AUAR Transportation/Traffic Information

20. Transportation

a. Describe traffic-related aspects of Project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

The AUAR area is bound by 490th Street to the North, TH 52 to the west and south, and 195th Avenue to the east. 490th Street is a two-lane rural roadway functionally classified as a local street. TH 52 is a four-lane divided urban roadway and functionally classified as Principal Arterial. The segment of TH 52 adjacent to the AUAR area had an average annual daily traffic (AADT) of 28,507 vehicles per day in 2023. 195th Avenue is a two-lane rural roadway and is functionally classified as Minor Collector. No formal parking areas are present within the AUAR area under existing conditions. Based on City Code requirements, it is estimated that Scenario A would include approximately 1,565 parking spaces and Scenario B would include approximately 1,550 parking spaces. It is anticipated that parking needs for the development scenarios may vary from 1,500 to 3,100 depending on the number of employees and shift changes. Table 26 summarizes the existing roadway characteristics of the surrounding road network.

Table 26. Existing Roadway Characteristics

Roadway	Jurisdiction	Functional Classification	General Configuration	Posted Speed Limit (mph)
TH 52	MnDOT	Principal Arterial	4-lane divided	65
CSAH 11	County	Regional Arterial	2-lane undivided	40
195th Avenue	Township	Regional Arterial	2-lane undivided	Unposted
500th Street	Township	Local Arterial	2-lane undivided	Unposted
490th Street	Township	Local Arterial	2-lane undivided	Unposted
White Pines Road	City	Local Street	2-lane undivided	30
Pine Court NE	City	Local Street	2-lane undivided	30

[1] *Functional Classification based on the City of Pine Island and Goodhue County Comprehensive Plans.*

Traffic control at the CSAH 11/TH 52 North Ramp intersection is roundabout controlled, whereas all other study intersections are unsignalized with side-street stop control.

A field assessment was completed to identify existing pedestrian and bicycle facilities within the study area. In general, the City provides pedestrian and bicycle connections between Main Street and the Douglas State Trail, including a connection across TH 52. While White Pines Road, the frontage road along the north side of TH 52, does not have a designated off-street facility, the paved shoulder on the west side was observed to be utilized by pedestrians and bicyclists. As development progresses, it is important to consider existing pedestrian and bicycle infrastructure, especially in areas where traffic volumes are expected to increase.

Hiawathaland Transit, sponsored by Three Rivers Community Action, Inc., operates a Dial-A-Ride bus service in the City of Pine Island and other neighboring communities in Goodhue, Rice, and Wabasha Counties. The service operates Monday through Friday from 7:00 A.M. to 5:00 P.M.

b. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the Project's impact on the regional transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: http://www.dot.state.mn.us/accessmanagement/resources.html) or a similar local guidance.

The Proposer and their traffic consultant, SRF Consulting Group, coordinated closely with representatives from MnDOT, Goodhue County, City of Pine Island, and Pine Island Township during the development of

the traffic analysis for the development scenarios. Three coordination meetings were held, allowing each agency with the opportunity to provide feedback on the study process, assumptions, and recommendations. A summary of the traffic analysis is provided in the following paragraphs. Appendix G includes the traffic analysis memorandum that provides detailed results.

Trip Generation Estimates

To account for traffic impacts associated with each of the development scenarios, trip generation estimates for the proposed land uses were developed for Scenarios A and B during the a.m. and p.m. peak hours and on a daily basis. Table 27 shows trip generation estimates for Scenarios A and B during the a.m. and p.m. peak hours and on a daily basis. The estimates were developed using the *ITE Trip Generation Manual, 11th Edition*, and information from the Proposer.

Table 27. Development Scenario Trip Generation Estimates

Land Use Type (ITE Code)	Size	A.M. Peak Hour Trips		P.M. Peak Hour Trips		Daily Trips
		In	Out	In	Out	
Scenario A - Mixed Light Industrial and Technology Center						
Technology Center (N/A) (1)	2 Tech. Bldgs.	173	17	14	137	1,153 (2)
Industrial Park (130)	2,200,000 SF	606	142	165	583	7,414
General Office Building (710)	31,000 SF	41	6	8	37	336
Scenario A - Total Trips		**820**	**165**	**187**	**757**	**8,903**
Scenario B – Technology Center						
Technology Center/ Office (N/A) (1)	9 Tech. Bldgs.	778	77	61	614	5,187 (2)
Scenario B - Total Trips		**778**	**77**	**61**	**614**	**5,187**

[1] The technology center trip generation estimate is based on data provided by the Proposer, using trip rate information from similar technology center sites and considering the expected size, power requirements, and staff needs for the development scenarios. The trip generation represents all traffic volumes, including the office space, visitors, deliveries, etc.

[2] Daily volumes were estimated based on general time-of-day distributions.

Results of the trip generation estimate indicated that Scenario A generates approximately 985 a.m. peak hour, 944 p.m. peak hour, and 8,903 daily trips, whereas Scenario B is expected to generate approximately 855 a.m. peak hour, 675 p.m. peak hour, and 5,187 daily trips.

Intersection Capacity Analysis

The traffic analysis memorandum (Appendix G) included analysis for the Year 2045 No Build and Year 2045 Build Conditions for the development scenarios. Peak hour models were developed for both No Build and Build conditions. Traffic operations for the weekday a.m. and p.m. peak hours were analyzed for each scenario. Traffic operations at the study intersections and the AUAR development access intersections were reported.

<u>No Build Conditions (Year 2045)</u>

Year 2045 no build conditions were reviewed to understand how the transportation system would operate assuming no development occurs within the study area. The following assumptions were included as part of the intersection capacity analysis:

- Assumes construction of a two-way frontage road at the TH 52/CSAH 11 South Ramp intersection, with side-street stop control maintained, the eastbound free-right converted to a standard right-turn lane, and turn lanes added on both the off-ramp and frontage road approaches.
- 2045 No Build traffic volumes include an annual background growth rate and travel patterns shifts from the planned TH 52/CSAH 11 frontage road project.
- CSAH 11 is referred to as eastbound/westbound at the TH 52 South Ramp, while the Frontage Road/White Pines Road is referred to as eastbound/westbound at the TH 52 North Ramp.

Results of the intersection capacity analysis, shown in Table 28, indicate that all study intersections are expected to continue to operate at an overall LOS A during the weekday a.m. and p.m. peak hours. However, the side-street stop delays are expected to worsen as traffic volumes increase along TH 52, which may result in aggressive maneuvers and/or safety risk at the study intersection, especially given the high travel speeds (i.e. 65-mph) along the corridor.

Table 28. Year 2045 No Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 11 / TH 52 North Ramp[2]	A	6 sec.	A	6 sec.
CSAH 11 / TH 52 South Ramp[1]	A/B	10 sec.	A/A	9 sec.
TH 52 / 490th Street[1]	A/A	6 sec.	**A/F**	**> 2 min**
TH 52 / 500th Street[1]	A/A	6 sec.	A/A	6 sec.
195th Ave / 490th Street[1]	A/A	5 sec.	A/A	3 sec.
195th Ave / 500th Street[1]	A/A	6 sec.	A/A	6 sec.
White Pines Rd / Pine Ct[1]	A/A	4 sec.	A/A	4 sec.

[1] Indicates an unsignalized intersection with side-street stop/yield 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] Indicates a roundabout, where the overall LOS and delay is shown.

Scenario A Build Conditions (Year 2045)

Year 2045 build conditions were reviewed to understand how the transportation system study area would be expected to operate based on Scenario A (Mixed Light Industrial and Technology Center). The following assumptions were included as part of the intersection capacity analysis:

- Assumes construction of a two-way frontage road at the CSAH 11/TH 52 South Ramp intersection, with side-street stop control maintained, the eastbound free-right converted to a standard right-turn lane, and turn lanes added on both the off-ramp and frontage road approaches.
- Assumes the east leg of the TH 52/500th Street intersection will be vacated per MnDOT's guidance. Potential maintenance is being considered at this location.
- Traffic forecasts include an annual background growth rate, travel patterns shifts from the planned TH 52/CSAH 11 frontage road project and 500th Street closure, and the Scenario A (i.e. Mixed Light Industrial and Technology Center) trip generation estimates.
- CSAH 11 referred to as eastbound/westbound at the TH 52 South Ramp, while the Frontage Road/White Pines Road is referred to as eastbound/westbound at the TH 52 North Ramp.

Results of the intersection capacity analysis, shown in Table 29, indicate that a majority of the study

intersections are expected to operate at an acceptable overall LOS C or better during weekday a.m. and p.m. peak hours based on the assumptions identified.

Table 29. Year 2045 Scenario A Build Condition – Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 11 / TH 52 North Ramp[2]	C	17 sec.	C	18 sec.
CSAH 11 / TH 52 South Ramp[1]	A/D	30 sec.	**B/F**	**90 sec.**
TH 52 / 490th Street[1]	A/C	18 sec.	**D/F**	**> 3 min**
195th Ave / 490th Street[1]	A/A	5 sec.	A/A	4 sec.
195th Ave / Proposed North Access[1]	A/A	6 sec.	A/A	6 sec.
195th Ave / 500th Street[1]	A/A	8 sec.	A/A	8 sec.
195th Ave / Proposed South Access[1]	A/A	6 sec.	A/A	9 sec.
White Pines Rd / Pine Ct[1]	A/A	10 sec.	A/A	9 sec.

[1] Indicates an unsignalized intersection with side-street stop/yield 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] Indicates a roundabout, where the overall LOS and delay is shown.

The following information summarizes the operational and/or queueing issues that warrant consideration as development occurs.

TH 52/490th Street:

- The westbound approach is expected to be overcapacity during the p.m. peak hour, with delays over three (3) minutes and 95th percentile queues over 1,000 feet. Note that based on the routing assumptions, there is expected to be approximately 200 westbound right-turn movements during the p.m. peak hour.
- While the southbound left-turn movement operates acceptably (i.e. LOS B) and queues are expected to be maintained within storage, there are expected to be over 200 southbound left-turn movements during the a.m. peak hour, which may present a safety concern given the speeds along TH 52.

Proposed Site Access:

While no operational issues are anticipated due to minimal conflicts, full build conditions are expected to generate approximately 100 to 350 left-turn movements at the access points during the a.m. peak hour, depending on the specific access location.

CSAH 11/TH 52 North Ramp:

- The six-legged roundabout operates at an acceptable overall LOS C; however, the TH 52 off-ramp (during the a.m. peak) and eastbound White Pines Road (during p.m. peak) approaches operate at LOS D, with volumes nearing capacity (1,000-1,100 entering/conflicting volumes) and 95th percentile queues of approximately 250 feet.

CSAH 11/TH 52 South Ramp:

- During the p.m. peak hour, over 400 westbound left-turning vehicles are expected to access the TH 52 southbound on-ramp. This movement will now conflict with a heavy eastbound right-turn volume (~200 vehicles) given the removal of the eastbound free-right lane. While the side-street approach volumes are anticipated to be relatively low (under 50 vehicles), finding acceptable gaps may be challenging, resulting in delays of approximately one (1) and half minutes.

- The high westbound left-turn volume without a dedicated turn lane presents a safety concern and 95th percentile queues at the approach are expected to be approximately 200 feet. It should be noted that two rear-end crashes occurred during the analysis period at this approach, which may have been prevented with a turn lane.
- The two-lane frontage road is unique and may introduce operational complexity, potentially leading to driver confusion at the intersection.

Scenario B Build Conditions (Year 2045)

Year 2045 build conditions were reviewed to understand how the transportation system study area would be expected to operate based on Scenario B (i.e. Technology Center). The following assumptions were included as part of the intersection capacity analysis:

- Assumes construction of a two-way frontage road at the CSAH 11/TH 52 South Ramp intersection, with side-street stop control maintained, the eastbound free-right converted to a standard right-turn lane, and turn lanes added on both the off-ramp and frontage road approaches.
- Assumes the east leg of the TH 52/500th Street intersection will be vacated per MnDOT's guidance. Potential maintenance is being considered at this location.
- Traffic forecasts include an annual background growth rate, travel patterns shift from the planned TH 52/CSAH 11 frontage road project and 500th Street closure, and the Scenario B (i.e. Technology Center) trip generation estimates.
- CSAH 11 referred to as eastbound/westbound at the TH 52 South Ramp, while the Frontage Road/White Pines Road is referred to as eastbound/westbound at the TH 52 North Ramp.

Results of the intersection capacity analysis, shown in Table 30, indicate that all study intersections are expected to operate at an acceptable overall LOS C or better during weekday a.m. and p.m. peak hours based on the assumptions identified.

Table 30. Year 2045 Scenario A Build Condition – Intersection Capacity Analysis

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	LOS	Delay	LOS	Delay
CSAH 11 / TH 52 North Ramp[2]	D	32 sec.	C	18 sec.
CSAH 11 / TH 52 South Ramp[1]	**B/F**	**56 sec.**	**A/E**	**42 sec.**
TH 52 / 490th Street[1]	A/C	16 sec.	**A/F**	**> 2 min**
195th Ave / 490th Street[1]	A/A	5 sec.	A/A	3 sec.
195th Ave / Proposed Site Access[1]	A/A	6 sec.	A/A	6 sec.
White Pines Rd / Pine Ct[1]	A/A	8 sec.	A/A	9 sec.

[1] Indicates an unsignalized intersection with side-street stop/yield 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] Indicates a roundabout, where the overall LOS and delay is shown.

The following information summarizes the operational and/or queueing issues that warrant consideration as development occurs. Several operational issues are similar to Scenario A; therefore, text has been included to clarify the key differences between the two scenarios.

TH 52/490th Street:

- Note that the operational issues shown in Table 30 are primarily due to existing left-turn and through volumes, as discussed in the existing and No Build conditions. For reference, Scenario B is expected to generate approximately 70 southbound left-turn trips during the a.m. peak hour,

and 55 westbound right-turn trips during the p.m. peak hour. Both movements are projected to operate at LOS D or better, with minimal queueing (75 feet or less).

- *Fewer vehicles are expected to use this intersection under Scenario B compared to Scenario A, due to differences in access and pavement assumptions.*

Proposed Site Access:

- While no operational issues are expected due to minimal conflicts, full build conditions are projected to generate approximately 700 northbound left-turns into the primary access during the a.m. peak hour.
    - *Site access is consolidated to a single primary location in Scenario B, unlike the multiple access points assumed in Scenario A.*

CSAH 11/TH 52 North Ramp:

- The six-legged roundabout operates at an acceptable overall LOS D or better; however, the TH 52 off-ramp and eastbound White Pines Road approaches experience volumes nearing capacity (1,000-1,100 entering/conflicting volumes) during peak hours.
- The eastbound approach of White Pines Road operates at LOS D during the p.m. peak hour, similar to Scenario A. However, the TH 52 off-ramp is expected to operate at LOS F (58 seconds) during the a.m. peak hour with 95th percentile queues of approximately 425 feet.
    - *The degraded performance during the a.m. peak hour, compared to Scenario A, is primarily due to the lack of alternative access for vehicles entering from the north, which leads to increased conflicts.*

CSAH 11/TH 52 South Ramp:

- Scenario B is expected to operate slightly better than Scenario A during the p.m. peak hour, as it generates slightly fewer trips. During the a.m. peak hour, the southbound left-turn movement from the TH 52 off-ramp is projected to exceed 200 vehicles and operate at LOS F (56 seconds), with 95th percentile queues of approximately 275 feet.
    - *The degraded performance during the a.m. peak hour, compared to Scenario A, is primarily due to the lack of alternative access for vehicles entering from the north, which leads to increased conflicts.*

c. Identify measures that will be taken to minimize or mitigate Project related transportation effects.

Traffic recommendations are listed in the following mitigation strategies. Detailed recommendations and traffic considerations are provided in the traffic analysis memorandum (Appendix G).

Item 20 Mitigation Strategies

The following recommendations were identified in the traffic analysis memorandum. The mitigation plan for proposed development in the AUAR area would be finalized in coordination with MnDOT and other stakeholders.

- **Proposed Site Access along 195th Avenue**: Construct turn lanes prior to opening/as part of access construction.
- **White Pines Road**: Construct off-street pedestrian/bicycle facilities on the northeast side and evaluate the pavement design to determine if the roadway is designed to accommodate the increase in traffic.
- **CSAH 11/ TH 52 North Ramp**: Monitor and consider staggered shift times, alternative access, and/or signalization if operational, safety, or queueing issues ever occur.
- **CSAH 11/ TH 52 South Ramp**: Construct a single-lane roundabout as part of an upcoming MnDOT project.

- **TH 52/ 490th Street**: Monitor and consider access restrictions and/or construct a westbound right-turn acceleration lane if access/pavement is extended north of 500th Street.
- **Construction Recommendations**: Consider implementing staggered construction shift times and use 500th Street as a temporary right-in/right-out (RIRO) construction access to alleviate long-term pressure at the CR 11 interchange.