

To: Mitch Michaelson, Officer
SEVER'S FESTIVALS

From: Jeff Bednar, TOPS, Senior Traffic Engineering Specialist

Date: April 2, 2019

Subject: SEVER'S FESTIVALS SITE | TRAFFIC IMPACT STUDY

Introduction

As requested, SRF has completed a traffic impact study moving toward the development of a special event traffic management plan for a relocated Sever's Festivals site, southeast of the US Highway 169/150th Street (CSAH 14) intersection, in Scott County Minnesota (see Figure 1: Project Location). The Sever's Fall Festival previous site was located just southwest of Canterbury Park in Shakopee, Minnesota. This traffic impact study and special event traffic management plan includes the subject short-term seasonal special event on selected Fridays, Saturdays and Sundays, from September through October, generating up to 3,000 vehicles parked per peak design event day.

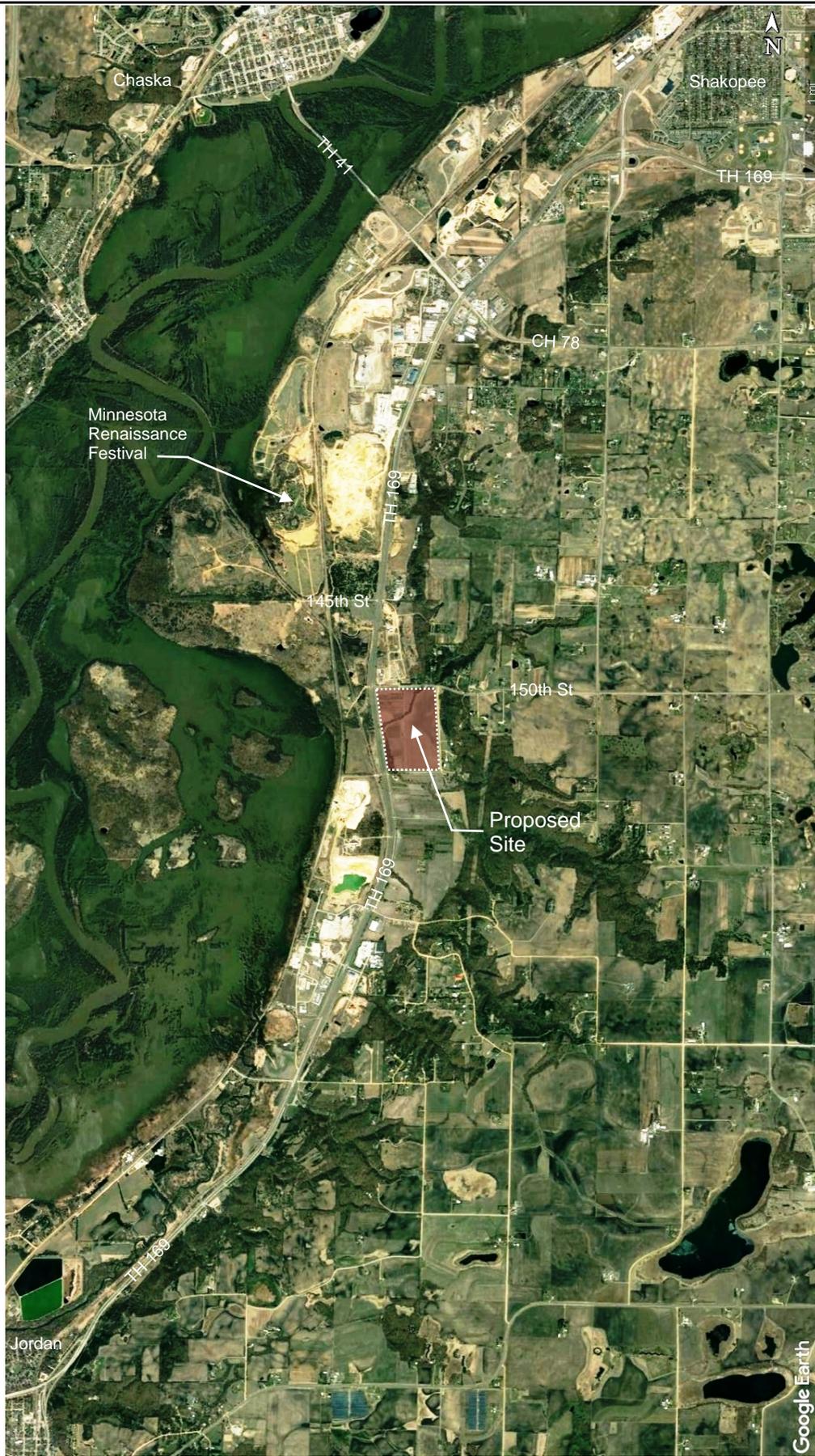
The primary objectives of the traffic impact study are to review existing and proposed special event traffic operations within the study area, evaluate traffic impacts to the adjacent roadway network and recommend any necessary improvements to accommodate the proposed special event venue. The following background, data, assumptions, analysis, study conclusions and recommendations, are offered for your consideration:

Existing Conditions

Due to the current and ongoing construction traffic impacts throughout the study area, associated with the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, collection of new traffic volume data was precluded. Therefore, the existing conditions included in this study were taken from the Environmental Assessment Worksheet (EAW) document for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, dated April 2017, and the US 169 at TH 41 Intersection Study - Existing Conditions memorandum, dated November 2016 (Appendix C in the EAW).

The existing conditions (for year 2015) included in these documents established the need and justification for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements. The evaluation of existing conditions in this study includes peak hour intersection turning movements, field observations and an intersection capacity analysis at the following study intersections:

- TH 169/145th Street
- TH 169/150th Street (CSAH 14)



Project Location

Observations were also completed to identify roadway characteristics within the study area (i.e. roadway geometry, posted speed limits, and traffic control). The adjacent supporting roadways have posted speed limits of 30 mph to 65 mph throughout the study area. The existing geometrics, traffic control, and traffic volumes are shown in Figure 2B: Existing Conditions.

Intersection Operations Analysis

An operations analysis was conducted to determine how traffic is currently operating at the study intersections. All intersections were analyzed using the Highway Capacity Manual (HCM) and Synchro/SimTraffic. Intersection capacity analysis results identify a Level of Service (LOS) which indicates how well an intersection is operating. Intersections are ranked from LOS A through LOS F. The intersection LOS results are based on average control delay per vehicle from SimTraffic, which correspond to the delay threshold values shown in Table 1. LOS A indicates the best traffic operation and LOS F indicates an intersection where demand exceeds capacity. Based on widely accepted guidelines, overall intersection LOS A through D is generally considered acceptable by drivers in the Twin Cities Metropolitan Area.

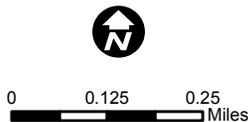
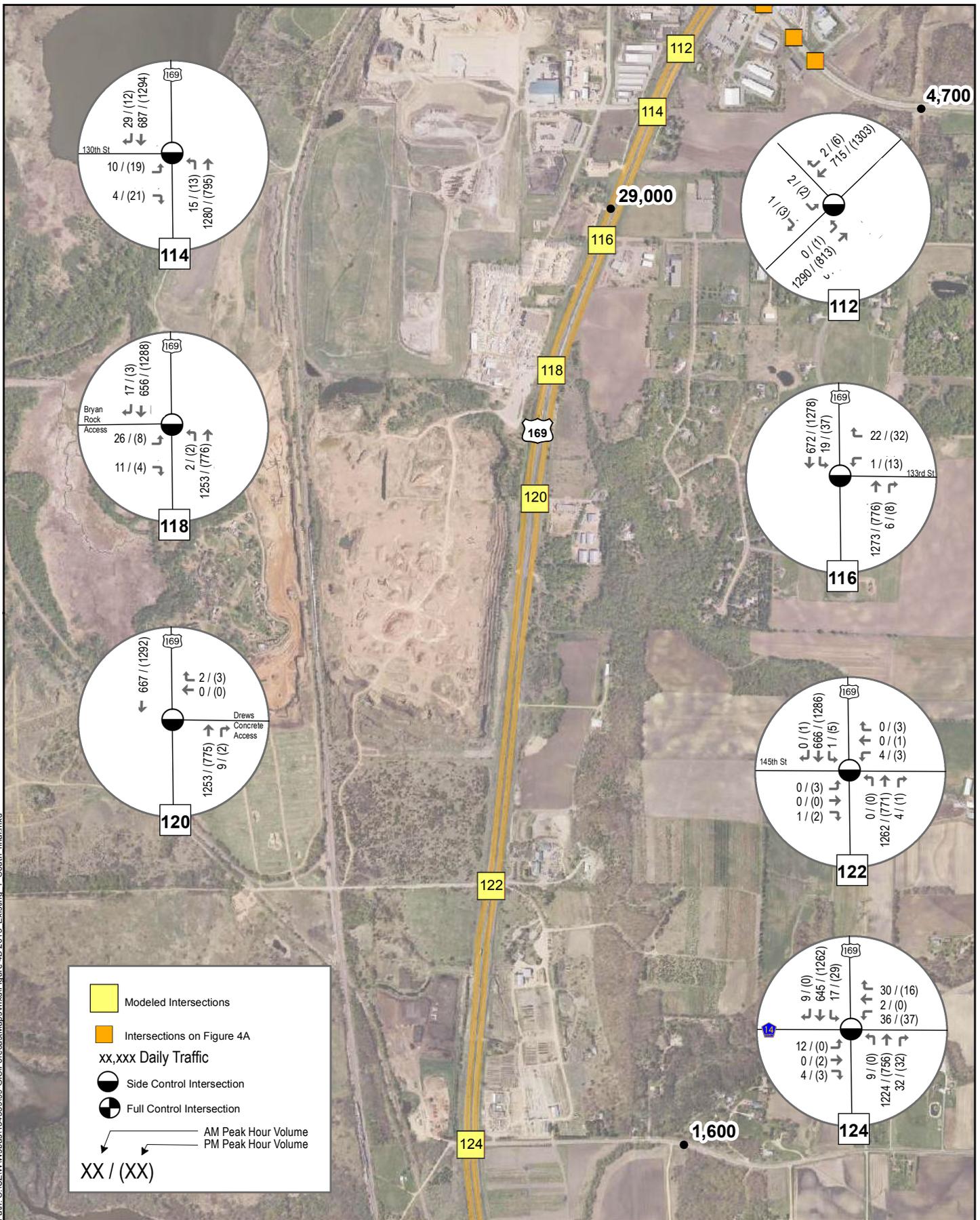
Table 1. Level of Service Criteria for Signalized and Unsignalized Intersections

LOS Designation	Signalized Intersection Average Control Delay/Vehicle (seconds)	Unsignalized Intersection Average Control 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 unsignalized 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. 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 (poor levels of service) on the side-street approaches, but an acceptable overall intersection level of service during the peak hours.

Path: S:\UZ\WV\bas134559\09-GIS\ForecastMaps\mxd\Figure 4B 2015 Existing 1 South final.mxd



Project: WSBAS 134559
Print Date: 10/28/2016

Map by: hxiao
Projection: Scott County Coordinates
Source: SEH, Bing, MnDOT

2015 Counts

US 169 & TH 41 Improvements

Scott County, Minnesota

Figure 2B

This map is neither a legally recorded map nor a survey map and is not intended to be used as one. This map is a compilation of records, information, and data gathered from various sources listed on this map and is to be used for reference purposes only. SEH does not warrant that the Geographic Information System (GIS) Data used to prepare this map are error free, and SEH does not represent that the GIS Data can be used for navigational, tracking, or any other purpose requiring exacting measurement of distance or direction or precision in the depiction of geographic features. The user of this map acknowledges that SEH shall not be liable for any damages which arise out of the user's access or use of data provided.

Results of the existing operations analysis shown in Table 2 indicate that all study intersections currently operate at an acceptable overall LOS A during the weekday p.m. commuter peak hour under the existing traffic control and geometric layout. However, due to higher p.m. peak hour north and southbound through volumes on TH 169 (resulting in few acceptable gaps in the traffic flow), the side-street approaches at the two study intersections currently operate at unacceptable LOS F during the a.m. peak hour and unacceptable/approaching unacceptable LOS E/D during the p.m. peak hour.

The side-street approach volumes at these intersections are relatively low and no significant approach queuing issues were observed.

Table 2. Existing Weekday Peak Hour Intersection Capacity Analysis

Study Intersection Location	A.M. Peak Hour ⁽¹⁾		P.M. Peak Hour ⁽¹⁾	
	LOS	Worst Approach Delay	LOS	Worst Approach Delay
TH 169/145th Street ⁽¹⁾	A/F	57 Sec. (WB)	A/E	42 Sec. (EB)
TH 169/150th Street (CSAH 14) ⁽¹⁾	A/F	55 Sec. (EB)	A/D	34 Sec. (WB)

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

The existing roadway characteristics shown in Table 3 identify the functional class, typical cross-section, posted speed limit, roadway right-of-way (ROW) width and Annual Average Daily Traffic (AADT) volume for the study area roadways. Additional details and discussion of the site-adjacent roadway ROW widths are included in the Site Plan Review section of this memorandum.

Table 3. Existing Roadway Characteristics

Roadway	Functional Class	Typical Cross-Section	Posted Speed Limit	Right-Of-Way ⁽¹⁾	AADT ⁽²⁾
TH 169	Principal Arterial	4-lane Expressway	55 MPH	220'	28,000
150th Street (CSAH 14)	B Minor Arterial	2-lane Undivided Rural	55 MPH	150'	1,500

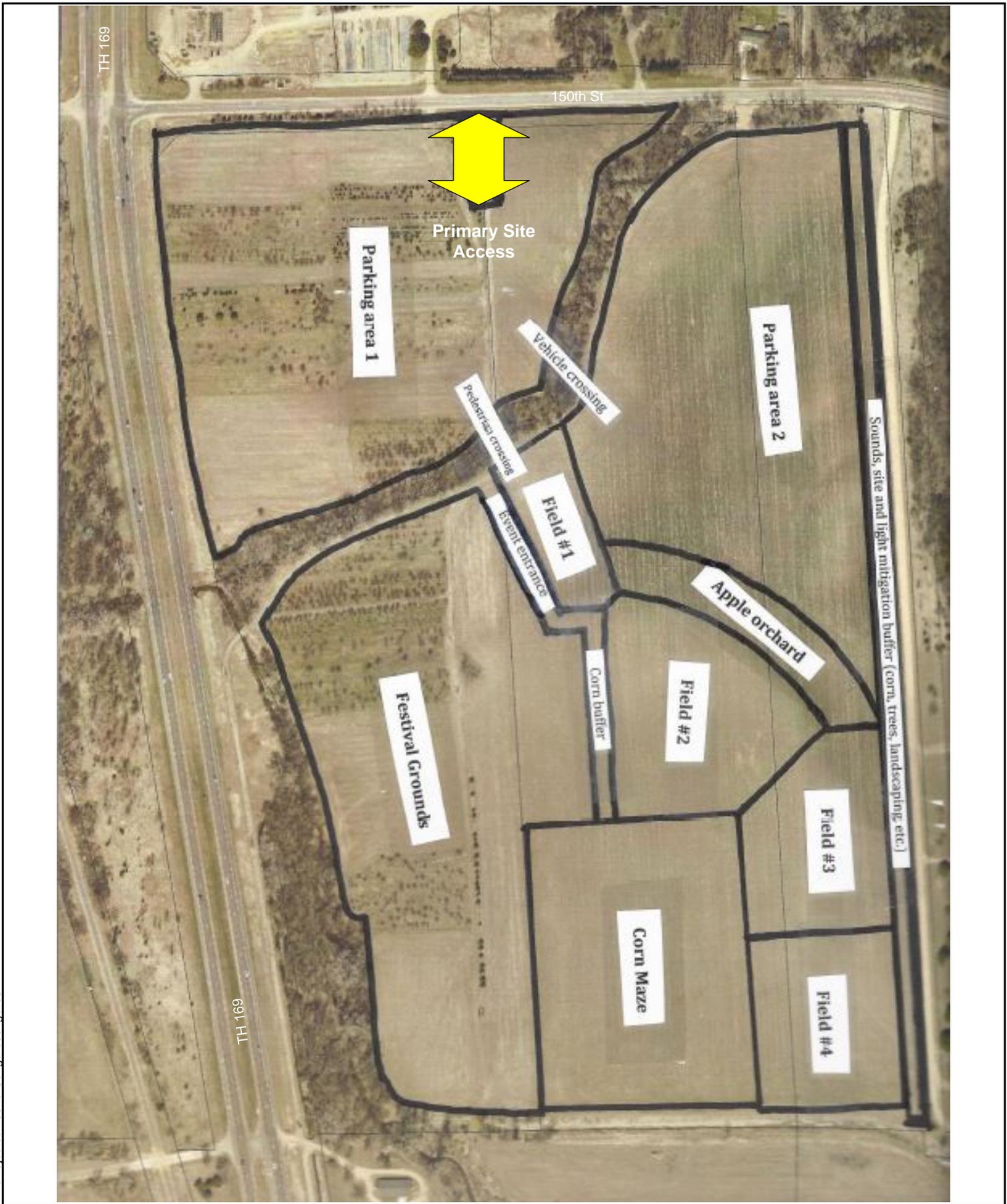
(1) Roadway Right-of-Way (ROW) width varies throughout the study area. ROW widths shown indicate the study area range.

(2) AADT as reported in MnDOT's 2017 Twin Cities Metro Area AADT Maps.

Future Conditions

Proposed Special Event

Sever's Festivals are seasonal family friendly events that operate in the fall and winter months. These events include a wide range of family friendly fun activities that would take place on a site generally east of TH 169 and south of 150th Street (see Figure 1: Project Location and Figure 3: Proposed Concept Site Plan). These events occur during variable hours of operation and days of the week.



Proposed Site Configuration/Layout (Fall Festival)

Figure 3

Sever's Festivals typical daily attendance ranges from 1,000 to 5,000 (600 to 3,000 vehicles per day) and is very weather dependent. An assumed design event day of 3,000 vehicles parked per day may occur two to four times per year. Based on attendance information, Minnesota Educators Academy (MEA) Week Friday was the highest day of the season and was selected as the design event day.

Cumulative Traffic Impacts

The proximity of the existing site of the Minnesota Renaissance Festival (northwest of the proposed Sever's Festivals site) to the proposed Sever's Festivals site, has raised concern for cumulative traffic impacts within the study area. Based on data provided by Sever's Festivals and the Minnesota Renaissance Festival for the 2015, 2016 and 2017 seasons (see Table 4), there is some operational overlap during September for the two special events. However, since the Minnesota Renaissance Festival attendance peaks in middle to late September and Sever's Fall Festival attendance peaks middle to late October (MEA Week) it is concluded that there would not be a long-term significant cumulative traffic impact associated with Sever's Festivals and the Minnesota Renaissance Festival.

While there is no apparent overlap or concurrence in peak events between Sever's Festivals and the Minnesota Renaissance Festival, it is recommended that the event operators and area stakeholders work together to coordinate event traffic management plans and directional signing to avoid event day traffic confusion and congestion.

Event-Generated Trips

Trip generation estimates for the MEA Week Friday design event day were developed based on an assumed design event day attendance of 5,000 persons and 3,000 vehicles per day. Traffic volume data from loop detectors on TH 169 north and east of the Canterbury Road interchange (the best available traffic data nearest the previous Sever's Festivals site) for the 2016 MEA Week Friday were compared and differentiated to typical non-event week Friday traffic data at the same locations, to develop estimated Sever's Fall Festival Event Hourly Traffic Volume Profiles (see Appendix A).

The proposed Sever's Festivals site was assumed to open for the 2019 season. Based on the MEA Week Friday Event Hourly Traffic Volume Profile (see Appendix A) it was determined that the design event peak hour is from 5:00-6:00 p.m. (see Table 5) and coincides with the commuter peak hour. The background p.m. peak hour commuter traffic on TH 169 combined with event-generated traffic, resulted in the highest combined vehicle volume during that hour on that day in that week.

Results of the event-generated MEA Week Friday trip estimates combined with TH 169 background through traffic shown in Table 5, indicate that the proposed event is expected to generate a total of 483 inbound peak hour, 449 outbound peak hour, and 3,000 inbound/3,000 outbound daily trips.

Table 4

Special Event Vehicles Parked/Day Sever's Fall Festival (Colored Bars) and Minnesota Renaissance Festival (Gray Bars)

Averaged for 2015, 2016 and 2017 Seasons

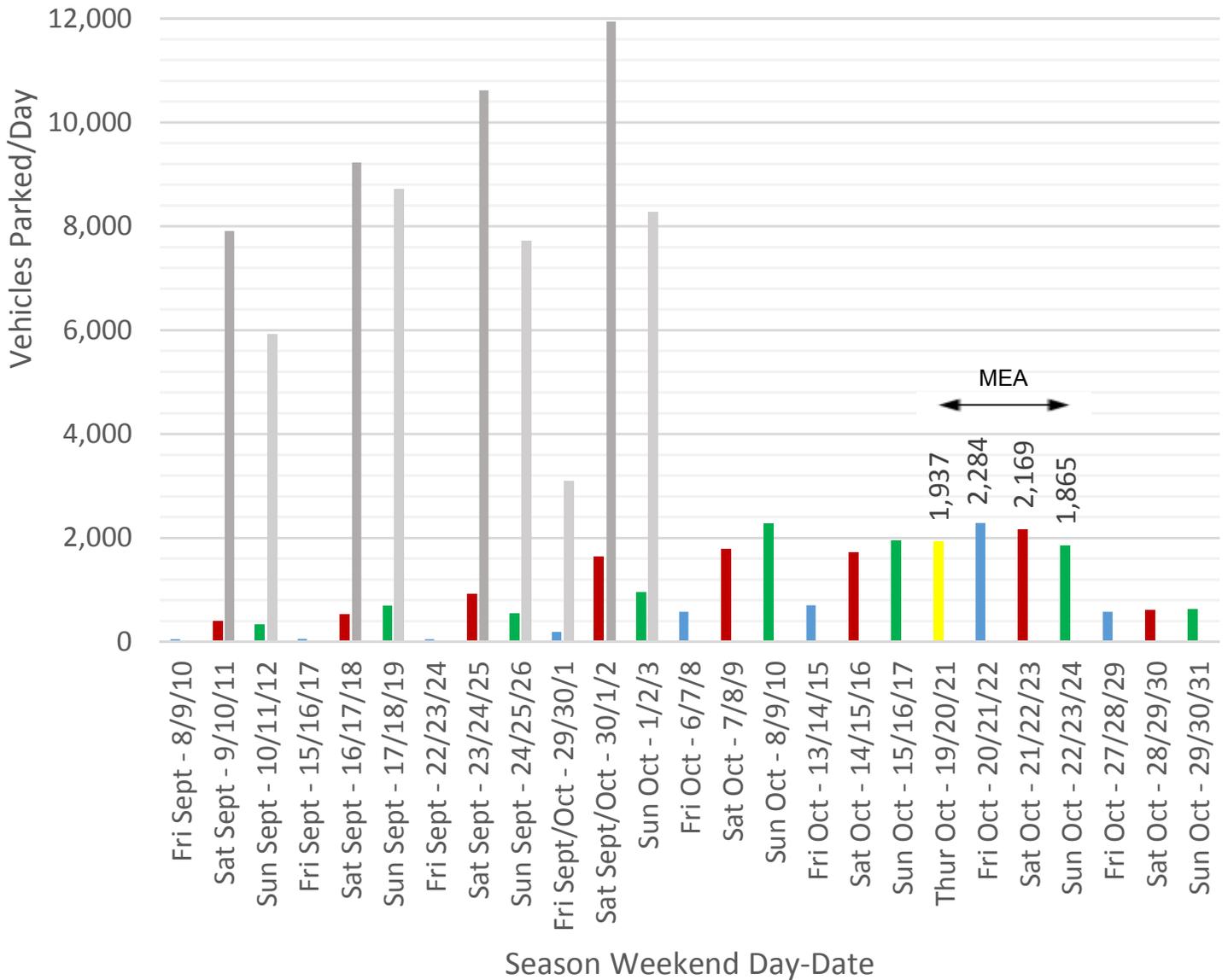


Table 5: Event-Generated Trip Estimates Combined with Future TH 169 Background Traffic Volumes

Hour Beginning	Event-Generated MEA Friday Traffic		TH 169 Future Background Traffic		Combined Volumes
	Inbound	Outbound	Northbound	Southbound	
9:00 AM	109	90	1,534	1,030	2,763
10:00 AM	367	196	1,375	1,161	3,099
11:00 AM	457	449	1,216	1,223	3,345
12:00 PM	483	251	1,178	1,197	3,109
1:00 PM	409	218	1,217	1,218	3,062
2:00 PM	345	377	1,256	1,352	3,330
3:00 PM	155	218	1,294	1,551	3,218
4:00 PM	28	25	1,333	1,843	3,229
5:00 PM	77	274	1,370	2,135	3,856
6:00 PM	158	438	1,148	1,478	3,222
7:00 PM	412	356	925	820	2,513
8:00 PM	0	109	651	636	1,396
9:00 PM	0	0	461	449	910
10:00 PM	0	0	269	358	627
	3,000	3,000			

(1) Yellow highlighted table cells indicate the volumes under the specific volume categories during the peak combined volume design event peak hour of 5-6 p.m. Blue highlighted table cells indicate the highest event-generated peak hourly inbound and outbound volumes.

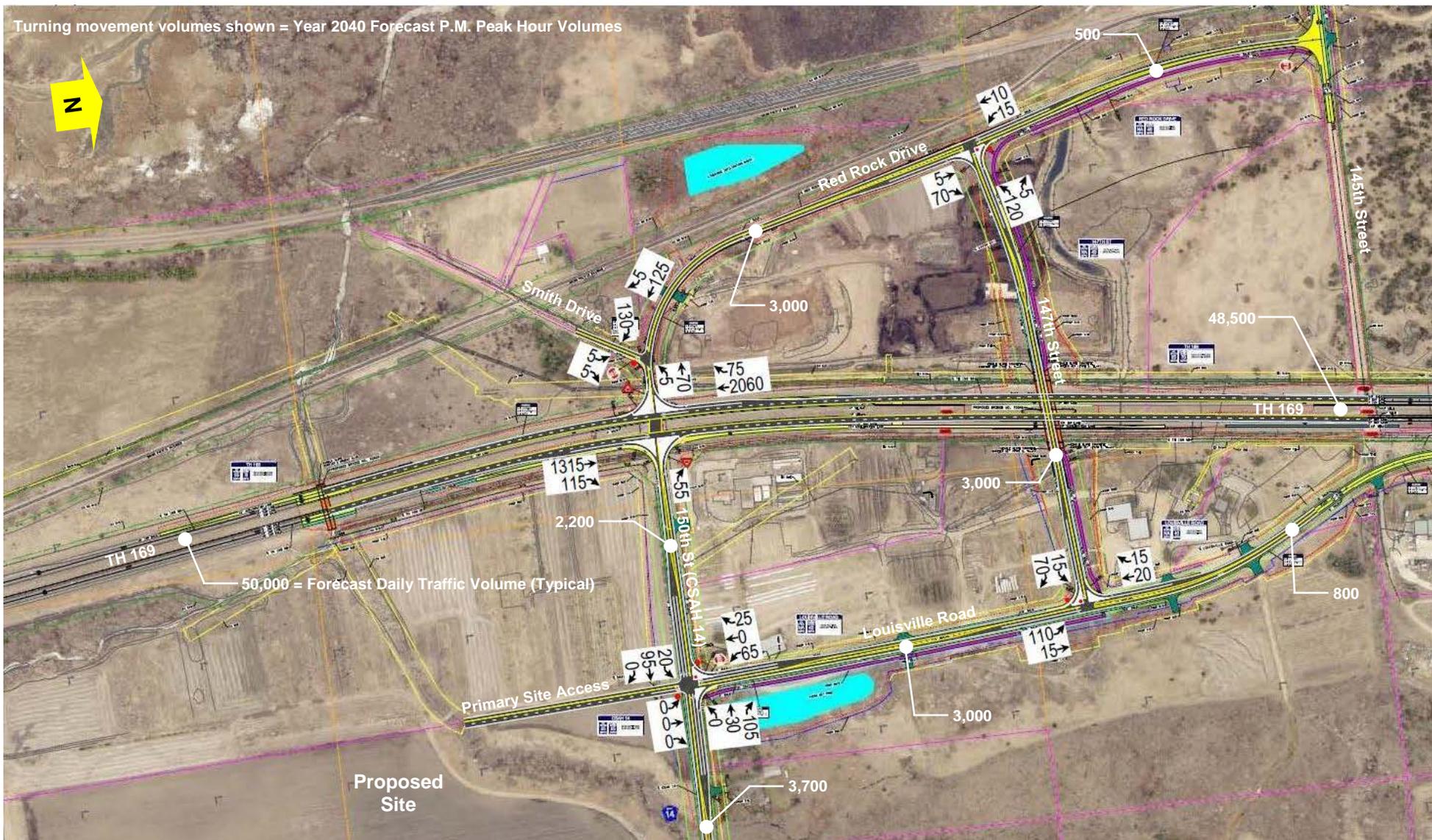
Future Background Traffic Forecasts

The year 2040 Background Traffic Forecast volumes included in this study were taken from the Environmental Assessment Worksheet (EAW) document for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, dated April 2017. Year 2040 Background Traffic Forecast volumes are shown in Figure 4: Year 2040 Background Conditions.

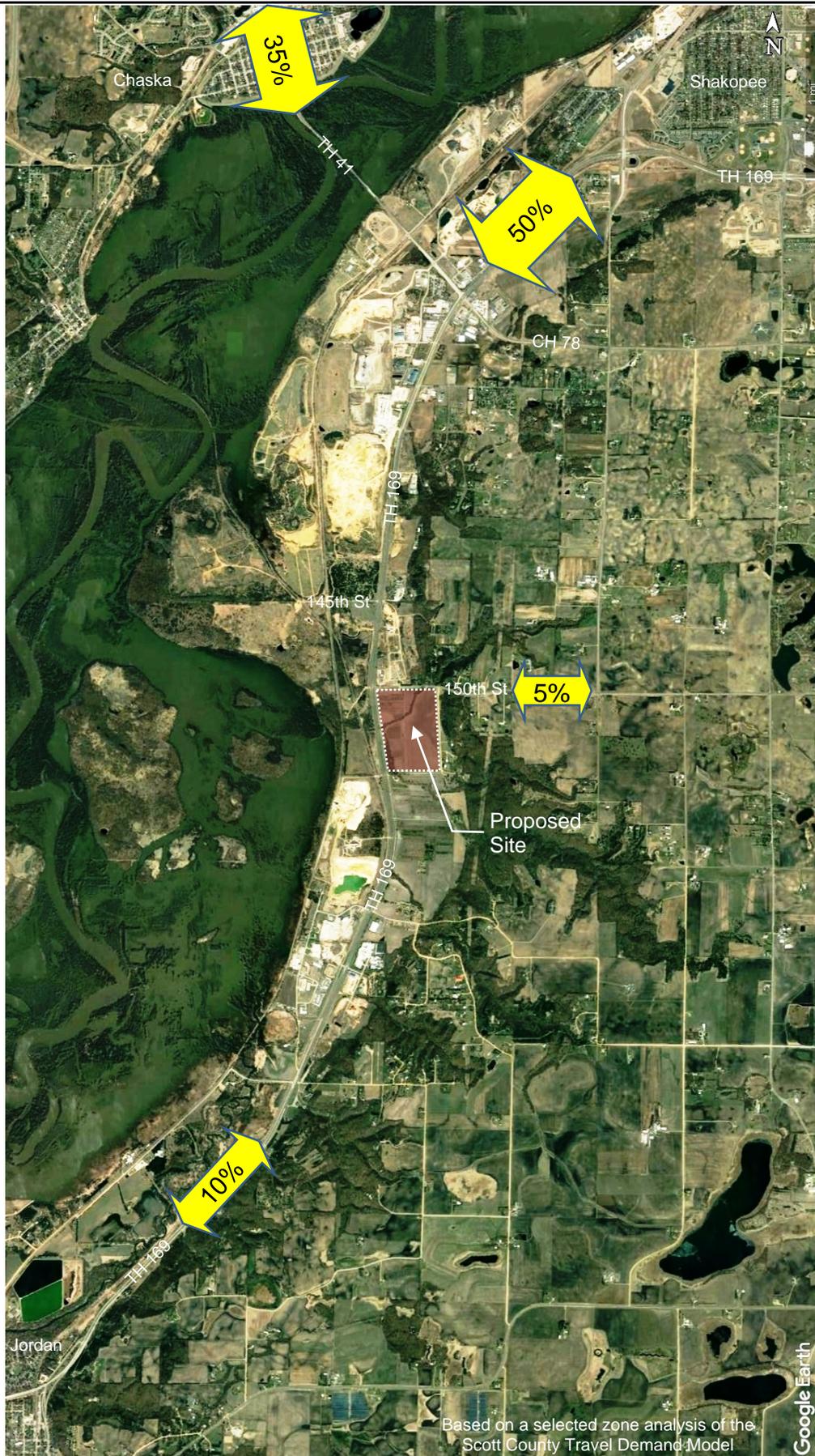
Future Build Traffic Forecasts

The total event-generated vehicle trips were assigned to the adjacent supporting future roadway network assuming a directional trip distribution (see Figure 5: Site/Event-Generated Trip Directional Distribution) based on the regional distribution of households and employment in the current Scott County Travel Demand model, a review of study area travel patterns and engineering judgment. The resultant year 2040 build condition traffic volumes are shown in Figure 6: Year 2040 Build Conditions - Design Event Day.

Turning movement volumes shown = Year 2040 Forecast P.M. Peak Hour Volumes



H:\Projects\12334\TS\Figures\Figure 4



Intersection Operations Analysis

To determine if the future roadway network can accommodate the forecast year 2040 background and build traffic forecasts, a detailed traffic operations analysis was completed. The study intersections were analyzed using HCM and Synchro/SimTraffic (see HCM/SimTraffic Performance Reports in Appendix B) assuming the future geometric layout and traffic control.

Results of the year 2040 background and build conditions traffic operations analysis shown in Tables 6 and 7, respectively, indicate that traffic operations/levels of service at the study intersections will not change from background to build conditions, during the MEA Friday design event day 5:00-6:00 p.m. commuter peak hour. The a.m. commuter peak hour was precluded from this analysis since it is outside the operating hours of the proposed Sever's Festivals site-related special events.

Table 6. Year 2040 Background Conditions – P.M. Peak Hour Intersection Capacity Analysis

Study Intersection Location	A.M. Peak Hour		P.M. Peak Hour ⁽¹⁾	
	LOS	Delay	LOS	Worst Approach Delay
TH 169/150th Street (CSAH 14) ⁽¹⁾	--	--	A/A	6 Sec. (EB)
150th Street (CSAH 14)/Louisville Road ⁽¹⁾	--	--	A/B	11 Sec. (SB)
147th Street (Overpass Road)/Louisville Road ⁽¹⁾	--	--	A/B	11 Sec. (EB)
147th Street (Overpass Road)/Red Rock Drive ⁽¹⁾	--	--	A/A	10 Sec. (WB)
Red Rock Drive/Smith Drive ⁽¹⁾	--	--	A/A	10 Sec. (NEB)

(1) Indicates an unsignalized intersection with side-street stop/yield control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach. Assumes future intersection geometrics, lane use and traffic control.

(2) The a.m. commuter peak hour was precluded from this analysis since it is outside the operating hours of the proposed Sever's Festivals site-related special events.

Table 7. Year 2040 Build Conditions - MEA Friday P.M. Peak Hour Intersection Capacity Analysis

Study Intersection Location	A.M. Peak Hour		P.M. Peak Hour	
	LOS	LOS	LOS	Worst Approach Delay
TH 169/150th Street (CSAH 14) ⁽¹⁾	--	--	A/A	8 Sec. (EB)
150th Street (CSAH 14)/Louisville Road ⁽¹⁾	--	--	A/B	14 Sec. (NB)
147th Street (Overpass Road)/Louisville Road ⁽¹⁾	--	--	A/B	12 Sec. (EB)
147th Street (Overpass Road)/Red Rock Drive ⁽¹⁾	--	--	A/A	10 Sec. (WB)
Red Rock Drive/Smith Drive ⁽¹⁾	--	--	A/A	10 Sec. (NEB)

(1) Indicates an unsignalized intersection with side-street stop/yield control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach. Assumes future intersection geometrics, lane use and traffic control.

(2) The a.m. commuter peak hour was precluded from this analysis since it is outside the operating hours of the proposed Sever's Festivals site-related special events.

Results of the year 2040 build conditions traffic operations analysis shown in Table 7 indicate that traffic operations at all of the study intersections will be at an acceptable overall LOS during the design event day, MEA Friday 5:00-6:00 p.m. peak hour, with no significant congestion, delay or queuing spillback. This is the hour that represents the highest event-generated traffic volume levels combined with the typical weekday traffic volumes on TH 169 (see Figure 7: Year 2040 Build Conditions).

As shown in this analysis, the proposed Sever's Festivals site-generated traffic would clearly not represent a significant long-term negative traffic impact to the study area roadway system.

Site Plan, Internal Site Circulation and Parking Review

Site Plan Review

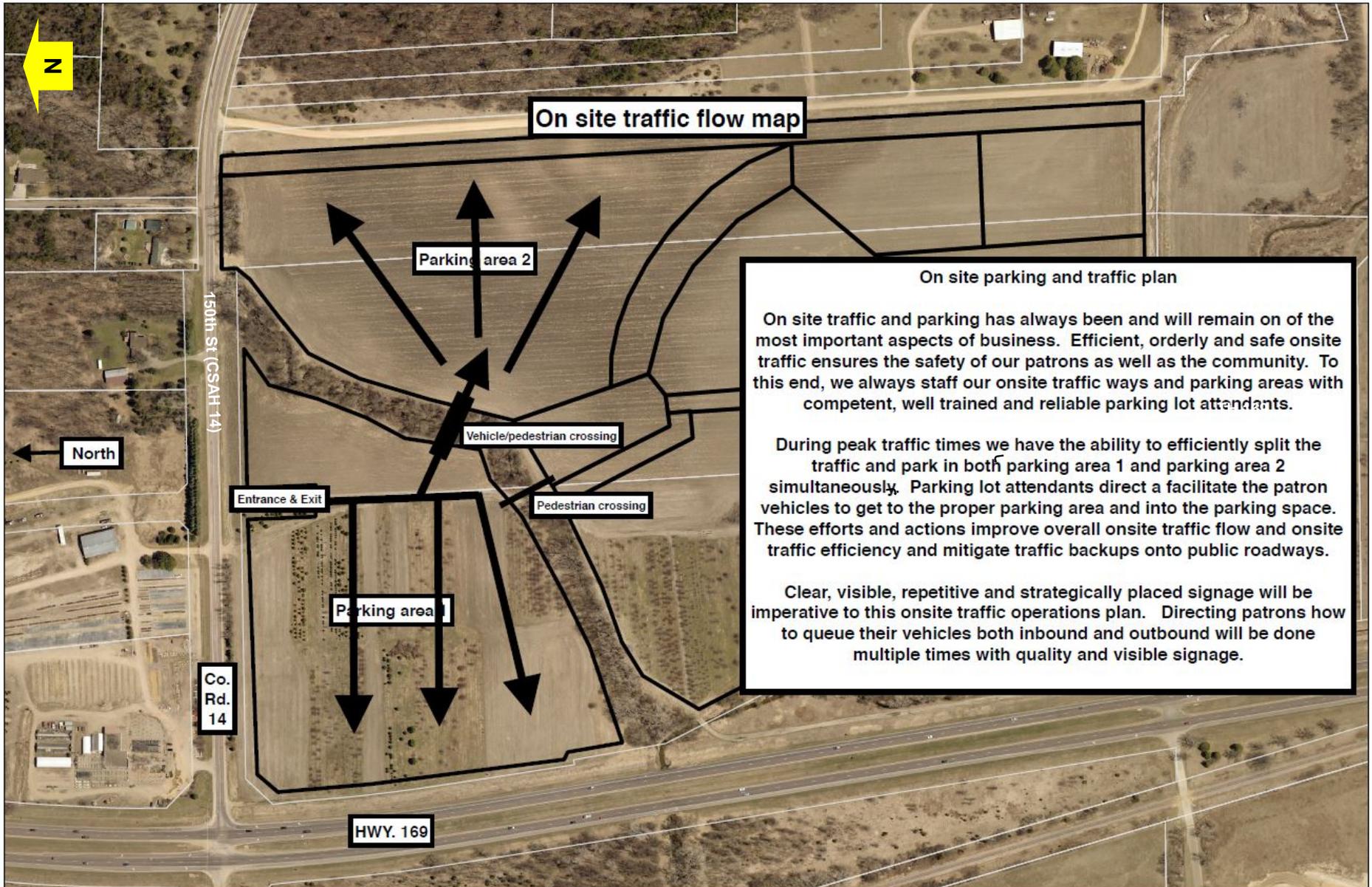
A review of the proposed site plan (see Figure 3: Proposed Concept Site Plan) was completed to identify any issues and recommend potential improvements with regard to access, sight distance, traffic control and circulation. The proposed site plan and access is generally well configured. Based on field observations there is adequate sight distance at the proposed primary site access location at the 150th Street (CSAH 14)/Louisville Road intersection currently under construction. The location of the primary site access would provide reasonable separation between the primary site access and the TH 169/150th Street (CSAH 14) intersection (approximately 900 feet).

Note that Louisville Road is planned to be extended south of 150th Street through the proposed site at some future time. The Sever's family will need to work with the township to determine the alignment, location and design section of this roadway through the site.

The existing primary site access drive appears to be generally adequate. However, Sever's Festivals and Scott County staff have been working together to include in the design/build of the 150th Street (CSAH 14)/Louisville Road intersection (currently under construction) an eastbound right-turn lane and westbound left-turn serving the primary site access (see attached plan sheet). These site access left and right-turn lanes will be required in order for the proposal to move forward.

The Proposed Concept Site Plan (Figure 3) and Onsite Traffic Flow Map (Figure 7) and following narrative, all provided by the family, describes the site layout, circulation and parking operation: Sever's Fall Festival believes the customer experience begins even before they reach our property. We strive to run a safe and smooth event so the families have a fun and enjoyable day from the moment they approach the event until after they leave the area.

Onsite Parking and Traffic Plan: Onsite traffic and parking has always been and will remain one of the most important aspects of business. Efficient, orderly and safe onsite traffic ensures the safety of our patrons as well as the community. To this end, we always staff our onsite traffic ways and parking areas with competent, well trained and reliable parking lot attendants.



H:\Projects\12334\TS\Figures\Figure 7

During peak traffic times we have the ability to efficiently split the traffic and park in both Parking Area 1 and Parking Area 2 simultaneously (see Figure 7: Onsite Traffic Flow Map). Parking lot attendants direct and facilitate the patron vehicles to get to the proper parking area and into the parking space. These efforts and actions improve overall onsite traffic flow and onsite traffic efficiency and mitigate traffic backups onto public roadways.

Clear, visible, repetitive and strategically placed signage will be imperative to this onsite traffic operations plan. Directing patrons how to queue their vehicles both inbound and outbound will be done multiple times with quality and visible signage.

Parking Staff: Our parking lot staff consists of 5-12 employees depending on the traffic flow. There is always an owner or manager on site working with the parking staff. Flaggers use high visibility flags or lights to keep traffic flowing off of the highway, on the main driveway(s) and into the parking area(s). In addition to flaggers, parking attendants keep traffic flowing within the parking areas. Parking attendants assist vehicles to their specific parking spots, monitor the parking and traffic flow situation and move to new or additional parking area(s) as needed. Greeters are staff members who work closely with the parking staff and assist our customers once they have exited their vehicles to the safe walking paths leading to the event entrance. Each parking lot employee is equipped with a 2-way radio for constant and immediate updates on traffic and parking.

Handicap Parking and "Drop-offs": We use signage on the main driveway to inform our customers with handicap parking passes or people making drop offs. This signage, along with the flaggers, helps prevent stoppage of vehicles on the driveway and causing traffic to backup. A parking attendant at the first staffed intersection (closest to the entrance) will direct customers to the handicap parking area or the drop off zone as necessary.

Exiting Traffic: It is important to make sure vehicles can exit safely, but do so while not disturbing inbound traffic. We use a combination of exit signs, parking attendants and flaggers to ensure exiting traffic can do so smoothly while causing minimal impact to the inbound traffic flow and overall safety.

Vehicle Count and Parking Order: We have built our parking area to hold an estimated 4,000 vehicles. Our parking area is built to accommodate 60 percent more cars than we have ever had at our event. If necessary in the future we have ample room to expand our parking areas. Our parking order will consist of parking vehicles closest to the event entrance first and spanning outward.

Conclusions and Recommendations Summary

Based on the traffic impact study and analysis, the following summary of conclusions and recommendations is offered for your consideration:

1. Due to the current and ongoing construction traffic impacts throughout the study area, associated with the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, collection of new traffic volume data was precluded. Therefore, the existing conditions included in this study were taken from the Environmental Assessment Worksheet (EAW) document for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, dated April 2017. The existing conditions (for year 2015) included in these documents established the need and justification for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements.
2. Sever's Festivals typical daily attendance ranges from 1,000 to 5,000 (600 to 3,000 vehicles per day) and is very weather dependent. An assumed design event day of 3,000 vehicles parked per day may occur two to four times per year. Based on attendance information, MEA Week Friday was the highest day of the season and was selected as the design event day.
3. Based on MEA Week Event Hourly Traffic Volume Profiles it was determined that the design event peak hour is from 5:00-6:00 p.m. and coincides with the commuter peak hour on a Friday during MEA Week. The background traffic on TH 169 combined with event-generated traffic, resulted in the highest combined vehicle volume during that hour on that day in that week.
4. There is no apparent overlap or concurrence in peak events between Sever's Festivals and the Minnesota Renaissance Festival, therefore, there are no significant long-term cumulative traffic impacts. However, there is some seasonal overlap, therefore, it is recommended that the event operators and area stakeholders work together to coordinate event traffic management plans and directional signing to avoid event day traffic confusion and congestion.
5. The a.m. commuter peak hour (7:00-8:00 a.m.) was precluded from this analysis since it is outside the operating hours of the Sever's Festivals site-related special events.
6. The year 2040 Background Traffic Forecast volumes included in this study were taken from the Environmental Assessment Worksheet (EAW) document for the TH 169/TH 41/CSAH 78/CSAH 14 Intersection Improvements, dated April 2017.
7. The Sever's Festivals event-generated vehicle trips were assigned to the adjacent supporting future roadway network assuming a directional trip distribution based on the regional distribution of households and employment in the current Scott County Travel Demand model, a review of study area travel patterns and engineering judgment.

8. To determine if the future roadway network can accommodate the forecast year 2040 background and build traffic forecasts, a detailed traffic operations analysis was completed. The study intersections were analyzed using HCM and Synchro/SimTraffic, assuming the future geometric layout and traffic control.
9. Results of the year 2040 background and build conditions traffic operations analysis indicate that traffic operations/levels of service at the study intersections will not change from background conditions to build conditions during the MEA Friday design event day p.m. commuter peak hour.
10. Results of the year 2040 build conditions traffic operations analysis indicate that traffic operations at all of the study intersections will be at an acceptable overall LOS during an MEA Friday 5:00-6:00 p.m. peak hour, with no significant congestion, delay or queuing spillback.
11. Based on these analyses, law enforcement officer control of the primary site access on 150th Street (CSAH 14) may be required. Law enforcement officers assigned to special event security, will monitor traffic conditions at the primary site access and, if necessary, control the primary site access on 150th Street (CSAH 14) for short periods as needed to manage unusual conditions and emergency response situations.
12. Based on these analyses, the proposed Sever's Festivals site-generated traffic would clearly not represent a significant long-term negative traffic impact to the study area roadway system.
13. The proposed site plan and site access is generally well configured. Based on field observations there is adequate sight distance at the proposed primary site access location on 150th Street (CSAH 14). The location of the primary site access provides reasonable separation between the site access and the TH 169/150th Street (CSAH 14) intersection (approximately 900 feet).
14. Appropriately designed left and right-turn lanes on 150th Street (CSAH 14) serving the primary site access, will be required to be constructed in order for the proposal to move forward.
15. It is recommended that a northbound left-turn lane and separate combined through-right-turn lane be provided on the event site primary access northbound approach to 150th Street (CSAH 14) Road to provide additional outbound intersection capacity.
16. Emergency response to and from incidents at the event will need to be facilitated. Identification of a secondary site access is recommended to provide backup emergency response to/from the site should the primary site access be unavailable for any reason. The site security staff and parking lot staff will clear onsite traffic to facilitate an emergency response to an incident scene onsite.
17. It is recommended that drivers on TH 169 in both directions as well as on other supporting roadways approaching the event, be advised by the use of appropriate special event advisory and

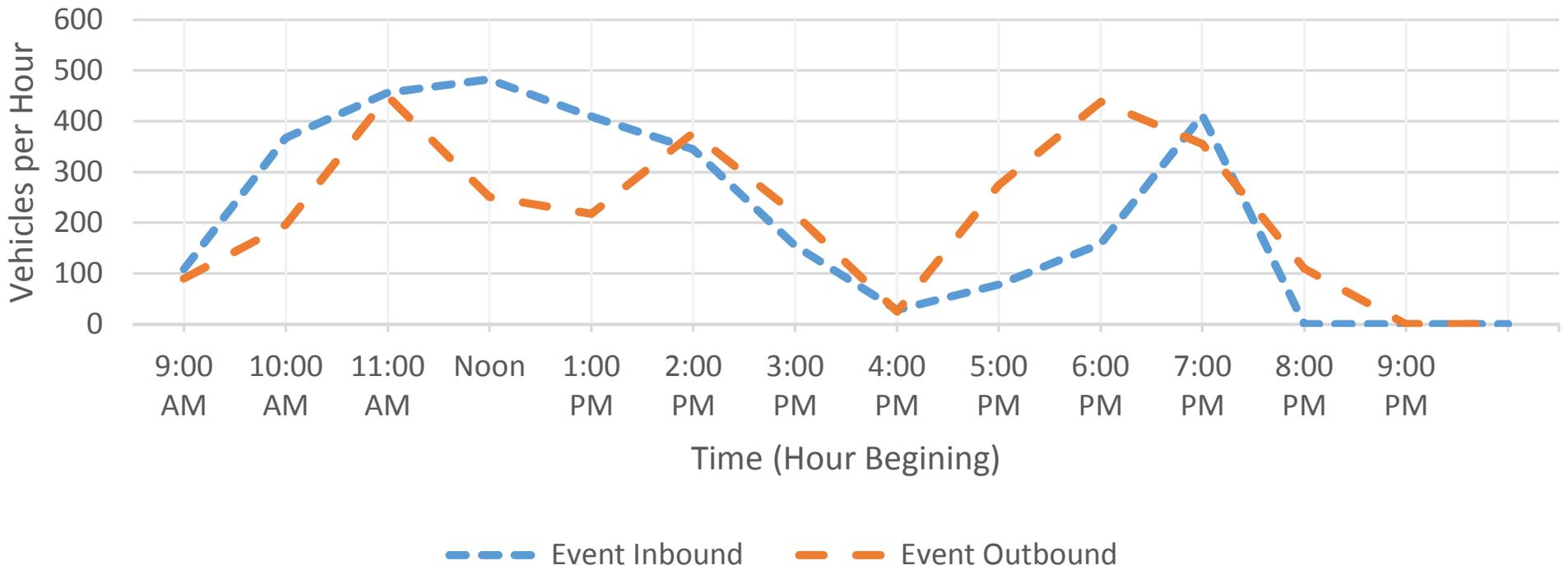
wayfinding signing, traffic control signing and other traffic control devices (traffic cones, etc.) as needed. These event traffic management elements shall be located as shown on a special event traffic management plan (to be developed with input from Scott County and MnDOT).

18. Based on this traffic impact study and analysis, the site-related special event-generated traffic will not degrade traffic operations to unacceptable levels at the study intersections on design event days and during hours of operation.

It is therefore concluded that the proposed Sever's Festivals site-generated traffic will not represent a significant long-term adverse traffic impact to the supporting roadway systems.

Appendix A

Sever's Fall Festival Hourly Traffic Volume Profile
October (Friday MEA Week) 3,000 Vehicle Design Event



Appendix B

Sever's Festivals Site | Traffic Feasibility Study

HCM/SimTraffic Performance Reports

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗	↖	↖	↗	↖	↖	↗		↖	↗	↖
Traffic Vol, veh/h	20	95	0	0	30	105	0	0	0	65	0	25
Future Vol, veh/h	20	95	0	0	30	105	0	0	0	65	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	300	-	300	300	-	300	0	-	-	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	103	0	0	33	114	0	0	0	71	0	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	103	0	0	180	180	103	180	180	33
Stage 1	-	-	-	-	-	-	147	147	-	33	33	-
Stage 2	-	-	-	-	-	-	33	33	-	147	147	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1579	-	-	1489	-	0	782	714	952	782	714	1041
Stage 1	-	-	-	-	-	0	856	775	-	983	868	-
Stage 2	-	-	-	-	-	0	983	868	-	856	775	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1489	-	-	754	704	952	773	704	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	754	704	-	773	704	-
Stage 1	-	-	-	-	-	-	844	764	-	969	868	-
Stage 2	-	-	-	-	-	-	957	868	-	844	764	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.3	0	0	9.7
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	-	-	1579	-	-	1489	-	773	-	1041
HCM Lane V/C Ratio	-	-	0.014	-	-	-	-	0.091	-	0.026
HCM Control Delay (s)	0	0	7.3	-	-	0	-	10.1	0	8.6
HCM Lane LOS	A	A	A	-	-	A	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	-	-	0	-	0.3	-	0.1

Intersection

Int Delay, s/veh 0.6

Movement EBT EBR WBL WBT NEL NER

Lane Configurations						
Traffic Vol, veh/h	125	5	5	70	5	5
Future Vol, veh/h	125	5	5	70	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	136	5	5	76	5	5

Major/Minor Major1 Major2 Minor1

Conflicting Flow All	0	0	141	0	225	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	86	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1442	-	763	909
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	937	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1442	-	760	909
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	933	-

Approach EB WB NE

HCM Control Delay, s	0	0.5	9.4
HCM LOS			A

Minor Lane/Major Mvmt NELn1 EBT EBR WBL WBT

Capacity (veh/h)	828	-	-	1442	-
HCM Lane V/C Ratio	0.013	-	-	0.004	-
HCM Control Delay (s)	9.4	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	8.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	120	5	5	70	15	10
Future Vol, veh/h	120	5	5	70	15	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	300	0	-	300	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	5	5	76	16	11

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	48	5	0	-	5
Stage 1	5	-	-	-	-
Stage 2	43	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	962	1078	-	0	1616
Stage 1	1018	-	-	0	-
Stage 2	979	-	-	0	-
Platoon blocked, %			-		-
Mov Cap-1 Maneuver	952	1078	-	-	1616
Mov Cap-2 Maneuver	952	-	-	-	-
Stage 1	1018	-	-	-	-
Stage 2	969	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.4	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	- 952 1078	1616	-
HCM Lane V/C Ratio	- 0.137 0.005	0.01	-
HCM Control Delay (s)	- 9.4 8.4	7.2	-
HCM Lane LOS	- A A	A	-
HCM 95th %tile Q(veh)	- 0.5 0	0	-

Intersection						
Int Delay, s/veh	6.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖	↗	↖	↗	↗	↖
Traffic Vol, veh/h	15	70	110	15	20	15
Future Vol, veh/h	15	70	110	15	20	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	300	300	-	-	300
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	76	120	16	22	16

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	278	22	22	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	256	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	712	1055	1593	-	-	0
Stage 1	1001	-	-	-	-	0
Stage 2	787	-	-	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	659	1055	1593	-	-	-
Mov Cap-2 Maneuver	659	-	-	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	787	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	6.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	1593	-	659	1055	-
HCM Lane V/C Ratio	0.075	-	0.025	0.072	-
HCM Control Delay (s)	7.4	-	10.6	8.7	-
HCM Lane LOS	A	-	B	A	-
HCM 95th %tile Q(veh)	0.2	-	0.1	0.2	-

1: TH 169 & Red Rock Rd/CSAH 14/150th St Performance by movement

Movement	EBT	EBR	WBT	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.3	2.3	0.5	1.6	0.5
Total Del/Veh (s)	0.6	2.3	0.8	2.7	1.3	4.1	4.6	5.9	3.3

4: Louisville Rd & CSAH 14/150th St Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.4	3.9	0.0	0.0	1.2
Total Del/Veh (s)	0.9	1.5	0.9	2.3	11.1	9.0	4.2

5: Smith Dr & Red Rock Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NEL	NER	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	1.8	0.0	5.6	5.8	4.3	3.4	3.3

7: Red Rock Rd & 147th St Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	3.7	0.1	0.3
Total Del/Veh (s)	3.8	0.0	2.0	0.2	2.2	0.8	0.4	2.7

8: Louisville Rd & 147th St Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	4.2	0.3
Total Del/Veh (s)	3.8	2.2	6.0	5.2	0.2	1.9	3.9

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	7.8

Queuing and Blocking Report
 Year 2040 Background PM Peak Hour Forecasts

03/19/2019

Intersection: 1: TH 169 & Red Rock Rd/CSAH 14/150th St

Movement	EB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	1
95th Queue (ft)	23
Link Distance (ft)	157
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: Louisville Rd & CSAH 14/150th St

Movement	EB	SB
Directions Served	L	L
Maximum Queue (ft)	15	68
Average Queue (ft)	1	29
95th Queue (ft)	7	50
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Smith Dr & Red Rock Rd

Movement	EB	WB	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	6	9	28
Average Queue (ft)	0	0	6
95th Queue (ft)	4	6	23
Link Distance (ft)	600	157	250
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
 Year 2040 Background PM Peak Hour Forecasts

03/19/2019

Intersection: 7: Red Rock Rd & 147th St

Movement	WB
Directions Served	L
Maximum Queue (ft)	58
Average Queue (ft)	32
95th Queue (ft)	48
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	300
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 8: Louisville Rd & 147th St

Movement	EB	NB
Directions Served	L	L
Maximum Queue (ft)	29	26
Average Queue (ft)	10	2
95th Queue (ft)	31	16
Link Distance (ft)	1113	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Intersection												
Int Delay, s/veh	9.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↗		↖	↑	↗
Traffic Vol, veh/h	20	95	10	5	30	105	235	25	15	65	65	25
Future Vol, veh/h	20	95	10	5	30	105	235	25	15	65	65	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	Stop
Storage Length	300	-	300	300	-	300	0	-	-	300	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	103	11	5	33	114	255	27	16	71	71	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	114	0	0	226	190	103	217	201	33
Stage 1	-	-	-	-	-	-	147	147	-	43	43	-
Stage 2	-	-	-	-	-	-	79	43	-	174	158	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1579	-	-	1475	-	0	729	705	952	739	695	1041
Stage 1	-	-	-	-	-	0	856	775	-	971	859	-
Stage 2	-	-	-	-	-	0	930	859	-	828	767	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1475	-	-	645	693	952	695	683	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	645	693	-	695	683	-
Stage 1	-	-	-	-	-	-	844	764	-	957	856	-
Stage 2	-	-	-	-	-	-	828	856	-	774	756	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.2			1.1			13.6			10.5		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	SBLn1	SBLn2	SBLn3
Capacity (veh/h)	645	772	1579	-	-	1475	-	695	683	1041
HCM Lane V/C Ratio	0.396	0.056	0.014	-	-	0.004	-	0.102	0.103	0.026
HCM Control Delay (s)	14.2	9.9	7.3	-	-	7.5	-	10.8	10.9	8.6
HCM Lane LOS	B	A	A	-	-	A	-	B	B	A
HCM 95th %tile Q(veh)	1.9	0.2	0	-	-	0	-	0.3	0.3	0.1

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NEL	NER
Lane Configurations						
Traffic Vol, veh/h	150	5	5	135	5	5
Future Vol, veh/h	150	5	5	135	5	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	163	5	5	147	5	5

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	168	0	323
Stage 1	-	-	-	-	166
Stage 2	-	-	-	-	157
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1410	-	671
Stage 1	-	-	-	-	863
Stage 2	-	-	-	-	871
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1410	-	668
Mov Cap-2 Maneuver	-	-	-	-	668
Stage 1	-	-	-	-	863
Stage 2	-	-	-	-	868

Approach	EB	WB	NE
HCM Control Delay, s	0	0.3	9.8
HCM LOS			A

Minor Lane/Major Mvmt	NELn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	759	-	-	1410	-
HCM Lane V/C Ratio	0.014	-	-	0.004	-
HCM Control Delay (s)	9.8	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection						
Int Delay, s/veh	8.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑
Traffic Vol, veh/h	145	5	5	135	15	10
Future Vol, veh/h	145	5	5	135	15	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	Free	-	None
Storage Length	300	0	-	300	300	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	158	5	5	147	16	11

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	48	5	0	-	5
Stage 1	5	-	-	-	-
Stage 2	43	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218
Pot Cap-1 Maneuver	962	1078	-	0	1616
Stage 1	1018	-	-	0	-
Stage 2	979	-	-	0	-
Platoon blocked, %			-		-
Mov Cap-1 Maneuver	952	1078	-	-	1616
Mov Cap-2 Maneuver	952	-	-	-	-
Stage 1	1018	-	-	-	-
Stage 2	969	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.5	0	4.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	- 952 1078	1616	-
HCM Lane V/C Ratio	- 0.166 0.005	0.01	-
HCM Control Delay (s)	- 9.5 8.4	7.2	-
HCM Lane LOS	- A A	A	-
HCM 95th %tile Q(veh)	- 0.6 0	0	-

Intersection						
Int Delay, s/veh	7.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↘	↗	↘	↗	↗	↘
Traffic Vol, veh/h	15	135	135	15	20	15
Future Vol, veh/h	15	135	135	15	20	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Stop	-	None	-	Free
Storage Length	0	300	300	-	-	300
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	147	147	16	22	16

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	332	22	22	0	0
Stage 1	22	-	-	-	-
Stage 2	310	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	663	1055	1593	-	0
Stage 1	1001	-	-	-	0
Stage 2	744	-	-	-	0
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	602	1055	1593	-	-
Mov Cap-2 Maneuver	602	-	-	-	-
Stage 1	909	-	-	-	-
Stage 2	744	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	6.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	1593	-	602	1055	-
HCM Lane V/C Ratio	0.092	-	0.027	0.139	-
HCM Control Delay (s)	7.5	-	11.1	9	-
HCM Lane LOS	A	-	B	A	-
HCM 95th %tile Q(veh)	0.3	-	0.1	0.5	-

1: TH 169 & Red Rock Rd/CSAH 14/150th St Performance by movement

Movement	EBR	WBT	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.0		0.0	0.3	2.3	0.6	1.5	0.5
Total Del/Veh (s)	3.6		3.4	2.1	4.4	6.0	6.9	4.4

4: Louisville Rd & CSAH 14/150th St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	4.2	0.4	3.9	0.2	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	0.8	1.7	0.3	0.5	1.7	2.3	7.1	8.1	2.1	11.4	16.0	10.3

4: Louisville Rd & CSAH 14/150th St Performance by movement

Movement	All
Denied Del/Veh (s)	0.8
Total Del/Veh (s)	6.2

5: Smith Dr & Red Rock Rd Performance by movement

Movement	EBT	EBR	WBL	WBT	NEL	NER	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	3.3	1.3	4.6	5.8	7.4	3.5	4.4

7: Red Rock Rd & 147th St Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	3.8	0.2	0.2
Total Del/Veh (s)	4.2	2.0	0.0	2.3	0.8	0.4	3.1

8: Louisville Rd & 147th St Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.1	4.0	0.2
Total Del/Veh (s)	4.3	2.4	6.8	5.6	0.3	1.9	4.4

Total Network Performance

Denied Del/Veh (s)	0.7
Total Del/Veh (s)	11.9

Queuing and Blocking Report
 Year 2040 Build Sever's Festivals PM Peak Hour Forecasts

03/19/2019

Intersection: 1: TH 169 & Red Rock Rd/CSAH 14/150th St

Movement	EB	WB
Directions Served	R	R
Maximum Queue (ft)	75	109
Average Queue (ft)	10	4
95th Queue (ft)	81	49
Link Distance (ft)	157	325
Upstream Blk Time (%)	3	
Queuing Penalty (veh)	4	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: Louisville Rd & CSAH 14/150th St

Movement	EB	WB	NB	NB	SB	SB
Directions Served	L	L	L	TR	L	T
Maximum Queue (ft)	5	9	112	45	43	55
Average Queue (ft)	0	0	47	18	24	27
95th Queue (ft)	3	5	81	37	42	49
Link Distance (ft)			806	806		1451
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	300	300			300	
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: Smith Dr & Red Rock Rd

Movement	EB	WB	NE
Directions Served	TR	LT	LR
Maximum Queue (ft)	38	4	28
Average Queue (ft)	4	0	7
95th Queue (ft)	39	6	24
Link Distance (ft)	600	157	250
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Queuing and Blocking Report
Year 2040 Build Sever's Festivals PM Peak Hour Forecasts

03/19/2019

Intersection: 7: Red Rock Rd & 147th St

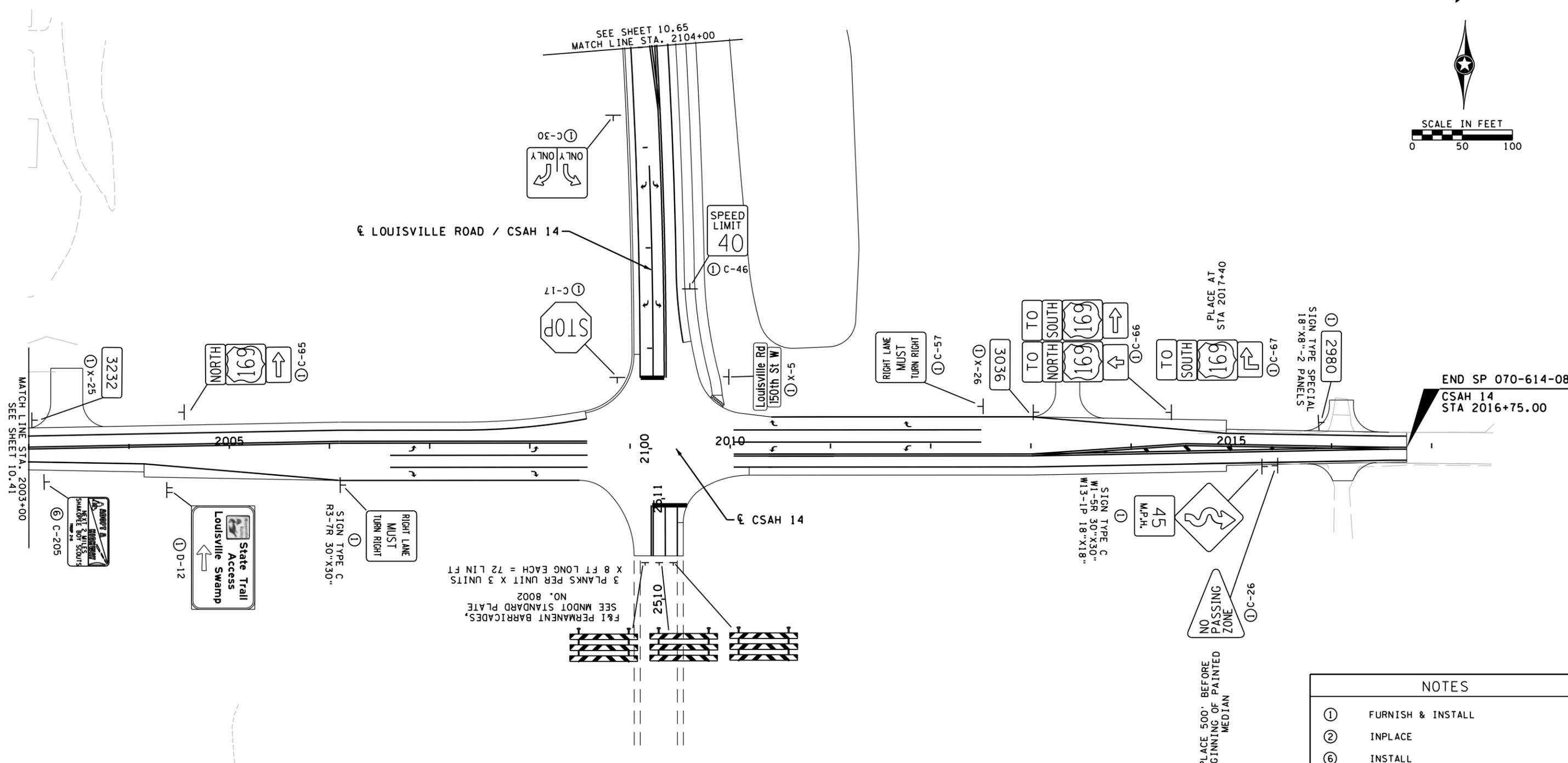
Movement	WB	SB
Directions Served	L	L
Maximum Queue (ft)	65	6
Average Queue (ft)	34	0
95th Queue (ft)	49	4
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	300	300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 8: Louisville Rd & 147th St

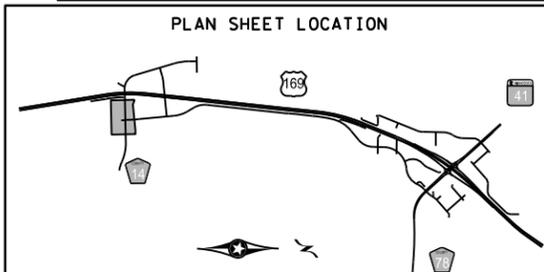
Movement	EB	NB
Directions Served	L	L
Maximum Queue (ft)	30	30
Average Queue (ft)	11	2
95th Queue (ft)	33	15
Link Distance (ft)	1113	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		300
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 4



NOTES	
①	FURNISH & INSTALL
②	INPLACE
⑥	INSTALL



DATE: 1/22/2019 11:19:59 AM
 PATH & FILENAME: K:\03212-040\Cad\Plan\cd7005-121.sgn24.dgn

NO.	DATE	BY	CHK	REVISIONS
4	1-21-19	DS	TG	MODIFICATIONS AT THE INTERSECTION OF CSAH 14 AND LOUISVILLE RD

Design By: MF
 Plan By: MF
 Checked By: ES
 Approved By: SD

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

Sean Delmore
 LICENSED PROFESSIONAL ENGINEER - SEAN DELMORE, PE
 DATE: 03/23/2018 40945



TH 169/TH 41/CSAH 78 DDI
 147th St. Overpass
 Scott County, Minnesota

SIGNING PLAN
 S.P.7005-121 (TH 169), S.P.070-596-013, ET AL

SHEET
 10.64R
 OF
 10.140
 SHEETS