PROJECT TRAFFIC STUDY REPORT

Intersection Improvements & Traffic Signal Installations-Various

MFT Section No. 13-00351-00-TS
RFQ# 2014-26

Prepared for:
City of Bloomington
Department of Public Works

February 3, 2014

KNIGHT
Engineers & Architects

Knight E/A, Inc.
993 Clocktower Drive
Suite A
Springfield, IL 62704

TABLE OF CONTENTS

PROJECT DESCRIPTION

This study has been prepared for the City of Bloomington, Illinois and includes evaluation of current and future traffic capacity, identification and quantification of intersection operation needs, analysis of improvement alternatives and recommendation of improvement to best address needs at each of the following three intersections:

- General Electric Road at Keaton Place/Auto Row Drive
- Hershey Road at Clearwater Avenue
- Hershey Road at Arrowhead Drive

This report summarizes traffic signal warrant analyses, accident analyses, existing traffic volumes and projections, and capacity/operations analyses of existing and future traffic volumes at each location.

EXISTING CONDITIONS

General Electric (G.E.) Road and Keaton Place/Auto Row Drive-G.E. Rd. is a four lane urban arterial which services over 18,000 vehicles per day eastbound and westbound. The intersection at Keaton Pl./Auto Row Dr. is located just over 400 feet from Veterans Parkway and services commercial development, including retail shops and popular restaurants. Traffic control at this intersection is two-way stop control for northbound and southbound with free flow eastbound and westbound. Large peak hour left turn volumes, particularly northbound, have resulted in frequent angled and turning type collisions. The speed limit on G.E. Rd. is posted at 35 mph and is not posted on Keaton Place/Auto Row Drive.

Hershey Road and Clearwater Avenue- Hershey Rd. is a four lane urban arterial which services nearly 12,000 vehicles per day northbound and southbound at the intersection of Clearwater Avenue. Clearwater Avenue is a two lane collector which connects to Veterans Parkway to the west and Airport Road near Bloomington Central Catholic High School to the east. Traffic control at this intersection is four way stop control. Along the Clearwater Avenue corridor are many residential driveways, apartment complexes and neighborhood streets. Commercial activity in the form of fast food, retail shops, gas station and convenience stores and auto service centers, is introduced to the west near Veterans Parkway. On-street parking is prohibited on Hershey Road Monday through Friday only, but permitted on Clearwater Avenue seven days a week.

Hershey Road and Arrowhead Drive- Hershey Rd. is a four lane urban arterial which services over 16,000 vehicles per day northbound and southbound at the intersection of Arrowhead Drive. Arrowhead Drive is a two lane local street which services residential neighborhoods and apartment complexes. Stevenson Park and Stevenson Elementary School is located in the northwest quadrant. Traffic control at this intersection is four way stop control. Because of the elementary school, park and nearby apartment complexes there is a strong presence of pedestrian activity at this intersection. On-street parking is prohibited on Hershey Road Monday through Friday only, but permitted on Arrowhead Drive seven days a week.

TRAFFIC VOLUMES

Existing (2013) traffic counts at all three locations were provided to Knight E/A, Inc. (Knight) by the City of Bloomington, and the raw data was adjusted for day of week and month of year variations by dividing the raw counts by each of the appropriate factors. The following adjustment factors were applied to all corresponding raw data:

INTERSECTION	DATE COUNTED	ADJUSTMENT FACTORS	
		Day of Week	Month
General Electric Road and Keaton Place/Auto Row Drive	Mon., Aug. 5, 2013	0.973	1.06
	Tues., Aug. 6, 2013	1.001	1.06
Hershey Road and Clearwater Avenue	Tues., Sept. 10, 2013	1.001	1.05
	Wed., Sept. 11, 2013	1.004	1.05
	Thurs., Sept.12, 2013	1.022	1.05
Hershey Road and Arrowhead Drive	Tues., Oct. 1, 2013	1.001	1.06
	Thurs., Oct. 3, 2013	1.022	1.06

Traffic volumes for each movement were collected at 15 minute intervals during the 12 hour period between 6 AM and 6 PM. From these updated counts design hourly volumes (DHV's)

were determined for the 2014 construction year by summing the 4 highest consecutive 15 minute intervals between 7:15 and 8:45 for AM peak hour and 4:15 and 5:45 for the PM peak hour. These construction year volumes were projected 20 years to the design year of 2034 at annual growth rates provided by the City of Bloomington. The annual growth rates applied to the 2014 volumes were as follows: General Electric Road and Hershey Road, 2%; Keaton Place/Auto Row Drive, 1%; Clearwater Avenue and Arrowhead Drive, 0.25%.

Existing DHV's at the intersections of IAA Drive and Vernon Avenue, General Electric Road/Vernon Avenue and Veterans Parkway, and Empire Street and Hershey Road were established by projecting 2008 volumes (provided by IDOT) to the construction year of 2014. The previously defined annual growth rates were applied to these adjacent intersections, with an additional annual growth rate of 1% being applied at Empire Street.

The construction year (2014) and design year (2034) volumes were balanced through the General Electric Road corridor between IAA Drive (at Vernon Drive) and Keaton Place/Auto Row Drive. The volumes were not balanced through the Hershey Road corridor between Empire Street and Clearwater Avenue because of the number of commercial and residential driveways, apartment complexes and city side streets in between the intersections. The final DHV's were used on all capacity analyses including HCS and Synchro, and will be used on all project intersection design studies (IDS). (See Appendix A-Traffic Data)

TRAFFIC SIGNAL WARRANTS

The most recent traffic counts provided by the City of Bloomington were used to analyze traffic signal warrants at all three intersections. The unadjusted (raw) data was used to reflect the actual conditions on that day. The analysis showed all three intersections meet Warrant 3, Peak Hour at the time the counts were performed in fall of 2013. (See Appendix B-Traffic Signal Warrants)

ACCIDENT ANALYSIS

Accident histories over the last three years were provided by the City of Bloomington and analyzed for accident patterns. Such patterns are helpful in determining corrective safety countermeasures that can be implemented to help greatly reduce accidents at intersections. The following table highlights accident patterns established over the past three years and provides corresponding safety countermeasures found to be successful in reducing each type of accident indicated:

INTERSECTION	TYPE	NO.	% OF TOT	INJURIES	*RECOMMENDED COUNTERMEASURES
General Electric Road and Keaton Place/Auto Row Drive	Rear End	0	0	1-A ,1-B, 2-C 7-PDO	N/A
	Turning	4	36		Provide traffic signal with left-turn phase
	Angle	7	64		Provide traffic signals
Hershey Road and Clearwater Avenue	Rear End	7	44	1-B, 2C 13-PDO	Create Lt./Rt. Turn lanes; Improve progression
	Turning	1	6		Provide traffic signal with left-turn phase
	Angle	8	50		Provide traffic signals
Hershey Road and Arrowhead Drive	Rear End	1	20	1-B 4-PDO	Create Lt./Rt. Turn lanes; Improve progression
	Turning	1	20		Provide traffic signal with left-turn phase
	Angle	3	60		Provide traffic signals

*Traffic Engineering Handbook, 5th Edition, pgs. 206-207.

As illustrated in the above table the overwhelming types of accidents at the intersection of General Electric Road and Keaton Place/Auto Row Drive are turning and angled accidents, indicating the need to provide protection for left turning vehicles, mostly northbound. Recommended countermeasures for these types of accidents at two-way stop controlled intersections is primarily the installation of traffic control signals with phasing to allow for protected left turns at the heavier volume approaches. This could be accomplished through either side street split phases or leading protected left turn phases in advance of the other movements. The Hershey Road intersections of Clearwater Avenue and Arrowhead Drive have similar recurring accidents mostly in the form of right angle collisions. Again, recommended safety countermeasures would indicate the need for traffic signals at both locations. Additionally, at Clearwater Avenue a high rate of rear end collisions seem to be establishing a pattern of those types of accidents typically found at high volume intersections capable of generating significant queue lengths during the peak periods. Corrective safety countermeasures to these types of accidents include installation of auxiliary lanes to separate turning movements from though lanes, and reducing queue lengths by improving progression with the installation of traffic signals interconnected within a corridor system. It should be noted the installation of traffic signals has proven to decrease the number and severity of certain types (angled, turning) of accidents, but may increase the number of less severe types (rear end) of accidents. (See Appendix C-Accident Data)

GEOMETRIC ALTERNATIVES

Installation of new traffic signals are warranted and proposed at each intersection location. In addition to new traffic signals, several different geometric alternatives were analyzed at each of the three project intersections. Capacity analyses for six alternatives at General Electric Road and Keaton Place/Auto Row Drive, and three alternatives at the Hershey Road intersections of

Clearwater Avenue and Arrowhead Drive were complete to help determine the optimal intersection improvements needed to complement the installation of traffic control signals. The geometric alternatives investigated include the following:

General Electric Road and Keaton Place/Auto Row Drive

- No Geometric Improvements-No Split Phase
- No Geometric Improvements-Split Phase
- Left Turn Lanes NB & SB-No Split Phase
- Left Turn Lanes NB & SB-Split Phase
- Left Turn Lanes NB & SB-Right Turn Lane EB-No Split Phase
- Left Turn Lanes NB & SB-Right Turn Lane EB-Split Phase

Hershey Road and Clearwater Avenue, Hershey Road and Arrowhead Drive

- No Geometric Improvements
- Left Turn Lanes NB & SB
- Left Turn Lanes All Approaches

All capacity results and calculated left turn storage lengths can be found in the Appendix of this report where each movement can be compared in greater depth. (See Appendix D-Capacity Analyses, and Appendix E-Storage Calculations)

Summaries of total intersection delay with level of service (LOS) results for each alternative are shown in the following tables:

General Electric Road and Keaton Place/Auto Row Drive

2014-AM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-AM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-No Split Phase	25.3	C	No Geometrics-No Split Phase	26.7	C
No Geometrics-Split Phase	30.0	C	No Geometrics-Split Phase	32.8	C
Left-Turn Lane-NB & SB-No Split	25.8	C	Left-Turn Lane-NB & SB-No Split	28.1	C
Left-Turn Lane-NB & SB-Split	27.4	C	Left-Turn Lane-NB & SB-Split	31.2	C
LTL-NB & SB; RTL EB-No Split	27.2	C	LTL-NB & SB; RTL EB-No Split	26.9	C
LTL-NB & SB; RTL EB-Split	30.6	C	LTL-NB & SB; RTL EB-Split	30.4	C

2014-PM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-PM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-No Split Phase	25.2	C	No Geometrics-No Split Phase	20.2	C
No Geometrics-Split Phase	28.4	C	No Geometrics-Split Phase	33.4	C
Left-Turn Lane-NB & SB-No Split	24.9	C	Left-Turn Lane-NB & SB-No Split	17.4	B

Left-Turn Lane-NB & SB-Split	28.0	C	Left-Turn Lane-NB & SB-Split	23.1	C
LTL-NB & SB; RTL EB-No Split	17.4	B	LTL-NB & SB; RTL EB-No Split	16.4	B
LTL-NB & SB; RTL EB-Split	26.8	C	LTL-NB & SB; RTL EB-Split	22.2	C

Hershey Road and Arrowhead Drive

2014-AM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-AM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-Split Phase	29.9	C	No Geometrics-Split Phase	38.6	D
Left-Turn Lanes-NB/SB	24.6	C	Left-Turn Lanes-NB/SB	29.6	C
Left-Turn Lane-All Approaches	18.2	B	Left-Turn Lane-All Approaches	21.3	C

2014-PM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-PM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-Split Phase	45.2	D	No Geometrics-Split Phase	159.0	F
Left-Turn Lanes-NB/SB	27.0	C	Left-Turn Lanes-NB/SB	38.3	D
Left-Turn Lane-All Approaches	21.9	C	Left-Turn Lane-All Approaches	31.3	C

Hershey Road and Clearwater Avenue

2014-AM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-AM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-Split Phase	31.3	C	No Geometrics-Split Phase	49.4	D
Left-Turn Lanes-NB/SB	25.5	C	Left-Turn Lanes-NB/SB	28.2	C
Left-Turn Lane-All Approaches	18.6	B	Left-Turn Lane-All Approaches	19.8	B

2014-PM Peak **Improvement Alternate**	**Delay (sec)**	**LOS**	***2034-PM Peak*** **Improvement Alternate**	**Delay (sec)**	**LOS**
No Geometrics-Split Phase	51.9	D	No Geometrics-Split Phase	152.0	F
Left-Turn Lanes-NB/SB	28.1	C	Left-Turn Lanes-NB/SB	34.8	C
Left-Turn Lane-All Approaches	19.8	B	Left-Turn Lane-All Approaches	24.0	C

Based on the above LOS results, calculated storage lengths and accident analyses the following geometric improvements appear to be optimum at each of the three intersections:

General Electric Road and Keaton Place/Auto Row Drive: The results of the above analyses appear to support optimum geometric improvements adequate through the 2034 design year to include widening for new northbound and southbound left turn lanes, at a minimum. The summary tables above may indicate a "No Geometric Improvements" approach will provide

acceptable levels of service well into the design year. While it may be true the average intersection delay for these alternatives are acceptable, the breakdown of control delay for each movement will show excessively large queues and LOS E and F for the northbound and southbound approaches. This can be attributed to the need for nearly all of the green time to be used for the eastbound through movements to prevent queuing into the upstream intersection of Veterans Parkway. The "LOS for the LTL-NB/SB" alternatives yield acceptable intersection levels of service but significantly better LOS on the NB and SB approaches than that of the "No Geometric Improvements" alternatives. The "LTL-NB/SB, RTL-EB" alternatives provide the best LOS well into the design year and beyond. However, the addition of an eastbound right turn lane, in combination with northbound and southbound left turn lanes, provides a minimally reduced delay while still resulting in a LOS C, and would require substantial longitudinal right-of-way acquisition from the existing Walgreens at the southwest quadrant. Although the addition of a right turn lane eastbound may not be warranted from an operational standpoint, the installation of an eastbound right turn lane from a safety standpoint should be considered for discussion. (See Appendix D-Capacity Analyses) Storage calculations utilizing data from HCS outputs for the "Left Turn-NB/SB" alternatives compute storage lengths of up to 255 ft. northbound and 30 ft. southbound. Further analyses with Synchro show northbound queuing of 137 ft. and 205 ft. at the 50% and 95% queue levels, and southbound queuing of 15 ft. and 41 ft. at the 50% and 95% queue levels, respectively. Storage calculations for eastbound and westbound left turning vehicles for the same alternative computes storage distances of 49 ft. for each movement. Adjacent HCS through lane queue calculations result in 400 ft. eastbound and 485 ft. westbound. However, synchro analyses greatly reduce these storage lengths to 36 ft. eastbound and 258 ft. westbound, at the 95% queue lengths. Therefore, the existing eastbound left turn lane appears to be adequate into the design year and the westbound left turn lanes should be lengthened sufficiently to allow access into the left turn lane during peak periods. (See Appendix E-Storage Calculations) The installation of traffic control signals are warranted under Warrant 3, Peak Hour for the construction year of 2014. (See Appendix B-Signal Warrants Worksheets)

Hershey Road and Clearwater Avenue: The results of the above analyses support the installation of left turn lanes at all four approaches. The three alternatives listed in the above LOS summary tables were analyzed utilizing 140 second cycle lengths to match the AM and PM cycle lengths currently in use at IL 9 (Empire Street), and 70 second cycle lengths or ½ cycle lengths than that in use at Empire Street. The 70 second cycle length analyses were much more efficient yielding much better LOS on all approaches. (See Appendix D-Capacity Analyses) Anticipated queues were much smaller when utilizing the 70 second cycle length than that of the 140 second cycle length. Calculated left turn lane storage lengths of up to 23 ft. eastbound, 61 ft. westbound, 101 ft. northbound and 25 ft. southbound were computed. Adjacent through lane queue lengths of 200 ft. eastbound, 164 ft. westbound, 408 ft. northbound and 334 ft.

southbound were also computed. By utilizing Synchro to optimize the Hershey Road corridor the estimated through lane queues were reduced to 119 ft. eastbound, 107 ft. westbound, 62 ft. northbound and 88 ft. southbound. These reduced through queue lengths will help to ensure access to all left turn lanes during peak periods well into the design year. (See Appendix E-Storage Calculations) Sufficient pavement width exists both eastbound and westbound to establish left turn lanes with striping as determined necessary without widening. However, widening of Hershey Road will be needed to install left turn lanes on the northbound and southbound approaches. Parking is currently permitted on Clearwater Avenue but should be prohibited within the left turn lanes and tapers unless widening for parking lanes can be considered with this project. Parking is also permitted on Hershey Road but only on the weekends and should also be prohibited at all times within the left turn lanes and tapers. Traffic control signals are warranted under Warrant 3, Peak Hour during the construction year of 2014. (See Appendix B-Signal Warrants Worksheets)

Hershey Road and Arrowhead Drive: The results of the above analyses support the installation of left turn lanes at all four approaches. The three alternatives listed in the above LOS summary tables were analyzed utilizing 140 second cycle lengths to match the AM and PM cycle lengths currently in use at IL 9 (Empire Street), and 70 second cycle lengths or ½ cycle length than that in use at Empire Street. The 70 second cycle length analyses were much more efficient yielding much better LOS on all approaches. In addition, capacity results for the shorter cycle length were not affected by the significant number of pedestrians (actual volume counts provided by the City of Bloomington) during the AM and PM school peak periods. (See Appendix D-Capacity Analyses) Anticipated queues were much smaller when utilizing the 70 second cycle length than that of the 140 second cycle length. Calculated left turn lane storage lengths of up to 55 ft. eastbound, 80 ft. westbound, 15 ft. northbound and 32 ft. southbound were computed with results achieved with the shorter cycle length. Adjacent through lane queue lengths of 58 ft. eastbound, 67 ft. westbound, 560 ft. northbound and 399 ft. southbound were computed. By utilizing Synchro to optimize the Hershey Road corridor the estimated through lane queues were reduced to 127 ft. northbound and 159 ft. southbound. These reduced through queue lengths will help ensure access to all left turn lanes during the peak periods through the design year. Additionally, capacity and storage calculations were performed for the school peak periods during morning drop off and afternoon pickup. Optimizing the intersection with Synchro during school peak periods results in estimated left turn storage distances of 115 ft. eastbound and 90 ft. westbound. (See Appendix D-Capacity Analyses) Sufficient pavement width exists both eastbound and westbound to establish left turn lanes without widening to accommodate all storage needs, even during school peak periods. However, widening of Hershey Road will be needed to install left turn lanes on the northbound and southbound approaches. Parking is currently permitted on Arrowhead Drive. Parking can remain on the north side of Arrowhead Drive by shifting all lanes to the south. Parking on the south side of

Arrowhead Drive will therefore need to be eliminated within the left turn lane and taper areas. Parking is also permitted on Hershey Road but only on the weekends and should also be prohibited at all times within the left turn lanes and tapers. Because of the public park and elementary school located in the northwest quadrant special attention should be given to the presence of pedestrians in the form of pedestrian signal timing, accessible ramps and well defined pedestrian crosswalk striping and signing. Traffic control signals are warranted under Warrant 3, Peak Hour during the construction year of 2014. (See Appendix E-Signal Warrants)

RECOMMENDATIONS

General Electric Road and Keaton Place/Auto Row Drive: Keaton Place/Auto Row Drive services significant commercial activity with potential for more growth over the next several years. The former General Electric manufacturing plant located in the southeast quadrant is currently closed as a full scale operation. Permanent closure and removal of the existing truck access driveway just east of the intersection should be considered at this time. Additional driveways exist further east into the plant that could possibly accommodate trucks with some interior traffic pattern changes being addressed by the property owners. Another option would be to allow truck access to the plant off Keaton Place, but is not recommended at this time. Current traffic volumes and accident history support the installation of traffic control signals now and are therefore recommended. Capacity analyses for the design year of 2034 support the addition of left turn lanes both northbound and southbound. Northbound left turn lane storage lengths of 205 ft. (95% queue) and 137 ft. (50% queue) were estimated utilizing Synchro progression analysis software. To minimize widening costs on the south leg a reasonable left turn lane length of 175 ft. (75% queue) northbound is recommended. Similarly, 15 ft. (50% queue) and 41 ft. (95% queue) were estimated for the southbound left turn lane storage lengths. On the north leg the nearest commercial driveway to the auto dealership is approximately 110 ft. from the proposed stop bar. This distance will allow for 60 ft. of storage and 49.5 ft. taper (9:1) which will accommodate the largest estimated queue length (41 ft.) for 2034 and is therefore recommended. Because the eastbound through lanes approaching Keaton Pl./Auto Row Dr. are to metered with the existing controller at Veterans Parkway, access to the existing eastbound left turn lane can be controlled and is therefore adequate through the design year. However, the westbound left turn lane should be lengthened to 115 ft. to ensure access beyond the anticipated westbound through queues in the design year, and can be achieved without pavement widening. The addition of an eastbound right turn lane will provide a minimally reduced delay, while still resulting in an acceptable LOS C, but will require significant right-of-way acquisition from Walgreens which will be costly and likely cause project delays. Although not recommended at this time from an operational standpoint, the installation of an eastbound right turn lane for safety purposes should be considered for discussion before any final decision on proposed geometrics is made. Due to the close

proximity of this intersection with the intersection of General Electric Road at Veterans Parkway (approximately 400 feet), a proposed traffic signal interconnect from the new signals to the existing IDOT maintained traffic signal controller at the General Electric Road and Veterans Parkway intersection is recommended via installation of underground fiber optic cable. Also, it is likely concurrence will be needed from IDOT that the new signal will not have negative impacts to their existing intersection/signal operations at Veterans Parkway. Further, IDOT may require geometric improvements to the eastbound approach (west leg) including extension of the existing left turn lane and/or constructing a right turn lane to help reduce the risk of future queues backing up into Veterans Parkway. Design Speeds of 40 MPH on General Electric Road and 30 MPH on Keaton Place/Auto Row Drive are recommended.

Hershey Road and Clearwater Avenue: Clearwater Avenue is connected to Veterans Parkway and significant commercial activity to the west and Airport Road and a local high school to the east. There are residential neighborhoods and apartment complexes that utilize Clearwater Avenue to gain access to the arterials of Hershey Road and Veterans Parkway. Capacity and progression analyses support the installation of left turn lanes on all approaches. Proposed left turn lane lengths established to provide adequate storage distance for the left turning vehicles and to ensure access to the left turn lanes beyond the through queues. IDOT policy left turn lane lengths of 115 feet for eastbound (135 ft. taper to avoid the Ridgeport Avenue intersection) and westbound (150 ft. taper) approaches are recommended. IDOT policy left turn lane lengths of 115 ft. for northbound (205 ft. taper) and southbound (205 ft. taper) approaches are also recommended. Additionally, widening for larger corner radii to accommodate a B40 (school/city bus) design vehicle is recommended. On-street parking should be prohibited on all approaches within the proposed left turn lanes and tapers, unless widening for parking lanes can be included with the project. Design speeds of 40 MPH on Hershey Road and 30 MPH on Clearwater Avenue are recommended. Traffic control signals are warranted under Warrant 3, Peak Hour during the construction year of 2014 and are recommended at the time of construction. Proposed connection of the new traffic signals to the existing IDOT controlled traffic signal controller at Hershey Road and IL 9 (Empire Street) and Arrowhead Drive to the south via microwave radio systems is also recommended.

Hershey Road and Arrowhead Drive: Arrowhead Drive mainly serves as a local street for residential neighborhoods and apartment complexes to access Hershey Road. Additionally, the Public Park and grade school in the northwest quadrant of the intersection highlights the need to accommodate pedestrians at this location. Capacity and progression analyses support the installation of left turn lanes on all approaches. Proposed left turn lane lengths were determined to provide adequate storage distance for the left turning vehicles and to ensure access to the turn lanes beyond the anticipated adjacent through queues. IDOT policy left turn lane lengths of 115 feet for eastbound (13:1, or 71.5 ft. taper to avoid Sandburg Drive),

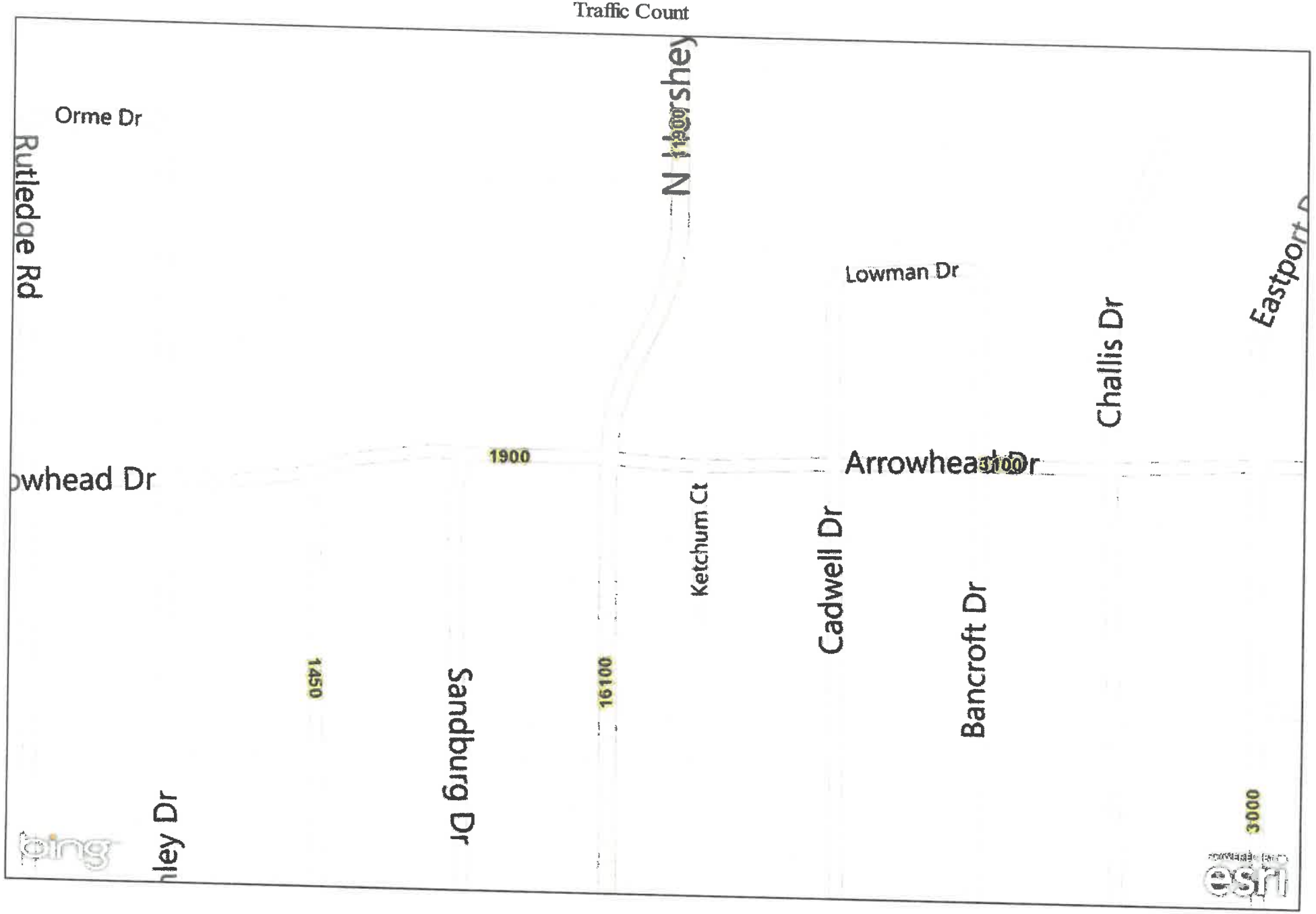
northbound (205 ft. taper) and southbound (205 ft. taper) approaches are recommended. A left turn lane of 80 ft. (50 ft. taper) for the westbound approach is recommended in order to avoid the Arrowhead Drive and Ketchum Court intersection. Design variances for the eastbound, westbound and southbound taper lengths will be needed. Additionally, widening for larger corner radii to accommodate a B40 (school/city bus) design vehicle is recommended. On street parking on the east and west approaches can remain on the north side of Arrowhead Drive by shifting the proposed three lane section to the south. Parking on the south side of Arrowhead Drive will therefore need to be eliminated within the left turn lane and taper areas. All on street parking on Hershey Road should be eliminated within the left turn lane and taper areas. Design speeds of 40 MPH on Hershey Road and 30 MPH of Arrowhead Drive are recommended. Traffic control signals are warranted under Warrant 3, Peak Hour during the construction year of 2014 and are recommended at the time of construction. Proposed connection of the new traffic signals to the existing IDOT controlled traffic signal controller at Hershey Road and IL 9 (Empire Street) to the south and Clearwater Avenue to the north via microwave radio systems is recommended.

TABLE OF CONTENTS

APPENDIX A
TRAFFIC DATA

Illinois Department of Transportation

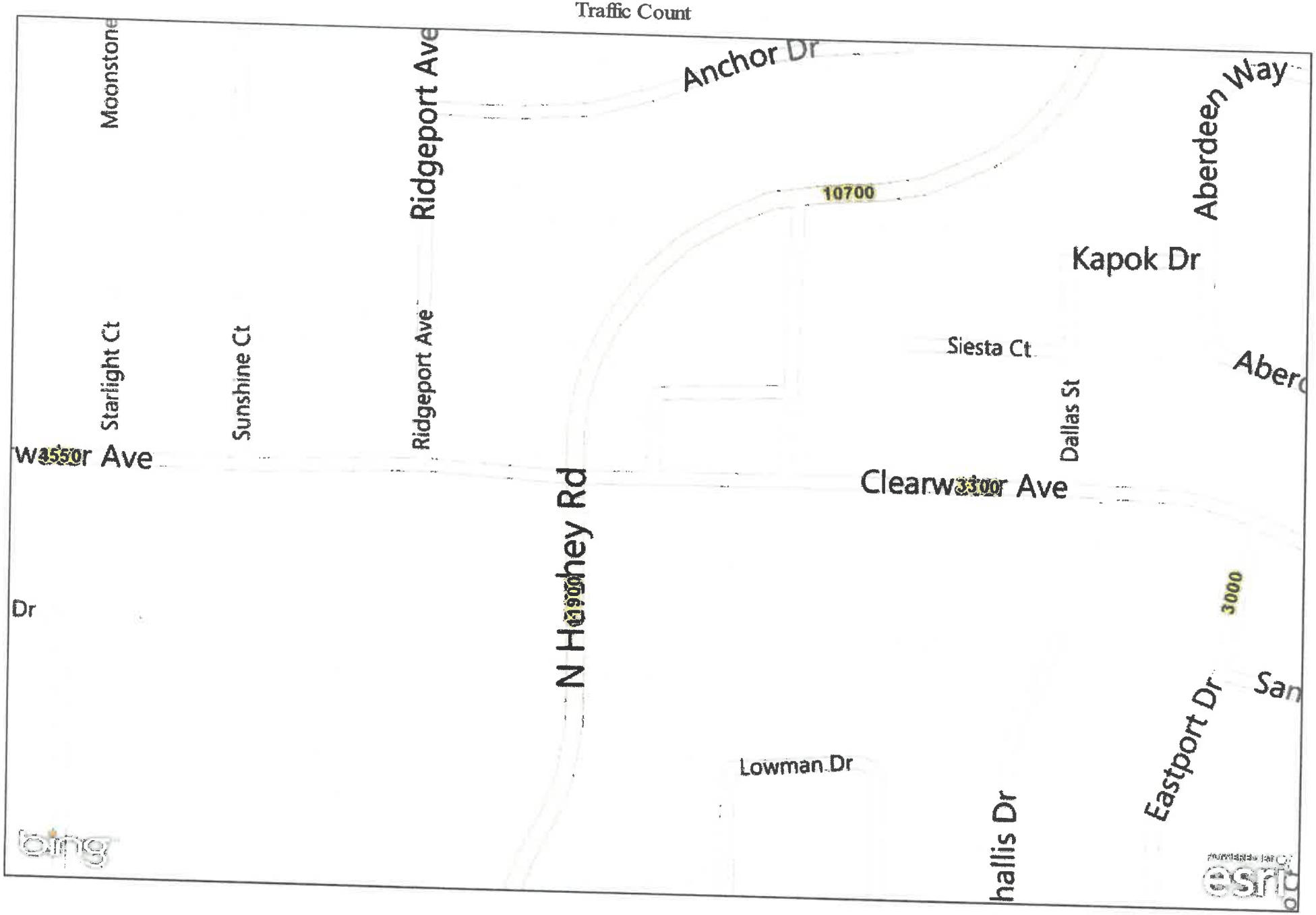
Traffic Count



Created by Illinois DOT, 12/17/113

Illinois Department of Transportation

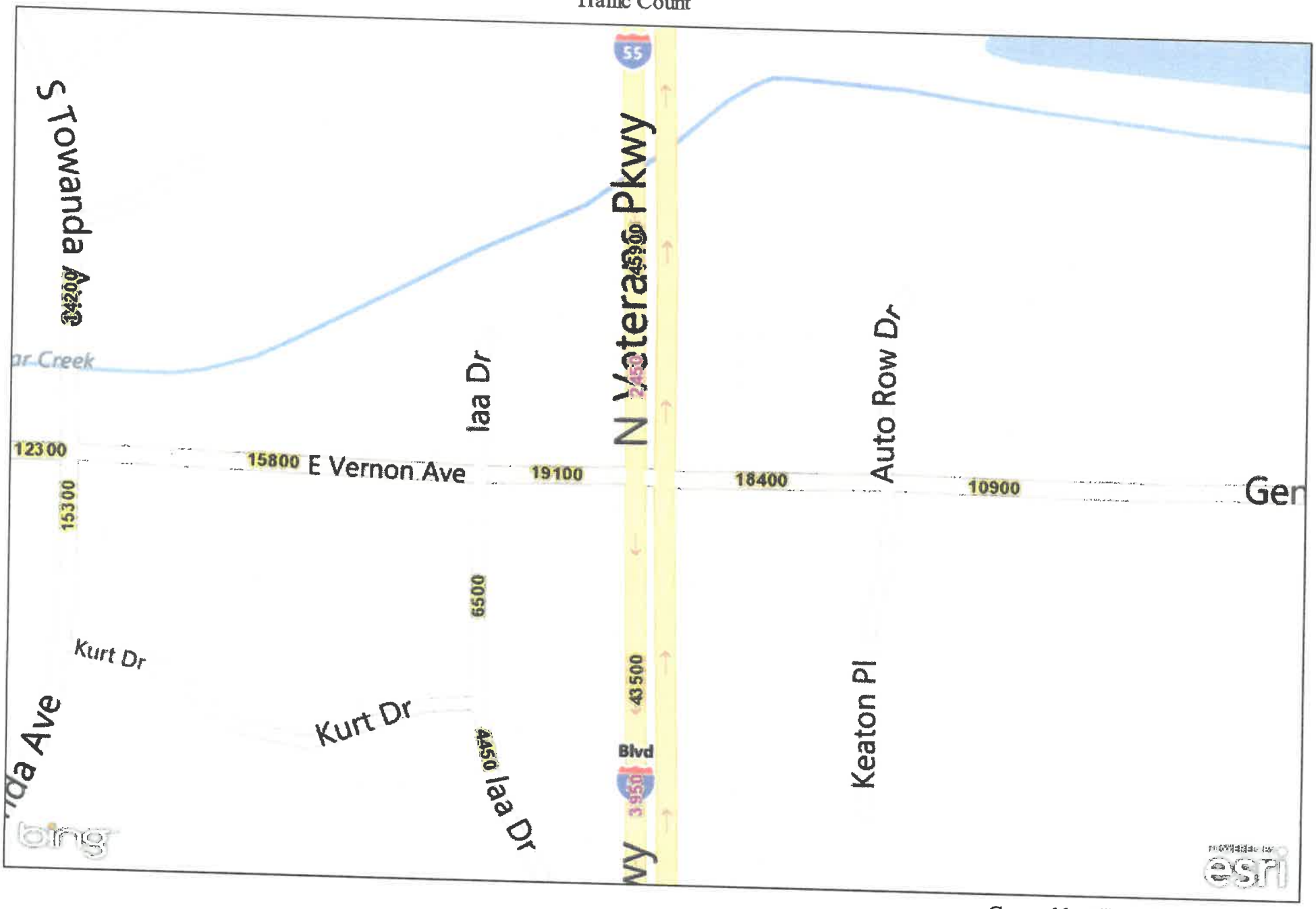
Traffic Count



Created by Illinois DOT, 12/17/113

Illinois Department of Transportation

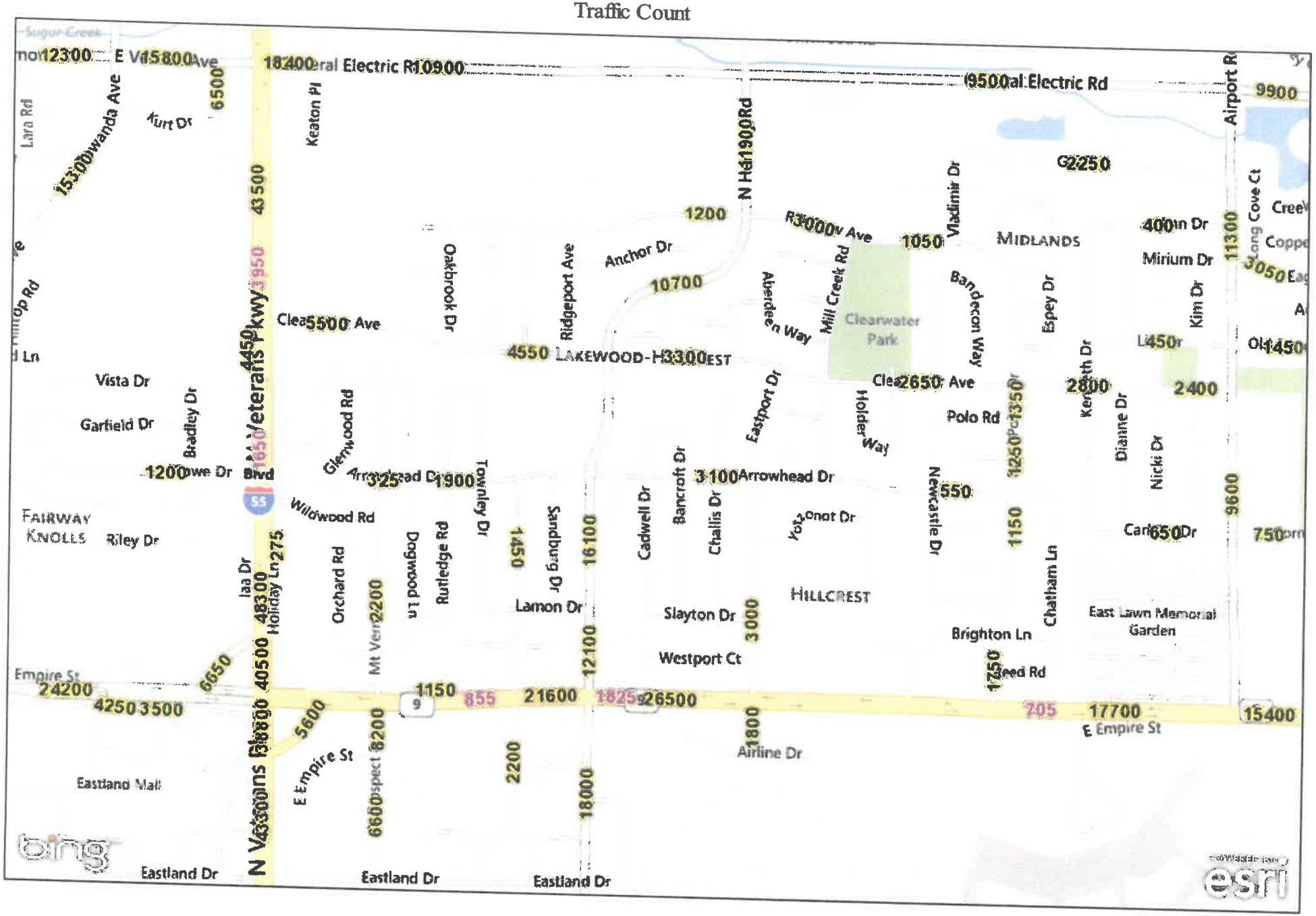
Traffic Count



Created by Illinois DOT, 12/17/113

Illinois Department of Transportation

Traffic Count



Created by Illinois DOT, 12/17/113

FINAL VOLUMES

GENERAL ELECTRIC ROAD & KEATON PLACE, BLOOMINGTON, IL

LOCATION		
	Eastbound	(EB) GENERAL ELECT. RD.
	Westbound	(WB) GENERAL ELECT. RD.
	Northbound	(NB) KEATON PLACE
	Southbound	(SB) AUTO ROW DRIVE

AM Peak	2014	%	2024	%	2034
EBL	34	2.0%	41	2.0%	51
EBT	432	2.0%	527	2.0%	642
EBR	32	2.0%	39	2.0%	48
WBL	34	2.0%	41	2.0%	51
WBT	566	2.0%	690	2.0%	841
WBR	12	2.0%	15	2.0%	18
NBL	35	1.0%	39	1.0%	43
NBT	1	1.0%	1	1.0%	1
NBR	8	1.0%	9	1.0%	10
SBL	7	1.0%	8	1.0%	9
SBT	1	1.0%	1	1.0%	1
SBR	7	1.0%	8	1.0%	9
SB A	**62**		**74**		**88**
NB B	**111**		**130**		**153**
EB C	**1106**		**1343**		**1632**
WB D	**1059**		**1289**		**1570**

Year 2014

8th Max Hourly Traffic

EB C	**274**
WB D	**337**
NB B	**24**
SB A	**8**

PM Peak	2014	%	2024	%	2034
EBL	45	2.0%	55	2.0%	67
EBT	700	2.0%	853	2.0%	1040
EBR	76	2.0%	93	2.0%	113
WBL	40	2.0%	49	2.0%	59
WBT	492	2.0%	600	2.0%	731
WBR	15	2.0%	18	2.0%	22
NBL	120	1.0%	133	1.0%	146
NBT	1	1.0%	1	1.0%	1
NBR	52	1.0%	57	1.0%	63
SBL	13	1.0%	14	1.0%	16
SBT	2	1.0%	2	1.0%	2
SBR	48	1.0%	53	1.0%	59
SB A	**124**		**144**		**167**
NB B	**291**		**335**		**386**
EB C	**1481**		**1786**		**2156**
WB D	**1312**		**1592**		**1932**

Year 2014

8th Max Hourly Traffic

EB C	**452**
WB D	**301**
NB B	**95**
SB A	**35**

HERSHEY ROAD & CLEARWATER AVENUE, BLOOMINGTON, IL

LOCATION		
	Eastbound	(EB) CLEARWATER AVE.
	Westbound	(WB) CLEARWATER AVE.
	Northbound	(NB) HERSHEY ROAD
	Southbound	(SB) HERSHEY ROAD

AM Peak	2014	%	2024	%	2034
EBL	34	0.25%	35	0.25%	36
EBT	28	0.25%	29	0.25%	29
EBR	99	0.25%	102	0.25%	104
WBL	98	0.25%	100	0.25%	103
WBT	129	0.25%	132	0.25%	136
WBR	27	0.25%	28	0.25%	28
NBL	58	2.0%	71	2.0%	86
NBT	232	2.0%	283	2.0%	345
NBR	21	2.0%	26	2.0%	31
SBL	21	2.0%	26	2.0%	31
SBT	383	2.0%	467	2.0%	569
SBR	19	2.0%	23	2.0%	28
SB A	**716**		**861**		**1037**
NB B	**891**		**1048**		**1238**
EB C	**367**		**391**		**419**
WB D	**324**		**340**		**359**

Year 2014

8th Max Hourly Traffic

EB C	**89**
WB D	**140**
NB B	**171**
SB A	**233**

PM Peak	2014	%	2024	%	2034
EBL	37	0.25%	38	0.25%	39
EBT	94	0.25%	96	0.25%	99
EBR	96	0.25%	98	0.25%	101
WBL	58	0.25%	59	0.25%	61
WBT	92	0.25%	94	0.25%	97
WBR	34	0.25%	35	0.25%	36
NBL	136	2.0%	166	2.0%	202
NBT	477	2.0%	581	2.0%	709
NBR	73	2.0%	89	2.0%	108
SBL	33	2.0%	40	2.0%	49
SBT	397	2.0%	484	2.0%	590
SBR	53	2.0%	65	2.0%	79
SB A	**1031**		**1243**		**1501**
NB B	**1237**		**1478**		**1771**
EB C	**508**		**557**		**616**
WB D	**384**		**414**		**450**

Year 2014

8th Max Hourly Traffic

EB C	**125**
WB D	**101**
NB B	**377**
SB A	**266**

HERSHEY ROAD & ARROWHEAD DRIVE, BLOOMINGTON, IL

LOCATION		
	Eastbound	(EB) ARROWHEAD DR.
	Westbound	(WB) ARROWHEAD DR.
	Northbound	(NB) HERSHEY ROAD
	Southbound	(SB) HERSHEY ROAD

AM Peak	2014	%	2024	%	2034
EBL	38	0.25%	39	0.25%	40
EBT	11	0.25%	11	0.25%	12
EBR	38	0.25%	39	0.25%	40
WBL	127	0.25%	130	0.25%	134
WBT	18	0.25%	18	0.25%	19
WBR	46	0.25%	47	0.25%	48
NBL	20	2.0%	24	2.0%	30
NBT	172	2.0%	210	2.0%	256
NBR	24	2.0%	29	2.0%	36
SBL	20	2.0%	24	2.0%	30
SBT	508	2.0%	619	2.0%	755
SBR	29	2.0%	35	2.0%	43
SB A	**813**		**975**		**1172**
NB B	**889**		**1052**		**1249**
EB C	**154**		**167**		**183**
WB D	**246**		**261**		**278**

Year 2014

8th Max Hourly Traffic

EB C	**48**
WB D	**105**
NB B	**119**
SB A	**306**

PM Peak	2014	%	2024	%	2034
EBL	80	0.25%	82	0.25%	84
EBT	29	0.25%	30	0.25%	30
EBR	27	0.25%	28	0.25%	28
WBL	47	0.25%	48	0.25%	49
WBT	13	0.25%	13	0.25%	14
WBR	48	0.25%	49	0.25%	50
NBL	21	2.0%	26	2.0%	31
NBT	683	2.0%	833	2.0%	1015
NBR	71	2.0%	87	2.0%	106
SBL	50	2.0%	61	2.0%	74
SBT	436	2.0%	531	2.0%	648
SBR	54	2.0%	66	2.0%	80
SB A	**1351**		**1622**		**1952**
NB B	**1285**		**1552**		**1877**
EB C	**224**		**244**		**268**
WB D	**258**		**288**		**324**

Year 2014

8th Max Hourly Traffic

EB C	**75**
WB D	**59**
NB B	**426**
SB A	**297**

HERSHEY ROAD & ARROWHEAD DRIVE (SCHOOL PEAKS), BLOOMINGTON, IL

LOCATION		
	Eastbound	(EB) ARROWHEAD DR.
	Westbound	(WB) ARROWHEAD DR.
	Northbound	(NB) HERSHEY ROAD
	Southbound	(SB) HERSHEY ROAD

AM Peak	2014	%	2024	%	2034
EBL	61	0.25%	63	0.25%	64
EBT	20	0.25%	21	0.25%	21
EBR	42	0.25%	43	0.25%	44
WBL	59	0.25%	60	0.25%	62
WBT	20	0.25%	21	0.25%	21
WBR	25	0.25%	26	0.25%	26
NBL	26	2.0%	32	2.0%	39
NBT	206	2.0%	251	2.0%	306
NBR	15	2.0%	18	2.0%	22
SBL	25	2.0%	30	2.0%	37
SBT	342	2.0%	417	2.0%	508
SBR	76	2.0%	93	2.0%	113
SB A	**735**		**879**		**1055**
NB B	**690**		**822**		**981**
EB C	**245**		**271**		**302**
WB D	**164**		**176**		**190**

Year 2014

8th Max Hourly Traffic

EB C	**68**
WB D	**57**
NB B	**136**
SB A	**244**

PM Peak	2014	%	2024	%	2034
EBL	80	0.25%	82	0.25%	84
EBT	29	0.25%	30	0.25%	30
EBR	27	0.25%	28	0.25%	28
WBL	27	0.25%	28	0.25%	28
WBT	10	0.25%	10	0.25%	11
WBR	22	0.25%	23	0.25%	23
NBL	30	2.0%	37	2.0%	45
NBT	331	2.0%	403	2.0%	492
NBR	48	2.0%	59	2.0%	71
SBL	39	2.0%	48	2.0%	58
SBT	330	2.0%	402	2.0%	490
SBR	51	2.0%	62	2.0%	76
SB A	**853**		**1020**		**1223**
NB B	**793**		**956**		**1155**
EB C	**227**		**248**		**274**
WB D	**175**		**196**		**222**

Year 2014

8th Max Hourly Traffic

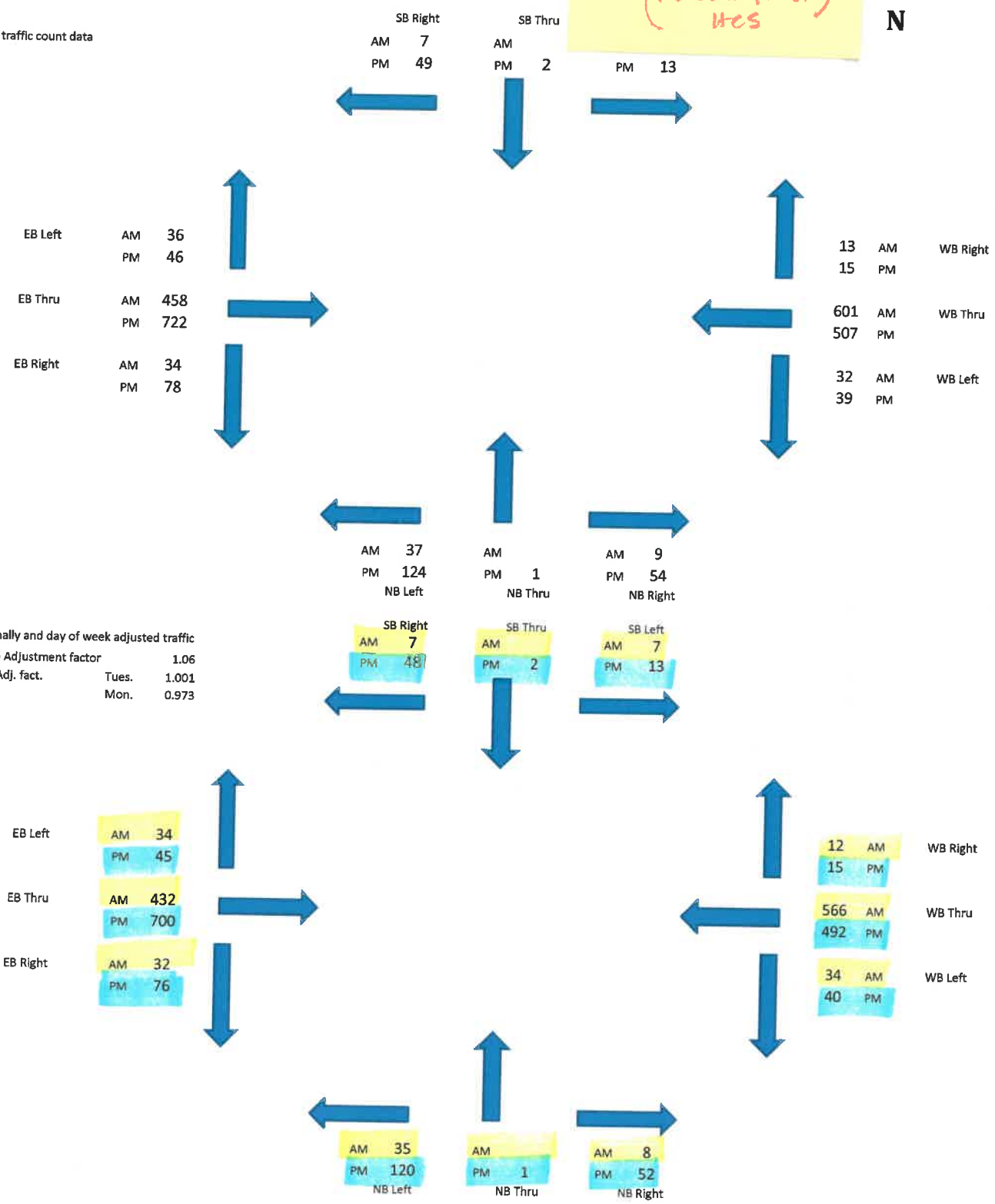
EB C	**75**
WB D	**32**
NB B	**225**
SB A	**231**

VOLUME CALCULATION WORKSHEETS

CHANGES:
WBL - AM
NBT - PM
(NO CHANGE ON HCS)

Intersection: G.E. Road at Keaton Place
Count Date: 8/5-6/2013
AM Peak Hour: 7:15-8:15am PHF 0.77 % Trucks
PM Peak Hour: 4:30-5:30pm PHF 0.93

Raw traffic count data



Seasonally and day of week adjusted traffic
Month Adjustment factor 1.06
DOW Adj. fact. Tues. 1.001
Mon. 0.973

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Keaton Place/Auto Row Dr
E/W Street: G.E.Road
City / State: Bloomington, IL
Job Number: 7133

Start Date: 8/5/2013
Start Time: 6:00 AM
End Date: 8/6/2013
End Time: 6:00 PM

	Keaton Place/Auto Row Dr Southbound				G.E.Road Westbound				Keaton Place/Auto Row Dr Northbound				G.E.Road Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
6:00 AM	0	0	0	0	0	34	1	35	1	0	2	3	1	33	3	37	75
6:15 AM	1	0	0	1	0	64	2	66	1	0	1	2	0	45	0	45	114
6:30 AM	0	0	1	1	0	78	2	80	1	0	2	3	1	44	2	47	131
6:45 AM	0	0	0	0	1	114	3	118	4	1	3	8	1	86	6	93	219
Hour Total	1	0	1	2	1	290	8	299	7	1	8	16	3	208	11	222	539
7:00 AM	0	0	2	2	1	103	2	106	3	0	5	8	4	78	5	87	203
7:15 AM	0	0	0	0	2	132	4	138	2	0	5	7	3	84	5	92	237
7:30 AM	1	0	0	1	2	154	3	159	2	0	4	6	5	115	7	127	293
7:45 AM	1	0	2	3	4	193	1	198	2	0	5	7	5	156	11	172	380
Hour Total	2	0	4	6	9	582	10	601	9	0	19	28	17	433	28	478	1113
8:00 AM	1	0	1	2	2	122	3	127	0	0	11	11	5	101	11	117	257
8:15 AM	3	0	4	7	5	128	7	140	5	0	7	12	6	86	4	96	255
8:30 AM	2	0	0	2	1	108	9	118	1	0	14	15	18	101	10	129	264
8:45 AM	1	0	2	3	2	86	7	95	3	0	10	13	5	106	5	116	227
Hour Total	7	0	7	14	10	444	26	480	9	0	42	51	34	394	30	458	1003
9:00 AM	2	0	1	3	2	64	9	75	4	0	7	11	7	47	5	59	148
9:15 AM	3	0	0	3	1	77	4	82	7	0	16	23	10	60	6	76	184
9:30 AM	3	0	2	5	0	65	6	71	8	0	9	17	11	79	5	95	188
9:45 AM	3	0	3	6	5	79	6	90	5	0	9	14	9	59	12	80	190
Hour Total	11	0	6	17	8	285	25	318	24	0	41	65	37	245	28	310	710
10:00 PM	9	2	2	13	0	73	4	77	5	0	17	22	9	57	11	77	189
10:15 PM	4	0	1	5	2	67	7	76	4	0	12	16	13	63	12	88	185
10:30 PM	7	1	1	9	3	69	6	78	9	0	23	32	12	68	8	88	207
10:45 PM	3	0	3	6	1	98	12	111	10	1	21	32	18	78	12	108	257
Hour Total	23	3	7	33	6	307	29	342	28	1	73	102	52	266	43	361	838
11:00 AM	5	2	2	9	6	118	15	139	5	0	19	24	19	91	11	121	293
11:15 AM	8	0	1	9	2	107	9	118	6	1	20	27	30	80	11	121	275
11:30 AM	7	0	4	11	3	76	15	94	10	0	19	29	14	108	11	133	267
11:45 AM	7	0	4	11	3	76	15	94	10	0	19	29	14	108	11	133	267
Hour Total	27	2	11	40	14	377	54	445	31	1	77	109	77	387	44	508	1102
12:00 PM	29	2	1	32	1	96	20	119	18	2	22	42	19	122	15	156	349
12:15 PM	9	2	1	12	0	105	13	118	9	0	33	42	23	140	14	177	349
12:30 PM	12	1	0	13	1	107	5	113	11	1	31	43	14	94	22	130	299
12:45 PM	10	0	1	11	1	102	6	109	9	1	31	41	16	87	26	129	290
Hour Total	60	5	3	68	3	412	44	459	47	4	117	168	72	443	77	592	1287
1:00 PM	11	0	0	11	2	76	12	90	16	2	35	53	16	81	9	106	260
1:15 PM	6	1	0	7	4	77	4	85	12	2	26	40	22	95	14	131	263
1:30 PM	4	0	3	7	2	79	9	90	12	0	30	42	6	91	8	105	244
1:45 PM	6	0	1	7	2	68	9	79	6	1	26	33	15	77	10	102	221
Hour Total	27	1	4	32	10	300	34	344	46	5	117	168	59	344	41	444	988
2:00 PM	6	0	0	6	4	75	11	90	11	1	20	32	10	89	11	110	238
2:15 PM	9	0	2	11	1	83	8	92	8	0	32	40	13	84	12	109	252
2:30 PM	11	0	0	11	0	77	6	83	14	1	22	37	12	73	11	96	227
2:45 PM	5	0	0	5	2	77	7	86	5	0	24	29	8	89	13	110	230
Hour Total	31	0	2	33	7	312	32	351	38	2	98	138	43	335	47	425	947

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Keaton Place/Auto Row Dr
E/W Street: G.E.Road
City / State: Bloomington, IL
Job Number: 7133

Start Date: 8/5/2013
Start Time: 6:00 AM
End Date: 8/6/2013
End Time: 6:00 PM

	Keaton Place/Auto Row Dr Southbound				G.E.Road Westbound				Keaton Place/Auto Row Dr Northbound				G.E.Road Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
3:00 PM	8	2	0	10	3	88	8	99	8	0	28	36	10	85	11	106	251
3:15 PM	17	0	1	18	5	86	16	107	11	0	21	32	17	95	16	128	285
3:30 PM	9	0	1	10	4	111	8	123	12	4	23	39	9	113	14	136	308
3:45 PM	14	0	2	16	10	63	12	85	12	3	13	28	15	97	9	121	250
Hour Total	48	2	4	54	22	348	44	414	43	7	85	135	51	390	50	491	1094
4:00 PM	15	0	0	15	0	54	7	61	10	0	13	23	12	60	4	76	175
4:15 PM	10	0	3	13	4	111	5	120	17	1	18	36	14	172	6	192	361
4:30 PM	8	0	1	9	4	129	13	146	13	0	22	35	11	185	8	204	394
4:45 PM	9	1	2	12	4	133	7	144	13	0	28	41	24	209	6	239	436
Hour Total	42	1	6	49	12	427	32	471	53	1	81	135	61	626	24	711	1366
5:00 PM	17	0	6	23	3	134	9	146	11	0	33	44	17	156	15	188	401
5:15 PM	14	0	4	18	3	107	10	120	14	0	39	53	17	172	17	206	397
5:30 PM	9	1	1	11	0	115	5	120	14	0	24	38	20	169	8	197	366
5:45 PM	11	0	0	11	1	85	16	102	11	0	27	38	16	121	5	142	293
Hour Total	51	1	11	63	7	441	40	488	50	0	123	173	70	618	45	733	1457

Pedestrians
Crossing north approach
Crossing east approach 2
Crossing south approach 1
Crossing west approach 2

Total Traffic 8961
Total Trucks
% Trucks 0.0

AM Peak

7:15 AM				0		132		132				0				0	132
7:30 AM		0	0	0	2	154		156	2	0		2		115		115	273
7:45 AM	1	0	2	3	4	193		197	2	0	5	7	5	156	11	172	379
8:00 AM	1	0	1	2	2	122		124	0	0	11	11	5	101	11	117	254
8:15 AM	3	0	4	7	5		7	12	5	0	7	12	6	86	4	96	127
8:30 AM	2			2			9	9			14	14	18		10	28	53
8:45 AM				0			7	7				0				0	7
9:00 AM				0			9	9				0				0	9
Hour Total	7	0	7	14	13	601	32	646	9	0	37	46	34	458	36	528	1234

MD Peak

12:00 PM	29	2	1	32	1	98	20	119	18	2	22	42	19	122	15	156	349
12:15 PM	9	2	1	12	0	105	13	118	9	0	33	42	23	140	14	177	349
12:30 PM	12	1	0	13	1	107	5	113	11	1	31	43	14	94	22	130	299
12:45 PM	10	0	1	11	1	102	6	109	9	1	31	41	16	87	26	129	290
Hour Total	60	5	3	68	3	412	44	459	47	4	117	168	72	443	77	592	1287

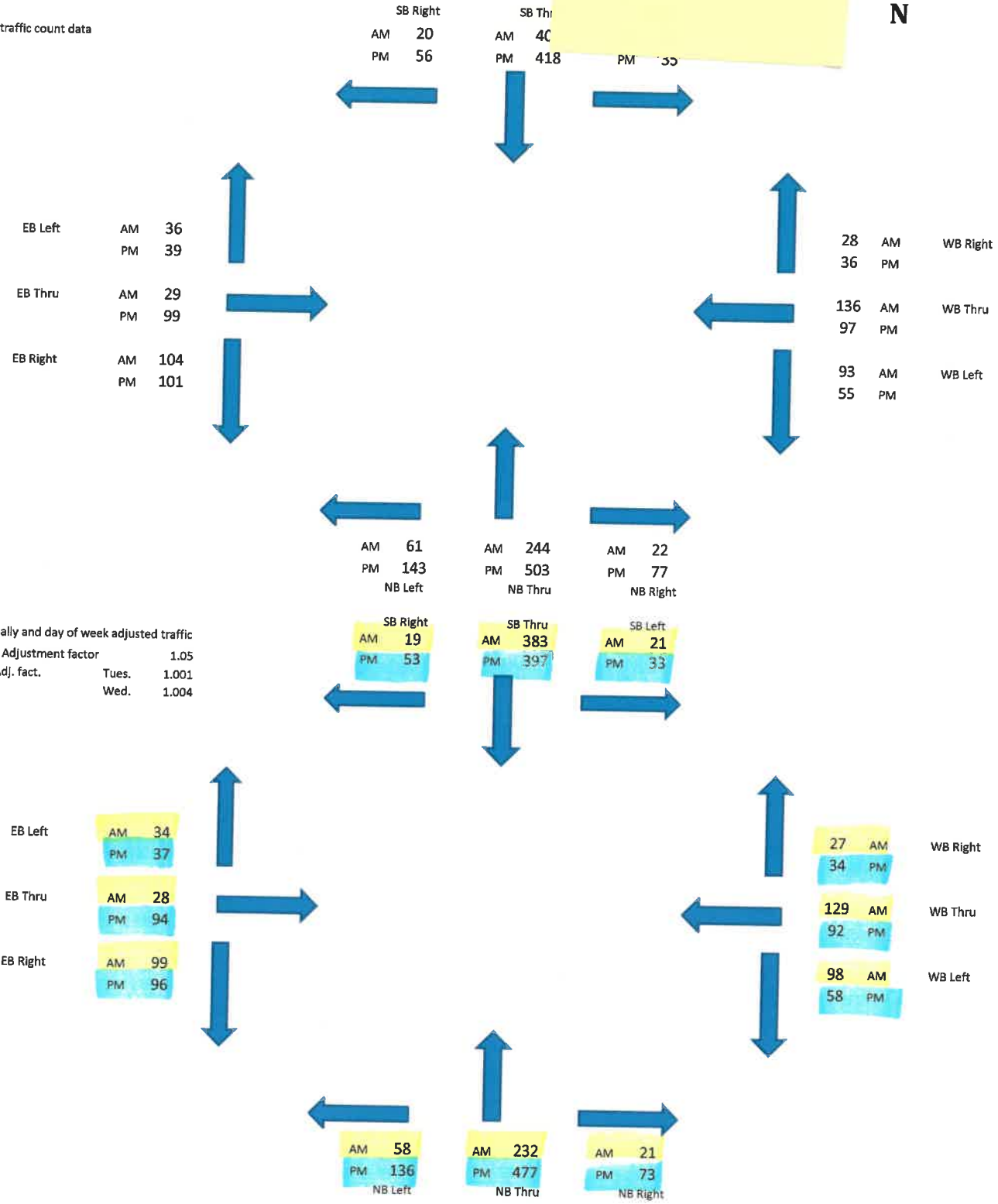
PM Peak

4:15 PM				0	4	111		115	17	1		18				0	133
4:30 PM				0	4	129	13	146	13	0		13		185	8	193	352
4:45 PM	9	1	2	12	4	133	7	144	13	0	28	41	24	209	6	239	436
5:00 AM	17	0	6	23	3	134	9	146	11	0	33	44	17	156	15	188	401
5:15 AM	14	0	4	18			10	10		0	39	39	17	172	17	206	273
4:30 AM	9	1	1	11				0		0	24	24	20			20	55
Hour Total	49	2	13	64	15	507	39	561	54	1	124	179	78	722	46	846	1650

NO CHANGE

Intersection: Hershey Road at Clearwater Avenue
Count Date: 9/10-12/2013
AM Peak Hour: 7:15-8:15am PHF 0.76 % Trucks
PM Peak Hour: 4:30-5:30pm PHF 0.94

Raw traffic count data



Seasonally and day of week adjusted traffic

Month Adjustment factor 1.05
DOW Adj. fact. Tues. 1.001
Wed. 1.004

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Hershey Road
E/W Street: Clearwater Avenue
City / State: Bloomington, IL
Job Number: 7133

Start Date: 9/10/2013
Start Time: 6:00 AM
End Date: 9/12/2013
End Time: 6:00 PM

	Hershey Road Southbound				Clearwater Avenue Westbound				Hershey Road Northbound				Clearwater Avenue Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
6:00 AM	0	16	1	17	0	7	0	7	1	18	4	23	3	2	0	5	52
6:15 AM	1	29	1	31	2	5	7	14	2	27	6	35	9	1	4	14	94
6:30 AM	2	44	1	47	5	12	9	26	2	29	7	38	8	1	1	10	121
6:45 AM	4	60	2	66	5	23	15	43	1	41	11	53	6	4	2	12	174
Hour Total	7	149	5	161	12	47	31	90	6	115	28	149	26	8	7	41	441
7:00 AM	3	73	3	79	4	14	16	34	5	31	7	43	13	8	7	28	184
7:15 AM	5	89	2	96	6	39	15	60	2	45	21	68	18	5	5	28	252
7:30 AM	7	91	5	103	10	38	29	77	3	68	17	88	16	7	10	33	301
7:45 AM	5	143	5	153	7	39	37	83	5	66	18	89	40	8	9	57	382
Hour Total	20	396	15	431	27	130	97	254	15	210	63	288	87	28	31	146	1119
8:00 AM	3	80	4	87	5	20	12	37	5	57	5	67	19	3	9	31	222
8:15 AM	5	77	7	89	4	16	12	32	9	53	8	70	19	11	8	38	229
8:30 AM	6	87	6	99	5	20	13	38	2	52	12	66	26	6	2	34	237
8:45 AM	6	79	7	92	10	16	14	40	5	75	22	102	31	9	3	43	277
Hour Total	20	323	24	367	24	72	51	147	21	237	47	305	95	29	22	146	965
9:00 AM	3	75	1	79	4	21	7	32	2	44	5	51	11	7	6	24	186
9:15 AM	3	53	1	57	4	8	3	15	4	50	16	70	9	5	1	15	157
9:30 AM	6	49	0	55	2	5	5	12	3	51	9	63	10	6	3	19	149
9:45 AM	4	53	1	58	3	9	6	18	3	62	10	75	9	4	3	16	167
Hour Total	16	230	3	249	13	43	21	77	12	207	40	259	39	22	13	74	659
10:00 PM	4	43	2	49	1	7	10	18	5	51	17	73	8	2	5	15	155
10:15 PM	7	44	3	54	1	11	7	19	6	54	8	68	12	4	7	23	164
10:30 PM	4	50	0	54	1	12	6	19	2	60	8	70	11	3	2	16	159
10:45 PM	5	58	2	65	2	5	2	9	5	62	16	83	11	7	2	20	177
Hour Total	20	195	7	222	5	35	25	65	18	227	49	294	42	16	16	74	655
11:00 AM	5	78	5	88	4	4	3	11	4	68	13	85	6	8	6	20	204
11:15 AM	9	89	6	104	3	13	1	17	9	71	15	95	19	5	4	28	244
11:30 AM	7	62	7	76	7	13	4	24	5	74	15	94	17	5	5	27	221
11:45 AM	13	93	2	108	4	11	4	19	10	81	21	112	18	7	6	31	270
Hour Total	34	322	20	376	18	41	12	71	28	294	64	386	60	25	21	106	939
12:00 PM	14	78	7	99	8	10	6	24	4	64	15	83	21	14	12	47	253
12:15 PM	8	103	5	116	8	16	7	31	6	74	19	99	22	12	9	43	289
12:30 PM	7	73	5	85	6	11	5	22	3	83	17	103	19	6	2	27	237
12:45 PM	10	69	5	84	2	17	10	29	3	86	9	98	22	10	13	45	256
Hour Total	39	323	22	384	24	54	28	106	16	307	60	383	84	42	36	162	1035
1:00 PM	7	78	6	91	5	13	4	22	6	89	16	111	20	8	13	41	265
1:15 PM	5	75	2	82	3	9	6	18	6	81	17	104	17	7	5	29	233
1:30 PM	7	59	2	68	3	12	4	19	7	72	18	97	12	5	4	21	205
1:45 PM	8	75	2	85	5	9	3	17	6	65	19	90	16	14	3	33	225
Hour Total	27	287	12	326	16	43	17	76	25	307	70	402	65	34	25	124	928

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Hershey Road
E/W Street: Clearwater Avenue
City / State: Bloomington, IL
Job Number: 7133

Start Date: 9/10/2013
Start Time: 6:00 AM
End Date: 9/12/2013
End Time: 6:00 PM

	Hershey Road Southbound				Clearwater Avenue Westbound				Hershey Road Northbound				Clearwater Avenue Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
2:00 PM	7	66	4	77	5	11	6	22	7	47	12	66	13	10	6	29	194
2:15 PM	7	71	1	79	1	12	8	21	3	59	7	69	21	7	8	36	205
2:30 PM	6	72	4	82	6	8	6	20	10	62	14	86	11	9	1	21	209
2:45 PM	5	82	8	95	4	9	9	22	4	65	13	82	17	11	5	33	232
Hour Total	25	291	17	333	16	40	29	85	24	233	46	303	62	37	20	119	840
3:00 PM	9	80	4	93	4	13	7	24	6	45	13	64	26	15	8	49	230
3:15 PM	10	76	1	87	2	12	4	18	8	76	30	114	17	15	8	40	259
3:30 PM	12	68	5	85	3	10	11	24	12	57	22	91	20	14	4	38	238
3:45 PM	13	93	4	110	5	16	11	32	10	79	28	117	21	20	6	47	306
Hour Total	44	317	14	375	14	51	33	98	36	257	93	386	84	64	26	174	1033
4:00 PM	7	83	3	93	5	11	6	22	17	103	21	141	22	24	4	50	306
4:15 PM	17	101	4	122	7	14	6	27	16	113	29	158	21	18	9	48	355
4:30 PM	18	125	11	154	10	23	16	49	20	118	31	169	29	26	13	68	440
4:45 PM	13	100	10	123	4	31	14	49	26	138	39	203	24	27	7	58	433
Hour Total	55	409	28	492	26	79	42	147	79	472	120	671	96	95	33	224	1534
5:00 PM	12	106	10	128	7	23	14	44	14	136	37	187	21	19	13	53	412
5:15 PM	13	87	4	104	15	20	11	46	17	111	36	164	27	27	6	60	374
5:30 PM	7	89	10	106	9	24	6	39	12	104	33	149	26	20	7	53	347
5:45 PM	6	88	8	102	7	34	14	55	15	111	25	151	25	20	17	62	370
Hour Total	38	370	32	440	38	101	45	184	58	462	131	651	99	86	43	228	1503

Pedestrians
Crossing north approach 1
Crossing east approach
Crossing south approach
Crossing west approach

Total Traffic 8569
Total Trucks
% Trucks 0.0

AM Peak

7:15 AM	5	89		94	6	39	15	60			21	21				0	175
7:30 AM	7	91		98	10	38	29	77	3	68	17	88		7	10	17	280
7:45 AM	5	143	5	153	7	39	37	83	5	66	18	89	40	8	9	57	382
8:00 AM	3	80	4	87	5	20	12	37	5	57	5	67	19	3	9	31	222
8:15 AM			7	7				0	9	53		62	19	11	8	38	107
8:30 AM			6	6				0				0	26			26	32
Hour Total	20	403	22	445	28	136	93	257	22	244	61	327	104	29	36	169	1198

MD Peak

11:45 PM	13	93		106	4			4	10		21	31				0	141
12:00 PM	14	78		92	8		6	14	4		15	19	21	14	12	47	172
12:15 PM	8	103	5	116	8	16	7	31	6	74	19	99	22	12	9	43	289
12:30 PM	7	73	5	85	6	11	5	22	3	83	17	103	19	6	2	27	237
12:45 PM			5	5		17	10	27		86		86	22	10	13	45	163
1:00 AM			6	6		13		13		89		89				0	108
Hour Total	42	347	21	410	26	57	28	111	23	332	72	427	84	42	36	162	1110

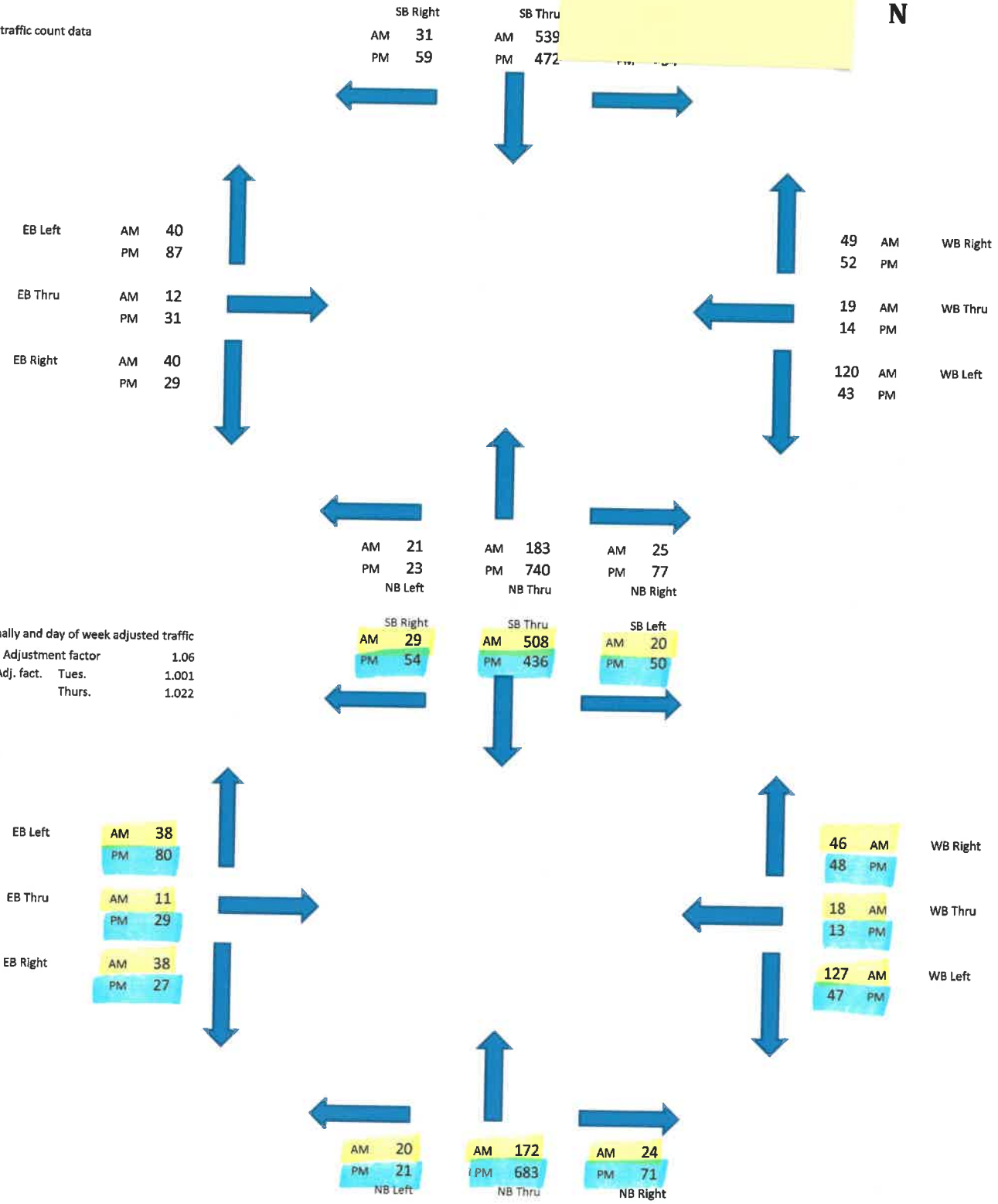
PM Peak

4:30 PM	18	125	11	154	10	23	16	49	20	118	31	169	29	26	13	68	440
4:45 PM	13	100	10	123	4	31	14	49	26	138	39	203	24	27	7	58	433
5:00 PM	12	106	10	128	7	23	14	44	14	136	37	187	21	19	13	53	412
5:15 AM	13	87	4	104	15	20	11	46	17	111	36	164	27	27	6	60	374
Hour Total	56	418	35	509	36	97	55	188	77	503	143	723	101	99	39	239	1659

NO CHANGE

Intersection: Hershey Road at Arrowhead Drive
Count Date: 10/1-3/2013
AM Peak Hour: 7:15-8:15am PHF 0.8 % Trucks
PM Peak Hour: 4:15-5:15pm PHF 0.91

Raw traffic count data



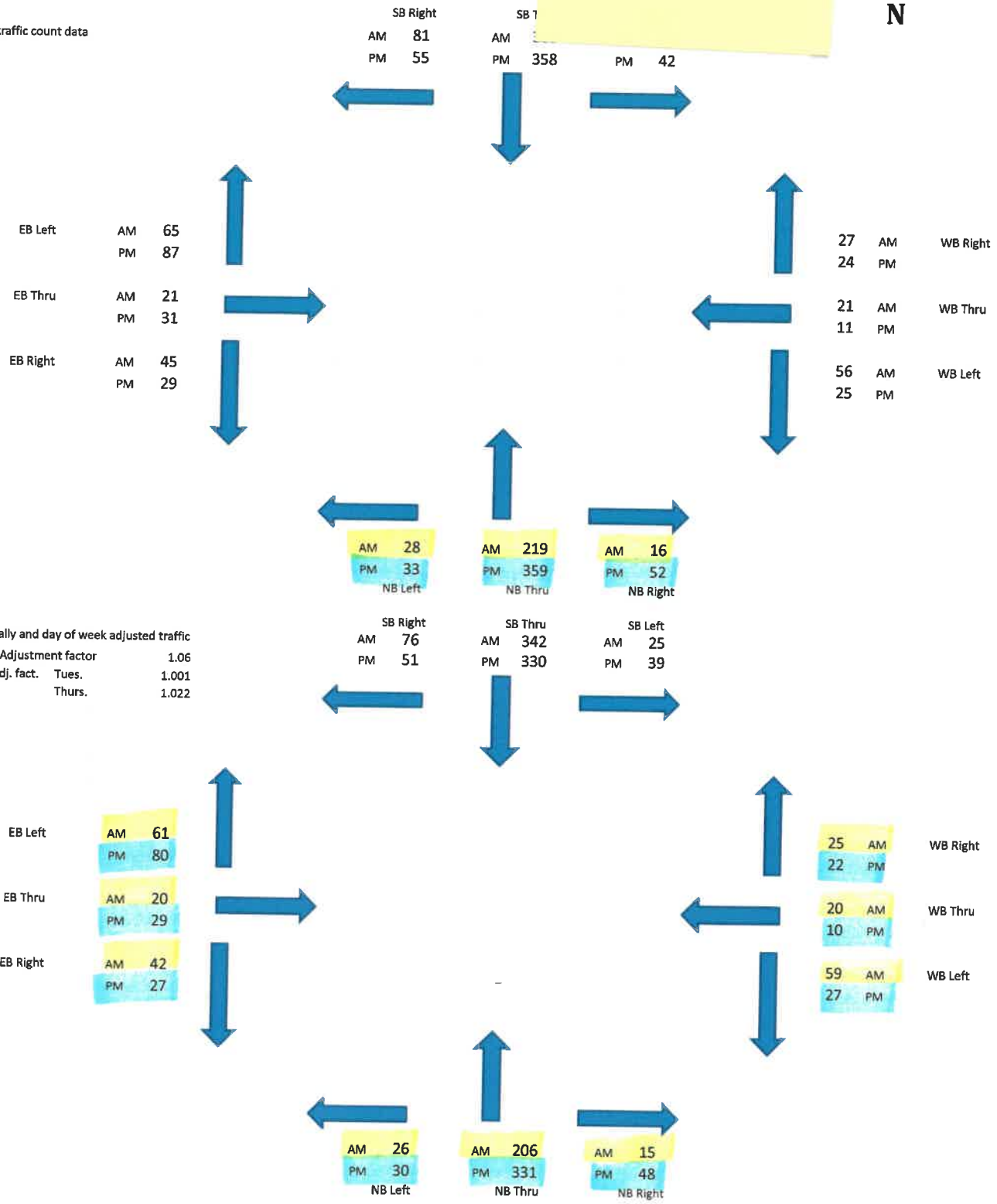
Seasonally and day of week adjusted traffic

Month Adjustment factor		1.06
DOW Adj. fact.	Tues.	1.001
	Thurs.	1.022

School Peaks

Intersection: Hershey Road at Arrowhead Drive (AM/PM School Volumes)
Count Date: 10/1-3/2013
AM Peak Hour: 7:15-8:15am PHF 0.8 % Trucks
PM Peak Hour: 4:15-5:15pm PHF 0.91

Raw traffic count data



Seasonally and day of week adjusted traffic

Month Adjustment factor		1.06
DOW Adj. fact.	Tues.	1.001
	Thurs.	1.022

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Hershey Road
E/W Street: Arrowhead Drive
City / State: Bloomington, IL
Job Number: 7133

Start Date: 10/1/2013
Start Time: 6:00 AM
End Date: 10/3/2013
End Time: 6:00 PM

	Hershey Road Southbound				Arrowhead Drive Westbound				Hershey Road Northbound				Arrowhead Drive Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
6:00 AM	5	51	1	57	5	2	4	11	3	27	2	32	8	0	4	12	112
6:15 AM	3	38	3	44	9	1	11	21	3	12	0	15	3	1	6	10	90
6:30 AM	1	59	2	62	11	1	22	34	1	25	4	30	7	0	5	12	138
6:45 AM	4	78	2	84	15	2	19	36	2	26	5	33	7	1	5	13	166
Hour Total	13	226	8	247	40	6	56	102	9	90	11	110	25	2	20	47	506
7:00 AM	5	79	1	85	12	0	20	32	1	34	7	42	9	0	6	15	174
7:15 AM	3	139	4	146	20	1	27	48	2	42	5	49	8	4	6	18	261
7:30 AM	4	145	4	153	16	7	42	65	7	44	2	53	6	0	11	17	288
7:45 AM	14	170	4	188	10	8	35	53	3	51	10	64	15	6	16	37	342
Hour Total	26	533	13	572	58	16	124	198	13	171	24	208	38	10	39	87	1065
8:00 AM	10	85	9	104	3	3	16	22	4	46	4	54	11	2	7	20	200
8:15 AM	18	95	8	121	9	2	14	25	1	46	10	57	7	7	13	27	230
8:30 AM	21	106	7	134	5	7	17	29	4	56	8	68	13	4	22	39	270
8:45 AM	31	90	10	131	10	11	16	37	4	65	6	75	19	5	25	49	292
Hour Total	80	376	34	490	27	23	63	113	13	213	28	254	50	18	67	135	992
9:00 AM	11	72	1	84	3	1	9	13	7	52	4	63	6	5	5	16	176
9:15 AM	7	62	5	74	7	0	9	16	4	51	1	56	2	1	9	12	158
9:30 AM	9	49	4	62	6	4	7	17	2	37	3	42	3	0	9	12	133
9:45 AM	7	53	6	66	8	0	7	15	7	56	0	63	0	1	8	9	153
Hour Total	34	236	16	286	24	5	32	61	20	196	8	224	11	7	31	49	620
10:00 AM	6	55	3	64	5	1	9	15	3	59	3	65	2	0	7	9	153
10:15 AM	4	63	3	70	7	0	10	17	3	56	5	64	4	1	6	11	162
10:30 AM	6	53	2	61	5	3	6	14	4	56	2	62	3	1	6	10	147
10:45 AM	6	65	4	75	8	1	4	13	6	70	2	78	3	1	8	12	178
Hour Total	22	236	12	270	25	5	29	59	16	241	12	269	12	3	27	42	640
11:00 AM	5	75	9	89	4	1	7	12	10	74	1	85	3	0	10	13	199
11:15 AM	18	97	11	126	5	1	6	12	3	68	5	76	2	0	5	7	221
11:30 AM	6	77	5	88	5	1	4	10	4	89	5	98	2	1	11	14	210
11:45 AM	8	100	7	116	13	2	4	19	8	96	8	112	2	2	11	15	262
Hour Total	38	349	32	419	27	5	21	53	25	327	19	371	9	3	37	49	892
12:00 PM	7	92	11	110	7	2	13	22	13	97	2	112	4	1	12	17	261
12:15 PM	11	109	10	130	9	3	11	23	7	102	2	111	2	2	4	8	272
12:30 PM	13	93	4	110	9	1	12	22	5	95	1	101	3	2	12	17	250
12:45 PM	8	105	7	120	11	1	6	18	7	88	1	96	3	4	8	15	249
Hour Total	39	399	32	470	36	7	42	85	32	382	6	420	12	9	36	57	1032
1:00 PM	6	76	8	90	6	2	6	14	7	89	4	100	6	3	8	17	221
1:15 PM	9	88	12	109	5	1	3	9	7	85	1	93	1	2	14	17	228
1:30 PM	7	63	6	76	6	2	8	16	5	78	1	84	11	1	5	17	193
1:45 PM	7	80	4	91	4	2	4	10	5	60	5	70	4	2	5	11	182
Hour Total	29	307	30	366	21	7	21	49	24	312	11	347	22	8	32	62	824

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street:	Hershey Road	Start Date:	10/1/2013
E/W Street:	Arrowhead Drive	Start Time:	6:00 AM
City / State:	Bloomington, IL	End Date:	10/3/2013
Job Number:	7133	End Time:	6:00 PM

	Hershey Road Southbound				Arrowhead Drive Westbound				Hershey Road Northbound				Arrowhead Drive Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
2:00 PM	11	74	8	93	8	1	3	12	2	62	3	67	0	0	6	6	178
2:15 PM	14	69	7	90	7	2	4	13	6	90	1	97	1	0	4	5	205
2:30 PM	12	71	9	92	6	2	8	16	8	66	2	76	5	0	8	13	197
2:45 PM	22	76	12	110	12	11	2	25	10	72	6	88	1	1	4	6	229
Hour Total	59	290	36	385	33	16	17	66	26	290	12	328	7	1	22	30	809
3:00 PM	11	85	11	107	8	8	7	23	10	57	15	82	7	3	9	19	231
3:15 PM	13	96	9	118	2	0	9	11	19	84	8	111	15	16	45	76	316
3:30 PM	14	104	13	131	7	2	7	16	11	95	1	107	10	4	22	36	290
3:45 PM	17	73	9	99	7	1	2	10	12	123	9	144	10	5	12	27	280
Hour Total	55	358	42	455	24	11	25	60	52	359	33	444	42	28	88	158	1117
4:00 PM	14	86	12	112	12	3	6	21	15	113	8	136	4	0	7	11	280
4:15 PM	15	112	17	144	6	0	8	14	14	168	4	186	3	4	15	22	366
4:30 PM	6	142	9	157	17	7	8	32	22	190	4	216	6	6	21	35	440
4:45 PM	18	101	14	133	13	5	10	28	15	172	8	195	5	7	29	41	397
Hour Total	53	441	52	546	48	15	32	95	66	643	24	733	18	19	72	109	1483
5:00 PM	20	117	14	151	12	2	10	24	23	210	7	240	12	10	17	39	454
5:15 PM	5	101	16	122	10	1	11	22	17	147	5	169	8	8	20	32	345
5:30 PM	19	109	18	146	12	2	12	26	11	117	4	132	2	3	16	21	325
5:45 PM	19	109	18	146	12	2	12	26	11	117	4	132	2	3	16	21	325
Hour Total	63	436	66	565	46	7	45	98	62	591	20	673	22	22	69	113	1449

Pedestrians		
	Crossing north approach	26
	Crossing east approach	4
	Crossing south approach	4
	Crossing west approach	1

Total Traffic	8536
Total Trucks	
% Trucks	0.0

AM Peak

7:15 AM	3	139	4	146	20	1	27	48	2	42	5	49	8	4	6	18	261
7:30 AM	4	145	4	153	16	7	42	65	7	44	2	53	6	0	11	17	288
7:45 AM	14	170	4	188	10	8	35	53	3	51	10	64	15	6	16	37	342
8:00 AM	10	85	9	104	3	3	16	22	13	46	4	63	11	2	7	20	209
Hour Total	31	539	21	591	49	19	120	188	25	183	21	229	40	12	40	92	1100

AM School

8:15 AM	18	95	8	121	9	2	14	25	1	46	10	57	7	7	13	27	230
8:30 AM	21	106	7	134	5	7	17	29	4	56	8	68	13	4	22	39	270
8:45 AM	31	90	10	131	10	11	16	37	4	65	6	75	19	5	25	49	292
9:00 AM	11	72	1	84	3	1	9	13	7	52	4	63	6	5	5	16	176
Hour Total	81	363	26	470	27	21	56	104	16	219	28	263	45	21	65	131	968

MD Peak

11:45 AM	9			9				0	8	96	8	112			11	11	132
12:00 PM	7	92	11	110	7	2	13	22	13	97	2	112			12	12	256
12:15 PM	11	109	10	130	9	3	11	23	7	102	2	111	2	2	4	8	272
12:30 PM	13	93	4	110	9	1	12	22	5	95	1	101	3	2	12	17	250
12:45 PM		105	7	112	11	1	6	18				0	3	4		7	137
1:00 PM				0				0				0	6	3		9	9
Hour Total	40	399	32	471	36	7	42	85	33	390	13	436	14	11	39	64	1056

Knight E/A
993 Clocktower, Suite A
Springfield, IL 62704

N/S Street: Hershey Road
E/W Street: Arrowhead Drive
City / State: Bloomington, IL
Job Number: 7133

Start Date: 10/1/2013
Start Time: 6:00 AM
End Date: 10/3/2013
End Time: 6:00 PM

	Hershey Road Southbound				Arrowhead Drive Westbound				Hershey Road Northbound				Arrowhead Drive Eastbound				
Start Time	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Int. Total
PM School																	
2:30 AM				0				0				0				0	0
2:45 AM				0				0				0				0	0
3:00 AM	11	85	11	107	8	8	7	23	10	57	15	82	7	3	9	19	231
3:15 AM	13	96	9	118	2	0	9	11	19	84	8	111	15	16	45	76	316
3:30 AM	14	104	13	131	7	2	7	16	11	95	1	107	10	4	22	36	290
3:45 AM	17	73	9	99	7	1	2	10	12	123	9	144	10	5	12	27	280
Hour Total	55	358	42	455	24	11	25	60	52	359	33	444	42	28	88	158	1117
PM Peak																	
4:15 AM	15	112	17	144		0		0		168	4	172				0	316
4:30 AM	6	142	9	157	17	7		24	22	190	4	216	6	8	21	35	432
4:45 AM	18	101	14	133	13	5	10	28	15	172	8	195	5	7	29	41	397
5:00 AM	20	117	14	151	12	2	10	24	23	210	7	240	12	10	17	39	454
5:15 AM				0	10		11	21	17			17	6	6	20	32	70
5:30 AM				0			12	12				0				0	12
Hour Total	59	472	54	585	52	14	43	109	77	740	23	840	29	31	87	147	1681

RAW DATA

TIME		SBRT	SB	SBLT		WBRT	WB	WBLT		NBRT	NB	NBLT		EBRT	EB	
08/05/13"		Keaton Pl./Auto Row Dr. @ G.E. Rd.														
12:00 PM -	12:15 PM	0	29	2	1	0	1	96	20	1	18	2	22	0	19	117
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
BANK2	MU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
12:15 PM -	12:30 PM	0	8	2	1	0	0	98	13	0	9	0	33	0	23	134
BANK1	SU	0	0	0	0	0	0	3	0	0	0	0	0	0	0	1
BANK2	MU	0	1	0	0	0	0	4	0	0	0	0	0	0	0	5
12:30 PM -	12:45 PM	0	12	1	0	0	1	101	5	0	11	1	31	0	14	92
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
BANK2	MU	0	0	0	0	0	0	5	0	0	0	0	0	0	0	1
12:45 PM -	01:00 PM	0	10	0	1	0	1	96	6	0	9	1	31	0	16	79
BANK1	SU	0	0	0	0	0	0	5	0	0	0	0	0	0	0	4
BANK2	MU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
01:00 PM -	01:15 PM	0	11	0	0	0	2	74	12	0	16	2	35	0	15	75
BANK1	SU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	4
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
01:15 PM -	01:30 PM	0	6	1	0	0	4	72	4	0	12	2	24	1	22	94
BANK1	SU	0	0	0	0	0	0	2	0	0	0	0	1	0	0	1
BANK2	MU	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0
01:30 PM -	01:45 PM	0	4	0	3	0	2	77	9	0	12	0	29	0	5	89
BANK1	SU	0	0	0	0	0	0	2	0	0	0	0	0	0	1	2
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
01:45 PM -	02:00 PM	0	6	0	1	0	2	66	8	0	5	1	26	0	14	73
BANK1	SU	0	0	0	0	0	0	2	0	0	1	0	0	0	1	4
BANK2	MU	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
02:00 PM -	02:15 PM	0	6	0	0	0	4	71	11	0	11	0	19	0	10	88
BANK1	SU	0	0	0	0	0	0	4	0	0	0	1	0	0	0	1
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
02:15 PM -	02:30 PM	0	9	0	2	0	1	80	8	0	8	0	32	0	13	79
BANK1	SU	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
02:30 PM -	02:45 PM	0	11	0	0	0	0	72	6	0	14	1	22	0	12	71
BANK1	SU	0	0	0	0	0	0	5	0	0	0	0	0	0	0	2
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM -	03:00 PM	0	5	0	0	0	2	77	7	0	4	0	24	0	8	87
BANK1	SU	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2
03:00 PM -	03:15 PM	0	8	2	0	0	3	88	8	0	8	0	28	0	10	85

03:15 PM -	03:30 PM	0	17	0	1	0	5	86	16	0	11	0	21	0	17	95
03:30 PM -	03:45 PM	0	9	0	1	0	4	111	8	0	12	4	23	0	9	113
03:45 PM -	04:00 PM	0	14	0	2	0	10	63	12	0	12	3	13	0	15	97
04:00 PM -	04:15 PM	1	15	0	0	0	0	54	7	1	10	0	13	0	12	60
04:15 PM -	04:30 PM	0	10	0	3	0	4	111	5	0	17	1	18	0	14	172
04:30 PM -	04:45 PM	0	8	0	1	0	4	129	13	0	13	0	22	0	11	185
04:45 PM -	05:00 PM	0	9	1	2	0	4	133	7	0	13	0	28	0	24	209
05:00 PM -	05:15 PM	0	17	0	6	0	3	134	9	0	11	1	33	0	17	156
05:15 PM -	05:30 PM	0	14	0	4	0	3	107	10	0	14	0	39	0	17	172
05:30 PM -	05:45 PM	0	9	1	1	0	0	115	5	0	14	0	24	0	20	169
05:45 PM -	06:00 PM	1	11	0	0	0	1	85	16	0	11	0	27	0	16	121
		2	259	10	30	0	61	2240	226	2	277	20	621	1	356	2756

Keaton Pl. / Auto Row Dr. @ G.E. Rd.

08/06/13"

06:00 AM -	06:15 AM	0	0	0	0	0	0	34	1	0	1	0	2	0	1	33
06:15 AM -	06:30 AM	0	1	0	0	0	0	64	2	0	1	0	1	0	0	45
06:30 AM -	06:45 AM	0	0	0	1	0	0	78	2	0	1	0	2	0	1	44
06:45 AM -	07:00 AM	0	0	0	0	0	1	114	3	0	4	1	3	0	1	86
07:00 AM -	07:15 AM	0	0	0	2	0	1	102	2	0	3	0	5	0	4	78
07:15 AM -	07:30 AM	0	0	0	0	0	2	132	4	0	2	0	5	0	3	84
07:30 AM -	07:45 AM	0	1	0	0	0	2	154	3	0	2	0	4	0	5	115
07:45 AM -	08:00 AM	0	1	0	2	0	4	193	1	0	2	0	5	0	5	156
08:00 AM -	08:15 AM	0	1	0	1	0	2	122	3	0	0	0	11	0	5	101
08:20 AM -	08:35 AM	0	3	0	4	0	5	128	7	0	5	0	7	0	6	86
08:35 AM -	08:50 AM	0	2	0	0	0	1	105	9	0	1	0	13	0	18	97
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	1	0	0	4
BANK2	MU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
08:50 AM -	09:05 AM	0	0	0	1	0	1	84	7	0	3	0	8	0	5	102
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	2	0	0	0
BANK2	MU	0	1	0	1	0	1	1	0	0	0	0	0	0	0	4
09:05 AM -	09:20 AM	0	2	0	1	0	1	55	9	0	3	0	7	0	6	45
BANK1	SU	0	0	0	0	0	1	5	0	0	0	0	0	0	0	1
BANK2	MU	0	0	0	0	0	0	4	0	0	1	0	0	0	1	1
09:20 AM -	09:35 AM	0	3	0	0	0	1	73	4	0	7	0	16	0	9	57
BANK1	SU	0	0	0	0	0	0	3	0	0	0	0	0	0	0	2
BANK2	MU	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1
09:35 AM -	09:50 AM	0	3	0	1	0	0	63	6	0	8	0	9	0	11	70
BANK1	SU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
BANK2	MU	0	0	0	1	0	0	2	0	0	0	0	0	0	0	5

09:50 AM - 10:05 AM		0	3	0	3	0	5	76	5	0	5	0	9	0	9	57
BANK1	SU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
BANK2	MU	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
10:05 AM - 10:20 AM		0	9	2	2	0	0	70	4	0	5	0	17	0	9	55
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
BANK2	MU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1
10:20 AM - 10:35 AM		0	4	0	1	0	2	63	7	0	4	0	11	0	13	59
BANK1	SU	0	0	0	0	0	0	3	0	0	0	0	1	0	0	2
BANK2	MU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
10:35 AM - 10:50 AM		0	7	1	1	0	3	66	6	0	8	0	23	0	12	63
BANK1	SU	0	0	0	0	0	0	2	0	0	1	0	0	0	0	3
BANK2	MU	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
10:50 AM - 11:05 AM		0	3	0	3	0	1	95	11	0	10	1	21	0	18	72
BANK1	SU	0	0	0	0	0	0	3	1	0	0	0	0	0	0	5
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
11:05 AM - 11:20 AM		0	5	2	2	0	6	117	15	0	5	0	19	0	18	83
BANK1	SU	0	0	0	0	0	0	1	0	0	0	0	0	0	1	8
11:20 AM - 11:35 AM		0	7	0	1	0	2	102	9	0	6	1	19	0	30	79
BANK1	SU	0	1	0	0	0	0	3	0	0	0	0	1	0	0	1
BANK2	MU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
11:35 AM - 11:50 AM		0	7	0	4	0	3	71	15	0	10	0	19	0	13	104
BANK1	SU	0	0	0	0	0	0	3	0	0	0	0	0	0	1	4
BANK2	MU	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
		0	64	5	32	0	45	2208	137	0	98	3	241	0	206	1825

EBLT
15
0
0
14
0
0
22
0
0
26
0
0
9
0
0
14
0
0
8
0
0
10
0
0
11
0
0
12
0
0
10
0
1
13
0
11

16
14
9
4
6
8
6
15
17
8
5
======
284

3
0
2
6
5
5
7
11
11
4
10
0
0
5
0
0
5
0
0
6
0
0
5
0
0

11
0
1
11
0
0
12
0
0
8
0
0
12
0
0
9
2
11
0
0
11
0
0
======
173

CITY OF BLOOMINGTON - ENGINEERING DEPARTMENT

Hershey Rd. @ Clearwater Ave

09/10/13"

TIME	SBRT	SB	SBLT		WBRT	WB	WBLT		NBRT	NB	NBLT		EBRT	EB	EBLT
05:59 AM - 06:14 AM	0	16	1	0	0	7	0	0	1	18	4	0	3	2	0
06:14 AM - 06:29 AM	0	29	1	0	2	5	7	0	2	27	6	0	9	1	4
06:29 AM - 06:44 AM	0	44	1	0	5	12	9	0	2	29	7	0	8	1	1
06:44 AM - 06:59 AM	0	60	2	0	5	23	15	0	1	41	11	0	6	4	2
06:59 AM - 07:14 AM	0	73	3	0	4	14	16	0	5	31	7	0	13	8	7
07:14 AM - 07:29 AM	0	89	2	0	6	39	15	0	2	45	21	0	18	5	5
07:29 AM - 07:44 AM	0	91	5	0	10	38	29	0	3	68	17	0	16	7	10
07:44 AM - 07:59 AM	0	143	5	0	7	39	37	0	5	66	18	0	40	8	9
07:59 AM - 08:14 AM	0	80	4	0	5	20	12	0	5	57	5	0	19	3	9
08:14 AM - 08:29 AM	0	77	7	0	4	16	12	0	9	53	8	0	19	11	8
08:29 AM - 08:44 AM	0	87	6	0	5	20	13	0	2	52	12	0	26	6	2
08:44 AM - 08:59 AM	0	79	7	0	10	16	14	0	5	75	22	0	31	9	3
08:59 AM - 09:14 AM	0	74	1	0	4	20	7	0	2	44	5	0	11	7	6
BANK1 SU	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
09:14 AM - 09:29 AM	0	52	1	0	4	8	3	0	4	49	16	0	9	5	1
BANK1 SU	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
09:29 AM - 09:44 AM	0	48	0	0	2	5	5	0	3	49	9	0	10	6	3
BANK1 SU	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0
BANK2 MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:44 AM - 09:59 AM	0	50	1	0	3	9	6	0	3	59	10	0	8	4	3
BANK1 SU	0	3	0	0	0	0	0	0	0	3	0	0	0	0	0
BANK2 MU	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
09:59 AM - 10:14 AM	0	43	2	0	1	7	10	0	5	51	15	0	8	2	5
BANK1 SU	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
10:14 AM - 10:29 AM	0	43	3	0	1	10	7	0	6	51	8	0	11	4	7
BANK1 SU	0	1	0	0	0	1	0	0	0	3	0	0	1	0	0
10:29 AM - 10:44 AM	0	48	0	0	1	11	5	0	1	56	8	0	11	2	2
BANK1 SU	0	2	0	0	0	1	1	0	1	4	0	0	0	1	0
10:44 AM - 10:59 AM	0	57	2	0	2	4	2	0	5	59	16	0	11	7	2
BANK1 SU	0	1	0	0	0	1	0	0	0	3	0	0	0	0	0

10:59 AM - 11:14 AM		0	5	77	5	0	4	4	3	0	4	66	12	0	6	8	6
BANK1	SU	0	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0
11:14 AM - 11:29 AM		0	9	88	6	0	3	13	1	0	9	70	15	0	19	4	4
BANK1	SU	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0
11:29 AM - 11:44 AM		0	6	62	7	0	7	12	4	0	5	73	15	0	16	5	5
BANK1	SU	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0
11:44 AM - 11:59 AM		0	16	92	2	0	4	10	4	0	9	78	20	0	18	5	6
BANK1	SU	0	0	1	0	0	0	1	0	0	1	3	1	0	0	1	0
BANK2	MU	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
		0	120	1615	74	0	99	368	237	0	100	1290	291	0	349	128	110

Hershey Rd @ Clearwater Ave

09/11/13"

03:00 PM - 03:15 PM		0	9	80	4	0	4	13	7	0	6	45	13	0	26	15	8
03:15 PM - 03:30 PM		0	10	76	1	0	2	12	4	0	8	76	30	0	17	15	8
03:30 PM - 03:45 PM		0	12	68	5	0	3	10	11	0	12	57	22	0	20	14	4
03:45 PM - 04:00 PM		0	13	93	4	0	5	16	11	0	10	79	28	0	21	20	6
04:00 PM - 04:15 PM		0	7	83	3	0	5	11	6	0	17	103	21	0	22	24	4
04:15 PM - 04:30 PM		0	17	101	4	0	7	14	6	0	16	113	29	0	21	18	9
04:30 PM - 04:45 PM		0	18	125	11	0	10	23	16	0	20	118	31	0	29	26	13
04:45 PM - 05:00 PM		0	13	100	10	0	4	31	14	0	26	138	39	0	24	27	7
05:00 PM - 05:15 PM		0	12	106	10	0	7	23	14	0	14	136	37	0	21	19	13
05:15 PM - 05:30 PM		0	13	87	4	0	15	20	11	0	17	111	36	0	27	27	6
05:30 PM - 05:45 PM		0	7	89	10	0	9	24	6	0	12	104	33	0	26	20	7
05:45 PM - 06:00 PM		0	6	88	8	0	7	34	14	0	15	111	25	0	25	20	17
		0	137	1096	74	0	78	231	120	0	173	1191	344	0	279	245	102

Hershey Rd @ Clearwater Ave

09/12/13"

12:00 PM - 12:15 PM		0	14	78	7	0	8	8	6	0	4	63	15	0	20	14	12
BANK1	SU	0	0	0	0	0	0	2	0	0	0	1	0	0	1	0	0
12:15 PM - 12:30 PM		0	8	101	5	0	8	16	7	0	5	70	19	0	22	12	9
BANK1	SU	0	0	2	0	0	0	0	0	0	1	3	0	0	0	0	0
BANK2	MU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0

12:30 PM -	12:45 PM	0	7	73	5	0	6	11	5	0	3	82	17	0	19	6	2
BANK1	SU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
12:45 PM -	01:00 PM	0	10	67	5	0	2	17	10	0	3	83	9	0	21	10	13
BANK1	SU	0	0	2	0	0	0	0	0	0	0	3	0	0	1	0	0
01:00 PM -	01:15 PM	0	7	74	6	0	5	13	4	0	6	89	16	0	20	8	13
BANK1	SU	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM -	01:30 PM	0	5	73	2	0	3	9	6	0	5	79	17	0	16	7	5
BANK1	SU	0	0	2	0	0	0	0	0	0	1	2	0	0	1	0	0
01:30 PM -	01:45 PM	0	7	59	2	0	3	12	4	0	7	72	18	0	12	5	4
01:45 PM -	02:00 PM	0	8	75	2	0	5	9	3	0	6	65	19	0	16	14	3
02:00 PM -	02:15 PM	0	7	66	4	1	5	11	6	0	7	47	12	0	13	10	6
02:15 PM -	02:30 PM	0	7	71	1	0	1	12	8	0	3	59	7	0	21	7	8
02:30 PM -	02:45 PM	0	6	72	4	0	6	8	6	0	10	62	14	0	11	9	1
02:45 PM -	03:00 PM	0	5	82	8	0	4	9	9	0	4	65	13	0	17	11	5
		0	91	901	51	1	56	137	74	0	65	847	176	0	211	113	81

Hershey Rd @ Arrowhead Dr

TIME		SBRT	SB	SBLT		WBRT	WB	WBLT		NBRT	NB	NBLT		EBRT	EB	EBLT
10/01/13"																
06:00 AM -	06:15 AM	0	5	51	1	0	5	2	4	0	3	27	2	0	8	0	4
06:15 AM -	06:30 AM	0	3	38	3	0	9	1	11	0	3	12	0	0	3	1	6
06:30 AM -	06:45 AM	0	1	59	2	0	11	1	22	0	1	25	4	0	7	0	5
06:45 AM -	07:00 AM	0	4	78	2	0	15	2	19	0	2	26	5	0	7	1	5
07:00 AM -	07:15 AM	0	5	79	1	1	12	0	20	0	1	34	7	0	9	0	6
07:15 AM -	07:30 AM	0	3	139	4	0	20	1	27	0	2	42	5	0	8	4	6
07:30 AM -	07:45 AM	0	4	145	4	0	16	7	42	0	7	44	2	0	6	0	11
07:45 AM -	08:00 AM	0	14	170	4	1	10	8	35	0	3	51	10	0	15	6	16
08:00 AM -	08:15 AM	0	10	85	9	0	3	3	16	0	4	46	4	0	11	2	7
08:15 AM -	08:30 AM	0	18	95	8	0	9	2	14	0	1	46	10	0	7	7	13
08:30 AM -	08:45 AM	0	21	106	7	0	5	7	17	0	4	56	8	0	13	4	22
08:45 AM -	09:00 AM	0	31	90	10	0	10	11	16	0	4	65	6	0	19	5	25
09:00 AM -	09:15 AM	0	11	71	1	0	3	1	9	0	6	51	4	0	6	5	5
BANK1	SU	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0
09:15 AM -	09:30 AM	0	6	62	5	0	7	0	9	0	2	49	1	0	2	1	9
BANK1	SU	0	1	0	0	0	0	0	0	0	2	2	0	0	0	0	0
BANK2	MU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
09:30 AM -	09:45 AM	0	9	48	4	0	6	4	7	0	2	37	3	1	3	0	9
BANK1	SU	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM -	10:00 AM	0	7	50	6	2	8	0	7	0	6	54	0	0	0	1	7
BANK1	SU	0	0	3	0	0	0	0	0	0	1	2	0	0	0	0	1
10:00 AM -	10:15 AM	0	5	55	3	0	5	1	9	0	3	58	3	0	2	0	7
BANK1	SU	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
10:15 AM -	10:30 AM	0	3	63	3	0	7	0	10	0	3	54	5	0	4	1	6
BANK1	SU	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0	0
10:30 AM -	10:45 AM	0	6	52	2	0	5	3	6	0	4	56	2	0	3	1	6
BANK1	SU	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM -	11:00 AM	0	6	63	4	0	8	1	4	0	6	68	2	0	3	1	7
BANK1	SU	0	0	2	0	0	0	0	0	0	0	2	0	0	0	0	1
11:00 AM -	11:15 AM	0	5	74	9	0	4	1	7	0	10	72	0	0	3	0	10

BANK1	SU	0	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0
11:15 AM -	11:30 AM	0	17	94	11	0	5	1	6	0	3	66	5	0	1	0	5
BANK1	SU	0	1	3	0	0	0	0	0	0	0	2	0	0	1	0	0
11:30 AM -	11:45 AM	0	6	76	5	0	5	1	4	0	4	89	4	0	2	1	11
BANK1	SU	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
11:45 AM -	12:00 PM	0	9	98	7	0	13	2	3	0	8	95	7	0	2	1	9
BANK1	SU	0	0	2	0	0	0	0	1	0	0	1	1	0	0	1	2
		0	213	1956	115	4	201	60	325	0	96	1239	102	1	145	43	221

Hershey Rd. @ Arrowhead Dr.

10/03/13"																	
12:00 PM -	12:15 PM	0	7	90	11	0	7	2	13	0	12	96	2	0	4	0	10
BANK1	SU	0	0	2	0	0	0	0	0	0	1	1	0	0	0	1	2
12:15 PM -	12:30 PM	0	10	107	10	0	9	3	11	0	7	100	2	0	2	2	4
BANK1	SU	0	1	2	0	0	0	0	0	0	0	2	0	0	0	0	0
12:30 PM -	12:45 PM	0	13	92	4	0	9	1	11	0	5	95	1	0	3	2	12
BANK1	SU	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
12:45 PM -	01:00 PM	0	7	100	7	0	11	1	6	0	7	84	1	0	3	4	7
BANK1	SU	0	1	5	0	0	0	0	0	0	0	4	0	0	0	0	1
01:00 PM -	01:15 PM	0	6	76	8	0	6	2	6	0	7	88	4	0	6	3	7
BANK1	SU	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
01:15 PM -	01:30 PM	0	8	87	11	0	5	1	2	0	7	83	1	0	1	2	13
BANK1	SU	0	1	1	1	0	0	0	1	0	0	2	0	0	0	0	1
01:30 PM -	01:45 PM	0	7	63	6	0	6	2	8	0	5	77	1	0	8	1	5
BANK1	SU	0	0	0	0	0	0	0	0	0	0	1	0	0	3	0	0
01:45 PM -	02:00 PM	0	7	78	4	0	4	2	4	0	5	59	5	0	3	2	4
BANK1	SU	0	0	2	0	0	0	0	0	0	0	1	0	0	1	0	1
02:00 PM -	02:15 PM	0	11	73	8	0	8	1	3	0	2	62	3	0	0	0	6
BANK1	SU	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM -	02:30 PM	0	11	69	7	0	7	2	4	0	6	88	1	0	0	0	3
BANK1	SU	0	3	0	0	0	0	0	0	0	0	2	0	0	1	0	1
02:30 PM -	02:45 PM	0	12	70	9	0	6	2	8	0	8	65	2	0	5	0	8
BANK1	SU	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
02:45 PM -	03:00 PM	0	22	73	12	0	10	11	2	0	9	70	6	0	1	1	3

BANK1	SU	0	0	3	0	0	2	0	0	0	1	2	0	0	0	0	1
03:04 PM -	03:19 PM	0	11	85	11	0	8	8	7	0	10	57	15	0	7	3	9
03:19 PM -	03:34 PM	0	13	96	9	0	2	0	9	0	19	84	8	0	15	16	45
03:34 PM -	03:49 PM	0	14	104	13	0	7	2	7	0	11	95	1	0	10	4	22
03:49 PM -	04:04 PM	0	17	73	9	0	7	1	2	0	12	123	9	0	10	5	12
04:04 PM -	04:19 PM	0	14	86	12	0	12	3	6	0	15	113	8	0	4	0	7
04:19 PM -	04:34 PM	0	15	112	17	0	6	0	8	0	14	168	4	0	3	4	15
04:34 PM -	04:49 PM	0	6	142	9	0	17	7	8	0	22	190	4	0	6	8	21
04:49 PM -	05:04 PM	0	18	101	14	0	13	5	10	0	15	172	8	0	5	7	29
05:04 PM -	05:19 PM	0	20	117	14	0	12	2	10	0	23	210	7	0	12	10	17
05:19 PM -	05:34 PM	0	5	101	16	0	10	1	11	0	17	147	5	0	6	6	20
05:34 PM -	05:49 PM	0	19	109	18	0	12	2	12	0	11	117	4	0	2	3	16
		0	279	2122	240	0	196	61	170	0	251	2460	102	0	121	84	303

CITY OF BLOOMINGTON - ENGINEERING DEPARTMENT

TIME		SB PED WSide	WB PED NSide	WB PED SSide	NB PED ESide	NB PED ESide	EB PED SSide	EB PED NSide
10/24/13"								
02:30 PM -	02:45 PM	0	0	1	2	0	0	0
02:45 PM -	03:00 PM	1	0	0	0	0	0	1
03:00 PM -	03:15 PM	0	3	0	0	0	0	0
03:15 PM -	03:30 PM	0	4	1	0	1	0	15
03:30 PM -	03:45 PM	0	0	0	0	0	0	3
03:45 PM -	04:00 PM	0	0	0	1	0	2	0
		1	7	2	3	1	2	19

Hershey Rd. @ Arrowhead Dr. Pedestrian Count During PM School Dismissal Time

APPENDIX B
SIGNAL WARRANTS WORKSHEETS

WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Adustment Factors (2013 values):

Facility Type-Other Urban
Weekly: Mon. 0.973
Tues 1.001
Monthly: Aug. 1.06

EB-WB: General Electric Road
NB: Keaton Place
SB: Auto Row Drive

HOUR	EB	WB	HR EB	HR WB	TOT EB+WB	COND A	COND B	NB	HR NB	COND A	COND B	SB	HR SB	COND A	COND B
6:00	35	33						3				0			
6:15	42	62						2				1			
6:30	44	75						3				1			
6:45	88	111	209	282	491			8	15			0	2		
7:00	82	100						8				2			
7:15	87	130						7				0			
7:30	120	150						6				1			
7:45	162	187	450	566	1017	X	X	7	26			3	6		
8:00	110	120						10				2			
8:15	90	132						11				7			
8:30	122	111						14				2			
8:45	109	90	432	452	884	X	X	12	48			3	13		
9:00	56	71						10				3			
9:15	72	82						22				3			
9:30	90	67						16				5			
9:45	75	85	292	304	597			13	61			6	16		
10:00	73	73						21				12			
10:15	83	72						15				5			
10:30	83	74						30				8			
10:45	102	105	340	322	663	X		30	96		X	6	31		
11:00	114	131						23				8			
11:15	114	111						25				8			
11:30	125	89						27				10			
11:45	125	89	479	419	898	X		27	103		X	10	38		
12:00	151	115						41				31			
12:15	172	114						41				12			
12:30	126	110						42				13			
12:45	125	106	574	445	1019	X	X	40	163	X	X	11	66		
13:00	103	87						51				11			
13:15	127	82						39				7			
13:30	102	87						41				7			
13:45	99	77	430	334	764	X		32	163	X	X	7	31		
14:00	107	87						31				6			
14:15	106	89						39				11			
14:30	93	80						36				11			
14:45	107	83	412	340	752	X		28	134		X	5	32		
15:00	103	96						35				10			
15:15	124	104						31				17			
15:30	132	119						38				10			
15:45	117	82	476	401	877	X		27	131		X	16	52		
16:00	74	59						22				15			
16:15	186	116						35				13			
16:30	198	142						34				9			
16:45	232	140	689	457	1146	X	X	40	131		X	12	48		
17:00	182	142						43				22			
17:15	200	116						51				17			
17:30	191	116						37				11			
17:45	138	99	711	473	1184	X	X	37	168	X	X	11	61		

RESULT: **Warrant 1 fails under both conditions at the 100% level (Table 4C-1).**
Warrant 1 meets under Condition B at the 80% level (Table 4C-1).

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

HOUR	EB	WB	HR EB	HR WB	TOT EB+WB	100%	70%	NB	HR NB	100%	70%	SB	HR SB	100%	70%
6:00	35	33						3				0			
6:15	42	62						2				1			
6:30	44	75						3				1			
6:45	88	111	209	282	491			8	15			0	2		
7:00	82	100						8				2			
7:15	87	130						7				0			
7:30	120	150						6				1			
7:45	162	187	450	566	1017			7	26			3	6		
8:00	110	120						10				2			
8:15	90	132						11				7			
8:30	122	111						14				2			
8:45	109	90	432	452	884			12	48			3	13		
9:00	56	71						10				3			
9:15	72	82						22				3			
9:30	90	67						16				5			
9:45	75	85	292	304	597			13	61			6	16		
10:00	73	73						21				12			
10:15	83	72						15				5			
10:30	83	74						30				8			
10:45	102	105	340	322	663			30	96			6	31		
11:00	114	131						23				8			
11:15	114	111						25				8			
11:30	125	89						27				10			
11:45	125	89	479	419	898			27	103			10	38		
12:00	151	115						41				31			
12:15	172	114						41				12			
12:30	126	110						42				13			
12:45	125	106	574	445	1019	X		40	163	X		11	66		
13:00	103	87						51				11			
13:15	127	82						39				7			
13:30	102	87						41				7			
13:45	99	77	430	334	764			32	163			7	31		
14:00	107	87						31				6			
14:15	106	89						39				11			
14:30	93	80						36				11			
14:45	107	83	412	340	752			28	134			5	32		
15:00	103	96						35				10			
15:15	124	104						31				17			
15:30	132	119						38				10			
15:45	117	82	476	401	877			27	131			16	52		
16:00	74	59						22				15			
16:15	186	116						35				13			
16:30	198	142						34				9			
16:45	232	140	689	457	1146	X		40	131	X		12	48		
17:00	182	142						43				22			
17:15	200	116						51				17			
17:30	191	116						37				11			
17:45	138	99	711	473	1184	X		37	168	X		11	61		

RESULT: **Warrant 2 fails by meeting only 3 of the 4 hours required (Fig. 4C-1).**

WARRANT 3, PEAK HOUR

HOUR	EB	WB	HR EB	HR WB	TOT EB+WB	100%	70%	NB	HR NB	100%	70%	SB	HR SB	100%	70%
6:00	35	112						3				0			
6:15	42	111						2				1			
6:30	44	106						3				1			
6:45	88	103	209	433	642			8	15			0	2		
7:00	82	85						8				2			
7:15	87	80						7				0			
7:30	120	85						6				1			
7:45	162	74	450	324	775			7	26			3	6		
8:00	110	85						10				2			
8:15	90	87						11				7			
8:30	122	78						14				2			
8:45	109	81	432	331	762			12	48			3	13		
9:00	56	93						10				3			
9:15	72	101						22				3			
9:30	90	116						16				5			
9:45	75	80	292	390	682			13	61			6	16		
10:00	73	57						21				12			
10:15	83	113						15				5			
10:30	83	138						30				8			
10:45	102	136	340	444	784			30	96			6	31		
11:00	114	138						23				8			
11:15	114	113						25				8			
11:30	125	113						27				10			
11:45	125	96	479	460	939			27	103			10	38		
12:00	151	115						41				31			
12:15	172	114						41				12			
12:30	126	110						42				13			
12:45	125	106	574	445	1019			40	163			11	66		
13:00	103	87						51				11			
13:15	127	82						39				7			
13:30	102	87						41				7			
13:45	99	77	430	334	764			32	163			7	31		
14:00	107	87						31				6			
14:15	106	89						39				11			
14:30	93	80						36				11			
14:45	107	83	412	340	752			28	134			5	32		
15:00	103	96						35				10			
15:15	124	104						31				17			
15:30	132	119						38				10			
15:45	117	82	476	401	877			27	131			16	52		
16:00	74	59						22				15			
16:15	186	116						35				13			
16:30	198	142						34				9			
16:45	232	140	689	457	1146			40	131			12	48		
17:00	182	142						43				22			
17:15	200	116	812	539	1351			51	168			17	60		
17:30	191	116						37				11			
17:45	138	99	711	473	1184			37	168			11	61		

RESULT: **Warrant 3 satisfied during PM Peak hour between 4:30 PM and 5:30 PM (Fig. 4C-3).**

WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Adustment Factors (2013 values): Facility Type-Other Urban

Weekly: Wed. 1.004
Tues. 1.001

Monthly: Oct. 1.05

NB-SB: Hershey Road
EB: Clearwater Avenue
WB: Clearwater Avenue

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	COND A	COND B	EB	HR EB	COND A	COND B	WB	HR WB	COND A	COND B
6:00	22	16						5				7			
6:15	33	29						13				13			
6:30	36	45						10				25			
6:45	50	63	142	153	295			11	39			41	86		X
7:00	41	75						27				32			
7:15	65	91						27				57			
7:30	84	98						31				73			
7:45	85	146	274	410	684	X		54	139		X	79	242	X	X
8:00	64	83						29				35			
8:15	67	85						36				30			
8:30	63	94						32				36			
8:45	97	88	290	349	639	X		41	139		X	38	140		X
9:00	49	75						23				30			
9:15	67	54						14				14			
9:30	60	52						18				11			
9:45	71	55	246	237	483			15	70			17	73		
10:00	69	47						14				17			
10:15	65	51						22				18			
10:30	67	51						15				18			
10:45	79	62	280	211	491			19	70			9	62		
11:00	81	84						19				10			
11:15	90	99						27				16			
11:30	89	72						26				23			
11:45	107	103	367	358	725	X	X	29	101		X	18	68		
12:00	79	94						45				23			
12:15	94	110						41				29			
12:30	98	81						26				21			
12:45	93	80	363	364	728	X	X	43	154	X	X	28	101		X
13:00	105	86						39				21			
13:15	99	78						28				17			
13:30	92	65						20				18			
13:45	85	81	381	309	691	X		31	118		X	16	72		
14:00	63	73						28				21			
14:15	65	75						34				20			
14:30	82	78						20				19			
14:45	78	90	287	316	603	X		31	113		X	21	81		X
15:00	61	88						46				23			
15:15	108	83						38				17			
15:30	86	81						36				23			
15:45	111	104	366	356	722	X	X	45	165	X	X	30	93		X
16:00	134	88						47				21			
16:15	150	116						46				26			
16:30	160	146						65				46			
16:45	193	117	637	467	1103	X	X	55	212	X	X	46	139	X	X
17:00	177	121						50				42			
17:15	156	99						57				44			
17:30	141	101						50				37			
17:45	143	97	618	417	1035	X	X	59	216	X	X	52	175	X	X

RESULT: **Warrant 1 fails under both conditions and at the 80% level for combination A and B (Table 4C-1).**

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	100%	70%	EB	HR EB	100%	70%	WB	HR WB	100%	70%
6:00	22	16						5				7			
6:15	33	29						13				13			
6:30	36	45						10				25			
6:45	50	63	142	153	295			11	39			41	86		
7:00	41	75						27				32			
7:15	65	91						27				57			
7:30	84	98						31				73			
7:45	85	146	274	410	684		X	54	139		X	79	242		X
8:00	64	83						29				35			
8:15	67	85						36				30			
8:30	63	94						32				36			
8:45	97	88	290	349	639		X	41	139		X	38	140		X
9:00	49	75						23				30			
9:15	67	54						14				14			
9:30	60	52						18				11			
9:45	71	55	246	237	483			15	70			17	73		
10:00	69	47						14				17			
10:15	65	51						22				18			
10:30	67	51						15				18			
10:45	79	62	280	211	491			19	70			9	62		
11:00	81	84						19				10			
11:15	90	99						27				16			
11:30	89	72						26				23			
11:45	107	103	367	358	725		X	29	101		X	18	68		
12:00	79	94						45				23			
12:15	94	117						41				29			
12:30	98	86						26				21			
12:45	93	85	363	382	746		X	43	154		X	28	101		
13:00	105	92						39				21			
13:15	99	83						28				17			
13:30	92	69						20				18			
13:45	85	86	381	330	711		X	31	118		X	16	72		
14:00	63	78						28				21			
14:15	65	80						34				20			
14:30	82	83						20				19			
14:45	78	96	287	337	624			31	113			21	81		
15:00	61	94						46				23			
15:15	108	88						38				17			
15:30	86	86						36				23			
15:45	111	111	366	380	746		X	45	165		X	30	93		
16:00	134	94						47				21			
16:15	150	123						46				26			
16:30	160	156						65				46			
16:45	193	124	637	498	1134	X	X	55	212	X	X	46	139		
17:00	177	130						50				42			
17:15	156	105						57				44			
17:30	141	107						50				37			
17:45	143	103	618	445	1063	X	X	59	216	X	X	52	175		

RESULT: **Warrant 2 fails at The 100% level by meeting only 2 of the 4 hours required (Fig. 4C-1).**
Warrant 2 meets at the 70% level if 85th% running speed >40 mph (Fig. 4C-2).

WARRANT 3, PEAK HOUR

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	100%	70%	EB	HR EB	100%	70%	WB	HR WB	100%	70%
6:00	22	94						5				7			
6:15	33	110						13				13			
6:30	36	81						10				25			
6:45	50	80	142	365	507			11	39			41	86		
7:00	41	87						27				32			
7:15	65	78						27				57			
7:30	84	65						31				73			
7:45	85	81	274	310	584			54	139			79	242		
8:00	64	73						29				35			
8:15	67	75						36				30			
8:30	63	78						32				36			
8:45	97	90	290	317	607			41	139			38	140		
9:00	49	88						23				30			
9:15	67	83						14				14			
9:30	60	81						18				11			
9:45	71	105	246	357	603			15	70			17	73		
10:00	69	88						14				17			
10:15	65	116						22				18			
10:30	67	147						15				18			
10:45	79	117	280	468	748			19	70			9	62		
11:00	81	122						19				10			
11:15	90	99						27				16			
11:30	89	101						26				23			
11:45	107	97	367	419	786			29	101			18	68		
12:00	79	94						48				23			
12:15	94	110						44				29			
12:30	98	81						27				21			
12:45	93	80	363	365	729			46	164			28	101		
13:00	105	87						41				21			
13:15	99	78						29				17			
13:30	92	65						21				18			
13:45	85	81	381	310	691			33	126			16	72		
14:00	63	73						29				21			
14:15	65	75						36				20			
14:30	82	78						21				19			
14:45	78	90	287	317	604			33	120			21	81		
15:00	61	88						50				23			
15:15	108	83						40				17			
15:30	86	81						38				23			
15:45	111	105	366	357	723			48	176			30	93		
16:00	134	88						51				21			
16:15	150	116						49				26			
16:30	160	147						69				46			
16:45	193	117	637	468	1105			59	227			46	139		
17:00	177	122	680	501	1182	X		54				42			
17:15	156	99						61	242	X		44			
17:30	141	101						54				37			
17:45	143	97	618	419	1036			63	231			52	175		

RESULT: **Warrant 3 satisfied during PM peak hour between 4:15 PM and 5:30 PM (Fig. 4-C-4).**

WARRANT 1, EIGHT-HOUR VEHICULAR VOLUME

Adustment Factors (2013 values): Facility Type-Other Urban

Weekly: Thurs. 1.022

Tues. 1.001

Monthly: Oct. 1.06

NB-SB: Hershey Road

EB: Arrowhead Drive

WB: Arrowhead Drive

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	COND A	COND B	EB	HR EB	COND A	COND B	WB	HR WB	COND A	COND B
6:00	30	54						11				10			
6:15	14	41						9				20			
6:30	28	58						11				32			
6:45	31	79	104	233	336			12	44			34	96		X
7:00	40	80						14				30			
7:15	46	138						17				45			
7:30	50	144						16				61			
7:45	60	177	196	539	735	X	X	35	82		X	50	187	X	X
8:00	51	98						19				21			
8:15	54	114						25				24			
8:30	64	126						37				27			
8:45	71	123	239	462	701	X		46	127		X	35	106		X
9:00	59	79						15				12			
9:15	53	70						11				15			
9:30	40	58						11				16			
9:45	59	62	211	270	481			8	46			14	57		
10:00	61	60						8				14			
10:15	60	66						10				16			
10:30	58	57						9				13			
10:45	74	71	254	254	508			11	40			12	56		
11:00	80	84						12				11			
11:15	72	119						7				11			
11:30	92	83						13				9			
11:45	106	109	350	395	745	X	X	14	46			18	50		
12:00	103	102						16				20			
12:15	102	120						7				21			
12:30	93	102						16				20			
12:45	89	111	388	434	822	X	X	14	53			17	78		X
13:00	92	83						16				13			
13:15	86	101						16				8			
13:30	78	70						16				15			
13:45	65	84	320	338	658	X	X	10	57			9	45		
14:00	62	86						6				11			
14:15	90	83						5				12			
14:30	70	85						12				15			
14:45	81	102	303	355	658	X	X	6	28			23	61		X
15:00	76	99						18				21			
15:15	102	109						70				10			
15:30	99	121						33				15			
15:45	133	91	410	420	830	X	X	25	146		X	9	55		
16:00	126	103						10				19			
16:15	172	133						20				13			
16:30	199	145						32				30			
16:45	180	123	677	504	1181	X	X	38	101		X	26	88		X
17:00	222	139						36				22			
17:15	156	113						30				20			
17:30	122	135						19				24			
17:45	122	135	621	522	1143	X	X	19	104		X	24	90		X

RESULT: **Warrant 1 fails under both volume conditions (Table 4C-1).**

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	100%	70%	EB	HR EB	100%	70%	WB	HR WB	100%	70%
6:00	30	54						11				10			
6:15	14	41						9				20			
6:30	28	58						11				32			
6:45	31	79	104	233	336			12	44			34	96		
7:00	40	80						14				30			
7:15	46	138						17				45			
7:30	50	144						16				61			
7:45	60	177	196	539	735		X	35	82		X	50	187		X
8:00	51	98						19				21			
8:15	54	114						25				24			
8:30	64	126						37				27			
8:45	71	123	239	462	701		X	46	127		X	35	106		X
9:00	59	79						15				12			
9:15	53	70						11				15			
9:30	40	58						11				16			
9:45	59	62	211	270	481			8	46			14	57		
10:00	61	60						8				14			
10:15	60	66						10				16			
10:30	58	57						9				13			
10:45	74	71	254	254	508			11	40			12	56		
11:00	80	84						12				11			
11:15	72	119						7				11			
11:30	92	83						13				9			
11:45	106	109	350	395	745			14	46			18	50		
12:00	103	102						16				20			
12:15	102	120						7				21			
12:30	93	102						16				20			
12:45	89	111	388	434	822			14	53			17	78		
13:00	92	83						16				13			
13:15	86	101						16				8			
13:30	78	70						16				15			
13:45	65	84	320	338	658			10	57			9	45		
14:00	62	86						6				11			
14:15	90	83						5				12			
14:30	70	85						12				15			
14:45	81	102	303	355	658			6	28			23	61		
15:00	76	99						18				21			
15:15	102	109						70				10			
15:30	99	121						33				15			
15:45	133	91	410	420	830			25	146			9	55		
16:00	126	103						10				19			
16:15	172	133						20				13			
16:30	199	145						32				30			
16:45	180	123	677	504	1181	X	X	38	101	X	X	26	88		X
17:00	222	139						36				22			
17:15	156	113						30				20			
17:30	122	135						19				24			
17:45	122	135	621	522	1143	X	X	19	104	X	X	24	90		X

RESULT: **Warrant 2 fails at the 100% level by meeting only 2 of the 4 hours required (Fig. 4C-1).**
Warrant 2 meets at the 70% Factor level if 85% running speed is assumed >40 mph. (Fig. 4C-2).

WARRANT 3, PEAK HOUR

HOUR	NB	SB	HR NB	HR SB	TOT NB+SB	100%	70%	EB	HR EB	100%	70%	WB	HR WB	100%	70%
6:00	30	104						11				10			
6:15	14	123						9				20			
6:30	28	104						11				32			
6:45	31	113	104	443	547			12	44			34	96		
7:00	40	85						14				30			
7:15	46	103						17				45			
7:30	50	72						16				61			
7:45	60	86	196	345	541			35	82			50	187		
8:00	51	88						19				21			
8:15	54	85						25				24			
8:30	64	87						37				27			
8:45	71	104	239	363	602			46	127			35	106		
9:00	59	101						15				12			
9:15	53	111						11				15			
9:30	40	123						11				16			
9:45	59	93	211	429	640			8	46			14	57		
10:00	61	106						8				14			
10:15	60	136						10				16			
10:30	58	148						9				13			
10:45	74	125	254	515	768			11	40			12	56		
11:00	80	142						12				11			
11:15	72	115						7				11			
11:30	92	138						13				9			
11:45	106	138	350	532	882			14	46			18	50		
12:00	103	104						17				20			
12:15	102	123						8				21			
12:30	93	104						17				20			
12:45	89	113	388	443	831			15	58			17	78		
13:00	92	85						17				13			
13:15	86	103						17				8			
13:30	78	72						17				15			
13:45	65	86	320	345	665			11	63			9	45		
14:00	62	88						6				11			
14:15	90	85						5				12			
14:30	70	87						13				15			
14:45	81	104	303	363	666			6	30			23	61		
15:00	76	101						19				21			
15:15	102	111						77				10			
15:30	99	123						36				15			
15:45	133	93	410	429	839			27	160			9	55		
16:00	126	106						11				19			
16:15	172	136						22				13			
16:30	199	148						35				30			
16:45	180	125	677	515	1191			41	110			26	88		
17:00	222	142	773	551	1324	X		39				22			
17:15	156	115						32	149	X		20	98		
17:30	122	138						21				24			
17:45	122	138	621	532	1154			21	114			24	90		

RESULT: **Warrant 3 satisfied during PM Peak hour between 4:30 Pm and 5:30 PM (Fig. 4-C-4).**

APPENDIX C
ACCIDENT DATA

Crash Data

Bloomington

G.E. Road at Keaton Place

	All Crashes						Wet						Dark					
Type	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total
Rear end						0						0						0
Turning		1		1	2	4						0						0
Angle			1	1	5	7			1		2	3					1	1
Total Crashes	0	1	1	2	7	11	0	0	1	0	2	3	0	0	0	0	1	1
Total injury count		1	1	2		4			1			1						0

Hershey Road at Clearwater Avenue

	All Crashes						Wet						Dark					
Type	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total
Rear end				1	6	7					2	2						0
Turning					1	1						0					1	1
Angle			1	1	6	8					2	2					1	1
Total Crashes	0	0	1	2	13	16	0	0	0	0	4	4	0	0	0	0	2	2
Total injury count			1	2		3						0						0

Hershey Road at Arrowhead Drive

	All Crashes						Wet						Dark					
Type	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total	Fatal	A Injury	B Injury	C Injury	PDO	Total
Rear end			1			1			1			1			1			1
Turning					1	1						0					1	1
Angle					3	3					1	1					1	1
Total Crashes	0	0	1	0	4	5	0	0	1	0	1	2	0	0	1	0	2	3
Total injury count			1			1			1			1			1			1

City of Bloomington, Illinois - Engineering Department Crash Details with Summary

01/01/2010 - 10/09/2013

11 Intersection
0 Midblock
0 Private Property
11 Total

0 1) Pedestrian
0 2) Pedalcyclist
0 3) Train
0 4) Animal
0 5) Overturned
0 6) Fixed Object
0 7) Other Object
0 8) Non Collision

0 9) Parked Vehicle
4 10) Turning
0 11) Rear End
0 12) Side Swipe Same Direction
0 13) Side Swipe Opposite Dir
0 14) Head On
7 15) Angle

Injuries Travel Direction

A	B	C	K	Unit 1	Unit 2
0				:12-1A	**0** :8-9A
0				:1-2A	**1** :9-10A
0				:2-3A	**0** :10-11A
0				:3-4A	**3** :11-12P
0				:4-5A	**1** :12-1P
0				:5-6A	**0** :1-2P
0				:6-7A	**1** :2-3P
2				:7-8A	**1** :3-4P

Action

Unit 1	Unit 2
0 :4-5P	**0** :11-12A
1 :5-6P	
1 :6-7P	
0 :7-8P	
0 :8-9P	
0 :9-10P	
0 :10-11P	

Surface Condition

8 1) Dry
3 2) Wet
0 3) Snow or Slush
0 4) Ice
0 5) Sand, Mud, Dirt
0 6) Other

Lighting Condition

10 1) Daylight
0 2) Dawn
0 3) Dusk
0 4) Darkness
1 5) Dark, Lighted Rd

286 AUTO ROW DR / KEATON PL @ GENERAL ELECTRIC RD — **1 1 2 0** Injury Totals

Police Report Number	Date	Day	Time	Type	Distance	Dir	Prop	A	B	C	K	Unit 1	Unit 2	Action Unit 1	Action Unit 2	Surface Condition	Lighting Condition
20100101	01/12/2010	Tue	11:35 AM	ANGLE	0	N		0	0	1	0	N	E	TURNING LEFT	STRAIGHT AHEAD	DRY	1
20101303	08/03/2010	Tue	3:42 PM	ANGLE	0	N		0	0	0	0	S	N	TURNING RIGHT	TURNING LEFT	DRY	1
20110257	02/08/2011	Tue	5:19 PM	ANGLE	0	N		0	0	0	0	N	E	STRAIGHT AHEAD	STRAIGHT AHEAD	DRY	1
20110570	04/08/2011	Fri	12:10 PM	ANGLE	0	N		0	0	0	0	S	E	STRAIGHT AHEAD	STRAIGHT AHEAD	WET	1
20111413	09/01/2011	Thu	11:28 AM	TURNING	0	N		1	0	1	0	N	E	TURNING LEFT	TURNING LEFT	DRY	1
20111581	10/05/2011	Wed	9:45 AM	TURNING	0	N		0	0	0	0	N	E	TURNING LEFT	STRAIGHT AHEAD	DRY	1
20120208	02/04/2012	Sat	6:50 PM	ANGLE	0	N		0	0	0	0	NE	N	ENTER FROM DRIVE/ALLE	STRAIGHT AHEAD	WET	5
20120297	02/21/2012	Tue	7:51 AM	TURNING	0	N		0	0	0	0	NE	W	TURNING LEFT	STRAIGHT AHEAD	DRY	1
20121018	07/09/2012	Mon	11:39 AM	ANGLE	0	N		0	0	0	0	NW	E	SLOW/STOP - LEFT TURN	STRAIGHT AHEAD	DRY	1
20121913	12/07/2012	Fri	2:48 PM	ANGLE	0	N		0	1	0	0	SE	W	TURNING LEFT	STRAIGHT AHEAD	WET	1
20130459	03/08/2013	Fri	7:41 AM	TURNING	0	N		0	0	0	0	NW	W	TURNING LEFT	STRAIGHT AHEAD	DRY	1

City of Bloomington, Illinois - Engineering Department Crash Details with Summary

01/01/2010 - 10/09/2013

Location	Type	Type (cont.)	Injuries Time of Day	Travel Time of Day	Action Time of Day	Surface Condition	Lighting Condition
16 Intersection	0 1) Pedestrian	0 9) Parked Vehicle	0 :12-1A	1 :8-9A	3 :4-5P	12 1) Dry	13 1) Daylight
0 Midblock	0 2) Pedalcyclist	1 10) Turning	0 :1-2A	0 :9-10A	0 :5-6P	4 2) Wet	0 2) Dawn
0 Private Property	0 3) Train	7 11) Rear End	0 :2-3A	2 :10-11A	1 :6-7P	0 3) Snow or Slush	0 3) Dusk
16 Total	0 4) Animal	0 12) Side Swipe Same Direction	0 :3-4A	1 :11-12P	0 :7-8P	0 4) Ice	2 4) Darkness
	0 5) Overturned	0 13) Side Swipe Opposite Dir	0 :4-5A	1 :12-1P	2 :8-9P	0 5) Sand, Mud, Dirt	1 5) Dark, Lighted Rd
	0 6) Fixed Object	0 14) Head On	0 :5-6A	2 :1-2P	1 :9-10P	0 6) Other	
	0 7) Other Object	8 15) Angle	0 :6-7A	0 :2-3P	0 :10-11P		
	0 8) Non Collision		0 :7-8A	2 :3-4P	0 :11-12A		

327 HERSHEY RD @ CLEARWATER AVE — Injury Totals: A 0, B 1, C 2, K 0

Police Report Number	Date	Day	Time	Type	Dist-ance	Dir	Pri Prop	A	B	C	K	Travel Direction Unit 1	Travel Direction Unit 2	Action Unit 1	Action Unit 2	Surface Condition	Lighting Condition
20100471	03/06/2010	Sat	8:56 PM	REAR END	0		N	0	0	0	0	N	N	STRAIGHT AHEAD	SLOW/STOP IN TRAFFIC	DRY	1
20100921	05/28/2010	Fri	1:25 PM	ANGLE	0		N	0	0	0	0	S	W	STARTING IN TRAFFIC	STARTING IN TRAFFIC	DRY	1
20101083	06/25/2010	Fri	3:46 PM	REAR END	0		N	0	0	0	0	N	N	SLOW/STOP IN TRAFFIC	SLOW/STOP IN TRAFFIC	DRY	1
20101370	08/10/2010	Tue	4:36 PM	REAR END	0		N	0	0	0	0	N	N	STRAIGHT AHEAD	STRAIGHT AHEAD	DRY	1
20102187	12/17/2010	Fri	12:18 PM	REAR END	0		N	0	0	0	0	S	S	STRAIGHT AHEAD	STRAIGHT AHEAD	WET	1
20102217	12/22/2010	Wed	11:19 AM	REAR END	0		N	0	0	0	0	N	N	STRAIGHT AHEAD	SLOW/STOP IN TRAFFIC	DRY	1
20110301	02/14/2011	Mon	8:00 PM	TURNING	0		N	0	0	0	0	NE	E	TURNING RIGHT	STRAIGHT AHEAD	DRY	4
20110845	05/24/2011	Tue	6:30 PM	REAR END	0		N	0	0	1	0	E	E	STRAIGHT AHEAD	STRAIGHT AHEAD	DRY	1
20111015	06/19/2011	Sun	10:57 AM	ANGLE	0		N	0	0	0	0	W	S	SLOW/STOP - LEFT TURN	STRAIGHT AHEAD	DRY	1
20111591	10/06/2011	Thu	8:33 AM	ANGLE	0		N	0	0	0	0	S	W	STRAIGHT AHEAD	STRAIGHT AHEAD	DRY	1
20111649	10/09/2011	Sun	4:29 PM	ANGLE	0		N	0	0	1	0	E	S	STRAIGHT AHEAD	STARTING IN TRAFFIC	DRY	1
20121521	09/29/2012	Sat	10:59 AM	ANGLE	0		N	0	0	0	0	W	N	STARTING IN TRAFFIC	STRAIGHT AHEAD	DRY	1
20121629	10/18/2012	Thu	9:12 PM	ANGLE	0		N	0	0	0	0	W	S	STRAIGHT AHEAD	STRAIGHT AHEAD	WET	5
20121916	12/07/2012	Fri	1:03 PM	ANGLE	0		N	0	0	0	0	S	W	STRAIGHT AHEAD	STRAIGHT AHEAD	WET	1
20130181	01/29/2013	Tue	4:23 PM	REAR END	0		N	0	0	0	0	N	N	STRAIGHT AHEAD	SLOW/STOP IN TRAFFIC	WET	4
20132062	02/08/2013	Fri	3:41 PM	ANGLE	0		N	0	1	0	0	W	N	STRAIGHT AHEAD	STRAIGHT AHEAD	DRY	1

City of Bloomington, Illinois - Engineering Department Crash Details with Summary

01/01/2010 - 10/09/2013

Police Report Number	Date	Day	Time	Type	Distance	Dir	Pri Prop	A	B	C	K	Travel Direction Unit 1	Travel Direction Unit 2	Action Unit 1	Action Unit 2	Surface Condition	Lighting Condition
5 Intersection				**0** 1) Pedestrian			**0** 9) Parked Vehicle		**0**	:12-1A		**0** :8-9A		**1** :4-5P		**3** 1) Dry	**1** 1) Daylight
0 Midblock				**0** 2) Pedalcyclist			**1** 10) Turning		**0**	:1-2A		**0** :9-10A		**2** :5-6P		**1** 2) Wet	**1** 2) Dawn
0 Private Property				**0** 3) Train			**1** 11) Rear End		**0**	:2-3A		**0** :10-11A		**0** :6-7P		**1** 3) Snow or Slush	**0** 3) Dusk
5 **Total**				**0** 4) Animal			**0** 12) Side Swipe Same Direction		**0**	:3-4A		**0** :11-12P		**0** :7-8P		**0** 4) Ice	**1** 4) Darkness
				0 5) Overturned			**0** 13) Side Swipe Opposite Dir		**0**	:4-5A		**0** :12-1P		**0** :8-9P		**0** 5) Sand, Mud, Dirt	**2** 5) Dark, Lighted Rd
				0 6) Fixed Object			**0** 14) Head On		**0**	:5-6A		**0** :1-2P		**0** :9-10P		**0** 6) Other	
				0 7) Other Object			**3** 15) Angle		**1**	:6-7A		**1** :2-3P		**0** :10-11P			
				0 8) Non Collision					**0**	:7-8A		**0** :3-4P		**0** :11-12A			
313 HERSHEY RD @ ARROWHEAD DR								**0**	**1**	**0**	**0**	Injury Totals					
20100071	01/07/2010	Thu	2:30 PM	ANGLE	0	N		0	0	0	0	E	S	STRAIGHT AHEAD	STARTING IN TRAFFIC	SNOW OR SLUSH	1
20111818	11/09/2011	Wed	5:24 PM	TURNING	0	N		0	0	0	0	N	S	TURNING LEFT	STRAIGHT AHEAD	DRY	5
20121733	11/06/2012	Tue	6:41 AM	ANGLE	0	N		0	0	0	0	S	NW	STRAIGHT AHEAD	TURNING LEFT	DRY	2
20121897	12/07/2012	Fri	4:49 PM	REAR END	0	N		0	1	0	0	N	N	STRAIGHT AHEAD	SLOW/STOP IN TRAFFIC	WET	4
20122038	12/24/2012	Mon	5:30 PM	ANGLE	0	N		0	0	0	0	S	W	STRAIGHT AHEAD	STARTING IN TRAFFIC	DRY	5

APPENDIX D
CAPACITY ANALYSES

LEVEL OF SERVICE (LOS) SUMMARY

General Electric Road and Keaton Place/Auto Row Drive

2014	No Geometric Improvements				LTL-NB/SB		LTL-NB/SB		RTL-EB; LTL-NB/SB		RTL-EB; LTL-NB/SB	
	Split Phase		No Split Phase		Split Phase		No Split Phase		Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	19.9	B	16.8	B	17.2	B	17.2	B	21.0	C	18.8	B
EBT	29.1	C	25.2	C	26.4	C	25.7	C	30.1	C	27.3	C
EBR	29.1	C	25.2	C	26.4	C	25.7	C	9.1	A	17.4	B
WBL	19.3	B	16.3	B	16.7	B	16.7	B	20.2	B	18.1	B
WBT	30.3	C	26.3	C	27.5	C	26.8	C	31.8	C	28.9	C
WBR	30.1	C	26.3	C	27.5	C	26.8	C	31.8	C	28.9	C
NBL	43.8	D	25.7	C	46.0	D	24.6	C	44.3	D	22.9	C
NBT	43.8	D	25.7	C	45.1	D	31.8	C	43.5	D	29.8	C
NBR	43.8	D	25.7	C	45.1	D	31.8	C	43.5	D	29.8	C
SBL	47.0	D	25.1	C	48.3	D	24.1	C	44.2	D	22.4	C
SBT	47.0	D	25.1	C	48.4	D	31.8	C	44.3	D	29.8	C
SBR	47.0	D	25.1	C	48.4	D	31.8	C	44.3	D	29.8	C
INT	**30.0**	**C**	**25.3**	**C**	**27.4**	**C**	**25.8**	**C**	**30.6**	**C**	**27.2**	**C**

2014	No Geometric Improvements				LTL-NB/SB		LTL-NB/SB		RTL-EB; LTL-NB/SB		RTL-EB; LTL-NB/SB	
	Split Phase		No Split Phase		Split Phase		No Split Phase		Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	15.0	B	14.6	B	14.6	B	14.6	B	14.6	B	6.5	A
EBT	25.8	C	25.8	C	25.8	C	25.8	C	24.7	C	14.1	B
EBR	25.8	C	25.8	C	25.8	C	25.8	C	7.0	A	14.1	B
WBL	16.5	B	16.0	B	16.0	B	16.0	B	15.5	B	9.2	A
WBT	22.8	C	22.8	C	22.8	C	22.8	C	22.8	C	11.4	B
WBR	22.8	C	22.8	C	22.8	C	22.8	C	22.8	C	11.4	B
NBL	53.3	D	32.7	C	52.0	D	31.2	C	52.0	D	55.9	E
NBT	53.3	D	32.7	C	49.5	D	28.8	C	49.5	D	46.4	D
NBR	53.3	D	32.7	C	49.5	D	28.8	C	49.5	D	46.4	D
SBL	53.7	D	29.1	C	50.2	D	28.0	C	50.2	D	44.7	D
SBT	53.7	D	29.1	C	52.3	D	28.8	C	52.3	D	46.5	D
SBR	53.7	D	29.1	C	52.3	D	28.8	C	52.3	D	46.5	D
INT	**28.4**	**C**	**25.2**	**C**	**28.0**	**C**	**24.9**	**C**	**26.8**	**C**	**17.4**	**B**

General Electric Road and Keaton Place/Auto Row Drive

2034	No Geometric Improvements				LTL-NB/SB		LTL-NB/SB		RTL-EB; LTL-NB/SB		RTL-EB; LTL-NB/SB	
	Split Phase		No Split Phase		Split Phase		No Split Phase		Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	23.1	C	18.2	B	21.2	C	19.4	B	21.2	C	18.8	B
EBT	31.3	C	26.1	C	29.8	C	27.5	C	29.0	C	26.2	C
EBR	31.3	C	26.1	C	29.8	C	27.5	C	8.1	A	15.1	B
WBL	21.0	C	16.6	B	19.3	B	17.7	B	18.9	B	16.8	B
WBT	34.1	C	28.2	C	32.3	C	29.8	C	32.3	C	29.0	C
WBR	34.1	C	28.2	C	32.3	C	29.8	C	32.3	C	29.0	C
NBL	44.9	D	27.6	C	47.1	D	25.4	C	46.2	D	26.0	C
NBT	44.9	D	27.6	C	46.0	D	32.5	C	45.2	D	33.2	C
NBR	44.9	D	27.6	C	46.0	D	32.5	C	45.2	D	33.2	C
SBL	46.3	D	26.8	C	45.9	D	24.8	C	46.7	D	25.4	C
SBT	46.3	D	26.8	C	46.0	D	32.5	C	46.8	D	33.2	C
SBR	46.3	D	26.8	C	46.0	D	32.5	C	46.8	D	33.2	C
INT	**32.8**	**C**	**26.7**	**C**	**31.2**	**C**	**28.1**	**C**	**30.4**	**C**	**26.9**	**C**

2034	No Geometric Improvements				LTL-NB/SB		LTL-NB/SB		RTL-EB; LTL-NB/SB		RTL-EB; LTL-NB/SB	
	Split Phase		No Split Phase		Split Phase		No Split Phase		Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	6.5	A	6.5	A	6.5	A	6.5	A	6.5	A	6.5	A
EBT	14.1	B	14.1	B	14.1	B	14.1	B	13.1	B	13.1	B
EBR	14.1	B	14.1	B	14.1	B	14.1	B	3.0	A	0.9	A
WBL	9.2	A	9.2	A	9.2	A	9.2	A	8.1	A	8.1	A
WBT	11.4	B	11.4	B	11.4	B	11.4	B	11.4	B	11.4	B
WBR	11.4	B	11.4	B	11.4	B	11.4	B	11.4	B	11.4	B
NBL	172.7	F	82.8	F	82.6	F	55.9	E	82.6	F	55.9	E
NBT	172.7	F	82.8	F	58.9	E	46.4	D	58.9	E	46.4	D
NBR	172.7	F	82.8	F	58.9	E	46.4	D	58.9	E	46.4	D
SBL	201.9	F	47.2	D	63.7	E	44.7	D	63.7	E	44.7	D
SBT	201.9	F	47.2	D	182.0	F	46.5	D	182.0	F	46.5	D
SBR	201.9	F	47.2	D	182.0	F	46.5	D	182.0	F	46.5	D
INT	**33.4**	**C**	**20.2**	**C**	**23.1**	**C**	**17.4**	**B**	**22.2**	**C**	**16.4**	**B**

Hershey Road and Arrowhead Drive

2014	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	28.4	C	13.7	B	26.1	C
EBT	28.4	C	22.6	C	26.1	C
EBR	28.4	C	22.6	C	26.1	C
WBL	31.4	C	14.8	B	28.7	C
WBT	31.4	C	23.0	C	28.7	C
WBR	31.4	C	23.0	C	28.7	C
NBL	27.4	C	9.6	A	12.5	B
NBT	27.4	C	16.9	B	20.8	C
NBR	27.4	C	16.9	B	20.8	C
SBL	30.5	C	9.0	A	11.7	B
SBT	30.5	C	19.5	B	25.3	C
SBR	30.5	C	19.5	B	25.3	C
INT	**29.9**	**C**	**18.2**	**B**	**24.6**	**C**

2014	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	35.9	D	13.5	B	27.5	C
EBT	35.9	D	21.8	C	27.5	C
EBR	35.9	D	21.8	C	27.5	C
WBL	32.1	C	13.1	B	26.9	C
WBT	32.1	C	22.1	C	26.9	C
WBR	32.1	C	22.1	C	26.9	C
NBL	52.2	D	10.0	B	11.2	B
NBT	52.2	D	25.6	C	31.6	C
NBR	52.2	D	25.6	C	31.6	C
SBL	40.0	D	11.7	B	12.9	B
SBT	40.0	D	19.9	B	21.9	C
SBR	40.0	D	19.9	B	21.9	C
INT	**45.2**	**D**	**21.9**	**C**	**27.0**	**C**

Hershey Road and Arrowhead Drive

2034	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	32.0	C	13.7	B	28.5	C
EBT	32.0	C	22.7	C	28.5	C
EBR	32.0	C	22.7	C	28.5	C
WBL	33.0	C	14.9	B	29.8	C
WBT	33.0	C	23.0	C	29.8	C
WBR	33.0	C	23.0	C	29.8	C
NBL	43.0	D	11.0	B	12.9	B
NBT	43.0	D	17.6	B	20.0	B
NBR	43.0	D	17.6	B	20.0	B
SBL	38.9	D	9.2	A	10.8	B
SBT	38.9	D	24.7	C	34.5	C
SBR	38.9	D	24.7	C	34.5	C
INT	**38.6**	**D**	**21.3**	**C**	**29.6**	**C**

2034	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	47.3	D	17.1	B	32.7	C
EBT	47.3	D	26.4	C	32.7	C
EBR	47.3	D	26.4	C	32.7	C
WBL	38.3	D	16.5	B	33.0	C
WBT	38.3	D	26.8	C	33.0	C
WBR	38.3	D	26.8	C	33.0	C
NBL	173.7	F	8.4	A	9.5	A
NBT	173.7	F	44.0	D	53.7	D
NBR	173.7	F	44.0	D	53.7	D
SBL	174.6	F	12.3	B	13.4	B
SBT	174.6	F	18.1	B	20.2	C
SBR	174.6	F	18.1	B	20.2	C
INT	**159.0**	**F**	**31.3**	**C**	**38.3**	**D**

Hershey Road and Clearwater Avenue

2014	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	35.3	D	13.9	B	31.5	C
EBT	35.5	D	24.6	C	31.5	C
EBR	35.5	D	24.6	C	31.5	C
WBL	32.3	C	14.6	B	29.1	C
WBT	32.3	C	24.9	C	29.1	C
WBR	32.3	C	24.9	C	29.1	C
NBL	29.9	C	9.6	A	13.9	B
NBT	29.9	C	17.3	B	23.0	C
NBR	29.9	C	17.3	B	23.0	C
SBL	30.2	C	9.0	A	13.0	B
SBT	30.2	C	18.3	B	24.8	C
SBR	30.2	C	18.3	B	24.8	C
INT	**31.3**	**C**	**18.6**	**B**	**25.5**	**C**

2014	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	47.6	D	13.1	B	33.3	C
EBT	47.6	D	25.6	C	33.3	C
EBR	47.6	D	25.6	C	33.3	C
WBL	46.2	D	13.7	B	29.7	C
WBT	46.2	D	23.2	C	29.7	C
WBR	46.2	D	23.2	C	29.7	C
NBL	57.0	E	11.3	B	14.9	B
NBT	57.0	E	20.9	C	31.2	C
NBR	57.0	E	20.9	C	31.2	C
SBL	49.0	D	10.4	B	13.4	B
SBT	49.0	D	19.6	B	26.2	C
SBR	49.0	D	19.6	B	26.2	C
INT	**51.9**	**D**	**19.8**	**B**	**28.1**	**C**

Hershey Road and Clearwater Avenue

2034	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
AM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	47.5	D	13.3	B	32.9	C
EBT	47.5	D	23.8	C	32.9	C
EBR	47.5	D	23.8	C	32.9	C
WBL	40.3	D	14.0	B	34.6	C
WBT	40.3	D	24.0	C	34.6	C
WBR	40.3	D	24.0	C	34.6	C
NBL	59.6	E	11.3	B	14.7	B
NBT	59.6	E	19.0	B	23.4	C
NBR	59.6	E	19.0	B	23.4	C
SBL	46.4	D	9.8	A	12.8	B
SBT	46.4	D	21.3	C	29.7	C
SBR	46.4	D	21.3	C	29.7	C
INT	**49.4**	**D**	**19.8**	**B**	**28.2**	**C**

2034	No Geo Imp		LTL All		LTL-NB/SB	
70 Sec	Split Phase		No Split Phase		No Split Phase	
PM Peak	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS
EBL	110.5	F	13.6	B	43.0	D
EBT	110.5	F	27.1	C	43.0	D
EBR	110.5	F	27.1	C	43.0	D
WBL	73.2	E	14.2	B	40.3	D
WBT	73.2	E	23.9	C	40.3	D
WBR	73.2	E	23.9	C	40.3	D
NBL	156.6	F	19.9	B	28.2	C
NBT	156.6	F	27.6	C	40.9	D
NBR	156.6	F	27.6	C	40.9	D
SBL	180.4	F	11.9	B	13.3	B
SBT	180.4	F	22.3	C	26.4	C
SBR	180.4	F	22.3	C	26.4	C
INT	**152.0**	**F**	**24.0**	**C**	**34.8**	**C**

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

General Electric Road and Keaton Place/Auto Row Drive

2014	No Geometric Improvements								LTL-NB/SB				RTL-EB; LTL-NB/SB			
	Split Phase				No Split Phase				Split Phase				Split Phase			
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	0.7	A	1	m3	0.4	A	1	m2	0.7	A	1	m3	0.7	A	1	m3
EBT	1.0	A	6	15	0.7	A	6	10	1.0	A	6	15	0.9	A	6	15
EBR	1.0	A	6	15	0.7	A	6	10	1.0	A	6	15	0.0	A	0	m0
WBL	3.2	A	3	15	1.6	A	3	9	3.0	A	3	15	3.0	A	3	15
WBT	5.5	A	59	133	3.6	A	61	92	5.3	A	58	128	5.3	A	58	128
WBR	5.5	A	59	133	3.6	A	61	92	5.3	A	58	128	5.3	A	58	125
NBL	64.7	E	36	77	68.2	E	35	77	70.7	E	33	70	70.7	E	33	70
NBT	64.7	E	36	77	68.2	E	35	77	35.0	C	1	20	35.0	C	1	20
NBR	64.7	E	36	77	68.2	E	35	77	35.0	C	1	20	35.0	C	1	20
SBL	48.3	D	7	31	43.9	D	7	30	66.0	E	6	23	66.0	E	6	23
SBT	48.3	D	7	31	43.9	D	7	30	39.4	D	1	20	39.4	D	1	20
SBR	48.3	D	7	31	43.9	D	7	30	39.4	D	1	20	39.4	D	1	20
INT	**6.2**	**A**			**5.2**	**A**			**6.1**	**A**			**6.1**	**A**		

2014	No Geometric Improvements								LTL-NB/SB				RTL-EB; LTL-NB/SB			
	Split Phase				No Split Phase				Split Phase				Split Phase			
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	1.3	A	2	m3	0.8	A	1	m3	1.0	A	1	m3	1.0	A	1	m3
EBT	2.1	A	18	28	1.7	A	15	23	1.8	A	17	25	1.7	A	17	25
EBR	2.1	A	18	28	1.7	A	15	23	1.8	A	17	25	0.1	A	0	m0
WBL	7.8	A	10	28	4.9	A	7	21	6.1	A	9	24	6.0	A	9	24
WBT	11.6	B	101	166	8.1	A	82	133	9.5	A	92	146	9.5	A	92	146
WBR	11.6	B	101	166	8.1	A	82	133	9.5	A	92	146	9.5	A	92	146
NBL	69.8	E	149	223	73.9	E	148	221	74.1	E	112	175	74.1	E	112	175
NBT	69.8	E	149	223	73.9	E	148	221	16.4	B	1	42	16.4	B	1	42
NBR	69.8	E	149	223	73.9	E	148	221	16.4	B	1	42	16.4	B	1	42
SBL	33.9	C	14	63	18.9	B	13	53	66.5	E	13	36	66.5	E	13	36
SBT	33.9	C	14	63	18.9	B	13	53	26.1	C	2	46	26.1	C	2	46
SBR	33.9	C	14	63	18.9	B	13	53	16.1	C	2	46	26.1	C	2	46
INT	**13.8**	**B**			**12.2**	**B**			**11.5**	**B**			**11.4**	**B**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

General Electric Road and Keaton Place/Auto Row Drive

2034	No Geometric Improvements								LTL-NB/SB				RTL-EB; LTL-NB/SB			
	Split Phase				No Split Phase				Split Phase				Split Phase			
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	1.0	A	2	m3	0.6	A	1	m2	1.0	A	2	m3	1.0	A	2	m3
EBT	1.4	A	16	24	1.0	A	11	16	1.4	A	16	23	1.3	A	16	23
EBR	1.4	A	16	24	1.0	A	11	16	1.4	A	16	23	0.0	A	0	m0
WBL	3.9	A	9	22	2.0	A	5	13	3.7	A	9	21	3.6	A	9	21
WBT	7.5	A	154	224	4.5	A	106	158	7.1	A	152	215	7.1	A	151	214
WBR	7.5	A	154	224	4.5	A	106	158	7.1	A	152	215	7.1	A	151	214
NBL	65.2	E	45	90	69.7	E	45	90	71.7	E	40	81	71.7	E	40	81
NBT	65.2	E	45	90	69.7	E	45	90	31.3	C	1	22	31.3	C	1	22
NBR	65.2	E	45	90	69.7	E	45	90	31.3	C	1	22	31.3	C	1	22
SBL	47.7	D	9	37	42.0	D	9	35	66.3	E	8	28	66.3	E	8	26
SBT	47.7	D	9	37	42.0	D	9	35	36.1	D	1	20	36.1	D	1	20
SBR	47.4	D	9	37	42.0	D	9	35	36.1	D	1	20	36.1	D	1	20
INT	**7.0**	**A**			**5.4**	**A**			**6.7**	**A**			**6.7**	**A**		

2034	No Geometric Improvements								LTL-NB/SB				RTL-EB; LTL-NB/SB			
	Split Phase				No Split Phase				Split Phase				Split Phase			
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	1.6	A	3	m4	1.1	A	3	m3	1.2	A	2	m3	1.2	A	2	m3
EBT	3.8	A	32	m41	3.3	A	32	m35	3.2	A	28	m36	2.4	A	27	m35
EBR	3.8	A	32	m41	3.3	A	32	m35	3.2	A	28	m36	0.1	A	0	m0
WBL	10.3	B	16	41	7.2	A	16	33	7.8	A	14	35	7.5	A	14	35
WBT	14.7	B	179	269	11.2	B	179	238	11.9	B	161	248	12.0	B	161	248
WBR	14.7	B	179	269	11.2	B	179	238	11.9	B	161	248	12.0	B	161	248
NBL	70.0	E	184	262	75.1	E	184	261	74.2	E	137	205	74.1	E	137	205
NBT	70.0	E	184	262	75.1	E	184	261	14.4	B	1	45	14.4	B	1	45
NBR	70.0	E	184	262	75.1	E	184	261	14.4	B	1	45	14.4	B	1	45
SBL	33.5	C	17	69	16.3	B	17	56	66.9	E	15	41	66.9	E	15	41
SBT	33.5	C	17	69	16.3	B	17	56	25.0	C	2	50	25.0	C	2	50
SBR	33.5	C	17	69	16.3	B	17	56	25.0	C	2	50	25.0	C	2	50
INT	**14.4**	**B**			**12.8**	**B**			**11.9**	**B**			**11.4**	**B**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Arrowhead Drive

2014 140 Sec	No Geo Imp				LTL NS				LTL All			
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	33.3	C	48	95	32.4	C	46	93	52.8	C	72	131
EBT	33.3	C	48	95	32.4	C	46	93	19.6	C	25	68
EBR	33.3	C	48	95	32.4	C	46	93	19.6	C	25	68
WBL	73.6	E	173	246	73.5	E	172	245	75.4	C	41	84
WBT	73.6	E	173	246	73.5	E	172	245	20.3	C	11	56
WBR	73.6	E	173	246	73.5	E	172	245	20.3	C	11	56
NBL	2.3	A	10	16	2.8	A	2	m5	2.4	B	2	m5
NBT	2.3	A	10	16	2.2	A	8	14	1.9	C	52	60
NBR	2.3	A	10	16	2.2	A	8	14	1.9	C	52	60
SBL	8.9	A	147	216	4.1	A	3	10	3.5	B	8	16
SBT	8.9	A	147	216	3.9	A	50	71	3.4	C	41	51
SBR	8.9	A	147	216	3.9	A	50	71	3.4	C	41	51
INT	**21.3**	**C**			**18.6**	**B**			**15.3**	**B**		

2014 70 Sec	No Geo Imp				LTL NS				LTL All			
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	13.7	B	19	47	13.7	B	19	47	20.5	C	15	33
EBT	13.7	B	19	47	13.7	B	19	47	8.8	A	4	26
EBR	13.7	B	19	47	13.7	B	19	47	8.8	A	4	26
WBL	25.3	C	71	114	25.3	C	71	114	28.0	C	55	89
WBT	25.3	C	71	114	25.3	C	71	114	9.2	A	7	32
WBR	25.3	C	71	114	25.3	C	71	114	9.2	A	7	32
NBL	3.8	A	18	53	4.8	A	4	m10	4.7	A	3	m8
NBT	3.8	A	18	53	3.6	A	16	28	3.4	A	13	22
NBR	3.8	A	18	53	3.6	A	16	28	3.4	A	13	22
SBL	6.1	A	41	236	5.8	A	3	m10	6.1	A	3	12
SBT	6.1	A	41	236	5.8	A	40	64	5.6	A	46	76
SBR	6.1	A	41	236	5.8	A	40	64	5.6	A	46	76
INT	**9.7**	**A**			**9.6**	**A**			**8.8**	**A**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Arrowhead Drive

2014	No Geo Imp				LTL NS				LTL All			
140 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	75.4	E	120	193	75.8	E	120	193	68.1	E	72	131
EBT	75.4	E	120	193	75.8	E	120	193	32.4	C	25	68
EBR	75.4	E	120	193	75.8	E	120	193	32.4	C	25	68
WBL	48.1	D	73	134	47.6	D	72	133	58.8	E	41	84
WBT	48.1	D	73	134	47.6	D	72	133	20.2	C	11	56
WBR	48.1	D	73	134	47.6	D	72	133	20.2	C	11	56
NBL	3.0	A	55	85	2.6	A	2	m6	2.3	A	2	m5
NBT	3.0	A	55	85	2.9	A	52	88	2.5	A	52	60
NBR	3.0	A	55	85	2.9	A	52	88	3.2	A	52	60
SBL	3.1	A	47	66	3.5	A	8	18	3.2	A	8	16
SBT	3.1	A	47	66	2.8	A	41	57	2.6	A	41	51
SBR	3.1	A	47	66	2.8	A	41	57	2.6	A	41	51
INT	**12.5**	**B**			**12.4**	**B**			**9.4**	**A**		

2014	No Geo Imp				LTL NS				LTL All			
70 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	23.0	C	52	84	23.0	C	52	84	24.8	C	35	60
EBT	23.0	C	52	84	23.0	C	52	84	12.7	B	12	34
EBR	23.0	C	52	84	23.0	C	52	84	12.7	B	12	34
WBL	14.5	B	25	55	14.5	B	25	55	22.0	C	20	39
WBT	14.5	B	25	55	14.5	B	25	55	8.7	A	5	29
WBR	14.5	B	25	55	14.5	B	25	55	8.7	A	5	29
NBL	5.2	A	62	126	5.1	A	3	m8	5.5	A	3	m10
NBT	5.2	A	62	126	4.5	A	55	90	4.8	A	57	116
NBR	5.2	A	62	126	4.5	A	55	90	4.8	A	57	116
SBL	8.6	A	66	136	9.7	A	9	m36	9.2	A	8	33
SBT	8.6	A	66	136	7.3	A	47	105	7.0	A	44	94
SBR	8.6	A	66	136	7.3	A	47	105	7.0	A	44	94
INT	**8.5**	**A**			**7.9**	**A**			**7.6**	**A**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Arrowhead Drive

2034	No Geo Imp				LTL NS				LTL All			
140 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	35.3	D	55	102	34.8	D	54	101	52.2	D	35	69
EBT	35.3	D	55	102	34.8	D	54	101	19.4	B	10	47
EBR	35.3	D	55	102	34.8	D	54	101	19.4	B	10	47
WBL	74.8	E	184	260	74.4	E	184	259	76.4	E	128	194
WBT	74.8	E	184	260	74.4	E	184	259	20.1	C	17	59
WBR	74.8	E	184	260	74.4	E	184	259	20.1	C	17	59
NBL	4.2	A	16	108	4.8	A	3	m23	4.3	A	5	m21
NBT	4.2	A	16	108	3.8	A	16	87	3.6	A	28	83
NBR	4.2	A	16	108	3.8	A	16	87	3.6	A	28	83
SBL	5.3	A	96	145	4.7	A	6	m16	4.0	A	5	15
SBT	5.3	A	96	145	5.0	A	90	132	4.3	A	87	127
SBR	5.3	A	96	145	5.0	A	90	132	4.3	A	87	127
INT	**16.6**	**B**			**16.3**	**B**			**13.4**	**B**		

2034	No Geo Imp				LTL NS				LTL All			
70 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	13.7	B	20	49	13.7	B	20	49	20.6	C	16	34
EBT	13.7	B	20	49	13.7	B	20	49	8.8	A	5	27
EBR	13.7	B	20	49	13.7	B	20	49	8.8	A	5	27
WBL	26.6	C	77	122	26.6	C	77	122	28.7	C	58	94
WBT	26.6	C	77	122	26.6	C	77	122	9.2	A	8	33
WBR	26.6	C	77	122	26.6	C	77	122	9.2	A	8	33
NBL	4.4	A	15	61	4.7	A	5	m10	5.7	A	3	m14
NBT	4.4	A	15	61	3.3	A	22	33	3.7	A	12	51
NBR	4.4	A	15	61	3.3	A	22	33	3.7	A	12	51
SBL	5.8	A	55	81	7.0	A	6	m22	5.6	A	4	14
SBT	5.8	A	55	81	8.7	A	107	189	5.8	A	62	94
SBR	5.8	A	55	81	8.7	A	107	189	5.8	A	62	94
INT	**8.9**	**A**			**10.3**	**B**			**8.2**	**A**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Arrowhead Drive

2034	No Geo Imp				LTL NS				LTL All			
140 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	76.7	E	127	200	76.8	E	127	200	69.2	E	76	136
EBT	76.7	E	127	200	76.8	E	127	200	32.4	C	26	70
EBR	76.7	E	127	200	76.8	E	127	200	32.4	C	26	70
WBL	49.4	D	79	140	49.4	D	79	140	59.1	E	43	87
WBT	49.4	D	79	140	49.4	D	79	140	20.1	C	12	57
WBR	49.4	D	79	140	49.4	D	79	140	20.1	C	12	57
NBL	4.8	A	86	m256	3.1	A	4	m8	3.5	A	6	m8
NBT	4.8	A	86	m256	4.2	A	83	m228	3.9	A	122	m117
NBR	4.8	A	86	m256	4.2	A	83	m228	3.9	A	122	m117
SBL	4.6	A	93	115	6.0	A	14	m29	9.5	A	27	m58
SBT	4.6	A	93	115	3.5	A	72	98	6.5	A	137	178
SBR	4.6	A	93	115	3.5	A	72	98	6.5	A	137	178
INT	**11.6**	**B**			**11.0**	**B**			**9.9**	**A**		

2034	No Geo Imp				LTL NS				LTL All			
70 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	23.6	C	54	88	23.6	C	54	88	25.2	C	37	62
EBT	23.6	C	54	88	23.6	C	54	88	12.6	B	13	34
EBR	23.6	C	54	88	23.6	C	54	88	12.6	B	13	34
WBL	14.5	B	26	56	14.5	B	26	56	22.1	C	21	40
WBT	14.5	B	26	56	14.5	B	26	56	8.6	A	6	29
WBR	14.5	B	26	56	14.5	B	26	56	8.6	A	6	29
NBL	7.7	A	126	m178	5.4	A	4	m8	5.2	A	4	m8
NBT	7.7	A	126	m178	6.3	A	88	m141	5.5	A	85	m127
NBR	7.7	A	126	m178	6.3	A	88	m141	5.5	A	85	m127
SBL	12.2	B	111	215	17.3	B	17	m64	14.6	B	15	m62
SBT	12.2	B	111	215	9.8	A	87	170	7.9	A	75	159
SBR	12.2	B	111	215	9.8	A	87	170	7.9	A	75	159
INT	**10.7**	**B**			**9.3**	**B**			**7.9**	**A**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Clearwater Avenue

2014	No Geo Imp				LTL NS				LTL All			
140 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	26.8	C	72	132	25.2	C	67	128	67.5	E	34	70
EBT	26.8	C	72	132	25.2	C	67	128	18.3	B	149	225
EBR	26.8	C	72	132	25.2	C	67	128	18.3	B	149	225
WBL	89.4	F	245	330	87.4	F	244	328	125.7	F	~65	#144
WBT	89.4	F	245	330	87.4	F	244	328	63.5	E	106	168
WBR	89.4	F	245	330	87.4	F	244	328	63.5	E	106	168
NBL	2.9	A	17	35	8.2	A	18	38	6.5	A	18	40
NBT	2.9	A	17	35	7.0	A	41	61	5.4	A	36	51
NBR	2.9	A	17	35	7.0	A	41	61	5.4	A	36	51
SBL	7.2	A	63	108	7.5	A	5	18	4.0	A	6	17
SBT	7.2	A	63	108	7.1	A	60	102	3.7	A	43	74
SBR	7.2	A	63	108	7.1	A	60	102	3.7	A	43	74
INT	**27.0**	**C**			**27.4**	**C**			**26.3**	**C**		

2014	No Geo Imp				LTL NS				LTL All			
70 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	10.7	B	23	61	10.7	B	23	61	25.9	C	14	35
EBT	10.7	B	23	61	10.7	B	23	61	10.3	B	11	49
EBR	10.7	B	23	61	10.7	B	23	61	10.3	B	11	49
WBL	33.1	C	105	159	32.9	C	105	159	34.6	C	43	80
WBT	33.1	C	105	159	32.9	C	105	159	27.1	C	60	102
WBR	33.1	C	105	159	32.9	C	105	159	27.1	C	60	102
NBL	6.2	A	23	81	7.2	A	8	40	7.1	A	17	38
NBT	6.2	A	23	81	5.9	A	18	60	5.9	A	38	61
NBR	6.2	A	23	81	5.9	A	18	60	5.9	A	38	61
SBL	6.9	A	38	77	7.1	A	3	15	4.8	A	3	12
SBT	6.9	A	38	77	6.7	A	36	72	4.5	A	27	57
SBR	6.9	A	38	77	6.7	A	36	72	4.5	A	27	57
INT	**13.0**	**B**			**12.9**	**B**			**11.9**	**B**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Clearwater Avenue

2014	No Geo Imp				LTL NS				LTL All			
140 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	75.3	E	208	290	74.2	E	195	277	62.9	E	34	70
EBT	75.3	E	208	290	74.2	E	195	277	62.5	E	149	225
EBR	75.3	E	208	290	74.2	E	195	277	62.5	E	149	225
WBL	152.6	F	186	#290	153.6	F	~203	#308	204.0	F	~65	#144
WBT	152.6	F	186	#290	153.6	F	~203	#308	56.8	E	106	168
WBR	152.6	F	186	#290	153.6	F	~203	#308	56.8	E	106	168
NBL	6.4	A	393	542	4.5	A	25	40	3.9	A	18	40
NBT	6.4	A	393	542	3.4	A	50	64	3.0	A	36	51
NBR	6.4	A	393	542	3.4	A	50	64	3.0	A	36	51
SBL	5.2	A	115	186	5.4	A	7	21	3.9	A	6	17
SBT	5.2	A	115	186	4.9	A	52	90	3.5	A	43	74
SBR	5.2	A	115	186	4.9	A	52	90	3.5	A	43	74
INT	**32.9**	**C**			**31.6**	**C**			**23.4**	**C**		

2014	No Geo Imp				LTL NS				LTL All			
70 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	28.9	C	77	133	28.6	C	76	132	27.5	C	15	39
EBT	28.9	C	77	133	28.6	C	76	132	24.2	C	53	105
EBR	28.9	C	77	133	28.6	C	76	132	24.2	C	53	105
WBL	41.5	D	76	131	41.7	D	75	130	40.1	D	25	57
WBT	41.5	D	76	131	41.7	D	75	130	24.8	C	43	85
WBR	41.5	D	76	131	41.7	D	75	130	24.8	C	43	85
NBL	6.2	A	76	123	4.1	A	24	20	2.8	A	23	8
NBT	6.2	A	76	123	2.8	A	48	13	1.8	A	45	8
NBR	6.2	A	76	123	2.8	A	48	13	1.8	A	45	8
SBL	5.2	A	36	71	5.5	A	4	17	4.4	A	4	14
SBT	5.2	A	36	71	4.8	A	32	64	3.8	A	27	54
SBR	5.2	A	36	71	4.8	A	32	64	3.8	A	27	54
INT	**13.2**	**B**			**11.8**	**B**			**9.0**	**A**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Clearwater Avenue

2034	No Geo Imp				LTL NS				LTL All			
140 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	30.6	C	88	149	30.1	C	87	147	66.9	C	33	69
EBT	30.6	C	88	149	30.1	C	87	147	17.8	C	26	85
EBR	30.6	C	88	149	30.1	C	87	147	17.8	C	26	85
WBL	86.9	F	257	343	87.7	F	258	343	127.2	C	103	#178
WBT	86.9	F	257	343	87.7	F	258	343	62.9	C	148	213
WBR	86.9	F	257	343	87.7	F	258	343	62.9	C	148	213
NBL	10.1	B	136	220	10.2	B	23	55	6.7	B	17	91
NBT	10.1	B	136	220	7.7	A	51	101	4.9	C	37	60
NBR	10.1	B	136	220	7.7	A	51	101	4.9	C	37	60
SBL	8.6	A	109	176	8.1	A	9	25	4.3	B	6	18
SBT	8.6	A	109	176	8.2	A	100	161	4.3	C	65	113
SBR	8.6	A	109	176	8.2	A	100	161	4.3	C	65	113
INT	**25.2**	**C**			**24.5**	**C**			**21.8**	**C**		

2034	No Geo Imp				LTL NS				LTL All			
70 Sec												
AM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	10.7	B	24	63	10.7	B	24	63	26.0	C	15	36
EBT	10.7	B	24	63	10.7	B	24	63	10.2	B	12	51
EBR	10.7	B	24	63	10.7	B	24	63	10.2	B	12	51
WBL	34.6	C	111	168	34.6	C	111	168	35.0	D	45	83
WBT	34.6	C	111	168	34.6	C	111	168	27.7	C	65	107
WBR	34.6	C	111	168	34.6	C	111	168	27.7	C	65	107
NBL	7.6	A	40	122	6.6	A	15	32	5.8	A	13	44
NBT	7.6	A	40	122	4.9	A	33	52	4.3	A	26	62
NBR	7.6	A	40	122	4.9	A	33	52	4.3	A	26	62
SBL	7.9	A	65	121	7.4	A	5	20	5.0	A	4	16
SBT	7.9	A	65	121	7.4	A	59	110	5.0	A	44	88
SBR	7.9	A	65	121	7.4	A	59	110	5.0	A	44	88
INT	**12.8**	**B**			**11.9**	**B**			**10.3**	**B**		

SYNCHRO LEVEL OF SERVICE (LOS) SUMMARY

Hershey Road and Clearwater Avenue

2034	No Geo Imp				LTL NS				LTL All			
140 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	66.3	E	208	290	68.7	E	208	290	61.7	E	35	72
EBT	66.3	E	208	290	68.7	E	208	290	64.3	E	164	241
EBR	66.3	E	208	290	68.7	E	208	290	64.3	E	164	241
WBL	112.1	F	186	#290	123.6	F	~197	#298	211.6	F	~69	#152
WBT	112.1	F	186	#290	123.6	F	~197	#298	56.8	E	113	175
WBR	112.1	F	186	#290	123.6	F	~197	#298	56.8	E	113	175
NBL	11.5	B	393	542	8.4	A	31	228	5.4	A	23	109
NBT	11.5	B	393	542	3.7	A	61	78	2.6	A	44	87
NBR	11.5	B	393	542	3.7	A	61	78	2.6	A	44	87
SBL	7.4	A	115	186	6.9	A	12	33	4.8	A	9	26
SBT	7.4	A	115	186	6.2	A	93	152	4.2	A	73	158
SBR	7.4	A	115	186	6.2	A	93	152	4.2	A	73	158
INT	**25.2**	**C**			**22.8**	**C**			**19.3**	**C**		

2034	No Geo Imp				LTL NS				LTL All			
70 Sec												
PM Peak	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue	Delay (sec)	LOS	50% Queue	95% Queue
EBL	32.0	C	83	155	30.1	C	83	148	27.8	C	16	40
EBT	32.0	C	83	155	30.1	C	83	148	27.0	C	61	119
EBR	32.0	C	83	155	30.1	C	83	148	27.0	C	61	119
WBL	47.6	D	78	#172	43.4	D	79	#144	43.2	D	27	62
WBT	47.6	D	78	#172	43.4	D	79	#144	25.9	C	47	91
WBR	47.6	D	78	#172	43.4	D	79	#144	25.9	C	47	91
NBL	7.7	A	26	162	7.1	A	14	43	5.2	A	7	37
NBT	7.7	A	26	162	2.9	A	19	83	1.9	A	6	70
NBR	7.7	A	26	162	2.9	A	19	83	1.9	A	6	70
SBL	6.1	A	69	101	6.5	A	7	24	5.1	A	6	20
SBT	6.1	A	69	101	6.5	A	56	94	4.3	A	46	80
SBR	6.1	A	69	10	6.5	A	56	94	4.3	A	46	80
INT	**13.4**	**B**			**10.8**	**B**			**8.4**	**A**		

HIGHWAY CAPACITY SOFTWARE (HCS)

LEFT TURN LANES - NB/SB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 62.0	G =	G =	G = 7.0	G = 46.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	37	505		37	628		38	10		8	9	
Lane Group Capacity	342	1488		413	1520		551	514		570	489	
v/c Ratio	0.11	0.34		0.09	0.41		0.07	0.02		0.01	0.02	
Green Ratio	0.53	0.44		0.53	0.44		0.41	0.33		0.41	0.33	
Uniform Delay d_1	17.1	25.6		16.6	26.6		24.6	31.8		24.1	31.7	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.1		0.1	0.2		0.1	0.0		0.0	0.0	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	17.2	25.7		16.7	26.8		24.6	31.8		24.1	31.8	
Lane Group LOS	B	C		B	C		C	C		C	C	
Approach Delay	25.1			26.2			26.1			28.2		
Approach LOS	C			C			C			C		
Intersection Delay	25.8			Intersection LOS			C					

LEFT TURN LANES - NB/SB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 8.0	G = 61.0	G =	G =	G = 28.0	G = 24.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	37	505		37	628		38	10		8	9	
Lane Group Capacity	348	1464		418	1495		344	313		292	245	
v/c Ratio	0.11	0.34		0.09	0.42		0.11	0.03		0.03	0.04	
Green Ratio	0.53	0.44		0.53	0.44		0.20	0.20		0.17	0.17	
Uniform Delay d_1	17.1	26.2		16.6	27.3		45.8	45.1		48.3	48.4	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.1		0.1	0.2		0.1	0.0		0.0	0.1	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	17.2	26.4		16.7	27.5		46.0	45.1		48.3	48.4	
Lane Group LOS	B	C		B	C		D	D		D	D	
Approach Delay	25.7			26.9			45.8			48.4		
Approach LOS	C			C			D			D		
Intersection Delay	27.4			Intersection LOS			C					

No Geometric Improvements – No Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 7.0	G = 62.0	G =	G =	G = 56.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 139.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	37	505		37	628			48			17	
Lane Group Capacity	345	1499		417	1531			584			636	
v/c Ratio	0.11	0.34		0.09	0.41			0.08			0.03	
Green Ratio	0.53	0.45		0.53	0.45			0.40			0.40	
Uniform Delay d_1	16.7	25.1		16.2	26.1			25.6			25.1	
Delay Factor k	0.11	0.11		0.11	0.11			0.11			0.11	
Incremental Delay d_2	0.1	0.1		0.1	0.2			0.1			0.0	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	16.8	25.2		16.3	26.3			25.7			25.1	
Lane Group LOS	B	C		B	C			C			C	
Approach Delay	24.7			25.7			25.7			25.1		
Approach LOS	C			C			C			C		
Intersection Delay	25.3			Intersection LOS						C		

NO GEOMETRIC IMPROVEMENTS - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 57.0	G =	G =	G = 31.0	G = 26.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	37	505		37	628			48			17	
Lane Group Capacity	310	1368		378	1397			389			303	
v/c Ratio	0.12	0.37		0.10	0.45			0.12			0.06	
Green Ratio	0.49	0.41		0.49	0.41			0.22			0.19	
Uniform Delay d_1	19.7	29.0		19.2	30.1			43.6			46.9	
Delay Factor k	0.11	0.11		0.11	0.11			0.11			0.11	
Incremental Delay d_2	0.2	0.2		0.1	0.2			0.1			0.1	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	19.9	29.1		19.3	30.3			43.8			47.0	
Lane Group LOS	B	C		B	C			D			D	
Approach Delay	28.5			29.7			43.8			47.0		
Approach LOS	C			C			D			D		
Intersection Delay	30.0			Intersection LOS						C		

LEFT TURN LANES-NB/SB ; RT. TURN LANE - EB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	3	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 59.0	G =	G =	G = 7.0	G = 49.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 140.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	37	470	32	37	628		38	10		8	9
Lane Group Capacity	323	1430	776	409	1446		580	548		599	523
v/c Ratio	0.11	0.33	0.04	0.09	0.43		0.07	0.02		0.01	0.02
Green Ratio	0.51	0.42	0.51	0.51	0.42		0.44	0.35		0.44	0.35
Uniform Delay d_1	18.6	27.2	17.4	18.0	28.7		22.8	29.8		22.4	29.8
Delay Factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.2	0.1	0.0	0.1	0.2		0.0	0.0		0.0	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	18.8	27.3	17.4	18.1	28.9		22.9	29.8		22.4	29.8
Lane Group LOS	B	C	B	B	C		C	C		C	C
Approach Delay	26.2			28.3			24.3			26.3	

Approach LOS	C	C	C	C
Intersection Delay	27.2	Intersection LOS		C

HCS+™ Version 5.5 Generated: 1/9/2014 5:27 PM

LEFT TURN LANES - NB/SB; RIGHT TURN LANE - EB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	34	432	32	34	566	12	35	1	8	7	1	7
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	3	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 55.0	G =	G =	G = 30.0	G = 29.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	37	470	32	37	628		38	10		8	9	
Lane Group Capacity	297	1333	984	380	1348		368	335		353	301	
v/c Ratio	0.12	0.35	0.03	0.10	0.47		0.10	0.03		0.02	0.03	
Green Ratio	0.48	0.39	0.64	0.48	0.39		0.21	0.21		0.21	0.21	
Uniform Delay d_1	20.8	30.0	9.1	20.1	31.6		44.2	43.5		44.2	44.3	
Delay Factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.2	0.2	0.0	0.1	0.3		0.1	0.0		0.0	0.0	
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	21.0	30.1	9.1	20.2	31.8		44.3	43.5		44.2	44.3	
Lane Group LOS	C	C	A	C	C		D	D		D	D	
Approach Delay	28.2			31.2			44.2			44.3		
Approach LOS	C			C			D			D		
Intersection Delay	30.6			Intersection LOS						C		

LEFT TURN LANES - NB / SB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 63.0	G =	G =	G = 7.0	G = 45.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	55	750		55	934		47	12		10	11
Lane Group Capacity	238	1512		310	1544		540	502		559	476
v/c Ratio	0.23	0.50		0.18	0.60		0.09	0.02		0.02	0.02
Green Ratio	0.54	0.45		0.54	0.45		0.41	0.32		0.41	0.32
Uniform Delay d_1	18.9	27.3		17.4	29.1		25.3	32.5		24.8	32.5
Delay Factor k	0.11	0.11		0.11	0.19		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.5	0.3		0.3	0.7		0.1	0.0		0.0	0.0
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	19.4	27.5		17.7	29.8		25.4	32.5		24.8	32.5
Lane Group LOS	B	C		B	C		C	C		C	C
Approach Delay	27.0			29.1			26.8			28.8	

Approach LOS	C	C	C	C
Intersection Delay	28.1	Intersection LOS		C

LEFT TURN LANES - NB/SB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 60.0	G =	G =	G = 27.0	G = 27.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	55	750		55	934		47	12		10	11
Lane Group Capacity	221	1440		291	1470		332	301		328	277
v/c Ratio	0.25	0.52		0.19	0.64		0.14	0.04		0.03	0.04
Green Ratio	0.51	0.43		0.51	0.43		0.19	0.19		0.19	0.19
Uniform Delay d_1	20.6	29.4		19.0	31.4		46.9	46.0		45.9	46.0
Delay Factor k	0.11	0.13		0.11	0.22		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.6	0.3		0.3	0.9		0.2	0.1		0.0	0.1
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	21.2	29.8		19.3	32.3		47.1	46.0		45.9	46.0
Lane Group LOS	C	C		B	C		D	D		D	D
Approach Delay	29.2			31.6			46.9			46.0	

Approach LOS	C	C	D	D
Intersection Delay	31.2	Intersection LOS		C

NO GEOMETRIC IMPROVEMENTS – NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 7.0	G = 65.0	G =	G =	G = 54.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	55	750		55	934			59			21	
Lane Group Capacity	249	1560		322	1593			548			601	
v/c Ratio	0.22	0.48		0.17	0.59			0.11			0.03	
Green Ratio	0.55	0.46		0.55	0.46			0.39			0.39	
Uniform Delay d_1	17.8	25.9		16.4	27.6			27.6			26.8	
Delay Factor k	0.11	0.11		0.11	0.18			0.11			0.11	
Incremental Delay d_2	0.5	0.2		0.3	0.6			0.1			0.0	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	18.2	26.1		16.6	28.2			27.6			26.8	
Lane Group LOS	B	C		B	C			C			C	
Approach Delay	25.6			27.5			27.6			26.8		
Approach LOS	C			C			C			C		
Intersection Delay	26.7			Intersection LOS			C					

No Geometric Improvements - Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 6.0	G = 58.0	G =	G =	G = 30.0	G = 27.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 140.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	55	750		55	934			59			21	
Lane Group Capacity	198	1392		266	1421			376			315	
v/c Ratio	0.28	0.54		0.21	0.66			0.16			0.07	
Green Ratio	0.49	0.41		0.49	0.41			0.21			0.19	
Uniform Delay d_1	22.4	30.9		20.6	33.0			44.7			46.2	
Delay Factor k	0.11	0.14		0.11	0.23			0.11			0.11	
Incremental Delay d_2	0.8	0.4		0.4	1.1			0.2			0.1	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	23.1	31.3		21.0	34.1			44.9			46.3	
Lane Group LOS	C	C		C	C			D			D	
Approach Delay	30.8			33.4			44.9			46.3		
Approach LOS	C			C			D			D		
Intersection Delay	32.8			Intersection LOS						C		

LEFT TURN LANES - NB/SB; RIGHT TURN LANE - EB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	8	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 64.0	G =	G =	G = 7.0	G = 44.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 140.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	55	698	43	55	934		47	12		10	11
Lane Group Capacity	243	1552	831	337	1568		530	491		549	465
v/c Ratio	0.23	0.45	0.05	0.16	0.60		0.09	0.02		0.02	0.02
Green Ratio	0.54	0.46	0.54	0.54	0.46		0.40	0.31		0.40	0.31
Uniform Delay d_1	18.3	26.0	15.1	16.6	28.3		25.9	33.2		25.4	33.2
Delay Factor k	0.11	0.11	0.11	0.11	0.18		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.5	0.2	0.0	0.2	0.6		0.1	0.0		0.0	0.0
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	18.8	26.2	15.1	16.8	29.0		26.0	33.2		25.4	33.2
Lane Group LOS	B	C	B	B	C		C	C		C	C
Approach Delay	25.1			28.3			27.5			29.5	

Approach LOS	C	C	C	C
Intersection Delay	26.9	Intersection LOS		C

LEFT TURN LANES - NB/SB ; RIGHT TURN LANE - EB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	51	642	48	51	841	18	43	1	10	9	1	9
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	8	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 60.0	G =	G =	G = 28.0	G = 26.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	55	698	43	55	934		47	12		10	11	
Lane Group Capacity	221	1455	1016	312	1470		344	312		316	266	
v/c Ratio	0.25	0.48	0.04	0.18	0.64		0.14	0.04		0.03	0.04	
Green Ratio	0.51	0.43	0.66	0.51	0.43		0.20	0.20		0.19	0.19	
Uniform Delay d_1	20.6	28.8	8.1	18.7	31.4		46.1	45.1		46.7	46.8	
Delay Factor k	0.11	0.11	0.11	0.11	0.22		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.6	0.3	0.0	0.3	0.9		0.2	0.1		0.0	0.1	
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	21.2	29.0	8.1	18.9	32.3		46.2	45.2		46.7	46.8	
Lane Group LOS	C	C	A	B	C		D	D		D	D	
Approach Delay	27.4			31.6			46.0			46.8		
Approach LOS	C			C			D			D		
Intersection Delay	30.4			Intersection LOS						C		

LEFT TURN LANES-NB/SB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 7.0	G = 67.0	G =	G =	G = 52.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	49	844		43	551		130	58		14	54	
Lane Group Capacity	410	1602		298	1640		467	573		478	547	
v/c Ratio	0.12	0.53		0.14	0.34		0.28	0.10		0.03	0.10	
Green Ratio	0.56	0.48		0.56	0.48		0.37	0.37		0.37	0.37	
Uniform Delay d_1	14.4	25.4		15.8	22.7		30.8	28.7		28.0	28.7	
Delay Factor k	0.11	0.13		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.3		0.2	0.1		0.3	0.1		0.0	0.1	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	14.6	25.8		16.0	22.8		31.2	28.8		28.0	28.8	
Lane Group LOS	B	C		B	C		C	C		C	C	
Approach Delay	25.2			22.3			30.4			28.6		
Approach LOS	C			C			C			C		
Intersection Delay	24.9			Intersection LOS						C		

LEFT TURN LANES - NB/SB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 67.0	G =	G =	G = 25.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	49	844		43	551		130	58		14	54
Lane Group Capacity	410	1602		298	1640		307	276		267	219
v/c Ratio	0.12	0.53		0.14	0.34		0.42	0.21		0.05	0.25
Green Ratio	0.56	0.48		0.56	0.48		0.18	0.18		0.16	0.16
Uniform Delay d_1	14.4	25.4		15.8	22.7		51.1	49.1		50.1	51.7
Delay Factor k	0.11	0.13		0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.1	0.3		0.2	0.1		0.9	0.4		0.1	0.6
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	14.6	25.8		16.0	22.8		52.0	49.5		50.2	52.3
Lane Group LOS	B	C		B	C		D	D		D	D
Approach Delay	25.2			22.3			51.2			51.9	

Approach LOS	C	C	D	D
Intersection Delay	28.0	Intersection LOS		C

No Geometric Improvements - No Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 7.0	G = 67.0	G =	G =	G = 52.0	G = 0.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	49	844		43	551			188			68	
Lane Group Capacity	410	1602		298	1640			493			559	
v/c Ratio	0.12	0.53		0.14	0.34			0.38			0.12	
Green Ratio	0.56	0.48		0.56	0.48			0.37			0.37	
Uniform Delay d_1	14.4	25.4		15.8	22.7			32.2			29.0	
Delay Factor k	0.11	0.13		0.11	0.11			0.11			0.11	
Incremental Delay d_2	0.1	0.3		0.2	0.1			0.5			0.1	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	14.6	25.8		16.0	22.8			32.7			29.1	
Lane Group LOS	B	C		B	C			C			C	
Approach Delay	25.2			22.3			32.7			29.1		

Approach LOS	C	C	C	C
Intersection Delay	25.2	Intersection LOS		C

No Geometric Improvements - Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 6.0	G = 67.0	G =	G =	G = 27.0	G = 21.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	49	844		43	551			188			68	
Lane Group Capacity	398	1602		285	1640			335			228	
v/c Ratio	0.12	0.53		0.15	0.34			0.56			0.30	
Green Ratio	0.56	0.48		0.56	0.48			0.19			0.15	
Uniform Delay d_1	14.9	25.4		16.3	22.7			51.1			52.9	
Delay Factor k	0.11	0.13		0.11	0.11			0.16			0.11	
Incremental Delay d_2	0.1	0.3		0.2	0.1			2.1			0.7	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	15.0	25.8		16.5	22.8			53.3			53.7	
Lane Group LOS	B	C		B	C			D			D	
Approach Delay	25.2			22.3			53.3			53.7		
Approach LOS	C			C			D			D		
Intersection Delay	28.4			Intersection LOS						C		

LEFT TURN LANES -NB/SB; RIGHT TURN LANE-EB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	8	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 7.0	G = 67.0	G =	G =	G = 52.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	49	761	74	43	551		130	58		14	54	
Lane Group Capacity	410	1624	732	330	1640		467	573		478	547	
v/c Ratio	0.12	0.47	0.10	0.13	0.34		0.28	0.10		0.03	0.10	
Green Ratio	0.56	0.48	0.48	0.56	0.48		0.37	0.37		0.37	0.37	
Uniform Delay d_1	14.4	24.5	20.0	15.3	22.7		30.8	28.7		28.0	28.7	
Delay Factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.2	0.1	0.2	0.1		0.3	0.1		0.0	0.1	
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	14.6	24.7	20.1	15.5	22.8		31.2	28.8		28.0	28.8	
Lane Group LOS	B	C	C	B	C		C	C		C	C	
Approach Delay	23.8			22.3			30.4			28.6		
Approach LOS	C			C			C			C		
Intersection Delay	24.2			Intersection LOS						C		

LEFT TURN LANES - NB/SB; RIGHT TURN LANE - EB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	45	700	76	40	492	15	120	1	52	13	2	48
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	8	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 7.0	G = 67.0	G =	G =	G = 25.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	49	761	74	43	551		130	58		14	54
Lane Group Capacity	410	1624	1060	330	1640		307	276		267	219
v/c Ratio	0.12	0.47	0.07	0.13	0.34		0.42	0.21		0.05	0.25
Green Ratio	0.56	0.48	0.69	0.56	0.48		0.18	0.18		0.16	0.16
Uniform Delay d_1	14.4	24.5	6.9	15.3	22.7		51.1	49.1		50.1	51.7
Delay Factor k	0.11	0.11	0.11	0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.1	0.2	0.0	0.2	0.1		0.9	0.4		0.1	0.6
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	14.6	24.7	7.0	15.5	22.8		52.0	49.5		50.2	52.3
Lane Group LOS	B	C	A	B	C		D	D		D	D
Approach Delay	22.7			22.3			51.2			51.9	

Approach LOS	C	C	D	D
Intersection Delay	26.8	Intersection LOS		C

LEFT TURN LANE - NB/SB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 29.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 140.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	73	1253		64	819		159	69		17	66	
Lane Group Capacity	424	2176		271	2228		250	319		264	295	
v/c Ratio	0.17	0.58		0.24	0.37		0.64	0.22		0.06	0.22	
Green Ratio	0.73	0.65		0.73	0.65		0.21	0.21		0.21	0.21	
Uniform Delay d_1	6.4	13.7		8.7	11.3		50.7	46.1		44.6	46.1	
Delay Factor k	0.11	0.17		0.11	0.11		0.22	0.11		0.11	0.11	
Incremental Delay d_2	0.2	0.4		0.5	0.1		5.3	0.3		0.1	0.4	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	6.5	14.1		9.2	11.4		55.9	46.4		44.7	46.5	
Lane Group LOS	A	B		A	B		E	D		D	D	
Approach Delay	13.7			11.2			53.1			46.2		
Approach LOS	B			B			D			D		
Intersection Delay	17.4			Intersection LOS						B		

LEFT TURN LANES - NB/SB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	1	1	0	1	1	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 16.0	G = 8.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 140.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	73	1253		64	819		159	69		17	66	
Lane Group Capacity	424	2176		271	2228		196	176		97	65	
v/c Ratio	0.17	0.58		0.24	0.37		0.81	0.39		0.18	1.02	
Green Ratio	0.73	0.65		0.73	0.65		0.11	0.11		0.06	0.06	
Uniform Delay d_1	6.4	13.7		8.7	11.3		60.5	57.5		62.9	66.0	
Delay Factor k	0.11	0.17		0.11	0.11		0.35	0.11		0.11	0.50	
Incremental Delay d_2	0.2	0.4		0.5	0.1		22.1	1.4		0.9	116.0	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	6.5	14.1		9.2	11.4		82.6	58.9		63.7	182.0	
Lane Group LOS	A	B		A	B		F	E		E	F	
Approach Delay	13.7			11.2			75.5			157.8		
Approach LOS	B			B			E			F		
Intersection Delay	23.1			Intersection LOS						C		

No Geometric Improvements - No Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 29.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 140.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	73	1253		64	819			228			83	
Lane Group Capacity	424	2176		271	2228			257			300	
v/c Ratio	0.17	0.58		0.24	0.37			0.89			0.28	
Green Ratio	0.73	0.65		0.73	0.65			0.21			0.21	
Uniform Delay d_1	6.4	13.7		8.7	11.3			53.9			46.7	
Delay Factor k	0.11	0.17		0.11	0.11			0.41			0.11	
Incremental Delay d_2	0.2	0.4		0.5	0.1			28.9			0.5	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	6.5	14.1		9.2	11.4			82.8			47.2	
Lane Group LOS	A	B		A	B			F			D	
Approach Delay	13.7			11.2			82.8			47.2		
Approach LOS	B			B			F			D		
Intersection Delay	20.2			Intersection LOS						C		

No Geometric Improvements - Split Phase

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0
Lane Group	L	TR		L	TR			LTR			LTR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0			2.0			2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0			2.0			2.0	
Arrival Type	3	3		3	3			3			3	
Unit Extension	3.0	3.0		3.0	3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0			12.0			12.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0			0			0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 16.0	G = 8.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	73	1253		64	819			228			83	
Lane Group Capacity	424	2176		271	2228			198			75	
v/c Ratio	0.17	0.58		0.24	0.37			1.15			1.11	
Green Ratio	0.73	0.65		0.73	0.65			0.11			0.06	
Uniform Delay d_1	6.4	13.7		8.7	11.3			62.0			66.0	
Delay Factor k	0.11	0.17		0.11	0.11			0.50			0.50	
Incremental Delay d_2	0.2	0.4		0.5	0.1			110.7			135.9	
PF Factor	1.000	1.000		1.000	1.000			1.000			1.000	
Control Delay	6.5	14.1		9.2	11.4			172.7			201.9	
Lane Group LOS	A	B		A	B			F			F	
Approach Delay	13.7			11.2			172.7			201.9		
Approach LOS	B			B			F			F		
Intersection Delay	33.4			Intersection LOS						C		

LEFT TURN LANES - NB/SB; RIGHT TURN LANE - EB - NO SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	12	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NS Perm	06	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 29.0	G =	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y =	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	73	1130	110	64	819		159	69		17	66
Lane Group Capacity	424	2206	1366	311	2228		250	319		264	295
v/c Ratio	0.17	0.51	0.08	0.21	0.37		0.64	0.22		0.06	0.22
Green Ratio	0.73	0.65	0.89	0.73	0.65		0.21	0.21		0.21	0.21
Uniform Delay d_1	6.4	12.9	0.9	7.8	11.3		50.7	46.1		44.6	46.1
Delay Factor k	0.11	0.12	0.11	0.11	0.11		0.22	0.11		0.11	0.11
Incremental Delay d_2	0.2	0.2	0.0	0.3	0.1		5.3	0.3		0.1	0.4
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	6.5	13.1	0.9	8.1	11.4		55.9	46.4		44.7	46.5
Lane Group LOS	A	B	A	A	B		E	D		D	D
Approach Delay	11.7			11.1			53.1			46.2	

Approach LOS	B	B	D	D
Intersection Delay	16.4	Intersection LOS		B

LEFT TURN LANES - NB/SB; RIGHT TURN LANE - EB - SPLIT PHASE

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci,PE, PTOE	Intersection	General Electric and Keaton
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/20/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	2	1	1	2	0	1	1	0	1	1	0
Lane Group	L	T	R	L	TR		L	TR		L	TR	
Volume (vph)	67	1040	113	59	731	22	146	1	63	16	2	59
% Heavy Vehicles	1	2	1	1	2	1	1	1	1	1	1	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0	2.0	2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3	3	3	3		3	3		3	3	
Unit Extension	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	12	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0	11.0	11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	2	N	N	-1	N	N	1	N	N	3	N
Parking/Hour												
Bus Stops/Hour	0	0	0	0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	NB Only	SB Only	07	08
Timing	G = 6.0	G = 91.0	G =	G =	G = 16.0	G = 8.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 140.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	73	1130	110	64	819		159	69		17	66	
Lane Group Capacity	424	2206	1224	311	2228		196	176		97	65	
v/c Ratio	0.17	0.51	0.09	0.21	0.37		0.81	0.39		0.18	1.02	
Green Ratio	0.73	0.65	0.80	0.73	0.65		0.11	0.11		0.06	0.06	
Uniform Delay d_1	6.4	12.9	3.0	7.8	11.3		60.5	57.5		62.9	66.0	
Delay Factor k	0.11	0.12	0.11	0.11	0.11		0.35	0.11		0.11	0.50	
Incremental Delay d_2	0.2	0.2	0.0	0.3	0.1		22.1	1.4		0.9	116.0	
PF Factor	1.000	1.000	1.000	1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	6.5	13.1	3.0	8.1	11.4		82.6	58.9		63.7	182.0	
Lane Group LOS	A	B	A	A	B		F	E		E	F	
Approach Delay	11.9			11.1			75.5			157.8		
Approach LOS	B			B			E			F		
Intersection Delay	22.2			Intersection LOS						C		

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	34	28	99	98	129	27	58	232	21	21	383	19
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 15.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	37	138		107	169		63	275		23	437
Lane Group Capacity	398	327		413	369		429	1101		511	1120
v/c Ratio	0.09	0.42		0.26	0.46		0.15	0.25		0.05	0.39
Green Ratio	0.39	0.21		0.39	0.21		0.50	0.33		0.50	0.33
Uniform Delay d_1	13.7	23.8		14.3	24.0		9.5	17.2		9.0	18.1
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.1	0.9		0.3	0.9		0.2	0.1		0.0	0.2
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.9	24.6		14.6	24.9		9.6	17.3		9.0	18.3
Lane Group LOS	B	C		B	C		A	B		A	B
Approach Delay	22.4			20.9			15.9			17.9	

Approach LOS	C	C	B	B
Intersection Delay	18.6	Intersection LOS		B

HCS+™ Version 5.5 Generated: 1/9/2014 4:07 PM

LEFT TURN LANE - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	AM Peak 2014-LTL NB SB-70 Sec	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	34	28	99	98	129	27	58	232	21	21	383	19
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 12.0	G = 16.0	G =	G =	G = 7.0	G = 16.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		175			276		63	275		23	437	
Lane Group Capacity		278			407		325	764		395	778	
v/c Ratio		0.63			0.68		0.19	0.36		0.06	0.56	
Green Ratio		0.17			0.23		0.40	0.23		0.40	0.23	
Uniform Delay d_1		26.9			24.6		13.6	22.7		12.9	23.9	
Delay Factor k		0.21			0.25		0.11	0.11		0.11	0.16	
Incremental Delay d_2		4.5			4.5		0.3	0.3		0.1	0.9	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		31.5			29.1		13.9	23.0		13.0	24.8	
Lane Group LOS		C			C		B	C		B	C	
Approach Delay	31.5			29.1			21.3			24.2		
Approach LOS	C			C			C			C		
Intersection Delay	25.5			Intersection LOS			C					

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	34	28	99	98	129	27	58	232	21	21	383	19
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			12.0			12.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 11.0	G = 15.0	G =	G =	G = 11.0	G = 13.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	175	276	338	460
Lane Group Capacity	254	381	539	652
v/c Ratio	0.69	0.72	0.63	0.71
Green Ratio	0.16	0.21	0.16	0.19
Uniform Delay d_1	27.9	25.6	27.6	26.7
Delay Factor k	0.26	0.29	0.21	0.27
Incremental Delay d_2	7.7	6.7	2.3	3.5
PF Factor	1.000	1.000	1.000	1.000
Control Delay	35.5	32.3	29.9	30.2
Lane Group LOS	D	C	C	C
Approach Delay	35.5	32.3	29.9	30.2
Approach LOS	D	C	C	C
Intersection Delay	31.3	Intersection LOS		C

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	36	29	104	103	136	28	86	345	31	31	569	28
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 16.0	G =	G =	G = 7.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	39	145		112	178		93	409		34	648
Lane Group Capacity	409	350		426	395		330	1053		430	1072
v/c Ratio	0.10	0.41		0.26	0.45		0.28	0.39		0.08	0.60
Green Ratio	0.40	0.23		0.40	0.23		0.49	0.31		0.49	0.31
Uniform Delay d_1	13.2	23.0		13.7	23.2		10.8	18.7		9.8	20.3
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.19
Incremental Delay d_2	0.1	0.8		0.3	0.8		0.5	0.2		0.1	1.0
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.3	23.8		14.0	24.0		11.3	19.0		9.8	21.3
Lane Group LOS	B	C		B	C		B	B		A	C
Approach Delay	21.6			20.2			17.6			20.7	

Approach LOS	C	C	B	C
Intersection Delay	19.8	Intersection LOS		B

HCS+™ Version 5.5

Generated: 1/9/2014 4:11 PM

LEFT TURN LANES - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	36	29	104	103	136	28	86	345	31	31	569	28
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 12.0	G = 15.0	G =	G =	G = 7.0	G = 17.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		184			290		93	409		34	648	
Lane Group Capacity		278			381		270	812		355	827	
v/c Ratio		0.66			0.76		0.34	0.50		0.10	0.78	
Green Ratio		0.17			0.21		0.41	0.24		0.41	0.24	
Uniform Delay d_1		27.1			25.8		14.0	22.9		12.6	24.8	
Delay Factor k		0.24			0.31		0.11	0.11		0.11	0.33	
Incremental Delay d_2		5.8			8.7		0.8	0.5		0.1	5.0	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		32.9			34.6		14.7	23.4		12.8	29.7	
Lane Group LOS		C			C		B	C		B	C	
Approach Delay	32.9			34.6			21.8			28.9		
Approach LOS	C			C			C			C		
Intersection Delay	28.2			Intersection LOS						C		

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	36	29	104	103	136	28	86	345	31	31	569	28
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 10.0	G = 14.0	G =	G =	G = 11.0	G = 15.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	184	290	502	682
Lane Group Capacity	229	356	521	729
v/c Ratio	0.80	0.81	0.96	0.94
Green Ratio	0.14	0.20	0.16	0.21
Uniform Delay d_1	29.0	26.8	29.3	27.0
Delay Factor k	0.35	0.36	0.47	0.45
Incremental Delay d_2	18.4	13.6	30.3	19.3
PF Factor	1.000	1.000	1.000	1.000
Control Delay	47.5	40.3	59.6	46.4
Lane Group LOS	D	D	E	D
Approach Delay	47.5	40.3	59.6	46.4
Approach LOS	D	D	E	D

Intersection Delay	49.4	Intersection LOS	D

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	37	94	96	58	92	34	136	477	73	33	397	53
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 16.0	G =	G =	G = 7.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	40	206		63	137		148	597		36	490
Lane Group Capacity	442	373		381	386		391	1041		352	1055
v/c Ratio	0.09	0.55		0.17	0.35		0.38	0.57		0.10	0.46
Green Ratio	0.40	0.23		0.40	0.23		0.49	0.31		0.49	0.31
Uniform Delay d_1	13.1	23.8		13.5	22.7		10.7	20.1		10.2	19.3
Delay Factor k	0.11	0.15		0.11	0.11		0.11	0.17		0.11	0.11
Incremental Delay d_2	0.1	1.8		0.2	0.6		0.6	0.8		0.1	0.3
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.1	25.6		13.7	23.2		11.3	20.9		10.4	19.6
Lane Group LOS	B	C		B	C		B	C		B	B
Approach Delay	23.6			20.2			19.0			19.0	

Approach LOS	C	C	B	B
Intersection Delay	19.8	Intersection LOS		B

HCS+™ Version 5.5 Generated: 1/9/2014 4:15 PM

LEFT TURN LANES - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	37	94	96	58	92	34	136	477	73	33	397	53
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 14.0	G = 13.0	G =	G =	G = 8.0	G = 16.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		246			200		148	597		36	490	
Lane Group Capacity		342			325		330	754		296	765	
v/c Ratio		0.72			0.62		0.45	0.79		0.12	0.64	
Green Ratio		0.20			0.19		0.41	0.23		0.41	0.23	
Uniform Delay d_1		26.2			26.2		13.9	25.4		13.2	24.4	
Delay Factor k		0.28			0.20		0.11	0.34		0.11	0.22	
Incremental Delay d_2		7.2			3.5		1.0	5.8		0.2	1.8	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		33.3			29.7		14.9	31.2		13.4	26.2	
Lane Group LOS		C			C		B	C		B	C	
Approach Delay	33.3			29.7			28.0			25.3		
Approach LOS	C			C			C			C		
Intersection Delay	28.1			Intersection LOS						C		

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	37	94	96	58	92	34	136	477	73	33	397	53
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 12.0	G = 10.0	G =	G =	G = 16.0	G = 12.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	246	200	745	526
Lane Group Capacity	292	249	753	571
v/c Ratio	0.84	0.80	0.99	0.92
Green Ratio	0.17	0.14	0.23	0.17
Uniform Delay d_1	28.1	29.0	26.9	28.5
Delay Factor k	0.38	0.35	0.49	0.44
Incremental Delay d_2	19.5	17.1	30.0	20.5
PF Factor	1.000	1.000	1.000	1.000
Control Delay	47.6	46.2	57.0	49.0
Lane Group LOS	D	D	E	D
Approach Delay	47.6	46.2	57.0	49.0
Approach LOS	D	D	E	D

Intersection Delay	51.9	Intersection LOS	D

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	39	99	101	61	97	36	202	709	108	49	590	79
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 16.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 71.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	42	218		66	144		220	888		53	727	
Lane Group Capacity	428	368		364	380		308	1074		270	1088	
v/c Ratio	0.10	0.59		0.18	0.38		0.71	0.83		0.20	0.67	
Green Ratio	0.39	0.23		0.39	0.23		0.49	0.32		0.49	0.32	
Uniform Delay d_1	13.5	24.6		14.0	23.3		12.3	22.2		11.6	20.7	
Delay Factor k	0.11	0.18		0.11	0.11		0.28	0.36		0.11	0.24	
Incremental Delay d_2	0.1	2.6		0.2	0.6		7.6	5.5		0.4	1.6	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	13.6	27.1		14.2	23.9		19.9	27.6		11.9	22.3	
Lane Group LOS	B	C		B	C		B	C		B	C	
Approach Delay	25.0			20.9			26.1			21.6		
Approach LOS	C			C			C			C		
Intersection Delay	24.0			Intersection LOS						C		

LEFT TURN LANES - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	39	99	101	61	97	36	202	709	108	49	590	79
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 13.0	G = 11.0	G =	G =	G = 7.0	G = 20.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB		WB		NB		SB	
Adjusted Flow Rate	260		210		220	888	53	727
Lane Group Capacity	317		275		278	946	274	958
v/c Ratio	0.82		0.76		0.79	0.94	0.19	0.76
Green Ratio	0.19		0.16		0.46	0.29	0.46	0.29
Uniform Delay d_1	27.4		28.3		13.8	24.4	13.0	22.8
Delay Factor k	0.36		0.32		0.34	0.45	0.11	0.31
Incremental Delay d_2	15.6		12.0		14.4	16.5	0.3	3.6
PF Factor	1.000		1.000		1.000	1.000	1.000	1.000
Control Delay	43.0		40.3		28.2	40.9	13.3	26.4
Lane Group LOS	D		D		C	D	B	C
Approach Delay	43.0		40.3		38.4		25.5	
Approach LOS	D		D		D		C	

Intersection Delay	34.8	Intersection LOS	C

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Clearwater Ave
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	39	99	101	61	97	36	202	709	108	49	590	79
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 10.0	G = 9.0	G =	G =	G = 18.5	G = 12.5	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25

Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		260			210			1108			780	
Lane Group Capacity		241			224			872			595	
v/c Ratio		1.08			0.94			1.27			1.31	
Green Ratio		0.14			0.13			0.26			0.18	
Uniform Delay d_1		30.0			30.2			25.8			28.8	
Delay Factor k		0.50			0.45			0.50			0.50	
Incremental Delay d_2		80.5			43.0			130.8			151.7	
PF Factor		1.000			1.000			1.000			1.000	
Control Delay		110.5			73.2			156.6			180.4	
Lane Group LOS		F			E			F			F	
Approach Delay	110.5			73.2			156.6			180.4		
Approach LOS	F			E			F			F		
Intersection Delay	152.0			Intersection LOS						F		

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	38	11	38	127	18	46	20	172	24	20	508	29
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 15.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	41	53		138	70		22	213		22	584	
Lane Group Capacity	474	327		478	326		367	1092		546	1119	
v/c Ratio	0.09	0.16		0.29	0.21		0.06	0.20		0.04	0.52	
Green Ratio	0.39	0.21		0.39	0.21		0.50	0.33		0.50	0.33	
Uniform Delay d_1	13.6	22.4		14.5	22.6		9.6	16.9		8.9	19.0	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.13	
Incremental Delay d_2	0.1	0.2		0.3	0.3		0.1	0.1		0.0	0.4	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	13.7	22.6		14.8	23.0		9.6	16.9		9.0	19.5	
Lane Group LOS	B	C		B	C		A	B		A	B	
Approach Delay	18.7			17.6			16.3			19.1		
Approach LOS	B			B			B			B		
Intersection Delay	18.2			Intersection LOS			B					

LEFT TURN LANE – NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	38	11	38	127	18	46	20	172	24	20	508	29
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 12.0	G = 14.0	G =	G =	G = 7.0	G = 18.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		94			208		22	213		22	584	
Lane Group Capacity		287			341		300	852		457	875	
v/c Ratio		0.33			0.61		0.07	0.25		0.05	0.67	
Green Ratio		0.17			0.20		0.43	0.26		0.43	0.26	
Uniform Delay d_1		25.5			25.5		12.4	20.6		11.7	23.3	
Delay Factor k		0.11			0.20		0.11	0.11		0.11	0.24	
Incremental Delay d_2		0.7			3.2		0.1	0.2		0.0	2.0	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		26.1			28.7		12.5	20.8		11.7	25.3	
Lane Group LOS		C			C		B	C		B	C	
Approach Delay	26.1			28.7			20.0			24.8		
Approach LOS	C			C			C			C		
Intersection Delay	24.6			Intersection LOS			C					

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	38	11	38	127	18	46	20	172	24	20	508	29
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 10.0	G = 13.0	G =	G =	G = 11.0	G = 16.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	94	208	235	606
Lane Group Capacity	237	316	517	776
v/c Ratio	0.40	0.66	0.45	0.78
Green Ratio	0.14	0.19	0.16	0.23
Uniform Delay d_1	27.3	26.4	26.8	25.4
Delay Factor k	0.11	0.23	0.11	0.33
Incremental Delay d_2	1.1	5.0	0.6	5.2
PF Factor	1.000	1.000	1.000	1.000
Control Delay	28.4	31.4	27.4	30.5
Lane Group LOS	C	C	C	C
Approach Delay	28.4	31.4	27.4	30.5
Approach LOS	C	C	C	C

Intersection Delay	29.9	Intersection LOS	C

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	40	12	40	134	19	48	30	256	36	30	755	43
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 15.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	43	56		146	73		33	317		33	868	
Lane Group Capacity	472	328		476	326		272	1091		490	1119	
v/c Ratio	0.09	0.17		0.31	0.22		0.12	0.29		0.07	0.78	
Green Ratio	0.39	0.21		0.39	0.21		0.50	0.33		0.50	0.33	
Uniform Delay d_1	13.6	22.4		14.6	22.7		10.8	17.4		9.1	21.2	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.33	
Incremental Delay d_2	0.1	0.2		0.4	0.4		0.2	0.1		0.1	3.5	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	13.7	22.7		14.9	23.0		11.0	17.6		9.2	24.7	
Lane Group LOS	B	C		B	C		B	B		A	C	
Approach Delay	18.8			17.6			17.0			24.1		
Approach LOS	B			B			B			C		
Intersection Delay	21.3			Intersection LOS						C		

LEFT TURN LANES - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	40	12	40	134	19	48	30	256	36	30	755	43
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 10.0	G = 14.0	G =	G =	G = 7.0	G = 20.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		99			219		33	317		33	868	
Lane Group Capacity		237			341		272	947		442	972	
v/c Ratio		0.42			0.64		0.12	0.33		0.07	0.89	
Green Ratio		0.14			0.20		0.46	0.29		0.46	0.29	
Uniform Delay d_1		27.3			25.7		12.7	19.7		10.7	24.0	
Delay Factor k		0.11			0.22		0.11	0.11		0.11	0.42	
Incremental Delay d_2		1.2			4.1		0.2	0.2		0.1	10.6	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		28.5			29.8		12.9	20.0		10.8	34.5	
Lane Group LOS		C			C		B	B		B	C	
Approach Delay	28.5			29.8			19.3			33.7		
Approach LOS	C			C			B			C		

Intersection Delay	29.6	Intersection LOS	C

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	40	12	40	134	19	48	30	256	36	30	755	43
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 8.0	G = 13.0	G =	G =	G = 9.0	G = 20.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	99	219	350	901
Lane Group Capacity	188	316	421	971
v/c Ratio	0.53	0.69	0.83	0.93
Green Ratio	0.11	0.19	0.13	0.29
Uniform Delay d_1	29.2	26.6	29.8	24.3
Delay Factor k	0.13	0.26	0.37	0.44
Incremental Delay d_2	2.7	6.4	13.2	14.6
PF Factor	1.000	1.000	1.000	1.000
Control Delay	32.0	33.0	43.0	38.9
Lane Group LOS	C	C	D	D
Approach Delay	32.0	33.0	43.0	38.9
Approach LOS	C	C	D	D

Intersection Delay	38.6	Intersection LOS	D

AM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - TO SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	61	20	42	59	20	25	26	206	15	25	342	76
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 15.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	66	68		64	49		28	240		27	455
Lane Group Capacity	491	335		466	339		420	1105		531	1088
v/c Ratio	0.13	0.20		0.14	0.14		0.07	0.22		0.05	0.42
Green Ratio	0.39	0.21		0.39	0.21		0.50	0.33		0.50	0.33
Uniform Delay d_1	13.8	22.6		13.8	22.3		9.3	17.0		9.0	18.3
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.1	0.3		0.1	0.2		0.1	0.1		0.0	0.3
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.9	22.9		13.9	22.5		9.3	17.1		9.0	18.6
Lane Group LOS	B	C		B	C		A	B		A	B
Approach Delay	18.5			17.6			16.3			18.0	

Approach LOS	B	B	B	B
Intersection Delay	17.6	Intersection LOS		B

AM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - 120 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	61	20	42	59	20	25	26	206	15	25	342	76
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 42.0	G =	G =	G = 7.0	G = 46.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	66	68		64	49		28	240		27	455	
Lane Group Capacity	573	558		546	562		381	1290		496	1272	
v/c Ratio	0.12	0.12		0.12	0.09		0.07	0.19		0.05	0.36	
Green Ratio	0.45	0.35		0.45	0.35		0.48	0.38		0.48	0.38	
Uniform Delay d_1	18.9	26.5		18.9	26.1		16.8	24.6		16.4	26.4	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.1		0.1	0.1		0.1	0.1		0.0	0.2	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	19.0	26.6		19.0	26.2		16.9	24.6		16.5	26.6	
Lane Group LOS	B	C		B	C		B	C		B	C	
Approach Delay	22.8			22.1			23.8			26.0		
Approach LOS	C			C			C			C		
Intersection Delay	24.6			Intersection LOS						C		

AM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - 70 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM School Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	64	21	44	62	21	26	39	306	22	37	508	113
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 15.0	G =	G =	G = 7.0	G = 23.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	70	71		67	51		42	357		40	675	
Lane Group Capacity	489	335		464	339		333	1105		471	1088	
v/c Ratio	0.14	0.21		0.14	0.15		0.13	0.32		0.08	0.62	
Green Ratio	0.39	0.21		0.39	0.21		0.50	0.33		0.50	0.33	
Uniform Delay d_1	13.8	22.6		13.8	22.3		10.0	17.7		9.2	19.8	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.20	
Incremental Delay d_2	0.1	0.3		0.1	0.2		0.2	0.2		0.1	1.1	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	14.0	23.0		14.0	22.5		10.2	17.8		9.3	20.9	
Lane Group LOS	B	C		B	C		B	B		A	C	
Approach Delay	18.5			17.7			17.0			20.3		
Approach LOS	B			B			B			C		
Intersection Delay	18.9			Intersection LOS						B		

AM School Peak - Left Turn Lanes - All Approaches - 120 sec

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	AM School Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	64	21	44	62	21	26	39	306	22	37	508	113
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 42.0	G =	G =	G = 7.0	G = 46.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	70	71		67	51		42	357		40	675	
Lane Group Capacity	571	558		543	562		290	1290		433	1272	
v/c Ratio	0.12	0.13		0.12	0.09		0.14	0.28		0.09	0.53	
Green Ratio	0.45	0.35		0.45	0.35		0.48	0.38		0.48	0.38	
Uniform Delay d_1	19.0	26.5		19.0	26.2		17.9	25.5		16.7	28.6	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.13	
Incremental Delay d_2	0.1	0.1		0.1	0.1		0.2	0.1		0.1	0.4	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	19.1	26.6		19.1	26.3		18.1	25.6		16.8	29.1	
Lane Group LOS	B	C		B	C		B	C		B	C	
Approach Delay	22.9			22.2			24.8			28.4		
Approach LOS	C			C			C			C		
Intersection Delay	26.3			Intersection LOS						C		

LEFT TURN LANES - ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	80	29	27	47	13	48	21	683	71	50	436	54
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 16.0	G =	G =	G = 7.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	87	61		51	66		23	819		54	533
Lane Group Capacity	497	376		492	342		374	1050		276	1057
v/c Ratio	0.18	0.16		0.10	0.19		0.06	0.78		0.20	0.50
Green Ratio	0.40	0.23		0.40	0.23		0.49	0.31		0.49	0.31
Uniform Delay d_1	13.3	21.6		13.0	21.8		10.0	21.8		11.3	19.6
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.33		0.11	0.11
Incremental Delay d_2	0.2	0.2		0.1	0.3		0.1	3.8		0.3	0.4
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.5	21.8		13.1	22.1		10.0	25.6		11.7	19.9
Lane Group LOS	B	C		B	C		B	C		B	B
Approach Delay	16.9			18.2			25.2			19.2	

Approach LOS	B	B	C	B
Intersection Delay	21.9	Intersection LOS		C

LEFT TURN LANES - NB/SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	80	29	27	47	13	48	21	683	71	50	436	54
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 12.0	G = 12.0	G =	G =	G = 7.0	G = 20.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		148			117		23	819		54	533	
Lane Group Capacity		301			281		346	954		274	960	
v/c Ratio		0.49			0.42		0.07	0.86		0.20	0.56	
Green Ratio		0.17			0.17		0.46	0.29		0.46	0.29	
Uniform Delay d_1		26.2			25.9		11.1	23.7		12.5	21.2	
Delay Factor k		0.11			0.11		0.11	0.39		0.11	0.15	
Incremental Delay d_2		1.3			1.0		0.1	7.9		0.4	0.7	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		27.5			26.9		11.2	31.6		12.9	21.9	
Lane Group LOS		C			C		B	C		B	C	
Approach Delay	27.5			26.9			31.0			21.1		
Approach LOS	C			C			C			C		
Intersection Delay	27.0			Intersection LOS			C					

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	80	29	27	47	13	48	21	683	71	50	436	54
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 9.0	G = 9.0	G =	G =	G = 18.0	G = 14.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =

Duration of Analysis (hrs) = 0.25 — Cycle Length C = 70.0

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	148	117	842	587
Lane Group Capacity	225	208	857	668
v/c Ratio	0.66	0.56	0.98	0.88
Green Ratio	0.13	0.13	0.26	0.20
Uniform Delay d_1	29.0	28.7	25.8	27.2
Delay Factor k	0.23	0.16	0.49	0.41
Incremental Delay d_2	6.9	3.5	26.4	12.8
PF Factor	1.000	1.000	1.000	1.000
Control Delay	35.9	32.1	52.2	40.0
Lane Group LOS	D	C	D	D
Approach Delay	35.9	32.1	52.2	40.0
Approach LOS	D	C	D	D
Intersection Delay	45.2	Intersection LOS		D

LEFT TURN LANES – ALL APPROACHES

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	84	30	28	49	14	50	31	1015	106	74	648	80
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	504	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			5.8			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 11.0	G =	G =	G = 7.0	G = 27.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	91	63		53	69		34	1218		80	791
Lane Group Capacity	394	255		391	230		340	1233		267	1299
v/c Ratio	0.23	0.25		0.14	0.30		0.10	0.99		0.30	0.61
Green Ratio	0.33	0.16		0.33	0.16		0.56	0.39		0.56	0.39
Uniform Delay d_1	16.8	25.9		16.4	26.1		8.3	21.3		11.7	17.3
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.49		0.11	0.19
Incremental Delay d_2	0.3	0.5		0.2	0.7		0.1	22.6		0.6	0.8
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	17.1	26.4		16.5	26.8		8.4	44.0		12.3	18.1
Lane Group LOS	B	C		B	C		A	D		B	B
Approach Delay	20.9			22.4			43.0			17.6	

Approach LOS	C	C	D	B
Intersection Delay	31.3	Intersection LOS		C

LEFT TURN LANES - NB / SB

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	1	2	0	1	2	0
Lane Group		LTR			LTR		L	TR		L	TR	
Volume (vph)	84	30	28	49	14	50	31	1015	106	74	648	80
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green		2.0			2.0		2.0	2.0		2.0	2.0	
Arrival Type		3			3		3	3		3	3	
Unit Extension		3.0			3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	Excl. Left	NS Perm	07	08
Timing	G = 10.0	G = 9.0	G =	G =	G = 7.0	G = 25.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate		154			122		34	1218		80	791	
Lane Group Capacity		250			208		317	1194		277	1202	
v/c Ratio		0.62			0.59		0.11	1.02		0.29	0.66	
Green Ratio		0.14			0.13		0.53	0.36		0.53	0.36	
Uniform Delay d_1		28.2			28.7		9.3	22.5		12.8	18.9	
Delay Factor k		0.20			0.18		0.11	0.50		0.11	0.23	
Incremental Delay d_2		4.5			4.3		0.2	31.2		0.6	1.3	
PF Factor		1.000			1.000		1.000	1.000		1.000	1.000	
Control Delay		32.7			33.0		9.5	53.7		13.4	20.2	
Lane Group LOS		C			C		A	D		B	C	
Approach Delay		32.7			33.0			52.5			19.6	
Approach LOS		C			C			D			B	
Intersection Delay		38.3			Intersection LOS						D	

No Geometric Improvements

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Lane Group		LTR			LTR			LTR			LTR	
Volume (vph)	84	30	28	49	14	50	31	1015	106	74	648	80
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time		2.0			2.0			2.0			2.0	
Extension of Effective Green		2.0			2.0			2.0			2.0	
Arrival Type		3			3			3			3	
Unit Extension		3.0			3.0			3.0			3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width		12.0			12.0			11.0			11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour		0			0			0			0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	EB Only	WB Only	03	04	NB Only	SB Only	07	08
Timing	G = 8.0	G = 8.0	G =	G =	G = 20.0	G = 14.0	G =	G =
	Y = 5	Y = 5	Y =	Y =	Y = 5	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB	WB	NB	SB
Adjusted Flow Rate	154	122	1252	871
Lane Group Capacity	199	184	953	669
v/c Ratio	0.77	0.66	1.31	1.30
Green Ratio	0.11	0.11	0.29	0.20
Uniform Delay d_1	30.1	29.7	25.0	28.0
Delay Factor k	0.32	0.24	0.50	0.50
Incremental Delay d_2	17.1	8.6	148.7	146.6
PF Factor	1.000	1.000	1.000	1.000
Control Delay	47.3	38.3	173.7	174.6
Lane Group LOS	D	D	F	F
Approach Delay	47.3	38.3	173.7	174.6

Approach LOS	D	D	F	F
Intersection Delay	159.0	Intersection LOS		F

PM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - 70 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	80	29	27	27	10	22	30	331	48	39	330	51
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 16.0	G =	G =	G = 7.0	G = 22.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 70.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB	
Adjusted Flow Rate	87	61		29	35		33	412		42	414
Lane Group Capacity	522	376		492	351		424	1042		429	1052
v/c Ratio	0.17	0.16		0.06	0.10		0.08	0.40		0.10	0.39
Green Ratio	0.40	0.23		0.40	0.23		0.49	0.31		0.49	0.31
Uniform Delay d_1	13.3	21.6		12.9	21.3		9.8	18.8		9.8	18.8
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11
Incremental Delay d_2	0.2	0.2		0.1	0.1		0.1	0.2		0.1	0.2
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000
Control Delay	13.5	21.8		12.9	21.4		9.8	19.0		9.9	19.0
Lane Group LOS	B	C		B	C		A	B		A	B
Approach Delay	16.9			17.6			18.4			18.2	

Approach LOS	B	B	B	B
Intersection Delay	18.1	Intersection LOS		B

PM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - 120 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2014

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	80	29	27	27	10	22	30	331	48	39	330	51
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 43.0	G =	G =	G = 7.0	G = 45.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	87	61		29	35		33	412		42	414	
Lane Group Capacity	597	596		563	559		392	1246		397	1257	
v/c Ratio	0.15	0.10		0.05	0.06		0.08	0.33		0.11	0.33	
Green Ratio	0.46	0.36		0.46	0.36		0.47	0.38		0.47	0.38	
Uniform Delay d_1	18.6	25.6		18.0	25.3		17.3	26.8		17.4	26.7	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.1		0.0	0.0		0.1	0.2		0.1	0.2	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	18.7	25.7		18.0	25.3		17.4	26.9		17.5	26.9	
Lane Group LOS	B	C		B	C		B	C		B	C	
Approach Delay	21.6			22.0			26.2			26.0		
Approach LOS	C			C			C			C		
Intersection Delay	25.3			Intersection LOS						C		

PM SCHOOL PEAK – LEFT TURN LANES – ALL APPROACHES – 70 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	84	30	28	49	14	50	31	1015	106	74	648	80
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.5			3.5			3.5			3.5	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 11.0	G =	G =	G = 7.0	G = 27.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25					Cycle Length C = 70.0			

Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	91	63		53	69		34	1218		80	791	
Lane Group Capacity	394	255		391	230		340	1291		277	1299	
v/c Ratio	0.23	0.25		0.14	0.30		0.10	0.94		0.29	0.61	
Green Ratio	0.33	0.16		0.33	0.16		0.56	0.39		0.56	0.39	
Uniform Delay d_1	16.8	25.9		16.4	26.1		8.3	20.8		11.6	17.3	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.46		0.11	0.19	
Incremental Delay d_2	0.3	0.5		0.2	0.7		0.1	13.8		0.6	0.8	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	17.1	26.4		16.5	26.8		8.4	34.5		12.2	18.1	
Lane Group LOS	B	C		B	C		A	C		B	B	
Approach Delay	20.9			22.4			33.8			17.6		
Approach LOS	C			C			C			B		
Intersection Delay	26.5			Intersection LOS						C		

PM SCHOOL PEAK - LEFT TURN LANES - ALL APPROACHES - 120 SEC

SHORT REPORT

General Information		Site Information	
Analyst	Jeffrey S. Antonacci, PE, PTOE	Intersection	Hershey Rd. and Arrowhead Dr.
Agency or Co.	Knight E/A, Inc.	Area Type	All other areas
Date Performed	11/21/2013	Jurisdiction	City of Bloomington
Time Period	PM Peak	Analysis Year	2034

Volume and Timing Input

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Number of Lanes	1	1	0	1	1	0	1	2	0	1	2	0
Lane Group	L	TR		L	TR		L	TR		L	TR	
Volume (vph)	84	30	28	28	11	23	45	492	71	58	490	76
% Heavy Vehicles	1	1	1	1	1	1	1	2	1	1	2	1
PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Pretimed/Actuated (P/A)	A	A	A	A	A	A	A	A	A	A	A	A
Startup Lost Time	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Extension of Effective Green	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Arrival Type	3	3		3	3		3	3		3	3	
Unit Extension	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Ped/Bike/RTOR Volume	50	0	0	50	0	0	50	0	0	50	0	0
Lane Width	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Parking/Grade/Parking	N	-1	N	N	3	N	N	1	N	N	-1	N
Parking/Hour												
Bus Stops/Hour	0	0		0	0		0	0		0	0	
Minimum Pedestrian Time		3.7			3.7			3.7			3.7	

Phasing	Excl. Left	EW Perm	03	04	Excl. Left	NS Perm	07	08
Timing	G = 7.0	G = 42.0	G =	G =	G = 7.0	G = 46.0	G =	G =
	Y = 4	Y = 5	Y =	Y =	Y = 4	Y = 5	Y =	Y =
Duration of Analysis (hrs) = 0.25						Cycle Length C = 120.0		

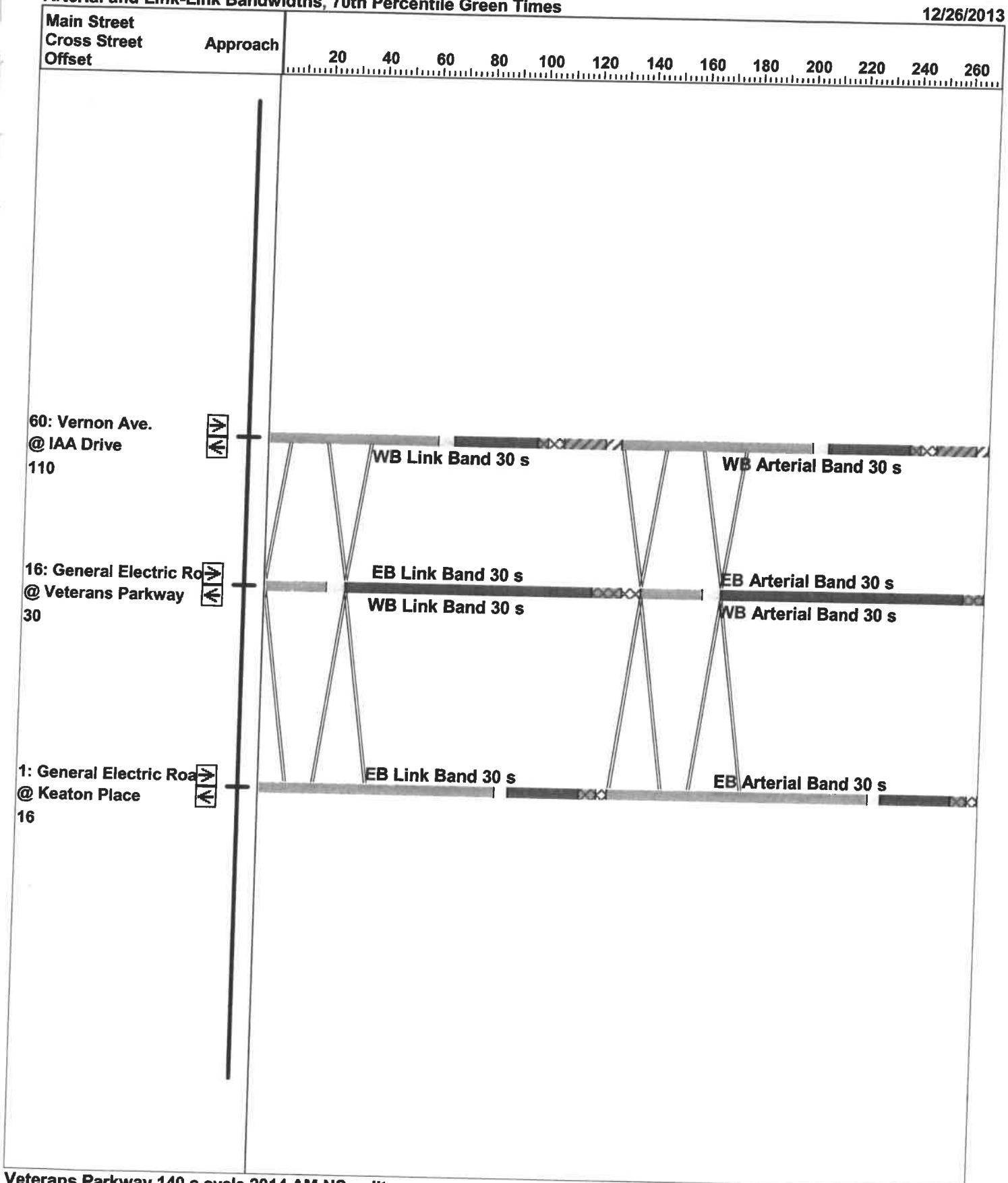
Lane Group Capacity, Control Delay, and LOS Determination

	EB			WB			NB			SB		
Adjusted Flow Rate	91	63		30	37		49	612		63	616	
Lane Group Capacity	583	582		549	547		313	1274		317	1285	
v/c Ratio	0.16	0.11		0.05	0.07		0.16	0.48		0.20	0.48	
Green Ratio	0.45	0.35		0.45	0.35		0.48	0.38		0.48	0.38	
Uniform Delay d_1	19.2	26.3		18.5	26.0		17.7	28.0		17.8	28.0	
Delay Factor k	0.11	0.11		0.11	0.11		0.11	0.11		0.11	0.11	
Incremental Delay d_2	0.1	0.1		0.0	0.1		0.2	0.3		0.3	0.3	
PF Factor	1.000	1.000		1.000	1.000		1.000	1.000		1.000	1.000	
Control Delay	19.3	26.4		18.6	26.0		17.9	28.3		18.1	28.2	
Lane Group LOS	B	C		B	C		B	C		B	C	
Approach Delay	22.2			22.7			27.5			27.3		
Approach LOS	C			C			C			C		
Intersection Delay	26.7			Intersection LOS						C		

PROGRESSION ANALYSIS (SYNCHRO)

Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

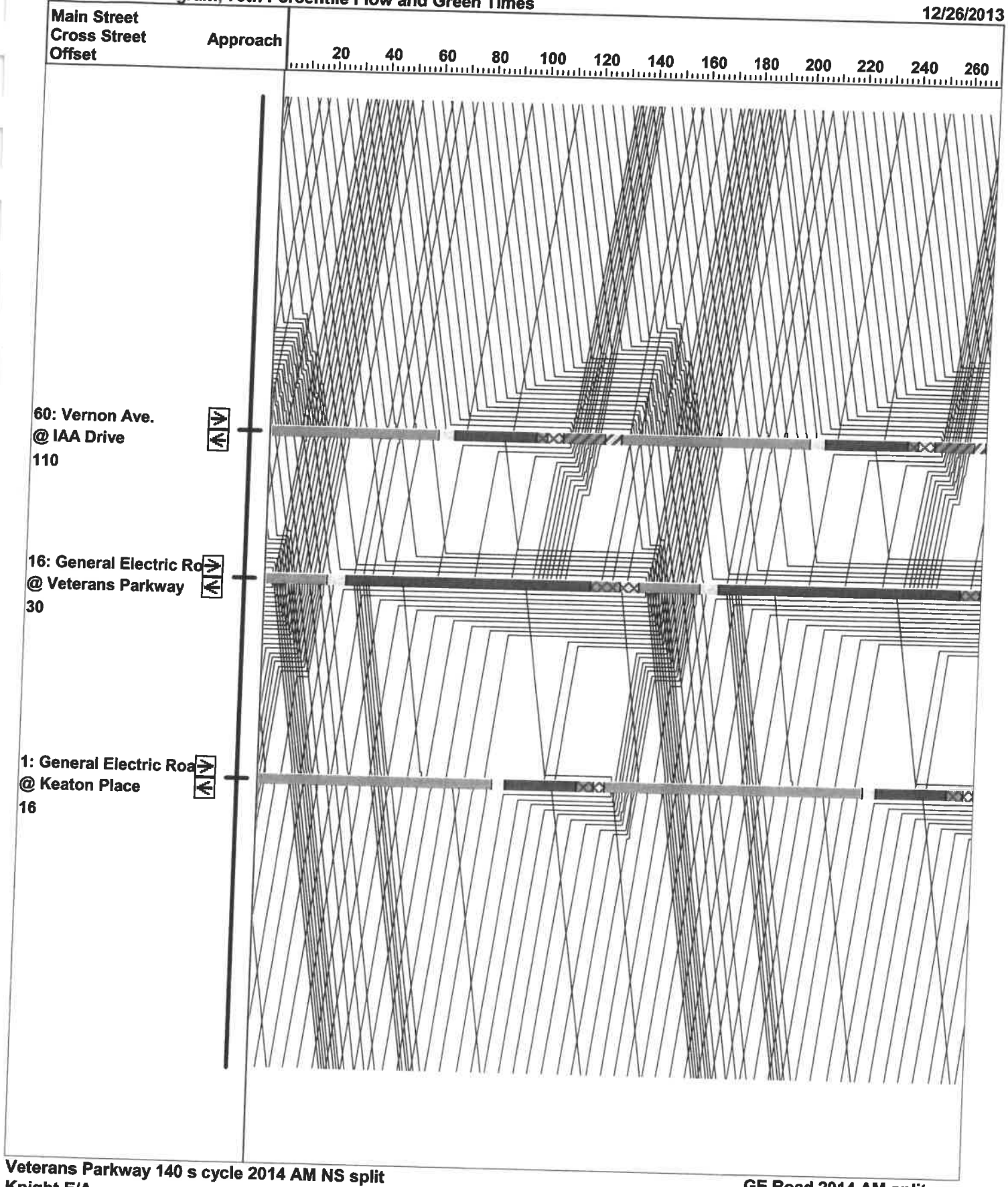


Veterans Parkway 140 s cycle 2014 AM NS split
Knight E/A

GE Road 2014 AM split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle 2014 AM NS split
Knight E/A

GE Road 2014 AM split.syn

Timings
1: Keaton Place & General Electric Road

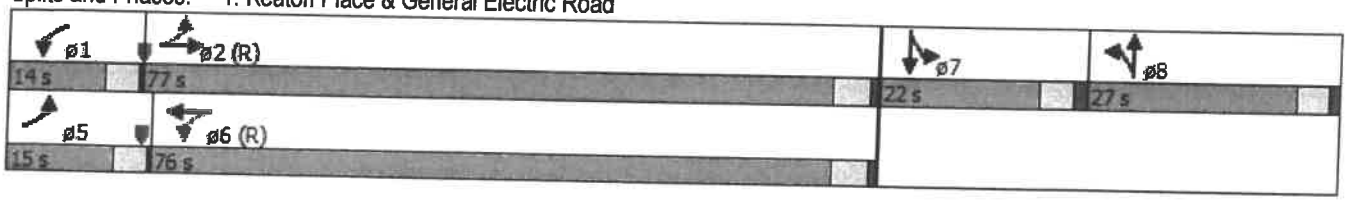
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	34	432	34	566	1	1
Lane Group Flow (vph)	36	489	36	609	46	15
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	5	2	1	6	8	7
Permitted Phases	2		6			
Detector Phase	5	2	1	6	8	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0
Total Split (s)	15.0	77.0	14.0	76.0	27.0	22.0
Total Split (%)	10.7%	55.0%	10.0%	54.3%	19.3%	15.7%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	None	C-Max	None	None
Act Effct Green (s)	116.5	111.5	116.5	111.5	8.5	6.4
Actuated g/C Ratio	0.83	0.80	0.83	0.80	0.06	0.05
v/c Ratio	0.05	0.18	0.05	0.22	0.39	0.17
Control Delay	0.7	1.0	3.2	5.5	64.7	48.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	1.0	3.2	5.5	64.7	48.3
LOS	A	A	A	A	E	D
Approach Delay		1.0		5.4	64.7	48.3
Approach LOS		A		A	E	D
Queue Length 50th (ft)	1	6	3	59	36	7
Queue Length 95th (ft)	m3	15	15	133	77	31
Internal Link Dist (ft)		412		658	350	262
Turn Bay Length (ft)	100		175			
Base Capacity (vph)	734	2793	811	2812	298	227
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.18	0.04	0.22	0.15	0.07

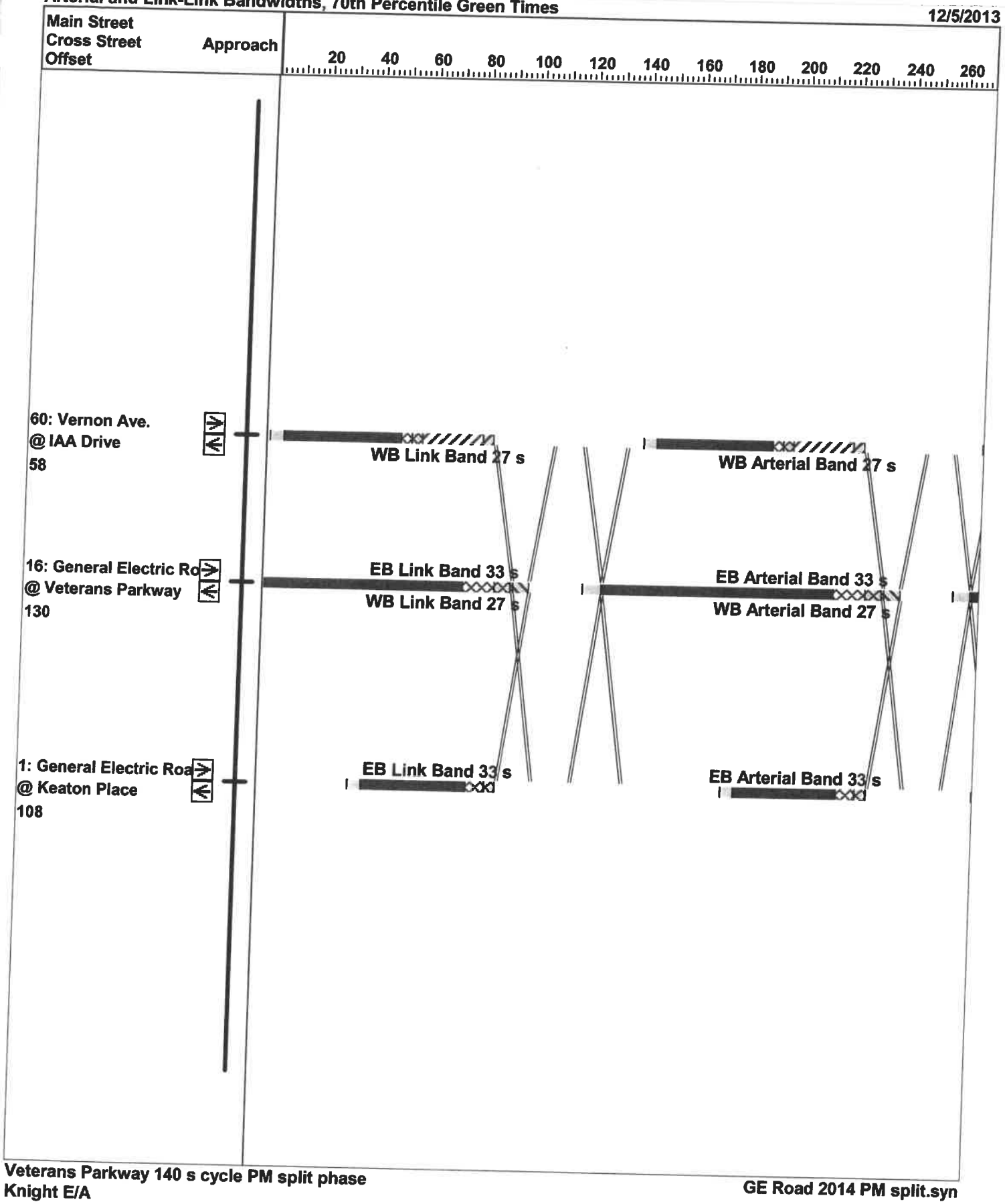
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 6.2 — Intersection LOS: A
Intersection Capacity Utilization 35.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

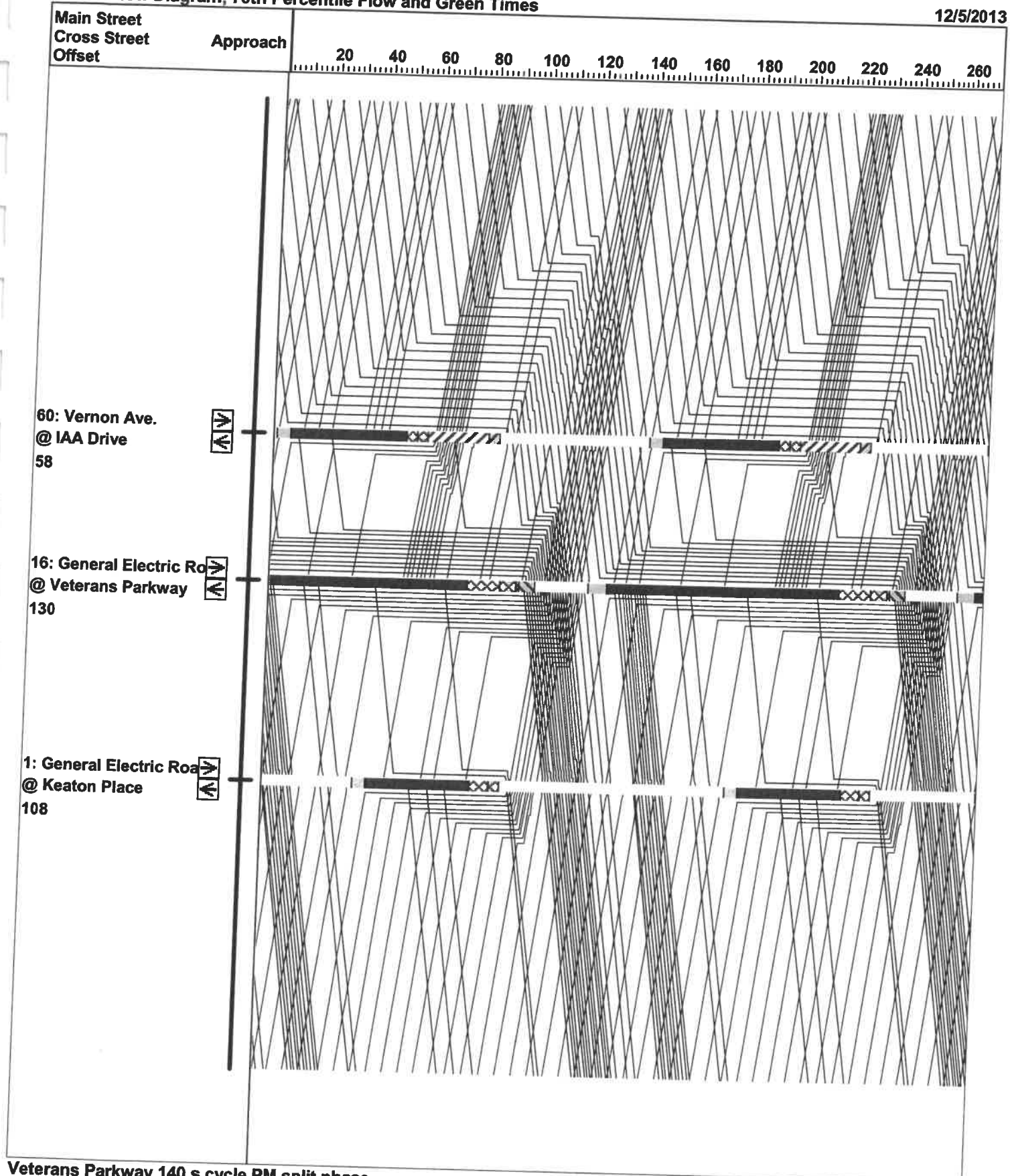


Veterans Parkway 140 s cycle PM split phase
Knight E/A

GE Road 2014 PM split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM split phase
Knight E/A

GE Road 2014 PM split.syn

Timings
1: Keaton Place & General Electric Road

12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	45	700	40	492	1	2
Lane Group Flow (vph)	47	817	42	534	182	67
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	5	2	1	6	8	7
Permitted Phases	2		6			
Detector Phase	5	2	1	6	8	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0
Total Split (s)	11.0	70.0	12.0	71.0	37.0	21.0
Total Split (%)	7.9%	50.0%	8.6%	50.7%	26.4%	15.0%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	None	C-Max	None	None
Act Effct Green (s)	99.4	92.9	99.2	92.7	18.2	7.4
Actuated g/C Ratio	0.71	0.66	0.71	0.66	0.13	0.05
v/c Ratio	0.08	0.35	0.09	0.23	0.73	0.47
Control Delay	1.3	1.9	7.8	11.6	69.8	33.9
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	1.3	2.1	7.8	11.6	69.8	33.9
LOS	A	A	A	B	E	C
Approach Delay		2.1		11.3	69.8	33.9
Approach LOS		A		B	E	C
Queue Length 50th (ft)	2	18	10	101	149	14
Queue Length 95th (ft)	m3	28	28	166	223	63
Internal Link Dist (ft)		412		658	350	262
Turn Bay Length (ft)	100		40			
Base Capacity (vph)	623	2315	474	2336	432	246
Starvation Cap Reductn	0	729	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.08	0.52	0.09	0.23	0.42	0.27

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 108 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 13.8 Intersection LOS: B
Intersection Capacity Utilization 53.3% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road

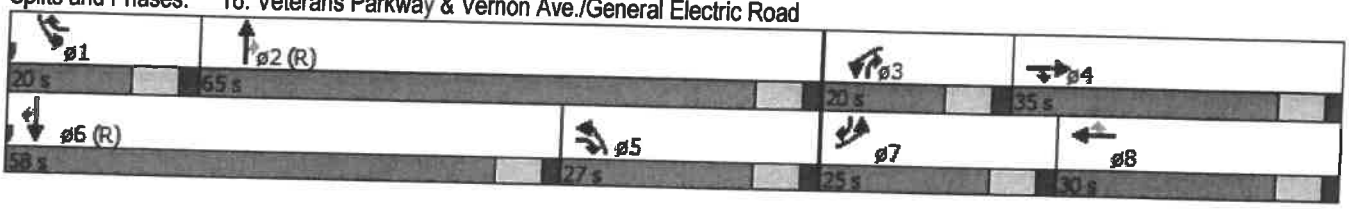
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	106.7	50.2	20.2	87.1	57.7	4.1	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	106.7	51.6	20.5	87.1	57.7	4.1	62.2	32.7	6.0	76.5	44.9	8.1
LOS	F	D	C	F	E	A	E	C	A	E	D	A
Approach Delay		60.3			53.1			35.3			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	182	143	92	85	176	8	128	407	18	122	581	49
Queue Length 95th (ft)	#295	212	185	121	140	17	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	28	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	44	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.65	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.4 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road



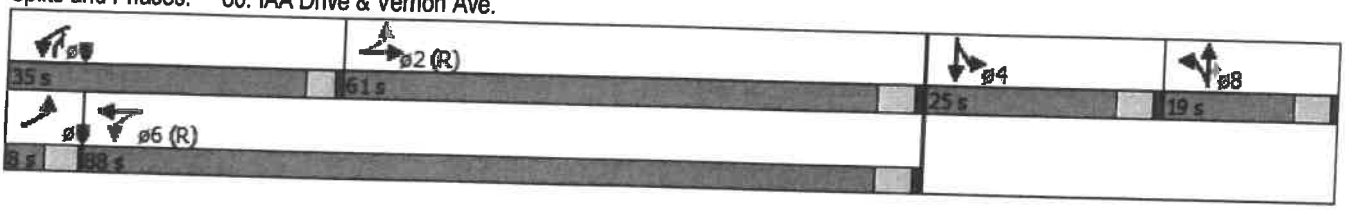
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	63	1012	319	524	21	95	25
Lane Group Flow (vph)	66	1143	336	627	105	100	181
Turn Type	pm+pt	NA	pm+pt	NA	NA	pm+ov	NA
Protected Phases	5	2	1	6	8	1	4
Permitted Phases	2		6			8	
Detector Phase	5	2	1	6	8	1	4
Switch Phase							
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	3.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	8.0	15.0
Total Split (s)	8.0	61.0	35.0	88.0	19.0	35.0	25.0
Total Split (%)	5.7%	43.6%	25.0%	62.9%	13.6%	25.0%	17.9%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.1	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	0.8	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	3.9	5.0
Lead/Lag	Lead	Lag	Lead	Lag		Lead	
Lead-Lag Optimize?							
Recall Mode	None	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	71.9	65.8	96.4	88.2	12.4	43.0	17.3
Actuated g/C Ratio	0.51	0.47	0.69	0.63	0.09	0.31	0.12
v/c Ratio	0.16	0.72	0.80	0.30	0.69	0.19	0.80
Control Delay	12.2	34.8	44.3	4.8	84.2	6.3	77.2
Queue Delay	0.0	0.0	2.7	0.5	0.0	0.0	0.0
Total Delay	12.2	34.8	47.0	5.3	84.2	6.3	77.2
LOS	B	C	D	A	F	A	E
Approach Delay		33.6		19.9	46.2		77.2
Approach LOS		C		B	D		E
Queue Length 50th (ft)	19	455	139	32	93	0	141
Queue Length 95th (ft)	38	585	335	68	158	40	#237
Internal Link Dist (ft)		770		274	520		42
Turn Bay Length (ft)	100		100			90	
Base Capacity (vph)	417	1595	481	2123	173	595	257
Starvation Cap Reductn	0	0	67	1010	0	0	0
Spillback Cap Reductn	0	6	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.72	0.81	0.56	0.61	0.17	0.70

Intersection Summary

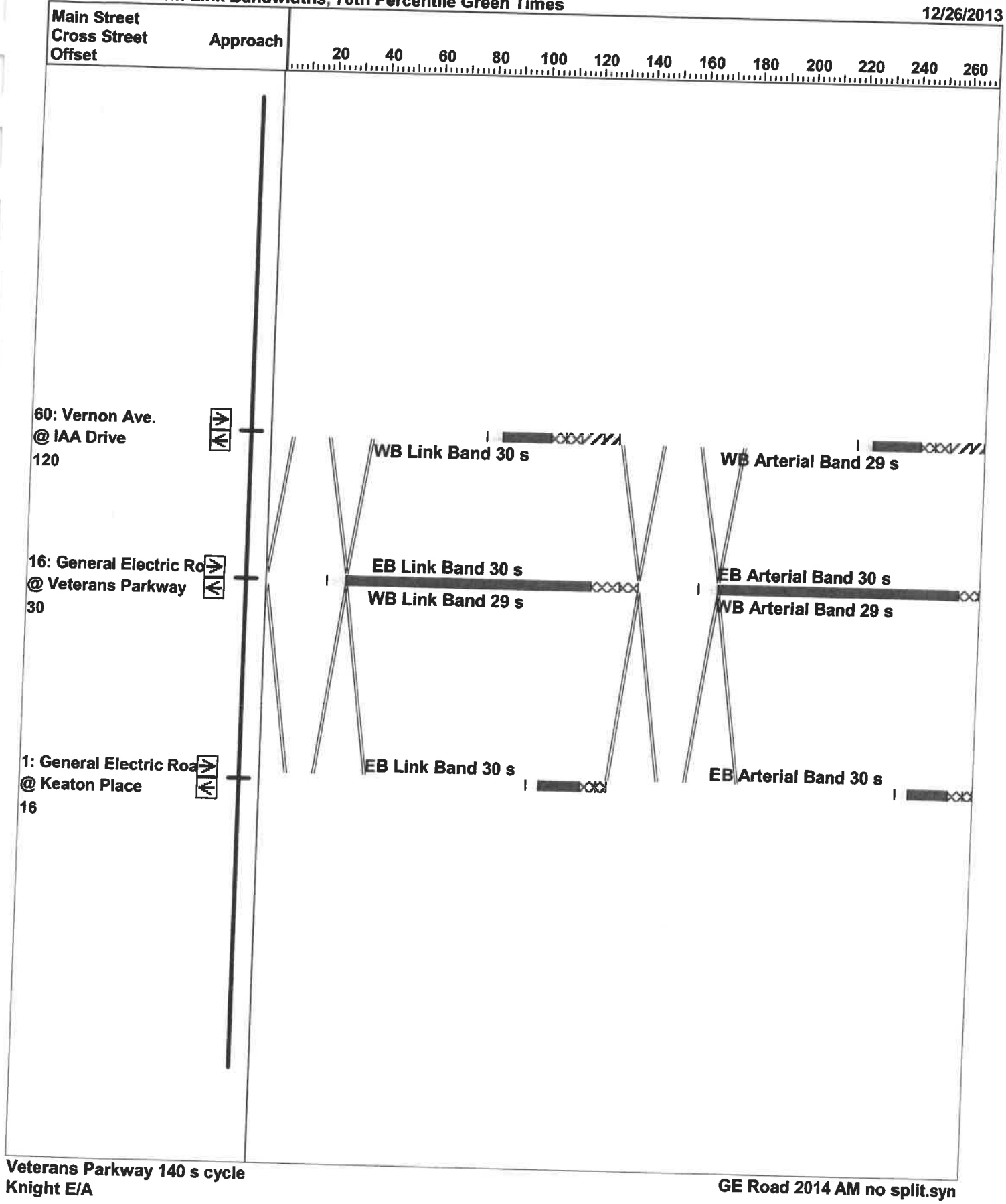
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 32.5 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

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

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

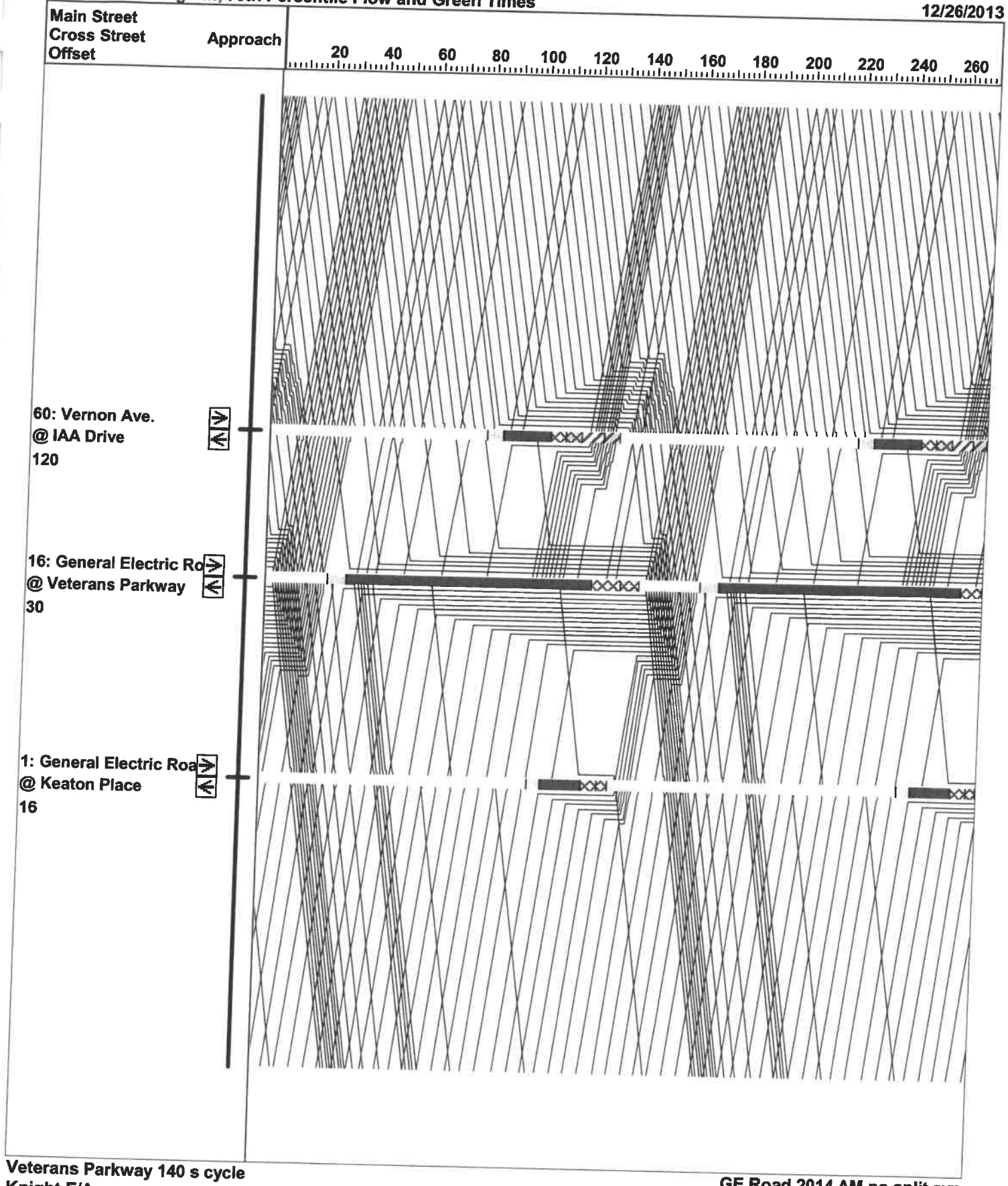


Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM no split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM no split.syn

Timings
1: Keaton Place & General Electric Road

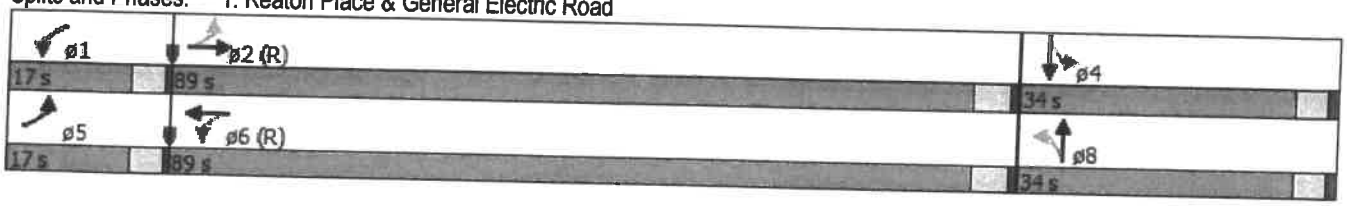
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	432	34	566	35	1	7	1
Lane Group Flow (vph)	36	489	36	609	0	46	0	15
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	17.0	89.0	17.0	89.0	34.0	34.0	34.0	34.0
Total Split (%)	12.1%	63.6%	12.1%	63.6%	24.3%	24.3%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	120.9	116.1	120.9	116.1		9.0		9.0
Actuated g/C Ratio	0.86	0.83	0.86	0.83		0.06		0.06
v/c Ratio	0.05	0.17	0.05	0.21		0.46		0.13
Control Delay	0.4	0.7	1.6	3.6		68.2		43.9
Queue Delay	0.0	0.0	0.0	0.0		0.0		0.0
Total Delay	0.4	0.7	1.6	3.6		68.2		43.9
LOS	A	A	A	A		E		D
Approach Delay		0.7		3.5		68.2		43.9
Approach LOS		A		A		E		D
Queue Length 50th (ft)	1	6	3	61		35		7
Queue Length 95th (ft)	m2	10	9	92		77		30
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	782	2907	865	2927		310		345
Starvation Cap Reductn	0	0	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.05	0.17	0.04	0.21		0.15		0.04

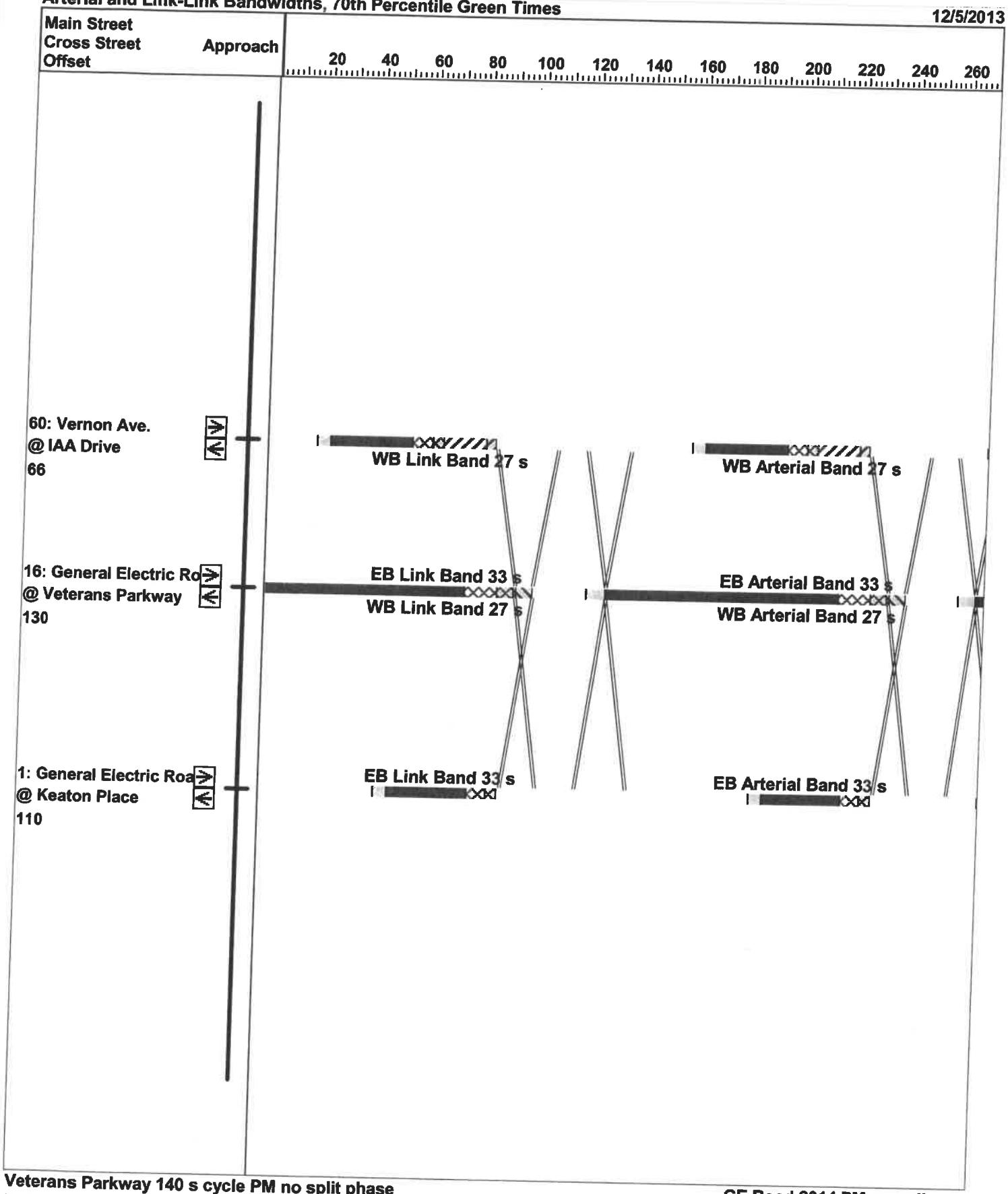
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 16 (11%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.46
Intersection Signal Delay: 5.2 — Intersection LOS: A
Intersection Capacity Utilization 35.1% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

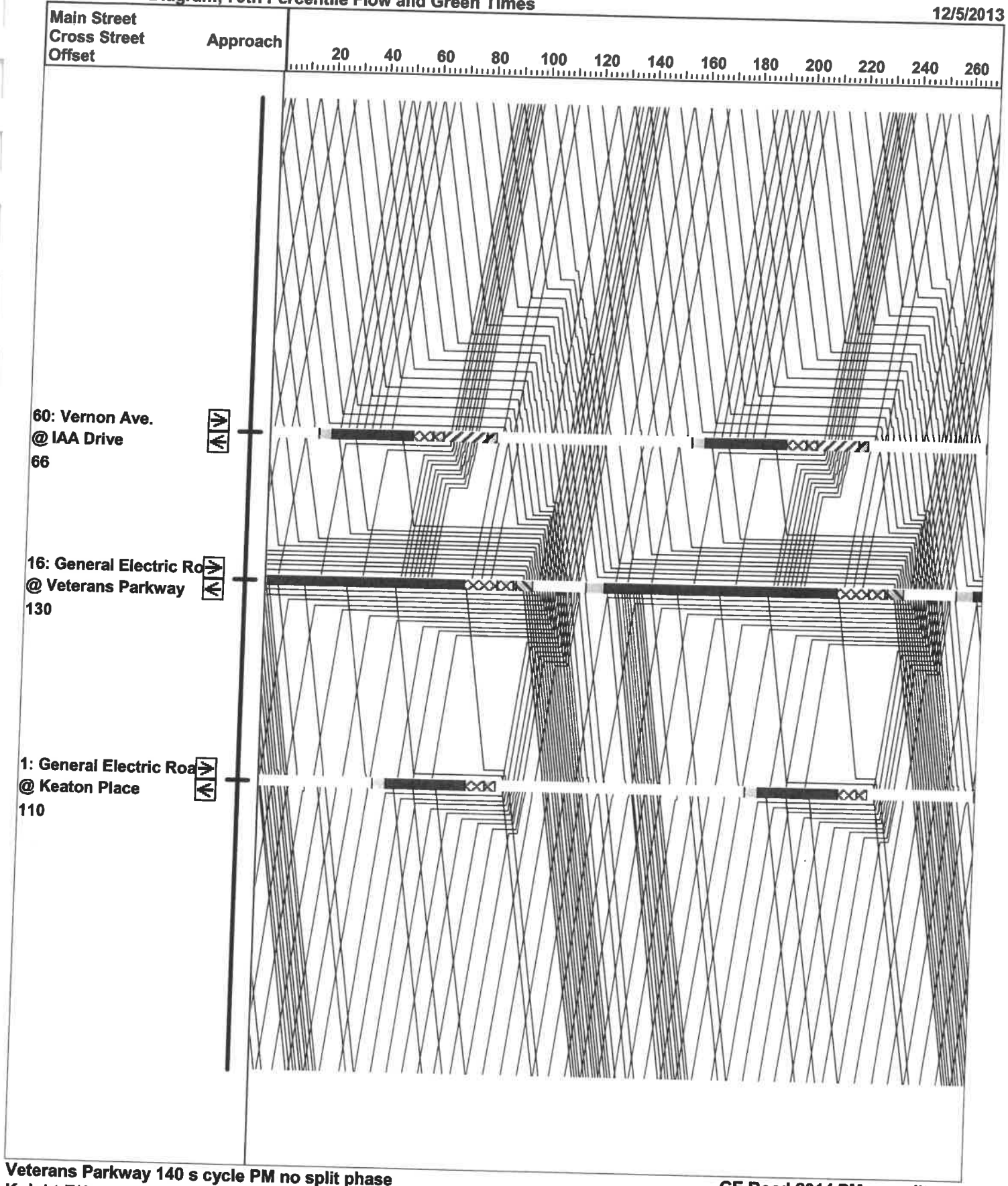


Veterans Parkway 140 s cycle PM no split phase
Knight E/A

GE Road 2014 PM no split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM no split phase
Knight E/A

GE Road 2014 PM no split.syn

Timings
1: Keaton Place & General Electric Road

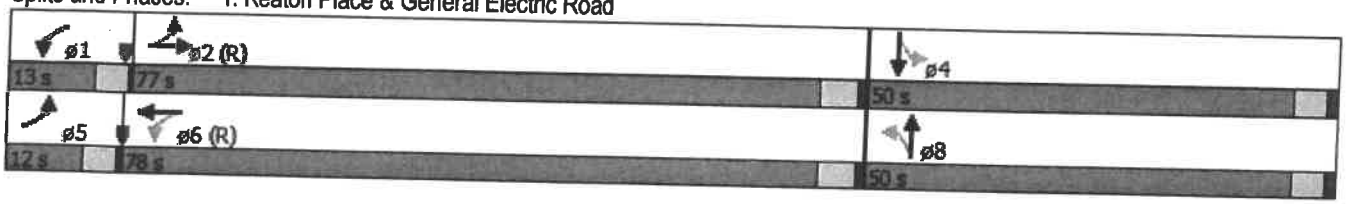
12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	45	700	40	492	120	1	13	2
Lane Group Flow (vph)	47	817	42	534	0	182	0	67
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	12.0	77.0	13.0	78.0	50.0	50.0	50.0	50.0
Total Split (%)	8.6%	55.0%	9.3%	55.7%	35.7%	35.7%	35.7%	35.7%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	106.3	100.0	106.0	99.8		21.6		21.6
Actuated g/C Ratio	0.76	0.71	0.76	0.71		0.15		0.15
v/c Ratio	0.07	0.33	0.08	0.21		0.79		0.22
Control Delay	0.8	1.4	4.9	8.1		73.9		18.9
Queue Delay	0.0	0.3	0.0	0.0		0.0		0.0
Total Delay	0.8	1.7	4.9	8.1		73.9		18.9
LOS	A	A	A	A		E		B
Approach Delay		1.6		7.8		73.9		18.9
Approach LOS		A		A		E		B
Queue Length 50th (ft)	1	15	7	82		148		13
Queue Length 95th (ft)	m3	23	21	133		221		53
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	683	2492	531	2514		465		567
Starvation Cap Reductn	0	929	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.07	0.52	0.08	0.21		0.39		0.12

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 110 (79%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 12.2 — Intersection LOS: B
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



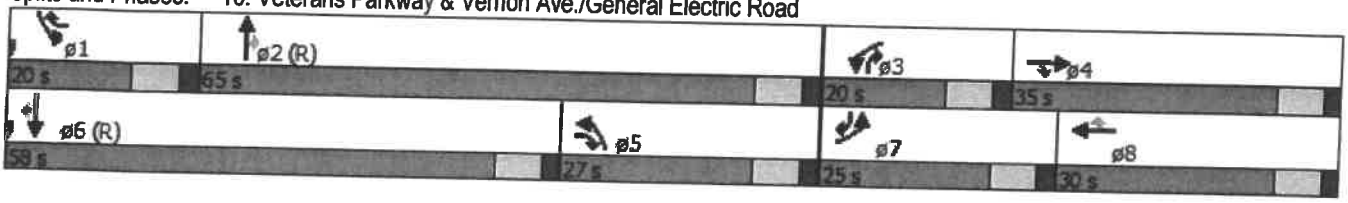
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	102.7	54.6	21.9	84.0	60.2	5.0	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	56.0	22.1	84.0	60.2	5.0	62.0	32.7	6.0	76.5	44.9	8.1
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		61.1			53.8			35.2			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	171	163	77	85	176	9	128	407	18	122	581	49
Queue Length 95th (ft)	#295	215	247	123	161	32	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	25	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	33	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.63	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.6 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

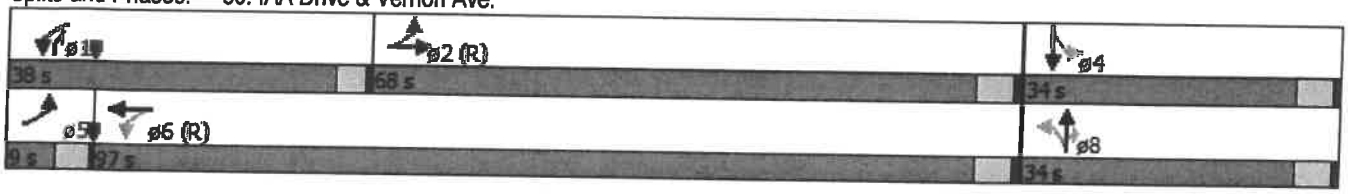


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	63	1012	319	524	79	21	95	73	25
Lane Group Flow (vph)	66	1143	336	627	0	105	100	0	181
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	21.0	21.0	8.0	21.0	21.0
Total Split (s)	9.0	68.0	38.0	97.0	34.0	34.0	38.0	34.0	34.0
Total Split (%)	6.4%	48.6%	27.1%	69.3%	24.3%	24.3%	27.1%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.9	3.1	3.9	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	1.1	0.8	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0		5.0	3.9		5.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	88.8	81.6	109.4	100.0		21.7	49.5		21.7
Actuated g/C Ratio	0.63	0.58	0.78	0.71		0.16	0.35		0.16
v/c Ratio	0.13	0.58	0.73	0.26		0.68	0.18		0.85
Control Delay	7.6	22.3	30.2	3.6		76.0	15.0		81.9
Queue Delay	0.0	0.0	1.0	0.4		0.0	0.0		0.7
Total Delay	7.6	22.3	31.2	4.0		76.0	15.0		82.5
LOS	A	C	C	A		E	B		F
Approach Delay		21.5		13.5		46.2			82.5
Approach LOS		C		B		D			F
Queue Length 50th (ft)	12	328	99	40		91	33		141
Queue Length 95th (ft)	29	531	275	133		150	60		221
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	514	1976	577	2406		207	690		274
Starvation Cap Reductn	0	0	84	1228		0	0		0
Spillback Cap Reductn	0	7	0	0		0	13		11
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.13	0.58	0.68	0.53		0.51	0.15		0.69

Intersection Summary

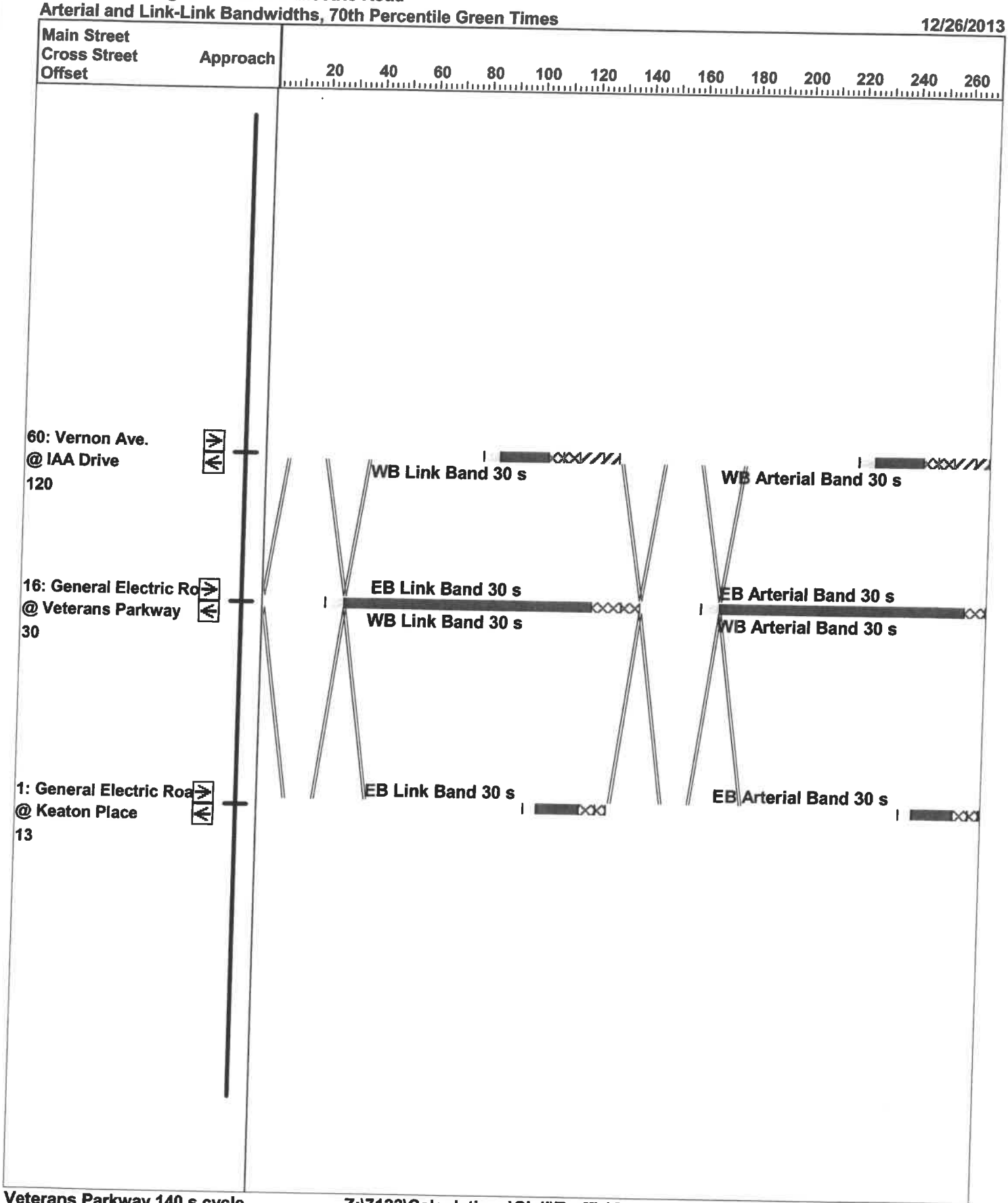
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 66 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 24.8 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

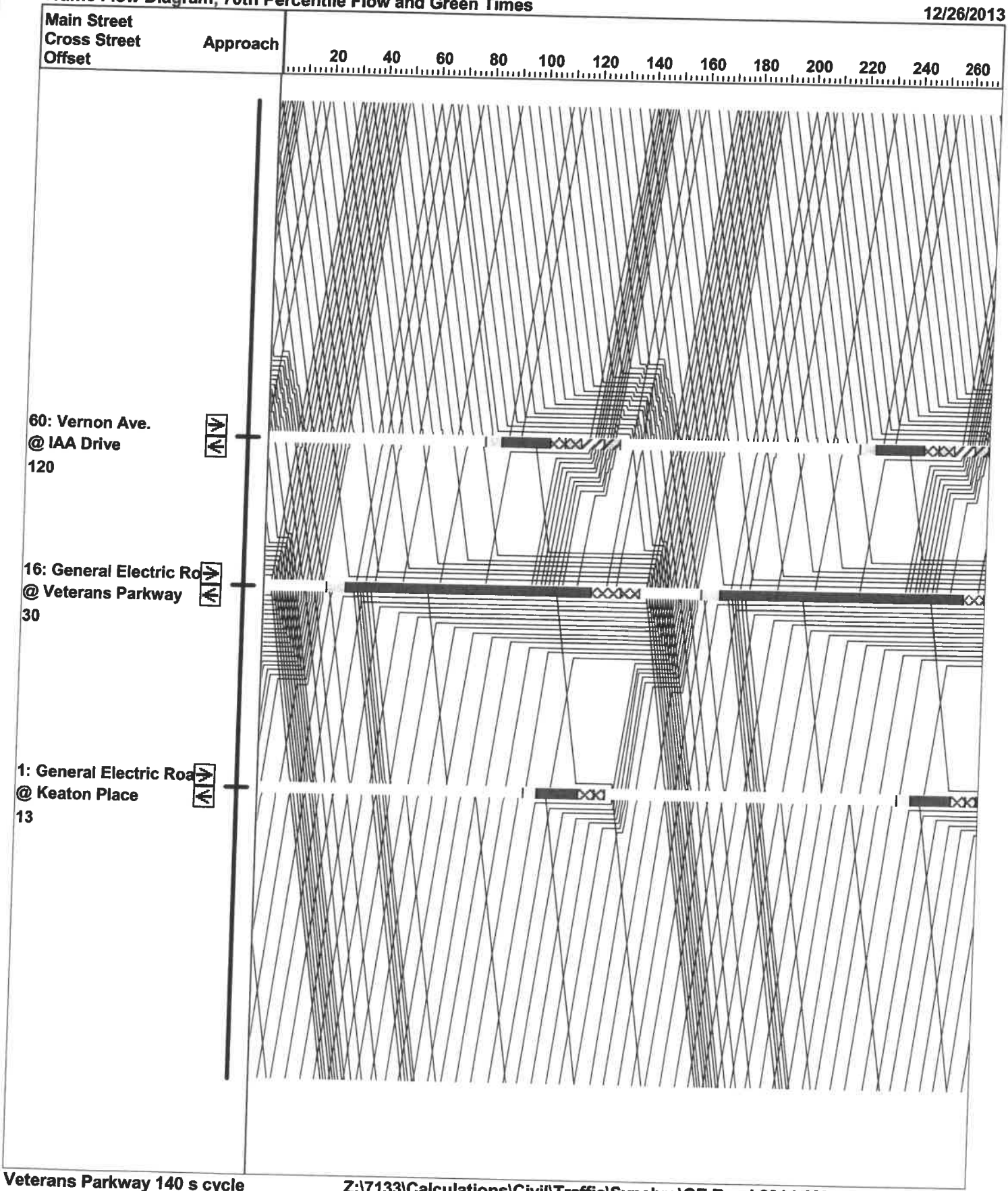


Veterans Parkway 140 s cycle
Knight E/A

Z:\7133\Calculations\Civil\Traffic\Synchro\GE Road 2014 AM no split ns lt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle
Knight E/A

Z:\7133\Calculations\Civil\Traffic\Synchro\GE Road 2014 AM no split ns lt.syn

Timings
1: Keaton Place & General Electric Road

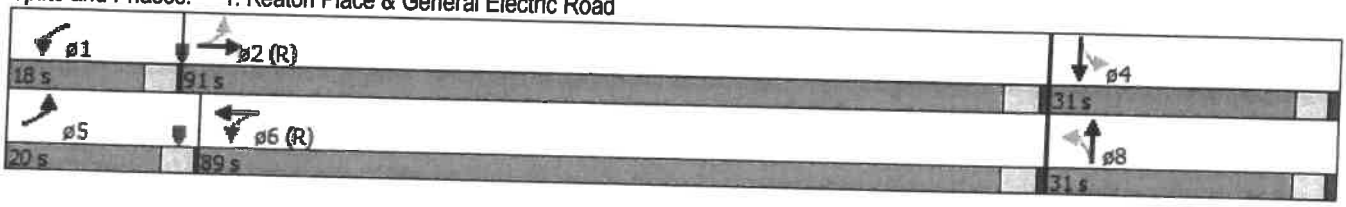
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	432	34	566	35	1	7	1
Lane Group Flow (vph)	36	489	36	609	37	9	7	8
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	20.0	91.0	18.0	89.0	31.0	31.0	31.0	31.0
Total Split (%)	14.3%	65.0%	12.9%	63.6%	22.1%	22.1%	22.1%	22.1%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	121.0	116.2	121.0	116.2	8.9	8.9	8.9	8.9
Actuated g/C Ratio	0.86	0.83	0.86	0.83	0.06	0.06	0.06	0.06
v/c Ratio	0.05	0.17	0.04	0.21	0.39	0.08	0.07	0.07
Control Delay	0.4	0.7	1.6	3.6	73.8	34.1	61.4	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	0.7	1.6	3.6	73.8	34.1	61.4	35.5
LOS	A	A	A	A	E	C	E	D
Approach Delay		0.7		3.4		66.0		47.6
Approach LOS		A		A		E		D
Queue Length 50th (ft)	1	6	3	61	33	1	6	1
Queue Length 95th (ft)	m2	10	9	91	70	20	22	19
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	804	2910	871	2929	277	326	277	326
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.17	0.04	0.21	0.13	0.03	0.03	0.02

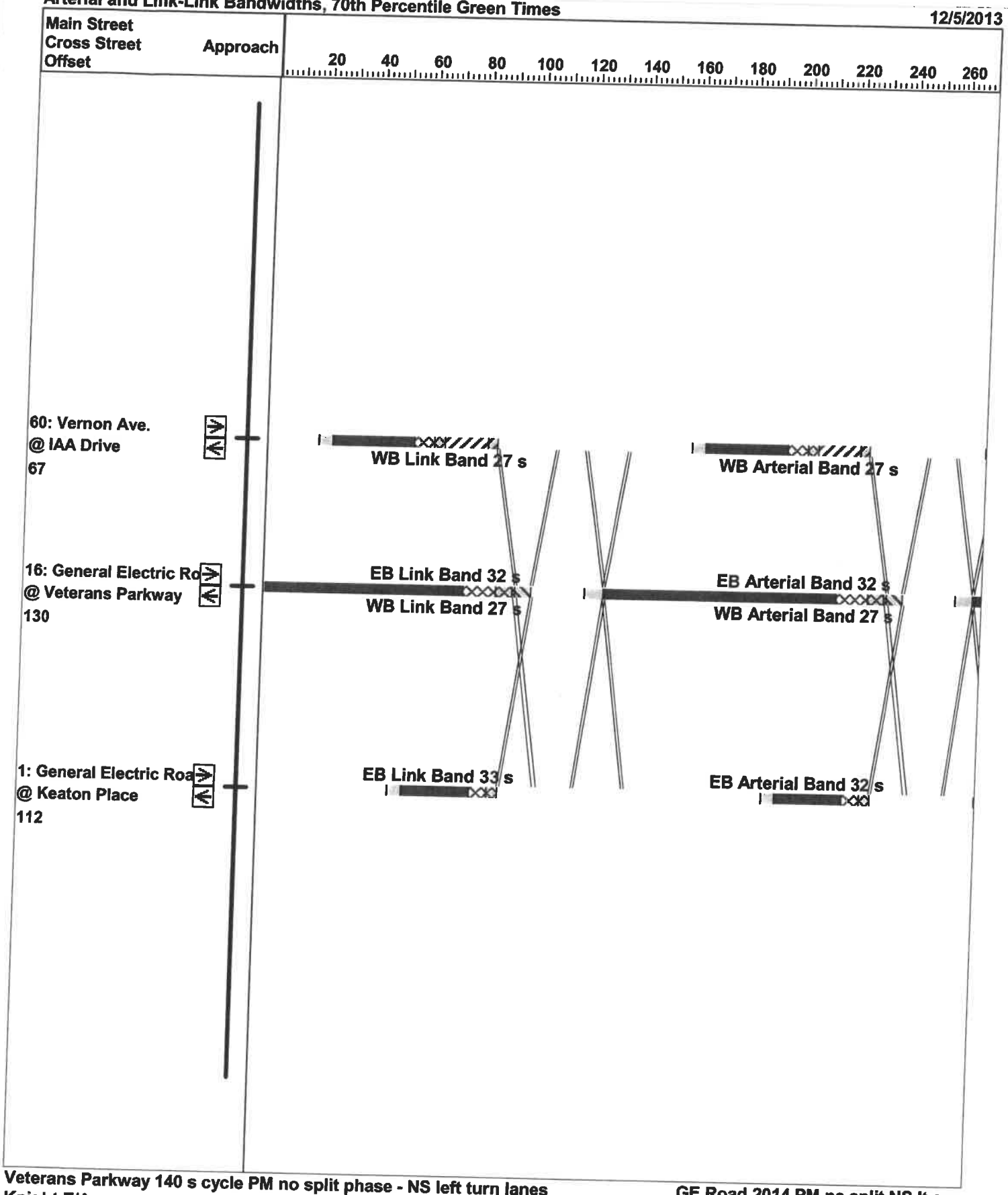
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 5.1 Intersection LOS: A
Intersection Capacity Utilization 39.6% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

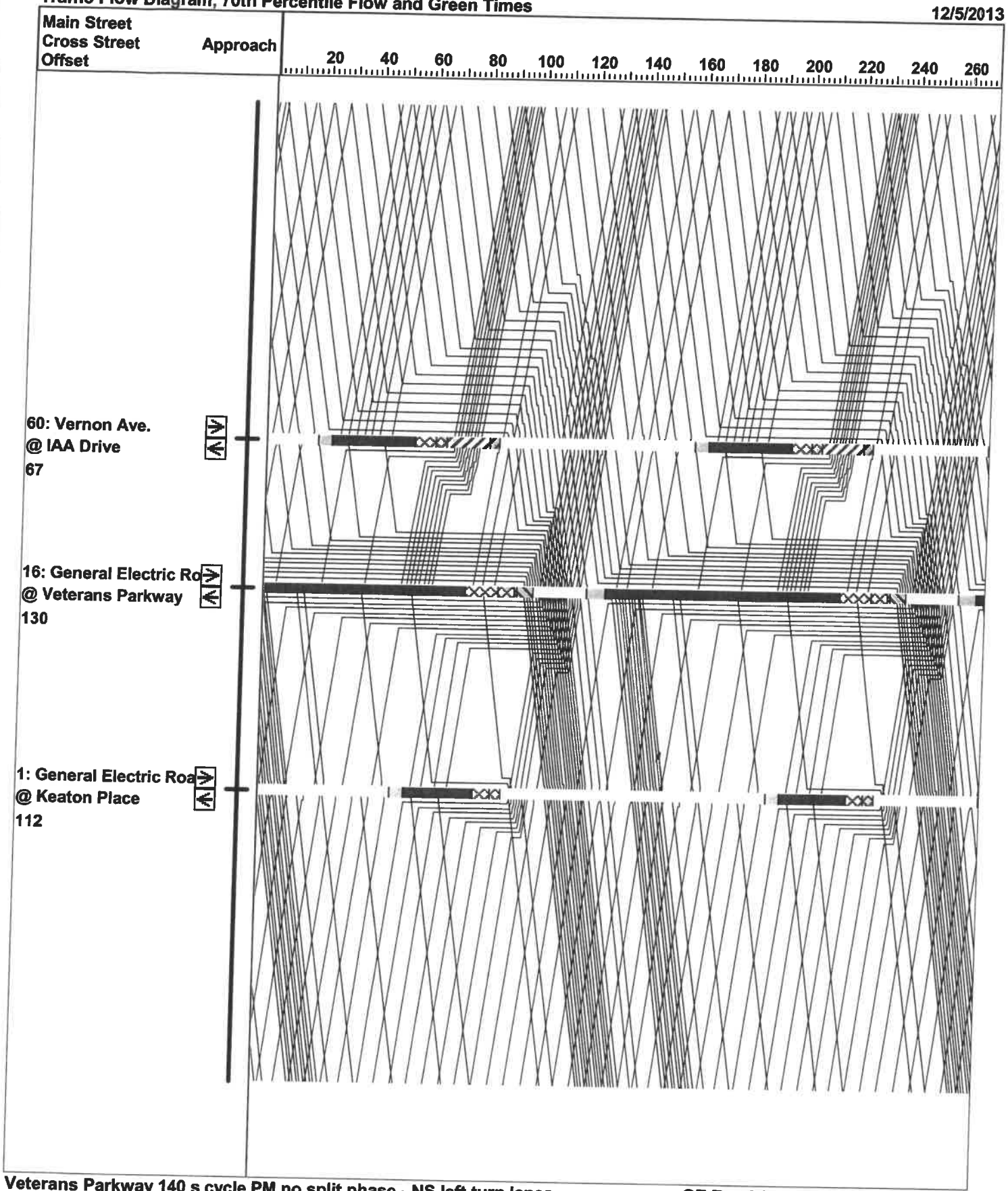


Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM no split NS lt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM no split NS lt.syn

Timings
1: Keaton Place & General Electric Road

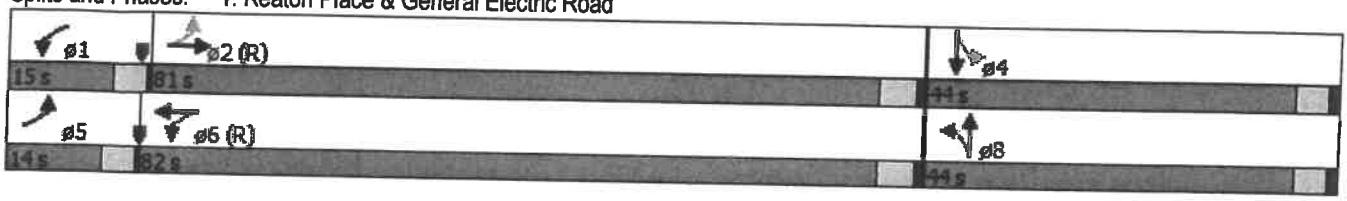
12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	45	700	40	492	120	1	13	2
Lane Group Flow (vph)	47	817	42	534	126	56	14	53
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	14.0	81.0	15.0	82.0	44.0	44.0	44.0	44.0
Total Split (%)	10.0%	57.9%	10.7%	58.6%	31.4%	31.4%	31.4%	31.4%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	110.2	104.0	110.0	103.9	17.7	17.7	17.7	17.7
Actuated g/C Ratio	0.79	0.74	0.79	0.74	0.13	0.13	0.13	0.13
v/c Ratio	0.07	0.32	0.08	0.20	0.70	0.21	0.08	0.20
Control Delay	0.6	1.2	3.8	6.5	77.6	14.6	51.8	15.3
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.6	1.5	3.8	6.5	77.6	14.6	51.8	15.3
LOS	A	A	A	A	E	B	D	B
Approach Delay		1.4		6.3		58.2		22.9
Approach LOS		A		A		E		C
Queue Length 50th (ft)	1	13	6	72	112	1	11	2
Queue Length 95th (ft)	m2	20	18	116	174	40	32	41
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	736	2593	577	2617	399	511	398	510
Starvation Cap Reductn	0	1061	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.53	0.07	0.20	0.32	0.11	0.04	0.10

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 112 (80%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 10.1 Intersection LOS: B
Intersection Capacity Utilization 50.1% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



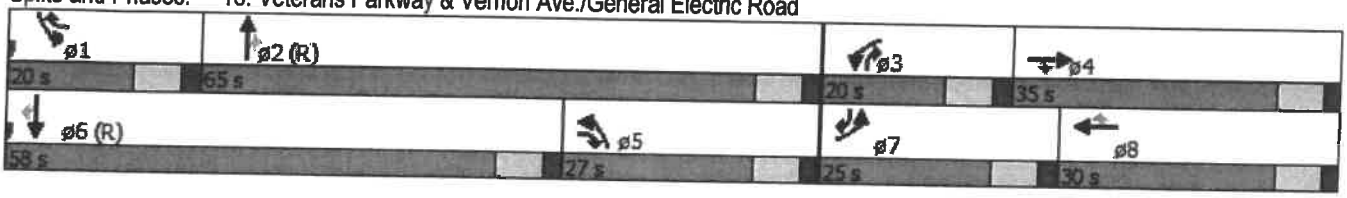
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	102.9	55.2	22.3	80.1	60.5	5.4	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	102.9	56.6	22.6	80.1	60.5	5.4	62.0	32.7	6.0	76.5	44.9	8.1
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		61.5			53.1			35.2			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	174	158	79	85	177	9	128	407	18	122	581	49
Queue Length 95th (ft)	#295	215	254	122	174	39	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	25	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	33	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.63	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.6 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

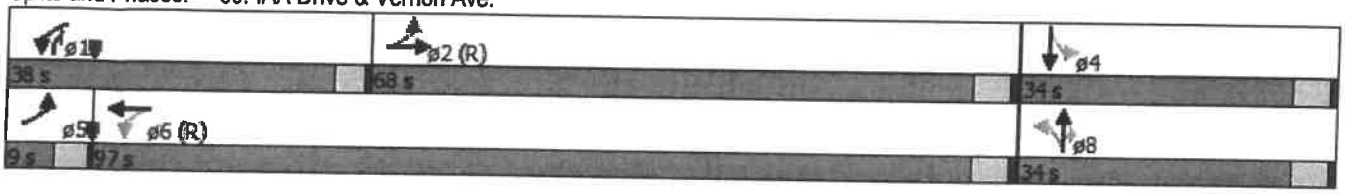


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	63	1012	319	524	79	21	95	73	25
Lane Group Flow (vph)	66	1143	336	627	0	105	100	0	181
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	21.0	21.0	8.0	21.0	21.0
Total Split (s)	9.0	68.0	38.0	97.0	34.0	34.0	38.0	34.0	34.0
Total Split (%)	6.4%	48.6%	27.1%	69.3%	24.3%	24.3%	27.1%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.9	3.1	3.9	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	1.1	0.8	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0		5.0	3.9		5.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	88.8	81.6	109.4	100.0		21.7	49.5		21.7
Actuated g/C Ratio	0.63	0.58	0.78	0.71		0.16	0.35		0.16
v/c Ratio	0.13	0.58	0.73	0.26		0.68	0.18		0.85
Control Delay	7.6	22.3	30.4	3.8		76.0	15.0		81.9
Queue Delay	0.0	0.0	1.0	0.4		0.0	0.0		0.7
Total Delay	7.6	22.3	31.4	4.2		76.0	15.0		82.6
LOS	A	C	C	A		E	B		F
Approach Delay		21.5		13.7		46.2			82.6
Approach LOS		C		B		D			F
Queue Length 50th (ft)	12	328	99	65		91	33		141
Queue Length 95th (ft)	29	531	274	138		150	60		221
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	514	1976	577	2406		207	690		274
Starvation Cap Reductn	0	0	83	1226		0	0		0
Spillback Cap Reductn	0	7	0	0		0	16		12
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.13	0.58	0.68	0.53		0.51	0.15		0.69

Intersection Summary

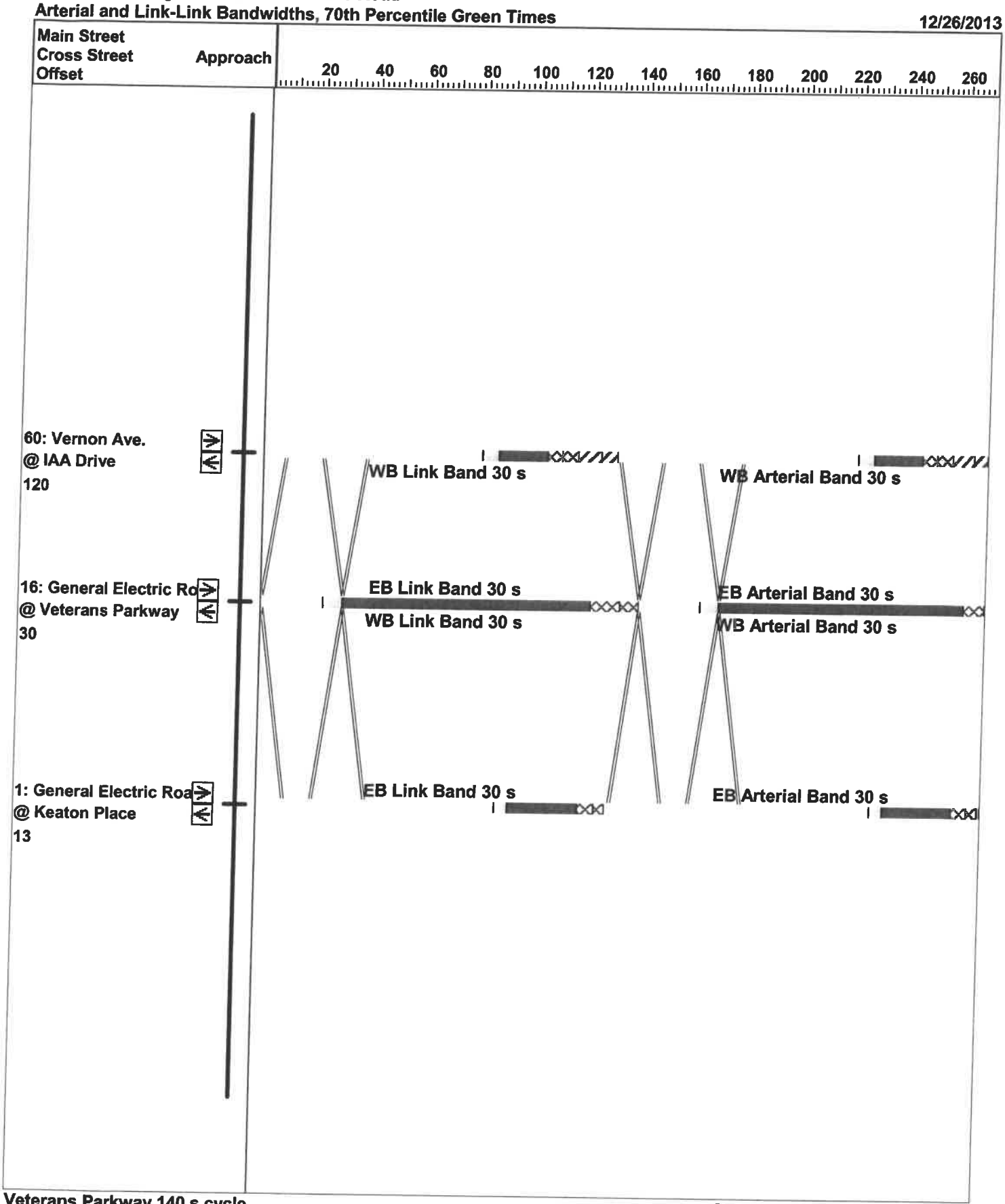
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 67 (48%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 24.8 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

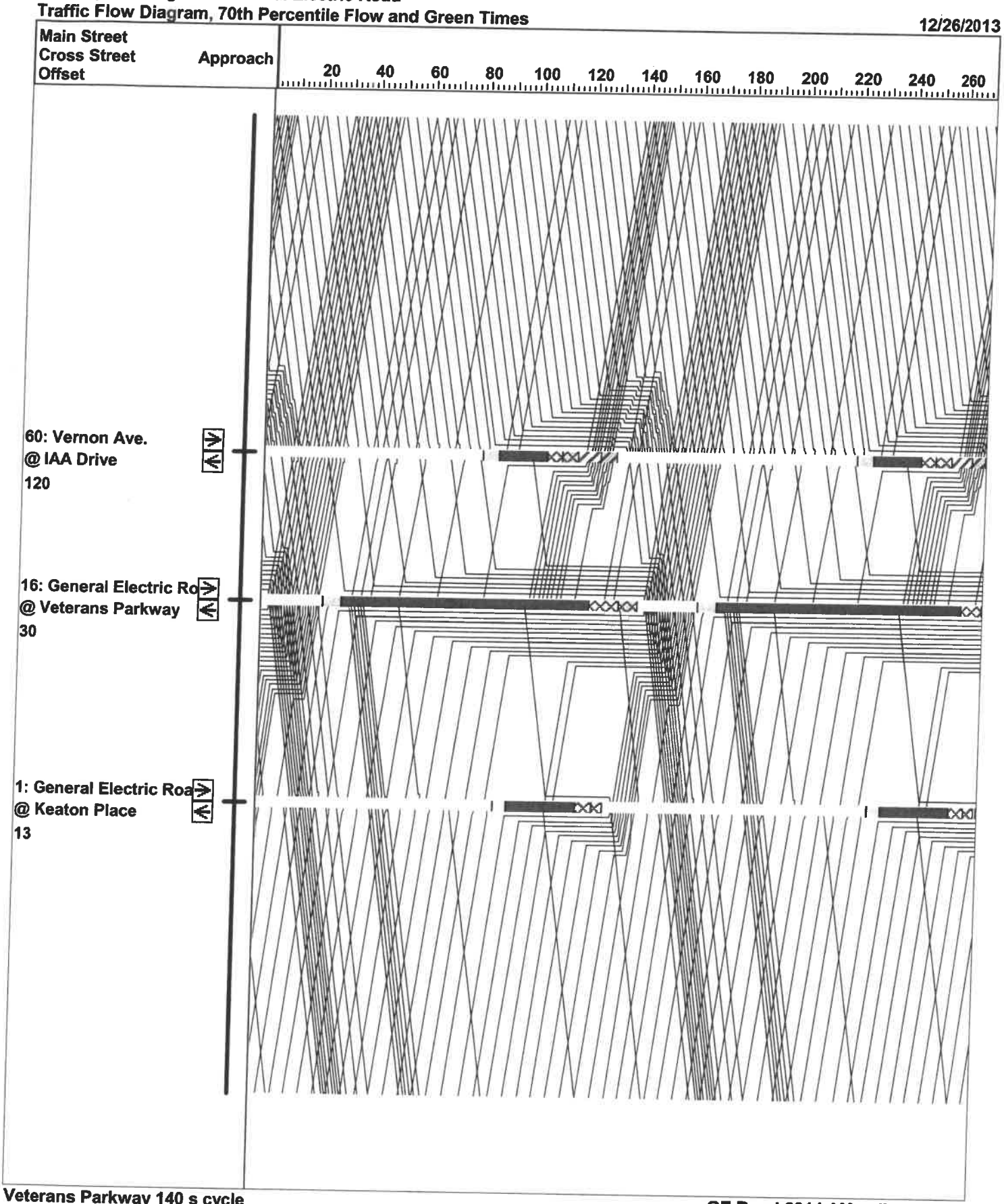


Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM split ns lt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM split ns lt.syn

Timings
1: Keaton Place & General Electric Road

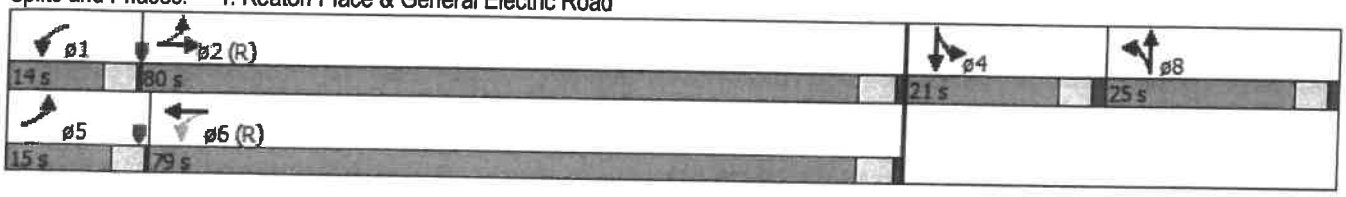
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	34	432	34	566	35	1	7	1
Lane Group Flow (vph)	36	489	36	609	37	9	7	8
Turn Type	pm+pt	NA	pm+pt	NA	Split	NA	Split	NA
Protected Phases	5	2	1	6	8	8	4	4
Permitted Phases	2		6					
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	15.0	80.0	14.0	79.0	25.0	25.0	21.0	21.0
Total Split (%)	10.7%	57.1%	10.0%	56.4%	17.9%	17.9%	15.0%	15.0%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	117.0	112.0	117.0	112.0	8.2	8.2	6.1	6.1
Actuated g/C Ratio	0.84	0.80	0.84	0.80	0.06	0.06	0.04	0.04
v/c Ratio	0.05	0.17	0.05	0.22	0.34	0.08	0.09	0.10
Control Delay	0.7	1.0	3.0	5.3	70.7	35.0	66.0	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	1.0	3.0	5.3	70.7	35.0	66.0	39.4
LOS	A	A	A	A	E	C	E	D
Approach Delay		0.9		5.1		63.7		51.8
Approach LOS		A		A		E		D
Queue Length 50th (ft)	1	6	3	58	33	1	6	1
Queue Length 95th (ft)	m3	15	15	128	70	20	23	20
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	737	2805	814	2824	269	253	215	203
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.17	0.04	0.22	0.14	0.04	0.03	0.04

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 6.1 — Intersection LOS: A
Intersection Capacity Utilization 39.6% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road

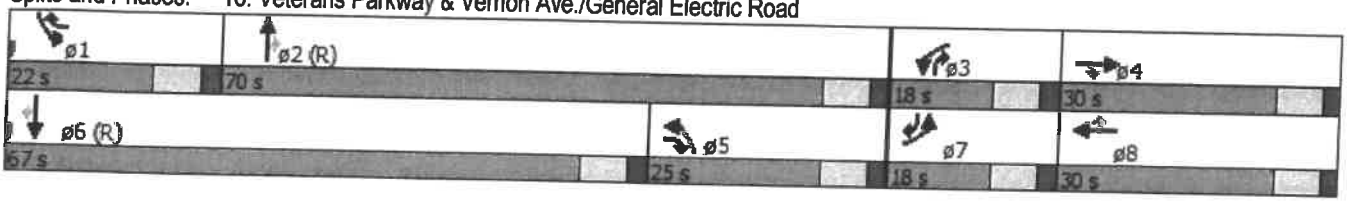


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	273	346	153	446	9	268	722	92	133	1953	334
Lane Group Flow (vph)	135	287	364	161	469	9	282	760	97	140	2056	352
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	18.0	30.0	25.0	18.0	30.0	22.0	25.0	70.0	18.0	22.0	67.0	18.0
Total Split (%)	12.9%	21.4%	17.9%	12.9%	21.4%	15.7%	17.9%	50.0%	12.9%	15.7%	47.9%	12.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	9.6	21.0	39.0	9.5	20.9	37.9	18.0	71.4	87.9	10.1	63.5	73.1
Actuated g/C Ratio	0.07	0.15	0.28	0.07	0.15	0.27	0.13	0.51	0.63	0.07	0.45	0.52
v/c Ratio	0.57	0.51	0.67	0.70	0.85	0.02	0.64	0.28	0.09	0.57	0.85	0.41
Control Delay	91.5	56.0	25.9	89.6	66.7	0.1	65.2	20.7	2.4	71.6	38.6	9.2
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.5	56.0	26.0	89.6	66.7	0.1	65.2	20.7	2.4	71.6	38.6	9.2
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		48.2			71.6			30.1			36.4	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	66	107	105	62	221	0	127	145	0	64	614	66
Queue Length 95th (ft)	103	146	257	121	283	0	177	188	24	98	698	108
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	269	611	542	269	611	581	441	2731	1046	367	2428	883
Starvation Cap Reductn	0	0	7	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	0.50	0.47	0.68	0.60	0.77	0.02	0.64	0.28	0.09	0.38	0.85	0.40

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 30 (21%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 41.2 Intersection LOS: D
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15
Description: V38

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

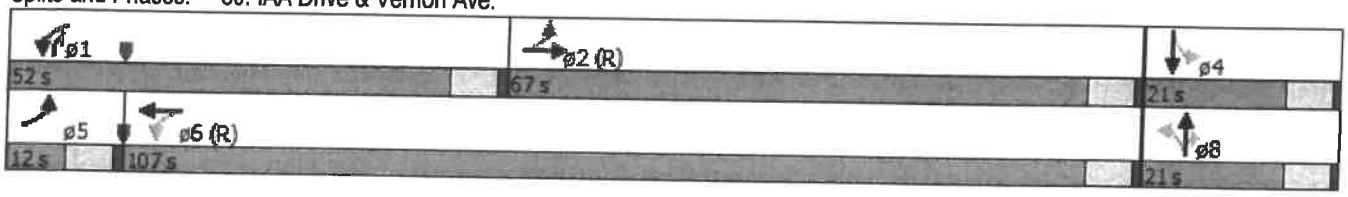


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	21	632	357	660	21	27	103	12	34
Lane Group Flow (vph)	22	886	376	728	0	50	108	0	61
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	10.0	21.0	9.0	21.0	15.0	15.0	9.0	15.0	15.0
Total Split (s)	12.0	67.0	52.0	107.0	21.0	21.0	52.0	21.0	21.0
Total Split (%)	8.6%	47.9%	37.1%	76.4%	15.0%	15.0%	37.1%	15.0%	15.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	103.5	97.7	120.3	114.3		10.5	30.3		10.5
Actuated g/C Ratio	0.74	0.70	0.86	0.82		0.08	0.22		0.08
v/c Ratio	0.04	0.38	0.66	0.26		0.44	0.26		0.48
Control Delay	4.3	10.8	16.0	2.9		73.5	7.4		67.2
Queue Delay	0.0	0.0	0.3	0.3		0.0	0.0		0.4
Total Delay	4.3	10.8	16.3	3.3		73.5	7.4		67.6
LOS	A	B	B	A		E	A		E
Approach Delay		10.7		7.7		28.3			67.6
Approach LOS		B		A		C			E
Queue Length 50th (ft)	2	159	99	109		45	0		48
Queue Length 95th (ft)	9	283	127	133		87	42		94
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	545	2312	823	2775		161	714		177
Starvation Cap Reductn	0	0	102	1344		0	0		0
Spillback Cap Reductn	0	0	0	0		0	17		15
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.04	0.38	0.52	0.51		0.31	0.15		0.38

Intersection Summary

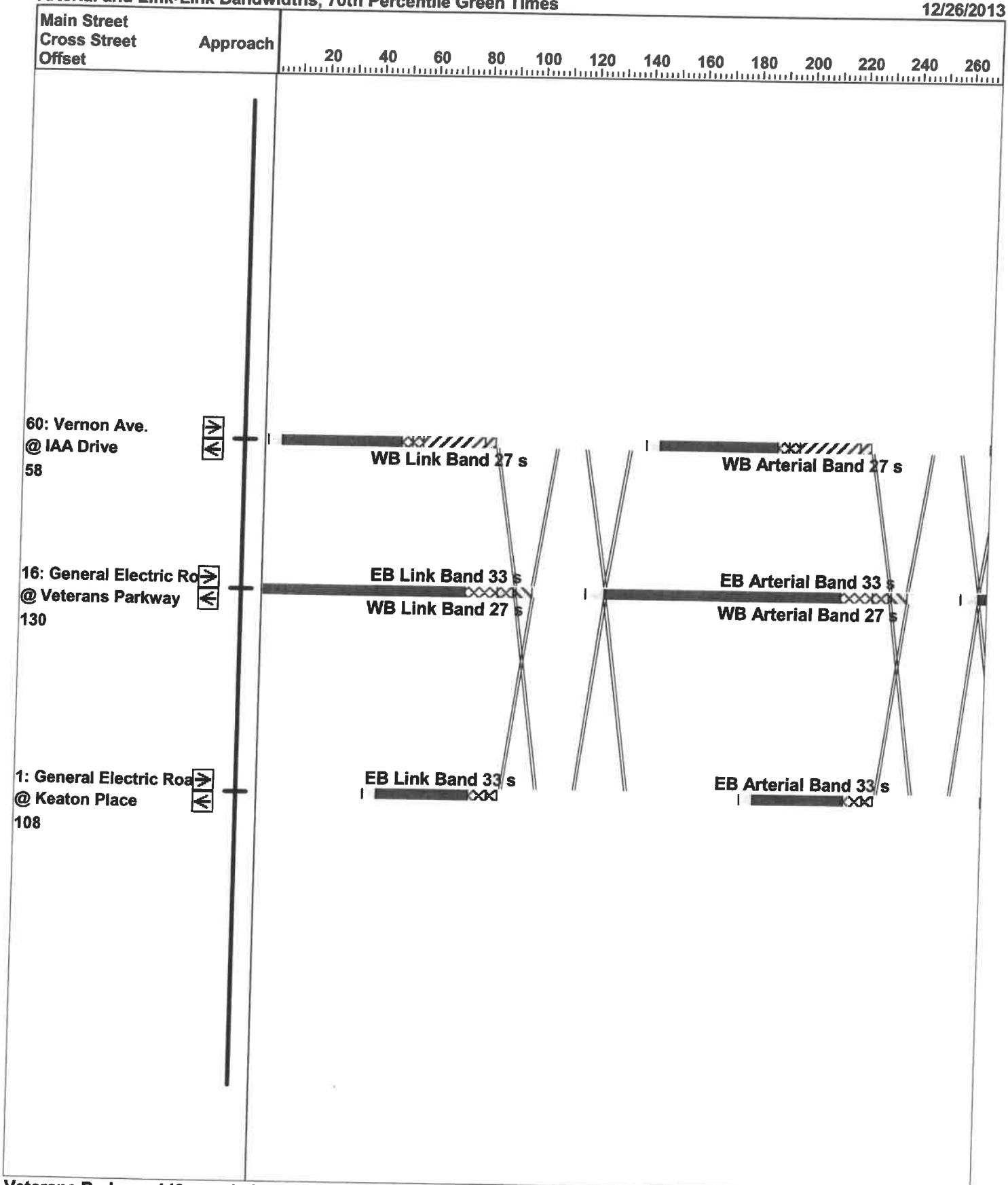
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 120 (86%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 12.0 Intersection LOS: B
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

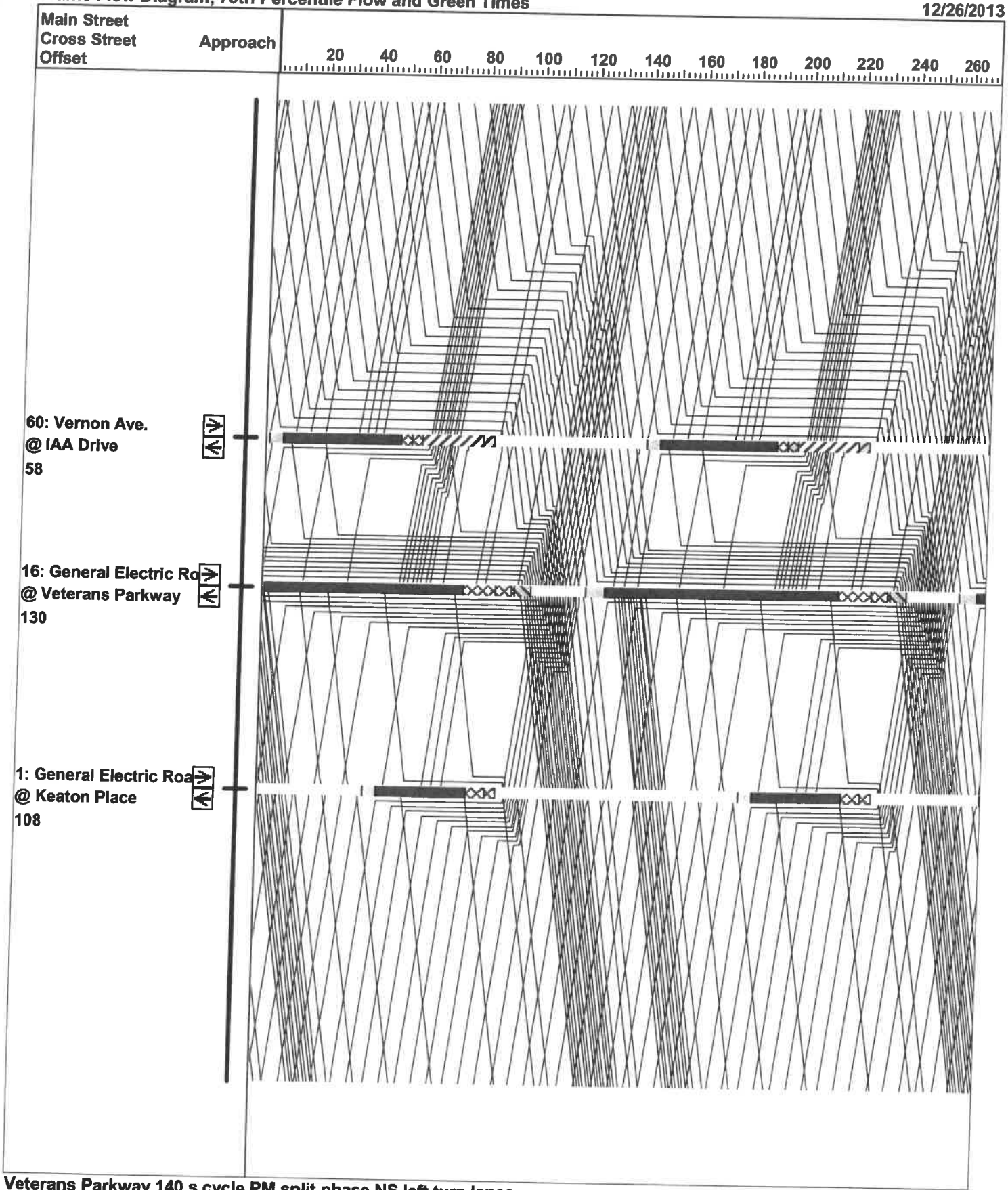


Veterans Parkway 140 s cycle PM split phase NS left turn lanes
Knight E/A

GE Road 2014 PM split nslt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle PM split phase NS left turn lanes
Knight E/A

GE Road 2014 PM split nslt.syn

Timings
1: Keaton Place & General Electric Road

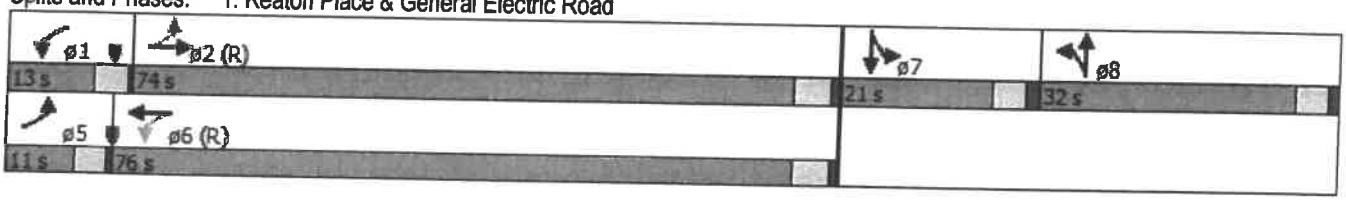
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	45	700	40	492	120	1	13	2
Lane Group Flow (vph)	47	817	42	534	126	56	14	53
Turn Type	pm+pt	NA	pm+pt	NA	Split	NA	Split	NA
Protected Phases	5	2	1	6	8	8	7	7
Permitted Phases	2		6					
Detector Phase	5	2	1	6	8	8	7	7
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	11.0	74.0	13.0	76.0	32.0	32.0	21.0	21.0
Total Split (%)	7.9%	52.9%	9.3%	54.3%	22.9%	22.9%	15.0%	15.0%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lag	Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	103.4	97.0	103.2	96.9	14.7	14.7	6.9	6.9
Actuated g/C Ratio	0.74	0.69	0.74	0.69	0.10	0.10	0.05	0.05
v/c Ratio	0.07	0.34	0.09	0.22	0.64	0.25	0.15	0.40
Control Delay	1.0	1.6	6.1	9.5	74.1	16.4	66.5	26.1
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	1.8	6.1	9.5	74.1	16.4	66.5	26.1
LOS	A	A	A	A	E	B	E	C
Approach Delay		1.8		9.3		56.4		34.5
Approach LOS		A		A		E		C
Queue Length 50th (ft)	1	17	9	92	112	1	13	2
Queue Length 95th (ft)	m3	25	24	146	175	42	36	46
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	652	2419	511	2441	364	371	215	239
Starvation Cap Reductn	0	840	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.52	0.08	0.22	0.35	0.15	0.07	0.22

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 108 (77%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 11.5 Intersection LOS: B
Intersection Capacity Utilization 50.1% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



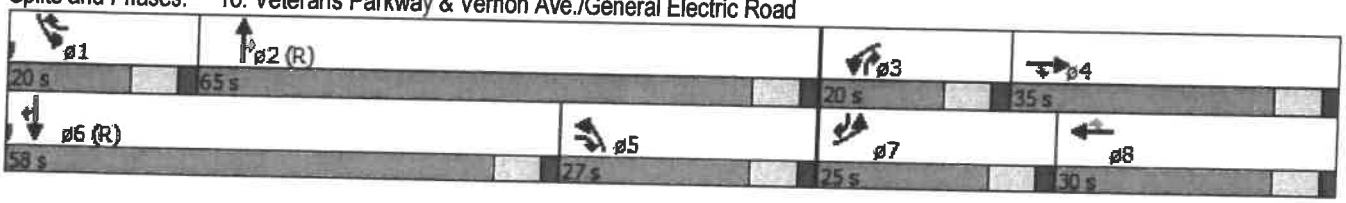
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	106.7	50.2	20.2	84.5	58.4	4.7	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	106.7	51.6	20.5	84.5	58.4	4.7	62.2	32.7	6.0	76.5	44.9	8.1
LOS	F	D	C	F	E	A	E	C	A	E	D	A
Approach Delay		60.3			53.0			35.3			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	182	143	92	85	176	7	128	407	18	122	581	49
Queue Length 95th (ft)	#295	212	185	121	147	22	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	28	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	44	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.65	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.4
Intersection LOS: D
Intersection Capacity Utilization 84.3%
ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road



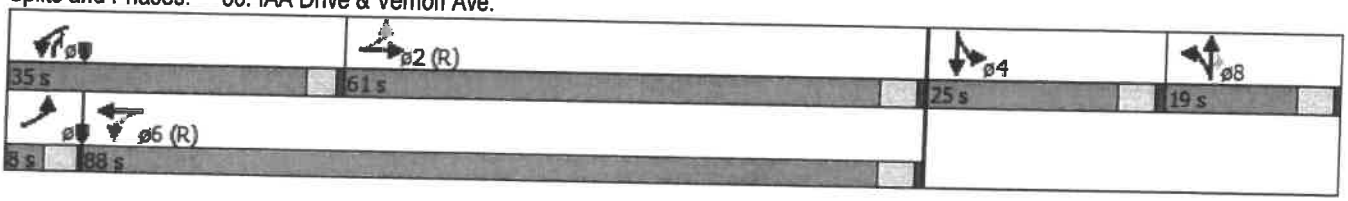
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	63	1012	319	524	21	95	25
Lane Group Flow (vph)	66	1143	336	627	105	100	181
Turn Type	pm+pt	NA	pm+pt	NA	NA	pm+ov	NA
Protected Phases	5	2	1	6	8	1	4
Permitted Phases	2		6			8	
Detector Phase	5	2	1	6	8	1	4
Switch Phase							
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	3.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	8.0	15.0
Total Split (s)	8.0	61.0	35.0	88.0	19.0	35.0	25.0
Total Split (%)	5.7%	43.6%	25.0%	62.9%	13.6%	25.0%	17.9%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.1	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	0.8	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	3.9	5.0
Lead/Lag	Lead	Lag	Lead	Lag		Lead	
Lead-Lag Optimize?							
Recall Mode	None	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	71.9	65.8	96.4	88.2	12.4	43.0	17.3
Actuated g/C Ratio	0.51	0.47	0.69	0.63	0.09	0.31	0.12
v/c Ratio	0.16	0.72	0.80	0.30	0.69	0.19	0.80
Control Delay	12.2	34.8	44.3	4.8	84.2	6.3	77.2
Queue Delay	0.0	0.0	2.7	0.5	0.0	0.0	0.0
Total Delay	12.2	34.8	47.1	5.3	84.2	6.3	77.2
LOS	B	C	D	A	F	A	E
Approach Delay		33.6		19.9	46.2		77.2
Approach LOS		C		B	D		E
Queue Length 50th (ft)	19	455	140	32	93	0	141
Queue Length 95th (ft)	38	585	335	68	158	40	#237
Internal Link Dist (ft)		770		274	520		42
Turn Bay Length (ft)	100		100			90	
Base Capacity (vph)	417	1595	481	2123	173	595	257
Starvation Cap Reductn	0	0	67	1010	0	0	0
Spillback Cap Reductn	0	6	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.72	0.81	0.56	0.61	0.17	0.70

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 58 (41%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 32.5
Intersection LOS: C
Intersection Capacity Utilization 76.2%
ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

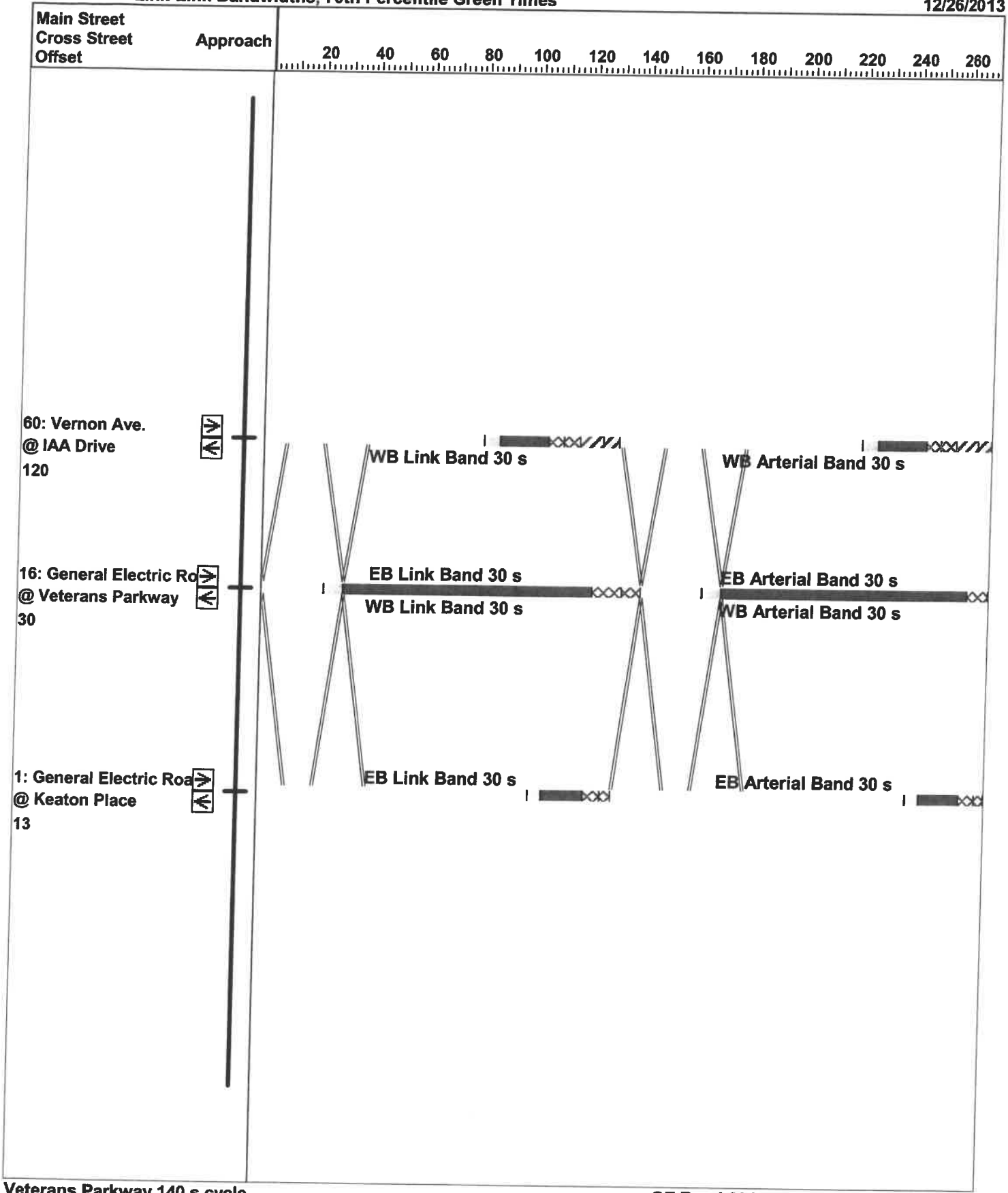
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

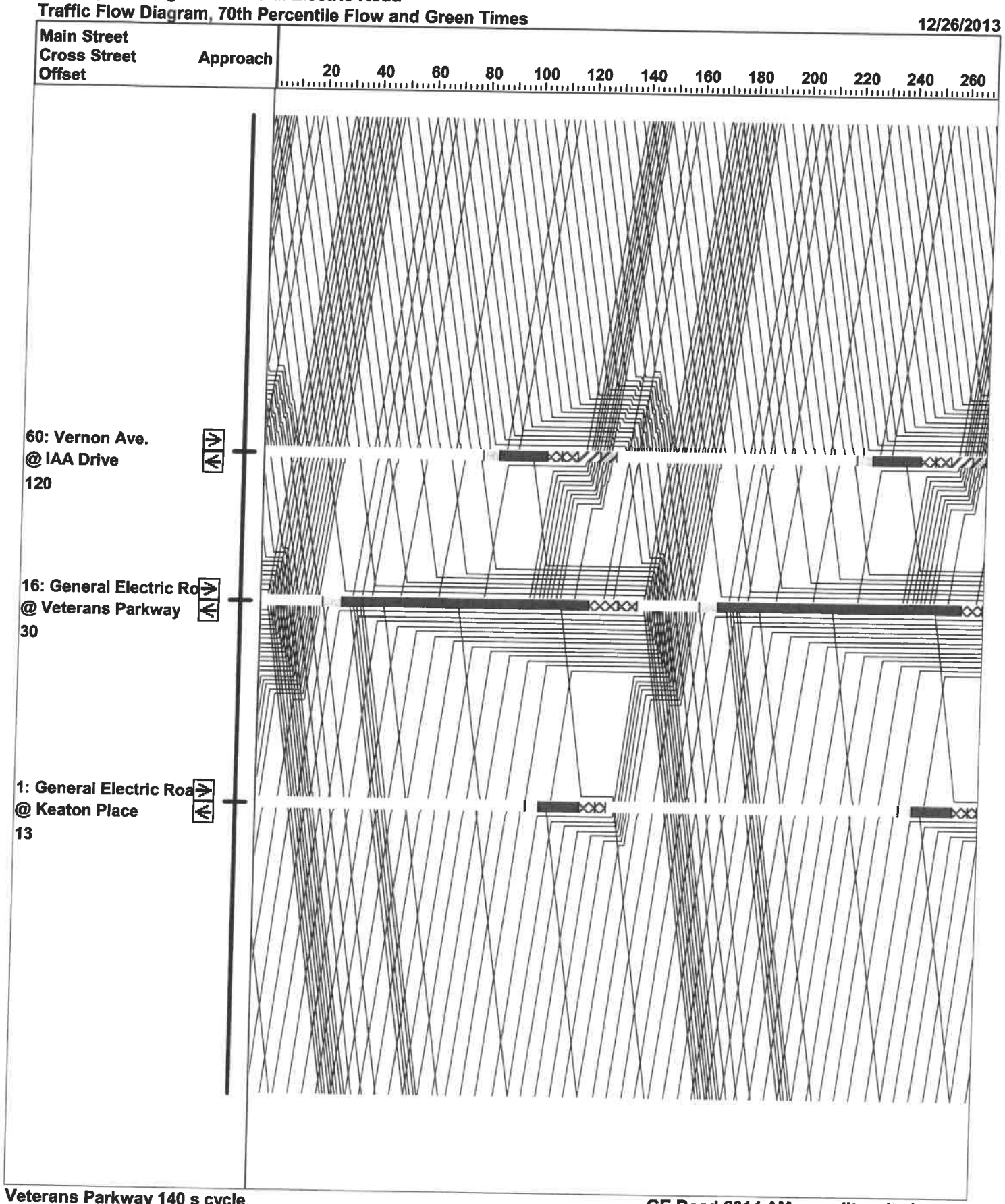


Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM no split ns lt ebrt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM no split ns lt ebrt.syn

Timings
1: Keaton Place & General Electric Road

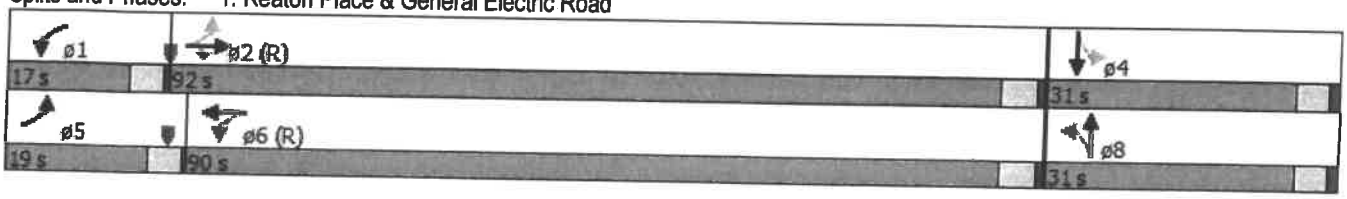
12/26/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	34	432	32	34	566	35	1	7	1
Lane Group Flow (vph)	36	455	34	36	609	37	9	7	8
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	19.0	92.0	92.0	17.0	90.0	31.0	31.0	31.0	31.0
Total Split (%)	13.6%	65.7%	65.7%	12.1%	64.3%	22.1%	22.1%	22.1%	22.1%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.5	1.5	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
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	121.0	116.2	116.2	121.0	116.2	8.9	8.9	8.9	8.9
Actuated g/C Ratio	0.86	0.83	0.83	0.86	0.83	0.06	0.06	0.06	0.06
v/c Ratio	0.05	0.15	0.03	0.04	0.21	0.39	0.08	0.07	0.07
Control Delay	0.4	0.7	0.0	1.6	3.6	73.8	34.1	61.4	35.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.4	0.7	0.0	1.6	3.6	73.8	34.1	61.4	35.5
LOS	A	A	A	A	A	E	C	E	D
Approach Delay		0.6			3.4		66.0		47.6
Approach LOS		A			A		E		D
Queue Length 50th (ft)	1	7	0	3	61	33	1	6	1
Queue Length 95th (ft)	m2	11	m0	9	91	70	20	22	19
Internal Link Dist (ft)		412			658		350		262
Turn Bay Length (ft)	100			40					
Base Capacity (vph)	797	2937	1321	889	2929	277	326	277	326
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.15	0.03	0.04	0.21	0.13	0.03	0.03	0.02

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 5.1 — Intersection LOS: A
Intersection Capacity Utilization 39.6% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road

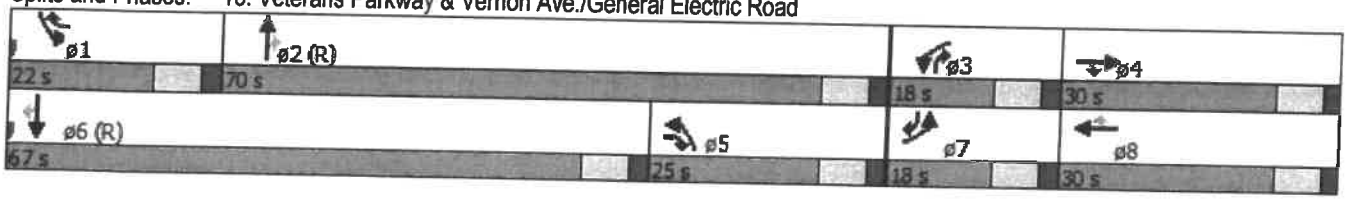


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	273	346	153	446	9	268	722	92	133	1953	334
Lane Group Flow (vph)	135	287	364	161	469	9	282	760	97	140	2056	352
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected Phases	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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	18.0	30.0	25.0	18.0	30.0	22.0	25.0	70.0	18.0	22.0	67.0	18.0
Total Split (%)	12.9%	21.4%	17.9%	12.9%	21.4%	15.7%	17.9%	50.0%	12.9%	15.7%	47.9%	12.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	9.6	21.0	39.0	9.5	20.9	37.9	18.0	71.4	87.9	10.1	63.5	73.1
Actuated g/C Ratio	0.07	0.15	0.28	0.07	0.15	0.27	0.13	0.51	0.63	0.07	0.45	0.52
v/c Ratio	0.57	0.51	0.67	0.70	0.85	0.02	0.64	0.28	0.09	0.57	0.85	0.41
Control Delay	91.5	56.0	25.9	92.1	68.1	0.1	65.2	20.7	2.4	71.6	38.6	9.2
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.5	56.0	26.0	92.1	68.1	0.1	65.2	20.7	2.4	71.6	38.6	9.2
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		48.2			73.2			30.1			36.4	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	66	107	105	80	221	0	127	145	0	64	614	66
Queue Length 95th (ft)	103	146	257	121	283	0	177	188	24	98	698	108
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	269	611	542	269	611	581	441	2731	1046	367	2428	883
Starvation Cap Reductn	0	0	7	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	0.50	0.47	0.68	0.60	0.77	0.02	0.64	0.28	0.09	0.38	0.85	0.40

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 30 (21%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 41.4 Intersection LOS: D
Intersection Capacity Utilization 82.7% ICU Level of Service E
Analysis Period (min) 15
Description: V38

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

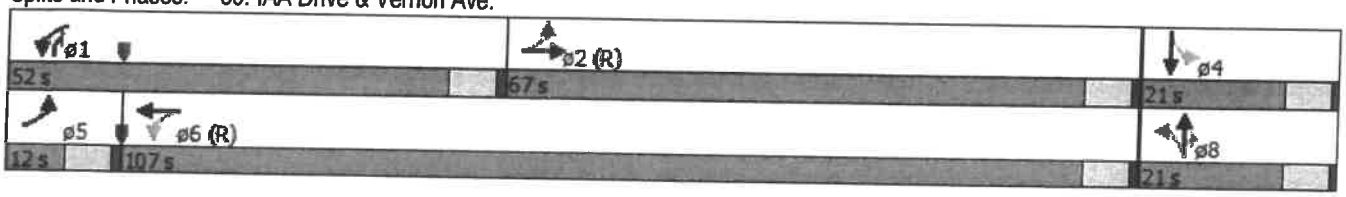


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	21	632	357	660	21	27	103	12	34
Lane Group Flow (vph)	22	886	376	728	0	50	108	0	61
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	10.0	21.0	9.0	21.0	15.0	15.0	9.0	15.0	15.0
Total Split (s)	12.0	67.0	52.0	107.0	21.0	21.0	52.0	21.0	21.0
Total Split (%)	8.6%	47.9%	37.1%	76.4%	15.0%	15.0%	37.1%	15.0%	15.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	103.5	97.7	120.3	114.3		10.5	30.3		10.5
Actuated g/C Ratio	0.74	0.70	0.86	0.82		0.08	0.22		0.08
v/c Ratio	0.04	0.38	0.66	0.26		0.44	0.26		0.48
Control Delay	4.3	10.8	16.0	2.9		73.5	7.4		67.2
Queue Delay	0.0	0.0	0.3	0.3		0.0	0.0		0.4
Total Delay	4.3	10.8	16.3	3.3		73.5	7.4		67.6
LOS	A	B	B	A		E	A		E
Approach Delay		10.7		7.7		28.3			67.6
Approach LOS		B		A		C			E
Queue Length 50th (ft)	2	159	99	109		45	0		48
Queue Length 95th (ft)	9	283	127	133		87	42		94
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	545	2312	823	2775		161	714		177
Starvation Cap Reductn	0	0	102	1344		0	0		0
Spillback Cap Reductn	0	0	0	0		0	17		15
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.04	0.38	0.52	0.51		0.31	0.15		0.38

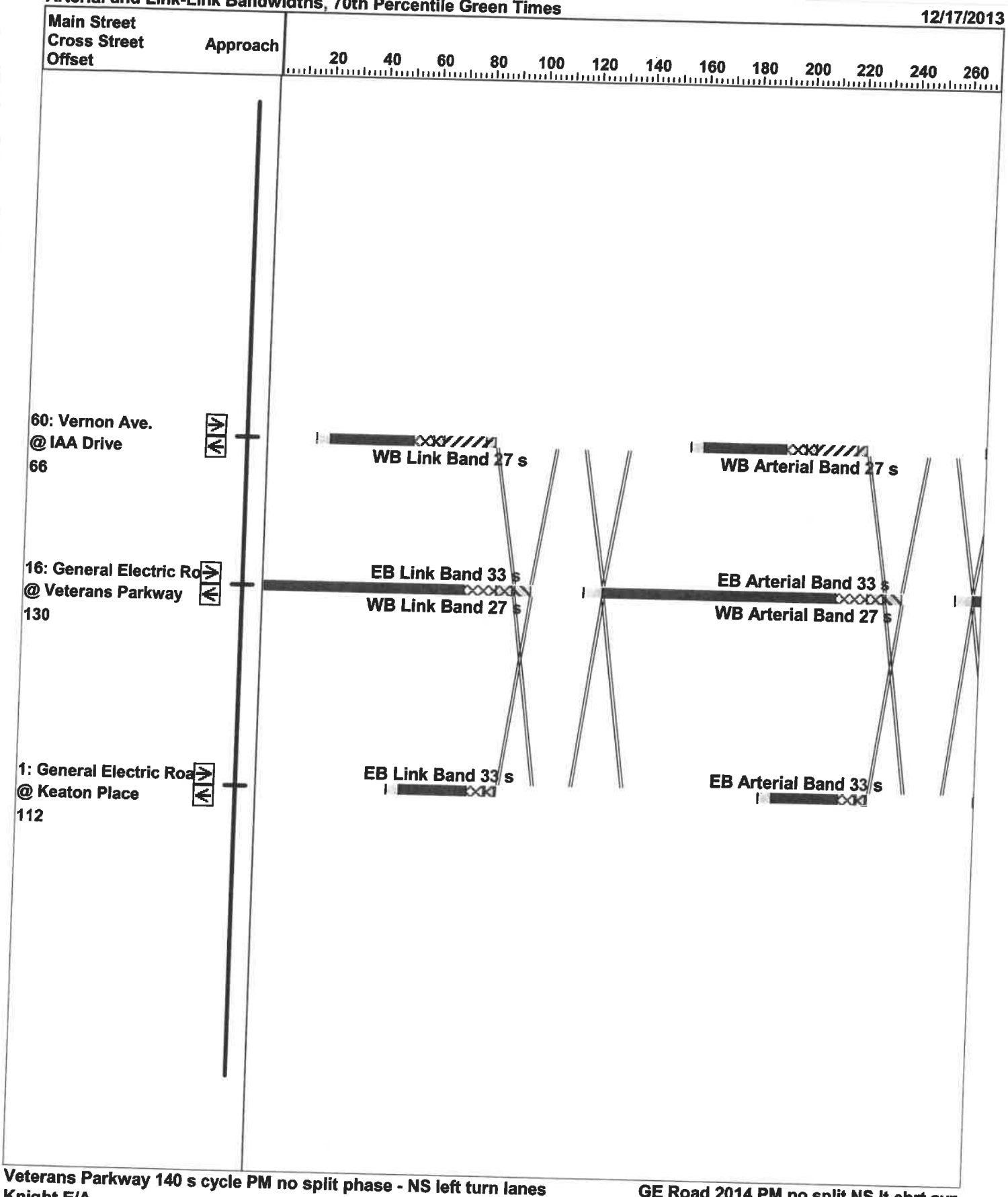
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 120 (86%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 12.0
Intersection LOS: B
Intersection Capacity Utilization 68.7%
ICU Level of Service C
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

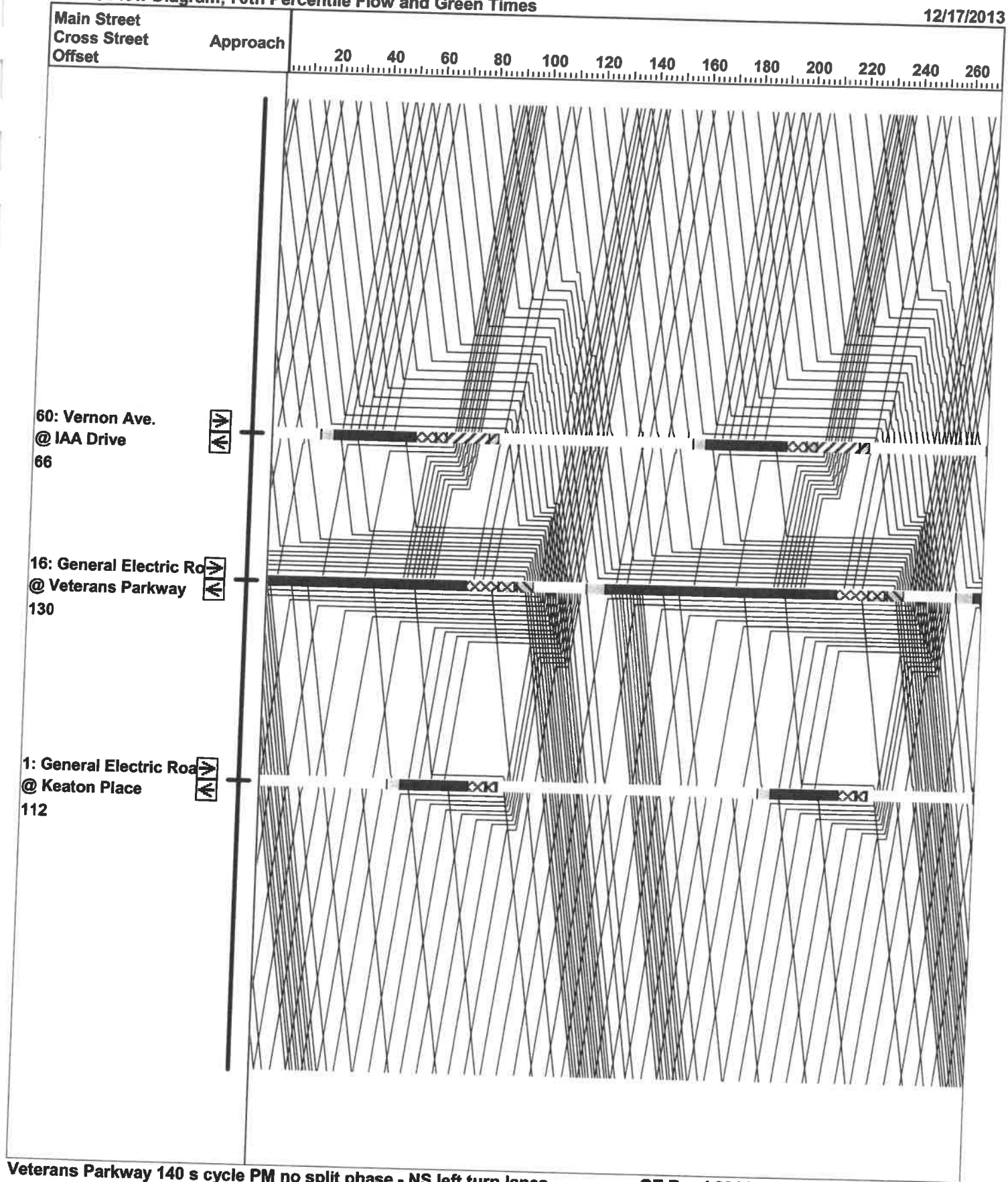


Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM no split NS lt ebrt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/17/2013



Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM no split NS lt ebrt.syn

Timings
1: Keaton Place & General Electric Road

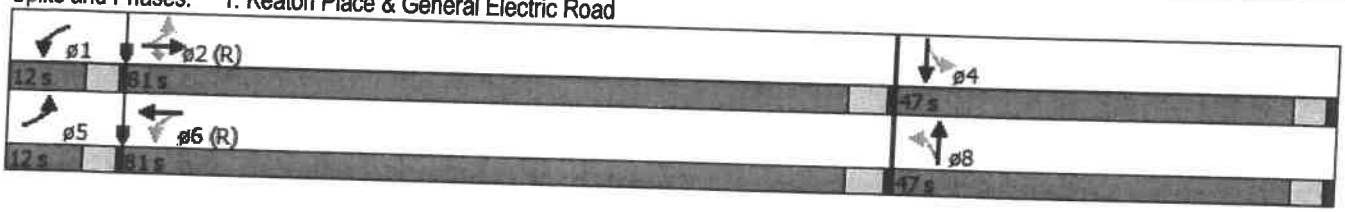
12/17/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	45	700	76	40	492	120	1	13	2
Lane Group Flow (vph)	47	737	80	42	534	126	56	14	53
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2		1	6		8		4
Permitted Phases	2		2	6		8		4	
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	12.0	81.0	81.0	12.0	81.0	47.0	47.0	47.0	47.0
Total Split (%)	8.6%	57.9%	57.9%	8.6%	57.9%	33.6%	33.6%	33.6%	33.6%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.5	1.5	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
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	110.1	104.0	104.0	110.0	103.9	17.7	17.7	17.7	17.7
Actuated g/C Ratio	0.79	0.74	0.74	0.79	0.74	0.13	0.13	0.13	0.13
v/c Ratio	0.07	0.28	0.07	0.07	0.20	0.70	0.21	0.08	0.20
Control Delay	0.6	1.1	0.1	3.7	6.5	77.3	14.6	51.6	15.3
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.6	1.3	0.1	3.7	6.5	77.3	14.6	51.6	15.3
LOS	A	A	A	A	A	E	B	D	B
Approach Delay		1.2			6.3		58.0		22.9
Approach LOS		A			A		E		C
Queue Length 50th (ft)	1	13	0	6	72	112	1	11	2
Queue Length 95th (ft)	m2	20	m0	18	117	174	40	32	41
Internal Link Dist (ft)		412			658		350		262
Turn Bay Length (ft)	100		115	175		225		75	
Base Capacity (vph)	713	2628	1192	587	2616	430	547	429	546
Starvation Cap Reductn	0	1123	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.07	0.07	0.20	0.29	0.10	0.03	0.10

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 112 (80%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 9.9 Intersection LOS: A
Intersection Capacity Utilization 47.7% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



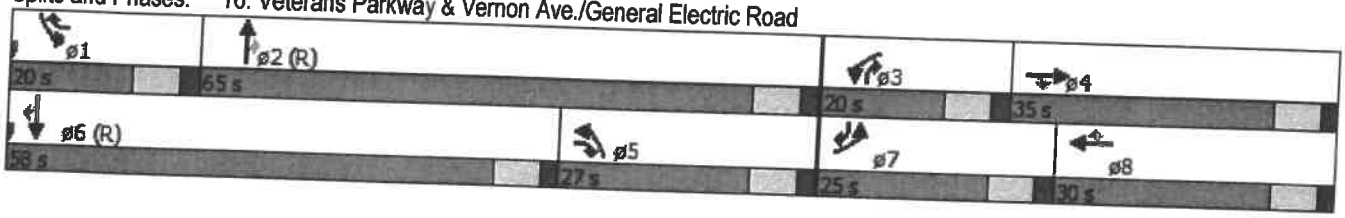
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	102.7	54.6	21.9	81.0	60.6	5.5	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	56.0	22.1	81.0	60.6	5.5	62.0	32.7	6.0	76.5	44.9	8.1
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		61.1			53.4			35.2			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	171	163	77	85	177	9	128	407	18	122	581	49
Queue Length 95th (ft)	#295	215	247	123	184	39	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	25	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	33	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.63	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.6 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

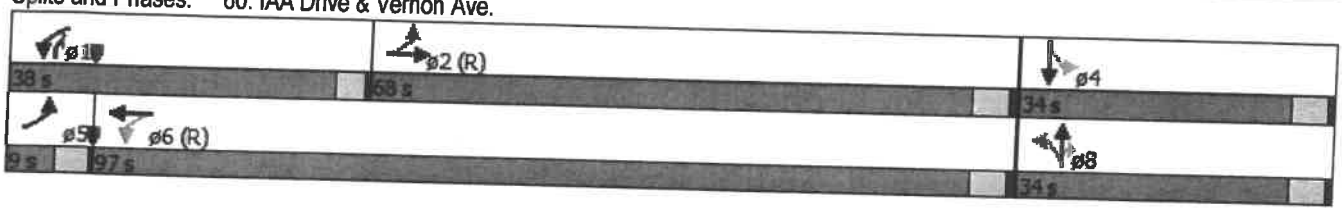


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	63	1012	319	524	79	21	95	73	25
Lane Group Flow (vph)	66	1143	336	627	0	105	100	0	181
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	21.0	21.0	8.0	21.0	21.0
Total Split (s)	9.0	68.0	38.0	97.0	34.0	34.0	38.0	34.0	34.0
Total Split (%)	6.4%	48.6%	27.1%	69.3%	24.3%	24.3%	27.1%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.9	3.1	3.9	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	1.1	0.8	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0		5.0	3.9		5.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	88.8	81.6	109.4	100.0		21.7	49.5		21.7
Actuated g/C Ratio	0.63	0.58	0.78	0.71		0.16	0.35		0.16
v/c Ratio	0.13	0.58	0.73	0.26		0.68	0.18		0.85
Control Delay	7.6	22.3	30.2	3.6		76.0	15.0		81.9
Queue Delay	0.0	0.0	1.0	0.4		0.0	0.0		0.7
Total Delay	7.6	22.3	31.2	4.0		76.0	15.0		82.5
LOS	A	C	C	A		E	B		F
Approach Delay		21.5		13.5		46.2			82.5
Approach LOS		C		B		D			F
Queue Length 50th (ft)	12	328	99	40		91	33		141
Queue Length 95th (ft)	29	531	275	133		150	60		221
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	514	1976	577	2406		207	690		274
Starvation Cap Reductn	0	0	84	1228		0	0		0
Spillback Cap Reductn	0	7	0	0		0	13		11
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.13	0.58	0.68	0.53		0.51	0.15		0.69

Intersection Summary

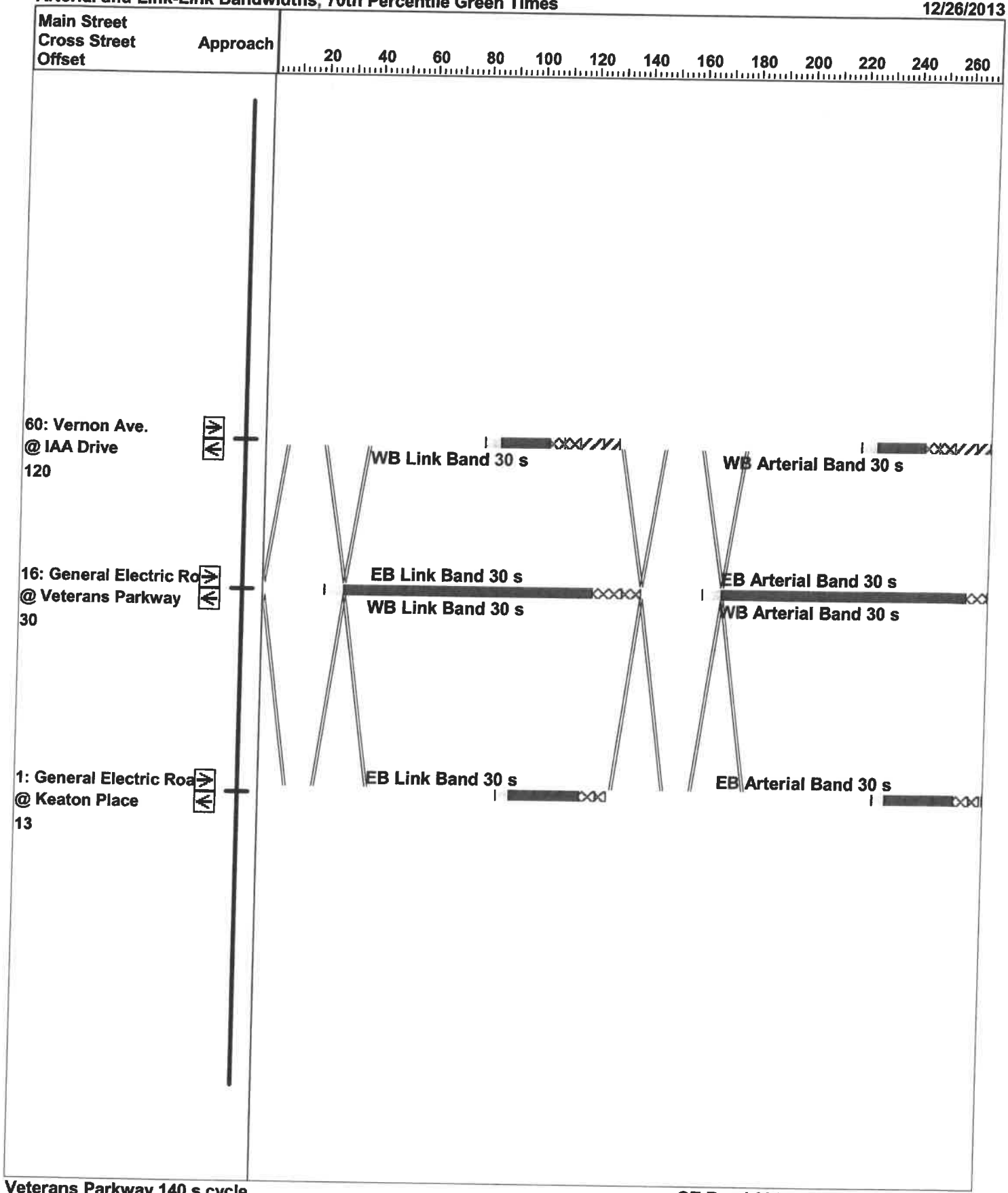
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 66 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 24.8 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

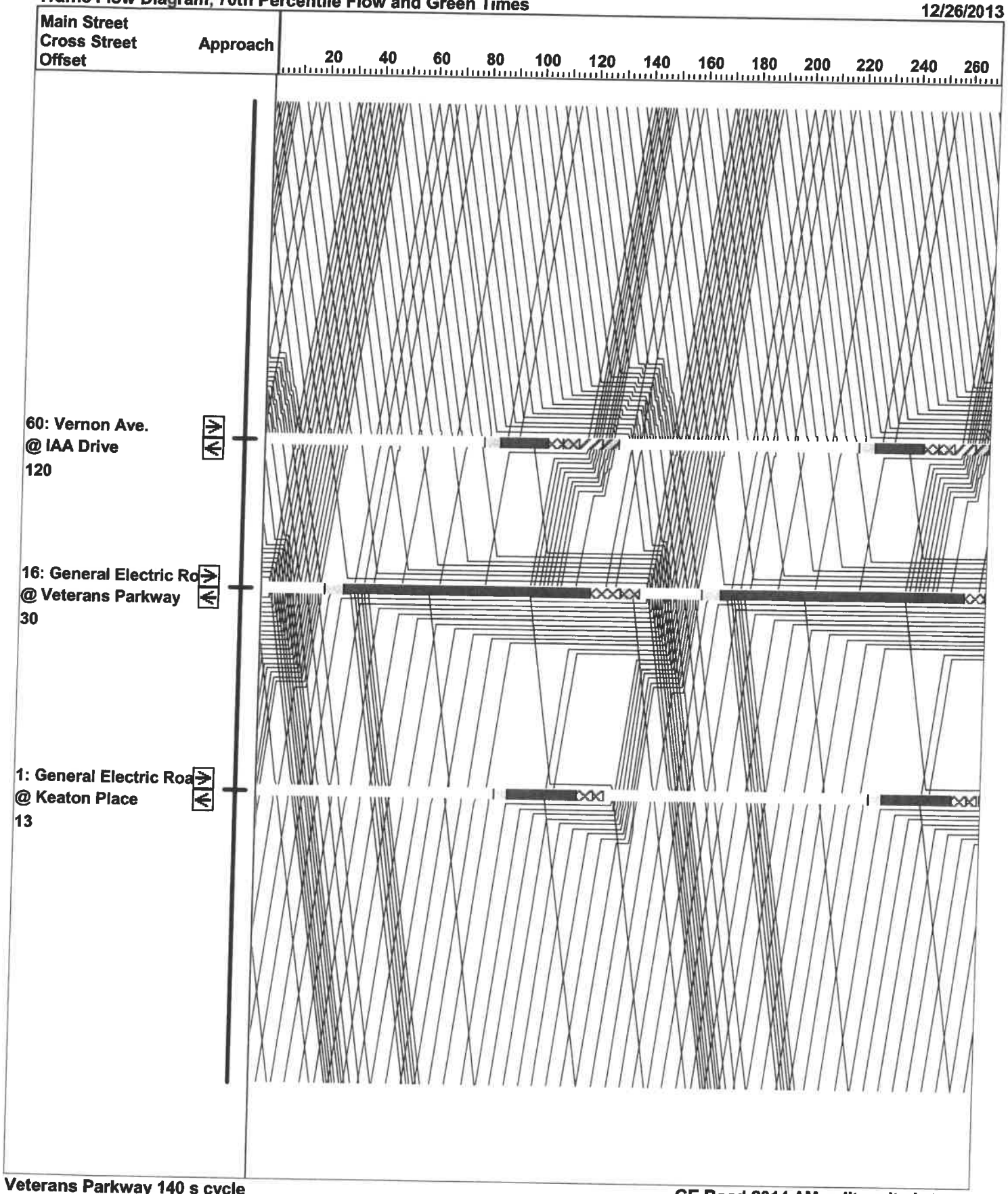


Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM split ns lt ebrt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle
Knight E/A

GE Road 2014 AM split ns lt ebrt.syn

Timings
1: Keaton Place & General Electric Road

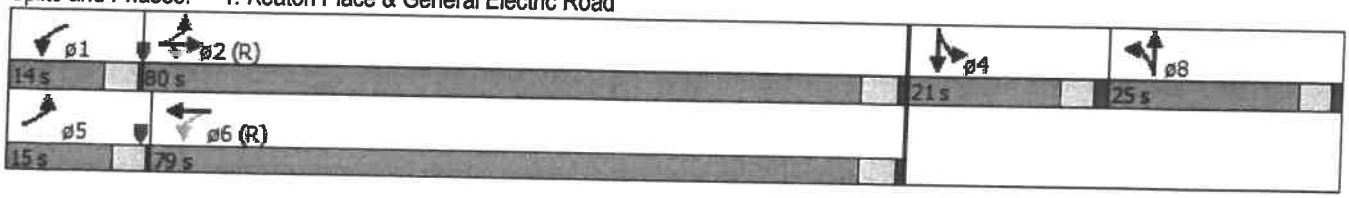
12/26/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	34	432	32	34	566	35	1	7	1
Lane Group Flow (vph)	36	455	34	36	609	37	9	7	8
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Split	NA
Protected Phases	5	2		1	6	8	8	4	4
Permitted Phases	2		2	6					
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	15.0	80.0	80.0	14.0	79.0	25.0	25.0	21.0	21.0
Total Split (%)	10.7%	57.1%	57.1%	10.0%	56.4%	17.9%	17.9%	15.0%	15.0%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.5	1.5	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
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	117.0	112.0	112.0	117.0	112.0	8.2	8.2	6.1	6.1
Actuated g/C Ratio	0.84	0.80	0.80	0.84	0.80	0.06	0.06	0.04	0.04
v/c Ratio	0.05	0.16	0.03	0.05	0.22	0.34	0.08	0.09	0.10
Control Delay	0.7	0.9	0.0	3.0	5.3	70.7	35.0	66.0	39.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.7	0.9	0.0	3.0	5.3	70.7	35.0	66.0	39.4
LOS	A	A	A	A	A	E	C	E	D
Approach Delay		0.9			5.1		63.7		51.8
Approach LOS		A			A		E		D
Queue Length 50th (ft)	1	6	0	3	58	33	1	6	1
Queue Length 95th (ft)	m3	15	m0	15	128	70	20	23	20
Internal Link Dist (ft)		412			658		350		262
Turn Bay Length (ft)	100			40					
Base Capacity (vph)	737	2831	1283	841	2824	269	253	215	203
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.16	0.03	0.04	0.22	0.14	0.04	0.03	0.04

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 13 (9%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.34
Intersection Signal Delay: 6.1 — Intersection LOS: A
Intersection Capacity Utilization 39.6% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Timings
16: Veterans Parkway & Vernon Ave./General Electric Road

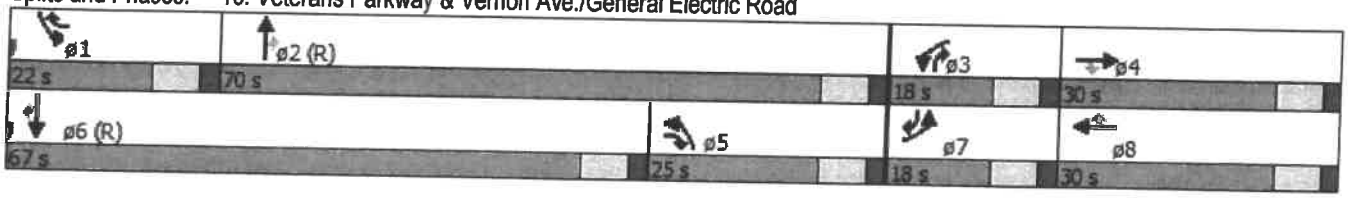
12/26/2013

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	128	273	346	153	446	9	268	722	92	133	1953	334
Lane Group Flow (vph)	135	287	364	161	469	9	282	760	97	140	2056	352
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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	18.0	30.0	25.0	18.0	30.0	22.0	25.0	70.0	18.0	22.0	67.0	18.0
Total Split (%)	12.9%	21.4%	17.9%	12.9%	21.4%	15.7%	17.9%	50.0%	12.9%	15.7%	47.9%	12.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	9.6	21.0	39.0	9.5	20.9	37.9	18.0	71.4	87.9	10.1	63.5	73.1
Actuated g/C Ratio	0.07	0.15	0.28	0.07	0.15	0.27	0.13	0.51	0.63	0.07	0.45	0.52
v/c Ratio	0.57	0.51	0.67	0.70	0.85	0.02	0.64	0.28	0.09	0.57	0.85	0.41
Control Delay	91.5	56.0	25.9	89.6	66.7	0.1	65.2	20.7	2.4	71.6	38.6	9.2
Queue Delay	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.5	56.0	26.0	89.6	66.7	0.1	65.2	20.7	2.4	71.6	38.6	9.2
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		48.2			71.6			30.1			36.4	
Approach LOS		D			E			C			D	
Queue Length 50th (ft)	66	107	105	62	221	0	127	145	0	64	614	66
Queue Length 95th (ft)	103	146	257	121	283	0	177	188	24	98	698	108
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	269	611	542	269	611	581	441	2731	1046	367	2428	883
Starvation Cap Reductn	0	0	7	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	0.50	0.47	0.68	0.60	0.77	0.02	0.64	0.28	0.09	0.38	0.85	0.40

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 30 (21%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 41.2
Intersection LOS: D
Intersection Capacity Utilization 82.7%
ICU Level of Service E
Analysis Period (min) 15
Description: V38

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	21	632	357	660	21	27	103	12	34
Lane Group Flow (vph)	22	886	376	728	0	50	108	0	61
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	10.0	21.0	9.0	21.0	15.0	15.0	9.0	15.0	15.0
Total Split (s)	12.0	67.0	52.0	107.0	21.0	21.0	52.0	21.0	21.0
Total Split (%)	8.6%	47.9%	37.1%	76.4%	15.0%	15.0%	37.1%	15.0%	15.0%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0		6.0	6.0		6.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	103.5	97.7	120.3	114.3		10.5	30.3		10.5
Actuated g/C Ratio	0.74	0.70	0.86	0.82		0.08	0.22		0.08
v/c Ratio	0.04	0.38	0.66	0.26		0.44	0.26		0.48
Control Delay	4.3	10.8	16.0	2.9		73.5	7.4		67.2
Queue Delay	0.0	0.0	0.3	0.3		0.0	0.0		0.4
Total Delay	4.3	10.8	16.3	3.3		73.5	7.4		67.6
LOS	A	B	B	A		E	A		E
Approach Delay		10.7		7.7		28.3			67.6
Approach LOS		B		A		C			E
Queue Length 50th (ft)	2	159	99	109		45	0		48
Queue Length 95th (ft)	9	283	127	133		87	42		94
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	545	2312	823	2775		161	714		177
Starvation Cap Reductn	0	0	102	1344		0	0		0
Spillback Cap Reductn	0	0	0	0		0	17		15
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.04	0.38	0.52	0.51		0.31	0.15		0.38

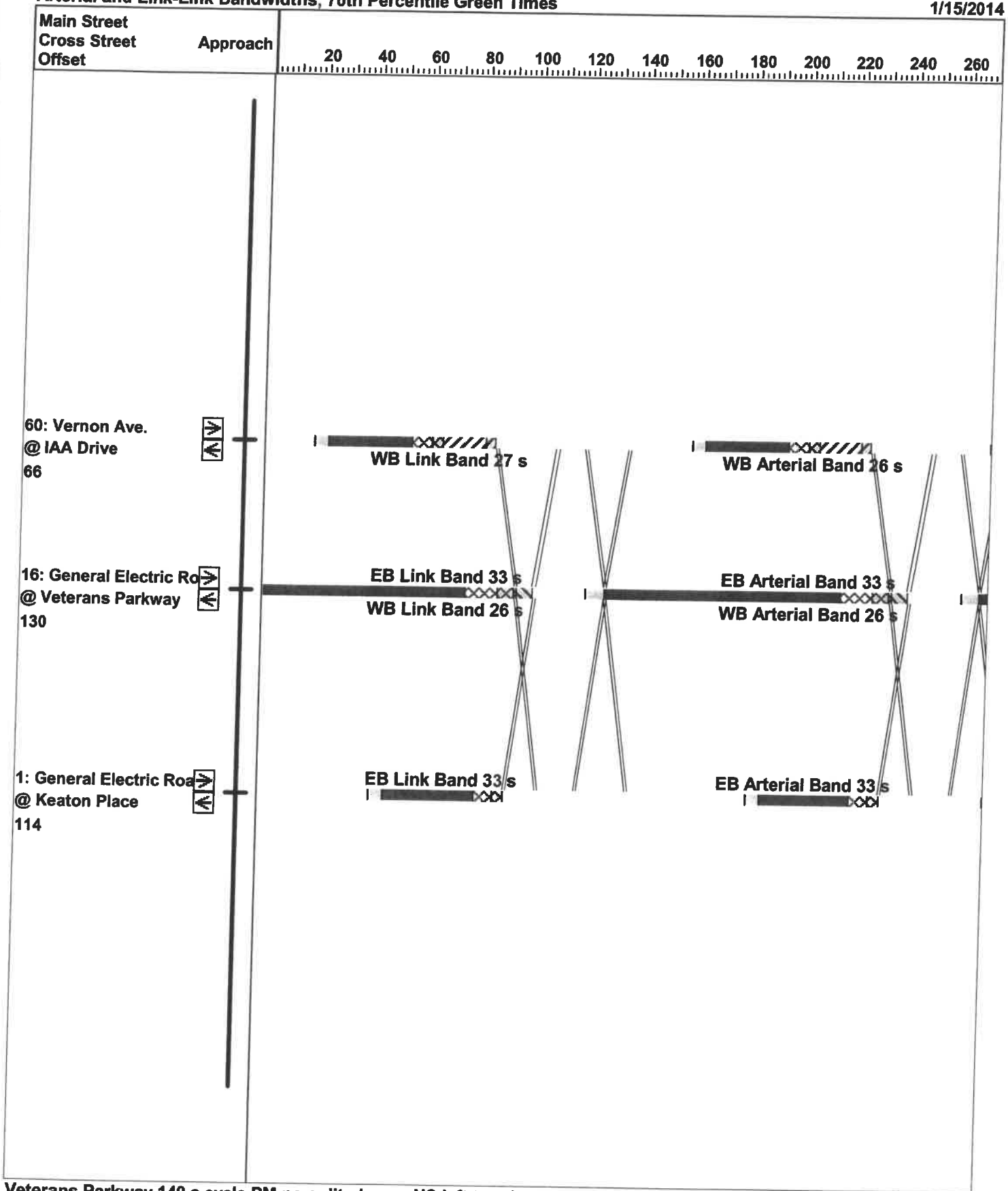
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 120 (86%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.66
Intersection Signal Delay: 12.0 Intersection LOS: B
Intersection Capacity Utilization 68.7% ICU Level of Service C
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.

Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

1/15/2014

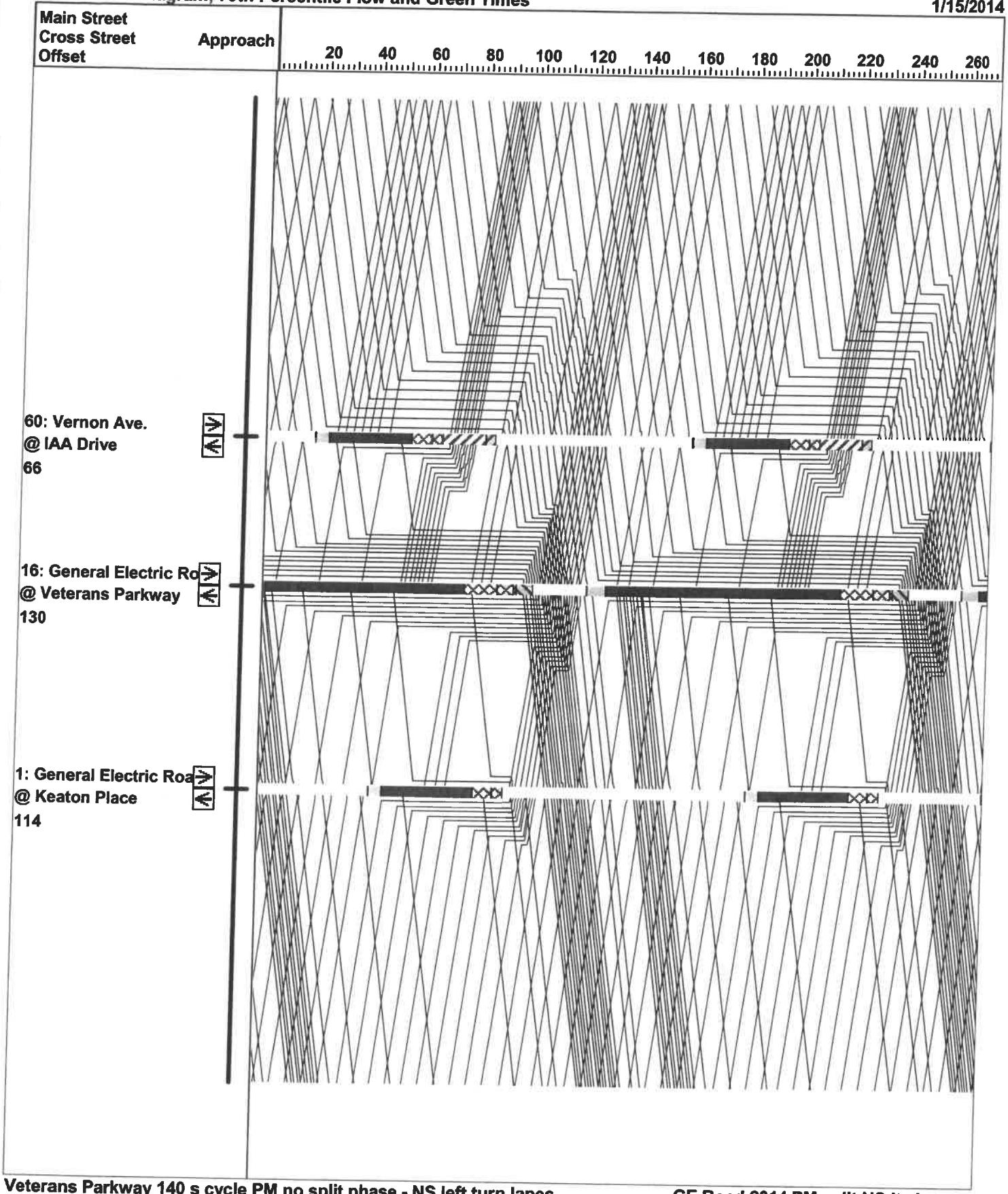


Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM split NS lt ebrt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

1/15/2014



Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2014 PM split NS lt ebrt.syn

Timings
1: Keaton Place & General Electric Road

1/15/2014

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Volume (vph)	45	700	76	40	492	120	1	13	2
Lane Group Flow (vph)	47	737	80	42	534	126	56	14	53
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Split	NA	Split	NA
Protected Phases	5	2		1	6	8	8	4	4
Permitted Phases	2		2	6					
Detector Phase	5	2	2	1	6	8	8	4	4
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	12.0	72.0	72.0	12.0	72.0	34.0	34.0	22.0	22.0
Total Split (%)	8.6%	51.4%	51.4%	8.6%	51.4%	24.3%	24.3%	15.7%	15.7%
Yellow Time (s)	3.5	4.0	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	1.0	0.5	1.0	1.5	1.5	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
Total Lost Time (s)	4.0	5.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag				
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	103.4	97.0	97.0	103.2	96.9	14.7	14.7	6.9	6.9
Actuated g/C Ratio	0.74	0.69	0.69	0.74	0.69	0.10	0.10	0.05	0.05
v/c Ratio	0.07	0.30	0.07	0.08	0.22	0.64	0.25	0.15	0.40
Control Delay	1.0	1.5	0.1	6.0	9.5	74.1	16.4	66.5	26.1
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	1.0	1.7	0.1	6.0	9.5	74.1	16.4	66.5	26.1
LOS	A	A	A	A	A	E	B	E	C
Approach Delay		1.5			9.3		56.4		34.5
Approach LOS		A			A		E		C
Queue Length 50th (ft)	1	17	0	9	92	112	1	13	2
Queue Length 95th (ft)	m3	25	m0	24	146	175	42	36	46
Internal Link Dist (ft)		412			658		350		262
Turn Bay Length (ft)	100		115	175		225		75	
Base Capacity (vph)	661	2452	1123	541	2441	391	394	229	251
Starvation Cap Reductn	0	957	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.49	0.07	0.08	0.22	0.32	0.14	0.06	0.21

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 114 (81%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.64
Intersection Signal Delay: 11.4 Intersection LOS: B
Intersection Capacity Utilization 47.7% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road

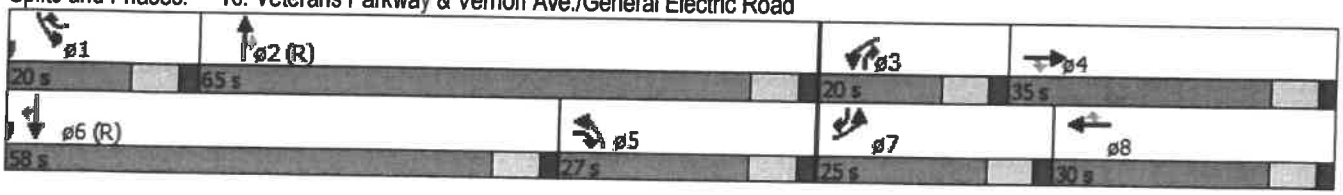
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	385	443	352	163	351	146	274	1465	124	254	1795	289
Lane Group Flow (vph)	405	466	371	172	369	154	288	1542	131	267	1889	304
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	17.6	25.6	45.6	10.2	18.2	39.3	20.0	62.1	79.3	14.1	56.2	73.8
Actuated g/C Ratio	0.13	0.18	0.33	0.07	0.13	0.28	0.14	0.44	0.57	0.10	0.40	0.53
v/c Ratio	0.94	0.69	0.61	0.69	0.76	0.28	0.59	0.65	0.14	0.77	0.88	0.35
Control Delay	102.7	54.6	21.9	82.9	58.1	4.6	61.6	32.7	6.0	76.5	44.9	8.1
Queue Delay	0.0	1.4	0.2	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	102.7	56.0	22.1	82.9	58.1	4.6	62.0	32.7	6.0	76.5	44.9	8.1
LOS	F	E	C	F	E	A	E	C	A	E	D	A
Approach Delay		61.1			52.4			35.2			43.8	
Approach LOS		E			D			D			D	
Queue Length 50th (ft)	171	163	77	85	176	7	128	407	18	122	581	49
Queue Length 95th (ft)	#295	215	247	117	149	22	177	475	49	#195	#725	87
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	745	609	318	611	548	490	2373	963	352	2148	879
Starvation Cap Reductn	0	127	25	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	33	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.75	0.64	0.54	0.60	0.28	0.63	0.65	0.14	0.76	0.88	0.35

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.94
Intersection Signal Delay: 45.5 Intersection LOS: D
Intersection Capacity Utilization 84.3% ICU Level of Service E
Analysis Period (min) 15
Description: V38

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

Splits and Phases: 16: Veterans Parkway & Vernon Ave./General Electric Road

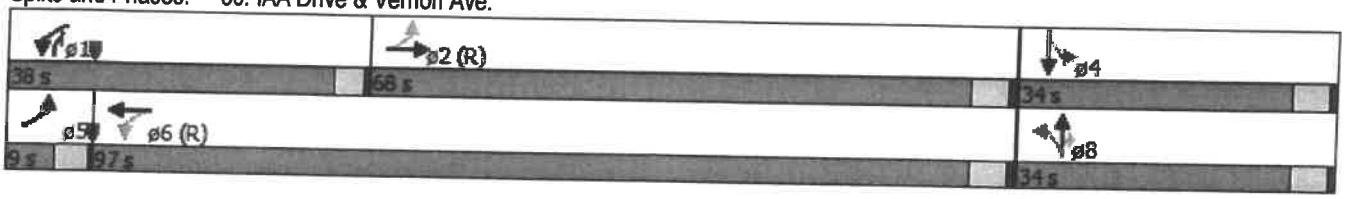


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	63	1012	319	524	79	21	95	73	25
Lane Group Flow (vph)	66	1143	336	627	0	105	100	0	181
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	21.0	21.0	8.0	21.0	21.0
Total Split (s)	9.0	68.0	38.0	97.0	34.0	34.0	38.0	34.0	34.0
Total Split (%)	6.4%	48.6%	27.1%	69.3%	24.3%	24.3%	27.1%	24.3%	24.3%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.9	3.1	3.9	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	1.1	0.8	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0		5.0	3.9		5.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	88.8	81.6	109.4	100.0		21.7	49.5		21.7
Actuated g/C Ratio	0.63	0.58	0.78	0.71		0.16	0.35		0.16
v/c Ratio	0.13	0.58	0.73	0.26		0.68	0.18		0.85
Control Delay	7.6	22.3	30.2	3.6		76.0	15.0		81.9
Queue Delay	0.0	0.0	1.0	0.4		0.0	0.0		0.7
Total Delay	7.6	22.3	31.2	4.0		76.0	15.0		82.5
LOS	A	C	C	A		E	B		F
Approach Delay		21.5		13.5		46.2			82.5
Approach LOS		C		B		D			F
Queue Length 50th (ft)	12	328	99	40		91	33		141
Queue Length 95th (ft)	29	531	275	133		150	60		221
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	514	1976	577	2406		207	690		274
Starvation Cap Reductn	0	0	84	1228		0	0		0
Spillback Cap Reductn	0	7	0	0		0	13		11
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.13	0.58	0.68	0.53		0.51	0.15		0.69

Intersection Summary

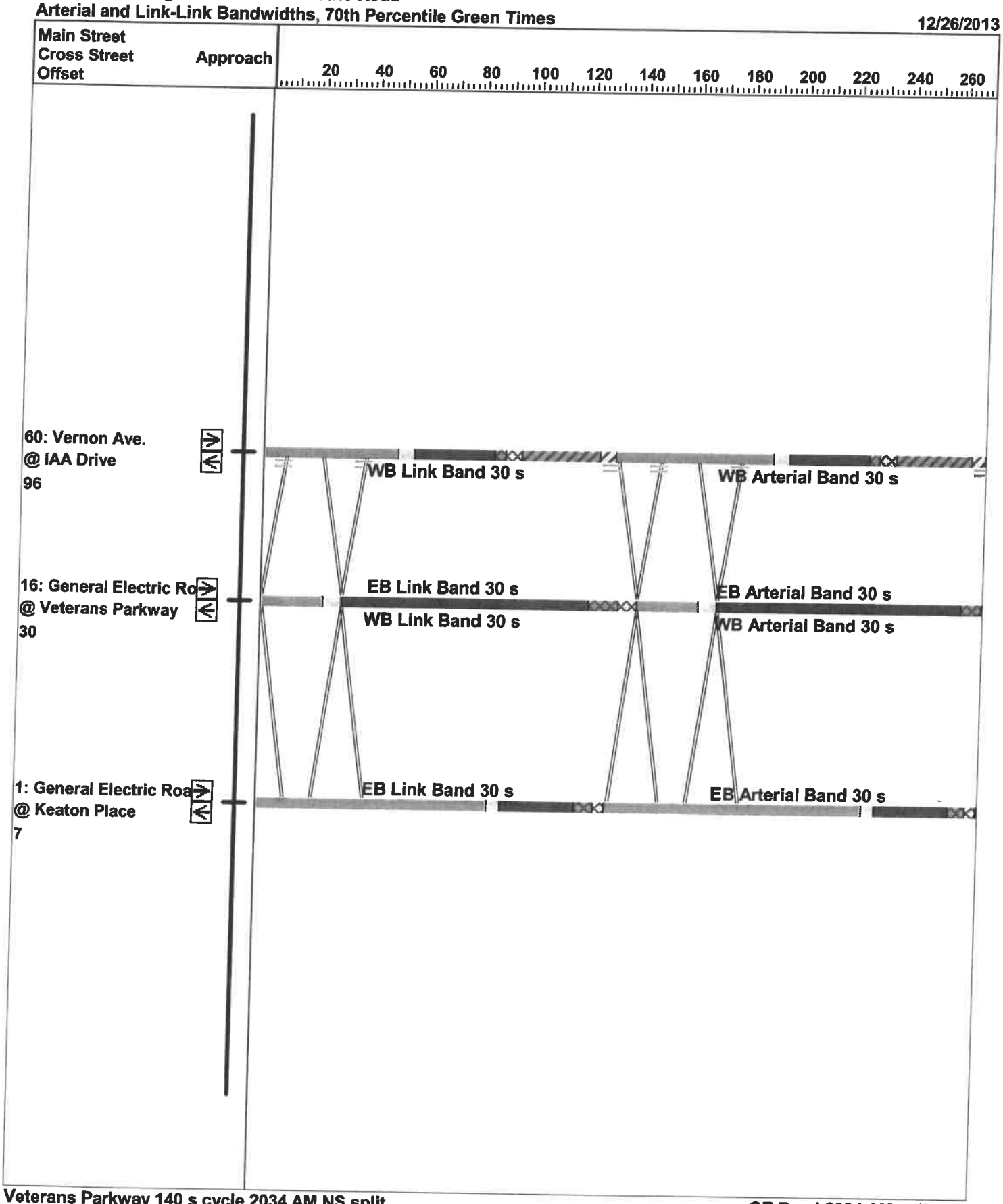
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 66 (47%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 24.8 Intersection LOS: C
Intersection Capacity Utilization 76.2% ICU Level of Service D
Analysis Period (min) 15
Description: V37 - est RT

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

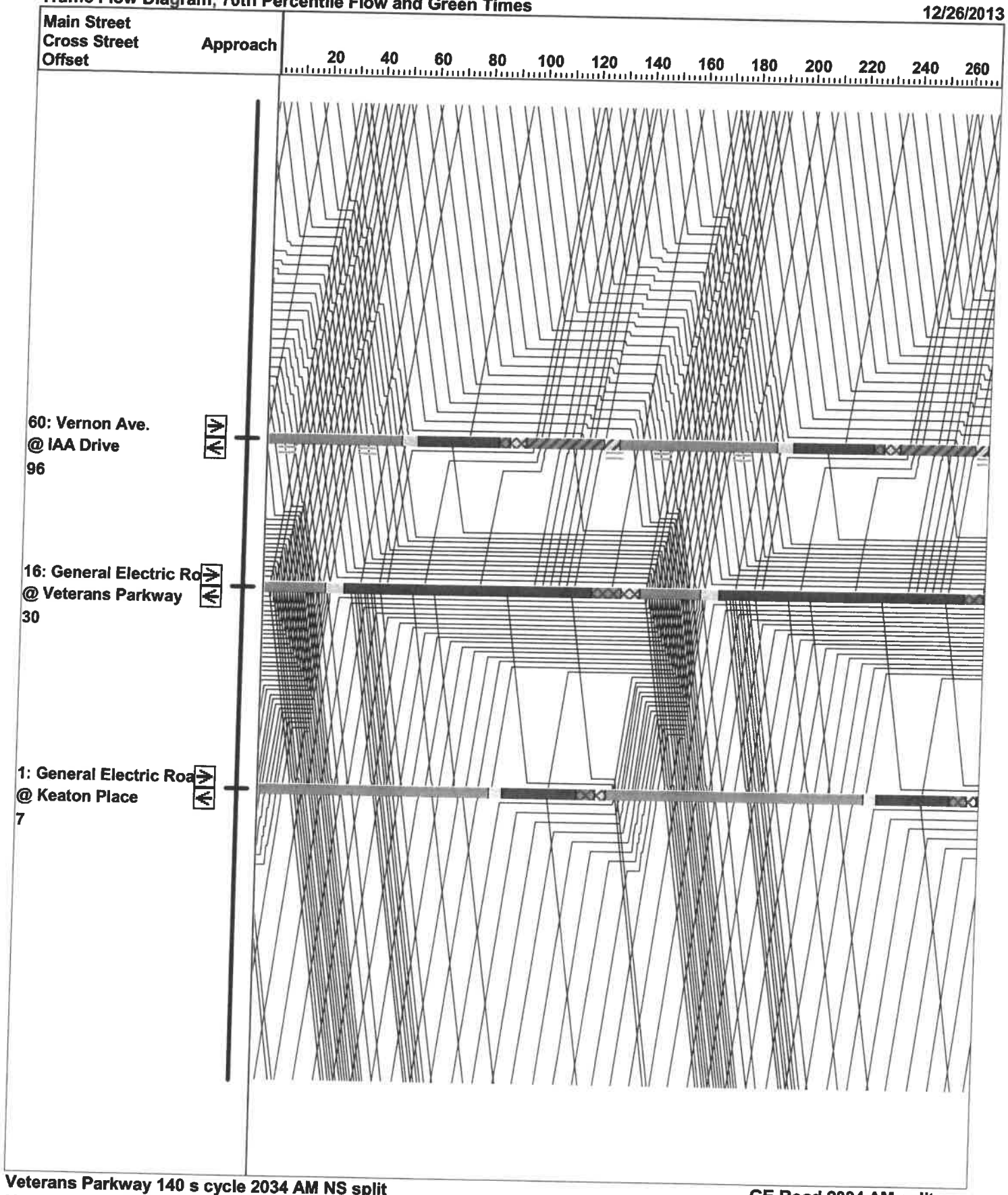


Veterans Parkway 140 s cycle 2034 AM NS split
Knight E/A

GE Road 2034 AM split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle 2034 AM NS split
Knight E/A

GE Road 2034 AM split.syn

Timings
1: Keaton Place & General Electric Road

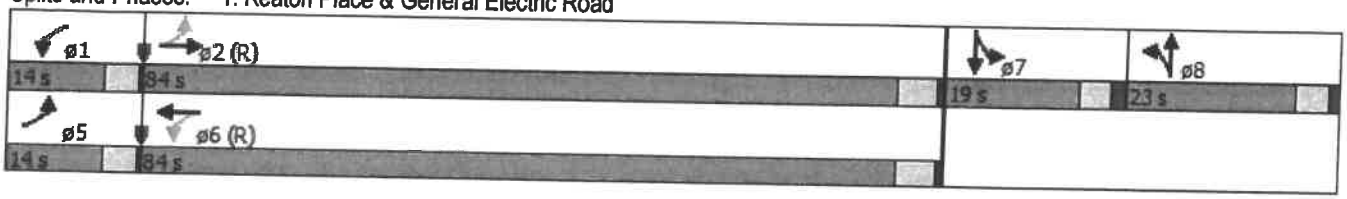
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	51	642	51	841	1	1
Lane Group Flow (vph)	54	727	54	904	57	19
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	5	2	1	6	8	7
Permitted Phases	2		6			
Detector Phase	5	2	1	6	8	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0
Total Split (s)	14.0	84.0	14.0	84.0	23.0	19.0
Total Split (%)	10.0%	60.0%	10.0%	60.0%	16.4%	13.6%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	None	C-Max	None	None
Act Effct Green (s)	113.4	108.1	113.4	108.1	9.2	6.5
Actuated g/C Ratio	0.81	0.77	0.81	0.77	0.07	0.05
v/c Ratio	0.11	0.27	0.09	0.33	0.45	0.20
Control Delay	1.0	1.3	3.9	7.5	65.2	47.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	1.0	1.4	3.9	7.5	65.2	47.7
LOS	A	A	A	A	E	D
Approach Delay		1.4		7.3	65.2	47.7
Approach LOS		A		A	E	D
Queue Length 50th (ft)	2	16	9	154	45	9
Queue Length 95th (ft)	m3	24	22	224	90	37
Internal Link Dist (ft)		412		658	350	262
Turn Bay Length (ft)	100		175			
Base Capacity (vph)	535	2704	631	2725	245	189
Starvation Cap Reductn	0	965	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.42	0.09	0.33	0.23	0.10

Intersection Summary

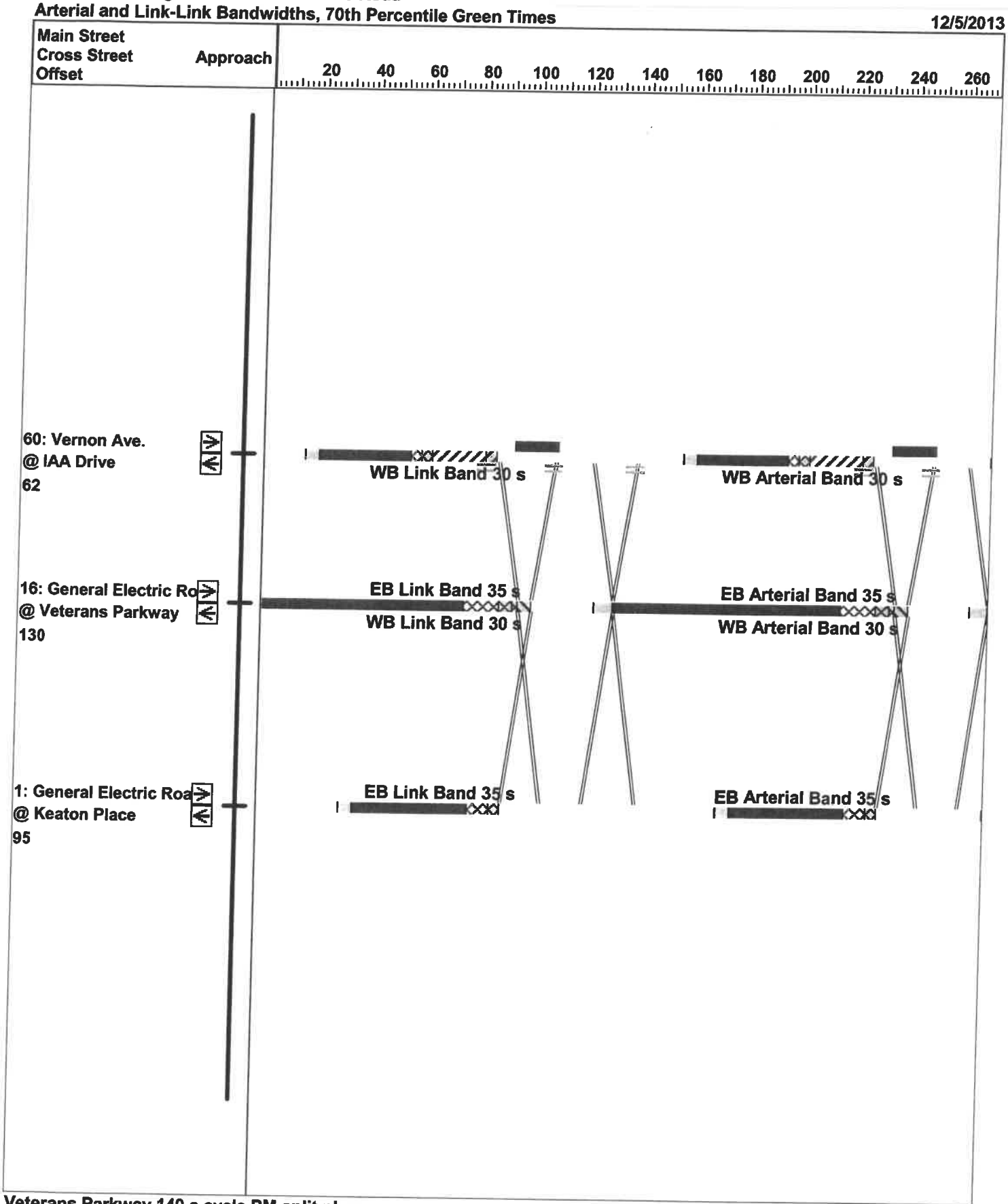
Cycle Length: 140
Actuated Cycle Length: 140
Offset: 7 (5%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.45
Intersection Signal Delay: 7.0 — Intersection LOS: A
Intersection Capacity Utilization 43.7% — ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/5/2013

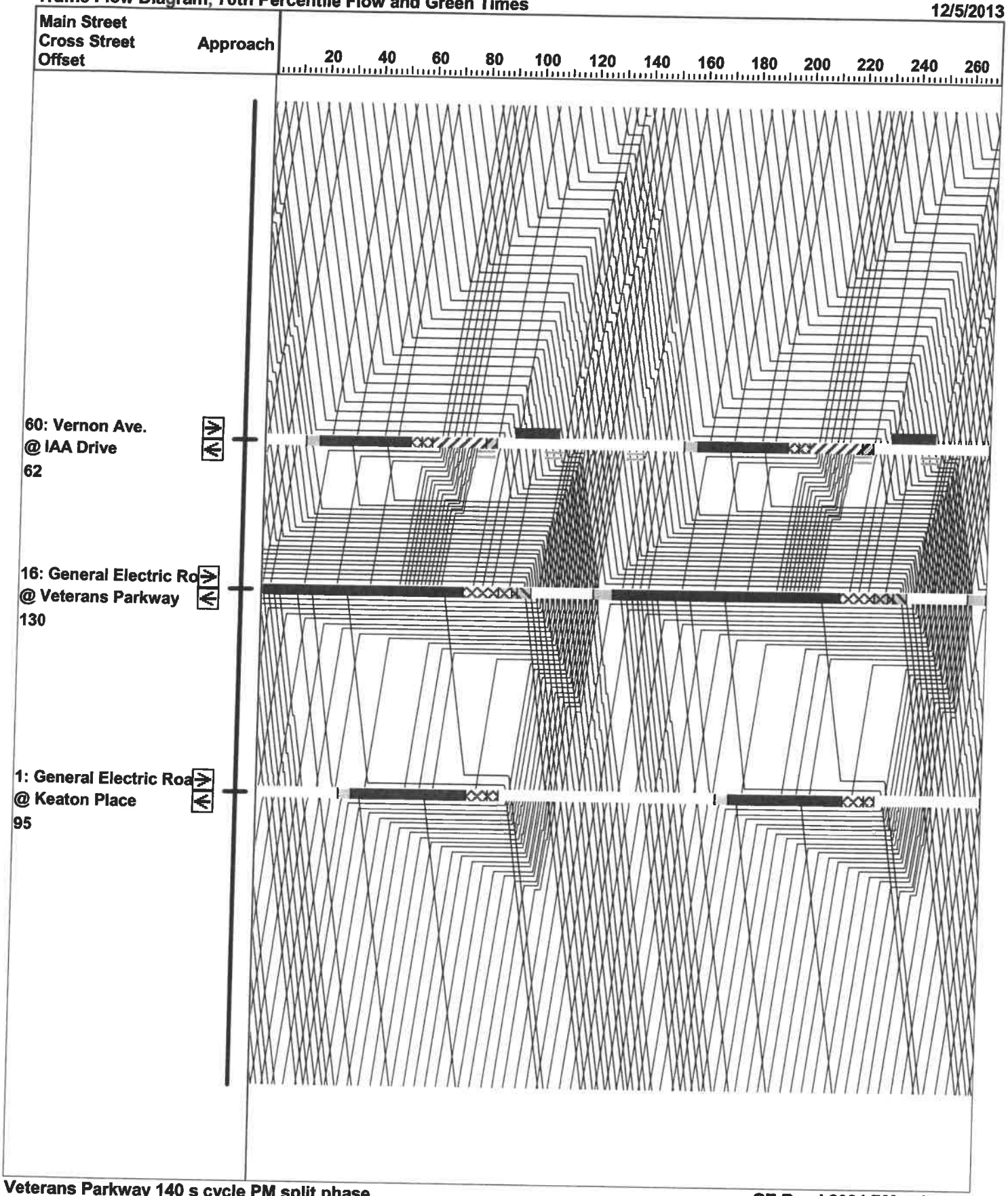


Veterans Parkway 140 s cycle PM split phase
Knight E/A

GE Road 2034 PM split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM split phase
Knight E/A

GE Road 2034 PM split.syn

Timings
1: Keaton Place & General Electric Road

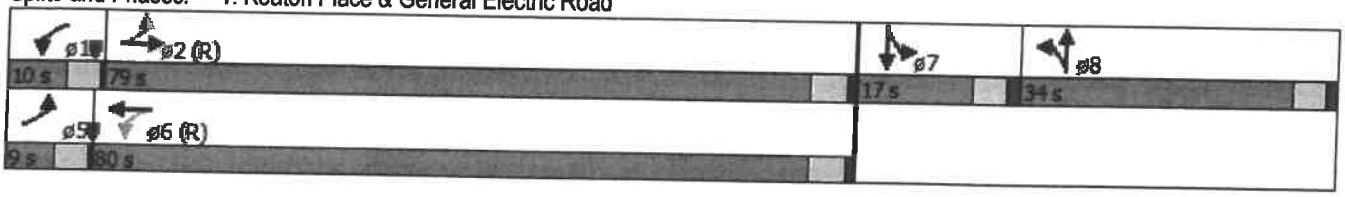
12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Configurations						
Volume (vph)	67	1040	59	731	1	2
Lane Group Flow (vph)	71	1214	62	792	221	81
Turn Type	pm+pt	NA	pm+pt	NA	NA	NA
Protected Phases	5	2	1	6	8	7
Permitted Phases	2		6			
Detector Phase	5	2	1	6	8	7
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0
Total Split (s)	9.0	79.0	10.0	80.0	34.0	17.0
Total Split (%)	6.4%	56.4%	7.1%	57.1%	24.3%	12.1%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead
Lead-Lag Optimize?						
Recall Mode	None	C-Max	None	C-Max	None	None
Act Effct Green (s)	93.9	87.4	94.1	87.4	21.1	7.7
Actuated g/C Ratio	0.67	0.62	0.67	0.62	0.15	0.06
v/c Ratio	0.16	0.56	0.22	0.36	0.76	0.52
Control Delay	1.6	3.0	10.3	14.7	70.0	33.5
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0
Total Delay	1.6	3.8	10.3	14.7	70.0	33.5
LOS	A	A	B	B	E	C
Approach Delay		3.7		14.4	70.0	33.5
Approach LOS		A		B	E	C
Queue Length 50th (ft)	3	32	16	179	184	17
Queue Length 95th (ft)	m4	m41	41	269	262	69
Internal Link Dist (ft)		412		658	350	262
Turn Bay Length (ft)	100		40			
Base Capacity (vph)	441	2180	278	2202	392	207
Starvation Cap Reductn	0	591	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.76	0.22	0.36	0.56	0.39

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 95 (68%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 66.0% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



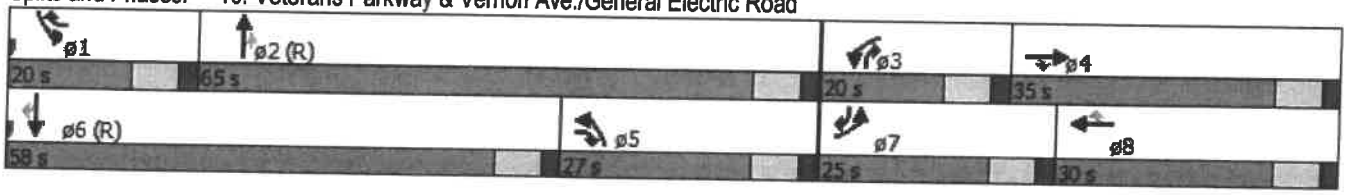
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	541	658	495	218	522	196	351	1788	185	377	2190	370
Lane Group Flow (vph)	569	693	521	229	549	206	369	1882	195	397	2305	389
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	18.0	28.7	48.7	11.8	22.5	43.0	20.0	58.0	76.8	13.5	51.5	69.5
Actuated g/C Ratio	0.13	0.20	0.35	0.08	0.16	0.31	0.14	0.41	0.55	0.10	0.37	0.50
v/c Ratio	1.29	0.91	0.81	0.80	0.92	0.35	0.75	0.85	0.21	1.20	1.17	0.47
Control Delay	201.4	66.0	31.8	95.3	68.8	6.4	68.2	41.6	9.2	166.8	121.9	10.9
Queue Delay	0.0	47.1	1.6	0.0	0.0	0.0	57.5	0.0	0.0	0.0	0.0	0.1
Total Delay	201.4	113.1	33.4	95.3	68.8	6.4	125.7	41.6	9.2	166.8	121.9	11.0
LOS	F	F	C	F	E	A	F	D	A	F	F	B
Approach Delay		118.0			61.9			51.7			113.7	
Approach LOS		F			E			D			F	
Queue Length 50th (ft)	~348	297	248	114	265	10	168	561	46	~231	~920	82
Queue Length 95th (ft)	m#355	m305	m248	#158	#345	31	225	627	87	#338	#1010	125
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	763	641	318	611	583	490	2217	920	331	1971	829
Starvation Cap Reductn	0	153	36	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	211	0	0	0	0	43
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.14	0.86	0.72	0.90	0.35	1.32	0.85	0.21	1.20	1.17	0.49

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 90.2 Intersection LOS: F
Intersection Capacity Utilization 102.7% ICU Level of Service G
Analysis Period (min) 15
Description: V38

~ 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: 16: Veterans Parkway & Vernon Ave./General Electric Road



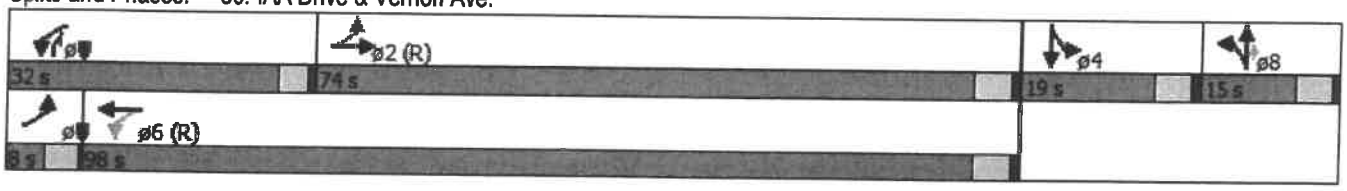
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT
Lane Configurations							
Volume (vph)	66	1502	389	779	22	115	26
Lane Group Flow (vph)	69	1676	409	899	124	121	190
Turn Type	pm+pt	NA	pm+pt	NA	NA	pm+ov	NA
Protected Phases	5	2	1	6	8	1	4
Permitted Phases	2		6			8	
Detector Phase	5	2	1	6	8	1	4
Switch Phase							
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	3.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	8.0	15.0
Total Split (s)	8.0	74.0	32.0	98.0	15.0	32.0	19.0
Total Split (%)	5.7%	52.9%	22.9%	70.0%	10.7%	22.9%	13.6%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.1	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	0.8	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0	5.0	3.9	5.0
Lead/Lag	Lead	Lag	Lead	Lag		Lead	
Lead-Lag Optimize?							
Recall Mode	None	C-Max	None	C-Max	None	None	None
Act Effct Green (s)	74.0	69.0	102.1	94.6	10.0	43.1	14.0
Actuated g/C Ratio	0.53	0.49	0.73	0.68	0.07	0.31	0.10
v/c Ratio	0.21	1.00	1.04	0.39	1.01	0.23	1.03
Control Delay	10.2	57.7	93.4	3.9	146.5	15.9	126.7
Queue Delay	0.0	36.3	25.1	1.0	0.0	0.2	25.4
Total Delay	10.2	94.0	118.5	5.0	146.5	16.1	152.1
LOS	B	F	F	A	F	B	F
Approach Delay		90.7		40.5	82.1		152.1
Approach LOS		F		D	F		F
Queue Length 50th (ft)	16	~787	~359	117	~115	29	~164
Queue Length 95th (ft)	30	#973	m#522	m96	#252	80	#327
Internal Link Dist (ft)		770		274	520		42
Turn Bay Length (ft)	100		100			90	
Base Capacity (vph)	334	1673	395	2286	123	523	185
Starvation Cap Reductn	0	0	86	1053	0	0	0
Spillback Cap Reductn	0	224	0	0	0	93	21
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	1.16	1.32	0.73	1.01	0.28	1.16

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 62 (44%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.04
Intersection Signal Delay: 74.6 Intersection LOS: E
Intersection Capacity Utilization 94.7% ICU Level of Service F
Analysis Period (min) 15
Description: V37 - est RT

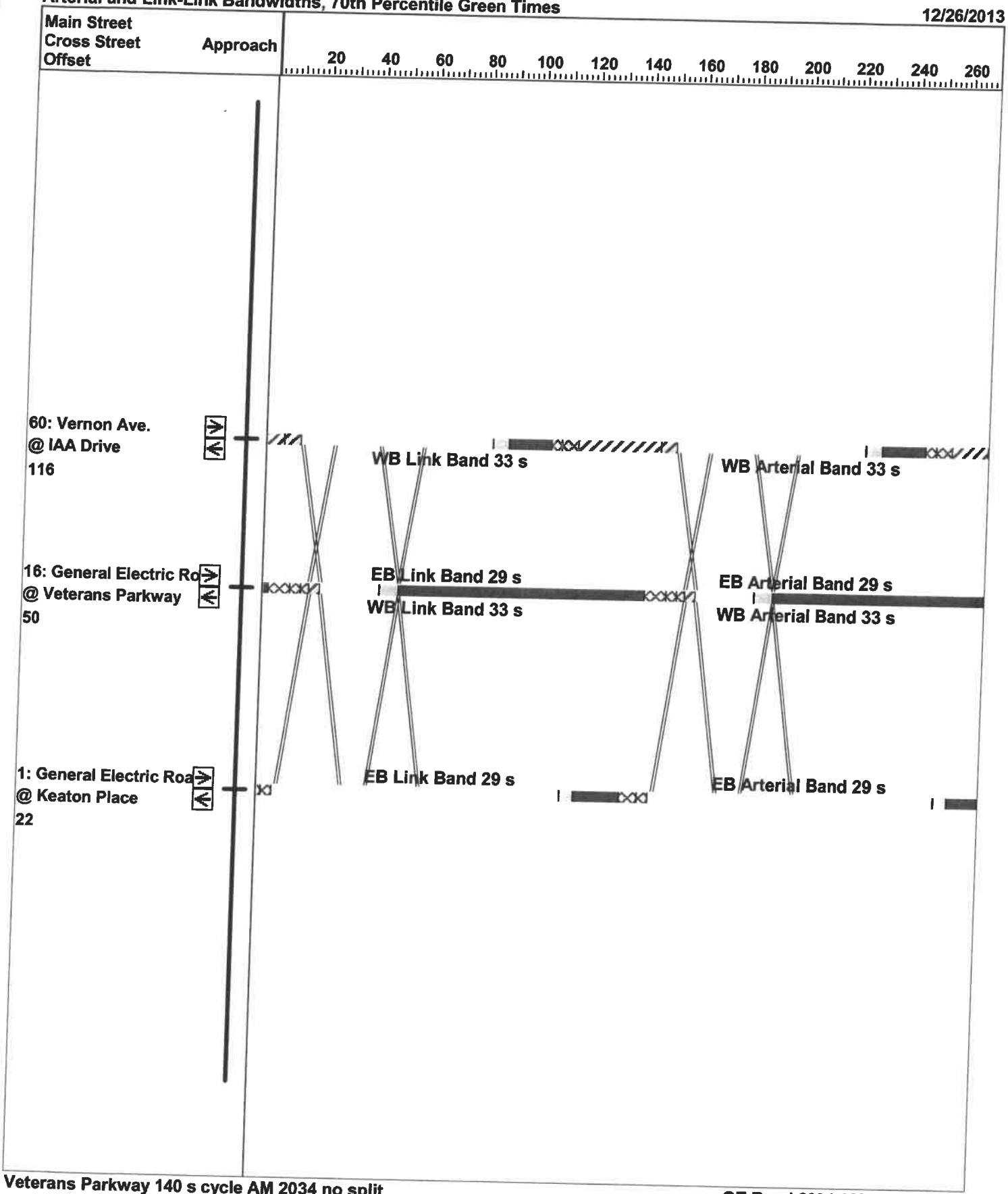
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

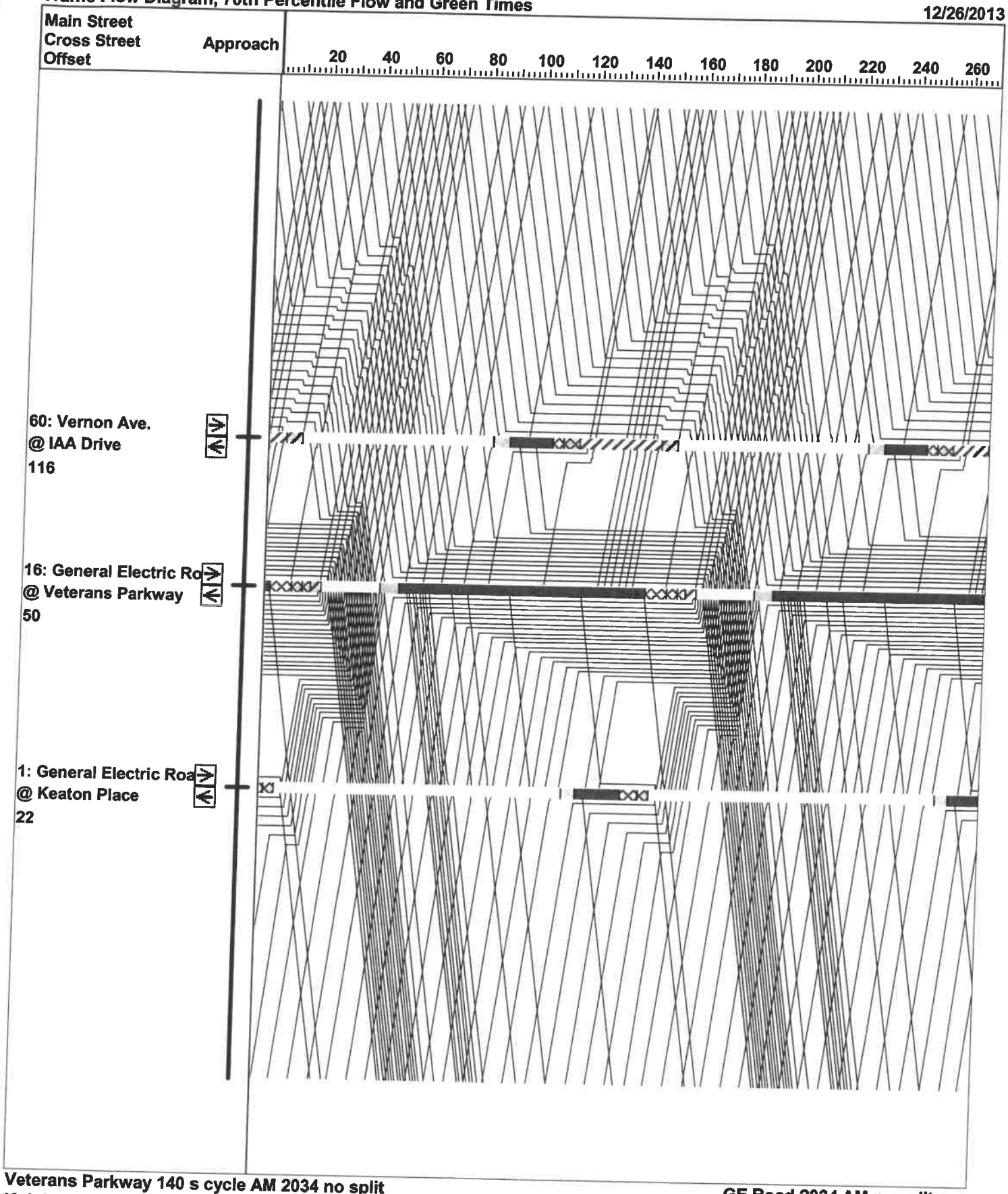


Veterans Parkway 140 s cycle AM 2034 no split
Knight E/A

GE Road 2034 AM no split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle AM 2034 no split
Knight E/A

GE Road 2034 AM no split.syn

Timings
1: Keaton Place & General Electric Road

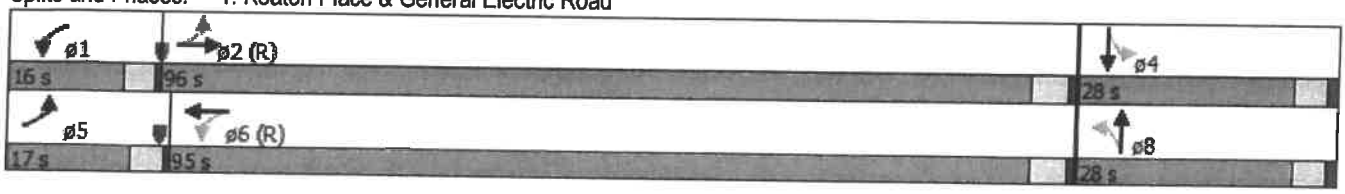
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	51	642	51	841	43	1	9	1
Lane Group Flow (vph)	54	727	54	904	0	57	0	19
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	17.0	96.0	16.0	95.0	28.0	28.0	28.0	28.0
Total Split (%)	12.1%	68.6%	11.4%	67.9%	20.0%	20.0%	20.0%	20.0%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	119.9	114.8	119.9	114.8		10.0		10.0
Actuated g/C Ratio	0.86	0.82	0.86	0.82		0.07		0.07
v/c Ratio	0.10	0.25	0.09	0.31		0.51		0.15
Control Delay	0.6	0.9	2.0	4.5		69.7		42.0
Queue Delay	0.0	0.2	0.0	0.0		0.0		0.0
Total Delay	0.6	1.0	2.0	4.5		69.7		42.0
LOS	A	A	A	A		E		D
Approach Delay		1.0		4.4		69.7		42.0
Approach LOS		A		A		E		D
Queue Length 50th (ft)	1	11	5	106		45		9
Queue Length 95th (ft)	m2	16	13	158		90		35
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		175					
Base Capacity (vph)	605	2873	694	2895		246		274
Starvation Cap Reductn	0	1123	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.09	0.42	0.08	0.31		0.23		0.07

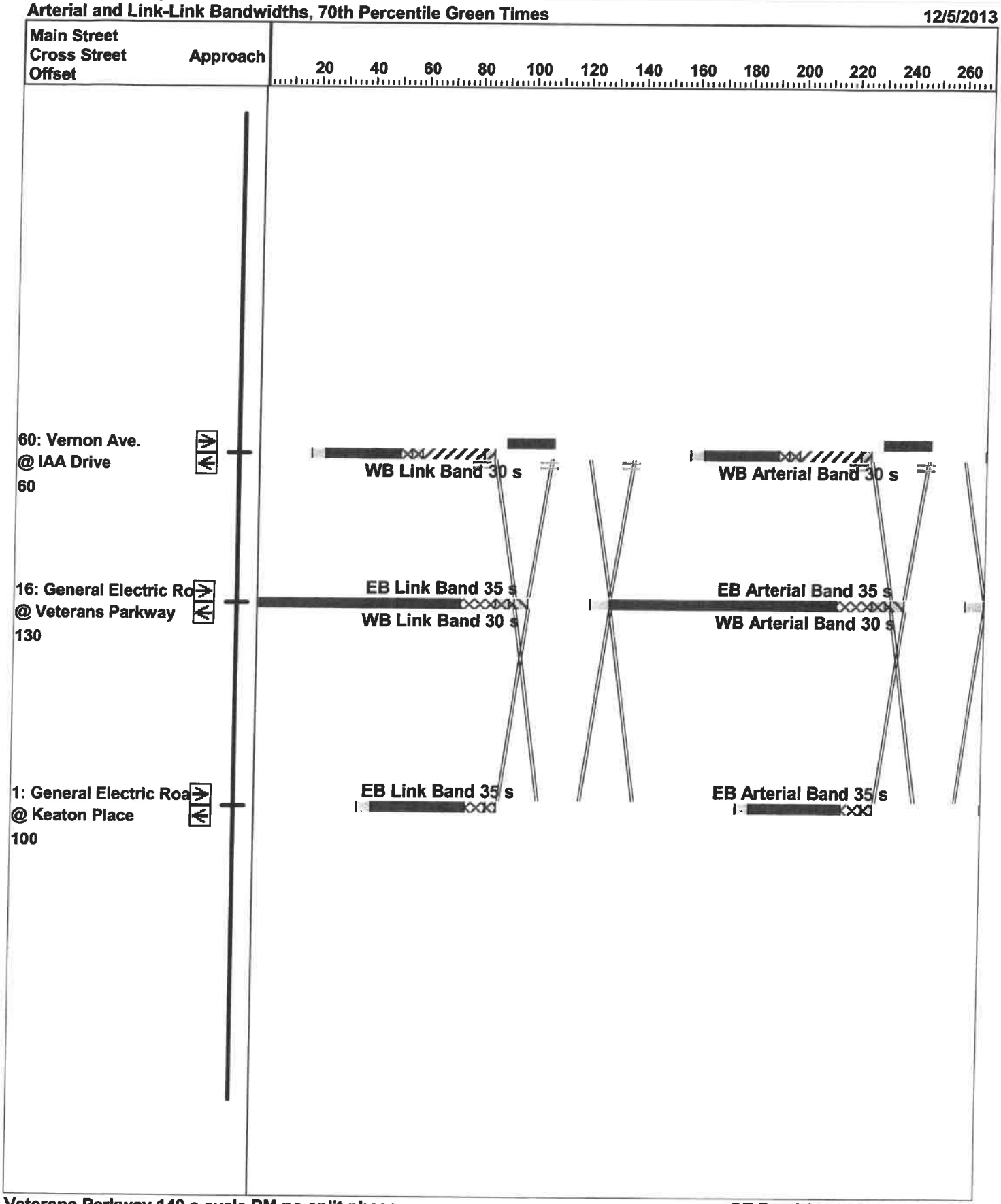
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 22 (16%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 5.4 Intersection LOS: A
Intersection Capacity Utilization 43.7% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 12/5/2013

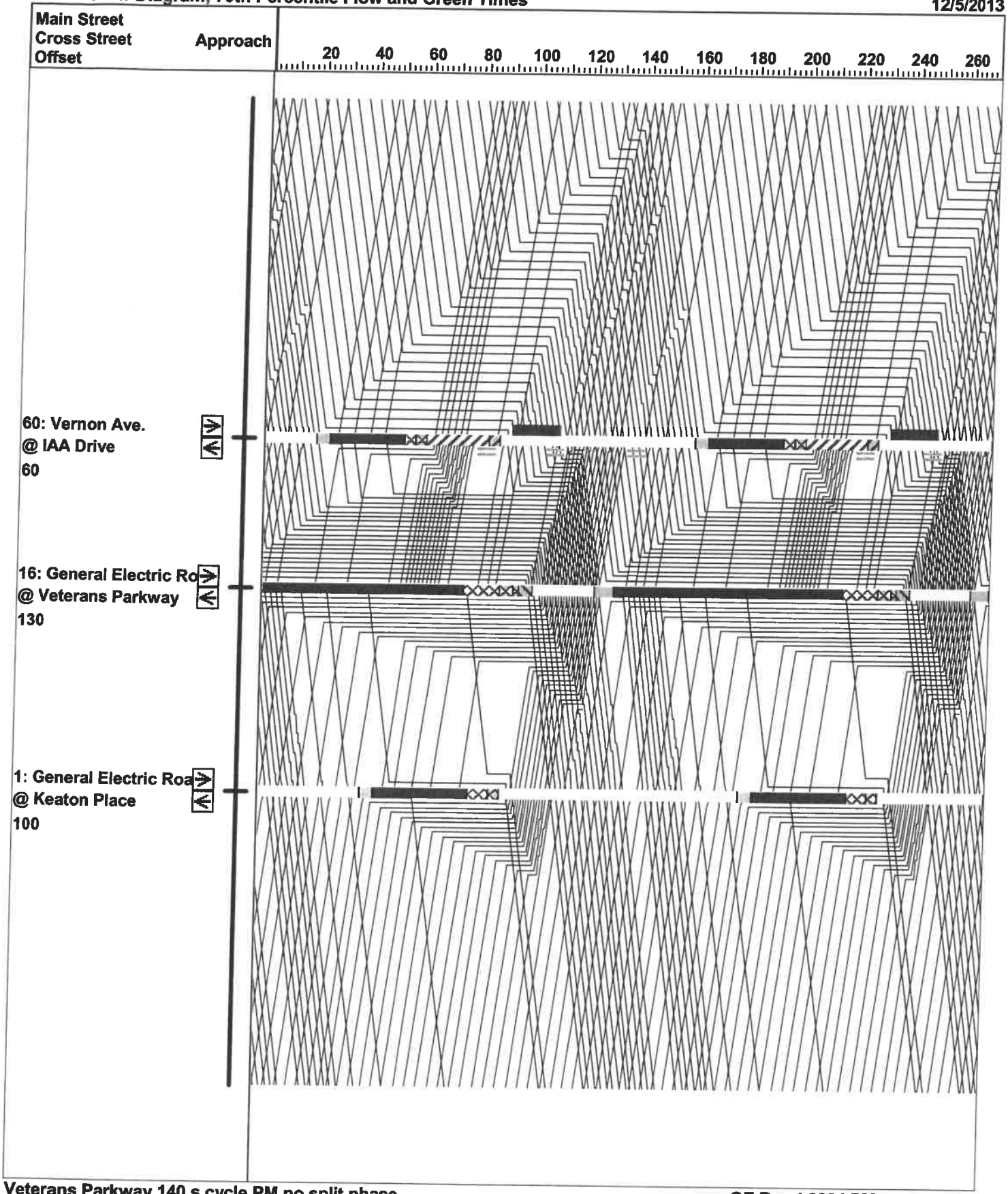


Veterans Parkway 140 s cycle PM no split phase
Knight E/A

GE Road 2034 PM no split.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM no split phase
Knight E/A

GE Road 2034 PM no split.syn

Timings
1: Keaton Place & General Electric Road

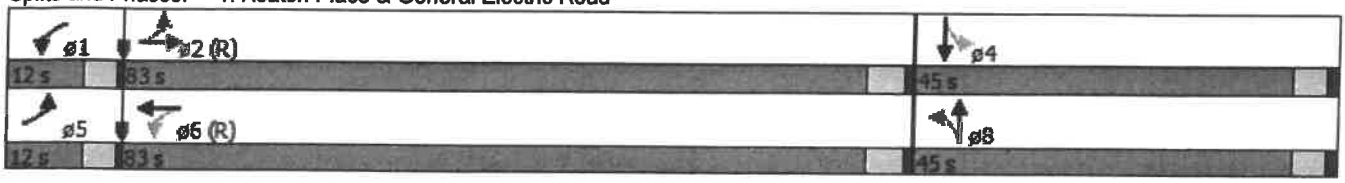
12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	67	1040	59	731	146	1	16	2
Lane Group Flow (vph)	71	1214	62	792	0	221	0	81
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	12.0	83.0	12.0	83.0	45.0	45.0	45.0	45.0
Total Split (%)	8.6%	59.3%	8.6%	59.3%	32.1%	32.1%	32.1%	32.1%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0		0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0		5.0		5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	102.0	95.0	101.6	94.8		26.0		26.0
Actuated g/C Ratio	0.73	0.68	0.73	0.68		0.19		0.19
v/c Ratio	0.14	0.51	0.20	0.33		0.83		0.23
Control Delay	1.1	2.5	7.2	11.2		75.1		16.3
Queue Delay	0.0	0.8	0.0	0.0		0.0		0.0
Total Delay	1.1	3.3	7.2	11.2		75.1		16.3
LOS	A	A	A	B		E		B
Approach Delay		3.2		10.9		75.1		16.3
Approach LOS		A		B		E		B
Queue Length 50th (ft)	2	26	13	152		183		14
Queue Length 95th (ft)	m3	m35	33	238		261		56
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	503	2370	330	2388		401		514
Starvation Cap Reductn	0	756	0	0		0		0
Spillback Cap Reductn	0	0	0	0		0		0
Storage Cap Reductn	0	0	0	0		0		0
Reduced v/c Ratio	0.14	0.75	0.19	0.33		0.55		0.16

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 100 (71%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 12.8 Intersection LOS: B
Intersection Capacity Utilization 66.0% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



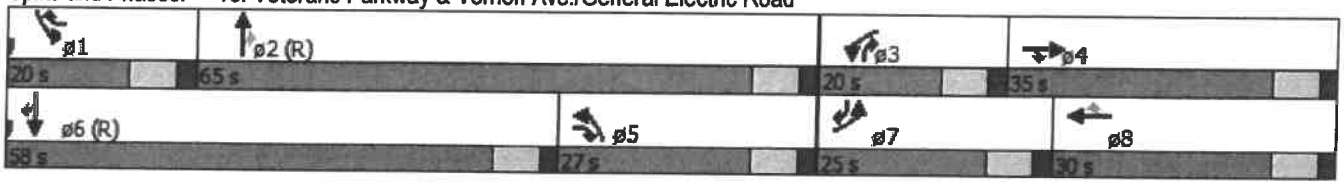
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	541	658	495	218	522	196	351	1788	185	377	2190	370
Lane Group Flow (vph)	569	693	521	229	549	206	369	1882	195	397	2305	389
Turn Type	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	pm+ov
Protected 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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	18.0	28.7	48.7	11.8	22.5	43.0	20.0	58.0	76.8	13.5	51.5	69.5
Actuated g/C Ratio	0.13	0.20	0.35	0.08	0.16	0.31	0.14	0.41	0.55	0.10	0.37	0.50
v/c Ratio	1.29	0.91	0.81	0.80	0.92	0.35	0.75	0.85	0.21	1.20	1.17	0.47
Control Delay	201.1	67.6	33.1	93.0	71.3	7.9	68.2	41.6	9.2	166.8	121.9	10.9
Queue Delay	0.0	47.1	1.4	0.0	0.0	0.0	56.5	0.0	0.0	0.0	0.0	0.2
Total Delay	201.1	114.8	34.4	93.0	71.3	7.9	124.7	41.6	9.2	166.8	121.9	11.1
LOS	F	F	C	F	E	A	F	D	A	F	F	B
Approach Delay		118.8			63.1			51.6			113.7	
Approach LOS		F			E			D			F	
Queue Length 50th (ft)	~348	298	260	114	265	16	168	561	46	~231	~920	82
Queue Length 95th (ft)	m#391	m336	m292	#159	#345	49	225	627	87	#338	#1010	125
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	763	641	318	611	583	490	2217	920	331	1971	829
Starvation Cap Reductn	0	154	32	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	186	0	0	0	0	85
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.14	0.86	0.72	0.90	0.35	1.21	0.85	0.21	1.20	1.17	0.52

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 90.5 Intersection LOS: F
Intersection Capacity Utilization 102.7% ICU Level of Service G
Analysis Period (min) 15
Description: V38

~ 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: 16: Veterans Parkway & Vernon Ave./General Electric Road



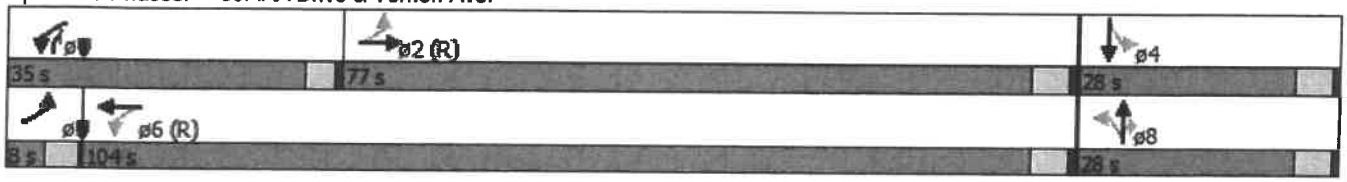
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Volume (vph)	66	1502	389	779	96	22	115	77	26
Lane Group Flow (vph)	69	1676	409	899	0	124	121	0	190
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	pm+ov	Perm	NA
Protected Phases	5	2	1	6		8	1		4
Permitted Phases	2		6		8		8	4	
Detector Phase	5	2	1	6	8	8	1	4	4
Switch Phase									
Minimum Initial (s)	4.0	15.0	3.0	15.0	8.0	8.0	3.0	8.0	8.0
Minimum Split (s)	8.0	21.0	8.0	21.0	21.0	21.0	8.0	21.0	21.0
Total Split (s)	8.0	77.0	35.0	104.0	28.0	28.0	35.0	28.0	28.0
Total Split (%)	5.7%	55.0%	25.0%	74.3%	20.0%	20.0%	25.0%	20.0%	20.0%
Yellow Time (s)	3.5	4.0	3.1	4.0	3.9	3.9	3.1	3.9	3.9
All-Red Time (s)	0.5	1.0	0.8	1.0	1.1	1.1	0.8	1.1	1.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0		0.0	0.0		0.0
Total Lost Time (s)	4.0	5.0	3.9	5.0		5.0	3.9		5.0
Lead/Lag	Lead	Lag	Lead	Lag			Lead		
Lead-Lag Optimize?									
Recall Mode	None	C-Max	None	C-Max	None	None	None	None	None
Act Effct Green (s)	78.7	73.4	108.8	101.3		22.3	57.7		22.3
Actuated g/C Ratio	0.56	0.52	0.78	0.72		0.16	0.41		0.16
v/c Ratio	0.19	0.94	0.96	0.37		0.79	0.19		0.95
Control Delay	9.1	43.3	75.6	2.8		89.7	23.1		101.8
Queue Delay	0.0	34.8	44.9	0.9		0.0	0.1		48.3
Total Delay	9.1	78.0	120.5	3.6		89.7	23.2		150.1
LOS	A	E	F	A		F	C		F
Approach Delay		75.3		40.2		56.8			150.1
Approach LOS		E		D		E			F
Queue Length 50th (ft)	13	748	345	40		109	59		153
Queue Length 95th (ft)	24	#936	m#487	m45		#216	104		#308
Internal Link Dist (ft)		770		274		520			42
Turn Bay Length (ft)	100		100				90		
Base Capacity (vph)	356	1779	432	2448		161	648		206
Starvation Cap Reductn	0	0	106	1166		0	0		0
Spillback Cap Reductn	0	223	0	0		0	122		37
Storage Cap Reductn	0	0	0	0		0	0		0
Reduced v/c Ratio	0.19	1.08	1.25	0.70		0.77	0.23		1.12

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 60 (43%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 64.9 Intersection LOS: E
Intersection Capacity Utilization 94.7% ICU Level of Service F
Analysis Period (min) 15
Description: V37 - est RT

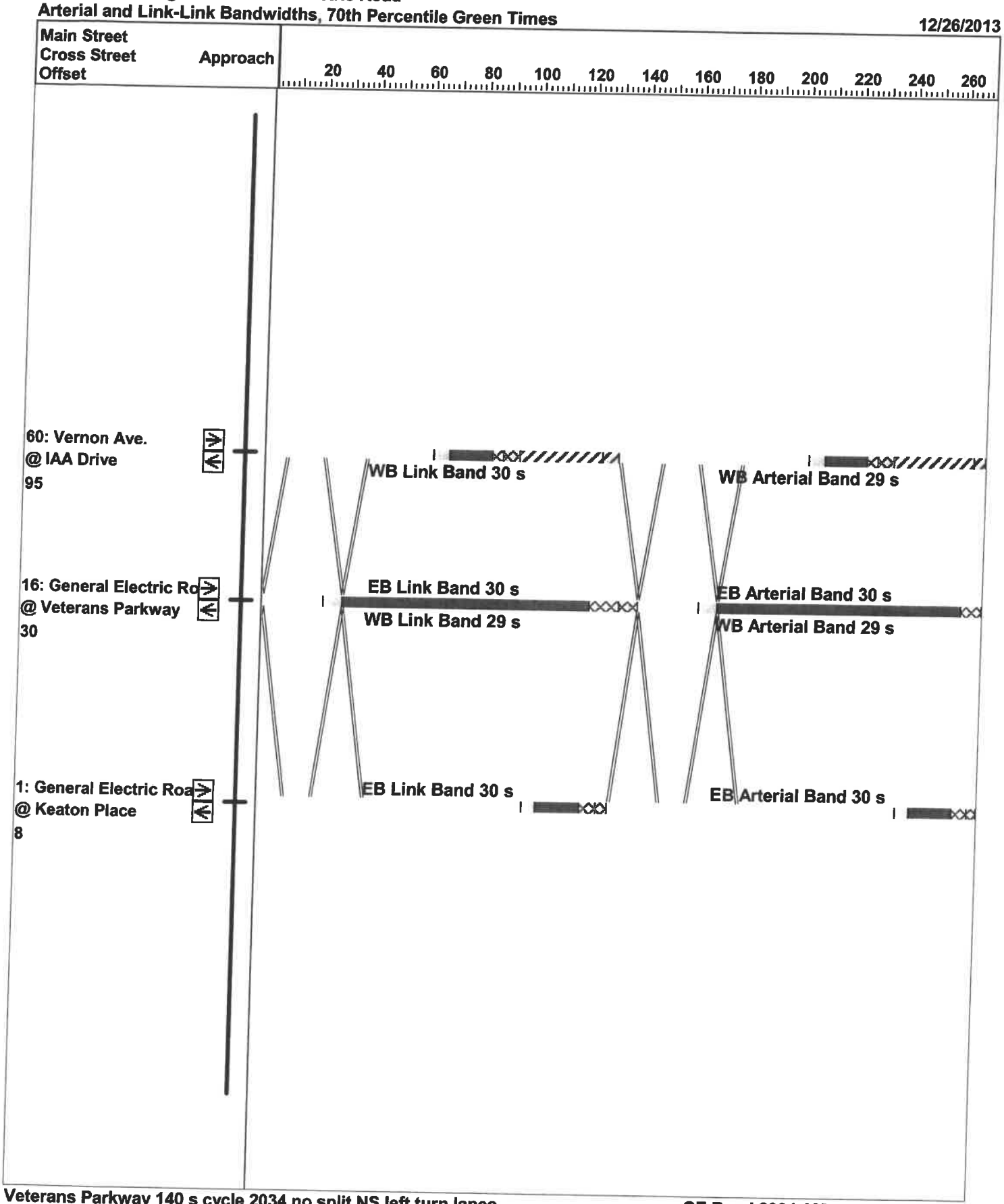
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 60: IAA Drive & Vernon Ave.



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times

12/26/2013

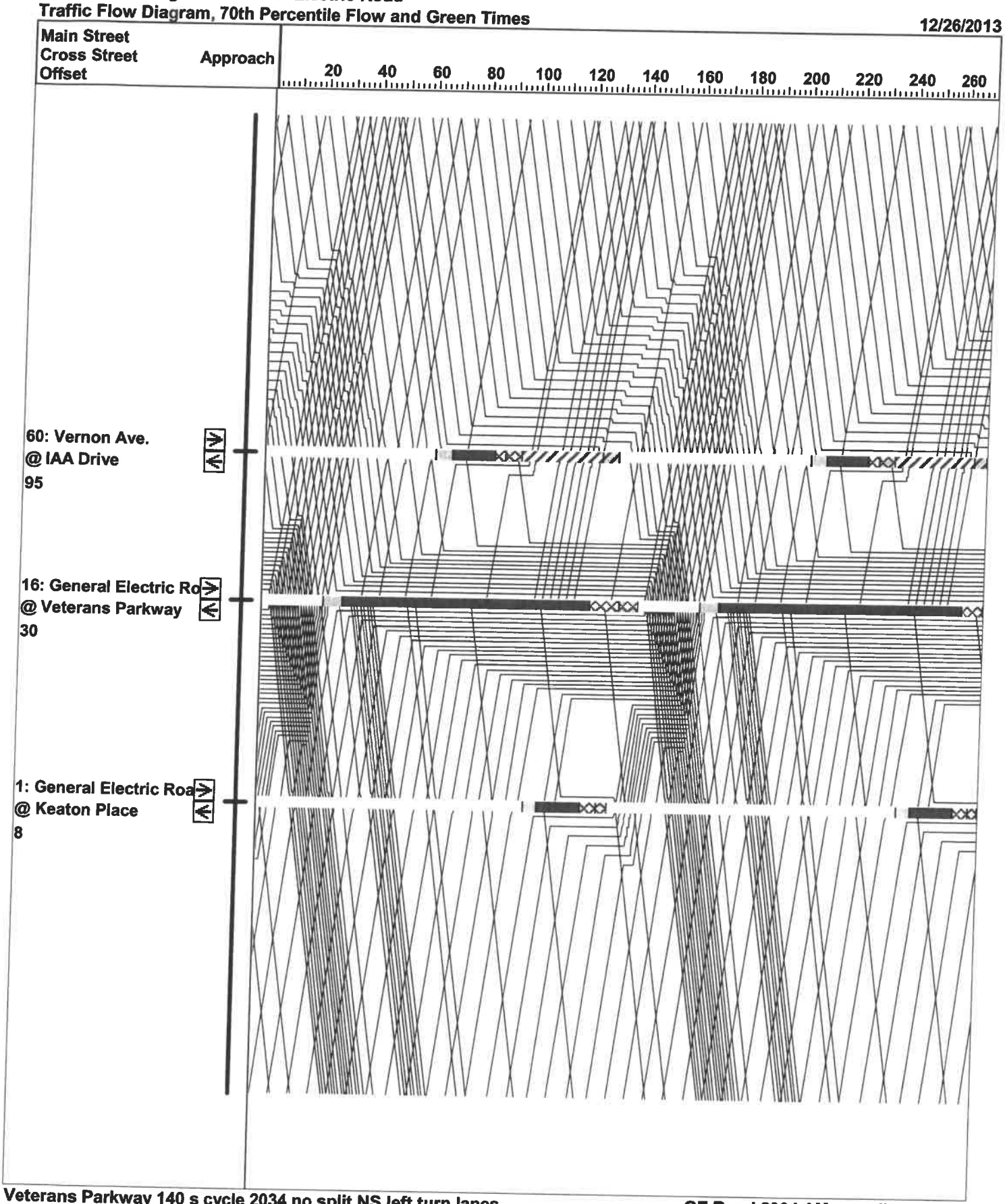


Veterans Parkway 140 s cycle 2034 no split NS left turn lanes
Knight E/A

GE Road 2034 AM no split ns lt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/26/2013



Veterans Parkway 140 s cycle 2034 no split NS left turn lanes
Knight E/A

GE Road 2034 AM no split ns lt.syn

Timings
1: Keaton Place & General Electric Road

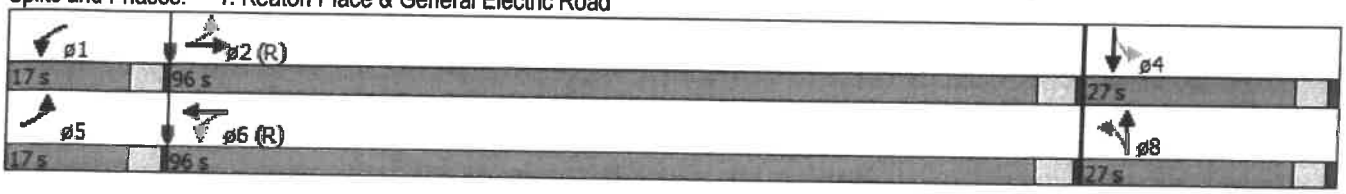
12/26/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	51	642	51	841	43	1	9	1
Lane Group Flow (vph)	54	727	54	904	45	12	9	10
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	17.0	96.0	17.0	96.0	27.0	27.0	27.0	27.0
Total Split (%)	12.1%	68.6%	12.1%	68.6%	19.3%	19.3%	19.3%	19.3%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	120.3	115.3	120.3	115.3	9.6	9.6	9.6	9.6
Actuated g/C Ratio	0.86	0.82	0.86	0.82	0.07	0.07	0.07	0.07
v/c Ratio	0.10	0.25	0.09	0.31	0.44	0.09	0.09	0.08
Control Delay	0.6	0.8	1.9	4.3	74.9	30.3	60.9	31.8
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.6	1.0	1.9	4.3	74.9	30.3	60.9	31.8
LOS	A	A	A	A	E	C	E	C
Approach Delay		1.0		4.2		65.5		45.6
Approach LOS		A		A		E		D
Queue Length 50th (ft)	1	11	5	104	40	1	8	1
Queue Length 95th (ft)	m2	16	13	153	81	22	26	20
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		175		225		75	
Base Capacity (vph)	608	2885	704	2907	234	278	234	277
Starvation Cap Reductn	0	1251	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.44	0.08	0.31	0.19	0.04	0.04	0.04

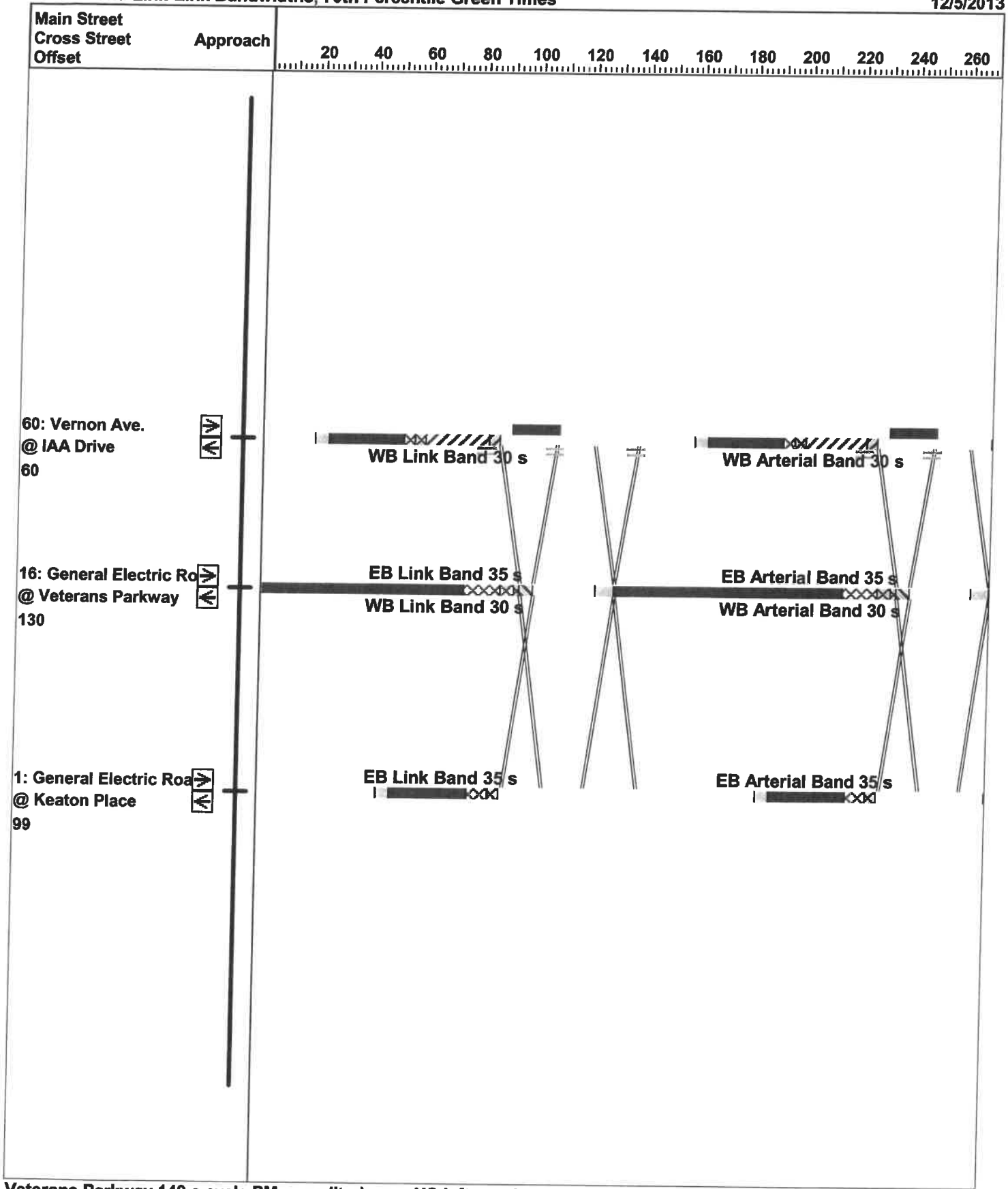
Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 8 (6%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 45
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.44
Intersection Signal Delay: 5.2 Intersection LOS: A
Intersection Capacity Utilization 47.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Time-Space Diagram - General Electric Road
Arterial and Link-Link Bandwidths, 70th Percentile Green Times 12/5/2013

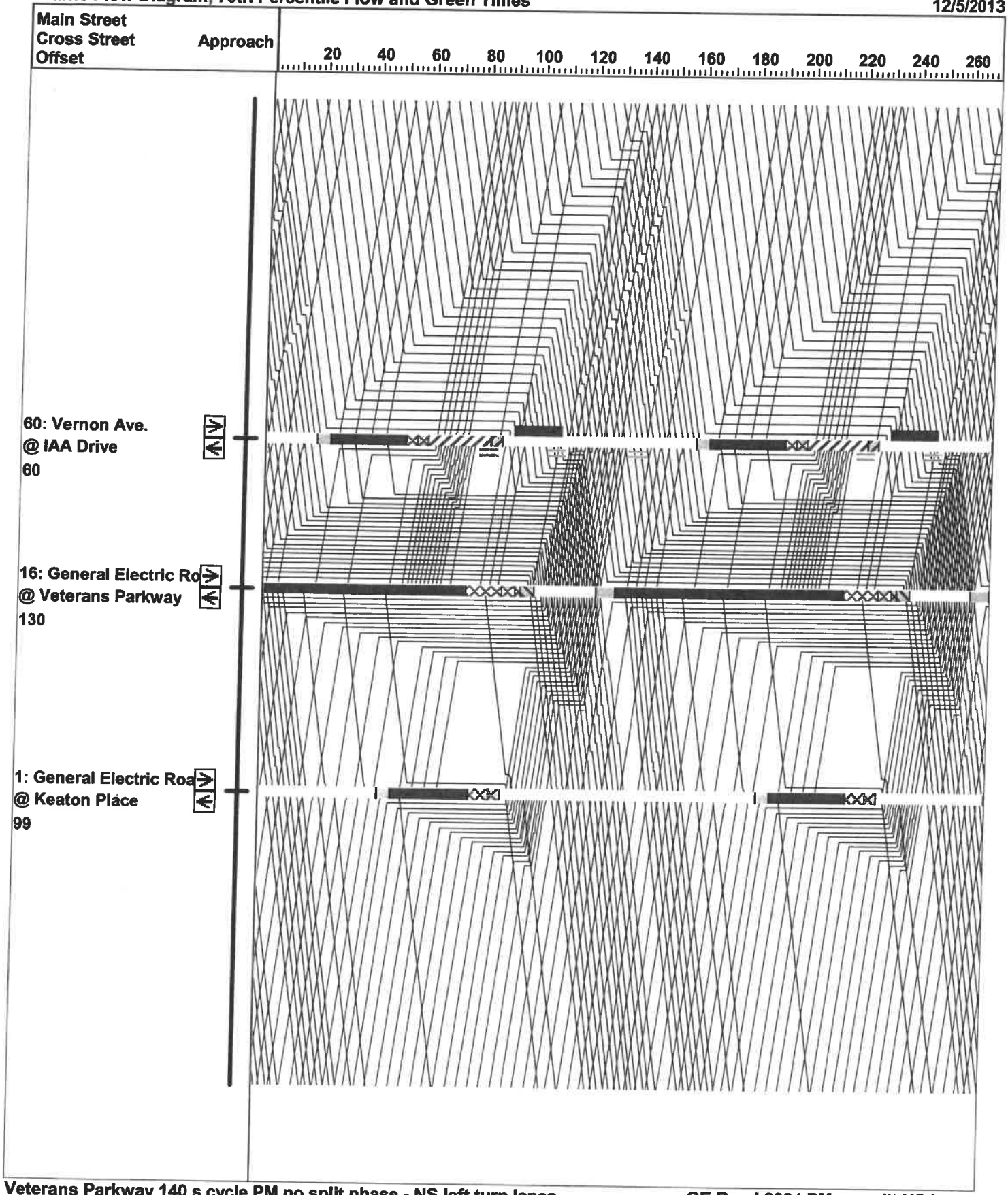


Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2034 PM no split NS lt.syn

Time-Space Diagram - General Electric Road
Traffic Flow Diagram, 70th Percentile Flow and Green Times

12/5/2013



Veterans Parkway 140 s cycle PM no split phase - NS left turn lanes
Knight E/A

GE Road 2034 PM no split NS lt.syn

Timings
1: Keaton Place & General Electric Road

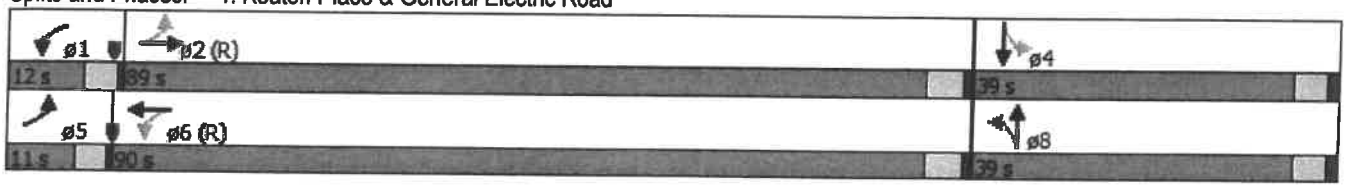
12/5/2013

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	67	1040	59	731	146	1	16	2
Lane Group Flow (vph)	71	1214	62	792	154	67	17	64
Turn Type	pm+pt	NA	pm+pt	NA	Perm	NA	Perm	NA
Protected Phases	5	2	1	6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	5	2	1	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	21.0	8.0	21.0	15.0	15.0	15.0	15.0
Total Split (s)	11.0	89.0	12.0	90.0	39.0	39.0	39.0	39.0
Total Split (%)	7.9%	63.6%	8.6%	64.3%	27.9%	27.9%	27.9%	27.9%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	1.0	0.5	1.0	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	5.0	4.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag				
Lead-Lag Optimize?								
Recall Mode	None	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	107.5	100.8	107.1	100.6	20.5	20.5	20.5	20.5
Actuated g/C Ratio	0.77	0.72	0.76	0.72	0.15	0.15	0.15	0.15
v/c Ratio	0.14	0.48	0.18	0.31	0.74	0.22	0.08	0.21
Control Delay	0.8	2.2	5.3	8.5	77.3	12.6	49.2	13.2
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.8	2.9	5.3	8.5	77.3	12.6	49.2	13.2
LOS	A	A	A	A	E	B	D	B
Approach Delay		2.8		8.3		57.7		20.8
Approach LOS		A		A		E		C
Queue Length 50th (ft)	2	23	10	130	136	1	14	2
Queue Length 95th (ft)	m3	m30	27	203	203	42	35	42
Internal Link Dist (ft)		412		658		350		262
Turn Bay Length (ft)	100		40					
Base Capacity (vph)	527	2513	356	2533	345	461	344	459
Starvation Cap Reductn	0	880	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.74	0.17	0.31	0.45	0.15	0.05	0.14

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 99 (71%), Referenced to phase 2:EBTL and 6:WBTL, Start of 1st Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 10.3 Intersection LOS: B
Intersection Capacity Utilization 62.1% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Keaton Place & General Electric Road



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	541	658	495	218	522	196	351	1788	185	377	2190	370
Lane Group Flow (vph)	569	693	521	229	549	206	369	1882	195	397	2305	389
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	7.0	5.0	5.0	7.0	5.0	5.0	10.0	5.0	5.0	10.0	5.0
Minimum Split (s)	12.0	20.0	12.0	12.0	20.0	12.0	12.0	21.4	12.0	12.0	21.4	12.0
Total Split (s)	25.0	35.0	27.0	20.0	30.0	20.0	27.0	65.0	20.0	20.0	58.0	25.0
Total Split (%)	17.9%	25.0%	19.3%	14.3%	21.4%	14.3%	19.3%	46.4%	14.3%	14.3%	41.4%	17.9%
Yellow Time (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
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lead	Lead
Lead-Lag Optimize?												
Recall Mode	None	None	None	None	None	None	None	C-Max	None	None	C-Max	None
Act Effct Green (s)	18.0	28.7	48.7	11.8	22.5	43.0	20.0	58.0	76.8	13.5	51.5	69.5
Actuated g/C Ratio	0.13	0.20	0.35	0.08	0.16	0.31	0.14	0.41	0.55	0.10	0.37	0.50
v/c Ratio	1.29	0.91	0.81	0.80	0.92	0.35	0.75	0.85	0.21	1.20	1.17	0.47
Control Delay	201.1	67.6	33.1	90.4	70.7	9.0	68.2	41.6	9.2	166.8	121.9	10.9
Queue Delay	0.0	47.1	1.4	0.0	0.0	0.0	56.5	0.0	0.0	0.0	0.0	0.2
Total Delay	201.1	114.8	34.4	90.4	70.7	9.0	124.7	41.6	9.2	166.8	121.9	11.1
LOS	F	F	C	F	E	A	F	D	A	F	F	B
Approach Delay		118.8			62.4			51.6			113.7	
Approach LOS		F			E			D			F	
Queue Length 50th (ft)	~348	298	260	114	265	20	168	561	46	~231	~920	82
Queue Length 95th (ft)	m#391	m336	m292	#160	#346	61	225	627	87	#338	#1010	125
Internal Link Dist (ft)		274			412			2141			1291	
Turn Bay Length (ft)	175			175		175	500		500	500		500
Base Capacity (vph)	441	763	641	318	611	583	490	2217	920	331	1971	829
Starvation Cap Reductn	0	154	32	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	186	0	0	0	0	85
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.29	1.14	0.86	0.72	0.90	0.35	1.21	0.85	0.21	1.20	1.17	0.52

Intersection Summary

Cycle Length: 140
Actuated Cycle Length: 140
Offset: 130 (93%), Referenced to phase 2:NBT and 6:SBT, Start of 1st Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 90.4 Intersection LOS: F
Intersection Capacity Utilization 102.7% ICU Level of Service G
Analysis Period (min) 15
Description: V38

LEFT TURN LANES-NB/SB-NO SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.540	140	1	46	14	Avail. Stor.=100
	EB	T	345	AM	2%	0.450	140	1	376	115	Avail. Stor.=400
	EB	TR	345	AM	1%	0.450	140	1	373	114	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.540	140	1	46	14	Avail. Stor.=115
	WB	T	429	AM	2%	0.450	140	1	468	143	Avail. Stor.=600
	WB	TR	430	AM	1%	0.450	140	1	464	142	Avail. Stor.=600
Keaton Place	NB	L	43	AM	1%	0.410	140	1	50	15	Avail. Stor.=175
	NB	T		AM			140	0			
	NB	TR	11	AM	1%	0.320	140	1	15	4	Avail. Stor.=400
Auto Row Drive	SB	L	9	AM	1%	0.410	140	1	10	3	Avail. Stor.=60
	SB	T		AM			140	0			
	SB	TR	10	AM	1%	0.320	140	1	13	4	Avail. Stor.=115

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	576	PM	2%	0.650	140	1	400	122	Avail. Stor.=400
	EB	TR	577	PM	1%	0.650	140	1	397	121	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L	146	PM	1%	0.210	140	1	227	69	Avail. Stor.=175
	NB	T		PM			140	0			
	NB	TR	64	PM	1%	0.210	140	1	99	30	Avail. Stor.=400
Auto Row Drive	SB	L	16	PM	1%	0.210	140	1	25	8	Avail. Stor.=60
	SB	T		PM			140	0			
	SB	TR	61	PM	1%	0.210	140	1	95	29	Avail. Stor.=115

LEFT TURN LANES-NB/SB-SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

Calculated Storage Length = $\frac{(DHV)(1 + \% \text{ of trucks})(2 * 25)(1 - G/C)}{(3600/\text{cycle length})(\text{no. of lanes})}$

Date:

Location: (B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.510	140	1	49	15	Avail. Stor.=100
	EB	T	345	AM	2%	0.430	140	1	390	119	Avail. Stor.=400
	EB	TR	345	AM	1%	0.430	140	1	386	118	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.510	140	1	49	15	Avail. Stor.=115
	WB	T	429	AM	2%	0.430	140	1	485	148	Avail. Stor.=600
	WB	TR	430	AM	1%	0.430	140	1	481	147	Avail. Stor.=600
Keaton Place	NB	L	43	AM	1%	0.190	140	1	68	21	Avail. Stor.=175
	NB	T		AM			140	0			
	NB	TR	11	AM	1%	0.190	140	1	17	5	Avail. Stor.=400
Auto Row Drive	SB	L	9	AM	1%	0.190	140	1	14	4	Avail. Stor.=60
	SB	T		AM			140	0			
	SB	TR	10	AM	1%	0.190	140	1	16	5	Avail. Stor.=115

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	576	PM	2%	0.650	140	1	400	122	Avail. Stor.=400
	EB	TR	577	PM	1%	0.650	140	1	397	121	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L	146	PM	1%	0.110	140	1	255	78	Avail. Stor.=175
	NB	T		PM			140	0			
	NB	TR	64	PM	1%	0.110	140	1	112	34	Avail. Stor.=400
Auto Row Drive	SB	L	16	PM	1%	0.060	140	1	30	9	Avail. Stor.=60
	SB	T		PM			140	0			
	SB	TR	61	PM	1%	0.060	140	1	113	34	Avail. Stor.=115

LT. TURN LANE-NB/SB; RT. TURN LANE-EB-NO SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

Calculated Storage Length = $\frac{(DHV)(1 + \% \text{ of trucks})(2 * 25)(1 - G/C)}{(3600/\text{cycle length})(\text{no. of lanes})}$

Date:

Location: B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.540	140	1	46	14	Avail. Stor.=100
	EB	T	642	AM	2%	0.460	140	2	344	105	Avail. Stor.=400
	EB	R	48	AM	1%	0.540	140	1	43	13	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.540	140	1	46	14	Avail. Stor.=115
	WB	T	429	AM	2%	0.460	140	1	459	140	Avail. Stor.=600
	WB	TR	430	AM	1%	0.460	140	1	456	139	Avail. Stor.=600
Keaton Place	NB	L	43	AM	1%	0.400	140	1	51	15	Avail. Stor.=175
	NB	T		AM			140	0			
	NB	TR	11	AM	1%	0.310	140	1	15	5	Avail. Stor.=400
Auto Row Drive	SB	L	9	AM	1%	0.400	140	1	11	3	Avail. Stor.=60
	SB	T		AM			140	0			
	SB	TR	10	AM	1%	0.310	140	1	14	4	Avail. Stor.=115

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	1040	PM	2%	0.650	140	2	361	110	Avail. Stor.=400
	EB	R	113	PM	1%	0.650	140	1	78	24	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L	146	PM	1%	0.210	140	1	227	69	Avail. Stor.=175
	NB	T		PM			140	0			
	NB	TR	64	PM	1%	0.210	140	1	99	30	Avail. Stor.=400
Auto Row Drive	SB	L	16	PM	1%	0.210	140	1	25	8	Avail. Stor.=60
	SB	T		PM			140	0			
	SB	TR	61	PM	1%	0.210	140	1	95	29	Avail. Stor.=115

LT. TURN LANE-NB/SB; RT. TURN LANE-EB-SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.510	140	1	49	15	Avail. Stor.=100
	EB	T	642	AM	2%	0.430	140	2	363	111	Avail. Stor.=400
	EB	R	48	AM	1%	0.660	140	1	32	10	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.510	140	1	49	15	Avail. Stor.=115
	WB	T	429	AM	2%	0.430	140	1	485	148	Avail. Stor.=600
	WB	TR	430	AM	1%	0.430	140	1	481	147	Avail. Stor.=600
Keaton Place	NB	L	43	AM	1%	0.200	140	1	68	21	Avail. Stor.=175
	NB	T		AM			140	0			
	NB	TR	11	AM	1%	0.200	140	1	17	5	Avail. Stor.=400
Auto Row Drive	SB	L	9	AM	1%	0.190	140	1	14	4	Avail. Stor.=60
	SB	T		AM			140	0			
	SB	TR	10	AM	1%	0.190	140	1	16	5	Avail. Stor.=115

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	1040	PM	2%	0.650	140	2	361	110	Avail. Stor.=400
	EB	R	113	PM	1%	0.650	140	1	78	24	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L	146	PM	1%	0.110	140	1	255	78	Avail. Stor.=175
	NB	T		PM			140	0			
	NB	TR	64	PM	1%	0.110	140	1	112	34	Avail. Stor.=400
Auto Row Drive	SB	L	16	PM	1%	0.060	140	1	30	9	Avail. Stor.=60
	SB	T		PM			140	0			
	SB	TR	61	PM	1%	0.060	140	1	113	34	Avail. Stor.=115

NO GEOMETRIC IMPROVEMENTS-NO SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.550	140	1	45	14	Avail. Stor.=100
	EB	T	345	AM	2%	0.460	140	1	369	113	Avail. Stor.=400
	EB	TR	345	AM	1%	0.460	140	1	366	112	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.550	140	1	45	14	Avail. Stor.=115
	WB	T	429	AM	2%	0.460	140	1	459	140	Avail. Stor.=600
	WB	TR	430	AM	1%	0.460	140	1	456	139	Avail. Stor.=600
Keaton Place	NB	L		AM			140	0			
	NB	LTR	54	AM	1%	0.390	140	1	65	20	Avail. Stor.=400
	NB	R		AM			140	0			
Auto Row Drive	SB	L		AM			140	0			
	SB	LTR	19	AM	1%	0.390	140	1	23	7	Avail Stor.=115
	SB	R		AM			140	0			

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	576	PM	2%	0.650	140	1	400	122	Avail. Stor.=400
	EB	TR	577	PM	1%	0.650	140	1	397	121	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L		PM			140	0			
	NB	LTR	210	PM	1%	0.210	140	1	326	99	Avail. Stor.=400
	NB	R		PM			140	0			
Auto Row Drive	SB	L		PM			140	0			
	SB	LTR	77	PM	1%	0.210	140	1	119	36	Avail Stor.=115
	SB	R		PM			140	0			

NO GEOMETRIC IMPROVEMENTS-SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: B) GENERAL ELECT. RD. and (NB) KEATON PLACE

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	51	AM	1%	0.490	140	1	51	16	Avail. Stor.=100
	EB	T	345	AM	2%	0.410	140	1	404	123	Avail. Stor.=400
	EB	TR	345	AM	1%	0.410	140	1	400	122	Avail. Stor.=400
General Electric Rd.	WB	L	51	AM	1%	0.490	140	1	51	16	Avail. Stor.=115
	WB	T	429	AM	2%	0.410	140	1	502	153	Avail. Stor.=600
	WB	TR	430	AM	1%	0.410	140	1	498	152	Avail. Stor.=600
Keaton Place	NB	L		AM			140	0			
	NB	LTR	54	AM	1%	0.210	140	1	84	26	Avail. Stor.=400
	NB	R		AM			140	0			
Auto Row Drive	SB	L		AM			140	0			
	SB	LTR	19	AM	1%	0.190	140	1	30	9	Avail Stor.=115
	SB	R		AM			140	0			

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
General Electric Rd.	EB	L	67	PM	1%	0.730	140	1	36	11	Avail. Stor.=100
	EB	T	576	PM	2%	0.650	140	1	400	122	Avail. Stor.=400
	EB	TR	577	PM	1%	0.650	140	1	397	121	Avail. Stor.=400
General Electric Rd.	WB	L	59	PM	1%	0.730	140	1	31	10	Avail. Stor.=115
	WB	T	376	PM	2%	0.650	140	1	261	80	Avail. Stor.=600
	WB	TR	377	PM	1%	0.650	140	1	259	79	Avail. Stor.=600
Keaton Place	NB	L		PM			140	0			
	NB	LTR	210	PM	1%	0.110	140	1	367	112	Avail. Stor.=400
	NB	R		PM			140	0			
Auto Row Drive	SB	L		PM			140	0			
	SB	LTR	77	PM	1%	0.060	140	1	142	43	Avail Stor.=115
	SB	R		PM			140	0			

LEFT TURN LANES-ALL APPROACHES

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

Calculated Storage Length = $\frac{(DHV)(1 + \%\ of\ trucks)(2 * 25)(1 - G/C)}{(3600/cycle\ length)(no.\ of\ lanes)}$

Date:

Location: (EB) ARROWHEAD DR. and (NB) HERSHEY ROAD

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L	40	AM	1%	0.390	70	1	24	7	Avail. Stor.=115
	EB	T		AM			70	0			
	EB	TR	52	AM	1%	0.210	70	1	40	12	Avail. Stor.=240
Arrowhead Drive	WB	L	134	AM	1%	0.390	70	1	80	24	Avail. Stor.=80
	WB	T		AM			70	0			
	WB	TR	67	AM	1%	0.210	70	1	52	16	Avail. Stor.=120
Hershey Road	NB	L	30	AM	1%	0.500	70	1	15	4	Avail. Stor.=115
	NB	T	146	AM	2%	0.330	70	1	97	30	Avail. Stor.=500
	NB	TR	146	AM	2%	0.330	70	1	97	30	Avail. Stor.=500
Hershey Road	SB	L	30	AM	1%	0.500	70	1	15	4	Avail. Stor.=115
	SB	T	399	AM	2%	0.330	70	1	265	81	Avail. Stor.=500
	SB	TR	399	AM	2%	0.330	70	1	265	81	Avail. Stor.=500

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L	84	PM	1%	0.330	70	1	55	17	Avail. Stor.=115
	EB	T		PM			70	0			
	EB	TR	58	PM	1%	0.160	70	1	48	15	Avail. Stor.=240
Arrowhead Drive	WB	L	49	PM	1%	0.330	70	1	32	10	Avail. Stor.=80
	WB	T		PM			70	0			
	WB	TR	64	PM	1%	0.160	70	1	53	16	Avail. Stor.=120
Hershey Road	NB	L	31	PM	1%	0.560	70	1	13	4	Avail. Stor.=115
	NB	T	560	PM	2%	0.390	70	1	339	103	Avail. Stor.=500
	NB	TR	561	PM	2%	0.390	70	1	339	103	Avail. Stor.=500
Hershey Road	SB	L	74	PM	1%	0.560	70	1	32	10	Avail. Stor.=115
	SB	T	364	PM	2%	0.390	70	1	220	67	Avail. Stor.=500
	SB	TR	364	PM	2%	0.390	70	1	220	67	Avail. Stor.=500

LT. TURN LANES-NB/SB

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (EB) ARROWHEAD DR. and (NB) HERSHEY ROAD

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L		AM			70	0			
	EB	LTR	92	AM	1%	0.140	70	1	78	24	Avail. Stor.=240
	EB	R		AM			70	0			
Arrowhead Drive	WB	L		AM			70	0			
	WB	LTR	201	AM	1%	0.200	70	1	158	48	Avail. Stor.=120
	WB	R		AM			70	0			
Hershey Road	NB	L	30	AM	1%	0.460	70	1	16	5	Avail. Stor.=115
	NB	T	146	AM	2%	0.290	70	1	103	31	Avail. Stor.=500
	NB	TR	146	AM	2%	0.290	70	1	103	31	Avail. Stor.=500
Hershey Road	SB	L	30	AM	1%	0.460	70	1	16	5	Avail. Stor.=115
	SB	T	399	AM	2%	0.290	70	1	281	86	Avail. Stor.=500
	SB	TR	399	AM	2%	0.290	70	1	281	86	Avail. Stor.=500

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L		PM			70	0			
	EB	LTR	142	PM	1%	0.140	70	1	120	37	Avail. Stor.=240
	EB	R		PM			70	0			
Arrowhead Drive	WB	L		PM			70	0			
	WB	LTR	113	PM	1%	0.130	70	1	97	29	Avail. Stor.=120
	WB	R		PM			70	0			
Hershey Road	NB	L	31	PM	1%	0.530	70	1	14	4	Avail. Stor.=115
	NB	T	560	PM	2%	0.360	70	1	355	108	Avail. Stor.=500
	NB	TR	561	PM	2%	0.360	70	1	356	109	Avail. Stor.=500
Hershey Road	SB	L	74	PM	1%	0.530	70	1	34	10	Avail. Stor.=115
	SB	T	364	PM	2%	0.360	70	1	231	70	Avail. Stor.=500
	SB	TR	364	PM	2%	0.360	70	1	231	70	Avail. Stor.=500

NO GEOMETRIC IMPROVEMENTS-SPLIT PHASE

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (EB) ARROWHEAD DR. and (NB) HERSHEY ROAD

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L		AM			70	0			
	EB	LTR	92	AM	1%	0.110	70	1	80	25	Avail. Stor.=240
	EB	R		AM			70	0			
Arrowhead Drive	WB	L		AM			70	0			
	WB	LTR	201	AM	1%	0.190	70	1	160	49	Avail. Ator.=120
	WB	R		AM			70	0			
Hershey Road	NB	LT	161	AM	2%	0.130	70	1	139	42	Avail. Stor.=500
	NB	T		AM			70	0			
	NB	TR	161	AM	2%	0.130	70	1	139	42	Avail. Stor.=500
Hershey Road	SB	LT	414	AM	2%	0.290	70	1	291	89	Avail. Stor.=500
	SB	T		AM			70	0			
	SB	TR	414	AM	2%	0.290	70	1	291	89	Avail. Stor.=500

XX = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L		PM			70	0			
	EB	LTR	142	PM	1%	0.110	70	1	124	38	Avail. Stor.=240
	EB	R		PM			70	0			
Arrowhead Drive	WB	L		PM			70	0			
	WB	LTR	113	PM	1%	0.110	70	1	99	30	Avail. Ator.=120
	WB	R		PM			70	0			
Hershey Road	NB	LT	576	PM	2%	0.290	70	1	406	124	Avail. Stor.=500
	NB	T		PM			70	0			
	NB	TR	576	PM	2%	0.290	70	1	406	124	Avail. Stor.=500
Hershey Road	SB	LT	401	PM	2%	0.200	70	1	318	97	Avail. Stor.=500
	SB	T		PM			70	0			
	SB	TR	401	PM	2%	0.200	70	1	318	97	Avail. Stor.=500

LEFT TURN LANES-ALL APPROACHES (SCHOOL PEAKS)

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (EB) ARROWHEAD DR. and (NB) HERSHEY ROAD

AM School Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L	64	AM	1%	0.450	120	1	59	18	Avail. Stor.=115
	EB	T		AM			120	0			
	EB	TR	65	AM	1%	0.350	120	1	71	22	Avail. Stor.=240
Arrowhead Drive	WB	L	62	AM	1%	0.450	120	1	57	18	Avail. Stor.=80
	WB	T		AM			120	0			
	WB	TR	47	AM	1%	0.350	120	1	51	16	Avail. Stor.=120
Hershey Road	NB	L	39	AM	1%	0.480	120	1	34	10	Avail. Stor.=115
	NB	T	164	AM	2%	0.380	120	1	173	53	Avail. Stor.=500
	NB	TR	164	AM	2%	0.380	120	1	173	53	Avail. Stor.=500
Hershey Road	SB	L	37	AM	1%	0.480	120	1	32	10	Avail. Stor.=115
	SB	T	310	AM	2%	0.380	120	1	327	100	Avail. Stor.=500
	SB	TR	311	AM	2%	0.380	120	1	328	100	Avail. Stor.=500

xx = Larger value

PM School Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Arrowhead Drive	EB	L	84	PM	1%	0.460	120	1	76	23	Avail. Stor.=115
	EB	T		PM			120	0			
	EB	TR	58	PM	1%	0.360	120	1	62	19	Avail. Stor.=240
Arrowhead Drive	WB	L	28	PM	1%	0.460	120	1	25	8	Avail. Stor.=80
	WB	T		PM			120	0			
	WB	TR	34	PM	1%	0.360	120	1	37	11	Avail. Stor.=120
Hershey Road	NB	L	45	PM	1%	0.470	120	1	40	12	Avail. Stor.=115
	NB	T	281	PM	2%	0.380	120	1	296	90	Avail. Stor.=500
	NB	TR	282	PM	2%	0.380	120	1	297	91	Avail. Stor.=500
Hershey Road	SB	L	58	PM	1%	0.470	120	1	52	16	Avail. Stor.=115
	SB	T	283	PM	2%	0.380	120	1	298	91	Avail. Stor.=500
	SB	TR	283	PM	2%	0.380	120	1	298	91	Avail. Stor.=500

LEFT TURN LANES-ALL APPROACHES

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (EB) CLEARWATER AVE. and (NB) HERSHEY ROAD

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Clearwater Avenue	EB	L	36	AM	1%	0.400	70	1	21	6	Avail. Stor.=115
	EB	T		AM			70	0			
	EB	TR	133	AM	1%	0.230	70	1	101	31	Avail. Stor.=250
Clearwater Avenue	WB	L	103	AM	1%	0.400	70	1	61	19	Avail. Stor.=115
	WB	T		AM			70	0			
	WB	TR	164	AM	1%	0.230	70	1	124	38	Avail Stor.=375
Hershey Road	NB	L	86	AM	1%	0.490	70	1	43	13	Avail. Stor.=115
	NB	T	188	AM	2%	0.310	70	1	129	39	Avail. Stor.=500
	NB	TR	188	AM	2%	0.310	70	1	129	39	Avail. Stor.=500
Hershey Road	SB	L	31	AM	1%	0.490	70	1	16	5	Avail. Stor.=115
	SB	T	298	AM	2%	0.310	70	1	204	62	Avail. Stor.=500
	SB	TR	299	AM	2%	0.310	70	1	205	62	Avail. Stor.=500

XX = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Clearwater Avenue	EB	L	39	PM	1%	0.390	70	1	23	7	Avail. Stor.=115
	EB	T		PM			70	0			
	EB	TR	200	PM	1%	0.230	70	1	151	46	Avail. Stor.=250
Clearwater Avenue	WB	L	61	PM	1%	0.390	70	1	37	11	Avail. Stor.=115
	WB	T		PM			70	0			
	WB	TR	133	PM	1%	0.230	70	1	101	31	Avail Stor.-375
Hershey Road	NB	L	202	PM	1%	0.490	70	1	101	31	Avail. Stor.=115
	NB	T	408	PM	2%	0.320	70	1	275	84	Avail. Stor.=500
	NB	TR	409	PM	2%	0.320	70	1	276	84	Avail. Stor.=500
Hershey Road	SB	L	49	PM	1%	0.490	70	1	25	7	Avail. Stor.=115
	SB	T	334	PM	2%	0.320	70	1	225	69	Avail. Stor.=500
	SB	TR	335	PM	2%	0.320	70	1	226	69	Avail. Stor.=500

LT. TURN LANES-NB/SB

D - DISTANCE WORKSHEET

NOTE: All distances based on the equation:

$$\text{Calculated Storage Length} = \frac{(\text{DHV})(1 + \%\text{ of trucks})(2 * 25)(1 - \text{G/C})}{(3600/\text{cycle length})(\text{no. of lanes})}$$

Date:

Location: (EB) CLEARWATER AVE. and (NB) HERSHEY ROAD

AM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Clearwater Avenue	EB	L		AM			70	0			
	EB	LTR	169	AM	1%	0.170	70	1	138	42	Avail. Stor.-250
	EB	R		AM			70	0			
Clearwater Avenue	WB	L		AM			70	0			
	WB	LTR	267	AM	1%	0.210	70	1	207	63	Avail. Stor.=375
	WB	R		AM			70	0			
Hershey Road	NB	L	86	AM	1%	0.410	70	1	50	15	Avail. Stor.=115
	NB	T	188	AM	2%	0.240	70	1	142	43	Avail. Stor.=500
	NB	TR	188	AM	2%	0.240	70	1	142	43	Avail. Stor.=500
Hershey Road	SB	L	31	AM	1%	0.410	70	1	18	5	Avail. Stor.=115
	SB	T	298	AM	2%	0.240	70	1	225	68	Avail. Stor.=500
	SB	TR	299	AM	2%	0.240	70	1	225	69	Avail. Stor.=500

xx = Larger value

PM Peak Hour

Approach	Dir.	Mvt. Dir.	Max. DHV	Time Period	% Trucks	G/C	Cycle Length	No. of Lanes	D - Distance (Feet)	D - Distance (Meters)	Remarks
Clearwater Avenue	EB	L		PM			70	0			
	EB	LTR	239	PM	1%	0.190	70	1	190	58	Avail. Stor.-250
	EB	R		PM			70	0			
Clearwater Avenue	WB	L		PM			70	0			
	WB	LTR	194	PM	1%	0.160	70	1	160	49	Avail. Stor.=375
	WB	R		PM			70	0			
Hershey Road	NB	L	202	PM	1%	0.460	70	1	107	33	Avail. Stor.=115
	NB	T	408	PM	2%	0.290	70	1	287	88	Avail. Stor.=500
	NB	TR	409	PM	2%	0.290	70	1	288	88	Avail. Stor.=500
Hershey Road	SB	L	49	PM	1%	0.460	70	1	26	8	Avail. Stor.=115
	SB	T	334	PM	2%	0.290	70	1	235	72	Avail. Stor.=500
	SB	TR	335	PM	2%	0.290	70	1	236	72	Avail. Stor.=500