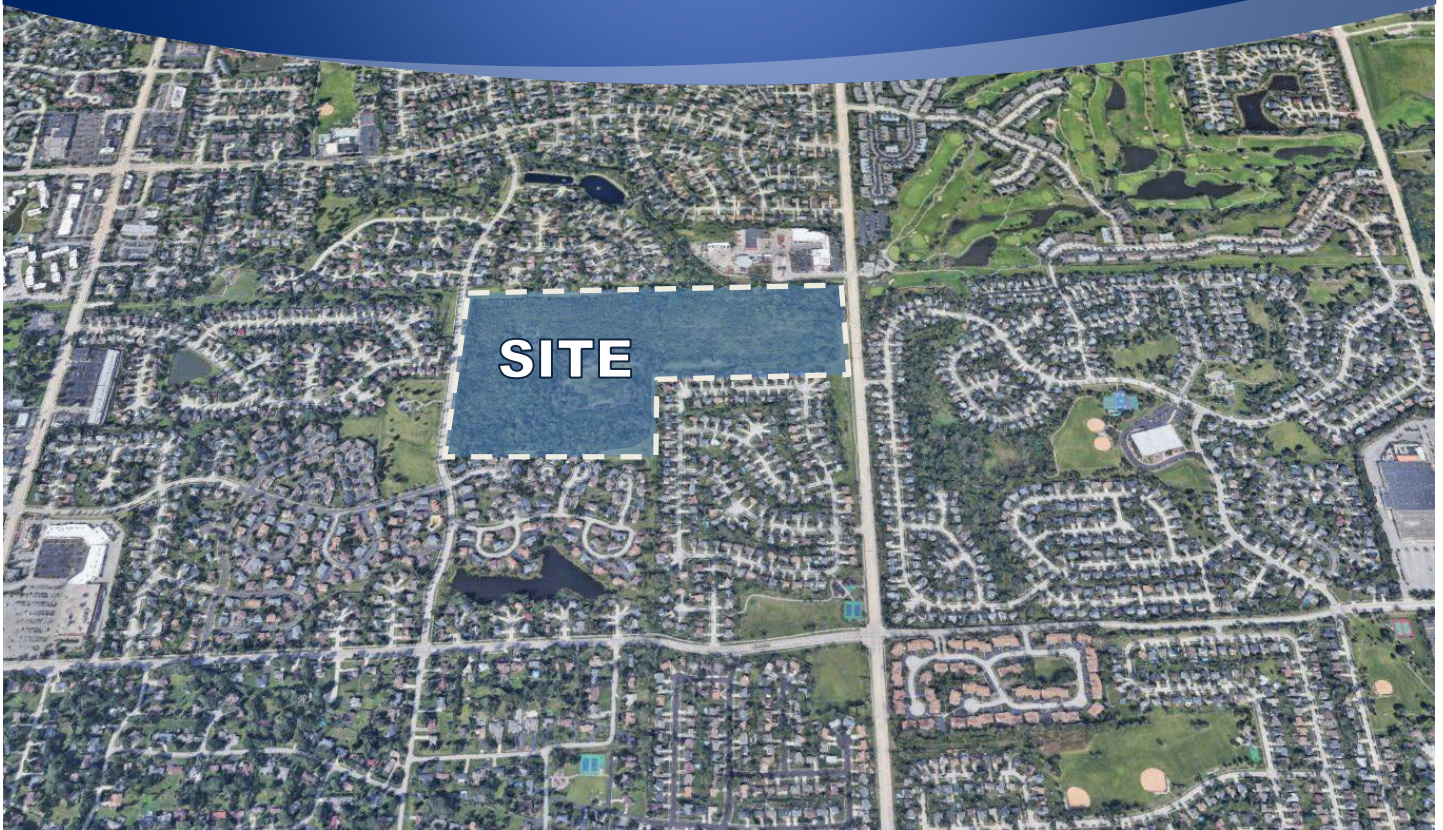


Traffic Impact Study Proposed Residential Development

Schaumburg, Illinois



Prepared For:

Nitti Group, LLC - Schaumburg, LLC



May 27, 2020

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 residential development to be located in Schaumburg, Illinois. The site, which is currently vacant, is located on the west side of Plum Grove Road approximately one-half mile north of its intersection with Wise Road. As proposed, the site will be developed with 148 single family homes. Access to the development will be provided via a full movement access drive off Plum Grove Road located approximately 275 feet north of Julie Drive and via a full movement access drive off Summit Drive that will form the fourth (east) leg of the intersection of Summit Drive with Kingsport Drive.

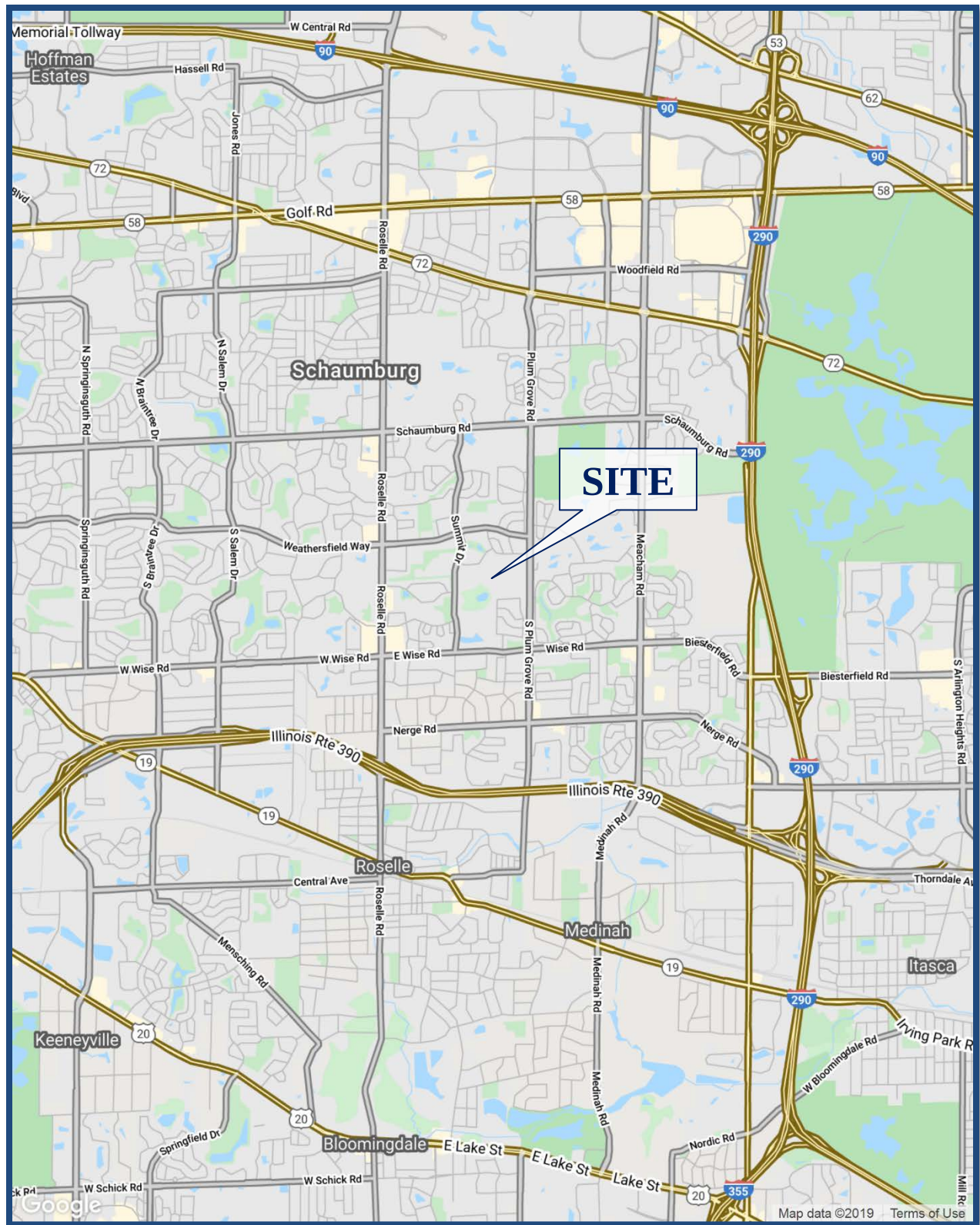
The purpose of this study was to examine background traffic conditions, assess the impact that the proposed development will have on traffic conditions in the area, and determine if any roadway or access improvements are necessary to accommodate traffic generated by the proposed development. **Figure 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 development
- Directional distribution of the development traffic
- Vehicle trip generation for the development
- Future traffic conditions including access to the development
- Traffic analyses for the weekday morning and weekday 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:

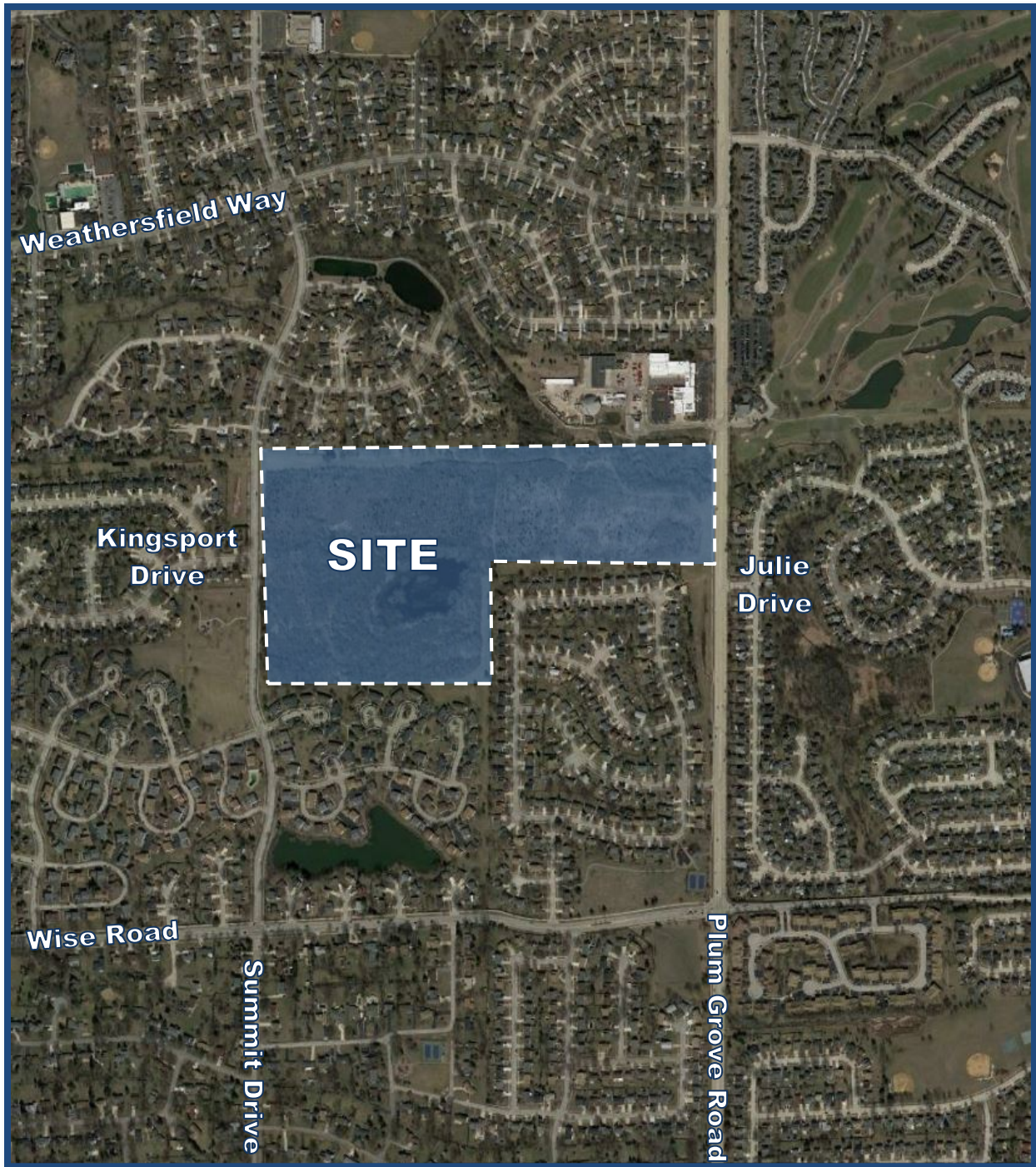
1. Existing Conditions - Analyzes the capacity of the existing roadway system using existing peak hour traffic volumes in the surrounding area.
2. Projected Conditions – Analyzes the capacity of the future roadway system using the projected traffic volumes that include the existing traffic volumes, ambient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



Site Location

Figure 1

*Proposed Residential Development
Schaumburg, Illinois*



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

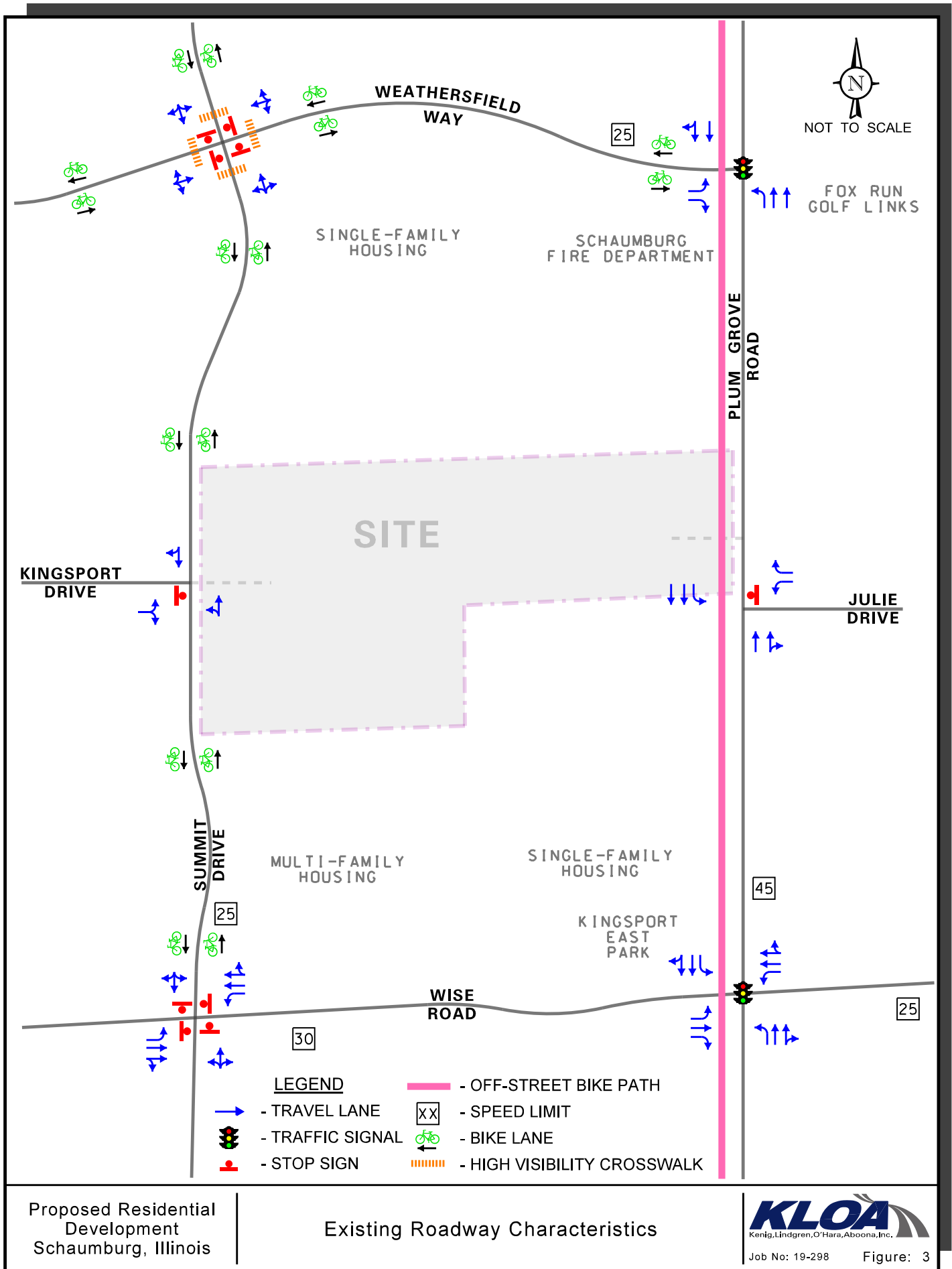
The site is located on the west side of Plum Grove Road approximately one-half mile north of Wise Road and one quarter mile south of Weathersfield Way. Land uses within the vicinity of the site are primarily residential with single-family homes north, east, and west of the site and multi-family homes south of the site. The Schaumburg Engineering and Public Works and the Schaumburg Fire Department are located north of the site on Plum Grove Road.

Existing Roadway System Characteristics

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

Plum Grove Road is a north-south, major collector roadway that provides two lanes in each direction generally divided by a mountable concrete median. At its signalized intersection with Weathersfield Way, Plum Grove Road provides an exclusive left-turn lane and two through lanes on the northbound approach and a through lane and a combined through/right-turn lane on the southbound approach. At its signalized intersection with Wise Road, Plum Grove Road provides an exclusive left-turn lane, a through lane, and a combined through/right-turn on both approaches. At its unsignalized intersection with Julie Drive, Plum Grove Road provides a through lane and a combined through/right-turn lane on the northbound approach and an exclusive left-turn lane and two through lanes on the southbound approach. Plum Grove Road is under the jurisdiction of the Cook County Department of Transportation and Highways (CCDTH), has a posted speed limit of 45 mph, and carries an Average Annual Daily Traffic (AADT) volume of 14,800 vehicles (Illinois Department of Transportation [IDOT] 2018).

Wise Road is an east-west minor arterial roadway that provides two lanes in each direction west of Plum Grove Road and one lane in each direction east of Plum Grove Road. At its intersection with Plum Grove Road, Wise Road provides an exclusive left-turn lane, a through lane, and an exclusive right-turn lane on the eastbound approach and an exclusive left-turn lane, a through lane, and a combined through/right-turn lane on the westbound approach. At its unsignalized intersection with Summit Drive, Wise Road provides an exclusive left-turn lane, a through lane, and a combined through/right-turn lanes on both approaches. Wise Road has a posted speed limit of 30 mph west of Plum Grove Road and 25 mph east of Plum Grove Road, is under the jurisdiction of the Village of Schaumburg, and carries an AADT volume of 13,200 vehicles (IDOT 2018).



Weathersfield Way is an east-west local road that provides one lane in each direction. At its signalized intersection with Plum Grove Road, Weathersfield Way terminates and provides an exclusive left-turn lane and an exclusive right-turn lane. At its unsignalized intersection with Summit Drive, Weathersfield Way provides one lane on both approaches and is under stop sign control. Weathersfield Way has a posted speed limit of 25 mph, provides a bike lane on both sides of the roadway, and is under the jurisdiction of the Village of Schaumburg.

Summit Drive is a north-south local road that provides one lane in each direction. At its unsignalized intersection with Weathersfield Way, Summit Drive provides one lane on both approaches under stop sign control. At its unsignalized intersection with Wise Road, Summit Drive provides one lane on both approaches under stop sign control. Weathersfield Way has a posted speed limit of 25 mph, provides a bike lane on both sides of the roadway, and is under the jurisdiction of the Village of Schaumburg.

Julie Drive is an east-west local road that provides a connection between Newberry Drive and Plum Grove Road. At its unsignalized intersection with Plum Grove Road, Julie Drive terminates and provides an exclusive left-turn lane and an exclusive right-turn lane under stop sign control. Julie Drive is under the jurisdiction of the Village of Schaumburg.

Kingsport Drive is an east-west local road that provides one lane in each direction. At its unsignalized intersection with Summit Drive, Kingsport Drive terminates and provides one lane under stop sign control. Kingsport Drive has a posted speed limit of 25 mph and is under the jurisdiction of the Village of Schaumburg.

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 on Tuesday, October 9, 2018 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 Plum Grove Road with Weathersfield Way, Julie Drive, and Wise Road and the intersections of Summit Drive with Weathersfield Way, Kingsport Drive, and Wise Road. 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 4:45 P.M. to 5:45 P.M.

Figure 4 illustrates the existing peak hour traffic volumes for both peak periods that the counts were performed. Copies of the traffic count summary sheets are included in the Appendix.

Crash Analysis

KLOA, Inc. obtained accident data for the most recent available five years (2014 to 2018) for the intersections of Plum Grove Road with Weathersfield Way, Julie Drive, and Wise Road and the intersections of Summit Drive with Weathersfield Way, Kingsport Drive, and Wise Road. A review of the accident data indicated that there were no accidents at the intersection of Summit Drive with Kingsport Drive. Further, no fatalities were reported at any intersection during the reviewed period. **Tables 1** through **5** show a summary of the crash data.¹

Table 1

PLUM GROVE ROAD WITH WEATHERSFIELD WAY- CRASH SUMMARY

Year	Type of Accident Frequency						Total
	Angle	Object	Rear End	Sideswipe	Turning	Other	
2014	1	0	0	0	4	0	5
2015	0	0	0	0	2	0	2
2016	0	0	1	0	1	0	2
2017	0	0	0	0	1	0	1
2018	2	1	0	1	3	0	7
Total	3	1	1	1	11	0	17
Average/Year	<1.0	<1.0	<1.0	<1.0	2.2	--	3.4

¹ IDOT DISCLAIMER: The motor vehicle crash data referenced herein was provided by the Illinois Department of Transportation. Any conclusions drawn from analysis of the aforementioned data are the sole responsibility of the data recipient(s). Additionally, for coding years 2015 to present, the Bureau of Data Collection uses the exact latitude/longitude supplied by the investigating law enforcement agency to locate crashes. Therefore, location data may vary in previous years since data prior to 2015 was physically located by bureau personnel.

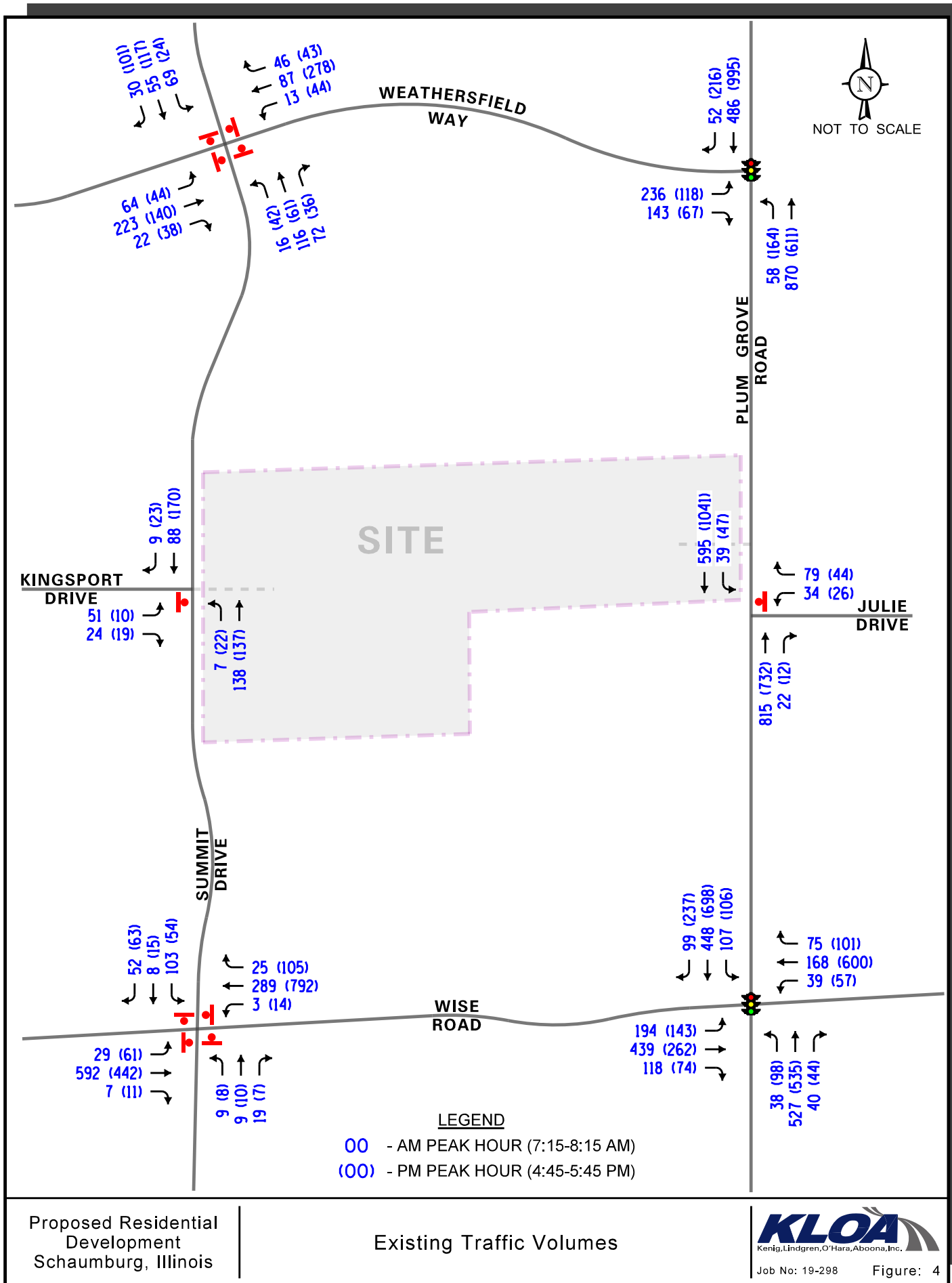


Table 2

PLUM GROVE ROAD WITH JULIE DRIVE- CRASH SUMMARY

Year	Type of Accident Frequency						Total
	Angle	Object	Rear End	Sideswipe	Turning	Other	
2014	0	0	0	0	2	0	2
2015	0	0	0	0	1	0	1
2016	0	0	0	0	0	0	0
2017	0	0	0	0	0	0	0
2018	0	0	0	0	0	0	0
Total	0	0	0	0	3	0	3
Average/Year	--	--	--	--	<1.0	--	<1.0

Table 3

PLUM GROVE ROAD WITH WISE ROAD – CRASH SUMMARY

Year	Type of Accident Frequency						Total
	Angle	Object	Rear End	Sideswipe	Turning	Other	
2014	1	1	2	1	4	0	9
2015	1	0	6	0	2	0	9
2016	2	1	3	0	1	0	7
2017	3	0	1	0	1	1	6
2018	0	0	5	0	5	0	10
Total	7	2	17	1	13	1	41
Average/Year	1.4	<1.0	3.4	<1.0	2.6	<1.0	8.2

Table 4

SUMMIT DRIVE WITH WEATHERSFIELD WAY – CRASH SUMMARY

Year	Type of Accident Frequency						Total
	Angle	Object	Rear End	Sideswipe	Turning	Other	
2014	5	0	0	0	0	0	5
2015	2	0	0	0	0	0	2
2016	3	0	0	0	0	0	3
2017	2	0	0	0	0	0	2
2018	1	0	0	0	0	0	1
Total	13	0	0	0	0	0	13
Average/Year	2.6	--	--	--	--	--	2.6

Table 5

SUMMIT DRIVE WITH WISE ROAD - CRASH SUMMARY

Year	Type of Accident Frequency						Total
	Angle	Object	Rear End	Sideswipe	Turning	Other	
2014	0	0	0	0	0	0	0
2015	1	0	1	0	0	1	3
2016	0	0	1	1	0	1	3
2017	2	0	1	0	2	0	5
2018	0	0	4	1	0	0	5
Total	3	0	7	2	2	2	16
Average/Year	<1.0	--	1.2	<1.0	<1.0	<1.0	1.8

3. Traffic Characteristics of the Proposed Development

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

Proposed Site and Development Plan

As proposed, the plans call for developing the site with 148 single family homes. Access to the internal access road serving the homes will be provided as follows:

- A full movement access drives off Plum Grove Road approximately 275 feet north of Julie Drive that will provide one inbound lane and two outbound lanes with outbound movements under stop sign control. The outbound lanes should be striped to provide an exclusive left-turn lane and an exclusive right-turn lane. As part of the development, the existing left-turn lane serving Julie Drive as well as the existing mountable median on Plum Grove will be modified to provide a two-way left-turn lane along the site frontage.
- A full movement access drive off Summit Drive that will form the fourth (east) leg of the intersection of Summit Drive with Kingsport Drive. The access drive will provide one inbound lane and one outbound lane with outbound movements under stop sign control.

A copy of the preliminary site plan is included in the Appendix.

Directional Distribution

The directions from which residents of the homes 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 development-generated traffic.

Peak Hour Traffic Volumes

The number of peak hour trips estimated to be generated by the proposed development was based on vehicle trip generation rates contained in *Trip Generation Manual*, 10th Edition, published by the Institute of Transportation Engineers (ITE). The “Single-Family Detached Housing” (Land-Use Code 210) rate was used for the development. Copies of the trip generation worksheets are included in appendix. **Table 3** summarizes the trips projected to be generated by the proposed development and **Table 4** summarizes the equations utilized from the ITE Trip Generation Manual.

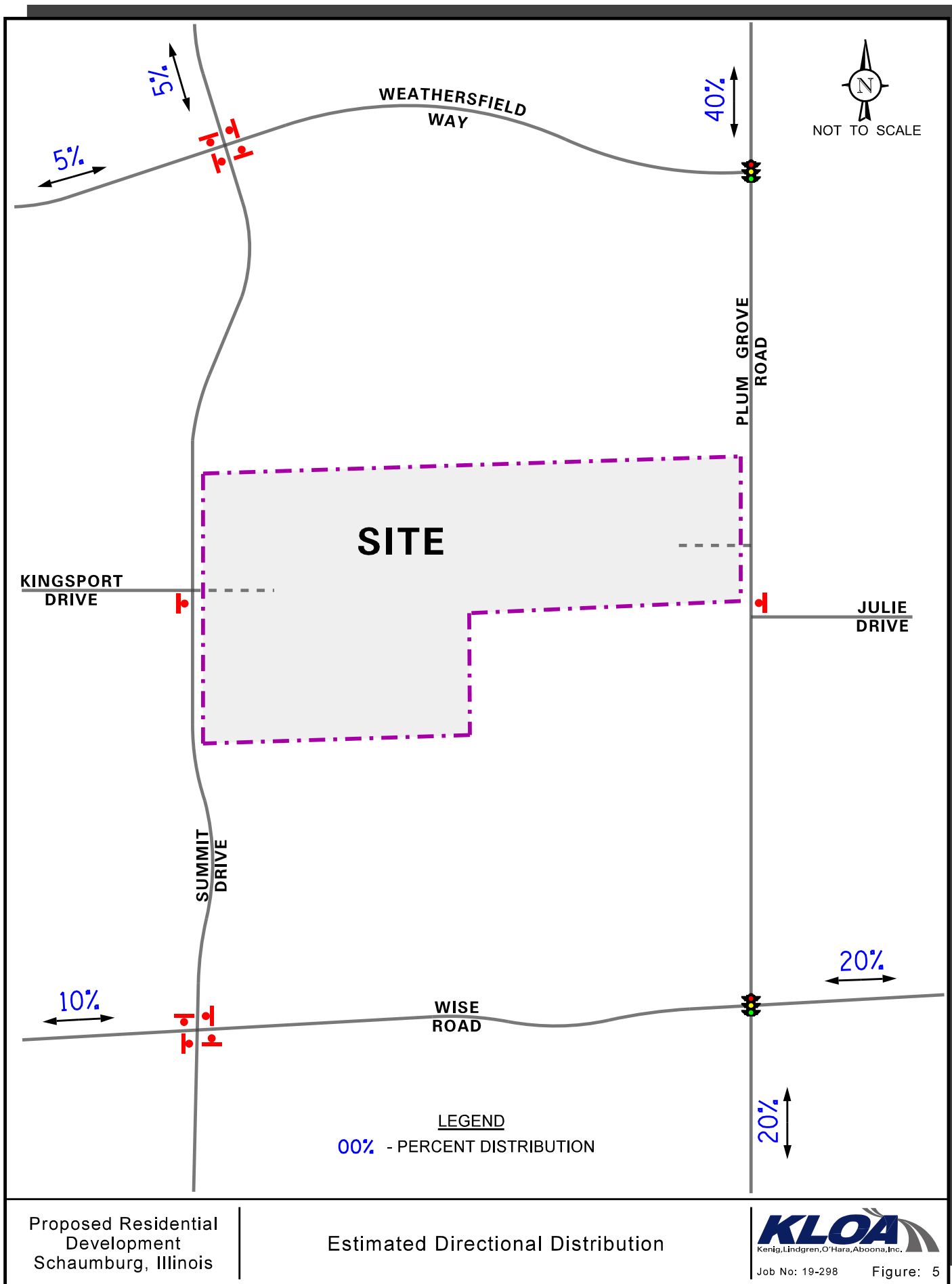


Table 6

PROJECTED SITE-GENERATED TRAFFIC VOLUMES

ITE Land Use Code	Type/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Daily Two-Way Traffic
		In	Out	Total	In	Out	Total	
210	Single-Family Homes (148 Homes)	28	82	110	93	55	148	1,492

Table 7

PROJECTED SITE-GENERATED TRAFFIC VOLUMES - EQUATIONS

ITE Land Use Code	Type/Size	Weekday Morning Peak Hour	Weekday Evening Peak Hour	Daily Two-Way Traffic
210	Single-Family Homes (Homes)	$T = .71*(X)+4.8$	$\ln(T) = .96*\ln(X)+0.2$	$\ln(T) = .92*\ln(X)+2.71$
T = Number of Trips X = Homes				

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 development.

Development Traffic Assignment

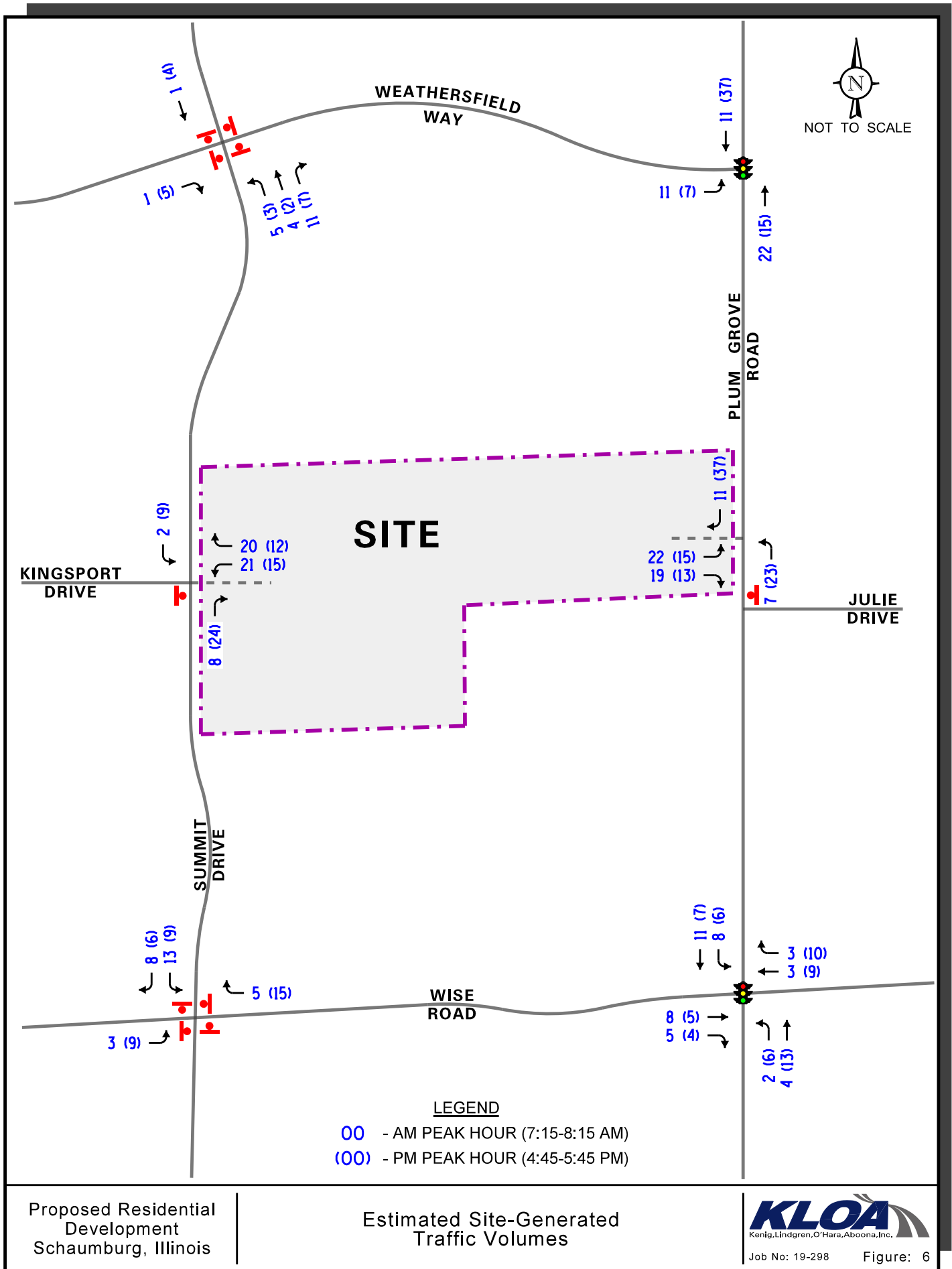
The estimated weekday morning and evening peak hour traffic volumes that will be generated by the proposed development were assigned to the roadway system in accordance with the previously described directional distribution (Figure 5). The traffic assignment for the development is illustrated in **Figure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

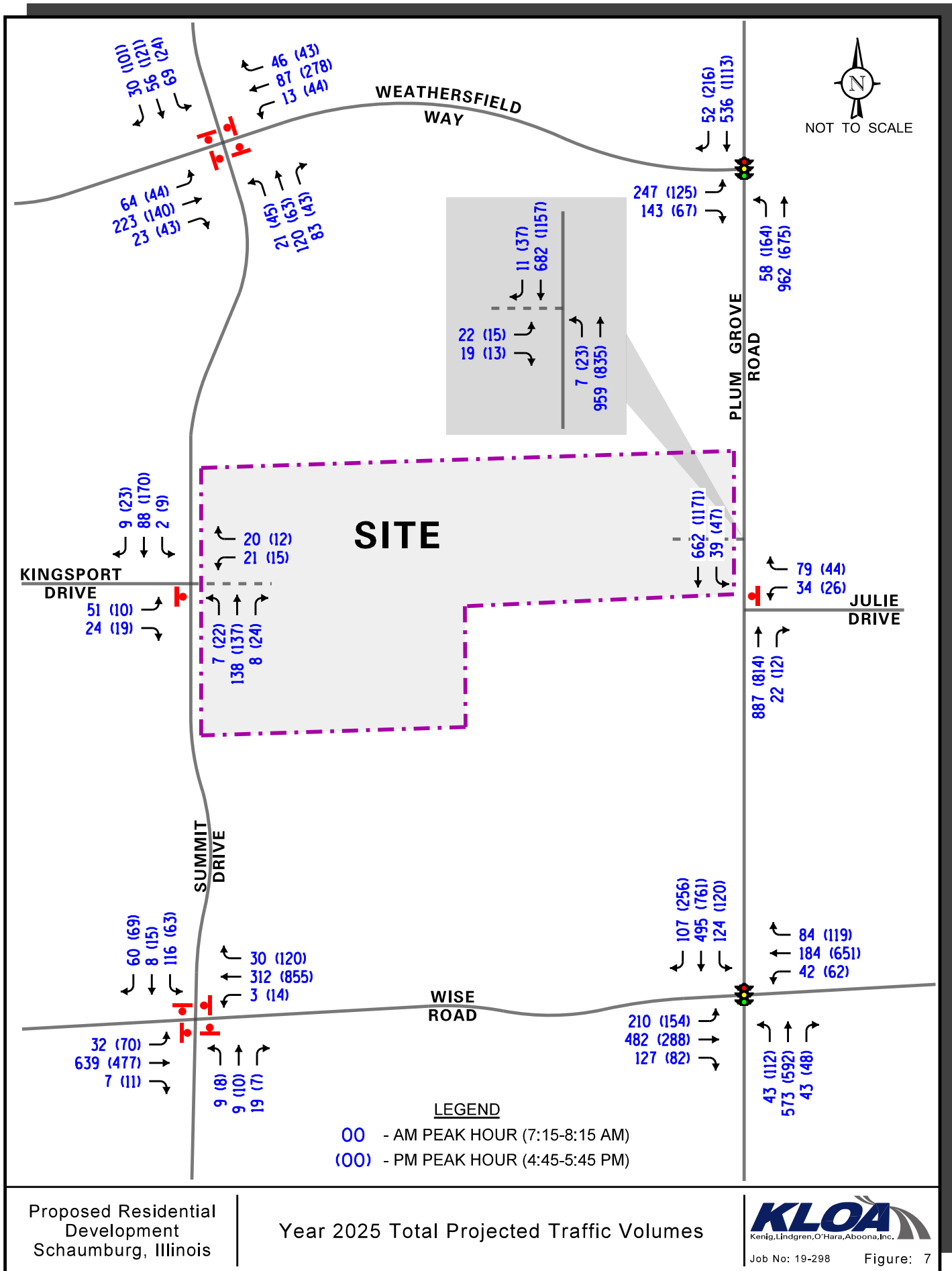
Background Traffic Conditions

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), the existing traffic volumes are projected to increase by compound annual growth rate of 1.1 percent per year. Traffic volumes were increased by a total of eight percent to represent Year 2025 conditions. A copy of the CMAP projections letter is included in the Appendix.

Total Projected Traffic Volumes

The development-generated traffic was added to the existing traffic volumes accounting for background growth to determine the Year 2025 total projected traffic volumes, as shown in **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 2025) traffic volumes.

The traffic analyses were performed using the methodologies outlined in the Transportation Research Board's *Highway Capacity Manual (HCM)*, 2010 and analyzed using the Synchro/SimTraffic 10 software. The analysis for the traffic-signal controlled intersections were accomplished using field measured cycle lengths and phasings to determine the average overall vehicle delay and levels of service.

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 2025 total projected conditions are presented in **Tables 8 through 11**. A discussion of the intersections follows. Summary sheets for the capacity analyses are included in the Appendix.

Table 8

CAPACITY ANALYSIS RESULTS – PLUM GROVE ROAD WITH WEATHERSFIELD WAY – SIGNALIZED

Year 2018 Existing Conditions	Peak Hour	Eastbound		Northbound		Southbound	Overall
		Left	Right	Left	Through	Through/Right	
	Weekday Morning Peak Hour	D 40.8	A 7.9	A 5.1	A 8.0	B 10.4	B 12.8
		C – 28.4		A – 7.8			
	Weekday Evening Peak Hour	D 41.7	B 11.3	A 6.2	A 3.9	B 12.8	B 11.3
C – 30.7		A – 4.4					
Year 2025 Projected Conditions	Weekday Morning Peak Hour	D 47.7	A 8.0	A 5.0	A 8.0	B 11.0	B 13.7
		C – 33.2		A – 7.8			
	Weekday Evening Peak Hour	D 43.9	B 11.5	B 10.0	A 4.4	B 14.9	B 13.0
		C – 32.7		A – 5.5			
Delay is measured in seconds. L - Left T- Through R - Right							

Table 9

CAPACITY ANALYSIS RESULTS – PLUM GROVE ROAD WITH WISE ROAD – SIGNALIZED

Year 2018 Existing Conditions	Peak Hour	Eastbound			Westbound		Northbound		Southbound		Overall	
		L	T	R	L	T/R	L	T/R	L	T/R		
	Weekday Morning Peak Hour	B 14.3	C 28.1	A 2.6	B 11.9	B 17.3	B 16.1	C 33.2	B 18.0	C 27.6	C 24.7	
		C – 20.5			B – 16.6		C – 32.2		C – 26.1			
	Weekday Evening Peak Hour	C 24.8	C 30.7	A 3.9	B 18.0	D 40.3	C 22.6	C 29.2	B 18.4	C 36.0	C 32.4	
		C – 24.8			D – 38.6		C – 28.3		C – 34.2			
	Year 2025 Projected Conditions	Weekday Morning Peak Hour	B 15.3	C 32.4	A 2.5	B 12.6	B 18.1	B 17.1	D 35.6	B 19.2	C 31.4	C 27.2
			C – 23.4			B – 17.3		C – 34.4		C – 29.3		
		Weekday Evening Peak Hour	C 26.8	C 30.4	A 3.6	B 17.7	D 41.1	C 28.7	C 32.4	C 21.1	D 44.1	D 36.1
			C – 25.1			D – 39.3		C – 31.9		D – 41.7		
Delay is measured in seconds. L – Left T- Through R - Right												

Table 10

CAPACITY ANALYSIS RESULTS – EXISTING CONDITIONS - UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Plum Grove Road with Julie Drive				
• Westbound Left Turns	C	22.2	C	22.4
• Westbound Right Turns	B	13.1	B	11.6
• Southbound Left Turns	B	11.2	A	9.7
Summit Drive with Weathersfield Way				
• Eastbound Approach	C	15.2	B	14.4
• Westbound Approach	B	10.7	C	21.6
• Northbound Approach	B	12.4	B	12.9
• Southbound Approach	B	11.5	C	15.3
Summit Drive with Kingsport Drive				
• Eastbound Approach	B	10.5	B	10.2
• Northbound Left Turns	A	7.7	A	7.7
Summit Drive with Wise Road¹				
• ICU Level of Service	A	45.9%	A	49.8%
LOS = Level of Service Delay is measured in seconds. 1 - The operation of this intersection is based on a critical volume to saturation flow (v/s) evaluation also known as the Intersection Capacity Utilization (ICU) method.				

Table 11

CAPACITY ANALYSIS RESULTS – PROJECTED CONDITIONS - UNSIGNALIZED

Intersection	Weekday Morning Peak Hour		Weekday Evening Peak Hour	
	LOS	Delay	LOS	Delay
Plum Grove Road with Julie Drive				
• Westbound Left Turns	C	24.5	C	24.9
• Westbound Right Turns	B	13.7	B	12.1
• Southbound Left Turns	B	11.7	A	10.0
Summit Drive with Weathersfield Way				
• Eastbound Approach	C	15.7	B	15.0
• Westbound Approach	B	10.9	C	22.7
• Northbound Approach	B	13.0	B	13.5
• Southbound Approach	B	11.7	C	16.0
Summit Drive with Kingsport Drive and the Site Access Drive				
• Eastbound Approach	B	11.1	B	10.6
• Westbound Approach	B	10.4	B	11.1
• Northbound Left Turns	A	7.7	A	7.7
• Southbound Left Turns	A	7.6	A	7.6
Summit Drive with Wise Road¹				
• ICU Level of Service	A	48.2%	A	54.0%
Plum Grove Road with Proposed the Site Access Drive				
• Eastbound Left Turns	C	18.0	D	27.7
• Eastbound Right Turns	B	10.8	B	13.8
• Northbound Left Turns	A	9.1	B	11.8
LOS = Level of Service Delay is measured in seconds. 1 - The operation of this intersection is based on a critical volume to saturation flow (v/s) evaluation also known as the Intersection Capacity Utilization (ICU) method.				

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 development-generated traffic.

Plum Grove Road with Weathersfield Way

The results of the capacity analyses indicate that the intersection currently operates at LOS B during the weekday morning and weekday evening peak hours. Under Year 2025 projected conditions, the intersection is projected to continue to operate at LOS B during both peak hours with an increase in delay of less than two seconds. It should be noted that the eastbound left-turn movements currently operate and are projected to continue to operate at LOS D. As such, this intersection has sufficient reserve capacity to accommodate the development-generated traffic and no roadway improvements or signal modifications are required at this intersection.

Plum Grove Road with Wise Road

The results of the capacity analyses indicate that the intersection currently operates at LOS C during the weekday morning and weekday evening peak hours. Under Year 2025 projected conditions, the intersection is projected to continue to operate at LOS C during both peak hours with an increase in delay of three to four seconds. As such, this intersection has sufficient reserve capacity to accommodate the development-generated traffic and no roadway improvements or signal modifications are required at this intersection.

Plum Grove Road with Julie Drive

The results of the capacity analyses indicate that the eastbound left-turn movement operates at LOS C and the eastbound right-turn movement operates at LOS B during the weekday morning and weekday evening peak hours. Under future conditions, both westbound movements are projected to operate at the same LOS during the peak hours with increases in delay of less than three seconds. Further, the southbound left-turn movement operates at LOS B or better during both peak hours and is projected to continue to operate at the same LOS during both peak hours. As previously mentioned, the southbound left-turn lane serving Julie Drive will be modified to provide a two-way left turn lane that will serve both Julie Drive and the proposed site. As such, the proposed development traffic will have a limited impact on the operations of this intersection and no additional roadway or traffic control improvements will be required.

Summit Drive with Weathersfield Way

The results of the capacity analyses indicate that all movements operate at LOS C or better during the weekday morning and weekday evening peak hours. Under future conditions, all movements are projected to operate at the same LOS during the peak hours with increases in delay of less than two seconds. As such, the proposed development traffic will have a limited impact on the operations of this intersection and no roadway or traffic control improvements will be required.

Summit Drive with Kingsport Drive and the Site Access Drive

The results of the capacity analyses indicate that the eastbound approach operates at LOS B during the weekday morning and weekday evening peak hours. Under projected conditions, the eastbound approach is projected to operate at the same LOS during the peak hours with increases in delay of less than one second. Further, the northbound left-turn movement operates at LOS A during both peak hours and is projected to continue to operate at the same LOS during both peak hours. The access drive (westbound) approach is projected to operate at LOS B during both peak hours and southbound left-turn movements into the site are projected to operate at LOS A during both peak hours.

When the projected traffic volumes are compared to the turn lane warrant guidelines published in Chapter 36 of the IDOT *Bureau of Design and Environment* (BDE) Manual, neither a northbound right-turn lane nor a southbound left-turn lane will be warranted during either peak hour. As such, the proposed addition of the site access drive as the fourth (east) leg of this intersection will have a limited impact on the existing operations of this intersection and the access drive will adequately accommodate site-generated traffic..

Summit Drive with Wise Road

Because of the traffic control configuration of this intersection, the intersection could not be analyzed using HCM procedures. Given this traffic control configuration and the limitations of the HCM procedures, the intersection was analyzed using the Intersection Capacity Utilization (ICU) level of service. The ICU indicates how much reserve capacity is available or how much an intersection is over capacity.

Based on the ICU analysis, the intersection currently utilizes approximately 45 to 50 percent of the capacity of the intersection. Under future conditions, it is projected that the intersection will utilize approximately 48 to 54 percent of the capacity of the intersection. As a result, the intersection will continue to operate efficiently and with minimal delays.

Plum Grove Road with the Site Access Drive

The results of the capacity analyses indicate that under projected conditions, eastbound left-turn movements will operate at LOS C during the weekday morning peak hour and LOS D during the evening peak hour. Further, the northbound left-turn movements into the site are projected to operate at LOS B or better during both peak hours. As previously mentioned, as part of the development, Plum Grove Road will be modified to provide a two-way left turn lane along the site frontage that will serve vehicles entering the site at this access drive. When the projected traffic volumes are compared to the turn lane warrant guidelines published in Chapter 36 of the IDOT *Bureau of Design and Environment* (BDE) Manual, a southbound right-turn lane is not warranted during either peak hour. A copy of the turn lane warrant is included in the appendix. As such, the access drive will adequately accommodate site-generated traffic.

6. Conclusion

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

- The results of the traffic impact study indicate that the development-generated traffic will not have a significant impact, and, as such, will be accommodated by the area roadways.
- The proposed access system on Plum Grove Road and Summit Drive will be adequate in accommodating the development-generated traffic and will ensure that efficient and flexible access is provided.
- As part of the development, the existing left-turn lane serving Julie Drive as well as the existing mountable median on Plum Grove Road will be modified to provide a two-way left-turn lane along the site frontage.
- Based on the guidelines provided in the IDOT BDE Manual and the projected traffic volumes, an exclusive right-turn and an exclusive left-turn lane are not required on Summit Drive serving the access road. Similarly, an exclusive right-turn lane is not required on Plum Grove Road serving the access road.

Appendix

Traffic Count Summary Sheets
Preliminary Site Plan
ITE Trip Generation Worksheets
CMAP Projections Letter
Level of Service Criteria
Capacity Analysis Summary
Sheets Turn Lane Warrant

Traffic Count Summary Sheets



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

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

Count Name: Plum Grove Rd & Julie Drive
Site Code:
Start Date: 10/09/2018
Page No: 1

Turning Movement Data

Start Time	Julie Drive Westbound					Plum Grove Rd Northbound					Plum Grove Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:00 AM	9	11	0	0	20	129	5	0	1	134	7	93	0	0	100	254
7:15 AM	15	23	0	0	38	198	8	0	2	206	15	179	0	0	194	438
7:30 AM	4	18	0	0	22	231	8	0	0	239	13	137	0	0	150	411
7:45 AM	4	22	0	0	26	221	3	0	0	224	8	135	0	0	143	393
Hourly Total	32	74	0	0	106	779	24	0	3	803	43	544	0	0	587	1496
8:00 AM	11	16	0	0	27	165	3	0	0	168	4	144	0	0	148	343
8:15 AM	5	17	0	0	22	200	8	0	0	208	7	115	0	0	122	352
8:30 AM	6	10	0	0	16	177	4	0	0	181	2	100	0	0	102	299
8:45 AM	10	7	0	0	17	159	5	0	0	164	5	105	1	0	111	292
Hourly Total	32	50	0	0	82	701	20	0	0	721	18	464	1	0	483	1286
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	8	10	0	0	18	116	14	0	0	130	11	176	0	0	187	335
4:15 PM	11	14	0	0	25	147	3	0	0	150	5	210	0	0	215	390
4:30 PM	12	16	0	0	28	163	4	0	0	167	12	197	0	0	209	404
4:45 PM	4	10	0	0	14	148	3	0	0	151	14	268	0	0	282	447
Hourly Total	35	50	0	0	85	574	24	0	0	598	42	851	0	0	893	1576
5:00 PM	7	8	0	0	15	176	0	0	0	176	8	250	0	0	258	449
5:15 PM	8	11	0	0	19	183	2	0	0	185	14	271	0	0	285	489
5:30 PM	7	15	0	0	22	225	7	0	0	232	11	252	0	0	263	517
5:45 PM	6	24	0	0	30	188	4	0	0	192	13	214	0	0	227	449
Hourly Total	28	58	0	0	86	772	13	0	0	785	46	987	0	0	1033	1904
Grand Total	127	232	0	0	359	2826	81	0	3	2907	149	2846	1	0	2996	6262
Approach %	35.4	64.6	0.0	-	-	97.2	2.8	0.0	-	-	5.0	95.0	0.0	-	-	-
Total %	2.0	3.7	0.0	-	5.7	45.1	1.3	0.0	-	46.4	2.4	45.4	0.0	-	47.8	-
Lights	123	218	0	-	341	2765	74	0	-	2839	139	2792	1	-	2932	6112
% Lights	96.9	94.0	-	-	95.0	97.8	91.4	-	-	97.7	93.3	98.1	100.0	-	97.9	97.6
Buses	2	11	0	-	13	40	7	0	-	47	8	33	0	-	41	101
% Buses	1.6	4.7	-	-	3.6	1.4	8.6	-	-	1.6	5.4	1.2	0.0	-	1.4	1.6
Single-Unit Trucks	1	2	0	-	3	15	0	0	-	15	1	16	0	-	17	35
% Single-Unit Trucks	0.8	0.9	-	-	0.8	0.5	0.0	-	-	0.5	0.7	0.6	0.0	-	0.6	0.6
Articulated Trucks	1	0	0	-	1	6	0	0	-	6	0	5	0	-	5	12
% Articulated Trucks	0.8	0.0	-	-	0.3	0.2	0.0	-	-	0.2	0.0	0.2	0.0	-	0.2	0.2
Bicycles on Road	0	1	0	-	1	0	0	0	-	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.4	-	-	0.3	0.0	0.0	-	-	0.0	0.7	0.0	0.0	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	3	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-



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

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

Count Name: Plum Grove Rd & Julie Drive
Site Code:
Start Date: 10/09/2018
Page No: 2

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Julie Drive Westbound					Plum Grove Rd Northbound					Plum Grove Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	
7:15 AM	15	23	0	0	38	198	8	0	2	206	15	179	0	0	194	438
7:30 AM	4	18	0	0	22	231	8	0	0	239	13	137	0	0	150	411
7:45 AM	4	22	0	0	26	221	3	0	0	224	8	135	0	0	143	393
8:00 AM	11	16	0	0	27	165	3	0	0	168	4	144	0	0	148	343
Total	34	79	0	0	113	815	22	0	2	837	40	595	0	0	635	1585
Approach %	30.1	69.9	0.0	-	-	97.4	2.6	0.0	-	-	6.3	93.7	0.0	-	-	-
Total %	2.1	5.0	0.0	-	7.1	51.4	1.4	0.0	-	52.8	2.5	37.5	0.0	-	40.1	-
PHF	0.567	0.859	0.000	-	0.743	0.882	0.688	0.000	-	0.876	0.667	0.831	0.000	-	0.818	0.905
Lights	33	72	0	-	105	782	18	0	-	800	31	569	0	-	600	1505
% Lights	97.1	91.1	-	-	92.9	96.0	81.8	-	-	95.6	77.5	95.6	-	-	94.5	95.0
Buses	1	6	0	-	7	27	4	0	-	31	7	19	0	-	26	64
% Buses	2.9	7.6	-	-	6.2	3.3	18.2	-	-	3.7	17.5	3.2	-	-	4.1	4.0
Single-Unit Trucks	0	1	0	-	1	4	0	0	-	4	1	4	0	-	5	10
% Single-Unit Trucks	0.0	1.3	-	-	0.9	0.5	0.0	-	-	0.5	2.5	0.7	-	-	0.8	0.6
Articulated Trucks	0	0	0	-	0	2	0	0	-	2	0	3	0	-	3	5
% Articulated Trucks	0.0	0.0	-	-	0.0	0.2	0.0	-	-	0.2	0.0	0.5	-	-	0.5	0.3
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	2.5	0.0	-	-	0.2	0.1
Pedestrians	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-

[illegible]



Kenig Lindgren O'Hara Aboona, Inc.
9575 W. Higgins Rd., Suite 400
Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Plum Grove Rd & Weathersfield Way
Site Code:
Start Date: 10/09/2018
Page No: 1

Turning Movement Data

Start Time	Weathersfield Way Eastbound					Plum Grove Rd Northbound					Plum Grove Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	40	19	0	0	59	9	128	0	0	137	91	5	0	0	96	292
7:15 AM	50	53	0	0	103	10	201	0	0	211	139	12	0	0	151	465
7:30 AM	71	28	0	0	99	7	240	0	0	247	114	9	0	0	123	469
7:45 AM	73	38	0	0	111	20	248	0	0	268	105	19	0	0	124	503
Hourly Total	234	138	0	0	372	46	817	0	0	863	449	45	0	0	494	1729
8:00 AM	42	24	0	0	66	21	181	0	0	202	128	12	0	0	140	408
8:15 AM	42	28	0	0	70	16	193	0	0	209	87	12	0	0	99	378
8:30 AM	43	26	0	0	69	22	163	0	0	185	78	9	0	0	87	341
8:45 AM	42	21	0	0	63	12	150	0	0	162	100	13	0	0	113	338
Hourly Total	169	99	0	0	268	71	687	0	0	758	393	46	0	0	439	1465
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	38	20	0	1	58	20	111	0	0	131	184	36	0	0	220	409
4:15 PM	28	13	0	0	41	29	126	0	0	155	175	44	0	1	219	415
4:30 PM	28	20	0	0	48	28	153	0	0	181	207	53	0	0	260	489
4:45 PM	34	20	0	0	54	33	141	0	0	174	259	61	0	0	320	548
Hourly Total	128	73	0	1	201	110	531	0	0	641	825	194	0	1	1019	1861
5:00 PM	32	10	0	0	42	35	139	0	0	174	253	53	0	0	306	522
5:15 PM	31	16	0	0	47	50	142	0	0	192	257	49	0	0	306	545
5:30 PM	21	21	0	0	42	46	189	1	0	236	226	53	0	0	279	557
5:45 PM	35	24	0	1	59	37	181	0	0	218	213	36	0	0	249	526
Hourly Total	119	71	0	1	190	168	651	1	0	820	949	191	0	0	1140	2150
Grand Total	650	381	0	2	1031	395	2686	1	0	3082	2616	476	0	1	3092	7205
Approach %	63.0	37.0	0.0	-	-	12.8	87.2	0.0	-	-	84.6	15.4	0.0	-	-	-
Total %	9.0	5.3	0.0	-	14.3	5.5	37.3	0.0	-	42.8	36.3	6.6	0.0	-	42.9	-
Lights	628	370	0	-	998	390	2608	1	-	2999	2554	467	0	-	3021	7018
% Lights	96.6	97.1	-	-	96.8	98.7	97.1	100.0	-	97.3	97.6	98.1	-	-	97.7	97.4
Buses	20	10	0	-	30	3	49	0	-	52	33	4	0	-	37	119
% Buses	3.1	2.6	-	-	2.9	0.8	1.8	0.0	-	1.7	1.3	0.8	-	-	1.2	1.7
Single-Unit Trucks	2	1	0	-	3	1	26	0	-	27	18	2	0	-	20	50
% Single-Unit Trucks	0.3	0.3	-	-	0.3	0.3	1.0	0.0	-	0.9	0.7	0.4	-	-	0.6	0.7
Articulated Trucks	0	0	0	-	0	1	1	0	-	2	11	2	0	-	13	15
% Articulated Trucks	0.0	0.0	-	-	0.0	0.3	0.0	0.0	-	0.1	0.4	0.4	-	-	0.4	0.2
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	1	0	-	1	3
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	0.1	0.0	0.2	-	-	0.0	0.0
Pedestrians	-	-	-	2	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	-	-	-	-	-	100.0	-	-

Start Time	Weathersfield Way Eastbound					Plum Grove Rd Northbound					Plum Grove Rd Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	50	53	0	0	103	10	201	0	0	211	139	12	0	0	151	465
7:30 AM	71	28	0	0	99	7	240	0	0	247	114	9	0	0	123	469
7:45 AM	73	38	0	0	111	20	248	0	0	268	105	19	0	0	124	503
8:00 AM	42	24	0	0	66	21	181	0	0	202	128	12	0	0	140	408
Total	236	143	0	0	379	58	870	0	0	928	486	52	0	0	538	1845
Approach %	62.3	37.7	0.0	-	-	6.3	93.8	0.0	-	-	90.3	9.7	0.0	-	-	-
Total %	12.8	7.8	0.0	-	20.5	3.1	47.2	0.0	-	50.3	26.3	2.8	0.0	-	29.2	-
PHF	0.808	0.675	0.000	-	0.854	0.690	0.877	0.000	-	0.866	0.874	0.684	0.000	-	0.891	0.917
Lights	219	137	0	-	356	57	819	0	-	876	456	50	0	-	506	1738
% Lights	92.8	95.8	-	-	93.9	98.3	94.1	-	-	94.4	93.8	96.2	-	-	94.1	94.2
Buses	16	6	0	-	22	0	34	0	-	34	21	2	0	-	23	79
% Buses	6.8	4.2	-	-	5.8	0.0	3.9	-	-	3.7	4.3	3.8	-	-	4.3	4.3
Single-Unit Trucks	1	0	0	-	1	1	14	0	-	15	7	0	0	-	7	23
% Single-Unit Trucks	0.4	0.0	-	-	0.3	1.7	1.6	-	-	1.6	1.4	0.0	-	-	1.3	1.2
Articulated Trucks	0	0	0	-	0	0	1	0	-	1	2	0	0	-	2	3
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.1	-	-	0.1	0.4	0.0	-	-	0.4	0.2
Bicycles on Road	0	0	0	-	0	0	2	0	-	2	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.2	-	-	0.2	0.0	0.0	-	-	0.0	0.1
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[illegible]



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

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

Count Name: Plum Grove Rd & Wise Rd
Site Code:
Start Date: 10/09/2018
Page No: 1

Turning Movement Data

Start Time	Wise Rd Eastbound						Wise Rd Westbound						Plum Grove Rd Northbound						Plum Grove Rd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	31	94	18	0	0	143	8	31	20	0	0	59	10	99	13	0	0	122	16	71	17	0	0	104	428
7:15 AM	49	118	37	0	0	204	3	32	22	0	0	57	10	121	9	0	0	140	28	152	21	0	0	201	602
7:30 AM	64	116	36	0	0	216	16	45	21	0	0	82	6	161	10	0	0	177	32	96	26	0	0	154	629
7:45 AM	46	114	25	0	0	185	11	44	16	0	0	71	12	127	10	0	0	149	25	91	26	0	0	142	547
Hourly Total	190	442	116	0	0	748	38	152	79	0	0	269	38	508	42	0	0	588	101	410	90	0	0	601	2206
8:00 AM	35	91	20	0	0	146	9	47	16	0	0	72	10	118	11	0	0	139	22	109	26	0	0	157	514
8:15 AM	54	101	20	0	0	175	13	55	13	0	0	81	6	132	12	0	0	150	19	90	24	0	0	133	539
8:30 AM	42	78	22	0	0	142	13	43	11	0	0	67	9	112	7	0	0	128	22	63	28	0	0	113	450
8:45 AM	49	91	21	0	0	161	4	48	8	0	0	60	8	99	15	0	0	122	14	78	29	0	0	121	464
Hourly Total	180	361	83	0	0	624	39	193	48	0	0	280	33	461	45	0	0	539	77	340	107	0	0	524	1967
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	30	65	20	0	0	115	13	118	20	0	0	151	18	67	15	0	0	100	15	103	52	0	0	170	536
4:15 PM	30	64	24	0	0	118	12	130	32	0	0	174	24	77	5	0	0	106	26	144	45	0	0	215	613
4:30 PM	36	85	11	0	0	132	13	118	25	0	0	156	33	107	7	0	0	147	18	142	45	0	0	205	640
4:45 PM	29	72	19	0	0	120	11	155	24	1	0	191	22	100	8	0	0	130	27	157	55	0	0	239	680
Hourly Total	125	286	74	0	0	485	49	521	101	1	0	672	97	351	35	0	0	483	86	546	197	0	0	829	2469
5:00 PM	37	56	15	0	0	108	17	139	32	0	0	188	19	129	11	0	0	159	27	189	62	0	0	278	733
5:15 PM	32	63	18	0	0	113	14	159	28	0	0	201	30	129	11	0	0	170	22	186	58	0	0	266	750
5:30 PM	45	71	22	0	0	138	14	147	17	0	0	178	27	177	11	0	0	215	30	166	62	0	0	258	789
5:45 PM	36	54	24	0	0	114	18	141	21	0	0	180	31	145	13	0	0	189	18	144	51	0	0	213	696
Hourly Total	150	244	79	0	0	473	63	586	98	0	0	747	107	580	46	0	0	733	97	685	233	0	0	1015	2968
Grand Total	645	1333	352	0	0	2330	189	1452	326	1	0	1968	275	1900	168	0	0	2343	361	1981	627	0	0	2969	9610
Approach %	27.7	57.2	15.1	0.0	-	-	9.6	73.8	16.6	0.1	-	-	11.7	81.1	7.2	0.0	-	-	12.2	66.7	21.1	0.0	-	-	-
Total %	6.7	13.9	3.7	0.0	-	24.2	2.0	15.1	3.4	0.0	-	20.5	2.9	19.8	1.7	0.0	-	24.4	3.8	20.6	6.5	0.0	-	30.9	-
Lights	613	1288	337	0	-	2238	177	1392	323	1	-	1893	262	1869	162	0	-	2293	354	1956	597	0	-	2907	9331
% Lights	95.0	96.6	95.7	-	-	96.1	93.7	95.9	99.1	100.0	-	96.2	95.3	98.4	96.4	-	-	97.9	98.1	98.7	95.2	-	-	97.9	97.1
Buses	25	35	14	0	-	74	9	53	3	0	-	65	10	15	5	0	-	30	7	8	20	0	-	35	204
% Buses	3.9	2.6	4.0	-	-	3.2	4.8	3.7	0.9	0.0	-	3.3	3.6	0.8	3.0	-	-	1.3	1.9	0.4	3.2	-	-	1.2	2.1
Single-Unit Trucks	6	9	1	0	-	16	3	3	0	0	-	6	3	10	1	0	-	14	0	15	7	0	-	22	58
% Single-Unit Trucks	0.9	0.7	0.3	-	-	0.7	1.6	0.2	0.0	0.0	-	0.3	1.1	0.5	0.6	-	-	0.6	0.0	0.8	1.1	-	-	0.7	0.6
Articulated Trucks	1	1	0	0	-	2	0	4	0	0	-	4	0	6	0	0	-	6	0	2	2	0	-	4	16
% Articulated Trucks	0.2	0.1	0.0	-	-	0.1	0.0	0.3	0.0	0.0	-	0.2	0.0	0.3	0.0	-	-	0.3	0.0	0.1	0.3	-	-	0.1	0.2
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	1	0	-	1	1
% Bicycles on Road	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	0.2	-	-	0.0	0.0
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

[illegible]

Start Time	Wise Rd Eastbound						Wise Rd Westbound						Plum Grove Rd Northbound						Plum Grove Rd Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	29	72	19	0	0	120	11	155	24	1	0	191	22	100	8	0	0	130	27	157	55	0	0	239	680
5:00 PM	37	56	15	0	0	108	17	139	32	0	0	188	19	129	11	0	0	159	27	189	62	0	0	278	733
5:15 PM	32	63	18	0	0	113	14	159	28	0	0	201	30	129	11	0	0	170	22	186	58	0	0	266	750
5:30 PM	45	71	22	0	0	138	14	147	17	0	0	178	27	177	11	0	0	215	30	166	62	0	0	258	789
Total	143	262	74	0	0	479	56	600	101	1	0	758	98	535	41	0	0	674	106	698	237	0	0	1041	2952
Approach %	29.9	54.7	15.4	0.0	-	-	7.4	79.2	13.3	0.1	-	-	14.5	79.4	6.1	0.0	-	-	10.2	67.1	22.8	0.0	-	-	-
Total %	4.8	8.9	2.5	0.0	-	16.2	1.9	20.3	3.4	0.0	-	25.7	3.3	18.1	1.4	0.0	-	22.8	3.6	23.6	8.0	0.0	-	35.3	-
PHF	0.794	0.910	0.841	0.000	-	0.868	0.824	0.943	0.789	0.250	-	0.943	0.817	0.756	0.932	0.000	-	0.784	0.883	0.923	0.956	0.000	-	0.936	0.935
Lights	143	258	74	0	-	475	56	595	99	1	-	751	98	535	41	0	-	674	106	692	233	0	-	1031	2931
% Lights	100.0	98.5	100.0	-	-	99.2	100.0	99.2	98.0	100.0	-	99.1	100.0	100.0	100.0	-	-	100.0	100.0	99.1	98.3	-	-	99.0	99.3
Buses	0	2	0	0	-	2	0	4	2	0	-	6	0	0	0	0	-	0	0	0	4	0	-	4	12
% Buses	0.0	0.8	0.0	-	-	0.4	0.0	0.7	2.0	0.0	-	0.8	0.0	0.0	0.0	-	-	0.0	0.0	0.0	1.7	-	-	0.4	0.4
Single-Unit Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	6	0	0	-	6	7
% Single-Unit Trucks	0.0	0.4	0.0	-	-	0.2	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.9	0.0	-	-	0.6	0.2
Articulated Trucks	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.4	0.0	-	-	0.2	0.0	0.2	0.0	0.0	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles on Road	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
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



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Count Name: Summit Drive & Weathersfield Way
Site Code:
Start Date: 10/09/2018
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Turning Movement Data

Start Time	Weathersfield Way Eastbound						Weathersfield Way Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	20	41	2	0	3	63	0	16	9	0	0	25	3	21	11	0	0	35	5	6	5	0	0	16	139
7:15 AM	13	74	8	0	0	95	1	30	4	0	0	35	3	18	12	0	0	33	21	8	7	0	0	36	199
7:30 AM	14	57	7	0	3	78	3	19	7	0	1	29	3	31	22	0	1	56	18	15	9	0	0	42	205
7:45 AM	24	57	5	0	0	86	5	20	17	0	0	42	4	37	21	0	0	62	19	21	10	0	0	50	240
Hourly Total	71	229	22	0	6	322	9	85	37	0	1	131	13	107	66	0	1	186	63	50	31	0	0	144	783
8:00 AM	13	35	3	0	0	51	4	18	18	0	3	40	6	30	17	0	0	53	11	11	4	0	0	26	170
8:15 AM	15	35	4	0	2	54	5	23	22	0	12	50	12	32	15	0	3	59	13	27	15	0	0	55	218
8:30 AM	10	57	8	0	2	75	1	27	8	0	8	36	12	18	8	0	6	38	10	17	10	0	1	37	186
8:45 AM	6	43	11	0	0	60	2	24	7	0	4	33	5	15	11	0	1	31	4	9	7	0	0	20	144
Hourly Total	44	170	26	0	4	240	12	92	55	0	27	159	35	95	51	0	10	181	38	64	36	0	1	138	718
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	6	41	7	0	6	54	13	47	10	0	6	70	6	18	13	0	2	37	20	37	27	0	0	84	245
4:15 PM	11	26	5	0	0	42	11	55	6	0	0	72	7	15	8	0	1	30	4	27	25	0	0	56	200
4:30 PM	3	43	5	0	1	51	12	60	8	0	1	80	10	20	10	0	0	40	10	35	25	0	0	70	241
4:45 PM	10	38	9	0	0	57	13	71	9	0	1	93	9	10	10	0	0	29	9	37	14	0	1	60	239
Hourly Total	30	148	26	0	7	204	49	233	33	0	8	315	32	63	41	0	3	136	43	136	91	0	1	270	925
5:00 PM	4	30	11	0	0	45	6	67	15	0	1	88	7	12	8	0	0	27	7	31	25	0	0	63	223
5:15 PM	16	37	7	0	0	60	14	68	7	0	0	89	14	17	5	0	0	36	3	27	28	0	0	58	243
5:30 PM	14	35	11	0	4	60	11	73	12	0	0	96	12	23	13	0	0	48	5	22	34	0	0	61	265
5:45 PM	14	40	9	0	0	63	6	58	8	0	0	72	7	16	14	0	0	37	5	25	25	0	0	55	227
Hourly Total	48	142	38	0	4	228	37	266	42	0	1	345	40	68	40	0	0	148	20	105	112	0	0	237	958
Grand Total	193	689	112	0	21	994	107	676	167	0	37	950	120	333	198	0	14	651	164	355	270	0	2	789	3384
Approach %	19.4	69.3	11.3	0.0	-	-	11.3	71.2	17.6	0.0	-	-	18.4	51.2	30.4	0.0	-	-	20.8	45.0	34.2	0.0	-	-	-
Total %	5.7	20.4	3.3	0.0	-	29.4	3.2	20.0	4.9	0.0	-	28.1	3.5	9.8	5.9	0.0	-	19.2	4.8	10.5	8.0	0.0	-	23.3	-
Lights	187	671	101	0	-	959	105	662	161	0	-	928	112	326	191	0	-	629	157	339	262	0	-	758	3274
% Lights	96.9	97.4	90.2	-	-	96.5	98.1	97.9	96.4	-	-	97.7	93.3	97.9	96.5	-	-	96.6	95.7	95.5	97.0	-	-	96.1	96.7
Buses	6	15	8	0	-	29	1	10	4	0	-	15	5	5	7	0	-	17	6	8	7	0	-	21	82
% Buses	3.1	2.2	7.1	-	-	2.9	0.9	1.5	2.4	-	-	1.6	4.2	1.5	3.5	-	-	2.6	3.7	2.3	2.6	-	-	2.7	2.4
Single-Unit Trucks	0	3	0	0	-	3	1	2	2	0	-	5	3	1	0	0	-	4	1	4	0	0	-	5	17
% Single-Unit Trucks	0.0	0.4	0.0	-	-	0.3	0.9	0.3	1.2	-	-	0.5	2.5	0.3	0.0	-	-	0.6	0.6	1.1	0.0	-	-	0.6	0.5
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	4	1	0	-	5	6
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	1.1	0.4	-	-	0.6	0.2
Bicycles on Road	0	0	3	0	-	3	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	5
% Bicycles on Road	0.0	0.0	2.7	-	-	0.3	0.0	0.1	0.0	-	-	0.1	0.0	0.3	0.0	-	-	0.2	0.0	0.0	0.0	-	-	0.0	0.1
Pedestrians	-	-	-	-	21	-	-	-	-	-	37	-	-	-	-	-	14	-	-	-	-	-	2	-	-



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Count Name: Summit Drive & Weathersfield Way
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Start Date: 10/09/2018
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Turning Movement Peak Hour Data (7:15 AM)

Start Time	Weathersfield Way Eastbound						Weathersfield Way Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	13	74	8	0	0	95	1	30	4	0	0	35	3	18	12	0	0	33	21	8	7	0	0	36	199
7:30 AM	14	57	7	0	3	78	3	19	7	0	1	29	3	31	22	0	1	56	18	15	9	0	0	42	205
7:45 AM	24	57	5	0	0	86	5	20	17	0	0	42	4	37	21	0	0	62	19	21	10	0	0	50	240
8:00 AM	13	35	3	0	0	51	4	18	18	0	3	40	6	30	17	0	0	53	11	11	4	0	0	26	170
Total	64	223	23	0	3	310	13	87	46	0	4	146	16	116	72	0	1	204	69	55	30	0	0	154	814
Approach %	20.6	71.9	7.4	0.0	-	-	8.9	59.6	31.5	0.0	-	-	7.8	56.9	35.3	0.0	-	-	44.8	35.7	19.5	0.0	-	-	-
Total %	7.9	27.4	2.8	0.0	-	38.1	1.6	10.7	5.7	0.0	-	17.9	2.0	14.3	8.8	0.0	-	25.1	8.5	6.8	3.7	0.0	-	18.9	-
PHF	0.667	0.753	0.719	0.000	-	0.816	0.650	0.725	0.639	0.000	-	0.869	0.667	0.784	0.818	0.000	-	0.823	0.821	0.655	0.750	0.000	-	0.770	0.848
Lights	62	211	15	0	-	288	13	85	44	0	-	142	14	115	69	0	-	198	65	49	28	0	-	142	770
% Lights	96.9	94.6	65.2	-	-	92.9	100.0	97.7	95.7	-	-	97.3	87.5	99.1	95.8	-	-	97.1	94.2	89.1	93.3	-	-	92.2	94.6
Buses	2	11	7	0	-	20	0	2	1	0	-	3	1	1	3	0	-	5	4	6	2	0	-	12	40
% Buses	3.1	4.9	30.4	-	-	6.5	0.0	2.3	2.2	-	-	2.1	6.3	0.9	4.2	-	-	2.5	5.8	10.9	6.7	-	-	7.8	4.9
Single-Unit Trucks	0	1	0	0	-	1	0	0	1	0	-	1	1	0	0	0	-	1	0	0	0	0	-	0	3
% Single-Unit Trucks	0.0	0.4	0.0	-	-	0.3	0.0	0.0	2.2	-	-	0.7	6.3	0.0	0.0	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	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
Bicycles on Road	0	0	1	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	4.3	-	-	0.3	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	-	-	-	-	3	-	-	-	-	-	4	-	-	-	-	-	1	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-



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Count Name: Summit Drive & Weathersfield Way
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Turning Movement Peak Hour Data (4:45 PM)

Start Time	Weathersfield Way Eastbound						Weathersfield Way Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	10	38	9	0	0	57	13	71	9	0	1	93	9	10	10	0	0	29	9	37	14	0	1	60	239
5:00 PM	4	30	11	0	0	45	6	67	15	0	1	88	7	12	8	0	0	27	7	31	25	0	0	63	223
5:15 PM	16	37	7	0	0	60	14	68	7	0	0	89	14	17	5	0	0	36	3	27	28	0	0	58	243
5:30 PM	14	35	11	0	4	60	11	73	12	0	0	96	12	23	13	0	0	48	5	22	34	0	0	61	265
Total	44	140	38	0	4	222	44	279	43	0	2	366	42	62	36	0	0	140	24	117	101	0	1	242	970
Approach %	19.8	63.1	17.1	0.0	-	-	12.0	76.2	11.7	0.0	-	-	30.0	44.3	25.7	0.0	-	-	9.9	48.3	41.7	0.0	-	-	-
Total %	4.5	14.4	3.9	0.0	-	22.9	4.5	28.8	4.4	0.0	-	37.7	4.3	6.4	3.7	0.0	-	14.4	2.5	12.1	10.4	0.0	-	24.9	-
PHF	0.688	0.921	0.864	0.000	-	0.925	0.786	0.955	0.717	0.000	-	0.953	0.750	0.674	0.692	0.000	-	0.729	0.667	0.791	0.743	0.000	-	0.960	0.915
Lights	44	138	38	0	-	220	44	276	42	0	-	362	42	61	36	0	-	139	24	113	101	0	-	238	959
% Lights	100.0	98.6	100.0	-	-	99.1	100.0	98.9	97.7	-	-	98.9	100.0	98.4	100.0	-	-	99.3	100.0	96.6	100.0	-	-	98.3	98.9
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
% 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	2	0	0	-	2	0	1	1	0	-	2	0	0	0	0	-	0	0	1	0	0	-	1	5
% Single-Unit Trucks	0.0	1.4	0.0	-	-	0.9	0.0	0.4	2.3	-	-	0.5	0.0	0.0	0.0	-	-	0.0	0.0	0.9	0.0	-	-	0.4	0.5
Articulated Trucks	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	3	0	0	-	3	4
% Articulated Trucks	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	2.6	0.0	-	-	1.2	0.4
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	-	-	0.0	0.0	0.4	0.0	-	-	0.3	0.0	1.6	0.0	-	-	0.7	0.0	0.0	0.0	-	-	0.0	0.2
Pedestrians	-	-	-	-	4	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



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Count Name: Summit Drive & Kingsport Drive
Site Code:
Start Date: 10/09/2018
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Turning Movement Data

Start Time	Kingsport Drive Eastbound					Summit Drive Northbound					Summit Drive Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	2	6	0	0	8	2	30	0	0	32	16	0	0	0	16	56
7:15 AM	11	5	0	0	16	0	19	0	0	19	20	1	0	0	21	56
7:30 AM	16	5	0	0	21	1	44	0	0	45	20	0	0	0	20	86
7:45 AM	11	4	0	0	15	2	32	0	0	34	31	0	0	1	31	80
Hourly Total	40	20	0	0	60	5	125	0	0	130	87	1	0	1	88	278
8:00 AM	13	10	0	0	23	4	43	0	0	47	17	8	0	0	25	95
8:15 AM	7	3	0	0	10	1	51	0	0	52	29	5	0	0	34	96
8:30 AM	4	0	0	3	4	2	24	1	0	27	18	7	0	0	25	56
8:45 AM	6	6	0	0	12	1	23	0	0	24	10	5	0	0	15	51
Hourly Total	30	19	0	3	49	8	141	1	0	150	74	25	0	0	99	298
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	6	5	0	2	11	5	30	0	0	35	34	10	0	0	44	90
4:15 PM	5	6	0	5	11	4	25	0	0	29	37	9	0	0	46	86
4:30 PM	5	2	0	1	7	4	31	0	0	35	43	12	0	0	55	97
4:45 PM	2	4	0	0	6	5	28	0	0	33	41	2	0	0	43	82
Hourly Total	18	17	0	8	35	18	114	0	0	132	155	33	0	0	188	355
5:00 PM	2	5	0	1	7	3	32	0	0	35	47	10	0	0	57	99
5:15 PM	3	4	0	1	7	10	31	0	0	41	40	6	0	0	46	94
5:30 PM	3	6	0	2	9	4	46	0	0	50	42	5	0	0	47	106
5:45 PM	9	4	0	1	13	6	29	0	0	35	43	5	0	0	48	96
Hourly Total	17	19	0	5	36	23	138	0	0	161	172	26	0	0	198	395
Grand Total	105	75	0	16	180	54	518	1	0	573	488	85	0	1	573	1326
Approach %	58.3	41.7	0.0	-	-	9.4	90.4	0.2	-	-	85.2	14.8	0.0	-	-	-
Total %	7.9	5.7	0.0	-	13.6	4.1	39.1	0.1	-	43.2	36.8	6.4	0.0	-	43.2	-
Lights	101	69	0	-	170	49	501	1	-	551	472	83	0	-	555	1276
% Lights	96.2	92.0	-	-	94.4	90.7	96.7	100.0	-	96.2	96.7	97.6	-	-	96.9	96.2
Buses	2	6	0	-	8	4	16	0	-	20	12	2	0	-	14	42
% Buses	1.9	8.0	-	-	4.4	7.4	3.1	0.0	-	3.5	2.5	2.4	-	-	2.4	3.2
Single-Unit Trucks	2	0	0	-	2	1	1	0	-	2	4	0	0	-	4	8
% Single-Unit Trucks	1.9	0.0	-	-	1.1	1.9	0.2	0.0	-	0.3	0.8	0.0	-	-	0.7	0.6
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	16	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	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: Summit Drive & Kingsport Drive
Site Code:
Start Date: 10/09/2018
Page No: 2

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Kingsport Drive Eastbound					Summit Drive Northbound					Summit Drive Southbound					Int. Total
	Left	Right	U-Turn	Peds	App. Total	Left	Thru	U-Turn	Peds	App. Total	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	11	5	0	0	16	0	19	0	0	19	20	1	0	0	21	56
7:30 AM	16	5	0	0	21	1	44	0	0	45	20	0	0	0	20	86
7:45 AM	11	4	0	0	15	2	32	0	0	34	31	0	0	1	31	80
8:00 AM	13	10	0	0	23	4	43	0	0	47	17	8	0	0	25	95
Total	51	24	0	0	75	7	138	0	0	145	88	9	0	1	97	317
Approach %	68.0	32.0	0.0	-	-	4.8	95.2	0.0	-	-	90.7	9.3	0.0	-	-	-
Total %	16.1	7.6	0.0	-	23.7	2.2	43.5	0.0	-	45.7	27.8	2.8	0.0	-	30.6	-
PHF	0.797	0.600	0.000	-	0.815	0.438	0.784	0.000	-	0.771	0.710	0.281	0.000	-	0.782	0.834
Lights	50	20	0	-	70	5	132	0	-	137	80	8	0	-	88	295
% Lights	98.0	83.3	-	-	93.3	71.4	95.7	-	-	94.5	90.9	88.9	-	-	90.7	93.1
Buses	1	4	0	-	5	2	6	0	-	8	7	1	0	-	8	21
% Buses	2.0	16.7	-	-	6.7	28.6	4.3	-	-	5.5	8.0	11.1	-	-	8.2	6.6
Single-Unit Trucks	0	0	0	-	0	0	0	0	-	0	1	0	0	-	1	1
% Single-Unit Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	1.1	0.0	-	-	1.0	0.3
Articulated Trucks	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Articulated Trucks	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Road	0	0	0	-	0	0	0	0	-	0	0	0	0	-	0	0
% Bicycles on Road	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0	0.0	-	-	0.0	0.0
Pedestrians	-	-	-	0	-	-	-	-	0	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

[illegible]



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9575 W. Higgins Rd., Suite 400

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

Count Name: Summit Drive & Wise Road
Site Code:
Start Date: 10/09/2018
Page No: 1

Turning Movement Data

Start Time	Wise Rd Eastbound						Wise Rd Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:00 AM	15	123	3	0	0	141	0	58	6	0	0	64	2	3	5	0	0	10	18	1	23	0	1	42	257
7:15 AM	2	145	2	0	0	149	0	62	3	0	0	65	1	0	6	0	0	7	28	5	12	0	0	45	266
7:30 AM	10	175	2	0	0	187	0	74	5	0	0	79	2	1	3	0	0	6	28	0	14	0	1	42	314
7:45 AM	8	143	1	0	0	152	0	80	9	0	0	89	6	5	4	0	0	15	26	1	18	0	0	45	301
Hourly Total	35	586	8	0	0	629	0	274	23	0	0	297	11	9	18	0	0	38	100	7	67	0	2	174	1138
8:00 AM	9	129	2	0	0	140	3	73	8	0	0	84	0	3	6	0	0	9	21	3	8	0	0	32	265
8:15 AM	6	138	0	0	0	144	0	84	9	0	1	93	4	0	4	0	0	8	16	1	9	0	0	26	271
8:30 AM	6	131	1	0	0	138	3	76	4	0	0	83	2	2	1	0	0	5	13	0	10	0	3	23	249
8:45 AM	9	125	1	0	0	135	2	80	4	0	0	86	3	2	3	0	0	8	12	3	5	0	2	20	249
Hourly Total	30	523	4	0	0	557	8	313	25	0	1	346	9	7	14	0	0	30	62	7	32	0	5	101	1034
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4:00 PM	15	96	4	0	0	115	6	153	15	0	0	174	4	3	1	0	0	8	12	5	17	0	0	34	331
4:15 PM	11	115	3	0	2	129	6	168	24	0	0	198	2	3	2	0	0	7	16	7	14	0	0	37	371
4:30 PM	20	106	2	0	0	128	6	178	23	0	1	207	5	2	2	0	0	9	6	3	20	0	0	29	373
4:45 PM	11	111	3	0	0	125	3	189	25	0	0	217	2	4	1	0	0	7	11	4	18	0	0	33	382
Hourly Total	57	428	12	0	2	497	21	688	87	0	1	796	13	12	6	0	0	31	45	19	69	0	0	133	1457
5:00 PM	19	103	1	0	0	123	3	193	22	0	0	218	2	2	3	0	0	7	11	7	13	0	0	31	379
5:15 PM	15	107	4	0	0	126	3	204	32	0	0	239	3	2	0	0	0	5	13	1	16	0	0	30	400
5:30 PM	16	121	3	0	0	140	5	207	26	0	0	238	1	2	3	0	0	6	19	3	16	0	1	38	422
5:45 PM	12	93	8	0	0	113	0	185	26	0	0	211	6	1	2	0	0	9	13	3	20	0	2	36	369
Hourly Total	62	424	16	0	0	502	11	789	106	0	0	906	12	7	8	0	0	27	56	14	65	0	3	135	1570
Grand Total	184	1961	40	0	2	2185	40	2064	241	0	2	2345	45	35	46	0	0	126	263	47	233	0	10	543	5199
Approach %	8.4	89.7	1.8	0.0	-	-	1.7	88.0	10.3	0.0	-	-	35.7	27.8	36.5	0.0	-	-	48.4	8.7	42.9	0.0	-	-	-
Total %	3.5	37.7	0.8	0.0	-	42.0	0.8	39.7	4.6	0.0	-	45.1	0.9	0.7	0.9	0.0	-	2.4	5.1	0.9	4.5	0.0	-	10.4	-
Lights	180	1887	36	0	-	2103	39	1975	225	0	-	2239	41	32	39	0	-	112	252	43	221	0	-	516	4970
% Lights	97.8	96.2	90.0	-	-	96.2	97.5	95.7	93.4	-	-	95.5	91.1	91.4	84.8	-	-	88.9	95.8	91.5	94.8	-	-	95.0	95.6
Buses	4	62	0	0	-	66	1	73	13	0	-	87	3	2	7	0	-	12	10	1	8	0	-	19	184
% Buses	2.2	3.2	0.0	-	-	3.0	2.5	3.5	5.4	-	-	3.7	6.7	5.7	15.2	-	-	9.5	3.8	2.1	3.4	-	-	3.5	3.5
Single-Unit Trucks	0	9	4	0	-	13	0	11	3	0	-	14	0	1	0	0	-	1	0	1	2	0	-	3	31
% Single-Unit Trucks	0.0	0.5	10.0	-	-	0.6	0.0	0.5	1.2	-	-	0.6	0.0	2.9	0.0	-	-	0.8	0.0	2.1	0.9	-	-	0.6	0.6
Articulated Trucks	0	3	0	0	-	3	0	4	0	0	-	4	1	0	0	0	-	1	1	1	2	0	-	4	12
% Articulated Trucks	0.0	0.2	0.0	-	-	0.1	0.0	0.2	0.0	-	-	0.2	2.2	0.0	0.0	-	-	0.8	0.4	2.1	0.9	-	-	0.7	0.2
Bicycles on Road	0	0	0	0	-	0	0	1	0	0	-	1	0	0	0	0	-	0	0	1	0	0	-	1	2
% Bicycles on Road	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	2.1	0.0	-	-	0.2	0.0
Pedestrians	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	10	-	-



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

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

Count Name: Summit Drive & Wise Road
Site Code:
Start Date: 10/09/2018
Page No: 3

Turning Movement Peak Hour Data (7:15 AM)

Start Time	Wise Rd Eastbound						Wise Rd Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
7:15 AM	2	145	2	0	0	149	0	62	3	0	0	65	1	0	6	0	0	7	28	5	12	0	0	45	266
7:30 AM	10	175	2	0	0	187	0	74	5	0	0	79	2	1	3	0	0	6	28	0	14	0	1	42	314
7:45 AM	8	143	1	0	0	152	0	80	9	0	0	89	6	5	4	0	0	15	26	1	18	0	0	45	301
8:00 AM	9	129	2	0	0	140	3	73	8	0	0	84	0	3	6	0	0	9	21	3	8	0	0	32	265
Total	29	592	7	0	0	628	3	289	25	0	0	317	9	9	19	0	0	37	103	9	52	0	1	164	1146
Approach %	4.6	94.3	1.1	0.0	-	-	0.9	91.2	7.9	0.0	-	-	24.3	24.3	51.4	0.0	-	-	62.8	5.5	31.7	0.0	-	-	-
Total %	2.5	51.7	0.6	0.0	-	54.8	0.3	25.2	2.2	0.0	-	27.7	0.8	0.8	1.7	0.0	-	3.2	9.0	0.8	4.5	0.0	-	14.3	-
PHF	0.725	0.846	0.875	0.000	-	0.840	0.250	0.903	0.694	0.000	-	0.890	0.375	0.450	0.792	0.000	-	0.617	0.920	0.450	0.722	0.000	-	0.911	0.912
Lights	28	557	6	0	-	591	2	275	21	0	-	298	8	8	15	0	-	31	96	7	49	0	-	152	1072
% Lights	96.6	94.1	85.7	-	-	94.1	66.7	95.2	84.0	-	-	94.0	88.9	88.9	78.9	-	-	83.8	93.2	77.8	94.2	-	-	92.7	93.5
Buses	1	31	0	0	-	32	1	12	4	0	-	17	0	1	4	0	-	5	7	1	3	0	-	11	65
% Buses	3.4	5.2	0.0	-	-	5.1	33.3	4.2	16.0	-	-	5.4	0.0	11.1	21.1	-	-	13.5	6.8	11.1	5.8	-	-	6.7	5.7
Single-Unit Trucks	0	2	1	0	-	3	0	2	0	0	-	2	0	0	0	0	-	0	0	0	0	0	-	0	5
% Single-Unit Trucks	0.0	0.3	14.3	-	-	0.5	0.0	0.7	0.0	-	-	0.6	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.4
Articulated Trucks	0	2	0	0	-	2	0	0	0	0	-	0	1	0	0	0	-	1	0	0	0	0	-	0	3
% Articulated Trucks	0.0	0.3	0.0	-	-	0.3	0.0	0.0	0.0	-	-	0.0	11.1	0.0	0.0	-	-	2.7	0.0	0.0	0.0	-	-	0.0	0.3
Bicycles on Road	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	1
% Bicycles on Road	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	11.1	0.0	-	-	0.6	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-



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

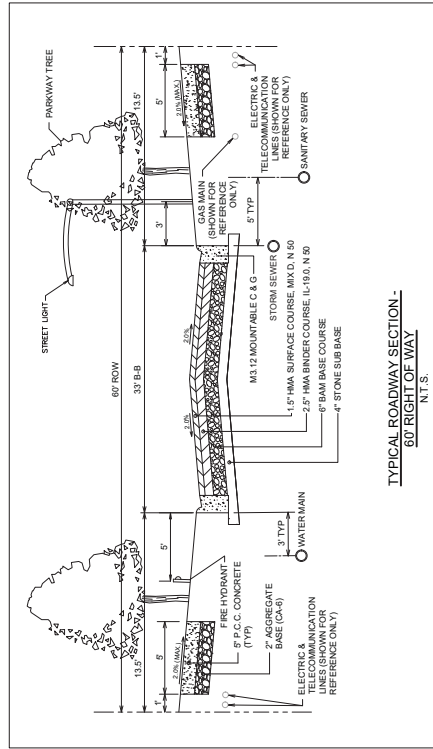
Rosemont, Illinois, United States 60018
(847)518-9990

Count Name: Summit Drive & Wise Road
Site Code:
Start Date: 10/09/2018
Page No: 4

Turning Movement Peak Hour Data (4:45 PM)

Start Time	Wise Rd Eastbound						Wise Rd Westbound						Summit Drive Northbound						Summit Drive Southbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
4:45 PM	11	111	3	0	0	125	3	189	25	0	0	217	2	4	1	0	0	7	11	4	18	0	0	33	382
5:00 PM	19	103	1	0	0	123	3	193	22	0	0	218	2	2	3	0	0	7	11	7	13	0	0	31	379
5:15 PM	15	107	4	0	0	126	3	204	32	0	0	239	3	2	0	0	0	5	13	1	16	0	0	30	400
5:30 PM	16	121	3	0	0	140	5	207	26	0	0	238	1	2	3	0	0	6	19	3	16	0	1	38	422
Total	61	442	11	0	0	514	14	793	105	0	0	912	8	10	7	0	0	25	54	15	63	0	1	132	1583
Approach %	11.9	86.0	2.1	0.0	-	-	1.5	87.0	11.5	0.0	-	-	32.0	40.0	28.0	0.0	-	-	40.9	11.4	47.7	0.0	-	-	-
Total %	3.9	27.9	0.7	0.0	-	32.5	0.9	50.1	6.6	0.0	-	57.6	0.5	0.6	0.4	0.0	-	1.6	3.4	0.9	4.0	0.0	-	8.3	-
PHF	0.803	0.913	0.688	0.000	-	0.918	0.700	0.958	0.820	0.000	-	0.954	0.667	0.625	0.583	0.000	-	0.893	0.711	0.536	0.875	0.000	-	0.868	0.938
Lights	61	440	10	0	-	511	14	783	102	0	-	899	8	10	6	0	-	24	54	14	63	0	-	131	1565
% Lights	100.0	99.5	90.9	-	-	99.4	100.0	98.7	97.1	-	-	98.6	100.0	100.0	85.7	-	-	96.0	100.0	93.3	100.0	-	-	99.2	98.9
Buses	0	1	0	0	-	1	0	8	1	0	-	9	0	0	1	0	-	1	0	0	0	0	-	0	11
% Buses	0.0	0.2	0.0	-	-	0.2	0.0	1.0	1.0	-	-	1.0	0.0	0.0	14.3	-	-	4.0	0.0	0.0	0.0	-	-	0.0	0.7
Single-Unit Trucks	0	1	1	0	-	2	0	1	2	0	-	3	0	0	0	0	-	0	0	1	0	0	-	1	6
% Single-Unit Trucks	0.0	0.2	9.1	-	-	0.4	0.0	0.1	1.9	-	-	0.3	0.0	0.0	0.0	-	-	0.0	0.0	6.7	0.0	-	-	0.8	0.4
Articulated Trucks	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Articulated Trucks	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
Bicycles on Road	0	0	0	0	-	0	0	1	0	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	0.1	0.0	-	-	0.1	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Pedestrians	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-

Preliminary Site Plan



TYPICAL ROADWAY SECTION -
60' RIGHT OF WAY
N.T.S.

SITE DATA

PROPOSED ZONING: R-4C
 SITE AREA = 62.04 ACRES
 TOTAL LOTS = 148
 DENSITY = 2.4 DU/AC
 ROW WIDTH = 60'
 MIN. STANDARD LOT = 8,100 SF
 MIN. CORNER LOT = 10,732 SF
 TYP. STANDARD LOT = 60' x 135'
 TYP. CORNER LOT = 84' x 135'

CURVE TABLE

CURVE TABLE					
CURVE	P.I. Data	P.C. DATA	P.T. DATA	CHORD DATA	CURVE DATA
CURVE 1	P.I. STA. 25+65.74	P.C. STA. 24+70.00	P.T. STA. 26+16.50	ANGLE N48°31'17"W DISTANCE 13111	ANGLE 146.87° RADIUS 96.87
CURVE 2	P.I. STA. 34+94.15	P.C. STA. 34+09.46	P.T. STA. 35+45.37	ANGLE N44°22'20"E DISTANCE 12335	LENGTH 135.90 RADIUS 96.87
CURVE 3	P.I. STA. 49+80.05	P.C. STA. 48+49.05	P.T. STA. 50+32.23	ANGLE N44°22'20"E DISTANCE 12726	ANGLE 93.00° RADIUS 96.87
CURVE 4	P.I. STA. 76+24.13	P.C. STA. 73+41.08	P.T. STA. 77+44.94	ANGLE N44°22'20"E DISTANCE 14118	ANGLE 100.50° RADIUS 300.00
CURVE 5	P.I. STA. 85+48.10	P.C. STA. 82+47.07	P.T. STA. 88+43.07	ANGLE N89°30'07"E DISTANCE 20042	LENGTH 200.43 RADIUS 2000.00
CURVE 6	P.I. STA. 89+47.67	P.C. STA. 88+43.07	P.T. STA. 90+47.70		

LINE TABLE

LINE TABLE				
LINE	ANGLE	DISTANCE	START STATION	END STATION
LINE 1	S89°33'E	214.65	10+00	12+14.65
LINE 2	S57°17'00"	61.26	20+00	20+61.26
LINE 3	S88°30'30"	408.81	20+61.26	24+70.06
LINE 4	N00°09'47"	792.53	26+16.93	34+09.46
LINE 5	N68°37'54"	1345.49	35+45.37	48+90.85
LINE 6	S03°22'06"	271.59	50+32.23	53+03.81
LINE 7	N03°22'06"	348.00	60+00	63+48
LINE 8	N00°09'47"	341.83	70+00	73+41.83
LINE 9	N68°37'54"	693.02	77+94.84	84+87.86
LINE 10	S87°37'29"	156.71	86+48.76	88+47.07
LINE 11	N68°37'47"	627.15	90+48.76	96+75.85
LINE 12	S87°37'29"	156.71	96+75.85	98+47.07

ITE Trip Generation Worksheets

Land Use: 210

Single-Family Detached Housing

Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project, and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations, and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas, and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

Time-of-day distribution data for this land use are presented in Appendix A. For the six general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:15 and 8:15 a.m. and 4:00 and 5:00 p.m., respectively. For the two sites with Saturday data, the overall highest vehicle volume was counted between 3:00 and 4:00 p.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 10:15 and 11:15 a.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, Connecticut, Delaware, Illinois, Indiana, Maryland, Minnesota, Montana, New Jersey, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, and Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 903, 925, 936

Single-Family Detached Housing (210)

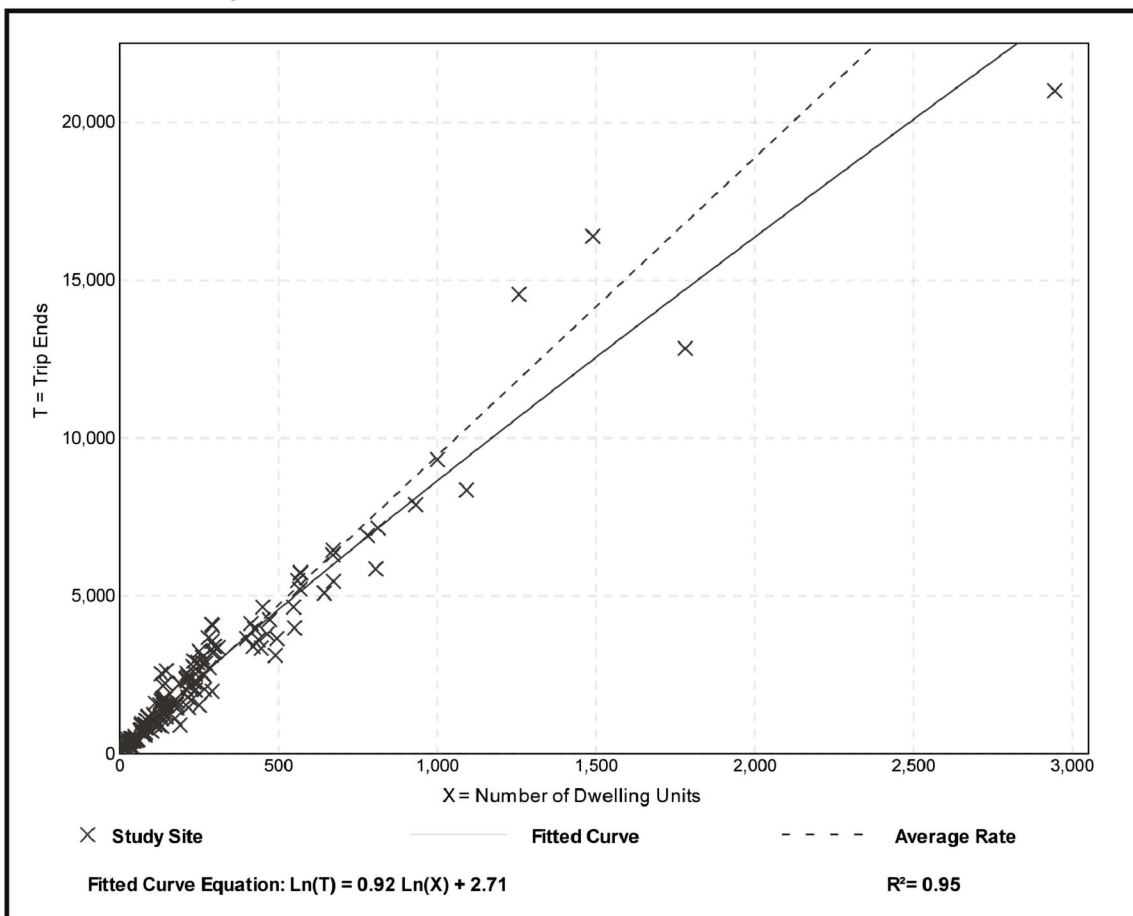
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 159
Avg. Num. of Dwelling Units: 264
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.44	4.81 - 19.39	2.10

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

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: 173

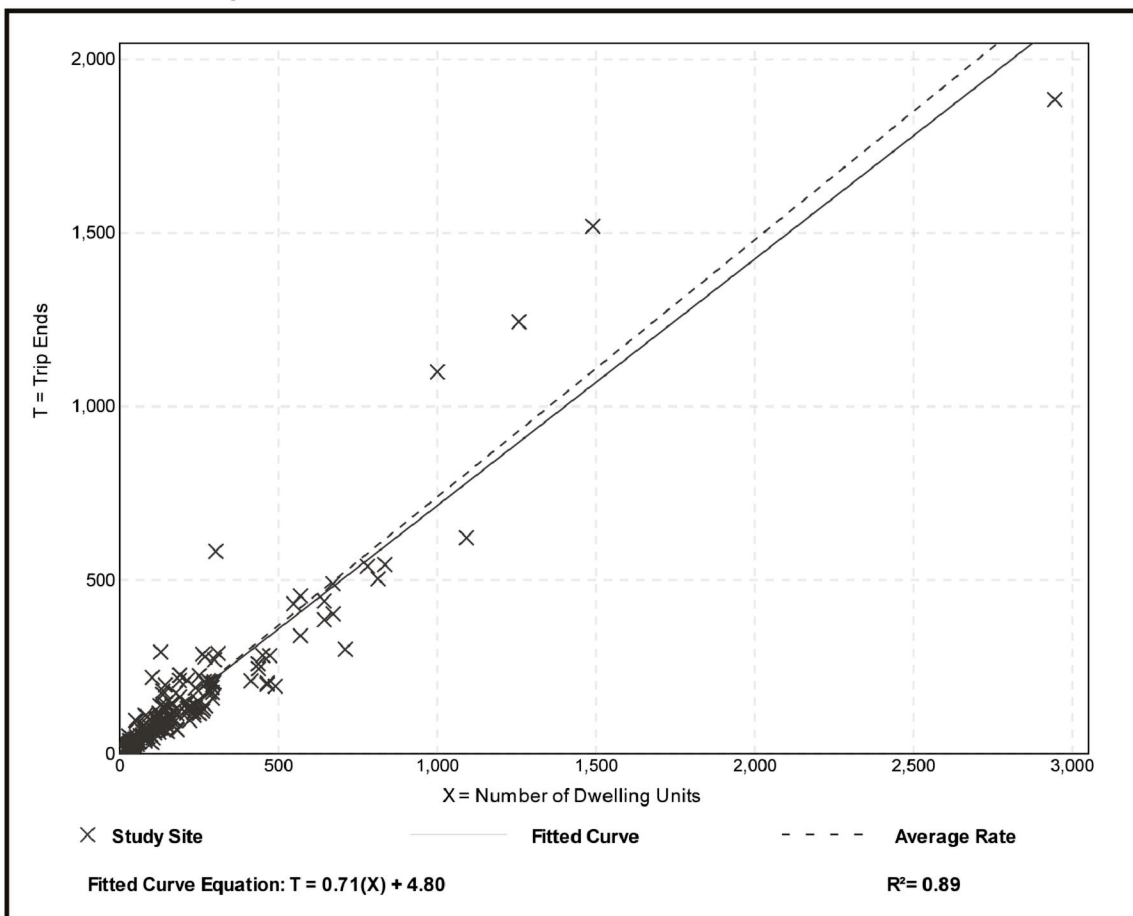
Avg. Num. of Dwelling Units: 219

Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.74	0.33 - 2.27	0.27

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

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: 190

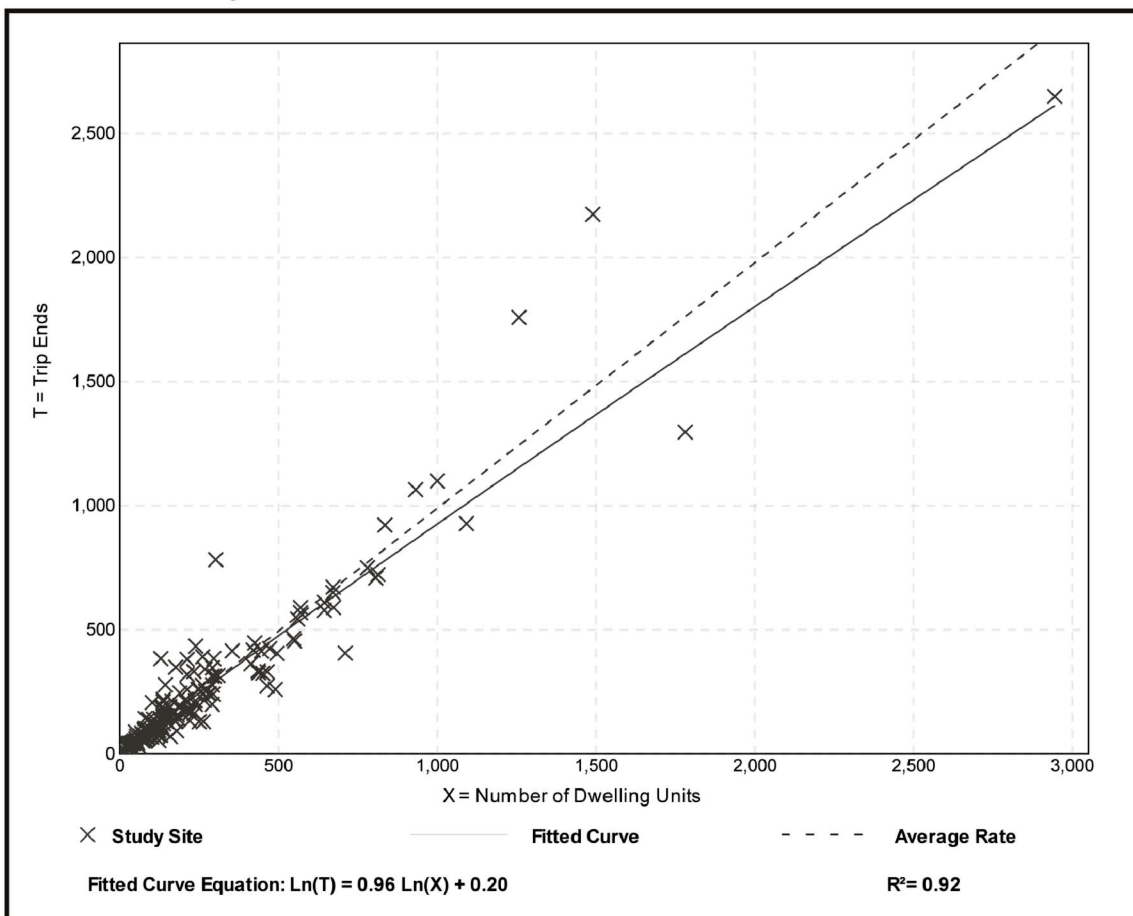
Avg. Num. of Dwelling Units: 242

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.44 - 2.98	0.31

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

November 1, 2018

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

Subject: Plum Grove Road @ Wise Road
IDOT

Dear Mr. Bowen:

In response to a request made on your behalf and dated November 1, 2018, we have developed year 2040 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current ADT	Year 2040ADT
Plum Grove Rd, @ Wise Rd	14,000	19,900
Wise Rd, @ Plum Grove Rd	11,700	14,700

Traffic projections are developed using existing ADT data provided in the request letter and the results from the October 2018 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2040 socioeconomic projections and assumes the implementation of the ON TO 2050 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\Schaumburg\ck-122-18\ck-122-18.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
Existing Weekday Morning Peak Hour Conditions

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

11/02/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	236	143	58	870	486	52
Future Volume (vph)	236	143	58	870	486	52
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	80	0	155			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		170			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.985	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1687	1553	1770	3585	3361	0
Flt Permitted	0.950		0.384			
Satd. Flow (perm)	1687	1553	715	3585	3361	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		155			20	
Link Speed (mph)	30			50	50	
Link Distance (ft)	1490			2154	1854	
Travel Time (s)	33.9			29.4	25.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	4%	2%	6%	6%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	257	155	63	946	585	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	8.0	8.0	3.5	15.0	15.0	
Minimum Split (s)	14.0	14.0	7.0	21.0	21.0	
Total Split (s)	24.0	24.0	10.0	66.0	56.0	
Total Split (%)	26.7%	26.7%	11.1%	73.3%	62.2%	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	3.5	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	None	None	
Act Effect Green (s)	15.8	15.8	46.6	44.0	38.7	
Actuated g/C Ratio	0.22	0.22	0.64	0.61	0.53	

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

11/02/2018



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
v/c Ratio	0.70	0.34	0.11	0.43	0.32	
Control Delay	40.8	7.9	5.1	8.0	10.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	40.8	7.9	5.1	8.0	10.4	
LOS	D	A	A	A	B	
Approach Delay	28.4			7.8	10.4	
Approach LOS	C			A	B	
Queue Length 50th (ft)	108	0	10	112	84	
Queue Length 95th (ft)	#255	50	21	146	116	
Internal Link Dist (ft)	1410			2074	1774	
Turn Bay Length (ft)	80		155			
Base Capacity (vph)	440	520	559	2958	2428	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.58	0.30	0.11	0.32	0.24	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 72.4

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 12.8

Intersection LOS: B

Intersection Capacity Utilization 45.9%

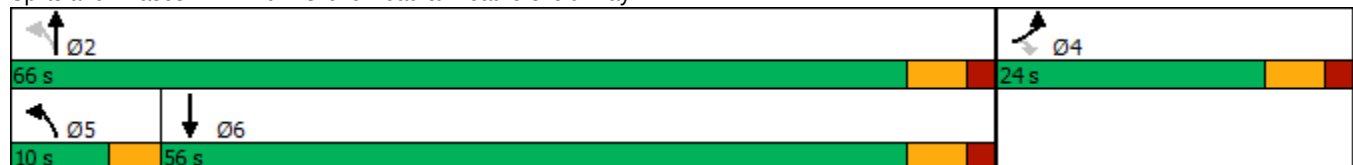
ICU Level of Service A

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Plum Grove Road & Weathersfield Way



Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

11/02/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	439	118	39	168	75	38	527	40	107	448	99
Future Volume (vph)	194	439	118	39	168	75	38	527	40	107	448	99
Ideal Flow (vphpl)	1900	2000	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)	400		0	140		115	250		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	150			110			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.954			0.989			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1923	1524	1641	3319	0	1671	3457	0	1736	3383	0
Flt Permitted	0.493			0.379			0.339			0.247		
Satd. Flow (perm)	852	1923	1524	655	3319	0	596	3457	0	451	3383	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			130		79			8			27	
Link Speed (mph)		35			30			50			50	
Link Distance (ft)		2650			952			576			1847	
Travel Time (s)		51.6			21.6			7.9			25.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	4%	6%	10%	5%	1%	8%	3%	7%	4%	2%	12%
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)	213	482	130	43	267	0	42	623	0	118	601	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	8.0	3.0	3.0	8.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	6.5	14.0	6.5	6.5	14.0		6.5	21.0		6.5	21.0	
Total Split (s)	17.0	37.0	14.0	13.0	33.0		14.0	22.0		18.0	26.0	
Total Split (%)	18.9%	41.1%	15.6%	14.4%	36.7%		15.6%	24.4%		20.0%	28.9%	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.0	2.0	0.0	0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	6.0	3.5	3.5	6.0		3.5	6.0		3.5	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effect Green (s)	34.1	25.9	39.0	25.7	16.4		26.4	18.5		29.9	20.3	
Actuated g/C Ratio	0.47	0.36	0.54	0.36	0.23		0.37	0.26		0.41	0.28	

Lanes, Volumes, Timings
2: Wise Road & Plum Grove Road

11/02/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.40	0.70	0.15	0.13	0.33		0.13	0.70		0.34	0.62	
Control Delay	14.3	28.1	2.6	11.9	17.3		16.1	33.3		18.0	27.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	14.3	28.1	2.6	11.9	17.3		16.1	33.3		18.0	27.6	
LOS	B	C	A	B	B		B	C		B	C	
Approach Delay		20.5			16.6			32.2			26.1	
Approach LOS		C			B			C			C	
Queue Length 50th (ft)	57	206	0	10	37		12	145		34	129	
Queue Length 95th (ft)	103	333	25	27	70		34	#286		76	214	
Internal Link Dist (ft)		2570			872			496			1767	
Turn Bay Length (ft)	400			140			250			225		
Base Capacity (vph)	556	861	961	397	1342		401	889		461	996	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.38	0.56	0.14	0.11	0.20		0.10	0.70		0.26	0.60	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 72.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 63.7%

ICU Level of Service B

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Wise Road & Plum Grove Road

 Ø1	 Ø2	 Ø3	 Ø4
18 s	22 s	13 s	37 s
 Ø5	 Ø6	 Ø7	 Ø8
14 s	26 s	17 s	33 s

HCM 6th AWSC

3: Summit Drive & Weathersfield Way

11/02/2018

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	64	223	22	13	87	46	16	116	72	69	55	30
Future Vol, veh/h	64	223	22	13	87	46	16	116	72	69	55	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	3	5	35	0	2	4	12	1	4	6	11	7
Mvmt Flow	75	262	26	15	102	54	19	136	85	81	65	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.2	10.7	12.4	11.5
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	21%	9%	45%
Vol Thru, %	57%	72%	60%	36%
Vol Right, %	35%	7%	32%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	204	309	146	154
LT Vol	16	64	13	69
Through Vol	116	223	87	55
RT Vol	72	22	46	30
Lane Flow Rate	240	364	172	181
Geometry Grp	1	1	1	1
Degree of Util (X)	0.383	0.553	0.267	0.298
Departure Headway (Hd)	5.747	5.481	5.598	5.922
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	624	654	637	603
Service Time	3.81	3.537	3.667	3.992
HCM Lane V/C Ratio	0.385	0.557	0.27	0.3
HCM Control Delay	12.4	15.2	10.7	11.5
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	1.8	3.4	1.1	1.2

Intersection Capacity Utilization

4: Wise Road & Summit Drive

11/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	29	592	7	3	289	25	9	9	19	103	8	52
Pedestrians	1					1	1					
Ped Button	Yes											
Pedestrian Timing (s)	16.0											
Free Right	No			No			No			No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	29	599	0	3	314	0	0	37	0	0	163	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.99	0.85	0.95	0.91	0.85	0.95	0.92	0.85
Saturated Flow (vph)	1805	3611	0	1805	3574	0	0	1732	0	0	1752	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.03			0.00			0.00		
Protected Option Allowed	Yes			Yes			No			No		
Reference Time (s)	1.9	19.9	0.0	0.2	10.6	0.0			0.0			0.0
Adj Reference Time (s)	8.0	23.9	0.0	8.0	14.7	0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	120	1806		120	1787		0	1730		0	779	
Reference Time A (s)	28.9	19.9		3.0	10.6		0.0	2.6		0.0	25.1	
Adj Saturation B (vph)	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.6	10.6		14.8	19.2	
Reference Time (s)		28.9			10.6			2.6			19.2	
Adj Reference Time (s)		32.9			14.7			8.0			23.2	
Split Option												
Ref Time Combined (s)	1.9	19.9		0.2	10.6		0.0	2.6		0.0	11.2	
Ref Time Seperate (s)	1.9	19.7		0.2	9.7		0.6	0.6		6.8	0.6	
Reference Time (s)	19.9	19.9		10.6	10.6		2.6	2.6		11.2	11.2	
Adj Reference Time (s)	23.9	23.9		14.7	14.7		8.0	8.0		15.2	15.2	
Summary	EB WB		NB SB		Combined							
Protected Option (s)	31.9		NA									
Permitted Option (s)	32.9		23.2									
Split Option (s)	38.6		23.2									
Minimum (s)	31.9		23.2		55.1							
Right Turns												
Adj Reference Time (s)												
Cross Thru Ref Time (s)												
Oncoming Left Ref Time (s)												
Combined (s)												
Intersection Summary												
Intersection Capacity Utilization	45.9%			ICU Level of Service			A					
Reference Times and Phasing Options do not represent an optimized timing plan.												

HCM 6th TWSC
5: Summit Drive & Kingsport Drive

11/02/2018

Intersection

Int Delay, s/veh 2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	51	24	7	138	88	9
Future Vol, veh/h	51	24	7	138	88	9
Conflicting Peds, #/hr	1	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	83	83	83	83	83	83
Heavy Vehicles, %	2	17	29	4	9	11
Mvmt Flow	61	29	8	166	106	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	295	112	117
Stage 1	112	-	-
Stage 2	183	-	-
Critical Hdwy	6.42	6.37	4.39
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.453	2.461
Pot Cap-1 Maneuver	696	902	1320
Stage 1	913	-	-
Stage 2	848	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	691	902	1320
Mov Cap-2 Maneuver	691	-	-
Stage 1	907	-	-
Stage 2	848	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1320	-	747	-	-
HCM Lane V/C Ratio	0.006	-	0.121	-	-
HCM Control Delay (s)	7.7	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

HCM 6th TWSC
6: Plum Grove Road & Julie Drive

11/02/2018

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	79	815	22	39	595
Future Vol, veh/h	34	79	815	22	39	595
Conflicting Peds, #/hr	2	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	120	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	9	4	18	22	4
Mvmt Flow	37	87	896	24	43	654

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1323	460	0
Stage 1	908	-	-
Stage 2	415	-	-
Critical Hdwy	6.86	7.08	-
Critical Hdwy Stg 1	5.86	-	-
Critical Hdwy Stg 2	5.86	-	-
Follow-up Hdwy	3.53	3.39	-
Pot Cap-1 Maneuver	146	530	-
Stage 1	351	-	-
Stage 2	632	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	136	530	-
Mov Cap-2 Maneuver	247	-	-
Stage 1	327	-	-
Stage 2	631	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 247 530	625	-
HCM Lane V/C Ratio	-	- 0.151 0.164	0.069	-
HCM Control Delay (s)	-	- 22.2 13.1	11.2	-
HCM Lane LOS	-	- C B	B	-
HCM 95th %tile Q(veh)	-	- 0.5 0.6	0.2	-

Capacity Analysis Summary Sheets
Existing Weekday Evening Peak Hour Conditions

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	118	67	164	611	995	216
Future Volume (vph)	118	67	164	611	995	216
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	80	0	155			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		170			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.973	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1787	1568	1787	3762	3472	0
Flt Permitted	0.950		0.153			
Satd. Flow (perm)	1787	1568	288	3762	3472	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		68			46	
Link Speed (mph)	30			50	50	
Link Distance (ft)	1490			2154	1854	
Travel Time (s)	33.9			29.4	25.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	3%	1%	1%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	120	68	167	623	1235	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	8.0	8.0	3.5	15.0	15.0	
Minimum Split (s)	14.0	14.0	7.0	21.0	21.0	
Total Split (s)	20.0	20.0	14.0	70.0	56.0	
Total Split (%)	22.2%	22.2%	15.6%	77.8%	62.2%	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	3.5	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	None	None	
Act Effect Green (s)	11.6	11.6	64.7	63.8	48.7	
Actuated g/C Ratio	0.14	0.14	0.79	0.78	0.59	

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
v/c Ratio	0.48	0.24	0.41	0.21	0.59	
Control Delay	41.7	11.3	6.2	3.9	12.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	41.7	11.3	6.2	3.9	12.8	
LOS	D	B	A	A	B	
Approach Delay	30.7			4.4	12.8	
Approach LOS	C			A	B	
Queue Length 50th (ft)	63	0	20	48	213	
Queue Length 95th (ft)	116	36	39	73	294	
Internal Link Dist (ft)	1410			2074	1774	
Turn Bay Length (ft)	80		155			
Base Capacity (vph)	314	332	425	2933	2202	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.38	0.20	0.39	0.21	0.56	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 82

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 1: Plum Grove Road & Weathersfield Way

70 s		20 s	
14 s	56 s		

Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	143	262	74	57	600	101	98	535	44	106	698	237
Future Volume (vph)	143	262	74	57	600	101	98	535	44	106	698	237
Ideal Flow (vphpl)	1900	2000	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)	400		0	140		115	250		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	150			110			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.978			0.989			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1980	1615	1805	3491	0	1805	3570	0	1805	3430	0
Flt Permitted	0.160			0.547			0.122			0.315		
Satd. Flow (perm)	304	1980	1615	1039	3491	0	232	3570	0	598	3430	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79		17			7			41	
Link Speed (mph)		35			30			50			50	
Link Distance (ft)		2650			952			576			1847	
Travel Time (s)		51.6			21.6			7.9			25.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	1%	2%
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)	152	279	79	61	745	0	104	616	0	113	995	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	8.0	3.0	3.0	8.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	6.5	14.0	6.5	6.5	14.0		6.5	21.0		6.5	21.0	
Total Split (s)	16.0	51.0	13.0	12.0	47.0		13.0	43.0		14.0	44.0	
Total Split (%)	13.3%	42.5%	10.8%	10.0%	39.2%		10.8%	35.8%		11.7%	36.7%	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.0	2.0	0.0	0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	6.0	3.5	3.5	6.0		3.5	6.0		3.5	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effect Green (s)	46.4	35.1	49.7	39.1	29.2		49.0	38.0		49.6	38.3	
Actuated g/C Ratio	0.44	0.33	0.47	0.37	0.27		0.46	0.36		0.47	0.36	

Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.52	0.43	0.10	0.14	0.77		0.45	0.48		0.30	0.79	
Control Delay	24.8	30.7	3.9	18.0	40.3		22.6	29.2		18.4	36.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	24.8	30.7	3.9	18.0	40.3		22.6	29.2		18.4	36.0	
LOS	C	C	A	B	D		C	C		B	D	
Approach Delay		24.8			38.6			28.3			34.2	
Approach LOS		C			D			C			C	
Queue Length 50th (ft)	62	153	0	24	244		38	172		41	313	
Queue Length 95th (ft)	104	231	25	48	314		80	260		86	#476	
Internal Link Dist (ft)		2570			872			496			1767	
Turn Bay Length (ft)	400			140			250			225		
Base Capacity (vph)	310	844	812	455	1366		250	1280		408	1260	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.49	0.33	0.10	0.13	0.55		0.42	0.48		0.28	0.79	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 106.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 32.4

Intersection LOS: C

Intersection Capacity Utilization 76.7%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Wise Road & Plum Grove Road

 Ø1	 Ø2	 Ø3	 Ø4
14 s	43 s	12 s	51 s
 Ø5	 Ø6	 Ø7	 Ø8
13 s	44 s	16 s	47 s

HCM 6th AWSC

3: Summit Drive & Weathersfield Way

12/19/2019

Intersection

Intersection Delay, s/veh 17.1
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	140	38	44	278	43	42	61	36	24	117	101
Future Vol, veh/h	44	140	38	44	278	43	42	61	36	24	117	101
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	3	5	35	0	2	4	12	1	4	6	11	7
Mvmt Flow	52	165	45	52	327	51	49	72	42	28	138	119
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	14.4	21.6	12.9	15.3
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	20%	12%	10%
Vol Thru, %	44%	63%	76%	48%
Vol Right, %	26%	17%	12%	42%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	139	222	365	242
LT Vol	42	44	44	24
Through Vol	61	140	278	117
RT Vol	36	38	43	101
Lane Flow Rate	164	261	429	285
Geometry Grp	1	1	1	1
Degree of Util (X)	0.309	0.452	0.701	0.495
Departure Headway (Hd)	6.803	6.235	5.877	6.264
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	527	577	614	575
Service Time	4.865	4.29	3.924	4.316
HCM Lane V/C Ratio	0.311	0.452	0.699	0.496
HCM Control Delay	12.9	14.4	21.6	15.3
HCM Lane LOS	B	B	C	C
HCM 95th-tile Q	1.3	2.3	5.6	2.7

Intersection Capacity Utilization

4: Wise Road & Summit Drive

11/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	442	11	14	792	105	8	10	7	54	15	63
Pedestrians	1					1						
Ped Button	Yes											
Pedestrian Timing (s)	16.0											
Free Right	No			No			No			No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	61	453	0	14	897	0	0	25	0	0	132	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.98	0.85	0.95	0.94	0.85	0.95	0.91	0.85
Saturated Flow (vph)	1805	3604	0	1805	3554	0	0	1791	0	0	1728	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00			0.03			0.00			0.00		
Protected Option Allowed	Yes			Yes			No			No		
Reference Time (s)	4.1	15.1	0.0	0.9	30.3	0.0			0.0			0.0
Adj Reference Time (s)	8.1	19.1	0.0	8.0	34.3	0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	120	1802		120	1777		0	1502		0	1186	
Reference Time A (s)	60.8	15.1		14.0	30.3		0.0	2.0		0.0	13.4	
Adj Saturation B (vph)	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.5	9.7		11.6	17.2	
Reference Time (s)		60.8			30.3			2.0			13.4	
Adj Reference Time (s)		64.8			34.3			8.0			17.4	
Split Option												
Ref Time Combined (s)	4.1	15.1		0.9	30.3		0.0	1.7		0.0	9.2	
Ref Time Seperate (s)	4.1	14.7		0.9	26.8		0.5	0.7		3.6	1.1	
Reference Time (s)	15.1	15.1		30.3	30.3		1.7	1.7		9.2	9.2	
Adj Reference Time (s)	19.1	19.1		34.3	34.3		8.0	8.0		13.2	13.2	
Summary	EB WB		NB SB		Combined							
Protected Option (s)	42.4		NA									
Permitted Option (s)	64.8		17.4									
Split Option (s)	53.4		21.2									
Minimum (s)	42.4		17.4		59.7							
Right Turns												
Adj Reference Time (s)												
Cross Thru Ref Time (s)												
Oncoming Left Ref Time (s)												
Combined (s)												
Intersection Summary												
Intersection Capacity Utilization	49.8%			ICU Level of Service			A					
Reference Times and Phasing Options do not represent an optimized timing plan.												

HCM 6th TWSC
5: Summit Drive & Kingsport Drive

11/05/2018

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	19	22	137	170	23
Future Vol, veh/h	10	19	22	137	170	23
Conflicting Peds, #/hr	0	0	4	0	0	4
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	90	90	90	90	90	90
Heavy Vehicles, %	0	5	4	0	0	0
Mvmt Flow	11	21	24	152	189	26
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	406	206	219	0	-	0
Stage 1	206	-	-	-	-	-
Stage 2	200	-	-	-	-	-
Critical Hdwy	6.4	6.25	4.14	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.345	2.236	-	-	-
Pot Cap-1 Maneuver	605	827	1339	-	-	-
Stage 1	833	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	588	824	1334	-	-	-
Mov Cap-2 Maneuver	588	-	-	-	-	-
Stage 1	813	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.2	1.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1334	-	724	-	-	
HCM Lane V/C Ratio	0.018	-	0.045	-	-	
HCM Control Delay (s)	7.7	0	10.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-	

HCM 6th TWSC
6: Plum Grove Road & Julie Drive

11/05/2018

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	44	732	12	47	1041
Future Vol, veh/h	26	44	732	12	47	1041
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	-	-	125	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	1	0	0	1
Mvmt Flow	28	48	796	13	51	1132

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1471	405	0
Stage 1	803	-	-
Stage 2	668	-	-
Critical Hdwy	6.8	6.94	-
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.32	-
Pot Cap-1 Maneuver	120	595	-
Stage 1	406	-	-
Stage 2	477	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	113	595	-
Mov Cap-2 Maneuver	235	-	-
Stage 1	381	-	-
Stage 2	477	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.6	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	-	235	595
HCM Lane V/C Ratio	-	-	0.12	0.08
HCM Control Delay (s)	-	-	22.4	11.6
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.4	0.3

Capacity Analysis Summary Sheets
Projected Weekday Morning Peak Hour Conditions

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	247	143	58	962	536	52
Future Volume (vph)	247	143	58	962	536	52
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	80	0	155			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		170			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.987	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1687	1553	1770	3585	3367	0
Flt Permitted	0.950		0.356			
Satd. Flow (perm)	1687	1553	663	3585	3367	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		155			18	
Link Speed (mph)	30			50	50	
Link Distance (ft)	1490			1864	1854	
Travel Time (s)	33.9			25.4	25.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	7%	4%	2%	6%	6%	4%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	268	155	63	1046	640	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	8.0	8.0	3.5	15.0	15.0	
Minimum Split (s)	14.0	14.0	7.0	21.0	21.0	
Total Split (s)	24.0	24.0	10.0	66.0	56.0	
Total Split (%)	26.7%	26.7%	11.1%	73.3%	62.2%	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	3.5	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	None	None	
Act Effect Green (s)	16.3	16.3	52.3	49.7	42.3	
Actuated g/C Ratio	0.21	0.21	0.67	0.63	0.54	

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
v/c Ratio	0.76	0.35	0.12	0.46	0.35	
Control Delay	47.7	8.0	5.0	8.0	11.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	47.7	8.0	5.0	8.0	11.0	
LOS	D	A	A	A	B	
Approach Delay	33.2			7.8	11.0	
Approach LOS	C			A	B	
Queue Length 50th (ft)	137	0	10	130	95	
Queue Length 95th (ft)	#269	50	21	167	130	
Internal Link Dist (ft)	1410			1784	1774	
Turn Bay Length (ft)	80		155			
Base Capacity (vph)	400	487	536	2772	2228	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.67	0.32	0.12	0.38	0.29	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 78.5

Natural Cycle: 45

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 13.7

Intersection LOS: B

Intersection Capacity Utilization 48.9%

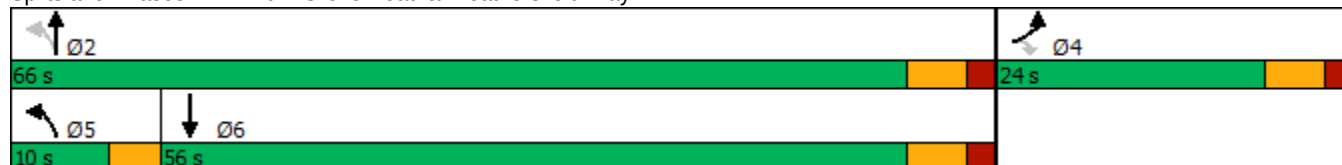
ICU Level of Service A

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Plum Grove Road & Weathersfield Way



Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	482	127	42	184	84	45	573	43	124	495	107
Future Volume (vph)	210	482	127	42	184	84	45	573	43	124	495	107
Ideal Flow (vphpl)	1900	2000	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)	400		0	140		115	250		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	150			110			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.953			0.990			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1641	1923	1524	1641	3316	0	1671	3460	0	1736	3385	0
Flt Permitted	0.483			0.281			0.266			0.227		
Satd. Flow (perm)	834	1923	1524	485	3316	0	468	3460	0	415	3385	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			140		83			7			26	
Link Speed (mph)		35			30			50			50	
Link Distance (ft)		2650			952			576			1847	
Travel Time (s)		51.6			21.6			7.9			25.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	10%	4%	6%	10%	5%	1%	8%	3%	7%	4%	2%	12%
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)	231	530	140	46	294	0	49	677	0	136	662	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	8.0	3.0	3.0	8.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	6.5	14.0	6.5	6.5	14.0		6.5	21.0		6.5	21.0	
Total Split (s)	17.0	37.0	14.0	13.0	33.0		14.0	22.0		18.0	26.0	
Total Split (%)	18.9%	41.1%	15.6%	14.4%	36.7%		15.6%	24.4%		20.0%	28.9%	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.0	2.0	0.0	0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	6.0	3.5	3.5	6.0		3.5	6.0		3.5	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effect Green (s)	35.3	26.9	40.1	26.7	17.5		28.8	20.5		32.4	20.5	
Actuated g/C Ratio	0.46	0.35	0.53	0.35	0.23		0.38	0.27		0.43	0.27	

Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.45	0.78	0.16	0.17	0.36		0.17	0.72		0.40	0.71	
Control Delay	15.3	32.4	2.5	12.6	18.1		17.1	35.6		19.2	31.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	15.3	32.4	2.5	12.6	18.1		17.1	35.6		19.2	31.4	
LOS	B	C	A	B	B		B	D		B	C	
Approach Delay	23.4			17.3			34.4			29.3		
Approach LOS	C			B			C			C		
Queue Length 50th (ft)	63	237	0	11	43		15	178		44	161	
Queue Length 95th (ft)	114	#399	26	29	78		38	#330		86	#260	
Internal Link Dist (ft)	2570			872			496			1767		
Turn Bay Length (ft)	400			140			250			225		
Base Capacity (vph)	532	799	935	336	1253		360	936		440	931	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.43	0.66	0.15	0.14	0.23		0.14	0.72		0.31	0.71	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 76.2

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.78

Intersection Signal Delay: 27.2

Intersection LOS: C

Intersection Capacity Utilization 68.2%

ICU Level of Service C

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Wise Road & Plum Grove Road

 Ø1	 Ø2	 Ø3	 Ø4
18 s	22 s	13 s	37 s
 Ø5	 Ø6	 Ø7	 Ø8
14 s	26 s	17 s	33 s

HCM 6th AWSC

3: Summit Drive & Weathersfield Way

12/19/2019

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	64	223	23	13	87	46	21	120	83	69	56	30
Future Vol, veh/h	64	223	23	13	87	46	21	120	83	69	56	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	3	5	35	0	2	4	12	1	4	6	11	7
Mvmt Flow	75	262	27	15	102	54	25	141	98	81	66	35
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.7	10.9	13	11.7
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	21%	9%	45%
Vol Thru, %	54%	72%	60%	36%
Vol Right, %	37%	7%	32%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	224	310	146	155
LT Vol	21	64	13	69
Through Vol	120	223	87	56
RT Vol	83	23	46	30
Lane Flow Rate	264	365	172	182
Geometry Grp	1	1	1	1
Degree of Util (X)	0.422	0.564	0.272	0.304
Departure Headway (Hd)	5.768	5.563	5.696	5.995
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	619	646	625	594
Service Time	3.842	3.629	3.778	4.076
HCM Lane V/C Ratio	0.426	0.565	0.275	0.306
HCM Control Delay	13	15.7	10.9	11.7
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	2.1	3.5	1.1	1.3

Intersection Capacity Utilization

4: Wise Road & Summit Drive

12/19/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	639	2	3	312	30	9	9	19	116	8	60
Pedestrians	1					1	1					
Ped Button	Yes											
Pedestrian Timing (s)	16.0											
Free Right	No			No			No			No		
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	31	641	0	3	342	0	0	37	0	0	184	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.99	0.85	0.95	0.91	0.85	0.95	0.92	0.85
Saturated Flow (vph)	1805	3616	0	1805	3570	0	0	1732	0	0	1750	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)	0.00		0.03			0.00			0.00			
Protected Option Allowed	Yes			Yes			No			No		
Reference Time (s)	2.1	21.3	0.0	0.2	11.5	0.0			0.0			0.0
Adj Reference Time (s)	8.0	25.3	0.0	8.0	15.7	0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	120	1808		120	1785		0	1729		0	780	
Reference Time A (s)	30.9	21.3		3.0	11.5		0.0	2.6		0.0	28.3	
Adj Saturation B (vph)	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.6	10.6		15.7	20.6	
Reference Time (s)		30.9			11.5			2.6			20.6	
Adj Reference Time (s)		34.9			15.7			8.0			24.6	
Split Option												
Ref Time Combined (s)	2.1	21.3		0.2	11.5		0.0	2.6		0.0	12.6	
Ref Time Seperate (s)	2.1	21.2		0.2	10.5		0.6	0.6		7.7	0.6	
Reference Time (s)	21.3	21.3		11.5	11.5		2.6	2.6		12.6	12.6	
Adj Reference Time (s)	25.3	25.3		15.7	15.7		8.0	8.0		16.6	16.6	
Summary	EB WB		NB SB		Combined							
Protected Option (s)	33.3		NA									
Permitted Option (s)	34.9		24.6									
Split Option (s)	40.9		24.6									
Minimum (s)	33.3		24.6		57.9							
Right Turns												
Adj Reference Time (s)												
Cross Thru Ref Time (s)												
Oncoming Left Ref Time (s)												
Combined (s)												
Intersection Summary												
Intersection Capacity Utilization	48.2%			ICU Level of Service			A					
Reference Times and Phasing Options do not represent an optimized timing plan.												

HCM 6th TWSC
5: Summit Drive & Kingsport Drive/Site Access

02/24/2020

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	51	0	24	21	0	20	7	138	8	2	88	9
Future Vol, veh/h	51	0	24	21	0	20	7	138	8	2	88	9
Conflicting Peds, #/hr	1	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	2	0	17	0	0	0	29	4	0	0	9	11
Mvmt Flow	61	0	29	25	0	24	8	166	10	2	106	11
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	316	308	112	317	308	172	117	0	0	176	0	0
Stage 1	116	116	-	187	187	-	-	-	-	-	-	-
Stage 2	200	192	-	130	121	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.5	6.37	7.1	6.5	6.2	4.39	-	-	4.1	-	-
Critical Hdwy Stg 1	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4	3.453	3.5	4	3.3	2.461	-	-	2.2	-	-
Pot Cap-1 Maneuver	637	609	902	640	609	877	1320	-	-	1412	-	-
Stage 1	889	803	-	819	749	-	-	-	-	-	-	-
Stage 2	802	745	-	878	800	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	615	604	902	615	604	876	1320	-	-	1412	-	-
Mov Cap-2 Maneuver	615	604	-	615	604	-	-	-	-	-	-	-
Stage 1	883	801	-	813	744	-	-	-	-	-	-	-
Stage 2	774	740	-	848	798	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.1		10.4		0.4		0.2					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1320	-	-	685	720	1412	-	-				
HCM Lane V/C Ratio	0.006	-	-	0.132	0.069	0.002	-	-				
HCM Control Delay (s)	7.7	0	-	11.1	10.4	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile O(veh)	0	-	-	0.5	0.2	0	-	-				

HCM 6th TWSC
6: Plum Grove Road & Julie Drive

02/24/2020

Intersection

Int Delay, s/veh 1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	34	79	887	22	39	662
Future Vol, veh/h	34	79	887	22	39	662
Conflicting Peds, #/hr	2	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	25	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	9	4	18	22	4
Mvmt Flow	37	87	975	24	43	727

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1439	500	0
Stage 1	987	-	-
Stage 2	452	-	-
Critical Hdwy	6.86	7.08	-
Critical Hdwy Stg 1	5.86	-	-
Critical Hdwy Stg 2	5.86	-	-
Follow-up Hdwy	3.53	3.39	-
Pot Cap-1 Maneuver	123	498	-
Stage 1	319	-	-
Stage 2	605	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	114	498	-
Mov Cap-2 Maneuver	222	-	-
Stage 1	295	-	-
Stage 2	604	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 222 498	579	-
HCM Lane V/C Ratio	-	- 0.168 0.174	0.074	-
HCM Control Delay (s)	-	- 24.5 13.7	11.7	-
HCM Lane LOS	-	- C B	B	-
HCM 95th %tile Q(veh)	-	- 0.6 0.6	0.2	-

HCM 6th TWSC
8: Plum Grove Road & Site Access Drive

02/24/2020

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	22	19	7	959	682	11
Future Vol, veh/h	22	19	7	959	682	11
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	25	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	4	4	0
Mvmt Flow	23	20	7	1009	718	12
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1243	365	730	0	-	0
Stage 1	724	-	-	-	-	-
Stage 2	519	-	-	-	-	-
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	169	638	883	-	-	-
Stage 1	446	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	168	638	883	-	-	-
Mov Cap-2 Maneuver	301	-	-	-	-	-
Stage 1	442	-	-	-	-	-
Stage 2	568	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.7	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	883	-	301	638	-	-
HCM Lane V/C Ratio	0.008	-	0.077	0.031	-	-
HCM Control Delay (s)	9.1	-	18	10.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	0.1	-	-

Capacity Analysis Summary Sheets
Projected Weekday Evening Peak Hour Conditions

Lanes, Volumes, Timings

1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	125	67	164	675	1113	216
Future Volume (vph)	125	67	164	675	1113	216
Ideal Flow (vphpl)	1900	1900	1900	2000	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	80	0	155			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		170			
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt		0.850			0.976	
Flt Protected	0.950		0.950			
Satd. Flow (prot)	1787	1568	1787	3762	3483	0
Flt Permitted	0.950		0.119			
Satd. Flow (perm)	1787	1568	224	3762	3483	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		68			40	
Link Speed (mph)	30			50	50	
Link Distance (ft)	1490			1844	1854	
Travel Time (s)	33.9			25.1	25.3	
Confl. Peds. (#/hr)						
Confl. Bikes (#/hr)						
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Growth Factor	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	3%	1%	1%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0
Parking (#/hr)						
Mid-Block Traffic (%)	0%			0%	0%	
Shared Lane Traffic (%)						
Lane Group Flow (vph)	128	68	167	689	1356	0
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Detector Phase	4	4	5	2	6	
Switch Phase						
Minimum Initial (s)	8.0	8.0	3.5	15.0	15.0	
Minimum Split (s)	14.0	14.0	7.0	21.0	21.0	
Total Split (s)	20.0	20.0	14.0	70.0	56.0	
Total Split (%)	22.2%	22.2%	15.6%	77.8%	62.2%	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	
All-Red Time (s)	2.0	2.0	0.0	2.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	3.5	6.0	6.0	
Lead/Lag			Lead		Lag	
Lead-Lag Optimize?			Yes		Yes	
Recall Mode	None	None	None	None	None	
Act Effect Green (s)	11.7	11.7	65.8	63.3	50.1	
Actuated g/C Ratio	0.13	0.13	0.76	0.73	0.58	

Lanes, Volumes, Timings
1: Plum Grove Road & Weathersfield Way

12/19/2019



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
v/c Ratio	0.54	0.25	0.49	0.25	0.67	
Control Delay	43.9	11.5	10.0	4.4	14.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	43.9	11.5	10.0	4.4	14.9	
LOS	D	B	B	A	B	
Approach Delay	32.7			5.5	14.9	
Approach LOS	C			A	B	
Queue Length 50th (ft)	67	0	20	56	252	
Queue Length 95th (ft)	123	36	60	82	343	
Internal Link Dist (ft)	1410			1764	1774	
Turn Bay Length (ft)	80		155			
Base Capacity (vph)	287	309	358	2770	2020	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.45	0.22	0.47	0.25	0.67	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 87

Natural Cycle: 55

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 13.0

Intersection LOS: B

Intersection Capacity Utilization 67.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 1: Plum Grove Road & Weathersfield Way

70 s		20 s	
14 s	56 s		

Lanes, Volumes, Timings

2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	154	288	82	62	657	119	112	592	48	120	761	256
Future Volume (vph)	154	288	82	62	657	119	112	592	48	120	761	256
Ideal Flow (vphpl)	1900	2000	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)	400		0	140		115	250		0	225		0
Storage Lanes	1		1	1		1	1		0	1		0
Taper Length (ft)	150			110			220			220		
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt			0.850		0.977			0.989			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1805	1980	1615	1805	3487	0	1805	3570	0	1805	3430	0
Flt Permitted	0.135			0.516			0.106			0.265		
Satd. Flow (perm)	256	1980	1615	980	3487	0	201	3570	0	504	3430	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87		19			7			40	
Link Speed (mph)		35			30			50			50	
Link Distance (ft)		2650			952			576			1847	
Travel Time (s)		51.6			21.6			7.9			25.2	
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	2%	0%	0%	0%	0%	1%	2%
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)	164	306	87	66	826	0	119	681	0	128	1082	0
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4	5	3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Detector Phase	7	4	5	3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	3.0	8.0	3.0	3.0	8.0		3.0	15.0		3.0	15.0	
Minimum Split (s)	6.5	14.0	6.5	6.5	14.0		6.5	21.0		6.5	21.0	
Total Split (s)	16.0	51.0	13.0	12.0	47.0		13.0	43.0		14.0	44.0	
Total Split (%)	13.3%	42.5%	10.8%	10.0%	39.2%		10.8%	35.8%		11.7%	36.7%	
Yellow Time (s)	3.5	4.0	3.5	3.5	4.0		3.5	4.0		3.5	4.0	
All-Red Time (s)	0.0	2.0	0.0	0.0	2.0		0.0	2.0		0.0	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	3.5	6.0	3.5	3.5	6.0		3.5	6.0		3.5	6.0	
Lead/Lag	Lead	Lag	Lead	Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	None	None	None	None		None	None		None	None	
Act Effect Green (s)	50.0	38.6	53.5	42.4	32.5		49.2	37.9		49.9	38.2	
Actuated g/C Ratio	0.45	0.35	0.49	0.39	0.30		0.45	0.34		0.45	0.35	

Lanes, Volumes, Timings
2: Wise Road & Plum Grove Road

12/19/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.59	0.44	0.11	0.15	0.79		0.55	0.55		0.38	0.89	
Control Delay	26.8	30.4	3.6	17.7	41.1		28.7	32.4		21.1	44.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	26.8	30.4	3.6	17.7	41.1		28.7	32.4		21.1	44.1	
LOS	C	C	A	B	D		C	C		C	D	
Approach Delay		25.1			39.3			31.9			41.7	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	68	171	0	26	281		46	207		50	376	
Queue Length 95th (ft)	110	254	26	51	354		96	298		98	#569	
Internal Link Dist (ft)		2570			872			496			1767	
Turn Bay Length (ft)	400			140			250			225		
Base Capacity (vph)	293	814	839	451	1318		230	1232		359	1217	
Starvation Cap Reductn	0	0	0	0	0		0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0		0	0		0	0	
Storage Cap Reductn	0	0	0	0	0		0	0		0	0	
Reduced v/c Ratio	0.56	0.38	0.10	0.15	0.63		0.52	0.55		0.36	0.89	

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 110.1

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 36.1

Intersection LOS: D

Intersection Capacity Utilization 82.6%

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Wise Road & Plum Grove Road

 Ø1	 Ø2	 Ø3	 Ø4
14 s	43 s	12 s	51 s
 Ø5	 Ø6	 Ø7	 Ø8
13 s	44 s	16 s	47 s

HCM 6th AWSC

3: Summit Drive & Weathersfield Way

12/19/2019

Intersection

Intersection Delay, s/veh 17.9
Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	140	43	44	278	43	45	63	43	24	121	101
Future Vol, veh/h	44	140	43	44	278	43	45	63	43	24	121	101
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	3	5	35	0	2	4	12	1	4	6	11	7
Mvmt Flow	52	165	51	52	327	51	53	74	51	28	142	119
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15	22.7	13.5	16
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	30%	19%	12%	10%
Vol Thru, %	42%	62%	76%	49%
Vol Right, %	28%	19%	12%	41%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	151	227	365	246
LT Vol	45	44	44	24
Through Vol	63	140	278	121
RT Vol	43	43	43	101
Lane Flow Rate	178	267	429	289
Geometry Grp	1	1	1	1
Degree of Util (X)	0.339	0.47	0.714	0.512
Departure Headway (Hd)	6.866	6.336	5.988	6.365
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	522	566	601	564
Service Time	4.94	4.402	4.045	4.428
HCM Lane V/C Ratio	0.341	0.472	0.714	0.512
HCM Control Delay	13.5	15	22.7	16
HCM Lane LOS	B	B	C	C
HCM 95th-tile Q	1.5	2.5	5.9	2.9

Intersection Capacity Utilization

4: Wise Road & Summit Drive

12/19/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	70	477	11	14	855	120	8	10	7	63	15	69
Pedestrians	1					1						
Ped Button					Yes							
Pedestrian Timing (s)					16.0							
Free Right			No			No			No			No
Ideal Flow	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Green (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Refr Cycle Length (s)	120	120	120	120	120	120	120	120	120	120	120	120
Volume Combined (vph)	70	488	0	14	975	0	0	25	0	0	147	0
Lane Utilization Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Factor (vph)	0.95	1.00	0.85	0.95	0.98	0.85	0.95	0.94	0.85	0.95	0.91	0.85
Saturated Flow (vph)	1805	3605	0	1805	3551	0	0	1791	0	0	1728	0
Ped Intf Time (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Pedestrian Frequency (%)		0.00			0.03			0.00			0.00	
Protected Option Allowed		Yes			Yes			No			No	
Reference Time (s)	4.7	16.2	0.0	0.9	33.0	0.0			0.0			0.0
Adj Reference Time (s)	8.7	20.2	0.0	8.0	37.0	0.0			0.0			0.0
Permitted Option												
Adj Saturation A (vph)	120	1803		120	1775		0	1529		0	1160	
Reference Time A (s)	69.8	16.2		14.0	33.0		0.0	2.0		0.0	15.2	
Adj Saturation B (vph)	NA	NA		NA	NA		0	0		0	0	
Reference Time B (s)	NA	NA		NA	NA		8.5	9.7		12.2	18.2	
Reference Time (s)		69.8			33.0			2.0			15.2	
Adj Reference Time (s)		73.8			37.0			8.0			19.2	
Split Option												
Ref Time Combined (s)	4.7	16.2		0.9	33.0		0.0	1.7		0.0	10.2	
Ref Time Seperate (s)	4.7	15.9		0.9	28.9		0.5	0.7		4.2	1.1	
Reference Time (s)	16.2	16.2		33.0	33.0		1.7	1.7		10.2	10.2	
Adj Reference Time (s)	20.2	20.2		37.0	37.0		8.0	8.0		14.2	14.2	
Summary	EB WB		NB SB		Combined							
Protected Option (s)	45.6		NA									
Permitted Option (s)	73.8		19.2									
Split Option (s)	57.2		22.2									
Minimum (s)	45.6		19.2		64.8							
Right Turns												
Adj Reference Time (s)												
Cross Thru Ref Time (s)												
Oncoming Left Ref Time (s)												
Combined (s)												
Intersection Summary												
Intersection Capacity Utilization			54.0%		ICU Level of Service				A			
Reference Times and Phasing Options do not represent an optimized timing plan.												

HCM 6th TWSC
5: Summit Drive & Kingsport Drive/Site Access

02/24/2020

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	0	19	15	0	12	22	137	24	9	170	23
Future Vol, veh/h	10	0	19	15	0	12	22	137	24	9	170	23
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	0	5	0	0	0	4	0	0	0	0	0
Mvmt Flow	11	0	21	17	0	13	24	152	27	10	189	26
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	446	453	206	447	453	166	219	0	0	179	0	0
Stage 1	226	226	-	214	214	-	-	-	-	-	-	-
Stage 2	220	227	-	233	239	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.25	7.1	6.5	6.2	4.14	-	-	4.1	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.345	3.5	4	3.3	2.236	-	-	2.2	-	-
Pot Cap-1 Maneuver	526	506	827	525	506	884	1339	-	-	1409	-	-
Stage 1	781	721	-	793	729	-	-	-	-	-	-	-
Stage 2	787	720	-	775	711	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	505	490	824	501	490	884	1334	-	-	1409	-	-
Mov Cap-2 Maneuver	505	490	-	501	490	-	-	-	-	-	-	-
Stage 1	762	712	-	777	714	-	-	-	-	-	-	-
Stage 2	760	706	-	749	702	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.6		11.1		0.9		0.3					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1334	-	-	677	620	1409	-	-				
HCM Lane V/C Ratio	0.018	-	-	0.048	0.048	0.007	-	-				
HCM Control Delay (s)	7.7	0	-	10.6	11.1	7.6	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile O(veh)	0.1	-	-	0.1	0.2	0	-	-				

HCM 6th TWSC
6: Plum Grove Road & Julie Drive

02/24/2020

Intersection

Int Delay, s/veh 0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	26	44	802	12	47	1123
Future Vol, veh/h	26	44	802	12	47	1123
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	-	-	25	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	2	1	0	0	1
Mvmt Flow	28	48	872	13	51	1221

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1592	443	0
Stage 1	879	-	-
Stage 2	713	-	-
Critical Hdwy	6.8	6.94	-
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.32	-
Pot Cap-1 Maneuver	100	562	-
Stage 1	371	-	-
Stage 2	452	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	93	562	-
Mov Cap-2 Maneuver	212	-	-
Stage 1	347	-	-
Stage 2	452	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.7	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 212 562	773	-
HCM Lane V/C Ratio	-	- 0.133 0.085	0.066	-
HCM Control Delay (s)	-	- 24.6 12	10	-
HCM Lane LOS	-	- C B	A	-
HCM 95th %tile Q(veh)	-	- 0.5 0.3	0.2	-

HCM 6th TWSC
8: Plum Grove Road & Site Access Drive

02/24/2020

Intersection							
Int Delay, s/veh	0.3						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	10	9	19	827	1161	32	
Future Vol, veh/h	10	9	19	827	1161	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	0	25	-	-	-	
Veh in Median Storage, #	1	-	-	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	11	9	20	871	1222	34	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	1715	628	1256	0	-	0	
Stage 1	1239	-	-	-	-	-	
Stage 2	476	-	-	-	-	-	
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	83	431	561	-	-	-	
Stage 1	240	-	-	-	-	-	
Stage 2	597	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	80	431	561	-	-	-	
Mov Cap-2 Maneuver	179	-	-	-	-	-	
Stage 1	231	-	-	-	-	-	
Stage 2	597	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	20.3		0.3		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	561		-	179	431	-	-
HCM Lane V/C Ratio	0.036		-	0.059	0.022	-	-
HCM Control Delay (s)	11.7		-	26.4	13.5	-	-
HCM Lane LOS	B		-	D	B	-	-
HCM 95th %tile O(veh)	0.1		-	0.2	0.1	-	-

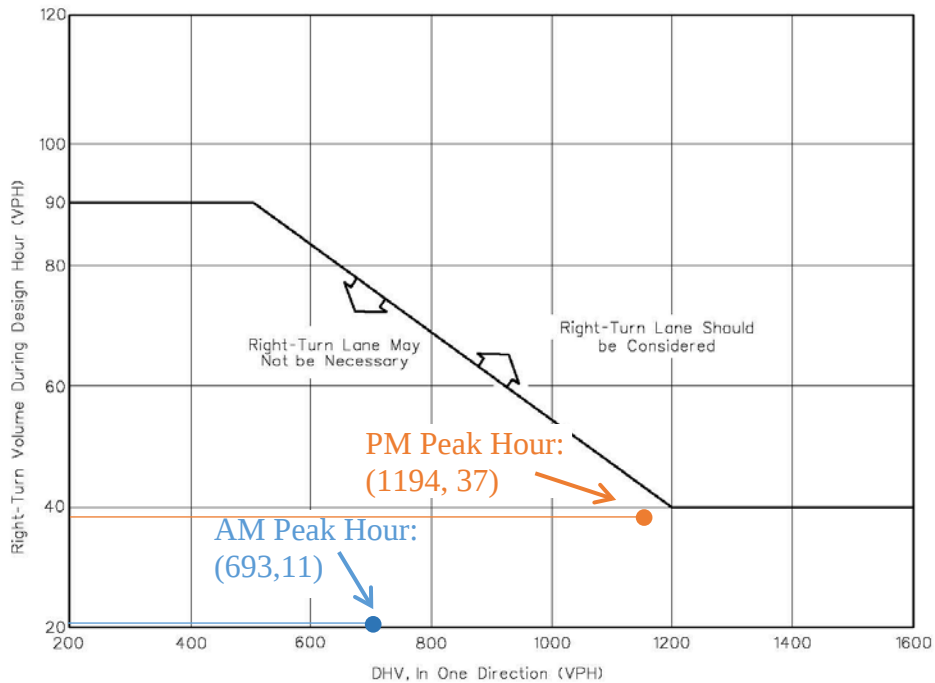
Turn Lane Warrant

Plum Grove Road with the Proposed Access Drive Right Turn Lane Guidelines

Illinois

INTERSECTIONS

October 2015



Note: For speeds less than 50 mph (80 km/hr), see Section 36-3.01(a).

GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTION
ON FOUR-LANE HIGHWAYS
(Design Speed of 50 mph (80 km/hr) or Greater)

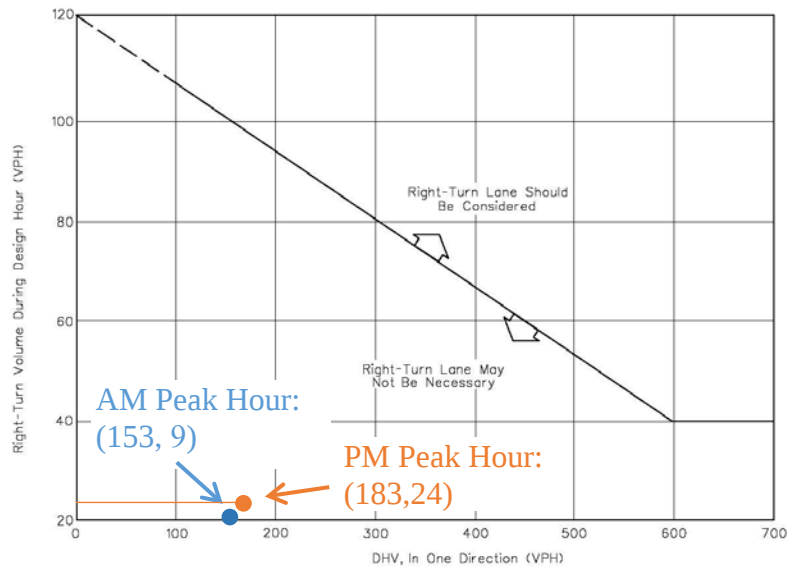
Figure 36-3.B

Summit Drive with the Proposed Access Drive Right Turn Lane Guidelines

Illinois

INTERSECTIONS

October 2015



Note: For highways with a design speed below 50 mph (80 km/hr), with a DHV in one direction of less than 300, and where right turns are greater than 40, an adjustment should be used. To read the vertical axis of the chart, subtract 20 from the actual number of right turns.

Example

Given: Design Speed = 35 mph (60 km/hr)
 DHV (in one direction) = 250 vph
 Right Turns = 100 vph

Problem: Determine if a right-turn lane is warranted.

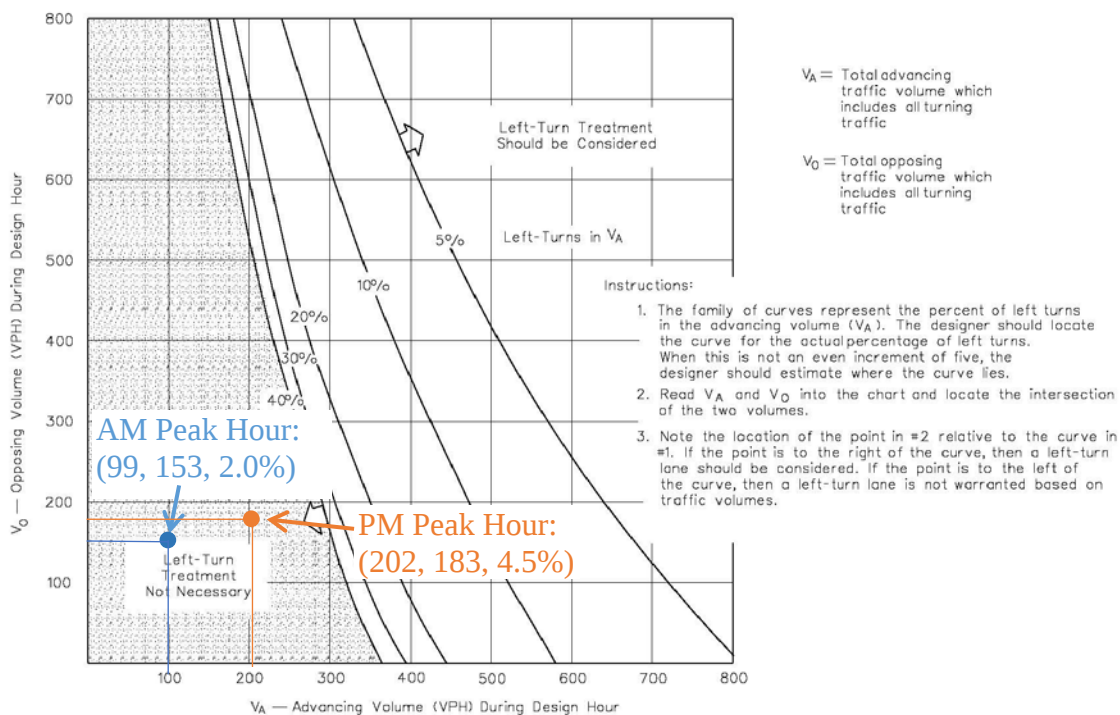
Solution: To read the vertical axis, use $100 - 20 = 80$ vph. The figure indicates that right-turn lane is not necessary, unless other factors (e.g., high crash rate) indicate a lane is needed.

GUIDELINES FOR RIGHT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS

Figure 36-3.A

Summit Drive with the Proposed Access Drive

Left Turn Lane Guidelines



VOLUME GUIDELINES FOR LEFT-TURN LANES AT UNSIGNALIZED INTERSECTIONS ON TWO-LANE HIGHWAYS (40 mph Design Speed)

Figure 36-3.G