Snelling Midway Soccer Stadium

DRAFT Transportation Study

Prepared for

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Executive Summary

Introduction

A transportation study was conducted for the proposed soccer stadium and surrounding mixed-use development located in the southeast quadrant of the University Avenue/Snelling Avenue intersection in Saint Paul, Minnesota. The main objectives of this study are to review future traffic operations within the study area, evaluate development traffic impacts to the adjacent roadway network, including the proposed site access and internal circulation, evaluate traffic impacts, evaluation of the transit and pedestrian/bike system and recommend any necessary transportation improvements to accommodate the proposed developments. In general, assumptions made for purposes of this analysis were conservative, in particular with regard to transit clearance times and availability of nearby parking for stadium events.

Analysis was completed for:

- Full Development (Master Plan) for Year 2035
 - No Build and Build Conditions
 - o Weekday AM and PM Peak Hour Traffic
- Soccer Stadium Event for Year of Opening in Year 2018
 - o Stadium capacity 20,000
 - o No new development
 - o No Build and Build Conditions
 - o Saturday 2:00 p.m. Start Time
 - Arrival Peak 1:00 to 2:00 p.m.
 - Departure Peak 4:00 p.m. to 5:00 p.m.
- Soccer Stadium for Year 2035
 - o Stadium capacity 25,500
 - o Full Development based on the Master Plan
 - No Build and Build Conditions
 - o Saturday 2:00 p.m. Start Time
 - Arrival Peak 1:00 to 2:00 p.m.
 - Departure Peak 4:00 p.m. to 5:00 p.m.

The City of Saint Paul PED and Public Works, Ramsey County Public Work, Minnesota Department of Transportation, Metro Transit and FWHA met seven (7) times from January 28, 2016 to May 16, 2016 to discuss and coordinate elements of the transportation study.

Overall Transportation Analysis Inputs

Data Collection - The existing traffic and pedestrian volumes were reviewed during eight (8) different time periods at 30 intersections shown in Figure 2.

Background Traffic Forecasts - Traffic forecasts were developed for year 2018 and 2035 no build conditions using an annual background growth rate of one-half percent. The annual background growth rate is based on results from the Twin Cities Regional Travel Demand Model. **Intersection Evaluation Measurement Criteria** - For the development scenario, overall intersection LOS A through LOS D is generally considered acceptable in the Twin Cities Metro Area for weekday peak hour traffic, with LOS E and F unacceptable. For the events scenarios, event traffic should dissipate in around one hour. Typically have acceptable LOS during the arrival of the event traffic.

Proposed Access to the development is proposed at the following locations in year 2035, shown in Figure 7, which includes modifying access at the Snelling Avenue and Spruce Tree Avenue intersection to a right-in/right-out only and relocate the traffic signal to a new full intersection at Shields. Realigning access on Pascal Street to line-up across from access points to Walmart and Cub.

Directional Distribution of the site trips are shown in Figure 8 for the development and Figure 15 for the event traffic. Development trips will be more regional in the future with the inclusion of the large office component. The traffic distribution for the event is based on other ticket information from other event venues, current soccer ticket sales and overall population density.

Proposed Development Analysis

Two development scenarios were evaluated for the proposed development. The development scenarios contain similar land uses, however, the sizes of the specific land uses differ from one another. These were:

- 1. Comprehensive Plan/Snelling Station TOD Development plan scenario,
- 2. RK Midway Master Plan Development plan

The RK Midway Master Plan includes 620 dwelling units, 1M square feet of Office, 370,000 square feet of shopping center, fitness club, movie theatre and supermarket, and 400 Hotel Spaces. This land use plan is slightly more intense than other and would generate 1,190 a.m. peak hour trips, 1,460 pm peak hour trips and 12,320 daily trip more than the existing site. Most of these new trips are generated by the office land use. These trips are more regional than the existing retail land use on the site.

Traffic Analysis - 2035 Development

2035 No Build Conditions - Weekday AM and PM Peak Hour

Results of the year 2035 No Build intersection capacity analysis indicate that all study intersections are expected to operate at an acceptable overall LOS D or better during the a.m. and p.m. peak hour with the proposed roadway geometry and traffic controls, except for the Snelling Avenue and Selby Avenue intersection during the a.m. peak hour.

Snelling Avenue during the p.m. peak is expected to be congested between I-94 and University Avenue and flow along Snelling Avenue south of the interchange is hindered by slower travel, high volumes and lane changing, however overall intersection is in the acceptable LOS D range.

2035 Build Conditions - Weekday AM and PM Peak Hour

Results of the year 2035 Build intersection capacity analysis indicate that all study intersections are expected to operate at an acceptable overall LOS D or better during the a.m. peak hour and p.m. peak hours with the new site access geometry and traffic controls, except for the Snelling Avenue and Selby Avenue intersection during the a.m. peak hour and the Hamline Avenue and Marshall Avenue intersection during the p.m. peak hour.

- The Snelling Avenue and Selby Avenue intersection is a no-build condition with no proposed mitigation.
- Poor operations are expected at the Hamline Avenue and Marshall Avenue intersection during the p.m. peak hour under the build condition. Based on preliminary analysis, providing an eastbound right-turn lane will improve to acceptable overall intersection operations. The improvement would require removing on-street parking stalls near the intersection, however, it may only be needed during the p.m. peak hour of the day. Another alternative would be adding left-turn lanes to Hamline Avenue.
- During the p.m. peak hour, intersections on Snelling Avenue between Thomas Avenue and Selby Avenue are expected to operate at an overall LOS D, however, side-street queuing and delay is expected, similar to year 2035 no build conditions. A rolling type queue is expected along southbound Snelling Avenue. The newly constructed westbound approach of the Snelling Avenue and Shields Avenue intersection is expected to have maximum queues of over 750 feet, which will potentially extend into the on-site parking structures.

Key Findings for Full Build Development

- 1. To improve Snelling Avenue operations, the traffic signal at Spruce Tree Avenue should be relocated to Shields Avenue. This will require modifications/reconstruction of Snelling Avenue to Shields Avenue. Shields Avenue will need three westbound approach lanes to accommodate the amount of traffic leaving the proposed office land use along Snelling.
- 2. Snelling Avenue will have intersections operating at acceptable LOS (delay) under the No Build and Build conditions. However, while all intersections are expected to operate at LOS D from Shields Avenue to Selby Avenue, the high volume, queues, and lane changing south of the I-94 interchange makes the area feel congested under no build and build conditions.
- 3. The only intersection that goes from an acceptable LOS in No Build to an unacceptable LOS in Build is at Hamline Avenue and Marshall Avenue. Mitigation would not be required with the year of opening of the Stadium or initial development. Addition of an eastbound right-turn lane (by time of day with the removal of on-street parking) would provide acceptable overall level of service or by providing left-turn lanes on Hamline Avenue.
- 4. Traffic signal timing within the study area would need to be updated to accommodate future development traffic.
- 5. The proposer should encourage future land use to use the transit system with Green Line LRT, A-Line BRT and the other regular Metro Transit service adjacent to the site. Consider travel demand management (TDM) measures to encourage the use of these facilities.

Soccer Stadium Events

As part of the Snelling Midway Stadium Alternative Urban Areawide Review (AUAR), an analysis was conducted to address transportation issues related to the proposed soccer stadium. The proposed stadium is expected to have a capacity of 20,000 for the 2018 year of opening with the opportunity to expand to a capacity of 25,500 by year 2035 and would include full re-development of the site.

The assumptions for the analysis are based on conditions prior to implementing mitigation strategies and could change based on mitigation strategies that are implemented. This analysis is intended to identify potential issues that will require further investigation. These could be strategies to increase auto-occupancy, provide additional parking, provide staging areas for transit, or provide pre and postgame activities.

Traffic Analysis Event Assumptions

Traffic Volumes - For the study area intersections were collected for events occurring on a weekday evening (7:00 p.m. start time), weekend afternoon (2:00 p.m. start time) and a weekend evening (7:00 p.m. start time). Typical matches last for approximately two hours. Based on a review of the traffic volumes collected, the weekend afternoon background volume was significantly higher than the other two scenarios.

Parking Availability - Included evaluation of on-site and nearby off-site parking within a one mile walking distance was completed for both a year of opening and future year full-build out scenario for event parking. The goal of the transportation analysis was to determine mitigation strategies such that parking in adjacent residential neighborhoods is not needed to meet event demand. Similarly, accommodating event parking in nearby lots or ramps on a first-come, first-serve basis is also unreliable, as capacity may vary from event to event, and staffing costs and insurance concerns may limit participation of lot/ramp owners.

Auto Occupancy - Based on prior experience with travel behavior characteristics for sports stadium around Twin Cities and around the country, it was estimated that 2.75 people per vehicle would be used as an average auto occupancy for all analysis time periods.

Event Traffic Characteristics - The arrival peak will be smoother and spread out over the course of the arrival hour, while the departure typically occurs all within about a half-hour interval. Not all event trips leave or arrive during the peak hour.

Year 2018 Event Conditions

Trip Generation - To account for traffic impacts associated with the proposed stadium development, trip generation estimates for weekend afternoon event (match starting at 2:00 p.m.) were developed. The highest background traffic is generated by the near-by retail land uses, connections to other destinations and access to I-94.

Transportation Mode

The year 2018 event transportation mode share is presented below. These are expected to differ from the mode share values in the year 2035 full build conditions.

Walk/Bike/Local Bus/Private Shuttle/Charter Bus would combined total of these modes would accommodate 2,000 (10 percent) for a weekday match and 3,000 (15 percent) for a weekend match.

<u>Drive to Site - On-Site Parking</u> is expected to keep changing as development occurs. For year of opening, it is expected that approximately 400 vehicles may be able to park on-site, which will equate to approximately 1,100 fans or 5.5 percent of fans for a capacity event.

<u>Drive to near Site - Off-Site Adjacent Parking</u> takes into account parking not on site, but within walking distance of the stadium. An assumption was made that a minimum of approximately 350 parking spaces, accommodating 1,000 fans, or 5 percent.

Arrive on Green Line LRT or A-Line BRT. The LRT mode share was identified that with a full one-hour utilization of both the eastbound and westbound LRT, approximately 6,200 fans or 31 percent will be able to utilize the LRT to arrive at the proposed stadium. The A-Line BRT is not operational until summer of 2016, based on the crush load and expected occupancy of the BRT buses, approximately 700 attendees or three and half percent of event fans.

Shuttle Buses to Remote Parking. The remaining event patrons would be take another mode. The proposed mitigation strategy has been proposed to provide a shuttle service to off-site parking facilities. Based on the crush load and 115 to 130 bus trips (40 to 50 buses), approximately 7,975 (weekend) to 8,975 (weekday) fans or 40 to 45 percent will utilize the shuttle bus service. Remote parking locations have not been confirmed.

The capacity of the stadium is expected to be approximately 20,000 patrons in year 2018. The trip generation estimates, shown in **Table S-1** (person trips, not vehicle trips), were developed using the described mode share.

Table S-1 Person Trip Generation Estimates – 20,000 Patrons

Modes	Percent	Weekday		Percent of	Weekend	
	of Total	Arrival	Departure	Total	Arrival	Departure
Non-Auto or LRT/BRT	10.0%	2,000	2,000	15.0%	3,000	3,000
On Site Parking	5.5%	1,100	1,100	5.5%	1,100	1,100
Off Site Parking	4.8%	965	965	4.8%	965	965
LRT/BRT	34.8%	6,960	6,960	34.8%	6,960	6,960
Off-Site Shuttles	44.9%	8,975	8,975	39.9%	7,975	7,975
Totals	100.0%	20,000	20,000	100.0%	20,000	20,000

Results of the trip generation estimates indicate that approximately 10 percent of trips for an event will occur using an automobile within the study area.

Traffic Analysis - Year 2018 Event Conditions

During the departure peak hour, minor issues are anticipated in the peak exiting half hour of event departure traffic. The majority of exiting vehicles are destined to exit in the half hour immediately after the game ends, which causes a spike in traffic volumes. Congestion is observed in the model at the following:

- Snelling Avenue and Shields Avenue intersection and along Snelling Avenue to St. Anthony Avenue. With a majority of vehicles destined to westbound I-94, expect queues from the southbound right-turn at St. Anthony Avenue and westbound thru on St. Anthony Avenue at Snelling Avenue.
- This queueing on St. Anthony Avenue could spill back from Snelling Avenue to Pascal Street and have an effect of a rolling queue from the parking lot exit on Pascal Street to the on-ramp at Snelling Avenue. Because of the amount of volume on Pascal Street after a match, driveway access from Midway Shopping Center, Walmart, and Cub will be busy.
- The event vehicles clear within one hour of the match. Mainly because of the limited number of parking spaces near the facility.

Multi-Modal Transportation Analysis - Year 2018 Event Conditions

A transportation model VISSIM/VISWALK was completed to analyze all modes (pedestrian/bicycle, LRT, transit, shuttle). The Saturday afternoon event departure conditions at 4 p.m. were analyzed with the proposed access configuration and a full capacity event (20,000) to determine potential multimodal transportation impacts due to the increased pedestrian, transit and vehicular traffic. Results of the detailed transportation analysis focus on the average travel time and queues for event patrons heading to these mode types, along with the expected amount of space needed to accommodate the queues.

The assumptions to complete the transportation analysis and are included in the mitigation strategies. These include the following items:

- 10 minute headways for all LRT and BRT transit vehicles Depending on the time and day
 of the event, this project may need to request the schedule be changed to higher frequency
 service.
- Three-vehicle LRT It was noted during site observations that on Saturdays, it is common to run two-vehicle LRT. This was assumed to be the full three-vehicle LRT at the end of an event. The project needs to work with Metro Transit.
- Based on data collected on LRT, of the 540 person crush-load capacity approximately 480 event patrons could board the LRT, while about 70 people could board the BRT.
- Approximately 40 to 50 shuttle buses would need to make 115 to 130 shuttle bus trips. At this point, the assumption is that shuttle buses would operate along Saint Anthony Avenue on the southeast corner of the site. It was assumed that a complete round trip for the shuttle bus could be completed in approximately 20 to 30 minutes in order to run two to three shuttle bus trips per hour requiring the parking facilities are two to three miles away.

Results from the transportation analysis, shown in **Table S-2**, indicate the largest queue and average travel time for pedestrians using LRT/BRT to depart an event. The travel time is based on the time between the patron leaving the stadium and boarding the LRT/BRT vehicle. With a slightly larger number of patrons destined on westbound LRT, it is expected that the queue length and travel time would be larger than eastbound.

Table S-2 Transportation Analysis Results – LRT/BRT

Direction and Mode	Maximum Queue (Peds)	Average Travel Time (Minutes)
Westbound LRT	2,050	30
Eastbound LRT	1,700	20 to 25
Northbound BRT	150	10 to 15
Southbound BRT	150	10 to 15

- The BRT is expected to finish boarding in about one hour
- Westbound LRT event passengers board the final train approximately one hour and 15 minutes after the completion of the event.
- Based on these guidelines, a <u>minimum</u> westbound queueing area of approximately 16,500 square feet and <u>minimum</u> eastbound queueing area of approximately 13,750 square feet would be necessary.
- It is expected that the BRT queuing would be accommodated by the existing sidewalk infrastructure.

Results from the shuttle bus transportation analysis, shown in **Table S-3**, indicate the largest queue and average travel time for 7,200 patrons using a shuttle bus to depart a Saturday event. Based on the current site plan, there is room for up to four or five buses in the shuttle area. The buses would need to be staged, perhaps along St. Anthony Avenue east of Pascal Street or to the north on Pascal Street. The departure shuttling need to be efficient to maximize the shuttle bus loading area.

Table S-3 Transportation Analysis Results – Shuttle Bus

Mode	Maximum Queue (Peds)	Travel Time (Minutes)
Shuttle Bus Queue	3,050	20

- It is expected to take between one hour and an hour and fifteen minutes to clear the shuttle bus area.
- This queue will require a minimum queuing space of approximately 25,000 sf.

Key Findings for Year of Opening Event - 2018

Many more event patrons will want to drive directly to the event than can be accommodated by the parking on-site or within walking distance. This could result in significant traffic congestion, circulation trying to find a space, illegal parking and overall frustration. An event Transportation Management Plan (TMP) is needed to safely and efficiently get event patrons to and from the event while minimizing impact to the local business and residents.

- For a weekend event, it is expected that approximately 10 to 15 percent of event patrons will walk, bike, or take local bus locally to the site, and approximately 10 percent of event patrons will be able to park on-site or off-site within a walking distance. The remaining 75 to 80 percent of patrons are expected to use LRT/BRT and shuttle buses.
- Approximately 35 percent of event patrons will be able to utilize LRT/BRT, however, the
 time to clear the site may slightly exceed one hour after the event and dependent on actual
 demand.
- The remaining 40 percent (45 percent on a weekday) will need to be shuttled to remote parking within two to three miles. This operation may need to utilize 40 to 50 buses, depending on where the remote parking is located. The time to clear the site may take slightly over one hour.
- Storage and waiting areas for pedestrians using transit or shuttle service will need to be defined and will require additional event staff outside of the facility to manage it.
- A minimum westbound LRT queueing area of approximately 16,500 square feet and minimum eastbound LRT queueing area of approximately 13,750 square feet would be necessary. The shuttle bus pedestrian queue will require a minimum queuing space of approximately 25,000 square feet. Both of these queues are expected to take just over one hour to clear out.
- The I-94/Snelling interchange is a key vehicular bottleneck in the system. Event patrons should be encourage to use adjacent interchanges when arriving and departing the event. Shuttle bus service along Saint Anthony may need to be reconsidered because of this bottleneck.
- The area has a significant amount of retail land use. Weekend (Saturday) events starting between 1:00 p.m. and 5:00 p.m. and ending between 3:00 p.m. and 7:00 p.m. place the event traffic during the busiest business times and background traffic. Capacity events should be encouraged for a 7:00/7:30 p.m. start time with departure at 9:00/9:30 p.m.

Year 2035 Event Conditions

To identify potential impacts associated with the proposed soccer stadium events under full build conditions, traffic forecasts for year 2035 conditions (i.e. year of full build of adjacent development) were reviewed. The year 2035 conditions take into account general area background growth, trips generated by the adjacent buildings on the proposed site, and the additional trips generated by a soccer stadium event. The proposed soccer stadium has the potential to expand to a capacity of 25,500 by the year 2035, therefore, this analysis will consider this larger event attendance in addition to the adjacent development. The following sections provide details on the background traffic forecasts, estimated trip generation, and intersection capacity analysis for year 2035 conditions.

Trip Generation - To account for traffic impacts associated with the proposed stadium development, trip generation estimates for weekend afternoon event (match starting at 2:00 p.m.) were developed. The highest background traffic is generated by the near-by retail land uses, connections to other destinations and access to I-94.

Transportation Mode

The year 2035 event transportation mode share is presented below. These are expected to differ from the mode share values in the year 2018.

<u>Walk/Bike/Local Bus/Private Shuttle/Charter Bus</u> would combined total of these modes would accommodate 3,500 (14 percent) for a weekday match and 4,600 (18 percent) for a weekend match. Higher share than in 2018 due to the proposed land uses including residential and hotel.

<u>Drive to Site - On-Site Parking</u> is expected to keep changing as development occurs. For year of opening, it is expected that approximately 2,000 vehicles may be able to park on-site, which will equate to approximately 5,525 fans or 22 percent of fans for a capacity event.

<u>Drive to near Site - Off-Site Adjacent Parking</u> takes into account parking not on site, but within walking distance of the stadium. An assumption was made that a minimum of approximately 350 parking spaces, accommodating 1,000 fans, or 4.5 percent.

Arrive on Green Line LRT or A-Line BRT. The LRT mode share was identified that with a full one-hour utilization of both the eastbound and westbound LRT, approximately 6,200 fans or 24 percent will be able to utilize the LRT to arrive at the proposed stadium. The A-Line BRT is not operational until summer of 2016, based on the crush load and expected occupancy of the BRT buses, approximately 700 attendees or three percent of event fans.

Shuttle Buses to Remote Parking. The remaining event patrons would be take another mode. The proposed mitigation strategy has been proposed to provide a shuttle service to off-site parking facilities. Based on the crush load and 100 to 120 bus trips, approximately 7,150 (weekend) to 8,250 (weekday) fans or 28 to 33 percent will utilize the shuttle bus service. Remote parking locations have not been confirmed.

The capacity of the stadium is expected to be approximately 25,500 patrons in year 2035. The trip generation estimates, shown in **Table S-4** (person trips, not vehicle trips), were developed using the described mode share.

Table S-4
Person Trip Generation Estimates – 25,500 Patrons

Modes	Percent	Weekday		Percent of	Weekend	
	of Total	Arrival	Departure	Total	Arrival	Departure
Non-Auto or LRT/BRT	14.0%	3,515	3,515	18.1%	4,605	4,605
On Site Parking	22.0%	5,650	5,650	22.0%	5,650	5,650
Off Site Parking	4.5%	1,155	1,155	4.5%	1,155	1,155
LRT/BRT	27.3%	6,960	6,960	27.3%	6,960	6,960
Off-Site Shuttles	32.2%	8,250	8,250	28.1%	7,150	7,150
Totals	100.0%	25,500	25,500	100.0%	25,500	25,500

Traffic Analysis - Year 2035 Event Conditions

Based on the traffic analysis for the 25,500 capacity event and future development, congestion is observed at the following:

- During the arrival peak hour on a weekend afternoon, there is expected to be queuing in the northbound direction of Snelling Avenue from south of Selby Avenue to the I-94 interchange. This is due to the eastbound left-turning volume at Snelling Avenue and Concordia Avenue intersection coming from I-94 heading to the on-site event parking ramp along Snelling Avenue. Poor intersection operations and queuing are expected on Concordia Avenue and the I-94 eastbound off-ramp west of Snelling Avenue and Northbound Snelling Avenue from Concordia Avenue to Selby Avenue.
- During the departure peak hour, the analysis identified congestion at the Snelling Avenue and Shields Avenue intersection and along the driveways on Pascal Street. Traffic volumes during the exiting peak hour are large along Snelling Avenue, and with much of the traffic destined to the westbound I-94 on-ramp, significant southbound right-turn queueing from St. Anthony Avenue to Shields Avenue and westbound thru traffic on St Anthony at Snelling Avenue. This is due to the added parking on the west side of the site along Snelling Avenue. Because these two major movements conflict with one another queues are expected in both directions. This queueing on St. Anthony Avenue could spill back from Snelling Avenue to Pascal Street and have an effect of a rolling queue from the parking lot exit on Pascal Street. Because of the amount of volume on Pascal Street after a match, driveway access from Midway Shopping Center, Walmart, and Cub will be difficult.
- The site is expected to take approximately one and a half to two hours to clear with the onsite parking to be the last to clear.

• The event arrival conditions (queues and poor LOS) at Snelling Avenue and Concordia Avenue and almost two hours to leave the site do not meet expectations for an event.

Key Findings for Year 2035 Capacity Event

Additional findings beyond those for year of opening (2018):

- The site will continue to change as re-development occurs. An updated TMP should be prepared each year to account for the changes.
- The additional on-site parking, all located along Snelling Avenue, departing at one access point, is challenging. The on-site parking will require one and a half to *two hours* to clear.
- Additional parking should be found away from the site and have good access to the other interchanges to I-94, not Snelling Avenue.
- In order to clear event traffic in one hour (besides on-site vehicles), slightly more shuttle bus service may be needed. It is expected that the new residential uses, office, and hotel will result in more event patrons walking to the event.
- Weekend start times should be even more encouraged to start later in the day, although, the significant amount of vehicles departing from the site at Shields Avenue after an event will be problematic any time.
- Issues are expected along Snelling Avenue during both the arrival and departure peak hours. During arrivals, the eastbound left-turning volume at the Concordia Avenue/Snelling Avenue intersection is expected to back-up onto the Snelling Avenue exit ramp and potentially onto I-94. Additionally, the northbound direction of Snelling Avenue between Concordia Avenue and Selby Avenue is expected to be congested. Typically, other event arrivals do not result in such poor operations.
- During the departure peak hour, poor operations are expected when exiting the site through the Snelling Avenue and Shields Avenue intersection. With the majority of these vehicles destined to I-94 westbound, the Snelling Avenue and St. Anthony Avenue intersection is expected to be over capacity and will not be able to accommodate all of the event traffic within one hour. It is expected to take **one and a half to two hours** to clear event traffic.
- These event departure issues along Snelling Avenue are expected to impact the shuttle bus delivery and pick-up area along St. Anthony Avenue. Due to these impacts, the shuttle bus area may not be able to clear the shuttle pedestrian queue within a one hour timeframe.
- These potential traffic issues will need to be evaluated with any expansion plans in the future.

Mitigation Measures

This section relates to mitigation needed based on the re-development of the entire site and not related to traffic generated by an event at the soccer stadium. It is important to remember that the proposed plan has just a slight increase in the amount of retail space compared to the existing site. The retail trips are more local in nature. The site does propose new office space of around 1 million square feet. These trips are typically more regional.

At the completion of full development, the new improvements should include the following:

Internal roadway system connections to public roadways

- 1. Two internal north-south roadways that connect to University Avenue (partial access; right-in/right-out only) and the easterly north-south roadway connecting to Saint Anthony as a right-in/right-out access and western north-south roadway terminating in the site.
- 2. Two east-west roadways that connect Snelling Avenue and Pascal Street
 - Extension of Spruce Tree would have modified access resulting in right-in/right-out only movements with the traffic signal removed at Snelling Avenue and full access at Pascal Street
 - b. Extension of Shields Avenue would result in a new full access signalized access at Shields Avenue and full access with potential of a traffic signal at Pascal Street
- 3. Pedestrian and bike accommodations internal to the site

Around the Site

- 4. Pedestrian sidewalk should be provided around the perimeter of the site, with a minimum width of eight feet.
- 5. Bike racks for a minimum of 400 bicycles should be provided.

Snelling Avenue – University Avenue to Shields Avenue

To address the close spacing of the Spruce Tree and University Avenue intersection;

- 6. Spruce Tree intersection
 - a. Add a center median to only allow right-in/right-only access
 - b. Remove the traffic signal ("relocated" to Shields Avenue)
- 7. University Avenue Intersection
 - a. Extend Northbound left-turn lane from 50 feet to 250 feet
- 8. Shields Avenue
 - a. New traffic signal ("relocated" from Spruce Tree Avenue)
 - b. Add Southbound left-turn lane
 - c. Two-lanes of approach for eastbound Shields Avenue (check alignment across intersection); left-thru lane and a right-turn lane (may be convertible to parking in off-peak hours)
 - d. Three-lanes of approach for Westbound Shields Avenue with two providing left-turn movements; left-turn lane, left-thru lane and right turn lane

- e. Traffic signal phasing can vary throughout the time of day, depending on traffic volume demand. It is expected that the new signal controller and signal heads will be able to accommodate both phasing options presented:
 - i. Westbound protected/permissive (i.e flashing yellow arrow) left-turn phasing with no eastbound left-turn phasing (more efficient)
 - 1. Best operation with an assumed 20 foot wide pedestrian crossing only on the north side
 - 2. This option is recommended to be run during all peak hours
 - ii. Split Phasing
 - 1. Pedestrian crossing only on the north side
 - 2. This may be run in off peak times

Pascal Street - University Avenue to Saint Anthony Avenue

With the new land use; access points should align across Pascal and left-turn lanes provided.

- 9. Shields Extension New traffic signal (when warranted)
- 10. Re-stripe Pascal to provide a three-lane roadway (one thru lane in each direction with left-turn lane) with the additional space as a bike-lane or shoulder. Maintain Northbound left-turn lane at University Avenue and add Southbound right-turn lane at Saint Anthony
- 11. Sufficient width and right-of-way should be obtained to provide a five-lane roadway if needed in the future.
- 12. Saint Anthony Install a permanent traffic control signal

Marshall Avenue / Hamline Avenue Intersection

The site does not generate much traffic going through this intersection, but enough to cause the intersection to be unacceptable. The operations can be mitigated with two solutions:

- 13. Add an Eastbound right-turn lane during the p.m. peak hour by restricting 100 feet of parking along Marshall Avenue.
 - a. Alternative would be to add northbound and southbound left-turn lanes.
 - b. This improvement is not needed with the initial development phases.

Snelling Avenue from University Avenue to Selby Avenue

The expected additional development generated traffic is expected to be a small increase south of the I-94 interchange, we know that today queues can somedays back from the I-94 Southbound ramp intersection onto the freeway. Snelling Avenue south of the interchange can feel congested with the number of vehicles changing lanes to Selby Avenue and queues blocking unsignalized intersections during the peaks.

14. Update traffic signal timing along Snelling Avenue for the six intersections for each phase of development.

Policy Measures

Encourage use of Transit

The site is served by great transit facilities with Central Corridor LRT (Green Line) along University Avenue and a new BRT (Bus Rapid Transit) "A-Line" starting in summer of 2016.

- 15. Consider implementing TDMP (Travel Demand Management Plan) strategies with future redevelopment
- 16. Land use guidance to promote TOD (Transit Orientated Developed) and complementary land uses

Mitigation – Event (Year of Opening 2018 – Capacity of 20,000)

Mitigating an event requires a management strategy and elements of that strategy. Based on the modeling of the events, the following items are needed to be addressed in a Transportation Management Plan (TMP) in order to clear the event traffic within one hour. The transportation management plan should be started after the AUAR and continue to within a few months of the first event. The TMP committee should include MnUnited Soccer Team, RK Midway, City of Saint Paul Planning and Public Works, Metro Transit, Ramsey County Public Works, MnDOT and FWHA. They should meet prior to every MLS soccer season to discuss potential modification to the site plan or transportation system.

Develop Transportation Management Plan

1. Event Traffic Control Plan

The event traffic control plan is how the actual day of the event will be managed outside of the physical stadium. This would include diagrams of routing event patrons, key conflict points would be managed by traffic control officers. Providing storage areas, etc.

- a. Traffic control officer locations
- b. Managed Storage Areas for Transit, Shuttle and Charter Bus
- c. Temporary lane or roadway closures
- d. Permanent or temporary barriers are needed to restrict uncontrolled pedestrian crossings on Snelling Avenue (median) and Pascal Street. Internal roadways and walkways will require barriers to direct pedestrian flow.
- e. Event traffic signal timing plan

2. Parking Plan

On-Site Parking is only expected to accommodate approximately 10 percent of a capacity crowd. There will be more demand for parking near the facility than can be accommodated. To reduce congestion and frustration caused by vehicles trying to find parking, communication must be stated that if you do not have a reserved parking space for the event, then please take transit or shuttle buses from (list where they can park and ride transit/shuttle service). Parking on-site and immediately (within one mile) near-by should be assigned and purchased with the tickets. Potentially, this should be considered for all locations in order to minimize confusion and maximize efficiency.

3. Transit Plan

Metro Transit is currently working with a transit consultant to work through some of the potential issues for transit before and after events. Expectations are that LRT, A-Line BRT and regular bus service are expected to accommodate approximately 35 percent of a capacity event. The project will need to work with Metro Transit to provide as much capacity for event arrival and departure as possible.

4. Shuttle Service to Remote Parking Plan

Expectation is this shuttle service to remote parking would accommodate around 40 to 45 percent of a capacity event. This would result in approximately 115 to 130 bus trips with a crush-load of 70 people and require 40 to 50 buses depending on the location of the remote parking. Two key elements of the shuttle service is the amount of space on-site required to stage event patrons waiting for the shuttles and finding remote parking areas within a reasonable distance.

5. Routing and Wayfinding Plan

All event patrons are pedestrians at some point of their trip to or from the Stadium. The team will need to provide direction to Snelling Avenue LRT Station, A-Line BRT Station (University Avenue Station), Charter Bus/Private Shuttle Bus, Shuttle Bus service to remote parking (and perhaps more than one destination) and parking lots. This information is needed on-site, but other off-site signage and wayfinding maybe needed. The intent is provide the most efficient, safe and easy to understand plan to have a great patron experience.

6. Communication and Education Plan

The technical analysis and the other plans need to be communicated to the event patrons, local businesses/residents and those who drive/walk/bike or take transit through the area. The transportation system will need its full capacity to accommodate the arrival and departure of the event. This information can be mailed to ticket holders, websites, on parking vouchers, with any ticket purchase, media outlets, email notifications to anyone, etc. Most importantly, not enough on-site parking with be available for the potential demand, and therefore event patrons need to use transit or shuttle bus service to remote parking

7. Incident Management and Safety Plan

This would be completed by emergency responders. It would cover situations in the case of an incident or issue at the stadium.

8. Other Considerations

Other items to consider that impact the transportation event include existing usage of the transportation system, how to manage the event by spreading out the peak demand and how the site might develop resulting in adaption of the plan to new conditions.

- a. Continue the transportation committee (TAC) to meet at least twice a year to discuss event scheduling, transportation issues, improvements, etc.
- b. With the amount of retail land use in the area, the existing volumes are high until 6:30 p.m. on both weekdays and weekends. Recommend considering games begin at 7:00 p.m. or later.
- c. Avoid over-lapping events at the University of Minnesota (TCF Bank), State Fair (operates for twelve days from late August into early September, ending on Labor Day) and Vikings (US Bank Stadium), as these events will likely consume remote parking, transit capacity and regional roadway capacity.
- d. The team should consider activities/concerts/etc. before and after match events to spread out arrival and departure times. Work with local businesses to participate or lead such events.
- e. Consider pre-sale of parking at all venues including on-site, near-by, and remote parking facilities. This will guarantee a parking space, reduce circulation and patron confusion and frustration.

- f. Consider pre-sale (and open marketing) of bike spaces, and transit and shuttle to remote parking. Limit money transfer to speed up process.
- g. Identify an Event Transportation Manager for the Stadium
- h. TMP needs to adapt as site changes

Items that need to be incorporated into the Year of Opening Plan Mitigation

- 1. Transportation Management Plan that includes event traffic control, parking, transit, shuttle service, routing and wayfinding, and communication and education.
- 2. Create a transportation management committee. Stakeholders should include MnUnited Soccer Team, RK Midway representative, City of Saint Paul Planning and Public Works, Metro Transit, Ramsey County Public Works, MnDOT and FHWA.
- 3. Fencing down the median of Snelling Avenue and allowance for future boulevard fencing on the west side of Pascal Street (permanent or temporary)
- 4. Providing shuttle service to remote parking
- 5. Site Plan
 - a. Identification of transit, charter bus, private shuttle and shuttle bus loading and unloading areas
 - b. Sufficient waiting areas for transit, charter bus, private shuttle and shuttle bus patrons
 - c. Identification of taxi and drop-off/pick-up areas
 - d. Identify bike parking facilities

Mitigation – Event (Future Expansion – Capacity of 25,500)

The mitigation of event would be similar to the year of opening plan. It will also have the benefit of knowing how the transportation is working on the site. Without any increase in Metro Transit's capacity to accommodate event patrons, the additional 5,500 patrons would need to be accommodated by on-site parking and shuttle bus service, as transit service is assumed at capacity. The expected proposed on-site parking would be available in the office developments along Snelling Avenue. This will result in adding traffic to the busiest roadway and a key interchange (I-94/Snelling) in the transportation network. Only so many additional cars can be added and this becomes more challenging when the event is scheduled on a Saturday starting at 2:00 to 4:00 p.m. and ending around 4:00 or 6:00 p.m., as the area is very active.

The additional parking spaces is planned to be in the office parking ramp along Snelling Avenue. This ramp is only served by one access point and would result in the event arrival conditions (queues and poor LOS) at Snelling Avenue and Concordia Avenue and almost two hours to leave the site. This condition does not meet expectations set for the event. These potential traffic issues will need to be evaluated with any expansion plans in the future. No additional mitigation is proposed because so much will possibly change between the year of opening and the full development and potential expansion of the stadium capacity. All stakeholders would have the ability to see how the existing facility operates and how to improve it under changes in the future.

Introduction

SRF has completed a transportation study for the proposed soccer stadium and surrounding mixed-use development located in the southeast quadrant of the University Avenue/Snelling Avenue intersection in St. Paul, MN (see Figure 1: Project Location). The main objectives of this study are to review future traffic operations within the study area, evaluate development traffic impacts to the adjacent roadway network, including the proposed site access and internal circulation, evaluate traffic impacts, and recommend any necessary improvements to accommodate the proposed developments. The future analysis will include analysis of both development related impacts and soccer stadium events. The future development will be analyzed under full build out conditions and for purposes of the study are expected to be completed by year 2035. The soccer stadium events will be analyzed for both a year of opening condition (20,000 seat stadium), and for purposes of the study future year 2035 (25,500 seat stadium) condition. The following information provides the assumptions, analysis, findings and recommendations offered for consideration. These assumptions were derived from a series of six sub-TAC meetings comprised of consultant, City, County, State, and FHWA staff in order to achieve concurrence.

Existing Traffic Volumes

The existing traffic volumes were reviewed during eight (8) different time periods to establish a baseline in order to identify any future impacts associated with the proposed development and during expected soccer stadium event times. The evaluation of existing conditions includes turning movement and field observations. It should be noted that there will not be an intersection capacity analysis completed for existing conditions as part of this study.

Data Collection

Peak hour turning movement counts were collected during the following time periods:.

- a) Weekday 7:30 a.m. to 8:30 a.m.
- b) Weekday 4:45 p.m. to 5:45 p.m.
- c) Weekday 6:00 p.m. to 7:00 p.m.
- d) Weekday 9:00 p.m. to 10:00 p.m.

- e) Saturday 1:00 p.m. to 2:00 p.m.
- f) Saturday 4:00 p.m. to 5:00 p.m.
- g) Saturday 6:00 p.m. to 7:00 p.m.
- h) Saturday 9:00 p.m. to 10:00 p.m.

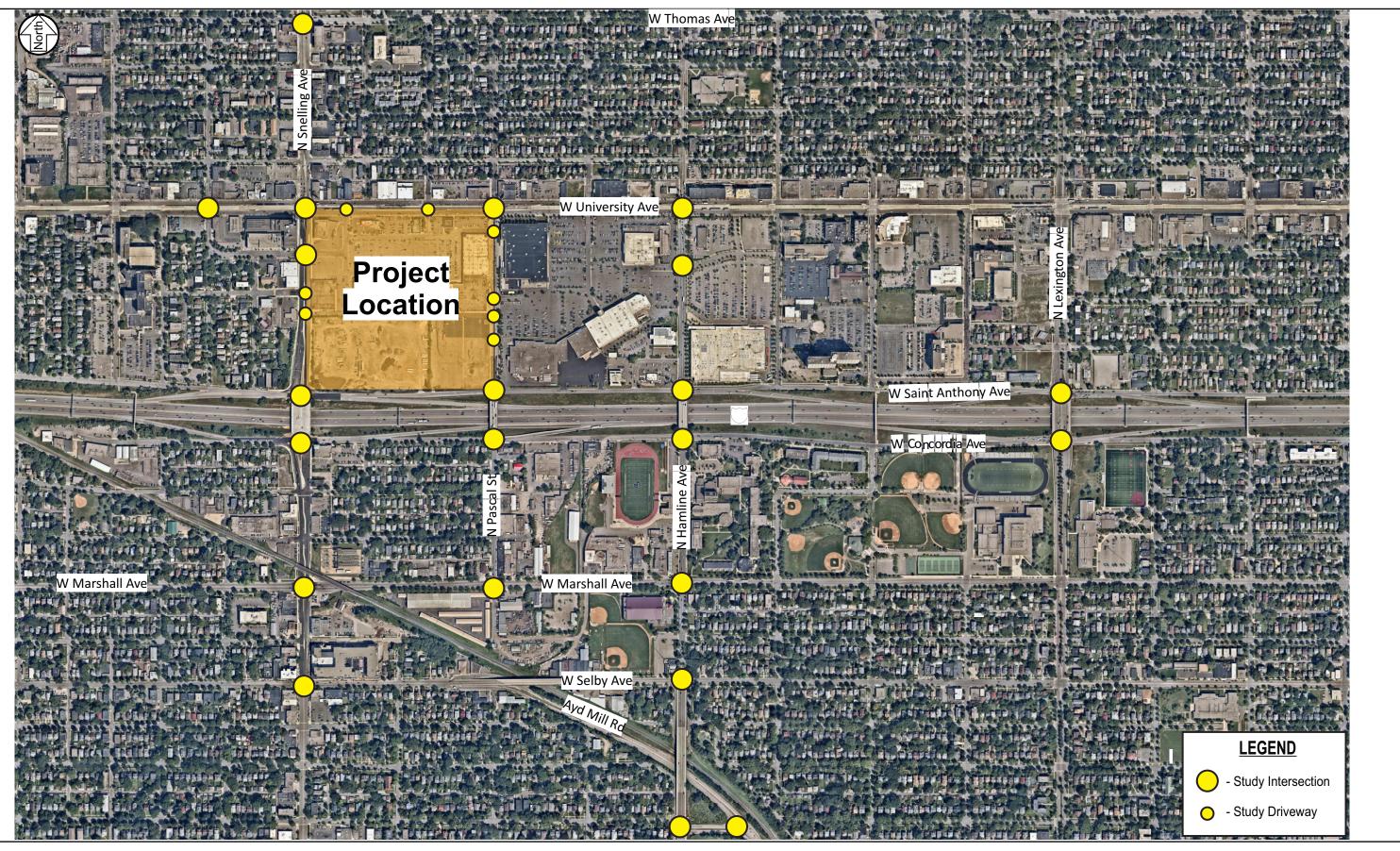
Existing traffic volumes were collected at locations shown in Figure 2. The time periods collected included a.m. and p.m. peak hours, and one hour before and after expected weekday and weekend Major League Soccer (MLS) games. A typical weekday game time is 7:00 p.m., while weekend games are typically between 2:00 p.m. and 7:00 p.m.



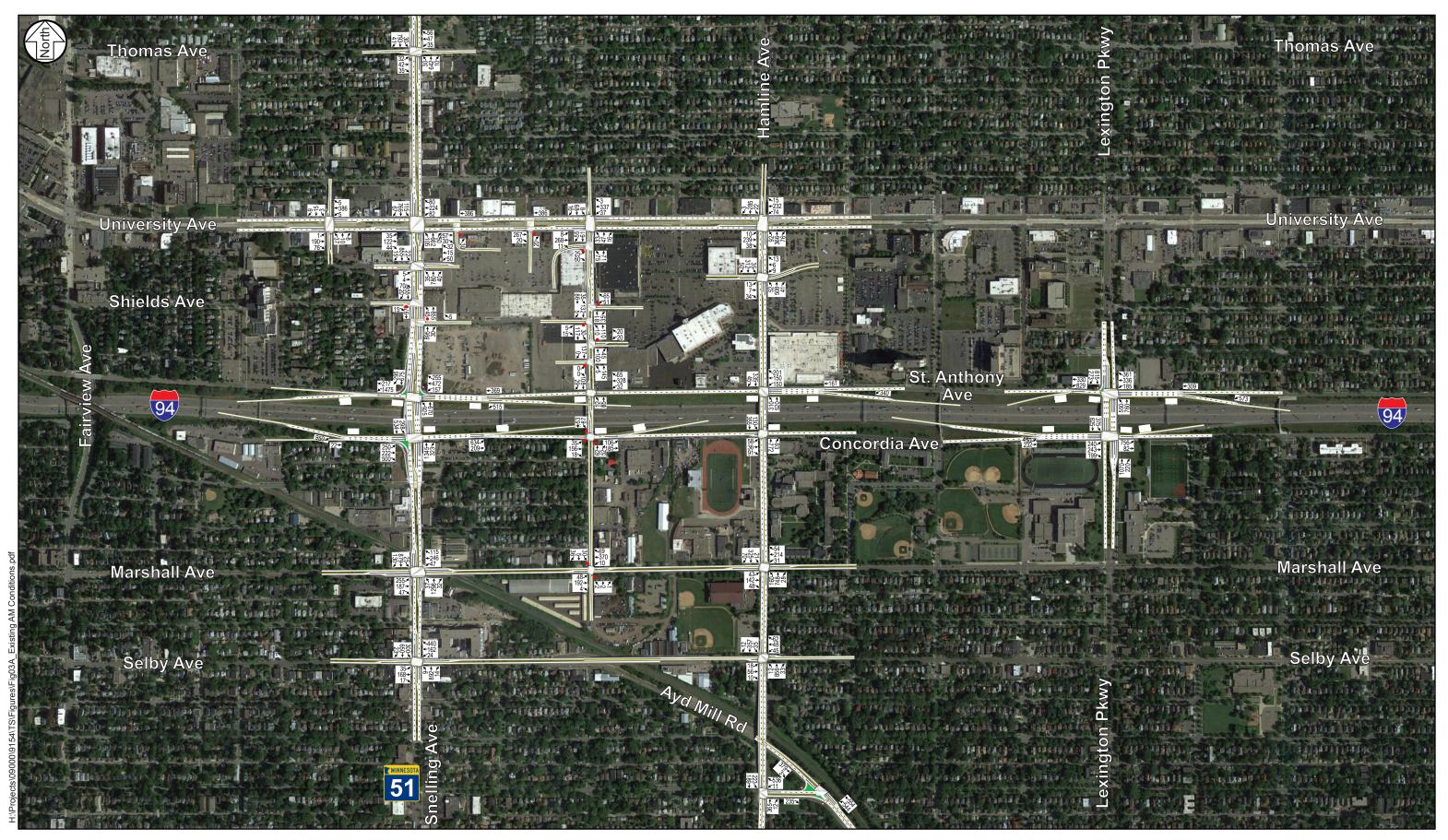
In addition to the intersection turning movement counts and average daily traffic volumes (provided by the Minnesota Department of Transportation), observations were completed to identify roadway characteristics within the study area (i.e. roadway geometry, posted speed limits, and traffic controls). The posted speed limit along all study roadways is 30 miles per hour. Existing geometrics, traffic controls, and volumes for the a.m. and p.m. weekday peak hours in the study area are shown in Figures 3A and 3B. The remaining traffic volumes for the other time periods collected are shown in Appendix A. It should be noted that the midday peak hour was considered, however, the a.m. and p.m. peak hour experiences significantly higher volumes along Snelling Avenue for commuter peaks and therefore were selected. Additionally, the a.m. and p.m. peak hour peaks were selected based on the significant office component of the proposed development, which tends to peak during weekday a.m. and p.m. peak hours and not midday or weekend peaks.

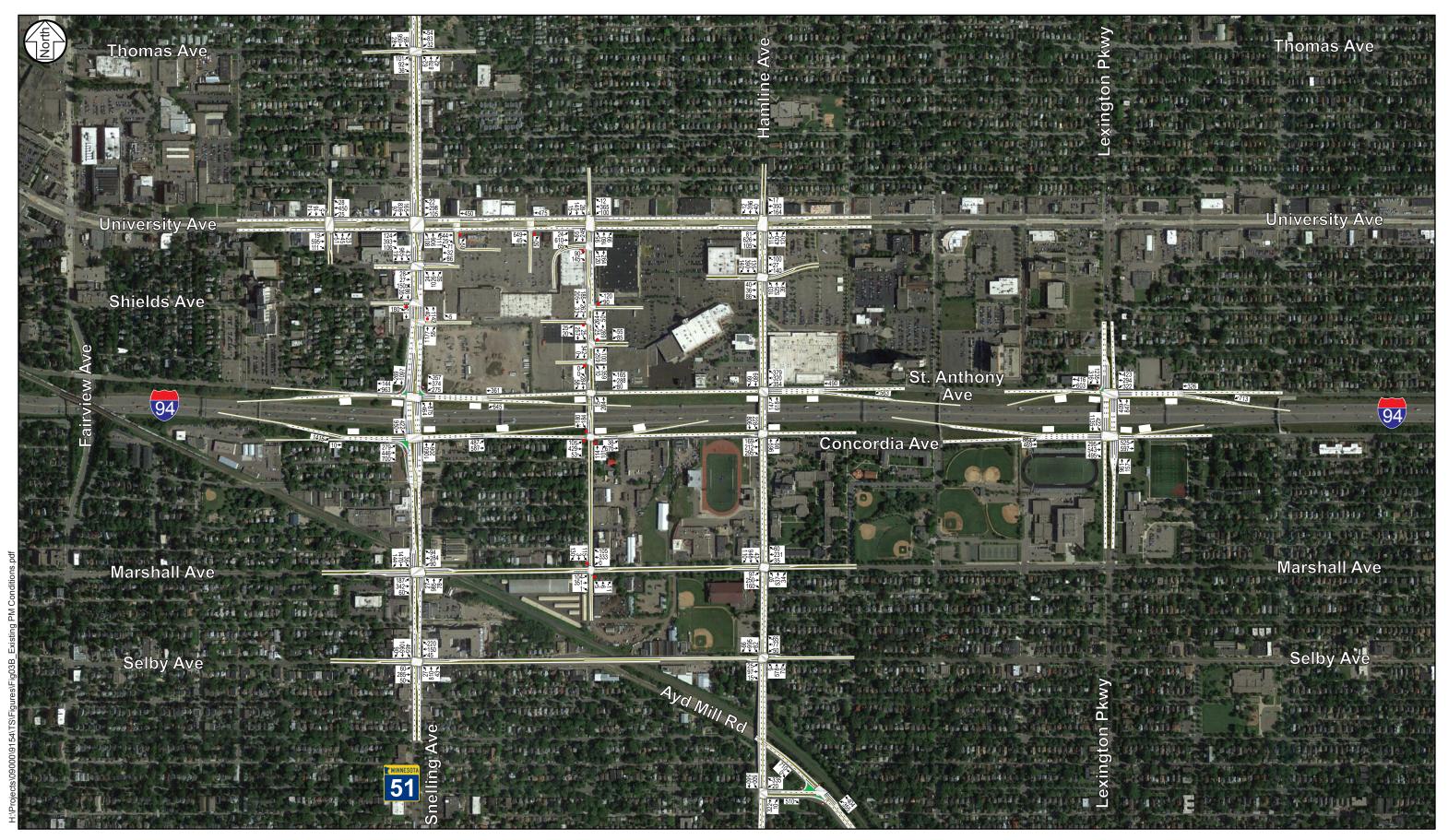
Intersection Capacity Analysis

An existing intersection capacity analysis was not completed for the existing hours collected. These were deemed unnecessary as the future year 2035 no build conditions would be analyzed and these would be the comparison for the year 2035 build conditions. The year 2035 no build conditions are expected to be similar to the existing conditions due to the minimal background growth. The proposed development is expected to be built in several phases, and therefore not completed for the purpose of the study until year 2035.









Year 2035 No Build Conditions

Traffic Forecasts

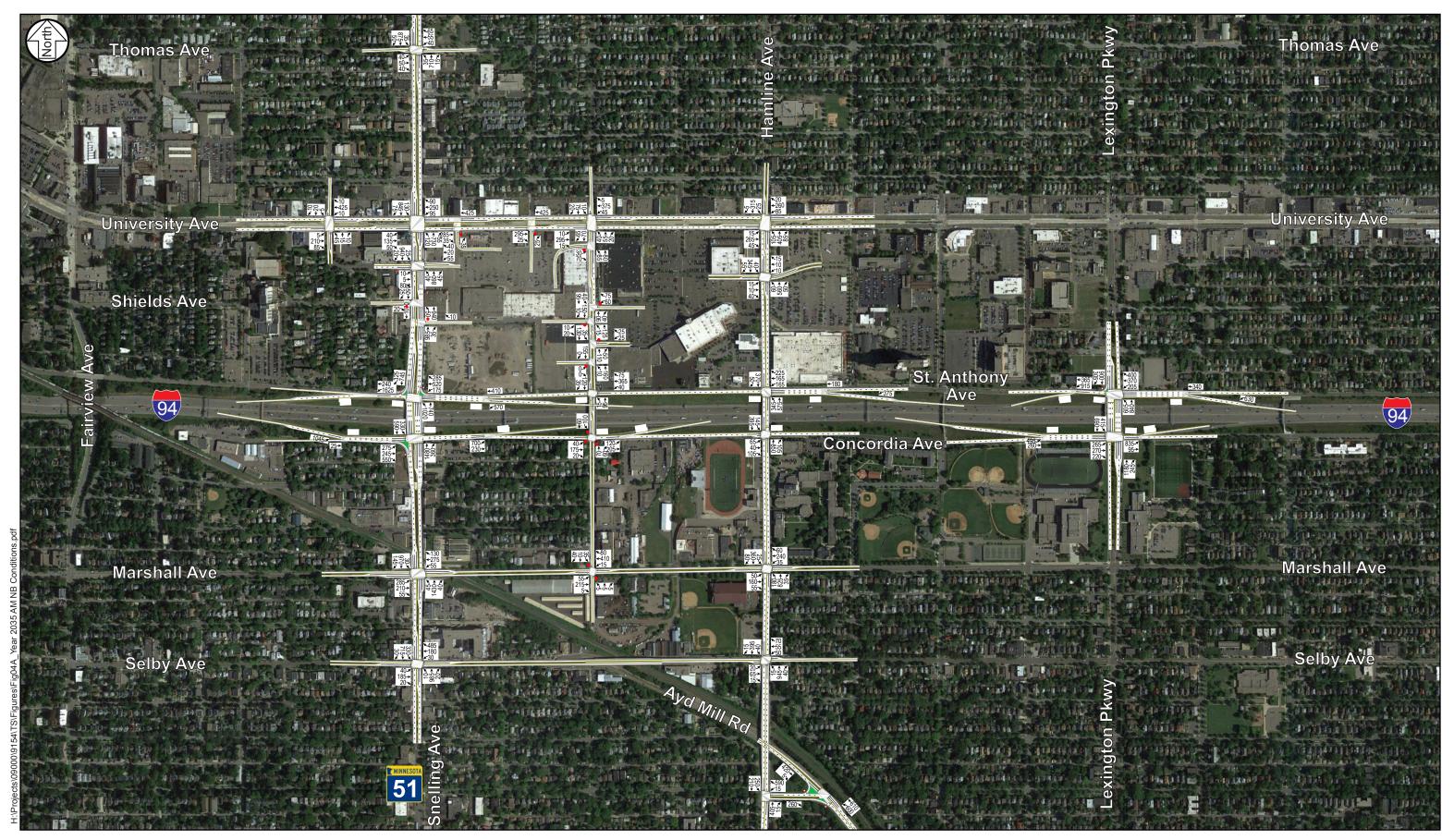
To determine the operational impact of the proposed development, a no build scenario was analyzed using the year 2035 traffic volumes and existing geometrics. Traffic forecasts were developed for year 2035 no build conditions (proposed year of full build out for purpose of the study) using an annual background growth rate of one-half percent. The annual background growth rate is based on results from the Twin Cities Regional Travel Demand Model. This growth rate provides a conservative approach and is consistent with previous traffic studies done in the area. The resultant year 2035 traffic forecasts for the a.m. and p.m. weekday peak hours, which include general background growth and trips generated by the proposed development, are shown in Figures 4A and 4B.

Intersection Capacity Analysis

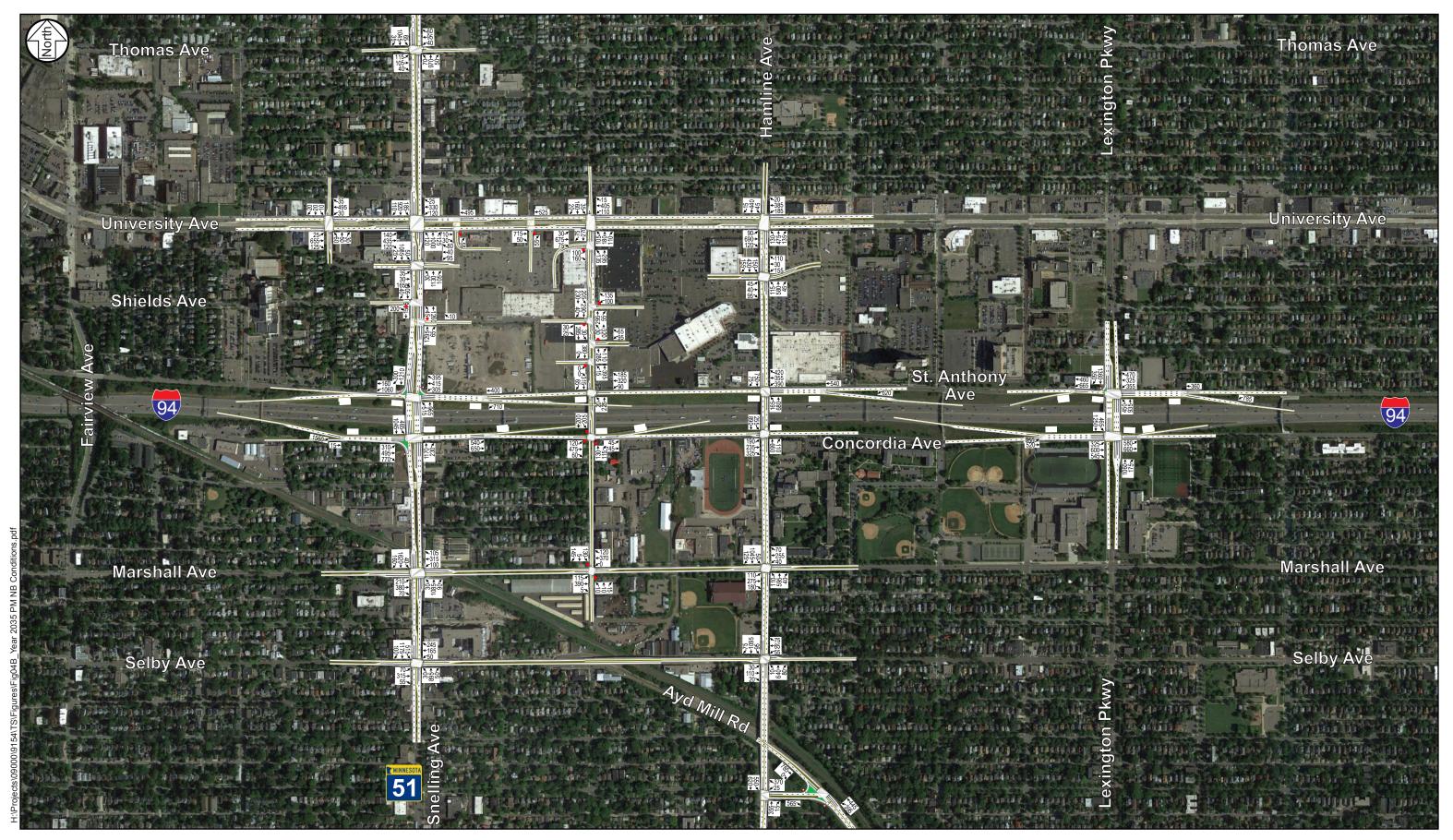
The study intersections were analyzed using Synchro/SimTraffic (V9). Capacity analysis results identify a Level of Service (LOS), which indicates the quality of traffic flow through an intersection. Intersections are given a ranking from LOS A through LOS F. The LOS results are based on average delay per vehicle, which correspond to the delay threshold values shown in Table 1. LOS A indicates the best traffic operation, with vehicles experiencing minimal delays. LOS F indicates an intersection where demand exceeds capacity, or a breakdown of traffic flow. Overall intersection LOS A through LOS D is generally considered acceptable in the Twin Cities Metro Area for weekday peak hour traffic, but not for event traffic. LOS D describes operations with moderate traffic control delay. This level is typically assigned when the volume is nearing the capacity of the intersection where progression along the corridor is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures (i.e. not getting through during the green time) are noticeable. Events are intense peak flows resulting in intersections operating at LOS F, so mitigation strategies are needed to manage the large peak flow. The duration of the impacts from event traffic is measured as a level of effectiveness for the events. For this size venue, event traffic should dissipate in around one hour.

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

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



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For two-way 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. 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.

To determine if the existing roadway network can accommodate the year 2035 no build traffic forecasts, a detailed intersection capacity analysis was completed using Synchro/SimTraffic software. It should be noted that Snelling Avenue was recently reconstructed between Marshall Avenue and University Avenue and no further geometric changes are considered in the near future.

Results of the year 2035 intersection capacity analysis shown in Table 2 indicate that all study intersections are expected to operate at an acceptable overall LOS D or better during the a.m. and p.m. peak hour with the existing roadway geometry and traffic controls, except for the Snelling Avenue and Selby Avenue intersection during the a.m. peak hour, notably the westbound approach. It should be noted that optimized signal timing was assumed under future conditions. Additionally, access onto Snelling Avenue during the p.m. peak is expected to be difficult between I-94 and University Avenue and flow along Snelling Avenue south of the interchange is hindered by slower travel, high volumes and lane changing, however overall intersection LOS/delay is in the acceptable range. The full simulation results for year 2035 no build conditions are presented in Appendix B.

The significant delay at the Snelling Avenue and Selby Avenue intersection during the a.m. peak hour is caused by the significant westbound right-turning movement at the intersection.

During the p.m. peak hour, significant queuing is expected along Snelling Avenue between Concordia Avenue and Selby Avenue. While the overall intersection LOS is expected to remain at an acceptable overall LOS D, significant side-street delay is expected. These queuing and delay issues are a product of the significant eastbound right-turn from Concordia Avenue to southbound Snelling Avenue and the large southbound left-turn volume from Snelling Avenue to Selby Avenue.

An evaluation of the arterial LOS on Snelling Avenue from Thomas Avenue to Selby Avenue, based on travel speed through the corridor and guidelines in the HCM was completed. The results show that the year 2035 no build conditions yield an arterial LOS near the LOS D/E threshold during the p.m. peak hour. LOS D/E conditions represent an arterial speed of about 40 percent of the typical free-flow speed. This is consistent with the individual intersection LOS and shows the congestion on the Snelling Avenue corridor that drivers will experience.

Table 2. Year 2035 No Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour	P.M. Peak Hour	
	LOS	LOS	
University Avenue/Fry Street	А	В	
Snelling Avenue/Thomas Avenue	В	В	
Snelling Avenue/University Avenue	С	D	
Snelling Avenue/Spruce Tree Avenue	А	D	
Snelling Avenue/Shields Avenue(1)	A/A	D/ F	
Snelling Avenue/Midway Shopping Center Driveway(1)	A/A	C/F	
Snelling Avenue/St. Anthony Avenue	В	D	
Snelling Avenue/Concordia Avenue	В	D	
Snelling Avenue/Marshall Avenue	D	D	
Snelling Avenue/Selby Avenue	F	D	
University Avenue/West Midway Shopping Center Driveway(1)	A/A	A/A	
University Avenue/East Midway Shopping Center Driveway ⁽¹⁾	A/A	A/A	
University Avenue/Pascal Street	В	В	
Pascal Street/North Midway Shopping Center Driveway ⁽¹⁾	A/A	A/C	
Pascal Street/Walmart Driveway ⁽¹⁾	A/A	A/C	
Pascal Street/South Midway Shopping Center Driveway ⁽¹⁾	A/A	A/A	
Pascal Street/Cub Driveway ⁽¹⁾	A/A	A/A	
Pascal Street/St. Anthony Avenue	В	В	
Pascal Street/Concordia Avenue ⁽²⁾	А	В	
Pascal Street/Marshall Avenue ⁽¹⁾	A/B	A/C	
University Avenue/Hamline Avenue	С	С	
Hamline Avenue/Midway Marketplace	А	В	
Hamline Avenue/St. Anthony Avenue	В	С	
Hamline Avenue/Concordia Avenue	В	В	
Hamline Avenue/Marshall Avenue	С	D	
Hamline Avenue/Selby Avenue	В	В	
Hamline Avenue/Ashland Avenue	В	В	
Ayd Mill Road/Ashland Avenue	В	В	
Lexington Avenue/St. Anthony Avenue	С	С	
Lexington Avenue/Concordia Avenue	С	С	

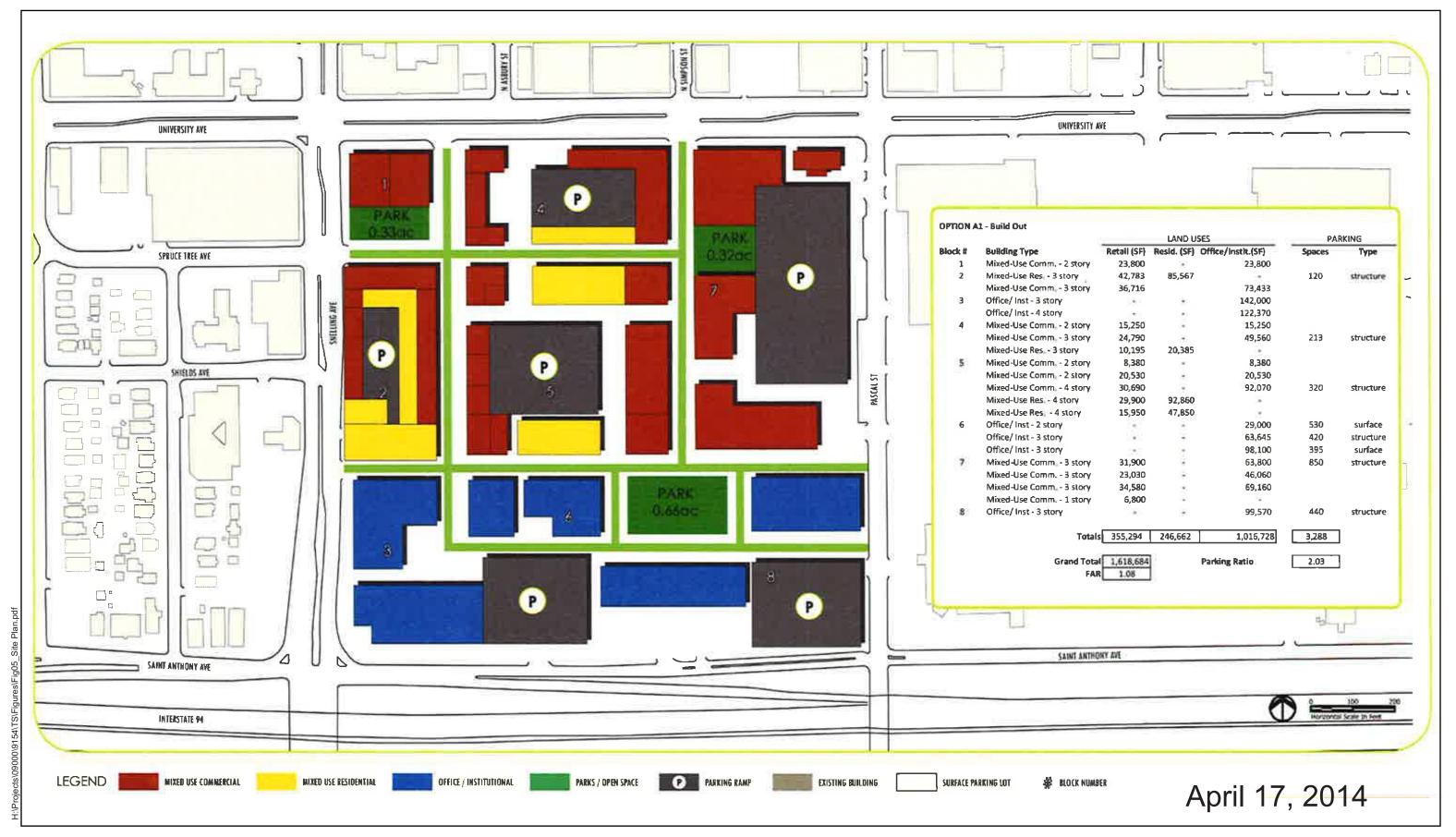
⁽¹⁾ Indicates an unsignalized intersection with side-street stop control, where the overall LOS is shown followed by the worst approach LOS. The delay shown represents the worst side-street approach delay.
(2) Indicates All-Way Stop Control

Proposed Development

The proposed mixed-use development is bound by St. Anthony Avenue, University Avenue, Snelling Avenue, and Pascal Street. There are two different development scenarios for the proposed development. The two development scenarios contain similar land uses, however, the sizes of the specific land uses differ from one another. Scenario one is referred to as the Comprehensive Plan/Snelling Station TOD Development plan scenario, shown in Figure 5 and scenario two is referred to as the RK Midway Master Plan Development plan, shown in Figure 6. Under each plan the proposed development is expected to include a mixture of uses, including multi-family apartments, office, service retail type uses. In the RK Midway Master Plan, a 20,000 person capacity soccer stadium that is expandable to a capacity of 25,500 is also included. For purposes of this study, the proposed development was assumed to be fully operational by the year 2035. However, the proposed soccer stadium will be completed initially by year 2018. The Comprehensive Plan/Snelling TOD development framework has been accepted by the city and will be compared to the proposed Master Plan. The development scenario with a higher intensity of trip generation will be analyzed. Trips will be generated for both scenarios and compared with the existing site trips to find out the total of the new external trips to the network. The existing site is approximately currently 80 percent occupied.

Access to the proposed development is proposed at the following locations in year 2035, shown in Figure 7. The access modifications and mitigation to the existing site include:

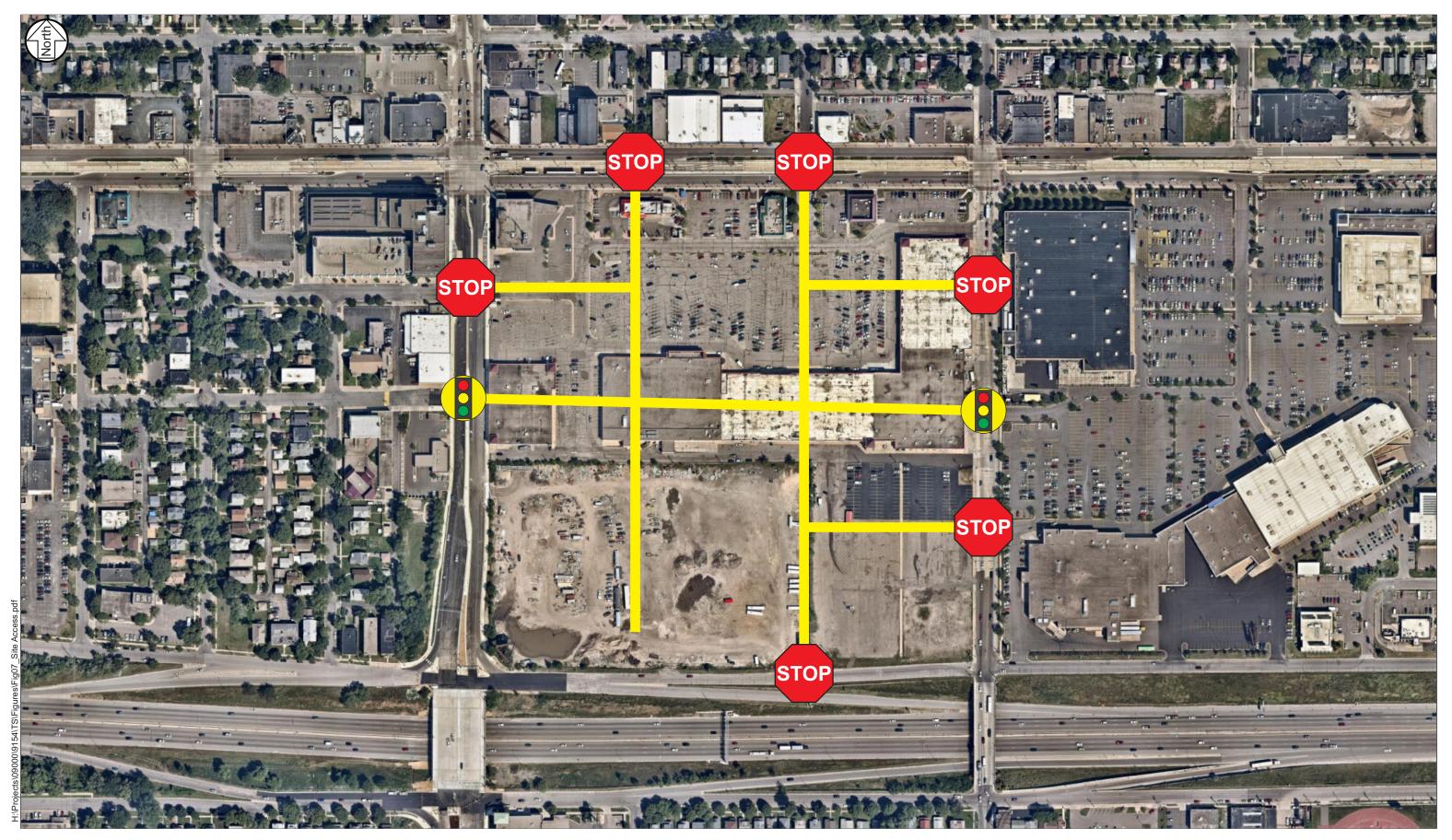
- Modifying access at the Snelling Avenue and Spruce Tree Avenue intersection to a right-in/right-out only and relocate the traffic signal to a new full intersection at Shields.
 - O This results in removal of the northbound and southbound left-turn lanes along Snelling Avenue. In conjunction, the northbound left-turn lane on Snelling Avenue at University Avenue is able to be lengthened.
- Constructing a westbound approach to the Shields Avenue and allowing for a full access intersection. It is expected that this intersection will become a signalized intersection under full build conditions.
 - o A southbound left-turn lane would be constructed at Shields Avenue.
 - O Westbound geometry is expected to include a left-turn lane, a shared left-turn and thru lane, and a right-turn lane.
- Realigning access on Pascal Street to line-up across from access points to Walmart and Cub.
 - O Under full build conditions, there is potential that a traffic signal will be installed at the site access point (extension of Shields) that aligns with the Walmart driveway.





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Trip Generation

In order to determine which development scenario would generate more external vehicle trips, a trip generation estimate for the proposed land uses in each plan was developed for the a.m. and p.m. weekday peak hours as well as a daily weekday basis. Trips are generated based on their land use sizes such as square footage, number of units, or seats. The trips are not generated based on the amount of parking spaces shown in the plans. Reductions were applied for trips between land uses (residential to retail) internal to the site, and for trips using other transportation modes besides a vehicle, and removal of the trips currently generated by the site.

The estimates for the Comprehensive Plan/Snelling Station TOD Development Plan from April 2014, shown in Table 3, were developed using the *ITE Trip Generation Manual*, *Ninth Edition*.

Table 3. Trip Generation Estimates - Comp. Plan/Snelling Station TOD Development Plan

Land Use Type (ITE Code)	Size	A.M. Peak Hour Trips		P.M. Peak Hour Trips		Daily Trips
		ln	Out	In	Out	
Proposed Land Use						
Apartments (220)	225 Dwelling Units	23	92	91	49	1,496
General Office Building (710)	1,141,000 s.f.	1,566	214	289	1,411	12,585
Shopping Center (820)	355,000 s.f.	211	130	632	685	15,159
	Total Trips	1,800	436	1,012	2,145	29,240
Internal Multi-Use Trip Reduction (10%)		180	44	101	214	2,924
Si	1,620	392	911	1,931	26,316	
External Trip Mode Share						
	49	12	27	58	789	
	32	8	18	39	526	
	162	39	91	193	2,632	
	81	20	46	97	1,316	
	1,296	313	729	1,544	21,053	
Existing On-Sit	298	257	539	574	13,000	
Total Ne	998	56	190	970	8,053	

Results of the trip generation estimates indicate the proposed development is expected to generate a total of approximately 1,054 a.m. peak hour, 1,160 p.m. peak hour and 8,053 daily <u>additional trips</u> to the network. This accounts for a 10 percent multi-use reduction (internal trips), which was developed based on the methodology within the *ITE Trip Generation Manual, Ninth Edition* and NCHRP Report 684: Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.

Additionally, a mode share was completed using results from the Twin Cities Regional Model and the Ford Site Mode Share Methodology completed by SRF Consulting Group. This mode share provides an estimate of multi-modal reductions and can be increased for non-vehicular traffic with the implementation of travel demand management (TDM) measures. With a higher non-vehicle share, traffic impacts would be expected to be less.

The estimates for the RK Midway Master Plan Development Plan from May 24, 2016, shown in Table 4, were developed using the *ITE Trip Generation Manual, Ninth Edition*.

Table 4. Trip Generation Estimates – RK Midway Master Plan Development Plan

Land Use Type (ITE Code)	Size	A.M. Peak Hour Trips		P.M. Peak Hour Trips		Daily Trips	
		In	Out	In	Out		
Proposed Land Use							
Apartments (220)	620 Dwelling Units	63	253	250	135	4,123	
General Office Building (710)	1,000,000 s.f.	1,373	187	253	1,237	11,030	
Shopping Center (820)	278,000 s.f.	165	101	495	536	11,871	
Hotel (310)	400 rooms	125	87	122	118	3,268	
Movie Theater (445)	800 Seats	0	0	23	41	1,000	
Fitness Club (492)	50,000 s.f.	35	35	101	76	1,647	
Supermarket (850) 42,000 s.f		89	54	203	195	4,294	
	1,850	717	1,447	2,338	37,233		
Internal Multi-Us	278	108	217	351	5,585		
S	1,572	609	1,230	1,987	31,648		
External Trip Mode Share							
	47	18	37	60	949		
	31	12	25	40	633		
	157	61	123	199	3,165		
	79	31	62	99	1,582		
	1,258	488	984	1,589	25,318		
Existing On-Sit	298	257	539	574	13,000		
Total Ne	960	231	445	1,015	12,318		

Results of the trip generation estimates indicate the proposed development is expected to generate a total of approximately 1,191 a.m. peak hour, 1,460 p.m. peak hour and 12,318 daily <u>additional trips</u> to the network. This accounts for a 15 percent multi-use reduction (internal trips), which was developed based on the methodology within the *ITE Trip Generation Manual, Ninth Edition* and NCHRP Report 684: *Enhancing Internal Trip Capture Estimation for Mixed-Use Developments.* The higher multi-use reduction is a result of a higher amount of housing on site, which is expected to increase internal trips.

Once again, a mode share was completed using results from the Twin Cities Regional Model and the Ford Site Mode Share Methodology completed by SRF Consulting Group.

The results trip generation comparison between the Comprehensive Plan/Snelling Station TOD Plan and the RK Midway Master Plan indicated that the RK Midway Master Plan is expected to generate 4,265 additional daily trips and slightly more peak hour trips than the Comprehensive Plan/Snelling Station TOD Plan, and therefore, will be utilized to complete future year 2035 build conditions.

Year 2035 Build Conditions - Site Development

To identify potential impacts associated with the proposed development without a soccer event, traffic forecasts for year 2035 conditions (i.e. year of full build out) were reviewed. The year 2035 conditions take into account general area background growth, a reduction in existing site trips due to the removal of various buildings, and the new trips generated by the proposed development. The following sections provide details on the background traffic forecasts, estimated trip generation, and intersection capacity analysis for year 2035 conditions.

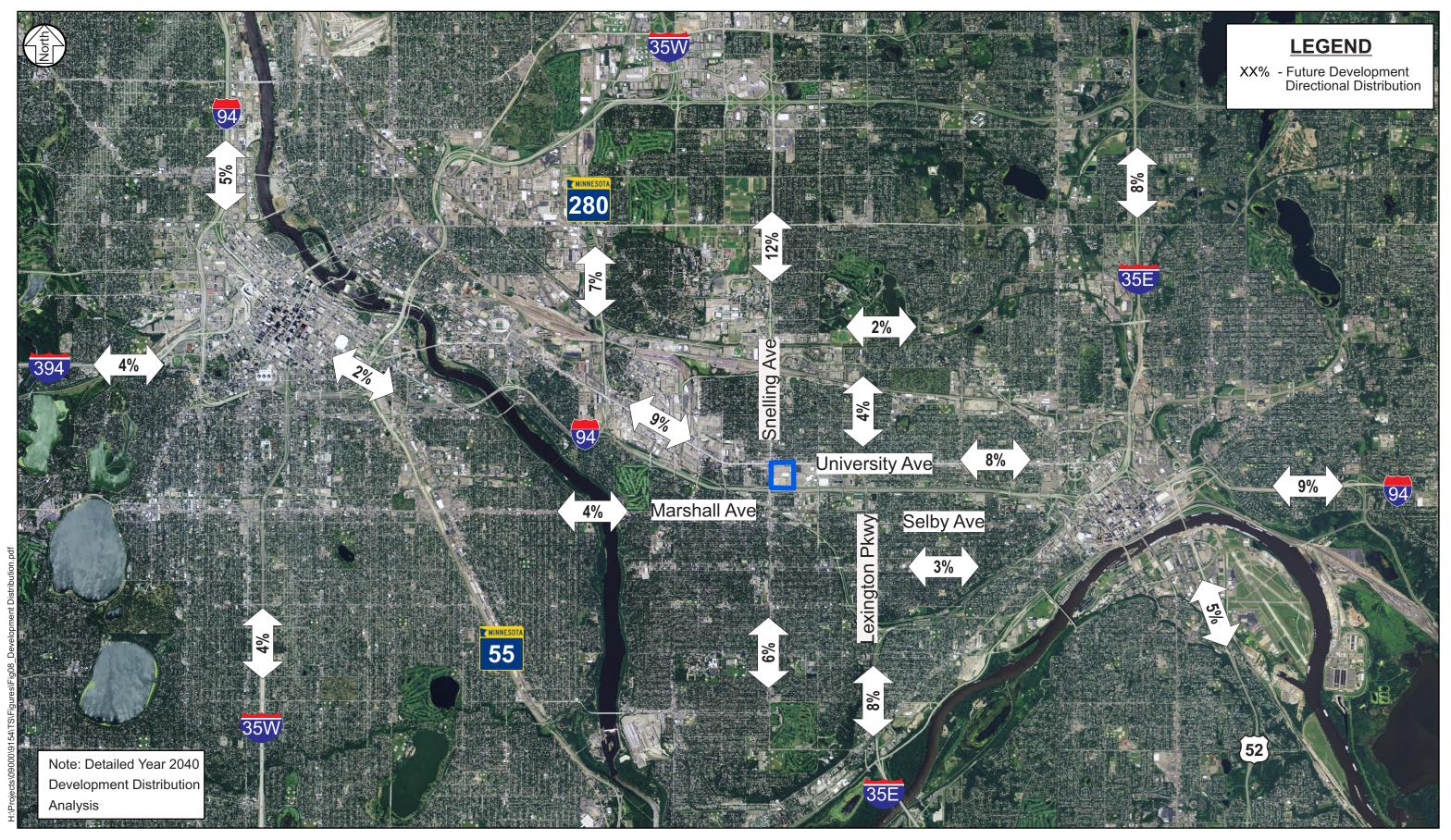
Background Traffic Growth

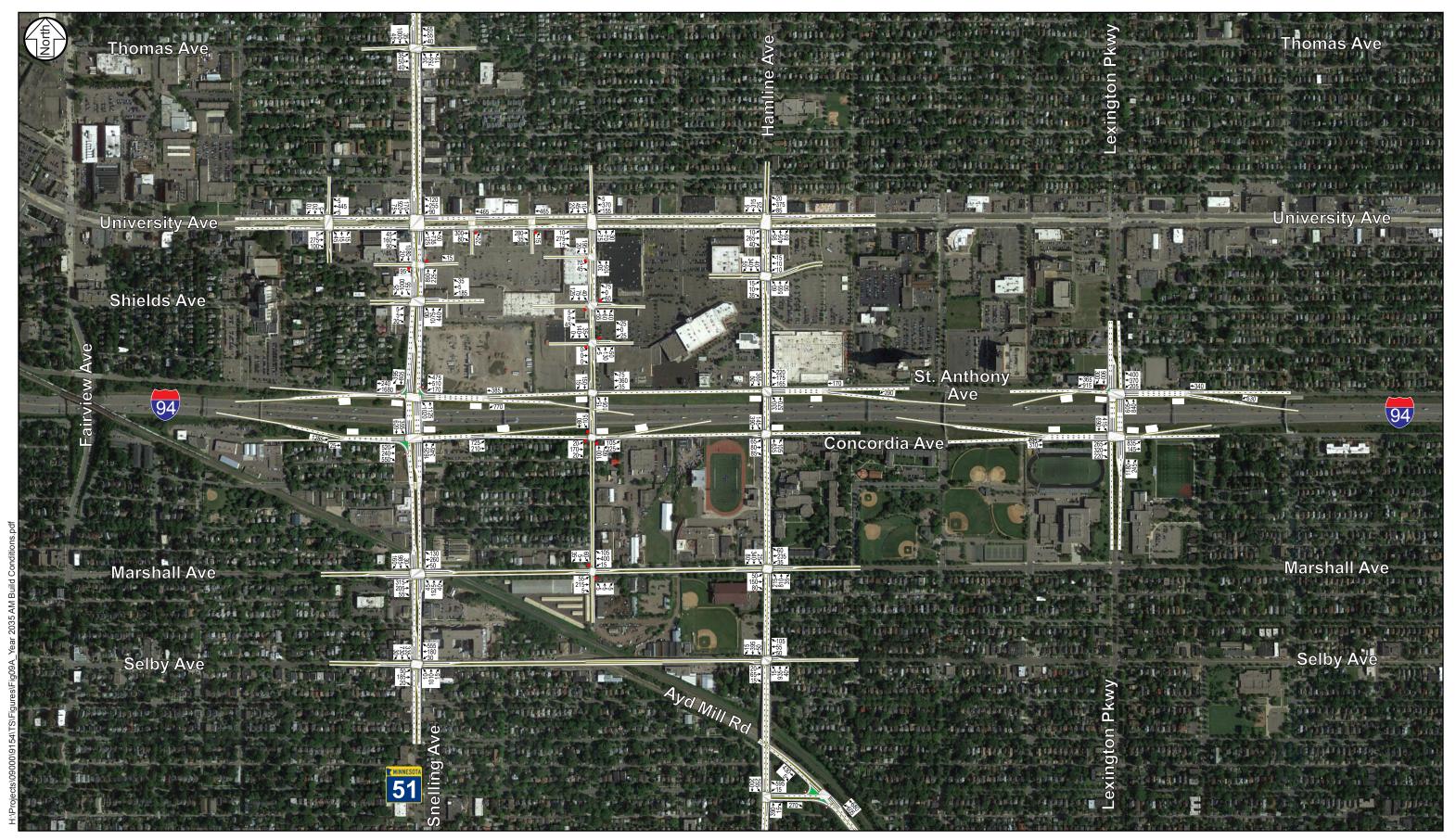
To account for general background growth and known adjacent developments in the area, an annual growth rate of one-half percent was applied to the existing peak hour traffic volumes to develop year 2035 background traffic forecasts. This growth rate is consistent with historical growth rates in the study area.

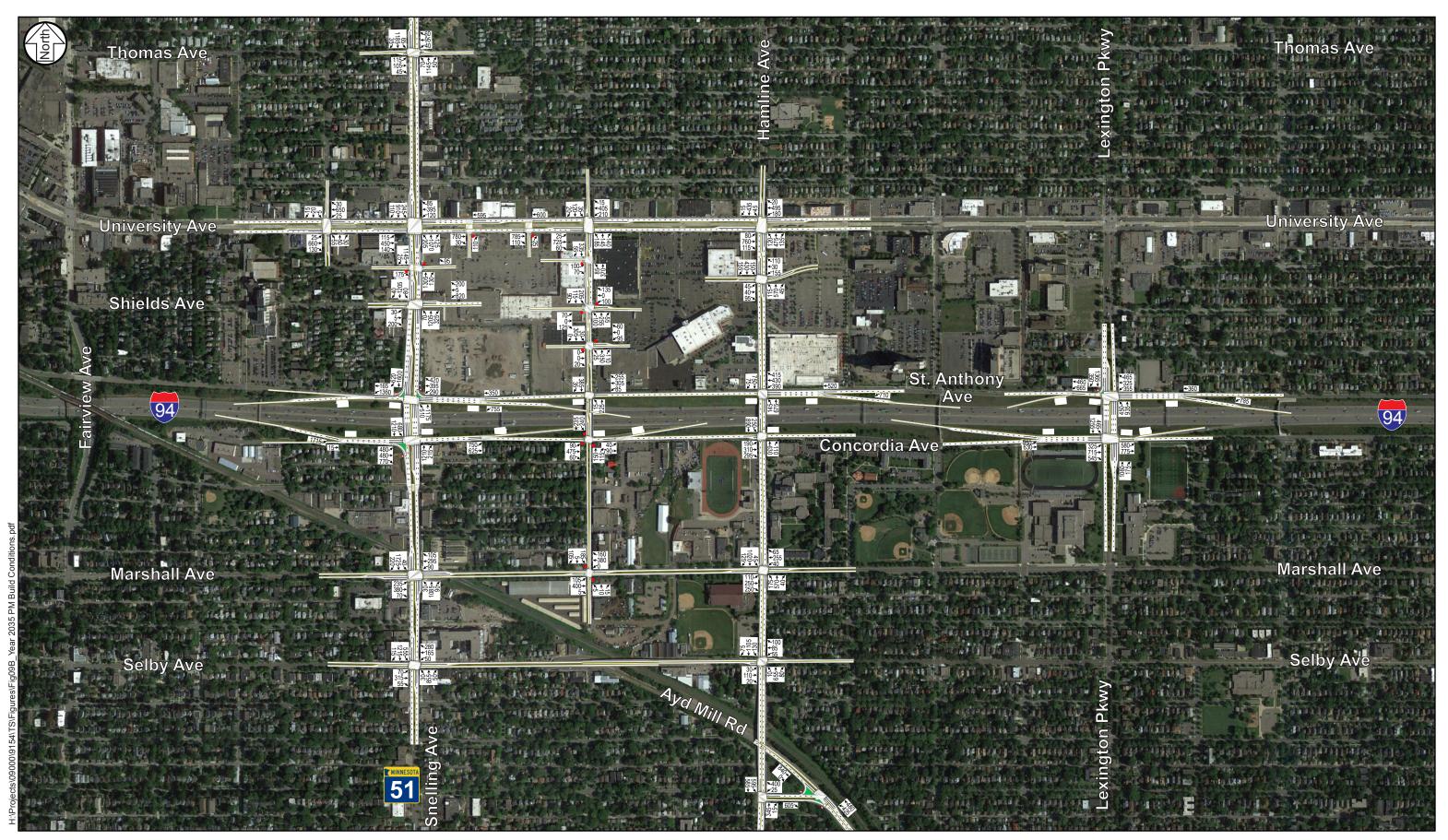
Trip Generation

Results of the previously completed trip generation estimates indicate the proposed development is expected to generate a total of approximately 1,191 a.m. peak hour, 1,460 p.m. peak hour and 12,318 daily new trips to the network. However based on the proposed land uses (i.e. the general retail), a portion of the trips using the site are expected to be from motorists already traveling along Snelling Avenue, University Avenue and Pascal Street within the study area. These trips are considered "passby" type trips. When accounting for the "pass-by" trip reductions (34 percent for retail based on the *ITE Trip Generation Manual, Ninth Edition*), the total new roadway network trip generation is expected to be approximately 1,091 a.m. peak hour, 1,110 p.m. peak hour and 8,363 daily trips.

Trips generated by the proposed development were distributed throughout the study area based on the directional distribution shown in Figure 8, which was developed based on existing travel patterns, the Twin Cities Regional Model, local business employee data, and engineering judgment. With the addition of the office space on site, the distribution of trips is expected to be more regional as opposed to the existing (i.e. only retail on-site) being more local. The resultant year 2035 traffic forecasts, which include general background growth and trips generated by the proposed development, are shown in Figures 9A and 9B.







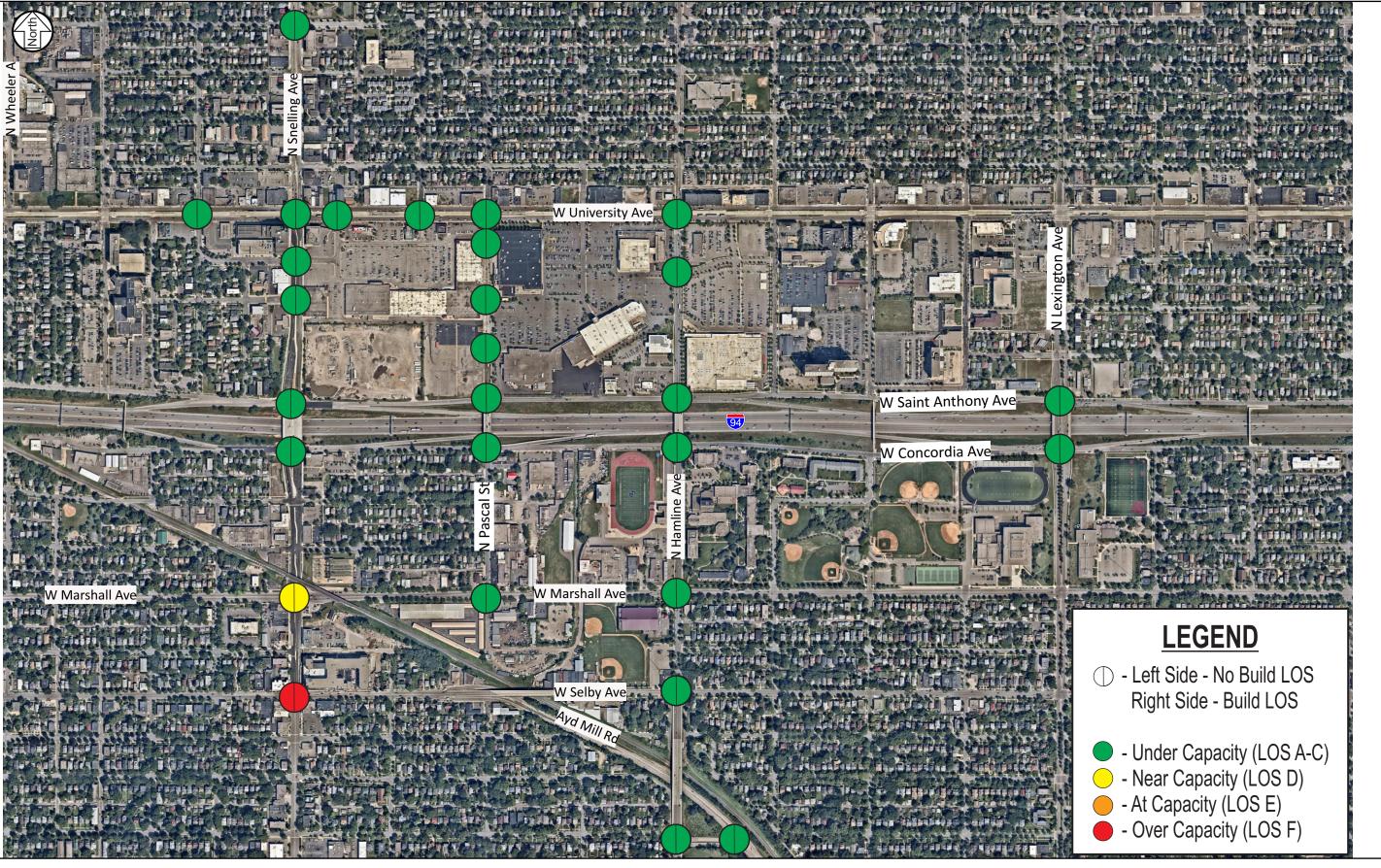
Intersection Capacity Analysis

Prior to completing the intersection capacity analysis for year 2035 build conditions, volumes were reviewed to determine preliminary geometry of the westbound approach of the Snelling Avenue and Shields Avenue intersection. Based on a review of the volumes, the westbound lanes of the intersection will require a left-turn lane, and a shared left-turn/thru lane and a right-turn lane. The right-turn lane is only needed during p.m. peak hour conditions, and can be converted to on-street parking during non-peak hours. With this configuration and the expected signal phasing, the south approach of the intersection is recommended to not include a pedestrian phase. A pedestrian phase and crosswalk would be provided on the north side of the intersection to allow pedestrians and bikes to cross Snelling Avenue. This will allow the large westbound left-turn movement from the development to operate in a permissive phase (i.e. flashing yellow arrow) in order to allow for improved intersection operations and eliminate potential pedestrian/vehicle safety conflicts.

Results of the year 2035 intersection capacity analysis shown in Table 5 indicate that all study intersections are expected to operate at an acceptable overall LOS D or better during the a.m. peak hour and p.m. peak hours with the previously described new site access geometry and traffic controls, except for the Snelling Avenue and Selby Avenue intersection during the a.m. peak hour and the Hamline Avenue and Marshall Avenue intersection during the p.m. peak hour. A comparison on the a.m. and p.m. peak hour analysis between year 2035 no build conditions and year 2035 build conditions in shown in Figures 10A and 10B. The full simulation results for year 2035 build conditions are presented in Appendix C.

The Snelling Avenue and Selby Avenue intersection is expected to continue to operate poorly during the a.m. peak hour due to the significant westbound right-turning volume. This is a no-build condition and mitigation is not identified. It should be noted that optimized signal timing for all study intersections was assumed under future build conditions.

During the p.m. peak hour, intersections of Snelling Avenue between Thomas Avenue and Selby Avenue are expected to operate at an overall LOS D, however, significant side-street queuing and delay is expected, similar to year 2035 no build conditions. A rolling type queue is expected along southbound Snelling Avenue. The newly constructed westbound approach of the Snelling Avenue and Shields Avenue intersection is expected to have queues of over 750 feet, which will potentially extend into the on-site parking structures. However, due to the nature of office trips, this is expected to only be a p.m. peak hour exiting issue. The queuing expected at these intersections is shown in Figures 11 and 12 for the area of Snelling Avenue between Thomas Avenue and Selby Avenue. The queues represent the average and 95th percentile queue from the a.m. or p.m. peak hours. It should be noted that since the new trips generated by the development would be office trips, these trips are generally more regional and destined for the near-by freeways. Therefore, the queues on Snelling Avenue south of the I-94 interchange are relatively similar between no build and build conditions since build conditions are expected to add on a minimal amount of trips within this area.



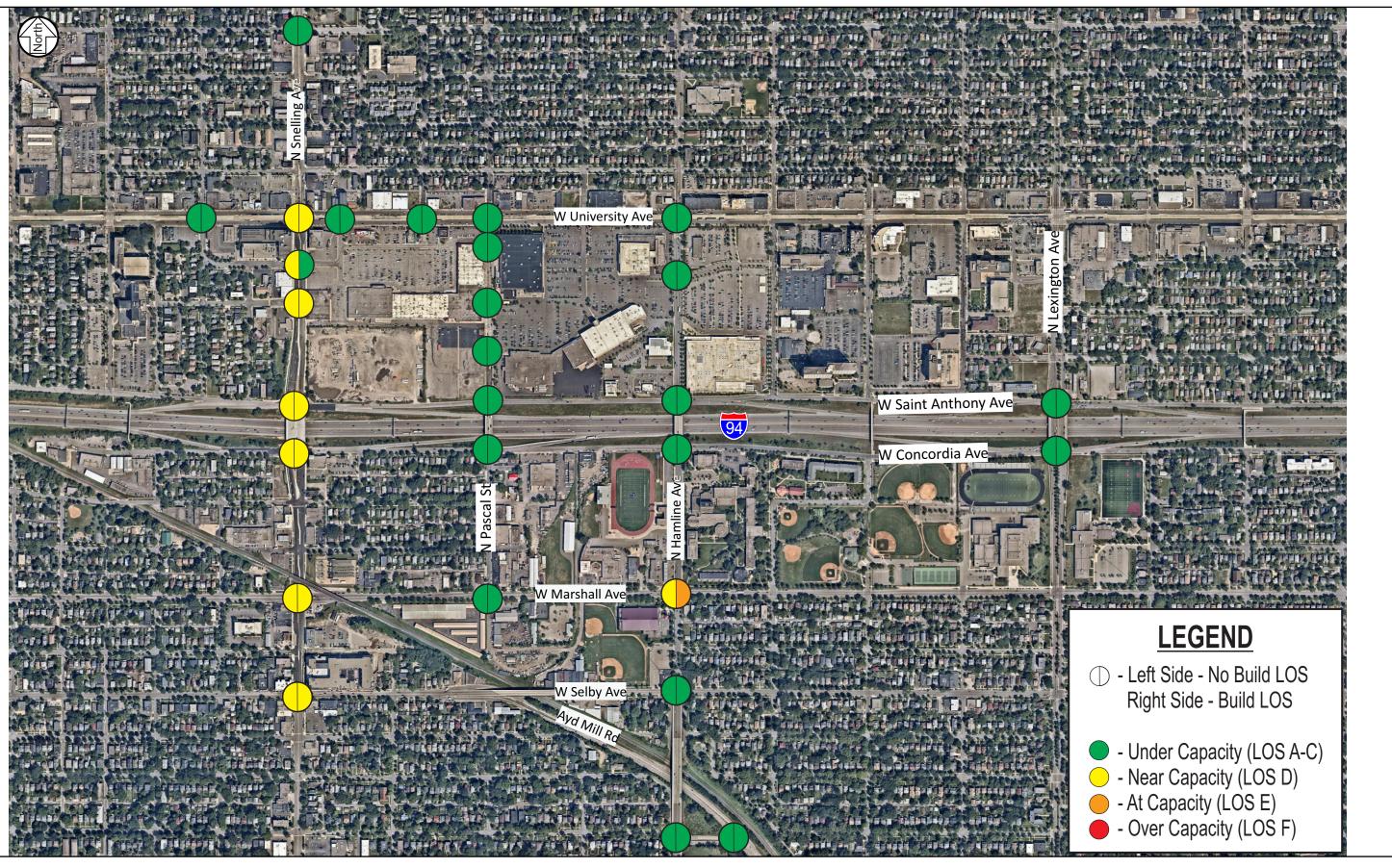






Table 5. Year 2035 Build Intersection Capacity Analysis

Intersection	A.M. Peak Hour	P.M. Peak Hour
	LOS	LOS
University Avenue/Fry Street	А	В
Snelling Avenue/Thomas Avenue	В	В
Snelling Avenue/University Avenue	С	D
Snelling Avenue/Spruce Tree Avenue(1)	A/B	B/ F
Snelling Avenue/Shields Avenue	В	D
Snelling Avenue/St. Anthony Avenue	С	D
Snelling Avenue/Concordia Avenue	С	D
Snelling Avenue/Marshall Avenue	D	D
Snelling Avenue/Selby Avenue	F	D
University Avenue/Asbury Street ⁽¹⁾	A/A	A/A
University Avenue/Simpson Place(1)	A/A	A/A
University Avenue/Pascal Street	В	С
Pascal Street/North Development Driveway(1)	A/A	A/B
Pascal Street/Shields Avenue ⁽¹⁾	A/A	A/C
Pascal Street/ South Development Driveway(1)	A/A	A/B
Pascal Street/St. Anthony Avenue	В	В
Pascal Street/Concordia Avenue ⁽²⁾	А	В
Pascal Street/Marshall Avenue(1)	A/B	B/ E
University Avenue/Hamline Avenue	С	D
Hamline Avenue/Midway Marketplace	А	В
Hamline Avenue/St. Anthony Avenue	В	С
Hamline Avenue/Concordia Avenue	В	С
Hamline Avenue/Marshall Avenue	С	Е
Hamline Avenue/Selby Avenue	В	В
Hamline Avenue/Ashland Avenue	В	С
Ayd Mill Road/Ashland Avenue	В	В
Lexington Avenue/St. Anthony Avenue	С	С
Lexington Avenue/Concordia Avenue	D	С

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 delay.
 Indicates All-Way Stop Control

The significant delay issues expected at the Hamline Avenue and Marshall Avenue intersection during the p.m. peak hour are due to the expected increase in volume making a northbound left-turn and eastbound right-turn at this intersection. Based on preliminary analysis, construction of an eastbound right-turn lane will improve overall intersection operations to an acceptable LOS. This would require removing some on-street parking stalls, however, it may only be needed during the peak hours of the day. Based on the analysis results, minimal mitigation may be necessary in order to allow for acceptable overall intersection operations within the study area.

A comparison of the arterial LOS on Snelling Avenue was completed between year 2035 no build and build conditions. The year 2035 build conditions experience very similar arterial LOS conditions near the LOS D/E threshold. In comparison to no build, this is approximately the same operations conditions along Snelling Avenue between Thomas Avenue and Selby Avenue. Both no build and build conditions are expected to experience a travel speed around 40 percent of the typical free-flow speed, meaning an average speed of about 12 miles per hour. This low travel speed is consistent with the congestion expected on the corridor.

Key Findings for Year 2035 Build Conditions

To improve Snelling Avenue operations, the traffic signal at Spruce Tree Avenue should be relocated to Shields Avenue. This will require modifications/reconstruction of Snelling Avenue to Shields Avenue. Shields Avenue will need a larger westbound approach to accommodate the amount of traffic leaving the proposed office land use along Snelling.

Snelling Avenue will have intersections operating at acceptable LOS (delay) under the No Build and Build. However, while all intersections are expected to operate at LOS D from Shields Avenue to Selby Avenue, the high volume, queues, and lane changing south of the I-94 interchange makes the area feel congested under no build and build conditions.

The only intersection that goes from an acceptable LOS in No Build to an unacceptable LOS in Build is at Hamline Avenue and Marshall Avenue. Mitigation would not be required with the year of opening of the Stadium or initial development. Addition of an eastbound right-turn lane (by time of day with the removal of on-street parking) would provide acceptable overall level of service.

Traffic signal timing within the study area is expected to be updated to accommodate future development travel pattern changes.

The proposer should encourage future land use to use the transit system with Green Line LRT, A-Line BRT and the other regular Metro Transit service adjacent to the site. Consider travel demand management (TDM) measures to encourage the use of these facilities.

Soccer Stadium

As part of the Snelling Midway Stadium Alternative Urban Areawide Review (AUAR), an analysis was conducted to address transportation issues related to the proposed soccer stadium. The proposed stadium is expected to have a capacity of 20,000 for the 2018 year of opening. The stadium is proposed to be constructed to allow for expansion to a capacity of 25,500 by year 2035, and will be located on land between University Avenue, I-94, Snelling Avenue, and Pascal Street as part of a larger overall redevelopment of the existing Midway shopping center. The soccer stadium is expected to open for the 2018 MLS season.

The transportation analysis was completed for all expected event time periods and included analysis of automobile traffic, transit, pedestrians, and bicyclists. Based on a review of other Midwestern teams, a typical MLS season consists of approximately 20 to 25 home matches (including preseason and exhibitions) and a potential for up to four home playoff matches. The following distribution of game days and times was assumed for this analysis in order to determine which time periods are most affected by event related traffic:

- Weekday Evening 7:00 or 7:30 p.m. start time approximately 5 games
- Saturday Afternoon 2:00 or 4:00 p.m. start time approximately 5 to 7games
- Saturday Evening 7:00 or 7:30 p.m. start time approximately 5 to 7 games
- Sunday Afternoon 2:00 or 4:00 p.m. start times approximately 5 to 7 games

Proposed access to the stadium is expected along the south edge of the building on St. Anthony Avenue, along the north edge of the building on the proposed Shields Avenue extension and access on both the east and west sides of the stadium. Each access is expected to attract a certain mode type. Each access and their respective mode type is shown in Figure 13.

The assumptions for the analysis are based on conditions prior to implementing mitigation strategies and could change based on mitigation strategies that are implemented. This analysis is intended to identify potential issues that will require further investigation/mitigation. These could be mitigation strategies to increase auto-occupancy, provide additional parking, provide staging areas for transit, or provide pre and post-game activities.

Traffic Analysis Assumptions

Traffic volumes for the study area intersections were collected for events occurring on a weekday evening (7:00 p.m. start time), weekend afternoon (2:00 p.m. start time) and a weekend evening (7:00 p.m. start time). Typical matches last for approximately two hours. Based on a review of the traffic volumes collected, the weekend afternoon background volume was significantly higher than the other two scenarios. This is due to the retail generated traffic peak that occurs on weekend afternoons. Therefore, the weekend afternoon peak scenario was selected for evaluation for worse-case conditions.

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The traffic operations analysis for the scenario was conducted for a one-hour time prior for event arrival and one-hour after for event departure. The event arrival is usually more spread-out, while the event departure is more concentrated. The traffic model used varying volumes within the analyzed one-hour time frame to reflect event traffic patterns. This allows for more accurate results and the magnitude of delay and queuing in the system. Event departure models were run longer than one-hour to determine when/if the duration of the event traffic exceeded one hour. To determine how event traffic will operate within the study area, the key intersections previously shown in Figure 2 were analyzed.

Parking Availability

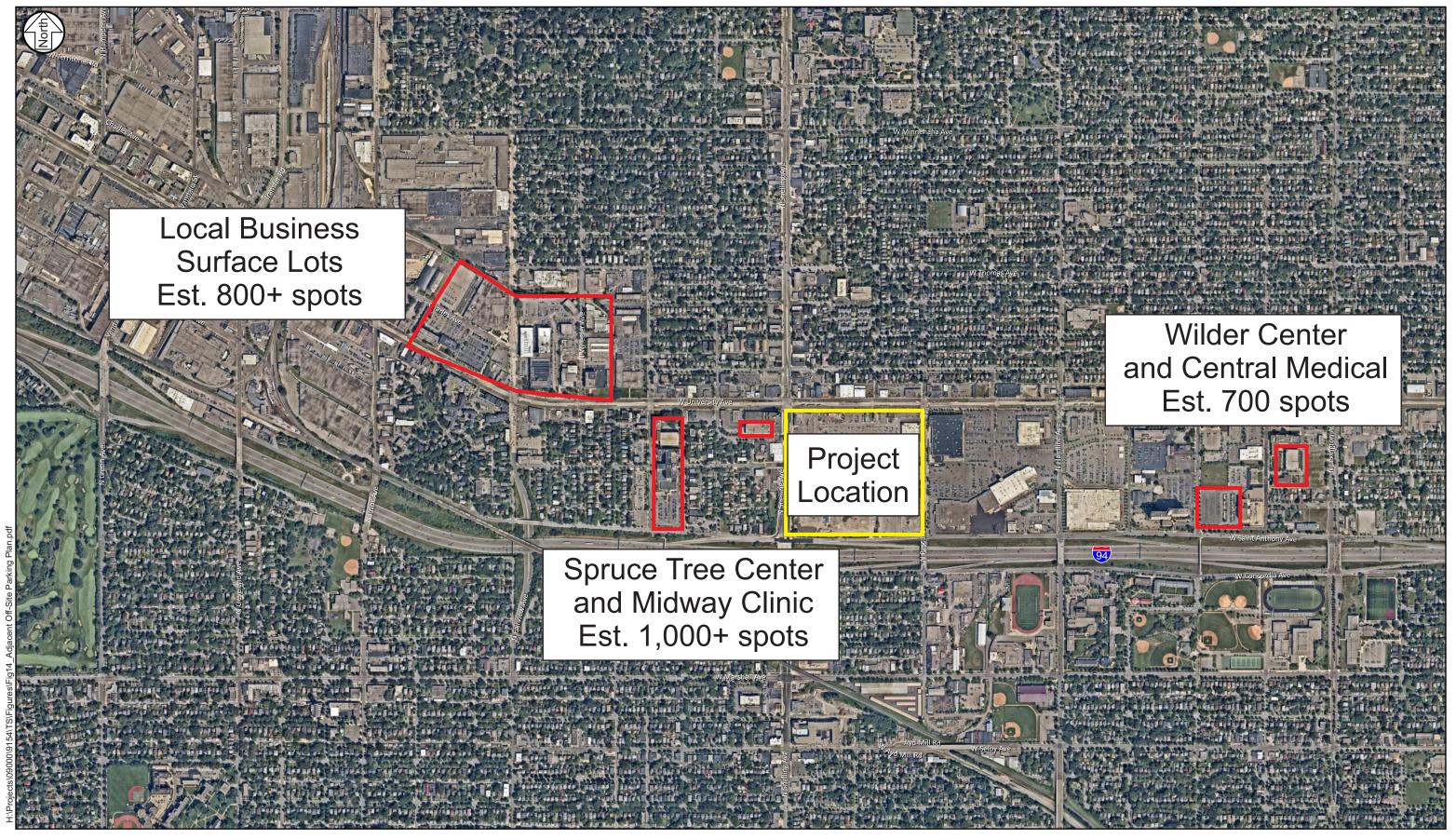
An evaluation of on-site and adjacent off-site parking availability within a one mile walking distance was completed for both a year of opening and future year full-build out scenario for event parking. On-street parking is not a reliable source of event parking, and therefore was not included in this analysis as an option for meeting event parking needs. The goal of the transportation analysis was to determine mitigation strategies such that parking in adjacent residential neighborhoods is not needed to meet event demand. Similarly, accommodating event parking in nearby lots or ramps can also be unreliable. The available parking supply was divided into parking on site and parking to the north, east, south, and west. The parking supply on site is expected to change between 2018 and 2035 with full development of the site.

The adjacent (within one mile) off-site parking options are shown in Figure 14. These are only potential options that may allow event parking and no contractual agreements are in place. These businesses may not want parking for various reasons including various reasons including already being used, not current practice, insurance, licensing and sales tax. Therefore, an assumption was made that only those spaces proposed as part of site or master plan and the 350 spaces for which the City has already verified availability would be available for event use. This study identified approximately 2,500 potential off-site spaces within one mile of the proposed stadium.

Mode Split

A specific mode split was completed for both year 2018 (Capacity 20,000 attendees) and year 2035 (Capacity 25,500 attendees) conditions. The mode split for the two different conditions is expected to differ due to the amount of on-site parking, land use changes and the potential expansion of the stadium capacity by an additional 5,500 people. The mode split for fans at the proposed stadium is divided into five categories: 1) Non-Auto, LRT or BRT, which includes walking from home, biking, and regular Metro Transit bus service, 2) On-Site Parking, 3) Off-Site Parking within walking distance of the site, 4) Metro Transit's LRT (Green Line)/BRT (A-Line), and 5) Shuttles to off-site parking facilities. The complete mode share split breakdown in presented in Appendix D

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Auto Occupancy

Based on prior experience with travel behavior characteristics for sports stadia around Twin Cities and around the country, an estimate of 2.75 people per vehicle would be used for average auto occupancy for all event transportation analysis.

Event Traffic Characteristics

It is assumed that not 100 percent of the event traffic is expected to arrive or depart the stadium area during the one-hour analysis periods. Based on previous experience with sports stadia in the Twin Cities, a certain percentage of attendees will arrive or depart outside of the analysis hour, depending on the time of day, available activities within the area, and day of the week. Table 6 shows the percent of vehicles arriving/departing during the analysis hour for each scenario. These assumptions are slightly more intense than the other stadium event studies completed in the Twin Cities Metro because of the current limited restaurant and pre-game/post-game entertainment options.

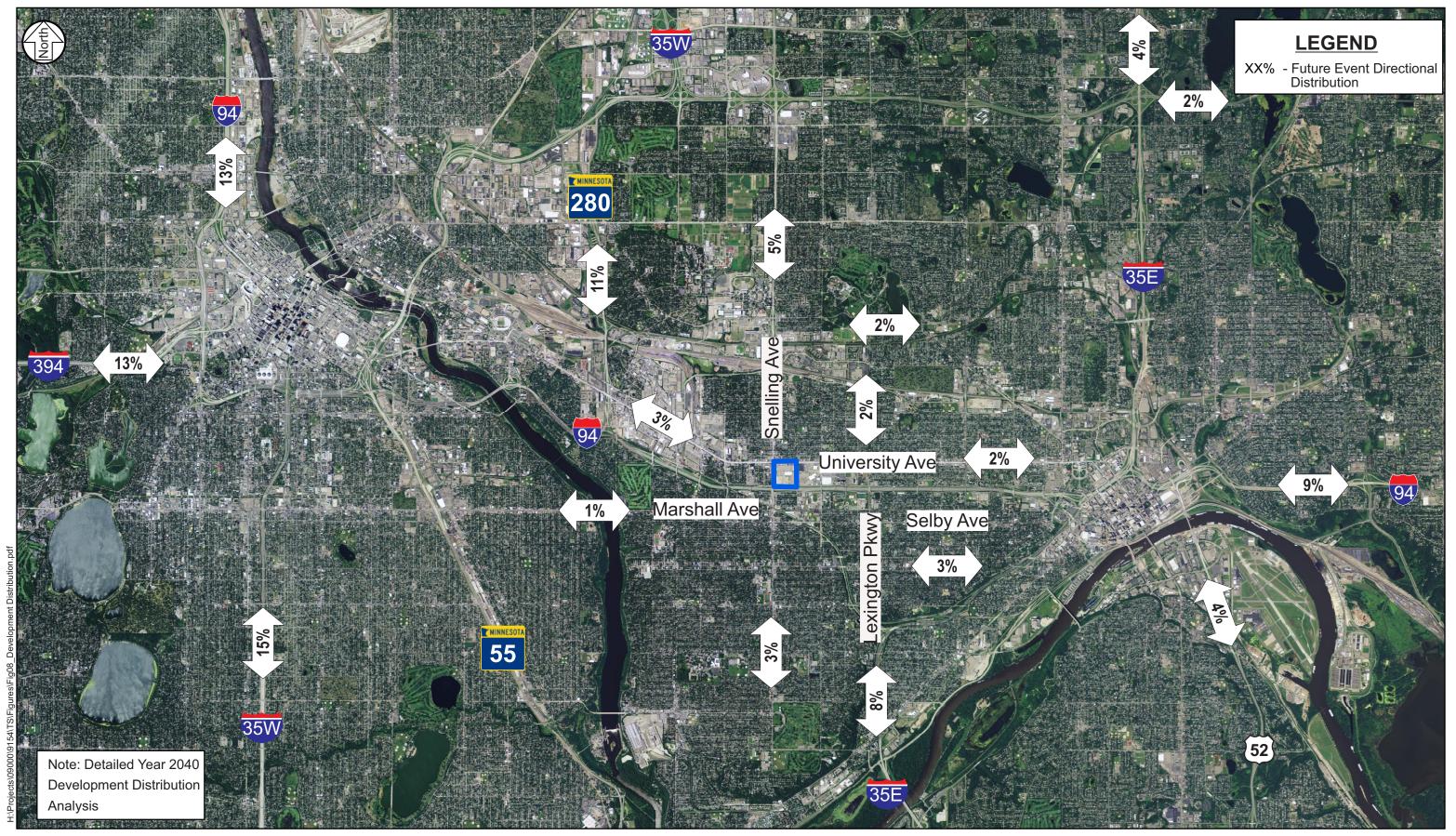
Table 6. Percent of Event Traffic to Arrive/Depart During Peak Hour

Scenario	Wee	kday	Weekend			
	2018	2035	2018	2035		
Arrival	85%	70%	75%	65%		
Departure	95%	95%	95%	90%		

Based on arrival and departure observations from other local stadium events, peaks occur for vehicular and pedestrian traffic within the arrival and departure hours. Based on the mode share of this stadium, both the pedestrian and vehicle peak should occur at approximately the same time. It is anticipated that the arrival peak will be smoother and spread out over the course of the arrival hour, while the departure typically occurs all within about a half-hour interval.

Event Attendees Origin/Destination Information

Event attendees' origin/destination information is based on zip codes collected from individual and season ticket holders for other professional sports teams in the Twin Cities, the current Minnesota United team, and metro area population densities. The zip codes were mapped and assigned to the most efficient travel shed to the stadium from the zip code. The zip code information helps represent the likely distribution of event attendees within the metro area. The directional distribution for an event based on season ticket holder information is shown in Figure 15.



Year 2018 Event Conditions

To identify potential impacts associated with the proposed soccer stadium events, traffic forecasts for year 2018 conditions (i.e. the expected year of soccer stadium opening) were analyzed. The year 2018 conditions take into account general area background growth, a reduction in existing site trips due to the removal of various buildings on-site, and the additional trips generated by a soccer stadium event. It should be noted that analysis conducted for year 2018 conditions focuses solely on event scenarios since it is expected that any proposed on-site non-stadium development will not be constructed prior to 2018. The following sections provide details on the background traffic forecasts, estimated trip generation, and intersection capacity analysis for year 2018 conditions.

Roadway/Access Closures

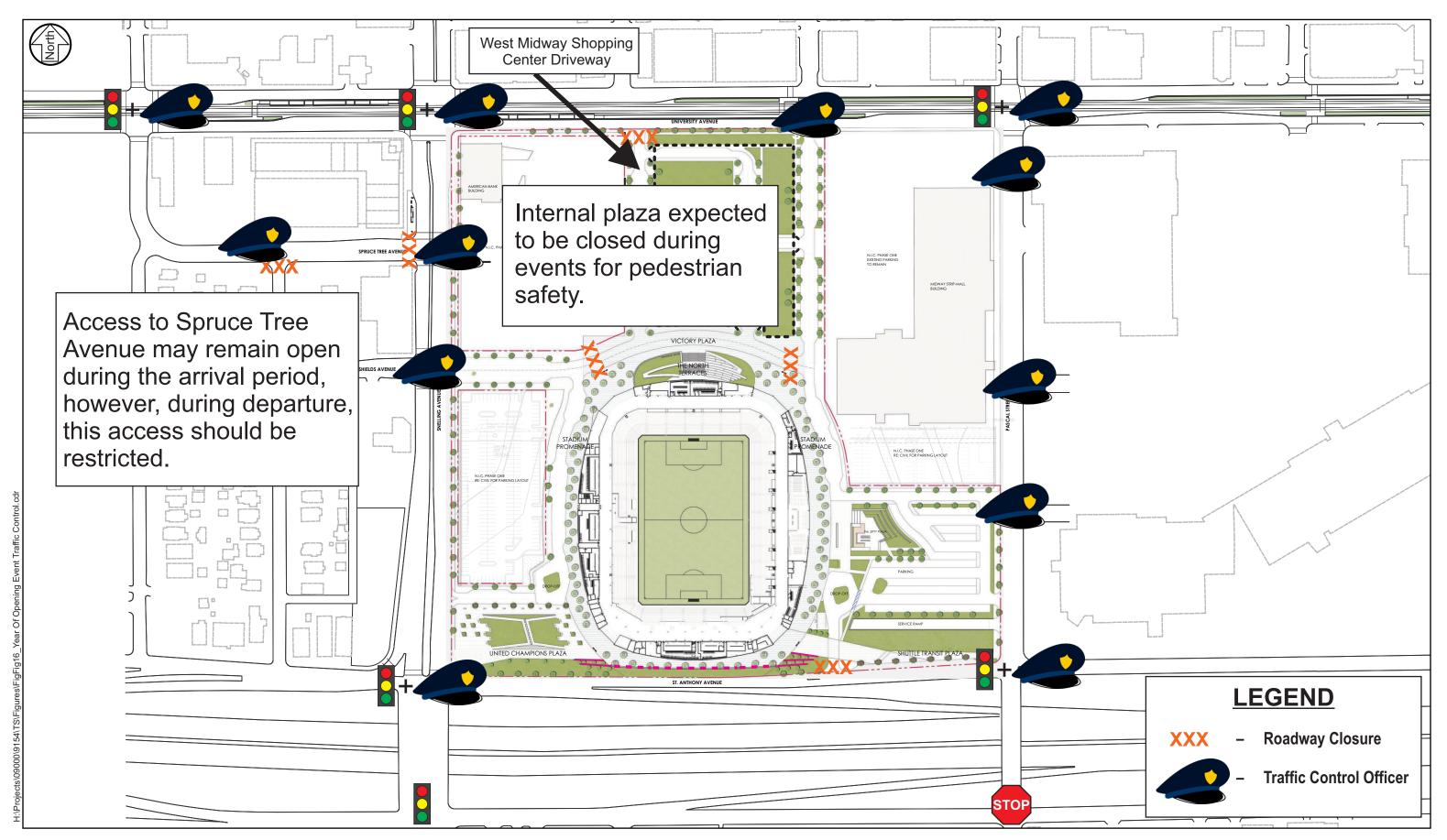
In the year of opening of the stadium, it is not expected that the full access modifications shown in Figure 6 will be completed. To allow for a safe and efficient flow of traffic, the following modifications are assumed for year of opening events:

- Traffic control officers at intersections adjacent to the site for arrival and departure times
- Restriction of traffic movements at the Snelling Avenue and Spruce Tree Avenue intersection
 during the post-game departure. This allows for safer pedestrian movements between the
 stadium and LRT.
- Restricting vehicles leaving the Spruce Tree Parking Ramp to only turning right and proceed north to the University Avenue and Fry Avenue intersection. Additionally, these motorists would be required to turn left onto westbound University Avenue.
- Close the University Avenue/West Midway Shopping Center Access for arrival and departure periods to allow for safer pedestrian movements between LRT and the stadium.

The following site access modifications for year of opening are shown in Figure 16.

Background Traffic Growth

To account for general background growth in the area, an annual growth rate of one-half percent was applied to the existing peak hour traffic volumes to develop year 2018 background traffic forecasts. This growth rate is consistent with historical growth rates in the study area and results from the Twin Cities Regional Demand Model. However, based on event management experience, it is anticipated that an event within the study area may have the effect of drivers modifying their trip to avoid the event traffic. For the analysis, it is assumed that 20 percent of background traffic will avoid interfering with event traffic either by modifying their route or completing their trip at a different time. These trips are still expected to occur to and from local area businesses, however, they are expected to occur at different times of the day in order to avoid the congestion of an event. This background traffic reduction is consistent with other studies completed for other Twin Cities sport's teams event traffic analysis competed by SRF. Mitigation strategies should include informing drivers using this area to use a different route or timeframe if not having an origin/destination in the area.



2018 Event Mode Share

The year 2018 event mode share will break down in more detail how the specific mode share numbers were developed for each mode. These are expected to differ from the mode share values in the year 2035 full build conditions.

Walk/Bike/Local Bus/Private Shuttle

The non-auto/LRT/BRT includes local bus service and people walking/biking to the event from their home or business. In order to determine the number of people walking to the site, an evaluation of the population of the metro was completed. It was determined that approximately one percent of the population lives within a one mile walking distance of the stadium. It was assumed that local area residents living close to the stadium would be more likely to attend since they are within walking distance. This results in an estimate of about three percent of event attendees. This number is expected to increase slightly to five percent during weekend events due to increased potential for family groups attending with potential guests within the walking distance.

The potential biking share of two percent was estimated from bike usage at Minnesota Twins games at Target Field.

The local bus service was evaluated to determine how many routes and number of trips are within the area. Figure 17 shows the existing transit stops and provides a proposed schedule for each transit option. Based on this data, it was assumed that approximately one and half percent of fans (about 250 people) will utilize existing transit service outside of LRT/BRT.

Charter bus usage for these events is difficult to estimate and therefore was assumed to be low in order to remain conservative. Charter bus usage from of Minnesota Twins games was used to assist with developing an estimate. It was determined that 200 (one percent) fans on weekdays and 600 fans (three percent) on weekends will utilize charter buses. The team does have a fan base outside the metro area based on current ticket purchases. Fans from Mankato, Rochester, St. Cloud, and Duluth would be likely candidates to use charter buses.

In addition to charter buses, local area private shuttle buses will bring fans to the match. These include local businesses/bars that may run shuttles to events from their business. Depending on the number of bars offering this service, this may vary, however, it was assumed that on weekdays about 400 (two percent) fans will arrive via private shuttle, and on the weekends, up to 600 (three percent) fans. An additional 100 (half percent) fans may arrive via taxi, Uber/Lyft, or limo service from other destinations.

The combined total of these modes would accommodate 2,000 (10 percent) for a weekday match and 3,000 (15 percent) for a weekend match.



On-Site Parking

The on-site parking mode-split is expected to differ between year 2018 and year 2035. Based on discussions with City staff and the developer, a proposed on-site parking plan for year 2018 was developed, shown in Figure 18. From this plan, it is expected that approximately 400 vehicles may be able to park on-site during the year of opening, which will equate to approximately 1,100 fans (based on a 2.75 person occupancy), or 5.5 percent of fans for a capacity event. This parking plan is considered temporary and will change over time to accommodate site development as further site redevelopment occurs.

Off-Site Adjacent Parking

The off-site parking mode-split takes into account parking not on site, but within walking distance of the stadium. Potential off-site parking locations are previously shown in Figure 14. An assumption was made that a minimum of approximately 350 parking spaces, accommodating 965 fans, or 5 percent of the event fans for a capacity event, will be able to utilize off-site adjacent parking. This percentage could fluctuate depending on local area businesses' desire to utilize their lots during events for parking. At this time, the City has verified the availability of 350 nearby off-street parking spaces for event use.

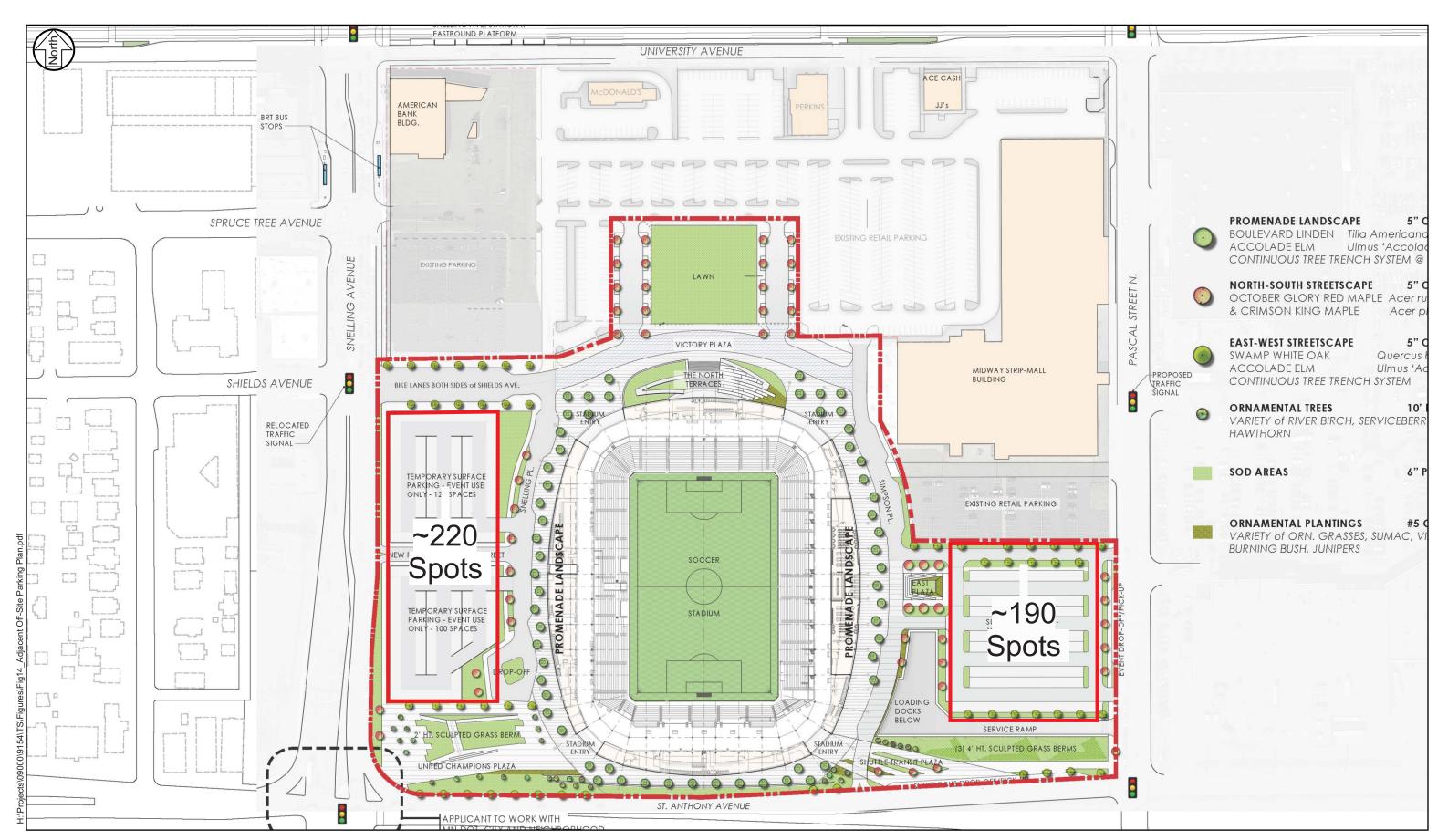
Although many adjacent retail and office centers may have a surplus of parking, most of these lots are not gate controlled and not specifically used for public paid parking. Therefore, these spaces may not be available for event use. The decision to open up a private lot for event use is determined by the private lot landowner, who is responsible for permits, insurance, and additional employment cost to control the lots.

LRT/BRT

The LRT mode share was determined on available capacity of the LRT during the peak hours and the available crush load of approximately 540 people per three car train. It is anticipated that the LRT will need to run three-car trains during all game times with the expected 10 minute headways. The LRT and BRT stations are also shown in Figure 17.

The LRT mode split is expected to be heavily utilized under both year 2018 and year 2035 conditions. Data was collected to determine the amount of available capacity during event arrival and departures. It was assumed that in each three-car LRT, there is availability for a crush load of 540 patrons, and therefore, the existing utilization of the LRT was subtracted from the crush load to determine how much available event capacity exists. The amount of utilization for each scenario is shown in the complete mode share breakdown in Appendix D

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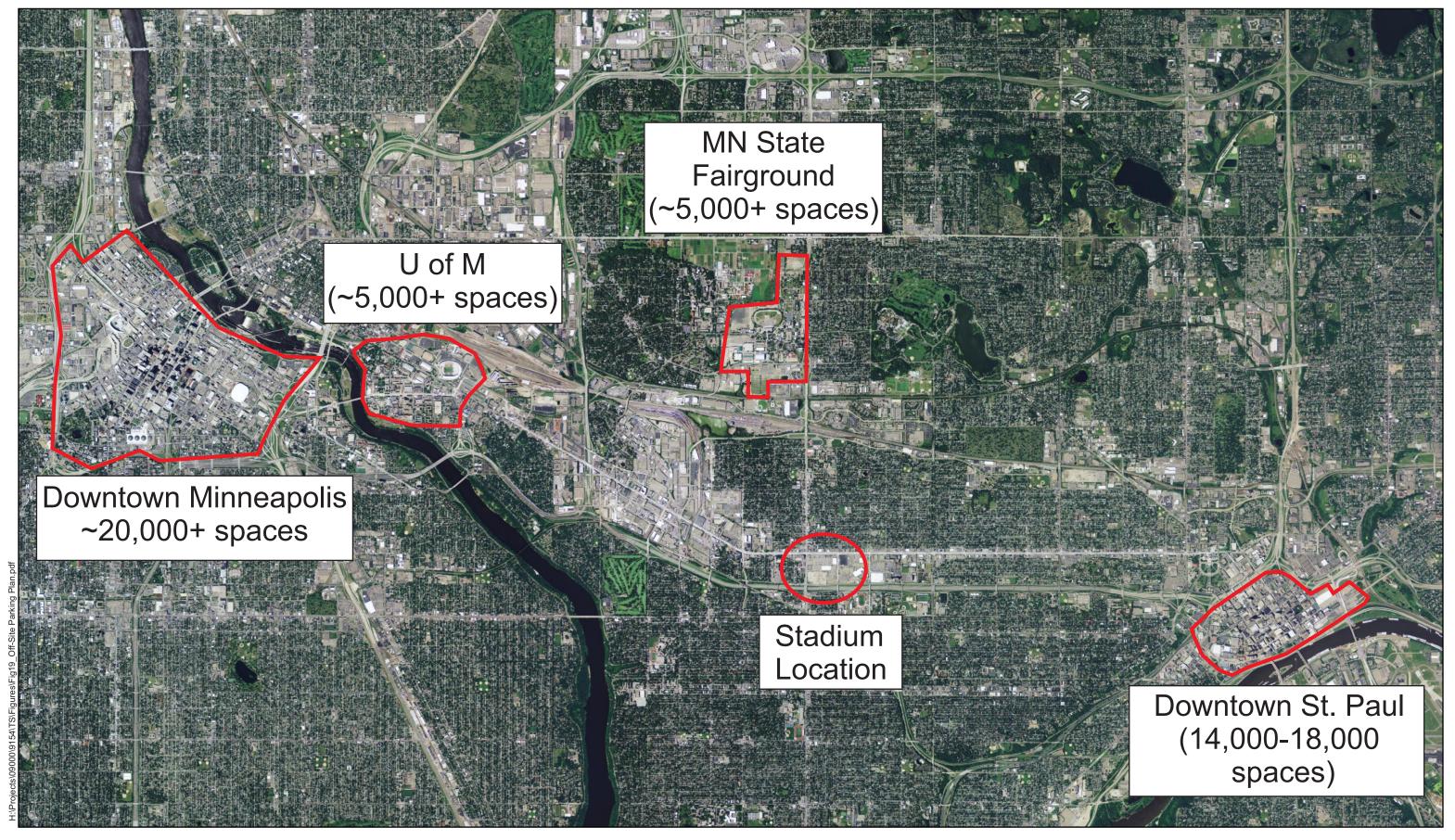
Based on comments from Metro Transit and observation of events, it is expected that most event patrons using LRT will arrive or depart one hour before or after the game. It is expected that the full hour before or after events will be fully utilized for both eastbound and westbound trains. These trains will be utilized by fans that are completing their trip without a car but live near the LRT stations outside of the walking distance, fans that park on-street in areas not near the stadium, or fans that park in ramps at the University of Minnesota, Downtown Minneapolis, Downtown St. Paul, and surrounding areas. These ramps are expected to be different locations than the ones identified for the park and ride shuttle users, unless the potential ramp has enough capacity to serve both LRT users and shuttle users. It was identified that with a full utilization of both the eastbound and westbound LRT, approximately 31 percent of fans will be able to utilize the LRT to arrive at the proposed stadium. Further discussions will be needed to further refine the parking locations.

It should be noted that based on the event distribution, the majority of fans will be coming from west of the site. Mitigation strategies will need to influence fans arriving via LRT to utilize stations to the east. The most likely candidates to consider this option would be fans in the north and south metro who may otherwise come from I-35W to potentially use I-35E and arrive east of the site and utilizing parking in downtown Saint Paul or near the capitol area.

The A-Line BRT is not operational until summer of 2016. However, a baseline assumption is shown in Appendix D. Based on discussions with Metro Transit, there is an assumed crush load of 70 people within a BRT bus with 10 minute headways both directions during many of the events. An assumption was made that the BRT will be fully utilized for one hour prior to and after the event. Based on the crush load and expected occupancy of the BRT buses, approximately 700 attendees or three and half percent of event fans will be able to utilize the BRT.

Shuttle Buses to Remote Parking

The remaining event patrons would be shuttles to remote parking facilities. A mitigation strategy has been proposed to provide a shuttle service to off-site parking facilities. These "park—and-ride lots" are desired to be located within a two to three mile (i.e. 20 to 30 minute round trip) radius as these shuttles are expected to operate a few trips back and forth to the stadium. Potential park-and-ride shuttle lots, along with estimated capacity, are shown in Figure 19. The number of potential identified remote parking spaces for events exceeds the number of parking spaces needed by a factor of approximately six (6). For purposes of this analysis, it is anticipated that a sufficient number of the spaces identified will be available at event times sufficient to provide for transportation to and from events for the number of anticipated patrons not served via other modes.



Trip Generation

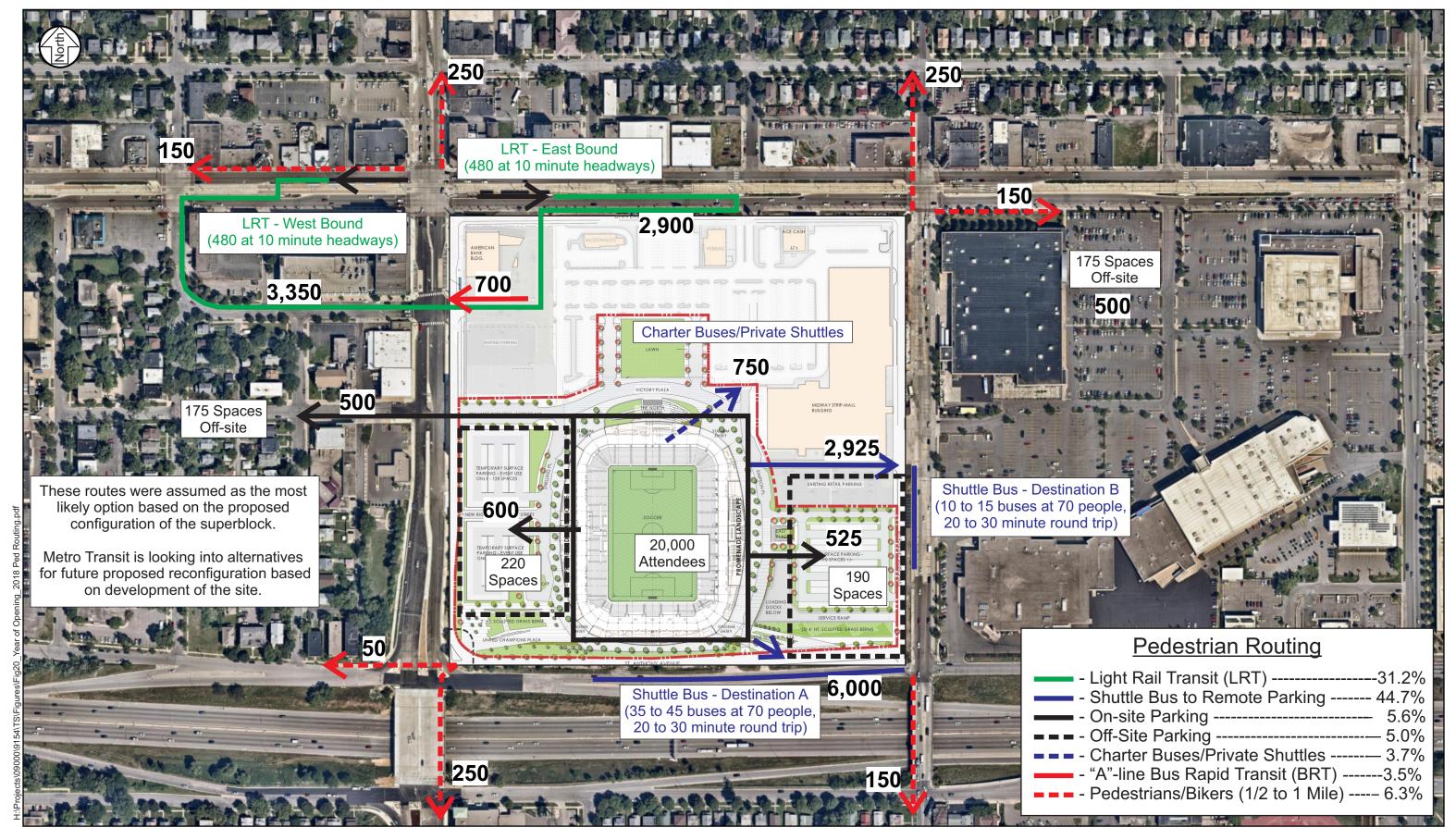
To account for traffic impacts associated with the proposed stadium development, trip generation estimates for weekend afternoon event (match starting at 2:00 p.m.) were developed. It should be noted that weekday evening and weekend evening events are possible, however, the weekend afternoon event was determined to have the highest background traffic, and therefore only this scenario was analyzed. The high background traffic is generated by the near-by retail land uses, connections to other destinations and access to I-94. Any mitigation as a result of the weekend afternoon event is expected to alleviate traffic concerns during the other two potential soccer match times.

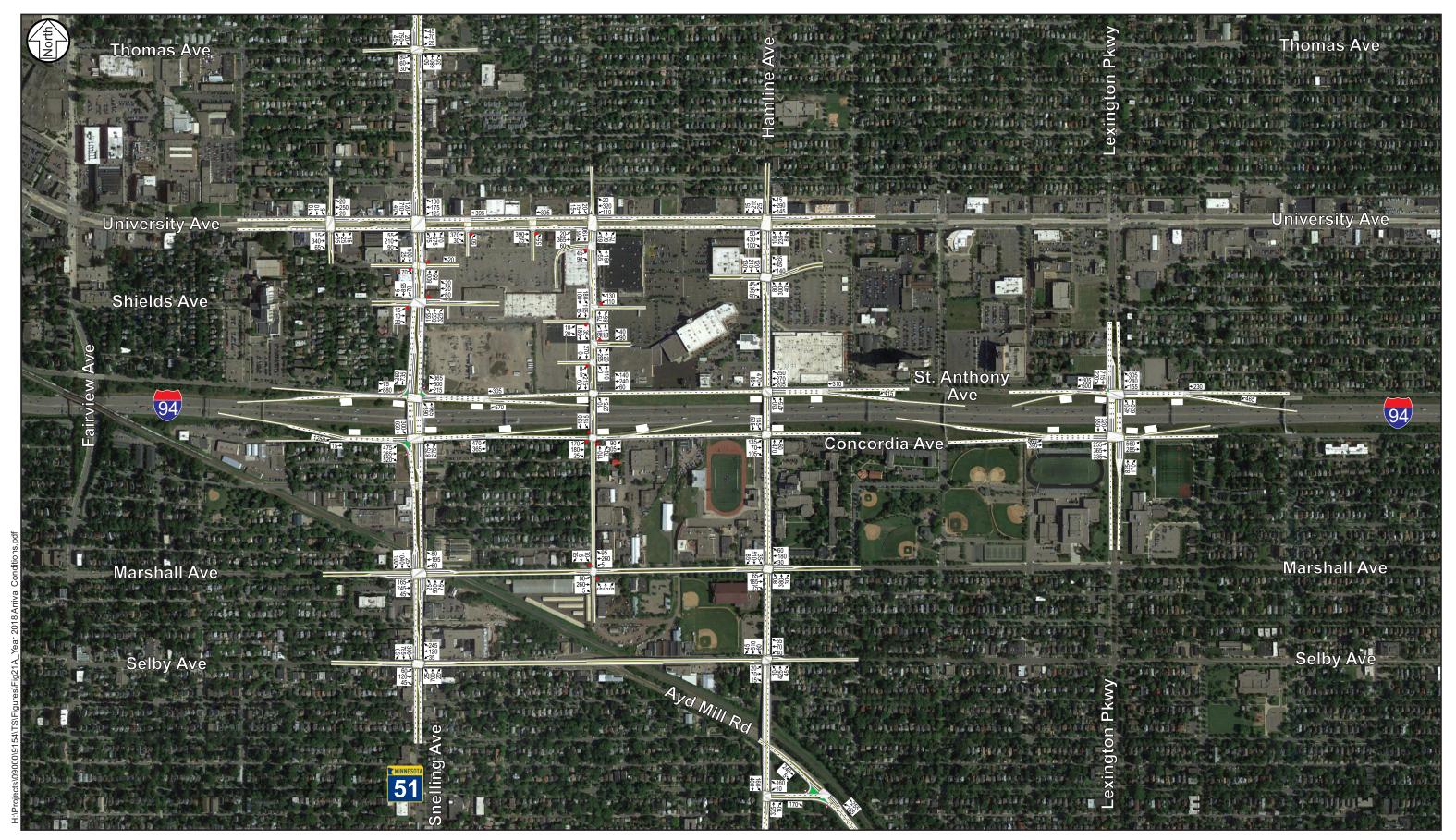
The capacity of the stadium is expected to be approximately 20,000 patrons in year 2018. The trip generation estimates, shown in Table 7, were developed using the previously described mode share. It should be noted that the trips shown in Table 7 are person trips, not vehicle trips.

Table 7. Person Trip Generation Estimates – 20,000 Patrons

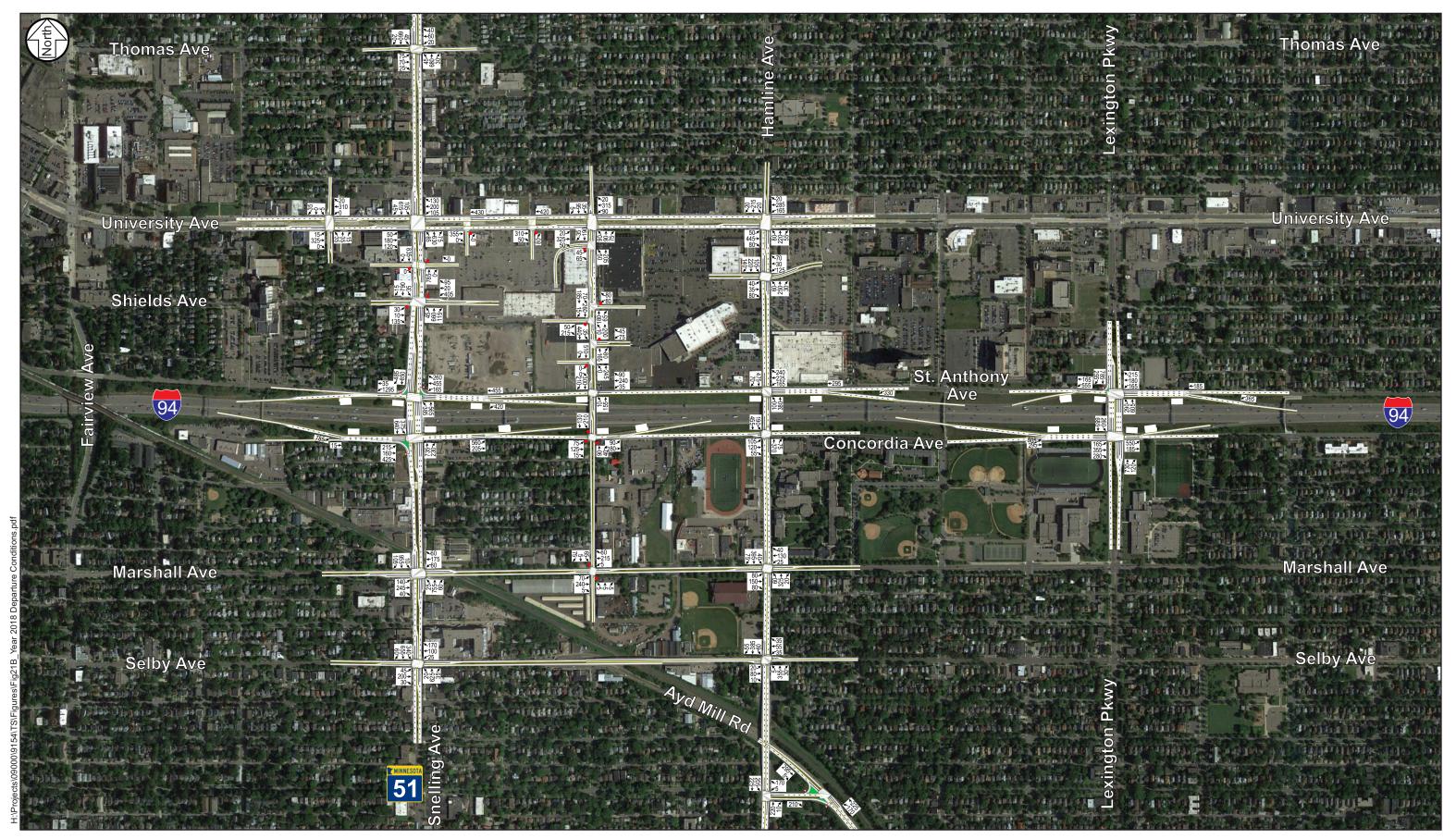
Mada	Percent Weekday		kday	Percent	Weekend	
Modes	of Total	Arrival	Departure	of Total	Arrival	Departure
Non-Auto or LRT/BRT	10.0%	2,000	2,000	15.0%	3,000	3,000
On Site Parking	5.5%	1,100	1,100	5.5%	1,100	1,100
Off Site Parking	4.8%	965	965	4.8%	965	965
LRT/BRT	34.8%	6,960	6,960	34.8%	6,960	6,960
Off-Site Shuttles	44.9%	8,975	8,975	39.9%	7,975	7,975
Totals	100.0%	20,000	20,000	100.0%	20,000	20,000

Results of the trip generation estimates indicate that approximately 10 percent of trips for an event will occur using an automobile within the study area. A breakdown of the proposed person trip routes is shown in Figure 20. It is expected that for weekend events, walking and biking become more attractive options due to events occurring earlier in the day and the potential event patrons will have more available time to walk or bike from further distances. Trips generated by the proposed development were distributed throughout the study area based on the directional distribution shown in Figure 12, which was developed based on existing sports team's ticket information and engineering judgment. The resultant year 2018 event vehicular traffic forecasts, which include general background growth and trips generated by an event, are shown in Figures 21A and 21B.





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Intersection Capacity Analysis

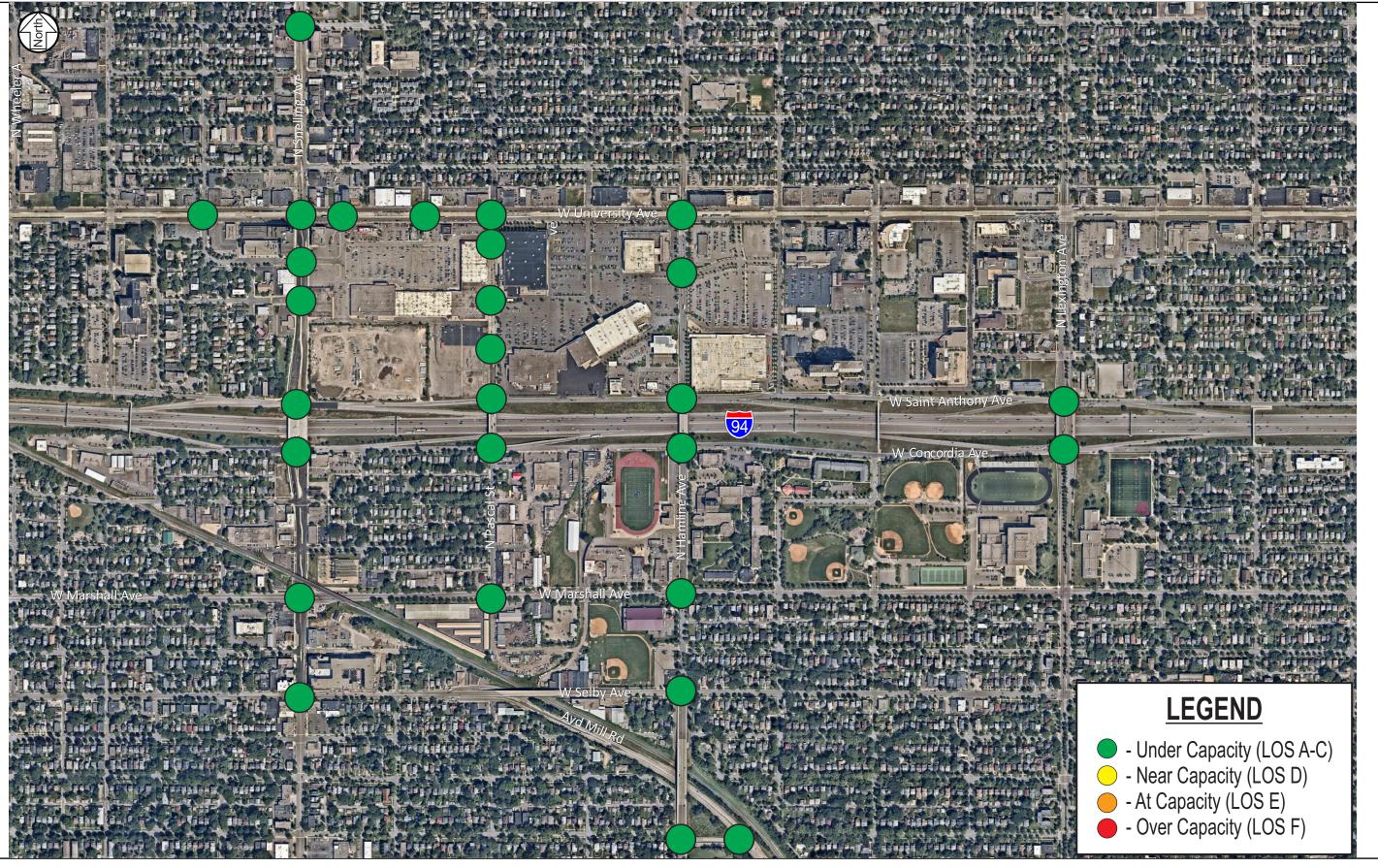
Weekend afternoon event conditions were analyzed with the proposed roadway configuration and a full capacity event to determine potential transportation impacts due to the increased pedestrian and vehicular traffic. It should be noted that weekday evening and weekend evening events are possible, however, the weekend afternoon event was determined to have the highest background traffic volumes, and therefore this worse-case scenario was analyzed. This is caused by the heavy retail peak that occurs on weekend afternoons within the study area. Any mitigation as a result of the weekend afternoon event is expected to alleviate traffic concerns during the other two potential soccer match times.

Events are intense peak flows resulting in intersections operating at LOS F, so mitigation strategies are needed to manage it. The amount of time needed to clear the departure will also be identified. Another metric is to identify if queues are impacting adjacent intersections and affecting network wide transportation options. Unacceptable conditions occur when queues begin to impact freeways free flow ability or limit the ability of transit options operation, especially if these occur over the course of more than one hour.

This scenario assumes an afternoon start time of 2:00 p.m. and departure time of 4:00 p.m. Arrival and departure traffic operations analysis were conducted for the hour before and after the match respectively. Based on the mode share methodology previously discussed, approximately 750 automobiles are assumed to drive to the site or have a parking space within walking distance for the event. It is expected that 75 percent of the vehicles (565) arrive prior to the game during the peak hour, and 95 percent of the vehicles (715) depart during the peak hour. It should be noted that an optimized event signal timing plan was assumed.

A detailed intersection capacity analysis was completed for vehicular traffic operations during the weekend afternoon arrival and departure using Synchro/SimTraffic. The analysis assumes there is no circulation of people looking for parking. The analysis was completed assuming everyone knows their destination (i.e parking/shuttle/transit) prior to coming to the events. This is necessary due to the limited amount of parking. Results of the detailed intersection capacity analysis are shown in Table 8. In addition, level of service results for the arrival and departure are shown in Figures 22A and 22B, respectively.

During the arrival peak hour on a weekend afternoon, it is not expected that any significant intersection operational issues will occur. These arrival trips are more spread-out than departure trips. It should be noted that a special game time arrival traffic signal optimization was assumed. A game time specific traffic signal plan is a recommended mitigation strategy, along with information to reduce vehicles searching for parking. The full simulation results for year of opening arrival and departure conditions are presented in Appendix E.



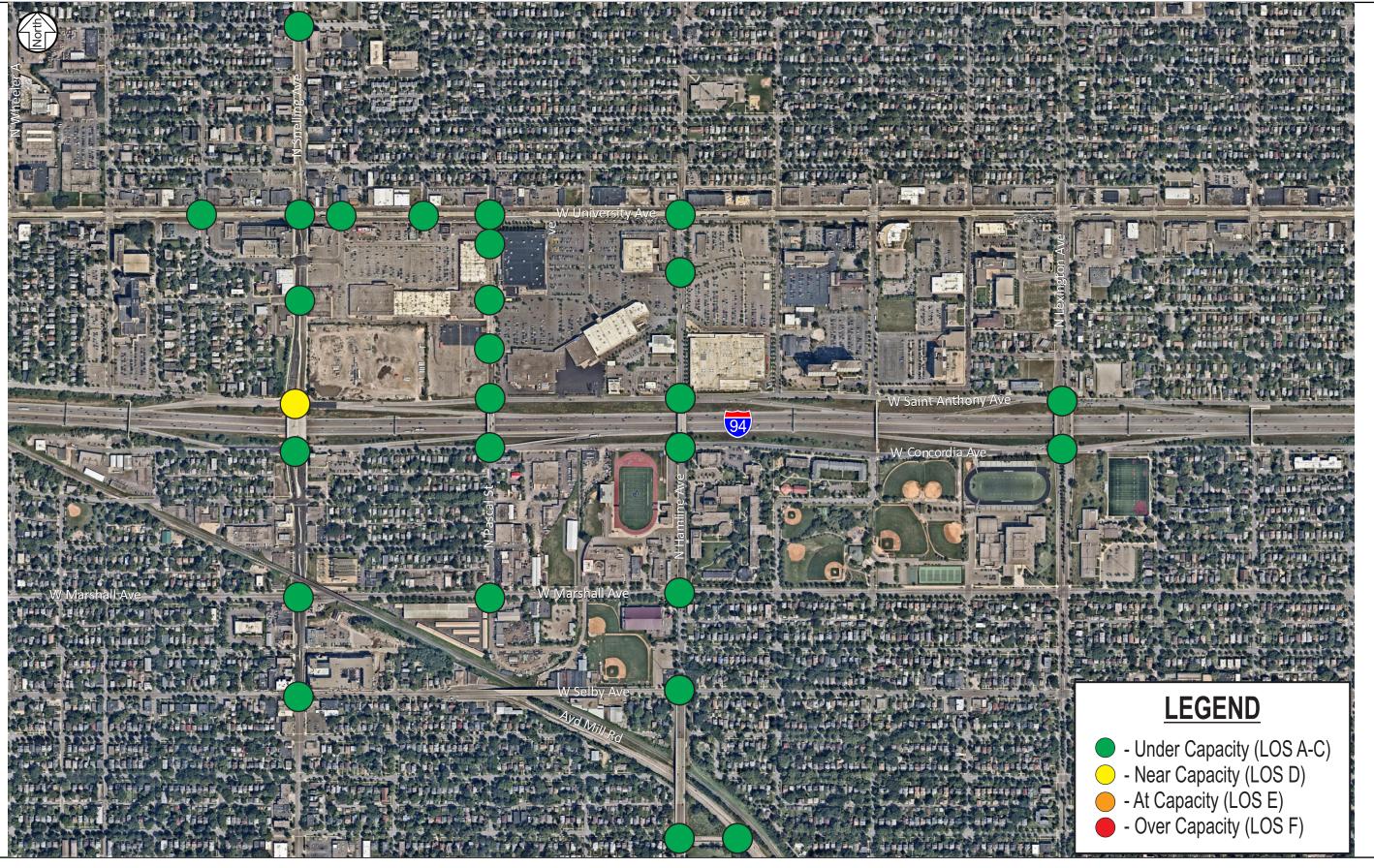


Table 8. Year 2018 Weekend Afternoon Event Intersection Capacity Analysis

Intersection	Arrival (1:00 p.m.) Peak Hour	Departure (4:00 p.m.) Peak Hour	
	LOS	LOS	
University Avenue/Fry Street	В	А	
Snelling Avenue/Thomas Avenue	В	В	
Snelling Avenue/University Avenue	С	С	
Snelling Avenue/Spruce Tree Avenue	B/C		
Snelling Avenue/Shields Avenue	С	С	
Snelling Avenue/St. Anthony Avenue	С	D	
Snelling Avenue/Concordia Avenue	С	В	
Snelling Avenue/Marshall Avenue	В	В	
Snelling Avenue/Selby Avenue	В	В	
University Avenue/West Midway Shopping Center Driveway ⁽¹⁾	A/A		
University Avenue/East Midway Shopping Center Driveway ⁽¹⁾	A/A	A/A	
University Avenue/Pascal Street	В	В	
Pascal Street/North Midway Shopping Center Driveway ⁽¹⁾	A/A	A/A	
Pascal Street/Walmart Driveway ⁽¹⁾	A/B	A/B	
Pascal Street/South Midway Shopping Center Driveway(1)	A/B	A/B	
Pascal Street/Cub Driveway ⁽¹⁾	A/C	A/B	
Pascal Street/St. Anthony Avenue	С	С	
Pascal Street/Concordia Avenue ⁽²⁾	В	А	
Pascal Street/Marshall Avenue ⁽¹⁾	A/B	A/B	
University Avenue/Hamline Avenue	С	С	
Hamline Avenue/Midway Marketplace	В	В	
Hamline Avenue/St. Anthony Avenue	В	В	
Hamline Avenue/Concordia Avenue	В	В	
Hamline Avenue/Marshall Avenue	В	В	
Hamline Avenue/Selby Avenue	А	А	
Hamline Avenue/Ashland Avenue	В	В	
Ayd Mill Road/Ashland Avenue	В	В	
Lexington Avenue/St. Anthony Avenue	В	В	
Lexington Avenue/Concordia Avenue	В	В	

⁽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 delay.
(2) Indicates All-Way Stop Control

During the departure peak hour, minor issues are observed in the peak exiting half hour of event departure traffic. The majority of exiting vehicles are destined to exit in the half hour immediately after the game ends, which causes a spike in traffic volumes. Congestion is observed at the Snelling Avenue and Shields Avenue intersection and along Snelling Avenue to St. Anthony Avenue. With a majority of vehicles destined to westbound I-94, expect queues from the southbound right-turn queueing at St. Anthony Avenue to extend to Shields Avenue. Additionally, the majority of traffic from Pascal Street is also destined to the I-94 westbound on-ramp, which travels westbound on St. Anthony Avenue. Because these two major movements conflict with one another queues are expected in both directions. This queueing on St. Anthony Avenue could spill back from Snelling Avenue to Pascal Street and have an effect of a rolling queue from the parking lot exit on Pascal Street to the on-ramp at Snelling Avenue. Because of the amount of volume on Pascal Street after a match, driveway access from Midway Shopping Center, Walmart, and Cub will be difficult. It is anticipated that motorists that use these facilities will find alternate routes out of the shopping area, however, to remain conservative, these volumes were kept in the network at the specific driveway. It should be noted the intersections with poor operations are expected to recover within one hour of the match.

Detailed mitigation strategies for the year of opening event scenario are provided on page 73.

Multi-Modal Transportation Analysis

A transportation model VISSIM/VISWALK was completed to analyze all modes (pedestrian/bicycle, LRT, transit, shuttle). Weekend afternoon event conditions were analyzed with the proposed roadway configuration and a full capacity event (20,000) to determine potential multi-modal transportation impacts due to the increased pedestrian, transit and vehicular traffic.

This scenario assumes a weekend (Saturday) afternoon departure time of 4:00 p.m. The departure was analyzed because of the peak pedestrian flows leaving the stadium. The event modeled had 90 percent of the event patrons leaving the stadium a half-hour after the match. This will result in people queuing to board any of the transit or shuttle modes. Based on the mode share methodology previously discussed, approximately 7,000 patrons are destined for LRT/BRT, while approximately 8,000 patrons are destined to off-site shuttle bus parking.

A detailed transportation analysis was completed for the weekend departure using the VISSIM/VISWALK software (Version 7.00-16). Results of the detailed transportation analysis focus on the average travel time and queues for event patrons heading to these mode types, along with the expected amount of space needed to accommodate the queues.

Assumptions were necessary in order to complete the transportation analysis and are included in the mitigation strategies. These include the following items:

- 10 minute headways for all LRT and BRT transit vehicles Depending on the time and day
 of the event, this project may need to request the schedule be changed to higher frequency
 service.
- Three-vehicle LRT It was noted during site observations that on Saturdays, it is common to run two-vehicle LRT. This was assumed to be the full three-vehicle LRT at the end of an event. The project needs to work with Metro Transit.
- Based on data collected on LRT, approximately 480 people could board the LRT, while about 70 people could board the BRT.
- Approximately 40 to 50 shuttle buses Would need 115 to 130 shuttle bus trips. At this point, the assumption is that shuttle buses would operate along Saint Anthony Avenue on the southeast corner of the site. Additionally, there may need to be storage for the shuttles prior to the event departure along St. Anthony Avenue east of Pascal Street or on Pascal Street to the north. Additionally, it was assumed that a complete round trip for the shuttle bus could be completed in approximately 20 to 30 minutes in order to run two to three shuttle bus trips per hour.
- For purposes of this analysis, pedestrians were routed to the LRT platform or bus stop based on routes shown in Figure 20. These routes were chosen based on understanding of likely configuration of the portion of the superblock north of the proposed extended Shields Avenue at the time of stadium opening in 2018. However, Metro Transit has looked at alternatives for pedestrian routing and staging that would also be feasible for accommodating transit riders. The alternatives implemented in 2018 will be determined in consultation with Metro Transit based on actual site configuration in 2018, and modified going forward as the remainder of the superblock redevelops.

Results from the LRT transportation analysis, shown in Table 9, indicate the largest queue and average travel time for pedestrians using LRT/BRT to depart an event. The travel time is based on the time between the patron leaving the stadium and boarding the LRT/BRT vehicle. With a slightly larger number of patrons destined on westbound LRT, it is expected that the queue length and travel time would be larger than eastbound. The BRT is expected to finish boarding in about one hour, while the LRT may board its final train about one and a half hours after the completion of the event.

Table 9. Transportation Analysis Results - LRT/BRT

Direction and Mode	Maximum Queue (Peds)	Average Travel Time (Minutes)
Westbound LRT	2,050	30
Eastbound LRT	1,700	20 to 25
Northbound BRT	150	10 to 15
Southbound BRT	150	10 to 15

Based on the results from the LRT transportation analysis, it was observed that the larger westbound queue and travel time accounted for approximately the amount of time and queue length of one extra train. Screen captures of the event queues in relation to how much physical space they may require are shown in Appendix F. The maximum observed queues for westbound and eastbound LRT indicate the need for 2,050 and 1,700 pedestrians, respectively. Guidelines from the Highway Capacity Manual (HCM), a minimum of eight (8) sf per person is expected for capacity conditions for a pedestrian and for an event departure, it is expected that capacity conditions will occur. This maximum queue represents the maximum number of people who have left the stadium and arrived in the queue to board the LRT/BRT. The 7,000 event patrons utilizing LRT/BRT are expected to depart over the course of a half hour after the match, not all immediately at one time. This can be a result of fans attending post game entertainment or nearby bars/restaurants before arriving in the queue to board. Additionally, full LRT/BRT vehicles will be departing the stations immediately after the match. This applied similarity to the shuttle bus maximum queue results. Additional post-game entertainment opportunities could help mitigate the queue.

Based on these guidelines, a <u>minimum</u> westbound queueing area of approximately 16,500 sf and <u>minimum</u> eastbound queueing area of approximately 13,750 sf would be necessary. It is expected that the BRT queuing would be accommodated by the existing sidewalk infrastructure.

Results from the shuttle bus transportation analysis, shown in Table 10, indicate the largest queue and average travel time for 8,000 patrons using a shuttle bus to depart an event. It was assumed that approximately 115 to 130 shuttle bus trips would be necessary to clear the shuttle bus queue which would require 40 to 50 shuttle busses making round trips. Based on the site plan in Figure 13, there is room for up to four or five buses in the shuttle area. The buses would need to be staged, perhaps along St. Anthony Avenue east of Pascal Street or to the north on Pascal Street. The departure shuttling need to be efficient to maximize the shuttle bus loading area.

Table 10. Transportation Analysis Results - Shuttle Bus

Mode	Maximum Queue (Peds)	Travel Time (Minutes)
Shuttle Bus Queue	3,050	20

Based on the results from the shuttle bus transportation analysis, a maximum queue of 3,050 pedestrians is expected. This queue will require a minimum queuing space of approximately 25,000 sf. On average, a shuttle bus user is expected to wait for 20 minutes to board a shuttle bus. It is expected to take between one hour and an hour and fifteen minutes to clear the shuttle bus area.

Additional information regarding the pedestrian routes, specific platform loading areas, shuttle bus destinations, and other mitigation factors is provided in the mitigation section on page 72.

Key Findings for Year of Opening Event

More event patrons will want to drive directly to the event than can be accommodated by the parking assumed to be available on-site or within walking distance. Unless carefully managed, this could potentially result in significant traffic congestion, circulation trying to find a space, illegal parking and overall frustration. An event Transportation Management Plan (TMP) is needed to safely and efficiently get event patrons to and from the event while minimizing impact to the local business and residents.

- It is expected that approximately 10 to 15 percent of event patrons will walk, bike, or take local bus locally to the site, and approximately 10 percent of event patrons will be able to park on-site or off-site within a walking distance. The remaining 75 to 80 percent of patrons are expected to be divided up between LRT/BRT and shuttle buses.
- Approximately 35 percent of event patrons will be able to utilize LRT/BRT, however, the time to clear the site may slightly exceed one hour after the event.
- The remaining 45 percent will need to be shuttled to remote parking within two to three miles, preferred. This operation may need to utilize up to 40 to 50 buses, depending on where the remote parking is located. Once again, the time to clear the site may take slightly over one hour.
- Storage and waiting areas for pedestrians using transit or shuttle service will need to be defined and will require additional event staff outside of the facility to manage it.
- Based on Highway Capacity Manual guidelines, a minimum westbound LRT queueing area of approximately 16,500 sf and minimum eastbound LRT queueing area of approximately 13,750 sf would be necessary. The shuttle bus pedestrian queue will require a minimum queuing space of approximately 25,000 sf. Both of these queues are expected to take just over one hour to clear out.
- The I-94/Snelling interchange is a key bottleneck in the system. Event patrons should be encourage to use adjacent interchanges when arriving and departing the event. Shuttle bus service along Saint Anthony may need to be reconsidered because of this bottleneck.
- The area has a significant amount of retail land use. Weekend events starting between 1:00 p.m. and 5:00 p.m. and ending between 3:00 p.m. and 7:00 p.m. place the event traffic during the busiest business times and background traffic. Capacity events should be encouraged for a 7:00/7:30 p.m. start time with departure at 9:00/9:30 p.m.

Year 2035 Event Conditions

To identify potential impacts associated with the proposed soccer stadium events under full build conditions, traffic forecasts for year 2035 conditions (i.e. year of full build of adjacent development) were reviewed. The year 2035 conditions take into account general area background growth, trips generated by the adjacent buildings on the proposed site, and the additional trips generated by a soccer stadium event. The proposed soccer stadium has the potential to expand to a capacity of 25,500 by the year 2035, therefore, this analysis will consider this larger event attendance in addition to the adjacent development. The following sections provide details on the background traffic forecasts, estimated trip generation, and intersection capacity analysis for year 2035 conditions.

Roadway/Access Closures

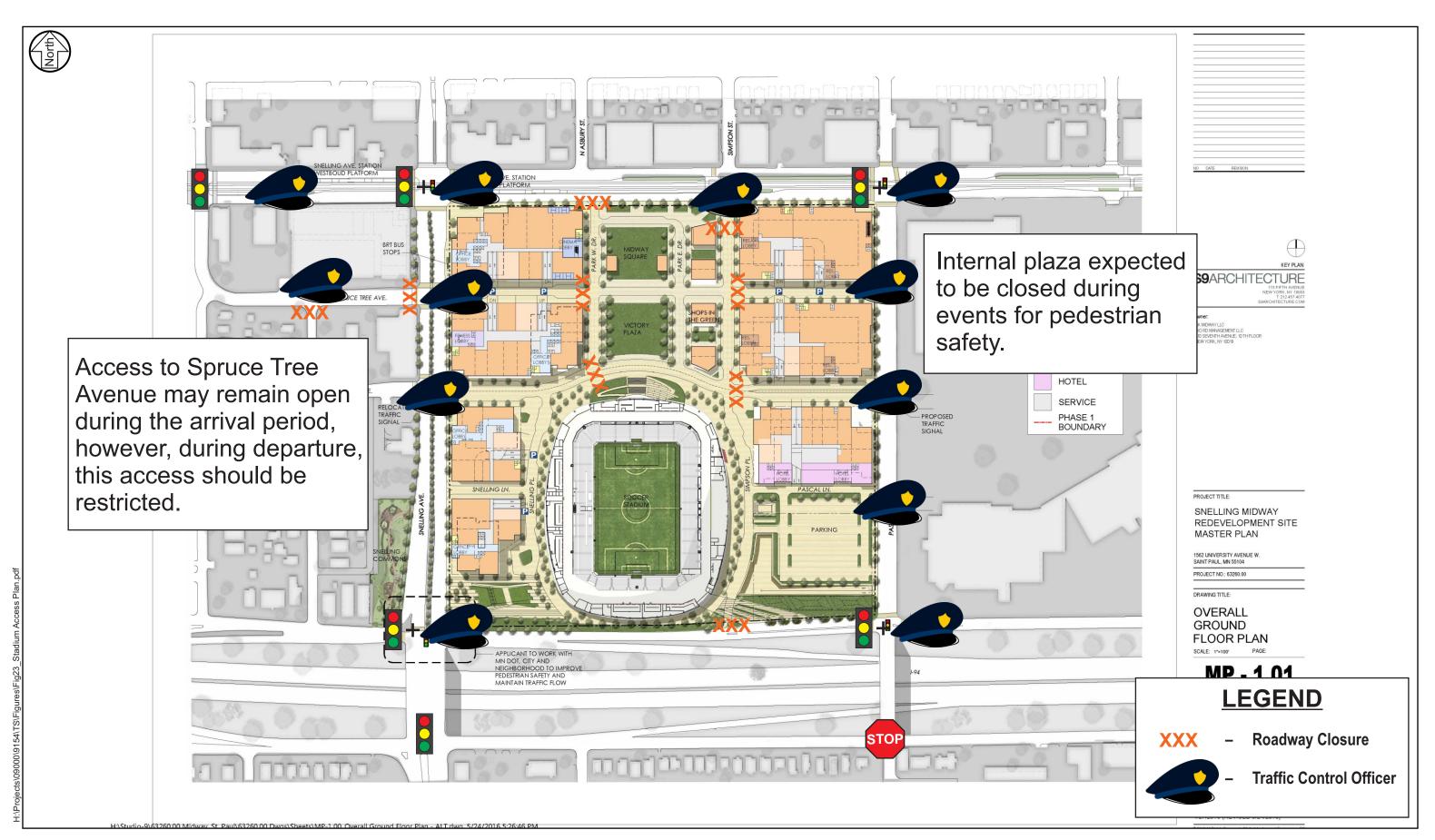
By the year 2035, it is expected that the full access modifications shown in Figure 6 will be completed. To allow for a safe and efficient flow of traffic, the following modifications are assumed for events:

- Traffic control officers at intersections adjacent to the site for arrival and departure times
- No traffic movements at the eastbound approach of the Snelling Avenue and Spruce Tree Avenue intersection during the post-game departure. This allows for safer pedestrian movements between the stadium and LRT.
- Restricting vehicles leaving the Spruce Tree Parking Ramp to only turning right and proceed north to the University Avenue and Fry Avenue intersection. Additionally, these motorists would be required to turn left onto westbound University Avenue.
- Close the University Avenue/Asbury Street access for arrival and departure periods to allow for safer pedestrian movements between LRT and the stadium.

The following site access modifications for year of opening are shown in Figure 23.

Background Traffic Growth

To account for general background growth in the area, an annual growth rate of one-half percent was applied to the existing peak hour traffic volumes to develop year 2035 background traffic forecasts. This growth rate is consistent with historical growth rates in the study area and results from the Twin Cities Regional Demand Model. However, based on event management experience, it is anticipated that an event within the study area may have the effect of drivers modifying their trip to avoid the event traffic. For the analysis, it is assumed that 20 percent of background traffic will avoid interfering with event traffic either by modifying their route or completing their trip at a different time. These trips are still expected to occur to and from local area businesses, however, they are expected to occur at different times of the day in order to avoid the congestion of an event. Mitigation strategies should include informing drivers using this area to use a different route or timeframe if not having an origin/destination in the area.



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2035 Event Mode Share

The year 2035 event mode share will break down in more detail how the specific mode share numbers were developed for each mode.

Walk/Bike/Local Bus/Charter and Private Shuttle

The non-auto/LRT/BRT includes local bus service and people walking/biking to the event from their home or business. In order to determine the number of people walking to the site, an evaluation of the population of the metro was completed. It was determined that approximately one percent of the population lives within a one mile walking distance of the stadium. By year 2035, it was assumed that additional soccer fans would have moved into the surrounding area. Therefore, four percent of event patrons are expected to walk from the surrounding area for weekday events, and up to six percent during weekend events due to increase in full families attending with potential guests.

With the new development expected on site near the stadium, it is expected that a portion of these workers, residents, and hotel visitors will attend a match. During a weekday and weekend, it is assumed that approximately 800 fans (three percent) of the total attendance could come from people already on site. This assumption is consistent between weekday and weekend matches. It is expected that local businesses will supply a larger amount of fans on weekdays, while the hotel visitors for matches will be higher on weekends. This is based on game day information provided from local businesses near stadiums, other Twin Cities sports teams, and information gathered from hotels near the Xcel Energy Center.

The biking and local bus service mode share of two percent is not expected to change from year 2018 conditions. The combined total of all of these modes would accommodate 3,515 (14 percent) fans on weekdays and 4,605 (18 percent) fans on weekends.

The percentages for charter buses destined to outstate metro areas and local area bars is not expected to change from three percent between year 2018 and year 2035.

On-Site Parking

The on-site parking mode-split is expected to differ between year 2018 and year 2035. Based on discussions with City staff and the developer, a proposed on-site parking plan for year 2035 was developed, shown in Figure 24. From this plan, it is expected that approximately 2,050 vehicles may be able to park on-site during events in year 2035 mostly along Snelling Avenue, which will equate to approximately 5,650 fans (based on a 2.75 person occupancy), or 22 percent of fans for a capacity event. This parking plan is considered preliminary as future discussions with office tenants on site will be necessary to discuss available game day parking on weekdays and weekends.

Off-Site Adjacent Parking

The off-site parking mode-split takes into account parking not on site, but within walking distance of the stadium. Potential off-site parking locations are previously shown in Figure 16 for year 2018 conditions and are expected to minimally change for year 2035 conditions.

LRT/BRT

The LRT/BRT mode share is not expected to differ between year 2018 and year 2035 conditions. Under both scenarios, it was assumed that the LRT/BRT will be fully utilized to full capacity for one hour. This equates to 27.5 percent.

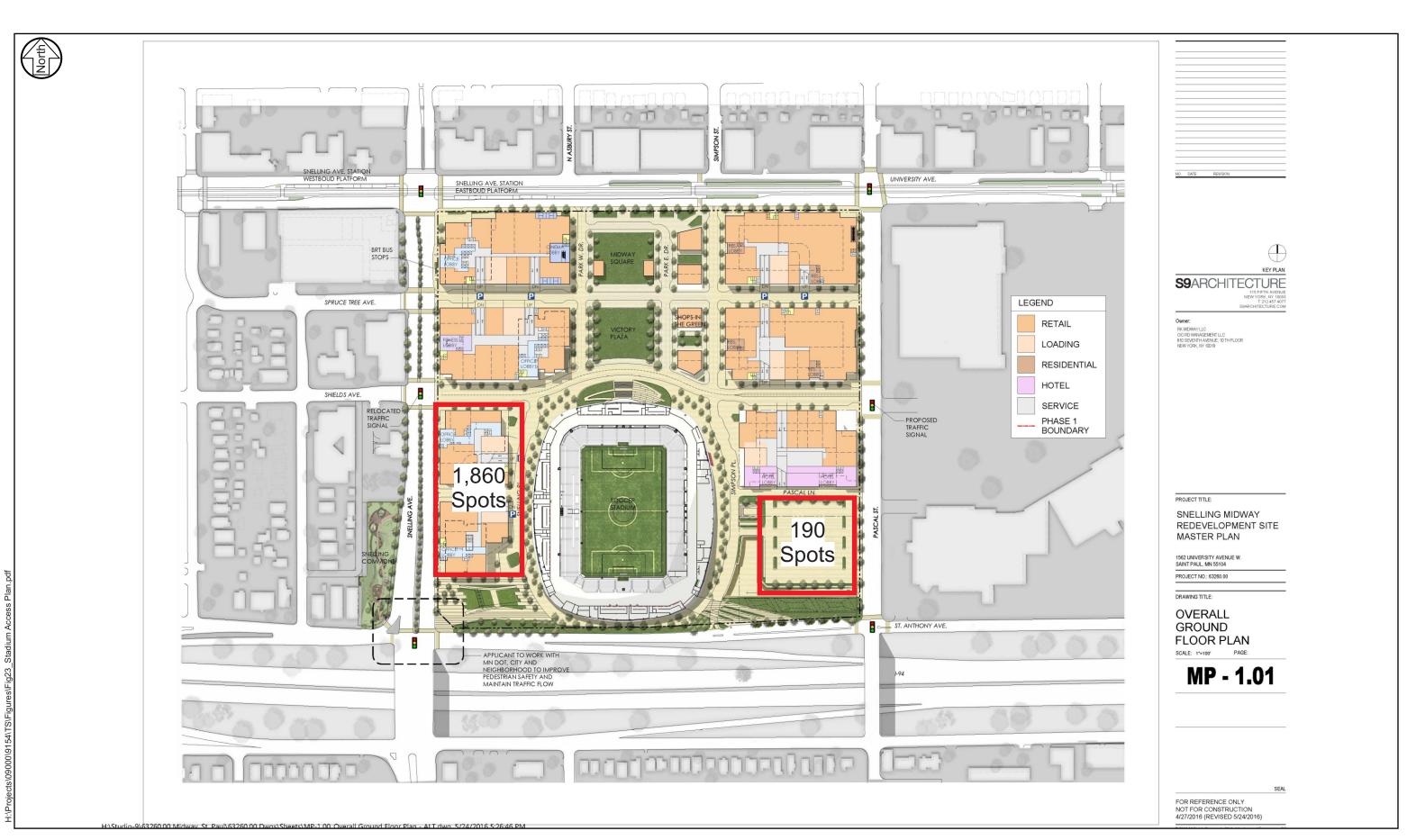
Shuttle Buses to Remote Parking

Once again all remaining event patrons that do not utilize the other modes are expected to arrive and depart the event utilizing a shuttle bus. The park and ride lots are desired to be located within a two to three mile radius as these shuttles are expected to operate a few trips back and forth to the stadium. Potential park and ride shuttle lots, along with capacity, were previously shown in Figure 19.

Trip Generation

To account for traffic impacts associated with the proposed stadium development, trip generation estimates for weekend afternoon event (match starting at 2:00 p.m.) were developed. It should be noted that weekday evening and weekend evening events are possible, however, the weekend afternoon event was determined to have the highest background traffic, and therefore this scenario was analyzed as the worse-case scenario. The high background traffic is generated by the near-by retail land uses, connections to other destinations and access to I-94. Any mitigation as a result of the weekend afternoon event is expected to alleviate traffic concerns during the other soccer match times.

The analysis completed was for a capacity of 25,500 patrons in year 2035 coinciding with the potential full development of the site. The trip generation estimates, shown in Table 11, were developed using the previously described mode share. It should be noted that the trips shown in Table 11 are person trips, not vehicle trips.





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Table 11. Person Trip Generation Estimates – 25,500 Patrons

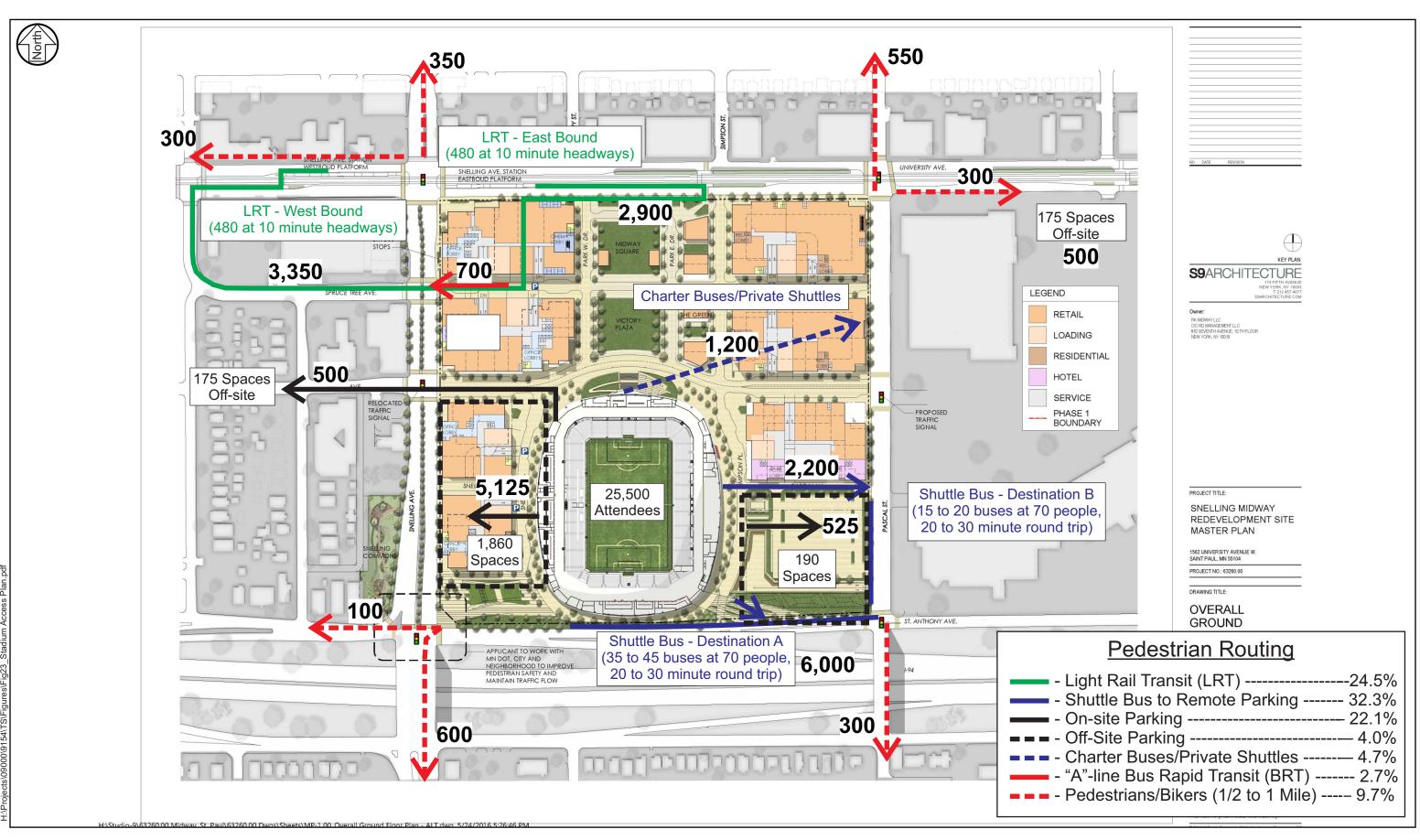
	Percent	Wee	kday	Percent of Total	Weekend	
Modes	of Total	Arrival	Departure		Arrival	Departure
Non-Auto or LRT/BRT	14.0%	3,515	3,515	18.1%	4,605	4,605
On Site Parking	22.0%	5,650	5,650	22.0%	5,650	5,650
Off Site Parking	4.5%	1,155	1,155	4.5%	1,155	1,155
LRT/BRT	27.3%	6,960	6,960	27.3%	6,960	6,960
Off-Site Shuttles	32.2%	8,250	8,250	28.1%	7,150	7,150
Totals	100.0%	25,500	25,500	100.0%	25,500	25,500

Results of the trip generation estimates indicate that approximately 26.5 percent of trips for an event will occur using an automobile within the study area. A breakdown of the proposed person trip routes is shown in Figure 25. It is expected that for weekend events, walking and biking become more attractive options due to events occurring earlier in the day and the potential event patrons will have more available time to walk or bike from further distances.

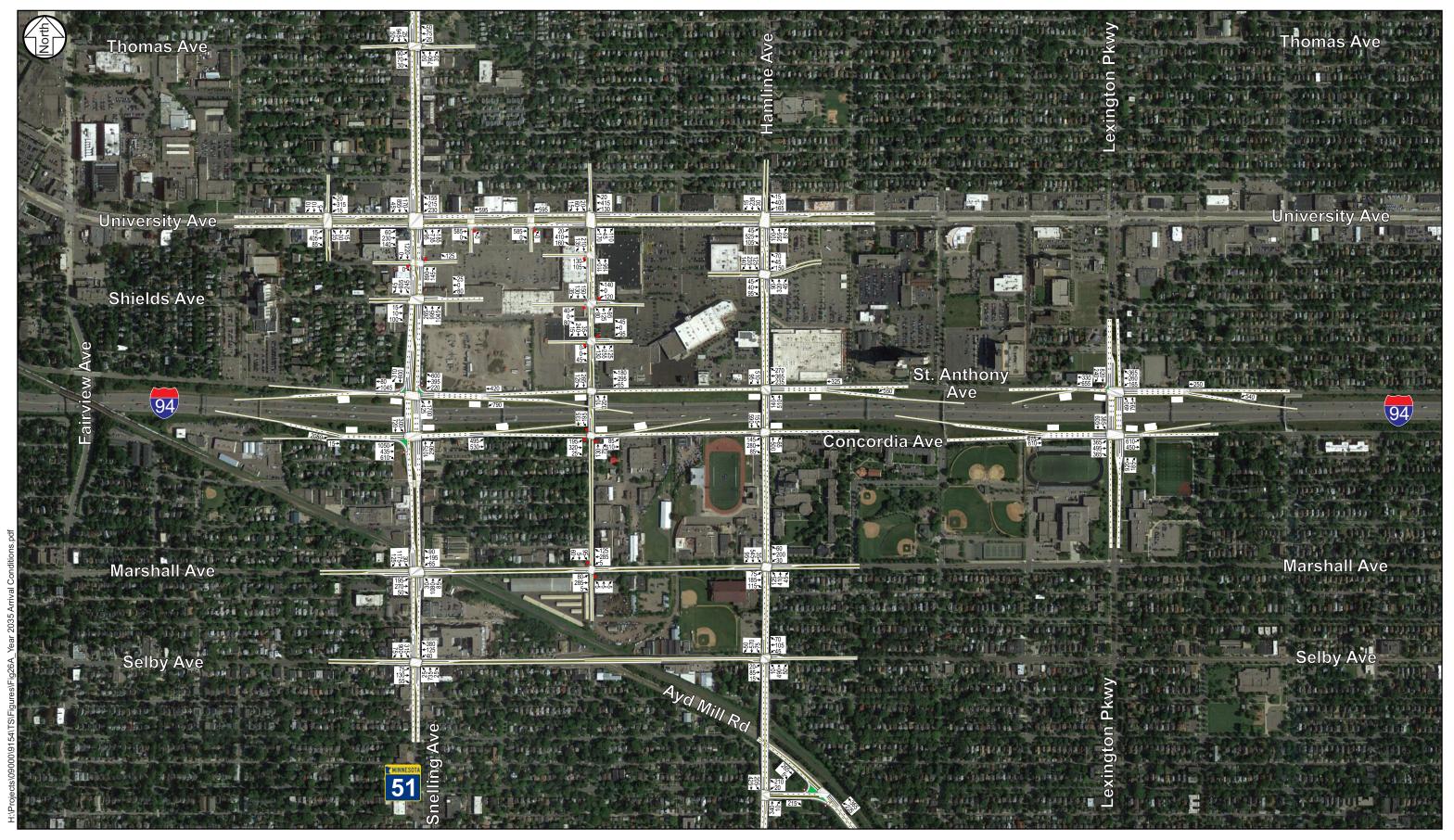
Trips generated by the proposed event were distributed throughout the study area based on event attendees' origin/destination information is based on zip codes collected from individual and season ticket holders for other professional sports teams in the Twin Cities, the current Minnesota United team, and metro area population densities. The zip codes were mapped and assigned to the most efficient travel shed to the stadium from the zip code. The zip code information provides an accurate representation of where potential attendees are expected to be located in the metro area. The directional distribution is shown in Figure 15.

In addition to the trips generated by the event, the surrounding development on site is expected to generate a significant amount of trips within the study area. Assumptions were made in order to determine the trips generated during the weekend peak hours. Certain land uses had published trip generation from a combination of ITE, SRF locally collected data on weekends, and other local data from TripGeneration.org. Based on these sources, the trips were able to be adjusted from the a.m. and p.m. peak hour trips to better represent weekend peak hour arrival and departure time peak hour trips. These trip generation estimates can be found Appendix G.

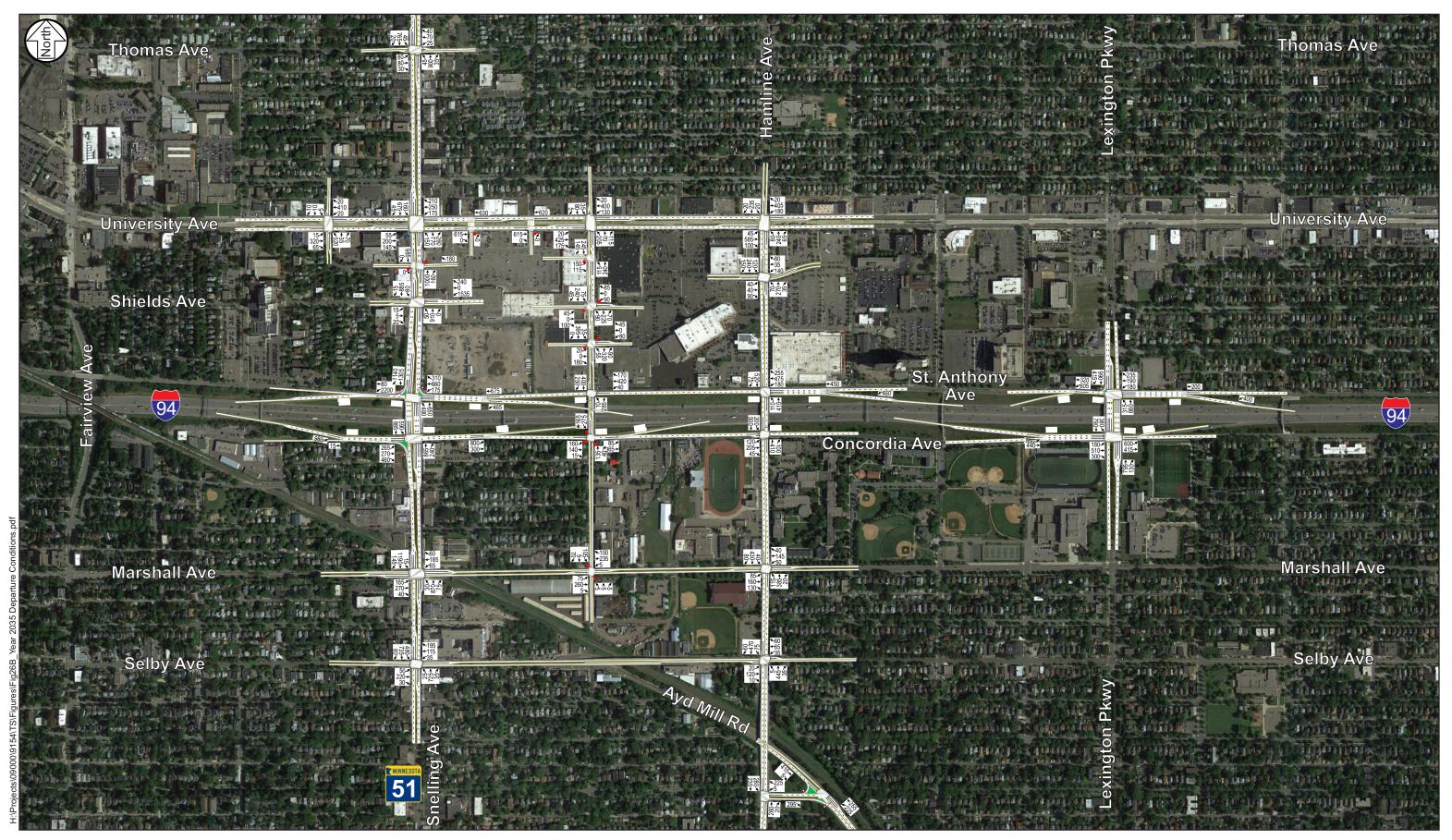
The resultant year 2035 event traffic forecasts, which include general background growth, trips generated by the adjacent on-site development, and trips generated by an event, are shown in Figures 26A and 26B.



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Intersection Capacity Analysis

Weekend afternoon event conditions were analyzed with the proposed roadway configuration and a full capacity event to determine potential transportation impacts due to the increased pedestrian and vehicular traffic. It should be noted that weekday evening and weekend evening events are possible, however, the weekend afternoon event was determined to have the highest background traffic volumes, and therefore this worse-case scenario was analyzed. This is caused by the heavy retail peak that occurs on weekend afternoons within the study area. Any mitigation as a result of the weekend afternoon event is expected to alleviate traffic concerns during the other two potential soccer match times. As previously noted, overall intersection LOS A through LOS D is generally considered acceptable in the Twin Cities Metro Area for weekday peak hour traffic, but not for event traffic. Events are intense peak flows resulting in intersections operating at LOS F, so mitigation strategies are needed to manage it and limit the duration of the event traffic. Additionally, events can be measured by the effects queues have on other intersections within the study area. The amount of time needed to clear the departure will be identified as another measure of effectiveness.

This scenario assumes an afternoon start time of 2:00 p.m. and a departure time of 4:00 p.m. Arrival and departure traffic operations analysis were conducted for the hour before and after the match respectively. Based on the mode share methodology previously discussed, approximately 2,430 automobiles are assumed to drive to the site or have a sparking space within walking distance for the event. It is expected that 65 percent of the vehicles (1,580) arrive prior to the game during the peak hour, and 90 percent of the vehicles (2,190) depart during the peak hour.

A detailed intersection capacity analysis was completed for the weekend afternoon arrival and departure using Synchro/SimTraffic. Results of the detailed intersection capacity analysis are shown in Table 12. In addition, level of service results for the arrival and departure are shown in Figures 27A and 27B, respectively. The full simulation results for year 2035 arrival and departure conditions are presented in Appendix H.

During the arrival peak hour on a weekend afternoon, there is expected to be queuing in the northbound direction of Snelling Avenue from south of Selby Avenue to the I-94 interchange. This is due to the significant eastbound left-turning volume at Snelling Avenue and Concordia Avenue intersection coming from I-94 heading to the on-site event parking lot along Snelling Avenue. Additionally, a rolling eastbound queue is expected from the exit from I-94 to Concordia Avenue that will spill back onto the freeway exit ramp. In addition to causing significant queuing, the overall LOS is expected to be an overall LOS E at the Snelling Avenue and Concordia Avenue intersection and an overall LOS F at the Snelling Avenue and Selby Avenue intersection. This operation is caused by needing additional green time for event traffic coming from I-94, resulting in queuing south of Concordia Avenue to Selby Avenue. This significant northbound Snelling Avenue queue is a result of the I-94 exit at on Concordia Avenue eastbound left-turn requiring a significant amount of green time within the traffic signal cycle. The queuing caused by the arrival conditions is considered unacceptable if it extends onto the I-94 mainline. The expectation is that the freeway will be free-flowing, and these queues could cause safety concerns.

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During the departure peak hour, issues are observed over the course of the peak hour for vehicular traffic. The majority of exiting vehicles are destined to exit in the half hour immediately after the end of the game, which causes a spike in traffic volumes. This is observed at the Snelling Avenue and Shields Avenue intersection and along the driveways on Pascal Street. Traffic volumes during the exiting peak hour are large along Snelling Avenue, and with much of the traffic destined to the westbound I-94 on-ramp, significant southbound right-turn queueing from St. Anthony Avenue to Shields Avenue is expected. This is due to the added parking on the west side of the site along Snelling Avenue. Additionally, the majority (~40 percent) of traffic from Pascal Street is also destined to the I-94 westbound on-ramp, which travels westbound on St. Anthony Avenue. Because these two major movements conflict with one another queues are expected in both directions. This queueing on St. Anthony Avenue could spill back from Snelling Avenue to Pascal Street and have an effect of a rolling queue from the parking lot exit on Pascal Street. Because of the amount of volume on Pascal Street after a match, driveway access from Midway Shopping Center, Walmart, and Cub will be difficult. It is anticipated that motorists that use these facilities will find alternate routes out of the shopping area, however, to remain conservative, these volumes were kept in the network at the specific driveway. Traffic control officers will be needed to control these access points. This significant queue along St. Anthony Avenue is also expected to have a major impact on the shuttle bus pick-up and drop-off area and could cause excessive delays for shuttles trying to depart. If the queuing does impact bus operations, the shuttle area may need to be moved for operational considerations. If the shuttle bus area is not allowed to work efficiently, this would cause an unacceptable condition. This includes leaving the shuttle area and getting to Snelling Avenue to depart to the park and ride locations.

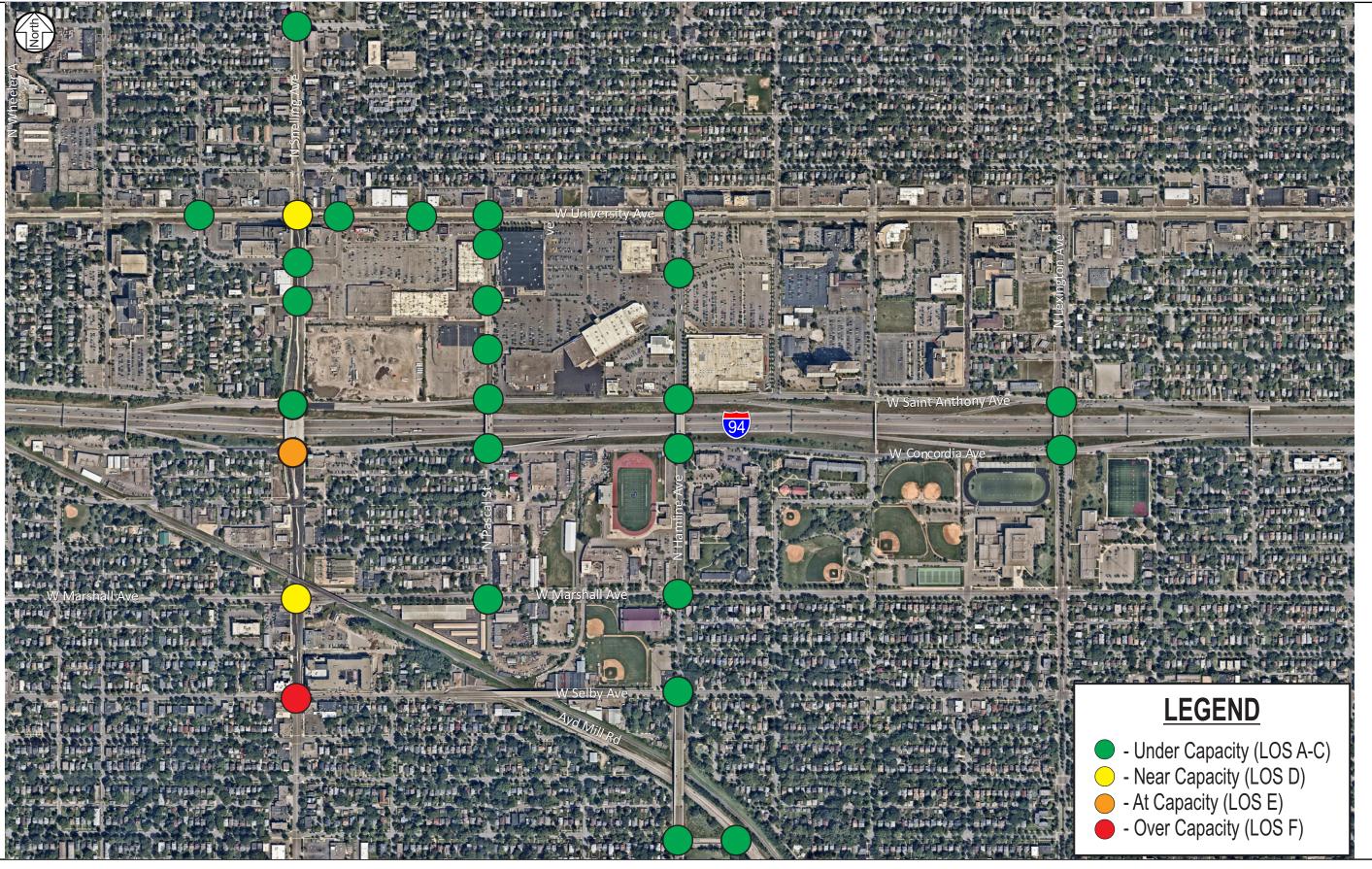
The majority of the study intersections not immediately adjacent to the site are expected to operate at an acceptable overall LOS D or better, however the significant queuing and delay is one that cannot be mitigated without negatively impacting other aspects of the overall transportation network. The significant queuing is expected to take approximately one and a half to two hours to clear.

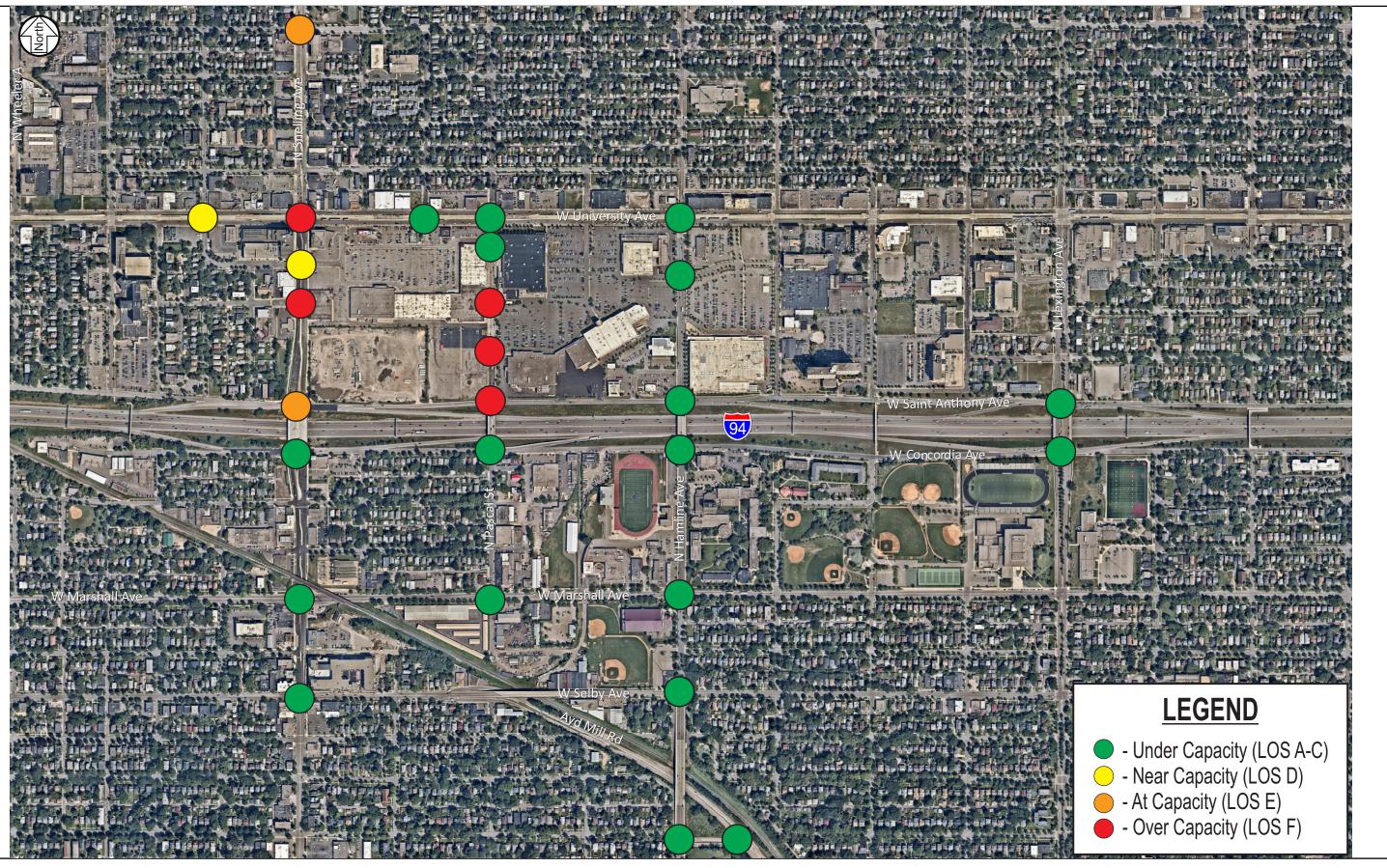
Table 12. Year 2035 Weekend Afternoon Event Intersection Capacity Analysis

Intersection	Arrival Peak Hour	Departure Peak Hour	
	LOS	LOS	
University Avenue/Fry Street	А	D	
Snelling Avenue/Thomas Avenue	В	Е	
Snelling Avenue/University Avenue	D	F	
Snelling Avenue/Spruce Tree Avenue	A/B	D/F	
Snelling Avenue/Shields Avenue	С	F	
Snelling Avenue/St. Anthony Avenue	С	Е	
Snelling Avenue/Concordia Avenue	E	С	
Snelling Avenue/Marshall Avenue	D	В	
Snelling Avenue/Selby Avenue	F	С	
University Avenue/Asbury Street ⁽¹⁾	A/A		
University Avenue/Simpson Place(1)	A/A	C/E	
University Avenue/Pascal Street	С	С	
Pascal Street/North Midway Shopping Center Driveway(1)	A/B	E/F	
Pascal Street/Shields Avenue-Walmart Driveway(1)	A/B	F/F	
Pascal Street/South Driveway-Cub Driveway ⁽¹⁾	A/B	F/F	
Pascal Street/St. Anthony Avenue	В	F	
Pascal Street/Concordia Avenue ⁽²⁾	А	А	
Pascal Street/Marshall Avenue(1)	A/B	A/A	
University Avenue/Hamline Avenue	С	С	
Hamline Avenue/Midway Marketplace	В	А	
Hamline Avenue/St. Anthony Avenue	В	С	
Hamline Avenue/Concordia Avenue	В	В	
Hamline Avenue/Marshall Avenue	С	В	
Hamline Avenue/Selby Avenue	В	В	
Hamline Avenue/Ashland Avenue	В	В	
Ayd Mill Road/Ashland Avenue	В	В	
Lexington Avenue/St. Anthony Avenue	В	В	
Lexington Avenue/Concordia Avenue	B B	B	

⁽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 delay.

(2) Indicates All-Way Stop Control





Key Findings for Year 2035 Capacity Event

Additional findings beyond those for year of opening (2018):

The site will continue to change as re-development occurs. An updated TMP should be prepared each year to account for the changes.

The additional on-site parking, all located along Snelling Avenue, departing at one access point, is challenging. The on-site parking will require almost **two hours to clear.**

Additional parking should be found away from the site and have good access to the other interchanges to I-94, not Snelling Avenue.

In order to clear event traffic in one hour (besides on-site vehicles), additional shuttle bus service will be needed. Although, it is expected that the new residential uses, office, and hotel will result in more event patrons walking to the event.

Weekend start times should be even more encouraged to start later in the day, although, the significant amount of vehicles departing from the site at Shields Avenue after an event will be problematic at any time.

Issues are expected along Snelling Avenue during both the arrival and departure peak hours. During arrivals, the significant eastbound left-turning volume at the Concordia Avenue/Snelling Avenue intersection is expected to back-up onto the Snelling Avenue exit ramp and potentially onto I-94. Additionally, the northbound direction of Snelling Avenue between Concordia Avenue and Selby Avenue is expected to suffer from the significant eastbound left-turning volume. Typically, other event arrivals do not result in such poor operations.

During the departure peak hour, significant issues are expected when exiting the site through the Snelling Avenue and Shields Avenue intersection. With the majority of these vehicles destined to I-94 westbound, the Snelling Avenue and St. Anthony Avenue intersection is expected to be significantly over capacity and will not be able to accommodate all of the event traffic within one hour. It is expected to take **one and a half to two hours** to clear event traffic due to the significant volumes heading westbound on Shields Avenue to southbound Snelling Avenue destined to the I-94 interchange.

These event departure issues along Snelling Avenue are expected to impact the shuttle bus delivery and pick-up area along St. Anthony Avenue. Due to these impacts, the shuttle bus area may not be able to operate as intended, which will impact how long the shuttle bus queue takes to dissipate. Additional shuttle areas may be necessary in order to clear the shuttle pedestrian queue within a one hour timeframe.

These potential traffic issues will need to be evaluated with any expansion plans in the future.

Mitigation Measures

This section relates to mitigation needed based on the re-development of the entire site and not related to traffic generated by an event at the soccer stadium. It is important to remember that the proposed plan has just a slight increase in the amount of retail space compared to the existing site. The retail trips are more local in nature. The site does propose new office space of around 1 million square feet. These trips are typically more regional.

Completion of full development

At the completion of full development, the new improvements should include the following:

Internal roadway system connections to public roadways:

- 17. Two internal north-south roadways that connect to University Avenue (partial access; right-in/right-out only) and the easterly north-south roadway connecting to Saint Anthony as a right-in/right-out access and western north-south roadway terminating in the site.
- 18. Two east-west roadways that connect Snelling Avenue and Pascal Street
 - a. Extension of Spruce Tree would have modified access resulting in right-in/right-out only movements with the traffic signal removed at Snelling Avenue and full access at Pascal Street
 - b. Extension of Shields Avenue would result in a new full access signalized access at Shields Avenue and full access with potential of a traffic signal at Pascal Street
- 19. Pedestrian and bike accommodations internal to the site

Around the Site

- 20. Pedestrian sidewalk should be provided around the perimeter of the site, with a minimum width of eight feet.
- 21. Bike racks for a minimum of 400 bicycles should be provided.

Snelling Avenue - University Avenue to Shields Avenue

To address the close spacing of the Spruce Tree and University Avenue intersection;

- 22. Spruce Tree intersection
 - a. Add a center median to only allow right-in/right-only access
 - b. Remove the traffic signal ("relocated" to Shields Avenue)
- 23. University Avenue Intersection
 - a. Extend Northbound left-turn lane from 50 feet to 250 feet
- 24. Shields Avenue
 - a. New traffic signal ("relocated" from Spruce Tree Avenue)
 - b. Add Southbound left-turn lane

- Two-lanes of approach for eastbound Shields Avenue (check alignment across intersection); left-thru lane and a right-turn lane (may be convertible to parking in offpeak hours)
- d. Three-lanes of approach for Westbound Shields Avenue with two providing left-turn movements; left-turn lane, left-thru lane and right turn lane
- e. Traffic signal phasing can vary throughout the time of day, depending on traffic volume demand. It is expected that the new signal controller and signal heads will be able to accommodate both phasing options presented:
 - i. Westbound protected/permissive (i.e flashing yellow arrow) left-turn phasing with no eastbound left-turn phasing (more efficient)
 - 1. Best operation with an assumed 20 foot wide pedestrian crossing
 - 2. Pedestrian crossing is only feasible on the north side
 - 3. This option is recommended to be run during all peak hours
 - ii. Split Phasing
 - 1. Pedestrian crossing only on the north side
 - 2. This may be run in off peak times

Pascal Street - University Avenue to Saint Anthony Avenue

With the new land use; access points should align across Pascal and left-turn lanes provided.

- 25. Shields Extension New traffic signal (when warranted)
- 26. Re-stripe Pascal to provide a three-lane roadway (one thru lane in each direction with left-turn lane) with the additional space as a bike-lane or shoulder. Maintain Northbound left-turn lane at University Avenue and add Southbound right-turn lane at Saint Anthony
- 27. Sufficient width and right-of-way should be obtained to provide a five-lane roadway if needed in the future.
- 28. Saint Anthony Install a permanent traffic control signal

Marshall Avenue / Hamline Avenue Intersection

The site does not generate much traffic going through this intersection, but enough to cause the intersection to be unacceptable. The operations can be mitigated with two solutions:

- 29. Add an Eastbound right-turn lane during the p.m. peak hour by restricting 100 feet of parking along Marshall Avenue.
 - a. Alternative would be to add northbound and southbound left-turn lanes.
 - b. This improvement is not needed with the initial development phases.

Snelling Avenue from University Avenue to Selby Avenue

The expected additional development generated traffic is expected to be a small increase south of the I-94 interchange, we know that today eastbound queues can somedays back from the I-94 eastbound ramp intersection onto the freeway due to southbound queuing on Snelling Avenue. Snelling Avenue south of the interchange can feel congested with the number of vehicles changing lanes to Selby Avenue and queues blocking unsignalized intersections during the peaks.

30. Update traffic signal timing along Snelling Avenue for the six intersections for each phase of development.

Policy Measures

Encourage use of Transit

The site is served by great transit facilities with Central Corridor LRT (Green Line) along University Avenue and a new BRT (Bus Rapid Transit) "A-Line" starting in summer of 2016.

- 31. Consider implementing TDMP (Travel Demand Management Plan) strategies with future redevelopment
- 32. Land use guidance to promote TOD (Transit Orientated Developed) and complementary land uses

Mitigation - Event (Year of Opening 2018 - Capacity of 20,000)

Mitigating an event requires a management strategy and elements of that strategy. Based on the modeling of the events, the following items are needed to be addressed in a Transportation Management Plan (TMP) in order to clear the event traffic within one hour. The transportation management plan should be started after the AUAR and continue to within a few months of the first event. The TMP committee should include MnUnited Soccer Team, RK Midway, City of Saint Paul Planning and Public Works, Metro Transit, Ramsey County Public Works, MnDOT and FWHA. They should meet prior to every MLS soccer season to discuss potential modification to the site plan or transportation system.

- 9. Develop Transportation Management Plan
 - a. The TMP will evaluate potential mitigation measures to determine the relative cost and effectiveness.
- 10. Event Traffic Control Plan

The event traffic control plan is how the actual day of the event will be managed outside of the physical stadium. This would include diagrams of routing event patrons, key conflict points would be managed by traffic control officers. Providing storage areas, etc.

a. Traffic Control Officers – They are needed to manage pedestrian flows and where modes (pedestrians, bikes, buses, cars or LRT) cross/conflict. Traffic control officers will be needed to be further explored in the TMP, but the following seem to be likely areas:

- i. Snelling Avenue at Concordia Avenue, Saint Anthony Avenue, Shields Avenue, Spruce Tree Avenue and University Avenue
- ii. Pascal Street at Concordia Avenue, Saint Anthony Avenue, two driveways, Shields Avenue extension, Spruce Tree Extension and University Avenue
- iii. University Avenue at Fry Street for westbound LRT platform and the crossing to the eastbound LRT platform on the south side of University Avenue at Simpson Street.
- iv. Metro Transits Staff at the Snelling Avenue Platforms and manage queues getting onto the platforms. Hamline Avenue Platform to ensure compliance.
- v. Additional traffic control will be needed at the Shuttle Bus Loading areas, Charter Bus and Private Shuttle Bus Loading areas to assist with loading and unloading on the site.
- vi. Traffic control for taxi, drop-off/pick-up areas.
- vii. Internal traffic control to direct pedestrians to transit service and maintain orderly flow and eliminate any modal conflict.
- b. Managed Storage Areas for Transit, Shuttle and Charter Bus. Storage areas have been *estimated* for the maximum number of patrons per transit mode:
 - i. Westbound LRT 1,500 to 2,100 people (12,000 to 17,000 sq. ft.)
 - ii. Eastbound LRT 1,250 to 1,750 people (10,000 to 14,000 sq. ft.)
 - iii. Shuttles to Remote Parking 3,000 to 3,500 people (24,000 to 28,000 sq. ft.)
 - iv. A Line BRT 200 people (2,000 sq. ft.)
- c. Temporary lane or roadway closures. Need to identify these locations in the TMP. Consideration could be given to lane closures on Spruce Tree Avenue, behind remaining businesses on-site and several internal roadways.
- d. Permanent or temporary barriers are needed to restrict uncontrolled pedestrian crossings on Snelling Avenue (median) and Pascal Street. Internal roadways and walkways will require barriers to direct pedestrian flow.
- e. Event traffic signal timing plan at the following intersections:
 - i. University Avenue at Fry Street, Snelling Avenue, Pascal Street, Hamline Avenue and Lexington Avenue.
 - ii. Snelling Avenue at Thomas Avenue, University Avenue, Shields Avenue, Saint Anthony Avenue, Concordia Avenue, Marshall Avenue and Selby Avenue
 - iii. Pascal Street at University Avenue, Shields Avenue (once built) and Saint Anthony Avenue

11. Parking Plan

On-Site Parking is only expected to accommodate approximately 10 percent of a capacity crowd. There will be more demand for parking near the facility than can be accommodated. To reduce congestion and frustration caused by vehicles trying to find parking, communication must be stated that if you do not have a reserved parking space for the event, then please take transit or shuttle buses from (list where they can park and ride transit/shuttle service). Assigned Parking on-site and immediately (within one mile) near-by should be assigned and purchased with the tickets. Potentially, this should be considered for all locations in order to minimize confusion.

a. LRT/BRT and Shuttle Buses to remote parking will need to identify these locations and communicate their locations to event patrons.

- b. Parking spaces for event patrons leaving by LRT westbound will need about 1,200 to 1,400 parking spaces. These could be located at the University of Minnesota or in Downtown Minneapolis.
- c. Parking spaces for event patrons leaving by LRT eastbound will need about 1,000 to 1,200 parking spaces. These could be located near the capitol or Downtown Saint Paul.
- d. Parking spaces for event patrons leaving by Shuttle Bus to remote parking will need about 3,000 parking spaces. These could be located at several locations including the State Fair Grounds, etc., although the destinations are preferably limited to two or three in order to maximize efficiency of shuttle operations.
- e. Work with businesses and quasi-government agencies to provide event parking such as the State Fair Grounds, University of Minnesota, Downtown Saint Paul, etc. Consider pre-sale of these facilities.
- f. Encourage on-site parking to have high vehicle occupancy. Example Able to purchase on-site parking pass with the purchase of 4 or more tickets, etc.
- g. Private businesses could have available parking supply during events but may not be interested in providing parking for various reasons including already being used, not current practice, insurance, licensing and sales tax. However, the potential for additional use of nearby lots during events should be explored if locations can be accessed without additional traffic passing through the I-94/Snelling interchange.

12. Transit Plan

Metro Transit is currently working with a transit consultant to work through some of the potential issues for transit before and after events. Expectations are that LRT, A-Line BRT and regular bus service are expected to accommodate approximately 35 percent of a capacity event. This analysis made the following assumptions regarding the movement and queueing of transit riders on the site:

The Snelling Ave LRT Station westbound platform departure operation would load from the Fry Street end. LRT passengers alighting at this station would proceed to Snelling Avenue side of the station. The Snelling Avenue LRT Station eastbound platform departure operation would load similar to the westbound, except boarding at the midblock crossing near Simpson Street with alightings directed toward to Snelling Avenue.

These operations are shown on Figure 20. The routes were chosen based on understanding of likely configuration of the portion of the superblock north of the proposed extended Shields Avenue at the time of stadium opening in 2018. However, Metro Transit has looked at alternatives for pedestrian routing and staging that would also be feasible for accommodating transit riders. The alternatives implemented in 2018 will be determined in consultation with Metro Transit based on actual site configuration in 2018, and modified going forward as the remainder of the superblock redevelops.

The project will need to work with Metro Transit in the following areas:

- a. Identification of preferred alternatives for movement and queueing of transit riders based on actual site configuration in 2018.
- b. Modification of alternatives as the remainder of the superblock redevelops.
- c. Request continued LRT frequency of 10 minute headways through event departures

- d. Request 3 car LRT trains are available during event arrivals and departures on the weekends
- e. Initial understanding is that Metro Transit would not be able to add LRT trains for the event, because no storage areas exist near this station and was never planned for Stadium. Continue to investigate this option with them.
- f. "A" Line (Snelling Avenue) BRT service will come on-line in summer of 2016. Request that BRT frequency of 10 minute headways is continued through event departures
- g. Ask Metro Transit if the frequency can be increased for the BRT service
- h. Ask if regular Metro Transit bus service can be expanded for events
- i. Ask if Metro Transit will supplement LRT with additional bus service, especially on University Avenue and Snelling Avenue.
- j. The limitation of expanded bus service depends on the availability of buses and operators

13. Shuttle Service to Remote Parking Plan

Expectation is this shuttle service to remote parking would accommodate around 30 percent of a capacity event. This would result in approximately 100 to 120 bus trips with a crush-load of 70 people and require 40 to 50 buses depending on the location of the remote parking. Two key elements of the shuttle service is the amount of space on-site required to stage event patrons waiting for the shuttles and finding remote parking areas within a reasonable distance.

- a. Shuttle service area to remote parking could include State Fair, University of Minnesota, large parking areas at private businesses, Capitol Area or downtown Saint Paul. Recommend parking locations within two to three miles to reduce the number of buses. Once locations are determined, then will need to determine location and routing.
- b. Temporary shuttle area alighting and boarding areas along either St Anthony or Pascal are contemplated, although event traffic queueing from the Snelling/Saint Anthony intersection might be an issue.
- c. Shuttle area's unloading and loading areas should be for one destination each, so event patrons don't become confused. The same location should be for drop-off and pick-up.
- d. Temporary fencing may be necessary in order to control how pedestrian queues flow within the shuttle area.

14. Routing and Wayfinding Plan

All event patrons are pedestrians at some point of their trip to or from the Stadium. The team will need to provide direction to Snelling Avenue LRT Station, A-Line BRT Station (University Avenue Station), Charter Bus/Private Shuttle Bus, Shuttle Bus service to remote parking (and perhaps more than one destination) and parking lots. This information is needed on-site, but other off-site signage and wayfinding maybe needed. The intent is provide the most efficient, safe and easy to understand plan to have a great patron experience.

- a. Bike rack storage (pre-sale spaces)
- b. Event signage (Changeable Message Sign (CMS)) on freeway, local streets and on-site
- c. Planning routes and minimizing use of Snelling/I-94 interchange
- d. Locations to all of the transportation modes
- e. Show these plans on the website, tickets, etc.

15. Communication and Education Plan

The technical analysis and the other plans need to be communicated to the event patrons, local businesses/residents and those who drive/walk/bike or take transit through the area. The transportation system will need its full capacity to accommodate the arrival and departure of the event. This information can be mailed to ticket holders, websites, on parking vouchers, with any ticket purchase, media outlets, email notifications to anyone, etc.

- a. Not enough on-site parking with be available for the potential demand, and therefore event patrons need to use transit or shuttle bus service to remote parking
- b. Need good information techniques to guide event patrons to remote parking and transit
- c. Information that on-site and adjacent off-site parking is limited and should be pre-sale
- d. Only want so much parking on-site. Desire parking that is east or west of site and does not use the Snelling Avenue interchange to access I-94.
- e. Provide private charter and shuttle bus service providers to event patrons.

16. Incident Management and Safety Plan

This would be completed by emergency responders. It would cover situations in the case of an incident or issue at the stadium.

17. Other Considerations

Other items to consider that impact the transportation event include existing usage of the transportation system, how to manage the event by spreading out the peak demand and how the site might develop resulting in adaption of the plan to new conditions.

- a. Form a transportation committee that meets at least twice a year to discuss event scheduling, transportation issues, improvements, etc. Group should include MnUnited Soccer Team, RK Midway, City of Saint Paul Planning and Public Works, Metro Transit, Ramsey County Public Works, MnDOT Area Manager and FWHA
- b. With the amount of retail land use in the area, the existing volumes are high until 6:30 p.m. on both weekdays and weekends. Recommend considering games begin at 7:00 p.m. or later. Matches starting at 2:00 or 4:00 p.m. would have challenges with event arrival and departure traffic.
- c. Avoid over-lapping events at the University of Minnesota (TCF Bank), State Fair (operates for twelve days from late August into early September, ending on Labor Day) and Vikings (US Bank Stadium), as these events will likely consume remote parking, transit capacity and regional roadway capacity.
- d. The team should consider activities/concerts/etc. before and after match events to spread out arrival and departure times. Work with local businesses to participate or lead such events.
- e. Consider pre-sale of parking at all venues including on-site, near-by, and remote parking facilities. This will guarantee a parking space, reduce circulation and patron confusion and frustration.
- f. Consider pre-sale (and open marketing) of bike spaces, and transit and shuttle to remote parking. Limit money transfer to speed up process.
- g. Identify an Event Transportation Manager for the Stadium
- h. TMP needs to adapt as site changes

- 18. Items that need to be incorporated into the Year of Opening Plan Mitigation
 - a. Transportation Management Plan that includes event traffic control, parking, transit, shuttle service, routing and wayfinding, and communication and education.
 - b. Create a transportation management committee. Stakeholders include MnUnited Soccer Team, RK Midway representative, City of Saint Paul Planning and Public Works, Metro Transit, Ramsey County Public Works, MnDOT and FHWA.
 - c. Fencing down the median of Snelling Avenue and allowance for future boulevard fencing on the west side of Pascal Street (permanent or temporary)
 - d. Providing shuttle service to remote parking
 - e. Site Plan
 - i. Identification of transit, charter bus, private shuttle and shuttle bus loading and unloading areas
 - ii. Sufficient waiting areas for transit, charter bus, private shuttle and shuttle bus patrons
 - iii. Identification of taxi and drop-off/pick-up areas
 - iv. Identify bike parking facilities

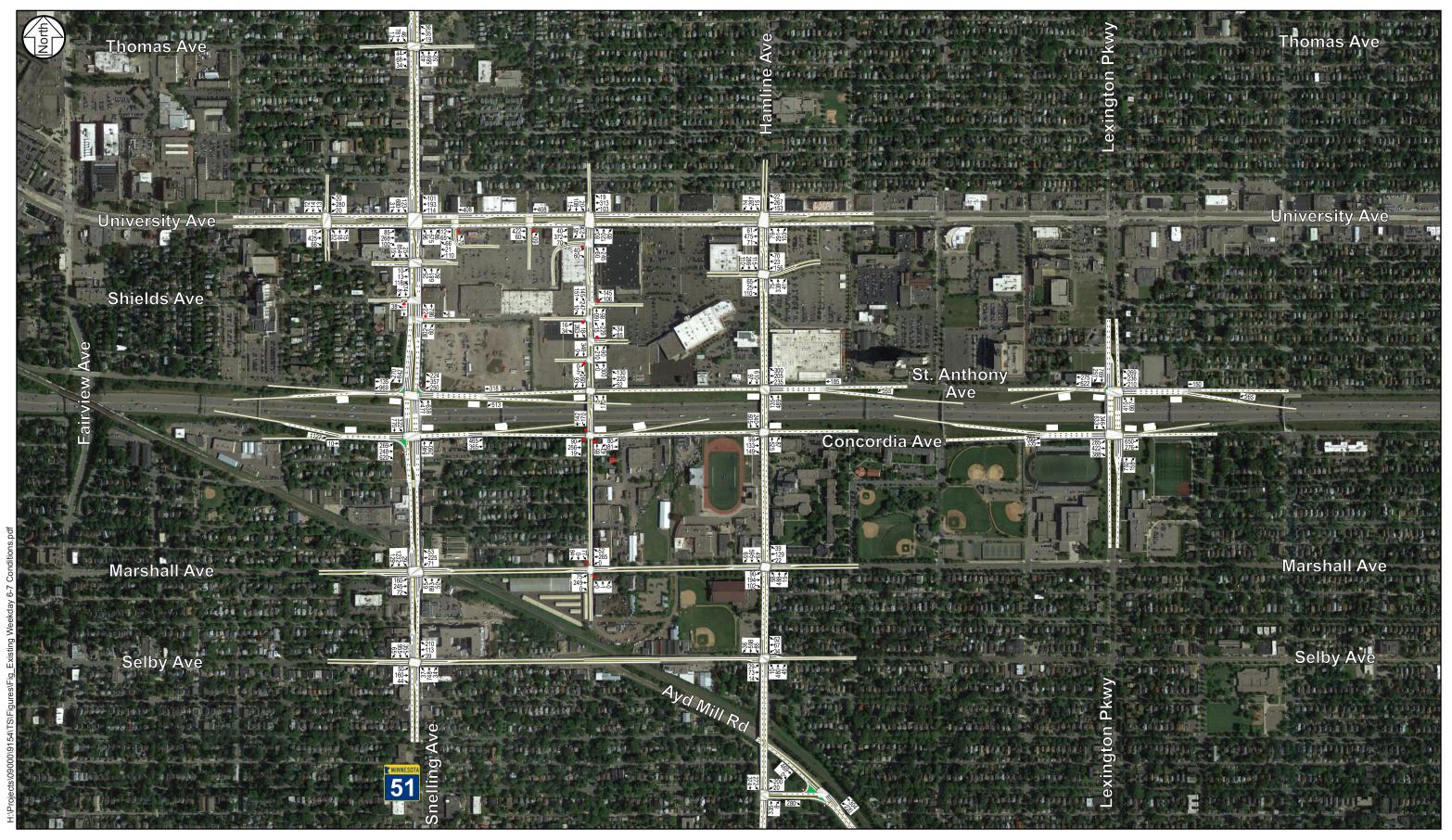
Mitigation - Event (Future Expansion - Capacity of 25,500)

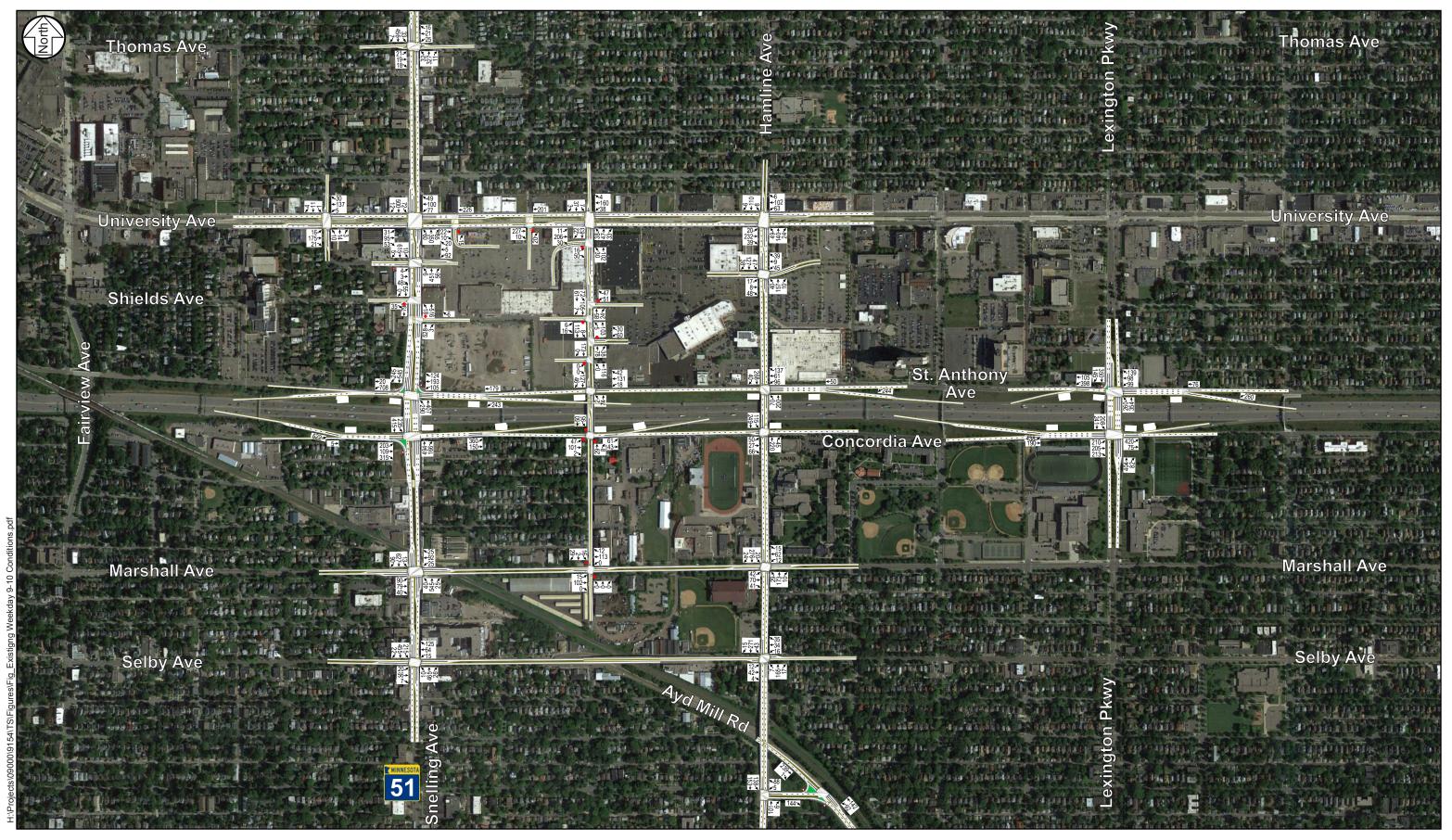
The mitigation of event would be similar to the year of opening plan. It will also have the benefit of knowing how the transportation is working on the site. Without any increase in Metro Transit's capacity to accommodate event patrons, the additional 5,500 patrons would need to be accommodated by on-site/adjacent parking and shuttle bus service. The proposed parking that would be available is expected to be in the office developments along Snelling Avenue. This will result in adding traffic to the busiest roadway and a key interchange (I-94/Snelling) in the transportation network. Only so many additional cars can be added and this becomes more challenging when the event is scheduled on a Saturday starting at 2:00 to 4:00 p.m. and ending around 4:00 or 6:00 p.m., as the area is very active.

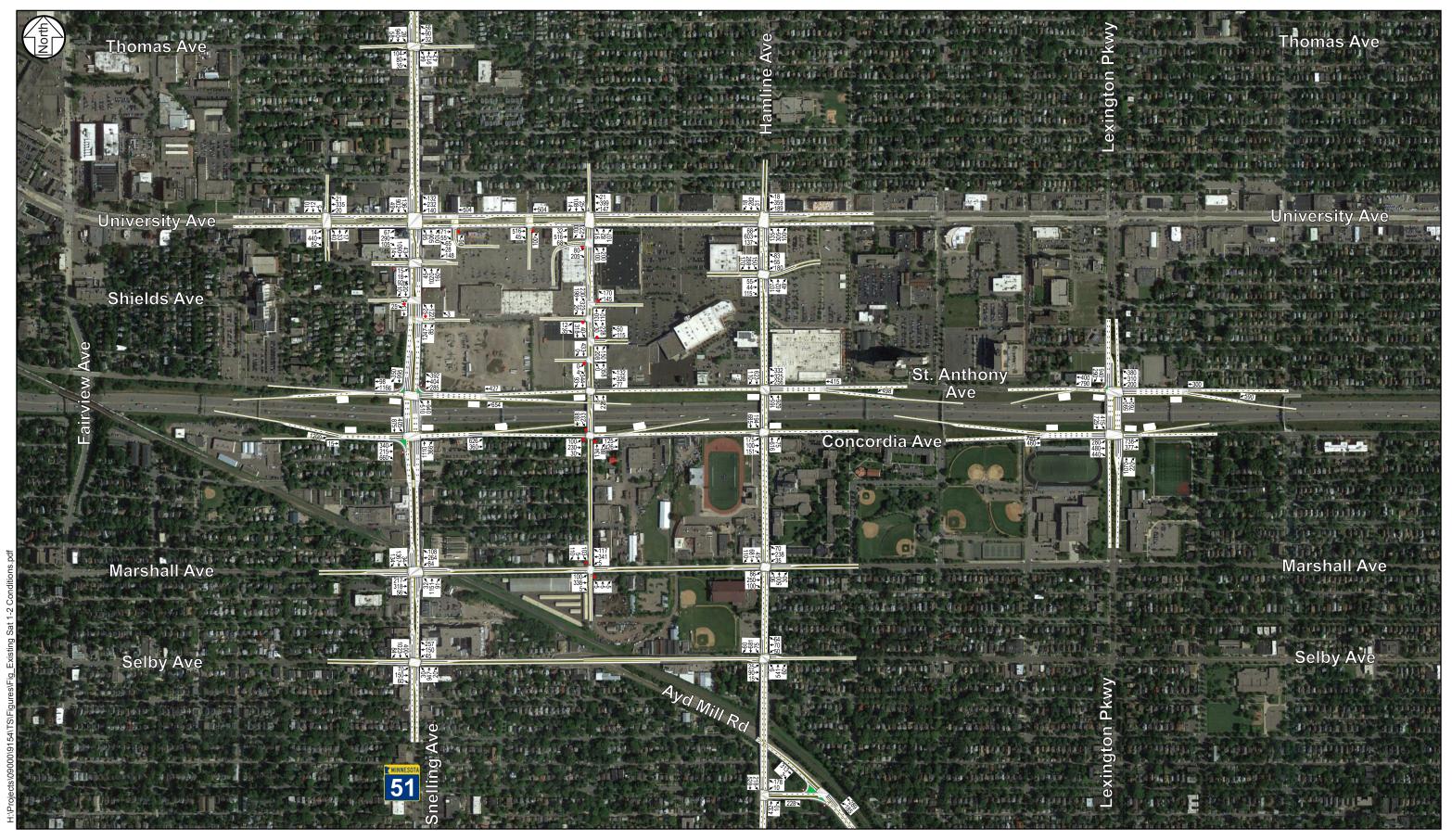
Additional parking for the event might be an additional 1,000 spaces with the full re-development of the site, so 2,750 of the additional 5,500 patrons would be accommodated by on-site parking. This might be challenging to accommodate all of these vehicles onto Snelling Avenue at Shields. It is expected that with new residential and hotels being planned for the site, more internal walking trips will be included in a mode to the stadium. This will likely result in full capacity of the transit system for one hour and similar bus service to remote parking. The one issue is the additional parking is challenging to accommodate at one access at Snelling Avenue and Shields Avenue. This could result in a two hour duration to clear the on-site parked vehicles. If the parking is able to be rearranged so that it is not as one-sided or all accessing through one intersection, the departure time may be able to be reduced.

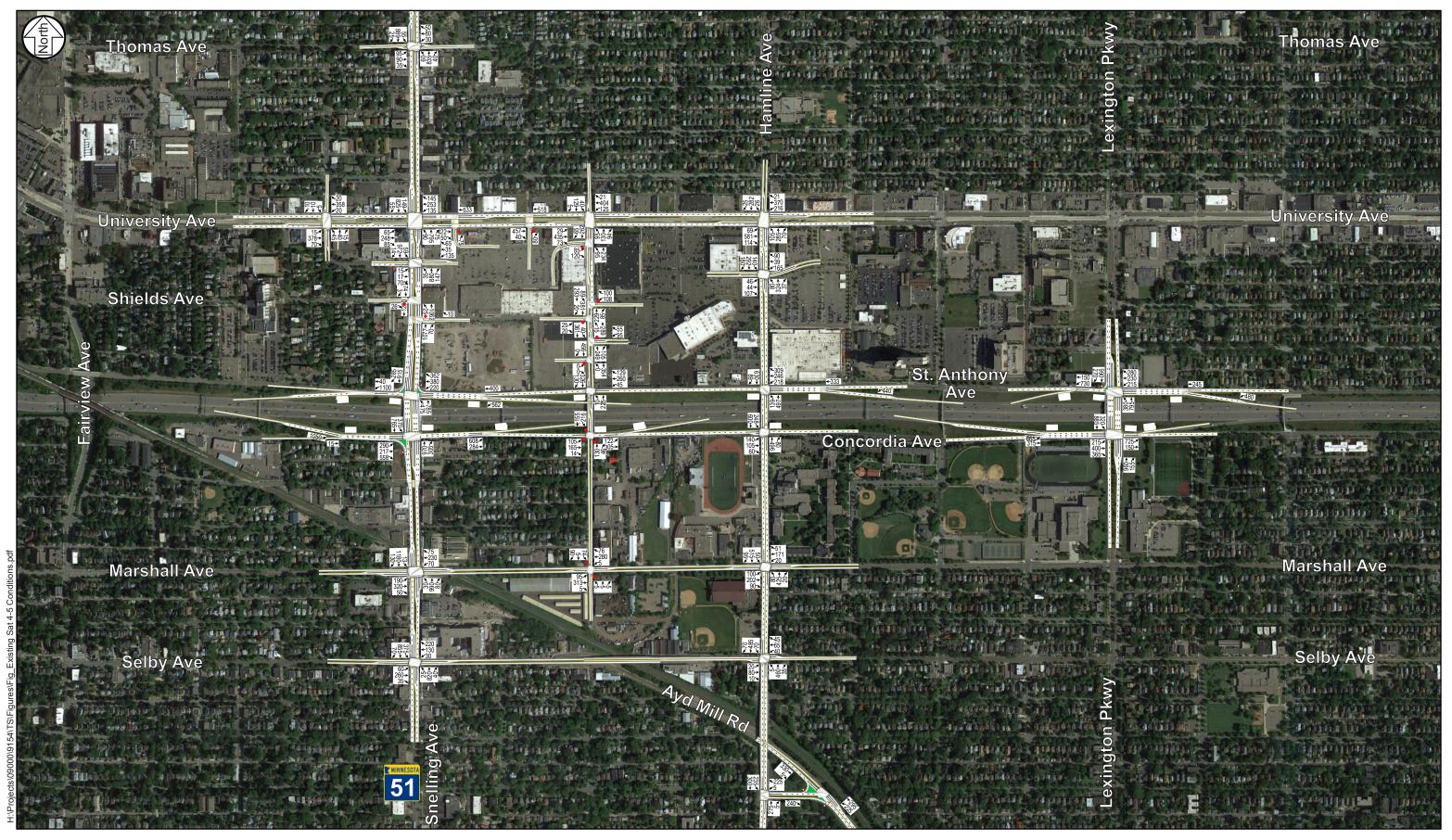
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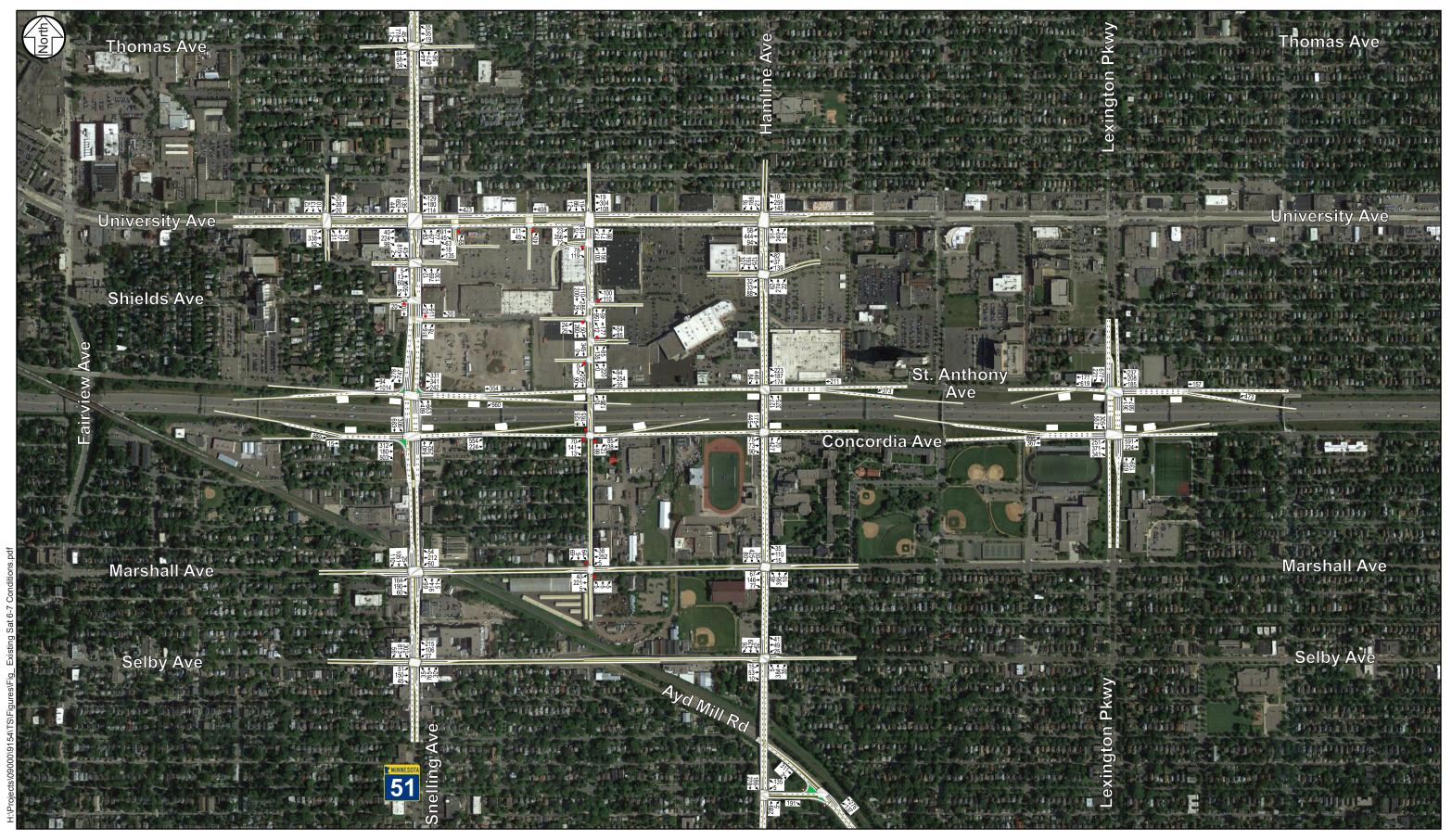
Appendix A
Existing Volumes

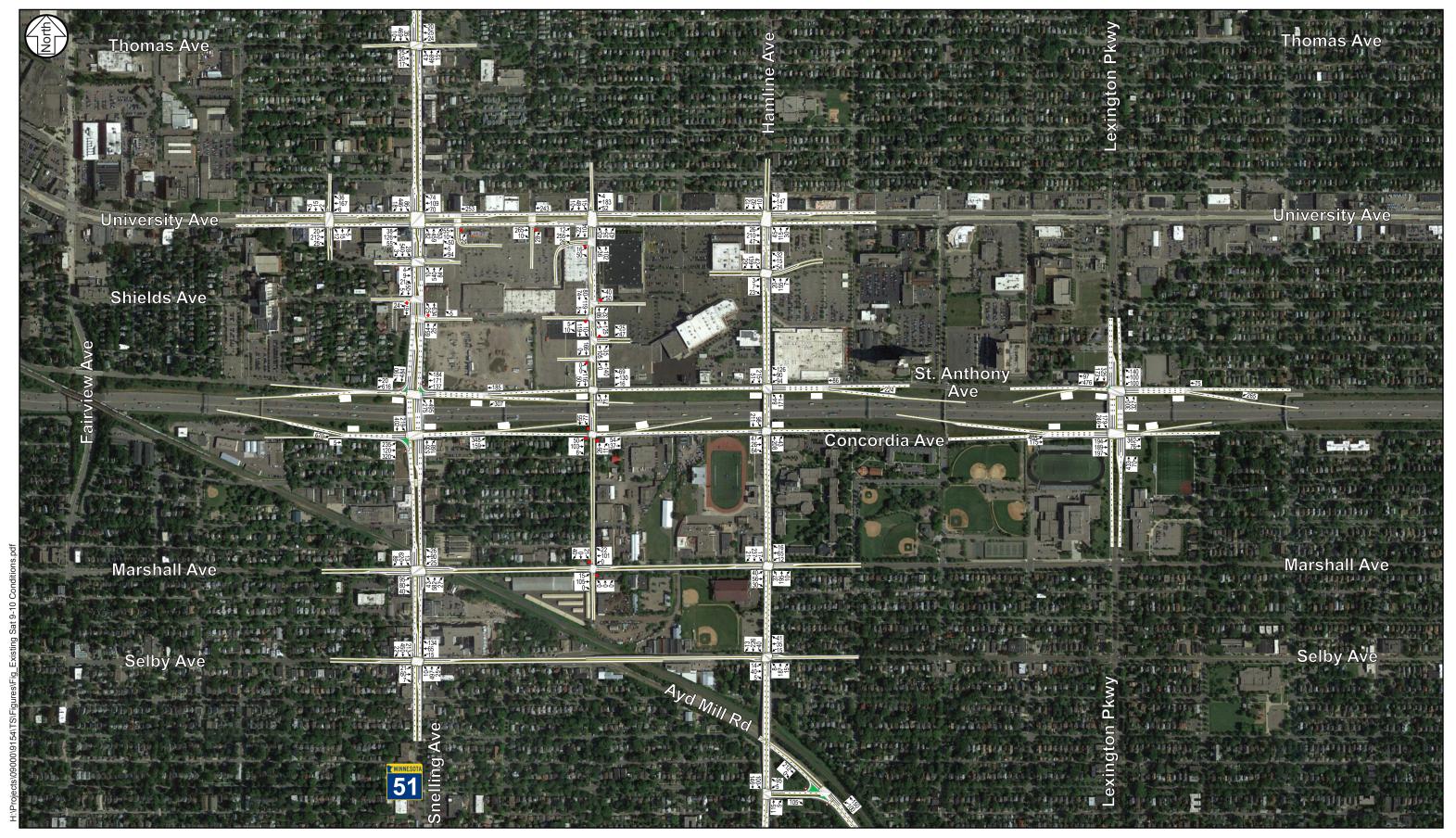














Appendix B Year 2035 No Build Analysis

110: Fry Street & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.3	0.1	0.2	0.0	0.0	0.0	4.1	0.1	0.3	0.1	0.1	3.9
Total Del/Veh (s)	69.9	4.5	2.0	63.1	2.2	1.9	53.6	46.6	14.1	37.0	51.2	9.1

110: Fry Street & University Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.3	
Total Del/Veh (s)	8.5	

200: Snelling Ave & Thomas Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.3	3.9	0.3	0.4	3.9	0.0	0.0	0.0	2.6	0.3	2.9
Total Del/Veh (s)	30.7	28.1	7.7	31.5	30.2	10.5	23.4	9.1	7.8	15.0	7.3	2.7

200: Snelling Ave & Thomas Ave Performance by movement

Movement	ment All
Denied Del/Veh (s)	d Del/Veh (s) 0.5
Total Del/Veh (s)	

210: Snelling Ave & University Ave 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	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.3
Total Del/Veh (s)	58.3	27.4	15.8	40.1	16.8	13.3	44.2	17.9	8.6	50.5	30.3	9.3

210: Snelling Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	25.9

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.2	0.3	0.3	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	39.1	44.0	10.8	44.2	44.7	13.5	19.6	7.1	1.4	10.9	2.8	2.3

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	7.2

230: Snelling Ave & Shields Ave Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.8	9.2	0.3	1.0	0.8	0.9

235: Snelling Ave & Snelling Access Performance by movement

Movement	WBR	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.7	2.2	2.1	0.3	1.2

239: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.2	0.1
Total Del/Veh (s)	1.0	1.2	1.1

240: Snelling Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	41.8	40.5	2.3	22.3	6.3	15.1	11.2	18.7

241: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.1	5.3	5.2

249: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	(s) 0.1	0.5	0.5
Total Del/Veh (s)	0.1	1.6	1.6

250: Snelling Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All	
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Del/Veh (s)	43.3	37.6	2.5	15.1	3.8	27.7	8.7	15.9	

251: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.0	0.9	4.8

260: Snelling Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	5.6	2.8	4.8	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Total Del/Veh (s)	102.1	48.7	25.9	35.4	54.4	31.4	45.9	29.7	15.6	51.8	27.0	14.0

260: Snelling Ave & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.7
Total Del/Veh (s)	37.7

270: Snelling Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.3	0.4	0.3	1.5	0.6	0.6	2.7	0.6	0.6	0.0	0.0	0.0
Total Del/Veh (s)	174.0	24.8	15.8	172.0	173.4	172.9	113.8	98.2	86.0	73.9	15.9	12.4

270: Snelling Ave & Selby Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	88.6

310: West Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.1	0.5	2.9	0.9

315: East Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	0.6	1.3	3.0	1.0

410: University Ave & Pascal 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	0.6	0.0	0.2	0.2	0.5	0.0	0.3	0.2	4.0
Total Del/Veh (s)	42.1	2.9	1.7	53.8	11.1	4.6	48.4	45.3	4.6	46.3	48.2	11.8

410: University Ave & Pascal St Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
nied Del/Veh (s)	0.2
otal Del/Veh (s)	17.2

415: Pascal St & North Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.3	4.0	0.0	0.0	0.0	0.0	0.7
Total Del/Veh (s)	7.9	3.0	3.0	2.2	2.3	1.4	2.8

420: Pascal St & North Walmart/Cub Entrance Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	6.2	3.6	0.4	0.1	2.9	0.6	2.1

425: Pascal St & South Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.4	2.7	2.2	0.6	0.4	0.2	0.8

430: Pascal St & South Cub Entrance Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	4.0	0.2	0.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	6.3	2.7	0.7	0.2	2.4	0.2	1.1

435: Pascal St & Empty St. Paul Lot Entrance Performance by movement

Movement	NBL	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	2.8	1.5	0.4	1.0

440: Pascal St & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.8	4.3	3.2	34.4	30.0	26.3	6.3	11.3

450: Pascal St & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All	
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Del/Veh (s)	5.4	6.4	3.3	6.1	4.0	7.3	7.9	6.2	

451: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.5	1.5	1.5

460: Pascal St & Marshall Ave 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	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	7.4	2.9	1.5	4.3	3.5	2.6	9.0	9.8	3.6	12.7	14.8	8.2

460: Pascal St & Marshall Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	0.0		
Total Del/Veh (s)	4.3		

510: Hamline Ave & University Ave 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	3.5	0.2	0.2	0.1	0.1	0.0	3.5	0.4	0.2
Total Del/Veh (s)	76.7	13.9	10.2	47.2	18.2	10.5	42.7	36.2	5.1	35.8	38.6	31.7

510: Hamline Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	28.6

520: Hamline Ave & Midway Market Place Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	4.1	0.2	0.1	4.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	54.0	47.7	7.7	48.5	50.6	11.3	11.9	6.4	1.8	14.3	3.4	2.6

520: Hamline Ave & Midway Market Place Performance by movement

Movement	All	
Denied Del/Veh (s)	0.1	
Total Del/Veh (s)	7.2	

539: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.1	0.2	0.2
Total Del/Veh (s)	0.1	0.5	0.4

540: Hamline Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	28.3	26.3	8.6	15.7	8.7	10.6	7.1	13.3

550: Hamline Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	27.4	25.2	5.7	22.3	13.8	19.6	9.1	17.7

560: Hamline Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.0	3.5	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	31.6	23.4	22.7	26.3	25.0	24.7	29.6	14.8	9.8	31.8	20.5	23.7

560: Hamline Ave & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	20.4

570: Hamline Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.2	2.8	0.3	0.4	3.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	33.4	30.7	5.5	32.9	32.3	10.2	9.4	6.6	4.3	27.1	13.2	8.4

570: Hamline Ave & Selby Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	11.5

580: Hamline Ave & Ashland Ave Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0		0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	19.9		19.1	13.6	5.8	16.4	5.5	15.2

590: Ayd Mill Rd & Ashland Ave Performance by movement

Movement	EBT	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.6	2.7	0.1	0.2	1.1
Total Del/Veh (s)	0.9	1.6	8.8	12.9	29.0	3.8	13.5

610: Lexington Ave & University Ave Performance by movement

Movement	NBT All
Denied Del/Veh (s)	0.0 0.0
Total Del/Veh (s)	1.1 1.1

639: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.3	0.3
Total Del/Veh (s)	0.2	1.1	0.8

640: Lexington Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	3.1	1.8	0.9
Total Del/Veh (s)	44.7	38.1	17.8	37.8	6.3	54.4	4.4	29.9

641: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.4	3.5	6.2

649: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.3	1.1	0.8

650: Lexington Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.3	2.4	0.0	0.0	0.7
Total Del/Veh (s)	57.8	48.6	9.6	31.0	18.8	40.5	25.3	32.3

651: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.2	1.1	2.9

Total Network Performance

Denied Del/Veh (s)	1.1	
Total Del/Veh (s)	76.1	

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	30	83	96	55	43	59	112	77	76	47	
Average Queue (ft)	4	21	22	10	5	11	38	18	22	8	
95th Queue (ft)	20	60	63	35	25	38	84	54	61	36	
Link Distance (ft)		1035	1035		570	570		259	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)							0	0	25	1	
Queuing Penalty (veh)							0	0	3	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	Т	T	R	
Maximum Queue (ft)	158	73	148	75	114	242	248	99	223	216	108	
Average Queue (ft)	57	25	62	42	29	81	99	22	108	91	18	
95th Queue (ft)	119	64	123	84	78	194	211	67	192	172	65	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	38	6	43	10		1			0	1	0	
Queuing Penalty (veh)	15	5	28	10		0			0	1	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	69	107	118	172	150	183	100	240	246	125	225	361
Average Queue (ft)	27	37	48	73	54	85	77	160	170	50	128	208
95th Queue (ft)	62	81	99	138	120	159	119	255	264	133	237	324
Link Distance (ft)		570	570	213	213	213		209	209			1213
Upstream Blk Time (%)						0		3	4			
Queuing Penalty (veh)						0		14	16			
Storage Bay Dist (ft)	250						50			75	125	
Storage Blk Time (%)							34	26	26	0	6	24
Queuing Penalty (veh)							123	31	14	1	26	31

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	383	225
Average Queue (ft)	223	60
95th Queue (ft)	341	186
Link Distance (ft)	1213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		175
Storage Blk Time (%)	17	
Queuing Penalty (veh)	13	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	T	R	L	T	TR	
Maximum Queue (ft)	56	73	114	65	72	193	214	33	65	50	80	
Average Queue (ft)	16	38	51	18	22	72	87	8	16	9	15	
95th Queue (ft)	46	65	104	48	53	153	168	27	48	34	52	
Link Distance (ft)	550	550	610			212	212	212		209	209	
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	1					
Storage Bay Dist (ft)				175	150				110			
Storage Blk Time (%)						1			0			
Queuing Penalty (veh)						0			0			

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	NB	SB
Directions Served	R	L	TR
Maximum Queue (ft)	52	64	21
Average Queue (ft)	15	24	1
95th Queue (ft)	43	54	10
Link Distance (ft)	910	92	212
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 235: Snelling Ave & Snelling Access

Movement	WB	SB	SB
Directions Served	R	T	T
Maximum Queue (ft)	31	6	11
Average Queue (ft)	8	0	0
95th Queue (ft)	29	4	8
Link Distance (ft)	350	92	92
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 239: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	239	317	325	106	246	246	172	161	115	80	185	169
Average Queue (ft)	96	179	167	5	158	168	67	69	48	27	77	80
95th Queue (ft)	175	273	264	66	234	246	127	125	91	64	143	142
Link Distance (ft)	450	450	450	450	233	233	233	233			507	507
Upstream Blk Time (%)		0	0		1	1						
Queuing Penalty (veh)		0	0		3	5						
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	332
Average Queue (ft)	73
95th Queue (ft)	245
Link Distance (ft)	507
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 249: Concordia Ave

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 250: Snelling Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	B5	B5	SB
Directions Served	L	LT	T	R	T	T	T	T	R	T	T	L
Maximum Queue (ft)	302	269	201	8	219	244	339	244	130	150	23	248
Average Queue (ft)	163	166	50	0	126	152	108	105	51	8	1	99
95th Queue (ft)	261	250	141	6	227	243	269	199	101	81	17	185
Link Distance (ft)	436	436	436				291	291	291	595	595	233
Upstream Blk Time (%)							1	0				0
Queuing Penalty (veh)							7	0				1
Storage Bay Dist (ft)				100	190	190						
Storage Blk Time (%)			0		1	3	0					
Queuing Penalty (veh)			2		2	11	1					

Intersection: 250: Snelling Ave & Concordia Ave

Movement	SB	SB	SB
Directions Served	L	Т	T
Maximum Queue (ft)	221	224	213
Average Queue (ft)	59	74	71
95th Queue (ft)	142	162	170
Link Distance (ft)	233	233	233
Upstream Blk Time (%)	0	0	0
Queuing Penalty (veh)	0	0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 251: Concordia Ave

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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	Т	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	347	616	148	250	458	225	224	488	469	100	122	434
Average Queue (ft)	231	276	22	59	212	105	51	278	245	18	30	194
95th Queue (ft)	381	828	77	171	399	231	156	440	408	74	88	370
Link Distance (ft)		1074			1226			602	602			595
Upstream Blk Time (%)		5						0	0			1
Queuing Penalty (veh)		0						0	0			5
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)	20	2	0		19	0		34	40	0		26
Queuing Penalty (veh)	54	6	0		36	0		16	16	0		8

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5	
Directions Served	T	R	T	T		
Maximum Queue (ft)	421	150	113	213	117	
Average Queue (ft)	196	84	6	19	4	
95th Queue (ft)	380	181	65	122	59	
Link Distance (ft)	595		291	291	291	
Upstream Blk Time (%)	1			0	0	
Queuing Penalty (veh)	6			0	0	
Storage Bay Dist (ft)		100				
Storage Blk Time (%)	30	0				
Queuing Penalty (veh)	44	1				

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	183	235	300	1733	199	776	762	250	509	448	
Average Queue (ft)	67	105	89	1080	24	544	509	215	237	168	
95th Queue (ft)	162	190	298	1822	115	838	802	286	550	415	
Link Distance (ft)		1089		2121		923	923		602	602	
Upstream Blk Time (%)						3	1		1	0	
Queuing Penalty (veh)						0	0		5	0	
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)	1	0		64		68		35	1		
Queuing Penalty (veh)	2	0		19		7		126	3		

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	48
Average Queue (ft)	20
95th Queue (ft)	46
Link Distance (ft)	499
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	53
Average Queue (ft)	21
95th Queue (ft)	47
Link Distance (ft)	439
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	48	54	77	106	147	146	79	79	68	161	74	
Average Queue (ft)	12	7	27	37	53	60	38	37	17	73	18	
95th Queue (ft)	38	33	66	83	115	124	78	78	48	141	61	
Link Distance (ft)		386	386		1220	1220	77	77	77	729		
Upstream Blk Time (%)							4	5	0			
Queuing Penalty (veh)							1	2	0			
Storage Bay Dist (ft)	225			250							25	
Storage Blk Time (%)										52	2	
Queuing Penalty (veh)										10	2	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	EB	NB	NB	NB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	36	55	61	28	6	18
Average Queue (ft)	20	31	13	2	0	1
95th Queue (ft)	44	47	46	19	4	9
Link Distance (ft)	494			404	404	77
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200	200			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	WB	NB	SB	SB	
Directions Served	LR	TR	L	T	
Maximum Queue (ft)	82	14	36	4	
Average Queue (ft)	39	0	6	0	
95th Queue (ft)	66	8	28	3	
Link Distance (ft)	778	49		404	
Upstream Blk Time (%)		0			
Queuing Penalty (veh)		0			
Storage Bay Dist (ft)			125		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 425: Pascal St & South Midway Shopping Entrance

Movement	EB	NB
Directions Served	LR	L
Maximum Queue (ft)	60	31
Average Queue (ft)	21	2
95th Queue (ft)	49	13
Link Distance (ft)	697	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		45
Storage Blk Time (%)		0
Queuing Penalty (veh)		0

Intersection: 430: Pascal St & South Cub Entrance

Movement	WB	WB	NB	SB
Directions Served	L	R	TR	L
Maximum Queue (ft)	47	52	4	35
Average Queue (ft)	18	17	0	6
95th Queue (ft)	44	44	3	27
Link Distance (ft)		798	74	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	75			40
Storage Blk Time (%)	0	0		0
Queuing Penalty (veh)	0	0		0

Intersection: 435: Pascal St & Empty St. Paul Lot Entrance

Movement	NB	SB
Directions Served	LT	TR
Maximum Queue (ft)	25	15
Average Queue (ft)	2	1
95th Queue (ft)	14	13
Link Distance (ft)	179	74
Upstream Blk Time (%)		0
Queuing Penalty (veh)		0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	Т	R
Maximum Queue (ft)	118	84	71	147	149	75
Average Queue (ft)	41	30	13	60	72	28
95th Queue (ft)	91	72	46	116	132	73
Link Distance (ft)	1228	1228		276	179	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					1	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				3	22	0
Queuing Penalty (veh)				0	8	0

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB
Directions Served	LT	TR	TR	L	T
Maximum Queue (ft)	80	76	67	97	76
Average Queue (ft)	41	36	39	42	30
95th Queue (ft)	65	59	59	78	62
Link Distance (ft)	676	676	947		276
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				100	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 451: Concordia Ave

Directions Served Maximum Queue (ft) Average Queue (ft) 95th Queue (ft) Link Distance (ft)
Average Queue (ft) 95th Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	TR	LTR	LTR
Maximum Queue (ft)	61	31	4	40	84
Average Queue (ft)	20	2	0	12	40
95th Queue (ft)	53	15	3	38	69
Link Distance (ft)			1247	350	947
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	Т	TR	L	Т	R	L	TR	
Maximum Queue (ft)	50	117	126	127	172	139	190	329	83	149	365	
Average Queue (ft)	15	41	59	64	76	42	92	224	35	31	203	
95th Queue (ft)	44	92	110	112	140	101	193	346	66	100	325	
Link Distance (ft)		1220	1220		782	782		315	315		606	
Upstream Blk Time (%)								5				
Queuing Penalty (veh)								15				
Storage Bay Dist (ft)	275			275			140			100		
Storage Blk Time (%)							3	31			38	
Queuing Penalty (veh)							11	32			10	

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	55	84	48	56	104	331	157	88	91	126	
Average Queue (ft)	15	31	10	18	30	101	27	26	18	22	
95th Queue (ft)	45	63	36	48	86	239	94	64	62	73	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)		0			1	11		0	0		
Queuing Penalty (veh)		0			3	6		0	0		

Intersection: 539: St Anthony Ave

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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	LT	T	R	LT	T	Ţ	TR	
Maximum Queue (ft)	145	148	117	148	266	234	156	156	
Average Queue (ft)	62	77	53	65	165	38	61	65	
95th Queue (ft)	112	128	98	110	278	138	126	134	
Link Distance (ft)	377	377	377	377	249	249	792	792	
Upstream Blk Time (%)					1	0			
Queuing Penalty (veh)					5	0			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	TR	LT	Т
Maximum Queue (ft)	78	78	76	334	299	198	190
Average Queue (ft)	39	24	41	181	124	94	68
95th Queue (ft)	73	60	71	290	235	163	147
Link Distance (ft)	937	937		942	942	249	249
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						0	0
Storage Bay Dist (ft)			25				
Storage Blk Time (%)		18	12				
Queuing Penalty (veh)		18	2				

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	86	234	143	248	360	301	200	193	
Average Queue (ft)	35	100	28	137	172	129	88	97	
95th Queue (ft)	70	183	80	219	304	259	159	163	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		1	0	6					
Queuing Penalty (veh)		0	0	2					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	128	83	159	100	153	179	183	162	
Average Queue (ft)	58	16	66	44	80	78	94	67	
95th Queue (ft)	104	57	122	91	139	147	165	136	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	20	0	22	4					
Queuing Penalty (veh)	3	0	16	4					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	T	TR	LT	T
Maximum Queue (ft)	222	202	194	159	212	98
Average Queue (ft)	117	106	101	51	92	33
95th Queue (ft)	184	180	169	115	169	81
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	TR
Maximum Queue (ft)	221	293	150	245	200
Average Queue (ft)	93	78	110	146	86
95th Queue (ft)	171	217	169	214	179
Link Distance (ft)	866	866		600	600
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)		0	8		
Queuing Penalty (veh)		1	25		

Intersection: 610: Lexington Ave & University Ave

Intersection: 639: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	252	311	258	294	299	256	151	120	215	249	494	408
Average Queue (ft)	137	200	112	132	202	116	49	47	168	134	257	215
95th Queue (ft)	224	287	234	234	304	255	108	103	245	310	498	404
Link Distance (ft)	443	443	443	443	241	241	241	241				
Upstream Blk Time (%)					13	1						
Queuing Penalty (veh)					48	3						
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)									22	7	14	
Queuing Penalty (veh)									50	16	61	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	279
Average Queue (ft)	73
95th Queue (ft)	190
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	Т
Maximum Queue (ft)	197	56
Average Queue (ft)	16	5
95th Queue (ft)	104	62
Link Distance (ft)	222	222
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Movement	EB	SE	SE
Directions Served	T	L	L
Maximum Queue (ft)	15	5	37
Average Queue (ft)	1	0	3
95th Queue (ft)	13	4	41
Link Distance (ft)	711	715	715
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	Т	T	T	T	R	L	L	T
Maximum Queue (ft)	344	361	313	148	200	274	435	354	200	275	105	253
Average Queue (ft)	187	220	62	65	146	148	193	184	114	230	30	188
95th Queue (ft)	314	340	221	114	218	272	319	287	213	287	75	308
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)	0	1	1							16		7
Queuing Penalty (veh)	0	1	1							44		18
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					20	9	20	18	4			
Queuing Penalty (veh)					60	27	120	43	11			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	253
Average Queue (ft)	186
95th Queue (ft)	310
Link Distance (ft)	241
Upstream Blk Time (%)	6
Queuing Penalty (veh)	18
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

lovement
irections Served
laximum Queue (ft)
verage Queue (ft)
5th Queue (ft)
ink Distance (ft)
pstream Blk Time (%)
lueuing Penalty (veh)
torage Bay Dist (ft)
torage Blk Time (%)
lueuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1423

110: Fry Street & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	2.7	0.2	0.2	0.0	0.0	0.0	4.0	0.3	0.3	0.2	0.2	4.0
Total Del/Veh (s)	48.9	12.9	12.2	57.0	6.8	6.1	41.2	38.1	15.9	47.1	48.1	5.7

110: Fry Street & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	14.9

200: Snelling Ave & Thomas Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.4	3.7	0.4	0.4	3.9	0.0	0.0	0.0	2.4	0.4	2.6
Total Del/Veh (s)	38.6	39.0	16.3	34.1	30.7	12.0	25.5	6.0	5.8	24.2	11.8	4.2

200: Snelling Ave & Thomas Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	13.3

210: Snelling Ave & University Ave 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	0.0	0.0	0.0	0.0	0.0	0.0	0.9	1.7	1.8
Total Del/Veh (s)	93.2	51.7	91.6	142.0	30.5	28.9	52.5	44.4	20.1	97.9	58.5	29.8

210: Snelling Ave & University Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	0.5		
Total Del/Veh (s)	55.7		

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.1	0.2	28.2	21.0	27.0	0.0	0.7	0.0	0.0	0.0	0.0
Total Del/Veh (s)	64.5	49.6	30.9	62.2	46.9	131.5	37.0	51.8	2.8	24.9	20.6	16.9

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	All
Denied Del/Veh (s)	2.4
Total Del/Veh (s)	39.0

230: Snelling Ave & Shields Ave Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	35.9	0.0	0.0	0.0	0.0	2.6
Total Del/Veh (s)	258.7	14.0	17.2	14.9	9.6	31.9

235: Snelling Ave & Snelling Access Performance by movement

Movement	WBR	NBT	NBR	SBT	All
Denied Del/Veh (s)	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	357.2	28.9	6.5	7.7	19.0

239: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.3	0.2
Total Del/Veh (s)	1.7	1.3	1.4

240: Snelling Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Del/Veh (s)	28.1	24.5	2.7	34.1	21.3	95.0	6.7	41.9

241: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	4.0	4.0	4.0

249: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.1	33.1	32.8
Total Del/Veh (s)	1.7	39.2	38.8

250: Snelling Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	40.9	59.6	55.0	33.1	7.2	41.9	32.8	39.8

251: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.5	1.2	3.2

260: Snelling Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.3	1.1	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.5
Total Del/Veh (s)	50.0	34.1	18.4	43.7	29.9	16.2	45.7	15.7	8.6	89.0	82.8	69.0

260: Snelling Ave & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.5
Total Del/Veh (s)	48.4

270: Snelling Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	24.7	20.3	19.4	3.4	0.5	0.5	2.7	0.3	0.3	0.0	0.0	0.0
Total Del/Veh (s)	222.4	61.1	52.8	111.5	72.8	60.7	86.3	44.0	34.9	37.6	13.3	12.4

270: Snelling Ave & Selby Ave Performance by movement

Movement	All
Denied Del/Veh (s)	2.8
Total Del/Veh (s)	41.9

310: West Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.7	1.9	9.6	4.8	5.0

315: East Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.8	0.7	1.4	5.1	1.2

410: University Ave & Pascal 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	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.3	3.9
Total Del/Veh (s)	58.7	10.6	10.5	53.6	7.1	5.6	40.0	25.8	6.9	37.4	35.4	13.1

410: University Ave & Pascal St Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	18.7

415: Pascal St & North Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.6	3.8	0.0	0.0	0.0	0.0	0.6
Total Del/Veh (s)	44.3	5.5	8.1	5.7	1.9	1.2	8.2

420: Pascal St & North Walmart/Cub Entrance Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.3	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	20.8	13.9	0.6	0.1	4.6	1.1	5.3

425: Pascal St & South Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	9.0	4.0	2.8	0.7	0.5	0.3	1.2

430: Pascal St & South Cub Entrance Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	3.8	0.4	0.0	0.0	0.0	0.0	0.4
Total Del/Veh (s)	10.6	4.4	0.9	0.2	3.5	0.3	2.0

435: Pascal St & Empty St. Paul Lot Entrance Performance by movement

Movement	NBL	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	4.0	1.5	0.6	1.1

440: Pascal St & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	12.0	12.2	9.3	23.6	13.1	12.8	5.5	11.9

450: Pascal St & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	9.6	11.1	7.9	10.2	6.8	9.9	10.8	10.1

451: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.8	1.9	1.9

460: Pascal St & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	7.5	4.3	3.5	4.3	3.1	15.9	14.4	7.5	27.4	23.8	19.3	8.7

510: Hamline Ave & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.0	0.0	3.2	0.3	0.3	0.0	0.0	0.0	3.9	1.3	0.7
Total Del/Veh (s)	46.4	29.8	33.8	46.6	24.3	15.1	48.9	25.2	7.1	61.9	52.0	40.0

510: Hamline Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.6
Total Del/Veh (s)	33.9

520: Hamline Ave & Midway Market Place Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.8	0.3	0.3	3.7	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	37.6	25.4	9.3	36.4	26.9	11.3	21.6	7.5	5.2	23.4	5.1	3.2

520: Hamline Ave & Midway Market Place Performance by movement

Movement	All	
Denied Del/Veh (s)	0.4	
Total Del/Veh (s)	11.7	

539: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.3	1.0	0.7

540: Hamline Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	33.0	29.6	15.6	28.8	14.7	14.5	12.1	19.9

550: Hamline Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	37.5	36.4	25.1	15.1	10.4	18.5	8.7	17.6

560: Hamline Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	0.2	3.5	0.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	91.1	71.8	70.2	54.5	39.0	37.1	85.6	25.6	16.1	29.7	21.1	17.6

560: Hamline Ave & Marshall Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.1	
Total Del/Veh (s)	37.5	

570: Hamline Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.2	3.0	0.4	0.5	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	41.4	41.0	10.9	43.8	42.1	11.2	26.3	5.3	3.6	20.2	12.6	7.7

570: Hamline Ave & Selby Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.2	
Total Del/Veh (s)	13.9	

580: Hamline Ave & Ashland Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	25.6	21.4	7.3	6.1	22.5	5.5	13.9

590: Ayd Mill Rd & Ashland Ave Performance by movement

Movement	EBR	NBL	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.4	3.0	0.1	0.7
Total Del/Veh (s)	3.3	15.5	19.3	23.8	16.2

610: Lexington Ave & University Ave Performance by movement

Movement	NBT All
Denied Del/Veh (s)	0.0 0.0
Total Del/Veh (s)	1.3 1.3

639: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.3	0.3
Total Del/Veh (s)	0.3	1.2	0.9

640: Lexington Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.3
Total Del/Veh (s)	32.2	30.6	18.3	36.4	8.4	27.4	4.0	21.9

641: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.6	3.6	5.4

649: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.2	0.4	0.3
Total Del/Veh (s)	0.6	2.3	1.7

650: Lexington Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.0	2.5	0.0	0.0	0.3
Total Del/Veh (s)	26.8	26.6	30.7	39.8	18.1	27.0	9.7	25.3

651: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.6	1.5	2.5

Total Network Performance

Denied Del/Veh (s)	4.5
Total Del/Veh (s)	99.1

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	122	330	318	72	91	119	117	107	78	50	
Average Queue (ft)	23	99	93	25	27	48	48	49	30	18	
95th Queue (ft)	76	247	246	60	72	101	93	97	66	50	
Link Distance (ft)		1035	1035		570	570		259	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)		2					0	1	30	2	
Queuing Penalty (veh)		1					0	0	6	1	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	Т	R	
Maximum Queue (ft)	273	75	177	75	122	77	116	135	297	272	126	
Average Queue (ft)	129	35	81	41	41	14	28	42	172	140	16	
95th Queue (ft)	227	87	145	84	86	52	79	91	272	243	72	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	64	6	48	12					4	6	0	
Queuing Penalty (veh)	26	13	29	16					3	2	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	298	506	514	279	179	196	100	260	268	125	225	906
Average Queue (ft)	157	193	214	138	95	113	73	237	240	81	170	379
95th Queue (ft)	298	435	444	279	159	179	125	263	268	159	271	848
Link Distance (ft)		570	570	213	213	213		209	209			1213
Upstream Blk Time (%)		2	2	20	0	0		35	45			0
Queuing Penalty (veh)		7	8	33	0	0		220	280			2
Storage Bay Dist (ft)	250						50			75	125	
Storage Blk Time (%)	2	11					25	65	66	1	23	32
Queuing Penalty (veh)	4	15					126	78	83	5	107	60

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	888	225
Average Queue (ft)	361	101
95th Queue (ft)	820	253
Link Distance (ft)	1213	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		175
Storage Blk Time (%)	26	
Queuing Penalty (veh)	29	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	Ţ	R	L	T	TR	
Maximum Queue (ft)	148	216	304	187	211	312	314	77	160	228	232	
Average Queue (ft)	56	88	132	80	60	253	264	22	39	121	126	
95th Queue (ft)	115	172	386	189	202	344	336	54	109	251	256	
Link Distance (ft)	550	550	610			212	212	212		209	209	
Upstream Blk Time (%)			7		0	50	56			15	14	
Queuing Penalty (veh)			0		0	209	235			85	83	
Storage Bay Dist (ft)				175	150				110			
Storage Blk Time (%)			1	12		57			0	27		
Queuing Penalty (veh)			1	16		17			1	14		

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	NB	NB	NB	NB	SB	SB
Directions Served	R	L	T	T	T	T	TR
Maximum Queue (ft)	857	78	182	184	11	240	255
Average Queue (ft)	333	28	94	99	0	114	114
95th Queue (ft)	915	63	224	229	8	298	299
Link Distance (ft)	910	92	92	92	92	212	212
Upstream Blk Time (%)	14	0	40	44		15	13
Queuing Penalty (veh)	0	0	129	143		102	87
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 235: Snelling Ave & Snelling Access

Movement	WB	NB	NB	NB	NB	SB	SB	SB	
Directions Served	R	T	T	T	TR	T	T	Т	
Maximum Queue (ft)	100	168	520	528	441	127	123	139	
Average Queue (ft)	26	43	177	193	115	55	54	33	
95th Queue (ft)	94	183	512	543	455	140	138	110	
Link Distance (ft)	350		507	507	507	92	92	92	
Upstream Blk Time (%)			1	3	1	25	19	3	
Queuing Penalty (veh)			3	11	6	125	97	13	
Storage Bay Dist (ft)		110							
Storage Blk Time (%)			33						
Queuing Penalty (veh)			107						

Intersection: 239: St Anthony Ave

Movement	WB
Directions Served	Т
Maximum Queue (ft)	7
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	751
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	Т	Т	T	Т	T
Maximum Queue (ft)	206	270	259	17	215	219	240	241	374	450	562	557
Average Queue (ft)	110	130	107	1	125	134	146	152	150	303	384	381
95th Queue (ft)	178	209	195	8	191	197	237	237	353	596	670	658
Link Distance (ft)	450	450	450	450	233	233	233	233			507	507
Upstream Blk Time (%)			0		0	0	1	1			27	27
Queuing Penalty (veh)			0		0	0	3	5			137	134
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)									0	5	55	
Queuing Penalty (veh)									0	15	333	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	514
Average Queue (ft)	154
95th Queue (ft)	514
Link Distance (ft)	507
Upstream Blk Time (%)	2
Queuing Penalty (veh)	11
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 249: Concordia Ave

Movement	EB	SE	SE
Directions Served	T	L	L
Maximum Queue (ft)	12	614	640
Average Queue (ft)	1	272	280
95th Queue (ft)	7	871	872
Link Distance (ft)	1483	785	785
Upstream Blk Time (%)		14	17
Queuing Penalty (veh)		0	0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 250: Snelling Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	B5	B5	SB
Directions Served	L	LT	T	R	T	T	T	T	R	T	T	L
Maximum Queue (ft)	435	496	449	400	200	250	360	366	172	192	196	240
Average Queue (ft)	269	335	305	265	82	133	191	211	52	40	41	145
95th Queue (ft)	502	559	539	532	169	255	363	371	115	243	243	233
Link Distance (ft)	436	436	436				291	291	291	595	595	233
Upstream Blk Time (%)	11	18	11				7	8		0	1	2
Queuing Penalty (veh)	57	97	57				31	38		2	4	6
Storage Bay Dist (ft)				100	190	190						
Storage Blk Time (%)			51	45	0	1	12					
Queuing Penalty (veh)			392	111	1	2	72					

Intersection: 250: Snelling Ave & Concordia Ave

Movement	SB	SB	SB
Directions Served	L	Т	T
Maximum Queue (ft)	233	261	260
Average Queue (ft)	155	199	201
95th Queue (ft)	236	316	316
Link Distance (ft)	233	233	233
Upstream Blk Time (%)	2	7	7
Queuing Penalty (veh)	6	25	25
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 251: Concordia Ave

MOVERNER
Directions Served
Marrian /

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	Т	R	L	T	T	R	L	T
Maximum Queue (ft)	284	371	193	159	237	166	90	261	253	98	199	686
Average Queue (ft)	137	190	47	63	130	46	26	112	113	25	51	652
95th Queue (ft)	246	326	150	120	211	114	67	226	230	82	155	735
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)												54
Queuing Penalty (veh)												488
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)	0	13			3			7	23	0		53
Queuing Penalty (veh)	2	37			6			2	21	0		21

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5
Directions Served	T	R	T	T	
Maximum Queue (ft)	694	150	343	348	401
Average Queue (ft)	653	97	270	275	311
95th Queue (ft)	745	198	408	409	535
Link Distance (ft)	595		291	291	291
Upstream Blk Time (%)	53		4	9	50
Queuing Penalty (veh)	482		25	52	303
Storage Bay Dist (ft)		100			
Storage Blk Time (%)	53	0			
Queuing Penalty (veh)	85	1			

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	275	537	300	526	200	436	423	250	519	482	
Average Queue (ft)	136	287	89	315	54	287	262	188	178	155	
95th Queue (ft)	289	555	253	606	163	448	413	286	451	387	
Link Distance (ft)		609		930		564	564		602	602	
Upstream Blk Time (%)		10				1	0		0	0	
Queuing Penalty (veh)		0				0	0		1	1	
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)	16	15	1	34	0	44		18	0		
Queuing Penalty (veh)	58	10	2	17	0	13		104	1		

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	EB	WB	WB	WB	NB
Directions Served	TR	Т	Т	Т	R
Maximum Queue (ft)	76	154	126	89	69
Average Queue (ft)	3	24	21	3	29
95th Queue (ft)	50	135	182	62	56
Link Distance (ft)	213		505	505	499
Upstream Blk Time (%)	0		2		
Queuing Penalty (veh)	0		5		
Storage Bay Dist (ft)		200			
Storage Blk Time (%)		6	1		
Queuing Penalty (veh)		9	1		

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	EB	WB	NB
Directions Served	TR	T	R
Maximum Queue (ft)	7	27	64
Average Queue (ft)	0	2	29
95th Queue (ft)	5	26	54
Link Distance (ft)	505	386	439
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	79	248	262	166	118	138	86	88	72	227	75	
Average Queue (ft)	31	80	110	70	32	36	61	72	40	120	21	
95th Queue (ft)	68	176	213	133	87	96	94	95	69	204	68	
Link Distance (ft)		386	386		1220	1220	77	77	77	729		
Upstream Blk Time (%)							18	24	1			
Queuing Penalty (veh)							24	31	1			
Storage Bay Dist (ft)	225			250							25	
Storage Blk Time (%)		0								58	2	
Queuing Penalty (veh)		0								12	4	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	EB	NB	NB	NB	SB
Directions Served	L	R	LT	T	T	TR
Maximum Queue (ft)	158	78	148	114	16	37
Average Queue (ft)	63	41	49	31	1	3
95th Queue (ft)	125	67	114	91	10	16
Link Distance (ft)	494			404	404	77
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)		200	200			
Storage Blk Time (%)	0		0			
Queuing Penalty (veh)	0		0			

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	WB	NB	SB
Directions Served	LR	TR	L
Maximum Queue (ft)	198	29	82
Average Queue (ft)	80	1	38
95th Queue (ft)	157	13	69
Link Distance (ft)	778	49	
Upstream Blk Time (%)		0	
Queuing Penalty (veh)		0	
Storage Bay Dist (ft)			125
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 425: Pascal St & South Midway Shopping Entrance

EB	NB	NB	SB
LR	L	Т	TR
62	40	16	6
31	9	1	0
54	33	12	4
697		112	49
	45		
	0		
	1		
	LR 62 31 54	LR L 62 40 31 9 54 33 697	LR L T 62 40 16 31 9 1 54 33 12 697 112

Intersection: 430: Pascal St & South Cub Entrance

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	88	76	16	35	6
Average Queue (ft)	38	30	1	9	0
95th Queue (ft)	69	57	8	32	4
Link Distance (ft)		798	74		112
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	75			40	
Storage Blk Time (%)	1	0		0	0
Queuing Penalty (veh)	1	0		1	0

Intersection: 435: Pascal St & Empty St. Paul Lot Entrance

Movement	NB	SB
Directions Served	LT	TR
Maximum Queue (ft)	62	28
Average Queue (ft)	8	2
95th Queue (ft)	38	19
Link Distance (ft)	179	74
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	T	R
Maximum Queue (ft)	202	183	44	141	179	76
Average Queue (ft)	87	88	13	72	103	35
95th Queue (ft)	167	165	38	121	169	83
Link Distance (ft)	1228	1228		276	179	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					1	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				2	23	0
Queuing Penalty (veh)				0	15	1

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB
Directions Served	LT	TR	TR	L	T
Maximum Queue (ft)	141	144	118	129	117
Average Queue (ft)	73	77	57	61	58
95th Queue (ft)	117	127	92	102	98
Link Distance (ft)	676	676	947		276
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				100	
Storage Blk Time (%)				1	1
Queuing Penalty (veh)				1	1

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR
Maximum Queue (ft)	64	32	56	214
Average Queue (ft)	26	2	24	100
95th Queue (ft)	56	15	49	176
Link Distance (ft)		1247	350	947
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR	
Maximum Queue (ft)	188	304	330	227	201	159	190	328	154	149	531	
Average Queue (ft)	69	178	198	120	116	70	99	188	46	50	299	
95th Queue (ft)	150	289	307	196	182	138	196	331	101	132	538	
Link Distance (ft)		1220	1220		782	782		315	315		606	
Upstream Blk Time (%)								2	0		3	
Queuing Penalty (veh)								9	0		0	
Storage Bay Dist (ft)	275			275			140			100		
Storage Blk Time (%)		1		0			3	19		0	50	
Queuing Penalty (veh)		1		0			13	25		0	23	

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	105	125	194	174	125	354	205	156	101	106	
Average Queue (ft)	34	54	98	63	59	126	56	68	28	44	
95th Queue (ft)	80	98	164	127	118	262	138	130	78	82	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)	0	0	0	0	4	14		2			
Queuing Penalty (veh)	0	0	0	0	13	16		5			

Intersection: 539: St Anthony Ave

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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LT	Т	R	LT	T	Т	TR
Maximum Queue (ft)	226	238	235	286	276	263	207	205
Average Queue (ft)	132	155	124	125	165	118	121	122
95th Queue (ft)	195	218	206	228	267	239	189	189
Link Distance (ft)	377	377	377	377	249	249	792	792
Upstream Blk Time (%)					2	1		
Queuing Penalty (veh)					8	2		
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	TR	LT	Т
Maximum Queue (ft)	277	322	75	262	215	262	246
Average Queue (ft)	157	178	71	110	95	157	130
95th Queue (ft)	238	279	88	199	173	234	223
Link Distance (ft)	937	937		942	942	249	249
Upstream Blk Time (%)						0	0
Queuing Penalty (veh)						2	1
Storage Bay Dist (ft)			25				
Storage Blk Time (%)		52	46				
Queuing Penalty (veh)		169	53				

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	TR	LT	TR
Maximum Queue (ft)	275	786	139	333	332	325	344	360
Average Queue (ft)	151	362	37	174	181	160	189	184
95th Queue (ft)	310	715	102	298	295	274	306	308
Link Distance (ft)		1247		659	612	612	942	942
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	200		150					
Storage Blk Time (%)	3	38		17				
Queuing Penalty (veh)	12	42		7				

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	179	99	223	100	133	133	298	275	
Average Queue (ft)	89	31	92	51	49	40	147	122	
95th Queue (ft)	152	88	179	104	104	98	257	236	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	42	0	40	2					
Queuing Penalty (veh)	8	0	30	3					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	T	TR	LT	T
Maximum Queue (ft)	134	131	142	125	391	245
Average Queue (ft)	65	52	61	36	167	59
95th Queue (ft)	109	109	117	86	306	161
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	L	T	T	TR
Maximum Queue (ft)	132	166	314	150	302	263
Average Queue (ft)	11	88	114	122	193	138
95th Queue (ft)	86	149	271	177	272	229
Link Distance (ft)	343	866	866		600	600
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				100		
Storage Blk Time (%)			1	14		
Queuing Penalty (veh)			3	27		

Intersection: 610: Lexington Ave & University Ave

Intersection: 639: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	T	T	T
Maximum Queue (ft)	280	312	268	309	273	268	201	190	166	250	527	386
Average Queue (ft)	149	172	85	157	169	107	93	85	76	138	253	224
95th Queue (ft)	230	258	195	268	283	236	156	153	136	271	429	350
Link Distance (ft)	443	443	443	443	241	241	241	241				
Upstream Blk Time (%)					4	1	0	0				
Queuing Penalty (veh)					13	4	0	0				
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)									0	0	18	
Queuing Penalty (veh)									0	1	120	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	185
Average Queue (ft)	53
95th Queue (ft)	148
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	Т
Maximum Queue (ft)	144	49
Average Queue (ft)	8	2
95th Queue (ft)	62	24
Link Distance (ft)	222	222
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Movement	EB	EB	SE	SE
Directions Served	Ţ	T	L	L
Maximum Queue (ft)	25	17	62	90
Average Queue (ft)	2	1	2	6
95th Queue (ft)	20	10	45	72
Link Distance (ft)	711	711	715	715
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	T	T	T	T	R	L	L	T
Maximum Queue (ft)	285	437	423	430	185	274	509	406	200	236	197	253
Average Queue (ft)	139	234	174	240	104	147	239	207	97	117	96	129
95th Queue (ft)	230	370	340	394	181	295	410	354	217	203	166	228
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)		1	0	1						0	0	0
Queuing Penalty (veh)		3	2	3						1	0	1
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					9	6	35	26	1			
Queuing Penalty (veh)					25	16	185	46	1			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	253
Average Queue (ft)	132
95th Queue (ft)	236
Link Distance (ft)	241
Upstream Blk Time (%)	0
Queuing Penalty (veh)	2
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

Movement	EB
Directions Served	T
Maximum Queue (ft)	11
Average Queue (ft)	0
95th Queue (ft)	8
Link Distance (ft)	104
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 6946

Appendix C Year 2035 Build Analysis

110: Fry Street & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)		0.1	0.2	0.0	0.0	0.0	4.0	0.2	0.1	0.1	0.1	4.3
Total Del/Veh (s)		5.6	3.0	25.7	7.7	7.0	12.7	6.9	2.4	7.2	10.2	3.9

110: Fry Street & University Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.3	
Total Del/Veh (s)	6.8	

200: Snelling Ave & Thomas Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.3	4.0	0.4	0.5	3.8	0.0	0.0	0.0	2.9	0.4	2.7
Total Del/Veh (s)	45.8	43.4	11.0	47.5	44.0	11.5	11.8	4.9	5.1	13.4	7.4	2.6

200: Snelling Ave & Thomas Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	0.5		
Total Del/Veh (s)	9.3		

210: Snelling Ave & University Ave 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	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.4
Total Del/Veh (s)	58.8	34.4	24.5	53.1	29.5	24.4	43.5	10.6	6.4	42.3	27.4	8.1

210: Snelling Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	25.4

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	EBR	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	11.8	8.0	3.4	2.9	3.2	2.4	3.6

230: Snelling Ave & Shields Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	4.1	0.1	0.1	0.2	0.4	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	65.1	70.6	10.9	47.4	49.0	9.3	54.4	18.7	19.0	27.9	3.5	1.3

230: Snelling Ave & Shields Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	17.0

239: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.3	0.2
Total Del/Veh (s)	1.5	1.8	1.7

240: Snelling Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1
Total Del/Veh (s)	34.0	32.9	2.9	31.0	9.5	24.1	11.3	19.8

241: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.6	5.4	5.6

249: Concordia Ave Performance by movement

Movement	EBT :	SEL .	ΔII
Denied Del/Veh (s)	Veh (s) 0.1	0.6	.5
Total Del/Veh (s)	h (s) 0.1	2.1 2	.0

250: Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.1	0.1	0.3	0.0	0.1
Total Del/Veh (s)	36.3	31.8	3.6	28.7	5.7	52.7	6.2	23.6

251: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.1	0.8	4.8

260: Snelling Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	52.1	51.1	52.4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Total Del/Veh (s)	189.3	75.0	56.2	42.1	46.7	26.4	39.9	19.7	10.5	45.6	23.0	12.0

260: Snelling Ave & Marshall Ave Performance by movement

270: Snelling Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.7	0.4	0.4	104.3	103.5	104.4	12.6	4.2	3.1	0.0	0.0	0.0
Total Del/Veh (s)	32.6	22.7	17.0	125.9	148.1	141.1	132.3	86.8	71.5	95.4	21.5	16.8

270: Snelling Ave & Selby Ave Performance by movement

Movement	All
Denied Del/Veh (s)	26.4
Total Del/Veh (s)	79.1

310: West Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.4	1.4	0.5	2.7	0.9

315: East Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	0.5	0.6	0.9	3.1	8.0

410: University Ave & Pascal 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	0.5	0.0	0.1	0.0	0.0	0.0	0.1	0.2	4.1
Total Del/Veh (s)	42.3	11.6	6.9	41.1	5.9	3.7	34.8	27.8	4.8	29.9	32.5	6.6

410: University Ave & Pascal St Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	17.4

415: Pascal St & North Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.9	4.3	2.6	0.3	1.6	1.2	2.4

420: Pascal St & North Walmart/Cub Entrance Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.5	3.1	6.9	3.7	3.5	0.6	0.3	2.7	2.0	1.1	2.5

430: Pascal St & South Cub Entrance Performance by movement

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.8	2.9	2.2	1.7	1.3	3.0	0.6	1.7

440: Pascal St & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.9	6.1	4.9	21.2	14.9	13.0	4.3	8.6

450: Pascal St & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.3	6.5	3.3	6.8	4.1	6.9	7.8	6.4

451: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.5	1.5	1.5

460: Pascal St & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0	0.0		0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	7.2	2.3	1.9	4.5	3.6	2.4		10.9	4.5	12.7	11.1	8.4

460: Pascal St & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	4.3

510: Hamline Ave & University Ave 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	3.4	0.2	0.2	0.0	0.0	0.0	3.3	0.4	0.3
Total Del/Veh (s)	56.6	16.8	12.5	38.4	16.3	10.6	22.5	17.9	4.8	23.3	25.0	24.8

510: Hamline Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.3
Total Del/Veh (s)	19.3

520: Hamline Ave & Midway Market Place Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	4.0	0.2	0.1	4.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	39.1	43.9	6.2	36.7	35.6	6.1	8.3	2.9	1.1	9.9	2.2	2.0

520: Hamline Ave & Midway Market Place Performance by movement

Movement	All		
Denied Del/Veh (s)	0.1		
Total Del/Veh (s)	4.0		

539: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.1	0.2	0.2
Total Del/Veh (s)	0.1	0.5	0.4

540: Hamline Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	31.6	30.8	8.5	10.7	7.0	8.0	4.0	12.2

550: Hamline Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	25.6	24.8	5.5	13.6	7.4	22.9	6.5	13.0

560: Hamline Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.0	3.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	36.2	25.2	27.5	28.7	28.4	27.2	27.8	14.8	8.6	27.9	16.5	18.4

560: Hamline Ave & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	20.2

570: Hamline Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.2	0.1	2.7	0.4	0.5	3.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	36.2	31.4	4.9	29.4	34.1	9.8	12.7	8.6	5.9	22.0	10.5	6.5

570: Hamline Ave & Selby Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	0.3		
Total Del/Veh (s)	11.8		

580: Hamline Ave & Ashland Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	30.4	20.7	13.8	6.3	17.5	6.4	16.4

590: Ayd Mill Rd & Ashland Ave Performance by movement

Movement	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.6	2.8	0.1	0.1	1.2
Total Del/Veh (s)	1.7	8.2	12.4	33.9	5.9	14.2

610: Lexington Ave & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	NBT	SBR	All
Denied Del/Veh (s)	4.1	0.1	0.1	0.1	0.0	4.1	0.2
Total Del/Veh (s)	30.2	16.1	1.9	19.2	1.2	1.5	3.2

639: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.3	0.3
Total Del/Veh (s)	0.2	1.0	0.8

640: Lexington Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.3
Total Del/Veh (s)	34.1	32.1	13.0	44.7	8.5	23.7	3.3	22.3

641: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	7.2	3.4	6.1

649: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.2	0.7	0.5

650: Lexington Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	5.7	7.3	0.0	0.0	2.6
Total Del/Veh (s)	39.9	34.8	8.9	48.6	18.1	39.8	5.3	31.7

651: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.2	1.1	2.9

Total Network Performance

Denied Del/Veh (s)	7.8
Total Del/Veh (s)	73.8

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	5	76	111	31	139	146	57	35	39	39	
Average Queue (ft)	0	26	39	4	48	60	25	12	15	9	
95th Queue (ft)	0	61	81	20	113	131	52	37	40	35	
Link Distance (ft)		1035	1035		570	570		259	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)					0				5	1	
Queuing Penalty (veh)					0				0	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	T	R	
Maximum Queue (ft)	148	75	189	75	52	75	91	64	250	248	147	
Average Queue (ft)	55	29	68	38	20	19	38	19	129	104	19	
95th Queue (ft)	113	74	143	84	50	58	79	50	219	201	80	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	51	6	52	9					1	3	0	
Queuing Penalty (veh)	19	5	32	8					0	1	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	82	109	162	154	158	187	194	226	252	122	224	304
Average Queue (ft)	34	46	82	68	74	105	94	108	130	27	126	182
95th Queue (ft)	70	92	139	128	137	166	166	210	233	94	217	289
Link Distance (ft)		570	570	212	212	212	208	208	208			1213
Upstream Blk Time (%)						0	0	0	1			
Queuing Penalty (veh)						0	1	1	3			
Storage Bay Dist (ft)	250									75	150	
Storage Blk Time (%)									9	0	3	18
Queuing Penalty (veh)									4	0	14	31

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	295	191
Average Queue (ft)	173	35
95th Queue (ft)	270	117
Link Distance (ft)	1213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		175
Storage Blk Time (%)	12	
Queuing Penalty (veh)	9	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	EB	WB	NB	NB	NB	NB	SB	SB	
Directions Served	R	R	T	T	Т	R	Т	TR	
Maximum Queue (ft)	116	26	73	138	143	90	136	171	
Average Queue (ft)	43	7	7	17	27	10	26	28	
95th Queue (ft)	79	24	39	79	98	49	95	113	
Link Distance (ft)	555	604		202	202	202	208	208	
Upstream Blk Time (%)					0		0	0	
Queuing Penalty (veh)					0		0	0	
Storage Bay Dist (ft)			25						
Storage Blk Time (%)			1	1					
Queuing Penalty (veh)			2	4					

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LT	R	L	T	T	TR	L	T	TR
Maximum Queue (ft)	34	50	154	144	85	202	300	618	595	173	245	160
Average Queue (ft)	5	17	76	70	22	73	166	198	228	90	41	39
95th Queue (ft)	22	44	133	127	58	146	258	385	426	155	138	104
Link Distance (ft)		909	766	766			644	644	644		202	202
Upstream Blk Time (%)								0	0		0	0
Queuing Penalty (veh)								1	0		2	1
Storage Bay Dist (ft)	100				100	250				125		
Storage Blk Time (%)				7		0	1			3	0	
Queuing Penalty (veh)				2		0	1			15	1	

Intersection: 239: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	T	Т	T
Maximum Queue (ft)	186	255	241	11	265	258	193	229	152	145	206	205
Average Queue (ft)	90	155	141	0	210	214	105	142	79	56	112	114
95th Queue (ft)	157	226	221	8	289	291	168	214	136	116	181	185
Link Distance (ft)	450	450	450	450	233	233	233	233			644	644
Upstream Blk Time (%)					5	6	0	0				
Queuing Penalty (veh)					27	33	0	2				
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	266
Average Queue (ft)	117
95th Queue (ft)	261
Link Distance (ft)	644
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 249: Concordia Ave

Movement		
Directions Served		
Maximum Queue (ft)		
Average Queue (ft)		
95th Queue (ft)		
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 250:

Movement	EB	EB	EB	NB	NB	NB	NB	NB	B5	B5	SB	SB
Directions Served	L	LT	Т	Т	Т	Т	Т	R	T	Т	L	L
Maximum Queue (ft)	335	334	287	219	250	363	321	129	284	187	248	220
Average Queue (ft)	211	213	66	147	173	181	185	58	49	28	138	99
95th Queue (ft)	299	300	197	248	271	356	303	108	259	187	212	181
Link Distance (ft)	436	436	436			291	291	291	595	595	233	233
Upstream Blk Time (%)						6	2		0	0	1	0
Queuing Penalty (veh)						40	15		1	0	1	0
Storage Bay Dist (ft)				190	190							
Storage Blk Time (%)			0	5	11	2						
Queuing Penalty (veh)			1	21	43	18						

Intersection: 250:

Movement	SB	SB
Directions Served	Т	Т
Maximum Queue (ft)	101	113
Average Queue (ft)	48	41
95th Queue (ft)	88	89
Link Distance (ft)	233	233
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 251: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	Ţ	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	350	708	102	154	351	225	198	426	419	100	173	331
Average Queue (ft)	333	530	21	43	159	70	48	212	215	15	32	188
95th Queue (ft)	402	905	70	120	272	167	133	349	357	62	115	308
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)		45										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)	72	1			9		0	16	32	0		25
Queuing Penalty (veh)	183	3			16		0	7	13	0		7

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5
Directions Served	T	R	T	T
Maximum Queue (ft)	341	150	86	142
Average Queue (ft)	189	82	3	7
95th Queue (ft)	305	178	46	71
Link Distance (ft)	595		291	291
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)	30	0		
Queuing Penalty (veh)	47	2		

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	106	189	300	980	199	589	580	250	552	547	
Average Queue (ft)	37	96	77	854	25	489	458	225	305	221	
95th Queue (ft)	82	167	274	1181	108	663	647	291	584	473	
Link Distance (ft)		609		930		564	564		602	602	
Upstream Blk Time (%)				53		18	11		1	0	
Queuing Penalty (veh)				0		0	0		5	0	
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)		0		64		65		48	1		
Queuing Penalty (veh)		0		17		7		175	3		

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	13
95th Queue (ft)	37
Link Distance (ft)	499
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	35
Average Queue (ft)	11
95th Queue (ft)	35
Link Distance (ft)	439
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	36	134	154	193	90	112	116	89	65	99	73	
Average Queue (ft)	7	44	57	89	27	35	49	37	18	37	17	
95th Queue (ft)	27	100	120	160	73	90	99	74	50	80	55	
Link Distance (ft)		387	387		1219	1219		225	225	729		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			250			200				25	
Storage Blk Time (%)				0						31	2	
Queuing Penalty (veh)				0						6	1	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	70	29	4
Average Queue (ft)	37	4	0
95th Queue (ft)	60	20	3
Link Distance (ft)	454		225
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	EB	WB	NB	SB	SB	
Directions Served	LTR	LTR	L	L	TR	
Maximum Queue (ft)	48	82	47	30	13	
Average Queue (ft)	25	37	14	3	1	
95th Queue (ft)	47	64	41	18	7	
Link Distance (ft)	651	779			260	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100	125		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 430: Pascal St & South Cub Entrance

Movement	WB	WB	NB	SB
Directions Served	LT	R	TR	L
Maximum Queue (ft)	34	48	4	43
Average Queue (ft)	16	16	0	5
95th Queue (ft)	41	41	3	25
Link Distance (ft)	798	798	315	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				125
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	T	R
Maximum Queue (ft)	114	121	39	87	122	64
Average Queue (ft)	52	49	9	43	56	9
95th Queue (ft)	99	91	32	78	106	37
Link Distance (ft)	1228	1228		276	315	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				0	11	0
Queuing Penalty (veh)				0	1	0

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB	
Directions Served	LT	TR	TR	L	T	
Maximum Queue (ft)	68	64	74	71	72	
Average Queue (ft)	36	37	39	40	34	
95th Queue (ft)	56	56	60	65	59	
Link Distance (ft)	676	676	947		276	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				100		
Storage Blk Time (%)				0	0	
Queuing Penalty (veh)				0	0	

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	NB	SB
Directions Served	L	L	LTR	LTR
Maximum Queue (ft)	58	36	24	92
Average Queue (ft)	20	3	2	42
95th Queue (ft)	49	18	16	73
Link Distance (ft)			350	947
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100	100		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	48	144	152	114	184	155	189	316	63	76	280
Average Queue (ft)	8	48	67	51	90	51	58	147	29	22	141
95th Queue (ft)	30	109	123	96	155	114	132	267	58	68	237
Link Distance (ft)		1219	1219		782	782		315	315		606
Upstream Blk Time (%)								0			
Queuing Penalty (veh)								1			
Storage Bay Dist (ft)	275			275			140			100	
Storage Blk Time (%)								9			20
Queuing Penalty (veh)								9			5

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	47	82	51	53	71	114	43	63	44	52	
Average Queue (ft)	11	26	7	14	22	40	8	20	5	9	
95th Queue (ft)	37	59	30	41	54	100	32	53	26	37	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)		0			0	2					
Queuing Penalty (veh)		0			0	1					

Intersection: 539: St Anthony Ave

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	LT	T	R	LT	T	T	TR	
Maximum Queue (ft)	128	155	138	136	225	181	139	126	
Average Queue (ft)	69	81	52	60	97	38	48	45	
95th Queue (ft)	116	130	106	104	182	113	101	99	
Link Distance (ft)	377	377	377	377	249	249	792	792	
Upstream Blk Time (%)					0	0			
Queuing Penalty (veh)					0	0			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	TR	LT	T
Maximum Queue (ft)	120	103	75	222	190	182	161
Average Queue (ft)	52	41	37	116	73	89	60
95th Queue (ft)	98	81	73	197	143	152	124
Link Distance (ft)	937	937		942	942	249	249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25				
Storage Blk Time (%)		28	9				
Queuing Penalty (veh)		23	4				

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	81	235	159	258	321	282	162	160	
Average Queue (ft)	34	110	31	141	155	115	69	67	
95th Queue (ft)	71	192	95	233	268	236	127	121	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		1		8					
Queuing Penalty (veh)		1		3					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	118	58	151	98	195	214	148	115	
Average Queue (ft)	50	10	63	47	100	103	67	42	
95th Queue (ft)	96	40	119	90	170	181	130	97	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	17	0	22	5					
Queuing Penalty (veh)	2	0	23	5					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	Т	TR	LT	Т
Maximum Queue (ft)	246	220	172	141	213	102
Average Queue (ft)	117	106	95	47	96	38
95th Queue (ft)	195	189	159	107	167	88
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	NB	NB	NB	SB	SB
Directions Served	L	L	Ţ	T	TR
Maximum Queue (ft)	175	255	150	264	212
Average Queue (ft)	86	82	113	151	93
95th Queue (ft)	148	217	172	228	194
Link Distance (ft)	866	866		600	600
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)		0	9		
Queuing Penalty (veh)		2	26		

Intersection: 610: Lexington Ave & University Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	Т	TR	T	TR	R
Maximum Queue (ft)	58	56	24	83	33	30
Average Queue (ft)	18	20	3	32	5	13
95th Queue (ft)	47	50	16	63	21	36
Link Distance (ft)		561	561	836	836	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	275					150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 639: St Anthony Ave

Maximum Queue (ft) Average Queue (ft) 95th Queue (ft) Link Distance (ft) Upstream Blk Time (%) Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	Movement	
Average Queue (ft) 95th Queue (ft) Link Distance (ft) Upstream Blk Time (%) Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	Directions Served	
95th Queue (ft) Link Distance (ft) Upstream Blk Time (%) Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	Maximum Queue (ft)	
Link Distance (ft) Upstream Blk Time (%) Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	Average Queue (ft)	
Upstream Blk Time (%) Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	95th Queue (ft)	
Queuing Penalty (veh) Storage Bay Dist (ft) Storage Blk Time (%)	Link Distance (ft)	
Storage Bay Dist (ft) Storage Blk Time (%)	Upstream Blk Time (%)	
Storage Blk Time (%)	Queuing Penalty (veh)	
Storage Blk Time (%) Oueuing Penalty (veh)	Storage Bay Dist (ft)	
Oueuing Penalty (veh)	Storage Blk Time (%)	
	Queuing Penalty (veh)	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	Т	T	T	T	T	T
Maximum Queue (ft)	226	283	231	208	277	274	169	168	201	195	230	202
Average Queue (ft)	106	174	89	105	221	142	86	84	117	50	132	113
95th Queue (ft)	187	263	205	183	306	297	144	142	194	147	203	185
Link Distance (ft)	443	443	443	443	241	241	241	241				
Upstream Blk Time (%)					15	3		0				
Queuing Penalty (veh)					55	12		0				
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)									2	1	1	
Queuing Penalty (veh)									5	1	6	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	159
Average Queue (ft)	48
95th Queue (ft)	125
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	T
Maximum Queue (ft)	210	40
Average Queue (ft)	28	2
95th Queue (ft)	135	21
Link Distance (ft)	222	222
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	1	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Directions Served Maximum Queue (ft) Average Queue (ft) 95th Queue (ft) Link Distance (ft)
Average Queue (ft) 95th Queue (ft) Link Distance (ft)
95th Queue (ft) Link Distance (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	T	Т	T	T	R	L	L	T
Maximum Queue (ft)	259	297	200	134	199	255	507	520	200	252	81	108
Average Queue (ft)	136	183	43	62	155	174	310	276	104	176	26	51
95th Queue (ft)	221	278	135	108	229	306	757	704	211	275	62	94
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)							10	3		5		
Queuing Penalty (veh)							0	0		14		
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					39	21	14	15	2			
Queuing Penalty (veh)					115	63	80	36	7			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	Т
Maximum Queue (ft)	116
Average Queue (ft)	49
95th Queue (ft)	99
Link Distance (ft)	241
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 1354

110: Fry Street & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	2.9	0.2	0.3	0.0	0.0	0.0	4.0	0.3	0.3	0.2	0.1	4.2
Total Del/Veh (s)	63.9	7.4	5.2	70.1	10.4	8.3	48.3	46.0	17.1	65.6	44.7	8.6

110: Fry Street & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	(s) 0.3
Total Del/Veh (s)	12.9

200: Snelling Ave & Thomas Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.4	0.4	3.7	0.4	0.4	3.8	0.0	0.0	0.0	2.4	0.5	2.5
Total Del/Veh (s)	45.6	44.4	23.2	45.8	37.5	17.8	32.3	7.0	7.2	37.6	14.2	5.8

200: Snelling Ave & Thomas Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.4
Total Del/Veh (s)	15.9

210: Snelling Ave & University Ave 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	59.7	58.4	64.8	69.3	32.7	27.6	31.7	27.2	13.6	89.8	60.0	37.1

210: Snelling Ave & University Ave Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	46.6

220: Snelling Ave & Spruce Tree Rd Performance by movement

Movement	EBR	WBR	NBT	NBR	SBT	SBR	All
Denied Del/Veh (s)	1.2	0.2	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	94.6	31.3	9.1	2.2	7.2	5.2	13.6

230: Snelling Ave & Shields Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.7	0.2	0.3	63.0	31.6	58.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	67.3	97.2	33.7	106.2	118.9	76.4	56.7	28.1	14.3	50.3	23.9	18.4

230: Snelling Ave & Shields Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	15.4		
Total Del/Veh (s)	44.1		

239: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.0	0.3	0.2
Total Del/Veh (s)	1.4	2.2	2.0

240: Snelling Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	100.7	42.1	3.1	39.9	10.9	71.0	18.2	40.5

241: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.8	6.1	5.8

249: Concordia Ave Performance by movement

Movement	EBT SE	. All
Denied Del/Veh (s)	eh (s) 0.1 6.	6.3
Total Del/Veh (s)	n (s) 0.4 14.	14.0

250: Concordia Ave & Snelling Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.1	0.2	0.1	0.9	1.3	0.5
Total Del/Veh (s)	55.1	53.4	16.0	36.9	15.0	44.5	31.3	35.9

251: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.8	1.3	4.3

260: Snelling Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	7.8	5.2	8.6	0.0	0.0	0.0	0.0	0.0	0.0	3.7	3.5	4.5
Total Del/Veh (s)	85.1	38.3	30.1	92.4	49.7	18.2	38.1	6.4	4.9	78.4	57.8	47.6

260: Snelling Ave & Marshall Ave Performance by movement

Movement	All
Denied Del/Veh (s)	2.6
Total Del/Veh (s)	41.8

270: Snelling Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.4	0.4	0.4	3.3	0.5	0.5	2.3	0.3	0.3	0.0	0.0	0.0
Total Del/Veh (s)	49.4	43.2	34.3	105.5	100.6	90.7	277.5	47.5	43.9	37.8	12.9	12.1

270: Snelling Ave & Selby Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.3	
Total Del/Veh (s)	42.0	

310: West Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.0
Total Del/Veh (s)	1.8	1.6	0.6	6.3	1.7

315: East Midway Shopping Entrance & University Ave Performance by movement

Movement	EBT	EBR	WBT	NBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.3	1.3	0.6	5.2	1.1

410: University Ave & Pascal 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	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	4.0
Total Del/Veh (s)	50.4	25.0	21.4	23.7	4.4	3.2	56.4	37.5	8.3	47.6	40.2	12.8

410: University Ave & Pascal St Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	24.8

415: Pascal St & North Midway Shopping Entrance Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	15.3	9.2	5.7	0.9	2.0	1.4	3.6

420: Pascal St & North Walmart/Cub Entrance Performance by movement

Movement	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	16.5	8.2	21.0	12.4	3.2	1.3	0.7	4.4	1.9	1.1	6.1

430: Pascal St & South Cub Entrance Performance by movement

Movement	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	6.0	13.5	4.6	4.2	2.3	1.5	5.5	8.0	3.1

440: Pascal St & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.8	11.1	8.2	27.2	19.7	21.3	10.0	15.2

450: Pascal St & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	10.1	11.5	9.5	10.2	7.1	12.5	13.7	11.4

451: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.9	1.9	1.9

460: Pascal St & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	9.8	4.3	3.8	4.9	3.5	15.5	18.6	7.8	49.0	48.2	40.3	13.7

510: Hamline Ave & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.0	0.1	3.2	0.4	0.4	0.0	0.0	0.0	4.3	1.3	0.9
Total Del/Veh (s)	42.1	25.0	27.2	56.3	24.9	15.4	49.7	37.2	8.8	67.5	64.5	52.8

510: Hamline Ave & University Ave Performance by movement

Movement	All	
Denied Del/Veh (s)	0.5	
Total Del/Veh (s)	36.5	

520: Hamline Ave & Midway Market Place Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	3.8	0.3	0.3	3.7	0.5	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	80.8	36.2	13.7	42.8	48.5	23.2	26.1	9.0	5.0	23.3	5.4	3.8

520: Hamline Ave & Midway Market Place Performance by movement

Movement	All	
Denied Del/Veh (s)	0.4	
Total Del/Veh (s)	15.3	

539: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.3	0.3
Total Del/Veh (s)	0.4	1.5	1.1

540: Hamline Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	34.9	24.7	13.7	30.6	14.9	21.8	17.0	21.5

550: Hamline Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	31.7	31.7	32.6	19.4	12.2	23.1	11.1	20.3

560: Hamline Ave & Marshall Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.1	0.0	0.0	3.7	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	54.5	53.4	48.8	43.0	34.0	32.4	128.7	41.7	26.6	102.3	78.6	75.3

560: Hamline Ave & Marshall Ave Performance by movement

Movement	All		
Denied Del/Veh (s)	0.1		
Total Del/Veh (s)	63.1		

570: Hamline Ave & Selby Ave Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.3	0.2	3.0	0.6	0.5	3.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	48.7	50.6	11.5	56.0	58.9	15.9	21.6	8.0	5.5	18.5	11.1	6.7

570: Hamline Ave & Selby Ave Performance by movement

Movement All
Denied Del/Veh (s) 0.2
Defiled Deliveri (3) 0.2
Total Del/Veh (s) 15.3

580: Hamline Ave & Ashland Ave Performance by movement

Movement	WBL	WBT	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0		0.0	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	24.7		21.7	8.1	4.5	39.8	11.6	21.7

590: Ayd Mill Rd & Ashland Ave Performance by movement

Movement	EBR	NBL	NBT	SBT	All
Denied Del/Veh (s)	0.0	0.4	2.9	0.2	0.7
Total Del/Veh (s)	3.0	13.3	17.3	21.0	14.4

610: Lexington Ave & University Ave Performance by movement

Movement	EBL	EBT	EBR	WBT	NBT	SBR	All
Denied Del/Veh (s)	3.8	0.1	0.2	0.1	0.0	4.1	0.3
Total Del/Veh (s)	55.2	38.8	4.2	47.8	1.3	1.3	8.2

639: St Anthony Ave Performance by movement

Movement	WBT	NWL	All
Denied Del/Veh (s)	0.2	0.3	0.3
Total Del/Veh (s)	0.2	1.2	0.9

640: Lexington Ave & St Anthony Ave Performance by movement

Movement	WBL	WBT	WBR	NBL	NBT	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.9	0.4	0.3
Total Del/Veh (s)	39.1	35.3	23.7	33.0	8.8	27.8	3.3	23.3

641: St Anthony Ave Performance by movement

Movement	WBL	WBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	6.7	3.4	5.4

649: Concordia Ave Performance by movement

Movement	EBT	SEL	All
Denied Del/Veh (s)	0.2	0.4	0.4
Total Del/Veh (s)	0.7	2.7	1.9

650: Lexington Ave & Concordia Ave Performance by movement

Movement	EBL	EBT	EBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	0.0	1.1	2.5	0.0	0.0	0.3
Total Del/Veh (s)	28.7	31.4	31.0	40.5	21.4	35.1	8.9	27.2

651: Concordia Ave Performance by movement

Movement	EBL	EBT	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	3.7	1.6	2.5

Total Network Performance

Denied Del/Veh (s)	4.6
Total Del/Veh (s)	96.7

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	77	191	209	68	224	239	106	128	69	47	
Average Queue (ft)	21	76	73	21	77	98	47	54	20	13	
95th Queue (ft)	53	161	169	55	166	190	93	102	55	42	
Link Distance (ft)		1035	1035		570	570		259	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)		0			1		0	1	20	2	
Queuing Penalty (veh)		0			0		0	0	3	1	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	T	R	
Maximum Queue (ft)	301	75	201	75	106	97	111	208	366	336	150	
Average Queue (ft)	157	37	94	44	47	19	41	53	214	187	19	
95th Queue (ft)	259	90	168	88	93	62	85	148	339	313	83	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	68	8	56	15					9	11	0	
Queuing Penalty (veh)	28	17	33	19					5	4	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	Т	TR	L	T	T	R	L	T
Maximum Queue (ft)	250	323	339	198	196	220	241	258	278	125	225	753
Average Queue (ft)	103	192	213	104	104	123	120	172	199	56	202	441
95th Queue (ft)	191	287	314	175	176	192	216	291	314	134	265	915
Link Distance (ft)		570	570	212	212	212	208	208	208			1213
Upstream Blk Time (%)				1	0	1	2	11	19			1
Queuing Penalty (veh)				2	0	1	7	50	89			4
Storage Bay Dist (ft)	250									75	150	
Storage Blk Time (%)		4							50	1	23	29
Queuing Penalty (veh)		4							60	3	104	71

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	732	225
Average Queue (ft)	435	122
95th Queue (ft)	891	274
Link Distance (ft)	1213	
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	2	
Storage Bay Dist (ft)		175
Storage Blk Time (%)	31	0
Queuing Penalty (veh)	33	0

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	EB	WB	NB	NB	NB	NB	SB	SB	
Directions Served	R	R	Т	T	T	R	T	TR	
Maximum Queue (ft)	309	146	74	299	306	83	211	212	
Average Queue (ft)	151	49	19	111	130	6	70	71	
95th Queue (ft)	400	105	69	305	326	42	206	202	
Link Distance (ft)	555	604		202	202	202	208	208	
Upstream Blk Time (%)	2			4	6	0	1	1	
Queuing Penalty (veh)	0			19	27	0	4	5	
Storage Bay Dist (ft)			25						
Storage Blk Time (%)			1	8					
Queuing Penalty (veh)			6	35					

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LT	R	L	T	T	TR	L	T	TR
Maximum Queue (ft)	149	258	727	737	150	261	564	637	586	165	253	270
Average Queue (ft)	34	106	449	450	124	77	270	307	207	76	176	191
95th Queue (ft)	105	216	845	852	194	190	437	510	425	160	286	292
Link Distance (ft)		909	782	782			644	644	644		202	202
Upstream Blk Time (%)			15	23			0	0	0		14	17
Queuing Penalty (veh)			0	0			0	1	0		94	115
Storage Bay Dist (ft)	100				100	250				125		
Storage Blk Time (%)	0	21		54	5		9			2	26	
Queuing Penalty (veh)	0	6		106	21		6			11	20	

Intersection: 239: St Anthony Ave

Movement	WB	NW	NW
Directions Served	T	L	L
Maximum Queue (ft)	19	75	79
Average Queue (ft)	1	5	7
95th Queue (ft)	15	60	75
Link Distance (ft)	751	1278	1278
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	T	T	T
Maximum Queue (ft)	359	365	323	71	249	252	203	211	375	450	694	697
Average Queue (ft)	198	200	177	3	162	175	134	139	195	308	460	450
95th Queue (ft)	369	362	333	52	233	250	192	198	365	548	793	771
Link Distance (ft)	450	450	450	450	233	233	233	233			644	644
Upstream Blk Time (%)	1	1	1		1	1	0	0			15	9
Queuing Penalty (veh)	4	2	2		2	6	0	0			113	69
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)									0	9	40	
Queuing Penalty (veh)									1	35	322	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	652
Average Queue (ft)	345
95th Queue (ft)	704
Link Distance (ft)	644
Upstream Blk Time (%)	6
Queuing Penalty (veh)	43
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 249: Concordia Ave

Movement	SE	SE
Directions Served	L	L
Maximum Queue (ft)	713	741
Average Queue (ft)	128	188
95th Queue (ft)	575	678
Link Distance (ft)	785	785
Upstream Blk Time (%)	2	5
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 250: Concordia Ave & Snelling Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	B5	B5	SB
Directions Served	L	LT	T	R	T	Т	Т	T	R	T	Т	L
Maximum Queue (ft)	437	491	444	372	202	250	348	358	184	48	54	260
Average Queue (ft)	264	354	292	133	94	149	227	250	80	3	3	190
95th Queue (ft)	414	499	511	418	160	251	325	334	149	29	35	272
Link Distance (ft)	436	436	436				291	291	291	595	595	233
Upstream Blk Time (%)	1	4	2				3	5				6
Queuing Penalty (veh)	5	23	10				15	23				27
Storage Bay Dist (ft)				100	190	190						
Storage Blk Time (%)			15	16	0	1	18					
Queuing Penalty (veh)			116	40	0	4	108					

Intersection: 250: Concordia Ave & Snelling Ave

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	258	268	271
Average Queue (ft)	185	185	185
95th Queue (ft)	271	325	331
Link Distance (ft)	233	233	233
Upstream Blk Time (%)	5	15	19
Queuing Penalty (veh)	22	71	88
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 251: Concordia Ave

IV	10	veme	ent	

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	Т	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	330	542	225	250	442	225	80	135	164	88	199	699
Average Queue (ft)	185	254	48	101	229	86	23	51	62	11	58	595
95th Queue (ft)	330	493	160	213	396	229	59	107	127	49	165	853
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)		3										30
Queuing Penalty (veh)		0										301
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)	8	14		3	17	0		0	4	0	0	45
Queuing Penalty (veh)	36	41		12	32	0		0	3	0	2	18

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5	
Directions Served	T	R	T	T		
Maximum Queue (ft)	700	150	376	350	396	
Average Queue (ft)	598	100	268	268	278	
95th Queue (ft)	855	200	458	442	520	
Link Distance (ft)	595		291	291	291	
Upstream Blk Time (%)	31		11	18	26	
Queuing Penalty (veh)	309		75	118	173	
Storage Bay Dist (ft)		100				
Storage Blk Time (%)	44	0				
Queuing Penalty (veh)	97	1				

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	199	378	300	808	199	435	420	250	572	583	
Average Queue (ft)	61	230	114	457	88	288	283	215	223	193	
95th Queue (ft)	143	352	311	835	199	400	398	293	553	503	
Link Distance (ft)		977		1142		1196	1196		602	602	
Upstream Blk Time (%)				0					0	0	
Queuing Penalty (veh)				0					2	2	
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)		10		54	7	45		22	0		
Queuing Penalty (veh)		7		26	31	14		133	1		

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	EB	NB
Directions Served	TR	R
Maximum Queue (ft)	22	75
Average Queue (ft)	0	39
95th Queue (ft)	8	66
Link Distance (ft)	212	499
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	EB	EB	NB
Directions Served	T	TR	R
Maximum Queue (ft)	12	115	53
Average Queue (ft)	0	4	19
95th Queue (ft)	5	84	46
Link Distance (ft)	505	505	439
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	135	309	334	238	42	44	219	233	102	215	75	
Average Queue (ft)	31	192	216	121	8	6	136	104	46	109	15	
95th Queue (ft)	87	296	307	207	31	25	206	202	82	191	57	
Link Distance (ft)		387	387		1219	1219		225	225	729		
Upstream Blk Time (%)							0	1				
Queuing Penalty (veh)							0	3				
Storage Bay Dist (ft)	225			250			200				25	
Storage Blk Time (%)		5		0			2	2		60	1	
Queuing Penalty (veh)		1		0			2	3		10	2	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	121	69	56	31
Average Queue (ft)	60	24	4	1
95th Queue (ft)	103	55	30	11
Link Distance (ft)	454		260	225
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		100		
Storage Blk Time (%)			0	
Queuing Penalty (veh)			0	

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	108	186	55	19	107	42
Average Queue (ft)	56	72	14	1	39	1
95th Queue (ft)	96	139	41	9	81	26
Link Distance (ft)	651	779		214		260
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100		125	
Storage Blk Time (%)			0		0	
Queuing Penalty (veh)			0		0	

Intersection: 430: Pascal St & South Cub Entrance

Movement	EB	WB	WB	NB	NB	SB	SB
Directions Served	LTR	LT	R	L	TR	L	T
Maximum Queue (ft)	39	95	62	31	22	42	9
Average Queue (ft)	15	42	28	6	1	9	0
95th Queue (ft)	40	73	52	26	9	31	7
Link Distance (ft)	638	798	798		315		214
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)				100		125	
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	Т	T	R
Maximum Queue (ft)	138	200	87	188	293	74
Average Queue (ft)	56	70	15	85	168	19
95th Queue (ft)	114	137	53	155	266	63
Link Distance (ft)	1228	1228		276	315	
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				6	38	0
Queuing Penalty (veh)				1	12	0

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB	
Directions Served	LT	TR	TR	L	T	
Maximum Queue (ft)	127	146	117	149	209	
Average Queue (ft)	69	80	60	81	85	
95th Queue (ft)	107	120	95	137	154	
Link Distance (ft)	676	676	947		276	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				100		
Storage Blk Time (%)				3	3	
Queuing Penalty (veh)				6	8	

Intersection: 451: Concordia Ave

Movement	
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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	NB	SB
Directions Served	L	TR	LTR	LTR
Maximum Queue (ft)	88	33	48	346
Average Queue (ft)	32	3	15	160
95th Queue (ft)	67	18	42	292
Link Distance (ft)		1247	350	947
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	100			
Storage Blk Time (%)	0			
Queuing Penalty (veh)	1			

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR	
Maximum Queue (ft)	126	262	280	255	258	245	190	335	157	149	569	
Average Queue (ft)	58	114	135	136	147	111	115	242	46	51	357	
95th Queue (ft)	108	213	226	231	225	204	211	365	101	137	598	
Link Distance (ft)		1219	1219		782	782		315	315		606	
Upstream Blk Time (%)								8	0		4	
Queuing Penalty (veh)								29	0		0	
Storage Bay Dist (ft)	275			275			140			100		
Storage Blk Time (%)		0		0	0		2	37		0	55	
Queuing Penalty (veh)		0		0	0		12	44		0	25	

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	125	170	197	202	125	391	240	160	128	107	
Average Queue (ft)	53	67	106	83	72	158	47	72	22	44	
95th Queue (ft)	117	131	177	164	135	318	163	134	67	88	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)	1	1	1	1	7	19		3	0		
Queuing Penalty (veh)	2	1	1	1	19	21		6	0		

Intersection: 539: St Anthony Ave

Movement	WB	NW
Directions Served	T	L
Maximum Queue (ft)	19	19
Average Queue (ft)	1	2
95th Queue (ft)	15	25
Link Distance (ft)	611	922
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	LT	T	R	LT	T	T	TR	
Maximum Queue (ft)	235	276	265	263	282	251	288	293	
Average Queue (ft)	129	159	134	123	167	98	141	144	
95th Queue (ft)	237	272	254	228	285	221	252	263	
Link Distance (ft)	377	377	377	377	249	249	792	792	
Upstream Blk Time (%)	0	1	0	0	3	0			
Queuing Penalty (veh)	0	2	1	0	13	1			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	TR	LT	T
Maximum Queue (ft)	299	356	75	292	230	255	261
Average Queue (ft)	153	185	72	146	123	153	132
95th Queue (ft)	247	328	85	248	213	258	248
Link Distance (ft)	937	937		942	942	249	249
Upstream Blk Time (%)						3	3
Queuing Penalty (veh)						19	16
Storage Bay Dist (ft)			25				
Storage Blk Time (%)		51	48				
Queuing Penalty (veh)		151	73				

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	TR	L	TR	LT	TR	LT	TR
Maximum Queue (ft)	275	626	137	332	529	514	880	884
Average Queue (ft)	115	292	33	173	327	269	489	490
95th Queue (ft)	269	532	89	288	500	474	884	894
Link Distance (ft)		1247		659	612	612	942	942
Upstream Blk Time (%)					0	0	1	3
Queuing Penalty (veh)					1	1	8	15
Storage Bay Dist (ft)	200		150					
Storage Blk Time (%)		28		14				
Queuing Penalty (veh)		30		5				

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	210	72	279	100	181	178	318	322	
Average Queue (ft)	95	16	122	68	86	78	119	91	
95th Queue (ft)	173	58	240	122	160	156	236	218	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	44	0	51	3					
Queuing Penalty (veh)	7	0	50	4					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	T	TR	LT	T
Maximum Queue (ft)	204	184	145	94	628	544
Average Queue (ft)	76	69	65	31	298	162
95th Queue (ft)	156	151	122	73	569	400
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	EB	NB	NB	NB	SB	SB
Directions Served	R	L	L	T	T	TR
Maximum Queue (ft)	142	154	251	150	298	259
Average Queue (ft)	5	80	79	112	189	133
95th Queue (ft)	62	131	203	167	270	231
Link Distance (ft)	343	866	866		600	600
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				100		
Storage Blk Time (%)			1	11		
Queuing Penalty (veh)			3	23		

Intersection: 610: Lexington Ave & University Ave

Movement	EB	EB	EB	WB	WB	SB
Directions Served	L	T	TR	Т	TR	R
Maximum Queue (ft)	142	158	108	103	41	49
Average Queue (ft)	53	67	24	49	6	12
95th Queue (ft)	110	123	70	95	23	37
Link Distance (ft)		561	561	836	836	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	275					150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 639: St Anthony Ave

Movement	NW
Directions Served	L
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	742
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	301	352	349	365	279	242	184	199	183	250	525	374
Average Queue (ft)	165	198	120	181	181	126	89	81	82	149	271	235
95th Queue (ft)	252	297	254	317	265	219	153	149	148	285	426	342
Link Distance (ft)	443	443	443	443	241	241	241	241			1203	1203
Upstream Blk Time (%)		0	0	0	2	0	0	0				
Queuing Penalty (veh)		0	0	0	6	0	0	0				
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)									0	0	20	
Queuing Penalty (veh)									0	1	136	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	157
Average Queue (ft)	44
95th Queue (ft)	121
Link Distance (ft)	1203
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	Т
Maximum Queue (ft)	156	36
Average Queue (ft)	10	1
95th Queue (ft)	72	14
Link Distance (ft)	222	222
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Movement	EB	EB	SE
Directions Served	Ţ	T	L
Maximum Queue (ft)	19	6	103
Average Queue (ft)	2	0	6
95th Queue (ft)	18	7	60
Link Distance (ft)	711	711	715
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	T	T	T	T	R	L	L	T
Maximum Queue (ft)	350	449	423	433	181	275	533	433	200	250	234	249
Average Queue (ft)	171	280	226	269	98	138	242	223	117	135	121	124
95th Queue (ft)	285	414	388	418	162	276	416	357	235	226	208	216
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)		1	1	0			0			1	0	0
Queuing Penalty (veh)		3	3	2			0			3	1	1
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					5	5	36	30	1			
Queuing Penalty (veh)					13	12	190	51	4			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	248
Average Queue (ft)	122
95th Queue (ft)	223
Link Distance (ft)	241
Upstream Blk Time (%)	0
Queuing Penalty (veh)	1
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

Movement	EB
Directions Served	Т
Maximum Queue (ft)	11
Average Queue (ft)	1
95th Queue (ft)	11
Link Distance (ft)	104
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 4667

Appendix D Event Mode Share

DRAFT - For Discussion Purposes Only!

2018 - 20,000 Capacity Event Trip Generation and Modal Split

24-May-16

		ļ_	Weekday	Weekday	L	Saturday	Saturday
	Stadium Capacity	-	6-7PM	9-10PM	_	1-2PM	4-5PM
			20,000	20,000		20,000	20,00
<u>Notes</u>	Modes						
١	Walk (Home or Work to Event)	3.0%	600	600	5.0%	1,000	1,00
	- Surrounding neighborhood	3.0%	600	600	5.0%	1,000	1,0
	- On-Site Apartments	0.0%	-	-	0.0%	-	-
	- Hotel	0.0%	-	-	0.0%	400	-
	Bike	2.0%	400	400	2.0% 0.0%	400	40
	Express Bus Charter Bus (Destination - Rochester to Event)	0.0% 1.0%	200	200	3.0%	600	- 60
	Shuttle Bus (Circulator to business)	2.0%	400	400	3.0%	600	60
	Metro Transit - Regular Service	1.5%	300	300	1.5%	300	30
	Taxi / Limo	0.5%	100	100	0.5%	100	10
	Total (Not from Auto or LRT/BRT)	0.5%	2,000	2,000	0.5%	3,000	3,00
	% (Not from Auto or LRT/BRT)	10%	10%	10%	15%	15%	15
	// (Not nom Auto of Ext/Bitt)	10/6	1070	1070	13/0	1570	
	Parking Spaces Available		400	400		400	40
	-Dedicated Event Spaces		400	400		400	4
	Average Auto Occupancy		2.75	2.75		2.75	2.7
	Arrive by Auto to Site	5.5%	1,100	1,100	5.5%	1,100	1,10
			2,200	=,===		-,	
	Auto Arrival/Departure in Peak Hour		85%	95%		75%	95
	Autos in Peak Hour		340	380		300	38
	Patrons using Transit (A-Line/LRT)	34.8%	6,960	6,960	34.8%	6,960	6,96
	NB	1.8%	360	360		360	30
	SB	1.8%	360	360		360	3
	EB	14.4%	2,880	2,880		2,880	2,8
	WB	16.8%	3,360	3,360		3,360	3,30
ì	"A" Line Snelling BRT						
	NB Capacity Available (per hour)		360	360		360	36
	- Capacity of Vehicle		70	70		70	7
	- Existing use		10	10		10	1
	- Frequency of Service		6	6		6	
	Hours Needed NB		1.0	1.0		1.0	1.
	SB Capacity Available (per hour)		360	360		360	36
	- Capacity of Vehicle		70	70		70	7
	- Existing use		10	10		10	1
	- Frequency of Service		6	6		6	
	Hours Needed SB		1.0	1.0		1.0	1
l	LRT						
	EB Capacity Available (per hour)		2,880	2,880		2,880	2,88
	- Capacity of Vehicle		540	540		540	54
	- Existing use		60	60		60	6
	- Frequency of Service		6	6		6	
	Hours Needed EB		1.0	1.0		1.0	1.
	WB Capacity Available (per hour)		3,360	3,360		3,360	3,36
	- Capacity of Vehicle		540	540		540	54
	- Existing use		60	60		60	
	- Frequency of Service		7	7		7	
	Hours Needed WB		1.0	1.0		1.0	1.
	Remaining	49.7%	9,940	9,940	44.7%	8,940	8,94
	Shuttle Service to remote PnR	44.9%	8,978	-	39.9%	7,978	-
	Adjacent Parking	4.8%	963	963	4.8%	963	96

ı	Ν	0	Т	E	S
ı					

 $\ \, \text{Event patrons within 1 mile walking radius (1\% of population)} \, \text{-} \, \text{Three times as likely to attend match on weekday } \\$ Walk and 5 times as likely on weekend. $% \label{eq:condition} % \label{$

Bike Estimated from Twins

Express Bus No express bus service has been identified - MVTA or SW or Metro Transit

Charter Bus

Local Shuttle Bus Conservative Estimate

 ${\tt DRAFT-Weekdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ Saturdays\ are\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ an\ hour,\ but\ after\ 9pm\ twice\ per\ hour;\ six\ times\ per\ hour;\ per\ hour;\ six\ times\ per\ hour;$ "A" Line Snelling BRT

between 7:30 to 9:30 3 to 4 times an hour and after 9:30 twice an hour (Crush Capacity 70 passengers) DRAFT - Route 84 (Snelling) - 3 times an hour; Route 16 (University) - 2 times an hour; Route 21 - 3 time pr hour

Metro Transit Assumption 20 patrons per bus per direction

LRT has 6 LRT trains in each direction with capacity for 540 people in each direction. One additional WB LRT

assumed due to attendance imbalance

Taxi/Limo Small number of event patrons

Auto occupancy can range from 2.5 to 3.0. 2.75 has been the typical range used on the other stadium studies. Auto Occupancy

Can be influenced by TMP Strategies.

Twins Ballpark Data and other local sporting events Arrival/Departure

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2035 - 25,500 Capacity Event Trip Generation and Modal Split

24-May-16

		L	Weekday	Weekday		Saturday	Saturday
	Stadium Capacity		6-7PM	9-10PM		1-2PM	4-5PM
			25,500	25,500		25,500	25,5
tes	Modes						
	Walk (Home or Work to Event)	6.9%	1,770	1,770	9.2%	2,345	2,3
	- Surrounding neighborhood	4.0%	1,020	1,020	6.0%	1,530	1
	- On-Site Work	1.0%	250	250	0.2%	50	
	- On-Site Apartments	0.5%	125	125	0.5%	125	
	- Hotel	1.5%	375	375	2.5%	640	
	Bike	2.0%	500	500	2.0%	500	
	Express Bus	0.0%	300	300	0.0%	300	
		1.0%	250	250	3.0%	765	
	Charter Bus (Destination - Rochester to Event)	2.0%	500	500	2.0%	500	
	Shuttle Bus (Circulator to business)						
	Metro Transit - Regular Service	1.5%	375	375	1.5%	375	
	Taxi / Limo	0.5%	120	120	0.5%	120	
	Total (Not from Auto or LRT/BRT)		3,515	3,515		4,605	4
	% (Not from Auto or LRT/BRT)	14%	14%	14%	18%	18%	
	Parking Spaces Available		2,050	2,050		2,050	2
	-Dedicated Event Spaces		190	190		190	
	- Available on-site Block A (755 Office Spaces - 0% for events)		-	-		-	
	- Available on-site Block B (665 Office Spaces - 0% for events)		-	-		-	
	- Available on-site Block C (735 Office Spaces - 100% for events)		1,860	1,860		1,860	
	Average Auto Occupancy		2.75	2.75		2.75	
	Arrive by Auto to Site	22.1%	5,638	5,638	22.1%	5,638	5
	Auto Arrival/Departure in Peak Hour		70%	95%		65%	
	Autos in Peak Hour		1,435	1,948		1,333	1
	Patrons using Transit (A-Line/LRT)	27.3%	6,960	6,960	27.3%	6,960	6
	NB	1.4%	360	360		360	
	SB	1.4%	360	360		360	
	EB	11.3%	2,880	2,880		2,880	- 2
	WB	13.2%	3,360	3,360		3,360	
			,,,,,,	-,,		.,	
	"A" Line Snelling BRT						
	NB Capacity Available (per hour)		360	360		360	
	- Capacity of Vehicle	-	70	70	-	70	
	- Existing use		10	10		10	
	- Existing use - Frequency of Service		6	6		6	
			1.0	1.0		1.0	
	Hours Needed NB	-	1.0	1.0		1.0	
	SB Capacity Available (per hour)		360	360		360	
	- Capacity of Vehicle		70	70		70	
	- Existing use		10	10		10	
	- Frequency of Service		6	6		6	
	Hours Needed SB		1.0	1.0		1.0	
	LRT						
	EB Capacity Available (per hour)		2,880	2,880		2,880	2
	- Capacity of Vehicle		540	540		540	
	- Existing use	Ī	60	60	j	60	
	- Frequency of Service	Ī	6	6	j	6	
	Hours Needed EB		1.0	1.0		1.0	
	1		-				
	WB Capacity Available (per hour)	-	3,360	3,360		3,360	3
	- Capacity of Vehicle	+	540	540	+	540	
	- Existing use	-	60	60	-	60	
			7	7		7	
	- Frequency of Service						
	Hours Needed WB	-	1.0	1.0		1.0	
	Remaining	36.8%	9,388	9,388	32.5%	8,298	8,
	Shuttle Service to remote PnR	32.3%	8,233	-	28.0%	7,143	
_	Adjacent Parking	4.5%	1,155	1,155	4.5%	1,155	1

Walk weekday and 5 times as likely on weekend.

Bike Estimated from Twins

Express Bus No express bus service has been identified - $\ensuremath{\mathsf{MVTA}}$ or $\ensuremath{\mathsf{SW}}$ or $\ensuremath{\mathsf{Metro}}$ Transit

Charter Bus Conservative Estimate Local Shuttle Bus Conservative Estimate

LRT

DRAFT - Weekdays are six times an hour, but after 9pm twice per hour; Saturdays are six times an hour, but "A" Line Snelling BRT DRAFT - Route 84 (Snelling) - 3 times an hour; Route 16 (University) - 2 times an hour; Route 21 - 3 time pr hour

Metro Transit Assumption 20 patrons per bus per direction

LRT has 6 LRT trains in each direction with capacity for 540 people in each direction. One additional WB

assumed due to attendance imbalance

Taxi/Limo Small number of event patrons

Auto occupancy can range from 2.5 to 3.0. 2.75 has been the typical range used on the other stadium studies. Auto Occupancy

Can be influenced by TMP Strategies.

Arrival/Departure Twins Ballpark Data and other local sporting events

Appendix E Year of Opening Event Analysis

110: Fry Street & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	2.0	2.0	0.4
Total Del/Veh (s)	7.0	7.1	36.7	25.8	10.2

200: Snelling Ave & Thomas Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.8	1.5	0.0	0.4	0.4
Total Del/Veh (s)	29.3	21.2	11.8	8.6	12.6

210: Snelling Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	27.0	30.6	27.6	31.0	29.2

220: Snelling Ave & Spruce Tree Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	16.4	12.1	9.7	13.7	11.9

230: Snelling Ave & Shields Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.6	0.0	0.0	0.0
Total Del/Veh (s)	32.1	39.9	18.2	23.8	21.3

239: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.3	0.7	0.9

240: Snelling Ave & St Anthony Ave Performance by approach

241: St Anthony Ave Performance by approach

Approach	WB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	3.8	3.8

249: Concordia Ave Performance by approach

Approach	EB	SE	All
Denied Del/Veh (s)	0.1	0.0	0.0
Total Del/Veh (s)	0.3	7.7	7.7

250: Snelling Ave & Concordia Ave Performance by approach

Approach	EB	NB	SB	All
Approacri	0.0	0.0	0.0	
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	32.6	31.5	22.8	29.7

251: Concordia Ave Performance by approach

Approach	EB All
Denied Del/Veh (s)	h (s) 0.0 0.0
Total Del/Veh (s)	(s) 3.4 3.4

260: Snelling Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	2.0	0.0	0.0	0.0	0.3
Total Del/Veh (s)	24.5	22.1	13.0	20.5	18.8

270: Snelling Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.3	0.7	0.3	0.0	0.3
Total Del/Veh (s)	29.1	25.9	27.8	9.0	18.9

310: West Midway Shopping Entrance & University Ave Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.4	0.4	3.6	1.1

315: East Midway Shopping Entrance & University Ave Performance by approach

410: University Ave & Pascal St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.7	0.1
Total Del/Veh (s)	11.5	13.3	23.6	32.0	15.7

415: Pascal St & North Midway Shopping Entrance Performance by approach

Approach	pproach EE	NB	SB	All
Denied Del/Veh (s)	enied Del/Veh (s) 2.9	0.0	0.0	0.7
Total Del/Veh (s)		2.0	1.2	2.9

420: Pascal St & North Walmart/Cub Entrance Performance by approach

Approach	roach WB NB	SB	All
Denied Del/Veh (s)	nied Del/Veh (s) 0.2 0.0	0.0	0.1
Total Del/Veh (s)	. ,	2.6	4.4

425: Pascal St & South Midway Shopping Entrance Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

430: Pascal St & South Cub Entrance Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	2.7	0.0	0.0	0.4
Total Del/Veh (s)	20.1	2.3	2.7	4.7

435: Pascal St & Empty St. Paul Lot Entrance Performance by approach

440: Pascal St & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	13.8	35.4	23.4	23.3

450: Pascal St & Concordia Ave Performance by approach

451: Concordia Ave Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

460: Pascal St & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	4.2	3.1	8.9	11.2	4.9

510: Hamline Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.3	0.0	0.7	0.5
Total Del/Veh (s)	20.8	25.9	25.2	30.1	24.6

520: Hamline Ave & Midway Market Place Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.2	2.4	0.0	0.0	0.5
Total Del/Veh (s)	18.3	26.2	6.2	7.4	11.0

539: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.2	8.0	0.5

540: Hamline Ave & St Anthony Ave Performance by approach

Approach	WB NE	SB SB	All
Denied Del/Veh (s)	0.0 0.0	0.0	0.0
Total Del/Veh (s)	18.5 10.1		14.5

550: Hamline Ave & Concordia Ave Performance by approach

Approach	EB NB SE	All
Denied Del/Veh (s)	0.0 0.0 0.0	0.0
Total Del/Veh (s)	15.9 12.8 6.6	10.6

560: Hamline Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.7	0.0	0.0	0.1
Total Del/Veh (s)	23.2	23.3	17.3	13.7	18.0

570: Hamline Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.5	1.5	0.0	0.0	0.2
Total Del/Veh (s)	27.8	23.1	3.7	4.5	8.4

580: Hamline Ave & Ashland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0
Total Del/Veh (s)	27.6	4.5	8.4	10.8

590: Ayd Mill Rd & Ashland Ave Performance by approach

Approach	EB	NB	SB	All
ipproderi		110	0.1	7 (1)
Denied Del/Veh (s)	0.0	2.1	0.1	1.1
Total Del/Veh (s)	1.2	9.5	18.7	10.3

610: Lexington Ave & University Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.4	0.0	3.4	0.1
Total Del/Veh (s)	37.7	1.0	1.6	2.0

639: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.1	0.2	0.2
Total Del/Veh (s)	0.2	0.7	0.5

640: Lexington Ave & St Anthony Ave Performance by approach

Approach	WB NB	SB	All
Denied Del/Veh (s)	0.0 0.0	1.0	0.3
Total Del/Veh (s)	25.3 9.5	11.1	14.1

641: St Anthony Ave Performance by approach

Approach	WB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	4.5	4.5

649: Concordia Ave Performance by approach

Approach	EB	SE	All
Denied Del/Veh (s)	0.2	0.3	0.2
Total Del/Veh (s)	0.2	1.0	0.7

650: Lexington Ave & Concordia Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	1.4	0.0	0.5
Total Del/Veh (s)	23.1	18.3	12.5	18.3

651: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	2.7	2.7

Total Network Performance

Denied Del/Veh (s)	1.8	
Total Del/Veh (s)	60.0	

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	46	114	132	51	47	72	92	82	52	50	
Average Queue (ft)	10	37	41	13	11	20	31	29	13	13	
95th Queue (ft)	33	90	97	37	36	56	73	64	42	44	
Link Distance (ft)		1035	1035		569	569		467	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)							0		14	1	
Queuing Penalty (veh)							0		1	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	Т	TR	L	T	T	R	
Maximum Queue (ft)	166	75	123	74	109	248	263	42	244	192	89	
Average Queue (ft)	88	23	53	30	32	74	93	12	124	81	15	
95th Queue (ft)	148	70	103	69	82	197	213	38	213	161	56	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	54	3	38	6		1			1	1	0	
Queuing Penalty (veh)	15	4	17	5		0			0	0	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	91	160	175	216	106	170	114	261	258	125	224	362
Average Queue (ft)	41	59	85	94	44	72	51	167	185	66	98	190
95th Queue (ft)	82	119	146	174	90	132	92	278	295	148	201	311
Link Distance (ft)		569	569	212	212	212	208	208	208			1213
Upstream Blk Time (%)				1				6	12			
Queuing Penalty (veh)				2				16	31			
Storage Bay Dist (ft)	250									75	125	
Storage Blk Time (%)		0							37	0	1	23
Queuing Penalty (veh)		0							25	1	4	33

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	339	190
Average Queue (ft)	190	23
95th Queue (ft)	305	86
Link Distance (ft)	1213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		175
Storage Blk Time (%)	13	
Queuing Penalty (veh)	5	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	EB	WB	NB	NB	NB	NB	SB	SB	
Directions Served	R	R	Т	T	T	R	T	TR	
Maximum Queue (ft)	85	57	97	248	264	57	234	226	
Average Queue (ft)	36	17	14	72	86	11	119	120	
95th Queue (ft)	72	42	64	203	233	40	256	259	
Link Distance (ft)	553	602		215	215	215	208	208	
Upstream Blk Time (%)				1	2		4	4	
Queuing Penalty (veh)				4	6		18	21	
Storage Bay Dist (ft)			50						
Storage Blk Time (%)			2	13					
Queuing Penalty (veh)			4	33					

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	
Directions Served	LTR	L	LTR	L	Т	T	TR	L	T	TR	
Maximum Queue (ft)	77	72	110	274	583	662	358	174	250	265	
Average Queue (ft)	30	23	47	155	123	166	89	71	172	180	
95th Queue (ft)	62	55	86	249	353	461	228	156	278	284	
Link Distance (ft)	909		1792		644	644	644		215	215	
Upstream Blk Time (%)					0	0			10	11	
Queuing Penalty (veh)					0	1			47	54	
Storage Bay Dist (ft)		300		200				100			
Storage Blk Time (%)				5	1			3	24		
Queuing Penalty (veh)				15	4			13	16		

Intersection: 239: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	T	T	T
Maximum Queue (ft)	156	179	145	11	224	221	268	272	179	237	287	281
Average Queue (ft)	74	108	47	0	144	105	223	229	66	74	125	134
95th Queue (ft)	135	162	108	8	203	193	302	295	139	160	245	246
Link Distance (ft)	450	450	450	450	233	233	233	233			644	644
Upstream Blk Time (%)					0	0	13	13				
Queuing Penalty (veh)					1	1	48	49				
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											1	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	111
Average Queue (ft)	5
95th Queue (ft)	48
Link Distance (ft)	644
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement	WB
Directions Served	L
Maximum Queue (ft)	46
Average Queue (ft)	2
95th Queue (ft)	28
Link Distance (ft)	202
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 249: Concordia Ave

Movement	SE	SE
Directions Served	L	L
Maximum Queue (ft)	322	396
Average Queue (ft)	40	60
95th Queue (ft)	257	316
Link Distance (ft)	781	781
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 250: Snelling Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	B5	SB	SB
Directions Served	L	LT	T	R	T	T	T	T	R	T	L	L
Maximum Queue (ft)	461	481	403	160	209	243	289	289	177	15	190	189
Average Queue (ft)	247	274	188	6	99	120	163	176	76	1	95	97
95th Queue (ft)	477	486	438	84	169	222	251	261	138	8	164	169
Link Distance (ft)	436	436	436				291	291	291	595	233	233
Upstream Blk Time (%)	8	7	2				0	0			0	0
Queuing Penalty (veh)	41	35	9				1	1			0	0
Storage Bay Dist (ft)				100	190	190						
Storage Blk Time (%)			2		0	1	5					
Queuing Penalty (veh)			11		0	3	23					

Intersection: 250: Snelling Ave & Concordia Ave

Movement	SB	SB
Directions Served	Ţ	T
Maximum Queue (ft)	262	254
Average Queue (ft)	161	170
95th Queue (ft)	268	267
Link Distance (ft)	233	233
Upstream Blk Time (%)	2	1
Queuing Penalty (veh)	4	3
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 251: Concordia Ave

Movement	
Directions Served	
Maximum Queue (ft)	
Average Queue (ft)	
95th Queue (ft)	
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	T
Maximum Queue (ft)	170	198	86	78	204	145	49	210	205	100	199	359
Average Queue (ft)	75	113	16	32	93	29	15	90	107	27	28	200
95th Queue (ft)	135	188	52	65	168	79	40	165	188	86	107	337
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)		1			1			2	19	0		20
Queuing Penalty (veh)		3			1			1	16	0		5

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5
Directions Served	T	R	T	T	
Maximum Queue (ft)	366	150	259	267	65
Average Queue (ft)	212	67	22	27	3
95th Queue (ft)	351	172	138	158	48
Link Distance (ft)	595		291	291	291
Upstream Blk Time (%)			0	0	0
Queuing Penalty (veh)			0	0	0
Storage Bay Dist (ft)		100			
Storage Blk Time (%)	26				
Queuing Penalty (veh)	26				

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	130	152	119	310	174	303	284	232	164	115	
Average Queue (ft)	46	76	27	163	34	174	167	118	32	41	
95th Queue (ft)	106	134	80	276	100	255	251	202	96	89	
Link Distance (ft)		609		930		564	564		602	602	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)		0		6	1	20		1			
Queuing Penalty (veh)		0		2	2	5		5			

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	51
Average Queue (ft)	25
95th Queue (ft)	49
Link Distance (ft)	499
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	54
Average Queue (ft)	26
95th Queue (ft)	50
Link Distance (ft)	439
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	65	111	138	153	70	75	79	80	59	144	74	
Average Queue (ft)	19	51	73	67	24	22	46	39	29	61	15	
95th Queue (ft)	51	93	125	132	56	56	84	77	52	120	52	
Link Distance (ft)		386	386		1220	1220	77	77	77	729		
Upstream Blk Time (%)							7	4	0			
Queuing Penalty (veh)							4	2	0			
Storage Bay Dist (ft)	225			250							25	
Storage Blk Time (%)										44	1	
Queuing Penalty (veh)										5	1	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	EB	NB	NB	SB
Directions Served	L	R	LT	T	TR
Maximum Queue (ft)	52	85	74	46	18
Average Queue (ft)	25	36	19	3	1
95th Queue (ft)	49	61	56	22	9
Link Distance (ft)	494			404	77
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		200	200		
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (ft)	159	22	84	42
Average Queue (ft)	61	1	28	2
95th Queue (ft)	122	8	65	19
Link Distance (ft)	778	49		404
Upstream Blk Time (%)		0		
Queuing Penalty (veh)		0		
Storage Bay Dist (ft)			125	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 425: Pascal St & South Midway Shopping Entrance

Movement	EB	EB	NB	NB	SB	
Directions Served	L	R	L	T	TR	
Maximum Queue (ft)	35	40	72	151	60	
Average Queue (ft)	7	13	58	55	27	
95th Queue (ft)	28	37	81	148	58	
Link Distance (ft)		2305		100	49	
Upstream Blk Time (%)				3	1	
Queuing Penalty (veh)				18	3	
Storage Bay Dist (ft)	300		45			
Storage Blk Time (%)			13	0		
Queuing Penalty (veh)			20	2		

Intersection: 430: Pascal St & South Cub Entrance

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	92	127	79	49	18
Average Queue (ft)	45	30	16	15	1
95th Queue (ft)	80	75	65	44	9
Link Distance (ft)		798	74		100
Upstream Blk Time (%)			2		
Queuing Penalty (veh)			10		
Storage Bay Dist (ft)	75			40	
Storage Blk Time (%)	4	0		2	0
Queuing Penalty (veh)	2	0		3	0

Intersection: 435: Pascal St & Empty St. Paul Lot Entrance

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	31	144	66
Average Queue (ft)	4	14	9
95th Queue (ft)	19	78	43
Link Distance (ft)	734	179	74
Upstream Blk Time (%)		0	0
Queuing Penalty (veh)		0	1
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	T	R
Maximum Queue (ft)	184	256	130	291	184	75
Average Queue (ft)	77	98	15	230	117	32
95th Queue (ft)	157	198	73	328	194	83
Link Distance (ft)	1228	1228		276	179	
Upstream Blk Time (%)				8	3	
Queuing Penalty (veh)				35	9	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				39	35	0
Queuing Penalty (veh)				3	20	1

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB
Directions Served	LT	TR	TR	L	T
Maximum Queue (ft)	279	166	128	122	100
Average Queue (ft)	106	43	56	60	48
95th Queue (ft)	200	111	98	105	82
Link Distance (ft)	676	676	947		276
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				100	
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				1	0

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	WB	NB	SB	
Directions Served	L	L	TR	LTR	LTR	
Maximum Queue (ft)	76	6	20	31	114	
Average Queue (ft)	24	0	1	9	50	
95th Queue (ft)	58	4	9	32	90	
Link Distance (ft)			1247	350	947	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	Т	TR	L	T	R	L	TR
Maximum Queue (ft)	91	173	182	178	151	111	173	264	94	149	259
Average Queue (ft)	38	80	97	101	73	41	68	122	31	29	127
95th Queue (ft)	80	150	164	168	137	95	138	226	71	97	222
Link Distance (ft)		1220	1220		782	782		315	315		606
Upstream Blk Time (%)								0			
Queuing Penalty (veh)								0			
Storage Bay Dist (ft)	275			275			140			100	
Storage Blk Time (%)							1	8			16
Queuing Penalty (veh)							2	8			4

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	107	128	162	121	107	171	95	127	97	124	
Average Queue (ft)	34	52	86	49	41	63	28	48	24	46	
95th Queue (ft)	82	104	144	101	87	135	70	98	68	95	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)	0	1	0		1	6		0			
Queuing Penalty (veh)	0	0	0		2	5		0			

Intersection: 539: St Anthony Ave

Movement	
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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LT	T	R	LT	T	Т	TR
Maximum Queue (ft)	141	166	152	107	192	132	163	187
Average Queue (ft)	77	103	87	59	91	46	84	91
95th Queue (ft)	127	155	143	94	160	99	146	159
Link Distance (ft)	377	377	377	377	249	249	792	792
Upstream Blk Time (%)					0	0		
Queuing Penalty (veh)					0	0		
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB		
Directions Served	LT	T	R	T	TR	LT	T		
Maximum Queue (ft)	164	99	72	182	138	132	125		
Average Queue (ft)	76	35	41	75	56	78	64		
95th Queue (ft)	132	70	73	136	111	123	115		
Link Distance (ft)	937	937		942	942	249	249		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			25						
Storage Blk Time (%)		21	12						
Queuing Penalty (veh)		22	4						

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	95	241	76	213	212	214	143	157	
Average Queue (ft)	39	116	22	105	110	101	64	75	
95th Queue (ft)	81	206	55	174	178	175	113	129	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		1		2					
Queuing Penalty (veh)		1		1					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	LT	R	LT	R	LT	TR	LT	TR
Maximum Queue (ft)	144	59	140	98	88	83	110	80
Average Queue (ft)	63	12	66	30	32	19	37	21
95th Queue (ft)	120	45	120	69	69	51	82	56
Link Distance (ft)	1319		651		947	947	612	612
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		50		50				
Storage Blk Time (%)	22	0	25	1				
Queuing Penalty (veh)	3	0	13	1				

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	T	TR	LT	T
Maximum Queue (ft)	115	106	120	81	146	130
Average Queue (ft)	55	42	46	19	67	55
95th Queue (ft)	95	87	93	55	118	110
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	TR
Maximum Queue (ft)	94	60	140	142	101
Average Queue (ft)	36	10	58	76	18
95th Queue (ft)	73	36	115	127	57
Link Distance (ft)	866	866		600	600
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)			1		
Queuing Penalty (veh)			1		

Intersection: 610: Lexington Ave & University Ave

Movement	WB	WB	WB	SB	SB	SB
Directions Served	L	T	TR	T	T	R
Maximum Queue (ft)	23	55	24	16	11	38
Average Queue (ft)	2	18	2	1	0	5
95th Queue (ft)	12	46	14	7	4	23
Link Distance (ft)		836	836	617	617	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	275					150
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 639: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	Т	T	T
Maximum Queue (ft)	166	218	150	207	242	181	154	134	118	123	176	149
Average Queue (ft)	84	124	47	94	122	64	56	49	55	35	88	70
95th Queue (ft)	143	191	117	157	197	125	126	113	103	81	152	132
Link Distance (ft)	443	443	443	443	241	241	241	241			1203	1203
Upstream Blk Time (%)					0	0						
Queuing Penalty (veh)					0	0						
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)									0	0	0	
Queuing Penalty (veh)									0	0	0	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	85
Average Queue (ft)	10
95th Queue (ft)	50
Link Distance (ft)	1203
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	T
Maximum Queue (ft)	45	11
Average Queue (ft)	2	0
95th Queue (ft)	17	8
Link Distance (ft)	222	222
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Movement Control of the Control of t
virections Served
Maximum Queue (ft)
verage Queue (ft)
5th Queue (ft)
ink Distance (ft)
lpstream Blk Time (%)
Dueuing Penalty (veh)
torage Bay Dist (ft)
torage Blk Time (%)
Queuing Penalty (veh)
Queuing Penalty (veh)

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	T	T	Т	T	R	L	L	T
Maximum Queue (ft)	239	277	199	180	150	154	219	193	138	192	124	121
Average Queue (ft)	154	179	79	82	73	59	119	98	48	98	54	43
95th Queue (ft)	222	255	172	143	129	114	200	175	99	164	102	93
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					1	0	8	3	0			
Queuing Penalty (veh)					3	1	34	6	1			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	105
Average Queue (ft)	31
95th Queue (ft)	82
Link Distance (ft)	241
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 950

110: Fry Street & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	1.9	3.8	0.5
Total Del/Veh (s)	5.5	4.9	34.3	7.0	8.1

200: Snelling Ave & Thomas Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.8	1.5	0.0	0.5	0.4
Total Del/Veh (s)	28.7	24.4	12.0	7.0	12.4

210: Snelling Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.0
Total Del/Veh (s)	23.9	24.8	26.7	31.6	27.6

220: Snelling Ave & Spruce Tree Rd Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	5.8	16.7	11.4

230: Snelling Ave & Shields Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.9	1.3	0.0	0.0	0.4
Total Del/Veh (s)	28.0	20.7	38.5	34.8	32.4

239: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.0	0.2	0.1
Total Del/Veh (s)	11.9	19.1	15.2

240: Snelling Ave & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.1
Total Del/Veh (s)	69.9	22.6	22.2	35.3

241: St Anthony Ave Performance by approach

Approach	WB A
Denied Del/Veh (s)	0.0 0.0
Total Del/Veh (s)	8.4 8.4

249: Concordia Ave Performance by approach

Approach	EB	SE	All
Denied Del/Veh (s)	0.1	0.4	0.4
Total Del/Veh (s)	0.0	1.2	1.1

250: Snelling Ave & Concordia Ave Performance by approach

251: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	4.2	4.2

260: Snelling Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.9	0.0	0.0	0.0	0.3
Total Del/Veh (s)	23.9	22.6	7.8	19.5	16.8

270: Snelling Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.0	0.6	0.3	0.0	0.3
Total Del/Veh (s)	31.4	24.9	25.9	9.1	18.6

310: West Midway Shopping Entrance & University Ave Performance by approach

Approach	EB WB	All
Denied Del/Veh (s)	0.0 0.0	0.0
Total Del/Veh (s)	1.2 0.4	0.8

315: East Midway Shopping Entrance & University Ave Performance by approach

410: University Ave & Pascal St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.3	0.1
Total Del/Veh (s)	12.0	11.9	25.7	36.2	17.5

415: Pascal St & North Midway Shopping Entrance Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	2.6	0.0	0.0	0.5
Total Del/Veh (s)	7.4	3.3	1.4	3.3

420: Pascal St & North Walmart/Cub Entrance Performance by approach

425: Pascal St & South Midway Shopping Entrance Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

430: Pascal St & South Cub Entrance Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	2.6	0.0	0.0	0.4
Total Del/Veh (s)	12.3	1.1	2.9	3.7

435: Pascal St & Empty St. Paul Lot Entrance Performance by approach

Approach	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.6	3.4	2.8

440: Pascal St & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	14.2	31.0	20.0	19.6

450: Pascal St & Concordia Ave Performance by approach

451: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	1.3	1.3

460: Pascal St & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	3.7	2.5	6.4	9.8	4.4

510: Hamline Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.4	0.0	0.6	0.5
Total Del/Veh (s)	19.3	25.9	24.5	28.1	23.6

520: Hamline Ave & Midway Market Place Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.1	2.3	0.0	0.0	0.5
Total Del/Veh (s)	20.0	25.7	5.3	6.1	10.3

539: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.1	0.5	0.3

540: Hamline Ave & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	17.9	7.2	10.2	12.2

550: Hamline Ave & Concordia Ave Performance by approach

Approach	proach EB NB SB	All
Denied Del/Veh (s)	nied Del/Veh (s) 0.0 0.0 0.0	0.0
Total Del/Veh (s)	• • • • • • • • • • • • • • • • • • • •	11.6

560: Hamline Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.6	0.0	0.0	0.1
Total Del/Veh (s)	23.6	20.8	17.5	13.2	17.7

570: Hamline Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.4	1.3	0.0	0.0	0.2
Total Del/Veh (s)	26.9	25.1	2.9	4.3	8.3

580: Hamline Ave & Ashland Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.0
Total Del/Veh (s)	27.6	4.0	7.3	10.7

590: Ayd Mill Rd & Ashland Ave Performance by approach

610: Lexington Ave & University Ave Performance by approach

Approach	EB	NB	All
Denied Del/Veh (s)	2.0	0.0	0.1
Total Del/Veh (s)	41.3	8.0	2.4

639: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.1	0.2	0.2
Total Del/Veh (s)	0.1	0.6	0.4

640: Lexington Ave & St Anthony Ave Performance by approach

641: St Anthony Ave Performance by approach

Approach	WB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	4.6	4.6

649: Concordia Ave Performance by approach

650: Lexington Ave & Concordia Ave Performance by approach

651: Concordia Ave Performance by approach

Approach	EB	All	
Denied Del/Veh (s)	0.0	0.0	
Total Del/Veh (s)	3.1	3.1	

Total Network Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	59.3

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	T	TR	L	TR	LT	R	
Maximum Queue (ft)	43	69	84	86	72	68	70	48	53	
Average Queue (ft)	11	20	22	18	23	28	31	5	22	
95th Queue (ft)	34	55	61	57	61	63	63	26	54	
Link Distance (ft)		1035	1035	570	570		259	508		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	250					125			25	
Storage Blk Time (%)								3	3	
Queuing Penalty (veh)								1	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	Т	TR	L	T	T	R	
Maximum Queue (ft)	163	75	107	73	76	284	315	60	212	160	52	
Average Queue (ft)	79	24	48	25	24	81	99	20	91	52	7	
95th Queue (ft)	138	71	90	67	56	205	224	48	164	119	34	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	54	3	41	4		1			0	0	0	
Queuing Penalty (veh)	13	4	16	3		1			0	0	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	T	R	L	T
Maximum Queue (ft)	87	131	168	152	129	160	134	257	267	125	224	317
Average Queue (ft)	31	50	77	72	51	82	55	156	170	57	68	158
95th Queue (ft)	70	99	141	131	102	146	110	283	295	139	153	276
Link Distance (ft)		570	570	212	212	212	220	220	220			1213
Upstream Blk Time (%)						0		8	10			
Queuing Penalty (veh)						0		21	27			
Storage Bay Dist (ft)	250									75	125	
Storage Blk Time (%)									30	1	0	17
Queuing Penalty (veh)									21	2	1	17

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	321	126
Average Queue (ft)	162	30
95th Queue (ft)	278	98
Link Distance (ft)	1213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		175
Storage Blk Time (%)	9	
Queuing Penalty (veh)	4	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Directions Served T	Movement	NB	NB	NB	SB	SB	
Average Queue (ft) 4 26 43 136 147 95th Queue (ft) 27 96 128 264 275 Link Distance (ft) 203 203 220 220 Upstream Blk Time (%) 0 0 4 5 Queuing Penalty (veh) 0 0 15 21 Storage Bay Dist (ft) 50 Storage Blk Time (%) 0 5	Directions Served	T	T	T	T	TR	
95th Queue (ft) 27 96 128 264 275 Link Distance (ft) 203 203 220 220 Upstream Blk Time (%) 0 0 4 5 Queuing Penalty (veh) 0 0 15 21 Storage Bay Dist (ft) 50 Storage Blk Time (%) 0 5	Maximum Queue (ft)	52	162	194	231	238	
Link Distance (ft) 203 203 220 220 Upstream Blk Time (%) 0 0 4 5 Queuing Penalty (veh) 0 0 15 21 Storage Bay Dist (ft) 50 Storage Blk Time (%) 0 5	Average Queue (ft)	4	26	43	136	147	
Upstream Blk Time (%) 0 0 4 5 Queuing Penalty (veh) 0 0 15 21 Storage Bay Dist (ft) 50 Storage Blk Time (%) 0 5	95th Queue (ft)	27	96	128	264	275	
Queuing Penalty (veh)001521Storage Bay Dist (ft)50Storage Blk Time (%)05	Link Distance (ft)		203	203	220	220	
Storage Bay Dist (ft) 50 Storage Blk Time (%) 5	Upstream Blk Time (%)		0	0	4	5	
Storage Blk Time (%) 0 5			0	0	15	21	
	Storage Bay Dist (ft)	50					
Queuing Penalty (veh) 0 14	Storage Blk Time (%)	0	5				
	Queuing Penalty (veh)	0	14				

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LT	R	L	Т	Т	TR	L	Т	TR
Maximum Queue (ft)	124	247	354	393	150	180	300	376	83	174	241	230
Average Queue (ft)	21	71	90	111	55	42	180	195	34	37	166	176
95th Queue (ft)	65	170	237	274	144	108	268	301	62	121	269	270
Link Distance (ft)		909		1792			644	644	644		203	203
Upstream Blk Time (%)											13	17
Queuing Penalty (veh)											53	72
Storage Bay Dist (ft)	100		300		100	200				100		
Storage Blk Time (%)	0	10	1	14	0		9			0	28	
Queuing Penalty (veh)	0	4	3	67	1		4			0	9	

Intersection: 239: St Anthony Ave

Movement	WB	WB	NW	NW
Directions Served	T	Т	L	L
Maximum Queue (ft)	236	178	122	267
Average Queue (ft)	56	21	17	68
95th Queue (ft)	237	130	130	280
Link Distance (ft)	751	751	1278	1278
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	439	491	496	361	264	249	166	188	134	106	246	513
Average Queue (ft)	187	299	272	80	162	106	75	88	42	27	62	121
95th Queue (ft)	430	543	565	349	261	228	140	165	107	76	176	364
Link Distance (ft)	450	450	450	450	233	233	233	233			644	644
Upstream Blk Time (%)	1	17	16	0	5	1		0				0
Queuing Penalty (veh)	2	40	36	0	12	2		0				0
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	628
Average Queue (ft)	243
95th Queue (ft)	667
Link Distance (ft)	644
Upstream Blk Time (%)	2
Queuing Penalty (veh)	9
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement	WB	WB
Directions Served	L	LT
Maximum Queue (ft)	209	275
Average Queue (ft)	56	44
95th Queue (ft)	177	199
Link Distance (ft)	202	202
Upstream Blk Time (%)	0	2
Queuing Penalty (veh)	3	17
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 249: Concordia Ave

Move	пеп	l
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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 250: Snelling Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	T	T	T	T	R	L	L	T	T
Maximum Queue (ft)	165	183	118	184	196	235	190	116	205	185	182	185
Average Queue (ft)	96	100	20	88	58	74	85	54	89	60	76	79
95th Queue (ft)	156	164	75	164	148	155	162	102	160	125	154	162
Link Distance (ft)	436	436	436			291	291	291	233	233	233	233
Upstream Blk Time (%)						1			0	0	0	0
Queuing Penalty (veh)						2			1	0	0	0
Storage Bay Dist (ft)				190	190							
Storage Blk Time (%)			0	0	1	0						
Queuing Penalty (veh)			0	1	1	1						

Intersection: 251: Concordia Ave

Movement

Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	Т	R	L	Т	R	L	T	Т	R	L	T
Maximum Queue (ft)	174	208	86	85	167	87	44	153	160	82	63	405
Average Queue (ft)	69	109	18	34	84	21	15	57	56	10	10	194
95th Queue (ft)	126	181	56	69	153	58	39	124	120	45	44	340
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)		1			1			0	4	0		18
Queuing Penalty (veh)		2			1			0	2	0		1

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5
Directions Served	T	R	T	T	
Maximum Queue (ft)	384	150	110	115	93
Average Queue (ft)	186	67	6	6	3
95th Queue (ft)	325	166	70	72	49
Link Distance (ft)	595		291	291	291
Upstream Blk Time (%)			0	0	
Queuing Penalty (veh)			0	0	
Storage Bay Dist (ft)		100			
Storage Blk Time (%)	22				
Queuing Penalty (veh)	22				

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	86	220	69	234	141	280	281	237	251	87	
Average Queue (ft)	35	115	20	114	23	163	142	111	35	33	
95th Queue (ft)	74	192	55	200	91	265	248	200	136	77	
Link Distance (ft)		609		930		564	564		602	602	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)		0		1		17		1	0		
Queuing Penalty (veh)		0		0		3		5	0		

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement		
Directions Served		
Maximum Queue (ft)		
Average Queue (ft)		
95th Queue (ft)		
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	NB
Directions Served	R
Maximum Queue (ft)	62
Average Queue (ft)	32
95th Queue (ft)	53
Link Distance (ft)	439
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	57	96	120	159	84	80	83	83	65	160	65	
Average Queue (ft)	16	40	58	55	19	22	57	57	28	82	7	
95th Queue (ft)	47	84	110	115	52	58	95	95	54	143	36	
Link Distance (ft)		386	386		1220	1220	77	77	77	729		
Upstream Blk Time (%)							12	9	0			
Queuing Penalty (veh)							10	8	0			
Storage Bay Dist (ft)	225			250							25	
Storage Blk Time (%)				0						53	1	
Queuing Penalty (veh)				0						2	1	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	EB	NB	NB
Directions Served	L	R	LT	T
Maximum Queue (ft)	70	57	106	53
Average Queue (ft)	27	30	22	6
95th Queue (ft)	56	49	67	30
Link Distance (ft)	494			404
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		200	200	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	Т
Maximum Queue (ft)	176	15	49	100
Average Queue (ft)	52	1	15	18
95th Queue (ft)	106	6	43	65
Link Distance (ft)	778	49		404
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			125	
Storage Blk Time (%)				0
Queuing Penalty (veh)				0

Intersection: 425: Pascal St & South Midway Shopping Entrance

Movement	EB	EB	NB	NB	SB	
Directions Served	L	R	L	T	TR	
Maximum Queue (ft)	74	182	43	100	63	
Average Queue (ft)	23	60	4	41	41	
95th Queue (ft)	57	136	23	93	70	
Link Distance (ft)		2305		100	49	
Upstream Blk Time (%)				1	11	
Queuing Penalty (veh)				2	28	
Storage Bay Dist (ft)	300		45			
Storage Blk Time (%)			0	6		
Queuing Penalty (veh)			0	0		

Intersection: 430: Pascal St & South Cub Entrance

Movement	WB	WB	NB	SB	SB
Directions Served	L	R	TR	L	T
Maximum Queue (ft)	83	105	62	48	110
Average Queue (ft)	35	28	4	8	36
95th Queue (ft)	64	67	26	31	111
Link Distance (ft)		798	74		100
Upstream Blk Time (%)			0		4
Queuing Penalty (veh)			0		22
Storage Bay Dist (ft)	75			40	
Storage Blk Time (%)	3	0		0	6
Queuing Penalty (veh)	1	0		2	2

Intersection: 435: Pascal St & Empty St. Paul Lot Entrance

Movement	NB	SB
Directions Served	LT	TR
Maximum Queue (ft)	26	80
Average Queue (ft)	1	39
95th Queue (ft)	14	97
Link Distance (ft)	179	74
Upstream Blk Time (%)		8
Queuing Penalty (veh)		49
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	Т	T	R
Maximum Queue (ft)	157	133	102	213	186	75
Average Queue (ft)	69	60	11	85	155	51
95th Queue (ft)	144	122	58	176	225	96
Link Distance (ft)	1228	1228		276	179	
Upstream Blk Time (%)				0	13	
Queuing Penalty (veh)				0	72	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				10	42	3
Queuing Penalty (veh)				1	84	9

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB	
Directions Served	LT	TR	TR	L	T	
Maximum Queue (ft)	80	55	77	127	99	
Average Queue (ft)	44	32	40	65	42	
95th Queue (ft)	70	52	65	107	73	
Link Distance (ft)	676	676	947		276	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)				100		
Storage Blk Time (%)				1	0	
Queuing Penalty (veh)				2	0	

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	WB	NB	SB	
Directions Served	L	L	TR	LTR	LTR	
Maximum Queue (ft)	51	11	17	35	103	
Average Queue (ft)	13	1	1	10	48	
95th Queue (ft)	39	7	6	33	85	
Link Distance (ft)			1247	350	947	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	100	100				
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	Т	TR	L	Т	TR	L	Т	R	L	TR
Maximum Queue (ft)	116	139	167	215	140	122	146	245	69	110	214
Average Queue (ft)	38	74	83	104	64	39	56	110	25	20	115
95th Queue (ft)	85	127	144	182	122	91	114	191	55	70	192
Link Distance (ft)		1220	1220		782	782		315	315		606
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	275			275			140			100	
Storage Blk Time (%)				0			0	5			14
Queuing Penalty (veh)				0			0	4			3

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	89	155	155	113	93	131	74	95	87	106	
Average Queue (ft)	26	50	81	46	31	53	20	36	20	40	
95th Queue (ft)	64	106	138	93	72	110	56	79	62	90	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)		1			2	4		0	0		
Queuing Penalty (veh)		0			2	2		0	0		

Intersection: 539: St Anthony Ave

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Directions	(

Served Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%) Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	LT	T	R	LT	T	T	TR	
Maximum Queue (ft)	117	153	124	131	156	82	175	158	
Average Queue (ft)	59	81	65	58	64	31	76	63	
95th Queue (ft)	103	133	110	101	121	69	141	125	
Link Distance (ft)	377	377	377	377	249	249	792	792	
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					0				
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB
Directions Served	LT	T	R	T	TR	LT	T
Maximum Queue (ft)	150	116	75	146	133	143	128
Average Queue (ft)	72	49	29	64	54	80	58
95th Queue (ft)	123	102	70	123	110	131	105
Link Distance (ft)	937	937		942	942	249	249
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25				
Storage Blk Time (%)		29	5				
Queuing Penalty (veh)		17	3				

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	126	233	56	154	184	170	129	124	
Average Queue (ft)	43	102	16	74	92	87	56	59	
95th Queue (ft)	95	185	46	136	151	143	102	111	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		1		1					
Queuing Penalty (veh)		1		0					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	135	58	157	90	62	59	93	64	
Average Queue (ft)	57	7	60	25	21	12	32	13	
95th Queue (ft)	105	33	116	67	51	38	73	41	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	18	0	21	0					
Queuing Penalty (veh)	1	0	7	0					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	Т	TR	LT	Т
Maximum Queue (ft)	105	98	86	57	134	79
Average Queue (ft)	49	36	32	13	58	25
95th Queue (ft)	88	81	75	43	113	68
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	NB	NB	NB	SB	SB	
Directions Served	L	L	Т	T	TR	
Maximum Queue (ft)	86	47	111	169	115	
Average Queue (ft)	35	11	54	80	22	
95th Queue (ft)	72	34	103	139	71	
Link Distance (ft)	866	866		600	600	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100			
Storage Blk Time (%)			1			
Queuing Penalty (veh)			0			

Intersection: 610: Lexington Ave & University Ave

Movement	EB	EB	EB	NB
Directions Served	L	T	TR	Т
Maximum Queue (ft)	62	57	18	6
Average Queue (ft)	15	13	1	0
95th Queue (ft)	47	44	10	4
Link Distance (ft)		561	561	1203
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	275			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 639: St Anthony Ave

Directions Served Maximum Queue (ft)
• •
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	200	263	205	163	184	102	120	107	118	76	189	153
Average Queue (ft)	79	119	31	54	97	38	30	26	39	21	89	64
95th Queue (ft)	139	197	101	88	163	81	83	73	87	57	160	127
Link Distance (ft)	443	443	443	443	241	241	241	241				
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											1	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	80
Average Queue (ft)	9
95th Queue (ft)	46
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LT	T
Maximum Queue (ft)	26	9
Average Queue (ft)	1	0
95th Queue (ft)	11	0
Link Distance (ft)	222	222
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

ovement
irections Served
aximum Queue (ft)
verage Queue (ft)
5th Queue (ft)
nk Distance (ft)
pstream Blk Time (%)
ueuing Penalty (veh)
torage Bay Dist (ft)
torage Blk Time (%)
ueuing Penalty (veh)
ucuing Ferially (von)

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	Т	T	T	T	R	L	L	T
Maximum Queue (ft)	274	296	204	140	123	134	200	194	112	162	84	142
Average Queue (ft)	92	166	65	69	57	42	106	78	30	72	31	56
95th Queue (ft)	175	249	167	118	108	96	179	155	76	133	68	113
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					0	0	5	2	0			
Queuing Penalty (veh)					1	0	18	2	0			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	132
Average Queue (ft)	50
95th Queue (ft)	110
Link Distance (ft)	241
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

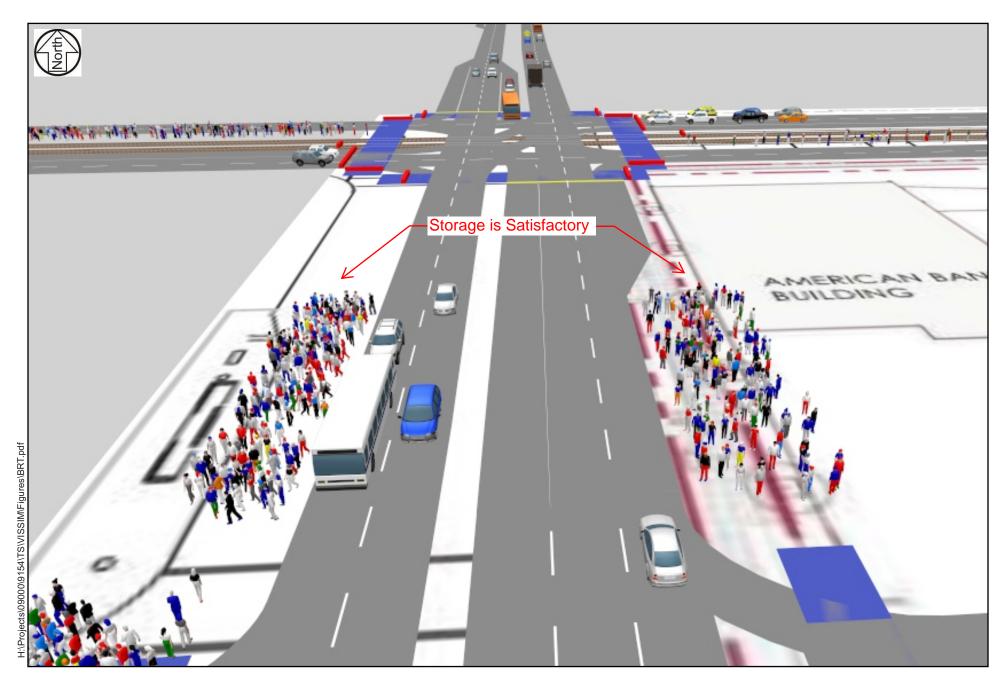
Intersection: 651: Concordia Ave

Movement		
Directions Served		
Maximum Queue (ft)		
Average Queue (ft)		
95th Queue (ft)		
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

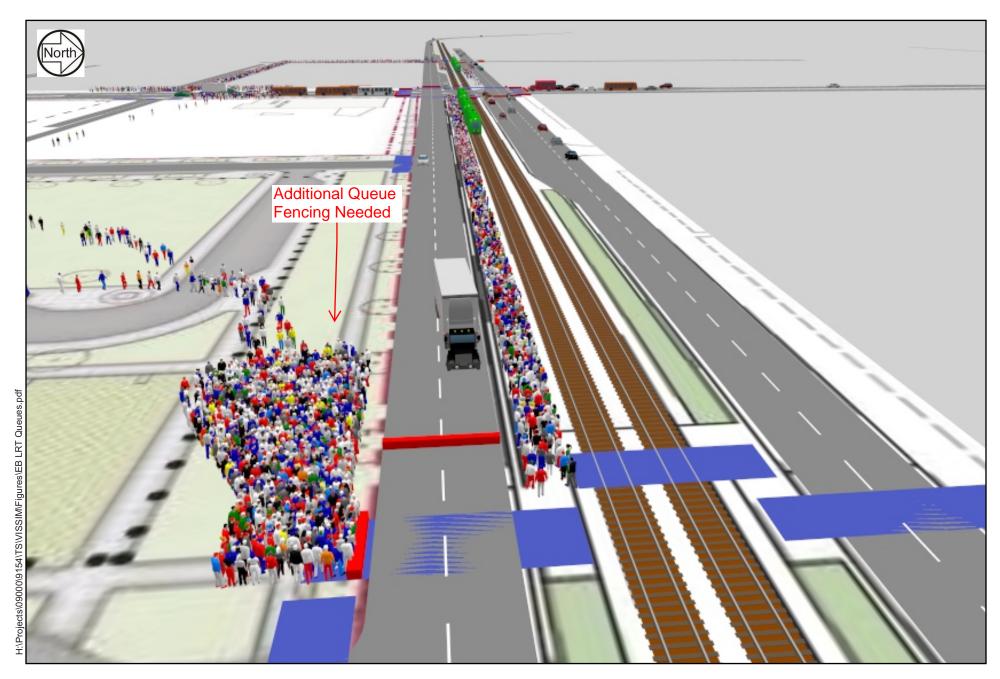
Network wide Queuing Penalty: 919

Appendix F VISSIM Screen Captures



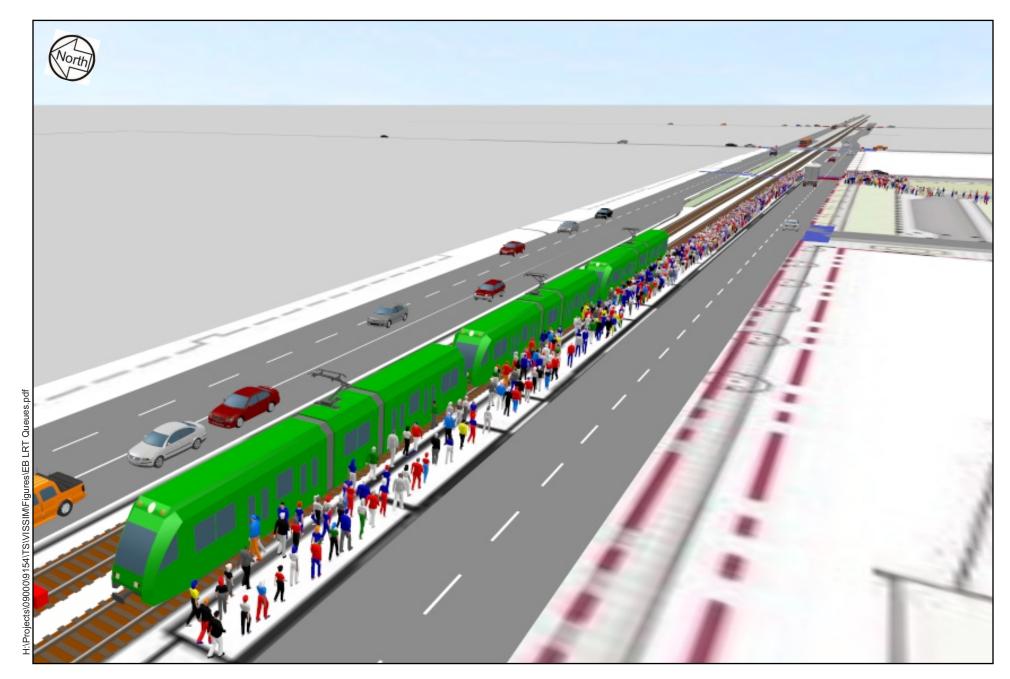


Pedestrian Modeling - Bus Rapid Transit Max Queues (35 min After Event)

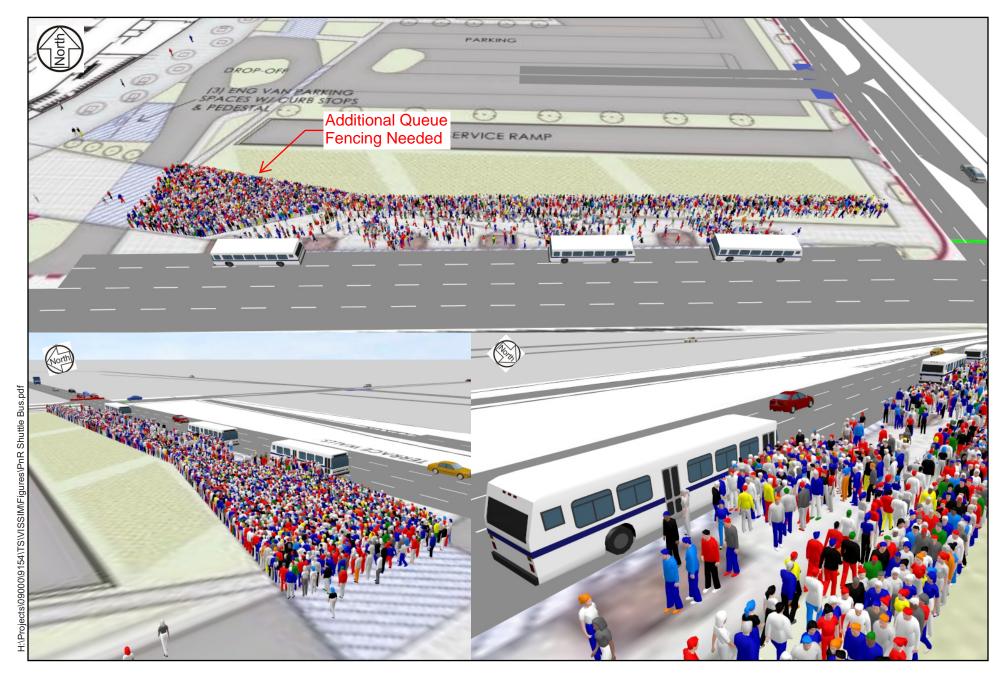




Pedestrian Modeling - Eastbound Light Rail Train Max Queues (35 min After Event)

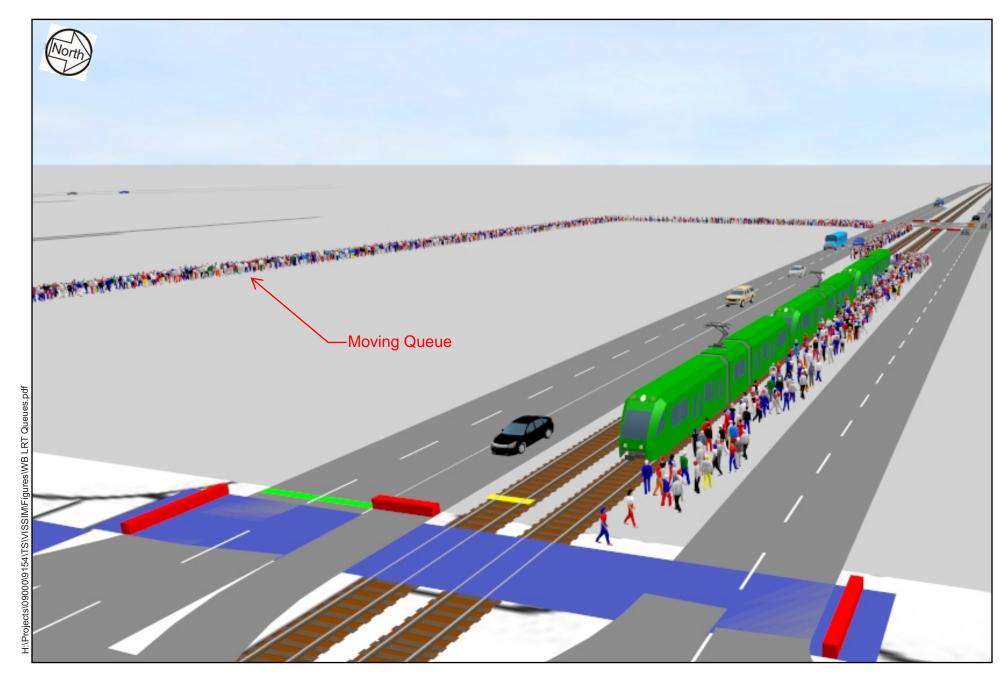






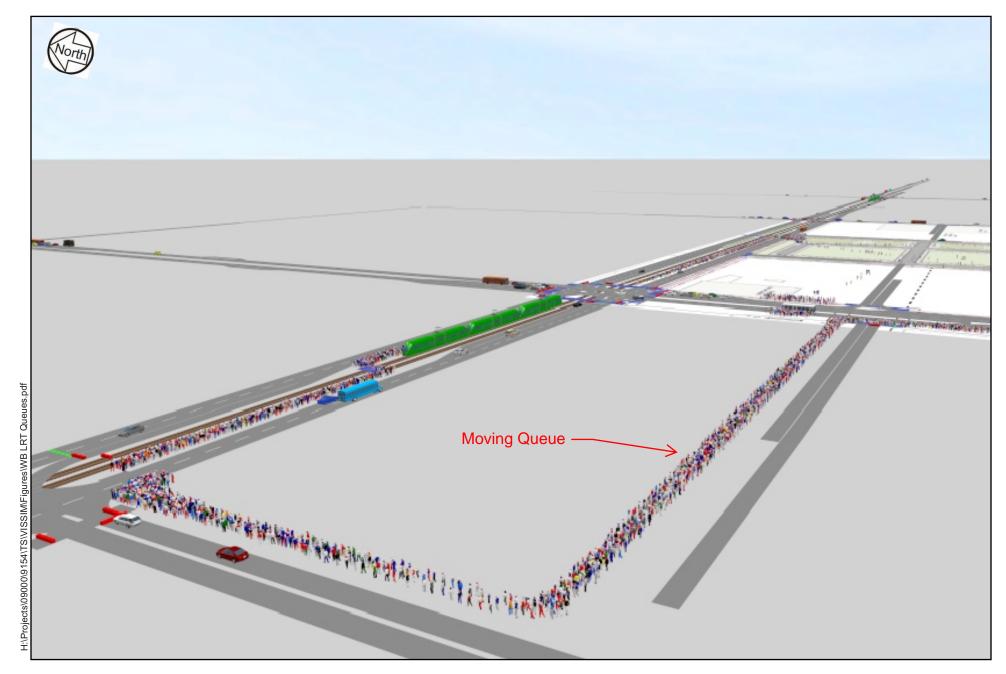


Pedestrian Modeling - Park and Ride Shuttle Bus Max Queues (35 min After Event)





Pedestrian Modeling - Westbound Light Rail Train Max Queues (35 min After Event)





Appendix G Saturday Trip Generation

DRAFT

Saturday 1-2 PM
Master Plan Development Scenario
Trip Generation and Modal Split

Land Use Code	Land Use	Day of Data	Time Period	Size	ln	Out
220	Apartment (Dwelling Units)	Weekday	1-2 PM	620	90	110
710	General Office Building (1000 Sq. Ft. Gross Floor Area)	Weekdey	1-2 PM	1000	69	62
710	General Office Building (1000 Sq. Ft. Gross Floor Area)	Weekday	I-2 PIVI	1000	69	02
820	Shopping Center (1000 Sq. Ft. Gross Leasable Area)	Weekday	1-2 PM	294.1	737	680
	,	, , ,				
310	Hotel (Rooms)	Weekday	1-2 PM	400	49	48
445	Multiplex Movie Theater (Seats)	Weekday	1-2 PM	800	52	20
492	Health/Fitness Club (1000 Sq. Ft. Gross Floor Area)	Weekday	1-2 PM	50	51	63
432	Treatility litress order (1000 oq. 1 t. oross 1 loor Area)	vvcckuuy	I Z I W	30	O1	00
850	Supermarket (1000 Sq. Ft. Gross Floor Area)	Saturday	1-2 PM	42	212	204
				Tatal Trina	4000	4407
		lne	tornal Multi Llaa Trin	Total Trips	1260	1187
		1111	ternal Multi-Use Trip	of External Trips	189 1071	178 1009
			Subiolai	oi Externar rrips	1071	1009
			Mode of	External Trips		
		3%		Walk	32	30
		2%		Bike	21	20
		10%		LRT	107	101
		5%		Bus	54	50
		80%		Vehicle	857	807

DRAFT

Saturday 4-5 PM
Master Plan Development Scenario
Trip Generation and Modal Split

Land Use Code	Land Use	Day of Data	Time Period	Size	ln	Out
220	Apartment (Dwelling Units)	Weekday	1-2 PM	620	117	106
	110000000000000000000000000000000000000					
710	General Office Building (1000 Sq. Ft. Gross Floor Area)	Weekday	1-2 PM	1000	69	62
820	Shopping Center (1000 Sq. Ft. Gross Leasable Area)	Weekday	1-2 PM	294.1	463	599
		_	_			
310	Hotel (Rooms)	Weekday	1-2 PM	400	88	59
445	Multiplex Movie Theater (Seats)	Weekday	1-2 PM	800	124	114
492	Health/Fitness Club (1000 Sq. Ft. Gross Floor Area)	Weekday	1-2 PM	50	48	59
850	Supermarket (1000 Sq. Ft. Gross Floor Area)	Saturday	1-2 PM	42	212	204
		In	ternal Multi-Use Trip I Subtotal	Total Trips Reduction (15%) of External Trips	1120 168 952	1203 180 1022
			Mode of I	External Trips		
		3%		Walk	29	31
		2%		Bike	19	20
		10% 5%		LRT Bus	95 48	102 51
		80%		Vehicle	762	818

Appendix H Year 2035 Event Analysis

110: Fry Street & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	1.9	1.9	0.3
Total Del/Veh (s)	7.6	8.0	13.0	10.1	8.2

200: Snelling Ave & Thomas Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.7	1.4	0.0	0.3	0.3
Total Del/Veh (s)	40.2	28.8	5.9	10.3	12.2

210: Snelling Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.1
Total Del/Veh (s)	42.0	33.9	30.0	46.8	38.7

220: Snelling Ave & Spruce Tree Rd Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	10.5	2.2	8.0	5.9

230: Snelling Ave & Shields Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	1.2	0.0	0.0	0.1
Total Del/Veh (s)	19.9	30.7	33.6	26.0	30.3

239: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.0	0.3	0.2
Total Del/Veh (s)	1.5	1.6	1.6

240: Snelling Ave & St Anthony Ave Performance by approach

Approach	WB NB SB	All
Denied Del/Veh (s)	0.0 0.3 0.0	0.1
Total Del/Veh (s)	12.3 25.8 18.1	19.6

241: St Anthony Ave Performance by approach

Approach	WB All
Denied Del/Veh (s)	0.0 0.0
Total Del/Veh (s)	3.4 3.4

250: Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	s) 0.0	9.6	0.0	3.0
Total Del/Veh (s)	•	8.8	17.5	71.7

251: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	3.3	3.3

260: Snelling Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.2	0.0	0.0	0.0	0.2
Total Del/Veh (s)	30.5	22.9	115.8	12.1	50.2

270: Snelling Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.4	22.5	25.8	0.0	12.1
Total Del/Veh (s)	21.8	113.4	347.7	13.7	129.8

310: West Midway Shopping Entrance & University Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	1.3	1.0	1.1

315: East Midway Shopping Entrance & University Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.0	0.0
Total Del/Veh (s)	0.5	1.3	0.9

410: University Ave & Pascal St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.6	0.1
Total Del/Veh (s)	17.4	17.9	25.6	25.6	19.8

415: Pascal St & North Midway Shopping Entrance Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

420: Pascal St & North Walmart/Cub Entrance Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.2	0.0	0.0	0.1
Total Del/Veh (s)	6.3	10.3	1.5	2.1	4.7

430: Pascal St & South Cub Entrance Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	0.1	0.0	0.0	0.0
Total Del/Veh (s)	4.8	10.0	2.6	1.0	3.3

440: Pascal St & St Anthony Ave Performance by approach

Approach	WB NB SB	All
Denied Del/Veh (s)	el/Veh (s) 0.0 0.0 0.0	0.0
Total Del/Veh (s)	` '	11.2

450: Pascal St & Concordia Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
Total Del/Veh (s)	7.6	7.3	8.6	7.9

451: Concordia Ave Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

460: Pascal St & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	4.0	3.6	8.1	11.6	5.1

510: Hamline Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.1	0.0	0.6	0.5
Total Del/Veh (s)	20.4	25.9	17.4	27.1	22.3

520: Hamline Ave & Midway Market Place Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.2	2.3	0.0	0.0	0.5
Total Del/Veh (s)	17.6	23.9	4.8	6.4	9.5

539: St Anthony Ave Performance by approach

Approach	WB 1	۱W	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.2	0.9	0.6

540: Hamline Ave & St Anthony Ave Performance by approach

Approach	WB NB	SB	All
opied Del/Veh (c)		0.0	
Denied Del/Veh (s)	0.0 0.0	0.0	0.0
Total Del/Veh (s)	21.1 9.4	10.4	14.6

550: Hamline Ave & Concordia Ave Performance by approach

Approach	EB NB	SB	All
Denied Del/Veh (s)		0.0	0.0
Total Del/Veh (s)	• •	7.8	12.1

560: Hamline Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.7	0.0	0.0	0.1
Total Del/Veh (s)	33.3	29.9	12.9	12.9	19.5

570: Hamline Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.5	1.5	0.0	0.0	0.3
Total Del/Veh (s)	28.6	25.9	8.4	10.6	13.3

580: Hamline Ave & Ashland Ave Performance by approach

Approach	WB NB SB	All
Denied Del/Veh (s)	el/Veh (s) 0.0 0.1 0.0	0.0
Total Del/Veh (s)	• •	11.9

590: Ayd Mill Rd & Ashland Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	2.1	0.1	1.2
Total Del/Veh (s)	1.1	9.0	24.6	11.3

610: Lexington Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.0	0.2	0.0	3.7	0.3
Total Del/Veh (s)	15.0	20.4	1.2	2.1	3.6

639: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.1	0.3	0.2
Total Del/Veh (s)	0.2	0.8	0.6

640: Lexington Ave & St Anthony Ave Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

641: St Anthony Ave Performance by approach

Approach	WB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	4.9	4.9

649: Concordia Ave Performance by approach

Approach	EB	SE	All
Denied Del/Veh (s)	0.3	0.2	0.3
Total Del/Veh (s)	0.5	1.1	0.8

650: Lexington Ave & Concordia Ave Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

651: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	2.7	2.7

Total Network Performance

Denied Del/Veh (s)	69.0	
Total Del/Veh (s)	103.3	

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	L	TR	LT	R	
Maximum Queue (ft)	31	122	151	39	116	112	60	65	52	42	
Average Queue (ft)	7	37	58	12	36	42	22	23	10	10	
95th Queue (ft)	27	87	119	34	88	95	53	54	35	36	
Link Distance (ft)		2798	2798		569	569		882	508		
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)									5	1	
Queuing Penalty (veh)									0	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	T	TR	L	T	Т	R	
Maximum Queue (ft)	221	76	189	75	81	83	110	54	262	252	150	
Average Queue (ft)	107	26	71	31	24	26	42	13	134	121	21	
95th Queue (ft)	188	75	143	80	56	71	93	40	220	217	87	
Link Distance (ft)	1352		884			1213	1213		1771	1771		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	62	4	48	5					1	5	0	
Queuing Penalty (veh)	16	6	23	5					0	3	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	120	168	232	278	172	208	141	246	277	125	224	621
Average Queue (ft)	50	87	127	161	63	103	61	164	197	98	132	256
95th Queue (ft)	100	154	214	267	130	177	116	248	291	163	242	587
Link Distance (ft)		569	569	212	212	212	208	208	208			1213
Upstream Blk Time (%)				5	0	0	0	3	11			
Queuing Penalty (veh)				11	0	1	0	10	37			
Storage Bay Dist (ft)	250									75	150	
Storage Blk Time (%)									43	2	3	29
Queuing Penalty (veh)									80	6	15	47

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	588	225
Average Queue (ft)	242	40
95th Queue (ft)	552	152
Link Distance (ft)	1213	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		175
Storage Blk Time (%)	18	
Queuing Penalty (veh)	8	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	WB	NB	NB	NB	NB	SB	SB
Directions Served	R	T	T	T	R	T	TR
Maximum Queue (ft)	104	38	95	123	39	222	226
Average Queue (ft)	41	2	14	23	3	98	87
95th Queue (ft)	80	17	55	77	21	233	210
Link Distance (ft)	604		202	202	202	208	208
Upstream Blk Time (%)						3	1
Queuing Penalty (veh)						17	7
Storage Bay Dist (ft)		25					
Storage Blk Time (%)		0	2				
Queuing Penalty (veh)		0	5				

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LT	R	L	T	T	TR	UL	T	TR
Maximum Queue (ft)	48	111	89	64	54	246	664	700	723	175	268	226
Average Queue (ft)	10	45	39	21	19	131	108	472	498	149	181	162
95th Queue (ft)	35	86	75	54	47	210	430	908	776	206	299	258
Link Distance (ft)		909	766	766			644	644	644		202	202
Upstream Blk Time (%)							0	4	3		18	5
Queuing Penalty (veh)							1	34	27		111	32
Storage Bay Dist (ft)	100				100	250				125		
Storage Blk Time (%)		1				0				39	11	
Queuing Penalty (veh)		0				1				180	26	

Intersection: 239: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	158	160	150	147	158	168	294	276	126	156	250	236
Average Queue (ft)	80	103	87	5	74	79	234	248	58	60	133	141
95th Queue (ft)	137	152	137	66	132	140	295	266	110	115	222	224
Link Distance (ft)	450	450	450	450	232	232	232	232			644	644
Upstream Blk Time (%)							16	34				
Queuing Penalty (veh)							87	182				
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											0	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	185
Average Queue (ft)	18
95th Queue (ft)	99
Link Distance (ft)	644
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 241: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 250:

Movement	EB	EB	EB	EB	B7	NB	NB	NB	NB	NB	B5	B5
Directions Served	L	LT	T	R	T	T	T	Т	T	R	T	T
Maximum Queue (ft)	872	924	700	330	2500	141	250	394	394	341	617	626
Average Queue (ft)	617	721	511	27	910	47	228	364	362	133	513	543
95th Queue (ft)	941	1057	921	225	2718	106	324	386	378	280	772	763
Link Distance (ft)	835	835			2454			293	293	293	595	595
Upstream Blk Time (%)	1	18			14			69	81	0	7	13
Queuing Penalty (veh)	0	0			0			312	368	0	47	91
Storage Bay Dist (ft)			400	400		190	190					
Storage Blk Time (%)		75	2				0	64				
Queuing Penalty (veh)		623	18				0	343				

Intersection: 250:

Movement	SB	SB	SB	SB
Directions Served	L	L	Ţ	T
Maximum Queue (ft)	153	150	169	150
Average Queue (ft)	81	87	68	62
95th Queue (ft)	134	140	123	117
Link Distance (ft)	232	232	232	232
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 251: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	Т	T	R	L	T
Maximum Queue (ft)	316	267	85	101	176	93	225	646	645	100	114	215
Average Queue (ft)	133	98	15	41	83	35	42	493	507	72	21	99
95th Queue (ft)	262	205	54	83	148	77	165	812	804	142	66	200
Link Distance (ft)		1898			1226			602	602			595
Upstream Blk Time (%)								11	20			
Queuing Penalty (veh)								66	117			
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)	1	1			0			62	79	0		5
Queuing Penalty (veh)	4	2			0			16	63	2		1

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5
Directions Served	Т	R	T	T	
Maximum Queue (ft)	242	149	134	152	10
Average Queue (ft)	109	34	8	8	0
95th Queue (ft)	213	109	72	74	7
Link Distance (ft)	595		293	293	293
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		100			
Storage Blk Time (%)	10	0			
Queuing Penalty (veh)	13	0			

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	98	169	300	934	200	2080	2056	213	160	153	
Average Queue (ft)	46	77	91	525	59	949	961	106	66	78	
95th Queue (ft)	86	141	292	1027	192	2387	2365	189	135	135	
Link Distance (ft)		609		930		2488	2488		602	602	
Upstream Blk Time (%)				17		10	10				
Queuing Penalty (veh)				0		0	0				
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)				55		62		2			
Queuing Penalty (veh)				20		16		7			

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	WB
Directions Served	T
Maximum Queue (ft)	38
Average Queue (ft)	5
95th Queue (ft)	46
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 315: East Midway Shopping Entrance & University Ave

Directions Served Maximum Queue (ft) Average Queue (ft) 95th Queue (ft) Link Distance (ft) Upstream Blk Time (%) Queuing Penalty (veh)
Average Queue (ft) 95th Queue (ft) Link Distance (ft) Upstream Blk Time (%)
95th Queue (ft) Link Distance (ft) Upstream Blk Time (%)
Link Distance (ft) Upstream Blk Time (%)
Upstream Blk Time (%)
Queuing Penalty (veh)
2 3 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	66	214	266	165	147	141	176	118	78	95	55	
Average Queue (ft)	20	89	122	72	58	60	104	36	34	47	9	
95th Queue (ft)	54	186	230	128	123	122	167	82	63	82	36	
Link Distance (ft)		387	387		1219	1219		225	225	729		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	225			250			200				25	
Storage Blk Time (%)		0					0			37	2	
Queuing Penalty (veh)		0					0			4	1	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	145	62	22
Average Queue (ft)	62	28	1
95th Queue (ft)	106	57	9
Link Distance (ft)	454		225
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		100	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	EB	WB	NB	NB	SB
Directions Served	LTR	LTR	L	TR	L
Maximum Queue (ft)	78	157	44	18	83
Average Queue (ft)	40	67	11	1	26
95th Queue (ft)	66	118	38	7	63
Link Distance (ft)	651	779		214	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		125
Storage Blk Time (%)					0
Queuing Penalty (veh)					0

Intersection: 430: Pascal St & South Cub Entrance

Movement	EB	WB	WB	NB	NB	SB	
Directions Served	LTR	LT	R	L	TR	L	
Maximum Queue (ft)	70	90	60	70	4	51	
Average Queue (ft)	28	40	25	20	0	7	
95th Queue (ft)	55	72	52	52	4	30	
Link Distance (ft)	638	798	798		315		
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)				100		125	
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	T	R
Maximum Queue (ft)	168	184	30	162	161	75
Average Queue (ft)	76	92	4	91	84	48
95th Queue (ft)	145	166	21	142	147	89
Link Distance (ft)	1228	1228		276	315	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				5	17	1
Queuing Penalty (veh)				0	21	3

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB
Directions Served	LT	TR	TR	L	Т
Maximum Queue (ft)	121	75	98	108	92
Average Queue (ft)	61	43	48	55	44
95th Queue (ft)	97	66	76	90	75
Link Distance (ft)	676	676	947		276
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				100	
Storage Blk Time (%)				0	0
Queuing Penalty (veh)				0	0

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	TR	LTR	LTR
Maximum Queue (ft)	83	24	26	36	111
Average Queue (ft)	27	1	2	11	51
95th Queue (ft)	62	12	12	35	88
Link Distance (ft)			1247	350	947
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			
Storage Blk Time (%)	0				
Queuing Penalty (veh)	0				

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	Т	TR	L	T	R	L	TR
Maximum Queue (ft)	91	222	240	198	209	160	170	205	63	98	262
Average Queue (ft)	35	100	120	105	102	55	62	98	33	25	118
95th Queue (ft)	74	183	210	178	171	119	123	170	57	68	204
Link Distance (ft)		1219	1219		782	782		315	315		606
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	275			275			140			100	
Storage Blk Time (%)		0					0	2			14
Queuing Penalty (veh)		0					1	2			4

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	94	122	177	125	98	117	66	96	61	75	
Average Queue (ft)	31	51	83	53	36	48	23	43	17	29	
95th Queue (ft)	66	95	144	103	74	101	57	77	48	67	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)		1	0		1	3		0			
Queuing Penalty (veh)		0	0		2	3		0			

Intersection: 539: St Anthony Ave

Movement	
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Directions Served

Maximum Queue (ft)

Average Queue (ft)

95th Queue (ft)

Link Distance (ft)

Upstream Blk Time (%)

Queuing Penalty (veh)

Storage Bay Dist (ft)

Storage Blk Time (%)

Queuing Penalty (veh)

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	LT	T	R	LT	T	Т	TR
Maximum Queue (ft)	181	195	193	147	174	114	143	163
Average Queue (ft)	90	119	101	71	89	47	75	77
95th Queue (ft)	146	174	160	117	148	102	130	141
Link Distance (ft)	377	377	377	377	249	249	792	792
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)								
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB		
Directions Served	LT	Т	R	T	TR	LT	T		
Maximum Queue (ft)	182	171	75	148	120	157	145		
Average Queue (ft)	97	86	41	64	47	90	76		
95th Queue (ft)	153	143	86	122	94	136	135		
Link Distance (ft)	937	937		942	942	249	249		
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)			25						
Storage Blk Time (%)		48	8						
Queuing Penalty (veh)		39	11						

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	138	289	95	252	267	136	145	155	
Average Queue (ft)	52	164	22	135	85	57	63	70	
95th Queue (ft)	107	256	66	224	147	114	122	124	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					0				
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		5		8					
Queuing Penalty (veh)		3		2					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	124	82	245	100	142	144	191	154	
Average Queue (ft)	57	11	92	46	62	57	83	72	
95th Queue (ft)	104	44	173	103	113	115	154	131	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	20	0	35	1					
Queuing Penalty (veh)	2	0	24	1					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	Т	TR	LT	T
Maximum Queue (ft)	169	145	113	84	134	93
Average Queue (ft)	83	67	48	25	56	20
95th Queue (ft)	136	123	98	66	113	68
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

NB	NB	NB	SB	SB
L	L	T	T	TR
83	87	133	179	140
34	13	72	91	31
72	49	128	155	92
866	866		600	600
		100		
		2		
		2		
	L 83 34 72	L L 83 87 34 13 72 49	L L T 83 87 133 34 13 72 72 49 128 866 866	L L T T 83 87 133 179 34 13 72 91 72 49 128 155 866 866 600

Intersection: 610: Lexington Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB	
Directions Served	L	Т	TR	L	T	TR	T	T	R	
Maximum Queue (ft)	76	75	62	18	85	30	23	12	52	
Average Queue (ft)	23	26	24	2	31	3	1	0	21	
95th Queue (ft)	58	62	51	11	64	16	9	6	49	
Link Distance (ft)		561	561		836	836	617	617		
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	275			275					150	
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 639: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	Т	Т	T	T
Maximum Queue (ft)	151	253	204	227	260	241	138	128	141	140	179	158
Average Queue (ft)	81	130	58	106	138	72	74	71	68	54	96	85
95th Queue (ft)	138	210	149	188	237	156	126	120	124	110	161	149
Link Distance (ft)	443	443	443	443	241	241	241	241			1203	1203
Upstream Blk Time (%)					1	0						
Queuing Penalty (veh)					3	1						
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)										0	0	
Queuing Penalty (veh)										0	1	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	81
Average Queue (ft)	17
95th Queue (ft)	63
Link Distance (ft)	1203
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB
Directions Served	LT
Maximum Queue (ft)	57
Average Queue (ft)	3
95th Queue (ft)	47
Link Distance (ft)	222
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 649: Concordia Ave

lovement
irections Served
faximum Queue (ft)
verage Queue (ft)
5th Queue (ft)
ink Distance (ft)
pstream Blk Time (%)
Dueuing Penalty (veh)
torage Bay Dist (ft)
torage Blk Time (%)
Queuing Penalty (veh)
queuing Penaity (ven)

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	Т	T	Т	Т	R	L	L	T
Maximum Queue (ft)	288	324	248	197	162	190	241	217	164	196	141	77
Average Queue (ft)	148	206	103	88	89	75	134	115	54	98	65	38
95th Queue (ft)	242	292	197	158	147	150	214	194	115	168	117	72
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)										0		
Queuing Penalty (veh)										0		
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					2	1	10	5	0			
Queuing Penalty (veh)					6	2	48	9	1			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB
Directions Served	T
Maximum Queue (ft)	85
Average Queue (ft)	35
95th Queue (ft)	78
Link Distance (ft)	241
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 651: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Network Summary

Network wide Queuing Penalty: 3307

110: Fry Street & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.8	0.0	4.8	1.5	1.9
Total Del/Veh (s)	82.4	18.1	26.4	16.2	41.6

200: Snelling Ave & Thomas Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.7	1.4	0.0	138.3	56.1
Total Del/Veh (s)	56.3	47.2	7.9	115.6	52.9

210: Snelling Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.6	0.0	0.0	39.5	10.3
Total Del/Veh (s)	152.3	68.6	28.9	309.8	126.2

220: Snelling Ave & Spruce Tree Rd Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.5	0.0	0.0	
Defiled Del/Veri (S)	0.3	0.0	0.0	0.1
Total Del/Veh (s)	42.2	6.0	51.9	26.5

230: Snelling Ave & Shields Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.1	817.2	0.0	0.0	439.0
Total Del/Veh (s)	39.0	382.6	46.9	66.8	189.1

239: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.0	0.2	0.1
Total Del/Veh (s)	220.5	142.8	182.7

240: Snelling Ave & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	1.5	0.6
Total Del/Veh (s)	130.2	12.5	49.1	58.6

250: Performance by approach

251: Concordia Ave Performance by approach

Approach	EB	All	
Denied Del/Veh (s)	0.0	0.0	
Total Del/Veh (s)	4.6	4.6	

260: Snelling Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.9	0.0	0.0	0.0	0.3
Total Del/Veh (s)	27.9	34.0	5.6	16.1	16.2

270: Snelling Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.9	0.7	0.4	0.0	0.4
Total Del/Veh (s)	40.7	39.1	39.5	9.3	27.4

310: West Midway Shopping Entrance & University Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.4	0.2
Total Del/Veh (s)	1.1	61.7	33.3

315: East Midway Shopping Entrance & University Ave Performance by approach

Approach	EB	WB	All
Denied Del/Veh (s)	0.0	0.6	0.3
Total Del/Veh (s)	0.4	35.0	18.9

410: University Ave & Pascal St Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.1	0.0	0.3	0.1
Total Del/Veh (s)	20.8	35.3	38.3	26.4	30.5

415: Pascal St & North Midway Shopping Entrance Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	152.0	0.0	0.0	42.7
Total Del/Veh (s)	130.3	7.3	5.0	40.9

420: Pascal St & North Walmart/Cub Entrance Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	7.9	11.0	0.0	0.0	3.1
Total Del/Veh (s)	201.0	166.3	3.2	17.0	65.5

430: Pascal St & South Cub Entrance Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	599.6	5.6	0.0	0.3	103.3
Total Del/Veh (s)	602.0	289.4	2.8	30.2	113.2

440: Pascal St & St Anthony Ave Performance by approach

Approach	WB NB	SB	All
Denied Del/Veh (s)	0.0 0.0	0.5	0.2
Total Del/Veh (s)	268.9 14.9	56.6	144.6

450: Pascal St & Concordia Ave Performance by approach

451: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	1.3	1.3

460: Pascal St & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	3.6	2.7	7.4	11.3	4.5

510: Hamline Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	1.1	0.0	0.6	0.5
Total Del/Veh (s)	21.0	27.4	17.0	26.2	23.0

520: Hamline Ave & Midway Market Place Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.2	2.3	0.0	0.0	0.5
Total Del/Veh (s)	17.0	23.2	4.3	6.2	9.3

539: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	3.2	0.5	1.8
Total Del/Veh (s)	24.0	35.6	29.9

540: Hamline Ave & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0
` '		22.4		
Total Del/Veh (s)	52.7	22.0	16.0	34.2

550: Hamline Ave & Concordia Ave Performance by approach

Approach	ach EB NB	SB	All
Denied Del/Veh (s)		0.0	0.0
Total Del/Veh (s)	` '	7.5	12.2

560: Hamline Ave & Marshall Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	1.0	0.0	0.0	0.2
Total Del/Veh (s)	29.1	25.6	11.4	12.4	17.5

570: Hamline Ave & Selby Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.3	1.7	0.0	0.0	0.2
Total Del/Veh (s)	29.2	23.8	9.0	10.8	13.7

580: Hamline Ave & Ashland Ave Performance by approach

Approach
Denied Del/Veh (s)
Total Del/Veh (s)

590: Ayd Mill Rd & Ashland Ave Performance by approach

610: Lexington Ave & University Ave Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	1.2	0.1	0.0	4.2	0.3
Total Del/Veh (s)	20.0	23.2	1.1	2.0	5.5

639: St Anthony Ave Performance by approach

Approach	WB	NW	All
Denied Del/Veh (s)	0.2	0.2	0.2
Total Del/Veh (s)	0.1	0.5	0.4

640: Lexington Ave & St Anthony Ave Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.8	0.4
Total Del/Veh (s)	23.4	8.5	10.2	12.3

641: St Anthony Ave Performance by approach

Approach	WB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	5.5	5.5

649: Concordia Ave Performance by approach

Approach	EB S	⊢ ΔII
Denied Del/Veh (s)	0.2 0.	3 0.3
Total Del/Veh (s)	0.5 1.	1 0.8

650: Lexington Ave & Concordia Ave Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.0	1.3	0.0	0.4
Total Del/Veh (s)	23.4	19.5	8.7	16.7

651: Concordia Ave Performance by approach

Approach	EB	All
Denied Del/Veh (s)	0.0	0.0
Total Del/Veh (s)	2.8	2.8

Total Network Performance

Denied Del/Veh (s)	104.3	
Total Del/Veh (s)	158.6	

Intersection: 12: Bend

Movement	SW	SW
Directions Served	T	
Maximum Queue (ft)	928	1028
Average Queue (ft)	562	569
95th Queue (ft)	1196	1248
Link Distance (ft)	938	938
Upstream Blk Time (%)	0	6
Queuing Penalty (veh)	1	75
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 110: Fry Street & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	Т	TR	L	TR	LT	R	
Maximum Queue (ft)	93	582	607	49	206	201	174	269	48	42	
Average Queue (ft)	9	144	166	11	64	72	109	114	7	6	
95th Queue (ft)	54	516	537	35	164	172	213	287	31	28	
Link Distance (ft)		1035	1035		570	570		259	508		
Upstream Blk Time (%)		1	1					6			
Queuing Penalty (veh)		0	0					0			
Storage Bay Dist (ft)	250			170			125			25	
Storage Blk Time (%)		13			2		10	9	6	1	
Queuing Penalty (veh)		2			0		11	12	0	0	

Intersection: 200: Snelling Ave & Thomas Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB	
Directions Served	LT	R	LT	R	L	Т	TR	L	T	T	R	
Maximum Queue (ft)	357	75	246	75	58	156	176	234	621	621	126	
Average Queue (ft)	140	36	86	32	18	53	72	47	324	289	12	
95th Queue (ft)	313	88	185	80	47	121	140	186	712	707	73	
Link Distance (ft)	488		400			1213	1213		585	585		
Upstream Blk Time (%)	1								37	31		
Queuing Penalty (veh)	0								0	0		
Storage Bay Dist (ft)		25		25	200			200			125	
Storage Blk Time (%)	56	26	56	6					42	40	0	
Queuing Penalty (veh)	16	40	23	5					19	8	0	

Intersection: 210: Snelling Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	UL	T	T	R	L	T
Maximum Queue (ft)	324	577	580	290	205	276	232	264	276	125	225	1246
Average Queue (ft)	45	241	314	204	76	135	88	172	202	91	124	717
95th Queue (ft)	143	588	658	353	169	249	179	283	315	167	266	1568
Link Distance (ft)		570	570	212	212	212	207	207	207			1213
Upstream Blk Time (%)		4	21	55	0	3	1	10	16			31
Queuing Penalty (veh)		7	38	117	0	6	7	41	68			122
Storage Bay Dist (ft)	250									75	150	
Storage Blk Time (%)		9							41	5	4	58
Queuing Penalty (veh)		5							111	24	12	92

Intersection: 210: Snelling Ave & University Ave

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1234	225
Average Queue (ft)	710	47
95th Queue (ft)	1560	185
Link Distance (ft)	1213	
Upstream Blk Time (%)	30	
Queuing Penalty (veh)	119	
Storage Bay Dist (ft)		175
Storage Blk Time (%)	57	
Queuing Penalty (veh)	25	

Intersection: 220: Snelling Ave & Spruce Tree Rd

Movement	WB	NB	NB	NB	NB	SB	SB
Directions Served	R	T	T	T	R	T	TR
Maximum Queue (ft)	365	74	207	241	110	242	230
Average Queue (ft)	96	6	38	62	6	146	154
95th Queue (ft)	299	38	135	183	45	302	303
Link Distance (ft)	604		203	203	203	207	207
Upstream Blk Time (%)	1		0	1		28	41
Queuing Penalty (veh)	0		1	6		141	204
Storage Bay Dist (ft)		25					
Storage Blk Time (%)		0	7				
Queuing Penalty (veh)		0	25				

Intersection: 230: Snelling Ave & Shields Ave

Movement	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	LT	R	L	T	Т	TR	UL	T	TR
Maximum Queue (ft)	40	66	2323	2319	150	185	459	538	456	175	258	234
Average Queue (ft)	8	19	1657	1666	107	52	179	208	111	72	182	182
95th Queue (ft)	30	50	3205	3206	209	131	372	422	335	181	303	289
Link Distance (ft)		1442	2265	2265			644	644	644		203	203
Upstream Blk Time (%)			60	62			0	0	0		42	52
Queuing Penalty (veh)			0	0			0	0	0		210	260
Storage Bay Dist (ft)	100				100	250				125		
Storage Blk Time (%)		0		65	0		7			5	38	
Queuing Penalty (veh)		0		168	4		3			22	36	

Intersection: 239: St Anthony Ave

Movement	WB	WB	NW	NW
Directions Served	T	T	L	L
Maximum Queue (ft)	788	793	842	846
Average Queue (ft)	441	434	321	350
95th Queue (ft)	1035	1038	870	898
Link Distance (ft)	751	751	1278	1278
Upstream Blk Time (%)	34	35		
Queuing Penalty (veh)	110	114		
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	Ţ	R	L	L	T	T	T	T	Т	T
Maximum Queue (ft)	499	522	519	502	221	224	149	166	165	196	542	644
Average Queue (ft)	328	385	386	311	103	96	66	78	64	50	168	359
95th Queue (ft)	598	632	639	664	178	184	125	145	137	132	434	633
Link Distance (ft)	450	450	450	450	233	233	233	233			644	644
Upstream Blk Time (%)	20	50	53	29	0	0	0	0			0	0
Queuing Penalty (veh)	61	149	159	87	1	1	0	0			4	0
Storage Bay Dist (ft)									300	300		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											1	

Intersection: 240: Snelling Ave & St Anthony Ave

Movement	SB	
Directions Served	R	
Maximum Queue (ft)	660	
Average Queue (ft)	480	
95th Queue (ft)	908	
Link Distance (ft)	644	
Upstream Blk Time (%)	24	
Queuing Penalty (veh)	219	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 250:

Movement	EB	EB	EB	NB	NB	NB	NB	NB	B5	B5	SB	SB
Directions Served	L	LT	T	T	T	T	T	R	T	T	L	L
Maximum Queue (ft)	278	422	242	179	233	301	304	200	44	52	218	221
Average Queue (ft)	149	215	54	61	87	94	109	56	1	1	99	73
95th Queue (ft)	239	350	146	151	185	220	242	120	20	17	189	160
Link Distance (ft)	4065	4065				290	290	290	595	595	233	233
Upstream Blk Time (%)						1	1				1	0
Queuing Penalty (veh)						4	5				3	1
Storage Bay Dist (ft)			400	190	190							
Storage Blk Time (%)		1		0	1	4						
Queuing Penalty (veh)		4		0	2	19						

Intersection: 250:

Movement	SB	SB
Directions Served	T	T
Maximum Queue (ft)	187	174
Average Queue (ft)	57	46
95th Queue (ft)	140	127
Link Distance (ft)	233	233
Upstream Blk Time (%)	0	0
Queuing Penalty (veh)	1	1
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 251: Concordia Ave

Movement	EB
Directions Served	L
Maximum Queue (ft)	4
Average Queue (ft)	0
95th Queue (ft)	0
Link Distance (ft)	454
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 260: Snelling Ave & Marshall Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	Т	R	L	Т	R	L	T	T	R	L	T
Maximum Queue (ft)	198	228	48	99	202	47	58	126	126	84	67	439
Average Queue (ft)	88	121	13	40	93	19	18	41	50	14	7	171
95th Queue (ft)	159	199	37	84	166	42	47	91	98	50	41	317
Link Distance (ft)		664			1226			602	602			595
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	300		175	200		175	150			75	125	
Storage Blk Time (%)		3			1			0	2	0		14
Queuing Penalty (veh)		5			1			0	1	0		2

Intersection: 260: Snelling Ave & Marshall Ave

Movement	SB	SB	B5	B5	B5
Directions Served	T	R	T	T	
Maximum Queue (ft)	407	150	104	160	45
Average Queue (ft)	160	55	5	8	2
95th Queue (ft)	304	147	66	82	33
Link Distance (ft)	595		290	290	290
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)		100			
Storage Blk Time (%)	16				
Queuing Penalty (veh)	23				

Intersection: 270: Snelling Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	183	290	210	352	174	434	407	249	383	68	
Average Queue (ft)	47	153	33	175	29	236	221	154	46	23	
95th Queue (ft)	115	251	108	321	109	384	362	266	206	58	
Link Distance (ft)		609		930		564	564		602	602	
Upstream Blk Time (%)						0	0				
Queuing Penalty (veh)						0	0				
Storage Bay Dist (ft)	225		200		125			175			
Storage Blk Time (%)		3		10		33		4			
Queuing Penalty (veh)		1		4		8		17			

Intersection: 310: West Midway Shopping Entrance & University Ave

Movement	WB	WB	WB
Directions Served	T	T	T
Maximum Queue (ft)	275	519	470
Average Queue (ft)	138	221	51
95th Queue (ft)	352	629	288
Link Distance (ft)		505	505
Upstream Blk Time (%)		33	3
Queuing Penalty (veh)		89	7
Storage Bay Dist (ft)	200		
Storage Blk Time (%)	46	0	
Queuing Penalty (veh)	91	0	

Intersection: 315: East Midway Shopping Entrance & University Ave

Movement	WB	WB
Directions Served	T	T
Maximum Queue (ft)	406	414
Average Queue (ft)	126	82
95th Queue (ft)	410	332
Link Distance (ft)	387	387
Upstream Blk Time (%)	14	6
Queuing Penalty (veh)	31	12
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 410: University Ave & Pascal St

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	
Directions Served	L	T	TR	L	T	TR	L	T	R	LT	R	
Maximum Queue (ft)	52	245	307	240	419	412	219	243	78	148	51	
Average Queue (ft)	13	90	126	86	94	93	128	57	37	65	4	
95th Queue (ft)	40	197	255	187	262	242	228	164	66	123	25	
Link Distance (ft)		387	387		1219	1219		225	225	729		
Upstream Blk Time (%)							6	6				
Queuing Penalty (veh)							0	7				
Storage Bay Dist (ft)	225			250			200				25	
Storage Blk Time (%)		1		0	5		10	2		41	2	
Queuing Penalty (veh)		0		0	4		7	2		2	2	

Intersection: 415: Pascal St & North Midway Shopping Entrance

Movement	EB	NB	NB	NB	SB
Directions Served	LR	L	T	T	TR
Maximum Queue (ft)	506	126	143	35	206
Average Queue (ft)	281	29	11	1	21
95th Queue (ft)	624	84	88	26	111
Link Distance (ft)	454		260	260	225
Upstream Blk Time (%)	41		2		1
Queuing Penalty (veh)	0		2		5
Storage Bay Dist (ft)		100			
Storage Blk Time (%)		0	4		
Queuing Penalty (veh)		0	1		

Intersection: 420: Pascal St & North Walmart/Cub Entrance

Movement	EB	WB	NB	NB	SB	SB
Directions Served	LTR	LTR	L	TR	L	TR
Maximum Queue (ft)	618	744	93	60	155	269
Average Queue (ft)	226	232	20	3	23	68
95th Queue (ft)	617	666	61	38	97	235
Link Distance (ft)	651	779		214		260
Upstream Blk Time (%)	10	7		1		5
Queuing Penalty (veh)	0	0		1		16
Storage Bay Dist (ft)			100		125	
Storage Blk Time (%)			0	1		12
Queuing Penalty (veh)			1	0		9

Intersection: 430: Pascal St & South Cub Entrance

Movement	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LTR	LT	R	L	TR	L	T	
Maximum Queue (ft)	657	806	385	56	37	149	224	
Average Queue (ft)	417	255	53	13	1	26	103	
95th Queue (ft)	873	706	282	43	7	108	272	
Link Distance (ft)	638	798	798		315		214	
Upstream Blk Time (%)	55	6	2				20	
Queuing Penalty (veh)	0	0	0				81	
Storage Bay Dist (ft)				100		125		
Storage Blk Time (%)					0	0	31	
Queuing Penalty (veh)					0	0	10	

Intersection: 440: Pascal St & St Anthony Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LT	TR	L	T	T	R
Maximum Queue (ft)	1249	1261	39	182	333	75
Average Queue (ft)	590	604	8	79	241	66
95th Queue (ft)	1469	1479	31	151	417	94
Link Distance (ft)	1228	1228		276	315	
Upstream Blk Time (%)	16	20			32	
Queuing Penalty (veh)	40	50			198	
Storage Bay Dist (ft)			100			50
Storage Blk Time (%)				4	25	42
Queuing Penalty (veh)				0	76	168

Intersection: 450: Pascal St & Concordia Ave

Movement	EB	EB	NB	SB	SB
Directions Served	LT	TR	TR	L	T
Maximum Queue (ft)	101	80	95	131	88
Average Queue (ft)	51	33	44	62	43
95th Queue (ft)	85	59	76	108	77
Link Distance (ft)	676	676	947		276
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)				100	
Storage Blk Time (%)				1	0
Queuing Penalty (veh)				2	0

Intersection: 451: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 460: Pascal St & Marshall Ave

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	TR	LTR	LTR
Maximum Queue (ft)	60	18	18	36	115
Average Queue (ft)	17	1	1	8	46
95th Queue (ft)	47	8	7	31	91
Link Distance (ft)			1247	350	947
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100	100			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 510: Hamline Ave & University Ave

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	73	224	240	223	237	167	126	192	78	109	248
Average Queue (ft)	31	97	114	119	104	62	49	94	27	20	117
95th Queue (ft)	61	184	210	202	182	138	100	166	58	70	200
Link Distance (ft)		1219	1219		782	782		315	315		606
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	275			275			140			100	
Storage Blk Time (%)		0		0	0			2			14
Queuing Penalty (veh)		0		0	0			1			3

Intersection: 520: Hamline Ave & Midway Market Place

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR	
Maximum Queue (ft)	73	127	172	130	91	145	66	96	61	77	
Average Queue (ft)	25	52	79	44	31	37	16	34	18	30	
95th Queue (ft)	57	102	143	88	67	95	48	76	50	68	
Link Distance (ft)		380		396		792	792		315	315	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	125		200		75			125			
Storage Blk Time (%)		0	0	0	0	2		0			
Queuing Penalty (veh)		0	0	0	0	1		0			

Intersection: 539: St Anthony Ave

Movement	WB	WB	NW	NW
Directions Served	T	T	L	L
Maximum Queue (ft)	273	259	393	436
Average Queue (ft)	66	46	80	95
95th Queue (ft)	335	289	414	462
Link Distance (ft)	611	611	922	922
Upstream Blk Time (%)	4	3	0	1
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 540: Hamline Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	SB	SB	
Directions Served	L	LT	T	R	LT	T	T	TR	
Maximum Queue (ft)	330	377	371	320	238	201	213	211	
Average Queue (ft)	126	202	202	100	111	67	91	86	
95th Queue (ft)	298	390	397	274	225	167	177	178	
Link Distance (ft)	377	377	377	377	249	249	792	792	
Upstream Blk Time (%)	1	16	16	1	5	1			
Queuing Penalty (veh)	2	30	30	2	12	3			
Storage Bay Dist (ft)									
Storage Blk Time (%)									
Queuing Penalty (veh)									

Intersection: 550: Hamline Ave & Concordia Ave

Movement	EB	EB	EB	NB	NB	SB	SB	
Directions Served	LT	T	R	T	TR	LT	Т	
Maximum Queue (ft)	160	150	76	148	175	156	135	
Average Queue (ft)	76	56	24	56	52	82	51	
95th Queue (ft)	139	110	70	123	122	134	107	
Link Distance (ft)	937	937		942	942	249	249	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			25					
Storage Blk Time (%)		38	3					
Queuing Penalty (veh)		17	3					

Intersection: 560: Hamline Ave & Marshall Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	L	TR	L	TR	LT	TR	LT	TR	
Maximum Queue (ft)	145	298	108	180	188	106	135	129	
Average Queue (ft)	51	127	31	84	73	44	63	69	
95th Queue (ft)	107	223	77	149	147	91	114	121	
Link Distance (ft)		1247		659	612	612	942	942	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	200		150						
Storage Blk Time (%)		2		1					
Queuing Penalty (veh)		2		0					

Intersection: 570: Hamline Ave & Selby Ave

Movement	EB	EB	WB	WB	NB	NB	SB	SB	
Directions Served	LT	R	LT	R	LT	TR	LT	TR	
Maximum Queue (ft)	170	83	160	99	156	156	196	146	
Average Queue (ft)	76	7	66	38	63	52	80	54	
95th Queue (ft)	138	37	124	84	126	118	155	114	
Link Distance (ft)	1319		651		947	947	612	612	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		50		50					
Storage Blk Time (%)	27	0	26	1					
Queuing Penalty (veh)	2	0	15	1					

Intersection: 580: Hamline Ave & Ashland Ave

Movement	WB	WB	NB	NB	SB	SB
Directions Served	LR	R	T	TR	LT	T
Maximum Queue (ft)	137	133	121	91	176	78
Average Queue (ft)	77	66	39	19	60	10
95th Queue (ft)	125	127	91	60	133	42
Link Distance (ft)	343	343	677	677	947	947
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 590: Ayd Mill Rd & Ashland Ave

Movement	NB	NB	NB	SB	SB
Directions Served	L	L	T	T	TR
Maximum Queue (ft)	109	122	138	227	194
Average Queue (ft)	46	17	68	111	54
95th Queue (ft)	95	63	125	183	137
Link Distance (ft)	866	866		600	600
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)			100		
Storage Blk Time (%)		0	2		
Queuing Penalty (veh)		0	3		

Intersection: 610: Lexington Ave & University Ave

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	
Directions Served	L	T	TR	T	TR	T	T	R	R	
Maximum Queue (ft)	146	115	87	82	34	24	35	29	38	
Average Queue (ft)	47	37	28	23	3	1	3	2	9	
95th Queue (ft)	116	90	71	61	17	10	17	14	31	
Link Distance (ft)		561	561	836	836	1203	1203			
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	275							175	150	
Storage Blk Time (%)										
Queuing Penalty (veh)										

Intersection: 639: St Anthony Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	WB	WB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	LT	T	R	L	L	T	T	T	T	T	T
Maximum Queue (ft)	143	218	170	130	211	112	110	91	133	133	206	193
Average Queue (ft)	82	112	38	62	91	46	47	36	60	46	112	99
95th Queue (ft)	132	176	104	105	165	92	84	80	112	108	178	169
Link Distance (ft)	443	443	443	443	241	241	241	241			1203	1203
Upstream Blk Time (%)					0							
Queuing Penalty (veh)					0							
Storage Bay Dist (ft)									180	180		
Storage Blk Time (%)											0	
Queuing Penalty (veh)											3	

Intersection: 640: Lexington Ave & St Anthony Ave

Movement	SB
Directions Served	R
Maximum Queue (ft)	198
Average Queue (ft)	51
95th Queue (ft)	150
Link Distance (ft)	1203
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 641: St Anthony Ave

Movement	WB	WB
Directions Served	LŢ	Т
Maximum Queue (ft)	66	11
Average Queue (ft)	4	0
95th Queue (ft)	48	8
Link Distance (ft)	222	222
Upstream Blk Time (%)	0	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 649: Concordia Ave

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 650: Lexington Ave & Concordia Ave

Movement	EB	EB	EB	EB	NB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	LT	T	R	T	T	T	T	R	L	L	T
Maximum Queue (ft)	247	338	295	179	140	144	217	191	119	175	158	98
Average Queue (ft)	104	203	98	81	59	52	127	98	40	81	52	46
95th Queue (ft)	203	314	237	143	115	112	201	182	91	138	112	85
Link Distance (ft)	443	443	443	443			812	812		241	241	241
Upstream Blk Time (%)										0	0	
Queuing Penalty (veh)										0	0	
Storage Bay Dist (ft)					125	125			125			
Storage Blk Time (%)					0	0	9	3	0			
Queuing Penalty (veh)					1	0	37	4	0			

Intersection: 650: Lexington Ave & Concordia Ave

Movement	SB		
Directions Served	Т		
Maximum Queue (ft)	105		
Average Queue (ft)	44		
95th Queue (ft)	90		
Link Distance (ft)	241		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 651: Concordia Ave

Movement	EB
Directions Served	T
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	5
Link Distance (ft)	104
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 4183