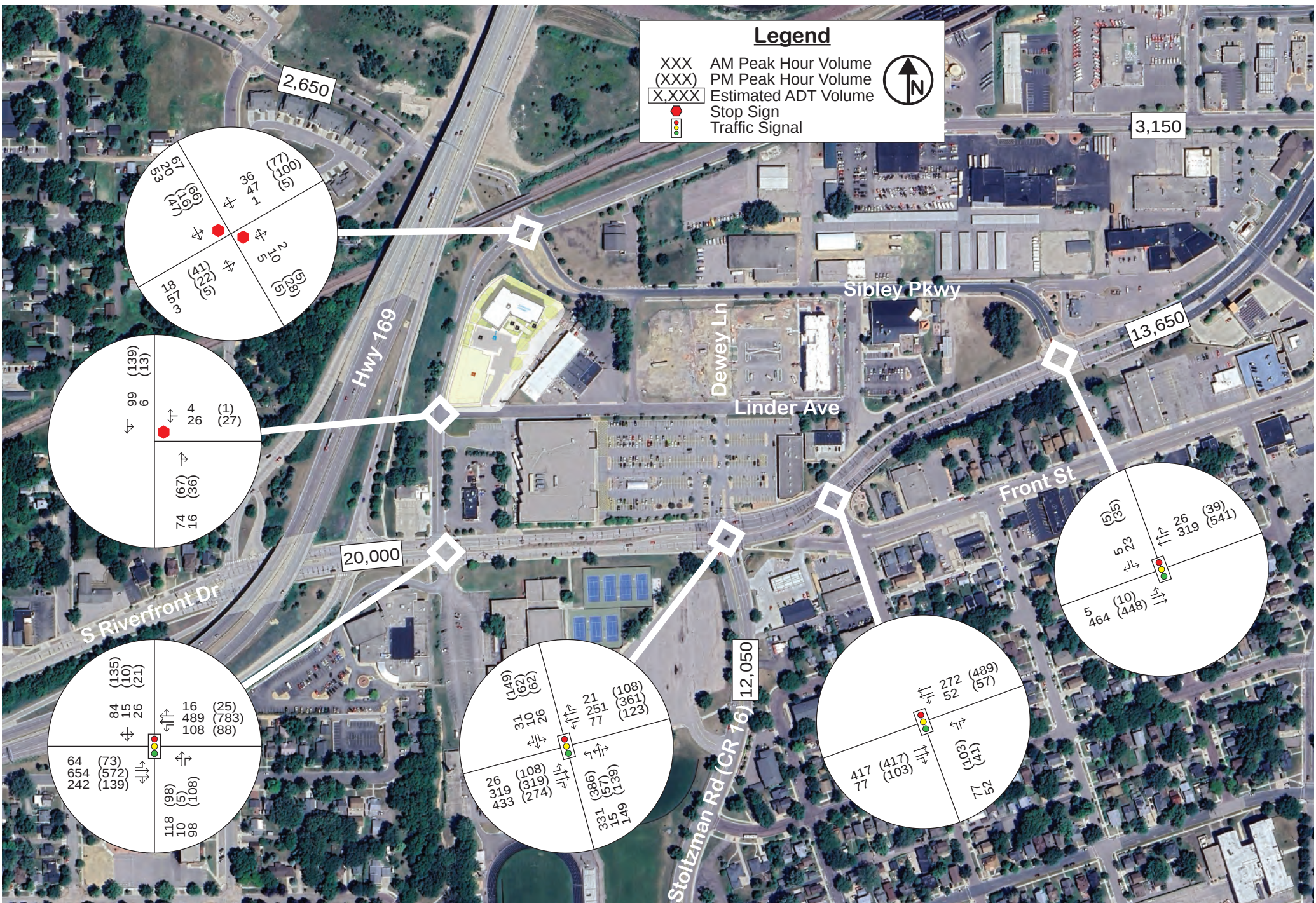
SSS – Side-Street-Stop

SITE PLAN CONSIDERATIONS

A review of the proposed site plan does not indicate any major issues. However, the following items are offered for further consideration between the City and / or project team.

- Locate signage and landscaping to avoid creating any sight distance issues.
- Review truck maneuverability to limit potential internal circulation conflicts; a second access may be needed to support internal truck maneuverability, such as an access to Poplar Street.
- Install appropriate internal traffic controls (i.e., stop signs, etc.) per coordination with City staff.





CONCLUSIONS

Based on the findings of the study, the following conclusions are offered for consideration.

- 1) There are no existing intersection crash frequency or severity issues within the study area.
- 2) All study intersections and approaches operate at an acceptable LOS C or better during the typical weekday a.m. and p.m. peak hours; there are no significant existing operational issues from an intersection capacity perspective.
- 3) The project includes a total of 40 multi-family supportive housing units, which includes a combination of studio, one-, and two-bedroom units.
 - a. Adjacent projects accounted for in this study include the 64-unit Lewis Lofts affordable senior housing development planned to open this spring, as well as approximately 105 townhome / multifamily units planned / under construction to the northwest of the Poplar Street and Sibley Parkway intersection.
- 4) Traffic forecasts were developed for year 2028 build conditions, which includes a one (1) percent annual background growth rate and trip generation from the proposed and adjacent developments.
 - a. The proposed development is estimated to generate 25 a.m. peak hour (7 in / 18 out), 27 p.m. peak hour (16 in / 11 out), and 290 daily (145 in / 145 out) trips.
 - b. The adjacent developments are estimated to generate a total of 63 a.m. peak hour (17 in / 46 out), 76 p.m. peak hour (44 in / 32 out), and 960 daily (480 in / 480 out) trips
- 5) Results of the year 2028 build capacity analysis indicate that all study intersections and approaches are expected to continue to operate at an acceptable LOS C or better during the typical weekday a.m. and p.m. peak hours; minimal change to intersection delays and queues are expected.
 - a. No operational issues are expected because of the area developments from an intersection capacity perspective.
- 6) The following site plan related items are offered for further consideration.
 - a. Locate signage and landscaping to avoid creating any sight distance issues.
 - b. Review truck maneuverability to limit potential internal circulation conflicts; a second access may be needed to support internal truck maneuverability, such as an access to Poplar Street.
 - c. Install appropriate internal traffic controls (i.e., stop signs, etc.) per coordination with City staff.