

MEMORANDUM

Date: November 9th, 2023
To: Mike Waltman, P.E.
Jordan City Engineer
From: Ross Tillman, P.E.
Chloe Weber, EIT
Subject: Sunset Drive Traffic Operations
City of Jordan
Project No.: 0T1131561

Introduction

In 2019, a traffic study was performed in the area of the Jordan Public Schools to identify existing traffic challenges and to develop possible solutions that improve safety, maintain access, and provide acceptable mobility for future expansion and development of the school property and adjacent land. The prior report analyzed the existing conditions, future conditions, and the build options for the area.

Part of the study was to anticipate traffic operations along Sunset Drive given a reconfiguration of the internal school site layout, including changing the structure of the parent drop-off at the elementary school and combining the elementary and high school access points. Since 2019, the anticipated internal site layout has changed, prompting the traffic operations to be analyzed again with updated conditions. Therefore, the area studied and summarized in this memorandum was reduced to the school accesses, Hillside Drive, and Timber Ridge Court.

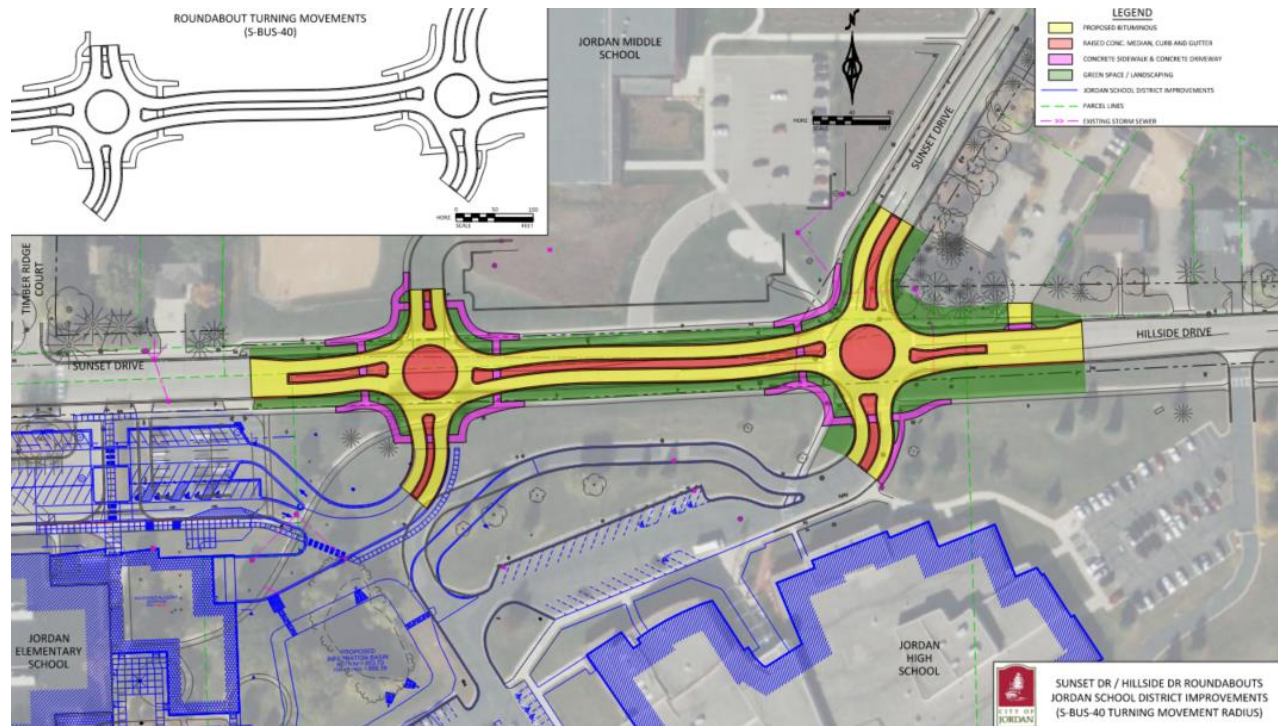
The study area is located in the City of Jordan, MN in Scott County. See Figure 1 for the project location map. The study area is located just south and east of TH 169.

Figure 1: Project Location Map



The updated proposed roadway changes along Sunset Drive include two compact roundabouts at the elementary school access and the intersection of Sunset Drive/Hillside Drive. See **Figure 2**, below.

Figure 2: Proposed Roundabout Layout on Sunset Drive at Hillside Drive and Jordan Middle School/Elementary School Access



Data Collection

Data was collected in May 2019 as part of the previous study. The updated analysis was completed using the same turning movement volumes and 2040 projections. Three peaks were analyzed; AM Peak (7:15 am to 8:15 am), Afternoon Peak (2:45 pm to 3:45 pm), and PM Peak (4:30 pm to 5:30 pm). Turning movement count details can be seen in the previous study report, which is found in the Appendix.

Traffic Forecasting

The traffic forecasting accounts for growth based on the school enrollment estimations - which was anticipated to be a 22% increase from 2019 to 2040, as well as an increase in background traffic growth caused by adjacent and regional development. For further detail, see the 2019 Jordan School Area Traffic Study in the Appendix. Turning movements for this analysis were altered to assume that all school traffic would be entering and exiting from the school entrances on Sunset Dr, whereas previously some had been assumed to use the southern elementary school driveway on Aberdeen Ave.

Safety and Compliance

Crash History

The 2019 Jordan School Area Traffic Study had analyzed a three-year period for safety evaluation (2015-2017). In this period, there were two crashes at the intersection of Sunset Dr and Hillside Dr (one right-angle and one bicycle crash, resulting in a possible injury and minor injury). This intersection was under the statewide average for observed crash rate. For further detail on the safety analysis, see the 2019 Jordan School Area Traffic Study in the Appendix.

The intersection of Sunset Dr and Timber Ridge Ct is known to have safety concerns. A serious pedestrian crash occurred near the intersection in September 2023. The traffic control, crosswalk placement, and sun glare/visibility of this intersection were taken into consideration when considering the design and enhancements along Sunset Dr.

Stop Sign Compliance

Due to the fact that the existing all-way stop control at Sunset Dr and Hillside Dr is unwarranted per vehicular volume requirements, an analysis was done to assess the compliance of drivers at the intersection. In a visual review over the fifteen-minute period leading into the afternoon peak hour, approximately 30% of drivers were seen rolling through the intersection (slowing down, but not fully stopping). This poses a safety risk to all modes of traffic, but specifically pedestrians and bicyclists crossing this intersection.

Warrant Analysis

The 2019 Jordan School Area Traffic Study found that the current all-way stop intersection of Sunset Drive and Hillside Drive does not meet warrants for an all-way stop control due to traffic volumes alone, as prescribed in the Minnesota Manual on Uniform Traffic Control Devices. Installing all-way stop controlled intersections when unwarranted by traffic volume may lead to non-compliance. Intersection specific compliance was discussed in the *Stop Sign Compliance* section of this memorandum. An additional all-way stop alternative was evaluated after the 2019 study and documented in this updated analysis.

Traffic Operations

An operations analysis was completed for the AM, Afternoon, and PM peak hours using the 2040 Build Condition turning movements. The operational analysis results are described as a Level of Service (LOS) ranging from A to F. These letters serve to describe a range of operating conditions for different types of facilities. Levels of Service are calculated based on the Highway Capacity Manual 6th Edition, which base the level of service on control delay. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection, and the time for the vehicle to speed up through the intersection and enter into the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. Level of service D is commonly taken as an acceptable design year LOS in the suburban area of the Twin Cities metro region.

The level of service and its associated intersection delay for a signalized and unsignalized intersection is presented below. The delay threshold for unsignalized intersections is lower compared to signalized intersections, which accounts for the fact that people expect a higher level of service when at a stop-controlled intersection. Roundabouts are considered unsignalized intersections.

Table 1 details the control delay thresholds for signalized and unsignalized intersections.

Table 1: Level of Service Criteria

LOS	Signalized	Unsignalized
	Control Delay per Vehicle (sec.)	Control Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Alternative 1: Compact Roundabout/All-Way Stop Combination

Per the previous study, the all-way stop controlled option at the eastern intersection of Sunset Dr and Hillside Dr was found to be unwarranted when considering traffic volume thresholds and also have poor anticipated traffic operations. However, with the new internal layout of the school’s entrances and lot circulation, a hybrid compact roundabout/all-way stop concept was reconsidered. The former school access concept proposed a shared elementary/high school access, whereas the current concept retains the existing high school access at all-way stop, and considers only the westerly proposed roundabout at the new elementary/CERC access. Analysis was completed by looking at the simulated behavior of the eastern intersection of Sunset Dr and Hillside Dr as an all-way stop controlled intersection.

The all-way stop controlled intersection was analyzed in Synchro/SimTraffic version 11. **Table 2** shows the operational results for the eastern intersection.

Table 2: All-Way Stop Controlled Operational Results

Intersection	Approach	AM Peak Hour						Afternoon Peak Hour						PM Peak Hour					
		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max
Sunset Dr and Hillside Dr/High School Access	EB	13	B	11	B	100	250	5	A	29	D	50	100	5	A	5	A	50	100
	WB	11	B			50	125	6	A			50	100	7	A			50	100
	NB	10	B			50	175	65	F			225	500	6	A			25	75
	SB	10	B			75	175	5	A			50	75	6	A			50	125

Table 2 shows that all approaches at Sunset Dr and Hillside Dr operate with overall LOS B, D, and A for the AM, Afternoon, and PM Peak respectively. The afternoon peak shows the highest anticipated delay with overall 29 seconds per vehicle on average.

The northbound approach at the high school shows over a minute of delay per vehicle (LOS F) and a maximum queue that is anticipated to block the parking stalls on the north side of the building. Excessive delay may cause drivers to make riskier maneuvers in order to continue to their destination. In an area with both younger pedestrians and younger drivers, minimizing delay on and around school property is a priority.

Alternative 2: Two Compact Roundabouts

Prior analysis utilized the Highway Capacity Software (HCS) Version 7 to analyze the roundabout operations. HCS uses equation-based theory to calculate operational results of delay and queueing. In this analysis, the roundabouts were analyzed using Junctions 10 ARCADY (Assessment of Roundabout Capacity and Delay) software. ARCADY uses simulation-based modeling to conclude the same operational metrics. When considering two intersections in close proximity, the queueing and delay at one may impact the other. Therefore, simulating the two intersections in the same model together in ARCADY provides more detailed results that reflect the driver behavior and intersection proximity impacts. Details on the approach delay, intersection delay, LOS, and queueing information for the analysis periods are shown in **Table 3**, below.

Table 3: Compact Roundabout Operational Results

Intersection	Approach	AM Peak Hour						Afternoon Peak Hour						PM Peak Hour					
		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max
Sunset Dr and Elementary School/CERC Access	EB	16	C	13	B	100	350	5	A	5	A	25	50	6	A	6	A	25	100
	WB	7	A			25	75	5	A			25	50	6	A			25	75
	NB	14	B			75	200	5	A			25	50	5	A			25	25
	SB	7	A			0	25	0	A			0	25	5	A			0	25
Sunset Dr and Hillside Dr/High School Access	EB	32	D	19	C	200	325	6	A	7	A	25	50	6	A	6	A	25	75
	WB	8	A			25	50	6	A			25	25	5	A			25	25
	NB	10	A			25	75	12	B			50	125	6	A			25	25
	SB	14	B			75	225	6	A			25	50	7	A			25	75

Table 3 shows that the two mini roundabouts would be anticipated to operate acceptably through 2040. The intersections overall operate with LOS A during both the afternoon and PM peaks hours. In the AM peak hour, the roundabouts are anticipated to operate with LOS B and C at the western and eastern intersections, respectively. At the eastern roundabout, the eastbound approach shows LOS D in the AM peak. With an approximate spacing of 350 feet between the roundabout entrances, no queue between the two roundabouts is anticipated to impact the other. Additionally, the spacing in the school parking lots is expected to be sufficient for these queues. None of the queues in the internal lots are anticipated to extend into areas where parking stalls exist.

Other Considerations

Roundabout Safety

A single lane compact roundabout would reduce the number of conflict points at each intersection from at least 32 conflict points to 8 conflict points. Data published by MnDOT’s Office of Traffic Engineering “A Study of the Traffic Safety at Roundabouts in Minnesota” indicates that single-lane roundabouts have similar crash rates compared to all-way stop controlled intersections but have around 45 percent fewer fatal and serious injury crashes. The MnDOT report also shows that single lane roundabouts were found to reduce right angle crashes by 68%.

Pedestrian Safety

Additionally, pedestrian safety is improved with the installation of a roundabout (or multiple roundabouts) as median refuges allow pedestrians to cross only one lane of traffic and only one direction of traffic at a time. The provision of splitter islands on the roundabout also reduces the pedestrian crossing distances. This is an improvement from the existing condition where pedestrians cross multiple lanes of traffic at once.

Additionally, due to the nature of roundabout design, speeds within the roundabouts and in the vicinity of the roundabouts are reduced. In an area adjacent to schools, 24/7 speed reduction and subsequent traffic calming will produce a safer street. Unlike stop signs which do not *require* vehicles to slow down but rather rely on compliance, roundabout geometry *causes* constant lower speed enforcement. Compact roundabout designs are often for 15 MPH.

RRFB placement

Due to the high pedestrian activity in the area and between the two schools, pedestrian safety and comfort was a priority in the redesign of the school access points' crossings both along and across Sunset Dr. Roundabouts at these locations are anticipated to increase pedestrian safety due to shorter crossing distances and slower vehicular speeds. However, the addition of rectangular rapid-flashing beacons (RRFBs) on certain crossings at the roundabouts is also expected to increase pedestrian visibility and therefore yield compliance.

Additionally, the "School Travel Safety Assessment" conducted by Dakota County in collaboration with the Minnesota Department of Transportation draft report (January 15, 2021) section on "School Crossings at Single Lane Roundabouts" included a research study and best practices for school crossings at single lane roundabouts, and specifically the use of RRFBs. The draft report notes that "There is no guidance or best practice to install RRFB for the crosswalks at a single-lane roundabout; however, RRFB at one or more roundabout crosswalks may be beneficial to the visibility of the school crossing or to increase drivers' yielding behavior." The study considerations include:

- The degrees of curvature at the roundabout should be evaluated and increased where feasible to decrease driver speeds at the crosswalks.
- RRFBs may be considered where the school route plan includes crossing a leg of the single-lane roundabout.
 - RRFBs are not recommended for all legs of the roundabout and should be prioritized on the leg of the roundabout where the school crossing is located. Driver speeds tend to be higher and driver yielding tends to be lower at roundabout exits compared with roundabout entrances.
- Adult crossing guards are still needed for middle school and elementary students crossing at a roundabout, even if RRFBs are installed. Crossing guards should be trained to use the RRFB push buttons even if they have a stop paddle or school patrol flag.
- Students should be trained to follow the direction of the adult crossing guard, and to wait for the crossing guard to enter the crosswalk and stop traffic, even if the RRFB is flashing.

The key study recommendations and considerations from the "School Travel Safety Assessment" are applicable to the Sunset Drive school area roundabouts. The conditions at the school crossings on county and state roads evaluated in the "School Travel Safety Assessment" indicate that an RRFB would be appropriate, but the final determination should be made as part of the design of each location.

As such, the locations of the RRFBs to be installed were determined based on the pedestrian volume, conflicting vehicular volume, existing safety concerns, and consolidation of pedestrian crossings. The relocation of the crosswalk at Timber Ridge Ct to the west leg of the westerly roundabout was prompted by the pedestrian safety concerns and crash history of the current intersection crossing. The high pedestrian volume and high conflicting vehicular volume was justification for the installation of the other two RRFBs on the two legs between the roundabouts (the western crossing at the high school entrance, and the eastern crossing at the elementary school entrance).

Site Circulation

The previous study contemplated a proposed shared access between the elementary school and high school. The previous study also considered queuing within the internal site, to confirm that no traffic should have backed up on the main road. The previous study stated that in 2040, it was anticipated that the internal site would need 1,275 feet of storage to accommodate expected enrollment.

With vehicles lining up and dwelling in a parent pick up loop at the elementary school, the circulation and queuing was analyzed again with the updated site layout plan (maintaining two separate access points on Sunset Dr). It was found that with a simulated dwell period of up to five minutes, the queues in the elementary school lot during the peak hour are not expected to back into the roundabout to affect operations. In other words, the space provided within the elementary school site is anticipated to be sufficient for parent pick-up and drop-off queues. The proposed design shows approximately 1,500 feet of storage from entrance to exit of the roundabout within the elementary school site.

Additional Analysis

The intersection at Beaumont Blvd, Aberdeen Ave, and Sunset Dr was analyzed for potential reconfiguration due to the proximity to the proposed changes at the schools. It is currently configured as a T-intersection where all approaches are stop controlled, though the intersection does not meet all-way stop control warrants based on volumes alone. Based on traffic volumes, an alternative considered for this location is to reconstruct the curvature of Sunset Dr / Aberdeen Ave to allow traffic to freely move between, and keep Beaumont Blvd stop controlled (in other words converting the intersection to a side-street stop for Beaumont Blvd only). **Table 4** shows the 2040 operational results for the existing (all way stop control) and potential alternative (side street stop control) at this intersection.

Table 4: Beaumont Ave/Sunset Dr/Aberdeen Ave Intersection Operational Summary

Intersection Control	Approach	AM Peak Hour						Afternoon Peak Hour						PM Peak Hour					
		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)		Approach		Intersection		Queue Length (ft)	
		Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Avg	Max
All Way Stop	EB	6	A	6	A	50	75	6	A	7	A	25	75	6	A	3	A	25	50
	WB	5	A			50	75	6	A			50	125	4	A			75	100
	NB	8	A			75	100	8	A			75	125	5	A			50	75
Side Street Stop (Beaumont Blvd-EB)	EB	8	A	1	A	50	75	8	A	1	A	50	75	8	A	1	A	25	50
	WB	1	A			0	0	1	A			0	0	1	A			0	0
	NB	1	A			0	0	2	A			25	50	2	A			25	50

In 2040, the intersection is anticipated to operate with overall LOS A in all peak periods. This layout would reduce delay and queues along Aberdeen Ave and Sunset Dr, without large impacts to Beaumont Blvd. No queues are anticipated to impact nearby intersections.

However, there may be safety and sightline concerns if the geometry and control were changed. The northbound left movement from Aberdeen Ave to Beaumont Blvd would need to be able to see clearly around the curve for any westbound traffic along Sunset Dr. Additionally, the westbound left traffic turning into the elementary school truck access just west of Timber Ridge Ct would need to be able to see any northbound traffic on Aberdeen Ave to safely make its turn. Therefore, any reconfiguration would need to consider these sight triangles to provide proper clear views from any vertical obstructions to the sightlines of the vehicles. The radius of the proposed curve would impact these sight lines as well as the speeds at which vehicles can navigate the corner. Both need to be considered if the alternative moves forward to achieve a safe design. At concept level review, reconfiguration of the intersection does not appear prudent, as benefits are minimal if any while there would be impacts and associated costs with any change. LOS A is anticipated under the current configuration in 2040.

Conclusion

The traffic operations shown in this memorandum have been updated to reflect proposed geometric layout improvements developed following the initial 2019 Jordan School Area Traffic Study. This analysis also revisited previous concepts with more detailed simulation-based analysis, as simulation considers the interdependence of nearby intersections. The operations results shown in this update compared to the prior study are different, though based on the methodology used are considered a more accurate representation of what will occur in the field.

The previous study recommended side-street stop control pairs at both intersections or two mini roundabout intersections on Sunset Dr, with various degrees of change to the internal site. This analysis (with updated internal layout assumptions) show that dual compact roundabouts have more benefits than a combination of a mini roundabout and an all-way stop controlled intersection, as well as other alternatives evaluated in 2019.

Operations show that during the school release and the PM peak, both roundabouts operate with LOS A overall, and all movements at LOS B or better. During the AM peak, the western intersection of Sunset Dr and the elementary school/CERC access operates with LOS C or better for all movements, and LOS B overall. At the eastern high school access and Hillside Dr intersection, the compact roundabout is anticipated to operate acceptably with LOS D or better for all movements, and LOS C for the intersection overall through 2040. No queues produced by the roundabouts are anticipated to impact internal site parking access or nearby intersections. In comparison, the all-way stop controlled intersection would produce queues that extend through larger portions of the internal site at the High School and cause higher delay (LOS D) at the intersection overall in the school release peak.

More importantly, the unwarranted nature of the all-way stop controlled intersection at Sunset Dr and Hillside Dr has led to non-compliance, which could cause a safety issue with the high volume of pedestrians and bicyclists in the area throughout the day. Analysis shows the intersection will continue to not meet warrants even with growth analyzed in 2040. Roundabouts produce a safer environment for multimodal users as the crossing distance is reduced, and pedestrians and bicyclists would only need to cross one lane and one direction of traffic at a time, where motorists are forced to travel at lower speeds. This is even more true when additional treatments are provided to key roundabout crossings, such as the RRFBs proposed with the project.

With the new internal layout considered, the combination of two mini roundabouts or a mini roundabout on the west and an all-way stop controlled intersection on the east were considered. When considering traffic operations, safety, speed control, and compliance, two compact roundabouts are recommended at the intersections of Sunset Dr at Hillside Dr and Sunset Dr and western school access (middle school and elementary school).



**BOLTON
& MENK**

Real People. Real Solutions.

Jordan School Area Traffic Study

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Scott County, MN

August 19, 2019

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Certification

Jordan School Area Traffic Study

City of Jordan, Minnesota

August 19, 2019

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision, and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

By: 

Ross B. Tillman, P.E.
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Date: 8/19/2019

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Appendix

Appendix A: Traffic Volumes

Appendix B: Crash Analysis

Appendix C: No Build Operational Analysis

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Appendix F: Mitigation Layouts

Appendix G: Warrant Analysis

I. Introduction

A traffic study was performed at in the area of the Jordan Public Schools to identify existing traffic challenges and to develop possible solutions that improve safety, maintain access, and provide acceptable mobility for future expansion and development of the school property and adjacent land. This report will analyze the existing conditions, future conditions, and the build options for the area.

The study area is located in the City of Jordan, MN in Scott County. See **Figure 1** for the project location map. The study area is located just south and east of TH 169.

Figure 1: Project Location Map



II. Existing Conditions

The study area includes the following three segments:

- County Road (CR) 66 from Prospect Pointe Rd to Aberdeen Ave
 - The posted speed limit is 55 mph.
 - The functional class is identified as Major Collector.
- Aberdeen Ave from CR 66 to Sunset Dr
 - The posted speed limit is 30 mph and 25 mph during School hours.
 - The functional class is identified as Major Collector.
- Sunset Dr from Aberdeen Ave to Hillside Dr/High School Access
 - The posted speed limit is 30 mph and 20 mph during School hours.
 - The functional class of Sunset Dr from Aberdeen Ave to Hillside Dr is identified as Major Collector. The functional class of the east of Sunset Dr is identified as Minor Collector.

A. Data Collection

Traffic counts were collected at thirteen (13) intersections along the study area. The counts were completed in May 2019. Three peak hours of traffic were determined from the data collected:

AM Peak	7:15 am to 8:15 am
Afternoon Peak	2:45 pm to 3:45 pm
PM Peak	4:30 pm to 5:30 pm

Figure 2 in the **Appendix A** shows existing 2019 peak hour turning movement counts and Average Daily Traffic (ADT).

B. Traffic Speed

85th percentile vehicle speeds were also collected at three (3) locations, one location on Aberdeen Ave and two locations on Sunset Dr/Hillside Dr. The 85th percentile speed indicates where only 15 percent of traffic is exceeding that speed and is used, in part, to set speed limit. The tables below show the collected speed information.

Table 1: Aberdeen Ave (between Sunset Dr and Elementary School Access) Vehicle Speed Data

85 th Percentile Vehicle Speed (mph)	37
Posted Speed Limits (mph)	30

Table 2: Sunset Dr (between Timber Ridge Ct and North Elementary Access 4) Vehicle Speed Data

85 th Percentile Vehicle Speed (mph)	37
Posted Speed Limits (mph)	30

Table 3: Sunset Dr (between North Elementary Access 4 and Hillside Dr) Vehicle Speed Data

85 th Percentile Vehicle Speed (mph)	33
Posted Speed Limits (mph)	30

Red text indicates value is greater than the posted speed limits.

C. Safety Analysis

Crash data was obtained from data administered by the Minnesota Department of Transportation (MnDOT) for a three-year time period (2015-2017). A summary of the crashes at the intersections where crashes occurred are shown in **Table 4**.

Table 4: Crash Detail

Crash Details 01/01/2015 – 12/31/2017									
Intersections	Total Crashes	F	A	B	C	PDO	Bicycle	Right Angle Crashes	Head On
Sunset Dr and Hillside Dr	2			1	1		1	1	
Aberdeen Ave and West Elementary School Access	1					1			1
CR 66 and Aberdeen Ave	2					2		1	1

To determine if there are existing safety issues, the intersection crash rates and the critical rates were compared. The crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside of the expected, normal range. The critical index reports the magnitude of this difference and a critical index of less than one indicates that the intersection is operating within the normal range. All intersections within the study area have a lower crash rate than the statewide average. All critical and severity indices are found to be less than one indicating that the intersections are operating within the normal range compared to similar intersections statewide. Intersection crash rate worksheets and crash diagrams are included in the **Appendix B**.

D. Existing Operational Analysis

The traffic operations analysis for the intersections in the project area included an evaluation of existing intersection delay and Level of Service (LOS). LOS results are described using letters ranging from A to F. These letters serve to describe a range of operating conditions for different types of facilities. Levels of Service are calculated based on the Highway Capacity Manual (HCM) 6th Edition, which defines the LOS, based on control delay. Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection, and the time for the vehicle to speed up through the intersection and enter the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. The control delay is modeled within the analysis software, Trafficware Synchro and SimTraffic. LOS D or better is considered acceptable. **Table 5** shows the control delay thresholds for LOS A through F from the Highway Capacity Manual (HCM) 6th Edition).

Table 5: Level of Service Criteria

	Signalized Intersection	Unsignalized Intersection
LOS	Control Delay per Vehicle (sec.)	Control Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

The 2019 No Build AM, Afternoon and PM peak traffic volumes were analyzed with current geometry. The results of this analysis are shown in **Table 6**. Detailed LOS and queues are included in **Appendix C**.

Table 6: 2019 No Build Operations

Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	8	A	NBL
	Afternoon	1	A	4	A	NBL
	PM	1	A	4	A	NBL
Sunset Dr and Hillside Dr <i>Stop Controlled</i>	AM	5	A	6	A	SBT
	Afternoon	4	A	5	A	NBT
	PM	4	A	5	A	WBT
Sunset Dr and Middle School Access <i>Stop Controlled</i>	AM	1	A	9	A	SBL
	Afternoon	0	A	3	A	EBL
	PM	1	A	7	A	SBL
Sunset Dr and North Elementary School Access 4 <i>Stop Controlled</i>	AM	0	A	3	A	WBL
	Afternoon	1	A	5	A	NBL
	PM	0	A	4	A	NBR
Sunset Dr and North Elementary School Access 3 <i>Stop Controlled</i>	AM	1	A	7	A	NBL
	Afternoon	1	A	1	A	EBT
	PM	1	A	1	A	EBT
Sunset Dr and North Elementary School Access 2 <i>Stop Controlled</i>	AM	2	A	4	A	EBT
	Afternoon	2	A	3	A	EBT
	PM	2	A	4	A	EBT
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	2	A	19	C	SBL
	Afternoon	1	A	12	B	SBL
	PM	1	A	13	B	SBL
Sunset Dr and North Elementary School Access 1 <i>Stop Controlled</i>	AM	1	A	3	A	WBL
	Afternoon	1	A	6	A	NBL
	PM	0	A	4	A	NBL
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	6	A	EBT
	Afternoon	3	A	5	A	WBT
	PM	4	A	7	A	EBT
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	2	A	5	A	WBL
	Afternoon	1	A	2	A	WBL
	PM	1	A	5	A	WBL
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	4	A	WBR
	Afternoon	1	A	3	A	WBR
	PM	2	A	7	A	WBL
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	10	B	EBT
	Afternoon	6	A	10	B	WBT
	PM	7	A	10	B	WBT
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	5	A	NBL
	Afternoon	1	A	4	A	NBL
	PM	1	A	6	A	NBL

1. Delay in seconds per vehicle
2. Maximum delay and LOS on any approach and/or movement
3. Limiting Movement is the highest delay movement.

Delay:

- All intersections are anticipated to operate with an intersection LOS A.

Queuing:

- Queues are acceptable at most intersections. However, there are a few approach queues that should be noted within the study area. The following will detail existing traffic queue conditions:
 - Aberdeen Ave and West Elementary School Area:
 - The queues for school drop off during the AM peak hour extend onto Aberdeen Ave. The maximum queues for school drop off are 975 feet during the AM peak hour, which extends beyond the current storage within the school site.
 - The northbound maximum queues are 50 feet and southbound maximum queues are 75 feet during the AM peak hour, which is a result of traffic queuing onto Aberdeen Ave from the site.
 - These queues block the southbound through and northbound through movements.

III. Future No Build Conditions

A. Traffic Forecasting

The forecasts were determined based on the Annual Average Daily Traffic (AADT) counts available from the City of Jordan 2040 Transportation Plan as well as conceptual site plans/housing numbers for the agricultural property west of Aberdeen. The City of Jordan 2040 Transportation Plan provides daily traffic volume forecasts for the corridor and surrounding areas. The peak hour turning movement counts were grown or reallocated at each count location based on the forecasted AADTs for each leg of the intersection. **Figure 3** in the **Appendix A** details the forecasted 2040 No Build peak hour turning movements. The No Build forecast assumes growth in the area however no growth or changes to the school site.

B. No Build Operational Analysis

The 2040 No Build AM, Afternoon and PM peak traffic volumes were analyzed with the current geometry. The results of this analysis shown in **Table 7**. Detailed LOS and queues are included in **Appendix C**.

Table 7: 2040 No Build Operations

Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	NBL
	Afternoon	1	A	5	A	NBL
	PM	1	A	4	A	NBL
Sunset Dr and Hillside Dr <i>Stop Controlled</i>	AM	5	A	6	A	SBT
	Afternoon	4	A	5	A	NBT
	PM	4	A	5	A	WBT
Sunset Dr and Middle School Access <i>Stop Controlled</i>	AM	1	A	5	A	SBL
	Afternoon	0	A	3	A	EBL
	PM	1	A	7	A	SBL
Sunset Dr and North Elementary School Access 4 <i>Stop Controlled</i>	AM	0	A	3	A	WBL
	Afternoon	1	A	5	A	NBL
	PM	0	A	2	A	NBR
Sunset Dr and North Elementary School Access 3 <i>Stop Controlled</i>	AM	1	A	6	A	NBL
	Afternoon	1	A	2	A	WBL
	PM	1	A	1	A	EBT
Sunset Dr and North Elementary School Access 2 <i>Stop Controlled</i>	AM	2	A	4	A	EBT
	Afternoon	1	A	3	A	EBT
	PM	2	A	4	A	EBT
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	3	A	34	D	SBL
	Afternoon	1	A	10	B	SBL
	PM	1	A	17	C	SBL
Sunset Dr and North Elementary School Access 1 <i>Stop Controlled</i>	AM	1	A	3	A	WBL
	Afternoon	1	A	6	A	NBL
	PM	0	A	10	B	NBL
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	5	A	6	A	WBL
	Afternoon	3	A	6	A	EBT
	PM	4	A	6	A	EBT
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	26	D	37	E	SBL
	Afternoon	1	A	3	A	WBL
	PM	1	A	4	A	WBL
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	10	B	24	C	EBL
	Afternoon	1	A	5	A	EBL
	PM	2	A	6	A	WBL
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	9	A	13	B	EBT
	Afternoon	8	A	12	B	WBT
	PM	10	B	14	B	WBT
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	3	A	6	A	SBL
	Afternoon	1	A	6	A	SBL
	PM	2	A	8	A	NBL

1. Delay in seconds per vehicle
2. Maximum delay and LOS on any approach and/or movement
3. Limiting Movement is the highest delay movement.

Delay:

- All intersections are anticipated to operate with an intersection LOS B or better except for the intersection at Aberdeen Ave and West Elementary School Access. It is anticipated to operate with an intersection LOS D during the AM peak hour.

Queuing:

- The maximum approach queue for the 2040 No Build analysis is shown in **Appendix C**, however, there are a few approach queues that should be noted within the study area:
 - Aberdeen Ave and West Elementary School Area:
 - The queues for school drop off during the AM peak hour are anticipated to extend on to Aberdeen Ave.

- The northbound maximum queues are anticipated to be 250 feet and southbound maximum queues are anticipated to be 175 feet during the AM peak hour.

IV. Future Build Conditions

The Build forecast accounts for traffic from school enrollment growth, which is estimated to be an 22% increase from 2019 to 2040. For purposes of this analysis, this increase was assumed to occur immediately to be accounted for in both the 2020 and 2040 Build analysis. Based on traffic generated by 2019 enrollment, the minimum required drop off storage length is 975 feet. Enrollment increases anticipated by 2040 necessitate 1275 feet of drop off storage length for the Elementary School.

Figures 4 and 5 in Appendix A detail the forecasted 2020 Build and 2040 Build conditions. Two reconfigured school area concept layouts were provided by the City of Jordan. **Figures 6 to 9 in Appendix D** detail the two layouts. Both options were analyzed, with summary information provided below.

A. Option 1a

1. Drop-off/Pick-up Operations

Option 1a provides approximately 450 feet vehicle storage length without extending into Sunset Dr. It is anticipated that this option decreases the existing vehicle storage length by 400 feet. Based on the above analysis and review of the concept drawing, it is anticipated that Option 1a could not be sufficiently modified to meet the needs of the transportation network would also cause additional delays along public roadways. Therefore, additional analysis of Option 1a was not completed.

B. Option 1b

1. Drop-off/Pick-up Operations

Option 1b provides approximately 2000 feet of vehicle storage length without extending onto Sunset Dr. It is anticipated that this option increases the existing vehicle storage length by 1200 feet and would provide sufficient storage length for future enrollment increases.

2. Parking

Based on the Option 1b layout, it is determined that a total of 144 stalls will be gained.

3. Vehicle access/circulation

An operational analysis was completed in Highway Capacity Software (HCS) Version 7 for the roundabout depicted at the intersection of Sunset Dr and Middle/High School Access. The roundabout was analyzed with single lane approaches for all approaches. The single lane roundabout option is anticipated to operate at LOS F during both AM and Afternoon peak hours in both 2020 and 2040, due to highly peaked, conflicting traffic entering and exiting the school site. The internal site roundabout was also analyzed and was found to provide sufficient operations for the anticipated traffic volumes. **Appendix E** shows the detailed LOS summary. See Section V for mitigation options analyzed to resolve this capacity issue.

4. Bus access/circulation

Option 1b does not appear to separate bus access and vehicle access for both Elementary School and High School, which would imply a mixed drop-off/pick-up zone. This is not recommended for effective operations. See Section V for mitigation options analyzed to resolve this issue.

5. Pedestrian/Bicycle accommodations

Option 1b, as provided, does not specifically call out any pedestrian accommodations. We recommend that any roundabouts provide signed and marked crossings on all approaches.

V. Alternative Roadway and Access Concepts

Alternative geometric designs and traffic control types were considered and analyzed focusing on the Elementary School, the Middle School and the High School accesses. These concept layouts were analyzed using forecasted 2020 and 2040 volumes with Synchro/SimTraffic version 10 software, while roundabout results were calculated using HCS 7 modeling software. **Figures 10 to 14 in Appendix F** detail the mitigation option layouts. The operations and queues of the following options were analyzed:

- *Two-Way Stop Control Option*: Two-Way stop control used at both Sunset Dr/Hillside Dr and Sunset Dr/Middle/High School Access intersections. Sunset Drive traffic is not required to stop. This also includes shifting the internal roadway network/internal roundabout southwest to increase stacking distance to Sunset Dr.
- *All Way Stop Control (Option 1)*: All-Way stop control used at both Sunset Dr/Hillside Dr and Sunset Dr/Middle/High School Access intersections.
- *All Way Stop Control (Option 2)*: All-Way stop control used at the intersection of Sunset Dr/Middle/High School Access and two-way stop control used at Sunset Dr/Hillside Dr intersection (east/west not required to stop).
- *All Way Stop Control (Option 3)*: All-Way stop control used at the intersection of Sunset Dr/Hillside Dr and two-way stop control used at Sunset Dr/Middle/High School Access (east/west not required to stop).
- *Mini Roundabout Option*: Mini roundabout control used at both Sunset Dr/Hillside Dr and Sunset Dr/Middle/High School Access intersections. Access to the schools is split with the Elementary and Middle School using the west roundabout and the high school using the east.

Note that all options include proposed pedestrian treatments and separate bus traffic from parent traffic, as depicted on **Figures 10 to 14**.

A. Two-Way Stop Control Option

Two-Way Stop Control option was analyzed for the intersection of Sunset Dr/Hillside Dr and the intersection of Sunset Dr/Middle-High School Access. **Table 8** below shows the operational analysis. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 8: Two-Way Stop Control Operational Analysis

Year	Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
2020	Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	3	A	12	B	SBL
		Afternoon	2	A	8	A	SBL
		PM	3	A	8	A	SBL
	Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	11	B	69	F	NBL
		Afternoon	3	A	5	A	NBL
		PM	2	A	7	A	NBL
2040	Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	4	A	21	C	SBL
		Afternoon	3	A	11	B	SBL
		PM	3	A	11	B	SBL
	Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	25	D	203	F	NBL
		Afternoon	4	A	10	B	NBL
		PM	2	A	10	B	NBL

1. Delay in seconds per vehicle

2. Maximum delay and LOS on any approach and/or movement

3. Limiting Movement is the highest delay movement.

Sunset Dr and Hillside Dr

- The intersection is anticipated to operate with an intersection LOS A in 2020 and 2040.
- Maximum southbound right queue is anticipated to be 200 feet during the AM peak hour in 2040.

Sunset Dr and Middle/High School Access

- The intersection is anticipated to operate with an intersection LOS B or better except for the AM peak hour in 2040. It is anticipated to operate with an intersection LOS D.
- Northbound left movements are anticipated to operate at LOS F during the AM peak hour in 2020 and 2040. Long delays can lead to driver frustration and can increase the likelihood of additional risk taking to exit the site for this short period of time. This could result in an increased crash rate if drivers attempt to turn into smaller gaps in traffic along Sunset Dr.
- Queues are acceptable for all peak hours in 2020 and 2040 with a shifted internal roundabout location providing more stacking distance to Sunset Dr. Maximum northbound queues in 2040 are anticipated to be 400 feet during the AM peak hour as vehicles leave the site after dropping off students.

B. All Way Stop Control (Option 1)

All Way Stop Control (Option 1) was analyzed for the intersection of Sunset Dr/Hillside Dr and the intersection of Sunset Dr/Middle-High School Access. Although neither intersection meets warrants to install all way stop control based on volumes, they are being considered as a means to control traffic for pedestrian/bicycle crossing. See **Appendix G** for warrant analysis results. **Table 9** details the All Way Stop Control (Option 1) traffic operations and queues. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 9: All Way Stop Control (Option 1) Operational Analysis

Year	Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
			Delay (s)	LOS	Delay (s)	LOS	
2020	Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	6	A	EBL
		Afternoon	4	A	5	A	EBL
		PM	4	A	5	A	EBL
	Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	12	B	22	C	WBL
		Afternoon	4	A	7	A	EBT
		PM	5	A	7	A	EBT
2040	Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	8	A	10	B	SBR
		Afternoon	4	A	5	A	EBL
		PM	4	A	5	A	EBL
	Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	13	B	27	D	WBL
		Afternoon	5	A	7	A	EBT
		PM	5	A	7	A	EBT

1. Delay in seconds per vehicle

2. Maximum delay and LOS on any approach and/or movement

3. Limiting Movement is the highest delay movement.

Sunset Dr and Hillside Dr

- The intersection is anticipated to operate with an intersection LOS A in 2020 and 2040.
- Maximum southbound right queue is anticipated to be 250 feet during the AM peak hour in 2040.

Sunset Dr and Middle/High School Access

- The intersection is anticipated to operate with an intersection LOS B or better in 2020 and 2040.

- Maximum westbound left queue is anticipated to exceed the storage capacity of the left turn lane during the AM peak hour in 2020 and 2040, causing additional queuing for southbound traffic along Sunset Dr and potentially blocking westbound through traffic.

C. All Way Stop Control (Option 2)

All Way Stop Control (Option 2) consists of a two-way stop at the intersection of Sunset Dr/Hillside Dr and an all-way stop at the intersection of Sunset Dr/Middle-High School Access. **Table 10** details the All Way Stop Control (Option 2) traffic operations and queues. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 10: All Way Stop Control (Option 2) Operational Analysis

Year	Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
2020	Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	4	A	14	B	SBL
		Afternoon	2	A	9	A	SBL
		PM	3	A	9	A	SBL
	Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	12	B	22	C	WBL
		Afternoon	5	A	7	A	EBT
		PM	5	A	7	A	EBT
2040	Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	6	A	18	C	SBL
		Afternoon	2	A	9	A	SBL
		PM	3	A	9	A	SBL
	Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	14	B	29	D	WBL
		Afternoon	5	A	7	A	EBT
		PM	5	A	7	A	EBT

1. Delay in seconds per vehicle
2. Maximum delay and LOS on any approach and/or movement
3. Limiting Movement is the highest delay movement.

Sunset Dr and Hillside Dr

- The intersection is anticipated to operate with an intersection LOS A in 2020 and 2040.
- Maximum southbound right queue is anticipated to be 175 feet during the AM peak hour in 2040.

Sunset Dr and Middle/High School Access

- The intersection is anticipated to operate with an intersection LOS B or better in 2020 and 2040.
- Maximum westbound left queue is anticipated to exceed the storage capacity of the left turn lane during the AM peak hour in 2020 and 2040, causing additional queuing for southbound traffic along Sunset Dr and potentially blocking westbound through traffic.

D. All Way Stop Control (Option 3)

All Way Stop Control (Option 3) flips the traffic control proposed for Option 2. The assumed traffic control for Option 3 is an all-way stop at the intersection of Sunset Dr/Hillside Dr and a two-way stop at the intersection of Sunset Dr/Middle-High School Access. **Table 11** details the All Way Stop Control (Option 3) traffic operations and queues. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 11: All Way Stop Control (Option 3) Operational Analysis

Year	Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)
2020	Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	8	A	EBL
		Afternoon	4	A	5	A	EBL
		PM	4	A	5	A	EBL
	Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	12	B	80	F	NBL
		Afternoon	3	A	6	A	NBL
		PM	2	A	7	A	NBL
2040	Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	7	A	EBL
		Afternoon	4	A	5	A	EBL
		PM	4	A	5	A	EBT
	Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	12	B	74	F	NBL
		Afternoon	3	A	7	A	NBL
		PM	2	A	9	A	SBL

1. Delay in seconds per vehicle
2. Maximum delay and LOS on any approach and/or movement
3. Limiting Movement is the highest delay movement.

Sunset Dr and Hillside Dr

- The intersection is anticipated to operate with an intersection LOS A in 2020 and 2040.
- Maximum southbound right queue is anticipated to be 200 feet during the AM peak hour in 2040.

Sunset Dr and Middle/High School Access

- The intersection is anticipated to operate with an intersection LOS B or better in 2020 and 2040.
- Northbound left movements are anticipated to operate at LOS F during the AM peak hour in 2020 and 2040. Delays for northbound traffic are not as long as shown in the Two-Way Stop Control Option, however they may increase driver frustration and lead to additional risk taking as described previously.
- Queues are acceptable for all peak hours in 2020 and 2040 with a shifted internal roundabout location providing more stacking distance to Sunset Dr. Maximum northbound queues in 2040 are anticipated to be 225 feet during the AM peak hour as vehicles leave the site after dropping off students. The all-way stop at Sunset Dr/Hillside Dr provides some gaps in traffic to allow northbound traffic to exit the site more efficiently than the Two-Way Stop Control Option.

E. Mini Roundabout Option

A roundabout option was analyzed for the intersection of Sunset Dr and Middle/Elementary School Access (West Mini-Roundabout) using Highway Capacity Software Version 7. Previous options retained the single point of access for the majority of traffic destined to the elementary or high schools, which leads to a congested intersection at Sunset Dr/Middle-High School Access during peak periods. This option splits the circulation entering and exiting the site into two access points to alleviate congestion. **Tables 12 and 13** detail the Mini-Roundabout traffic operations and queues. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 12: West Mini-Roundabout Operational Analysis

Year	Options	Peak Hour	Delay by Approach (sec)				LOS by Approach				Intersection Delay (sec)	Intersection LOS
			EB	WB	NB	SB	EB	WB	NB	SB		
2020	Sunset Dr and Middle/Elementary School Access <i>West Mini-Roundabout</i>	AM	11	7	8	5	B	A	A	A	9	A
		Afternoon	3	4	4	0	A	A	A	A	4	A
		PM	4	4	4	4	A	A	A	A	4	A
2040	Sunset Dr and Middle/Elementary School Access <i>West Mini-Roundabout</i>	AM	15	8	10	5	C	A	A	A	12	B
		Afternoon	4	4	4	0	A	A	A	A	4	A
		PM	4	5	4	4	A	A	A	A	5	A

Table 13: West Mini-Roundabout Queues

Year	Options	Peak Hour	Maximum Queues (ft)			
			EB	WB	NB	SB
2020	Sunset Dr and Middle/Elementary School Access <i>West Mini-Roundabout</i>	AM	100	50	50	25
		Afternoon	25	25	25	0
		PM	25	25	25	25
2040	Sunset Dr and Middle/Elementary School Access <i>West Mini-Roundabout</i>	AM	150	75	50	25
		Afternoon	25	25	25	0
		PM	25	25	25	25

Delay:

- The west Mini-Roundabout is anticipated to operate with an intersection LOS B or better for all peak hours in 2020 and 2040.

Queuing:

- Queues are acceptable for all peak hours in 2020 and 2040.

Roundabout option was analyzed for the intersection of Sunset Dr and Hillside Dr (east Mini-Roundabout). **Table 14 and 15** details the Mini-Roundabout traffic operations and queues. Detailed operations are attached in the **Appendix E**. Preliminary layout is attached in the **Appendix F**.

Table 14: East Mini-Roundabout Operational Analysis

Year	Options	Peak Hour	Delay by Approach (sec)				LOS by Approach				Intersection Delay (sec)	Intersection LOS
			EB	WB	NB	SB	EB	WB	NB	SB		
2020	Sunset Dr and Hillside Dr <i>East Mini-Roundabout</i>	AM	9	6	7	8	A	A	A	A	8	A
		Afternoon	4	4	5	4	A	A	A	A	4	A
		PM	5	4	4	5	A	A	A	A	4	A
2040	Sunset Dr and Hillside Dr <i>East Mini-Roundabout</i>	AM	13	8	8	9	B	A	A	A	10	A
		Afternoon	4	4	5	5	A	A	A	A	5	A
		PM	5	4	4	5	A	A	A	A	5	A

Table 15: East Mini-Roundabout Queues

Year	Options	Peak Hour	Maximum Queues (ft)			
			EB	WB	NB	SB
2020	Sunset Dr and Hillside Dr <i>East Mini-Roundabout</i>	AM	75	25	25	75
		Afternoon	25	25	25	25
		PM	25	25	25	25
2040	Sunset Dr and Hillside Dr <i>East Mini-Roundabout</i>	AM	100	25	25	75
		Afternoon	25	25	25	25
		PM	25	25	25	50

Delay:

- The east Mini-Roundabout is anticipated to operate with an intersection LOS A for all peak hours in 2020 and 2040.

Queuing:

- Queues are acceptable for all peak hours in 2020 and 2040.

VI. Analysis Summary

The speed analysis shows that there is a vehicle speed compliance issue along Aberdeen Ave and Sunset Dr. The 85th percentile speed at three tested locations were all higher than the posted speed limits. This could be attributable to the rural or wide character of the roadway and surrounding land use (Aberdeen) or the wide roadway width (Sunset). Improvements related to the school site circulation changes should take these findings into consideration.

Two site circulation options were provided based on work completed by the school district:

- Option 1a
 - The proposed parents drop off storage capacity at the Elementary School is undersized. Backups are anticipated to extend beyond the parking lot and onto Sunset Dr.
- Option 1b
 - The single lane roundabout is anticipated to operate at LOS F during AM and Afternoon peak hours in 2020 and 2040. Eastbound traffic largely would be unable to enter the roundabout during the AM peak due to conflicting traffic. The concentrated access to all schools shifts too much traffic to this location for this type of design to accommodate traffic during peak periods.

Based on these results, five alternative roadway and access concepts were considered to improve traffic operation characteristics, starting from Option 1b:

- Two-Way Stop Control Option
 - At the intersection of Sunset Dr and Middle/High School Access, southbound left movements are anticipated to operate at LOS F during the AM peak hour in 2040. Also, northbound left movements are anticipated to operate at LOS F during the AM peak hour in 2020 and 2040. However, if the internal roundabout were shifted further south, stacking distance can be increased to minimize the risk of this movement queuing into the roundabout. Long delays for drivers exiting the site could lead to safety issues if inadequate gaps in traffic are used to enter Sunset Dr.
 - Traffic flows along Sunset Dr work well.
 - Pedestrians would be provided marked and signed crossings of Sunset Dr with median refuges to aid in safe and efficient crossing. Enhanced treatments, such as RRFBs, could be considered as well.
 - Internal sidewalk networks need to be considered to provide relatively direct access to the crossing and destination points.
 - A traffic control officer is recommended to be present during the peak hours at the Sunset Dr and Middle/High School Access to manage traffic flows exiting the site.
- All Way Stop Control (Option 1)
 - All-way stop controlled intersections do not meet volume warrants at either intersection.
 - At the intersection of Sunset Dr and Middle/High School Access, maximum westbound left queue is anticipated to exceed the storage capacity of the left turn lane during the AM peak hour in 2020 and 2040. This would inhibit westbound through traffic flows for this period of time and cause additional backups for southbound Sunset Dr.
 - Traffic flows from the site work well.
 - Pedestrians would be provided marked crossings of Sunset Dr at the all way stop locations.
 - Internal sidewalk networks need to be considered to provide relatively direct access to the crossing and destination points.
 - Due to low volumes throughout most of the day, driver compliance with the all way stops may be low.

- All Way Stop Control (Option 2)
 - All-way stop controlled intersections do not meet volume warrants at either intersection.
 - At the intersection of Sunset Dr and Middle/High School Access, maximum westbound left queue is anticipated to exceed the storage capacity of the left turn lane during the AM peak hour in 2020 and 2040. This would inhibit westbound through traffic flows for this period of time and cause additional backups for southbound Sunset Dr.
 - Traffic flows from the site work well.
 - Pedestrians would be provided marked crossings of Sunset Dr at the all way stop location and marked/signed crossings with median refuge on the west leg of each intersection. Enhanced treatments could be considered as well.
 - Internal sidewalk networks need to be considered to provide relatively direct access to the crossing and destination points.
 - Due to low volumes throughout most of the day, driver compliance with the all way stop may be low.
- All Way Stop Control (Option 3)
 - All-way stop controlled intersections do not meet volume warrants at either intersection.
 - At the intersection of Sunset Dr and Middle/High School Access, northbound left movements are anticipated to operate at LOS F during the AM peak hour in 2020 and 2040. However, if the internal roundabout were shifted further south, stacking distance can be increased to minimize the risk of this movement queuing into the roundabout. Long delays for drivers exiting the site could lead to safety issues if inadequate gaps in traffic are used to enter Sunset Dr.
 - Traffic flows along Sunset Dr work well.
 - Pedestrians would be provided marked crossings of Sunset Dr at the all way stop location and marked/signed crossings with median refuge on the west leg of each intersection. Enhanced treatments could be considered as well.
 - Internal sidewalk networks need to be considered to provide relatively direct access to the crossing and destination points.
 - Due to low volumes throughout most of the day, driver compliance with the all way stop may be low, though this would likely be similar to the existing condition at Sunset Dr/Hillside Dr.
 - A traffic control officer is recommended to be present during the peak hours at the Sunset Dr and Middle/High School Access to manage traffic flows exiting the site.
- Mini-Roundabout Option
 - The intersections are anticipated to operate at LOS A for all peak hours in 2020 and 2040.
 - Queues are acceptable for all peak hours in 2020 and 2040.
 - Pedestrians would be provided marked crossings of Sunset Dr at the mini roundabout locations. A midblock crossing between roundabouts could be an option if the position aligned with the desired routes for pedestrians.
 - Internal sidewalk networks need to be considered to provide relatively direct access

to the crossing and destination points.

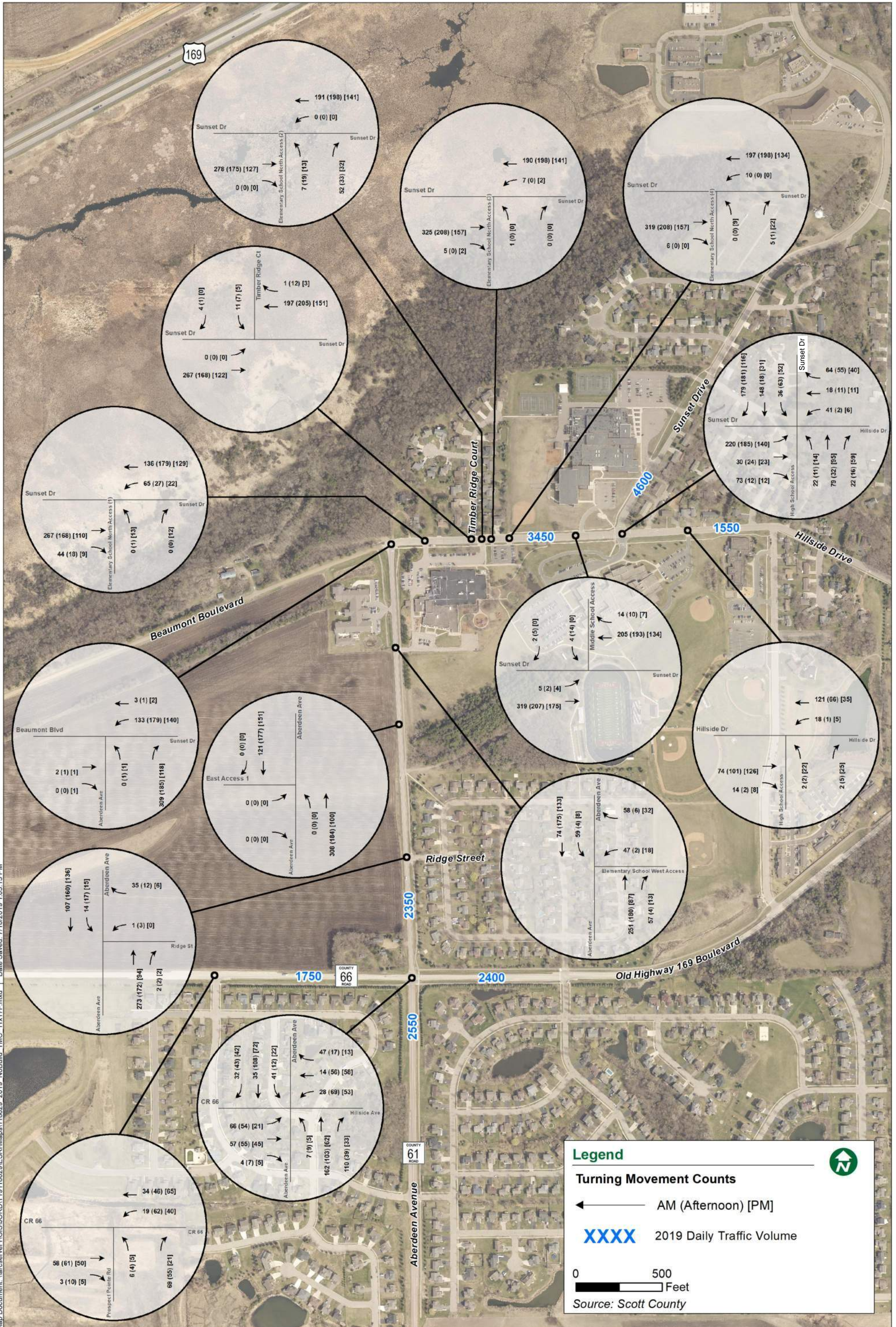
- Constant speed control would be provided along Sunset Dr.
- Mini-roundabouts have a smaller intersection footprint and can be constructed at a lower cost than traditional single-lane roundabouts. They can also be sized to accommodate busses without requiring tracking onto the traversable center island.

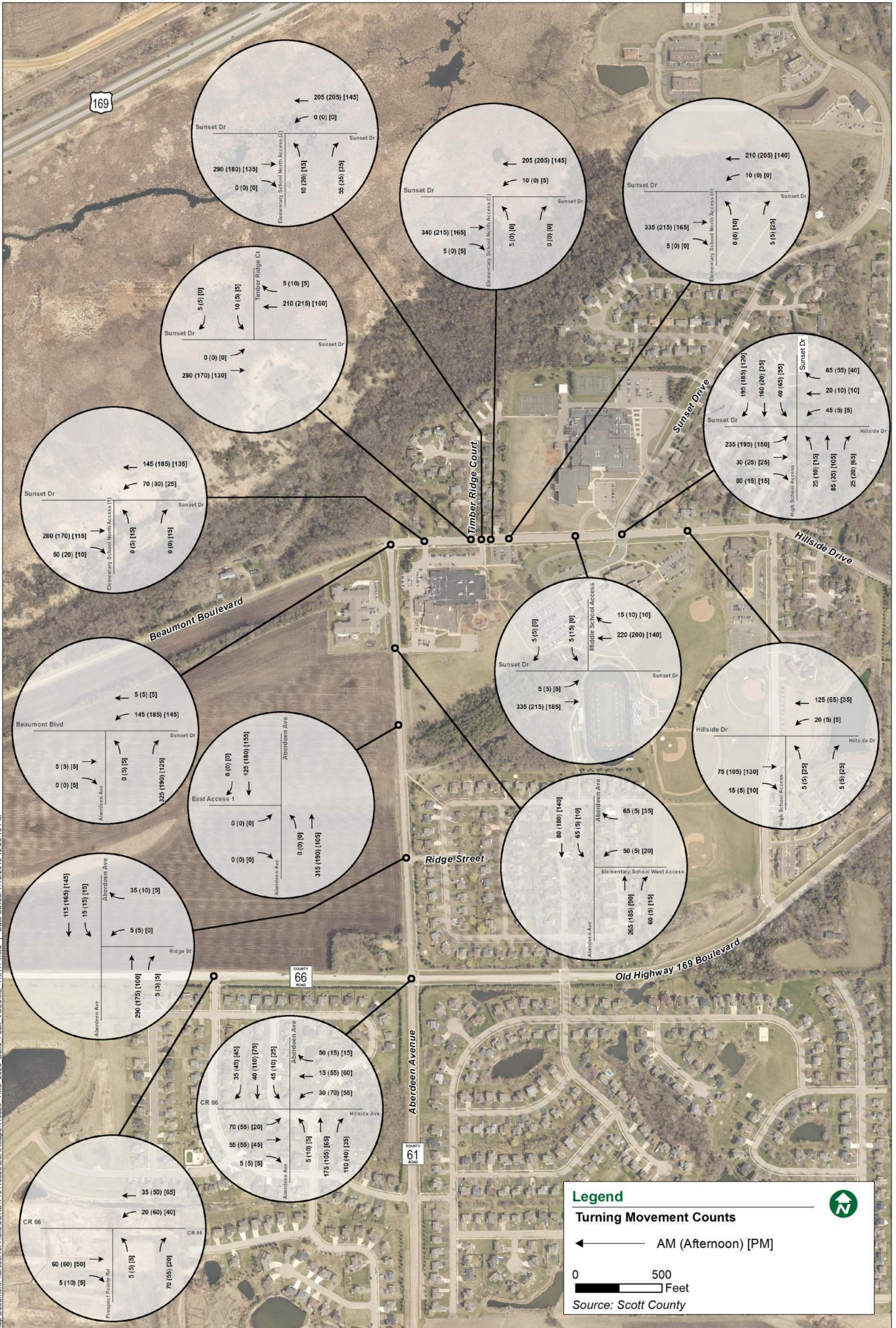
VII. Recommendations

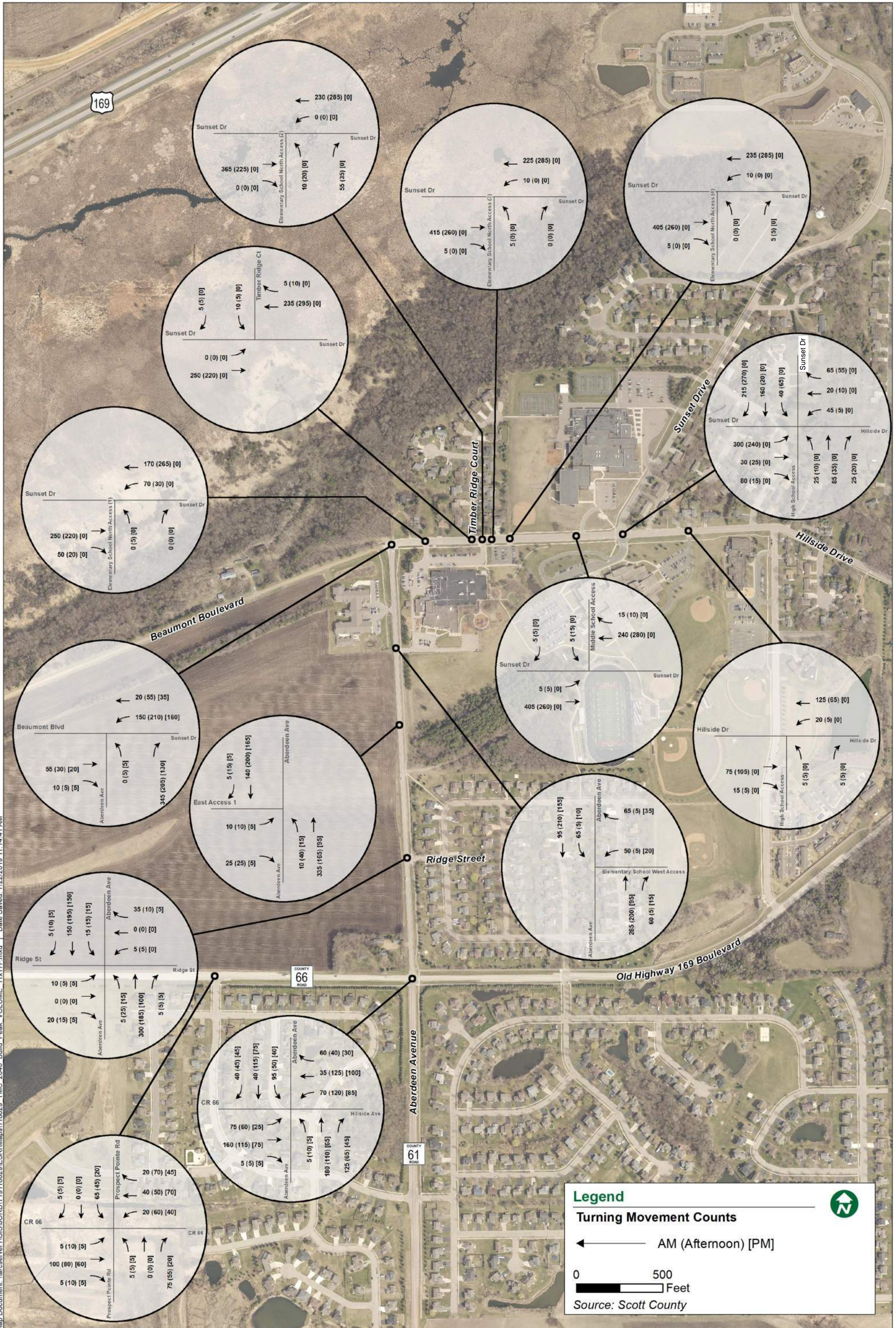
Both All Way Stop Control (Option 1) and (Option 2) have the possibility of causing long queues and stopped traffic related to westbound vehicles trying to enter the site. Additionally, the All Way Stop Control (Option 3) would include an all way stop at the Sunset Dr/Hillside Dr intersection that is not warranted based on traffic volumes, therefore compliance will likely be low. For these reasons, the all way stop control options are not recommended for further consideration.

We recommend the Two Way Stop Control Option as well as the Mini Roundabout Option to be further considered along with the school site improvements. Both provide for good traffic flow along Sunset Dr and can accommodate site traffic with site modifications and other provisions. Additionally, both can be designed to incorporate features to accommodate pedestrians as well as slow traffic speeds (median refuges and roundabout geometrics). The main differentiators between both of these options is how the site needs to interact with the roadway improvements to function properly as well as treatment construction cost (mini roundabout option likely more expensive as it relates to Sunset Dr). If roundabouts are pursued for inclusion in overall improvements, additional, more detailed, traffic modeling will be required to confirm lane needs and sizing. Roundabout geometry and placement along Sunset Dr and how they interact with site improvements is subject to this additional modeling during preliminary design.

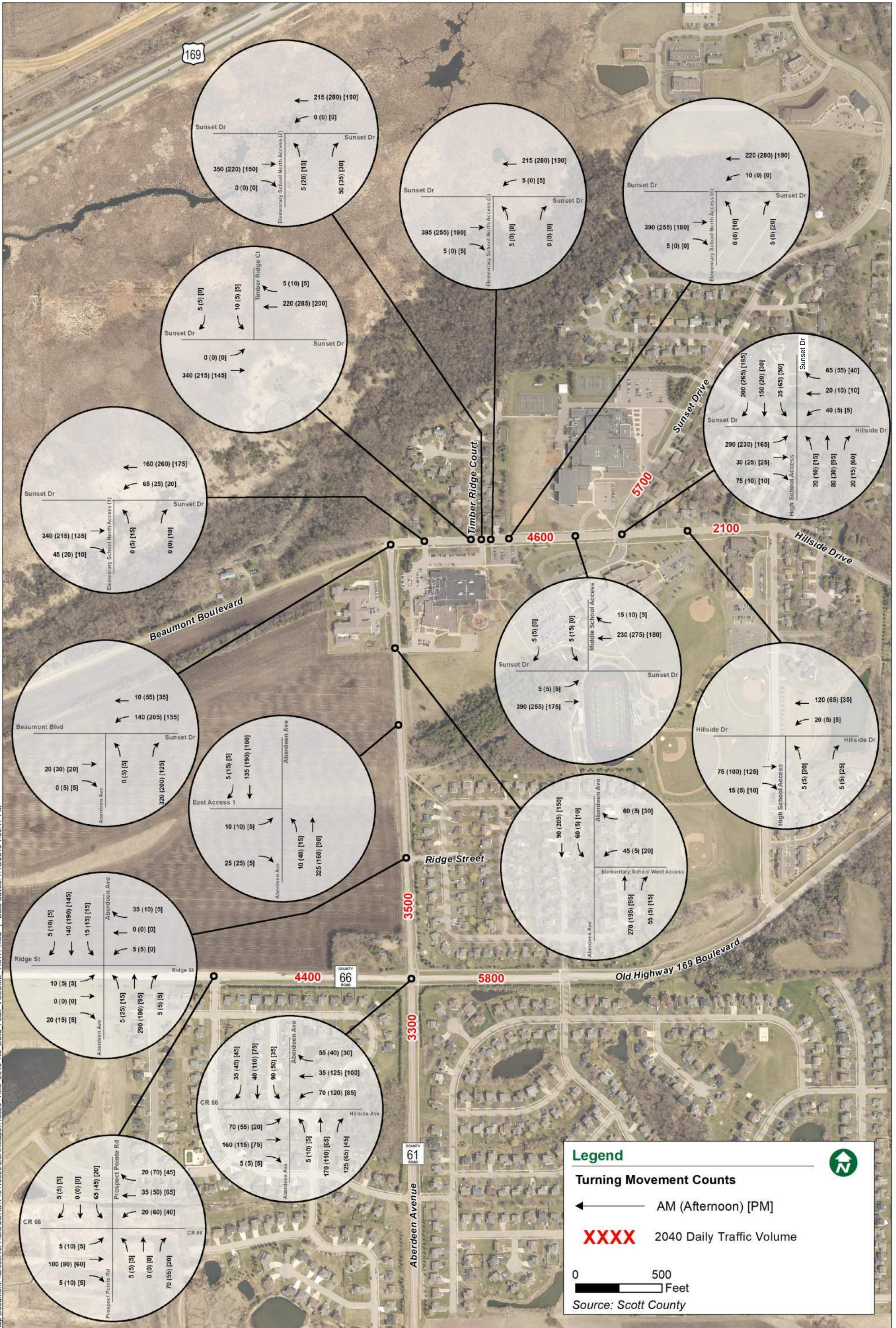
Appendix A: Traffic Volumes







Map Document: \\arcserver1\GIS\JORD\19118829\ESRI\Map\118829 TMC 2040 Build Peak VOLUME 11x17P.mxd | Date Saved: 7/22/2019 11:14:41 AM



Map Document: \\arcserver1\GIS\JORD\19118829\ESRI\Map\118829 TMC 2040 No Build Peak VOLUME 11x17P.mxd | Date Saved: 7/18/2019 1:03:17 PM

Appendix B: Crash Analysis

Intersection Safety Screening

Intersection: Sunset Dr and Hillside Dr



Crash Data: 2015-2017.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	1
Possible Injury	1
Property Damage	0
Total Crashes	2

Intersection Characteristics	
Entering Volume	4,800
Traffic Control	All stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$84,333

Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.38
Statewide Average	0.34
Critical Rate	1.10
Critical Index	0.35

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.72
Critical Rate	14.96
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.38 per MEV; this is 65% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the three years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: Aberdeen Ave and West Elementary School



Crash Data: 2015-2017.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	0
Property Damage	1
Total Crashes	1

Intersection Characteristics	
Entering Volume	2,600
Traffic Control	Thru / stop
Environment	Urban
Speed Limit	30 mph

Annual crash cost = \$2,533

Statewide Comparison

Urban Thru / Stop

Total Crash Rate	
Observed	0.35
Statewide Average	0.19
Critical Rate	1.02
Critical Index	0.34

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.36
Critical Rate	22.45
Critical Index	0.00

The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.35 per MEV; this is 66% below the critical rate. Based on similar statewide intersections, an additional 2 crashes over the three years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

Intersection Safety Screening

Intersection: CR 66 and Aberdeen Ave



Crash Data: 2015-2017.

Crashes by Crash Severity	
Fatal	0
Incapacitating Injury	0
Non-incapacitating Injury	0
Possible Injury	0
Property Damage	2
Total Crashes	2

Intersection Characteristics	
Entering Volume	4,525
Traffic Control	All stop
Environment	Urban
Speed Limit	55 mph

Annual crash cost = \$5,067

Statewide Comparison

All Way Stop

Total Crash Rate	
Observed	0.40
Statewide Average	0.34
Critical Rate	1.13
Critical Index	0.35

Fatal & Serious Injury Crash Rate	
Observed	0.00
Statewide Average	0.72
Critical Rate	15.68
Critical Index	0.00

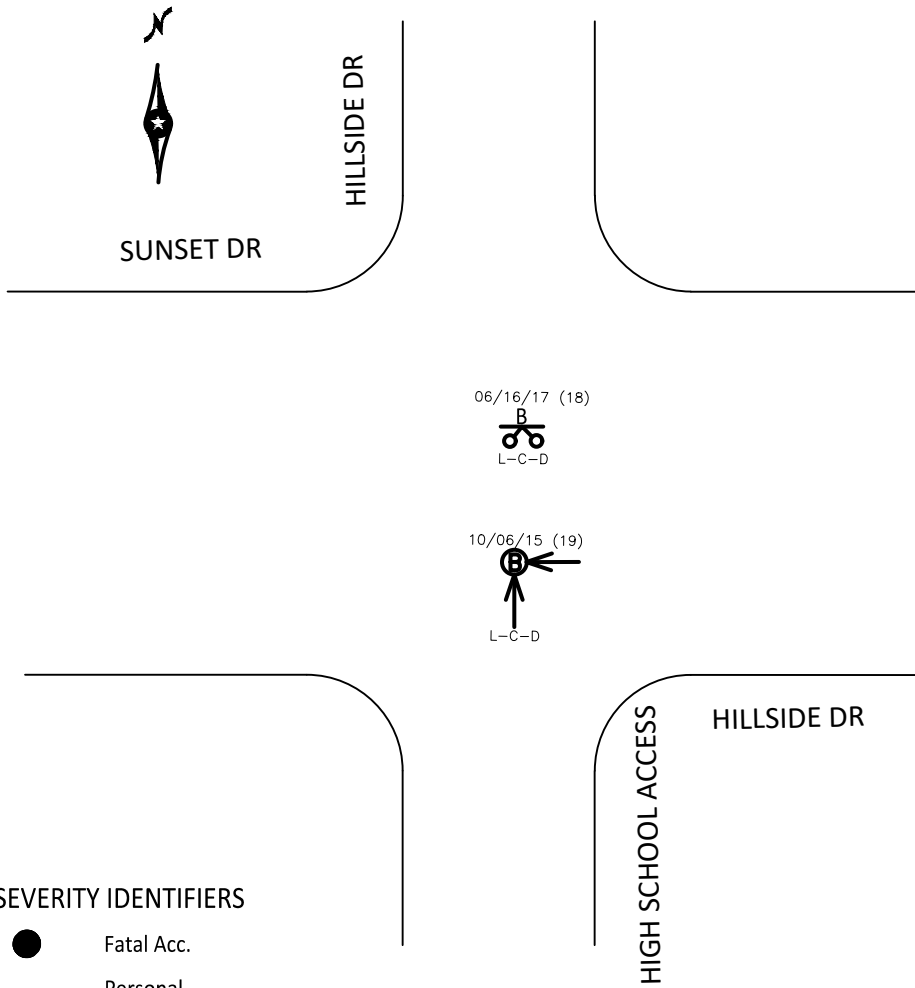
The observed crash rate is the number of crashes per million entering vehicles (MEV). The critical rate is a statistical comparison based on similar intersections statewide. An observed crash rate greater than the critical rate indicates that the intersection operates outside the expected, normal range. The critical index reports the magnitude of this difference.

The observed total crash rate for this period is 0.40 per MEV; this is 65% below the critical rate. Based on similar statewide intersections, an additional 4 crashes over the three years would indicate this intersection operates outside the normal range.

The observed fatal and serious injury crash rate for this period is 0.00 per 100 MEV; this is 100% below the critical rate. The intersection operates within the normal range.

COLLISION DIAGRAM

LOCATION: SUNSET DR AND HILLSIDE DR
 TIME PERIOD: 01/01/2015 - 12/31/2017 DATE: 06/20/19
 PREPARED BY: CW



Severity	Year		
	2015	2016	2017
Fatal	0	0	0
A Injury	0	0	0
B Injury	1	0	0
C Injury	0	0	0
Property Damage	0	0	0
Total Accidents	1	0	0

Crash Type	Year		
	2015	2016	2017
Bicycle	0	0	1
Right Angle	1	0	0
Total Accidents	1	0	1

SEVERITY IDENTIFIERS

- Fatal Acc.
- ⊙ Personal Injury
- Property Damage Acc.

KEY

- ↔ Motor Vehicle Backing Up
- ⚡ Motor Vehicle Out of Control
- ↔ SIDESWIPE
- ↔ Rear End
- ↔ Right Angle
- 🚶 Pedestrian
- 🚲 Bicycle/Moped
- 🏍 Motorcycle
- ↔ Left Turn
- ↔ Fixed Object

NOTES

- [1] _____
- [2] _____
- [3] _____

Light: L= Daylight (1) DN= Dawn (2) DU= Dusk (3) DI= Dark, Lighted (4) Do= Dark, Lights Off (5) D= Dark, Unlighted (6) X= Unknown (99)	Weather: C= Clear or Cloudy (1 or 2) R= Rain (3) S= Snow or Sleet (4 or 5) F= Fog, Smog, Smoke (6) B= Blowing Sand/Dust (7) W= Severe Crosswinds (8) X= Other or Unknown (99)	Surface: D= Dry (1) W= Wet (2) S= Snow or Ice (3 or 4) M= Muddy (5) DB= Debris (6) O= Oily (7) X= Other or Unknown (99)
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JORDAN SCHOOL AREA TRAFFIC STUDY
SUNSET DR AND HILLSIDE DR
COLLISION DIAGRAM

COLLISION DIAGRAM

LOCATION: ABERDEEN AVE AND WEST ELEMENTARY SCHOOL ACCESS
 TIME PERIOD: 01/01/2015 - 12/31/2017 DATE: 06/20/19
 PREPARED BY: CW



ABERDEEN AVE

11/10/16 (12)



WEST ELEMENTARY SCHOOL ACCESS

Severity	Year		
	2015	2016	2017
Fatal	0	0	0
A Injury	0	0	0
B Injury	0	0	0
C Injury	0	0	0
Property Damage	0	1	0
Total Accidents	0	1	0

Crash Type	Year		
	2015	2016	2017
Head On	0	1	0
Total Accidents	0	1	0

SEVERITY IDENTIFIERS

- Fatal Acc.
- ⒶⒷⒸ Injury
- Property Damage Acc.

KEY

- Motor Vehicle Backing Up
- Motor Vehicle Out of Control
- SIDESWIPE
- Rear End
- Right Angle
- Pedestrian
- Bicycle/Moped
- Motorcycle
- Left Turn
- Fixed Object

NOTES

- [1] _____
- [2] _____
- [3] _____

Light:

- L= Daylight (1)
- DN= Dawn (2)
- DU= Dusk (3)
- DI= Dark, Lighted (4)
- Do= Dark, Lights Off (5)
- D= Dark, Unlighted (6)
- X= Unknown (99)

Weather:

- C= Clear or Cloudy (1 or 2)
- R= Rain (3)
- S= Snow or Sleet (4 or 5)
- F= Fog, Smog, Smoke (6)
- B= Blowing Sand/Dust (7)
- W= Severe Crosswinds (8)
- X= Other or Unknown (99)

Surface:

- D= Dry (1)
- W= Wet (2)
- S= Snow or Ice (3 or 4)
- M= Muddy (5)
- DB= Debris (6)
- O= Oily (7)
- X= Other or Unknown (99)

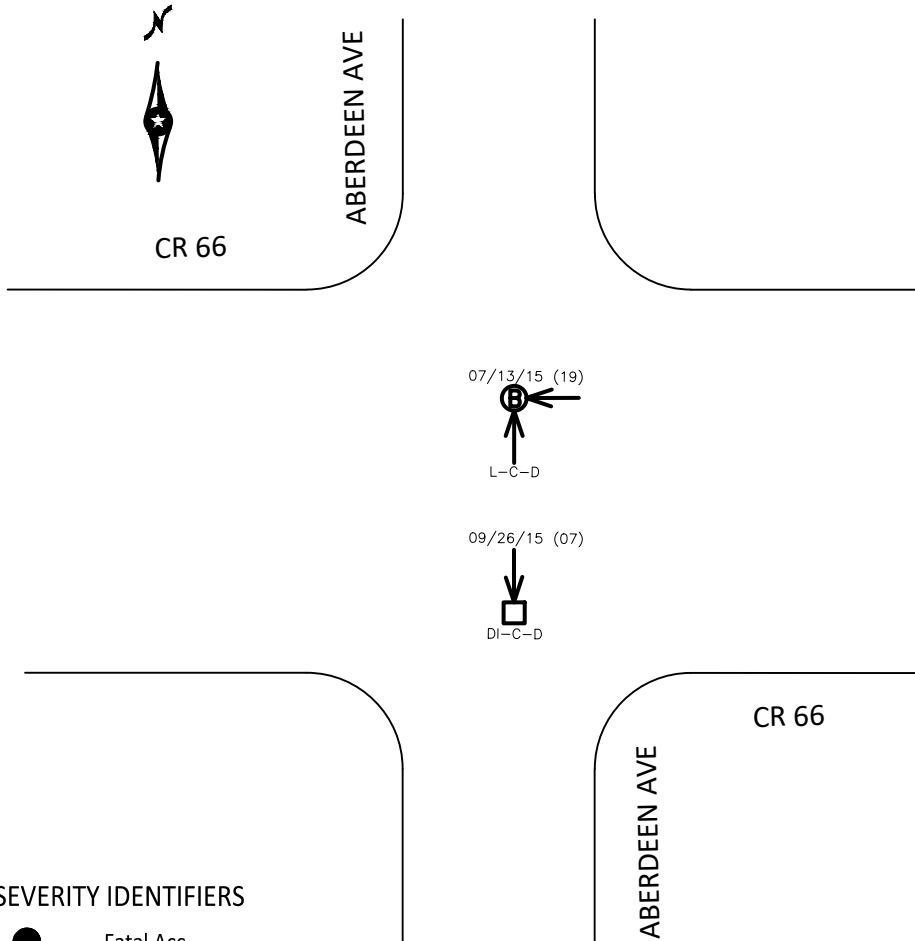


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JORDAN SCHOOL AREA TRAFFIC STUDY
ABERDEEN AVE AND WEST
ELEMENTARY SCHOOL ACCESS
COLLISION DIAGRAM

COLLISION DIAGRAM

LOCATION: CR 66 AND ABERDEEN AVE
 TIME PERIOD: 01/01/2015 - 12/31/2017 DATE: 06/20/19
 PREPARED BY: CW



Severity	Year		
	2015	2016	2017
Fatal	0	0	0
A Injury	0	0	0
B Injury	0	0	0
C Injury	0	0	0
Property Damage	2	0	0
Total Accidents	2	0	0

Crash Type	Year		
	2015	2016	2017
Fixed Object	1	0	0
Right Angle	1	0	0
Total Accidents	2	0	0

SEVERITY IDENTIFIERS

- Fatal Acc.
- ⊙ ABC Personal Injury
- Property Damage Acc.

KEY

- ↔ Motor Vehicle Backing Up
- ⚡ Motor Vehicle Out of Control
- ↔ SIDESWIPE
- ↔ Rear End
- ↔ Right Angle
- 🚶 Pedestrian
- 🚲 Bicycle/Moped
- 🏍 Motorcycle
- ↔ Left Turn
- ↔ Fixed Object

NOTES

- [1] _____
- [2] _____
- [3] _____

Light: L= Daylight (1) DN= Dawn (2) DU= Dusk (3) DI= Dark, Lighted (4) Do= Dark, Lights Off (5) D= Dark, Unlighted (6) X= Unknown (99)	Weather: C= Clear or Cloudy (1 or 2) R= Rain (3) S= Snow or Sleet (4 or 5) F= Fog, Smog, Smoke (6) B= Blowing Sand/Dust (7) W= Severe Crosswinds (8) X= Other or Unknown (99)	Surface: D= Dry (1) W= Wet (2) S= Snow or Ice (3 or 4) M= Muddy (5) DB= Debris (6) O= Oily (7) X= Other or Unknown (99)
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JORDAN SCHOOL AREA TRAFFIC STUDY
CR 66 AND ABERDEEN AVE
COLLISION DIAGRAM

Appendix C: No Build Operational Analysis

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																					
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	8	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
	Afternoon	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
	PM	1	A	4	A	-	-	2	A	-	-	-	-	-	-	1	A	1	A	-	-	0	A	-	-
Sunset Dr and Hillside Dr <i>Stop Controlled</i>	AM	5	A	5	A	6	A	3	A	6	A	6	A	3	A	5	A	5	A	3	A	5	A	4	A
	Afternoon	4	A	4	A	5	A	3	A	4	A	4	A	2	A	4	A	4	A	2	A	4	A	5	A
	PM	4	A	4	A	5	A	2	A	4	A	5	A	3	A	4	A	4	A	2	A	4	A	5	A
Sunset Dr and Middle School Access <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	9	A	-	-	3	A	2	A	0	A	-	-	-	-	1	A
	Afternoon	0	A	-	-	-	-	-	-	-	-	-	-	-	3	A	0	A	-	-	-	-	0	A	
	PM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	2	A	0	A	-	-	-	-	0	A
Sunset Dr and North Elementary School Access 4 <i>Stop Controlled</i>	AM	0	A	-	-	-	-	3	A	-	-	-	-	-	-	0	A	0	A	3	A	0	A	-	-
	Afternoon	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	-	-	-	-	0	A	-	-
	PM	0	A	-	-	-	-	4	A	-	-	-	-	-	-	0	A	-	-	-	-	0	A	-	-
Sunset Dr and North Elementary School Access 3 <i>Stop Controlled</i>	AM	1	A	7	A	-	-	-	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-	
	Afternoon	1	A	-	-	-	-	-	-	-	-	-	-	-	1	A	1	A	1	A	0	A	-	-	
	PM	1	A	-	-	-	-	-	-	-	-	-	-	-	1	A	-	-	-	-	0	A	-	-	
Sunset Dr and North Elementary School Access 2 <i>Stop Controlled</i>	AM	2	A	1	A	-	-	0	A	-	-	-	-	-	4	A	-	-	-	-	0	A	-	-	
	Afternoon	2	A	1	A	-	-	0	A	-	-	-	-	-	3	A	-	-	-	-	0	A	-	-	
	PM	2	A	2	A	-	-	0	A	-	-	-	-	-	4	A	-	-	-	-	0	A	-	-	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	2	A	-	-	-	-	-	-	19	C	-	4	A	-	3	A	-	-	-	-	0	A	0	A
	Afternoon	1	A	-	-	-	-	-	-	12	B	-	-	-	1	A	-	-	-	-	-	0	A	0	A
	PM	1	A	-	-	-	-	-	-	13	B	-	4	A	-	2	A	-	-	-	-	0	A	0	A
Sunset Dr and North Elementary School Access 1 <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	-	-	-	-	-	0	A	0	A	3	A	0	A	-	-	
	Afternoon	1	A	6	A	-	-	3	A	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-	
	PM	0	A	4	A	-	-	-	-	-	-	-	-	-	0	A	0	A	2	A	0	A	-	-	
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	4	A	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	-	-	
	Afternoon	3	A	3	A	1	A	3	A	-	-	-	-	-	-	-	3	A	4	A	5	A	-	-	
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	7	A	-	-	4	A	3	A	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	2	A	-	-	1	A	2	A	4	A	1	A	-	-	-	-	-	-	5	A	0	A	3	A
	Afternoon	1	A	-	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	2	A	-	-	2	A
	PM	1	A	-	-	1	A	0	A	2	A	1	A	-	-	-	-	-	-	5	A	-	-	2	A
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	-	-	2	A	2	A	4	A	1	A	-	-	-	-	-	-	3	A	-	-	4	A
	Afternoon	1	A	-	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	3	A
	PM	2	A	-	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	7	A	-	-	3	A
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	6	A	8	A	5	A	5	A	6	A	3	A	4	A	10	B	3	A	4	A	9	A
	Afternoon	6	A	5	A	6	A	3	A	5	A	7	A	4	A	3	A	9	A	2	A	4	A	10	B
	PM	7	A	6	A	7	A	4	A	7	A	7	A	4	A	10	B	3	A	5	A	10	B	4	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-	
	Afternoon	1	A	4	A	-	-	2	A	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-	
	PM	1	A	6	A	-	-	3	A	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-	

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2019 No Build

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	2	A	-	-	-	-	-	-	1	A	1	A	2	A	1	A	-	-		
	Afternoon	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	3	A	0	A	-	-		
	PM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	-	-	0	A	-	-		
Sunset Dr and Hillside Dr <i>Stop Controlled</i>	AM	5	A	4	A	5	A	4	A	6	A	6	A	3	A	5	A	5	A	3	A	5	A	6	A	4	A
	Afternoon	4	A	4	A	5	A	3	A	5	A	5	A	2	A	4	A	4	A	2	A	5	A	5	A	4	A
	PM	4	A	4	A	5	A	2	A	4	A	5	A	3	A	4	A	4	A	2	A	3	A	5	A	4	A
Sunset Dr and Middle School Access <i>Stop Controlled</i>	AM	1	A	-	-	-	-	5	A	-	-	3	A	2	A	0	A	-	-	-	-	1	A	0	A		
	Afternoon	0	A	-	-	-	-	-	-	-	-	-	-	3	A	0	A	-	-	-	-	0	A	0	A		
	PM	1	A	-	-	-	-	7	A	-	-	2	A	2	A	0	A	-	-	-	-	0	A	0	A		
Sunset Dr and North Elementary School Access 4 <i>Stop Controlled</i>	AM	0	A	-	-	-	-	3	A	-	-	-	-	-	-	0	A	0	A	3	A	0	A	-	-		
	Afternoon	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	-	-	-	-	0	A	-	-		
	PM	0	A	-	-	-	-	2	A	-	-	-	-	-	-	0	A	-	-	-	-	0	A	-	-		
Sunset Dr and North Elementary School Access 3 <i>Stop Controlled</i>	AM	1	A	6	A	-	-	-	-	-	-	-	-	-	1	A	1	A	2	A	0	A	0	A	-	-	
	Afternoon	1	A	-	-	-	-	-	-	-	-	-	-	-	1	A	1	A	2	A	0	A	0	A	-	-	
	PM	1	A	-	-	-	-	-	-	-	-	-	-	-	1	A	1	A	-	-	0	A	0	A	-	-	
Sunset Dr and North Elementary School Access 2 <i>Stop Controlled</i>	AM	2	A	2	A	-	-	0	A	-	-	-	-	-	4	A	-	-	-	-	0	A	0	A	-	-	
	Afternoon	1	A	1	A	-	-	0	A	-	-	-	-	-	3	A	-	-	-	-	0	A	0	A	-	-	
	PM	2	A	2	A	-	-	0	A	-	-	-	-	-	4	A	-	-	-	-	0	A	0	A	-	-	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	3	A	-	-	-	-	34	D	-	-	3	A	-	-	4	A	-	-	-	-	0	A	0	A		
	Afternoon	1	A	-	-	-	-	10	B	-	-	-	-	-	1	A	-	-	-	-	0	A	0	A			
	PM	1	A	-	-	-	-	17	C	-	-	3	A	-	-	2	A	-	-	-	0	A	0	A			
Sunset Dr and North Elementary School Access 1 <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	-	-	-	-	-	0	A	0	A	3	A	1	A	0	A			
	Afternoon	1	A	6	A	-	-	3	A	-	-	-	-	-	0	A	0	A	1	A	0	A	0	A			
	PM	0	A	10	B	-	-	-	-	-	-	-	-	-	0	A	0	A	2	A	0	A	0	A			
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	5	A	-	-	5	A	-	-	-	-	-	-	-	6	A	-	-	6	A	4	A	4	A			
	Afternoon	3	A	3	A	0	A	3	A	-	-	-	-	-	6	A	2	A	4	A	4	A	4	A			
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A			
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	26	D	-	-	28	D	30	D	37	E	28	D	-	-	-	-	-	16	C	-	-	4	A			
	Afternoon	1	A	-	-	0	A	0	A	3	A	1	A	-	-	-	-	-	3	A	-	-	2	A			
	PM	1	A	-	-	1	A	0	A	2	A	1	A	-	-	-	-	-	4	A	-	-	3	A			
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	10	B	-	-	12	B	2	A	3	A	3	A	1	A	24	C	-	-	-	-	-	13	B			
	Afternoon	1	A	-	-	2	A	2	A	3	A	1	A	1	A	5	A	-	-	-	-	-	2	A			
	PM	2	A	-	-	2	A	1	A	3	A	1	A	0	A	5	A	-	-	6	A	-	-	3	A		
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	9	A	10	B	10	B	6	A	6	A	7	A	4	A	9	A	13	B	4	A	7	A	11	B		
	Afternoon	8	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	3	A	7	A	12	B		
	PM	10	B	8	A	8	A	5	A	6	A	8	A	5	A	6	A	11	B	4	A	10	B	14	B		
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	3	A	5	A	-	-	3	A	6	A	-	-	4	A	2	A	0	A	0	A	1	A	0	A		
	Afternoon	1	A	5	A	-	-	3	A	6	A	-	-	3	A	2	A	0	A	0	A	1	A	1	A		
	PM	2	A	8	A	-	-	3	A	7	A	-	-	4	A	2	A	1	A	0	A	1	A	1	A		

1. Delay in seconds per vehicle
2. Maximum delay and LOS on any approach and/or movement
3. Limiting Movement is the highest delay movement.

2040 No Build

Table 2: Peak Hour Queues By Movement - Scenario Geometry

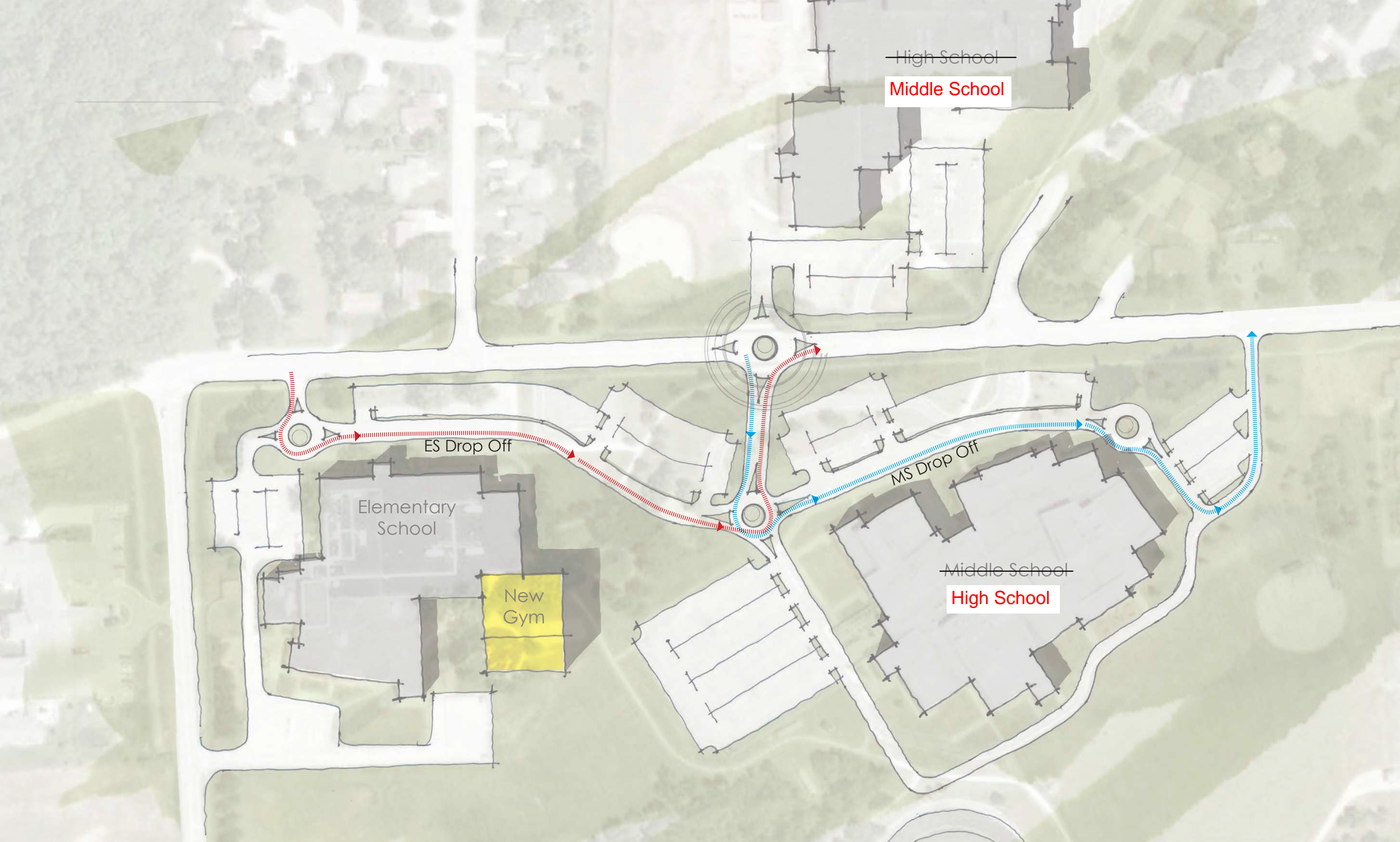
Table with columns for Intersection, Peak Hour, and Queue Lengths (EBL, EBL/T, EBL/T/R, EBT/R, EBR, WBL, WBL/R, WBL/T, WBL/T/R, WBT/R, NBL, NBL/R, NBL/T/R, NBT/R, SBL/R, SBL/T, SBL/T/R, SBR). It lists various intersections and their peak hour (AM, Afternoon, PM) average and maximum queue lengths.

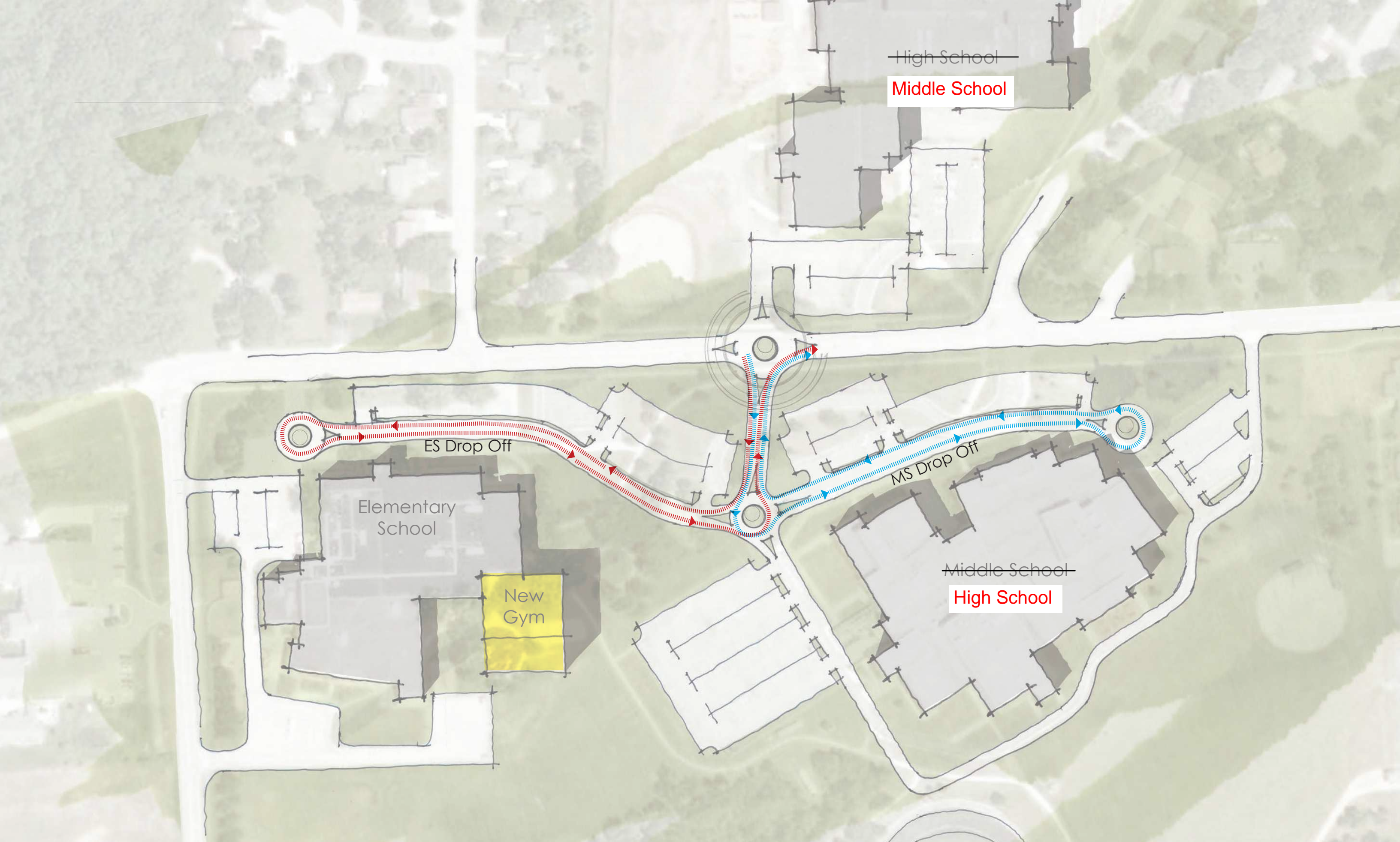
2040 No Build

Appendix D: Provided Layouts









Appendix E: Mitigation Operational Analysis

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2019			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.40		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	256	79	0	205	219	16	0	85	0	142	0	5	0	3
Percent Heavy Vehicles, %	3	3	4	3	3	3	3	3	3	12	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	15	666	203	0	528	564	41	0	237	0	366	0	13	0	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		884			1133			603			21		
Entry Volume veh/h		852			1100			568			20		
Circulating Flow (v _c), pc/h		541			252			694			1329		
Exiting Flow (v _{ex}), pc/h		1045			809			56			731		
Capacity (C _{PCE}), pc/h		795			1067			680			356		
Capacity (c), veh/h		766			1036			640			345		
v/c Ratio (x)		1.11			1.06			0.89			0.06		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		89.7			65.4			38.4			11.4		
Lane LOS		F			F			E			B		
95% Queue, veh		24.0			24.7			10.8			0.2		
Approach Delay, s/veh	89.7			65.4			38.4			11.4			
Approach LOS	F			F			E			B			
Intersection Delay, s/veh LOS	67.1						F						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2019			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	0.33		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	5	173	13	0	41	140	8	0	74	0	110	0	0	0	0
Percent Heavy Vehicles, %	3	3	9	3	3	3	9	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	16	572	41	0	128	462	25	0	231	0	343	0	0	0	0
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (V _e), pc/h		629			615			574			0		
Entry Volume veh/h		579			573			557			0		
Circulating Flow (V _c), pc/h		128			247			588			821		
Exiting Flow (V _{ex}), pc/h		915			693			41			169		
Capacity (C _{PCE}), pc/h		1211			1073			758			597		
Capacity (c), veh/h		1115			999			735			580		
v/c Ratio (x)		0.52			0.57			0.76			0.00		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		9.3			11.2			22.3			6.2		
Lane LOS		A			B			C			A		
95% Queue, veh		3.1			3.8			7.1			0.0		
Approach Delay, s/veh	9.3			11.2			22.3						
Approach LOS	A			B			C						
Intersection Delay, s/veh LOS	14.2						B						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2019			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	0.33		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	3	200	13	0	23	198	11	0	38	0	45	0	16	0	6
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	9	624	41	0	72	618	34	0	119	0	140	0	50	0	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		674			724			259			69		
Entry Volume veh/h		654			703			251			67		
Circulating Flow (v _c), pc/h		122			128			683			809		
Exiting Flow (v _{ex}), pc/h		814			756			43			113		
Capacity (C _{PCE}), pc/h		1219			1211			688			605		
Capacity (c), veh/h		1183			1176			668			587		
v/c Ratio (x)		0.55			0.60			0.38			0.11		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		9.5			10.5			10.5			7.5		
Lane LOS		A			B			B			A		
95% Queue, veh		3.5			4.2			1.8			0.4		
Approach Delay, s/veh	9.5			10.5			10.5			7.5			
Approach LOS	A			B			B			A			
Intersection Delay, s/veh LOS	10.0						A						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Internal Site Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name			
Date Performed	6/13/2019			N/S Street Name			
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.60		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	176	0	0	0	0	0	126	0	0	0	0	0	153	112	265
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	302	0	0	0	0	0	216	0	0	0	0	0	263	192	455
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		302			216			0			910	
Entry Volume veh/h		293			210			0			883	
Circulating Flow (v _c), pc/h		455			302			565			0	
Exiting Flow (v _{ex}), pc/h		263			455			518			192	
Capacity (c _{pc}), pc/h		868			1014			776			1380	
Capacity (c), veh/h		842			985			753			1340	
v/c Ratio (x)		0.35			0.21			0.00			0.66	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			5.7			4.8			11.0	
Lane LOS		A			A			A			B	
95% Queue, veh		1.6			0.8			0.0			5.3	
Approach Delay, s/veh	8.3			5.7						11.0		
Approach LOS	A			A						B		
Intersection Delay, s/veh LOS	9.6						A					

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	CW				Intersection	Internal Site Roundabout			
Agency or Co.	Bolton & Menk				E/W Street Name				
Date Performed	6/13/2019				N/S Street Name				
Analysis Year	2020				Analysis Time Period (hrs)	0.25			
Time Analyzed	Afternoon Peak				Peak Hour Factor	1.00			
Project Description	Jordan School Area Study				Jurisdiction	Jordan, MN			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	159	0	0	0	0	0	35	0	0	109	0	0	35	17	53
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{PCE}), pc/h	0	164	0	0	0	0	0	36	0	0	112	0	0	36	18	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		164			36			112			109	
Entry Volume veh/h		159			35			109			106	
Circulating Flow (v _c), pc/h		54			276			200			0	
Exiting Flow (v _{ex}), pc/h		36			55			312			18	
Capacity (c _{PCE}), pc/h		1306			1041			1125			1380	
Capacity (c), veh/h		1268			1011			1093			1340	
v/c Ratio (x)		0.13			0.03			0.10			0.08	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.9			3.9			4.2			3.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			0.1			0.3			0.3	
Approach Delay, s/veh		3.9			3.9			4.2			3.3	
Approach LOS		A			A			A			A	
Intersection Delay, s/veh LOS	3.8						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Internal Site Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name			
Date Performed	6/13/2019			N/S Street Name			
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	68	0	0	0	0	0	23	0	0	37	0	0	23	12	57
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{PCE}), pc/h	0	70	0	0	0	0	0	24	0	0	38	0	0	24	12	59
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		70			24			38			95	
Entry Volume veh/h		68			23			37			92	
Circulating Flow (v _c), pc/h		36			108			94			0	
Exiting Flow (v _{ex}), pc/h		24			59			132			12	
Capacity (c _{PCE}), pc/h		1330			1236			1254			1380	
Capacity (c), veh/h		1291			1200			1217			1340	
v/c Ratio (x)		0.05			0.02			0.03			0.07	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.2			3.2			3.2			3.2	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			0.1			0.2	
Approach Delay, s/veh		3.2			3.2			3.2			3.2	
Approach LOS		A			A			A			A	
Intersection Delay, s/veh LOS	3.2						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Internal Site Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name			
Date Performed	6/13/2019			N/S Street Name			
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.60		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	186	0	0	0	133	0	126	0	0	0	0	0	189	95	276
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	319	0	0	0	228	0	216	0	0	0	0	0	324	163	474
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		319			444			0			961		
Entry Volume veh/h		310			431			0			933		
Circulating Flow (v _c), pc/h		715			319			643			228		
Exiting Flow (v _{ex}), pc/h		324			474			535			391		
Capacity (c _{pc}), pc/h		666			997			716			1094		
Capacity (c), veh/h		646			968			695			1062		
v/c Ratio (x)		0.48			0.45			0.00			0.88		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		13.0			8.9			5.2			26.2		
Lane LOS		B			A			A			D		
95% Queue, veh		2.6			2.3			0.0			12.3		
Approach Delay, s/veh		13.0			8.9						26.2		
Approach LOS		B			A						D		
Intersection Delay, s/veh LOS	19.3						C						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Internal Site Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name			
Date Performed	6/13/2019			N/S Street Name			
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	165	0	0	0	0	0	36	0	0	120	0	0	36	18	63
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{PCE}), pc/h	0	170	0	0	0	0	0	37	0	0	124	0	0	37	19	65
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		170			37			124			121	
Entry Volume veh/h		165			36			120			117	
Circulating Flow (v _c), pc/h	56			294			207			0		
Exiting Flow (v _{ex}), pc/h	37			65			331			19		
Capacity (c _{PCE}), pc/h		1303			1022			1117			1380	
Capacity (c), veh/h		1265			993			1085			1340	
v/c Ratio (x)		0.13			0.04			0.11			0.09	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.9			3.9			4.3			3.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			0.1			0.4			0.3	
Approach Delay, s/veh	3.9			3.9			4.3			3.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	3.9						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Internal Site Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name			
Date Performed	6/13/2019			N/S Street Name			
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	71	0	0	0	0	0	24	0	0	39	0	0	24	12	60
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	73	0	0	0	0	0	25	0	0	40	0	0	25	12	62
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		73			25			40			99	
Entry Volume veh/h		71			24			39			96	
Circulating Flow (v _c), pc/h		37			113			98			0	
Exiting Flow (v _{ex}), pc/h		25			62			138			12	
Capacity (c _{pc}), pc/h		1329			1230			1249			1380	
Capacity (c), veh/h		1290			1194			1212			1340	
v/c Ratio (x)		0.05			0.02			0.03			0.07	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.2			3.2			3.2			3.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			0.1			0.2	
Approach Delay, s/veh		3.2			3.2			3.2			3.3	
Approach LOS		A			A			A			A	
Intersection Delay, s/veh LOS	3.2						A					

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	CW				Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout			
Agency or Co.	Bolton & Menk				E/W Street Name	Sunset Dr			
Date Performed	6/13/2019				N/S Street Name	High/Middle School Access			
Analysis Year	2020				Analysis Time Period (hrs)	0.25			
Time Analyzed	AM Peak				Peak Hour Factor	0.40			
Project Description	Jordan School Area Study				Jurisdiction	Jordan, MN			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	120	202	0	358	46	16	0	85	0	234	0	5	0	3
Percent Heavy Vehicles, %	3	3	4	6	3	3	3	3	3	12	3	18	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	15	312	533	0	922	118	41	0	237	0	687	0	13	0	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		860			1081			924			21		
Entry Volume veh/h		819			1050			797			20		
Circulating Flow (v _c), pc/h		935			252			340			1277		
Exiting Flow (v _{ex}), pc/h		1012			363			56			1455		
Capacity (C _{PCE}), pc/h		532			1067			976			375		
Capacity (c), veh/h		507			1036			842			364		
v/c Ratio (x)		1.62			1.01			0.95			0.06		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		307.4			51.3			41.4			10.7		
Lane LOS		F			F			E			B		
95% Queue, veh		45.8			20.7			14.7			0.2		
Approach Delay, s/veh		307.4			51.3			41.4			10.7		
Approach LOS		F			F			E			B		
Intersection Delay, s/veh LOS	126.2						F						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	0.33		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	5	61	40	0	77	104	8	0	60	0	261	0	0	0	0
Percent Heavy Vehicles, %	3	3	9	3	3	8	9	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	16	202	125	0	252	343	25	0	187	0	815	0	0	0	0
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		343			620			1002			0		
Entry Volume veh/h		322			572			973			0		
Circulating Flow (v _c), pc/h		252			203			218			782		
Exiting Flow (v _{ex}), pc/h		1017			530			41			377		
Capacity (C _{PCE}), pc/h		1067			1122			1105			622		
Capacity (c), veh/h		1001			1036			1073			603		
v/c Ratio (x)		0.32			0.55			0.91			0.00		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		6.9			10.4			29.5			6.0		
Lane LOS		A			B			D			A		
95% Queue, veh		1.4			3.5			13.9			0.0		
Approach Delay, s/veh	6.9			10.4			29.5			6.0			
Approach LOS	A			B			D			A			
Intersection Delay, s/veh LOS	19.7						C						

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	CW				Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout			
Agency or Co.	Bolton & Menk				E/W Street Name	Sunset Dr			
Date Performed	6/13/2019				N/S Street Name	High/Middle School Access			
Analysis Year	2019				Analysis Time Period (hrs)	0.25			
Time Analyzed	PM Peak				Peak Hour Factor	0.33			
Project Description	Jordan School Area Study				Jurisdiction	Jordan, MN			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	3	149	38	0	58	154	11	0	36	0	98	0	16	0	6
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	9	465	119	0	181	481	34	0	112	0	306	0	50	0	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		593			696			418			69		
Entry Volume veh/h		576			676			406			67		
Circulating Flow (v _c), pc/h		231			121			524			774		
Exiting Flow (v _{ex}), pc/h		821			612			43			300		
Capacity (C _{PCE}), pc/h		1090			1220			809			627		
Capacity (c), veh/h		1059			1184			785			608		
v/c Ratio (x)		0.54			0.57			0.52			0.11		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		10.1			9.9			12.0			7.2		
Lane LOS		B			A			B			A		
95% Queue, veh		3.4			3.8			3.0			0.4		
Approach Delay, s/veh	10.1			9.9			12.0			7.2			
Approach LOS	B			A			B			A			
Intersection Delay, s/veh LOS	10.3						B						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.40		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	147	202	0	358	55	16	0	85	0	234	0	5	0	3
Percent Heavy Vehicles, %	3	3	4	6	3	3	3	3	3	12	3	18	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	15	382	533	0	922	142	41	0	238	0	690	0	13	0	8
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		930			1105			928			21		
Entry Volume veh/h		887			1073			797			20		
Circulating Flow (v _c), pc/h		935			253			410			1302		
Exiting Flow (v _{ex}), pc/h		1085			388			56			1455		
Capacity (C _{PCE}), pc/h		532			1066			908			366		
Capacity (c), veh/h		507			1035			780			355		
v/c Ratio (x)		1.75			1.04			1.02			0.06		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		365.0			57.8			60.8			11.0		
Lane LOS		F			F			F			B		
95% Queue, veh		53.7			22.6			18.4			0.2		
Approach Delay, s/veh		365.0			57.8			60.8			11.0		
Approach LOS		F			F			F			B		
Intersection Delay, s/veh LOS	156.4						F						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	0.33		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	5	70	40	0	77	123	8	0	60	0	261	0	0	0	0
Percent Heavy Vehicles, %	3	3	9	3	3	8	9	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	16	232	125	0	252	406	25	0	187	0	815	0	0	0	0
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		373			683			1002			0		
Entry Volume veh/h		349			630			973			0		
Circulating Flow (v _c), pc/h		252			203			248			845		
Exiting Flow (v _{ex}), pc/h		1047			593			41			377		
Capacity (C _{PCE}), pc/h		1067			1122			1072			583		
Capacity (c), veh/h		1000			1035			1040			566		
v/c Ratio (x)		0.35			0.61			0.94			0.00		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		7.3			11.8			34.4			6.4		
Lane LOS		A			B			D			A		
95% Queue, veh		1.6			4.3			15.3			0.0		
Approach Delay, s/veh	7.3			11.8			34.4			6.4			
Approach LOS	A			B			D			A			
Intersection Delay, s/veh LOS	22.2						C						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	Proposed Sunset Dr & High/Middle School Access Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	0.33		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	3	167	38	0	58	184	11	0	36	0	98	0	16	0	6
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (V _{PCE}), pc/h	0	9	521	119	0	181	574	34	0	112	0	306	0	50	0	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		649			789			418			69		
Entry Volume veh/h		630			766			406			67		
Circulating Flow (v _c), pc/h		231			121			580			867		
Exiting Flow (v _{ex}), pc/h		877			705			43			300		
Capacity (C _{PCE}), pc/h		1090			1220			764			570		
Capacity (c), veh/h		1059			1184			742			553		
v/c Ratio (x)		0.60			0.65			0.55			0.12		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		11.2			11.7			13.3			8.0		
Lane LOS		B			B			B			A		
95% Queue, veh		4.1			5.0			3.4			0.4		
Approach Delay, s/veh		11.2			11.7			13.3			8.0		
Approach LOS		B			B			B			A		
Intersection Delay, s/veh LOS	11.7						B						

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	0	A	2	A	1	A	-	-		
	Afternoon	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
	PM	1	A	3	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	3	A	-	-	-	-	-	-	12	B	-	-	4	A	3	A	2	A	-	-	-	1	A	0	A	
	Afternoon	2	A	-	-	-	-	-	-	8	A	-	-	3	A	2	A	1	A	-	-	-	0	A	0	A	
	PM	3	A	-	-	-	-	-	-	8	A	-	-	3	A	2	A	1	A	-	-	-	0	A	0	A	
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	11	B	69	F	0	A	9	A	22	C	-	-	3	A	2	A	1	A	1	A	8	A	1	A	0	A
	Afternoon	3	A	5	A	0	A	4	A	-	-	-	-	3	A	1	A	0	A	0	A	3	A	0	A	0	A
	PM	2	A	7	A	0	A	4	A	7	A	-	-	3	A	3	A	1	A	0	A	3	A	0	A	0	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	8	A	-	-	4	A	-	-	1	A	-	-	-	1	A	0	A	
	Afternoon	1	A	-	-	-	-	-	-	6	A	-	-	-	-	0	A	-	-	-	-	-	1	A	1	A	
	PM	1	A	-	-	-	-	-	-	8	A	-	-	2	A	-	-	0	A	-	-	-	1	A	0	A	
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	4	A	-	-	-	-	-	-	-	-	5	A	-	-	4	A	4	A	-	-		
	Afternoon	3	A	-	-	3	A	-	-	-	-	-	-	-	-	-	-	3	A	4	A	4	A	-	-		
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	1	A	0	A	3	A	1	A	-	-	-	-	-	-	-	5	A	-	-	3	A		
	Afternoon	1	A	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	-	-	-	-	2	A			
	PM	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	-	4	A		
	Afternoon	1	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	-	2	A		
	PM	2	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	4	A	-	-	3	A		
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	7	A	8	A	5	A	6	A	7	A	4	A	4	A	10	B	2	A	4	A	10	B	3	A
	Afternoon	6	A	6	A	6	A	3	A	6	A	7	A	4	A	3	A	9	A	2	A	5	A	9	A	3	A
	PM	6	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	3	A	5	A	10	B	3	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	4	A	-	-	2	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-		
	Afternoon	1	A	5	A	-	-	2	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-		
	PM	1	A	5	A	-	-	2	A	-	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-		

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2020 Two-Way Stop Control

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																																						
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/R		WBL/T		WBL/T/R		WBT/R		NBL		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/R		SBL/T		SBL/T/R		SBR		
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	50	150	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	75	-	-	-	-	-	-	75	125	
	Afternoon	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	75	
	PM	25	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	100		
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	25	25	-	-	-	-	25	50	75	225	-	-	-	-	-	-	25	50	-	-	-	-	75	200	-	-	75	225	-	-	-	-	-	-	25	50	-	-	
	Afternoon	25	25	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	50	125	-	-	-	-	-	-	-	-	-	-	
	PM	25	25	-	-	-	-	0	25	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	25	50	-	-
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-		
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-		
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	25	25	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	25	25	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	25	50	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	-	-	50	100	-	-	
	Afternoon	-	-	50	50	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	
	PM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	

2020 Two-Way Stop Control

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	3	A	1	A	-	-		
	Afternoon	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	1	A	3	A	0	A	-	-		
	PM	1	A	3	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	4	A	-	-	-	-	-	-	21	C	-	6	A	4	A	2	A	-	-	-	-	1	A	1	A	
	Afternoon	3	A	-	-	-	-	-	-	11	B	-	3	A	2	A	1	A	-	-	-	-	0	A	0	A	
	PM	3	A	-	-	-	-	-	-	11	B	-	4	A	2	A	1	A	-	-	-	-	0	A	0	A	
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	25	D	203	F	2	A	19	C	57	F	-	13	B	2	A	1	A	1	A	15	C	1	A	0	A	
	Afternoon	4	A	10	B	1	A	6	A	-	-	-	-	-	2	A	1	A	0	A	3	A	0	A	0	A	
	PM	2	A	10	B	0	A	4	A	10	B	-	4	A	4	A	1	A	0	A	4	A	1	A	0	A	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	8	A	-	4	A	-	-	1	A	-	-	-	-	1	A	1	A	
	Afternoon	1	A	-	-	-	-	-	-	7	A	-	-	-	-	-	0	A	-	-	-	-	1	A	0	A	
	PM	1	A	-	-	-	-	-	-	7	A	-	3	A	-	-	1	A	-	-	-	-	1	A	0	A	
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	5	A	-	-	-	-	5	A	-	-	-	-	-	-	7	A	3	A	5	A	4	A	-	-		
	Afternoon	4	A	-	-	-	-	3	A	-	-	-	-	-	-	6	A	3	A	4	A	4	A	-	-		
	PM	4	A	-	-	-	-	4	A	-	-	-	-	-	-	6	A	3	A	4	A	5	A	-	-		
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Afternoon	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-		
	PM	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	4	A	2	A	2	A	3	A	1	A	0	A	7	A	-	-	4	A	-	-	-	4	A	
	Afternoon	1	A	4	A	2	A	1	A	3	A	1	A	0	A	8	A	-	-	3	A	-	-	-	3	A	
	PM	2	A	4	A	2	A	2	A	3	A	1	A	1	A	9	A	-	-	3	A	7	A	-	3	A	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	9	A	6	A	10	B	7	A	8	A	9	A	6	A	7	A	12	B	6	A	6	A	11	B	5	A
	Afternoon	7	A	4	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	2	A	6	A	12	B	5	A
	PM	8	A	8	A	8	A	5	A	7	A	8	A	5	A	6	A	11	B	4	A	8	A	13	B	7	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	2	A	6	A	-	-	3	A	6	A	-	3	A	1	A	0	A	0	A	1	A	1	A	0	A	
	Afternoon	1	A	6	A	-	-	2	A	5	A	-	2	A	1	A	0	A	0	A	1	A	1	A	0	A	
	PM	2	A	5	A	-	-	3	A	6	A	-	3	A	1	A	0	A	0	A	1	A	1	A	0	A	

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2040 Two-Way Stop Control

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																															
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/T		WBL/T/R		WBT/R		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/R		SBL/T/R		SBR	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	0	25	-	-	-	-	25	50	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	75	150	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	50	150	-	-	-	75	200	
	Afternoon	25	75	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	50	75	-	-	-	50	100	
	PM	25	100	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	50	100	-	-	-	75	125	
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	25	50	-	-	-	-	25	75	100	350	-	-	-	-	25	275	-	-	175	375	-	-	175	400	-	-	-	25	50	-	-	
	Afternoon	0	25	-	-	-	-	0	25	25	50	-	-	-	-	-	-	-	-	50	100	-	-	50	150	-	-	-	-	-	-	-	
	PM	25	50	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	25	75	-	-	50	75	-	-	-	25	75	-	-	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	50	75	-	-	-	-	50	75	-	-	-	-	75	125	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	25	50	-	-	-	-	50	75	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	25	75	-	-	-	-	50	100	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	25	50	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	25	25	-	-	-	-	-	25	50	-	-	
	Afternoon	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	50	-	-	-	-	-	25	25	-	-	
	PM	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	50	-	-	-	-	-	25	50	-	-	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	100	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	75	150	-	-	-	-	-	75	125	-	-		
	Afternoon	-	-	50	75	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	75	-	-	-	-	-	50	100	-	-		
	PM	-	-	50	100	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	50	125	-	-	-	-	-	75	100	-	-		
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	50	75	-	-	-		
	Afternoon	25	25	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	25	50	-	-	-		
	PM	25	25	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	50	75	-	-	-		

2040 Two-Way Stop Control

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																					
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	4	A	-	-	-	-	-	-	1	A	1	A	2	A	1	A	-	-
	Afternoon	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
	PM	1	A	3	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	-	-	-	-	5	A	-	-	5	A	6	A	5	A	-	-	-	-	6	A	4	A
	Afternoon	4	A	-	-	-	-	4	A	-	-	3	A	5	A	3	A	-	-	-	-	4	A	3	A
	PM	4	A	-	-	-	-	4	A	-	-	3	A	5	A	5	A	-	-	-	-	4	A	3	A
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	12	B	8	A	0	A	6	A	6	A	3	A	8	A	10	B	8	A	22	C	7	A	4	A
	Afternoon	4	A	4	A	0	A	4	A	-	-	-	-	4	A	7	A	3	A	5	A	6	A	3	A
	PM	5	A	4	A	0	A	3	A	5	A	-	-	4	A	7	A	3	A	5	A	6	A	4	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	7	A	-	-	2	A	-	-	1	A	-	-	-	-	2	A	-	-
	Afternoon	1	A	-	-	-	-	5	A	-	-	-	-	-	-	0	A	-	-	-	-	2	A	2	A
	PM	1	A	-	-	-	-	8	A	-	-	2	A	-	-	0	A	-	-	-	-	1	A	0	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	4	A	-	-	-	-	-	-	-	8	A	-	-	4	A	4	A	-	-	
	Afternoon	3	A	-	-	3	A	-	-	-	-	-	-	-	-	-	-	3	A	4	A	4	A	-	
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	1	A	1	A	3	A	1	A	-	-	-	-	-	-	4	A	-	-	3	A	
	Afternoon	1	A	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	-	-	-	-	2	A	
	PM	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	4	A	-	-	3	A	
	Afternoon	1	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	2	A	
	PM	2	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	4	A	-	-	3	A	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	7	A	8	A	5	A	6	A	4	A	4	A	10	B	2	A	4	A	10	B	3	A
	Afternoon	6	A	6	A	6	A	3	A	5	A	7	A	4	A	3	A	9	A	2	A	5	A	10	B
	PM	6	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	3	A	5	A	10	B
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	5	A	-	-	2	A	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-	
	Afternoon	1	A	5	A	-	-	2	A	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-	
	PM	1	A	5	A	-	-	2	A	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-	

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2020 All Way Stop Control - 1

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																																							
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/R		WBL/T		WBL/T/R		WBT/R		NBL		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/R		SBL/T		SBL/T/R		SBR			
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max				
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	75	125	-	-	-	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	-	-	25	100	-	-	-	-	-	-	-	75	150		
	Afternoon	50	100	-	-	-	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	75		
	PM	50	100	-	-	-	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	100		
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	75	125	-	-	-	-	75	150	125	300	-	-	-	-	-	50	250	-	-	-	-	50	100	-	-	50	125	-	-	-	-	-	-	25	50	-	-			
	Afternoon	50	75	-	-	-	-	50	75	25	50	-	-	-	-	-	50	75	-	-	-	-	50	75	-	-	-	50	125	-	-	-	-	-	-	-	-	-	-		
	PM	50	100	-	-	-	-	25	50	25	75	-	-	-	-	-	50	75	-	-	-	-	25	50	-	-	-	50	75	-	-	-	-	-	-	25	50	-	-		
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-		
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-		
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	25	25	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Afternoon	-	-	-	-	25	25	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	25	50	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	75	100	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-
	Afternoon	-	-	50	50	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-
	PM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

2020 All Way Stop Control - 1

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
	Afternoon	2	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
	PM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	8	A	-	-	-	-	-	-	7	A	-	-	10	B	6	A	5	A	-	-	-	-	6	A	4	A
	Afternoon	4	A	-	-	-	-	-	-	4	A	-	-	3	A	5	A	4	A	-	-	-	-	4	A	3	A
	PM	4	A	-	-	-	-	-	-	4	A	-	-	3	A	5	A	5	A	-	-	-	-	4	A	3	A
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	13	B	8	A	0	A	6	A	6	A	-	-	3	A	8	A	9	A	8	A	27	D	7	A	4	A
	Afternoon	5	A	4	A	0	A	4	A	5	A	-	-	3	A	5	A	7	A	3	A	5	A	6	A	3	A
	PM	5	A	5	A	0	A	3	A	5	A	-	-	3	A	6	A	7	A	3	A	5	A	6	A	3	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	-	-	1	A	-	-	-	-	2	A	2	A
	Afternoon	1	A	-	-	-	-	-	-	6	A	-	-	-	-	-	-	0	A	-	-	-	-	2	A	2	A
	PM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	-	-	0	A	-	-	-	-	2	A	2	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	5	A	-	-	-	-	-	-	-	-	6	A	-	-	4	A	3	A	-	-	-	-
	Afternoon	4	A	3	A	-	-	3	A	-	-	-	-	-	-	6	A	2	A	4	A	4	A	4	A	-	-
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A	-	-
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	1	A	1	A	3	A	1	A	-	-	-	-	-	-	-	5	A	-	-	-	-	3	A
	Afternoon	1	A	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	-	4	A	-	-	-	-	2	A
	PM	1	A	-	1	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	4	A	2	A	2	A	4	A	1	A	1	A	7	A	-	-	3	A	-	-	-	-	4	A
	Afternoon	2	A	3	A	2	A	1	A	3	A	1	A	0	A	5	A	-	-	3	A	-	-	-	-	3	A
	PM	2	A	4	A	2	A	3	A	3	A	1	A	0	A	6	A	-	-	3	A	9	A	-	-	3	A
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	8	A	9	A	9	A	7	A	7	A	8	A	5	A	6	A	12	B	4	A	7	A	11	B	5	A
	Afternoon	7	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	2	A	7	A	12	B	5	A
	PM	8	A	6	A	8	A	5	A	7	A	8	A	5	A	5	A	11	B	3	A	9	A	14	B	7	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	2	A	5	A	-	-	3	A	5	A	-	-	3	A	2	A	0	A	0	A	1	A	0	A	0	A
	Afternoon	1	A	5	A	-	-	2	A	5	A	-	-	3	A	1	A	0	A	0	A	1	A	0	A	0	A
	PM	2	A	6	A	-	-	3	A	6	A	-	-	3	A	2	A	0	A	0	A	1	A	1	A	0	A

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2040 All Way Stop Control - 1

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																																		
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/R		WBL/T		WBL/T/R		WBT/R		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/T		SBL/T/R		SBR		
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max			
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	75	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	250	-	-	-	-	75	175		
	Afternoon	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	75	-	-	-	-	50	75		
	PM	50	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	75	-	-	-	-	50	100		
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	75	125	-	-	-	-	75	150	125	325	-	-	-	-	-	-	75	300	-	-	50	100	-	-	50	125	-	-	-	-	25	50	-	-	
	Afternoon	50	75	-	-	-	-	25	75	50	75	-	-	-	-	-	-	50	75	-	-	25	75	-	-	50	150	-	-	-	-	25	50	-	-	
	PM	50	100	-	-	-	-	25	75	25	50	-	-	-	-	-	-	50	75	-	-	25	50	-	-	50	75	-	-	-	-	25	50	-	-	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	-	-	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Afternoon	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	25	50	-	-	-	-	-	-	50	100	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	25	50	-	-	-
	Afternoon	-	-	25	50	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	50	-	-	-
	PM	-	-	50	50	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	25	50	-	-	-
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	50	125	-	-	-	
	Afternoon	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	100	-	-	-	
	PM	-	-	50	75	-	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	100	-	-	-	
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	25	25	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	75	-	-	-	-	50	75	-	-	-	-	-	
	Afternoon	0	25	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	25	25	-	-	-	-	25	50	-	-	-	-	-	
	PM	25	25	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	50	75	-	-	-	-	-	

2040 All Way Stop Control - 1

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	1	A	-	-		
	Afternoon	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
	PM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	4	A	-	-	-	-	-	-	14	B	-	-	5	A	3	A	2	A	-	-	-	-	1	A	0	A
	Afternoon	2	A	-	-	-	-	-	-	9	A	-	-	3	A	2	A	1	A	-	-	-	-	0	A	0	A
	PM	3	A	-	-	-	-	-	-	9	A	-	-	3	A	2	A	1	A	-	-	-	-	0	A	0	A
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	12	B	7	A	0	A	5	A	7	A	-	-	3	A	8	A	10	B	8	A	22	C	7	A	3	A
	Afternoon	5	A	4	A	0	A	4	A	-	-	-	-	-	-	5	A	7	A	3	A	5	A	6	A	3	A
	PM	5	A	5	A	0	A	3	A	5	A	-	-	3	A	6	A	7	A	3	A	5	A	6	A	4	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	6	A	-	-	3	A	-	-	1	A	-	-	-	-	2	A	2	A
	Afternoon	1	A	-	-	-	-	-	-	5	A	-	-	-	-	-	-	0	A	-	-	-	-	2	A	2	A
	PM	1	A	-	-	-	-	-	-	7	A	-	-	7	A	-	-	0	A	-	-	-	-	2	A	2	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	4	A	-	-	-	-	-	-	-	-	5	A	-	-	4	A	4	A	4	A	-	-
	Afternoon	3	A	-	-	3	A	-	-	-	-	-	-	-	-	-	-	3	A	4	A	4	A	4	A	-	-
	PM	4	A	-	-	3	A	-	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A	-	-
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	1	A	1	A	3	A	1	A	-	-	-	-	-	-	-	-	4	A	-	-	-	3	A
	Afternoon	1	A	-	0	A	0	A	3	A	1	A	-	-	-	-	-	-	-	-	1	A	-	-	-	2	A
	PM	1	A	-	1	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	-	-	3	A	-	-	-	4	A
	Afternoon	1	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	2	A
	PM	1	A	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	-	-	5	A	-	-	-	3	A
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	7	A	8	A	5	A	6	A	7	A	3	A	4	A	10	B	2	A	4	A	9	A	3	A
	Afternoon	6	A	6	A	7	A	3	A	6	A	7	A	4	A	3	A	9	A	2	A	5	A	10	B	4	A
	PM	6	A	6	A	7	A	4	A	5	A	7	A	4	A	4	A	9	A	3	A	5	A	10	B	3	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	1	A	-	-
	Afternoon	1	A	5	A	-	-	2	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	1	A	-	-
	PM	1	A	6	A	-	-	3	A	-	-	-	-	-	-	0	A	0	A	1	A	1	A	1	A	-	-

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2020 All Way Stop Control - 2

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																																					
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/R		WBL/T		WBL/T/R		WBT/R		NBL		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/R		SBL/T		SBL/T/R		SBR	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max		
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	50	125	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	75	175	
	Afternoon	25	100	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	100	
	PM	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	50	100	
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	50	100	-	-	-	-	75	125	100	325	-	-	-	-	-	50	250	-	-	-	-	50	100	-	-	50	125	-	-	-	-	-	-	25	50	-	-	
	Afternoon	50	75	-	-	-	-	25	75	50	75	-	-	-	-	-	50	75	25	75	-	-	-	-	-	-	50	125	-	-	-	-	-	-	-	-	-	-	
	PM	50	100	-	-	-	-	25	75	50	75	-	-	-	-	-	50	75	25	50	-	-	-	-	-	-	25	75	-	-	-	-	-	-	25	50	-	-	
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	75	100	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	25	25	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	PM	-	-	-	-	25	25	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	-	-	50	75	-	-	
	Afternoon	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	50	100	-	-	
	PM	-	-	50	75	-	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	50	100	-	-	
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

2020 All Way Stop Control - 2

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																					
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	4	A	-	-	4	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
	Afternoon	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	0	A	3	A	0	A	-	-
	PM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	0	A	3	A	0	A	-	-
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	6	A	-	-	-	-	-	-	18	C	-	-	9	A	3	A	2	A	-	-	2	A	1	A
	Afternoon	2	A	-	-	-	-	-	-	9	A	-	-	3	A	2	A	1	A	-	-	-	-	0	A
	PM	3	A	-	-	-	-	-	-	9	A	-	-	3	A	2	A	2	A	-	-	-	-	0	A
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	14	B	8	A	0	A	6	A	6	A	-	-	3	A	8	A	10	B	9	A	29	D	7	A
	Afternoon	5	A	5	A	0	A	4	A	5	A	-	-	3	A	5	A	7	A	3	A	5	A	6	A
	PM	5	A	4	A	0	A	3	A	5	A	-	-	3	A	6	A	7	A	3	A	5	A	6	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	-	-	1	A	-	-	-	-	2	A
	Afternoon	1	A	-	-	-	-	-	-	5	A	-	-	-	-	-	-	0	A	-	-	-	-	2	A
	PM	2	A	-	-	-	-	-	-	8	A	-	-	2	A	-	-	0	A	-	-	-	-	2	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	5	A	-	-	-	-	5	A	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A
	Afternoon	4	A	7	A	-	-	3	A	-	-	-	-	-	-	6	A	4	A	4	A	4	A	4	A
	PM	4	A	3	A	-	-	3	A	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	-	1	A	1	A	3	A	1	A	-	-	-	-	-	-	5	A	-	-	3	A
	Afternoon	1	A	-	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	-	-	-	-	2	A
	PM	1	A	-	-	1	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	4	A	2	A	2	A	4	A	1	A	0	A	9	A	-	-	3	A	7	A	-	-
	Afternoon	2	A	3	A	2	A	1	A	3	A	1	A	1	A	5	A	-	-	3	A	-	-	3	A
	PM	2	A	4	A	2	A	2	A	3	A	1	A	0	A	6	A	-	-	3	A	7	A	-	-
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	8	A	7	A	10	B	7	A	7	A	7	A	4	A	6	A	12	B	5	A	7	A	11	B
	Afternoon	7	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	10	B	2	A	7	A	12	B
	PM	8	A	7	A	8	A	4	A	7	A	8	A	5	A	5	A	11	B	3	A	9	A	14	B
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	2	A	5	A	-	-	3	A	6	A	-	-	4	A	1	A	0	A	0	A	1	A	0	A
	Afternoon	1	A	4	A	-	-	2	A	5	A	-	-	3	A	1	A	0	A	0	A	1	A	0	A
	PM	2	A	6	A	-	-	3	A	6	A	-	-	3	A	2	A	0	A	0	A	1	A	1	A

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2040 All Way Stop Control - 2

Table 2: Peak Hour Queues By Movement - Scenario Geometry

Intersection	Peak Hour	Queue Lengths																																			
		EBL/T		EBL/T/R		EBT/R		EBR		WBL		WBL/R		WBL/T		WBL/T/R		WBT/R		NBL/R		NBL/T		NBL/T/R		NBR		SBL		SBL/R		SBL/T		SBL/T/R		SBR	
		Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max		
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	50	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sunset Dr and Hillside Dr <i>Two-Way Stop Controlled</i>	AM	50	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	50	150	-	-	-	-	-	-	75	175	
	Afternoon	25	75	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-	-	-	25	50	-	-	-	-	50	75	-	-	-	-	-	-	50	75	
	PM	25	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	75	
Sunset Dr and Middle/High School Access <i>All Way Stop Controlled</i>	AM	75	125	-	-	-	-	75	150	125	350	-	-	-	-	-	-	75	350	-	-	50	100	-	-	50	150	-	-	-	-	-	-	25	50		
	Afternoon	50	75	-	-	-	-	25	75	50	50	-	-	-	-	-	-	50	75	-	-	25	75	-	-	50	125	-	-	-	-	-	-	25	50		
	PM	50	100	-	-	-	-	25	75	25	50	-	-	-	-	-	-	50	75	-	-	25	50	-	-	50	75	-	-	-	-	-	-	25	50		
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	-	-	75	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	Afternoon	-	-	-	-	25	50	-	-	-	-	-	-	50	100	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	PM	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	-	-	50	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	50	-	-		
	Afternoon	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	-	-		
	PM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	-	-	50	75	-	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	25	50	-	-	
	Afternoon	-	-	25	50	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	25	50	-	-	
	PM	-	-	50	75	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	25	75	-	-	-	-	-	-	25	50	-	-	
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	-	-	50	100	-	-	-	-	-	-	-	-	-	50	75	-	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	50	100	-	-	
	Afternoon	-	-	50	75	-	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	100	-	-	
	PM	-	-	50	100	-	-	-	-	-	-	-	-	-	75	125	-	-	-	-	-	-	-	-	50	100	-	-	-	-	-	-	50	100	-	-	
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	-	-	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	
	Afternoon	0	25	-	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	-	-	-	25	25	-	-	-	-	-	-	25	50	-	-	
	PM	25	25	-	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	-	-	-	25	50	-	-	-	-	-	-	50	75	-	-	

2040 All Way Stop Control - 2

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																					
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	1	A	-	-
	Afternoon	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-
	PM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	3	A	0	A	-	-
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	-	-	-	-	-	-	5	A	-	-	4	A	8	A	6	A	-	-	6	A	5	A
	Afternoon	4	A	-	-	-	-	-	-	5	A	-	-	3	A	5	A	3	A	-	-	5	A	3	A
	PM	4	A	-	-	-	-	-	-	4	A	-	-	3	A	5	A	5	A	-	-	4	A	4	A
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	12	B	80	F	0	A	11	B	10	B	-	-	3	A	2	A	1	A	1	A	8	A	1	A
	Afternoon	3	A	6	A	0	A	4	A	-	-	-	-	2	A	1	A	0	A	0	A	3	A	1	A
	PM	2	A	7	A	0	A	4	A	7	A	-	-	4	A	2	A	1	A	0	A	3	A	1	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	6	A	-	-	2	A	-	-	1	A	-	-	1	A	1	A
	Afternoon	1	A	-	-	-	-	-	-	5	A	-	-	-	-	-	-	0	A	-	-	1	A	0	A
	PM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	-	-	0	A	-	-	1	A	0	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	4	A	-	-	-	-	-	-	-	-	6	A	-	-	4	A	4	A	-	-
	Afternoon	3	A	-	-	3	A	-	-	-	-	-	-	-	3	A	3	A	3	A	4	A	4	A	
	PM	4	A	3	A	-	-	3	A	-	-	-	-	-	5	A	-	-	4	A	4	A	4	A	
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	1	A	0	A	3	A	1	A	-	-	-	-	-	-	-	4	A	-	-	3	A
	Afternoon	1	A	-	0	A	0	A	2	A	1	A	-	-	-	-	-	-	-	2	A	-	-	2	A
	PM	1	A	-	0	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	-	2	A	2	A	3	A	1	A	-	-	-	-	-	-	-	6	A	-	-	3	A
	Afternoon	1	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	-	-	-	-	2	A
	PM	1	A	-	2	A	1	A	3	A	1	A	-	-	-	-	-	-	-	4	A	-	-	3	A
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	6	A	7	A	8	A	5	A	6	A	7	A	4	A	4	A	10	B	3	A	5	A	9	A
	Afternoon	6	A	5	A	7	A	3	A	5	A	7	A	4	A	3	A	9	A	2	A	4	A	9	A
	PM	6	A	6	A	7	A	4	A	5	A	7	A	4	A	4	A	10	B	3	A	5	A	10	B
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	1	A	4	A	-	-	3	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-
	Afternoon	1	A	5	A	-	-	2	A	-	-	-	-	-	-	0	A	0	A	1	A	0	A	-	-
	PM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	0	A	0	A	1	A	1	A	-	-

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2020 All Way Stop Control - 3

Table 1: Scenario Traffic Operations Analysis - Jordan School Area Study

Intersection	Peak Hour	Intersection Delay (1.)		Movement Delay (sec/veh)																							
				NBL		NBT		NBR		SBL		SBT		SBR		EBL		EBT		EBR		WBL		WBT		WBR	
Hillside Dr and High School Access <i>Stop Controlled</i>	AM	1	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	1	A	-	-		
	Afternoon	2	A	5	A	-	-	3	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
	PM	1	A	3	A	-	-	2	A	-	-	-	-	-	-	1	A	1	A	2	A	0	A	-	-		
Sunset Dr and Hillside Dr <i>All Way Stop Controlled</i>	AM	6	A	-	-	-	-	-	-	5	A	-	-	5	A	7	A	5	A	-	-	-	-	5	A	4	A
	Afternoon	4	A	-	-	-	-	-	-	4	A	-	-	3	A	5	A	3	A	-	-	-	-	4	A	3	A
	PM	4	A	-	-	-	-	-	-	4	A	-	-	3	A	5	A	5	A	-	-	-	-	4	A	3	A
Sunset Dr and Middle/High School Access <i>Two-Way Stop Controlled</i>	AM	12	B	74	F	1	A	11	B	27	D	-	-	3	A	2	A	1	A	1	A	1	A	9	A	1	A
	Afternoon	3	A	7	A	0	A	4	A	6	A	-	-	4	A	3	A	1	A	0	A	0	A	2	A	1	A
	PM	2	A	7	A	0	A	4	A	9	A	-	-	3	A	3	A	1	A	0	A	0	A	3	A	1	A
Sunset Dr and Timber Ridge Ct <i>Stop Controlled</i>	AM	1	A	-	-	-	-	-	-	7	A	-	-	3	A	-	-	1	A	-	-	-	-	1	A	0	A
	Afternoon	1	A	-	-	-	-	-	-	6	A	-	-	-	-	-	-	0	A	-	-	-	-	1	A	0	A
	PM	1	A	-	-	-	-	-	-	6	A	-	-	3	A	-	-	0	A	-	-	-	-	1	A	0	A
Sunset Dr and Aberdeen Ave <i>Stop Controlled</i>	AM	4	A	-	-	-	-	5	A	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A	-	-
	Afternoon	4	A	5	A	-	-	3	A	-	-	-	-	-	-	6	A	3	A	4	A	4	A	4	A	-	-
	PM	4	A	4	A	-	-	3	A	-	-	-	-	-	-	6	A	-	-	4	A	4	A	4	A	-	-
Aberdeen Ave and West Elementary School Access <i>Stop Controlled</i>	AM	1	A	-	-	1	A	1	A	3	A	1	A	-	-	-	-	-	-	2	A	-	-	-	-	3	A
	Afternoon	1	A	-	-	0	A	-	-	2	A	1	A	-	-	-	-	-	-	1	A	-	-	-	-	2	A
	PM	1	A	-	-	1	A	-	-	-	-	1	A	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aberdeen Ave and Ridge St <i>Stop Controlled</i>	AM	2	A	4	A	2	A	2	A	3	A	1	A	7	A	-	-	4	A	3	A	-	-	-	-	4	A
	Afternoon	2	A	4	A	2	A	1	A	3	A	1	A	1	A	4	A	-	-	3	A	-	-	-	-	2	A
	PM	2	A	4	A	2	A	2	A	3	A	1	A	0	A	7	A	-	-	3	A	9	A	-	-	3	A
CR 66 and Aberdeen Ave <i>Stop Controlled</i>	AM	8	A	7	A	9	A	6	A	7	A	8	A	5	A	6	A	11	B	6	A	7	A	12	B	5	A
	Afternoon	7	A	6	A	7	A	4	A	6	A	7	A	4	A	4	A	9	A	2	A	7	A	12	B	5	A
	PM	8	A	7	A	8	A	4	A	7	A	8	A	4	A	5	A	11	B	3	A	9	A	14	B	7	A
CR 66 and Prospect Pointe Rd <i>Stop Controlled</i>	AM	2	A	5	A	-	-	3	A	5	A	-	-	3	A	1	A	0	A	0	A	1	A	0	A	0	A
	Afternoon	1	A	5	A	-	-	2	A	5	A	-	-	3	A	2	A	0	A	0	A	1	A	1	A	0	A
	PM	2	A	6	A	-	-	3	A	6	A	-	-	3	A	2	A	0	A	0	A	1	A	1	A	0	A

1. Delay in seconds per vehicle
 2. Maximum delay and LOS on any approach and/or movement
 3. Limiting Movement is the highest delay movement.

2040 All Way Stop Control - 3

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	West Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.60		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	194	116	0	149	69	15	0	58	0	118	0	5	0	3
Percent Heavy Vehicles, %	3	5	7	11	3	7	6	3	3	27	13	0	3	3	5	6
Flow Rate (v _{PCE}), pc/h	0	10	346	215	0	266	122	26	0	123	0	197	0	9	0	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		571			414			320			14	
Entry Volume veh/h		527			389			294			13	
Circulating Flow (v _c), pc/h		275			133			365			511	
Exiting Flow (v _{ex}), pc/h		552			250			36			481	
Capacity (c _{PCE}), pc/h		1042			1205			951			819	
Capacity (c), veh/h		961			1132			873			788	
v/c Ratio (x)		0.55			0.34			0.34			0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.9			6.6			7.9			4.7	
Lane LOS		B			A			A			A	
95% Queue, veh		3.4			1.5			1.5			0.1	
Approach Delay, s/veh		10.9			6.6			7.9			4.7	
Approach LOS		B			A			A			A	
Intersection Delay, s/veh LOS	8.7						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	West Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	5	74	27	0	26	119	8	0	43	0	89	0	0	0	0
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	5	76	28	0	27	123	8	0	44	0	92	0	0	0	0
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		109			158			136			0	
Entry Volume veh/h		106			153			132			0	
Circulating Flow (v _c), pc/h		27			49			81			194	
Exiting Flow (v _{ex}), pc/h		168			167			13			55	
Capacity (c _{pc}), pc/h		1343			1313			1271			1132	
Capacity (c), veh/h		1303			1274			1234			1099	
v/c Ratio (x)		0.08			0.12			0.11			0.00	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.4			3.8			3.8			3.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.4			0.4			0.0	
Approach Delay, s/veh	3.4			3.8			3.8					
Approach LOS	A			A			A					
Intersection Delay, s/veh LOS	3.7						A					

HCS7 Roundabouts Report

General Information

Analyst	CW
Agency or Co.	Bolton & Menk
Date Performed	6/13/2019
Analysis Year	2020
Time Analyzed	AM Peak
Project Description	Jordan School Area Study

Site Information

Intersection	West Mini-Roundabout
E/W Street Name	Sunset Dr
N/S Street Name	High/Middle School Access
Analysis Time Period (hrs)	0.25
Peak Hour Factor	1.00
Jurisdiction	Jordan, MN

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	3	162	24	0	33	166	11	0	23	0	43	0	15	0	6
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	3	167	25	0	34	171	11	0	24	0	44	0	15	0	6
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		195			216			68			21	
Entry Volume veh/h		189			210			66			20	
Circulating Flow (v _c), pc/h		49			27			185			229	
Exiting Flow (v _{ex}), pc/h		226			201			14			59	
Capacity (c _{pc}), pc/h		1313			1343			1143			1093	
Capacity (c), veh/h		1274			1303			1109			1061	
v/c Ratio (x)		0.15			0.16			0.06			0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			4.1			3.7			3.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.5			0.6			0.2			0.1	
Approach Delay, s/veh	4.1			4.1			3.7			3.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.0						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	West Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.60		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	270	123	0	153	111	16	0	61	0	125	0	5	0	3
Percent Heavy Vehicles, %	3	5	7	11	3	7	6	3	3	27	13	0	3	3	5	6
Flow Rate (v _{pc}), pc/h	0	10	482	228	0	273	196	27	0	129	0	208	0	9	0	5
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		720			496			337			14	
Entry Volume veh/h		665			466			310			13	
Circulating Flow (v _c), pc/h	282			139			501			598		
Exiting Flow (v _{ex}), pc/h	699			330			37			501		
Capacity (c _{pc}), pc/h		1035			1198			828			750	
Capacity (c), veh/h		957			1126			760			721	
v/c Ratio (x)		0.70			0.41			0.41			0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.4			7.5			10.0			5.2	
Lane LOS		C			A			A			A	
95% Queue, veh		5.9			2.1			2.0			0.1	
Approach Delay, s/veh	15.4			7.5			10.0			5.2		
Approach LOS	C			A			A			A		
Intersection Delay, s/veh LOS	11.6						B					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	West Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	5	97	27	0	36	170	8	0	44	0	94	0	0	0	0
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	5	100	28	0	37	175	8	0	45	0	97	0	0	0	0
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		133			220			142			0	
Entry Volume veh/h		129			214			138			0	
Circulating Flow (v _c), pc/h		37			50			105			257	
Exiting Flow (v _{ex}), pc/h		197			220			13			65	
Capacity (c _{pc}), pc/h		1329			1311			1240			1062	
Capacity (c), veh/h		1290			1273			1204			1031	
v/c Ratio (x)		0.10			0.17			0.11			0.00	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		3.6			4.2			3.9			3.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.6			0.4			0.0	
Approach Delay, s/veh	3.6			4.2			3.9					
Approach LOS	A			A			A					
Intersection Delay, s/veh LOS	4.0						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	West Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	High/Middle School Access		
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	3	209	25	0	35	258	11	0	24	0	45	0	16	0	6
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{PCE}), pc/h	0	3	215	26	0	36	266	11	0	25	0	46	0	16	0	6
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		244			313			71			22	
Entry Volume veh/h		237			304			69			21	
Circulating Flow (v _c), pc/h		52			28			234			327	
Exiting Flow (v _{ex}), pc/h		277			297			14			62	
Capacity (c _{PCE}), pc/h		1309			1341			1087			989	
Capacity (c), veh/h		1271			1302			1055			960	
v/c Ratio (x)		0.19			0.23			0.07			0.02	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.4			4.8			4.0			3.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.7			0.9			0.2			0.1	
Approach Delay, s/veh	4.4			4.8			4.0			3.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.5						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	East Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	Hillside Dr		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	0.74		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	213	30	74	0	42	18	64	0	23	80	23	0	37	149	188
Percent Heavy Vehicles, %	3	5	7	11	3	7	6	0	3	27	13	0	3	3	5	6
Flow Rate (v _{pc}), pc/h	0	302	43	111	0	61	26	86	0	39	122	31	0	52	211	269
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		456			173			192			532		
Entry Volume veh/h		428			168			170			505		
Circulating Flow (v _c), pc/h		324			463			397			126		
Exiting Flow (v _{ex}), pc/h		126			334			510			383		
Capacity (c _{pc}), pc/h		992			861			920			1214		
Capacity (c), veh/h		930			833			813			1152		
v/c Ratio (x)		0.46			0.20			0.21			0.44		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		9.4			6.4			6.6			7.7		
Lane LOS		A			A			A			A		
95% Queue, veh		2.5			0.7			0.8			2.3		
Approach Delay, s/veh		9.4			6.4			6.6			7.7		
Approach LOS		A			A			A			A		
Intersection Delay, s/veh LOS	8.0						A						

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	CW				Intersection	East Mini-Roundabout			
Agency or Co.	Bolton & Menk				E/W Street Name	Sunset Dr			
Date Performed	6/13/2019				N/S Street Name	Hillside Dr			
Analysis Year	2020				Analysis Time Period (hrs)	0.25			
Time Analyzed	AM Peak				Peak Hour Factor	1.00			
Project Description	Jordan School Area Study				Jurisdiction	Jordan, MN			

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	127	23	13	0	7	11	40	0	15	96	60	0	53	32	111
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{PCE}), pc/h	0	131	24	13	0	7	11	41	0	15	99	62	0	55	33	114
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		168			59			176			202	
Entry Volume veh/h		163			57			171			196	
Circulating Flow (v _c), pc/h		95			245			210			33	
Exiting Flow (v _{ex}), pc/h		141			140			271			53	
Capacity (c _{PCE}), pc/h		1253			1075			1114			1334	
Capacity (c), veh/h		1216			1044			1081			1295	
v/c Ratio (x)		0.13			0.05			0.16			0.15	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			3.9			4.7			4.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.5			0.2			0.6			0.5	
Approach Delay, s/veh	4.1			3.9			4.7			4.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.2						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	East Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	Hillside Dr		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	AM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	183	24	13	0	3	11	55	0	12	33	17	0	64	19	184
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	188	25	13	0	3	11	57	0	12	34	18	0	66	20	190
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		226			71			64			276	
Entry Volume veh/h		219			69			62			268	
Circulating Flow (v _c), pc/h	89			234			279			26		
Exiting Flow (v _{ex}), pc/h	109			213			279			36		
Capacity (c _{pc}), pc/h		1260			1087			1038			1344	
Capacity (c), veh/h		1224			1055			1008			1305	
v/c Ratio (x)		0.18			0.07			0.06			0.21	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.5			4.0			4.1			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.7			0.2			0.2			0.8	
Approach Delay, s/veh	4.5			4.0			4.1			4.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.4						A					

HCS7 Roundabouts Report

General Information					Site Information				
Analyst	CW				Intersection	East Mini-Roundabout			
Agency or Co.	Bolton & Menk				E/W Street Name	Sunset Dr			
Date Performed	6/13/2019				N/S Street Name	Hillside Dr			
Analysis Year	2040				Analysis Time Period (hrs)	0.25			
Time Analyzed	AM Peak				Peak Hour Factor	0.74			
Project Description	Jordan School Area Study				Jurisdiction	Jordan, MN			

Volume Adjustments and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	291	30	79	0	45	18	64	0	24	85	24	0	38	160	216
Percent Heavy Vehicles, %	3	5	7	11	3	7	6	0	3	27	13	0	3	3	5	6
Flow Rate (v _{pc}), pc/h	0	413	43	119	0	65	26	86	0	41	130	32	0	53	227	309
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763		
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (v _e), pc/h		575			177			203			589		
Entry Volume veh/h		541			171			179			559		
Circulating Flow (v _c), pc/h		345			584			509			132		
Exiting Flow (v _{ex}), pc/h		128			376			629			411		
Capacity (c _{pc}), pc/h		971			761			821			1206		
Capacity (c), veh/h		913			736			725			1145		
v/c Ratio (x)		0.59			0.23			0.25			0.49		

Delay and Level of Service													
Approach	EB			WB			NB			SB			
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Lane Control Delay (d), s/veh		12.5			7.5			7.8			8.5		
Lane LOS		B			A			A			A		
95% Queue, veh		4.0			0.9			1.0			2.8		
Approach Delay, s/veh		12.5			7.5			7.8			8.5		
Approach LOS		B			A			A			A		
Intersection Delay, s/veh LOS	9.8						A						

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	East Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	Hillside Dr		
Analysis Year	2020			Analysis Time Period (hrs)	0.25		
Time Analyzed	Afternoon Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Movement																
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	155	23	13	0	7	11	40	0	16	103	64	0	53	34	168
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	160	24	13	0	7	11	41	0	16	106	66	0	55	35	173
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		197			59			188			263	
Entry Volume veh/h		191			57			183			255	
Circulating Flow (v _c), pc/h		97			282			239			34	
Exiting Flow (v _{ex}), pc/h		145			200			307			55	
Capacity (c _{pc}), pc/h		1250			1035			1081			1333	
Capacity (c), veh/h		1214			1005			1050			1294	
v/c Ratio (x)		0.16			0.06			0.17			0.20	

Delay and Level of Service

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			4.1			5.0			4.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.6			0.2			0.6			0.7	
Approach Delay, s/veh		4.3			4.1			5.0			4.5	
Approach LOS		A			A			A			A	
Intersection Delay, s/veh LOS	4.5						A					

HCS7 Roundabouts Report

General Information				Site Information			
Analyst	CW			Intersection	East Mini-Roundabout		
Agency or Co.	Bolton & Menk			E/W Street Name	Sunset Dr		
Date Performed	6/13/2019			N/S Street Name	Hillside Dr		
Analysis Year	2040			Analysis Time Period (hrs)	0.25		
Time Analyzed	PM Peak			Peak Hour Factor	1.00		
Project Description	Jordan School Area Study			Jurisdiction	Jordan, MN		

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	233	24	13	0	3	11	55	0	12	35	18	0	64	20	268
Percent Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Flow Rate (v _{pc}), pc/h	0	240	25	13	0	3	11	57	0	12	36	19	0	66	21	276
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	

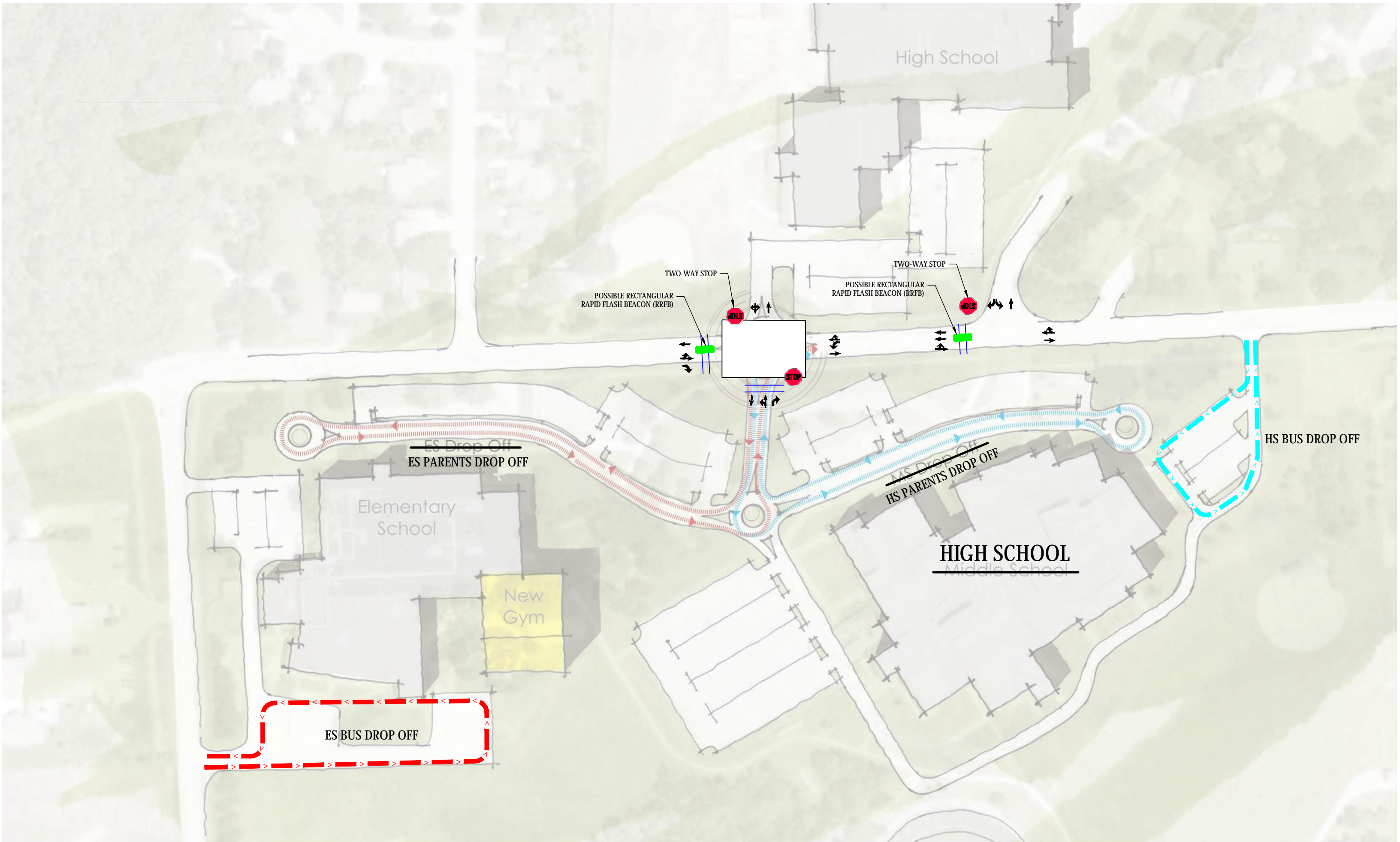
Flow Computations, Capacity and v/c Ratios

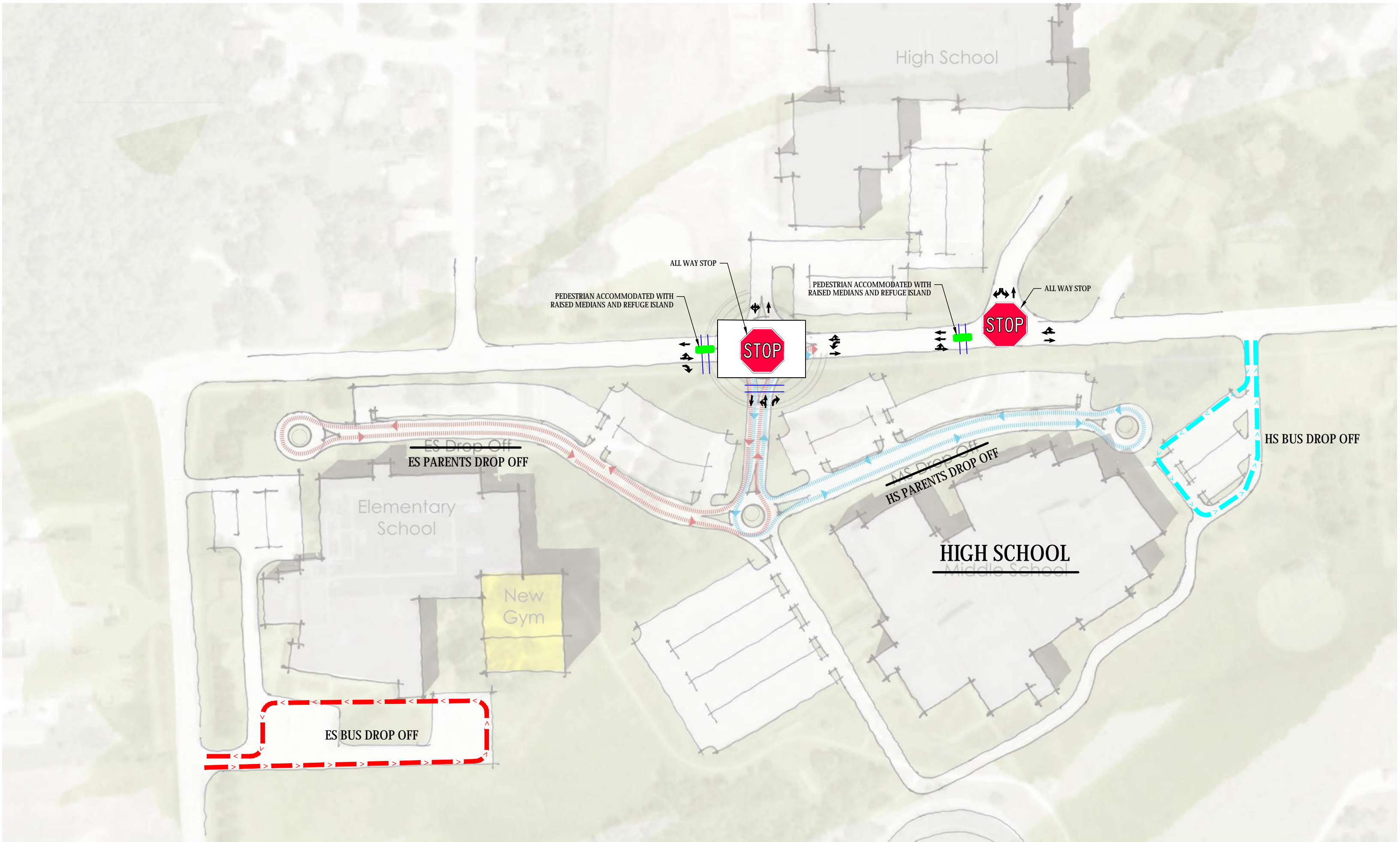
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v _e), pc/h		278			71			67			363	
Entry Volume veh/h		270			69			65			352	
Circulating Flow (v _c), pc/h		90			288			331			26	
Exiting Flow (v _{ex}), pc/h		110			299			333			37	
Capacity (c _{pc}), pc/h		1259			1029			985			1344	
Capacity (c), veh/h		1222			999			956			1305	
v/c Ratio (x)		0.22			0.07			0.07			0.27	

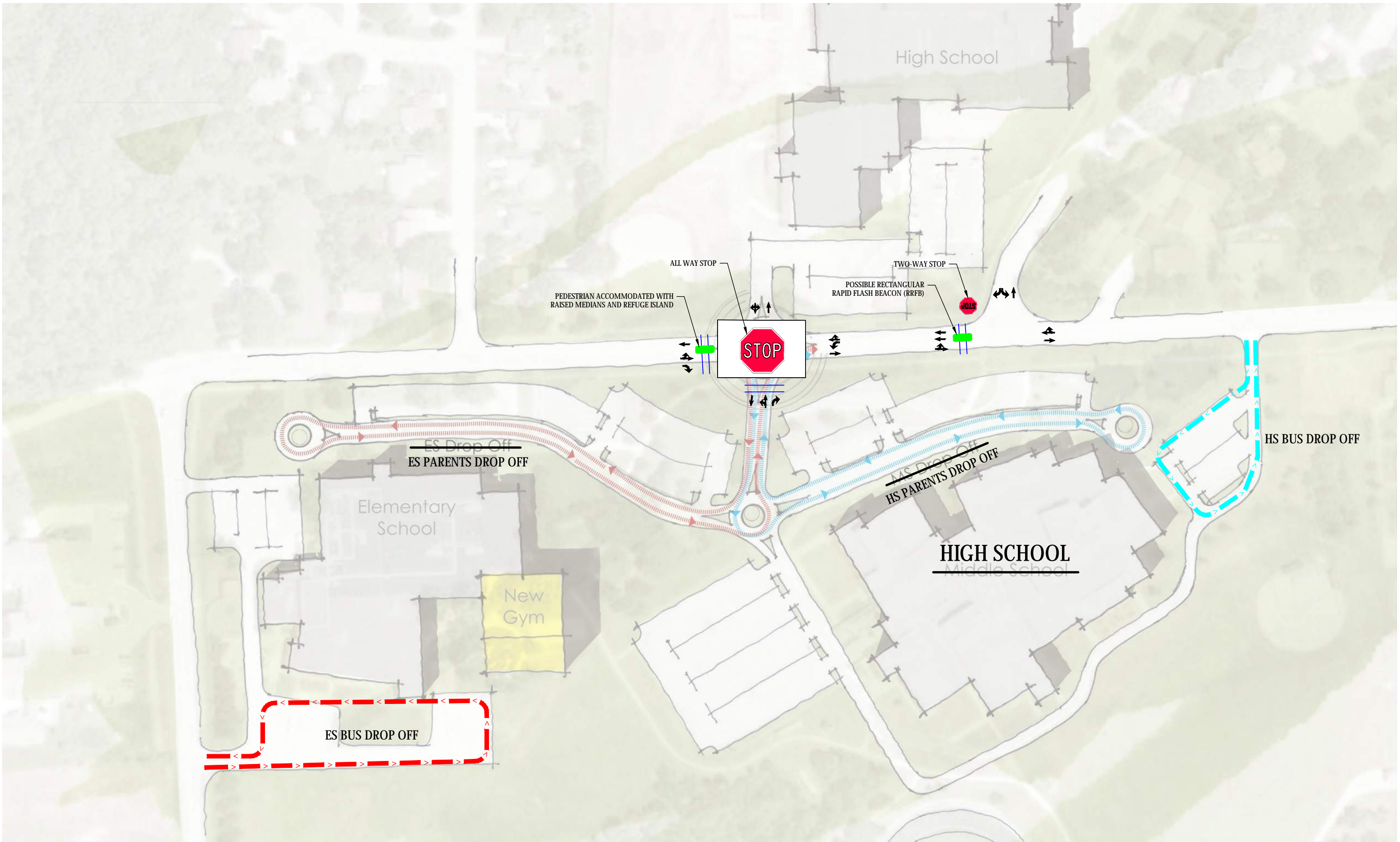
Delay and Level of Service

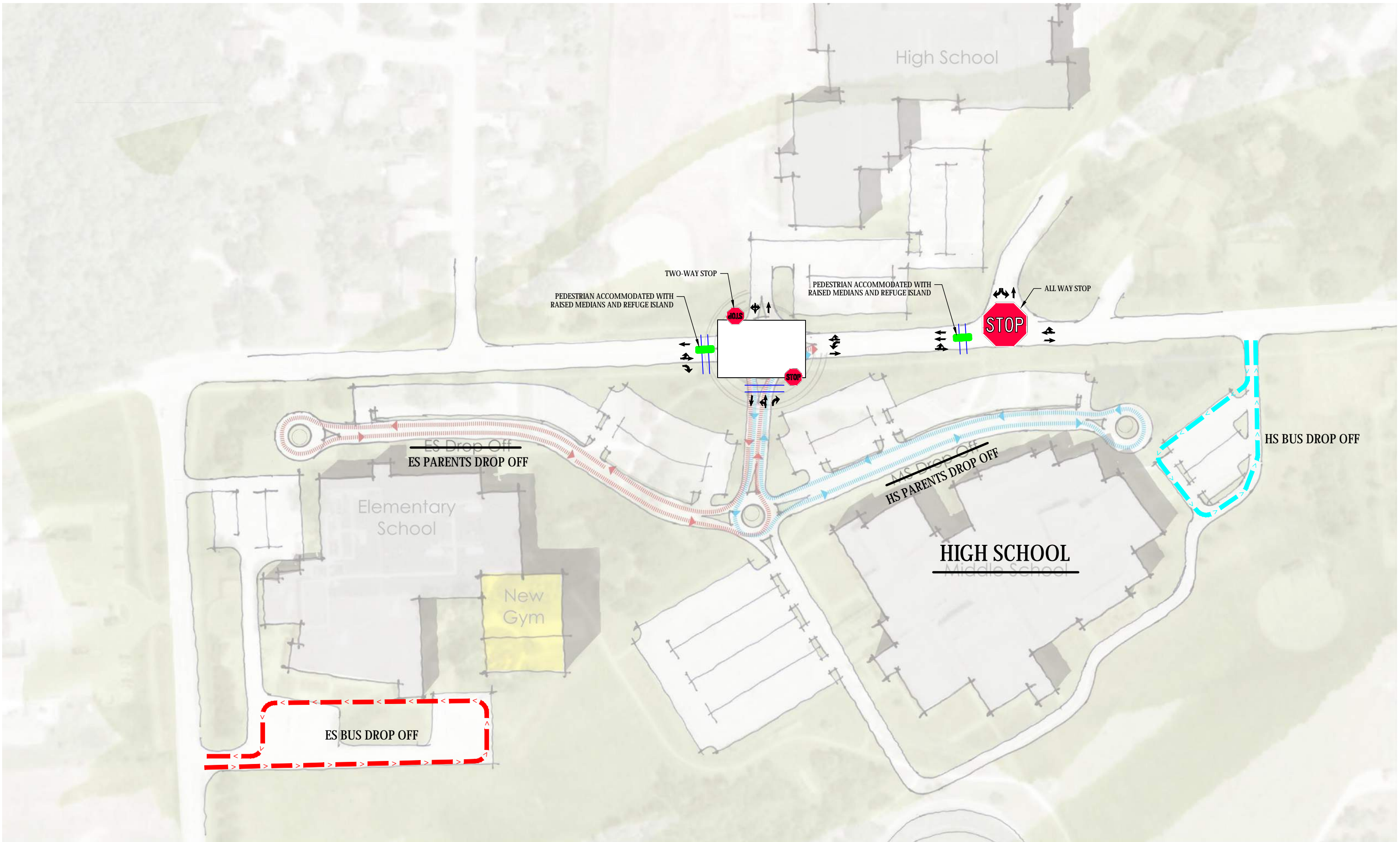
Approach	EB			WB			NB			SB		
	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			4.2			4.4			5.1	
Lane LOS		A			A			A			A	
95% Queue, veh		0.8			0.2			0.2			1.1	
Approach Delay, s/veh		4.9			4.2			4.4			5.1	
Approach LOS		A			A			A			A	
Intersection Delay, s/veh LOS	4.9						A					

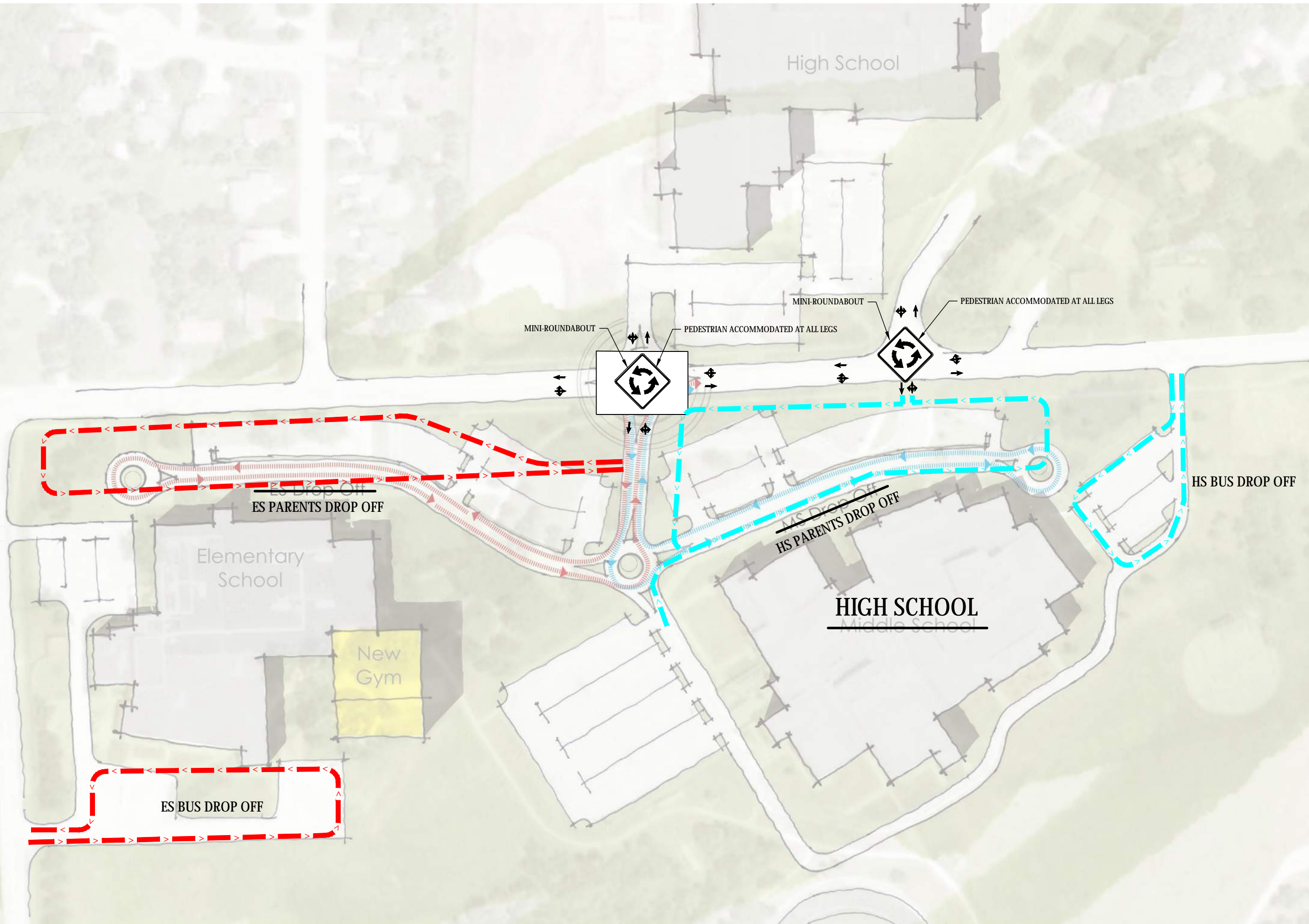
Appendix F: Mitigation Layouts











Appendix G: Warrant Analysis



Real People. Real Solutions.

SIGNAL WARRANTS ANALYSIS FOR Sunset Dr and Middle/High School Access

LOCATION: Jordan
 COUNTY: Scott County
 REF. POINT:
 DATE: 6/26/2019
 OPERATOR: CW

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: HILLSIDE DR (SOUTHBOUND)	1
	Minor App4: dsf	

0.70 FACTOR USED? No

POPULATION < 10,000? No

N/A Yes

THRESHOLDS 1A/1B:

480/720

120/60

HOUR	MAJOR APP. 1	MAJOR APP. 3	TOTAL 1+3	MAJOR 1A/1B	MINOR APP. 2	MINOR 2 1A/1B	MINOR APP. 4	MINOR 4 1A/1B	MET SAME 1A/1B
0:00 - 1:00	0	0	0	/	0	/			/
1:00 - 2:00	0	0	0	/	0	/			/
2:00 - 3:00	0	0	0	/	0	/			/
3:00 - 4:00	0	0	0	/	0	/			/
4:00 - 5:00	0	0	0	/	0	/			/
5:00 - 6:00	0	0	0	/	0	/			/
6:00 - 7:00	41	147	188	/	8	/			/
7:00 - 8:00	99	306	405	/	39	/			/
8:00 - 9:00	67	161	228	/	17	/			/
9:00 - 10:00	24	80	104	/	11	/			/
10:00 - 11:00	22	109	131	/	17	/			/
11:00 - 12:00	25	84	109	/	21	/			/
12:00 - 13:00	34	92	126	/	25	/			/
13:00 - 14:00	20	103	123	/	21	/			/
14:00 - 15:00	48	172	220	/	32	/			/
15:00 - 16:00	52	269	321	/	46	/			/
16:00 - 17:00	49	219	268	/	60	/X			/
17:00 - 18:00	62	230	292	/	53	/			/
18:00 - 19:00	76	159	235	/	78	/X			/
19:00 - 20:00	0	0	0	/	0	/			/
20:00 - 21:00	0	0	0	/	0	/			/
21:00 - 22:00	0	0	0	/	0	/			/
22:00 - 23:00	0	0	0	/	0	/			/
23:00 - 24:00	0	0	0	/	0	/			/

Required (Hr)

Warrant 1A	0	8	Not satisfied
Warrant 1B	0	8	Not satisfied
Warrant 2	0	4	Not satisfied
Warrant 3	0	1	Not satisfied
Warrant 7	0	8	Not satisfied

LOCATION: Jordan
 COUNTY: Scott County
 REF. POINT:
 DATE: 6/26/2019

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: HILLSIDE DR (SOUTHBOUND)	1
	Minor App4: dsf	

0.70 FACTOR USED? No
 POPULATION < 10,000? No
 EXISTING SIGNAL ? Yes

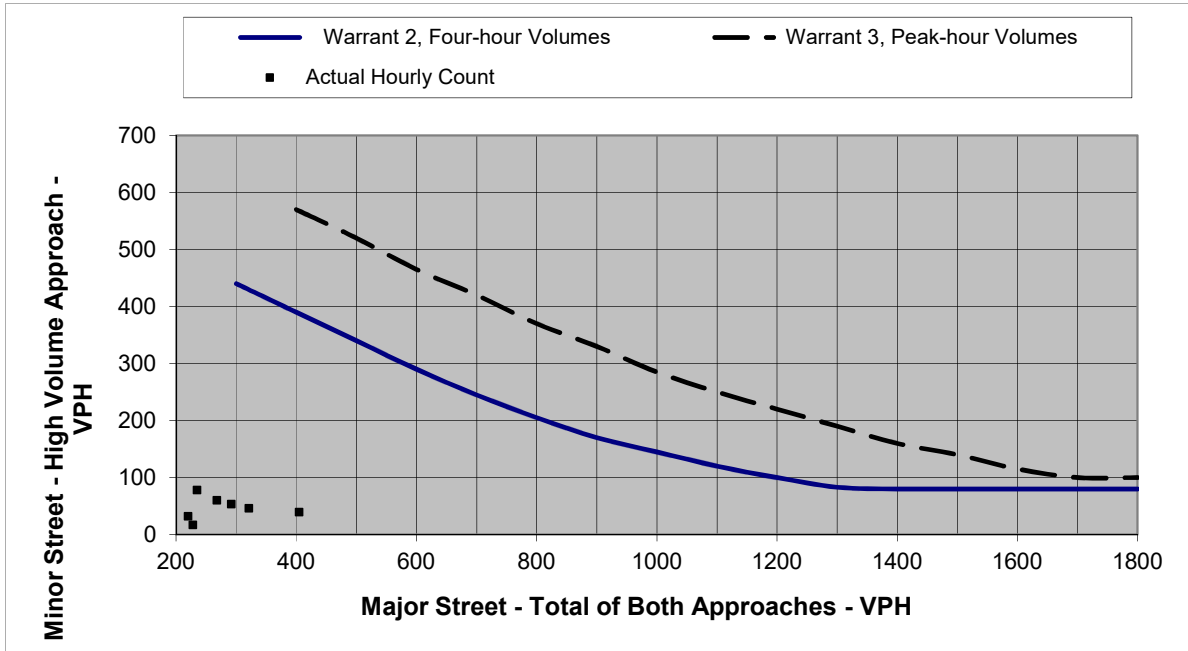


Figure 1. Four Hour and Peak Hour Warrant Analysis

Note: For data points outside the graph range, check the minor street volume against the lower thresholds

Major	Warrant Criteria		Actual Hourly Count	
	Warrant 2, F	Warrant 3, Pe	Major	Actual Hourly Count
200			0	0
300	440		0	0
400	390	570	0	0
500	340	520	0	0
600	290	465	0	0
700	245	420	0	0
800	205	370	188	8
900	170	330	405	39
1000	145	285	228	17
1100	120	250	104	11
1200	100	220	131	17
1300	83	190	109	21
1400	80	160	126	25
1500	80	140	123	21
1600	80	115	220	32
1700	80	100	321	46
1800	80	100	268	60
			292	53
			235	78
			0	0
			0	0
			0	0
			0	0
			0	0
			0	0

**ALL WAY STOP WARRANT ANALYSIS
FOR
Sunset Dr and Middle/High School Access**

LOCATION: Jordan
COUNTY: Scott County

REF. POINT:
DATE: 6/26/2019

OPERATOR: CW

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: MS ACCESS (SOUTHBOUND)	1
	Minor App4:	

0.70 FACTOR USED? No

HOUR	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	300	200	WARRANT MET
					MAJOR TOTAL Σ (APP. 1 & APP. 3)	MINOR TOTAL APP. 2 + APP. 4	
0:00 - 1:00	0	0	0		0	0	/
1:00 - 2:00	0	0	0		0	0	/
2:00 - 3:00	0	0	0		0	0	/
3:00 - 4:00	0	0	0		0	0	/
4:00 - 5:00	0	0	0		0	0	/
5:00 - 6:00	0	0	0		0	0	/
6:00 - 7:00	41	147	8		188	8	/
7:00 - 8:00	99	306	39		405	39	X/
8:00 - 9:00	67	161	17		228	17	/
9:00 - 10:00	24	80	11		104	11	/
10:00 - 11:00	22	109	17		131	17	/
11:00 - 12:00	25	84	21		109	21	/
12:00 - 13:00	34	92	25		126	25	/
13:00 - 14:00	20	103	21		123	21	/
14:00 - 15:00	48	172	32		220	32	/
15:00 - 16:00	52	269	46		321	46	X/
16:00 - 17:00	49	219	60		268	60	/
17:00 - 18:00	62	230	53		292	53	/
18:00 - 19:00	76	159	78		235	78	/
19:00 - 20:00	0	0	0		0	0	/
20:00 - 21:00	0	0	0		0	0	/
21:00 - 22:00	0	0	0		0	0	/
22:00 - 23:00	0	0	0		0	0	/
23:00 - 24:00	0	0	0		0	0	/

Allway Stop Warrant: Met (Hr) 0 Required (Hr) 8 Not satisfied

REMARKS: _____



Real People. Real Solutions.

SIGNAL WARRANTS ANALYSIS FOR Sunset Dr and Middle/High School Access

LOCATION: Jordan
 COUNTY: Scott County
 REF. POINT:
 DATE: 6/26/2019
 OPERATOR: CW

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: HS ACCESS (NORTHBOUND)	1
30	Minor App4: MS ACCESS (SOUTHBOUND)	1

0.70 FACTOR USED?
 POPULATION < 10,000?
 N/A

HOUR	600/900			150/75		150/75		MET SAME 1A/1B	
	MAJOR APP. 1	MAJOR APP. 3	TOTAL 1+3	MAJOR 1A/1B	MINOR APP. 2	MINOR 2 1A/1B	MINOR APP. 4		MINOR 4 1A/1B
0:00 - 1:00	0	0	0	/	0	/	0	/	/
1:00 - 2:00	0	0	0	/	0	/	0	/	/
2:00 - 3:00	0	0	0	/	0	/	0	/	/
3:00 - 4:00	0	0	0	/	0	/	0	/	/
4:00 - 5:00	0	0	0	/	0	/	0	/	/
5:00 - 6:00	0	0	0	/	0	/	0	/	/
6:00 - 7:00	81	105	186	/	12	/	0	/	/
7:00 - 8:00	240	252	492	/	58	/	4	/	/
8:00 - 9:00	247	197	444	/	39	/	2	/	/
9:00 - 10:00	37	39	76	/	12	/	0	/	/
10:00 - 11:00	69	60	129	/	8	/	0	/	/
11:00 - 12:00	66	42	108	/	35	/	1	/	/
12:00 - 13:00	90	43	133	/	16	/	0	/	/
13:00 - 14:00	106	57	163	/	20	/	1	/	/
14:00 - 15:00	150	135	285	/	19	/	1	/	/
15:00 - 16:00	272	231	503	/	58	/	3	/	/
16:00 - 17:00	91	169	260	/	36	/	2	/	/
17:00 - 18:00	133	118	251	/	43	/	2	/	/
18:00 - 19:00	110	85	195	/	31	/	1	/	/
19:00 - 20:00	0	0	0	/	0	/	0	/	/
20:00 - 21:00	0	0	0	/	0	/	0	/	/
21:00 - 22:00	0	0	0	/	0	/	0	/	/
22:00 - 23:00	0	0	0	/	0	/	0	/	/
23:00 - 24:00	0	0	0	/	0	/	0	/	/

	Met (Hr)	Required (Hr)	
Warrant 1A	0	8	Not satisfied
Warrant 1B	0	8	Not satisfied
Warrant 2	0	4	Not satisfied
Warrant 3	0	1	Not satisfied
Warrant 7	0	8	Not satisfied

LOCATION: Jordan
 COUNTY: Scott County
 REF. POINT:
 DATE: 6/26/2019

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: HS ACCESS (NORTHBOUND)	1
30	Minor App4: MS ACCESS (SOUTHBOUND)	1

0.70 FACTOR USED? No
 POPULATION < 10,000? No
 EXISTING SIGNAL ? No

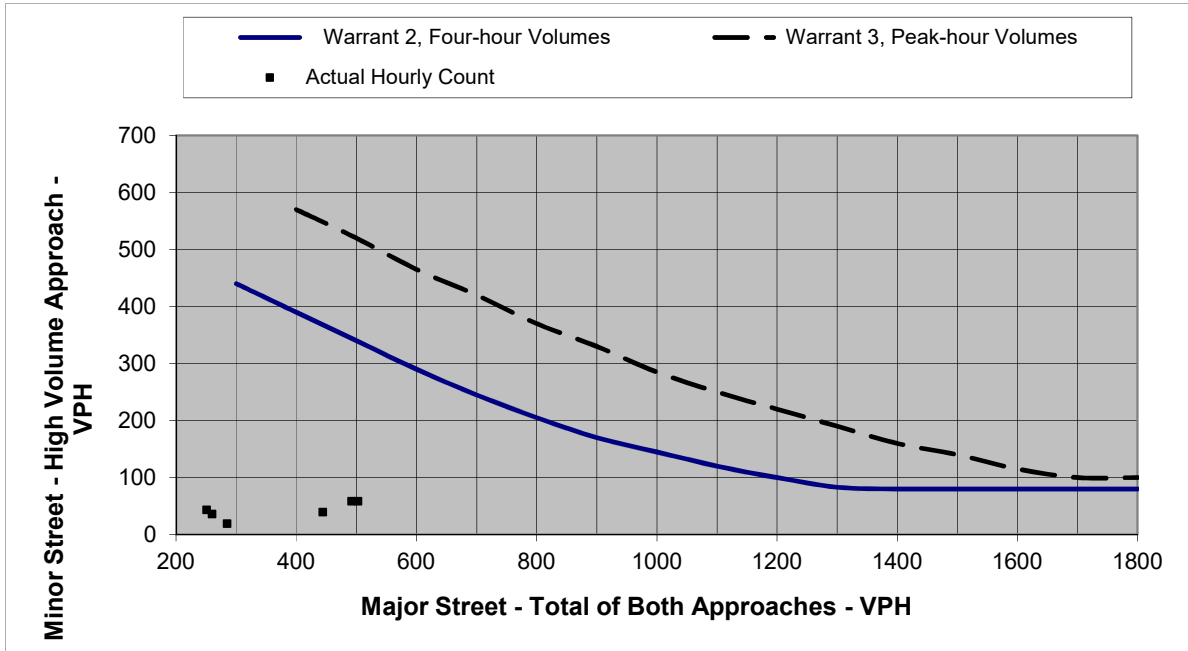


Figure 1. Four Hour and Peak Hour Warrant Analysis

Note: For data points outside the graph range, check the minor street volume against the lower thresholds

Major	Warrant Criteria		Actual Hourly Count	
	Warrant 2, F	Warrant 3, Pe	Major	Actual Hourly Count
200			0	0
300	440		0	0
400	390	570	0	0
500	340	520	0	0
600	290	465	0	0
700	245	420	0	0
800	205	370	186	12
900	170	330	492	58
1000	145	285	444	39
1100	120	250	76	12
1200	100	220	129	8
1300	83	190	108	35
1400	80	160	133	16
1500	80	140	163	20
1600	80	115	285	19
1700	80	100	503	58
1800	80	100	260	36
			251	43
			195	31
			0	0
			0	0
			0	0
			0	0
			0	0
			0	0

**ALL WAY STOP WARRANT ANALYSIS
FOR
Sunset Dr and Middle/High School Access**

LOCATION: Jordan
COUNTY: Scott County

REF. POINT:

DATE: 6/26/2019

OPERATOR: CW

Speed	Approach Description	Lanes
30	Major App1: SUNSET DR (WESTBOUND)	2
30	Major App3: SUNSET DR (EASTBOUND)	1
30	Minor App2: HS ACCESS (NORTHBOUND)	1
30	Minor App4: MS ACCESS (SOUTHBOUND)	1

0.70 FACTOR USED? No

HOUR					300	200	WARRANT MET
	MAJOR APP. 1	MAJOR APP. 3	MINOR APP. 2	MINOR APP. 4	MAJOR TOTAL Σ (APP. 1 & APP. 3)	MINOR TOTAL APP. 2 + APP. 4	
0:00 - 1:00	0	0	0	0	0	0	/
1:00 - 2:00	0	0	0	0	0	0	/
2:00 - 3:00	0	0	0	0	0	0	/
3:00 - 4:00	0	0	0	0	0	0	/
4:00 - 5:00	0	0	0	0	0	0	/
5:00 - 6:00	0	0	0	0	0	0	/
6:00 - 7:00	81	105	12	0	186	12	/
7:00 - 8:00	240	252	58	4	492	62	X/
8:00 - 9:00	247	197	39	2	444	41	X/
9:00 - 10:00	37	39	12	0	76	12	/
10:00 - 11:00	69	60	8	0	129	8	/
11:00 - 12:00	66	42	35	1	108	36	/
12:00 - 13:00	90	43	16	0	133	16	/
13:00 - 14:00	106	57	20	1	163	21	/
14:00 - 15:00	150	135	19	1	285	20	/
15:00 - 16:00	272	231	58	3	503	61	X/
16:00 - 17:00	91	169	36	2	260	38	/
17:00 - 18:00	133	118	43	2	251	45	/
18:00 - 19:00	110	85	31	1	195	32	/
19:00 - 20:00	0	0	0	0	0	0	/
20:00 - 21:00	0	0	0	0	0	0	/
21:00 - 22:00	0	0	0	0	0	0	/
22:00 - 23:00	0	0	0	0	0	0	/
23:00 - 24:00	0	0	0	0	0	0	/

Allway Stop Warrant: Met (Hr) Required (Hr) Not satisfied
 0 8

REMARKS: _____

