Traffic Impact Study
Naper Commons Development

Naperville, Illinois

Prepared For:

Pulte Homes

KLOA

Kenig, Lindgren, O'Hara, Aboona, Inc.

February 23, 2021

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 a proposed residential development to be located in the northwest quadrant of the intersection of Naperville Road and Warrenville Road within the Nokia campus in Naperville, Illinois. As proposed, the site will be developed with approximately 161 single-family home lots and approximately 66 townhome units. Access to the proposed residential development will be provided via the two existing signalized access drives serving the Nokia Campus off Naperville Road and Warrenville Road.

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 area.

The sections of this report present the following:

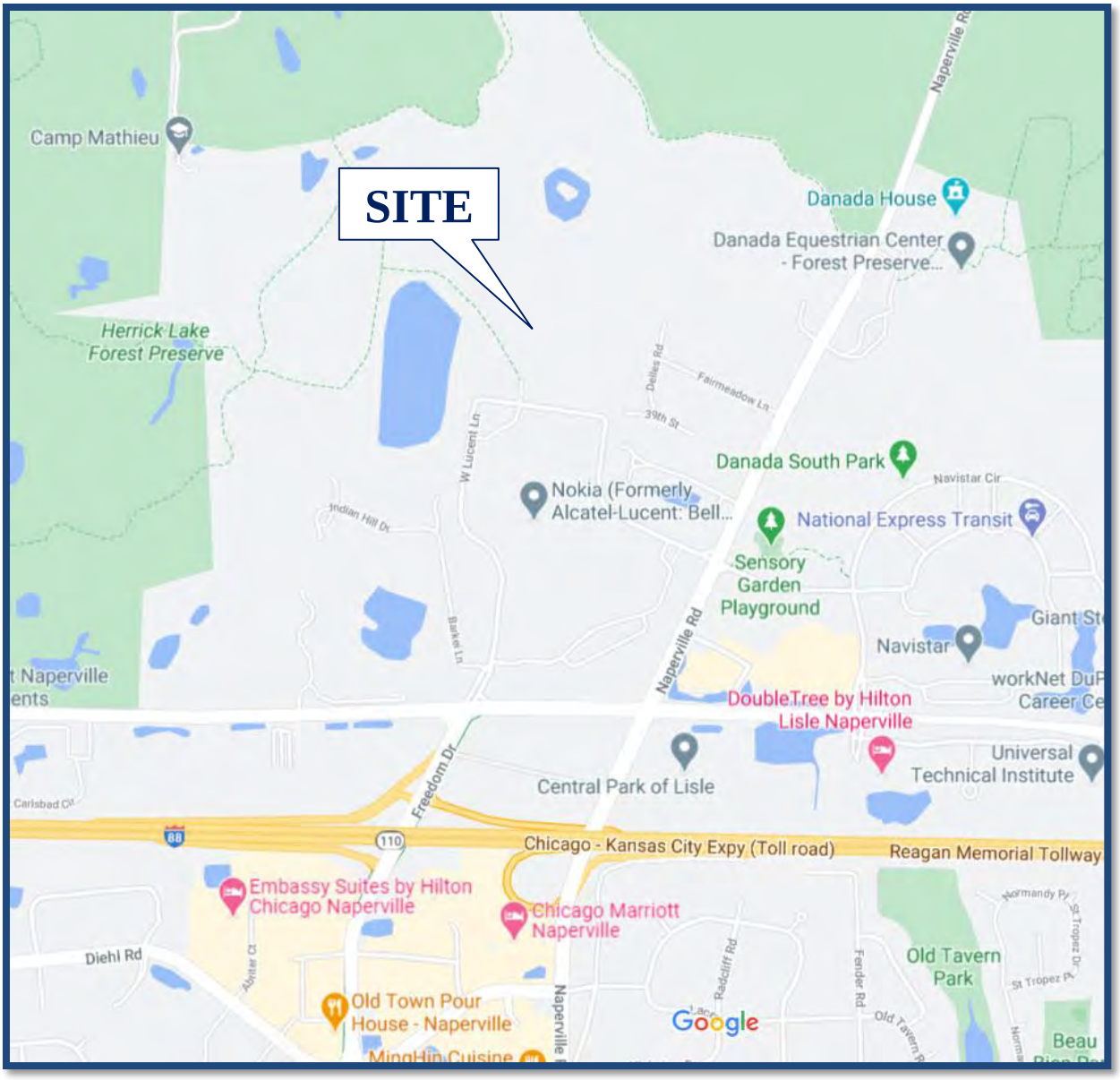
- Existing roadway conditions
- A description of the proposed development
- Directional distribution of the development traffic
- Vehicle trip generation for the development
- Future traffic conditions including access to the development
- Traffic analyses for the weekday morning and weekday evening 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 weekday 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. No-Build Conditions – Analyzes the projected traffic volumes which includes the existing traffic volumes increased by an ambient area growth factor and the full occupancy of the Nokia campus.

3. Future Conditions – Analyzes the projected traffic volumes which includes the existing traffic volumes increased by an ambient area growth factor (growth not attributable to any particular development), the full occupancy of the Nokia campus and the traffic estimated to be generated by the proposed subject development.



Site Location **Figure 1**

Aerial View of Site **Figure 2**

2. Existing Conditions

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

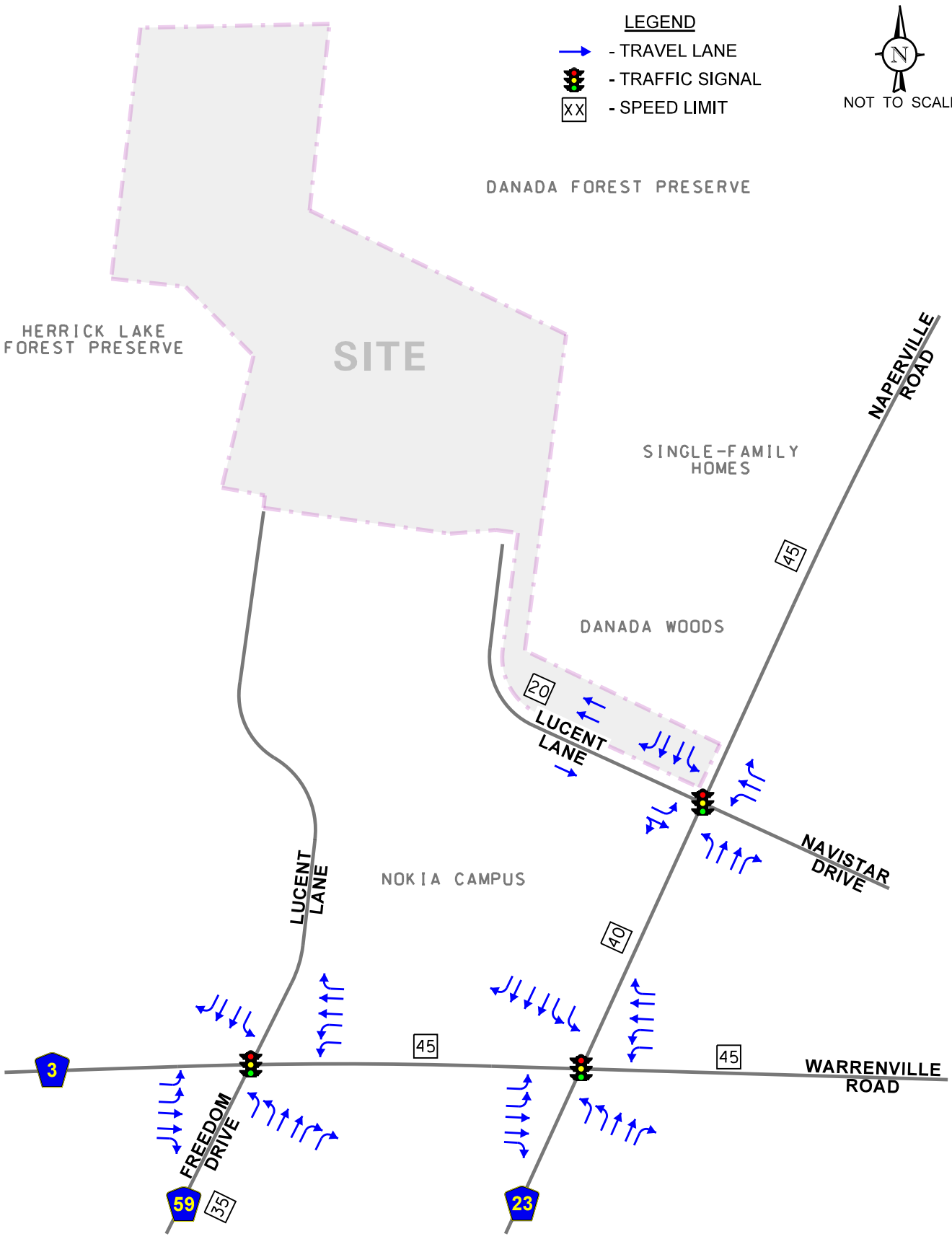
Site Location

The site, which is located in the northwest quadrant of the intersection of Naperville Road with Warrenville Road within the Nokia campus, is currently occupied by a parking lot and vacant land. Land uses in the vicinity of the site include the Danada Forest Preserve to the north, the Herrick Lake Forest Preserve to the west, the Danada Woods townhome development and single-family homes to the east and the Nokia campus to the south.

Existing Roadway System Characteristics

The characteristics of the existing roadways near the development are described below. **Figure 3** illustrates the existing roadway characteristics.

Naperville Road (County Highway 23) is a north-south arterial roadway that in the vicinity of the site provides three through lanes in the southbound direction and two through lanes in the northbound direction. At its signalized intersection with Warrenville Road, Naperville Road provides dual left-turn lanes, two through lanes and an exclusive right-turn lane on the northbound approach. The southbound approach provides dual left-turn lanes, three through lanes and an exclusive right-turn lane. Naperville Road provides access to I-88 to the east south of Warrenville Road. At its signalized intersection with Lucent Lane/Navistar Drive, Naperville Road provides an exclusive left-turn lane, two through lanes and an exclusive right-turn lane on both approaches. Naperville Road is under the jurisdiction of the DuPage County Division of Transportation (DuDOT), carries an annual average daily traffic (AADT) volume of 33,100 vehicles south of Warrenville Road and 28,000 vehicles north of Warrenville Road (IDOT 2016), and has a posted speed limit of 40 miles per hour increasing to 45 miles per hour north of Lucent Lane/Navistar Drive.



Proposed
Naper Commons
Naperville, Illinois

Existing Roadway Characteristics

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 3

Warrenville Road (County Highway 3) is an east-west arterial roadway that provides two lanes in each direction divided by a raised median. At its signalized intersections with Naperville Road and Lucent Lane/Freedom Drive, Warrenville Road provides dual left-turn lanes, two through lanes an exclusive right-turn lane on both approaches. Warrenville Road is under DuDOT's jurisdiction, carries an AADT volume of 16,600 vehicles east of Naperville Road and 20,000 vehicles west of Naperville Road (IDOT 2016), and has a posted speed limit of 45 mph.

Freedom Drive (County Highway 59) is a north-south major collector that extends from Diehl Road north to Warrenville Road where it intersects opposite Lucent Lane. Freedom Drive provides access to I-88 to and from the west and from the east. At its signalized intersection with Warrenville Road, Freedom Drive provides dual left-turn lanes, two through lanes and dual right-turn lanes on the northbound approach. The southbound approach is Lucent Lane and provides an exclusive left-turn lane, two through lanes and an exclusive right-turn lane. Freedom Drive is under DuDOT's jurisdiction, carries an AADT of 12,950 vehicles (IDOT 2016), and has a posted speed limit of 35 mph.

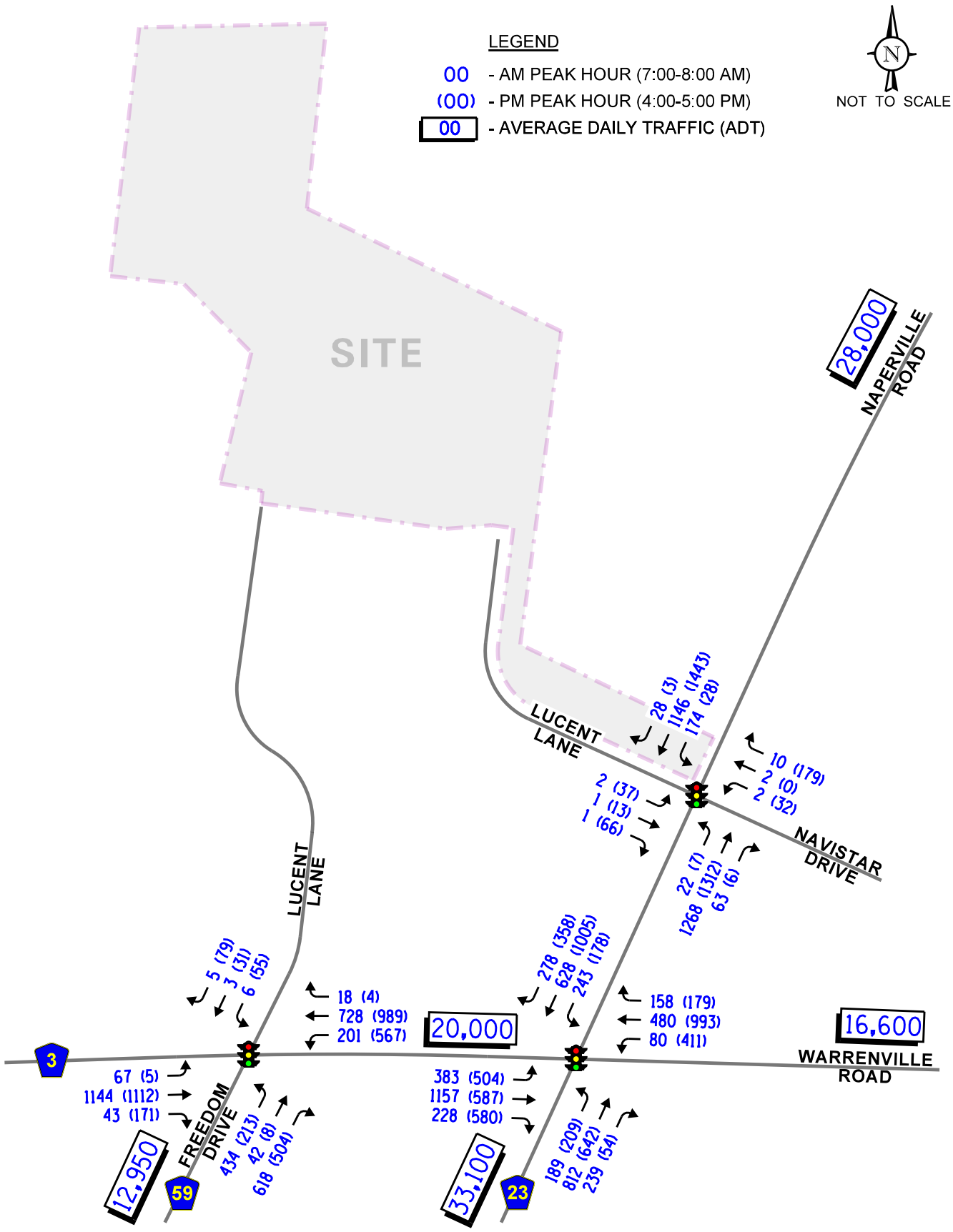
Lucent Lane/Navistar Drive are east-west private roadways serving the Nokia campus to the west and the Navistar campus as well as other businesses to the east. At its signalized intersection with Napervillle Road, Lucent lane provides an exclusive left-turn lane and a shared through/right-turn lane in the eastbound direction while Navistar Drive provides an exclusive left-turn lane, a through lane and an exclusive right-turn lane in the westbound direction.

Existing Traffic Volumes

In order to determine pre Covid-19 pandemic traffic conditions in the vicinity of the site, DuDOT provided KLOA, Inc. with turning movement traffic counts at the intersections of Warrenville Road with Freedom Drive/Lucent Lane and Naperville Road conducted in 2019 and at the intersection of Naperville Road with Lucent Lane/Navistar Drive conducted in 2018. The Naperville Road with Lucent Lane/Navistar Drive was adjusted to reflect 2019 traffic volumes based on the traffic counts at the intersection of Warrenville Road with Naperville Road.

The results of the traffic counts showed that the weekday morning peak hour of traffic occurs from 7:00 to 8:00 A.M. and the weekday evening peak hour of traffic occurs from 4:00 to 5:00 P.M.

Figure 4 illustrates the existing peak hour traffic volumes. Copies of the traffic count summary sheets are included in the Appendix.



Proposed
Naper Commons
Naperville, Illinois

Existing Traffic Volumes

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 4

Crash Analysis

KLOA, Inc. obtained crash data[1] for the past most recent available five years (2014 to 2018) for the study intersections. **Tables 1** through **3** summarize the crash data for the intersections of Naperville Road with Warrenville Road, Naperville Road with Lucent Lane/Navistar Drive, and Warrenville Road with Freedom Drive/Lucent Lane. A review of the crash data indicated that no fatalities were reported at any of the studied intersections.

Table 1
NAPERVILLE ROAD WITH WARRENVILLE ROAD – CRASH SUMMARY

	Type of Crash Frequency							
Year	**Angle**	**Head On**	**Object**	**Rear End**	**Sideswipe**	**Turning**	**Other**	**Total**
2014	0	0	0	21	0	5	0	26
2015	3	0	0	19	0	4	0	26
2016	2	0	0	13	3	6	0	24
2017	0	0	0	10	0	4	0	14
2018	1	0	0	13	1	7	0	22
Total	**6**	**0**	**0**	**76**	**4**	**26**	**0**	**112**
Average	**1.2**	**0**	**0**	**15.2**	**<1**	**5.2**	**0**	**22.4**

[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
NAPERVILLE ROAD WITH LUCENT LANE/NAVISTAR DRIVE – CRASH SUMMARY

	Type of Crash Frequency							
Year	**Angle**	**Head On**	**Object**	**Rear End**	**Sideswipe**	**Turning**	**Other**	**Total**
2014	0	0	0	1	0	0	0	1
2015	0	0	0	1	0	1	0	2
2016	0	0	0	1	0	0	0	1
2017	0	0	0	0	0	2	0	2
2018	0	0	0	0	0	0	0	0
Total	**0**	**0**	**0**	**3**	**0**	**3**	**0**	**6**
Average	**0**	**0**	**0**	**< 1**	**0**	**< 1**	**0**	**1.2**

Table 3
WARRENVILLE ROAD WITH FREEDOM DRIVE/LUCENT LANE – CRASH SUMMARY

	Type of Crash Frequency							
Year	**Angle**	**Head On**	**Object**	**Rear End**	**Sideswipe**	**Turning**	**Other**	**Total**
2014	0	0	0	8	0	2	0	10
2015	0	0	1	7	0	8	0	16
2016	0	1	0	5	0	2	0	8
2017	0	0	0	7	0	1	1	9
2018	0	0	0	7	0	3	0	10
Total	**0**	**1**	**1**	**34**	**0**	**16**	**1**	**53**
Average	**0**	**< 1**	**< 1**	**6.8**	**0**	**3.2**	**< 1**	**4.8**

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 161 single-family home lots and 66 townhomes. Access to the site will be provided via the existing signalized intersections of Lucent Lane with Naperville Road and Lucent Lane with Warrenville Road.

Directional Distribution

The directions from which residents 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.

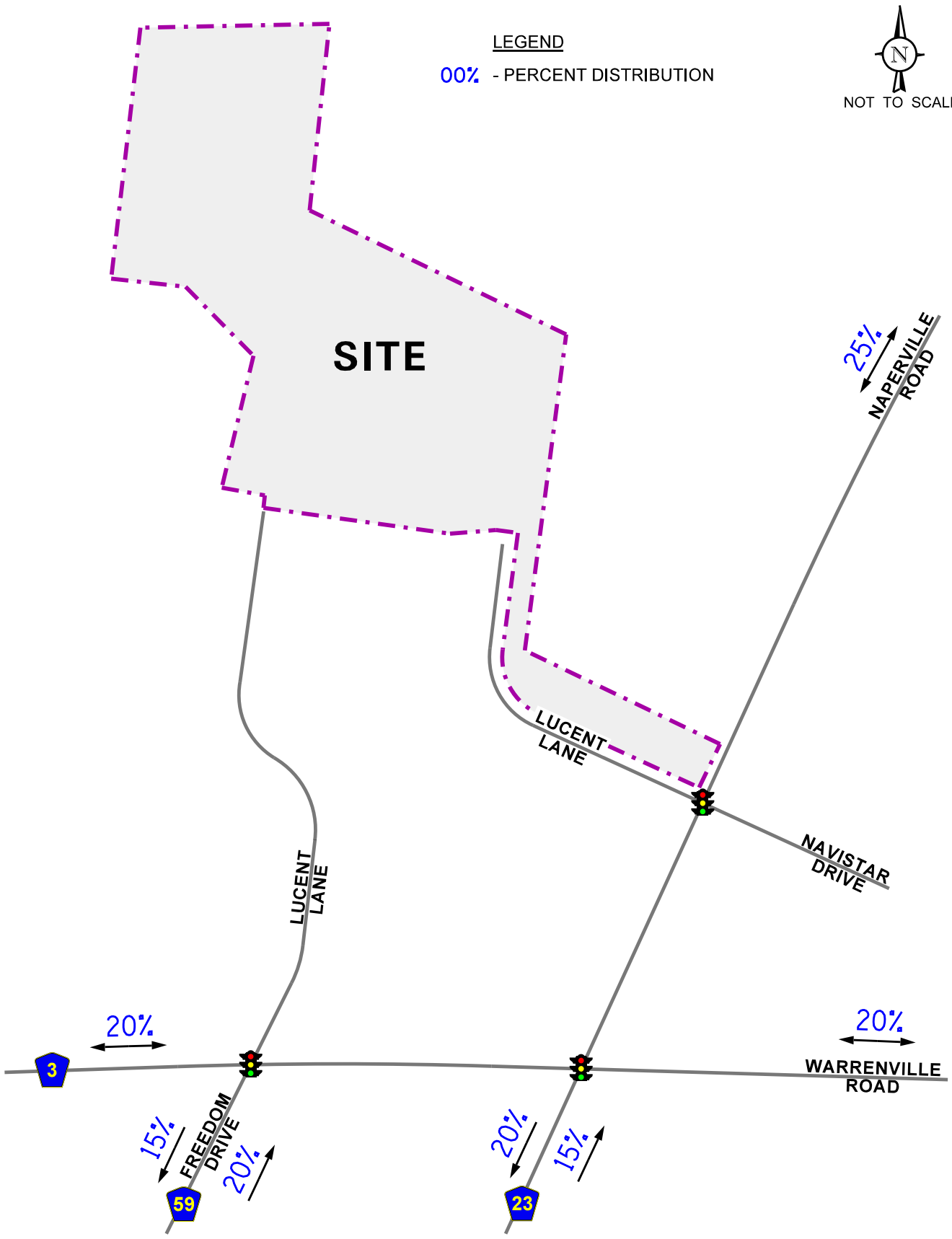
Estimated Site Traffic Generation

The volume of traffic generated be the proposed development was estimated using data published in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition. The "Single-Family Detached Housing" (Land-Use Code 210) was used for the single-family homes while the "Multi-Family Housing - Low Rise" (Land Use Code 220) was used for the townhomes.

Table 4 tabulates the peak hour vehicle trips anticipated for this development. The ITE *Trip Generation Manual* 10th Edition rates and equations are included in the Appendix.

Table 4
ESTIMATED PEAK HOUR SITE-GENERATED TRAFFIC VOLUMES

ITE Land Use Code	Type/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Daily		
		In	Out	Total	In	Out	Total	In	Out	Total
210	Single-Family (161 Units)	30	89	119	101	59	160	805	805	1,610
220	Townhomes (66 Units)	7	25	32	26	15	41	229	229	458
	Total	**37**	**114**	**151**	**127**	**74**	**201**	**1,034**	**1,034**	**2,068**



Proposed
Naper Commons
Naperville, Illinois

Estimated Directional Distribution

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 5

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 weekday 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 total new traffic assignment for the development is illustrated in **Figure 6**.

Figure 7 shows the existing plus site traffic volumes.

Nokia Campus Vacancies

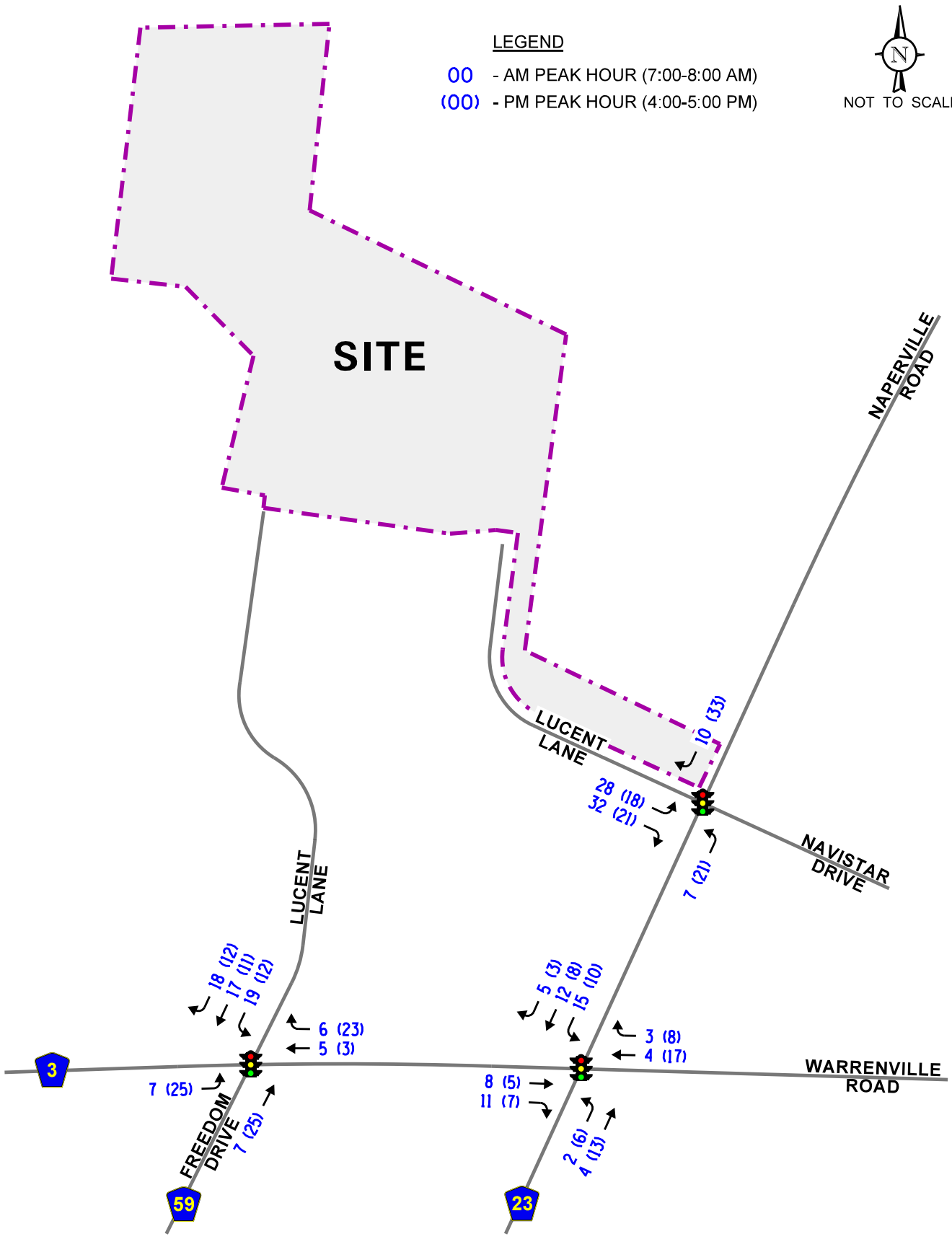
It is important to note that the Nokia campus is comprised of two buildings: 1960 Lucent Lane and 2000 Lucent Lane. The 1960 Lucent Lane is approximately 620,000 square feet in size and the 2000 Lucent Lane building is approximately 1,056,000 square feet in size. It is our understanding that in 2016 Nokia vacated the 1960 Lucent Lane and consolidated its work force in the 2000 Lucent Lane building. However, only 353,553 square feet are occupied at the 2000 Lucent Lane thus the two buildings have a total vacancy of approximately 1,322,447 square feet (620,000 s.f. + 702,447 s.f.)

To account for this, the volume of traffic to be generated by the full occupancy of the vacant space was estimated using data published in the ITE *Trip Generation Manual*, 10th Edition. The "General Office" (Land-Use Code 710) was used. **Table 5** tabulates the peak hour vehicle trips anticipated to be generated by the vacant office space. The ITE *Trip Generation Manual* 10th Edition rates and equations are included in the Appendix.

Table 5
NOKIA VACANCIES ESTIMATED PEAK HOUR GENERATED TRAFFIC VOLUMES

ITE Land Use Code	Type/Size	Weekday Morning Peak Hour			Weekday Evening Peak Hour			Daily		
		In	Out	Total	In	Out	Total	In	Out	Total
710	Office (1,322,447 s.f.)	1,092	178	1,270	212	1,111	1,323	6,493	6,493	12,986

The estimated traffic volumes that will be generated by the vacant office space were assigned to the area roadways and is illustrated in **Figure 8**.

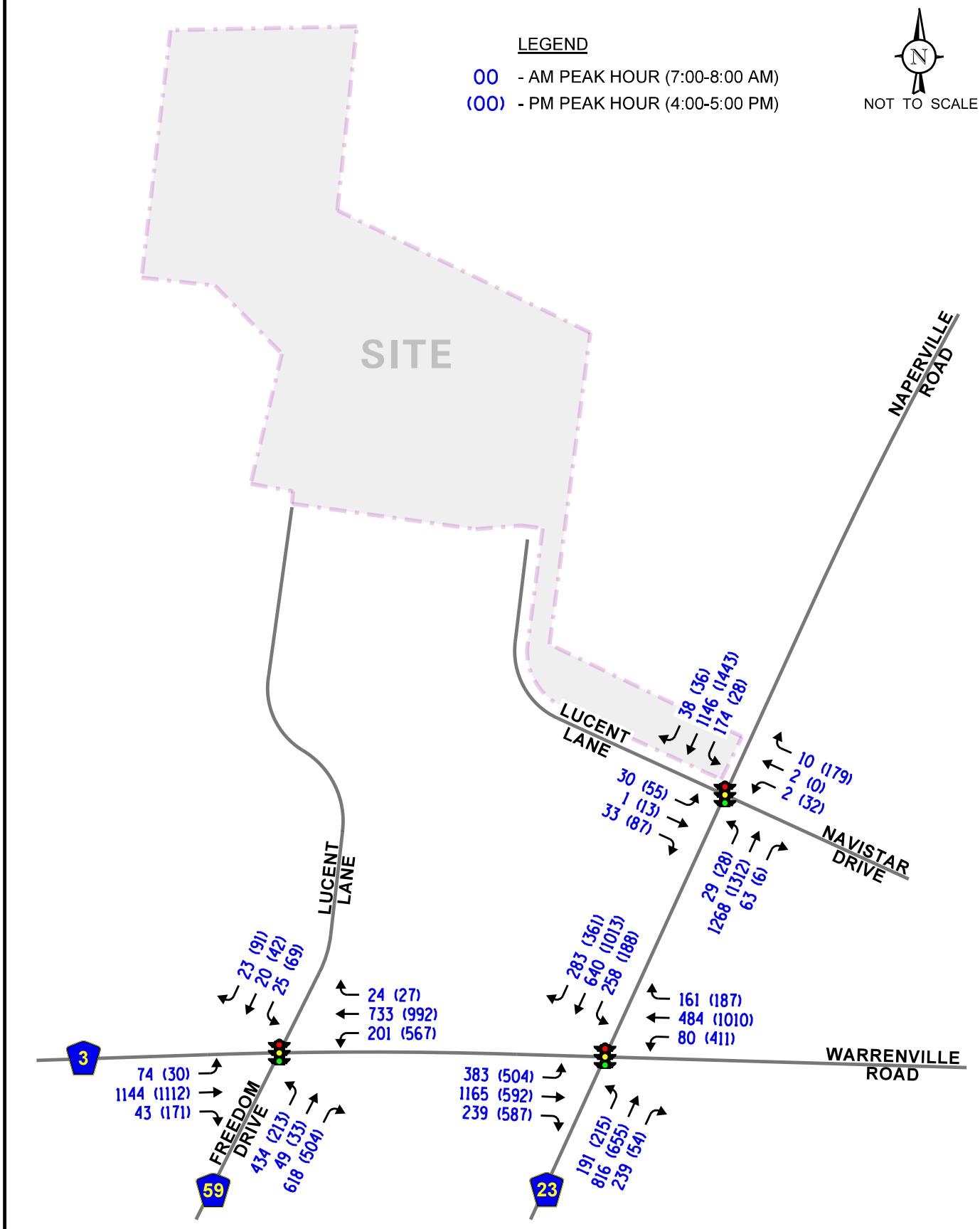


Proposed
Naper Commons
Naperville, Illinois

Estimated Site Traffic Assignment

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 6

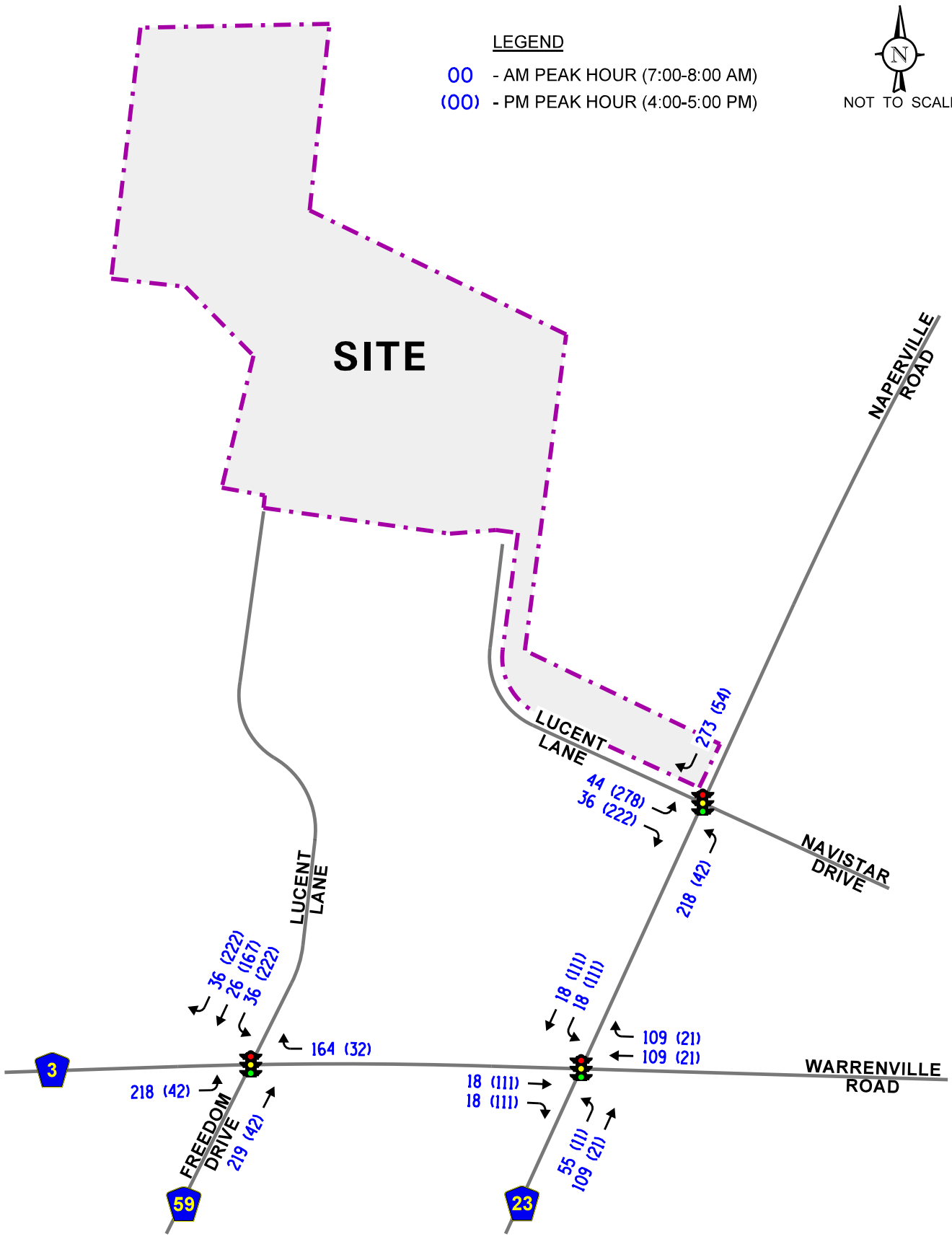


Proposed
Naper Commons
Naperville, Illinois

Existing Plus Site-Generated Traffic Volumes

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 7



Proposed
Naper Commons
Naperville, Illinois

Vacant Office Traffic Assignment

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

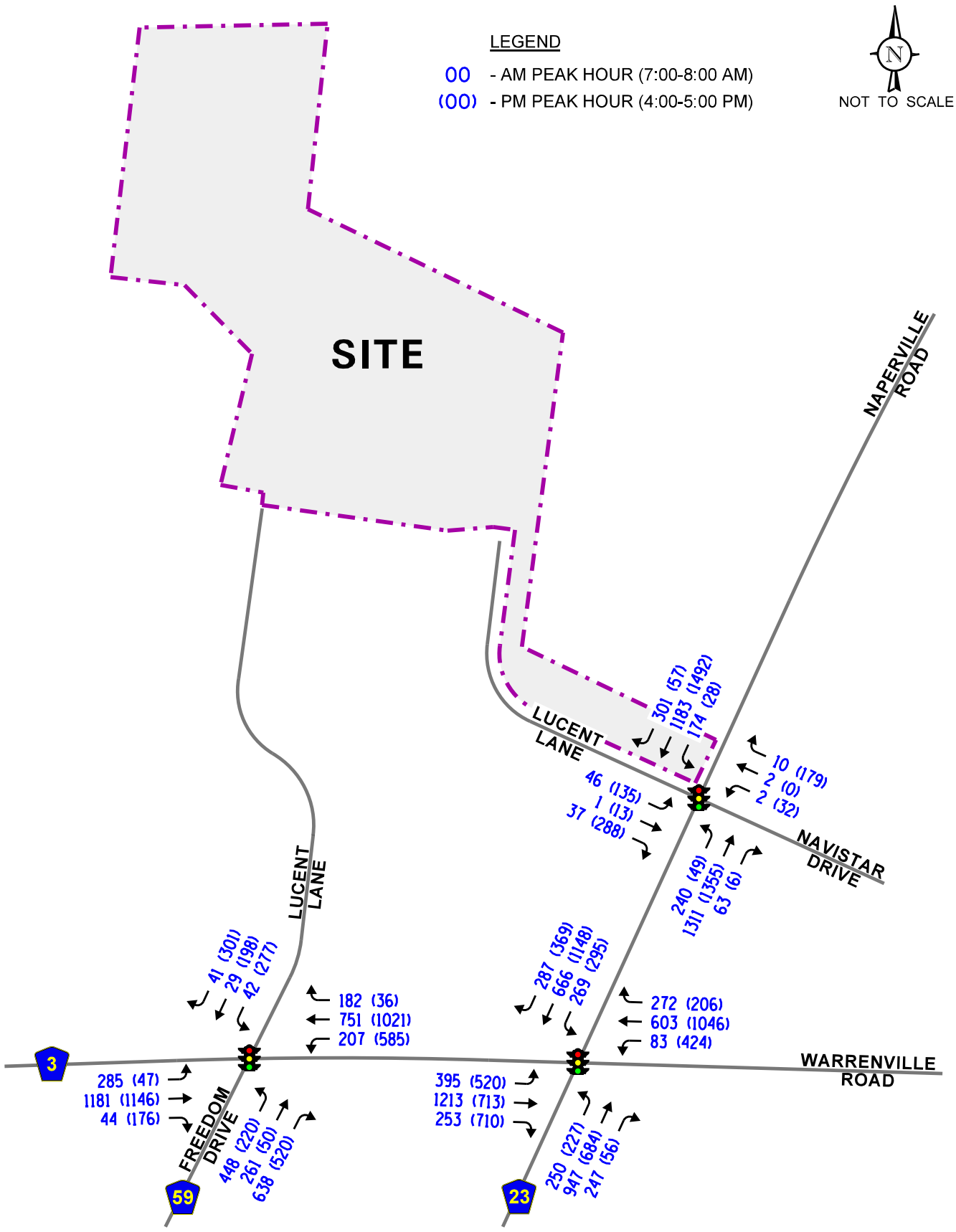
Job No: 20-177 Figure: 8

Background (No-Build) 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 a compound annual growth rate of 0.44 percent per year. As such, traffic volumes were increased by 3.20 percent to represent Year 2026 conditions. A copy of the CMAP projections letter is included in the Appendix. In addition, the traffic to be generated by the Nokia campus vacancies (Figure 7) was included in the no-build conditions. The Year 2026 no-build traffic volumes are illustrated in **Figure 9.**

Total Projected Traffic Volumes

The development-generated traffic (Figure 6) was added to the Year 2026 no-build traffic volumes (Figure 8) to determine the Year 2026 total projected traffic volumes, as illustrated in **Figure 10**.

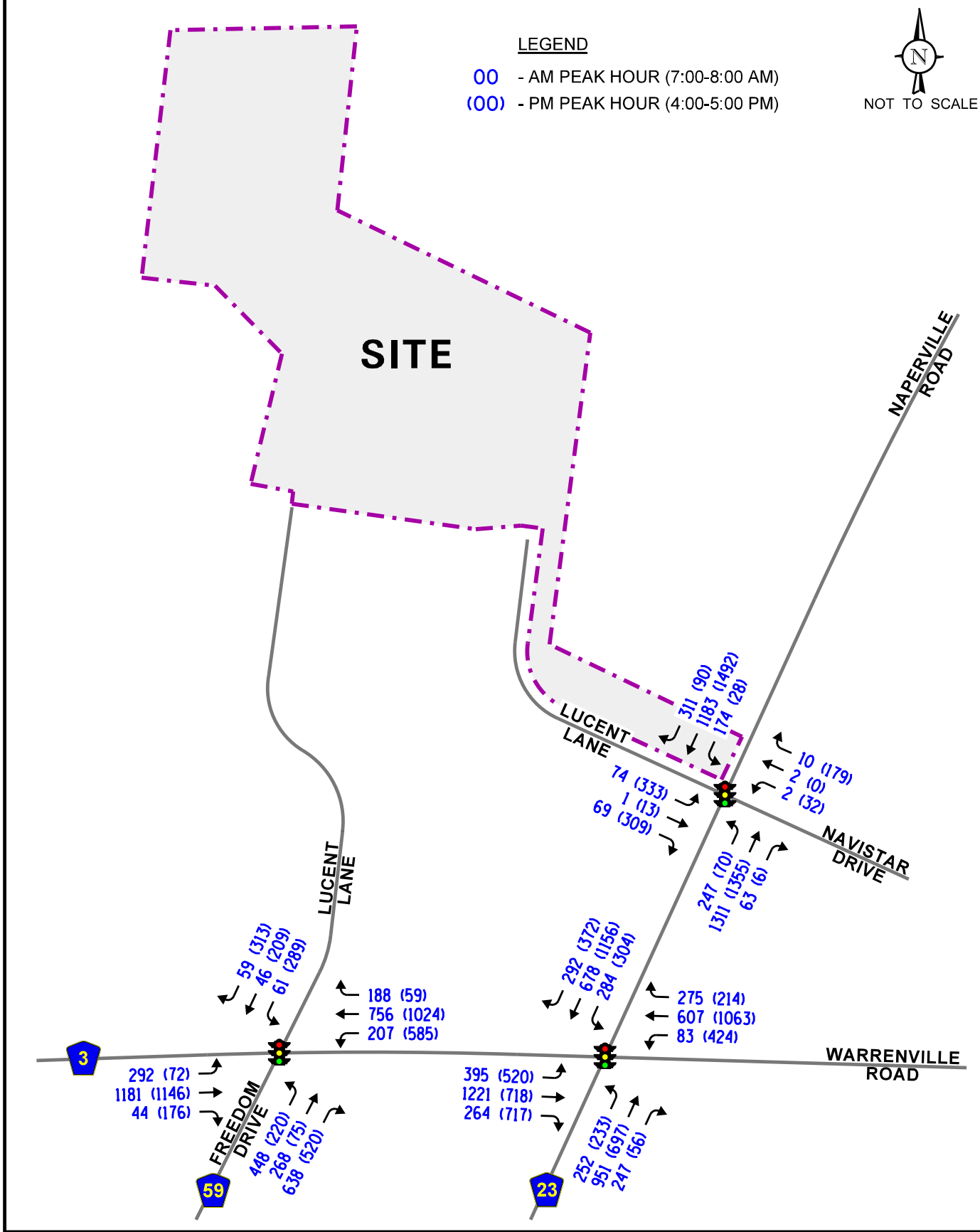


Proposed
Naper Commons
Naperville, Illinois

Year 2026 No-Build Traffic Volumes
(Includes Nokia Campus Full Occupancy)

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 9



Proposed
Naper Commons
Naperville, Illinois

Year 2026 Total Projected Traffic Volumes

KLOA
Kenig,Lindgren,O'Hara,Aboona,Inc.

Job No: 20-177 Figure: 10

5. Traffic Analysis and Recommendations

The following provides an evaluation conducted for the weekday morning and evening peak hours. The analysis includes conducting capacity analyses to determine how well the roadway system and access roadways 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 2019), Existing Plus Site, Year 2026 no-build, and Year 2026 total projected 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 computer software. Synchro/SimTraffic 10 was utilized to represent the operations of the intersections.

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, existing plus site, Year 2026 no-build, and Year 2026 total projected conditions are presented in **Tables 6** through **9**. A discussion of the intersections follows. Summary sheets for the capacity analyses are included in the Appendix.

Table 6
CAPACITY ANALYSIS RESULTS – NAPERVILLE ROAD WITH WARRENVILLE ROAD – SIGNALIZED

	Peak Hour	Eastbound			Westbound			Northbound			Southbound			Overall
		L	T	R	L	T	R	L	T	R	L	T	R	
Year 2019 Existing Conditions	**Weekday Morning**	E 58.9	D 44.7	B 13.3	E 77.0	D 44.7	B 12.1	E 74.2	D 52.5	C 23.5	E 72.9	D 39.4	B 12.4	D 44.1
		D – 43.7			D – 41.1			D – 50.2			D – 40.0			
	Weekday Evening	F 108.8	C 29.6	C 32.2	E 70.6	D 53.9	B 12.8	E 72.9	D 50.6	A 5.0	E 69.2	D 48.5	C 29.8	D 51.8
		D – 54.4			D – 53.6			D – 53.0			D – 46.5			
Year 2019 Existing Plus Site Conditions	**Weekday Morning**	E 57.0	D 46.2	B 12.3	E 77.0	D 44.5	B 12.1	E 74.4	D 53.7	C 23.8	E 72.3	D 38.2	B 11.2	D 44.2
		D – 44.0			D – 40.9			D – 51.1			D – 39.2			
	Weekday Evening	F 111.3	C 28.5	C 30.8	E 70.6	D 54.0	B 13.3	E 73.0	D 51.6	A 5.0	E 68.3	D 47.6	C 28.8	D 51.6
		D – 54.1			D – 53.5			D – 53.9			D – 45.8			
Year 2026 No-Build Conditions	**Weekday Morning**	E 55.9	D 45.7	B 10.8	E 77.5	D 46.2	B 19.4	E 77.1	E 65.6	C 25.2	E 77.3	D 38.4	B 13.6	D 47.0
		D – 43.9			D – 41.3			E – 60.7			D – 41.2			
	Weekday Evening	F 106.2	D 36.0	C 30.5	E 70.4	D 54.0	B 13.6	E 65.4	E 59.3	A 5.8	E 68.6	E 67.0	C 27.6	E 55.4
		D – 52.8			D – 53.2			E – 57.6			E – 59.3			
Year 2026 Projected Conditions	**Weekday Morning**	E 55.8	D 45.3	B 10.7	E 77.5	D 46.0	B 19.2	E 77.2	E 69.0	C 25.5	E 78.1	D 38.2	B 13.5	D 47.4
		D – 42.7			D – 41.1			E – 63.0			D – 41.5			
	Weekday Evening	F 104.9	D 36.1	C 29.3	E 70.4	D 54.1	B 13.9	E 65.1	E 60.6	A 5.8	E 70.1	E 75.8	C 27.5	E 56.9
		D – 51.9			D – 53.1			E – 58.6			E – 65.0			

Letter denotes Level of Service L – Left Turns R – Right Turns
Delay is measured in seconds. T – Through

Table 7
CAPACITY ANALYSIS RESULTS – WARRENVILLE ROAD WITH FREEDOM DRIVE/LUCENT LANE – SIGNALIZED

	Peak Hour	Eastbound			Westbound			Northbound			Southbound			Overall
		L	T	R	L	T	R	L	T	R	L	T	R	
Year 2019 Existing Conditions	Weekday Morning	E 73.0	C 33.0	A 1.6	E 67.1	C 24.6	A 1.7	D 48.6	D 40.7	D 39.4	E 71.3	E 61.7	A 0.2	D 36.9
		C – 34.1			C – 33.2			D – 43.1			D – 43.9			
	Weekday Evening	E 69.8	D 38.6	A 6.7	D 52.6	C 29.7	A 0.0	F 82.2	D 54.5	C 34.5	F 85.8	E 55.2	A 9.3	D 39.1
		C – 34.5			D – 38.0			D – 48.7			D – 43.5			
Year 2019 Existing Plus Site Conditions	Weekday Morning	E 73.1	D 36.0	A 2.0	E 68.7	C 27.5	A 3.0	E 57.9	D 41.1	D 39.4	E 75.8	E 56.9	A 0.4	D 39.9
		D – 37.0			D – 35.5			D – 46.8			D – 44.7			
	Weekday Evening	E 71.5	D 40.2	A 6.7	D 53.8	C 31.8	A 2.1	E 74.2	E 55.1	C 34.7	F 92.5	E 55.6	B 12.2	D 40.2
		D – 36.6			D – 39.2			D – 46.8			D – 48.2			
Year 2026 No-Build Conditions	Weekday Morning	E 73.1	D 41.1	A 2.2	E 68.2	D 38.4	B 14.6	E 61.9	D 44.2	D 37.8	F 80.7	D 54.0	A 0.3	D 44.7
		D – 46.0			D – 40.0			D – 47.1			D – 44.4			
	Weekday Evening	E 71.5	D 42.7	B 10.0	D 54.9	C 32.9	A 3.5	F 118.4	E 55.6	C 34.4	F 669.6	E 59.6	D 46.4	F 82.6
		D – 39.5			D – 40.1			E – 59.2			F – 272.5			
Year 2026 Projected Conditions	Weekday Morning	E 73.0	D 41.9	A 2.2	E 68.7	D 39.2	B 14.7	E 60.8	D 44.2	D 37.8	F 88.7	D 54.6	A 2.9	D 45.1
		D – 46.8			D – 40.5			D – 46.7			D – 48.7			
	Weekday Evening	E 73.4	D 42.7	B 10.8	D 55.0	C 33.4	A 4.7	F 118.4	E 56.1	C 34.4	F 711.8	E 60.0	D 47.2	F 86.0
		D – 40.3			D – 39.7			E – 59.1			F – 287.3			

Letter denotes Level of Service L – Left Turns R – Right Turns
Delay is measured in seconds. T – Through

Table 8
CAPACITY ANALYSIS RESULTS – WARRENVILLE ROAD WITH FREEDOM DRIVE/LUCENT LANE – SIGNALIZED

	Peak Hour	Eastbound			Westbound			Northbound			Southbound			Overall
		L	T	R	L	T	R	L	T	R	L	T	R	
Year 2026 No-Build Conditions[1]	Weekday Morning	E 73.1	D 39.8	A 2.2	E 67.6	D 37.2	B 14.2	E 61.9	D 44.0	D 37.7	E 72.1	E 55.2	A 0.3	D 43.9
		D – 45.0			D – 39.1			D – 46.9			D – 41.5			
	Weekday Evening	E 71.5	D 42.7	B 10.0	D 54.9	C 32.9	A 3.5	F 118.4	E 55.6	C 34.4	F 184.7	E 59.6	D 46.4	D 53.2
		D – 39.5			D – 40.1			E – 59.2			F – 99.2			
Year 2026 Projected Conditions[1]	Weekday Morning	E 73.0	D 40.7	A 2.2	E 67.8	D 38.2	B 14.4	E 60.9	D 44.1	D 37.6	E 72.8	E 55.4	A 2.9	D 44.3
		D – 45.8			D – 39.6			D – 46.6			D – 43.1			
	Weekday Evening	E 73.4	D 42.7	B 10.8	D 54.9	C 33.4	A 4.8	F 118.4	E 56.1	C 34.4	F 201.8	E 60.0	D 47.2	D 54.7
		D – 40.3			D – 40.0			E – 59.1			F – 105.6			

Letter denotes Level of Service L – Left Turns R – Right Turns
Delay is measured in seconds. T – Through

1 – Assumes the restriping of the southbound approach to provide dual left-turn lanes, two through lanes and an exclusive right-turn lane

Table 9
CAPACITY ANALYSIS RESULTS – NAPERVILLE ROAD WITH LUCENT LANE/NAVISTAR DRIVE – SIGNALIZED

	Peak Hour	Eastbound			Westbound			Northbound			Southbound			Overall
		L	T	R	L	T	R	L	T	R	L	T	R	
Year 2019 Existing Conditions	**Weekday Morning**	E 63.5	E 59.0		E 63.5	E 70.0	A 0.8	A 2.0	A 6.8	A 2.2	A 4.9	A 2.7	A 0.0	A 4.9
		E – 61.3			B – 18.4			A – 6.6			A – 2.9			
	Weekday Evening	E 55.2	C 33.9		E 75.8	--	C 31.8	B 11.3	C 31.1	A 0.0	A 4.5	A 7.9	A 0.0	C 20.9
		D – 40.7			D – 38.5			C – 30.9			A – 7.8			
Year 2019 Existing Plus Site Conditions	**Weekday Morning**	E 69.9	C 29.6		E 61.5	E 70.0	A 0.6	A 2.8	B 10.0	A 3.3	A 6.6	A 4.6	A 0.1	A 8.1
		D – 48.6			B – 18.0			A – 9.5			A – 4.7			
	Weekday Evening	E 57.1	C 31.7		E 75.8	--	D 37.1	B 11.6	C 32.3	A 0.0	A 4.6	B 10.2	A 0.1	C 22.6
		D – 40.7			D – 43.0			C – 31.7			A – 9.8			
Year 2026 No-Build Conditions	**Weekday Morning**	E 73.8	C 28.6		E 61.5	E 70.0	A 0.7	B 19.8	A 9.6	A 2.6	A 7.5	A 7.5	A 3.8	B 10.0
		D – 53.2			B – 18.0			B – 10.9			A – 6.8			
	Weekday Evening	F 96.0	E 55.2		E 77.0	--	F 128.0	B 17.0	D 45.6	A 0.0	A 7.2	B 16.9	A 1.2	D 42.0
		E – 76.1			F – 120.2			D – 44.4			B – 16.1			
Year 2026 Projected Conditions	**Weekday Morning**	F 85.5	C 25.3		E 61.0	E 69.0	A 0.7	C 21.7	B 10.7	A 2.6	A 8.4	A 8.6	A 4.1	B 11.9
		E – 56.8			B – 17.8			B – 12.1			A – 7.7			
	Weekday Evening	F 94.4	E 60.3		E 77.0	--	F 150.3	B 19.1	D 46.1	A 0.0	A 7.5	B 18.8	A 3.5	D 44.2
		E – 77.7			F – 139.1			D – 44.6			B – 17.8			

Letter denotes Level of Service L – Left Turns R – Right Turns
Delay is measured in seconds. T – Through

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 traffic. As discussed in this section, the results of the capacity analyses under Year 2026 total projected conditions reflect primarily the assumed increase in background traffic volumes due to the regional growth factors and the traffic to be generated by the substantial vacancies within the Nokia campus discussed in the previous chapter.

Naperville Road with Warrenville Road

The results of the capacity analysis indicate that overall this intersection currently operates at Level of Service (LOS) D during the weekday morning and evening peak hours. It is important to note that while the left-turn movements operate at a LOS E or F, this is due to the long cycle length and the fact that these movements can only proceed through the intersection on a protected phase (green arrow) only. Inspection of the simulation runs indicate that these movements, although operating at LOS E or F, are able to process the traffic volumes efficiently.

Under existing traffic plus site conditions, the intersection will continue operating at the same LOS with virtually no changes in the delay experienced at this intersection. Therefore, this indicates that the proposed Naper Commons development will have a minimal impact on traffic conditions at this intersection.

Under Year 2026 no-build conditions, assuming the background growth and the traffic to be generated by the Nokia campus vacancies, this intersection overall is projected to operate at LOS D during the weekday morning peak hour and LOS E during the weekday evening peak hour with increases in overall delay of approximately three seconds and four seconds, respectively.

Under Year 2026 total projected traffic conditions, this intersection overall is projected to continue operating at LOS D during the weekday morning peak hour and LOS E during the weekday evening peak hour with increases in delay of approximately 0.5 seconds and 1.5 seconds, respectively, over Year 2026 no-build conditions. As previously indicated, this indicates that the proposed development will have a minimal impact on traffic condition at this intersection. In fact inspection of the traffic volumes indicates that the proposed development will amount to approximately one percent of the traffic at this intersection. As such, no geometric or traffic control improvements will be necessary in conjunction with the proposed development.

Warrenville Road with Freedom Drive/Lucent Lane

The results of the capacity analysis indicate that overall this intersection currently operates at LOS D during the weekday morning and evening peak hours. It is important to note that while the left-turn movements operate at a LOS E or F, it is due particularly to the long cycle length and the fact that these movements can only proceed through the intersection on a protected phase (green arrow) only. Inspection of the simulation runs indicate that these movements are contained within the provided storage length and are processed efficiently.

Under existing traffic plus site conditions, the intersection will continue operating at the same overall LOS with increases in delay of approximately three seconds during the morning peak hour and one second during the evening peak hour. Therefore, this indicates that the proposed Naper Commons development will have a minimal impact on traffic conditions at this intersection.

Under Year 2026 no-build conditions, assuming the background growth and the traffic to be generated by the Nokia campus vacancies, this intersection overall is projected to operate at LOS D during the weekday morning peak hour and LOS F during the weekday evening peak hour. It is important to note that the LOS F to be experienced during the weekday evening peak hour is mainly the result of the projected southbound left-turn movement (over 270 vehicles) in a single left-turn lane and on a protected phase (green arrow) only. If the Nokia campus is fully occupied, this poor LOS can be mitigated by restriping the southbound approach to provide dual left-turn lanes, two through lanes and an exclusive right-turn lane. Based on the results of the capacity analyses, the overall LOS during the evening peak hour would improve to LOS D.

Under Year 2026 total projected conditions, the overall delay will increase by approximately 0.5 seconds and 3.4 seconds during the weekday morning and evening peak hours, respectively. This indicates that the proposed development will have a minimal impact on traffic conditions at this intersection. As such, no geometric or traffic control improvements will be necessary at this intersection in conjunction with the proposed development.

Naperville Road with Lucent Lane/Navistar Drive

The results of the capacity analysis indicate that overall this intersection currently operates at LOS A during the weekday morning peak hour and LOS C during the weekday evening peak hour.

Under existing traffic plus site conditions, the intersection will continue operating at the same overall LOS with increases in delay of approximately three seconds during the morning peak hour and two seconds during the evening peak hour. Therefore, this indicates that the proposed Naper Commons development will have a minimal impact on traffic conditions at this intersection.

Under Year 2026 no-build conditions, assuming the background growth and the traffic to be generated by the Nokia campus vacancies, this intersection overall is projected to operate at LOS B during the weekday morning peak hour and LOS D during the weekday evening peak hour.

Under Year 2026 total projected conditions, the overall delay will increase by approximately two seconds during the weekday morning and evening peak hours. This indicates that the proposed development will have a minimal impact on traffic conditions at this intersection. As such, no geometric or traffic control improvements will be necessary at this intersection in conjunction with the proposed development.

7. Conclusion

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

- The traffic that will be generated by the proposed development can be accommodated by the area roadway system.

- The projected traffic volumes will amount to approximately one percent of the traffic at the intersection of Naperville Road with Warrenville Road and will have a negligible impact on traffic conditions in the area.

- The existing access system serving the Nokia campus and the proposed development will ensure that efficient and flexible access is provided.

- If the Nokia campus becomes fully occupied, consideration should be given to restriping the southbound approach of Lucent Lane at its intersection with Warrenville Road to provide dual left-turn lanes, two through lanes, and an exclusive right-turn lane. This can be accommodated by the existing pavement width.

Appendix

Traffic Count Summary Sheets
Site Plan
ITE Trip Generation Rates and Equations
CMAP 2050 Projections Letter
Level of Service Criteria
Capacity Analysis Summary Sheets

Traffic Count Summary Sheets

DuPage County Division of Transportation
421 N. County Farm Road
Wheaton, Illinois, 60187

File Name: Warrenville and Freedom
Study Date: 09/10/19

	Freedom Southbound				Warrenville Westbound				Freedom Northbound				Warrenville Eastbound			
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total
7:00	1	0	2	3	5	153	51	209	142	7	77	226	9	228	18	255
7:15	2	0	1	3	3	169	47	219	127	9	100	236	10	276	14	300
7:30	1	2	1	4	3	187	59	249	182	12	113	307	11	343	17	371
7:45	1	1	2	4	7	236	44	287	167	14	144	325	13	312	18	343
Total	5	3	6	14	18	745	201	964	618	42	434	1094	43	1159	67	1269

	Freedom Southbound				Warrenville Westbound				Freedom Northbound				Warrenville Eastbound			
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total
16:00	29	4	15	48	1	241	144	386	109	4	29	142	45	314	1	360
16:15	13	7	10	30	1	237	146	384	144	1	44	189	38	261	2	301
16:30	16	7	14	37	0	286	149	435	121	2	84	207	49	327	2	378
16:45	21	13	16	50	2	296	128	426	130	1	56	187	39	319	0	358
Total	79	31	55	165	4	1060	567	1631	504	8	213	725	171	1221	5	1397

DuPage County Division of Transportation
421 N. County Farm Road
Wheaton, Illinois, 60187

File Name: Warrenville and Naperville
Study Date: 8/29/19

	Naperville Southbound				Warrenville Westbound				Naperville Northbound				Warrenville Eastbound			
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total
7:00	59	100	39	198	33	120	20	173	45	155	56	256	55	206	89	350
7:15	67	162	58	287	41	116	14	171	61	208	49	318	56	289	88	433
7:30	59	183	74	316	33	113	24	170	66	233	42	341	65	311	104	480
7:45	93	183	72	348	51	131	22	204	67	216	42	325	52	351	102	505
Total	278	628	243	1149	158	480	80	718	239	812	189	1240	228	1157	383	1768

	Naperville Southbound				Warrenville Westbound				Naperville Northbound				Warrenville Eastbound			
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total
16:00	76	237	35	348	47	213	95	355	13	150	49	212	130	108	129	367
16:15	83	228	43	354	42	241	87	370	9	155	50	214	144	154	115	413
16:30	80	243	50	373	47	269	117	433	13	143	59	215	162	133	140	435
16:45	119	297	50	466	43	270	112	425	19	194	51	264	144	192	120	456
Total	358	1005	178	1541	179	993	411	1583	54	642	209	905	580	587	504	1671

DuPage County Division of Transportation
421 N. County Farm Road
Wheaton, IL. 60187

File Name: Naperville Road and Lucent
Study Date: 7/8/18

	Naperville Southbound				Lucent Westbound				Naperville Northbound				Lucent Eastbou		
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left
7:00	5	199	41	245	4	0	0	4	17	246	7	270	0	0	0
7:15	8	262	28	298	4	1	1	6	10	323	5	338	0	0	0
7:30	9	312	49	370	1	0	0	1	13	342	3	358	1	1	1
7:45	6	345	56	407	1	1	1	3	23	285	7	315	0	0	1
Total	28	1118	174	1320	10	2	2	14	63	1196	22	1281	1	1	2

	Naperville Southbound				Lucent Westbound				Naperville Northbound				Lucen Eastbou		
Time	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left	Appr. Total	Right	Thru	Left
16:00	1	304	4	309	46	0	5	51	2	270	1	273	12	0	13
16:15	2	302	7	311	26	0	15	41	1	312	1	314	19	2	4
16:30	0	345	6	351	60	0	7	67	0	375	3	378	19	0	6
16:45	0	341	11	352	47	0	5	52	3	351	2	356	16	11	14
Total	3	1292	28	1323	179	0	32	211	6	1308	7	1321	66	13	37

t

ınd

Appr. Total
0
0
3
1
4

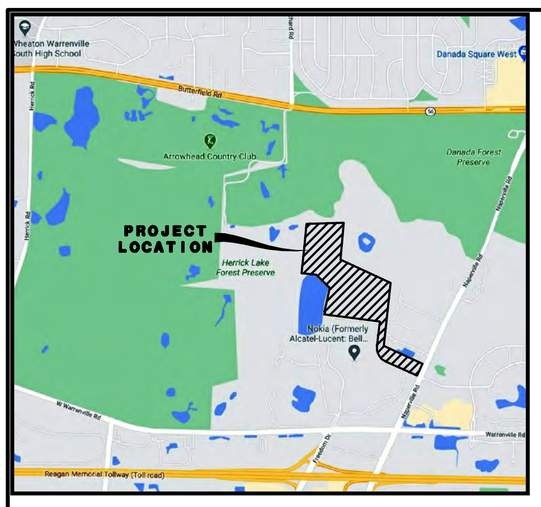
t

ınd

Appr. Total
25
25
25
41
116

Site Plan

SITE PLAN
FOR
NAPER COMMONS



LOCATION MAP

PARCEL DESCRIPTION

PART OF LOT 4 IN NOKIA CAMPUS SUBDIVISION, BEING A SUBDIVISION IN PART OF THE NORTH 1/2 OF SECTION 5, TOWNSHIP 38 NORTH, RANGE 10 EAST AND THE SOUTH HALF OF SECTION 32, TOWNSHIP 39 NORTH RANGE 10 EAST OF THE THIRD PRINCIPAL MERIDIAN, ACCORDING TO THE PLAT THEREOF RECORDED AUGUST 6, 2020 AS DOCUMENT R2020-085330, IN DUPAGE COUNTY, ILLINOIS.

N

150 75 0 150

SCALE: 1" = 150'

SITE DATA

A. TOTAL AREA	64.71 AC.±
B. PROPOSED ZONING	R2 PUD
C. INTERNAL R.O.W.	11.75 AC.±
D. STORMWATER/WETLAND PRESERVATION/COMMON AREA	20.31 AC.±
E. PARK SITE	2.06 AC.±
F. P.U.D OPEN SPACE CALCULATION	36.61%
G. RESIDENTIAL UNITS:	
TOWNES (TOWNHOMES)	66
FRONT SETBACK	20 FT.
CORNER SIDE YARD SETBACK	15 FT.
SIDE YARD SETBACK	12 FT.
REAR YARD SETBACK	25 FT.
BUILDING SEPARATION	
FRONT TO FRONT	61 FT.
REAR TO REAR	60 FT.
SIDE TO SIDE	12 FT.
REAR TO SIDE	35 FT.
FRONT TO SIDE	50 FT.
MEADOWS (51' X 120' LOTS)	118
MINIMUM LOT SIZE	6,120 S.F.
AVERAGE LOT SIZE	6,841 S.F.
MAXIMUM LOT SIZE	9,464 S.F.
FRONT YARD SETBACK	20/25 FT.
*(MINIMUM 20' WHERE SHOWN ON PLAN)	
*(MINIMUM 25' WHERE SHOWN ON PLAN)	
CORNER SIDE YARD SETBACK	15 FT.
INTERIOR SIDE YARD SETBACK	6 FT.
*INTERIOR SIDE YARD SETBACK - RANCH HOMES	5 FT.
REAR YARD SETBACK	25 FT.
ESTATES (64' X 120' LOTS)	43
MINIMUM LOT SIZE	7,680 S.F.
AVERAGE LOT SIZE	8,630 S.F.
MAXIMUM LOT SIZE	10,927 S.F.
FRONT YARD SETBACK	20/25 FT.
*(MINIMUM 20' WHERE SHOWN ON PLAN)	
*(MINIMUM 25' WHERE SHOWN ON PLAN)	
CORNER SIDE YARD SETBACK	15 FT.
INTERIOR SIDE YARD SETBACK	7 FT.
REAR YARD SETBACK	25 FT.
H. TOTAL UNITS	227
I. GROSS DENSITY	3.51 DU/AC.
J. LOT AREA	
REQUIRED	
6,000 S.F. PER SINGLE FAMILY DETACHED	966,000 S.F.
4,000 S.F. PER SINGLE FAMILY ATTACHED	264,000 S.F.
TOTAL	1,230,000 S.F.
PROVIDED	
SINGLE FAMILY DETACHED	1,178,324 S.F.
SINGLE FAMILY ATTACHED	153,996 S.F.
TOTAL	1,332,320 S.F.
K. TOWNHOME GUEST PARKING	
REQUIRED	17
PROVIDED	17

PREPARED FOR:

PULTE HOME COMPANY, LLC
1900 E. GOLF ROAD, SUITE 300
SCHAUMBURG, IL 60173
(847) 230-5400

PREPARED BY:

CEMCON, Ltd.
Consulting Engineers, Land Surveyors & Planners
2280 White Oak Circle, Suite 100
Aurora, Illinois 60502-9675
PH: 630.862.2100 FAX: 630.862.2199
E-Mail: cadd@cemcon.com Website: www.cemcon.com

DISC NO.: 402138 FILE NAME: SITE PLAN
DRAWN BY: LAL FLD. BK. / PG. NO.: NOTES
COMPLETION DATE: 02-24-21 JOB NO.: 402.138
XREF : TOPO PROJECT MANAGER : CRM

PLOT FILE CREATED: 2/24/2021 BY: LESLIE LUNDBERG DRAWING PATH: P:\402138\DWG\ENG\DRAWINGS\CONCEPT\SITE PLAN.DWG

ITE Trip Generation Rates and Equations

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)

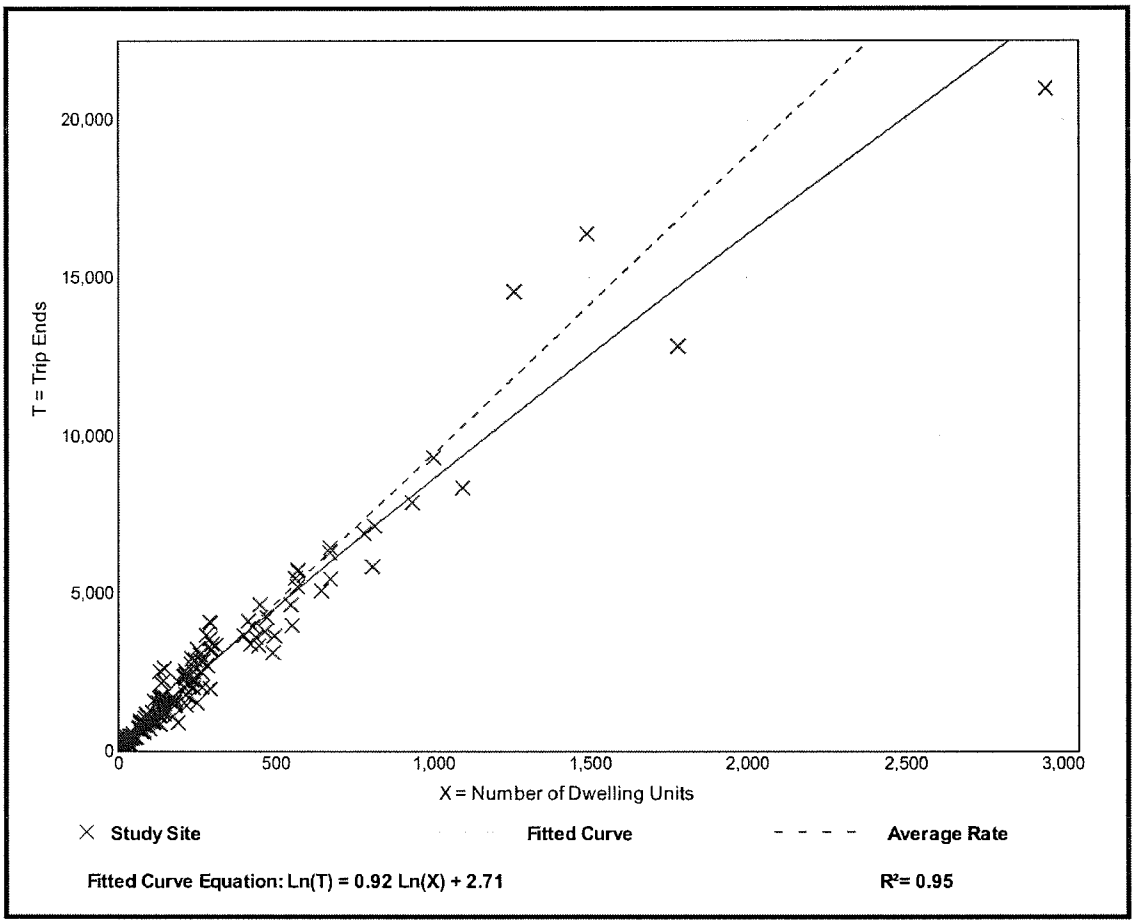
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.71

R^2= 0.95

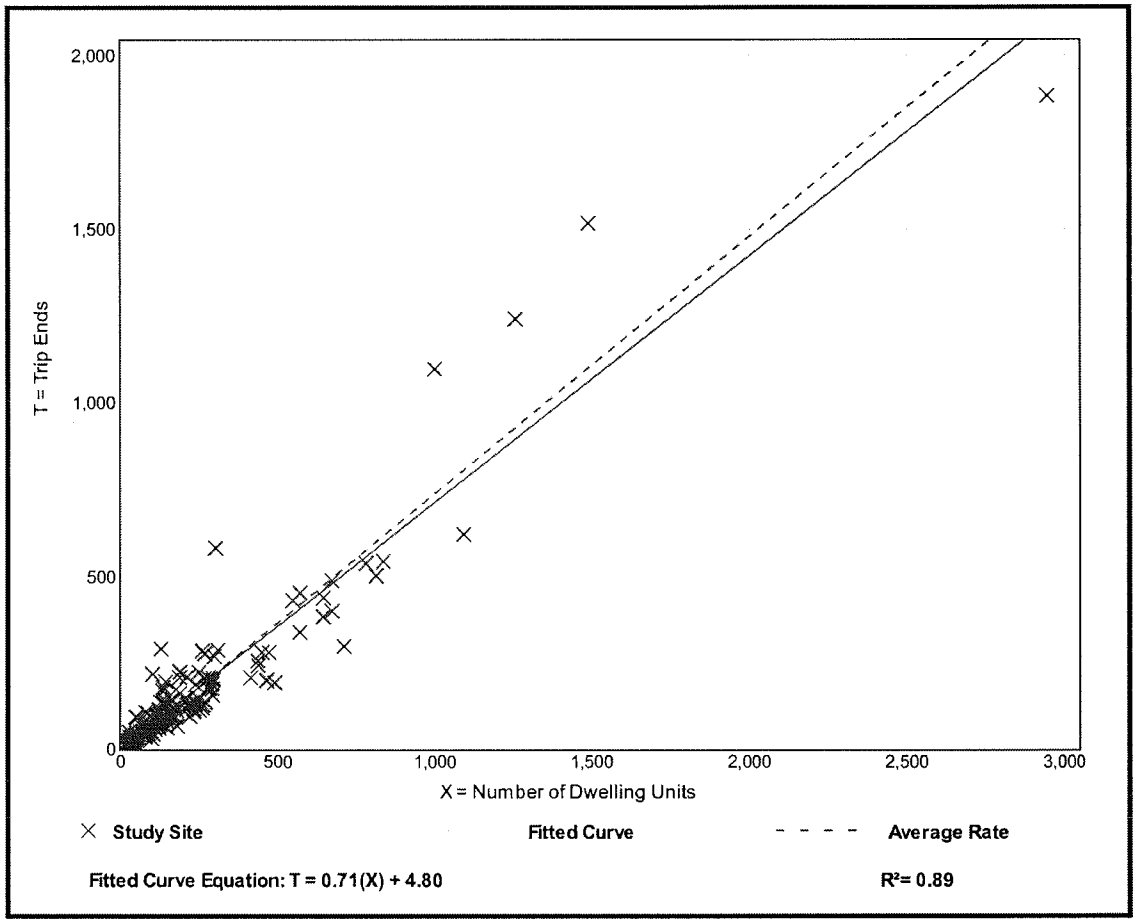
Single-Family Detached Housing
(210)

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



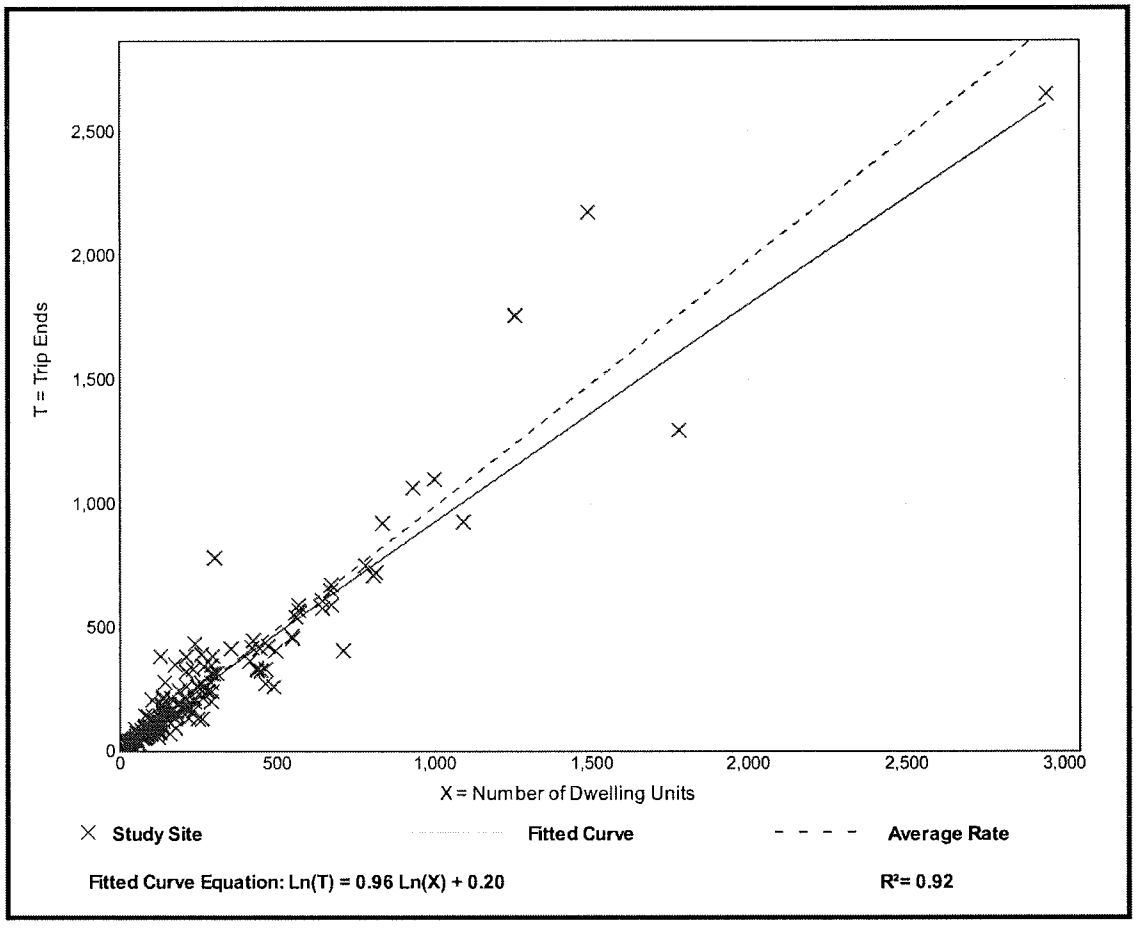
Single-Family Detached Housing
(210)

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



Fitted Curve Equation: Ln(T) = 0.96 Ln(X) + 0.20

R^2= 0.92

Land Use: 220
Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors). Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), and off-campus student apartment (Land Use 225) are related land uses.

Additional Data

In prior editions of *Trip Generation Manual*, the low-rise multifamily housing sites were further divided into rental and condominium categories. An investigation of vehicle trip data found no clear differences in trip making patterns between the rental and condominium sites within the ITE database. As more data are compiled for future editions, this land use classification can be reinvestigated.

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

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.

Time-of-day distribution data for this land use are presented in Appendix A. For the 10 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 4:45 and 5:45 p.m., respectively. For the one site with Saturday data, the overall highest vehicle volume was counted between 9:45 and 10:45 a.m. For the one site with Sunday data, the overall highest vehicle volume was counted between 11:45 a.m. and 12:45 p.m.

For the one dense multi-use urban site with 24-hour count data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:00 and 8:00 a.m. and 6:15 and 7:15 p.m., respectively.

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

The average numbers of person trips per vehicle trip at the five general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.13 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.21 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, District of Columbia, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Minnesota, New Jersey, New York, Ontario, Oregon, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, and Washington.

It is expected that the number of bedrooms and number of residents are likely correlated to the number of trips generated by a residential site. Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.

Source Numbers

168, 187, 188, 204, 211, 300, 305, 306, 319, 320, 321, 357, 390, 412, 418, 525, 530, 571, 579, 583, 864, 868, 869, 870, 896, 903, 918, 946, 947, 948, 951

Multifamily Housing (Low-Rise)
(220)

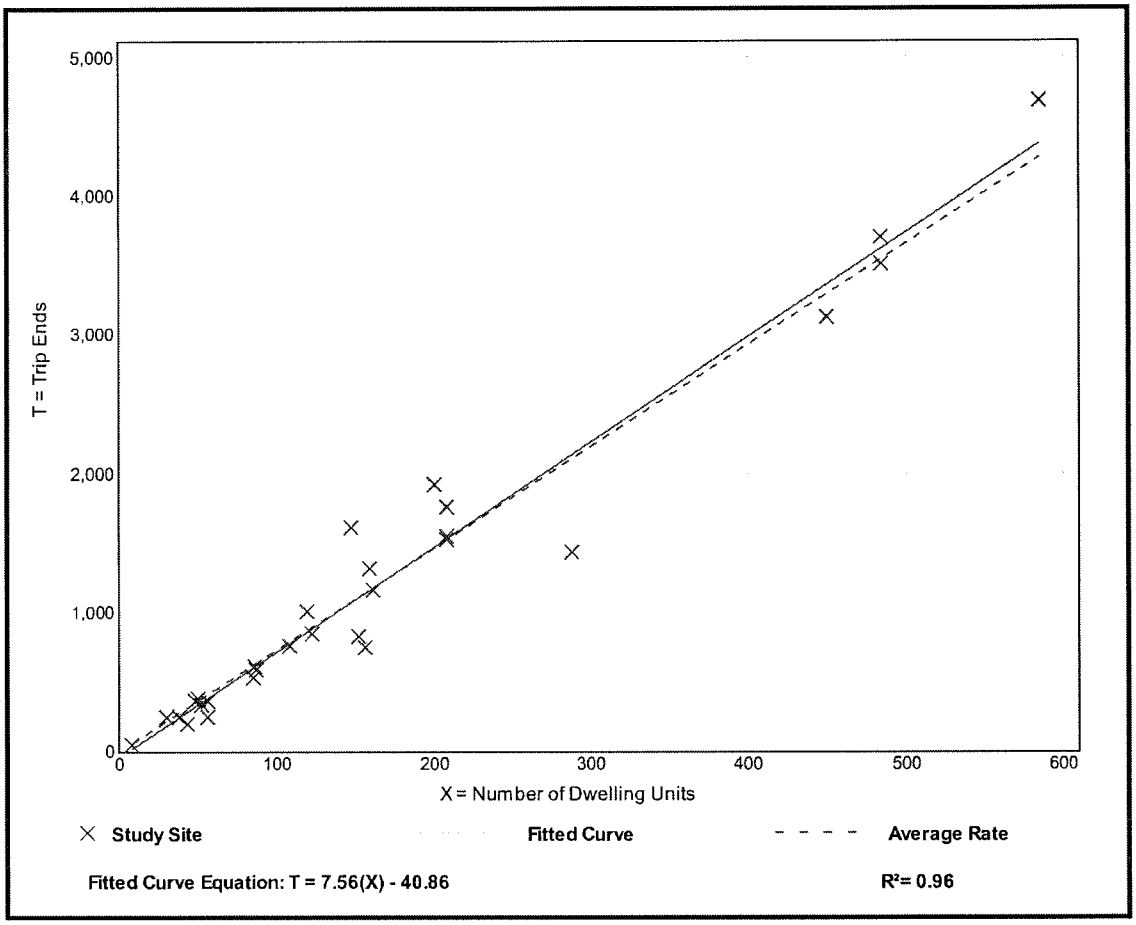
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 29
Avg. Num. of Dwelling Units: 168
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.32	4.45 - 10.97	1.31

Data Plot and Equation



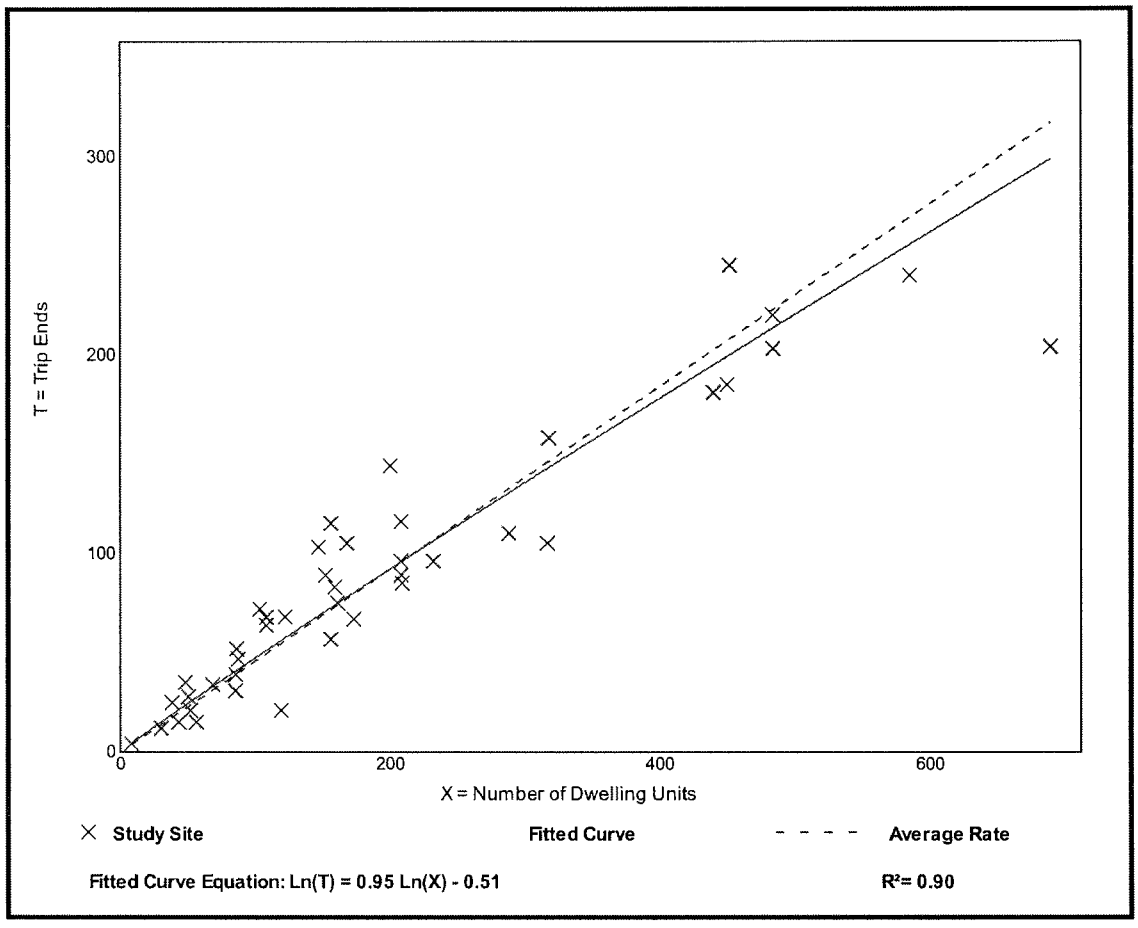
Multifamily Housing (Low-Rise)
(220)

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:	42
Avg. Num. of Dwelling Units:	199
Directional Distribution:	23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.46	0.18 - 0.74	0.12

Data Plot and Equation



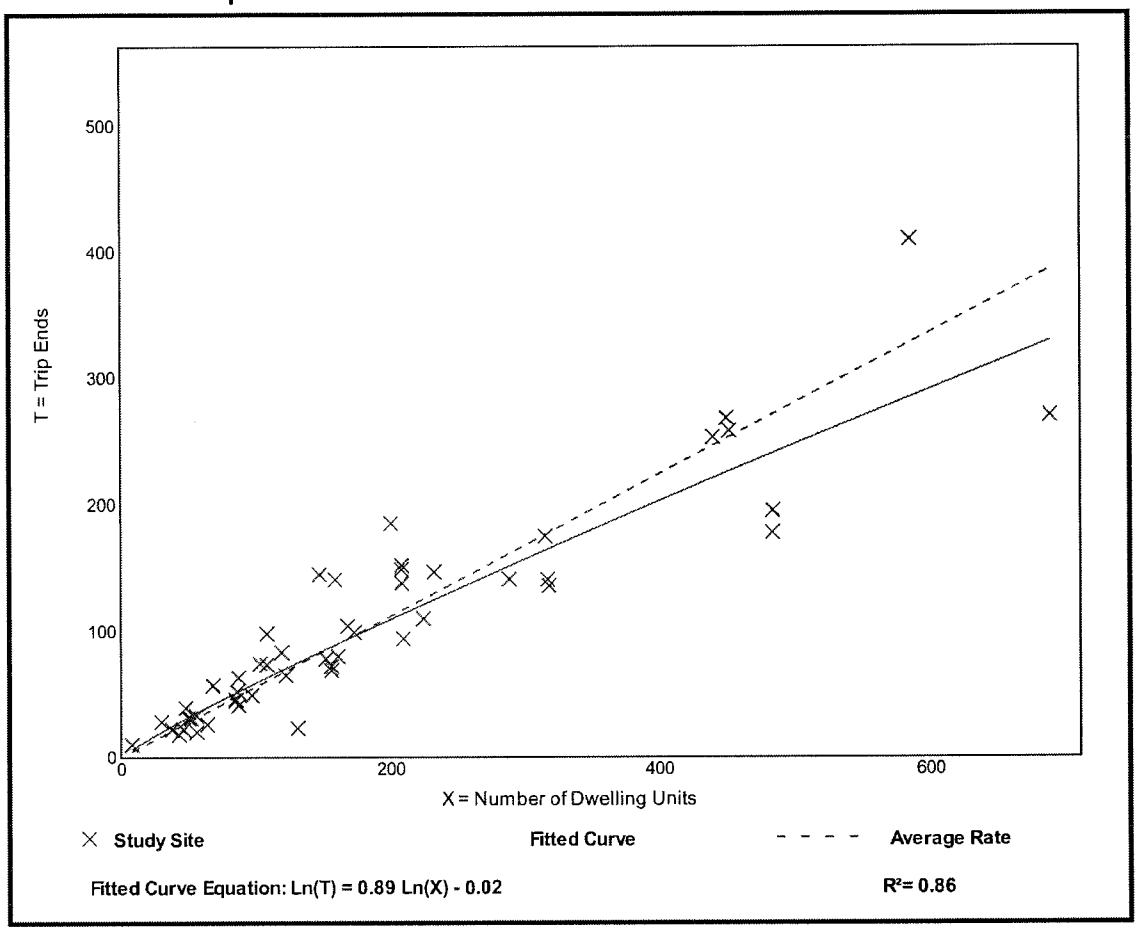
Multifamily Housing (Low-Rise)
(220)

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: 50
Avg. Num. of Dwelling Units: 187
Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.56	0.18 - 1.25	0.16

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.89 Ln(X) - 0.02

R^2= 0.86

Land Use: 710
General Office Building

Description

A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers, and tenant services, such as a bank or savings and loan institution, a restaurant, or cafeteria and service retail facilities. A general office building with a gross floor area of 5,000 square feet or less is classified as a small office building (Land Use 712). Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), office park (Land Use 750), research and development center (Land Use 760), and business park (Land Use 770) are additional related uses.

If information is known about individual buildings, it is suggested that the general office building category be used rather than office parks when estimating trip generation for one or more office buildings in a single development. The office park category is more general and should be used when a breakdown of individual or different uses is not known. If the general office building category is used and if additional buildings, such as banks, restaurants, or retail stores are included in the development, the development should be treated as a multiuse project. On the other hand, if the office park category is used, internal trips are already reflected in the data and do not need to be considered.

When the buildings are interrelated (defined by shared parking facilities or the ability to easily walk between buildings) or house one tenant, it is suggested that the total area or employment of all the buildings be used for calculating the trip generation. When the individual buildings are isolated and not related to one another, it is suggested that trip generation be calculated for each building separately and then summed.

Additional Data

The average building occupancy varied considerably within the studies for which occupancy data were provided. The reported occupied gross floor area was 88 for general urban/suburban sites and 96 percent for the center city core and dense multi-use urban sites.

Time-of-day distribution data for this land use for a weekday, Saturday, and Sunday are presented in Appendix A. For the 16 general urban/suburban sites with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 7:30 and 8:30 a.m. and 4:30 and 5:30 p.m., respectively.

For the three general urban/suburban sites with person trip data, the overall highest volumes during the AM and PM on a weekday were counted between 8:45 and 9:45 a.m. and 12:45 and 1:45 p.m., respectively. For the three dense multi-use urban sites with person trip data, the overall highest volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 a.m. and 4:45 and 5:45 p.m., respectively. For the four center city core sites with person trip data, the overall highest volumes during the AM and PM on a weekday were counted between 9:00 and 10:00 a.m. and 12:45 and 1:45 p.m., respectively.

The average numbers of person trips per vehicle trip at the eight center city core sites at which both person trip and vehicle trip data were collected were as follows:

- 2.76 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 2.90 during Weekday, AM Peak Hour of Generator
- 2.91 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 3.02 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 18 dense multi-use urban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.47 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.47 during Weekday, AM Peak Hour of Generator
- 1.46 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.53 during Weekday, PM Peak Hour of Generator

The average numbers of person trips per vehicle trip at the 23 general urban/suburban sites at which both person trip and vehicle trip data were collected were as follows:

- 1.30 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 7 and 9 a.m.
- 1.34 during Weekday, AM Peak Hour of Generator
- 1.32 during Weekday, Peak Hour of Adjacent Street Traffic, one hour between 4 and 6 p.m.
- 1.41 during Weekday, PM Peak Hour of Generator

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, Colorado, Connecticut, Georgia, Illinois, Indiana, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, Pennsylvania, Texas, Utah, Virginia, and Washington.

Source Numbers

161, 175, 183, 184, 185, 207, 212, 217, 247, 253, 257, 260, 262, 273, 279, 297, 298, 300, 301, 302, 303, 304, 321, 322, 323, 324, 327, 404, 407, 408, 418, 419, 423, 562, 734, 850, 859, 862, 867, 869, 883, 884, 890, 891, 904, 940, 944, 946, 964, 965, 972

General Office Building
(710)

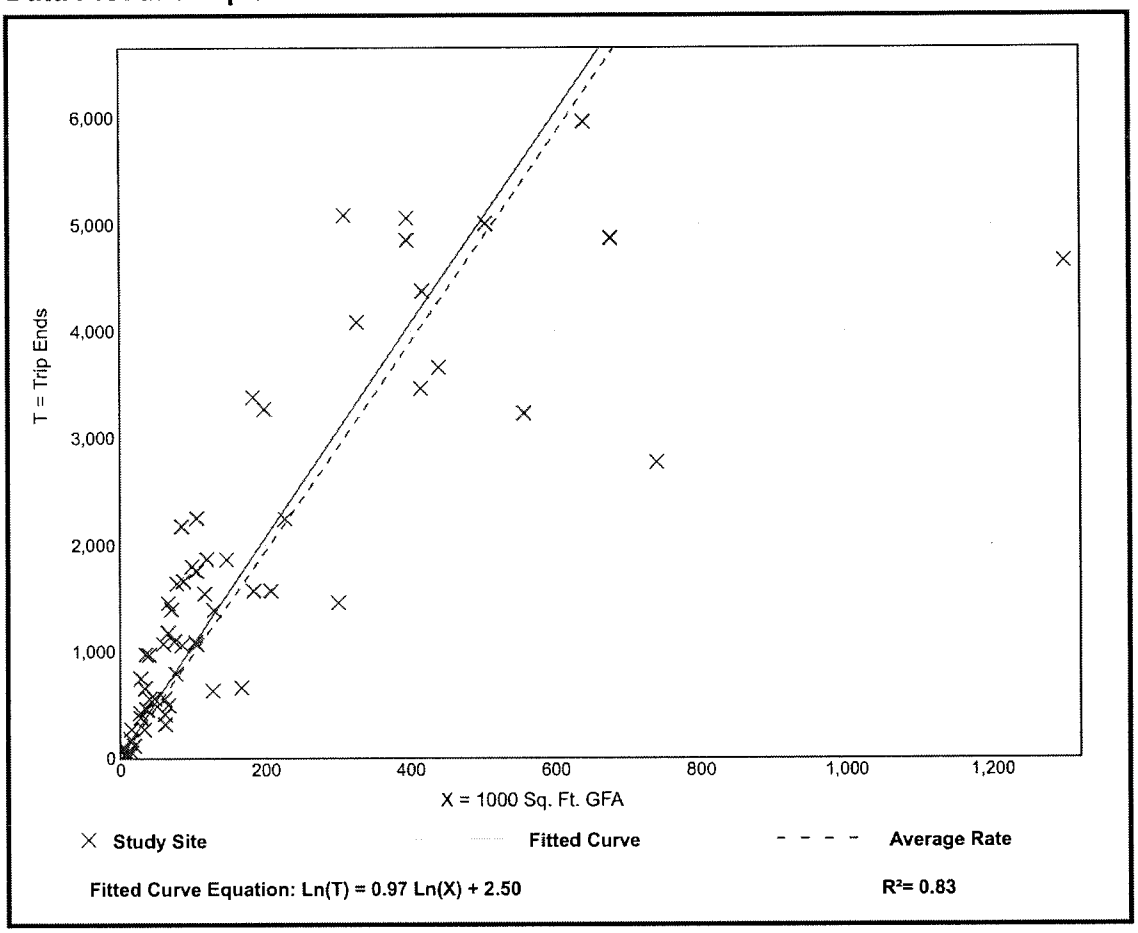
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 66
1000 Sq. Ft. GFA: 171
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.74	2.71 - 27.56	5.15

Data Plot and Equation



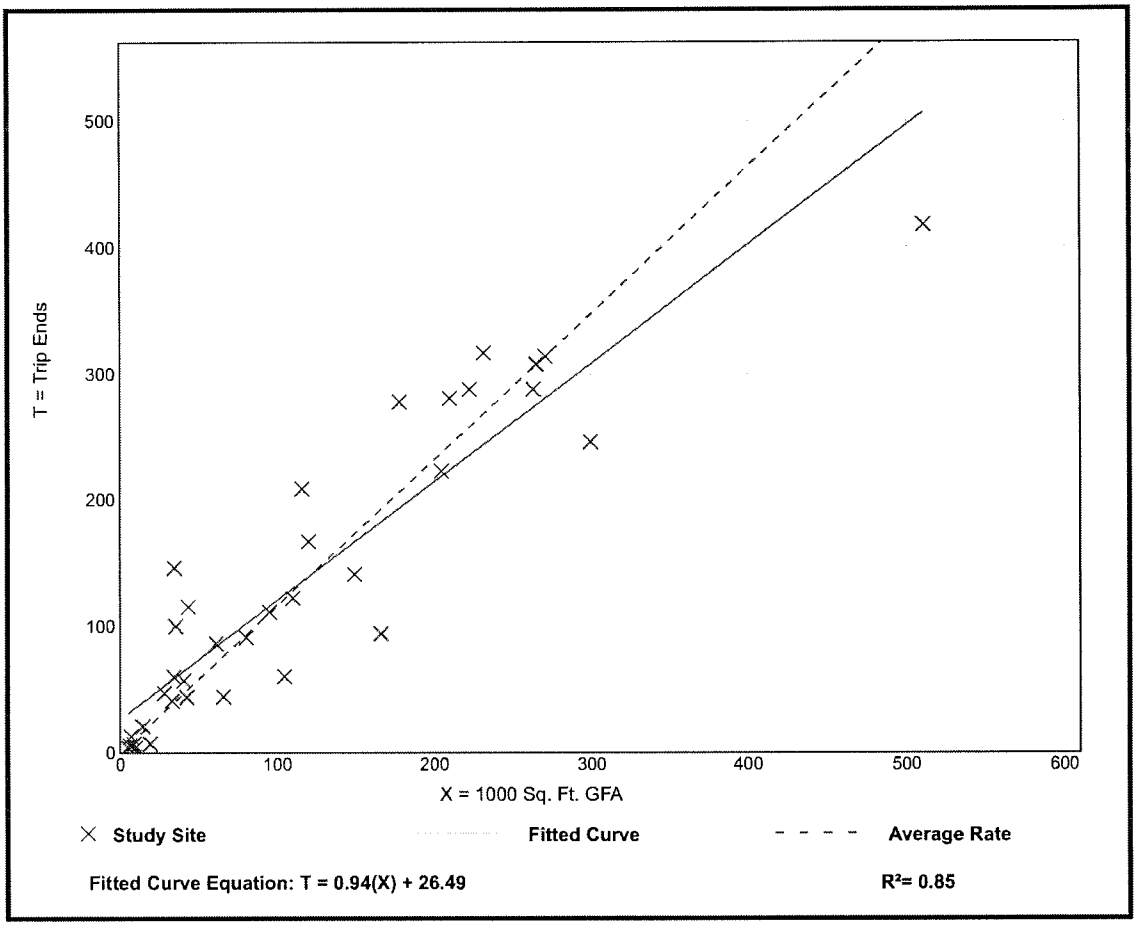
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 35
1000 Sq. Ft. GFA: 117
Directional Distribution: 86% entering, 14% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.16	0.37 - 4.23	0.47

Data Plot and Equation



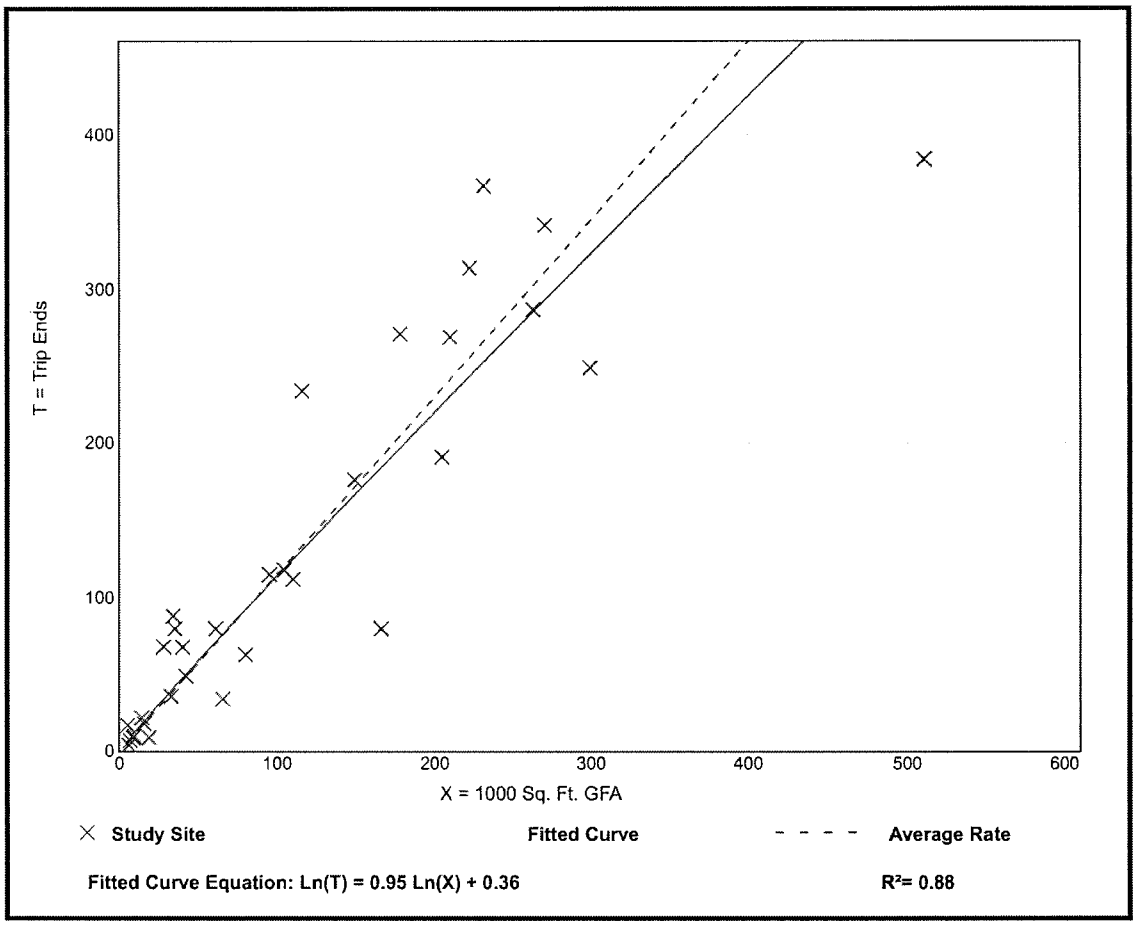
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
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: 32
1000 Sq. Ft. GFA: 114
Directional Distribution: 16% entering, 84% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.15	0.47 - 3.23	0.42

Data Plot and Equation



CMAP 2040 Projections Letter

Chicago Metropolitan Agency for Planning

233 South Wacker Drive
Suite 800
Chicago, Illinois 60606

312 454 0400
www.cmap.illinois.gov

August 19, 2020

Javier Millan
Principal
Kenig, Lindgren, O'Hara and Aboona, Inc.
9575 West Higgins Road
Suite 400
Rosemont, IL 60018

Subject: ***Naperville Road @ Warrenville Road***
IDOT

Dear Mr. Millan:

In response to a request made on your behalf and dated August 18, 2020, we have developed year 2050 average daily traffic (ADT) projections for the subject location.

ROAD SEGMENT	Current Volumes	Year 2050 ADT
Naperville Rd north of Warrenville Rd	28,000	30,600
Naperville Rd south of Warrenville Rd	33,100	34,800
Warrenville Rd east of Naperville Rd	16,600	21,000
Warrenville Rd west of Naperville Rd	20,000	25,300

Traffic projections are developed using existing ADT data provided in the request letter and the results from the March 2020 CMAP Travel Demand Analysis. The regional travel model uses CMAP 2050 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)
2020_TrafficForecast\Naperville\du-31-20\du-31-20.docx

Level of Service Criteria

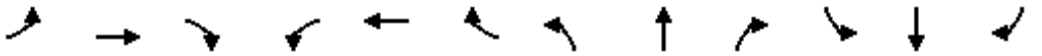
LEVEL OF SERVICE CRITERIA

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



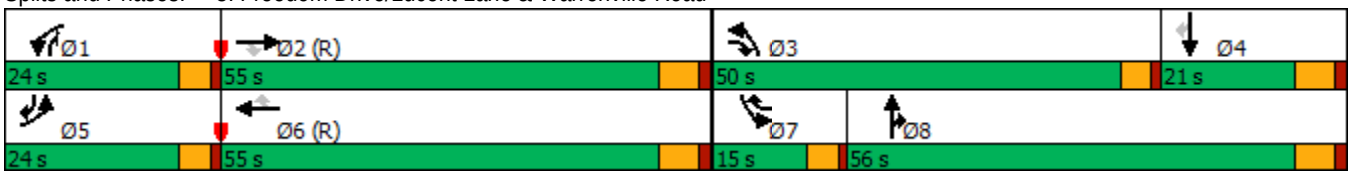
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1144	43	201	728	18	434	42	618	6	3	5
Future Volume (vph)	67	1144	43	201	728	18	434	42	618	6	3	5
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			87						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	1204	45	212	766	19	457	44	651	6	3	5
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	8.5	74.3	120.5	15.4	81.2	93.3	40.1	37.2	57.1	6.1	8.4	13.7
Actuated g/C Ratio	0.06	0.50	0.80	0.10	0.54	0.62	0.27	0.25	0.38	0.04	0.06	0.09
v/c Ratio	0.37	0.65	0.04	0.60	0.38	0.02	0.50	0.05	0.61	0.08	0.01	0.02
Control Delay	73.0	33.0	1.6	67.1	24.6	1.7	48.6	40.7	39.4	71.3	62.0	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	33.0	1.6	67.1	24.6	1.7	48.6	40.7	39.4	71.3	62.0	0.2
LOS	E	C	A	E	C	A	D	D	D	E	E	A
Approach Delay		34.1			33.2			43.1			43.9	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	35	486	0	108	337	0	177	17	287	6	1	0
Queue Length 95th (ft)	61	658	12	153	390	m5	273	32	316	22	6	0
Internal Link Dist (ft)		529			1426			1638			329	

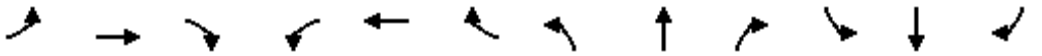
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	446	1845	1362	449	2016	1061	1098	1241	1139	123	396	333
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.65	0.03	0.47	0.38	0.02	0.42	0.04	0.57	0.05	0.01	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 36.9		Intersection LOS: D	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road



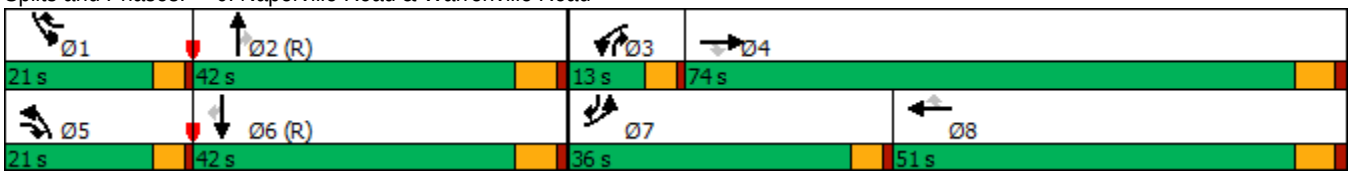


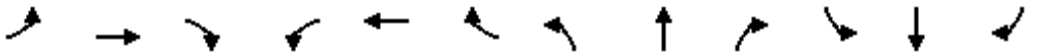
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	383	1157	228	80	480	158	189	812	239	243	628	278
Future Volume (vph)	383	1157	228	80	480	158	189	812	239	243	628	278
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			87			87			113
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	1218	240	84	505	166	199	855	252	256	661	293
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	36.0	74.0	21.0	13.0	51.0	21.0	21.0	42.0	13.0	21.0	42.0	36.0
Total Split (%)	24.0%	49.3%	14.0%	8.7%	34.0%	14.0%	14.0%	28.0%	8.7%	14.0%	28.0%	24.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.2	59.0	78.9	8.0	43.9	65.6	13.9	46.2	60.2	15.8	48.1	77.2
Actuated g/C Ratio	0.15	0.39	0.53	0.05	0.29	0.44	0.09	0.31	0.40	0.11	0.32	0.51
v/c Ratio	0.76	0.83	0.28	0.46	0.46	0.22	0.63	0.75	0.37	0.71	0.39	0.34
Control Delay	58.9	44.7	13.3	77.0	44.7	12.1	74.2	52.5	23.5	72.9	39.4	12.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	44.7	13.3	77.0	44.7	12.1	74.2	52.5	23.5	72.9	39.4	12.4
LOS	E	D	B	E	D	B	E	D	C	E	D	B
Approach Delay		43.7			41.1			50.2			40.0	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	203	572	124	41	211	44	98	403	111	126	186	99
Queue Length 95th (ft)	220	617	132	71	263	90	139	#571	207	161	251	199
Internal Link Dist (ft)		1426			1077			528			1272	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	720	1688	887	194	1128	754	381	1147	692	389	1715	951
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.72	0.27	0.43	0.45	0.22	0.52	0.75	0.36	0.66	0.39	0.31

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 136 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 44.1		Intersection LOS: D	
Intersection Capacity Utilization 80.3%		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: 6: Naperville Road & Warrenville Road





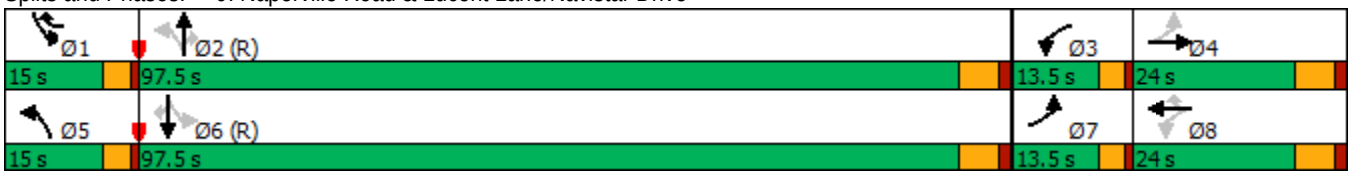
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	1	1	2	2	10	22	1268	63	174	1146	28
Future Volume (vph)	2	1	1	2	2	10	22	1268	63	174	1146	28
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.925				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1723	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted							0.228			0.175		
Satd. Flow (perm)	1863	1723	0	1863	1961	1583	425	3725	1583	326	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		1				51			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	2	2	0	2	2	11	23	1335	66	183	1206	29
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	13.5	24.0		13.5	24.0	15.0	15.0	97.5	97.5	15.0	97.5	97.5
Total Split (%)	9.0%	16.0%		9.0%	16.0%	10.0%	10.0%	65.0%	65.0%	10.0%	65.0%	65.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	7.4	5.7		7.4	5.8	11.2	134.4	126.7	126.7	141.1	136.0	136.0
Actuated g/C Ratio	0.05	0.04		0.05	0.04	0.07	0.90	0.84	0.84	0.94	0.91	0.91
v/c Ratio	0.02	0.03		0.02	0.03	0.07	0.05	0.42	0.05	0.47	0.36	0.02
Control Delay	63.5	59.0		63.5	70.0	0.8	2.0	6.8	2.2	4.9	2.7	0.0
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.5	59.0		63.5	70.0	0.8	2.0	6.8	2.2	4.9	2.7	0.0
LOS	E	E		E	E	A	A	A	A	A	A	A
Approach Delay		61.3			18.4			6.6			2.9	
Approach LOS		E			B			A			A	
Queue Length 50th (ft)	2	1		2	2	0	0	222	1	0	62	0
Queue Length 95th (ft)	11	11		11	12	0	m8	330	m13	44	251	0
Internal Link Dist (ft)		399			484			1272			427	

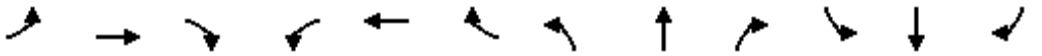
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	133	207		133	235	195	493	3146	1349	420	3378	1443
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.02	0.01	0.06	0.05	0.42	0.05	0.44	0.36	0.02

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 100 (67%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 4.9		Intersection LOS: A	
Intersection Capacity Utilization 60.4%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive





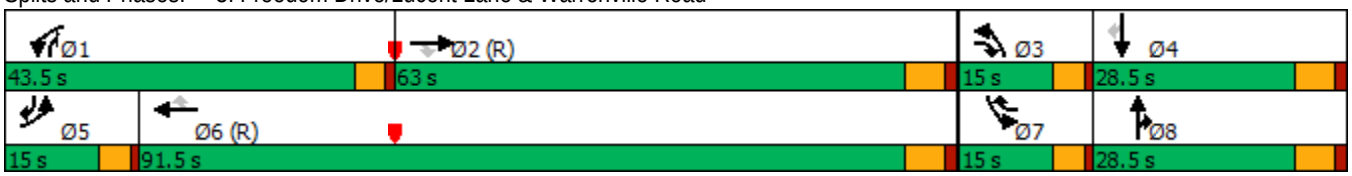
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1112	171	567	989	4	213	8	504	55	31	79
Future Volume (vph)	5	1112	171	567	989	4	213	8	504	55	31	79
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			129			55						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1171	180	597	1041	4	224	8	531	58	33	83
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	5.8	66.5	85.7	32.5	93.2	108.5	13.2	22.9	59.9	9.2	19.1	28.6
Actuated g/C Ratio	0.04	0.44	0.57	0.22	0.62	0.72	0.09	0.15	0.40	0.06	0.13	0.19
v/c Ratio	0.04	0.71	0.19	0.80	0.45	0.00	0.74	0.01	0.48	0.54	0.07	0.22
Control Delay	69.8	38.6	6.7	52.6	29.7	0.0	82.2	54.5	34.5	85.8	55.2	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.8	38.6	6.7	52.6	29.7	0.0	82.2	54.5	34.5	85.8	55.2	9.3
LOS	E	D	A	D	C	A	F	D	C	F	E	A
Approach Delay		34.5			38.0			48.7			43.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	2	505	24	289	416	0	114	3	217	56	14	0
Queue Length 95th (ft)	10	636	70	353	444	m0	#199	12	257	106	32	42
Internal Link Dist (ft)		529			1426			1638			329	

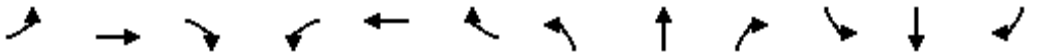
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1651	959	892	2315	1172	301	568	1211	123	558	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.71	0.19	0.67	0.45	0.00	0.74	0.01	0.44	0.47	0.06	0.20

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 39.1 Intersection LOS: D
Intersection Capacity Utilization 71.9% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road



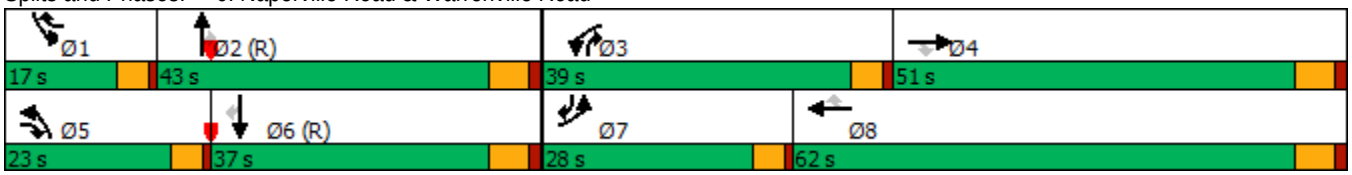


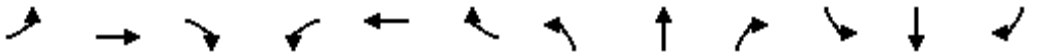
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	587	580	411	993	179	209	642	54	178	1005	358
Future Volume (vph)	504	587	580	411	993	179	209	642	54	178	1005	358
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			87			57			120
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	531	618	611	433	1045	188	220	676	57	187	1058	377
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	28.0	51.0	23.0	39.0	62.0	17.0	23.0	43.0	39.0	17.0	37.0	28.0
Total Split (%)	18.7%	34.0%	15.3%	26.0%	41.3%	11.3%	15.3%	28.7%	26.0%	11.3%	24.7%	18.7%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.5	48.9	70.1	24.2	49.6	68.1	15.2	43.4	73.6	12.5	40.8	70.3
Actuated g/C Ratio	0.16	0.33	0.47	0.16	0.33	0.45	0.10	0.29	0.49	0.08	0.27	0.47
v/c Ratio	0.99	0.51	0.78	0.78	0.85	0.25	0.63	0.63	0.07	0.65	0.73	0.47
Control Delay	108.8	29.6	32.2	70.6	53.9	12.8	72.9	50.6	5.0	69.2	48.5	29.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	108.8	29.6	32.2	70.6	53.9	12.8	72.9	50.6	5.0	69.2	48.5	29.8
LOS	F	C	C	E	D	B	E	D	A	E	D	C
Approach Delay		54.4			53.6			53.0			46.5	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	284	182	267	212	500	56	107	307	0	92	351	237
Queue Length 95th (ft)	#401	210	462	262	552	101	151	396	25	135	#473	396
Internal Link Dist (ft)		1426			1077			528			1272	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	537	1213	819	789	1390	772	423	1077	910	301	1454	805
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.51	0.75	0.55	0.75	0.24	0.52	0.63	0.06	0.62	0.73	0.47

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 5 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 51.8		Intersection LOS: D	
Intersection Capacity Utilization 82.4%		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: 6: Naperville Road & Warrenville Road





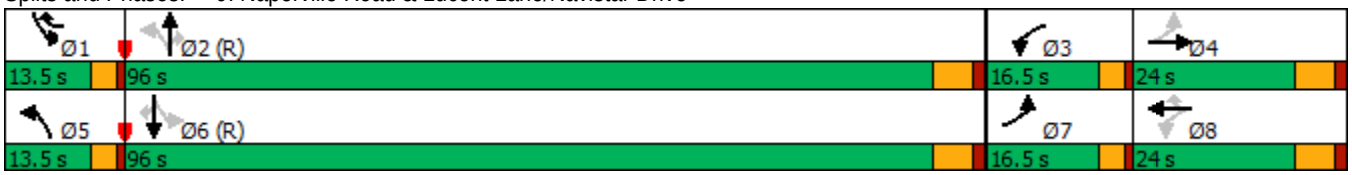
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	13	66	32	0	179	7	1312	6	28	1443	3
Future Volume (vph)	37	13	66	32	0	179	7	1312	6	28	1443	3
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.875				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1630	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.784						0.140			0.135		
Satd. Flow (perm)	1460	1630	0	1863	1961	1583	261	3725	1583	251	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69				147			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	39	83	0	34	0	188	7	1381	6	29	1519	3
Turn Type	pm+pt	NA		pm+pt		pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	16.5	24.0		16.5	24.0	13.5	13.5	96.0	96.0	13.5	96.0	96.0
Total Split (%)	11.0%	16.0%		11.0%	16.0%	9.0%	9.0%	64.0%	64.0%	9.0%	64.0%	64.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.2	7.8		8.7		12.7	113.1	105.4	105.4	121.8	117.8	117.8
Actuated g/C Ratio	0.13	0.05		0.06		0.08	0.75	0.70	0.70	0.81	0.79	0.79
v/c Ratio	0.16	0.56		0.33		0.70	0.03	0.53	0.01	0.09	0.52	0.00
Control Delay	55.2	33.9		75.8		31.8	11.3	31.1	0.0	4.5	7.9	0.0
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.2	33.9		75.8		31.8	11.3	31.1	0.0	4.5	7.9	0.0
LOS	E	C		E		C	B	C	A	A	A	A
Approach Delay		40.7			38.5			30.9			7.8	
Approach LOS		D			D			C			A	
Queue Length 50th (ft)	34	13		33		39	3	664	0	5	235	0
Queue Length 95th (ft)	67	68		70		122	m5	m780	m0	15	471	0
Internal Link Dist (ft)		399			484			1272			427	

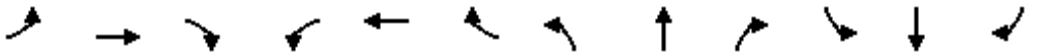
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	250	256		148		282	299	2618	1136	323	2925	1260
Starvation Cap Reductn	0	0		0		0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0		0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.32		0.23		0.67	0.02	0.53	0.01	0.09	0.52	0.00

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 81 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.70			
Intersection Signal Delay: 20.9		Intersection LOS: C	
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive





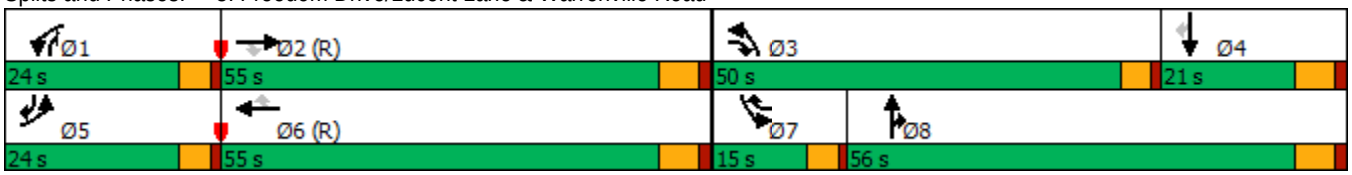
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	1144	43	201	733	24	434	49	618	25	20	23
Future Volume (vph)	74	1144	43	201	733	24	434	49	618	25	20	23
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			87						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	1204	45	212	772	25	457	52	651	26	21	24
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	8.8	70.7	109.2	15.4	77.3	91.0	32.5	37.2	57.1	7.7	15.1	25.2
Actuated g/C Ratio	0.06	0.47	0.73	0.10	0.52	0.61	0.22	0.25	0.38	0.05	0.10	0.17
v/c Ratio	0.39	0.69	0.04	0.60	0.40	0.03	0.62	0.06	0.61	0.29	0.06	0.07
Control Delay	73.1	36.0	2.0	68.7	27.5	3.0	57.9	41.1	39.4	75.8	56.9	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.1	36.0	2.0	68.7	27.5	3.0	57.9	41.1	39.4	75.8	56.9	0.4
LOS	E	D	A	E	C	A	E	D	D	E	E	A
Approach Delay		37.0			35.5			46.8			44.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	38	495	0	108	340	1	223	20	288	25	9	0
Queue Length 95th (ft)	66	678	13	152	394	m8	273	37	318	58	23	0
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	446	1755	1303	449	1919	1022	1049	1241	1139	123	467	445
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.69	0.03	0.47	0.40	0.02	0.44	0.04	0.57	0.21	0.04	0.05

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.69			
Intersection Signal Delay: 39.9		Intersection LOS: D	
Intersection Capacity Utilization 69.6%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road

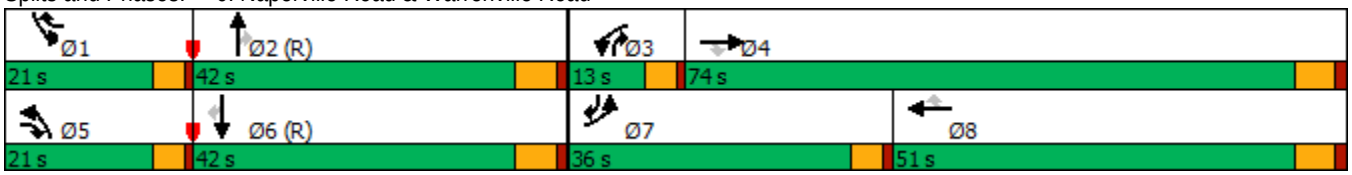


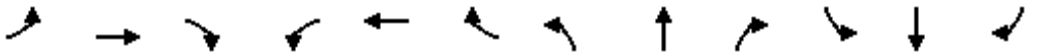
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	383	1165	239	80	484	161	191	816	239	258	640	283
Future Volume (vph)	383	1165	239	80	484	161	191	816	239	258	640	283
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			87			87			110
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	403	1226	252	84	509	169	201	859	252	272	674	298
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	36.0	74.0	21.0	13.0	51.0	21.0	21.0	42.0	13.0	21.0	42.0	36.0
Total Split (%)	24.0%	49.3%	14.0%	8.7%	34.0%	14.0%	14.0%	28.0%	8.7%	14.0%	28.0%	24.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.2	59.3	79.3	8.0	44.2	66.4	13.9	45.4	59.4	16.2	47.7	76.9
Actuated g/C Ratio	0.15	0.40	0.53	0.05	0.29	0.44	0.09	0.30	0.40	0.11	0.32	0.51
v/c Ratio	0.76	0.83	0.29	0.46	0.46	0.23	0.63	0.76	0.37	0.73	0.40	0.34
Control Delay	57.0	46.2	12.3	77.0	44.5	12.1	74.4	53.7	23.8	72.3	38.2	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	46.2	12.3	77.0	44.5	12.1	74.4	53.7	23.8	72.3	38.2	11.2
LOS	E	D	B	E	D	B	E	D	C	E	D	B
Approach Delay		44.0			40.9			51.1			39.2	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	198	586	131	41	212	45	99	409	113	134	191	107
Queue Length 95th (ft)	218	640	134	71	265	93	140	#575	207	162	257	201
Internal Link Dist (ft)		1426			1077			528			1272	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	720	1688	889	194	1132	759	380	1128	684	394	1702	946
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.73	0.28	0.43	0.45	0.22	0.53	0.76	0.37	0.69	0.40	0.32

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 136 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 44.2		Intersection LOS: D	
Intersection Capacity Utilization 81.0%		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: 6: Naperville Road & Warrenville Road





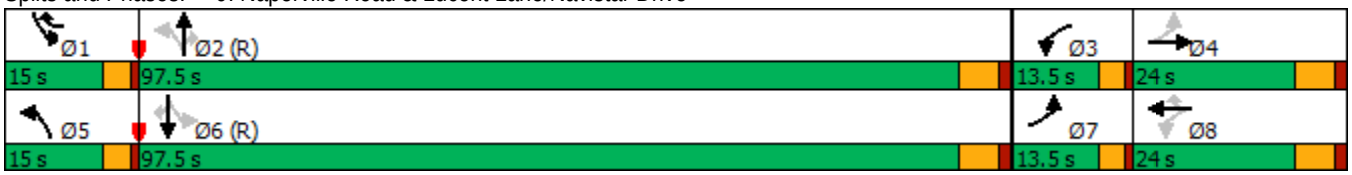
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1	33	2	2	10	29	1268	63	174	1146	38
Future Volume (vph)	30	1	33	2	2	10	29	1268	63	174	1146	38
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.854				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1591	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.625						0.222			0.167		
Satd. Flow (perm)	1164	1591	0	1863	1961	1583	414	3725	1583	311	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35				51			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	36	0	2	2	11	31	1335	66	183	1206	40
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	13.5	24.0		13.5	24.0	15.0	15.0	97.5	97.5	15.0	97.5	97.5
Total Split (%)	9.0%	16.0%		9.0%	16.0%	10.0%	10.0%	65.0%	65.0%	10.0%	65.0%	65.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	10.3	6.8		7.8	5.8	13.7	126.3	118.5	118.5	133.0	126.6	126.6
Actuated g/C Ratio	0.07	0.05		0.05	0.04	0.09	0.84	0.79	0.79	0.89	0.84	0.84
v/c Ratio	0.29	0.34		0.02	0.03	0.06	0.08	0.45	0.05	0.50	0.38	0.03
Control Delay	69.9	29.6		61.5	70.0	0.6	2.8	10.0	3.3	6.6	4.6	0.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.9	29.6		61.5	70.0	0.6	2.8	10.0	3.3	6.6	4.6	0.1
LOS	E	C		E	E	A	A	B	A	A	A	A
Approach Delay		48.6			18.0			9.5			4.7	
Approach LOS		D			B			A			A	
Queue Length 50th (ft)	31	1		2	2	0	2	253	7	14	142	0
Queue Length 95th (ft)	62	39		10	12	0	m12	332	m12	51	277	1
Internal Link Dist (ft)		399			484			1272			427	

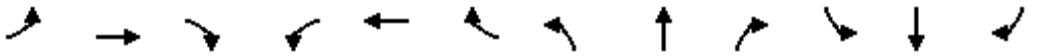
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	130	221		133	235	218	461	2942	1267	390	3144	1348
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.16		0.02	0.01	0.05	0.07	0.45	0.05	0.47	0.38	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 100 (67%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.50			
Intersection Signal Delay: 8.1		Intersection LOS: A	
Intersection Capacity Utilization 64.6%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive





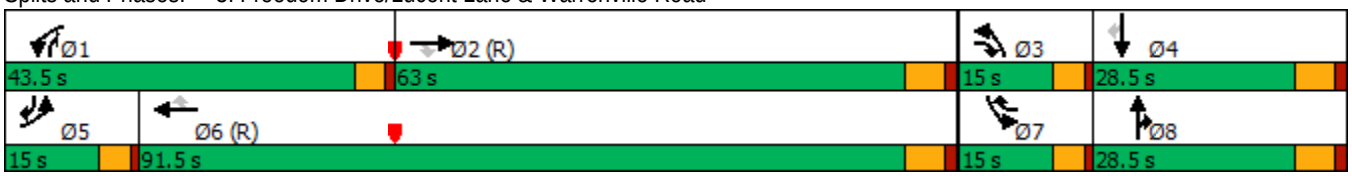
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	1112	171	567	992	27	213	33	504	67	42	91
Future Volume (vph)	30	1112	171	567	992	27	213	33	504	67	42	91
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			129			55						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	32	1171	180	597	1044	28	224	35	531	71	44	96
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	6.9	64.2	85.7	32.5	89.9	105.5	15.4	22.6	59.7	9.6	19.1	29.7
Actuated g/C Ratio	0.05	0.43	0.57	0.22	0.60	0.70	0.10	0.15	0.40	0.06	0.13	0.20
v/c Ratio	0.20	0.73	0.19	0.80	0.47	0.02	0.63	0.06	0.48	0.63	0.09	0.25
Control Delay	71.5	40.2	6.7	53.8	31.8	2.1	74.2	55.1	34.7	92.5	55.6	12.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	40.2	6.7	53.8	31.8	2.1	74.2	55.1	34.7	92.5	55.6	12.2
LOS	E	D	A	D	C	A	E	E	C	F	E	B
Approach Delay		36.6			39.2			46.8			48.2	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	15	505	24	289	420	1	114	15	217	69	20	7
Queue Length 95th (ft)	34	636	70	354	457	m2	#199	34	257	#126	39	55
Internal Link Dist (ft)		529			1426			1638			329	

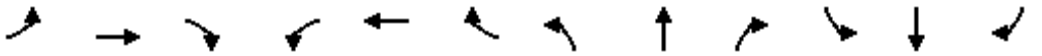
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1595	959	892	2232	1138	353	563	1207	123	558	418
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.73	0.19	0.67	0.47	0.02	0.63	0.06	0.44	0.58	0.08	0.23

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 40.2 Intersection LOS: D
Intersection Capacity Utilization 71.9% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road





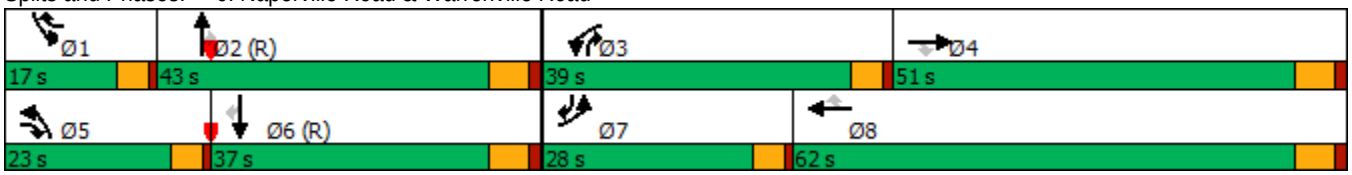
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	504	592	587	411	1010	187	215	655	54	188	1013	361
Future Volume (vph)	504	592	587	411	1010	187	215	655	54	188	1013	361
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			87			57			120
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	531	623	618	433	1063	197	226	689	57	198	1066	380
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	28.0	51.0	23.0	39.0	62.0	17.0	23.0	43.0	39.0	17.0	37.0	28.0
Total Split (%)	18.7%	34.0%	15.3%	26.0%	41.3%	11.3%	15.3%	28.7%	26.0%	11.3%	24.7%	18.7%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.5	49.4	70.8	24.2	50.1	68.8	15.4	42.7	72.9	12.7	40.1	69.6
Actuated g/C Ratio	0.16	0.33	0.47	0.16	0.33	0.46	0.10	0.28	0.49	0.08	0.27	0.46
v/c Ratio	0.99	0.51	0.78	0.78	0.86	0.25	0.64	0.65	0.07	0.68	0.75	0.48
Control Delay	111.3	28.5	30.8	70.6	54.0	13.3	73.0	51.6	5.0	68.3	47.6	28.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.3	28.5	30.8	70.6	54.0	13.3	73.0	51.6	5.0	68.3	47.6	28.8
LOS	F	C	C	E	D	B	E	D	A	E	D	C
Approach Delay		54.1			53.5			53.9			45.8	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	284	185	274	212	507	60	110	318	0	98	358	251
Queue Length 95th (ft)	#402	215	462	262	564	108	154	405	25	140	#479	397
Internal Link Dist (ft)		1426			1077			528			1272	

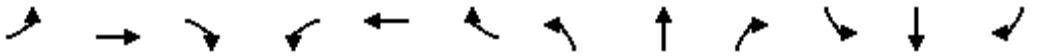
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	537	1226	824	789	1390	777	423	1061	903	301	1429	798
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.51	0.75	0.55	0.76	0.25	0.53	0.65	0.06	0.66	0.75	0.48

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 5 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 51.6 Intersection LOS: D
Intersection Capacity Utilization 83.1% 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: 6: Naperville Road & Warrenville Road





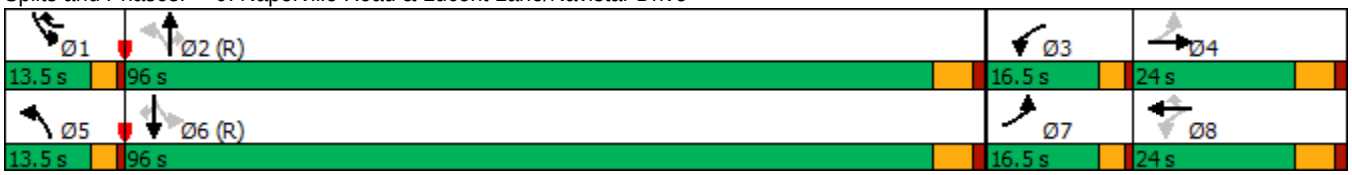
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	13	87	32	0	179	28	1312	6	28	1443	36
Future Volume (vph)	55	13	87	32	0	179	28	1312	6	28	1443	36
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.870				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1621	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.784						0.132			0.134		
Satd. Flow (perm)	1460	1621	0	1863	1961	1583	246	3725	1583	250	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		92				134			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	106	0	34	0	188	29	1381	6	29	1519	38
Turn Type	pm+pt	NA		pm+pt		pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	16.5	24.0		16.5	24.0	13.5	13.5	96.0	96.0	13.5	96.0	96.0
Total Split (%)	11.0%	16.0%		11.0%	16.0%	9.0%	9.0%	64.0%	64.0%	9.0%	64.0%	64.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	20.5	8.0		8.7		13.2	112.7	104.6	104.6	121.5	113.3	113.3
Actuated g/C Ratio	0.14	0.05		0.06		0.09	0.75	0.70	0.70	0.81	0.76	0.76
v/c Ratio	0.24	0.61		0.33		0.72	0.12	0.53	0.01	0.09	0.54	0.03
Control Delay	57.1	31.7		75.8		37.1	11.6	32.3	0.0	4.6	10.2	0.1
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.1	31.7		75.8		37.1	11.6	32.3	0.0	4.6	10.2	0.1
LOS	E	C		E		D	B	C	A	A	B	A
Approach Delay		40.7			43.0			31.7			9.8	
Approach LOS		D			D			C			A	
Queue Length 50th (ft)	51	13		33		52	11	678	0	5	328	0
Queue Length 95th (ft)	90	75		70		137	m21	m780	m0	15	491	0
Internal Link Dist (ft)		399			484			1272			427	

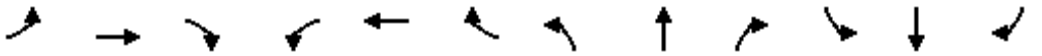
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	253	275		148		273	286	2598	1128	325	2813	1215
Starvation Cap Reductn	0	0		0		0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0		0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.39		0.23		0.69	0.10	0.53	0.01	0.09	0.54	0.03

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 81 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 61.4%		ICU Level of Service B	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive



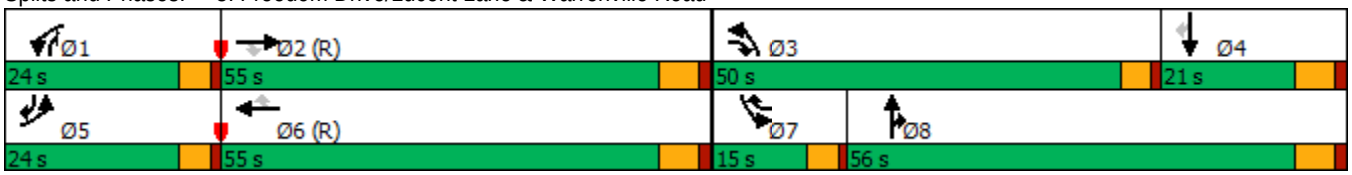


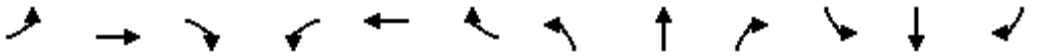
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1181	44	207	751	182	448	261	638	42	29	41
Future Volume (vph)	285	1181	44	207	751	182	448	261	638	42	29	41
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			192						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	1243	46	218	791	192	472	275	672	44	31	43
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.3	65.4	101.6	15.7	62.9	77.5	30.2	39.2	59.4	8.7	20.0	42.0
Actuated g/C Ratio	0.12	0.44	0.68	0.10	0.42	0.52	0.20	0.26	0.40	0.06	0.13	0.28
v/c Ratio	0.72	0.77	0.04	0.61	0.51	0.21	0.68	0.28	0.61	0.43	0.06	0.09
Control Delay	73.1	41.1	2.2	68.2	38.4	14.6	61.9	44.2	37.8	80.7	54.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.1	41.1	2.2	68.2	38.4	14.6	61.9	44.2	37.8	80.7	54.0	0.3
LOS	E	D	A	E	D	B	E	D	D	F	D	A
Approach Delay		46.0			40.0			47.1			44.4	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	147	541	0	112	369	59	230	113	294	42	13	0
Queue Length 95th (ft)	193	#778	14	152	468	135	280	146	318	85	30	0
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	465	1624	1246	451	1561	927	1041	1241	1170	123	542	525
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.77	0.04	0.48	0.51	0.21	0.45	0.22	0.57	0.36	0.06	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.77			
Intersection Signal Delay: 44.7		Intersection LOS: D	
Intersection Capacity Utilization 71.4%		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: 3: Freedom Drive/Lucent Lane & Warrenville Road



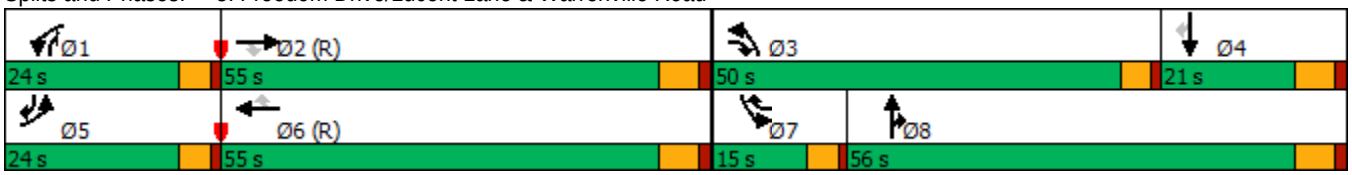


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	285	1181	44	207	751	182	448	261	638	42	29	41
Future Volume (vph)	285	1181	44	207	751	182	448	261	638	42	29	41
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			192						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	300	1243	46	218	791	192	472	275	672	44	31	43
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.3	66.6	102.8	15.7	64.0	77.3	30.2	39.4	59.6	7.3	18.8	40.8
Actuated g/C Ratio	0.12	0.44	0.69	0.10	0.43	0.52	0.20	0.26	0.40	0.05	0.13	0.27
v/c Ratio	0.72	0.75	0.04	0.61	0.50	0.21	0.68	0.28	0.61	0.26	0.07	0.09
Control Delay	73.1	39.8	2.2	67.6	37.2	14.2	61.9	44.0	37.7	72.1	55.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.1	39.8	2.2	67.6	37.2	14.2	61.9	44.0	37.7	72.1	55.2	0.3
LOS	E	D	A	E	D	B	E	D	D	E	E	A
Approach Delay		45.0			39.1			46.9			41.5	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	147	530	0	111	361	59	230	113	293	21	14	0
Queue Length 95th (ft)	193	#764	14	154	464	130	280	145	317	43	30	0
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	465	1653	1257	451	1589	938	1041	1241	1172	240	513	513
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	0.75	0.04	0.48	0.50	0.20	0.45	0.22	0.57	0.18	0.06	0.08

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 43.9		Intersection LOS: D	
Intersection Capacity Utilization 71.2%		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: 3: Freedom Drive/Lucent Lane & Warrenville Road



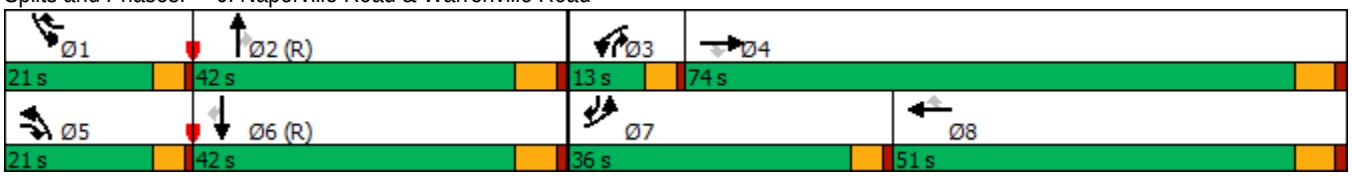
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	1213	253	83	603	272	250	947	247	269	666	287
Future Volume (vph)	395	1213	253	83	603	272	250	947	247	269	666	287
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			87			87			59
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	416	1277	266	87	635	286	263	997	260	283	701	302
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	36.0	74.0	21.0	13.0	51.0	21.0	21.0	42.0	13.0	21.0	42.0	36.0
Total Split (%)	24.0%	49.3%	14.0%	8.7%	34.0%	14.0%	14.0%	28.0%	8.7%	14.0%	28.0%	24.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.7	60.9	82.7	8.0	45.2	67.7	15.8	43.5	57.6	16.6	44.3	74.0
Actuated g/C Ratio	0.16	0.41	0.55	0.05	0.30	0.45	0.11	0.29	0.38	0.11	0.30	0.49
v/c Ratio	0.77	0.85	0.30	0.47	0.57	0.38	0.73	0.92	0.39	0.75	0.44	0.37
Control Delay	55.9	45.7	10.8	77.5	46.2	19.4	77.1	65.6	25.2	77.3	38.4	13.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	45.7	10.8	77.5	46.2	19.4	77.1	65.6	25.2	77.3	38.4	13.6
LOS	E	D	B	E	D	B	E	E	C	E	D	B
Approach Delay		43.1			41.3			60.7			41.2	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	191	612	140	43	272	120	129	511	123	139	209	148
Queue Length 95th (ft)	219	665	m134	73	335	195	180	#724	216	#175	256	215
Internal Link Dist (ft)		1426			1077			528			1272	

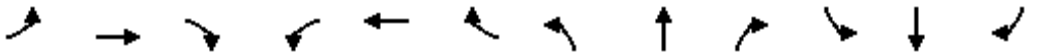
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	720	1688	908	194	1144	770	387	1080	665	396	1580	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.76	0.29	0.45	0.56	0.37	0.68	0.92	0.39	0.71	0.44	0.34

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 136 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 47.0		Intersection LOS: D	
Intersection Capacity Utilization 86.1%		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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Naperville Road & Warrenville Road





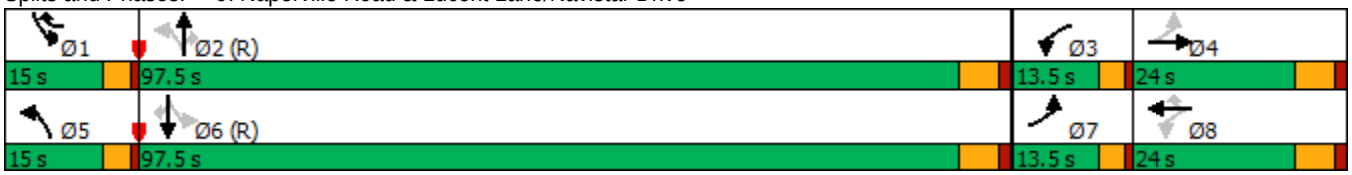
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	1	37	2	2	10	240	1311	63	174	1183	301
Future Volume (vph)	46	1	37	2	2	10	240	1311	63	174	1183	301
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.854				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1591	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.755						0.190			0.162		
Satd. Flow (perm)	1406	1591	0	1863	1961	1583	354	3725	1583	302	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		39				51			80			155
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	48	40	0	2	2	11	253	1380	66	183	1245	317
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	13.5	24.0		13.5	24.0	15.0	15.0	97.5	97.5	15.0	97.5	97.5
Total Split (%)	9.0%	16.0%		9.0%	16.0%	10.0%	10.0%	65.0%	65.0%	10.0%	65.0%	65.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	10.7	7.2		7.4	5.8	12.0	130.0	117.5	117.5	128.1	116.6	116.6
Actuated g/C Ratio	0.07	0.05		0.05	0.04	0.08	0.87	0.78	0.78	0.85	0.78	0.78
v/c Ratio	0.40	0.35		0.02	0.03	0.06	0.62	0.47	0.05	0.52	0.43	0.25
Control Delay	73.8	28.6		61.5	70.0	0.7	19.8	9.6	2.6	7.5	7.5	3.8
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	28.6		61.5	70.0	0.7	19.8	9.6	2.6	7.5	7.5	3.8
LOS	E	C		E	E	A	B	A	A	A	A	A
Approach Delay		53.2			18.0			10.9			6.8	
Approach LOS		D			B			B			A	
Queue Length 50th (ft)	46	1		2	2	0	108	256	5	16	183	34
Queue Length 95th (ft)	84	41		10	12	0	m183	m340	m7	51	375	106
Internal Link Dist (ft)		399			484			1272			427	

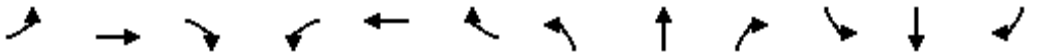
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	133	225		133	235	198	426	2917	1257	379	2894	1264
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.18		0.02	0.01	0.06	0.59	0.47	0.05	0.48	0.43	0.25

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 100 (67%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.62			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 66.9%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive





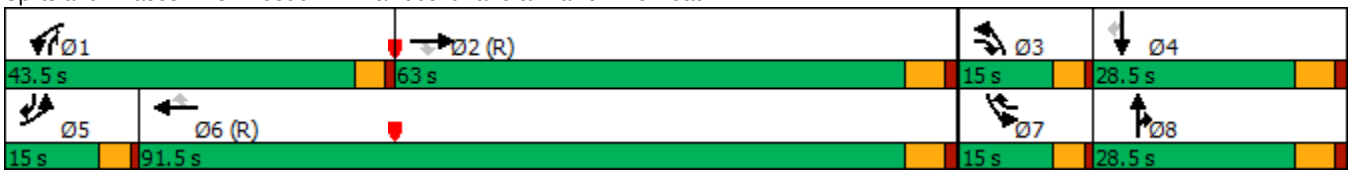
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1146	176	585	1021	36	220	50	520	277	198	301
Future Volume (vph)	47	1146	176	585	1021	36	220	50	520	277	198	301
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			97			55						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	1206	185	616	1075	38	232	53	547	292	208	317
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	7.8	62.6	79.1	33.4	88.2	104.7	10.5	22.5	60.4	10.5	22.5	36.3
Actuated g/C Ratio	0.05	0.42	0.53	0.22	0.59	0.70	0.07	0.15	0.40	0.07	0.15	0.24
v/c Ratio	0.27	0.78	0.21	0.81	0.49	0.03	0.97	0.09	0.49	2.37	0.37	0.71
Control Delay	71.5	42.7	10.0	54.9	32.9	3.5	118.4	55.6	34.4	669.6	59.6	46.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	42.7	10.0	54.9	32.9	3.5	118.4	55.6	34.4	669.6	59.6	46.4
LOS	E	D	B	D	C	A	F	E	C	F	E	D
Approach Delay		39.5			40.1			59.2			272.5	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	24	532	42	305	410	1	119	23	223	~467	97	211
Queue Length 95th (ft)	46	663	95	365	487	m5	#208	46	267	#659	140	318
Internal Link Dist (ft)		529			1426			1638			329	

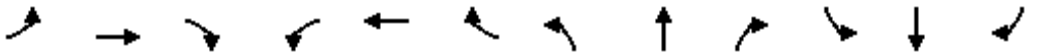
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1553	880	892	2189	1121	240	558	1226	123	558	475
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.78	0.21	0.69	0.49	0.03	0.97	0.09	0.45	2.37	0.37	0.67

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.37
Intersection Signal Delay: 82.6 Intersection LOS: F
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road





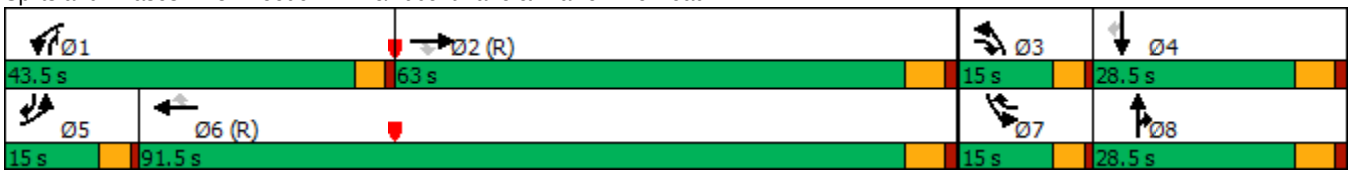
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	1146	176	585	1021	36	220	50	520	277	198	301
Future Volume (vph)	47	1146	176	585	1021	36	220	50	520	277	198	301
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			97			55						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	49	1206	185	616	1075	38	232	53	547	292	208	317
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	7.8	62.6	79.1	33.4	88.2	104.7	10.5	22.5	60.4	10.5	22.5	36.3
Actuated g/C Ratio	0.05	0.42	0.53	0.22	0.59	0.70	0.07	0.15	0.40	0.07	0.15	0.24
v/c Ratio	0.27	0.78	0.21	0.81	0.49	0.03	0.97	0.09	0.49	1.22	0.37	0.71
Control Delay	71.5	42.7	10.0	54.9	32.9	3.5	118.4	55.6	34.4	184.7	59.6	46.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.5	42.7	10.0	54.9	32.9	3.5	118.4	55.6	34.4	184.7	59.6	46.4
LOS	E	D	B	D	C	A	F	E	C	F	E	D
Approach Delay		39.5			40.1			59.2			99.2	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	24	532	42	305	410	1	119	23	223	~179	97	211
Queue Length 95th (ft)	46	663	95	365	487	m5	#208	46	267	#278	140	318
Internal Link Dist (ft)		529			1426			1638			329	

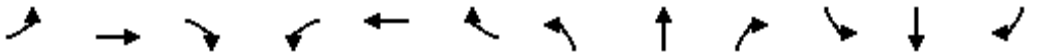
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1553	880	892	2189	1121	240	558	1226	240	558	475
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.78	0.21	0.69	0.49	0.03	0.97	0.09	0.45	1.22	0.37	0.67

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.22
Intersection Signal Delay: 53.2 Intersection LOS: D
Intersection Capacity Utilization 76.4% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road





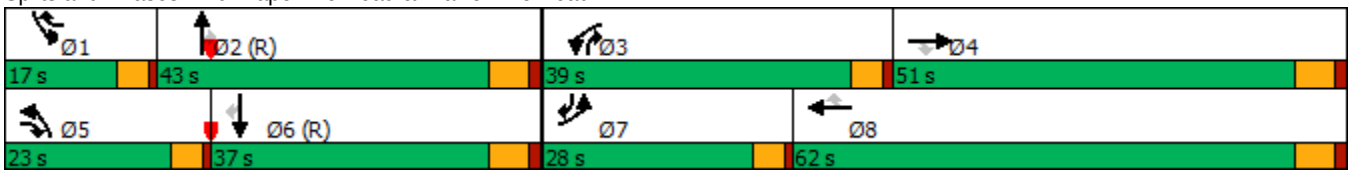
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	520	713	710	424	1046	206	227	684	56	295	1148	369
Future Volume (vph)	520	713	710	424	1046	206	227	684	56	295	1148	369
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			87			55			120
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	751	747	446	1101	217	239	720	59	311	1208	388
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	28.0	51.0	23.0	39.0	62.0	17.0	23.0	43.0	39.0	17.0	37.0	28.0
Total Split (%)	18.7%	34.0%	15.3%	26.0%	41.3%	11.3%	15.3%	28.7%	26.0%	11.3%	24.7%	18.7%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.5	50.0	75.9	24.7	51.2	74.2	19.9	37.3	68.1	16.9	34.4	63.9
Actuated g/C Ratio	0.16	0.33	0.51	0.16	0.34	0.49	0.13	0.25	0.45	0.11	0.23	0.43
v/c Ratio	1.02	0.61	0.89	0.79	0.87	0.26	0.53	0.78	0.08	0.80	0.98	0.52
Control Delay	106.2	36.0	30.5	70.4	54.0	13.6	65.4	59.3	5.8	68.6	67.0	27.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	106.2	36.0	30.5	70.4	54.0	13.6	65.4	59.3	5.8	68.6	67.0	27.6
LOS	F	D	C	E	D	B	E	E	A	E	E	C
Approach Delay		52.8			53.2			57.6			59.3	
Approach LOS		D			D			E			E	
Queue Length 50th (ft)	~300	269	420	218	523	69	112	348	2	153	~489	257
Queue Length 95th (ft)	m#354	m282	m351	269	591	124	162	425	27	m#267	#589	m387
Internal Link Dist (ft)		1426			1077			528			1272	

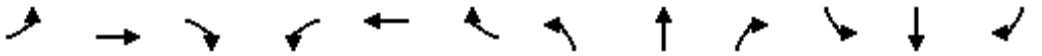
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	537	1241	843	789	1390	827	455	927	847	387	1227	743
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.61	0.89	0.57	0.79	0.26	0.53	0.78	0.07	0.80	0.98	0.52

Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 5 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 120	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 55.4	Intersection LOS: E
Intersection Capacity Utilization 89.6%	ICU Level of Service E
Analysis Period (min) 15	

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Naperville Road & Warrenville Road





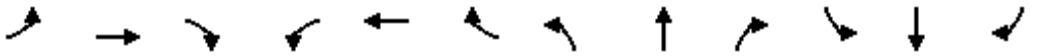
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	13	288	32	0	179	49	1355	6	28	1492	57
Future Volume (vph)	315	13	288	32	0	179	49	1355	6	28	1492	57
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.857				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1596	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.950			0.000			0.109			0.115		
Satd. Flow (perm)	1770	1596	0	0	1961	1583	203	3725	1583	214	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		190				61			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	332	317	0	34	0	188	52	1426	6	29	1571	60
Turn Type	pm+pt	NA		pm+pt		pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	16.5	24.0		16.5	24.0	13.5	13.5	96.0	96.0	13.5	96.0	96.0
Total Split (%)	11.0%	16.0%		11.0%	16.0%	9.0%	9.0%	64.0%	64.0%	9.0%	64.0%	64.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	29.5	17.0		8.3		11.4	103.8	95.1	95.1	111.7	101.7	101.7
Actuated g/C Ratio	0.20	0.11		0.06		0.08	0.69	0.63	0.63	0.74	0.68	0.68
v/c Ratio	0.96	0.91		0.35		1.07	0.25	0.60	0.01	0.10	0.62	0.05
Control Delay	96.0	55.2		77.0		128.0	17.0	45.6	0.0	7.2	16.9	1.2
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	96.0	55.2		77.0		128.0	17.0	45.6	0.0	7.2	16.9	1.2
LOS	F	E		E		F	B	D	A	A	B	A
Approach Delay		76.1			120.2			44.4			16.1	
Approach LOS		E			F			D			B	
Queue Length 50th (ft)	312	127		33		~138	26	753	0	7	483	0
Queue Length 95th (ft)	#426	#294		70		#328	m33	m795	m0	18	601	11
Internal Link Dist (ft)		399			484			1272			427	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	347	369		147		176	243	2362	1032	277	2526	1099
Starvation Cap Reductn	0	0		0		0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0		0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.86		0.23		1.07	0.21	0.60	0.01	0.10	0.62	0.05

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 81 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 42.0 Intersection LOS: D
Intersection Capacity Utilization 76.7% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive



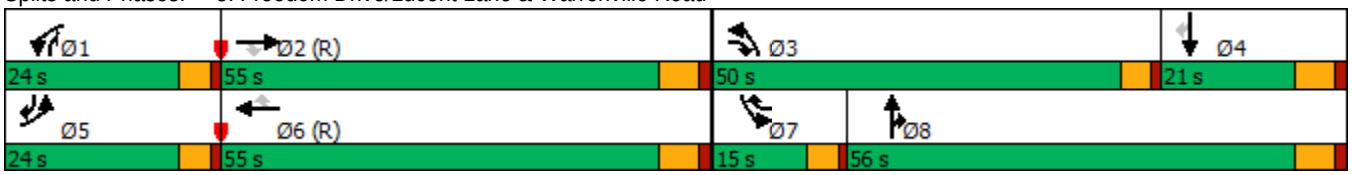
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	1181	44	207	756	188	448	268	638	61	46	59
Future Volume (vph)	292	1181	44	207	756	188	448	268	638	61	46	59
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			198						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1243	46	218	796	198	472	282	672	64	48	62
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.6	64.6	101.6	15.7	61.7	77.2	31.0	39.3	59.5	9.4	20.0	42.3
Actuated g/C Ratio	0.12	0.43	0.68	0.10	0.41	0.51	0.21	0.26	0.40	0.06	0.13	0.28
v/c Ratio	0.72	0.77	0.04	0.61	0.52	0.22	0.67	0.29	0.61	0.58	0.10	0.12
Control Delay	73.0	41.9	2.2	68.7	39.2	14.7	60.8	44.2	37.8	88.7	54.6	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	41.9	2.2	68.7	39.2	14.7	60.8	44.2	37.8	88.7	54.6	2.9
LOS	E	D	A	E	D	B	E	D	D	F	D	A
Approach Delay		46.8			40.5			46.7			48.7	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	151	549	0	112	377	61	230	116	294	62	21	0
Queue Length 95th (ft)	197	#778	14	153	471	136	280	149	318	114	42	17
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	467	1604	1237	451	1533	920	1041	1241	1171	123	544	527
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.77	0.04	0.48	0.52	0.22	0.45	0.23	0.57	0.52	0.09	0.12

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 45.1 Intersection LOS: D
Intersection Capacity Utilization 71.4% 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: 3: Freedom Drive/Lucent Lane & Warrenville Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	395	1221	264	83	607	275	252	951	247	284	678	292
Future Volume (vph)	395	1221	264	83	607	275	252	951	247	284	678	292
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			55			87			87			58
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	416	1285	278	87	639	289	265	1001	260	299	714	307
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	36.0	74.0	21.0	13.0	51.0	21.0	21.0	42.0	13.0	21.0	42.0	36.0
Total Split (%)	24.0%	49.3%	14.0%	8.7%	34.0%	14.0%	14.0%	28.0%	8.7%	14.0%	28.0%	24.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.7	61.2	83.0	8.0	45.5	68.5	15.9	42.8	56.8	17.0	43.9	73.7
Actuated g/C Ratio	0.16	0.41	0.55	0.05	0.30	0.46	0.11	0.29	0.38	0.11	0.29	0.49
v/c Ratio	0.77	0.85	0.31	0.47	0.57	0.38	0.73	0.94	0.40	0.77	0.46	0.38
Control Delay	55.8	45.3	10.7	77.5	46.0	19.2	77.2	69.0	25.5	78.1	38.2	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	45.3	10.7	77.5	46.0	19.2	77.2	69.0	25.5	78.1	38.2	13.5
LOS	E	D	B	E	D	B	E	E	C	E	D	B
Approach Delay		42.7			41.1			63.0			41.5	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	187	624	143	43	273	120	130	~523	124	146	213	153
Queue Length 95th (ft)	219	666	m140	73	338	198	181	#728	216	#209	245	189
Internal Link Dist (ft)		1426			1077			528			1272	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	720	1688	912	194	1148	775	388	1062	658	401	1567	885
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.76	0.30	0.45	0.56	0.37	0.68	0.94	0.40	0.75	0.46	0.35

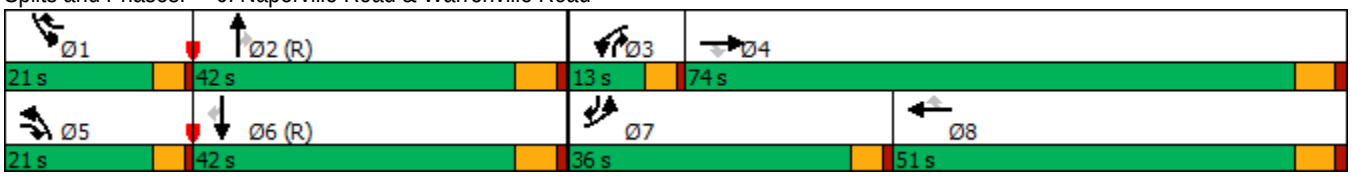
Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 136 (91%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.94			
Intersection Signal Delay: 47.4		Intersection LOS: D	
Intersection Capacity Utilization 86.8%		ICU Level of Service E	
Analysis Period (min) 15			

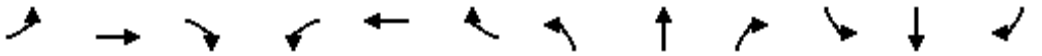
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Naperville Road & Warrenville Road





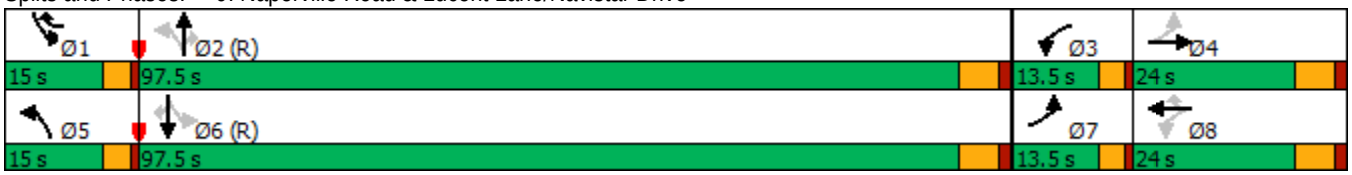
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	1	69	2	2	10	247	1311	63	174	1183	311
Future Volume (vph)	77	1	69	2	2	10	247	1311	63	174	1183	311
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.852				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1587	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.727						0.184			0.160		
Satd. Flow (perm)	1354	1587	0	1863	1961	1583	343	3725	1583	298	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		73				51			80			160
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	81	74	0	2	2	11	260	1380	66	183	1245	327
Turn Type	pm+pt	NA		pm+pt	NA	pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	13.5	24.0		13.5	24.0	15.0	15.0	97.5	97.5	15.0	97.5	97.5
Total Split (%)	9.0%	16.0%		9.0%	16.0%	10.0%	10.0%	65.0%	65.0%	10.0%	65.0%	65.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	11.7	7.8		7.6	6.0	12.4	127.8	114.4	114.4	124.6	112.8	112.8
Actuated g/C Ratio	0.08	0.05		0.05	0.04	0.08	0.85	0.76	0.76	0.83	0.75	0.75
v/c Ratio	0.62	0.49		0.02	0.03	0.06	0.65	0.49	0.05	0.53	0.44	0.27
Control Delay	85.5	25.3		61.0	69.0	0.7	21.7	10.7	2.6	8.4	8.6	4.1
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.5	25.3		61.0	69.0	0.7	21.7	10.7	2.6	8.4	8.6	4.1
LOS	F	C		E	E	A	C	B	A	A	A	A
Approach Delay		56.8			17.8			12.1			7.7	
Approach LOS		E			B			B			A	
Queue Length 50th (ft)	79	1		2	2	0	124	274	4	16	186	35
Queue Length 95th (ft)	127	54		10	11	0	m189	m336	m7	54	393	116
Internal Link Dist (ft)		399			484			1272			427	

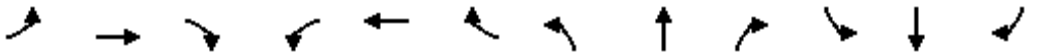
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	135	254		136	235	200	413	2841	1226	369	2801	1230
Starvation Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.29		0.01	0.01	0.06	0.63	0.49	0.05	0.50	0.44	0.27

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 100 (67%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 11.9		Intersection LOS: B	
Intersection Capacity Utilization 69.0%		ICU Level of Service C	
Analysis Period (min) 15			

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive





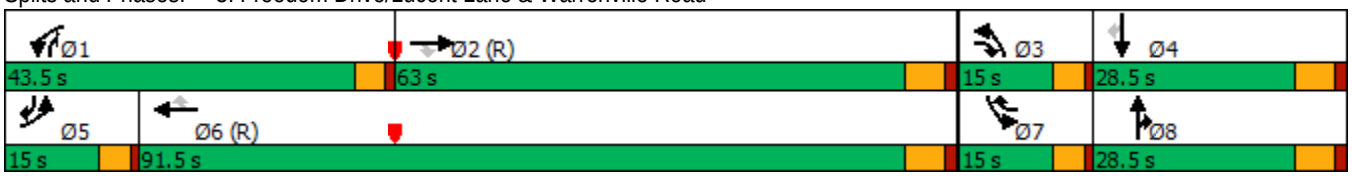
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1146	176	585	1024	69	220	75	520	289	209	313
Future Volume (vph)	72	1146	176	585	1024	69	220	75	520	289	209	313
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	1		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	1.00	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	1770	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			90			73						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	1206	185	616	1078	73	232	79	547	304	220	329
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	8.6	62.6	79.1	33.4	87.4	103.9	10.5	22.5	60.4	10.5	22.5	37.1
Actuated g/C Ratio	0.06	0.42	0.53	0.22	0.58	0.69	0.07	0.15	0.40	0.07	0.15	0.25
v/c Ratio	0.39	0.78	0.21	0.81	0.50	0.07	0.97	0.14	0.49	2.47	0.39	0.72
Control Delay	73.4	42.7	10.8	55.0	33.4	4.7	118.4	56.1	34.4	711.8	60.0	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	42.7	10.8	55.0	33.4	4.7	118.4	56.1	34.4	711.8	60.0	47.2
LOS	E	D	B	D	C	A	F	E	C	F	E	D
Approach Delay		40.3			39.7			59.1			287.3	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	37	532	46	306	418	3	119	35	223	~491	103	222
Queue Length 95th (ft)	64	663	99	368	490	m15	#208	62	267	#688	147	336
Internal Link Dist (ft)		529			1426			1638			329	

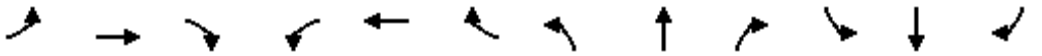
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1553	876	892	2169	1118	240	558	1226	123	558	475
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.78	0.21	0.69	0.50	0.07	0.97	0.14	0.45	2.47	0.39	0.69

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 2.47
Intersection Signal Delay: 86.0 Intersection LOS: F
Intersection Capacity Utilization 84.5% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	520	718	717	424	1063	214	233	697	56	304	1156	372
Future Volume (vph)	520	718	717	424	1063	214	233	697	56	304	1156	372
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	425		470	270		305	370		245	300		320
Storage Lanes	2		1	2		1	1		1	2		1
Taper Length (ft)	300			250			110			155		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.91	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	1583	3433	5353	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			87			87			55			120
Link Speed (mph)		45			45			40			40	
Link Distance (ft)		1506			1157			608			1352	
Travel Time (s)		22.8			17.5			10.4			23.0	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	547	756	755	446	1119	225	245	734	59	320	1217	392
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	7	4	5	3	8	1	5	2	3	1	6	7
Permitted Phases			4			8			2			6
Detector Phase	7	4	5	3	8	1	5	2	3	1	6	7
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0	9.5
Total Split (s)	28.0	51.0	23.0	39.0	62.0	17.0	23.0	43.0	39.0	17.0	37.0	28.0
Total Split (%)	18.7%	34.0%	15.3%	26.0%	41.3%	11.3%	15.3%	28.7%	26.0%	11.3%	24.7%	18.7%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	23.5	50.5	77.0	24.7	51.8	74.5	20.4	37.0	67.7	16.7	33.3	62.8
Actuated g/C Ratio	0.16	0.34	0.51	0.16	0.35	0.50	0.14	0.25	0.45	0.11	0.22	0.42
v/c Ratio	1.02	0.60	0.88	0.79	0.87	0.27	0.52	0.80	0.08	0.84	1.02	0.54
Control Delay	104.9	36.1	29.3	70.4	54.1	13.9	65.1	60.6	5.8	70.1	75.8	27.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.9	36.1	29.3	70.4	54.1	13.9	65.1	60.6	5.8	70.1	75.8	27.5
LOS	F	D	C	E	D	B	E	E	A	E	E	C
Approach Delay		51.9			53.1			58.6			65.0	
Approach LOS		D			D			E			E	
Queue Length 50th (ft)	~299	272	439	218	532	73	115	357	2	151	~495	263
Queue Length 95th (ft)	m#350	m283	m345	269	605	130	166	435	27	m#273	#595	m388
Internal Link Dist (ft)		1426			1077			528			1272	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	425		470	270		305	370		245	300		320
Base Capacity (vph)	537	1254	854	789	1390	830	467	918	844	383	1188	732
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.60	0.88	0.57	0.81	0.27	0.52	0.80	0.07	0.84	1.02	0.54

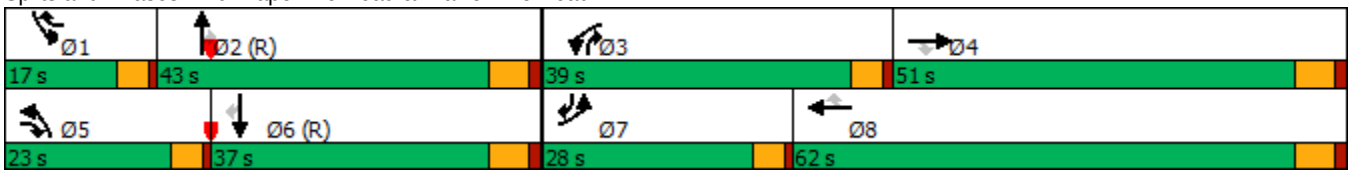
Intersection Summary	
Area Type:	Other
Cycle Length: 150	
Actuated Cycle Length: 150	
Offset: 5 (3%), Referenced to phase 2:NBT and 6:SBT, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 56.9	Intersection LOS: E
Intersection Capacity Utilization 90.2%	ICU Level of Service E
Analysis Period (min) 15	

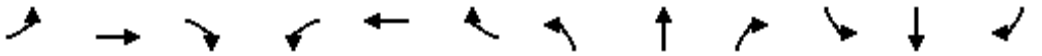
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Naperville Road & Warrenville Road





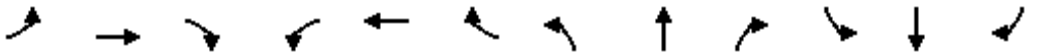
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	333	13	309	32	0	179	70	1355	6	28	1492	90
Future Volume (vph)	333	13	309	32	0	179	70	1355	6	28	1492	90
Ideal Flow (vphpl)	1900	1900	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	170		0	140		140	137		125	200		105
Storage Lanes	1		0	1		1	1		1	1		1
Taper Length (ft)	80			155			145			110		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.856				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1595	0	1770	1961	1583	1770	3725	1583	1770	3725	1583
Flt Permitted	0.950			0.000			0.099			0.114		
Satd. Flow (perm)	1770	1595	0	0	1961	1583	184	3725	1583	212	3725	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		190				59			80			80
Link Speed (mph)		20			20			40			45	
Link Distance (ft)		479			564			1352			507	
Travel Time (s)		16.3			19.2			23.0			7.7	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	351	339	0	34	0	188	74	1426	6	29	1571	95
Turn Type	pm+pt	NA		pm+pt		pm+ov	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0		9.5	24.0	9.5	9.5	24.0	24.0	9.5	24.0	24.0
Total Split (s)	16.5	24.0		16.5	24.0	13.5	13.5	96.0	96.0	13.5	96.0	96.0
Total Split (%)	11.0%	16.0%		11.0%	16.0%	9.0%	9.0%	64.0%	64.0%	9.0%	64.0%	64.0%
Yellow Time (s)	3.0	4.5		3.0	4.5	3.0	3.0	4.5	4.5	3.0	4.5	4.5
All-Red Time (s)	1.0	1.5		1.0	1.5	1.0	1.0	1.5	1.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	6.0		4.0	6.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0
Lead/Lag	Lead	Lag		Lead	Lag	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	31.1	18.7		8.3		10.6	103.7	94.3	94.3	109.3	97.6	97.6
Actuated g/C Ratio	0.21	0.12		0.06		0.07	0.69	0.63	0.63	0.73	0.65	0.65
v/c Ratio	0.96	0.93		0.35		1.13	0.36	0.61	0.01	0.11	0.65	0.09
Control Delay	94.4	60.3		77.0		150.3	19.1	46.1	0.0	7.5	18.8	3.5
Queue Delay	0.0	0.0		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	94.4	60.3		77.0		150.3	19.1	46.1	0.0	7.5	18.8	3.5
LOS	F	E		E		F	B	D	A	A	B	A
Approach Delay		77.7			139.1			44.6			17.8	
Approach LOS		E			F			D			B	
Queue Length 50th (ft)	327	150		33		~167	37	752	0	8	515	5
Queue Length 95th (ft)	#480	#344		70		#331	m46	m795	m0	18	611	30
Internal Link Dist (ft)		399			484			1272			427	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	170			140		140	137		125	200		105
Base Capacity (vph)	366	375		147		166	229	2343	1025	264	2422	1057
Starvation Cap Reductn	0	0		0		0	0	0	0	0	0	0
Spillback Cap Reductn	0	0		0		0	0	0	0	0	0	0
Storage Cap Reductn	0	0		0		0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.90		0.23		1.13	0.32	0.61	0.01	0.11	0.65	0.09

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 81 (54%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 44.2		Intersection LOS: D	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: Naperville Road & Lucent Lane/Navistar Drive

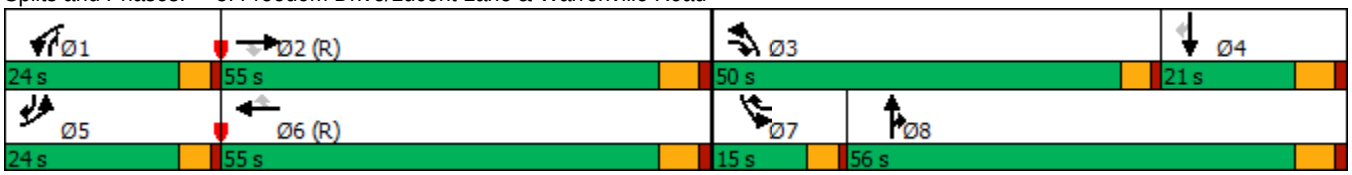


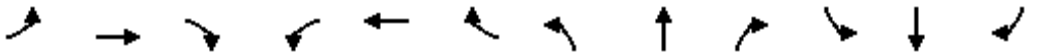
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	1181	44	207	756	188	448	268	638	61	46	59
Future Volume (vph)	292	1181	44	207	756	188	448	268	638	61	46	59
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			55			198						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1243	46	218	796	198	472	282	672	64	48	62
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	24.0	55.0	50.0	24.0	55.0	15.0	50.0	56.0		15.0	21.0	24.0
Total Split (%)	16.0%	36.7%	33.3%	16.0%	36.7%	10.0%	33.3%	37.3%		10.0%	14.0%	16.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	18.6	65.7	102.5	15.7	62.8	77.0	30.8	39.4	59.6	8.2	19.1	41.3
Actuated g/C Ratio	0.12	0.44	0.68	0.10	0.42	0.51	0.21	0.26	0.40	0.05	0.13	0.28
v/c Ratio	0.72	0.76	0.04	0.61	0.51	0.22	0.67	0.29	0.61	0.34	0.10	0.12
Control Delay	73.0	40.7	2.2	67.8	38.2	14.4	60.9	44.1	37.6	72.8	55.4	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.0	40.7	2.2	67.8	38.2	14.4	60.9	44.1	37.6	72.8	55.4	2.9
LOS	E	D	A	E	D	B	E	D	D	E	E	A
Approach Delay		45.8			39.6			46.6			43.1	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	151	535	0	112	366	61	230	116	293	31	21	0
Queue Length 95th (ft)	197	#777	14	153	470	137	280	148	318	57	42	17
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	467	1631	1248	451	1560	930	1041	1241	1174	240	519	517
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.76	0.04	0.48	0.51	0.21	0.45	0.23	0.57	0.27	0.09	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 150			
Actuated Cycle Length: 150			
Offset: 148 (99%), Referenced to phase 2:EBT and 6:WBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.76			
Intersection Signal Delay: 44.3		Intersection LOS: D	
Intersection Capacity Utilization 71.4%		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: 3: Freedom Drive/Lucent Lane & Warrenville Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	1146	176	585	1024	59	220	75	520	289	209	313
Future Volume (vph)	72	1146	176	585	1024	59	220	75	520	289	209	313
Ideal Flow (vphpl)	1900	2000	1900	1900	2000	1900	1900	2000	1900	1900	2000	1900
Storage Length (ft)	260		210	485		325	365		355	170		215
Storage Lanes	2		1	2		1	2		1	2		1
Taper Length (ft)	300			300			300			80		
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95	0.88	0.97	0.95	1.00
Frt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3725	1583	3433	3725	1583	3433	3725	2787	3433	3725	1583
Right Turn on Red			Yes			Yes			No			Yes
Satd. Flow (RTOR)			90			62						87
Link Speed (mph)		45			45			35			20	
Link Distance (ft)		609			1506			1718			409	
Travel Time (s)		9.2			22.8			33.5			13.9	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Shared Lane Traffic (%)												
Lane Group Flow (vph)	76	1206	185	616	1078	62	232	79	547	304	220	329
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pt+ov	Prot	NA	pm+ov
Protected Phases	5	2	3	1	6	7	3	8	8 1	7	4	5
Permitted Phases			2			6						4
Detector Phase	5	2	3	1	6	7	3	8	8 1	7	4	5
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	9.5	24.0	9.5	9.5	24.0		9.5	21.0	9.5
Total Split (s)	15.0	63.0	15.0	43.5	91.5	15.0	15.0	28.5		15.0	28.5	15.0
Total Split (%)	10.0%	42.0%	10.0%	29.0%	61.0%	10.0%	10.0%	19.0%		10.0%	19.0%	10.0%
Yellow Time (s)	3.5	4.5	3.5	3.5	4.5	3.5	3.5	4.5		3.5	4.5	3.5
All-Red Time (s)	1.0	1.5	1.0	1.0	1.5	1.0	1.0	1.5		1.0	1.5	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	4.5	6.0	4.5	4.5	6.0		4.5	6.0	4.5
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Recall Mode	None	C-Max	None	None	C-Max	None	None	None		None	None	None
Act Effct Green (s)	8.6	62.6	79.1	33.4	87.4	103.9	10.5	22.5	60.4	10.5	22.5	37.1
Actuated g/C Ratio	0.06	0.42	0.53	0.22	0.58	0.69	0.07	0.15	0.40	0.07	0.15	0.25
v/c Ratio	0.39	0.78	0.21	0.81	0.50	0.06	0.97	0.14	0.49	1.27	0.39	0.72
Control Delay	73.4	42.7	10.8	54.9	33.4	4.8	118.4	56.1	34.4	201.8	60.0	47.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	42.7	10.8	54.9	33.4	4.8	118.4	56.1	34.4	201.8	60.0	47.2
LOS	E	D	B	D	C	A	F	E	C	F	E	D
Approach Delay		40.3			40.0			59.1			105.6	
Approach LOS		D			D			E			F	
Queue Length 50th (ft)	37	532	46	305	419	3	119	35	223	~192	103	222
Queue Length 95th (ft)	64	663	99	367	492	m15	#208	62	267	#293	147	336
Internal Link Dist (ft)		529			1426			1638			329	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	260		210	485		325	365		355	170		215
Base Capacity (vph)	240	1553	876	892	2169	1115	240	558	1226	240	558	475
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.78	0.21	0.69	0.50	0.06	0.97	0.14	0.45	1.27	0.39	0.69

Intersection Summary

Area Type: Other
Cycle Length: 150
Actuated Cycle Length: 150
Offset: 50 (33%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.27
Intersection Signal Delay: 54.7 Intersection LOS: D
Intersection Capacity Utilization 76.7% ICU Level of Service D
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Freedom Drive/Lucent Lane & Warrenville Road