

Technical Memorandum

To: Jeff Evenson, Superintendent of Parks and Planning
From: Jonah Finkelstein, P.E.
Hailey Pederson
Date: October 16, 2019
Re: Gleason Fields Playfield Expansion and Access Change

Purpose of Report

Gleason Fields is a public park and recreational area located at 18815 67th Avenue North in Maple Grove, Minnesota. Currently, there is a proposed plan to convert the soccer portion of the park to a baseball focused facility through the addition of two new baseball fields and reconfigured parking and access. The primary purpose of this assessment is to review the feasibility of relocating the Brockton Lane park access and to determine the impacts of the park modifications on the adjacent roadways.

Conclusions

The traffic impacts of the proposed development were studied, and the principal findings are:

- The proposed expansion of Gleason Fields is forecasted to generate approximately 282 trips, 152 entering, and 130 exiting, during the p.m. peak hour of the event.
- A maximum parking count of 282 vehicles is expected on site (two overlapping events). With 348 parking stalls provided on site, sufficient parking is provided for park events.
- The Brockton Lane/67th Avenue intersection is forecasted to experience 95th percentile queues of 11 vehicles or more under the existing geometry and future traffic. These queues are reduced to less than two vehicles with the addition of a second park access onto Brockton Lane.
- Sight lines at the intersections of Brockton Lane/67th Avenue and Brockton Lane/proposed site access are adequate, however tree-trimming along Brockton Lane should be completed. This will help further improve sight lines and ensure drivers will not creep past the stop sign to achieve better sightlines along Brockton Lane.
- With only 150 feet separating Brockton Lane/67th Avenue and Brockton Lane/proposed site access, access spacing is not met. Therefore, an out-only access, restricting all in-bound vehicle movements, should be considered.
- The installation of wayfinding signs is recommended to help encourage visitors to park in the designated areas rather than in the neighborhoods.
- Signage instructing drivers not to block the private driveways along 67th Avenue should be installed.

Existing Conditions

As mentioned, the proposed site is located at 18815 67th Avenue North in Maple Grove, Minnesota. Currently, access to the park is located via the side street stop-controlled intersection of 67th Avenue/Brockton Lane and two accesses on Vagabond Lane. Table 1 shows the characteristics of the key roadway corridors around this site and within the study area.

Table 1 – Study Corridor Characteristics

Name	Designation ¹	Classification ²	Speed Limit	Lanes	Transit	Peds/Bicycles
Brockton Lane	CSAH 101	Minor Arterial	45 mph	2 undivided	None	None
67 th Avenue	-	Local Street	30 mph	2 undivided	None	None
Vagabond Lane	-	Local Street	30 mph	2 undivided	None	Sidewalks Both Sides

¹ Source: MnDOT; CSAH = County State Aid Highway

² Source: Metropolitan Council

Proposed Development

In the future Gleason Fields is planned to expand by replacing the existing soccer fields with two additional baseball fields (four total baseball fields). In addition to the play fields expansion, additional parking is proposed in the surface lot off 67th Avenue as well as marking parallel parking stalls along Vagabond Lane. A new access of Brockton Lane, and potential closure of the eastern parking access onto 67th Avenue is also considered within this site plan. Figure 1 shows the proposed site plan for the development.

Figure 1 – Proposed Development



Site Plan
GLEASON FIELDS - 2019 FEASIBILITY STUDY UPDATE



DATE: 8.12.19

Source: Hoisington Koegler Group, Inc.

Traffic Volumes

Due to the nature of the proposed land use, it is anticipated the highest site traffic will occur on Saturdays. However, weekday events will also occur at the park. Based on this both weekday and weekend peak periods were selected for analysis.

Intersection video was collected at three study intersections under normal Thursday and Saturday conditions in September 2019. These intersections were:

- i. Brockton Lane/67th Avenue
- ii. Vagabond Lane/Northern Park Access
- iii. Vagabond Lane/Southern Park Access

Using these videos, 24-hour turning movement counts were obtained at the study intersection. The Thursday and Saturday event peak hours were found to be from 6:00 to 7:00 p.m., and 1:15 to 2:15 p.m., respectively. The full turning movement count data is contained in fifteen-minute intervals in the Appendix.

Utilizing the collected turning movement counts the existing average daily weekday (Thursday) traffic volumes on each study corridor were determined as follows:

- iv. 7,675 vehicles per day on Brockton Lane
- v. 180 vehicles per day on 67th Avenue
- vi. 260 vehicles per day on Vagabond Lane

The current average daily Saturday traffic volumes on each study corridor are:

- i. 5,450 vehicles per day on Brockton Lane
- ii. 525 vehicles per day on 67th Avenue
- iii. 330 vehicles per day on Vagabond Lane

It is worth noting that these Saturday traffic volumes were collected during a soccer event and reflect game day volumes. This is why the volume along 67th Avenue increases Saturday, compared to Thursday.

Trip Generation

To determine the impacts of the modified park land-use the intersection operations with the addition of the proposed development traffic were examined. The typical ITE trip generation datasets do not have information for calculating trip generation for baseball fields. As a result, trip generation for the proposed development was estimated using turning movement counts obtained during an event day at Gleason Fields, as well as estimates based on average baseball team sizes, expected spectator volumes, and umpire counts. Using this information an educated estimate of expected parking demand was determined. The following assumptions were made:

- i. 12 players per team, with some carpooling
- ii. 2 coaches per team
- iii. 2 teams per field
- iv. 2 umpires/referees per field

- v. A few trips unrelated to the sporting event
- vi. Utilization of the lacrosse/soccer field, to the north, by one team for practice. No additional teams were assumed to be waiting for this field.

Based on these estimates it is anticipated that during the peak hour of an event, approximately 152 vehicles comprising of teams, vendors, and officials will enter the site and approximately 130 vehicles will exit. At peak capacity, it is anticipated that approximately 282 vehicles will be parked on site.

A trip distribution pattern was developed for the generated traffic going to and from the proposed development and is based on the existing traffic volumes and access to the surrounding transportation network. The general trip distribution pattern for this study is:

- i. 50% of the generated traffic to/from the north on Brockton Lane.
- ii. 50% of the generated traffic to/from the south on Brockton Lane.

This pattern represents a worst-case scenario for traffic operations. Once field visitors become more aware of the field layout some visitors may access the park utilizing the Vagabond Lane/Bass Lake Road intersection. Even if 10% of park users utilize this route a roadway increase of less than 29 vehicles would be expected. This is less than one vehicle every two minutes in the peak period.

Using this distribution pattern, the site generated trips were added to the study intersections. As previously noted, the weekend collected data already included traffic from a sports event occurring that day at the park. To prevent the double counting of event traffic a trip generation estimate was complete on the six homes with driveways on 67th Avenue using ITE data. The resulting trip generation showed that three inbound trips and three outbound trips would be expected during the weekend peak hour for these homes. The excess sports event related traffic was removed from the intersection to reflect these volumes.

Additionally, to account for general background growth in the area, a growth rate of approximately 1.0% per year was calculated based on historic traffic data on the study roadways. To obtain year 2020 forecasts, this growth rate was applied to all movements in the study network except for those accessing the development, since those movements will only be increased with the development's forecast trip generation.

Intersection Operations Analysis

Utilizing the Vistro Software Package a capacity analysis was run for the weekday and weekend events. Both the existing and 2020 scenarios were analyzed with both existing and proposed access layout review. The full capacity analysis backups containing queue lengths and delay calculations can be found in the Appendix.

Chart 1 (Weekday Event), Chart 2 (Weekend Event) show the 95th percentile queue lengths on the busiest stop sign controlled approach at the study intersections. Average delays are not calculated for intersections with side street stop sign control because the vast majority of vehicles going through the intersection are on the main roadway and have zero delay, which

leads to low overall average delays. At side street stop sign controlled approaches to busy roadways, the average delay for all the vehicles on the approach often exceeds 60 seconds. This can be the case for a few vehicles waiting at the stop sign where improvements would not be justified for the low traffic volume. Based on our experience, improvements are not warranted at these types of intersections until the 95th percentile queue at a stop sign is in the five to ten vehicle range.

Chart 1 – Weekday Event Queues

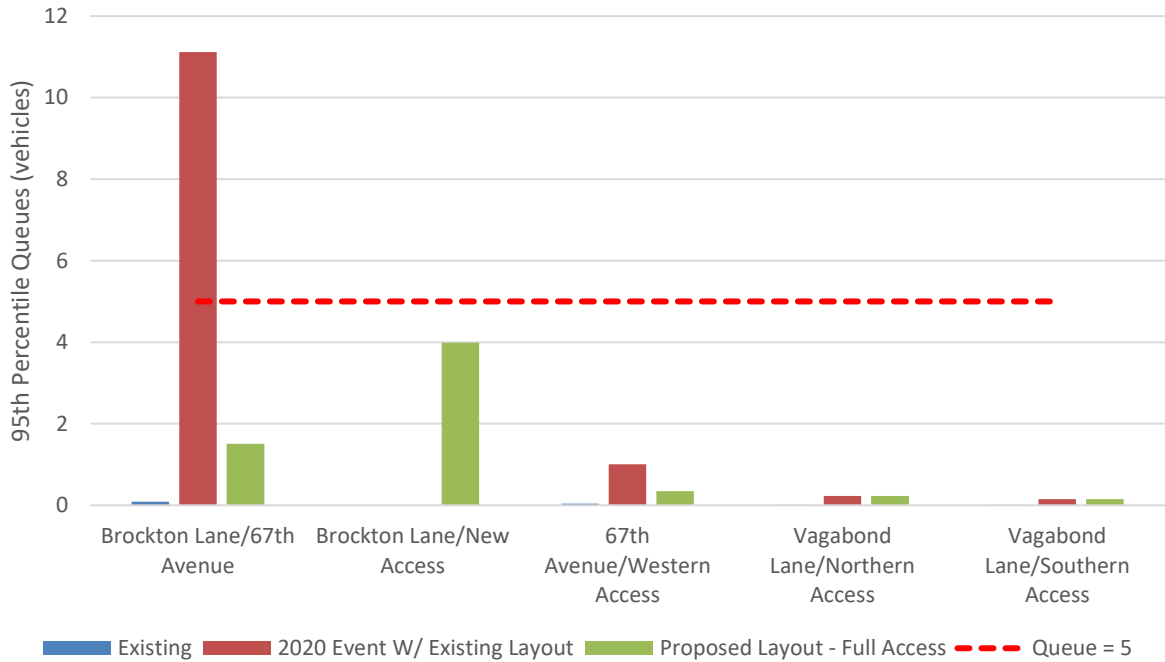
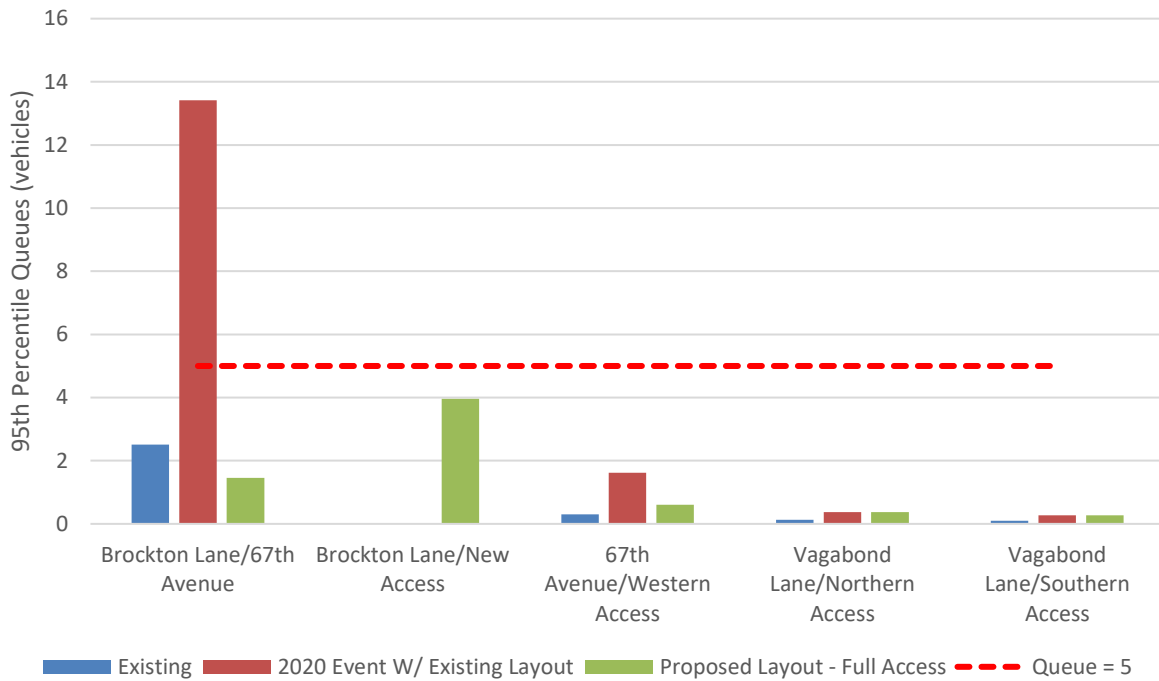


Chart 2 – Weekend Event Queues



As shown in Charts 1 and 2, all study intersections operate efficiently and with queues at or below acceptable levels under each analyzed scenario with one exception. This exception is the intersection of Brockton Lane/67th Avenue which experiences higher than preferred queuing under the existing park configuration with future event traffic.

When analyzing the existing configuration with future event traffic, operations exceed preferred limits with outbound queues on 67th Avenue reaching roughly 11 vehicles and 13 vehicles during the weekday and weekend events, respectively. This queue is due to the high volume of outbound vehicles exiting the park in a short period of time. The proposed park layout helps mitigate this issue as it provides an additional access onto Brockton Lane which will decrease the queue experienced along 67th Avenue. As shown in Chart 1 and Chart 2, the proposed park layout reduces the experienced 95th percentile queue along 67th Avenue to less than two vehicles.

It is noted that the results here reflect those of a typical event at the site in each of the 2020 Build scenarios. Different events will have different characteristics that may impact the actual queue lengths.

Sight Distance Analysis

Proper sight distance can reduce the possibility of conflicts at intersections. As a tool to evaluate the proposed site access location, the sight distances were evaluated at the existing and proposed access locations onto Brockton Lane. According to the American Association of State Highway and Transportation Officials' (AASHTO) *A Policy on Geometric Design of Highways and Streets* (commonly referred to as the Green Book), intersection sight distance is the distance

provided at intersections and driveways to allow drivers to perceive the presence of potentially conflicting vehicles and, when the appropriate gap in traffic is provided, to safely perform their movement.

Intersection sight distance requirements are provided in terms of both a physical distance and a time gap in the mainline traffic related to the speed of approaching vehicles. For approaching vehicles at any speed, per Table 9-5 of the AASHTO Green Book, a passenger car stopped at an intersection requires a minimum time gap of 7.5 seconds in either direction to complete a left turn movement. In other words, an average driver needs to see an approaching vehicle at least 7.5 seconds away to know if they have sufficient time to complete a left turn. To complete a right turn movement, per Table 9-7 of the AASHTO Green Book, the time gap is reduced to 6.5 seconds for a passenger car and applicable only to vehicles approaching from the left of the stopped driver. For single-unit trucks, the time gaps are 9.5 seconds for a left turn and 8.5 seconds for a right turn. For combination trucks, the time gaps are 11.5 seconds for a left turn and 10.5 seconds for a right turn.

A minimum of ten vehicle time measurements were made for each direction at the Brockton Lane/67th Avenue intersection as well as at the proposed site access location. Table 2 shows those results based on measurements made in a passenger vehicle. The times may be longer for single-unit or combination trucks as the driver is seated higher in those vehicles increasing the field of view.

Table 2 – Intersection Sight Distance

Location	Direction Looking	Measured ISD
Brockton Ln/67 th Ave	Left (to the south)	15+ sec
	Right (to the north)	9.03 sec
Proposed Site Access	Left (to the south)	15+ sec
	Right (to the north)	10.95 sec

As shown in Table 2, the existing site access has adequate sight distance to find an appropriate gap, however, it was noted the drivers must pull beyond the stop sign to achieve adequate sight lines due to overgrown brush. Tree-trimming along Brockton Lane should be completed and will provide more sight distance to drivers and minimize the need for drivers to pull out past the stop sign to achieve sufficient sight lines.

Access Spacing Review

As shown previously in the site plan, one new park access is proposed on Brockton Lane. This new access is located approximately 150 feet south of the Brockton Lane/67th Avenue intersection. Based on the proximity of these intersections an access spacing review was completed.

The access spacing guidelines developed for minor arterials reflect the standards adopted by Hennepin County. According to Hennepin County guidelines, a minimum of one-quarter mile spacing of all access points, such as cross streets and driveways, onto a minor arterial roadway

is required. Based on the most recent site plan, approximately 150 feet between intersections is proposed (less than 1/4 of a mile), and Hennepin County standards are not met. Due to this lower than preferred spacing an outbound only intersection, and a right-out only intersection, were both analyzed under the future scenario to determine the impacts on vehicle operations. By restricting the access to outbound traffic only any confusion regarding a northbound right turning vehicle's destination, once they enter the turn lane, will be eliminated, reducing the chances of conflicts.

Chart 3 and Chart 4 show the resulting queues.

Chart 3 – Weekday Event Queues – Brockton Lane Access Out Only

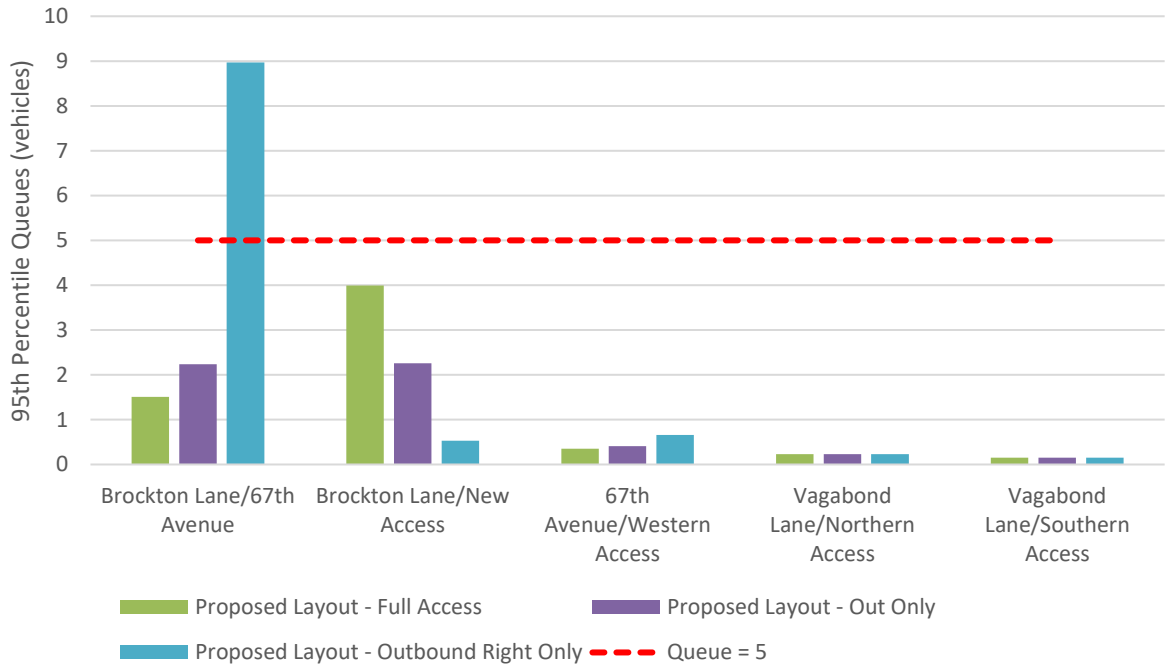
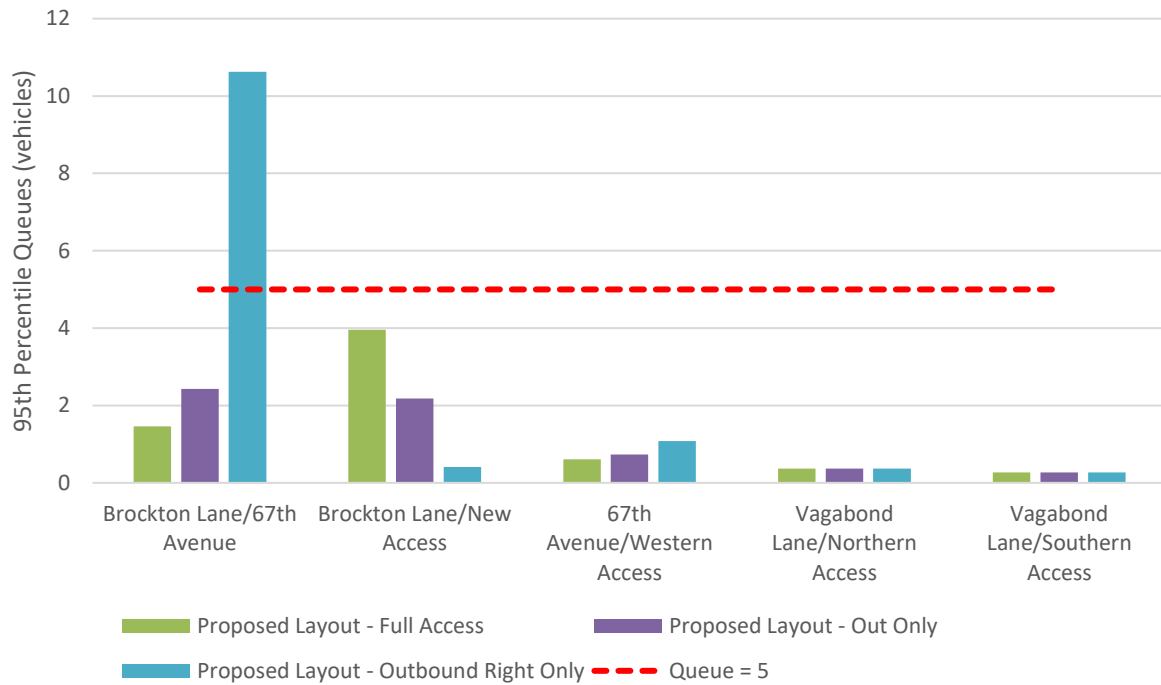


Chart 4 – Weekend Event Queues – Brockton Lane Access Out Only



As shown in Chart 3 and Chart 4 operations remain relatively similar to the full access condition with all intersections and approaches operating within acceptable bounds under the outbound only park access onto Brockton Lane. Under the right-out only operations queues extend beyond the preferred bounds with nine and 11 vehicle queues experienced during the weekday and weekend events, respectively. Based on these conditions an out-only access should be provided at this location. Appropriate pavement markings and “Do Not Enter” signs should be utilized at this access to notify drivers of the outbound only use. Additionally, the access width should only provide space for one lane to prevent potential inbound traffic.

Parking Review

As mentioned previously, at peak capacity approximately 282 vehicles are expected to be parked on site. Based on the distribution patterns assigned, it is anticipated that approximately 204 vehicles (72%) will utilize the 67th Avenue parking lot, while the remaining 78 vehicles (28% will utilize the lot/on-street parking along Vagabond Lane. With 240 parking stalls in the Brockton Lane lot and 108 stalls in the Vagabond Court parking lot, sufficient parking supply is provided for the proposed demand. The overflow parking area, as well as designated parallel parking stalls along Vagabond Lane, will rarely be used due to lack of onsite parking.

Site Plan Review

The concept site plan contained in the Appendix was reviewed to determine if the plan provides appropriate circulation and minimizes conflicts. Following are recommendations based on key transportation elements of the concept site plan:

- i. **Bicycle Parking** - Bicycle parking is not denoted on the site plan. It is recommended that bicycle parking be installed within the park to encourage cycling as a mode of

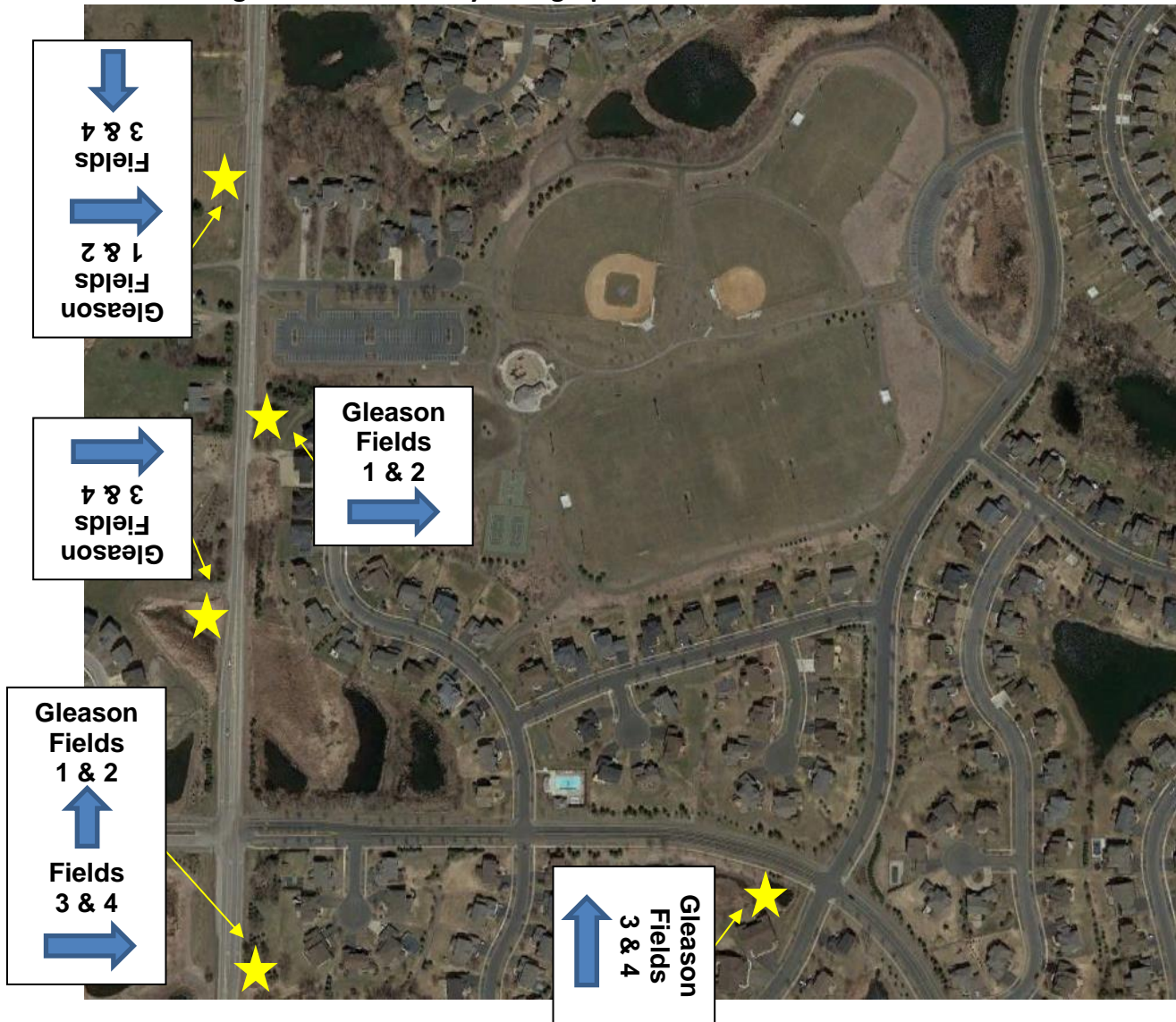
- transportation. The bicycle parking should be placed in a well-lit area near the main accesses to the park.
- ii. **Pedestrian Connectivity** - The existing sidewalk along the north and south edges of the Brockton Lane parking lot should be extended east along the proposed parking expansion. These sidewalks will provide pedestrians with a more direct path to their vehicles and help reduce random walking paths through the parking facility.
 - iii. **Signing & Striping** - It is recommended that a sign be installed instructing vehicles leaving the development not to block the private driveways along 67th Avenue.
 - iv. **Potential access closure** – As previously mentioned the proposed site plan shows the potential closure of one of the existing parking lot accesses onto 67th Avenue. Based on our analysis only one access is needed if the new Brockton Lane parking lot access is constructed as an outbound only access. Under this scenario either of the existing site accesses could be closed as minimal queuing is experienced. If this new access is restricted to a right-out only access at least 275 feet of space between the 67th Avenue stop bar and remaining access should be provided to prevent spillover of the outbound 67th Avenue queue into the parking lot.

Neighborhood Wayfinding

As discussed in the Parking review, the 67th Avenue parking lot is the heaviest utilized lot with roughly 72% of event traffic utilizing these facilities for drop-off/pick-up and parking. To help spread out entering and exiting traffic to the playfields and minimize park users from parking in the adjacent neighborhoods, the following wayfinding and mitigation techniques should be implemented:

- i. **Exterior Park Signage** – Park signage should be placed in advance of the park accesses and routes to help direct drivers to designated parking facilities. Through the use of a field numbering system, and strategic signage, park users can be directed to different parking areas depending on their ultimate destination. Park users who will be playing on the eastern two baseball fields, or the existing lacrosse field, should be directed to the parking area off Vagabond lane, while western field teams should be directed to the main parking lot off 67th Avenue. Figure 2, below, shows potential signage and locations to help facilitate this traffic flow.

Figure 2 – Vehicle Wayfinding Options



- ii. **Internal Park Signage** – Once park users are in the playfield facility internal signage should be utilized. This signage should point vehicles to overflow parking areas as well as help direct users to main park facilities. These facilities should include the bathrooms, hockey rinks, specific playfields, and other main park attractions. Additional signage, with walking distance markers, noting the larger walking path loop around the baseball fields should also be provided. These signs should be used to minimize the chances of park users accidentally taking the longer walking path, instead of the shorter cut through paths.
- iii. **Playfield Information Distribution** – The preferred parking area information, discussed above, should be provided to teams who will be utilizing the Gleason Playfields. By disseminating this information to teams and park users, buses, coaches, and parents will know the preferred parking areas and more evenly spread out through the park's parking facilities minimizing the incentive for parking in the adjacent neighborhoods. The information should be provided on the Park's website as well as through direct distribution to leagues and organizations which utilize the fields.

By implementing these strategies field users will be more evenly distributed through the parking facilities and will also have less incentive to park within the adjacent neighborhoods to gain close access to their desired park destination. Additionally, the baseball fields will likely reduce vehicles parking along residential roads, such as 65th Place, as there will no longer be direct connections to the spectator area, which is not the case with soccer fields. This is the case with baseball fields as the spectator area is behind home plate and centered in the park. If vehicle park along 65th Place they will have a longer walk to these areas which reduces the incentive for the neighborhood parking.

With the increase in trips and installation of wayfinding signs in the surrounding neighborhoods, Vagabond Lane is expected to see an increase in traffic on event days. However, given that the minority of vehicles accessing Gleason Fields will do so via Vagabond Lane, the increase in traffic is not expected to significantly impact operations along Vagabond Lane.

Appendix

- A. Turning Movement Counts
- B. Capacity Analysis Results
- C. Site Plan