Traffic Impact Study
Proposed Goddard School

Arlington Heights, Illinois

Prepared For:

THE GODDARD SCHOOL℠
FOR EARLY CHILDHOOD DEVELOPMENT

LICENSED PROFESSIONAL ENGINEER
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January 31, 2019

1. Introduction

This report summarizes the methodologies, results, and findings of a traffic impact study conducted by Kenig, Lindgren, O'Hara, Aboona, Inc. (KLOA, Inc.) for the proposed Goddard School to be located in Arlington Heights, Illinois. The site, which currently contains a vacant building, is located on the west side of Arlington Heights Road approximately 400 feet north of its intersection with Olive Street. As proposed, the plans call for a 13,500 square-foot daycare facility accommodating up to 165 children and up to 24 employees. The proposed school will be open Monday through Friday between 7:00 A.M. and 6:00 P.M. and will provide off-street parking for approximately 40 vehicles. Access to the proposed school will be provided via a full-movement access drive and via a right-out only access drive on Arlington Heights Road.

The purpose of this study was to examine background traffic conditions, assess the impact that the proposed Goddard School will have on traffic conditions in the area, and determine if any roadway or access improvements are necessary to accommodate the traffic generated by the proposed school. **Figure 1** shows the location of the site in relation to the area roadway system. **Figure 2** shows an aerial view of the site.

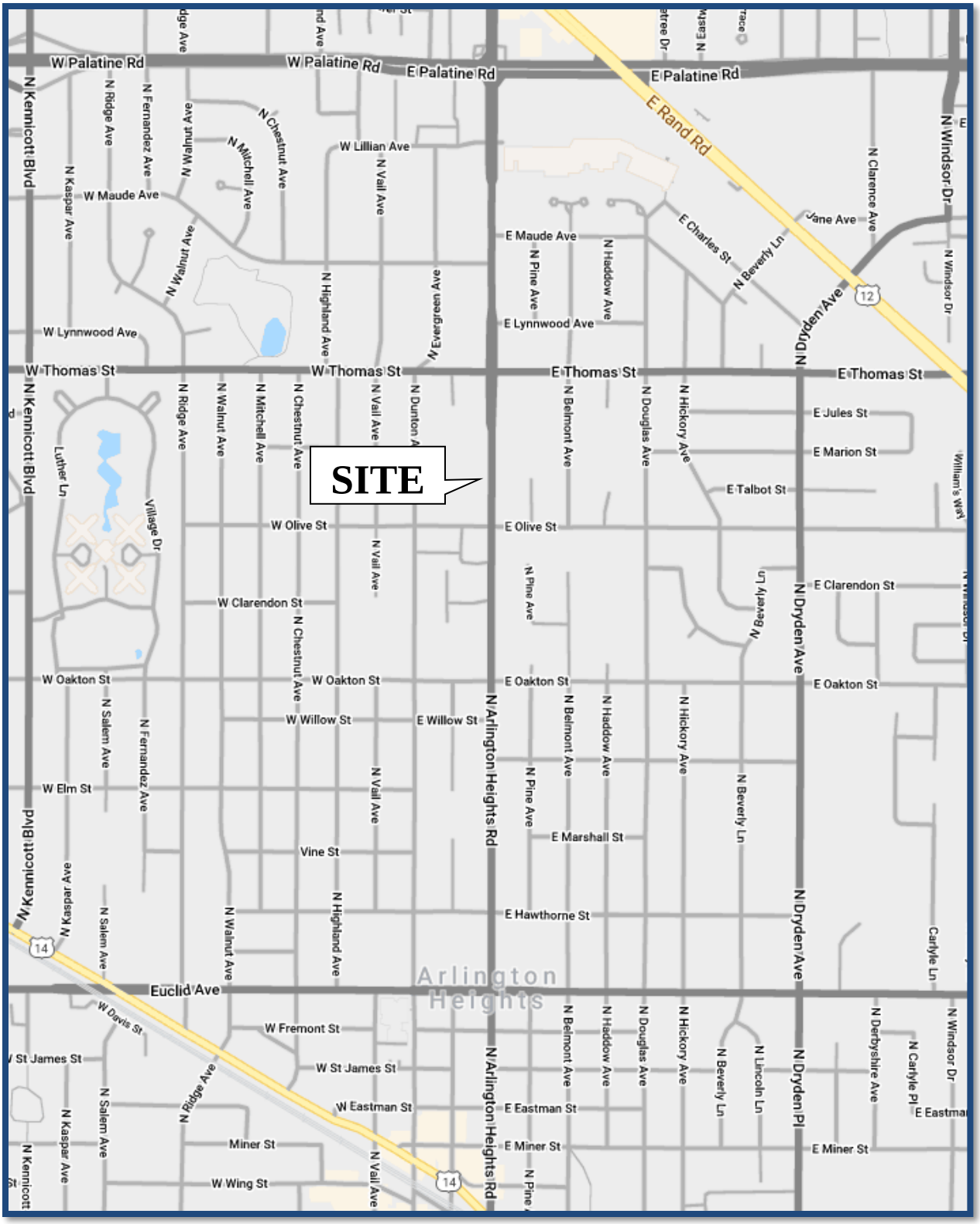
The sections of this report present the following:

- Existing roadway conditions
- A description of the proposed school
- Directional distribution of the school traffic
- Vehicle trip generation for the school
- Future traffic conditions including access to the school
- Traffic analyses for the weekday morning and evening peak hours
- Recommendations with respect to adequacy of the site access and adjacent roadway system

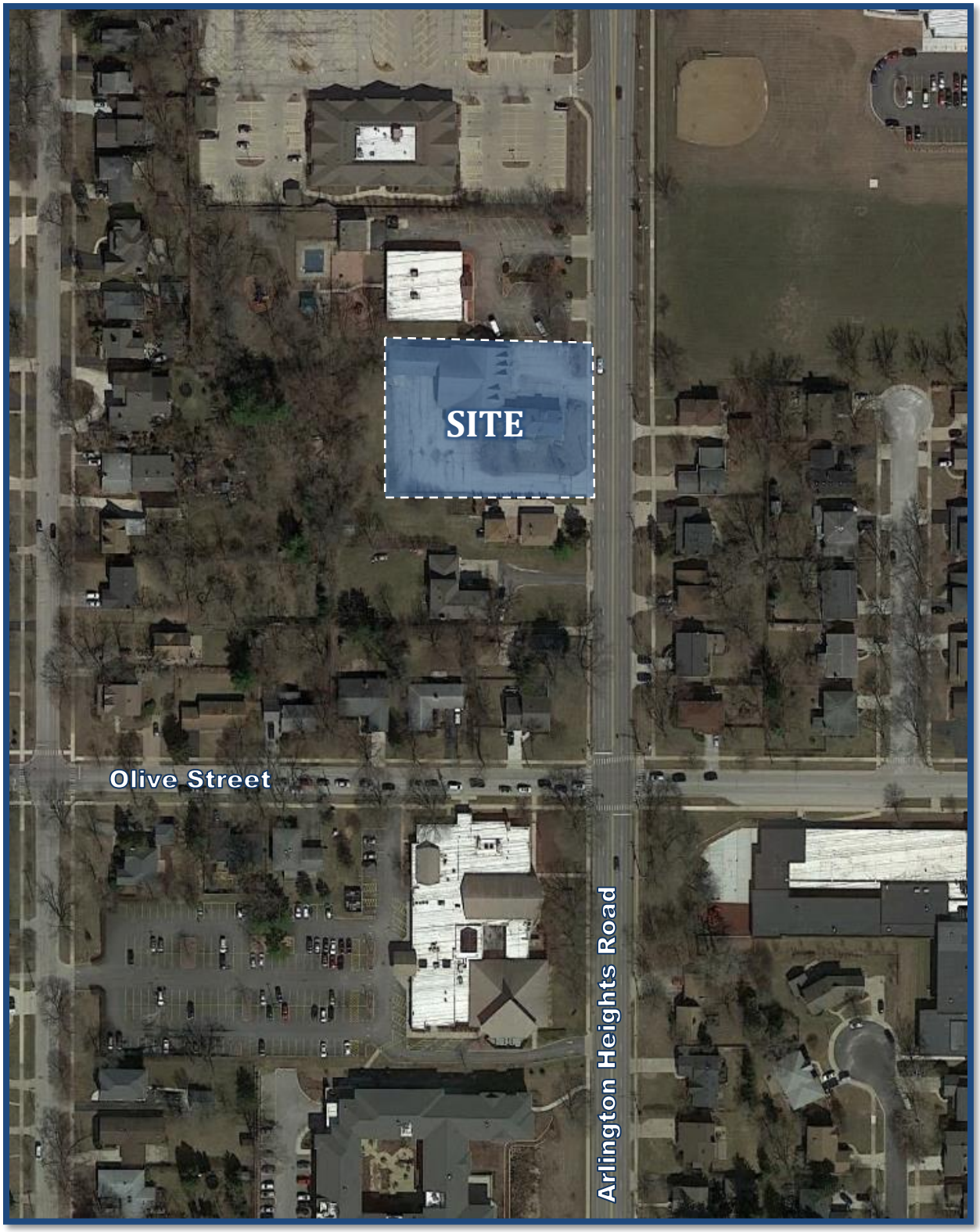
Traffic capacity analyses were conducted for the weekday morning and evening peak hours for the following conditions:

1. Existing Conditions - Analyzes the capacity of the existing roadway system using existing peak hour traffic volumes in the surrounding area.

2. Projected Conditions – Analyzes the capacity of the future roadway system using the projected traffic volumes that include the existing traffic volumes, ambient area growth not attributable to any particular development, and the traffic estimated to be generated by the full buildout of the proposed school.



Site Location **Figure 1**



Aerial View of Site **Figure 2**

2. Existing Conditions

Existing transportation conditions in the vicinity of the site were documented based on field visits conducted by KLOA, Inc. in order to obtain a database for projecting future conditions. The following provides a description of the geographical location of the site, physical characteristics of the area roadway system including lane usage and traffic control devices, and existing peak hour traffic volumes.

Site Location

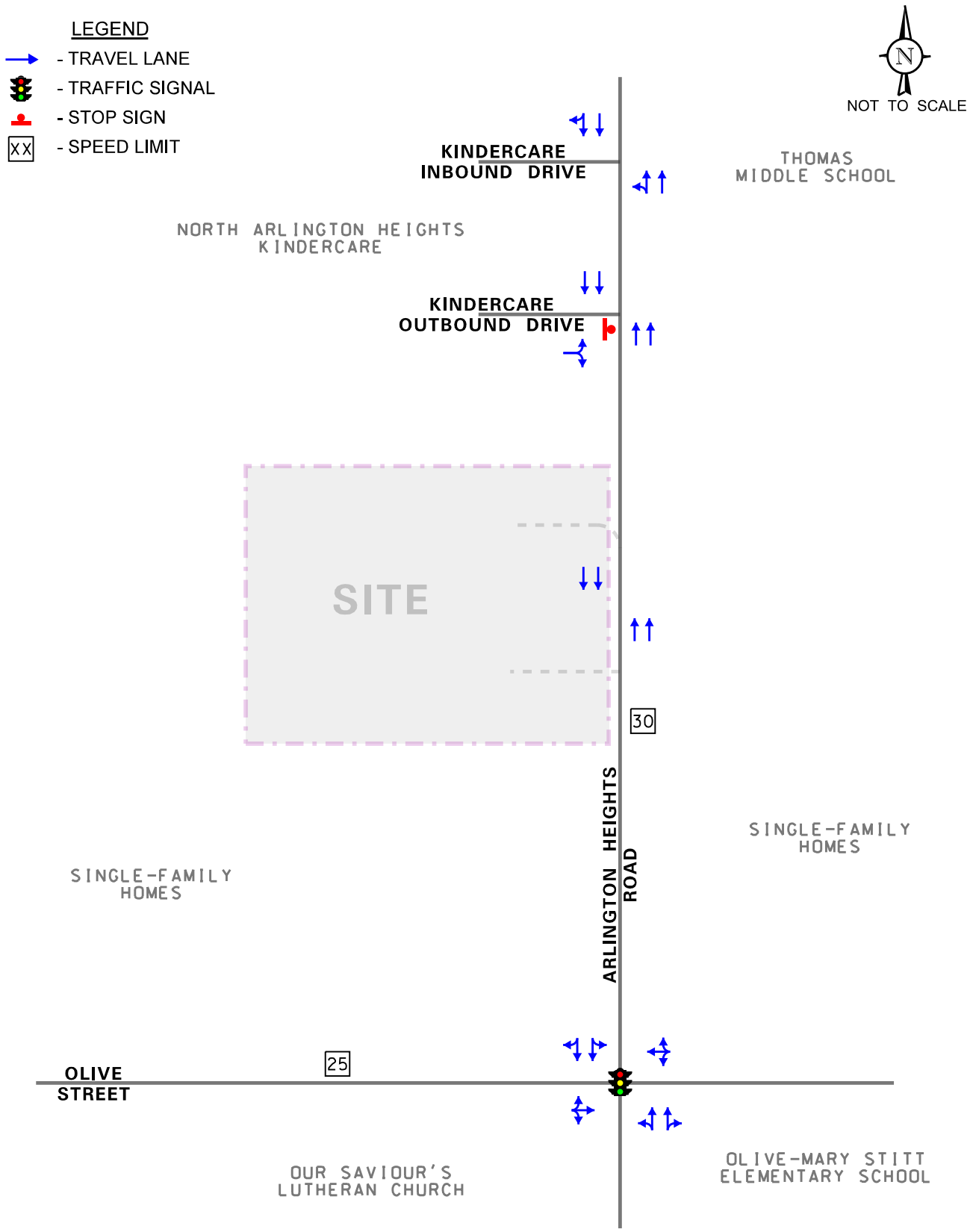
The site is located on the west side of Arlington Heights Road approximately 400 feet north of its intersection with Olive Street. The site is bounded by the North Arlington Heights KinderCare to the north, Arlington Heights Road to the east, and single-family homes to the south and west. Land uses in the vicinity of the site are primarily residential and also include Norwest Community Healthcare, Thomas Middle School, Olive-Mary Stitt Elementary School, St. Peter Lutheran School and Church, Our Saviour's Lutheran Church, and The Orchard Evangelical Free Church.

Existing Roadway System Characteristics

The characteristics of the existing roadways near the school are described below and illustrated in **Figure 3**.

Arlington Heights Road is a north-south, minor arterial roadway that provides two lanes in each direction. At its signalized intersection with Olive Street, Arlington Heights Road provides a combined left-turn/through lane and a combined through/right-turn lane on both approaches. At its unsignalized intersection with the KinderCare access drives, Arlington Heights Road provides two lanes in each direction. Arlington Heights Road is under the jurisdiction of the Illinois Department of Transportation (IDOT), has a posted speed limit of 30 mph, is not designated as a Strategic Regional Arterial (SRA), and carries an Average Daily Traffic (ADT) volume of 22,000 (IDOT 2014) vehicles.

Olive Street is an east-west local road that provides one lane in each direction. At its signalized intersection with Arlington Heights Road, Olive Street provides one lane on both approaches. Olive Street has a posted speed limit of 25 mph and is under the jurisdiction of the Village of Arlington Heights.



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Existing Roadway Characteristics

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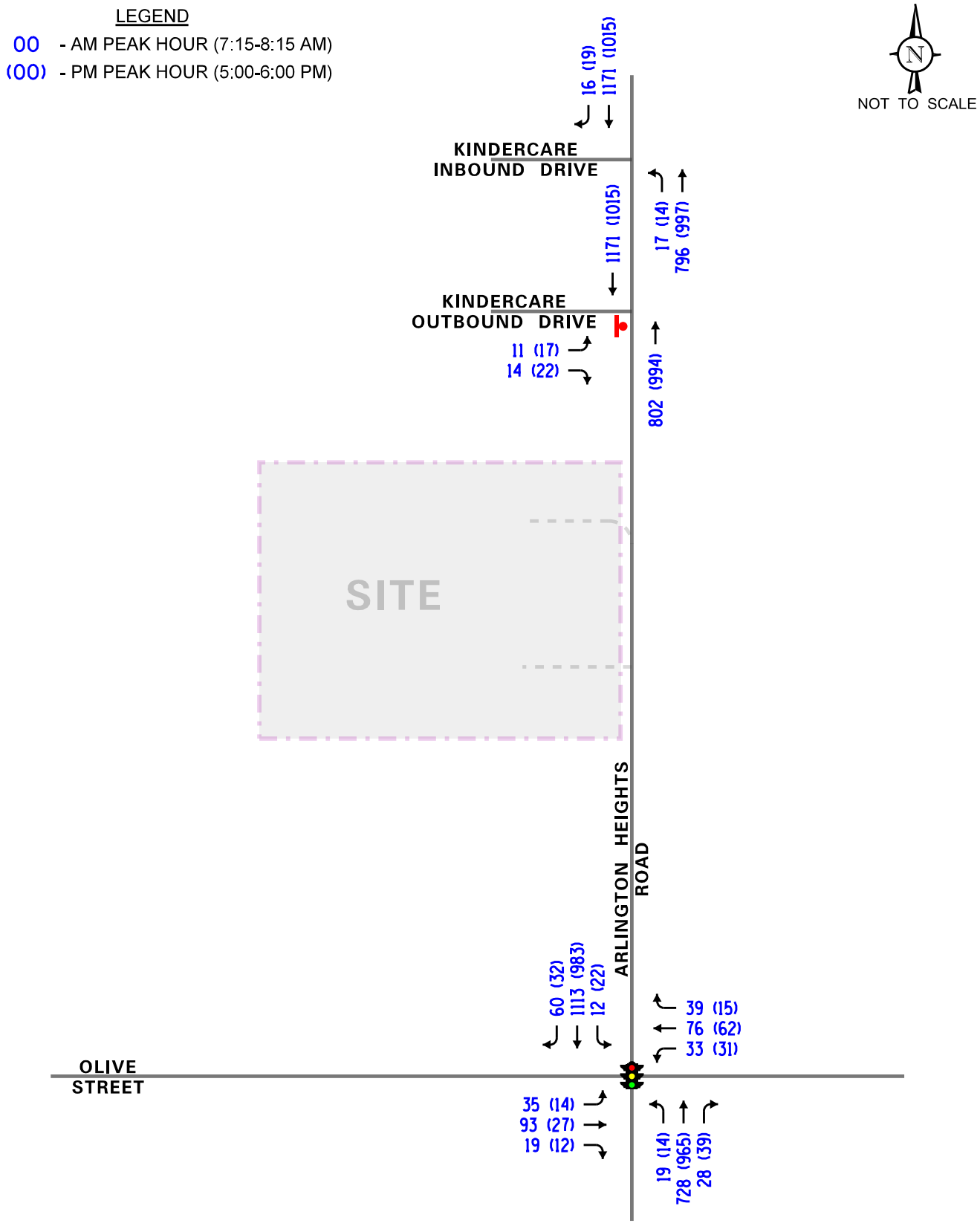
Job No: 18-142 Figure: 3

Existing Traffic Volumes

In order to determine current traffic conditions in the vicinity of the site, KLOA, Inc. conducted peak period traffic counts using Miovision Scout Collection Units during the weekday morning (7:00 A.M. to 9:00 A.M.) and weekday evening (4:00 P.M. to 6:00 P.M.) peak periods at the intersections of Arlington Heights Road with Olive Street and the KinderCare access drives. The counts were conducted on Thursday, July 12, 2018. In order to determine the impact of the schools on the traffic, the intersection of Olive Street with Arlington Heights Road was recounted on Tuesday September 4, 2018 during the weekday morning (7:00 A.M. to 9:00 A.M.) and weekday school and evening (2:30 P.M. to 6:00 P.M.) peak periods when schools were in session. A review of the traffic volumes indicated that while through traffic on Arlington Heights Road was generally consistent, the overall traffic at the intersection of Arlington Heights Road with Olive Street was generally higher during the September counts. As such, the counts conducted during September were used to provide a conservative analysis and through traffic on Arlington Heights at its intersection with the KinderCare access drives was balanced accordingly.

The results of the traffic counts showed that the weekday morning peak hour of traffic occurs from 7:15 A.M. to 8:15 A.M. and the evening peak hour of traffic occurs from 5:00 P.M. to 6:00 P.M. **Figure 4** illustrates the existing peak hour traffic volumes for both peak periods that the counts were performed. The peak hour factor utilized at the area intersections was based on the 15-minute volumes collected during the peak period traffic counts. Copies of the traffic count summary sheets including the 15-minute volumes and the existing peak hour factor are included in the Appendix.



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Existing Traffic Volumes

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Crash Analysis

KLOA, Inc. obtained accident data for the most recent available past five years (2012 to 2016) for the intersections of Arlington Heights Road with Olive Street. A review of the accident data revealed there were no fatalities were reported at any intersection during the reviewed period. **Table 1** shows a summary of the accident data.[1]

Table 1
ARLINGTON HEIGHTS ROAD WITH OLIVE STREET - ACCIDENT SUMMARY

	Type of Accident Frequency						
Year	**Angle**	**Object**	**Rear End**	**Sideswipe**	**Turning**	**Other**	**Total**
2011	1	0	2	0	0	1	4
2012	0	1	1	0	0	0	2
2013	2	0	3	0	2	0	7
2014	0	0	1	0	3	0	4
2015	0	0	2	1	2	0	5
Total	**3**	**1**	**9**	**1**	**7**	**1**	**22**
Average/Year	**<1.0**	**<1.0**	**1.8**	**<1.0**	**1.6**	**<1.0**	**4.4**

[1] **DISCLAIMER: The motor vehicle crash data referenced herein was provided by the Illinois Department of Transportation. The author is responsible for any data analyses and conclusions drawn.**

Area Traffic Observations

Traffic flow in the area was observed during the peak hours, particularly the southbound queues on Arlington Heights Road at its signalized intersection with Olive Street. The observations indicated that the southbound queues did not extend past the locations of the proposed access drives during the weekday morning and evening peak hours and that traffic generally cleared the intersection every cycle.

Gap Study

A gap study was performed on Arlington Heights Road at the location of the proposed full access drive during the weekday morning and evening peak hours in order to determine the availability of gaps or interruptions in the Arlington Heights Road traffic stream. The study examined gaps in the southbound direction along Arlington Heights Road, which would allow vehicles to turn left from Arlington Heights Road into the site and right from the school onto Arlington Heights Road, as well as gaps in both directions that would allow vehicles to turn left from the school onto Arlington Heights Road.

According to the *Highway Capacity Manual* published by the Transportation Research Board (TRB) of the National Academies, the critical gap is defined as the minimum time interval in the major-street traffic stream that allows intersection entry for one minor-street vehicle and the follow-up time is defined as the time between departure of one vehicle from the minor street and the departure of the next vehicle using the same major-street gap. Based on the above criteria, the following is a summary of the critical gaps and follow up times required for vehicles to perform various maneuvers to and from the access drive and Arlington Heights Road:

- Left Turn from Minor Street
    - Critical gap: 7.5 seconds
    - Follow-up time: 3.5 seconds

- Left Turn from Major Street
    - Critical gap: 4.1 seconds
    - Follow-up time: 2.2 seconds

- Right Turn from Minor Street
    - Critical gap: 6.9 seconds
    - Follow-up time: 3.3 seconds

The results of the gap study, showing the total number of potential movements based on gaps available for the peak hours, are summarized in **Table 2**. A summary of the gaps observed during the peak hours is included in the Appendix.

Table 2
GAP STUDY SUMMARY – ARLINGTON HEIGHTS ROAD

Movement	Weekday Morning Peak Hour Available Gaps	Weekday Evening Peak Hour Available Gaps
Left Turn from Arlington Heights Road	793	672
Left Turn from Proposed Access Drive	171	116
Right Turn from Proposed Access Drive	413	332

3. Traffic Characteristics of the Proposed School

In order to properly evaluate future traffic conditions in the surrounding area, it was necessary to determine the traffic characteristics of the proposed school, including the directional distribution and volumes of traffic that it will generate.

Proposed School Plan

The site, as previously mentioned, is occupied by a vacant building with two full ingress/egress access drives off Arlington Heights Road. As proposed, the plans call for developing the site with a 13,500 square-foot Goddard School daycare facility. The school will be open Monday through Friday between 7:00 A.M. and 6:00 P.M. and provide both full-day and half-day daycare services. The school will have up to 24 employees and a maximum enrollment of 165 children that will attend one to five days per week. An outdoor play area is proposed to occupy the area on the east and west sides of the building. A copy of the preliminary site plan is included in the Appendix.

Site Access

The site currently provides two full ingress/egress access drives off Arlington Heights Road. Under the proposed plan, the existing northern access drive will be restricted to outbound right-turn movements only and will primarily serve the parking on the eastern half of the site. The access drive will be designed to physically restrict the exiting movements to right turns only. "Do Not Enter" signs facing Arlington Heights Road should also be posted to enforce the one-way design. The southern access drive will be located at the location of the existing access drive and will primarily serve the drop-off/pick-up circle and the parking on the western half of the site. This access drive should provide one inbound lane and one outbound lane. The outbound movements at both access drives will be under stop sign control. It should be noted that the restriction of the northern access drive will reduce the number of conflict points within close proximity and will improve the traffic flow along Arlington Heights Road. Further, the outbound-only restriction of the access drive will minimize conflicts internally and, as such, will not impact internal circulation.

Drop-Off/Pick-Up Operations and Parking

All drop-off/pick-up of children will occur on the south side of the building in the proposed drop-off/pick-up loop. Given their young age, parents will be required to park in the provided spaces on the interior of the pick-up/drop-off loop and escort their children in and out of the facility. Additional pick-up/drop-off activity can occur in the parking spaces along the west border of the site if necessary. Typical morning drop-off is from 7:00 A.M. to 9:00 A.M. and typical evening pick-up is from 3:30 P.M. to 5:30 P.M. with arrivals and pickup staggered throughout the two-hour period.

Directional Distribution

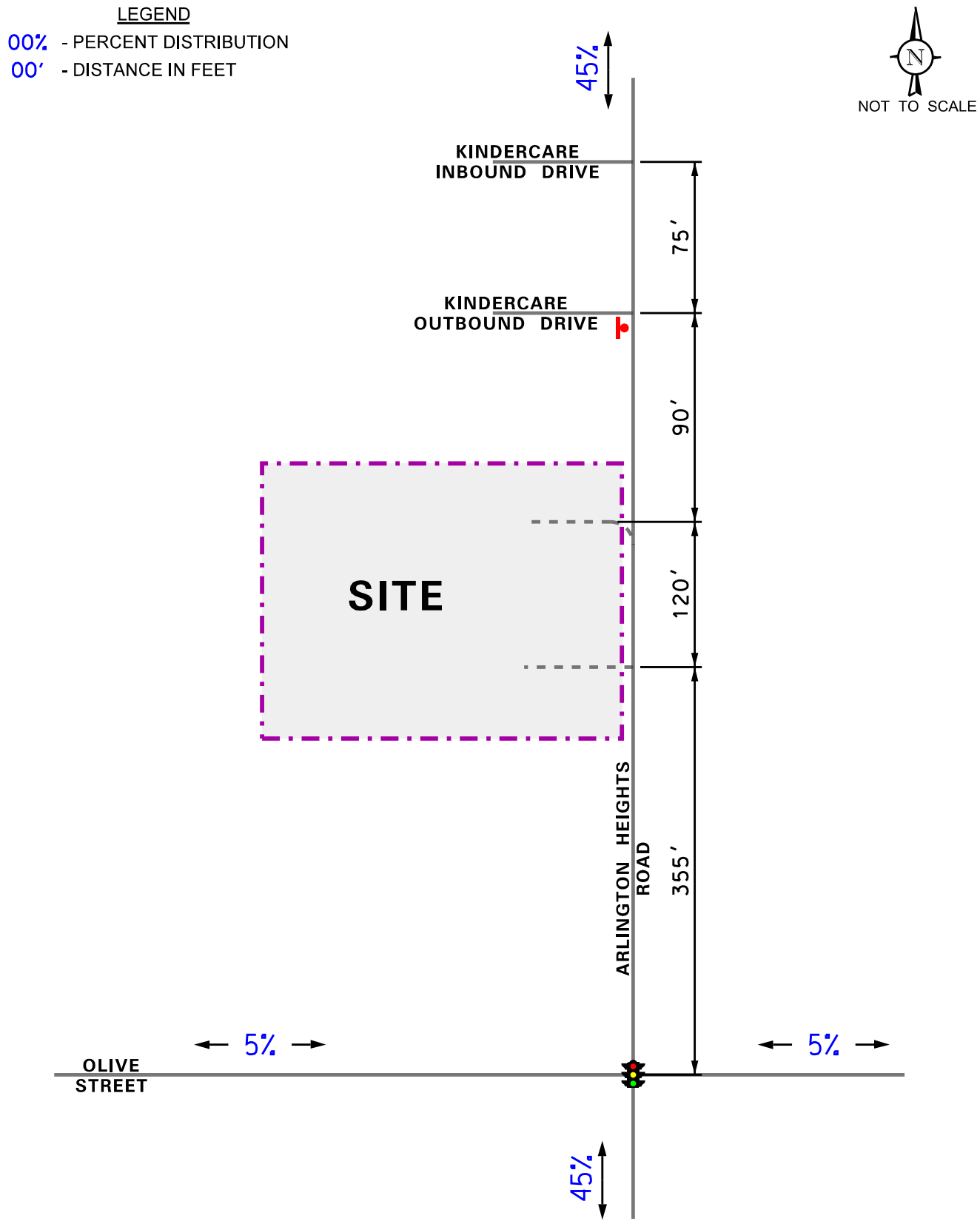
The directions from which employees and parents will approach and depart the site were estimated based on existing travel patterns, as determined from the traffic counts. **Figure 5** illustrates the directional distribution of the school-generated traffic.

Peak Hour Traffic Volumes

The volume of traffic generated by a development is based on the type of land uses and the size of the development. The number of peak hour vehicle trips estimated to be generated by the proposed development of a 165-student daycare was based on vehicle trip generation rates contained in *Trip Generation Manual*, 10th Edition, published by the Institute of Transportation Engineers (ITE). **Table 3** shows the site-generated traffic volumes for the proposed school. A copy of ITE's trip generation sheets are included in the Appendix.

Table 3
PROJECTED SITE-GENERATED TRAFFIC VOLUMES

ITE Land-Use Code	Type/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour		
		In	Out	Total	In	Out	Total
565	Daycare (165 Students)	70	71	141	63	71	134



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Estimated Directional Distribution

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4. Projected Traffic Conditions

The total projected traffic volumes include the existing traffic volumes, increase in background traffic due to growth, and the traffic estimated to be generated by the proposed subject school.

School Traffic Assignment

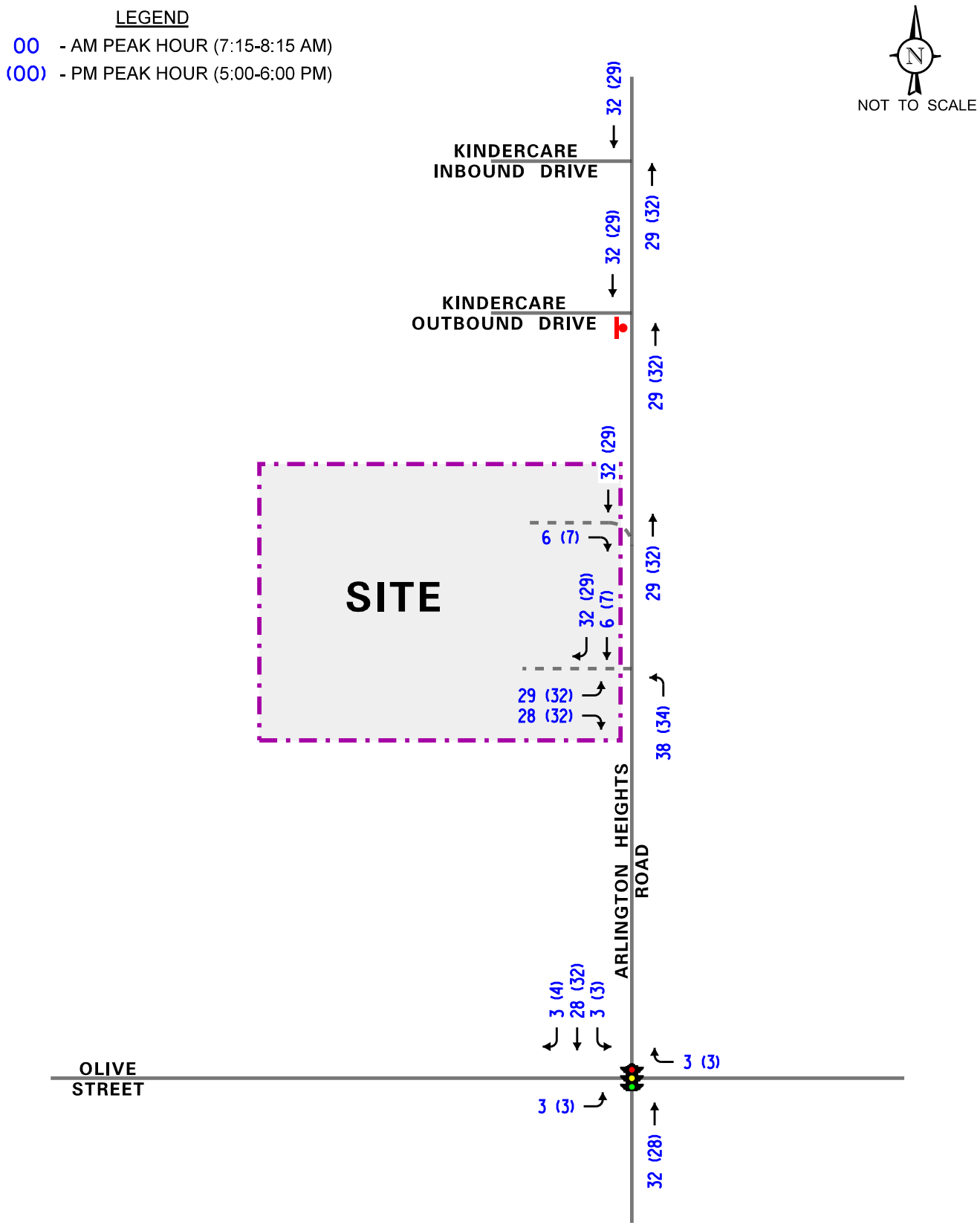
The estimated weekday morning and evening peak hour traffic volumes that will be generated by the proposed school were assigned to the roadway system in accordance with the previously described directional distribution (Figure 5). The traffic assignment for the school is illustrated in **Figure 6**.

Background Traffic Conditions

The existing traffic volumes (Figure 4) were increased by a regional growth factor to account for the increase in existing traffic related to regional growth in the area (i.e., not attributable to any particular planned development). Based on ADT projections provided by the Chicago Metropolitan Agency for Planning (CMAP) in a letter dated August 21, 2018, the existing traffic volumes are projected to increase by 0.8 percent per year. As such, traffic volumes were increased 4.8 percent (one-year buildout plus five years) to represent Year 2024 conditions. A copy of the CMAP projections letter is included in the Appendix.

Total Projected Traffic Volumes

The school-generated traffic was added to the existing traffic volumes accounting for background growth to determine the Year 2024 total projected traffic volumes, as shown in **Figure 7**.



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Estimated Site-Generated
Traffic Volumes

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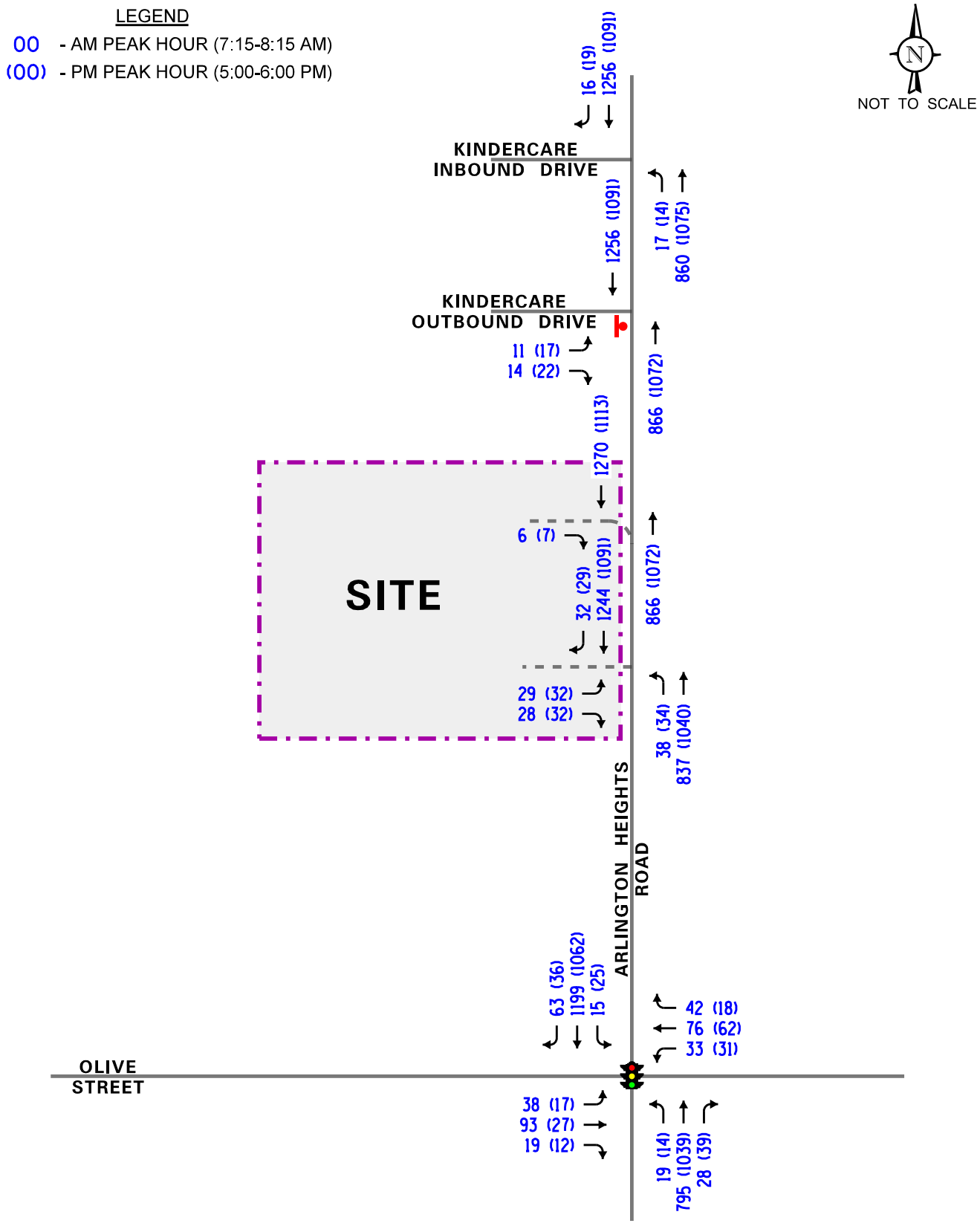

Proposed
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Total Projected Traffic Volumes

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Job No: 18-142 Figure: 7

5. Traffic Analysis and Recommendations

The following provides an evaluation conducted for the weekday morning and weekday evening peak hours. The analysis includes conducting capacity analyses to determine how well the roadway system and access drives are projected to operate and whether any roadway improvements or modifications are required.

Traffic Analyses

Roadway and adjacent or nearby intersection analyses were performed for the weekday morning and evening peak hours for the existing (Year 2018) as well as future projected (Year 2024) traffic volumes.

The traffic analyses were performed using the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM),* 6th Edition and analyzed using the Synchro/SimTraffic 10 software.

The analyses for the unsignalized intersections determine the average control delay to vehicles at an intersection. Control delay is the elapsed time from a vehicle joining the queue at a stop sign (includes the time required to decelerate to a stop) until its departure from the stop sign and resumption of free flow speed. The methodology analyzes each intersection approach controlled by a stop sign and considers traffic volumes on all approaches and lane characteristics.

The ability of an intersection to accommodate traffic flow is expressed in terms of level of service, which is assigned a letter from A to F based on the average control delay experienced by vehicles passing through the intersection. The *Highway Capacity Manual* definitions for levels of service and the corresponding control delay for signalized intersections and unsignalized intersections are included in the Appendix of this report.

Summaries of the traffic analysis results showing the level of service and overall intersection delay (measured in seconds) for the existing and Year 2024 total projected conditions are presented in **Tables 4** through **6**. A discussion of the intersections follows. Summary sheets for the capacity analyses are included in the Appendix.

Table 4
CAPACITY ANALYSIS RESULTS – ARLINGTON HEIGHTS ROAD WITH OLIVE STREET SIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Existing Conditions				
• Overall	B	16.0	A	9.4
• Eastbound Approach	E	69.3	E	56.4
• Westbound Approach	E	73.8	E	69.8
• Northbound Approach	A	6.6	A	4.9
• Southbound Approach	A	8.4	A	5.0
Projected Conditions				
• Overall	B	16.3	A	9.6
• Eastbound Approach	E	70.7	E	57.1
• Westbound Approach	E	73.2	E	70.0
• Northbound Approach	A	7.0	A	5.2
• Southbound Approach	A	9.2	A	5.4

LOS = Level of Service
Delay is measured in seconds.

Table 5
CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS - UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Arlington Heights Road with KinderCare Outbound Access Drive				
• Eastbound Left Turn	F	57.1	E	47.1
• Eastbound Right Turn	B	13.9	B	12.6

LOS = Level of Service
Delay is measured in seconds.

Table 6
CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS - UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Arlington Heights Road with Full Access Drive				
• Eastbound Approach	F	84.5	F	76.9
• Northbound Left Turn	B	12.5	B	11.4
Arlington Heights Road with Right-Out Access Drive				
• Eastbound Approach	B	14.0	B	13.0
Arlington Heights Road with KinderCare Outbound Access Drive				
• Northbound Left Turn	B	14.6	B	13.0
• Eastbound Approach	F	70.2	F	58.2

LOS = Level of Service
Delay is measured in seconds.

Discussion and Recommendations

The following summarizes how the intersections are projected to operate and identifies any roadway and traffic control improvements necessary to accommodate the school-generated traffic.

Arlington Heights Road with Olive Street

The results of the capacity analyses indicate that the intersection currently operates at a Level of Service (LOS) B during the weekday morning peak hour and LOS A during the weekday evening peak hour. Under future conditions, the intersection is projected to operate at the same LOS with an increase in delay of less than one second. Further, through movements on Arlington Heights Road will continue to operate at LOS A. The 95th percentile queues for the southbound approach are projected to be less than 230 feet and will not extend to the proposed full access drive. As such, the intersection has sufficient reserve capacity to accommodate site-generated traffic and no improvements are necessary at this intersection in conjunction with the proposed school.

Arlington Heights Road with the KinderCare Access Drives

The results of the capacity analyses indicate that under future conditions, all movements will continue to operate at a similar LOS to current conditions during the morning and evening peak hours with minimal increases in delay. As such, the proposed school will have a minimal impact on the intersections.

Arlington Heights Road with the School Access Drives

The northern access drive will be restricted to right-out only traffic and will primarily serve the parking spaces on the eastern half of the site. The results of the capacity analyses indicate that under future conditions, the eastbound approach will operate at LOS B during the morning and evening peak hours.

The southern access drive will provide one inbound lane and one outbound lane with outbound movements under stop sign control. The results of the capacity analyses indicate that under future conditions, the eastbound approach will operate at LOS F during the morning and evening peak hours. However, this is typical and expected at unsignalized intersections where a minor road intersects an arterial such as Arlington Heights Road. Further, the results of the capacity analysis do not take into account the gaps created by the traffic signals to the north and south of the intersection which, as the next section shows, provide more than adequate gaps to accommodate the projected movements. In addition, the results also show that the northbound left turns will operate at LOS B or better. As such, the proposed access drive can adequately accommodate school-generated traffic.

Gap Study Evaluation

Table 6 shows the total number of potential movements compared to the number of required gaps that are needed to accommodate the projected traffic turning to and from the proposed access drive. As shown in Table 6, there are more than sufficient gaps in the Arlington Heights Road traffic stream to accommodate the southbound left turns into the school, the westbound right turns onto Arlington Heights Road from the school and the right-in/right-out access, and westbound left turns onto Arlington Heights Road from the school for the weekday morning and evening peak hours of adjacent roadway traffic. These results indicate that these movements will be completed without significant delays and further confirm the results of the capacity analysis and simulation runs.

Table 6
REQUIRED GAPS – ARLINGTON HEIGHTS ROAD

Time Periods	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
Movement	Potential Movements	Required Gaps	Potential Movements	Required Gaps
Left Turn from Arlington Heights Road	793	38	672	34
Left Turn from Proposed Access Drive	171	29	116	32
Right Turn from Proposed Access Drive	413	34	332	39

On-Site Circulation Evaluation

All pick-up and drop-off of students will occur within the pick-up/drop-off loop on the south side of the site. Parents or guardians will enter the turn-around area from the east and travel along the south side of the site, stopping to park in one of the 12 spaces provided on the interior of the turn-around area or in one of the 10 spaces along the west side of the site. Students will then be escorted inside and the parent or guardian will return to their vehicle. Vehicles will then proceed in the same direction of travel, completing the circle and continuing east to the access drive's intersection with Arlington Heights Road. The circular flow of traffic will minimize conflicts between entering and exiting vehicles during peak pick-up/drop-off periods.

Parking Analysis

As proposed, the school will provide 40 off-street parking spaces. Based on the Village of Arlington Heights off-street parking requirements, the proposed school should provide parking at a ratio of three spaces for every two employees, which translates into a parking requirement of 36 spaces. KLOA, Inc. also reviewed ITE's *Parking Generation Manual*, 4th Edition to calculate the peak parking demand for the weekday conditions. Based on the ITE rates, the proposed school should provide parking at a ratio of 1.38 spaces per employee, translating into a parking requirement of 34 spaces. Therefore, the proposed 40 parking spaces will be sufficient to accommodate the peak parking demand.

6. Conclusion

Based on the preceding analyses and recommendations, the following conclusions have been made:

- The proposed school, given its size and type, will generated a limited amount of traffic during the peak hours.
- The results of the capacity analysis indicate that the roadway system has adequate reserve capacity to accommodate the increase in traffic.
- Southbound queues on Arlington Heights Road at its intersection with Olive Street will not extend to the locations of the proposed access drives.
- The proposed access system, with one full-movement access drive and one right-out only access drive, will be an improvement over existing conditions and will be adequate in accommodating the site-generated traffic.
- The results of the gap study indicate that adequate gaps exist in the Arlington Heights Road traffic stream to accommodate the projected site traffic.
- The proposed internal pick-up/drop-off turn-around area will allow for efficient on-site circulation during peak pick-up/drop-off periods.
- The proposed 40 parking spaces will be able to sufficiently accommodate the peak parking demand.

Appendix

Traffic Count Summary Sheets
Gap Study Observations
Preliminary Site Plan
ITE Trip Generation Sheets
CMAP Projections Letter
Level of Service Criteria
Capacity Analysis Summary Sheets

Traffic Count Summary Sheets

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Count Name: Arlington Heights Road and Olive Street
Site Code:
Start Date: 09/04/2018

Turning Movement Data

Start Time	Olive Street Eastbound						Olive Street Westbound						Arlington Heights Road Northbound						Arlington Heights Road Southbound						Int. Total
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	
7:00 AM	0	1	10	4	0	15	0	17	10	6	2	33	0	2	132	3	0	137	0	4	214	3	0	221	406
7:15 AM	0	4	12	2	1	18	0	7	7	12	0	26	0	5	180	7	4	192	0	1	265	14	1	280	516
7:30 AM	0	11	25	9	0	45	0	13	36	18	0	67	0	3	178	7	6	188	0	4	275	7	2	286	586
7:45 AM	0	12	33	4	0	49	0	10	17	6	0	33	0	8	202	10	1	220	0	4	312	26	0	342	644
Hourly Total	0	28	80	19	1	127	0	47	70	42	2	159	0	18	692	27	11	737	0	13	1066	50	3	1129	2152
8:00 AM	0	8	23	4	1	35	0	3	16	3	1	22	0	3	168	4	0	175	0	3	261	13	0	277	509
8:15 AM	0	10	13	7	0	30	0	7	5	5	0	17	0	1	166	4	0	171	0	2	289	5	1	296	514
8:30 AM	0	2	9	3	2	14	0	4	2	3	0	9	0	2	196	9	16	207	0	4	213	6	0	223	453
8:45 AM	0	3	21	0	1	24	0	4	5	3	0	12	0	4	170	24	76	198	0	3	247	4	0	254	488
Hourly Total	0	23	66	14	4	103	0	18	28	14	1	60	0	10	700	41	92	751	0	12	1010	28	1	1050	1964
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2:30 PM	0	24	9	6	0	39	0	4	7	4	0	15	0	2	171	7	0	180	0	1	184	8	1	193	427
2:45 PM	0	10	6	2	1	18	0	7	28	15	0	50	0	2	179	3	4	184	0	2	182	7	2	191	443
Hourly Total	0	34	15	8	1	57	0	11	35	19	0	65	0	4	350	10	4	364	0	3	366	15	3	384	870
3:00 PM	0	16	2	1	0	19	0	1	12	6	0	19	0	4	205	6	0	215	0	3	216	6	1	225	478
3:15 PM	0	11	22	2	2	35	0	3	8	1	0	12	0	3	194	13	12	210	0	10	204	11	0	225	482
3:30 PM	0	8	10	2	3	20	0	6	8	3	1	17	0	3	249	14	78	266	0	4	240	14	4	258	561
3:45 PM	0	1	8	2	0	11	0	11	18	11	0	40	0	0	238	3	7	241	0	5	219	8	0	232	524
Hourly Total	0	36	42	7	5	85	0	21	46	21	1	88	0	10	886	36	97	932	0	22	879	39	5	940	2045
4:00 PM	0	8	10	2	0	20	0	9	17	4	0	30	0	3	222	7	2	232	0	4	212	4	0	220	502
4:15 PM	0	4	6	3	0	13	0	10	25	8	0	43	0	8	230	8	2	246	0	5	236	12	0	253	555
4:30 PM	0	5	21	2	0	28	0	4	15	4	0	23	0	2	235	12	10	249	0	3	233	3	0	239	539
4:45 PM	0	2	7	1	0	10	0	4	15	7	0	26	0	6	198	6	0	210	0	4	254	5	0	263	509
Hourly Total	0	19	44	8	0	71	0	27	72	23	0	122	0	19	885	33	14	937	0	16	935	24	0	975	2105
5:00 PM	0	1	5	3	0	9	0	9	15	6	0	30	0	4	246	5	0	255	0	7	252	4	0	263	557
5:15 PM	0	4	9	5	0	18	0	5	15	3	0	23	0	4	219	10	1	233	0	4	253	7	0	264	538
5:30 PM	0	6	6	2	0	14	0	11	11	4	0	26	0	2	277	15	0	294	0	5	237	7	0	249	583
5:45 PM	0	3	7	2	0	12	0	6	21	2	1	29	0	4	223	9	0	236	0	6	241	14	1	261	538
Hourly Total	0	14	27	12	0	53	0	31	62	15	1	108	0	14	965	39	1	1018	0	22	983	32	1	1037	2216
Grand Total	0	154	274	68	11	496	0	155	313	134	5	602	0	75	4478	186	219	4739	0	88	5239	188	13	5515	11352
Approach %	0.0	31.0	55.2	13.7	-	-	0.0	25.7	52.0	22.3	-	-	0.0	1.6	94.5	3.9	-	-	0.0	1.6	95.0	3.4	-	-	-
Total %	0.0	1.4	2.4	0.6	-	4.4	0.0	1.4	2.8	1.2	-	5.3	0.0	0.7	39.4	1.6	-	41.7	0.0	0.8	46.2	1.7	-	48.6	-
Lights	0	153	265	62	-	480	0	150	305	120	-	575	0	75	4371	182	-	4628	0	81	5117	184	-	5382	11065
% Lights	-	99.4	96.7	91.2	-	96.8	-	96.8	97.4	89.6	-	95.5	-	100.0	97.6	97.8	-	97.7	-	92.0	97.7	97.9	-	97.6	97.5
Buses	0	1	3	0	-	4	0	3	3	13	-	19	0	0	32	4	-	36	0	4	30	2	-	36	95
% Buses	-	0.6	1.1	0.0	-	0.8	-	1.9	1.0	9.7	-	3.2	-	0.0	0.7	2.2	-	0.8	-	4.5	0.6	1.1	-	0.7	0.8
Single-Unit Trucks	0	0	4	5	-	9	0	2	2	1	-	5	0	0	63	0	-	63	0	3	72	2	-	77	154

% Single-Unit Trucks	-	0.0	1.5	7.4	-	1.8	-	1.3	0.6	0.7	-	0.8	-	0.0	1.4	0.0	-	1.3	-	3.4	1.4	1.1	-	1.4	1.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	12	0	-	12	0	0	20	0	-	20	32
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.3	0.0	-	0.3	-	0.0	0.4	0.0	-	0.4	0.3
Bicycles on Road	0	0	2	1	-	3	0	0	3	0	-	3	0	0	0	0	-	0	0	0	0	0	-	0	6
% Bicycles on Road	-	0.0	0.7	1.5	-	0.6	-	0.0	1.0	0.0	-	0.5	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	11	-	-	-	-	-	5	-	-	-	-	-	219	-	-	-	-	-	13	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Arlington Heights Road and Olive Street
Site Code:
Start Date: 09/04/2018

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Olive Street Eastbound						Olive Street Westbound						Arlington Heights Road Northbound						Arlington Heights Road Southbound						Int. Total
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	
7:15 AM	0	4	12	2	1	18	0	7	7	12	0	26	0	5	180	7	4	192	0	1	265	14	1	280	516
7:30 AM	0	11	25	9	0	45	0	13	36	18	0	67	0	3	178	7	6	188	0	4	275	7	2	286	586
7:45 AM	0	12	33	4	0	49	0	10	17	6	0	33	0	8	202	10	1	220	0	4	312	26	0	342	644
8:00 AM	0	8	23	4	1	35	0	3	16	3	1	22	0	3	168	4	0	175	0	3	261	13	0	277	509
Total	0	35	93	19	2	147	0	33	76	39	1	148	0	19	728	28	11	775	0	12	1113	60	3	1185	2255
Approach %	0.0	23.8	63.3	12.9	-	-	0.0	22.3	51.4	26.4	-	-	0.0	2.5	93.9	3.6	-	-	0.0	1.0	93.9	5.1	-	-	-
Total %	0.0	1.6	4.1	0.8	-	6.5	0.0	1.5	3.4	1.7	-	6.6	0.0	0.8	32.3	1.2	-	34.4	0.0	0.5	49.4	2.7	-	52.5	-
PHF	0.000	0.729	0.705	0.528	-	0.750	0.000	0.635	0.528	0.542	-	0.552	0.000	0.594	0.901	0.700	-	0.881	0.000	0.750	0.892	0.577	-	0.866	0.875
Lights	0	34	91	17	-	142	0	30	75	30	-	135	0	19	707	28	-	754	0	10	1084	60	-	1154	2185
% Lights	-	97.1	97.8	89.5	-	96.6	-	90.9	98.7	76.9	-	91.2	-	100.0	97.1	100.0	-	97.3	-	83.3	97.4	100.0	-	97.4	96.9
Buses	0	1	2	0	-	3	0	3	0	9	-	12	0	0	3	0	-	3	0	2	10	0	-	12	30
% Buses	-	2.9	2.2	0.0	-	2.0	-	9.1	0.0	23.1	-	8.1	-	0.0	0.4	0.0	-	0.4	-	16.7	0.9	0.0	-	1.0	1.3
Single-Unit Trucks	0	0	0	2	-	2	0	0	0	0	-	0	0	0	11	0	-	11	0	0	14	0	-	14	27
% Single-Unit Trucks	-	0.0	0.0	10.5	-	1.4	-	0.0	0.0	0.0	-	0.0	-	0.0	1.5	0.0	-	1.4	-	0.0	1.3	0.0	-	1.2	1.2
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	7	0	-	7	0	0	5	0	-	5	12
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	1.0	0.0	-	0.9	-	0.0	0.4	0.0	-	0.4	0.5
Bicycles on Road	0	0	0	0	-	0	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	-	0.0	0.0	0.0	-	0.0	-	0.0	1.3	0.0	-	0.7	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	-	2	-	-	-	-	-	1	-	-	-	-	-	11	-	-	-	-	-	3	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400

Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Arlington Heights Road and Olive Street
Site Code:
Start Date: 09/04/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Olive Street Eastbound						Olive Street Westbound						Arlington Heights Road Northbound						Arlington Heights Road Southbound						Int. Total
	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	U-Turn	Left	Thru	Right	Peds	App. Total	
5:00 PM	0	1	5	3	0	9	0	9	15	6	0	30	0	4	246	5	0	255	0	7	252	4	0	263	557
5:15 PM	0	4	9	5	0	18	0	5	15	3	0	23	0	4	219	10	1	233	0	4	253	7	0	264	538
5:30 PM	0	6	6	2	0	14	0	11	11	4	0	26	0	2	277	15	0	294	0	5	237	7	0	249	583
5:45 PM	0	3	7	2	0	12	0	6	21	2	1	29	0	4	223	9	0	236	0	6	241	14	1	261	538
Total	0	14	27	12	0	53	0	31	62	15	1	108	0	14	965	39	1	1018	0	22	983	32	1	1037	2216
Approach %	0.0	26.4	50.9	22.6	-	-	0.0	28.7	57.4	13.9	-	-	0.0	1.4	94.8	3.8	-	-	0.0	2.1	94.8	3.1	-	-	-
Total %	0.0	0.6	1.2	0.5	-	2.4	0.0	1.4	2.8	0.7	-	4.9	0.0	0.6	43.5	1.8	-	45.9	0.0	1.0	44.4	1.4	-	46.8	-
PHF	0.000	0.583	0.750	0.600	-	0.736	0.000	0.705	0.738	0.625	-	0.900	0.000	0.875	0.871	0.650	-	0.866	0.000	0.786	0.971	0.571	-	0.982	0.950
Lights	0	14	24	12	-	50	0	31	61	15	-	107	0	14	959	39	-	1012	0	21	971	32	-	1024	2193
% Lights	-	100.0	88.9	100.0	-	94.3	-	100.0	98.4	100.0	-	99.1	-	100.0	99.4	100.0	-	99.4	-	95.5	98.8	100.0	-	98.7	99.0
Buses	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Buses	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.0
Single-Unit Trucks	0	0	1	0	-	1	0	0	1	0	-	1	0	0	5	0	-	5	0	1	7	0	-	8	15
% Single-Unit Trucks	-	0.0	3.7	0.0	-	1.9	-	0.0	1.6	0.0	-	0.9	-	0.0	0.5	0.0	-	0.5	-	4.5	0.7	0.0	-	0.8	0.7
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	0	0	5	0	-	5	6
% Articulated Trucks	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.1	0.0	-	0.1	-	0.0	0.5	0.0	-	0.5	0.3
Bicycles on Road	0	0	2	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	2
% Bicycles on Road	-	0.0	7.4	0.0	-	3.8	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	-	0.0	0.0	0.0	-	0.0	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

Study Name	Arlington Heights Road and Kinder Care Access
Start Date	Thursday, July 12, 2018 7:00 AM
End Date	Thursday, July 12, 2018 6:00 PM
Site Code	

Report Summary

		Northbound						Southbound						Southeastbound						Northeastbound								Crosswalk	
Time Period	**Class.**	**U**	**HL**	**BL**	**T**	**I**	**O**	**U**	**T**	**BR**	**HR**	**I**	**O**	**U**	**HL**	**BR**	**R**	**I**	**O**	**U**	**L**	**BL**	**HR**	**I**	**O**	**Total**		**:destria**	**Total**
Peak 1	Lights	0	0	17	610	627	936	0	922	0	16	938	621	0	0	0	0	0	33	0	0	11	14	25	0	1590	S	0	0
Specified Period	%	0%	0%	100%	96%	96%	97%	0%	97%	0%	100%	97%	96%	0%	0%	0%	0%	0%	100%	0%	0%	100%	100%	100%	0%	97%		0%	
7:15 AM - 8:15 AM	Buses	0	0	0	5	5	2	0	2	0	0	2	5	0	0	0	0	0	0	0	0	0	0	0	0	7	N	0	0
One Hour Peak	%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
7:15 AM - 8:15 AM	ngle-Unit Truc	0	0	0	11	11	15	0	15	0	0	15	11	0	0	0	0	0	0	0	0	0	0	0	0	26	NW	0	0
	%	0%	0%	0%	2%	2%	2%	0%	2%	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%		0%	
	ticulated Truc	0	0	0	11	11	11	0	11	0	0	11	11	0	0	0	0	0	0	0	0	0	0	0	0	22	SW	0	0
	%	0%	0%	0%	2%	2%	1%	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%		0%	
	icycles on Roa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		**0**	**0**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	**0**	**0**	**17**	**637**	**654**	**964**	**0**	**950**	**0**	**16**	**966**	**648**	**0**	**0**	**0**	**0**	**0**	**33**	**0**	**0**	**11**	**14**	**25**	**0**	**1645**			
	PHF	0	0	0.71	0.87	0.88	0.94	0	0.93	0	0.57	0.93	0.87	0	0	0	0	0	0.75	0	0	0.69	0.58	0.78	0	0.91			
	Approach %					40%	59%					59%	39%					0%	2%					2%	0%				
Peak 2	Lights	0	0	14	1074	1088	1125	0	1103	1	18	1122	1089	0	0	0	0	0	34	0	2	15	22	39	1	2249	S	0	0
Specified Period	%	0%	0%	100%	99%	99%	99%	0%	99%	100%	100%	99%	99%	0%	0%	0%	0%	0%	100%	0%	100%	100%	100%	100%	100%	99%		0%	
5:00 PM - 6:00 PM	Buses	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	N	0	0
One Hour Peak	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		0%	
5:00 PM - 6:00 PM	ngle-Unit Truc	0	0	0	11	11	9	0	9	0	0	9	11	0	0	0	0	0	0	0	0	0	0	0	0	20	NW	1	1
	%	0%	0%	0%	1%	1%	1%	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%		100%	
	ticulated Truc	0	0	0	3	3	2	0	2	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	5	SW	1	1
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		100%	
	icycles on Roa	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		**2**	**2**
	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%			
	Total	**0**	**0**	**14**	**1088**	**1102**	**1137**	**0**	**1115**	**1**	**18**	**1134**	**1103**	**0**	**0**	**0**	**0**	**0**	**34**	**0**	**2**	**15**	**22**	**39**	**1**	**2275**			
	PHF	0	0	0.58	0.9	0.89	0.93	0	0.94	0.25	0.64	0.95	0.9	0	0	0	0	0	0.61	0	0.5	0.62	0.5	0.54	0.25	0.96			
	Approach %					48%	50%					50%	48%					0%	1%					2%	0%				

Gap Study Observations

Left Turns from Arlington Heights Road onto the Access Drive

Observed Gaps

		1 Vehicle	2 Vehicles	3 Vehicles	4 Vehicles	5 Vehicles	6 Vehicles	7 Vehicles	8 Vehicles	9 Vehicles	10 Vehicles	11 Vehicles	12 Vehicles
	Gap Length	4.1 - 6.3	6.4 - 8.5	8.6 - 10.7	10.8 - 12.9	13.0 - 15.1	15.2 - 17.3	17.4 - 19.5	19.6 - 21.7	21.8 - 23.9	24.0 - 26.1	26.2 - 28.3	28.4+
AM Peak Hour	8:00 AM	9	8	4	3	0	4	1	0	1	2	2	6
	8:15 AM	16	5	5	5	3	2	0	0	2	3	1	5
	8:30 AM	16	1	5	2	4	4	2	1	1	0	3	4
	8:45 AM	10	6	2	1	0	3	2	4	0	3	0	5
PM Peak Hour	5:00 PM	13	7	0	4	2	3	4	2	3	1	0	2
	5:15 PM	21	9	3	5	1	2	3	2	1	1	1	1
	5:30 PM	18	7	4	3	3	1	2	2	4	1	0	1
	5:45 PM	16	6	1	3	3	1	3	2	2	0	0	4

Potential Movements

		1	2	3	4	5	6	7	8	9	10	11	12	
	Gap Length	4.1 - 6.3	6.4 - 8.5	8.6 - 10.7	10.8 - 12.9	13.0 - 15.1	15.1 - 17.3	17.4 - 19.5	19.6 - 21.7	21.8 - 23.9	24.0 - 26.1	26.2 - 28.3	28.4+	**TOTAL**
AM Peak Hour	8:00 AM	9	16	12	12	0	24	7	0	9	20	22	72	**203**
	8:15 AM	16	10	15	20	15	12	0	0	18	30	11	60	**207**
	8:30 AM	16	2	15	8	20	24	14	8	9	0	33	48	**197**
	8:45 AM	10	12	6	4	0	18	14	32	0	30	0	60	**186**
PM Peak Hour	5:00 PM	13	14	0	16	10	18	28	16	27	10	0	24	**176**
	5:15 PM	21	18	9	20	5	12	21	16	9	10	11	12	**164**
	5:30 PM	18	14	12	12	15	6	14	16	36	10	0	12	**165**
	5:45 PM	16	12	3	12	15	6	21	16	18	0	0	48	**167**

Right Turns from the Access Drive onto Arlington Heights Road

Observed Gaps

		1 Vehicle	2 Vehicles	3 Vehicles	4 Vehicles	5 Vehicles	6 Vehicles	7 Vehicles
	Gap Length	6.9 - 10.2	10.3 - 13.5	13.6 - 16.8	16.9 - 20.1	20.2 - 23.4	23.5 - 26.7	26.8 - 30
AM Peak Hour	8:00 AM	9	3	4	1	1	2	8
	8:15 AM	10	6	5	0	2	4	5
	8:30 AM	5	4	7	3	2	0	7
	8:45 AM	6	1	2	4	3	3	5
PM Peak Hour	5:00 PM	6	4	5	6	3	1	2
	5:15 PM	11	5	1	6	2	2	1
	5:30 PM	10	4	4	2	5	2	1
	5:45 PM	5	3	4	3	2	2	4

Potential Movements

		1	2	3	4	5	6	7	
	Gap Length	6.9 - 10.2	10.3 - 13.5	13.6 - 16.8	16.9 - 20.1	20.2 - 23.4	23.5 - 26.7	26.8 - 30	**TOTAL**
AM Peak Hour	8:00 AM	9	6	12	4	5	12	56	**104**
	8:15 AM	10	12	15	0	10	24	35	**106**
	8:30 AM	5	8	21	12	10	0	49	**105**
	8:45 AM	6	2	6	16	15	18	35	**98**
PM Peak Hour	5:00 PM	6	8	15	24	15	6	14	**88**
	5:15 PM	11	10	3	24	10	12	7	**77**
	5:30 PM	10	8	12	8	25	12	7	**82**
	5:45 PM	5	6	12	12	10	12	28	**85**

Left Turns from the Access Drive onto Arlington Heights Road

Observed Gaps

		1 Vehicle	2 Vehicles	3 Vehicles	4 Vehicles	5 Vehicles	6 Vehicles
	Gap Length	7.5 - 11.0	11.1 - 14.5	14.6 - 18.0	18.1 - 21.5	21.6 - 25.0	25.1 - 28.5
AM Peak Hour	8:00 AM	8	4	6	2	0	1
	8:15 AM	4	8	0	2	3	1
	8:30 AM	8	3	5	0	0	1
	8:45 AM	7	3	2	1	2	1
PM Peak Hour	5:00 PM	8	4	4	1	0	1
	5:15 PM	9	4	0	1	0	0
	5:30 PM	11	4	1	1	0	0
	5:45 PM	6	2	2	1	1	1

Potential Movements

		1	2	3	4	5	6	
	Gap Length	7.5 - 11.0	11.1 - 14.5	14.6 - 18.0	18.1 - 21.5	21.6 - 25.0	25.1 - 28.5	**TOTAL**
AM Peak Hour	8:00 AM	8	8	18	8	0	6	**48**
	8:15 AM	4	16	0	8	15	6	**49**
	8:30 AM	8	6	15	0	0	6	**35**
	8:45 AM	7	6	6	4	10	6	**39**
PM Peak Hour	5:00 PM	8	8	12	4	0	6	**38**
	5:15 PM	9	8	0	4	0	0	**21**
	5:30 PM	11	8	3	4	0	0	**26**
	5:45 PM	6	4	6	4	5	6	**31**

Preliminary Site Plan


LOT 2
NORTH ARLINGTON HEIGHTS ROAD
279.76
279.83
179.96
180.04
PRESCHOOL PLAYGROUND
POUR IN PLACE SURFACING 923 SQ. FT
TODDLER PLAYGROUND
POUR IN PLACE SURFACING 800 SQ. FT
NEW CONC. WALK
NEW SOD
6" METAL FENCE
6" BARRIER CURB
LANDSCAPE BLOCK RETAINING WALL
BOLLARDS AROUND PERIMETER
THICKENED EDGE SIDEWALK
RAMP
CONC. APRON
TRASH ENCLOSURE
CONC. PAD
NEW SIGN
SIGN
BOTTOM OF SIDING ELEV.:705.63
BOTTOM OF SIDING ELEV.:705.60
BOTTOM OF SIDING ELEV.:704.88
DRAIN RIM ELEV.=706.52
T/F:709.75
T/F:709.70
T/F:705.74
T/F:705.69
T/F:705.71
71.79
66.42
30.10
59.10
38.35
7.36
30.87
23.92
37.18
11.79
12.14
15.99
9.97
22.69
0.51
21.30
38.46
13.57
22.36
4.19
30.81
702.68
703.70
703.12
702.75
702.70
702.63
701.35
701.29
701.69
701.76
702.05
701.61
701.68
701.19
T/C=701.68
G=701.43
701.79
702.30
702.65
703.13
703.51
703.73
702.76
702.56
702.11
702.60
702.96
703.01
702.52
703.28
702.91
703.26
703.09
703.78
703.38
703.25
703.74
703.86
703.39
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
01
11
24
25
26
2x8"
2x13"
CLUSTER

ITE Trip Generation Sheets

Day Care Center
(565)

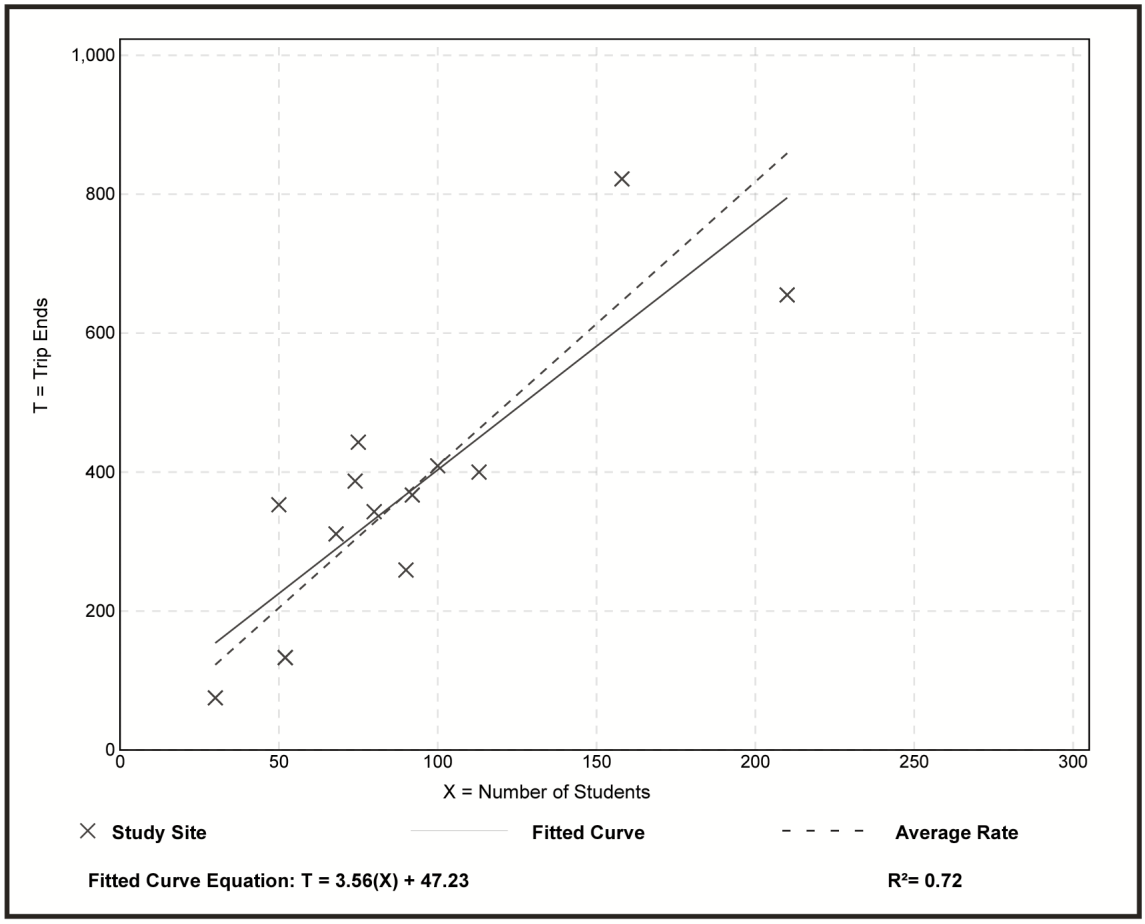
Vehicle Trip Ends vs: **Students**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 14
Avg. Num. of Students: 89
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
4.09	2.50 - 7.06	1.21

Data Plot and Equation



Fitted Curve Equation: T = 3.56(X) + 47.23

R^2= 0.72

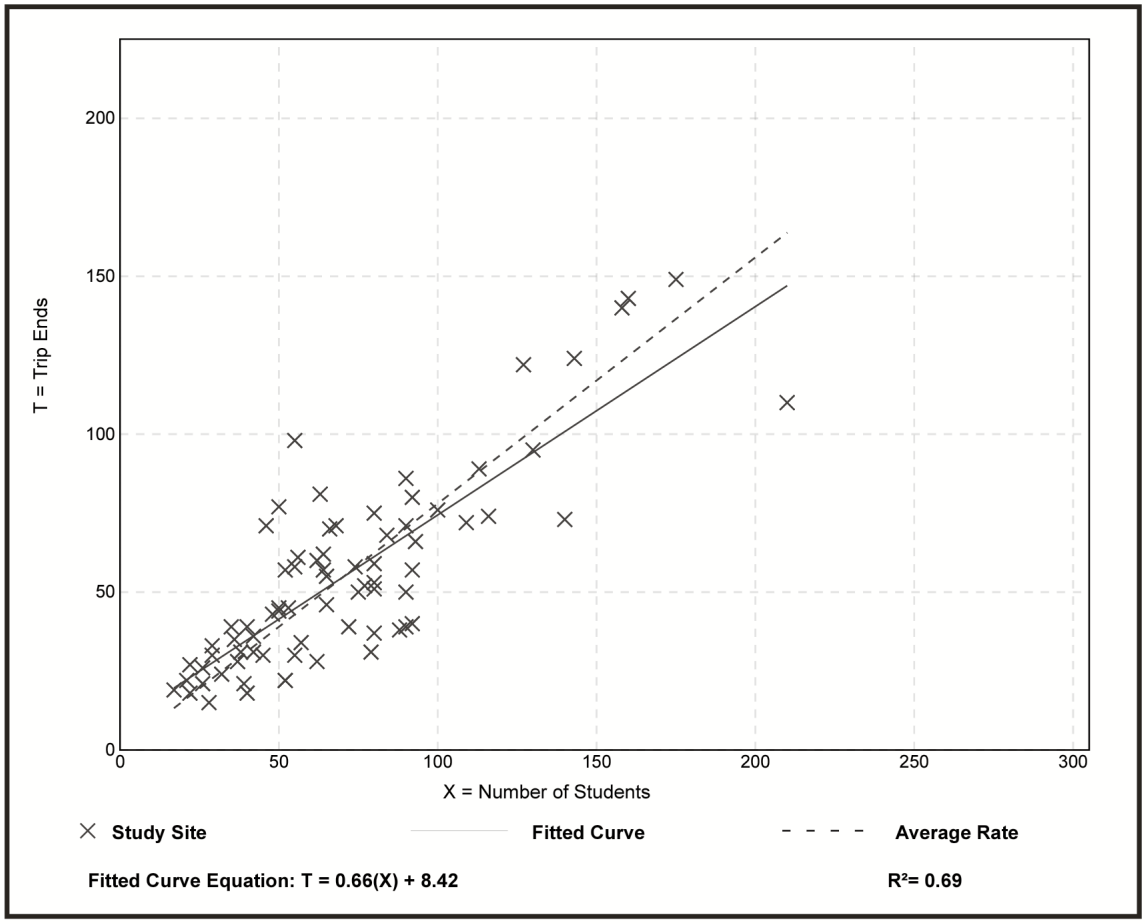
Day Care Center
(565)

Vehicle Trip Ends vs: **Students**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 75
Avg. Num. of Students: 71
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.78	0.39 - 1.78	0.25

Data Plot and Equation



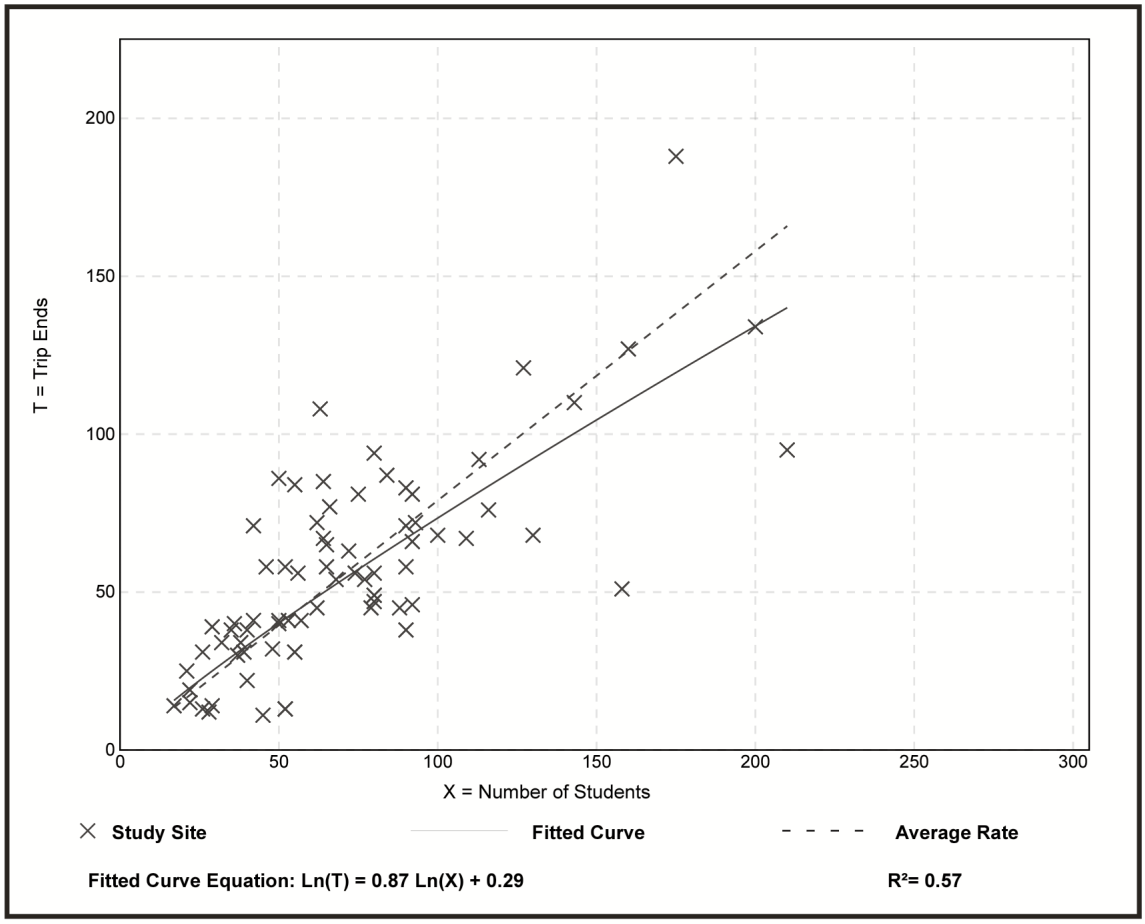
Day Care Center
(565)

Vehicle Trip Ends vs:	**Students**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	75
Avg. Num. of Students:	72
Directional Distribution:	47% entering, 53% exiting

Vehicle Trip Generation per Student

Average Rate	Range of Rates	Standard Deviation
0.79	0.24 - 1.72	0.30

Data Plot and Equation



CMAP Projections Letter

Chicago Metropolitan
Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

August 21, 2018

Andrew Bowen
Consultant
Kenig, Lindgren, O'Hara and Aboona, Inc.
9575 West Higgins Road
Suite 400
Rosemont, IL 60018

Subject: Arlington Heights Road @ Olive Street
IDOT

Dear Mr. Bowen:

In response to a request made on your behalf and dated August 21, 2018, we have developed year 2040 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2040 ADT
Arlington Heights Rd., @ Olive St.	22,000	26,400

Traffic projections are developed using existing ADT data provided in the request letter and the results from the March 2018 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2040 socioeconomic projections and assumes the implementation of the GO TO 2040 Comprehensive Regional Plan for the Northeastern Illinois area. The provision of this data in support of your request does not constitute a CMAP endorsement of the proposed development or any subsequent developments.

If you have any questions, please call me at (312) 386-8806.

Sincerely,

Jose Rodriguez, PTP, AICP
Senior Planner, Research & Analysis

cc: Quigley (IDOT)
S:\AdminGroups\ResearchAnalysis\2018cy_TrafficForecasts\ArlingtonHeights\ck-92-18\ck-92-18.docx

Level of Service Criteria

LEVEL OF SERVICE CRITERIA

Signalized Intersections		
Level of Service	Interpretation	Average Control Delay (seconds per vehicle)
A	Favorable progression. Most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Good progression, with more vehicles stopping than for Level of Service A.	>10 - 20
C	Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear. Number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 - 35
D	The volume-to-capacity ratio is high and either progression is ineffective or the cycle length is too long. Many vehicles stop and individual cycle failures are noticeable.	>35 - 55
E	Progression is unfavorable. The volume-to-capacity ratio is high and the cycle length is long. Individual cycle failures are frequent.	>55 - 80
F	The volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80.0

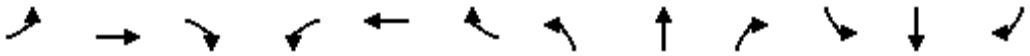
Unsignalized Intersections	
Level of Service	Average Total Delay (SEC/VEH)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Source: *Highway Capacity Manual*, 2010.

Capacity Analysis Summary Sheets

Capacity Analysis Summary Sheets

Existing Weekday Morning Peak Hour Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	93	19	33	76	39	19	728	28	12	1113	60
Future Volume (vph)	35	93	19	33	76	39	19	728	28	12	1113	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00			0.99			1.00			1.00	
Frt		0.982			0.965			0.995			0.992	
Flt Protected		0.988			0.989			0.999			0.999	
Satd. Flow (prot)	0	1779	0	0	1671	0	0	3487	0	0	3470	0
Flt Permitted		0.787			0.804			0.887			0.941	
Satd. Flow (perm)	0	1416	0	0	1356	0	0	3096	0	0	3268	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1040			1062			475			544	
Travel Time (s)		23.6			24.1			10.8			12.4	
Confl. Peds. (#/hr)	3		11	11		3	2		1	1		2
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	10%	9%	0%	23%	0%	3%	0%	17%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	168	0	0	168	0	0	881	0	0	1347	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		21.0	21.0		21.0	21.0	
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0		84.0	84.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		18.8			18.8			89.2			89.2	
Actuated g/C Ratio		0.16			0.16			0.74			0.74	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.76			0.80			0.38			0.55	
Control Delay		69.3			73.8			6.6			8.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		69.3			73.8			6.6			8.4	
LOS		E			E			A			A	
Approach Delay		69.3			73.8			6.6			8.4	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)		126			127			111			206	
Queue Length 95th (ft)		187			189			173			311	
Internal Link Dist (ft)		960			982			395			464	
Turn Bay Length (ft)												
Base Capacity (vph)		354			339			2302			2430	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.47			0.50			0.38			0.55	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.0		Intersection LOS: B	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Olive Street & Arlington Heights Road

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	14	0	802	1171	0
Future Vol, veh/h	11	14	0	802	1171	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	12	15	0	881	1287	0

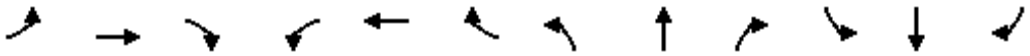
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1728	644	-	0	-	0
Stage 1	1287	-	-	-	-	-
Stage 2	441	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	81	420	0	-	-	0
Stage 1	227	-	0	-	-	0
Stage 2	622	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	81	420	-	-	-	-
Mov Cap-2 Maneuver	81	-	-	-	-	-
Stage 1	227	-	-	-	-	-
Stage 2	622	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	81	420	-
HCM Lane V/C Ratio	-	0.149	0.037	-
HCM Control Delay (s)	-	57.1	13.9	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	0.5	0.1	-

Capacity Analysis Summary Sheets

Existing Weekday Evening Peak Hour Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	25	12	33	62	15	14	965	39	22	983	32
Future Volume (vph)	14	25	12	33	62	15	14	965	39	22	983	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		0.99			0.99			1.00			1.00	
Frt		0.967			0.981			0.994			0.995	
Flt Protected		0.986			0.985			0.999			0.999	
Satd. Flow (prot)	0	1765	0	0	1811	0	0	3548	0	0	3549	0
Flt Permitted		0.861			0.899			0.929			0.909	
Satd. Flow (perm)	0	1540	0	0	1645	0	0	3300	0	0	3230	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1040			1062			475			544	
Travel Time (s)		23.6			24.1			10.8			12.4	
Confl. Peds. (#/hr)	3		11	11		3	2		1	1		2
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	1%	0%	4%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	54	0	0	116	0	0	1072	0	0	1092	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		21.0	21.0		21.0	21.0	
Total Split (s)	31.2	31.2		31.2	31.2		98.8	98.8		98.8	98.8	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		76.0%	76.0%		76.0%	76.0%	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.5			14.5			103.5			103.5	
Actuated g/C Ratio		0.11			0.11			0.80			0.80	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.31			0.63			0.41			0.42	
Control Delay		56.4			69.8			4.9			5.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		56.4			69.8			4.9			5.0	
LOS		E			E			A			A	
Approach Delay		56.4			69.8			4.9			5.0	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)		43			95			119			123	
Queue Length 95th (ft)		82			153			185			192	
Internal Link Dist (ft)		960			982			395			464	
Turn Bay Length (ft)												
Base Capacity (vph)		298			318			2626			2570	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.18			0.36			0.41			0.42	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.63			
Intersection Signal Delay: 9.4		Intersection LOS: A	
Intersection Capacity Utilization 62.3%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Olive Street & Arlington Heights Road

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	22	0	994	1015	0
Future Vol, veh/h	17	22	0	994	1015	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	18	23	0	1035	1057	0

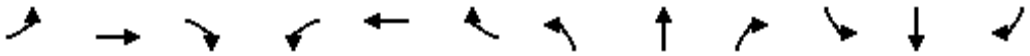
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1575	529	-	0	-	0
Stage 1	1057	-	-	-	-	-
Stage 2	518	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	103	499	0	-	-	0
Stage 1	300	-	0	-	-	0
Stage 2	568	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	103	499	-	-	-	-
Mov Cap-2 Maneuver	103	-	-	-	-	-
Stage 1	300	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.6	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	103	499	-
HCM Lane V/C Ratio	-	0.172	0.046	-
HCM Control Delay (s)	-	47.1	12.6	-
HCM Lane LOS	-	E	B	-
HCM 95th %tile Q(veh)	-	0.6	0.1	-

Capacity Analysis Summary Sheets

Projected Weekday Morning Peak Hour Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	93	19	33	76	42	19	795	28	15	1194	63
Future Volume (vph)	38	93	19	33	76	42	19	795	28	15	1194	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		1.00			0.99			1.00			1.00	
Frt		0.983			0.962			0.995			0.993	
Flt Protected		0.988			0.989			0.999			0.999	
Satd. Flow (prot)	0	1781	0	0	1660	0	0	3487	0	0	3473	0
Flt Permitted		0.768			0.811			0.885			0.936	
Satd. Flow (perm)	0	1384	0	0	1358	0	0	3089	0	0	3254	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1040			1062			475			344	
Travel Time (s)		23.6			24.1			10.8			7.8	
Confl. Peds. (#/hr)	3		11	11		3	2		1	1		2
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	10%	9%	0%	23%	0%	3%	0%	17%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	171	0	0	172	0	0	957	0	0	1446	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		21.0	21.0		21.0	21.0	
Total Split (s)	36.0	36.0		36.0	36.0		84.0	84.0		84.0	84.0	
Total Split (%)	30.0%	30.0%		30.0%	30.0%		70.0%	70.0%		70.0%	70.0%	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		19.1			19.1			88.9			88.9	
Actuated g/C Ratio		0.16			0.16			0.74			0.74	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.78			0.80			0.42			0.60	
Control Delay		70.7			73.2			7.0			9.2	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		70.7			73.2			7.0			9.2	
LOS		E			E			A			A	
Approach Delay		70.7			73.2			7.0			9.2	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)		129			130			127			238	
Queue Length 95th (ft)		190			192			197			357	
Internal Link Dist (ft)		960			982			395			264	
Turn Bay Length (ft)												
Base Capacity (vph)		346			339			2287			2409	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.49			0.51			0.42			0.60	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 55			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 16.3		Intersection LOS: B	
Intersection Capacity Utilization 67.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Olive Street & Arlington Heights Road

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	11	14	0	866	1256	0
Future Vol, veh/h	11	14	0	866	1256	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	12	15	0	952	1380	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1856	690	-	0	-	0
Stage 1	1380	-	-	-	-	-
Stage 2	476	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	67	392	0	-	-	0
Stage 1	202	-	0	-	-	0
Stage 2	597	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	67	392	-	-	-	-
Mov Cap-2 Maneuver	67	-	-	-	-	-
Stage 1	202	-	-	-	-	-
Stage 2	597	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	39.1	0	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	67	392	-
HCM Lane V/C Ratio	-	0.18	0.039	-
HCM Control Delay (s)	-	70.2	14.6	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	0.6	0.1	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	6	0	866	1270	0
Future Vol, veh/h	0	6	0	866	1270	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	6	0	912	1337	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	669	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	405	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	405	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	405	-
HCM Lane V/C Ratio	-	0.016	-
HCM Control Delay (s)	-	14	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	29	28	38	837	1244	32
Future Vol, veh/h	29	28	38	837	1244	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	31	29	40	881	1309	34

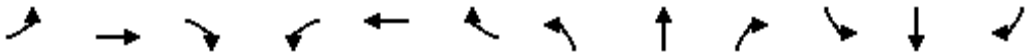
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1847	672	1343	0	-	0
Stage 1	1326	-	-	-	-	-
Stage 2	521	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	68	403	520	-	-	-
Stage 1	216	-	-	-	-	-
Stage 2	566	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	58	403	520	-	-	-
Mov Cap-2 Maneuver	58	-	-	-	-	-
Stage 1	183	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	84.5	1.4	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	520	-	100	-	-
HCM Lane V/C Ratio	0.077	-	0.6	-	-
HCM Control Delay (s)	12.5	0.9	84.5	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	2.9	-	-

Capacity Analysis Summary Sheets

Projected Weekday Evening Peak Hour Conditions



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	25	12	33	62	18	14	1039	39	25	1062	36
Future Volume (vph)	17	25	12	33	62	18	14	1039	39	25	1062	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	0.95	0.95	0.95
Ped Bike Factor		0.99			0.99			1.00			1.00	
Frt		0.969			0.978			0.995			0.995	
Flt Protected		0.984			0.986			0.999			0.999	
Satd. Flow (prot)	0	1768	0	0	1807	0	0	3552	0	0	3549	0
Flt Permitted		0.826			0.899			0.928			0.898	
Satd. Flow (perm)	0	1482	0	0	1640	0	0	3299	0	0	3190	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1040			1062			475			344	
Travel Time (s)		23.6			24.1			10.8			7.8	
Confl. Peds. (#/hr)	3		11	11		3	2		1	1		2
Confl. Bikes (#/hr)						1						
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	2%	0%	0%	1%	0%	4%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	57	0	0	119	0	0	1150	0	0	1182	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Detector Phase	4	4		8	8		2	2		6	6	
Switch Phase												
Minimum Initial (s)	8.0	8.0		8.0	8.0		15.0	15.0		15.0	15.0	
Minimum Split (s)	14.0	14.0		14.0	14.0		21.0	21.0		21.0	21.0	
Total Split (s)	31.2	31.2		31.2	31.2		98.8	98.8		98.8	98.8	
Total Split (%)	24.0%	24.0%		24.0%	24.0%		76.0%	76.0%		76.0%	76.0%	
Yellow Time (s)	4.5	4.5		4.5	4.5		4.5	4.5		4.5	4.5	
All-Red Time (s)	1.5	1.5		1.5	1.5		1.5	1.5		1.5	1.5	
Lost Time Adjust (s)		0.0			0.0			0.0			0.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		C-Min	C-Min		C-Min	C-Min	
Act Effct Green (s)		14.8			14.8			103.2			103.2	
Actuated g/C Ratio		0.11			0.11			0.79			0.79	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio		0.34			0.64			0.44			0.47	
Control Delay		57.1			70.0			5.2			5.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		57.1			70.0			5.2			5.4	
LOS		E			E			A			A	
Approach Delay		57.1			70.0			5.2			5.4	
Approach LOS		E			E			A			A	
Queue Length 50th (ft)		45			97			134			142	
Queue Length 95th (ft)		85			156			207			221	
Internal Link Dist (ft)		960			982			395			264	
Turn Bay Length (ft)												
Base Capacity (vph)		287			317			2619			2533	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.20			0.38			0.44			0.47	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 40			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.64			
Intersection Signal Delay: 9.6		Intersection LOS: A	
Intersection Capacity Utilization 66.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 1: Olive Street & Arlington Heights Road

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	17	22	0	1072	1091	0
Future Vol, veh/h	17	22	0	1072	1091	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	18	23	0	1117	1136	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1695	568	-	0	-	0
Stage 1	1136	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Critical Hdwy	6.8	6.9	-	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	-	-
Pot Cap-1 Maneuver	85	471	0	-	-	0
Stage 1	272	-	0	-	-	0
Stage 2	542	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	85	471	-	-	-	-
Mov Cap-2 Maneuver	85	-	-	-	-	-
Stage 1	272	-	-	-	-	-
Stage 2	542	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.7	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	EBLn2	SBT
Capacity (veh/h)	-	85	471	-
HCM Lane V/C Ratio	-	0.208	0.049	-
HCM Control Delay (s)	-	58.2	13	-
HCM Lane LOS	-	F	B	-
HCM 95th %tile Q(veh)	-	0.7	0.2	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	7	0	1072	1113	0
Future Vol, veh/h	0	7	0	1072	1113	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	7	0	1128	1172	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	586	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	459	0	-	-	0
Stage 1	0	-	0	-	-	0
Stage 2	0	-	0	-	-	0
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	-	459	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT
Capacity (veh/h)	-	459	-
HCM Lane V/C Ratio	-	0.016	-
HCM Control Delay (s)	-	13	-
HCM Lane LOS	-	B	-
HCM 95th %tile Q(veh)	-	0	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	32	34	1040	1091	29
Future Vol, veh/h	32	32	34	1040	1091	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	34	34	36	1095	1148	31

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1784	590	1179	0	-	0
Stage 1	1164	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Critical Hdwy	6.8	6.9	4.1	-	-	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	75	456	600	-	-	-
Stage 1	263	-	-	-	-	-
Stage 2	504	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	64	456	600	-	-	-
Mov Cap-2 Maneuver	64	-	-	-	-	-
Stage 1	223	-	-	-	-	-
Stage 2	504	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	76.9	1.1	0
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	600	-	112	-	-
HCM Lane V/C Ratio	0.06	-	0.602	-	-
HCM Control Delay (s)	11.4	0.8	76.9	-	-
HCM Lane LOS	B	A	F	-	-
HCM 95th %tile Q(veh)	0.2	-	3	-	-