APPENDIX D

TRAFFIC ANALYSIS – 2031 PLANNING HORIZON & 2021 INTERIM YEAR

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TO: Rob Hunton
FROM: Ian Borsuk
DATE: August 5, 2010
OUR FILE: 7499 West Transitway (Bayshore to Moodie)
SUBJECT: Traffic Analysis – 2031 Planning Horizon & 2021 Interim Year

Table of Contents

1.0 Introduction

The purpose of this memo is to document the forecasted traffic conditions for the proposed West Transitway extension from Bayshore Station to Moodie Drive. The analysis considers the signalized traffic intersections on Holly Acres road and Moodie Drive at the end of the 2031 planning horizon as well as at the 2021 interim year.

Existing traffic and transit conditions have been documented previously in a MEMO titled "West Transitway Existing Transit and Transportation Review" dated February 18, 2010.

2.0 Study Area

The study area for this project includes Highway 417 (Eagleson Road to Holly Acres Road), the 417/416 interchange, Holly Acres Road, and Moodie Drive. The study area is located within the Greenbelt and consequently limits the future development adjacent to the facility. Any increase in traffic travelling through the study area is therefore due to development on either side of the Greenbelt. It should be noted that the employment levels at the Nortel Campus have fluctuated in recent years influencing the traffic volume data within the study area.

3.0 Traffic and Transit Growth

Traffic and transit planning within the National Capital Region is currently being forecasted for the year 2031 as well as the interim year 2021. TRANS, a joint transportation planning committee serving the National Capital Region in order to coordinate efforts between major transportation planning agencies, has provided information regarding forecasted traffic and transit growth. For more information about TRANS please visit: http://www.ncr-trans-rcn.ca/.

This study, which is based on the provided TRANS model growth rates, considers the land use and demographic assumptions that were included in the 2008 Ottawa Official Plan (OP) and Transportation Master Plan (TMP). The OP and TMP undergo an update every 5 years considering revisions to land use and demographic projections. Future traffic studies may therefore include adjusted growth rates and traffic projections.

As described in the "West Transitway Existing Transit and Transportation Review" dated February 18, 2010, existing traffic flow data was organized for the two major corridors for typical peak-hour vehicular traffic movements at intersections. The most recent available traffic counts were reviewed as well as historic traffic data collected over the past 5 years. The growth rates provided by TRANS were applied to the existing traffic volumes to estimate the future volumes for 2031 and 2021. The traffic flows within each corridor were then normalized and balanced in order to determine the forecasted intersection Level of Service.

While the information provided by TRANS may show a decrease in traffic volumes for particular intersection approaches, this analysis will be conservative and will not consider reduction in traffic volumes.

4.0 Forecasted Transit Demand

Transit volumes were forecasted for the 2031 planning horizon and the 2021 interim year using the information provided by TRANS and confirmed through discussions with OC Transpo.

From the TRANS traffic model, the following growth in transit has been forecasted for the West Transitway corridor between Holly Acres and Moodie Drive.

Table 1 – Transit Passenger Volumes 2006, 2021, 2031 (from TRANS)

Year	AM Peak Hour Eastbound	PM Peak Hour Westbound
Existing (2006)	3,000 Passengers	2,300 Passengers
Interim (2021)	4,700 Passengers	N/A
Future (2031)	6,100 Passengers	6,800 Passengers
From 2006 to 2031 = 25 years	205% growth in transit	295% growth in transit

The existing transit volume of approximately 60 buses per AM peak hour in the peak direction accommodates approximately 3,000 passengers as shown in the existing traffic Model. This represents a passenger capacity of approximately 50 passengers per bus. Standard buses are assumed to accommodate 45 passengers, while articulated buses accommodate 70 passengers per bus. Assuming the same mix of articulated and standard buses (average passenger capacity of 50), the projected AM peak hour peak direction transit passenger volume of 6100 can be accommodate on 122 buses. If the passengers were accommodated exclusively with articulated buses then 87 buses would be required. Similarly in the PM, 136 buses/hr or 97 articulated buses/hr would be required. It is likely that a higher percentage of buses used in the future would be articulated. **This analysis considers an AM Peak Hour Transit Volume of 120 buses in the peak direction in 2031 and a PM Peak Hour Transit Volume of 130 buses.**

While many of the bus routes operate in a single direction during the peak hour, empty buses deadheading to the beginning of the route would still be travelling in the off-peak direction. The analysis therefore considers a worst case scenario, with the same peak hour transit volumes in both directions.

Transit service would also operate on the Transitway during the midday. Express routes are not in operation during this time period but Transitway buses would operate with frequent service. The analysis considers headways of 2 minute on the Transitway during the midday in 2031. Evening service would also operate with 2-minute between buses but night service would be at 5-minute headways.

Table 2 – 2031 Transit Frequency

Time Period		Headway	Frequency	# of Buses
AM Peak	6:30 – 9:00	30 sec	120 buses / hr	300
Midday	9:00 – 3:30	2 min	30 buses / hr	195
PM Peak	3:30 – 6:30	30 sec	130 buses / hr	390
Evening	6:30 – 9:00	2 min	30 buses / hr	75
Night	9:00 – 2:00	5 min	12 buses / hr	60
Total buses per direction				1,020

There would therefore be an estimated total of approximately 2,000 buses travelling on this section of Transitway throughout the day including deadheading buses in 2031.

The interim 2021 transit volumes were also determined for the AM peak period using the information provided by TRANS. Information for the PM is not available for the interim 2021 year and was not provided by TRANS. **The analysis considers a Peak Hour Transit Volume of 90 buses/hr eastbound in the AM and 95 buses/hr westbound in the PM in 2021.**

5.0 Forecasted Traffic Demand

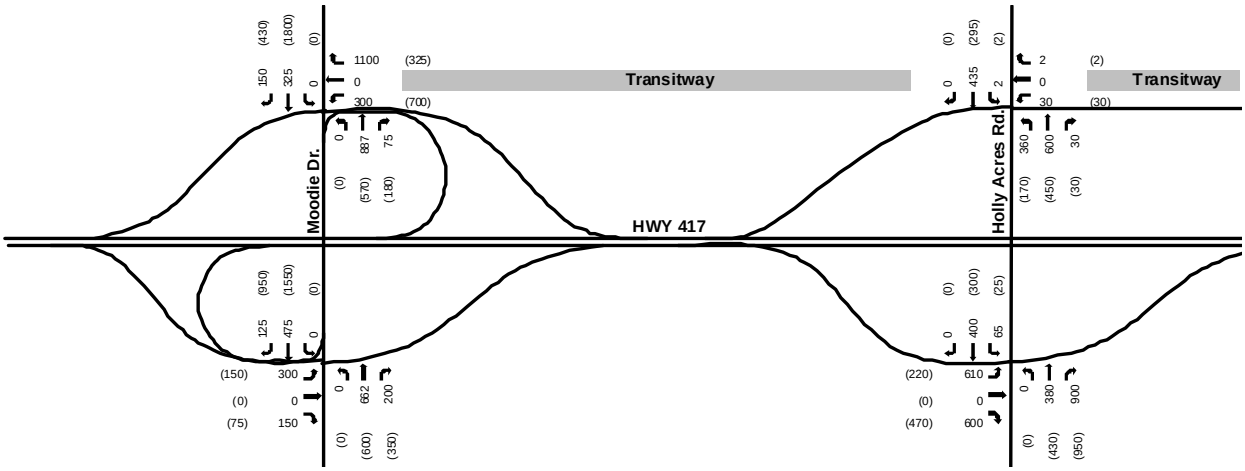
The TRANS transportation demand model was used to forecast future traffic Volumes at Holly Acres Road and at Moodie Drive for the 2031 planning horizon and 2021 interim year. The growth in traffic volumes for major roadways is identified and used to analyze the impacts to the roadway network.

The traffic volume considered for vehicles exiting Highway 417 at Moodie drive for northbound Moodie Drive during the AM peak hour is 1100 vehicles. This corresponds to the traffic volume when the Nortel Facility was fully operational. Traffic counts conducted recently at this location show a volume of approximately 600 vehicles per hour due to the reduction of employment at the Nortel facility.

The forecasted traffic volumes as presented in the figure below are used to assess the traffic and transit impacts for various interchange configurations in 2031. The figure does not present the Transitway vehicle volumes. The transit routings and vehicle volumes are considered for each alternative intersection configuration. Note that the analysis considers the relocated eastbound Highway 417 on-ramp from Richmond road to Holly Acres road.

A jersey barrier is included on Highway 417 westbound to restrict the weave of vehicles from northbound highway 416 trying to exit at Moodie Drive. The result is vehicles being required to exit highway 416 at Holly Acres Road, to travel Northbound on Holly Acres under Highway 417, and enter Highway 417 westbound using the existing highway on-ramp. The forecasted traffic volumes for the AM peak Hour include 360 vehicles/hr turning left from Northbound Holly Acres onto the Highway 417 WB on-ramp.

Figure 1 – Forecasted 2031 AM (PM) Peak Hour Traffic Only Volumes



6.0 Alternative Intersection Configurations

It is proposed for the West Transitway extension project, that the Transitway be aligned on the north side of Highway 417. A variety of configurations were considered for the intersections of the Transitway with Holly Acres Road and with Moodie Drive. Each configuration is presented in Appendix A.

6.1. Holly Acres Road

- At Grade
    - Buses travel in both directions across the Holly Acres intersection north of Highway 417
- Grade Separated
    - Buses are separated from mixed traffic at Holly Acres North of Highway 417

6.2. Moodie Drive

- At Grade
    - Eastbound buses exit the highway at and travel northbound on Moodie Drive. The buses cross the westbound Highway 417 on and off-ramp intersections before turning right into the Transitway Station.
    - Westbound buses travel on the planned Transitway between Holly Acres and Moodie Drive. The existing highway off-ramp intersection with Moodie Drive is to be reconfigured to accommodate an additional westbound Transitway approach. The signal timings must be revised to include the additional transit signal phase.
- Partially Grade-Separated
    - Eastbound buses exit the highway at and travel northbound on Moodie Drive. The buses cross the channelized westbound Highway 417 on-ramp before turning right to access the Transitway Station. The buses do not cross the westbound Highway 417 off-ramp as is required with the at-grade intersection configuration.
    - Westbound buses are grade separated with Moodie Drive. They travel on the Transitway between Holly Acres Road and Moodie Drive, cross under Moodie Drive before continuing west on the existing highway shoulder transit lanes.
- Fully Grade Separated
    - Eastbound buses use a flyover structure west of Moodie Drive to travel from the transit lanes on the south side of the Highway to the planned Transitway on the north side.
    - Westbound buses travel on the Transitway between Holly Acres Road and Moodie Drive, cross under Moodie Drive before continuing west on the existing highway shoulder transit lanes.

7.0 Analysis of Traffic and Transit Impacts

Level of service (LOS) is a measure used in the transportation field to describe the performance of an intersection under specific traffic conditions. A grade of A to F is used depending on how the intersection serves traffic demands. An LOS of A is used when traffic is accommodated with little delays to the road user as the traffic volume is considerable less than the capacity of the intersection, while F is used when the volume-to-capacity (V/C) ratio is higher than 1.0 or there is not sufficient capacity to meet demands during a certain period of time. Intersection LOS are defined specifically based on the City of Ottawa Traffic Impact Assessment guidelines as outlined in the table below based on the measure of traffic volume and capacity.

Table 3 – Description of Intersection Levels of Service

LOS	Volume to Capacity Ratio	General Description of Traffic Condition
A	0 to 0.60	Majority of vehicles arrive during the green phase, with only a few having to stop at the intersection.
B	0.61 to 0.70	Greater number of vehicles stopped at the intersection than for LOS A, but progression is still good.
C	0.71 to 0.80	Many vehicles progress through the intersection without having to stop, but a significant number must stop. Greater delay could be from vehicles arriving during red phase or long cycle lengths.
D	0.81 to 0.90	More vehicles are stopped at the intersection resulting in greater delays. This could be the result of high volume-to-capacity ratios, long cycle lengths or poor progression.
E	0.91 to 1.00	Individual cycles frequently fail to service the demand that has arrived, generally the result of high volume-to-capacity ratios, long cycle lengths and poor progression.
F	> 1.00	Traffic flow surpasses the capacity of the intersection (i.e. the volume-to-capacity ratio is greater than 1). This could be the result of long cycle lengths or poor progression. In this case, numerous individual cycles are failing.

As previously described, balanced corridor volumes were established for the study area intersections for each alternative configuration. The study area road network elements were analyzed using Synchro™ traffic analysis software, Version 7, to measure the LOS for intersections.

The analysis is based on signal timings that have been optimized to balance delays in all directions. It may be possible to further adjust the signal timings to favour critical movements such as the transit approaches, but it would result in further delays for other critical approaches.

7.1. Holly Acres (2031 Planning Horizon)

The following two tables present the results considering an at-grade and grade separated crossing of the Transitway at Holly Acres Road in 2031.

Table 4 – Forecasted 2031 AM (PM) peak hour Traffic at Holly Acres Road – At Grade

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay - seconds	V/C	LOS (City of Ottawa)	Volume	Delay - seconds	V/C	LOS (City of Ottawa)
Holly Acres Road & Highway 417N / Transitway								
NBL	360	3.2	0.50	A	170	3.2	0.21	A
NBT	600	22.7	0.83	D	450	25.6	0.79	C
SBT	435	19.4	0.61	B	295	23.7	0.53	A
WB-TWAY	**120**	**22.8**	**0.41**	**A**	**130**	**17.0**	**0.36**	**A**
EB-TWAY	**120**	**39.5**	**0.57**	**A**	**130**	**29.4**	**0.46**	**A**
Holly Acres Road & Highway 417S								
NBT	380	15.9	0.31	A	430	6.7	0.23	A
SBT	400	3.8	0.32	A	300	0.3	0.16	A
EBL	610	35.1	0.89	D	220	37.5	0.66	B
EBR	600	19.2	0.80	C	470	9.5	0.72	C

The at-grade crossing of the Transitway with Holly Acres road operates with satisfactory LOS when considering the forecasted 2031 traffic and transit volumes. All of the approaches operate with LOS D or better for both the AM and PM peak periods. The Highway 417/416 off ramp intersection with Holly acres road operates well in 2031 considering that the buses have now been removed from this intersection and relocated to the Transitway north of the Highway 417.

Table 5 – Forecasted 2031 AM (PM) peak hour Traffic at Holly Acres Road – Grade Separated

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay - seconds	V/C	LOS (City of Ottawa)	Volume	Delay - seconds	V/C	LOS (City of Ottawa)
Holly Acres Road & Highway 417N / Transitway								
NBL	360	3.6	0.47	A	170	1.9	0.20	A
NBT	600	2.4	0.42	A	450	2.4	0.32	A
SBT	435	9.3	0.42	A	295	6.4	0.25	A
WB-TWAY	**30**	**28.1**	**0.30**	**A**	30	47.6	0.39	A
Holly Acres Road & Highway 417S								
NBT	380	14.4	0.33	A	430	6.4	0.22	A
SBT	400	10.3	0.35	A	300	2.7	0.15	A
EBL	610	32.2	0.89	D	220	43.4	0.69	B
EBR	600	19.5	0.81	D	470	8.0	0.70	B

The grade separated crossing of the Transitway with Holly Acres Road results in better traffic operations than the at-grade alternative. The 30 buses per hour turning left from the Westbound Transitway onto Holly Acres Road do not require much greentime, therefore the northbound/southbound traffic movements operate with improved flow. The Highway 417/416 off ramp intersection with Holly Acres Road is not significantly impacted when considering at-grade versus grade separated alternatives.

7.2. Moodie Drive (2031 Planning Horizon)

This section presents the results from the Synchro analysis considering an at-grade, partially separated and grade separated crossing of the Transitway at Moodie Drive in 2031.

Table 6 – Forecasted 2031 AM (PM) peak hour Traffic at Moodie Drive – At Grade

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417N								
NBT: EB-TWAY	992	60.6	1.00	E	702	18.9	0.36	A
SBT	365	38.7	0.48	A	1800	119.8	1.2	F
WBL	300	20.3	0.23	A	700	163.8	1.25	F
WBR	1100	72.6	1.05	F	325	53.2	0.71	C
WB-TWAY	**120**	**167.5**	**1.14**	**F**	**130**	**213.6**	**1.28**	**F**
Moodie Drive & Highway 417S								
NBT	662	8.6	0.31	A	612	5.4	0.26	A
SBT	552	9.7	0.27	A	1562	0.9	0.70	B
EBL: EB-TWAY	**405**	**53.0**	**0.77**	**C**	**270**	**58.8**	**0.72**	**C**

The at-grade intersection configuration of the Transitway with Moodie Drive cannot accommodate the forecasted traffic and transit volumes for the year 2031. The existing free-flow westbound to northbound highway off-ramp becomes signalized because of the conflicting westbound Transitway approach. Right turns on red would also be prohibited for this critical movement in the AM. The other critical approaches that compete for available greentime are the northbound and westbound Transitway approaches which both are at a V/C of greater than 1 indicating there is not enough capacity to accommodate the traffic. Considering that these approaches are for Transitway buses, a LOS of E of F would not be acceptable. While additional greentime can be allocated to these particular approaches, it would impact the queues on the highway off-ramp. In the PM, the critical movements are the southbound traffic on Moodie. The other approaches that competes for greentime is the highway off-ramp left turn and the Transitway approach. All three critical approaches fail in the PM therefore no additional greentime can be allocated to an approach without significantly impacting the remaining approaches.

The eastbound Highway 417 off ramp intersection with Moodie Drive operates with adequate LOS in 2031. Eastbound Transitway buses exit the highway and turn left onto Northbound Moodie Drive. This approach operates with LOS C and results in an average delay of less than 30 seconds per vehicle. While this intersection can accommodate the forecasted traffic, queues from the failing upstream intersection may impact its operation.

Table 7 – Forecasted 2031 AM (PM) peak hour Traffic at Moodie Drive – Partially Grade-Separated

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417N								
NBT	877	7.5	0.49	A	570	6.8	0.30	A
NBR: EB-TWAY	**115**	**3.5**	**0.26**	**A**	132	1.4	0.28	A
SBT	377	5.9	0.22	A	1812	24.0	0.97	E
WBL	300	24.3	0.54	A	700	63.8	0.95	E
WBR	1100	7.0	0.85	D	325	0.4	0.25	A

Table 8 continued

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417S								
NBT	662	9.4	0.39	A	612	6.1	0.27	A
SBT	552	4.5	0.34	A	1562	7.1	0.67	B
EBL: EB-TWAY	**405**	**24.2**	**0.65**	**B**	270	59.1	0.75	C

For the partially grade separated configuration, the westbound Transitway buses are grade separated with Moodie drive, eliminating the additional intersection approach (and signal phase) that was required with the at-grade alternative. This allows the existing free-flow westbound to northbound highway off-ramp to be preserved. In the AM, the both highway ramp intersections operate with LOS D or better. In the PM, the critical approaches operate at LOS E, meaning that the configuration is reaching its theoretical capacity. This is due to the re-configuration of southbound vehicle lanes on Moodie Drive to better accommodate a dedicated southbound cycle lane and a segregated multi-use pathway. It is the policy for the City of Ottawa to prioritize travel modes focusing first on pedestrians and cyclists and then vehicular traffic. Additional capacity can be provided for vehicular traffic but it would be at the expense of the non-motorized modes.

The eastbound Highway 417 off ramp intersection with Moodie Drive operates with adequate LOS in 2031. Eastbound Transitway buses exit the highway and turn left onto Northbound Moodie Drive as with the at-grade alternative. This approach operates with LOS B and results in an average delay of less than 25 seconds per vehicle.

Table 9 – Forecasted 2031 AM (PM) peak hour Traffic at Moodie Drive – Fully Grade-Separated

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417N								
NBT	887	7.3	0.50	A	582	7.9	0.31	A
SBT	377	5.9	0.22	A	1812	28.0	0.99	E
WBL	300	24.3	0.54	A	700	63.8	0.95	E
WBR	1100	7.0	0.85	D	325	0.4	0.25	A
Moodie Drive & Highway 417S								
NBT	662	7.5	0.36	A	612	3.5	0.25	A
SBT	552	3.9	0.31	A	1562	4.2	0.65	B
EBL	300	22.8	0.47	A	150	54.8	0.47	A

The fully grade separated alternative operates with adequate LOS during the AM in 2031. In the PM, the critical approaches operate at LOS E, meaning that the configuration is reaching its theoretical capacity. This is due to the re-configuration of southbound vehicle lanes on Moodie Drive to better accommodate a dedicated southbound cycle lane and a segregated multi-use pathway. It is the policy for the City of Ottawa to prioritize travel modes focusing first on pedestrians, cyclists and transit and then vehicular traffic. Additional capacity can be provided for vehicular traffic but it would be at the expense of the non-motorized modes.

7.3. Moodie Drive (2021 Interim Year Analysis)

The above analysis indicated that the at-grade intersection cannot accommodate the forecasted traffic and transit volumes for the 2031 planning horizon. A subsequent analysis has therefore been undertaken to understand the implications of the at-grade intersection at an interim 2021 year. The following present the results from the Synchro analysis considering the at-grade and partially grade separated crossing of the Transitway at Moodie Drive in 2021.

Table 10 – Forecasted 2021 AM (PM) peak hour Traffic at Moodie Drive – At Grade

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417N								
NBT: EB-TWAY	**825**	**48.2**	**0.94**	**E**	**552**	**21.5**	**0.3**	**A**
SBT	320	40.5	0.48	A	1590	93.9	1.14	F
WBL	300	17.1	0.22	A	700	103	1.10	F
WBR	1100	54.1	1.00	E	325	43.6	0.63	B
WBL<T>RTWAY	**10 <90>2**	**118.6**	**0.96**	**E**	**7<90>7**	**124.3**	**0.98**	**E**
Moodie Drive & Highway 417S								
NBT	560	6.9	0.26	A	547	3.8	0.23	A
SBT	520	9.3	0.25	A	1397	0.8	0.60	A
EBL: EB-TWAY	**340**	**50.1**	**0.73**	**C**	**180**	**50.0**	**0.51**	**A**

The at-grade intersection configuration begins to reach capacity in the AM by the interim 2021 year. The additional signal phase for the Transitway approach and the elimination of the existing free-flow westbound to northbound highway ramp results in critical approaches reaching their theoretical capacity.

The two approaches that accommodate the Transitway buses operate at LOS E in the AM as well as the westbound to northbound highway off-ramp which operates at V/C = 1. Providing additional greentime for Transitway approaches causes the highway off-ramp to exceed capacity resulting in the potential for queues to backup onto the highway.

In the PM, the intersection at the Highway 417 westbound off-ramp has exceeded its capacity. The intersection configuration includes the reduction of southbound traffic lanes from 3 lanes to 2 in order to provide priority for pedestrian and cyclists. Without this reduction of traffic lanes, the intersection would be at capacity with V/C=1 for the critical approaches. Considering the reduction of southbound traffic lanes, the intersection would exceed the available capacity. The signal timings can be set in order to minimize traffic queues on the westbound Highway 417 off-ramp, resulting in additional delays for southbound traffic on Moodie Drive. With appropriate monitoring and adjustments to signal timings, the at-grade intersection configuration can be made to work until 2021. The partially separated alternative allows westbound buses to cross under Moodie Drive eliminating the need for the Transitway signal phase at the westbound 417 off-ramp. This configuration operates adequately in 2021 as presented below.

Table 11 – Forecasted 2021 AM (PM) peak hour Traffic at Moodie Drive – Partially Grade-Separated

Intersection / Turning Movement	AM peak				PM peak			
	Volume	Delay (sec)	V/C	LOS (City of Ottawa)	Volume	Delay (sec)	V/C	LOS (City of Ottawa)
Moodie Drive & Highway 417N								
NBT	730	4.2	0.41	A	457	7.7	0.25	A
NBR: EB-TWAY	**95**	**1.2**	**0.22**	**A**	**95**	**1.4**	**0.21**	**A**
SBT	330	5.9	0.19	A	1597	18.4	0.87	D
WBL	300	24.3	0.53	A	700	55.5	0.90	D
WBR	1100	7.0	0.85	D	325	0.4	0.25	A
Moodie Drive & Highway 417S								
NBT	560	8.0	0.32	A	547	4.3	0.23	A
SBT	520	7.0	0.30	A	1397	4.7	0.57	A
EBL: EB-TWAY	**340**	**24.5**	**0.60**	**A**	**180**	**60**	**0.66**	**B**

8.0 Conclusion

The implementation of an at-grade Transitway intersection at Holly Acres Road would operate for the 2031 planning horizon without negatively impacting the highway and arterial roadway traffic.

At Moodie drive, the at-grade intersection configuration does not operate satisfactorily at the end of the 2031 planning horizon. By the interim 2021 year, the intersection approaches reach a V/C of 1.0 indicating that it has reached capacity.

A partially or fully grade separated crossing of the Transitway with Moodie Drive allows for the forecast traffic volumes to be accommodated for both the 2021 and 2031 planning horizons.

Memo To: R. Hunton
Date: August 5, 2010

Appendix A – Alternative Intersection Configurations

Holly Acres

- At-Grade
- Grade-Separated

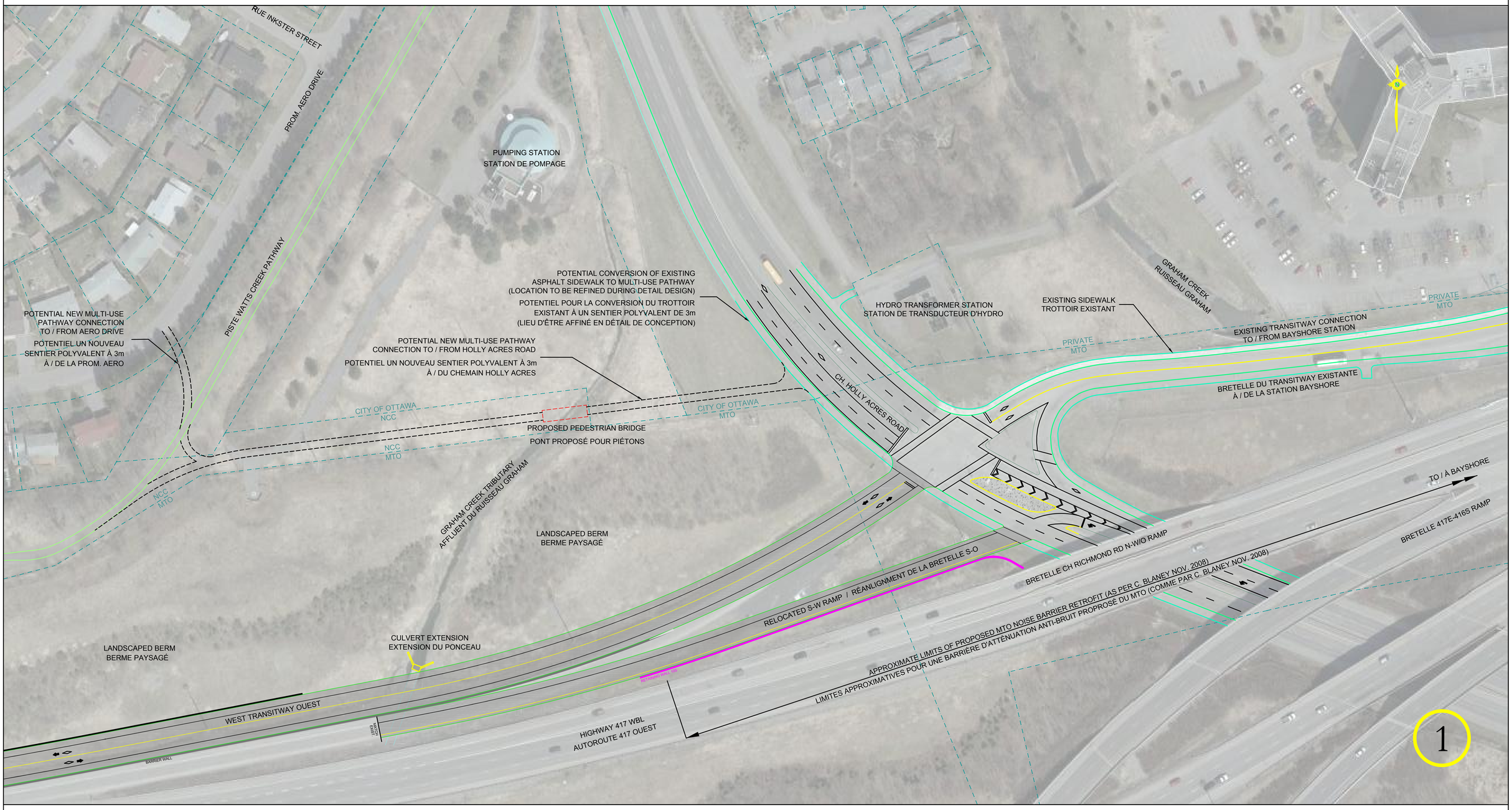
Moodie Drive

- At-Grade
- Partially Grade-Separated
- Fully Grade-Separated

WEST TRANSITWAY EXTENSION
PROLONGEMENT DU TRANSITWAY OUEST

Preliminary Design of Transitway At-Grade Intersection at Holly Acres Road
Concept préliminaire du passage à niveau du Transitway au chemain Holly Acres

BAYSHORE STATION TO MOODIE DRIVE
STATION BAYSHORE A LA PROMENADE MOODIE



23 JUNE/JUIN 2010

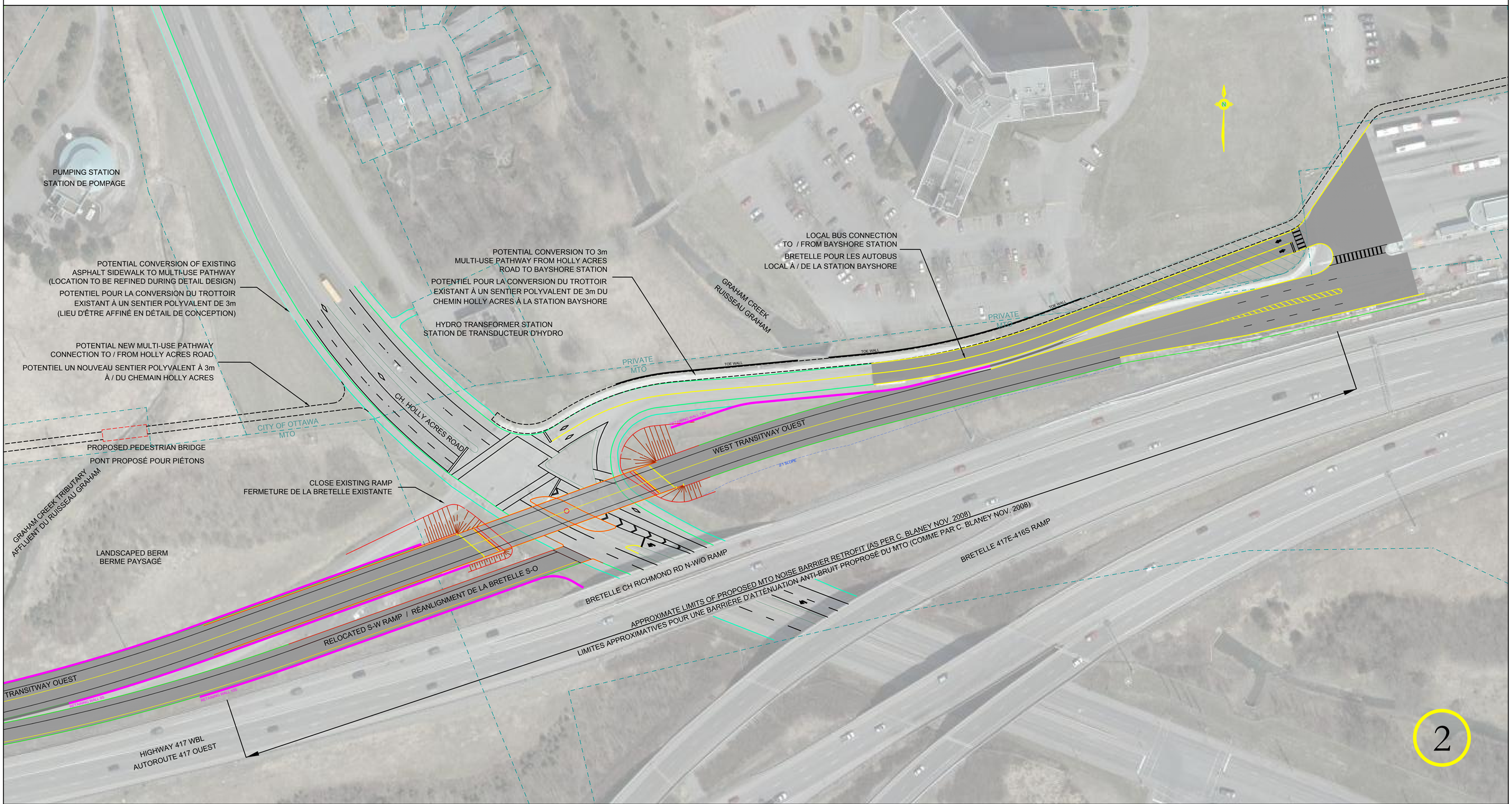
PUBLIC OPEN HOUSE #3
RÉUNION PORTES OUVERTES NO. 3

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

WEST TRANSITWAY EXTENSION
PROLONGEMENT DU TRANSITWAY OUEST

Preliminary Design of Grade-Separated Transitway at Holly Acres Road
Concept préliminaire du passage dénivelé du Transitway au chemain Holly Acres

BAYSHORE STATION TO MOODIE DRIVE
STATION BAYSHORE A LA PROMENADE MOODIE



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PUBLIC OPEN HOUSE #3
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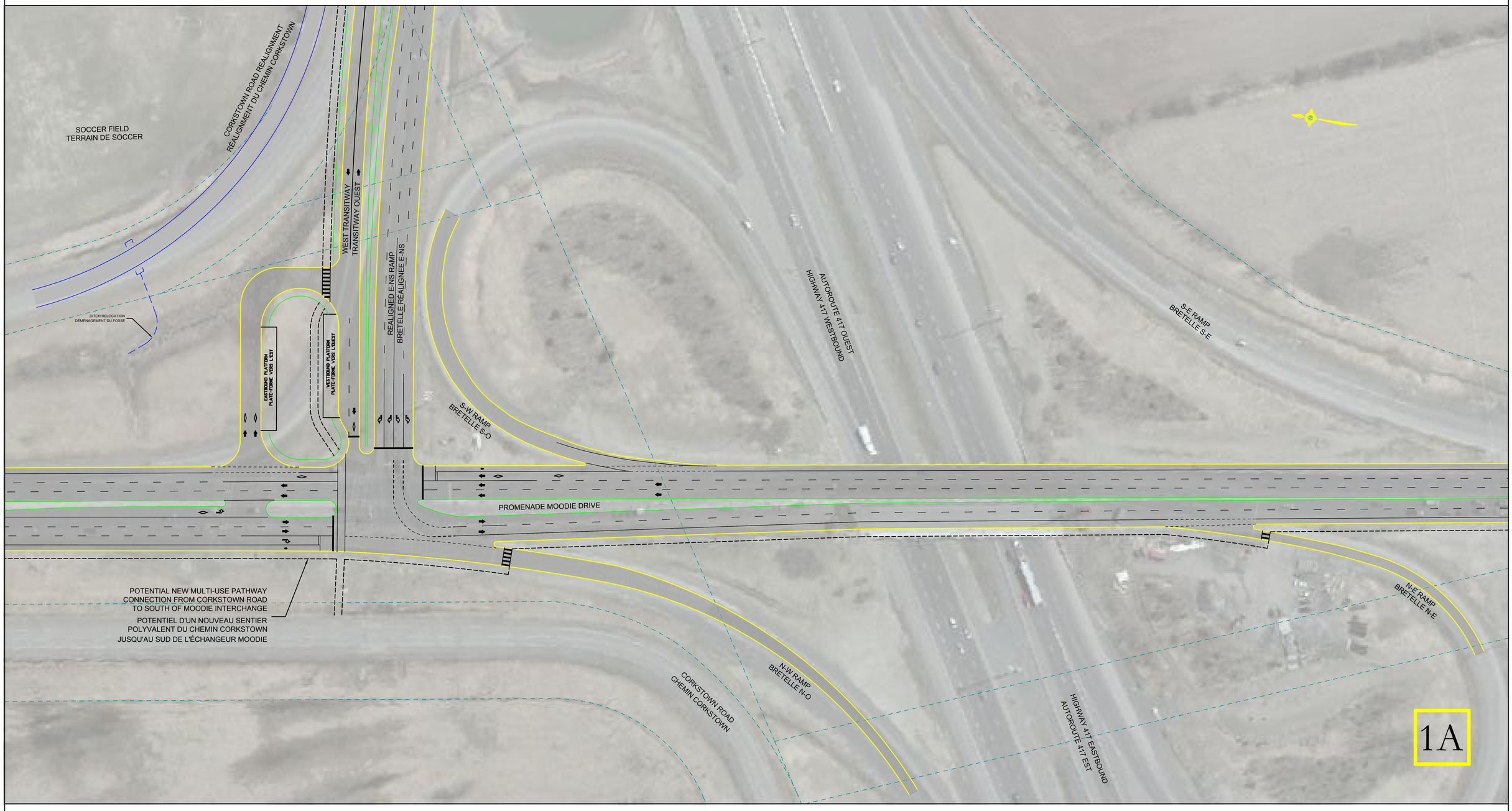
WEST TRANSITWAY EXTENSION
PROLONGEMENT DU TRANSITWAY OUEST

Preliminary Design of Transitway At-Grade Intersection at Moodie Drive
Concept préliminaire du passage à niveau du Transitway à la promenade Moodie

BAYSHORE STATION TO MOODIE DRIVE
STATION BAYSHORE A LA PROMENADE MOODIE



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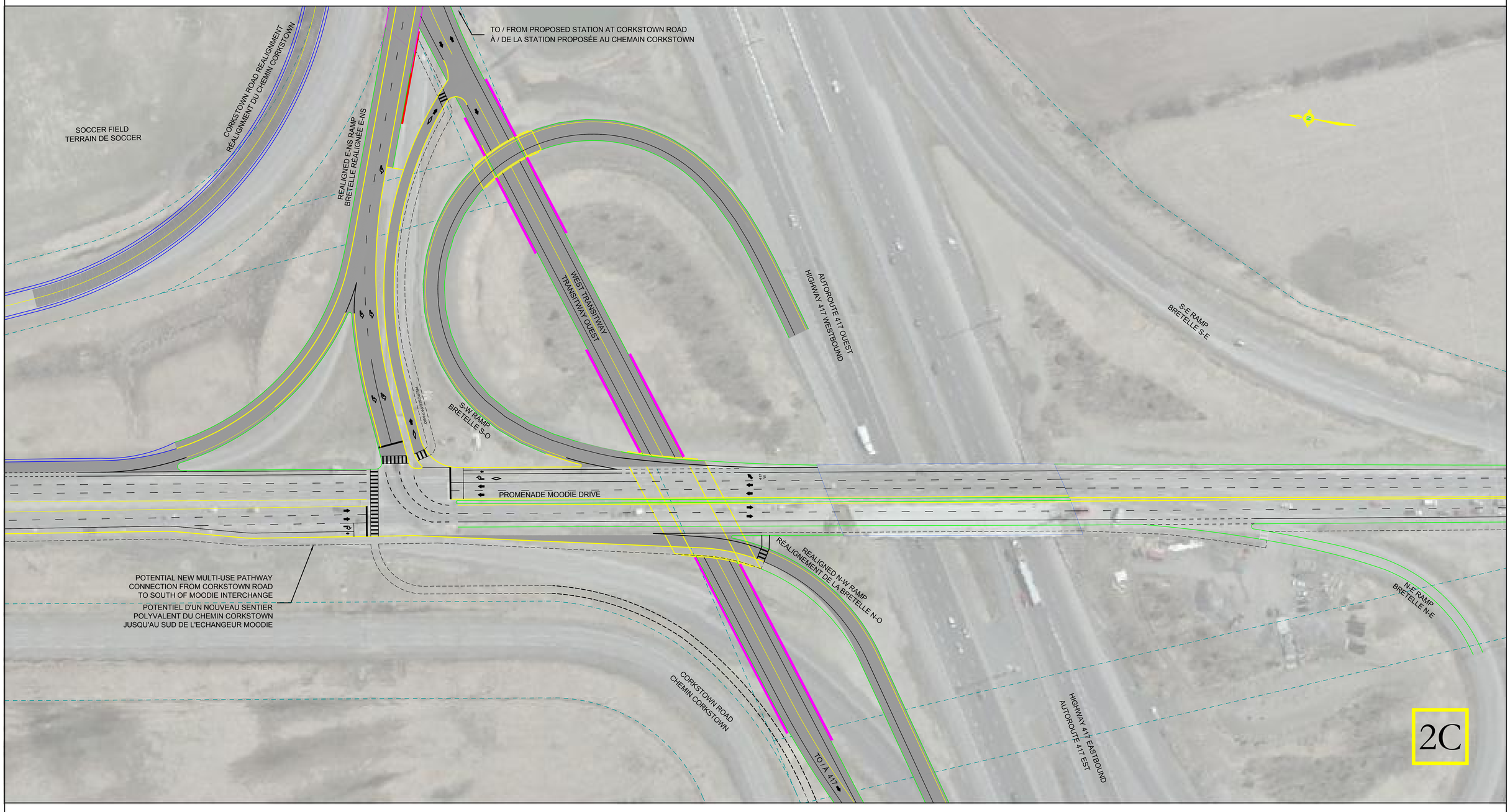
WEST TRANSITWAY EXTENSION
PROLONGEMENT DU TRANSITWAY OUEST

Preliminary Design of Partially Grade-Separated Transitway at Moodie Drive
Concept préliminaire du passage partiellemnet dénivelé du Transitway à la promenade Moodie

BAYSHORE STATION TO MOODIE DRIVE
STATION BAYSHORE A LA PROMENADE MOODIE



23 JUNE/JUIN 2010

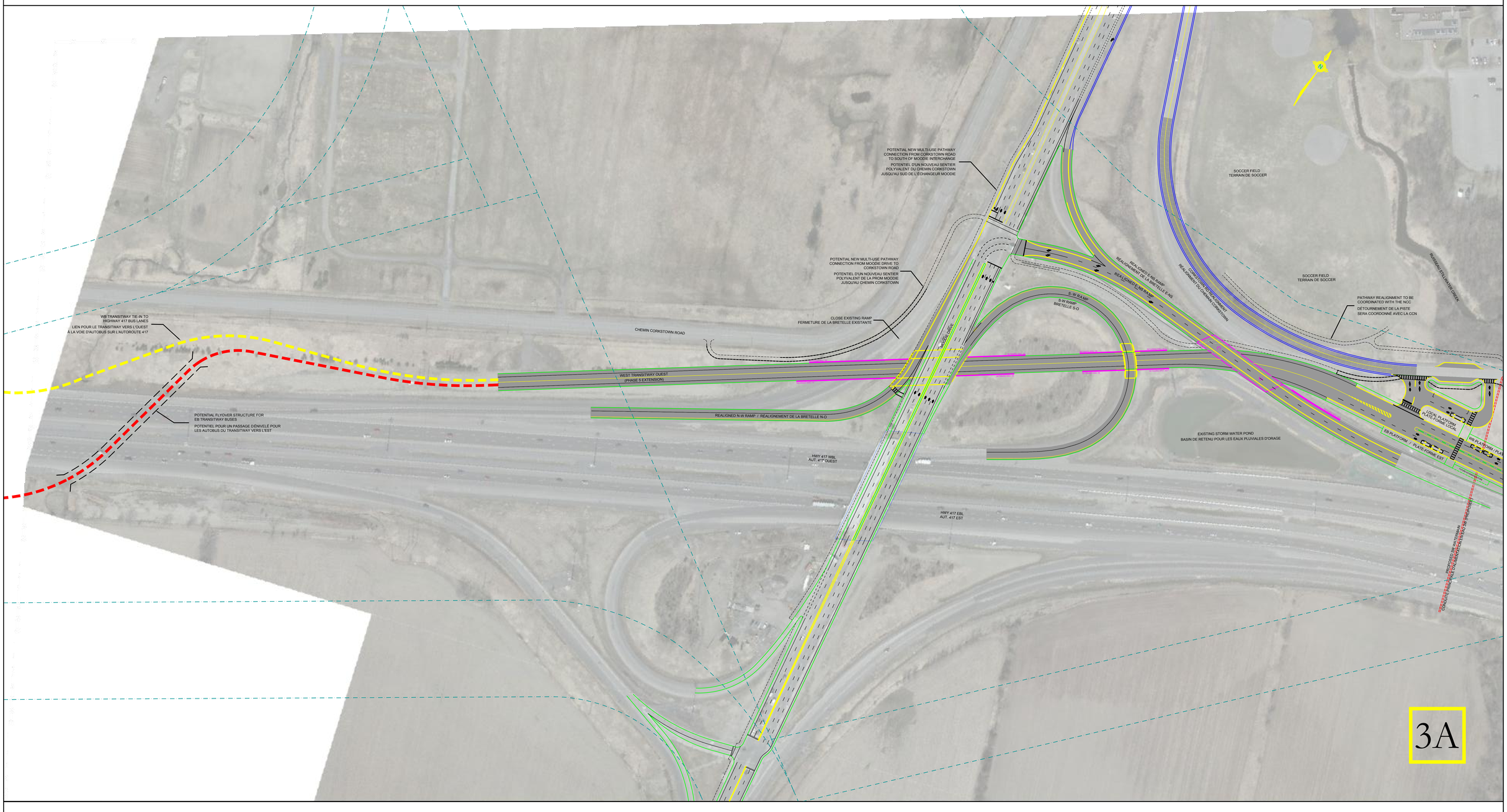
PUBLIC OPEN HOUSE #3
RÉUNION PORTES OUVERTES NO. 3

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

WEST TRANSITWAY EXTENSION
PROLONGEMENT DU TRANSITWAY OUEST

Preliminary Design of Fully Grade-Separated Transitway at Moodie Drive
Concept préliminaire du passage dénivelé du Transitway à la promenade Moodie

BAYSHORE STATION TO MOODIE DRIVE
STATION BAYSHORE A LA PROMENADE MOODIE



23 JUNE/JUIN 2010

PUBLIC OPEN HOUSE #3
RÉUNION PORTES OUVERTES NO. 3

McCORMICK RANKIN CORPORATION
A member of MMM GROUP

Memo To: R. Hunton
Date: August 5, 2010

Appendix B – Synchro™ Level of Service Calculation Sheets (2031 Planning Horizon)

- 2031 Holly Acres
  - Existing configuration (AM/PM)
  - At-grade (AM/PM)
  - Grade-separated (AM/PM)

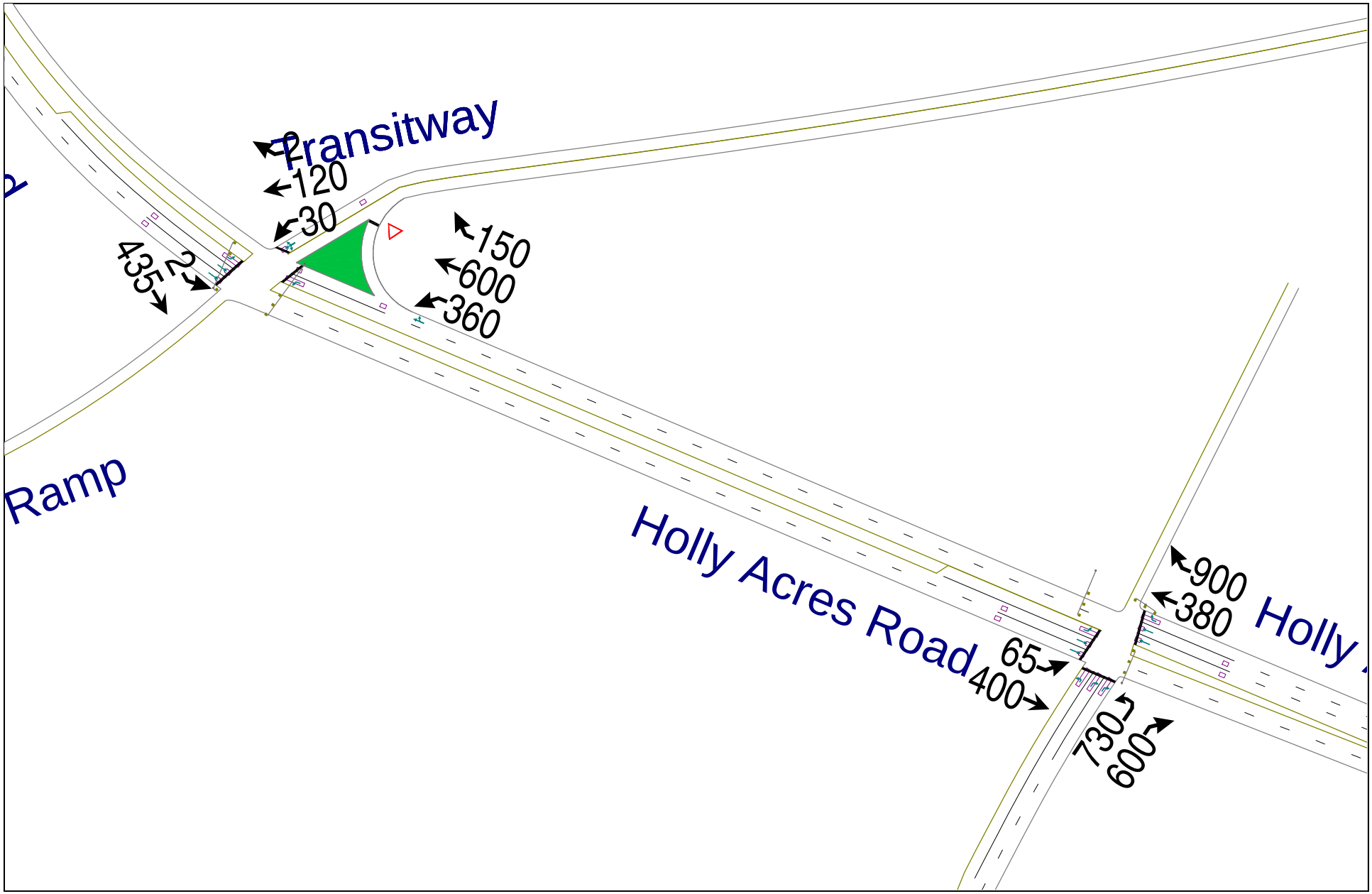
- 2031 Moodie Drive
  - Existing configuration (AM/PM)
  - At-grade (AM/PM)
  - Partially-separated (AM/PM)
  - Fully Grade-separated (AM/PM)

Note:

The Synchro LOS calculations for the existing volumes with existing signal timings are included as part of the "West Transitway Existing Transit and Transportation Review" dated February 2010.

Holly Acres Road - Existing
Volumes

2031 AMPKHR
7/15/2010



S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Existing AM - 2031 Acres.syn

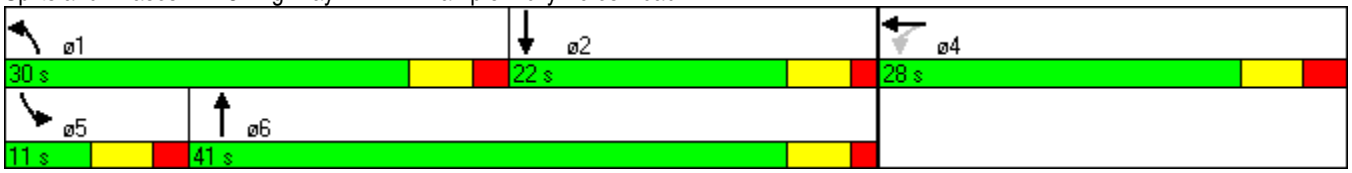
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	120	2	360	600	150	2	435	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5		2.5	2.5		2.5	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt					0.998			0.970				
Flt Protected					0.990		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	899	0	1729	1471	0	864	3458	0
Flt Permitted					0.990		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	899	0	1729	1471	0	864	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			20				
Link Speed (k/h)		100			48			48			48	
Link Distance (m)		385.7			377.7			290.9			336.3	
Travel Time (s)		13.9			28.3			21.8			25.2	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	100%	100%	100%	0%	0%	100%	100%	0%	0%
Adj. Flow (vph)	0	0	0	31	125	2	375	625	156	2	453	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	158	0	375	781	0	2	453	0
Turn Type				Perm			Prot			Prot		
Protected Phases					4		1	6		5	2	
Permitted Phases				4								
Detector Phase				4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)				22.4	22.4		10.9	21.4		10.9	21.4	
Total Split (s)	0.0	0.0	0.0	28.0	28.0	0.0	30.0	41.0	0.0	11.0	22.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	35.0%	35.0%	0.0%	37.5%	51.3%	0.0%	13.8%	27.5%	0.0%
Maximum Green (s)				21.6	21.6		24.1	35.6		5.1	16.6	
Yellow Time (s)				3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)				2.7	2.7		2.2	1.7		2.2	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.4	6.4	4.0	5.9	5.4	4.0	5.9	5.4	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		None	C-Max		None	C-Max	
Walk Time (s)				5.0	5.0			5.0			5.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)					17.7		21.1	48.3		5.4	23.5	
Actuated g/C Ratio					0.22		0.26	0.60		0.07	0.29	
v/c Ratio					0.79		0.82	0.87		0.03	0.45	
Control Delay					55.9		41.5	24.9		36.5	26.9	
Queue Delay					0.0		0.0	0.0		0.0	0.0	
Total Delay					55.9		41.5	24.9		36.5	26.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					E		D	C		D	C	
Approach Delay					55.9			30.3			26.9	
Approach LOS					E			C			C	
Queue Length 50th (m)					21.9		59.8	65.0		0.3	31.1	
Queue Length 95th (m)					#46.7		m66.6	m#116.7		2.4	48.1	
Internal Link Dist (m)		361.7			353.7			266.9			312.3	
Turn Bay Length (m)										70.0		
Base Capacity (vph)					243		521	895		58	1015	
Starvation Cap Reductn					0		0	0		0	0	
Spillback Cap Reductn					0		0	0		0	0	
Storage Cap Reductn					0		0	0		0	0	
Reduced v/c Ratio					0.65		0.72	0.87		0.03	0.45	

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 64 (80%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 31.7 Intersection LOS: C
Intersection Capacity Utilization 70.4% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Highway 417 WB Ramp & Holly Acres Road



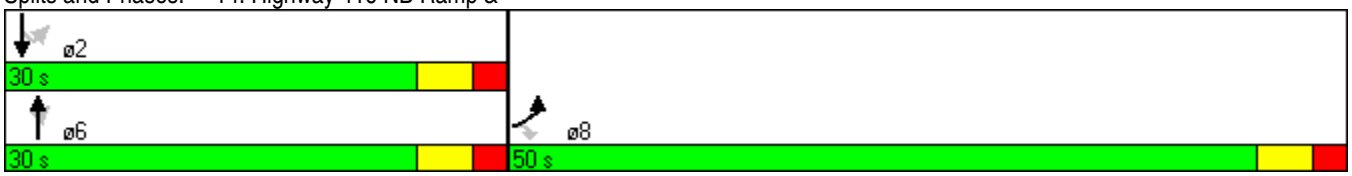
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	730	0	600	0	380	900	65	400	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		75.0	0.0	0.0		0.0	50.0		0.0	0.0	0.0
Storage Lanes		1	2	0		1	1		0	0	0
Taper Length (m)		40.0	2.5	2.5		2.5	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1465	0	2723	0	3202	1547	1729	3202	0	0	0
Flt Permitted	0.950						0.466				
Satd. Flow (perm)	1465	0	2723	0	3202	1547	848	3202	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			298			978					
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		303.5			156.2			290.9		125.4	
Travel Time (s)		10.9			11.7			21.8		9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	0%	0%	8%	0%	0%	8%	0%	2%	2%
Adj. Flow (vph)	793	0	652	0	413	978	71	435	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	793	0	652	0	413	978	71	435	0	0	0
Turn Type	Prot		custom			Perm	Perm				
Protected Phases	8				6			2			
Permitted Phases			8			6	2				
Detector Phase	8		8		6	6	2	2			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0	10.0	10.0			
Minimum Split (s)	29.5		29.5		26.5	26.5	26.5	26.5			
Total Split (s)	50.0	0.0	50.0	0.0	30.0	30.0	30.0	30.0	0.0	0.0	0.0
Total Split (%)	62.5%	0.0%	62.5%	0.0%	37.5%	37.5%	37.5%	37.5%	0.0%	0.0%	0.0%
Maximum Green (s)	44.5		44.5		24.5	24.5	24.5	24.5			
Yellow Time (s)	3.3		3.3		3.3	3.3	3.3	3.3			
All-Red Time (s)	2.2		2.2		2.2	2.2	2.2	2.2			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	4.0	5.5	4.0	5.5	5.5	5.5	5.5	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0			
Recall Mode	None		None		C-Max	C-Max	C-Max	C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	17.0		17.0		14.0	14.0	14.0	14.0			
Pedestrian Calls (#/hr)	0		0		0	0	0	0			
Act Effct Green (s)	44.4		44.4		24.6	24.6	24.6	24.6			
Actuated g/C Ratio	0.56		0.56		0.31	0.31	0.31	0.31			
v/c Ratio	0.98		0.40		0.42	0.85	0.27	0.44			
Control Delay	45.8		5.9		23.7	10.5	6.1	6.5			
Queue Delay	0.0		0.0		0.0	0.0	0.0	0.0			
Total Delay	45.8		5.9		23.7	10.5	6.1	6.5			

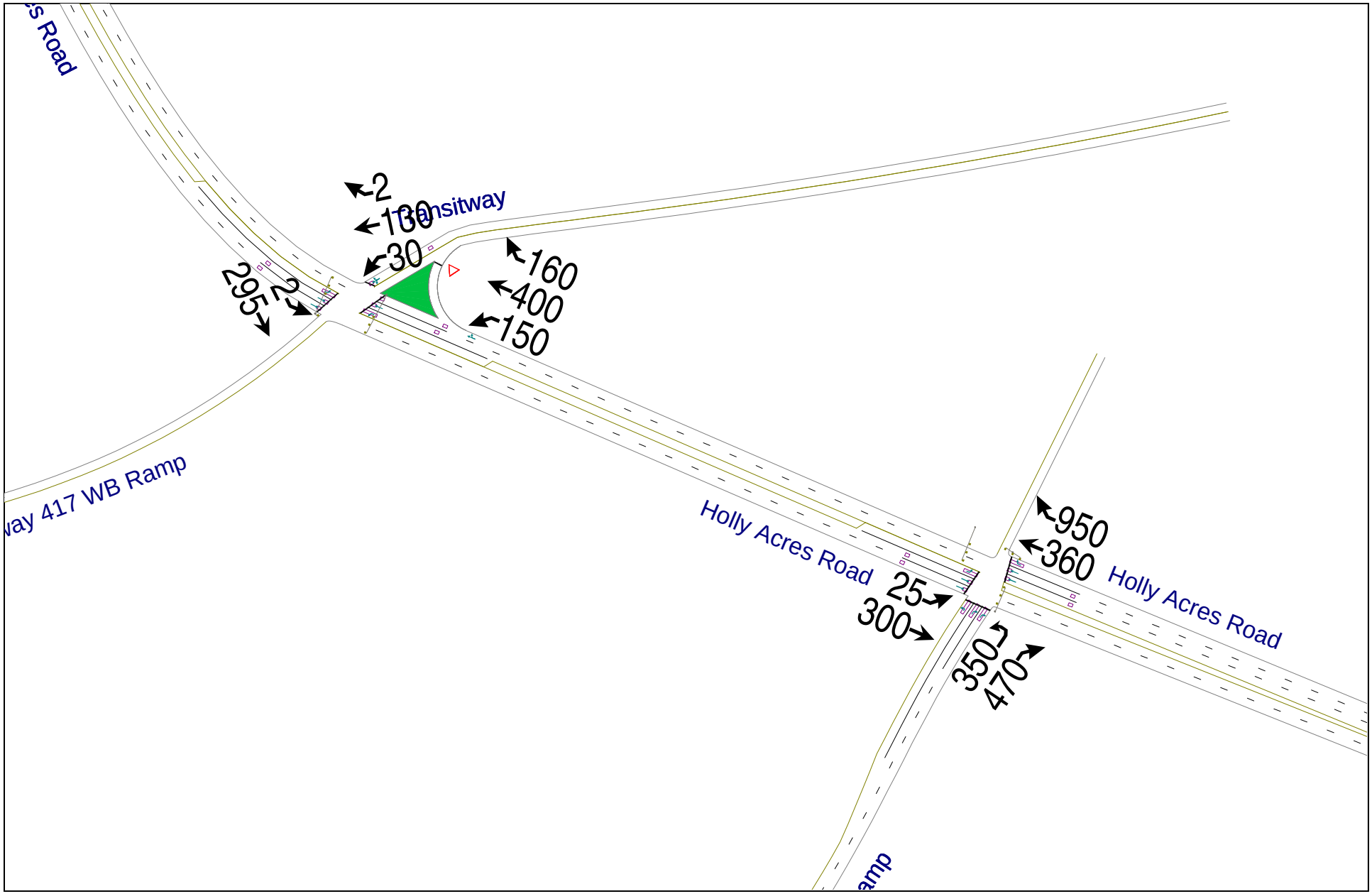
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		A		C	B	A	A			
Approach Delay					14.4			6.5			
Approach LOS					B			A			
Queue Length 50th (m)	107.7		14.4		26.1	0.0	1.1	3.4			
Queue Length 95th (m)	#188.3		24.7		38.3	#83.2	m2.1	4.7			
Internal Link Dist (m)		279.5			132.2			266.9		101.4	
Turn Bay Length (m)	75.0						50.0				
Base Capacity (vph)	815		1647		986	1153	261	986			
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	0.97		0.40		0.42	0.85	0.27	0.44			

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 19.0 Intersection LOS: B
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 416 NB Ramp &




Road
2
130
30
Transitway
160
400
150
295
2
way 417 WB Ramp
Holly Acres Road
25
300
950
360
Holly Acres Road
350
470
amp

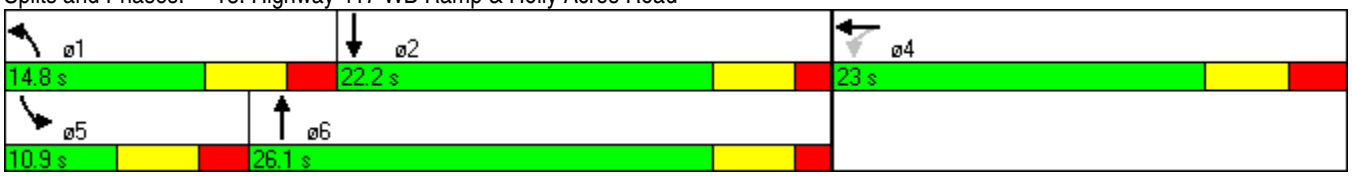
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	30	130	2	150	400	160	2	295	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	50.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5		2.5	2.5		2.5	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt					0.998			0.957				
Flt Protected					0.991		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	900	0	1729	2574	0	864	3458	0
Flt Permitted					0.991		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	900	0	1729	2574	0	864	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			108				
Link Speed (k/h)		100			48			48			48	
Link Distance (m)		385.7			377.7			290.9			592.4	
Travel Time (s)		13.9			28.3			21.8			44.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	100%	100%	100%	0%	0%	100%	100%	0%	0%
Adj. Flow (vph)	0	0	0	33	141	2	163	435	174	2	321	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	176	0	163	609	0	2	321	0
Turn Type				Perm			Prot			Prot		
Protected Phases					4		1	6		5	2	
Permitted Phases				4								
Detector Phase				4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)				22.4	22.4		10.9	21.4		10.9	21.4	
Total Split (s)	0.0	0.0	0.0	23.0	23.0	0.0	14.8	26.1	0.0	10.9	22.2	0.0
Total Split (%)	0.0%	0.0%	0.0%	38.3%	38.3%	0.0%	24.7%	43.5%	0.0%	18.2%	37.0%	0.0%
Maximum Green (s)				16.6	16.6		8.9	20.7		5.0	16.8	
Yellow Time (s)				3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)				2.7	2.7		2.2	1.7		2.2	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.4	6.4	4.0	5.9	5.4	4.0	5.9	5.4	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		None	C-Max		None	C-Max	
Walk Time (s)				5.0	5.0			5.0			5.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)					14.8		8.6	31.2		5.2	21.5	
Actuated g/C Ratio					0.25		0.14	0.52		0.09	0.36	
v/c Ratio					0.79		0.66	0.44		0.03	0.26	
Control Delay					47.4		34.9	11.3		26.5	16.6	
Queue Delay					0.0		0.0	0.0		0.0	0.0	
Total Delay					47.4		34.9	11.3		26.5	16.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					D		C	B		C	B	
Approach Delay					47.4			16.3			16.7	
Approach LOS					D			B			B	
Queue Length 50th (m)					17.2		18.9	20.5		0.2	14.6	
Queue Length 95th (m)					#44.5		m#31.3	39.2		1.9	23.7	
Internal Link Dist (m)		361.7			353.7			266.9			568.4	
Turn Bay Length (m)							50.0			70.0		
Base Capacity (vph)					250		259	1391		75	1237	
Starvation Cap Reductn					0		0	0		0	0	
Spillback Cap Reductn					0		0	0		0	0	
Storage Cap Reductn					0		0	0		0	0	
Reduced v/c Ratio					0.70		0.63	0.44		0.03	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 41 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 20.7 Intersection LOS: C
Intersection Capacity Utilization 45.1% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Highway 417 WB Ramp & Holly Acres Road



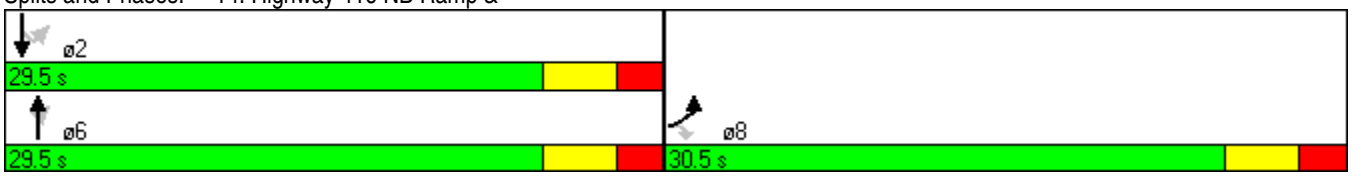
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	350	0	470	0	360	950	25	300	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		75.0	0.0	0.0		0.0	50.0		0.0	0.0	0.0
Storage Lanes		1	2	0		1	1		0	0	0
Taper Length (m)		40.0	2.5	2.5		2.5	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1262	0	2723	0	3202	1547	1729	3144	0	0	0
Flt Permitted	0.950						0.521				
Satd. Flow (perm)	1262	0	2723	0	3202	1547	948	3144	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			670			1033					
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		303.5			312.5			290.9		105.3	
Travel Time (s)		10.9			23.4			21.8		7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	37%	0%	0%	0%	8%	0%	0%	10%	0%	2%	2%
Adj. Flow (vph)	380	0	511	0	391	1033	27	326	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	380	0	511	0	391	1033	27	326	0	0	0
Turn Type	Prot		custom			Perm	Perm				
Protected Phases	8				6			2			
Permitted Phases			8			6	2				
Detector Phase	8		8		6	6	2	2			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0	10.0	10.0			
Minimum Split (s)	30.5		30.5		26.5	26.5	26.5	26.5			
Total Split (s)	30.5	0.0	30.5	0.0	29.5	29.5	29.5	29.5	0.0	0.0	0.0
Total Split (%)	50.8%	0.0%	50.8%	0.0%	49.2%	49.2%	49.2%	49.2%	0.0%	0.0%	0.0%
Maximum Green (s)	25.0		25.0		24.0	24.0	24.0	24.0			
Yellow Time (s)	3.3		3.3		3.3	3.3	3.3	3.3			
All-Red Time (s)	2.2		2.2		2.2	2.2	2.2	2.2			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	4.0	5.5	4.0	5.5	5.5	5.5	5.5	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0			
Recall Mode	None		None		C-Max	C-Max	C-Max	C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	17.0		17.0		14.0	14.0	14.0	14.0			
Pedestrian Calls (#/hr)	0		0		0	0	0	0			
Act Effct Green (s)	21.8		21.8		27.2	27.2	27.2	27.2			
Actuated g/C Ratio	0.36		0.36		0.45	0.45	0.45	0.45			
v/c Ratio	0.83		0.36		0.27	0.82	0.06	0.23			
Control Delay	33.8		1.0		11.8	8.3	2.5	2.7			
Queue Delay	0.0		0.0		0.0	0.0	0.0	0.0			
Total Delay	33.8		1.0		11.8	8.3	2.5	2.7			

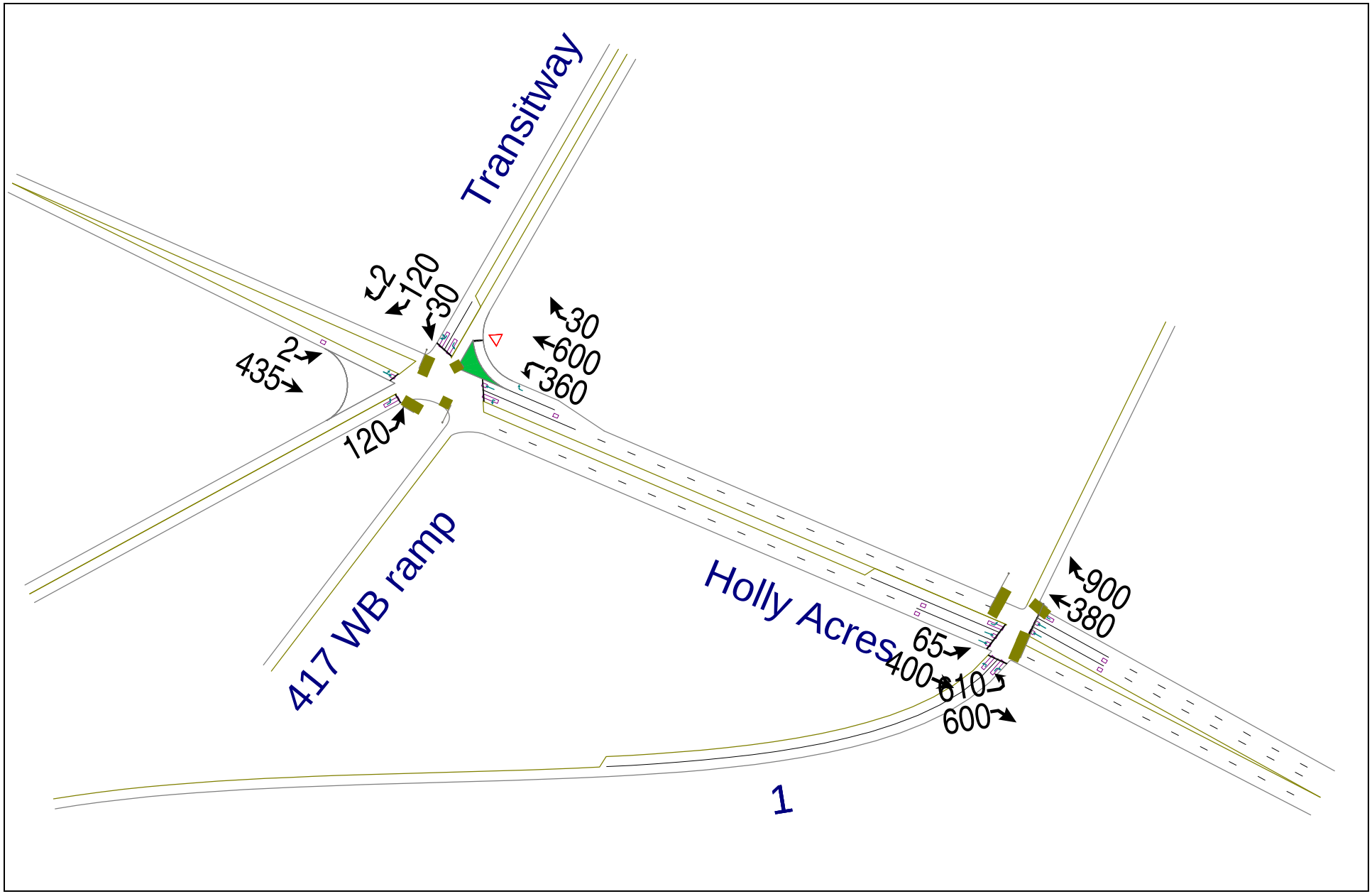
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C		A		B	A	A	A			
Approach Delay					9.2			2.7			
Approach LOS					A			A			
Queue Length 50th (m)	34.4		0.0		14.4	0.0	0.3	2.0			
Queue Length 95th (m)	#71.5		1.7		23.5	#82.9	m0.9	m3.0			
Internal Link Dist (m)		279.5			288.5			266.9		81.3	
Turn Bay Length (m)	75.0						50.0				
Base Capacity (vph)	526		1525		1452	1266	430	1425			
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	0.72		0.34		0.27	0.82	0.06	0.23			

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 56 (93%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 10.3 Intersection LOS: B
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 416 NB Ramp &




Transitway
2
120
30
30
600
360
2
435
120
417 WB ramp
Holly Acres
900
380
65
400
610
600
1

Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
Lane Configurations									
Volume (vph)	2	435	360	600	30	30	120	2	120
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0				20.0	20.0	0.0		0.0
Storage Lanes	0				1	1	1		1
Taper Length (m)	2.5				20.0	2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.850		0.850		
Flt Protected			0.950			0.950			0.950
Satd. Flow (prot)	0	1812	1729	1820	774	864	774	0	864
Flt Permitted		0.998	0.406			0.950			0.950
Satd. Flow (perm)	0	1809	739	1820	774	864	774	0	864
Right Turn on Red					Yes			Yes	
Satd. Flow (RTOR)					17		1		
Link Speed (k/h)		48		48					48
Link Distance (m)		171.5		234.2					168.8
Travel Time (s)		12.9		17.6					12.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	100%	100%	100%	100%	100%
Adj. Flow (vph)	2	473	391	652	33	33	130	2	130
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	475	391	652	33	33	132	0	130
Turn Type	Perm		pm+pt		Perm	Prot	custom		
Protected Phases		2	8	6		7			8
Permitted Phases	2		6		6		4		
Detector Phase	2	2	8	6	6	7	4		8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0
Minimum Split (s)	21.9	21.9	20.0	21.9	21.9	10.9	21.9		20.0
Total Split (s)	43.0	43.0	21.0	43.0	43.0	11.0	32.0	0.0	21.0
Total Split (%)	57.3%	57.3%	28.0%	57.3%	57.3%	14.7%	42.7%	0.0%	28.0%
Maximum Green (s)	37.1	37.1	15.1	37.1	37.1	6.3	26.1		15.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.7
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	1.0	2.2		2.2
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)	5.9	5.9	5.9	5.9	5.9	4.7	5.9	4.0	5.9
Lead/Lag			Lead			Lag			Lead
Lead-Lag Optimize?			Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min	Max	C-Min	C-Min	Min	Max		Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0		
Pedestrian Calls (#/hr)	0	0		0	0		0		
Act Effct Green (s)		32.3	52.2	32.3	32.3	6.3	30.9		19.9
Actuated g/C Ratio		0.43	0.70	0.43	0.43	0.08	0.41		0.27
v/c Ratio		0.61	0.50	0.83	0.10	0.45	0.41		0.57
Control Delay		19.4	3.2	22.7	7.3	54.1	22.8		39.5
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		19.4	3.2	22.7	7.3	54.1	22.8		39.5

Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
LOS		B	A	C	A	D	C		D
Approach Delay		19.4		15.1					39.5
Approach LOS		B		B					D
Queue Length 50th (m)		47.6	3.8	55.2	0.1	4.6	13.3		16.4
Queue Length 95th (m)		68.6	m5.0	m73.0	m2.4	#15.5	30.8		#44.1
Internal Link Dist (m)		147.5		210.2					144.8
Turn Bay Length (m)					20.0	20.0			
Base Capacity (vph)		895	777	900	391	73	319		229
Starvation Cap Reductn		0	0	0	0	0	0		0
Spillback Cap Reductn		0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0		0
Reduced v/c Ratio		0.53	0.50	0.72	0.08	0.45	0.41		0.57

Intersection Summary

Area Type: Other
Cycle Length: 75
Actuated Cycle Length: 75
Offset: 47 (63%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 19.2 Intersection LOS: B
Intersection Capacity Utilization 87.4% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Holly Acres &

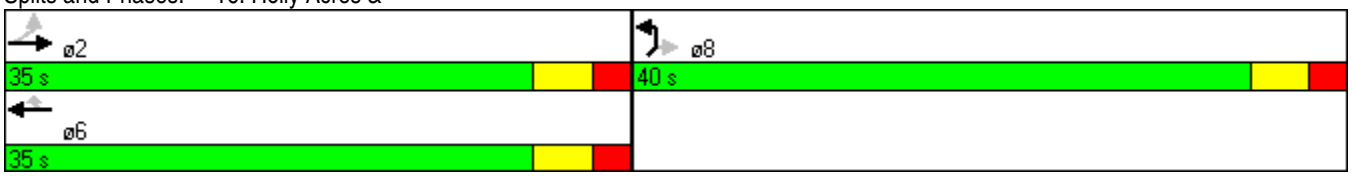
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	65	400	0	0	380	900	0	0	610	0	600
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3202	0	0	3202	1547	0	0	1729	0	1547
Flt Permitted	0.502								0.950		
Satd. Flow (perm)	914	3202	0	0	3202	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						978					258
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	0%	0%	8%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	71	435	0	0	413	978	0	0	663	0	652
Shared Lane Traffic (%)											
Lane Group Flow (vph)	71	435	0	0	413	978	0	0	663	0	652
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	35.0	35.0	0.0	0.0	35.0	35.0	0.0	0.0	40.0	0.0	40.0
Total Split (%)	46.7%	46.7%	0.0%	0.0%	46.7%	46.7%	0.0%	0.0%	53.3%	0.0%	53.3%
Maximum Green (s)	29.5	29.5			29.5	29.5			34.5		34.5
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	31.6	31.6			31.6	31.6			32.4		32.4
Actuated g/C Ratio	0.42	0.42			0.42	0.42			0.43		0.43
v/c Ratio	0.18	0.32			0.31	0.80			0.89		0.80
Control Delay	3.8	3.8			15.9	7.8			35.1		19.2
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	3.8	3.8			15.9	7.8			35.1		19.2

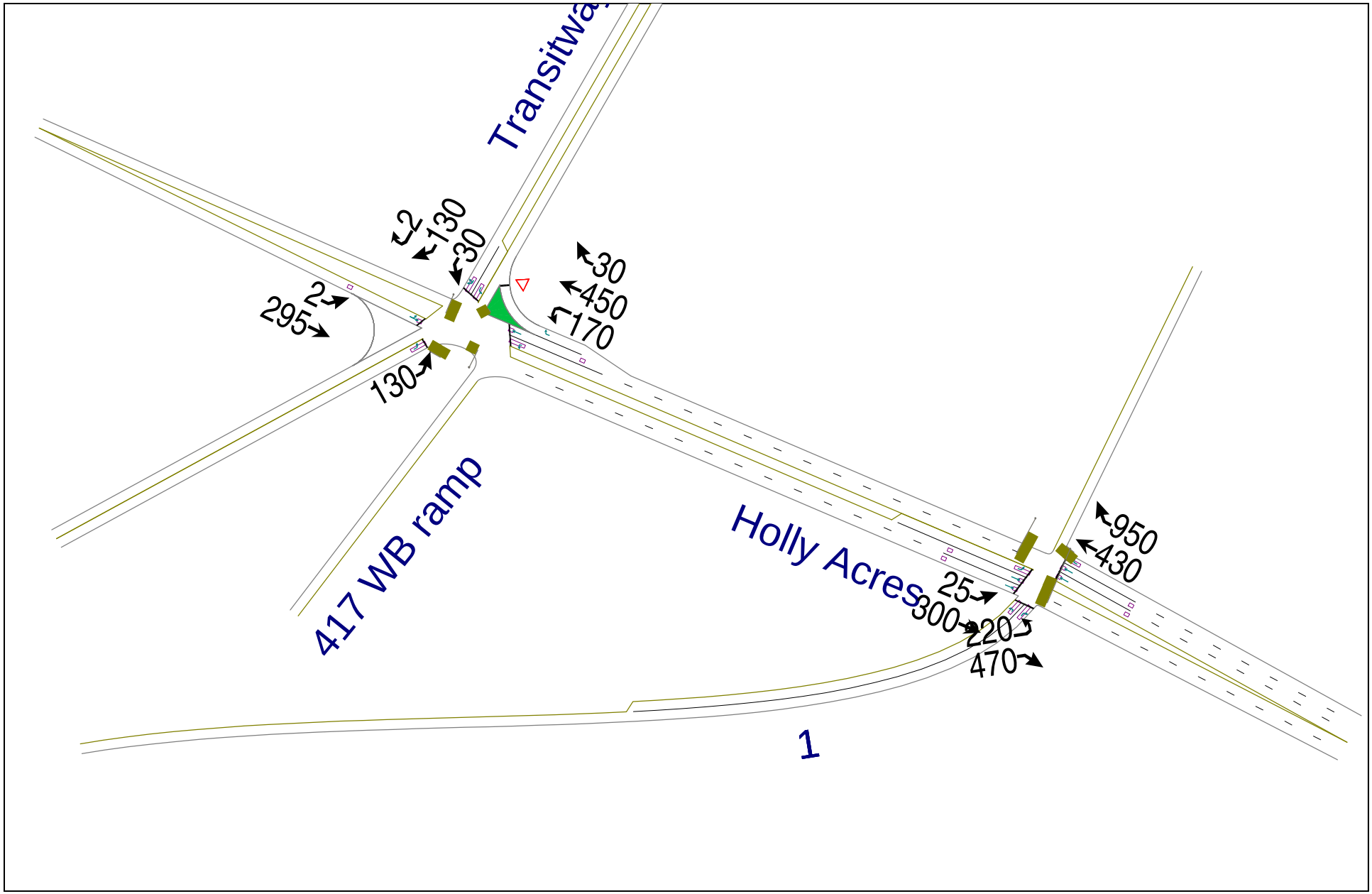
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	A	A			B	A			D		B
Approach Delay		3.8			10.2						
Approach LOS		A			B						
Queue Length 50th (m)	2.1	9.3			20.8	0.0			78.3		44.1
Queue Length 95th (m)	m3.9	11.3			31.1	28.2			#138.7		88.3
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	385	1347			1347	1217			795		851
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	0.18	0.32			0.31	0.80			0.83		0.77

Intersection Summary			
Area Type:	Other		
Cycle Length: 75			
Actuated Cycle Length: 75			
Offset: 72 (96%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 16.1		Intersection LOS: B	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 16: Holly Acres &




Transitway
2
130
30
30
450
170
2
295
130
417 WB ramp
Holly Acres
950
430
25
300
220
470
1

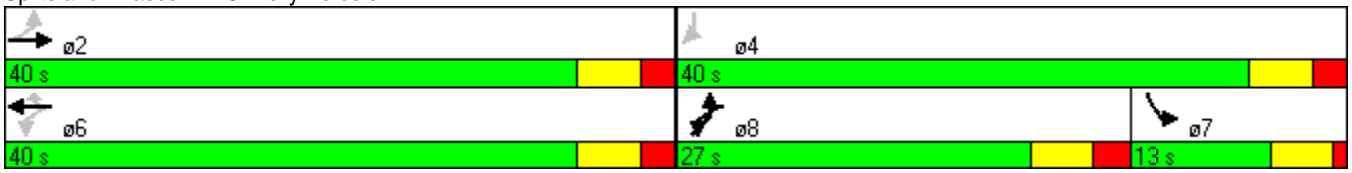
Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
Lane Configurations									
Volume (vph)	2	295	170	450	30	30	130	2	130
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0				20.0	20.0	0.0		0.0
Storage Lanes	0				1	1	1		1
Taper Length (m)	2.5				20.0	2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.850		0.850		
Flt Protected			0.950			0.950			0.950
Satd. Flow (prot)	0	1809	1729	1820	774	864	774	0	864
Flt Permitted		0.997	0.464			0.950			0.950
Satd. Flow (perm)	0	1803	844	1820	774	864	774	0	864
Right Turn on Red					Yes			Yes	
Satd. Flow (RTOR)					19		1		
Link Speed (k/h)		48		48					48
Link Distance (m)		171.5		234.2					168.8
Travel Time (s)		12.9		17.6					12.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	100%	100%	100%	100%	100%
Adj. Flow (vph)	2	321	185	489	33	33	141	2	141
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	323	185	489	33	33	143	0	141
Turn Type	Perm		pm+pt		Perm	Prot	custom		
Protected Phases		2	8	6		7			8
Permitted Phases	2		6		6		4		
Detector Phase	2	2	8	6	6	7	4		8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0
Minimum Split (s)	21.9	21.9	20.0	21.9	21.9	10.9	21.9		20.0
Total Split (s)	40.0	40.0	27.0	40.0	40.0	13.0	40.0	0.0	27.0
Total Split (%)	50.0%	50.0%	33.8%	50.0%	50.0%	16.3%	50.0%	0.0%	33.8%
Maximum Green (s)	34.1	34.1	21.1	34.1	34.1	8.3	34.1		21.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.7
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	1.0	2.2		2.2
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)	5.9	5.9	5.9	5.9	5.9	4.7	5.9	4.0	5.9
Lead/Lag			Lead			Lag			Lead
Lead-Lag Optimize?			Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min	Max	C-Min	C-Min	Min	Max		Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0		
Pedestrian Calls (#/hr)	0	0		0	0		0		
Act Effct Green (s)		27.1	55.2	27.1	27.1	8.3	41.1		28.1
Actuated g/C Ratio		0.34	0.69	0.34	0.34	0.10	0.51		0.35
v/c Ratio		0.53	0.21	0.79	0.12	0.37	0.36		0.46
Control Delay		23.7	3.2	25.6	5.2	45.7	17.0		29.4
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		23.7	3.2	25.6	5.2	45.7	17.0		29.4

Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
LOS		C	A	C	A	D	B		C
Approach Delay		23.7		18.8					29.4
Approach LOS		C		B					C
Queue Length 50th (m)		38.3	2.6	55.1	0.2	4.8	12.4		16.6
Queue Length 95th (m)		53.4	4.4	66.9	m2.3	13.2	30.6		#42.1
Internal Link Dist (m)		147.5		210.2					144.8
Turn Bay Length (m)					20.0	20.0			
Base Capacity (vph)		769	893	776	341	90	398		304
Starvation Cap Reductn		0	0	0	0	0	0		0
Spillback Cap Reductn		0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0		0
Reduced v/c Ratio		0.42	0.21	0.63	0.10	0.37	0.36		0.46

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 71 (89%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 21.5 Intersection LOS: C
Intersection Capacity Utilization 71.3% ICU Level of Service C
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Holly Acres &



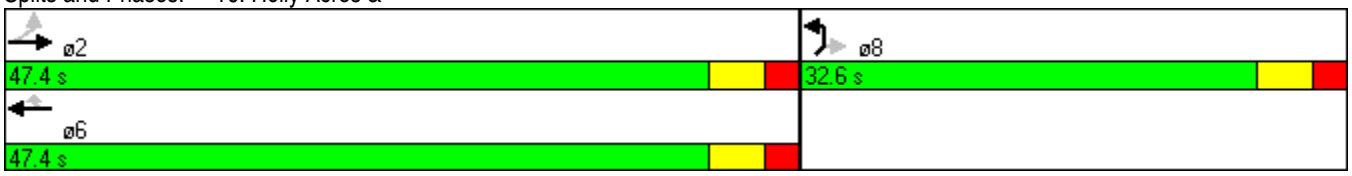
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	25	300	0	0	430	950	0	0	220	0	470
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3202	0	0	3172	1547	0	0	1729	0	1547
Flt Permitted	0.484								0.950		
Satd. Flow (perm)	881	3202	0	0	3172	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						1033					490
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	10%	0%	9%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	27	326	0	0	467	1033	0	0	239	0	511
Shared Lane Traffic (%)											
Lane Group Flow (vph)	27	326	0	0	467	1033	0	0	239	0	511
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	47.4	47.4	0.0	0.0	47.4	47.4	0.0	0.0	32.6	0.0	32.6
Total Split (%)	59.3%	59.3%	0.0%	0.0%	59.3%	59.3%	0.0%	0.0%	40.8%	0.0%	40.8%
Maximum Green (s)	41.9	41.9			41.9	41.9			27.1		27.1
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	52.3	52.3			52.3	52.3			16.7		16.7
Actuated g/C Ratio	0.65	0.65			0.65	0.65			0.21		0.21
v/c Ratio	0.05	0.16			0.23	0.75			0.66		0.72
Control Delay	0.3	0.3			6.7	4.9			37.5		9.5
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	0.3	0.3			6.7	4.9			37.5		9.5

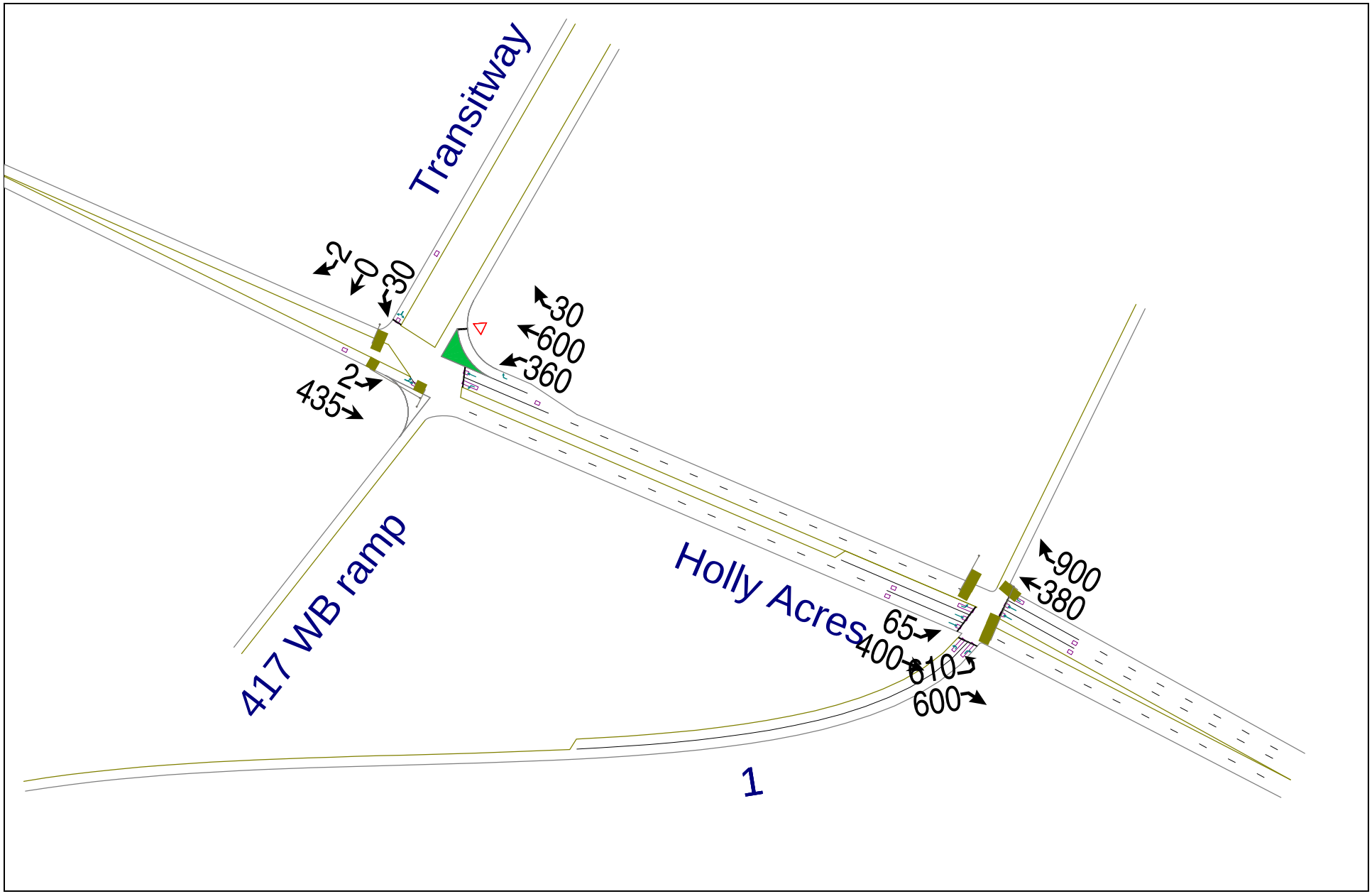
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	A	A			A	A			D		A
Approach Delay		0.3			5.5						
Approach LOS		A			A						
Queue Length 50th (m)	0.0	0.0			13.0	0.0			33.7		2.6
Queue Length 95th (m)	m0.2	0.3			24.7	14.9			50.5		26.3
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	576	2095			2075	1369			586		848
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	0.16			0.23	0.75			0.41		0.60

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 8.5		Intersection LOS: A	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 16: Holly Acres &




Transitway
2
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30
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360
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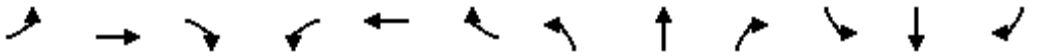
435
417 WB ramp
Holly Acres
900
380
65
400
610
600
1



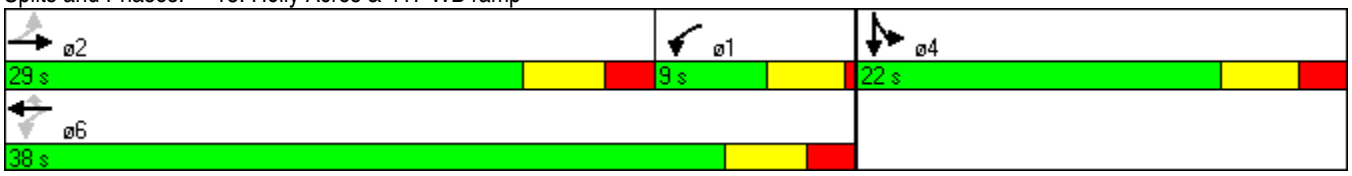
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	435	0	360	600	30	0	0	0	30	0	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	0.0		20.0	0.0		0.0	20.0		0.0
Storage Lanes	0		0	1		1	0		0	0		0
Taper Length (m)	2.5		2.5	2.5		20.0	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.992	
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	1812	0	1729	1820	774	0	0	0	0	862	0
Flt Permitted		0.998		0.494							0.955	
Satd. Flow (perm)	0	1809	0	899	1820	774	0	0	0	0	862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						24					2	
Link Speed (k/h)		48			48			100			48	
Link Distance (m)		171.5			234.2			123.2			140.1	
Travel Time (s)		12.9			17.6			4.4			10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	0%	100%	2%	2%	2%	100%	2%	100%
Adj. Flow (vph)	2	473	0	391	652	33	0	0	0	33	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	475	0	391	652	33	0	0	0	0	35	0
Turn Type	Perm			pm+pt		Perm				Split		
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6		6						
Detector Phase	2	2		1	6	6				4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0				5.0	5.0	
Minimum Split (s)	21.9	21.9		9.0	21.9	21.9				22.0	22.0	
Total Split (s)	29.0	29.0	0.0	9.0	38.0	38.0	0.0	0.0	0.0	22.0	22.0	0.0
Total Split (%)	48.3%	48.3%	0.0%	15.0%	63.3%	63.3%	0.0%	0.0%	0.0%	36.7%	36.7%	0.0%
Maximum Green (s)	23.1	23.1		5.0	32.1	32.1				16.3	16.3	
Yellow Time (s)	3.7	3.7		3.5	3.7	3.7				3.5	3.5	
All-Red Time (s)	2.2	2.2		0.5	2.2	2.2				2.2	2.2	
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)	5.9	5.9	4.0	4.0	5.9	5.9	4.0	4.0	4.0	5.7	5.7	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0				3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min				None	None	
Walk Time (s)	5.0	5.0			5.0	5.0				5.0	5.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0				11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)		37.6		49.5	51.2	51.2					8.0	
Actuated g/C Ratio		0.63		0.82	0.85	0.85					0.13	
v/c Ratio		0.42		0.47	0.42	0.05					0.30	
Control Delay		9.3		3.6	2.4	0.8					28.1	
Queue Delay		0.0		0.0	0.0	0.0					0.0	
Total Delay		9.3		3.6	2.4	0.8					28.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A		A	A	A					C	
Approach Delay		9.3			2.8						28.1	
Approach LOS		A			A						C	
Queue Length 50th (m)		13.9		0.0	0.0	0.0					3.4	
Queue Length 95th (m)		60.1		m5.2	m18.5	m0.0					9.8	
Internal Link Dist (m)		147.5			210.2			99.2			116.1	
Turn Bay Length (m)						20.0						
Base Capacity (vph)		1135		825	1552	664					236	
Starvation Cap Reductn		0		0	0	0					0	
Spillback Cap Reductn		0		0	0	0					0	
Storage Cap Reductn		0		0	0	0					0	
Reduced v/c Ratio		0.42		0.47	0.42	0.05					0.15	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 53 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 5.3 Intersection LOS: A
Intersection Capacity Utilization 76.4% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Holly Acres & 417 WB ramp

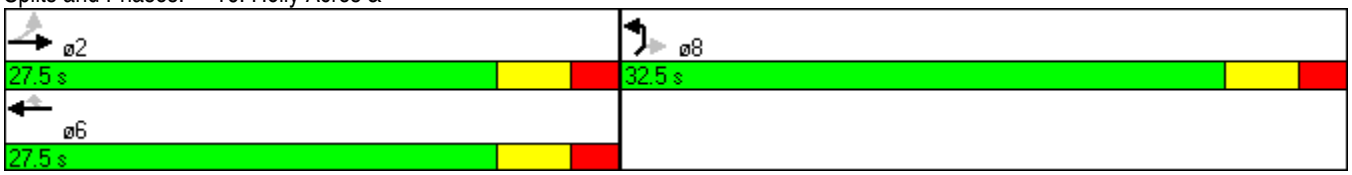


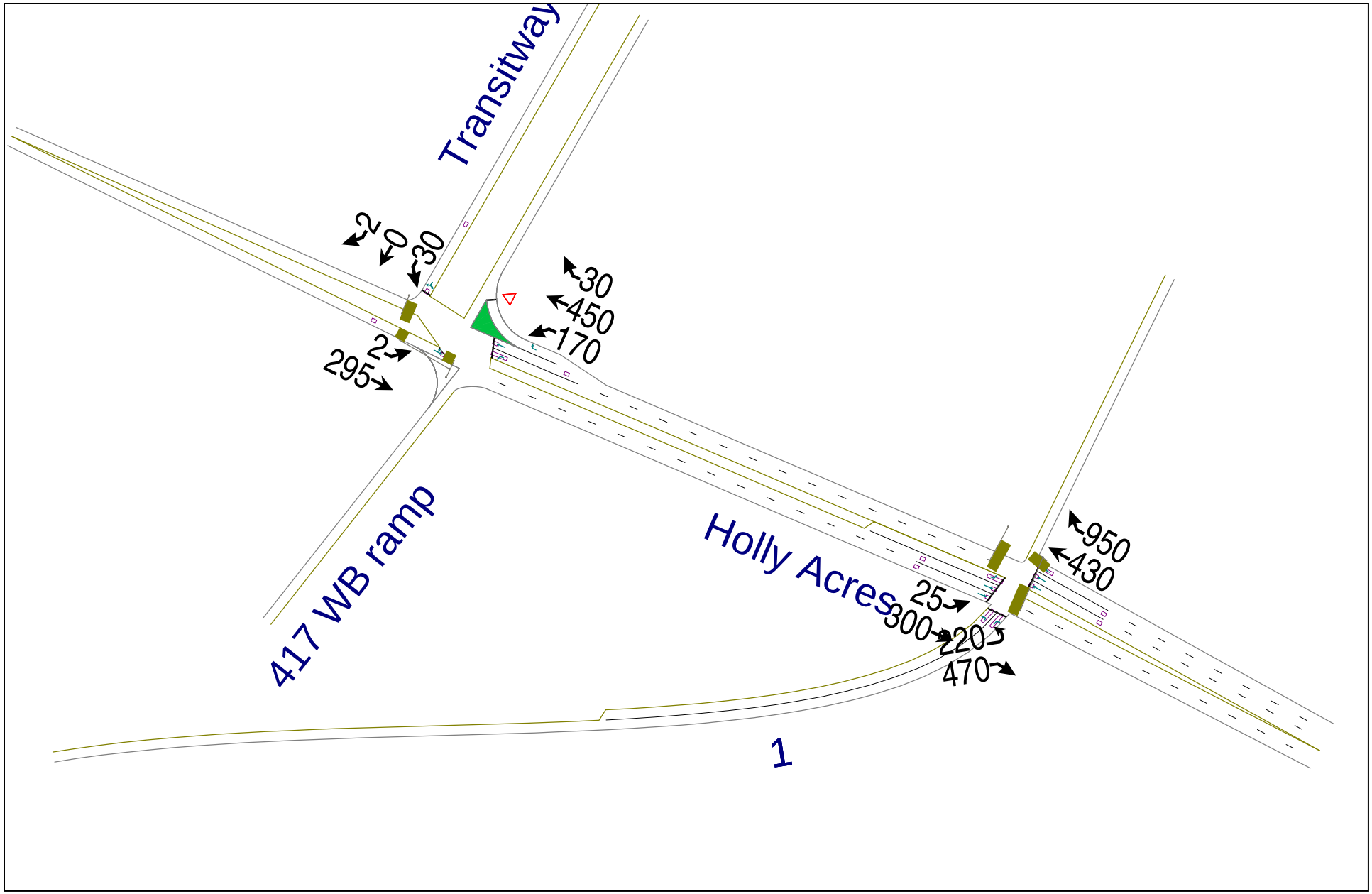
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	65	400	0	0	380	900	0	0	610	0	600
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3202	0	0	3202	1547	0	0	1729	0	1547
Flt Permitted	0.510								0.950		
Satd. Flow (perm)	928	3202	0	0	3202	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						978					232
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	0%	0%	8%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	71	435	0	0	413	978	0	0	663	0	652
Shared Lane Traffic (%)											
Lane Group Flow (vph)	71	435	0	0	413	978	0	0	663	0	652
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	27.5	27.5	0.0	0.0	27.5	27.5	0.0	0.0	32.5	0.0	32.5
Total Split (%)	45.8%	45.8%	0.0%	0.0%	45.8%	45.8%	0.0%	0.0%	54.2%	0.0%	54.2%
Maximum Green (s)	22.0	22.0			22.0	22.0			27.0		27.0
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	23.1	23.1			23.1	23.1			25.9		25.9
Actuated g/C Ratio	0.38	0.38			0.38	0.38			0.43		0.43
v/c Ratio	0.20	0.35			0.33	0.82			0.89		0.81
Control Delay	10.3	10.3			14.4	8.7			32.2		19.5
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	10.3	10.3			14.4	8.7			32.2		19.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	B	B			B	A			C		B
Approach Delay		10.3			10.4						
Approach LOS		B			B						
Queue Length 50th (m)	5.4	18.6			16.8	0.0			61.4		36.4
Queue Length 95th (m)	6.9	14.3			26.5	#74.5			#119.0		#94.9
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	357	1233			1233	1197			778		824
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	0.20	0.35			0.33	0.82			0.85		0.79

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.89			
Intersection Signal Delay: 16.7		Intersection LOS: B	
Intersection Capacity Utilization 76.3%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 16: Holly Acres &




Transitway
2
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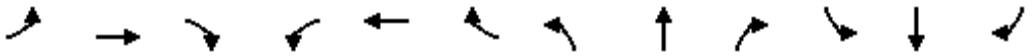
417 WB ramp
Holly Acres
950
430
25
300
220
470
1



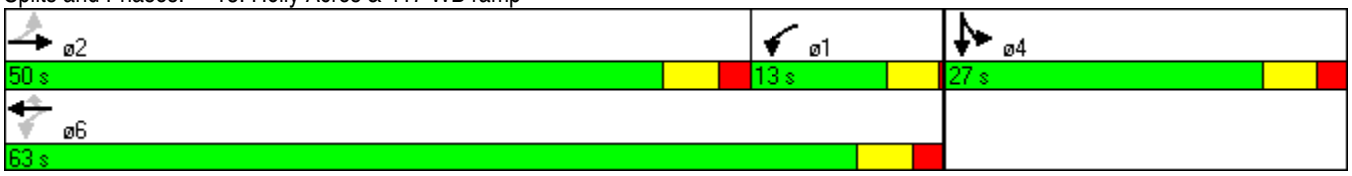
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	295	0	170	450	30	0	0	0	30	0	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0		0.0	0.0		20.0	0.0		0.0	20.0		0.0
Storage Lanes	0		0	1		1	0		0	0		0
Taper Length (m)	2.5		2.5	2.5		20.0	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.992	
Flt Protected				0.950							0.955	
Satd. Flow (prot)	0	1809	0	1729	1820	774	0	0	0	0	862	0
Flt Permitted		0.998		0.585							0.955	
Satd. Flow (perm)	0	1805	0	1065	1820	774	0	0	0	0	862	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						27					2	
Link Speed (k/h)		48			48			100			48	
Link Distance (m)		171.5			234.2			123.2			140.1	
Travel Time (s)		12.9			17.6			4.4			10.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	0%	100%	2%	2%	2%	100%	2%	100%
Adj. Flow (vph)	2	321	0	185	489	33	0	0	0	33	0	2
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	323	0	185	489	33	0	0	0	0	35	0
Turn Type	Perm			pm+pt		Perm				Split		
Protected Phases		2		1	6					4	4	
Permitted Phases	2			6		6						
Detector Phase	2	2		1	6	6				4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		5.0	10.0	10.0				5.0	5.0	
Minimum Split (s)	21.9	21.9		9.0	21.9	21.9				22.0	22.0	
Total Split (s)	50.0	50.0	0.0	13.0	63.0	63.0	0.0	0.0	0.0	27.0	27.0	0.0
Total Split (%)	55.6%	55.6%	0.0%	14.4%	70.0%	70.0%	0.0%	0.0%	0.0%	30.0%	30.0%	0.0%
Maximum Green (s)	44.1	44.1		9.0	57.1	57.1				21.3	21.3	
Yellow Time (s)	3.7	3.7		3.5	3.7	3.7				3.5	3.5	
All-Red Time (s)	2.2	2.2		0.5	2.2	2.2				2.2	2.2	
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)	5.9	5.9	4.0	4.0	5.9	5.9	4.0	4.0	4.0	5.7	5.7	4.0
Lead/Lag	Lead	Lead		Lag								
Lead-Lag Optimize?	Yes	Yes		Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0				3.0	3.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min				None	None	
Walk Time (s)	5.0	5.0			5.0	5.0				5.0	5.0	
Flash Dont Walk (s)	11.0	11.0			11.0	11.0				11.0	11.0	
Pedestrian Calls (#/hr)	0	0			0	0				0	0	
Act Effct Green (s)		64.5		75.9	76.4	76.4					9.1	
Actuated g/C Ratio		0.72		0.84	0.85	0.85					0.10	
v/c Ratio		0.25		0.20	0.32	0.05					0.39	
Control Delay		6.4		1.9	2.4	0.7					47.6	
Queue Delay		0.0		0.0	0.0	0.0					0.0	
Total Delay		6.4		1.9	2.4	0.7					47.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		A		A	A	A					D	
Approach Delay		6.4			2.2						47.6	
Approach LOS		A			A						D	
Queue Length 50th (m)		19.9		3.5	12.1	0.0					5.5	
Queue Length 95th (m)		37.5		7.7	18.8	m0.8					14.0	
Internal Link Dist (m)		147.5			210.2			99.2			116.1	
Turn Bay Length (m)						20.0						
Base Capacity (vph)		1293		1006	1544	661					206	
Starvation Cap Reductn		0		0	0	0					0	
Spillback Cap Reductn		0		0	0	0					0	
Storage Cap Reductn		0		0	0	0					0	
Reduced v/c Ratio		0.25		0.18	0.32	0.05					0.17	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 20 (22%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.39
Intersection Signal Delay: 5.0 Intersection LOS: A
Intersection Capacity Utilization 60.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Holly Acres & 417 WB ramp

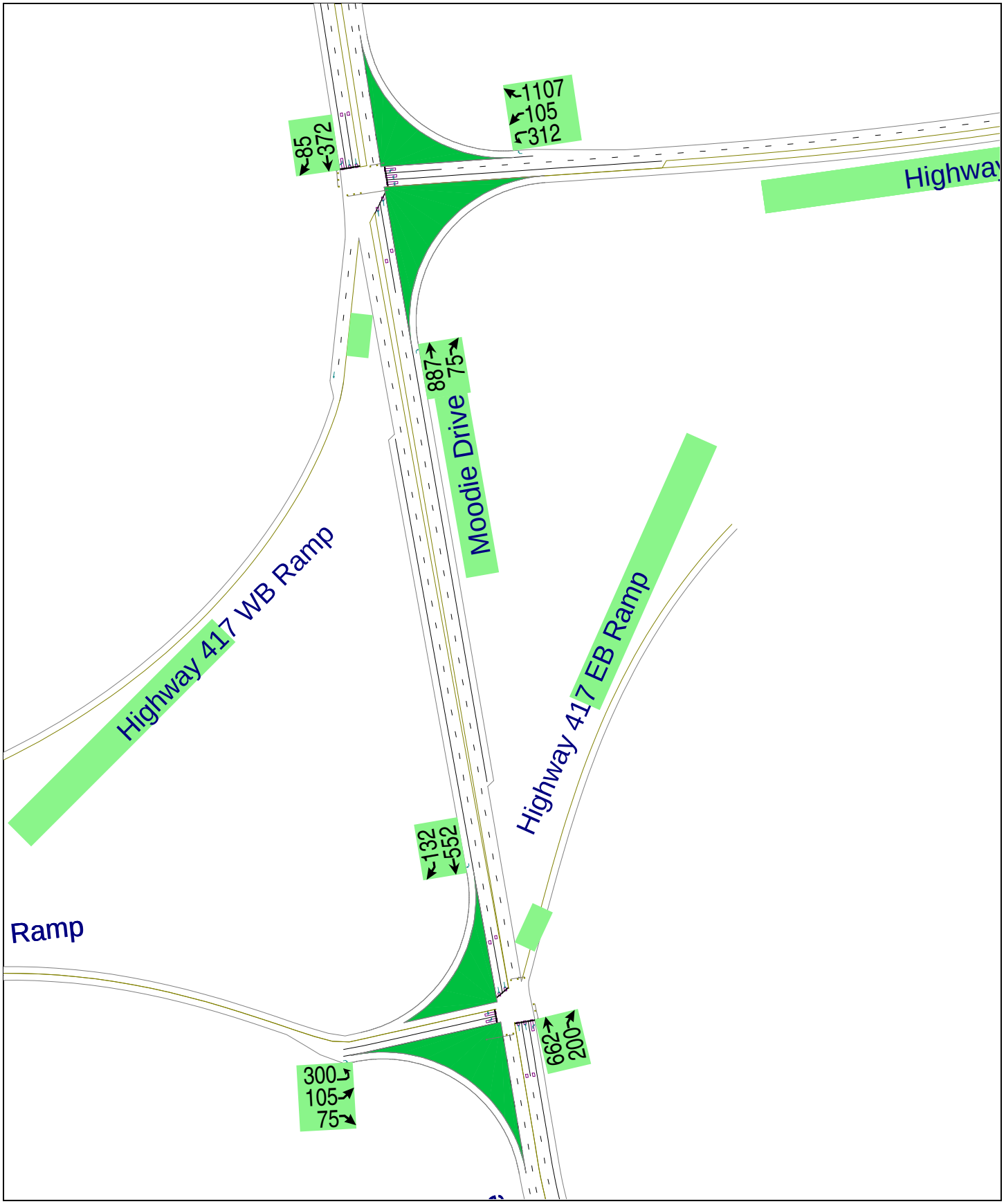


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	25	300	0	0	430	950	0	0	220	0	470
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3144	0	0	3172	1547	0	0	1729	0	1547
Flt Permitted	0.484								0.950		
Satd. Flow (perm)	881	3144	0	0	3172	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						1033					528
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	10%	0%	0%	9%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	27	326	0	0	467	1033	0	0	239	0	511
Shared Lane Traffic (%)											
Lane Group Flow (vph)	27	326	0	0	467	1033	0	0	239	0	511
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	57.4	57.4	0.0	0.0	57.4	57.4	0.0	0.0	32.6	0.0	32.6
Total Split (%)	63.8%	63.8%	0.0%	0.0%	63.8%	63.8%	0.0%	0.0%	36.2%	0.0%	36.2%
Maximum Green (s)	51.9	51.9			51.9	51.9			27.1		27.1
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	61.0	61.0			61.0	61.0			18.0		18.0
Actuated g/C Ratio	0.68	0.68			0.68	0.68			0.20		0.20
v/c Ratio	0.05	0.15			0.22	0.75			0.69		0.70
Control Delay	2.3	2.7			6.4	4.6			43.4		8.0
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	2.3	2.7			6.4	4.6			43.4		8.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	A	A			A	A			D		A
Approach Delay		2.7			5.2						
Approach LOS		A			A						
Queue Length 50th (m)	0.5	2.8			13.8	0.0			38.8		0.0
Queue Length 95th (m)	1.9	6.4			25.6	14.2			56.9		19.9
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	598	2132			2151	1382			521		835
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	0.15			0.22	0.75			0.46		0.61

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 90			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 16: Holly Acres &


1107
105
312
85
372
Highway
887
75
Moodie Drive
Highway 417 WB Ramp
Highway 417 EB Ramp
132
552
Ramp
662
200
300
105
75

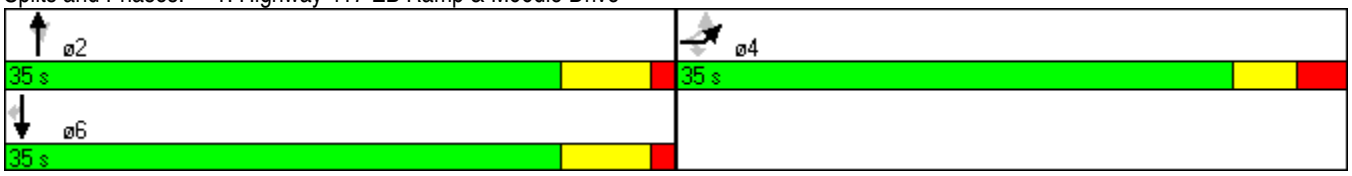
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	300	105	75	0	662	200	0	552	132	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		300.0	0.0	0.0
Storage Lanes		2	2	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	1695	1729	1532	0	3390	1502	0	3293	1473	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	1695	1729	1532	0	3390	1502	0	3293	1473	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			82			217			143		
Link Speed (k/h)		48			48			48		48	
Link Distance (m)		493.1			293.3			459.8		294.3	
Travel Time (s)		37.0			22.0			34.5		22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	0%	2%	3%	0%	5%	5%	0%	0%
Adj. Flow (vph)	326	114	82	0	720	217	0	600	143	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	326	114	82	0	720	217	0	600	143	0	0
Turn Type	Perm		Perm			Perm			Perm		
Protected Phases		4			2			6			
Permitted Phases	4		4			2			6		
Detector Phase	4	4	4		2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0		10.0	10.0		
Minimum Split (s)	24.0	24.0	24.0		24.0	24.0		24.0	24.0		
Total Split (s)	35.0	35.0	35.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0	0.0
Total Split (%)	50.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	0.0%
Maximum Green (s)	29.0	29.0	29.0		29.0	29.0		29.0	29.0		
Yellow Time (s)	3.3	3.3	3.3		4.6	4.6		4.6	4.6		
All-Red Time (s)	2.7	2.7	2.7		1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0	3.0		
Recall Mode	None	None	None		C-Max	C-Max		C-Max	C-Max		
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0	11.0		5.0	5.0		5.0	5.0		
Pedestrian Calls (#/hr)	1	1	1		1	1		1	1		
Act Effct Green (s)	19.0	19.0	19.0		39.0	39.0		39.0	39.0		
Actuated g/C Ratio	0.27	0.27	0.27		0.56	0.56		0.56	0.56		
v/c Ratio	0.71	0.24	0.17		0.38	0.23		0.33	0.16		
Control Delay	31.0	19.4	5.1		10.5	2.5		7.4	2.4		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	31.0	19.4	5.1		10.5	2.5		7.4	2.4		

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C	B	A		B	A		A	A		
Approach Delay		24.4			8.6			6.4			
Approach LOS		C			A			A			
Queue Length 50th (m)	38.4	11.6	0.0		25.4	0.0		15.5	0.1		
Queue Length 95th (m)	54.2	19.7	7.5		46.1	10.1		25.8	4.0		
Internal Link Dist (m)		469.1			269.3			435.8		270.3	
Turn Bay Length (m)			85.0			100.0			300.0		
Base Capacity (vph)	702	716	683		1888	933		1834	884		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.46	0.16	0.12		0.38	0.23		0.33	0.16		

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 45 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 46.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Highway 417 EB Ramp & Moodie Drive

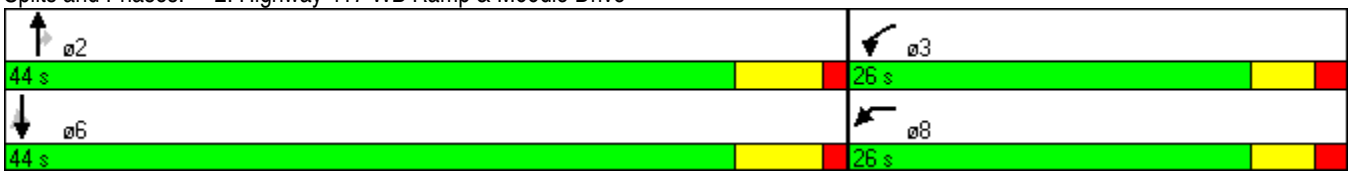


Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	312	105	1107	0	887	75	0	372	85	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		150.0	80.0	0.0		300.0	0.0		100.0	0.0	0.0
Storage Lanes		1	1	0		1	0		1	0	0
Taper Length (m)		2.5	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	3195	1153	1517	0	3390	1432	0	3357	1394	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	3195	1153	1517	0	3390	1432	0	3357	1394	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			440			89			101		
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		711.5			459.8			276.1		116.5	
Travel Time (s)		25.6			34.5			20.7		8.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.92	0.92
Heavy Vehicles (%)	5%	50%	2%	0%	2%	8%	0%	3%	11%	0%	0%
Adj. Flow (vph)	371	125	1318	0	1056	89	0	443	101	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	371	125	1318	0	1056	89	0	443	101	0	0
Turn Type	Prot		Free			Perm			Perm		
Protected Phases	3	8			2			6			
Permitted Phases			Free			2			6		
Detector Phase	3	8			2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0		10.0	10.0		
Minimum Split (s)	15.1	23.1			26.0	26.0		26.0	26.0		
Total Split (s)	26.0	26.0	0.0	0.0	44.0	44.0	0.0	44.0	44.0	0.0	0.0
Total Split (%)	37.1%	37.1%	0.0%	0.0%	62.9%	62.9%	0.0%	62.9%	62.9%	0.0%	0.0%
Maximum Green (s)	20.9	20.9			38.0	38.0		38.0	38.0		
Yellow Time (s)	3.3	3.3			4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8	1.8			1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		
Recall Mode	None	None			C-Max	C-Max		C-Max	C-Max		
Walk Time (s)		7.0			10.0	10.0		10.0	10.0		
Flash Dont Walk (s)		11.0			10.0	10.0		10.0	10.0		
Pedestrian Calls (#/hr)		1			1	1		1	1		
Act Effct Green (s)	13.9	13.9	70.0		45.0	45.0		45.0	45.0		
Actuated g/C Ratio	0.20	0.20	1.00		0.64	0.64		0.64	0.64		
v/c Ratio	0.59	0.55	0.87		0.48	0.09		0.21	0.11		
Control Delay	28.9	33.8	8.3		5.2	0.6		4.4	0.9		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	28.9	33.8	8.3		5.2	0.6		4.4	0.9		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
LOS	C	C	A		A	A		A	A		
Approach Delay		14.2			4.9			3.7			
Approach LOS		B			A			A			
Queue Length 50th (m)	23.0	15.0	0.0		17.8	0.0		7.7	0.0		
Queue Length 95th (m)	29.3	25.4	0.0		31.6	0.7		13.6	2.2		
Internal Link Dist (m)		687.5			435.8			252.1		92.5	
Turn Bay Length (m)	150.0	150.0	80.0			300.0			100.0		
Base Capacity (vph)	954	344	1517		2181	953		2160	933		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.39	0.36	0.87		0.48	0.09		0.21	0.11		

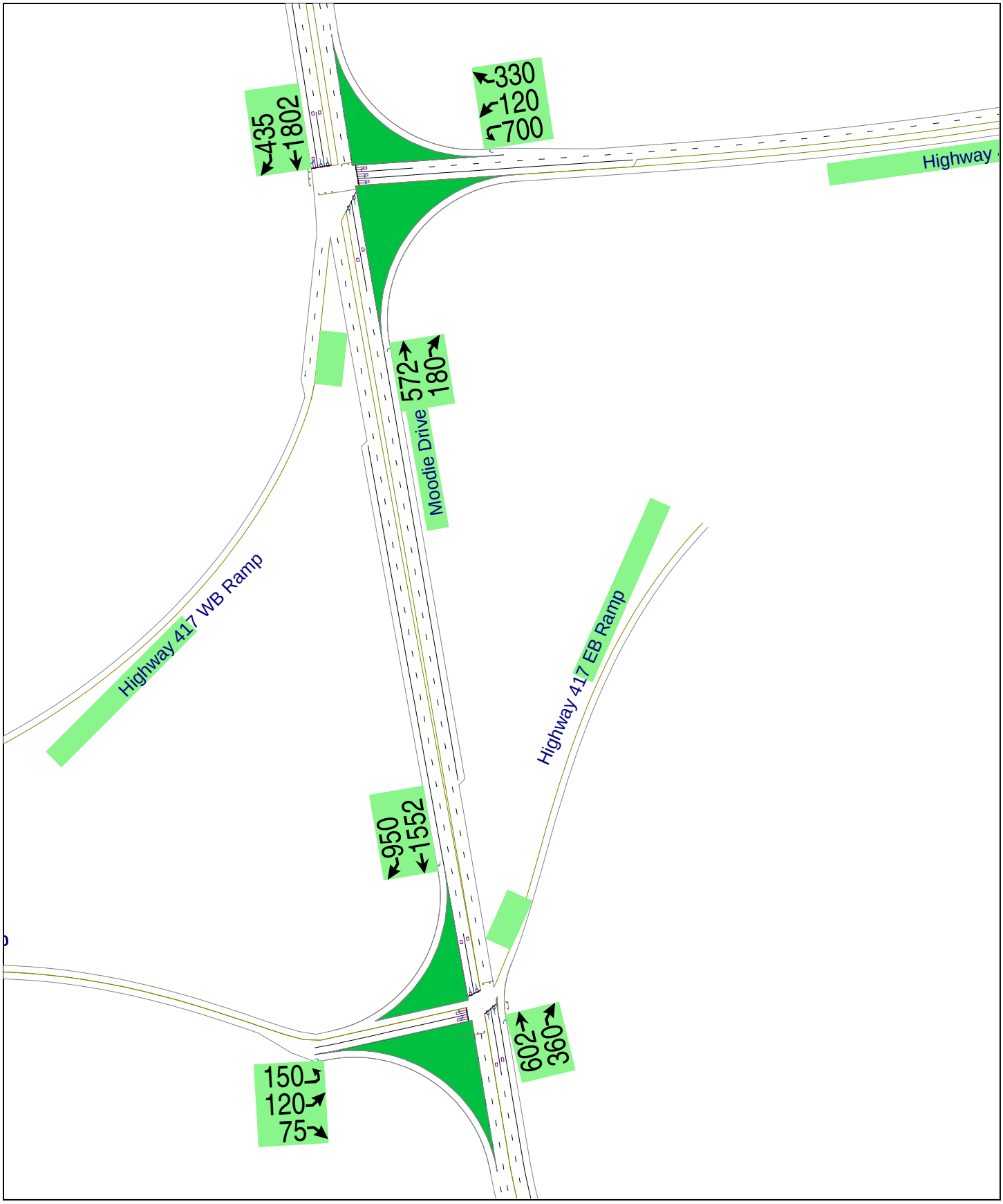
Intersection Summary			
Area Type:	Other		
Cycle Length: 70			
Actuated Cycle Length: 70			
Offset: 56 (80%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.87			
Intersection Signal Delay: 9.5		Intersection LOS: A	
Intersection Capacity Utilization 44.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: Highway 417 WB Ramp & Moodie Drive



Moodie Drive - Existing Volumes

2031 PMPKHR
7/15/2010



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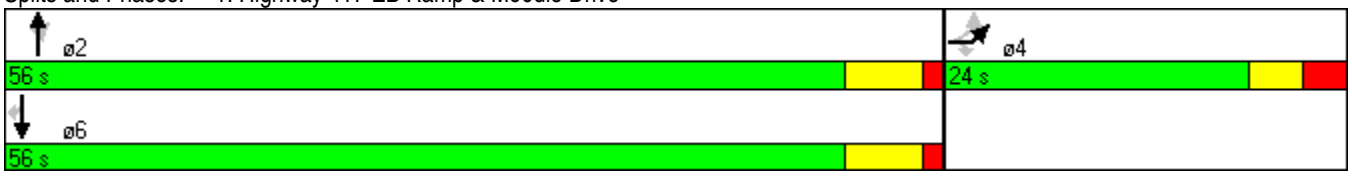
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	150	120	75	0	602	360	0	1552	950	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		300.0	0.0	0.0
Storage Lanes		2	2	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	1647	1729	1502	0	3424	1532	0	3424	1517	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	1647	1729	1502	0	3424	1532	0	3424	1517	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			28			391			1033		
Link Speed (k/h)		48			48			48		48	
Link Distance (m)		493.1			293.3			459.8		293.2	
Travel Time (s)		37.0			22.0			34.5		22.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99
Heavy Vehicles (%)	5%	0%	3%	0%	1%	1%	0%	1%	2%	0%	0%
Adj. Flow (vph)	163	130	82	0	654	391	0	1687	1033	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	163	130	82	0	654	391	0	1687	1033	0	0
Turn Type	Perm		Perm			Perm			Perm		
Protected Phases		4			2			6			
Permitted Phases	4		4			2			6		
Detector Phase	4	4	4		2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0		10.0	10.0		
Minimum Split (s)	24.0	24.0	24.0		24.0	24.0		24.0	24.0		
Total Split (s)	24.0	24.0	24.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0	0.0
Total Split (%)	30.0%	30.0%	30.0%	0.0%	70.0%	70.0%	0.0%	70.0%	70.0%	0.0%	0.0%
Maximum Green (s)	18.0	18.0	18.0		50.0	50.0		50.0	50.0		
Yellow Time (s)	3.3	3.3	3.3		4.6	4.6		4.6	4.6		
All-Red Time (s)	2.7	2.7	2.7		1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0	3.0		
Recall Mode	None	None	None		C-Max	C-Max		C-Max	C-Max		
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0	11.0		5.0	5.0		5.0	5.0		
Pedestrian Calls (#/hr)	1	1	1		1	1		1	1		
Act Effct Green (s)	13.5	13.5	13.5		54.5	54.5		54.5	54.5		
Actuated g/C Ratio	0.17	0.17	0.17		0.68	0.68		0.68	0.68		
v/c Ratio	0.59	0.45	0.30		0.28	0.33		0.72	0.76		
Control Delay	39.0	34.1	22.5		5.8	1.5		10.9	4.8		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	39.0	34.1	22.5		5.8	1.5		10.9	4.8		

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D	C	C		A	A		B	A		
Approach Delay		33.7			4.2			8.6			
Approach LOS		C			A			A			
Queue Length 50th (m)	23.3	18.1	7.2		17.2	0.0		70.5	0.0		
Queue Length 95th (m)	38.9	31.4	17.7		29.7	8.9		117.5	12.8		
Internal Link Dist (m)		469.1			269.3			435.8		269.2	
Turn Bay Length (m)			85.0			100.0			300.0		
Base Capacity (vph)	371	389	360		2334	1169		2334	1363		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.44	0.33	0.23		0.28	0.33		0.72	0.76		

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 6 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 9.8 Intersection LOS: A
Intersection Capacity Utilization 67.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 1: Highway 417 EB Ramp & Moodie Drive



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	700	120	330	0	572	180	0	1802	435	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		150.0	80.0	0.0		300.0	0.0		100.0	0.0	0.0
Storage Lanes		1	1	0		1	0		1	0	0
Taper Length (m)		2.5	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	3195	1235	1502	0	3390	1473	0	3424	1532	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	3195	1235	1502	0	3390	1473	0	3424	1532	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			340			186			448		
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		711.5			459.8			276.1		116.5	
Travel Time (s)		25.6			34.5			20.7		8.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92
Heavy Vehicles (%)	5%	40%	3%	0%	2%	5%	0%	1%	1%	0%	0%
Adj. Flow (vph)	722	124	340	0	590	186	0	1858	448	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	722	124	340	0	590	186	0	1858	448	0	0
Turn Type	Prot		Free			Perm			Perm		
Protected Phases	3	8			2			6			
Permitted Phases			Free			2			6		
Detector Phase	3	8			2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0		10.0	10.0		
Minimum Split (s)	15.1	23.1			26.0	26.0		26.0	26.0		
Total Split (s)	29.3	29.3	0.0	0.0	60.7	60.7	0.0	60.7	60.7	0.0	0.0
Total Split (%)	32.6%	32.6%	0.0%	0.0%	67.4%	67.4%	0.0%	67.4%	67.4%	0.0%	0.0%
Maximum Green (s)	24.2	24.2			54.7	54.7		54.7	54.7		
Yellow Time (s)	3.3	3.3			4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8	1.8			1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		
Recall Mode	None	None			C-Max	C-Max		C-Max	C-Max		
Walk Time (s)		7.0			10.0	10.0		10.0	10.0		
Flash Dont Walk (s)		11.0			10.0	10.0		10.0	10.0		
Pedestrian Calls (#/hr)		1			1	1		1	1		
Act Effct Green (s)	23.2	23.2	90.0		55.7	55.7		55.7	55.7		
Actuated g/C Ratio	0.26	0.26	1.00		0.62	0.62		0.62	0.62		
v/c Ratio	0.88	0.39	0.23		0.28	0.19		0.88	0.40		
Control Delay	45.4	31.4	0.4		8.5	1.7		10.4	0.6		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	45.4	31.4	0.4		8.5	1.7		10.4	0.6		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
LOS	D	C	A		A	A		B	A		
Approach Delay		31.0			6.9			8.5			
Approach LOS		C			A			A			
Queue Length 50th (m)	60.7	17.4	0.0		23.3	0.0		87.1	0.0		
Queue Length 95th (m)	#88.5	33.0	0.0		31.8	7.3		m27.5	m0.0		
Internal Link Dist (m)		687.5			435.8			252.1		92.5	
Turn Bay Length (m)	150.0	150.0	80.0			300.0			100.0		
Base Capacity (vph)	859	332	1502		2099	983		2121	1120		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.84	0.37	0.23		0.28	0.19		0.88	0.40		

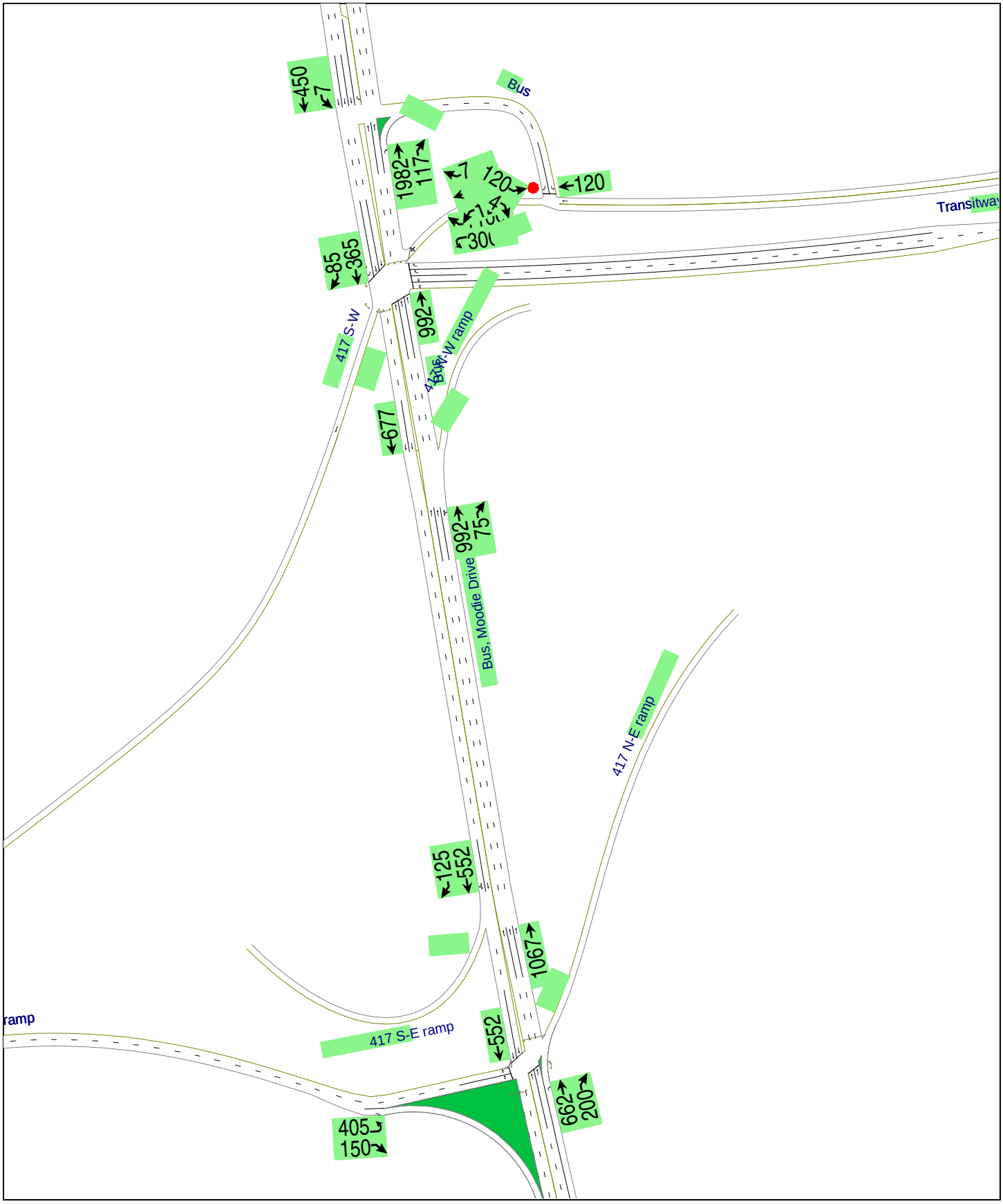
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 16 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 14.4 Intersection LOS: B
Intersection Capacity Utilization 82.9% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Highway 417 WB Ramp &

Moodie Drive - At-grade
Volumes

2031 AMPKHR
7/16/2010



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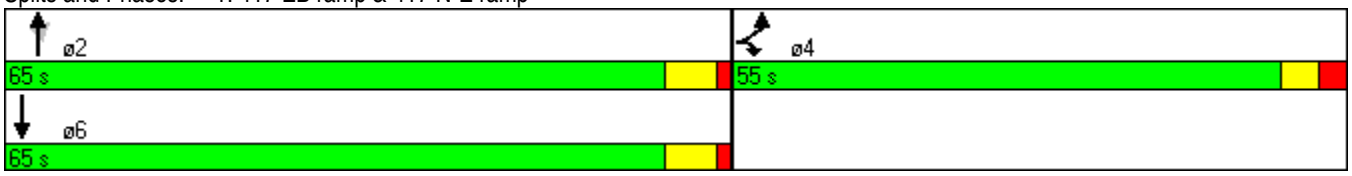
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	405	0	150	0	662	200	0	552	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			222			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	26%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	440	0	163	0	720	217	0	600	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	440	0	163	0	720	217	0	600	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	55.0	0.0	55.0	0.0	65.0	65.0	0.0	65.0	0.0	0.0	0.0
Total Split (%)	45.8%	0.0%	45.8%	0.0%	54.2%	54.2%	0.0%	54.2%	0.0%	0.0%	0.0%
Maximum Green (s)	49.0		49.0		59.0	59.0		59.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	25.9		25.9		82.1	82.1		82.1			
Actuated g/C Ratio	0.22		0.22		0.68	0.68		0.68			
v/c Ratio	0.77		0.32		0.31	0.20		0.27			
Control Delay	53.0		2.9		8.6	1.6		9.7			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	53.0		2.9		8.6	1.6		9.7			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		A		A	A		A			
Approach Delay					7.0			9.7			
Approach LOS					A			A			
Queue Length 50th (m)	50.6		0.0		32.2	0.0		35.5			
Queue Length 95th (m)	63.0		4.9		51.1	8.7		m37.5			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	1087		757		2297	1096		2232			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.40		0.22		0.31	0.20		0.27			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 118 (98%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 35.9% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp



Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	300	1100	992	365	85	12	105	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.993	
Flt Protected	0.950						0.995	
Satd. Flow (prot)	3354	2723	4436	3390	1394	0	899	0
Flt Permitted	0.950						0.995	
Satd. Flow (perm)	3354	2723	4436	3390	1394	0	899	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							2	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	12%	2%	11%	100%	100%	100%
Adj. Flow (vph)	357	1310	1181	435	101	14	125	8
Shared Lane Traffic (%)								
Lane Group Flow (vph)	357	1310	1181	435	101	0	147	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	60.0	60.0	38.0	38.0	38.0	22.0	22.0	0.0
Total Split (%)	50.0%	50.0%	31.7%	31.7%	31.7%	18.3%	18.3%	0.0%
Maximum Green (s)	54.9	54.9	32.0	32.0	32.0	17.0	17.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	54.9	54.9	32.0	32.0	32.0		17.0	
Actuated g/C Ratio	0.46	0.46	0.27	0.27	0.27		0.14	
v/c Ratio	0.23	1.05	1.00	0.48	0.27		1.14	
Control Delay	20.3	72.6	60.6	38.7	38.7		167.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	20.3	72.6	60.6	38.7	38.7		167.5	
LOS	C	E	E	D	D		F	
Approach Delay			60.6	38.7			167.5	
Approach LOS			E	D			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	25.7	~191.3	105.1	32.2	14.1		~40.1	
Queue Length 95th (m)	32.8	#209.0	#114.1	55.5	30.1		#74.0	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	1534	1246	1183	904	372		129	
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	0.23	1.05	1.00	0.48	0.27		1.14	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle: 120
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 62.1 Intersection LOS: E
Intersection Capacity Utilization 82.6% ICU Level of Service E
Analysis Period (min) 15

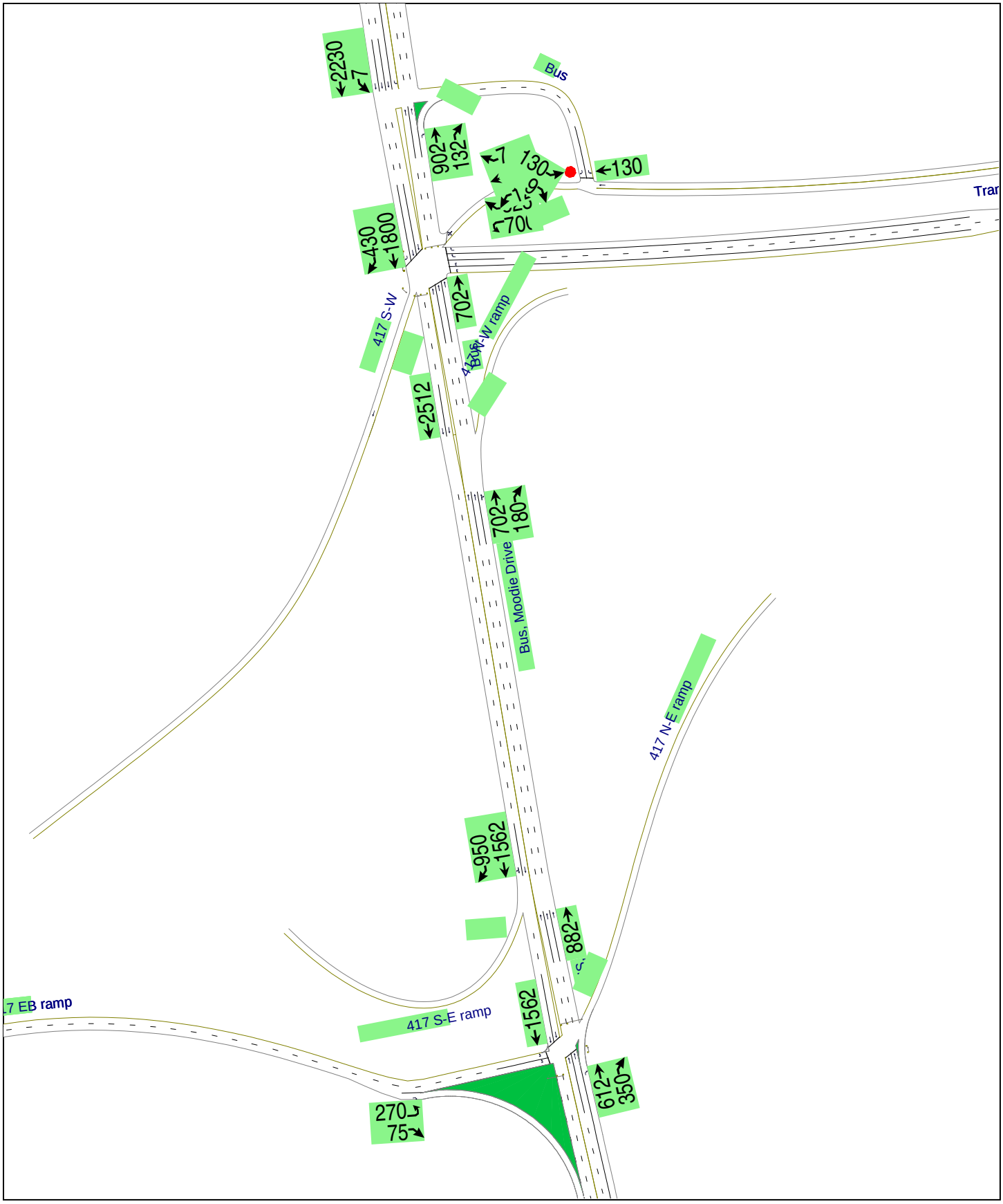
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Moodie Drive - At-grade
Volumes

2031 PMPKHR
7/16/2010



S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Future PM - 2031 Moodie loop.syn

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	270	0	75	0	612	350	0	1562	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			43			380					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	26%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	293	0	82	0	665	380	0	1698	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	293	0	82	0	665	380	0	1698	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	29.0	0.0	29.0	0.0	91.0	91.0	0.0	91.0	0.0	0.0	0.0
Total Split (%)	24.2%	0.0%	24.2%	0.0%	75.8%	75.8%	0.0%	75.8%	0.0%	0.0%	0.0%
Maximum Green (s)	23.0		23.0		85.0	85.0		85.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	18.2		18.2		89.8	89.8		89.8			
Actuated g/C Ratio	0.15		0.15		0.75	0.75		0.75			
v/c Ratio	0.72		0.30		0.26	0.31		0.70			
Control Delay	58.8		26.0		5.4	1.2		0.9			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	58.8		26.0		5.4	1.2		0.9			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	E		C		A	A		A			
Approach Delay					3.9			0.9			
Approach LOS					A			A			
Queue Length 50th (m)	34.2		8.1		22.5	0.0		0.2			
Queue Length 95th (m)	46.9		21.8		34.2	8.0		m10.5			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	510		328		2511	1219		2440			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.57		0.25		0.26	0.31		0.70			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 41 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.72			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 81.0%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	700	325	702	1800	430	12	120	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.993	
Flt Protected	0.950						0.996	
Satd. Flow (prot)	3354	2723	4436	3390	1394	0	900	0
Flt Permitted	0.950						0.996	
Satd. Flow (perm)	3354	2723	4436	3390	1394	0	900	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							2	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	12%	2%	11%	100%	100%	100%
Adj. Flow (vph)	833	387	836	2143	512	14	143	8
Shared Lane Traffic (%)								
Lane Group Flow (vph)	833	387	836	2143	512	0	165	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	29.0	29.0	69.0	69.0	69.0	22.0	22.0	0.0
Total Split (%)	24.2%	24.2%	57.5%	57.5%	57.5%	18.3%	18.3%	0.0%
Maximum Green (s)	23.9	23.9	63.0	63.0	63.0	17.0	17.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	23.9	23.9	63.0	63.0	63.0		17.0	
Actuated g/C Ratio	0.20	0.20	0.52	0.52	0.52		0.14	
v/c Ratio	1.25	0.71	0.36	1.20	0.70		1.28	
Control Delay	163.8	53.2	18.9	119.8	19.3		213.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	163.8	53.2	18.9	119.8	19.3		213.6	
LOS	F	D	B	F	B		F	
Approach Delay			18.9	100.4			213.6	
Approach LOS			B	F			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	~126.0	48.7	38.9	~325.9	43.9		~49.1	
Queue Length 95th (m)	#147.5	62.0	44.6	#327.5	63.5		#84.4	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	668	542	2329	1780	732		129	
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	1.25	0.71	0.36	1.20	0.70		1.28	

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.28			
Intersection Signal Delay: 97.3		Intersection LOS: F	
Intersection Capacity Utilization 94.4%		ICU Level of Service F	
Analysis Period (min) 15			

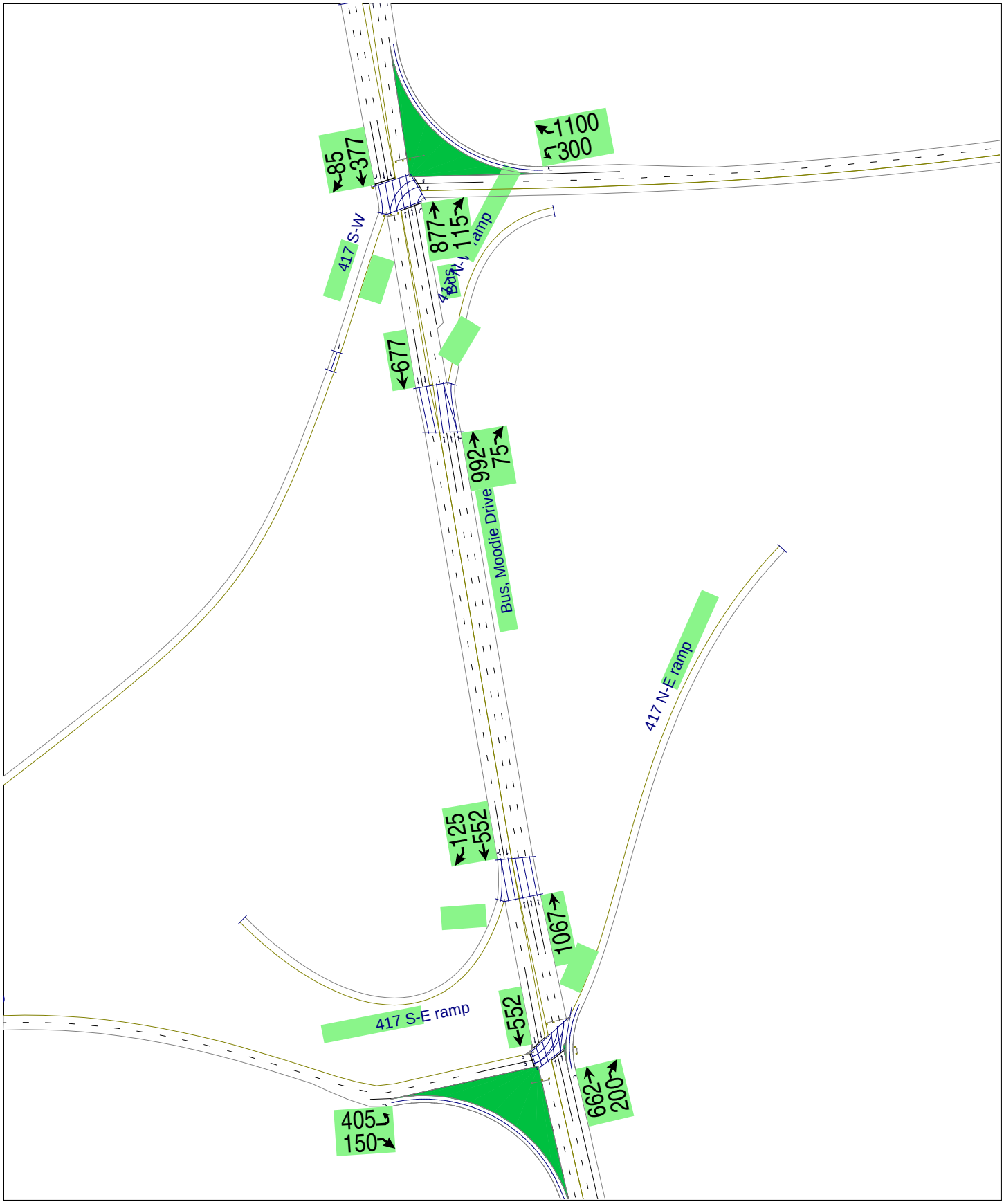
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Moodie Drive - Partially Separated
Volumes

2031 AMPKHR
7/16/2010



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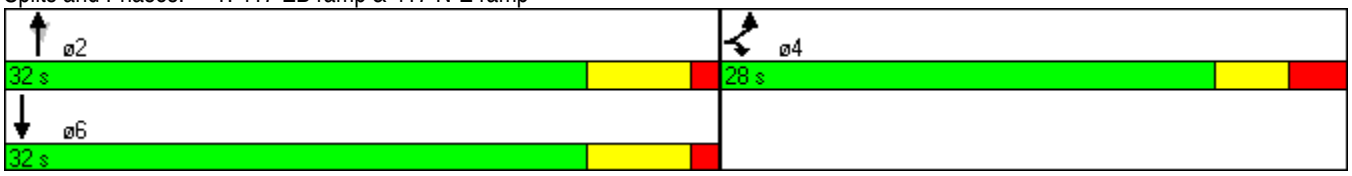
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	405	0	150	0	662	200	0	552	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			178			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	26%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	440	0	163	0	720	217	0	600	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	440	0	163	0	720	217	0	600	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	28.0	0.0	28.0	0.0	32.0	32.0	0.0	32.0	0.0	0.0	0.0
Total Split (%)	46.7%	0.0%	46.7%	0.0%	53.3%	53.3%	0.0%	53.3%	0.0%	0.0%	0.0%
Maximum Green (s)	22.0		22.0		26.0	26.0		26.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	15.3		15.3		32.7	32.7		32.7			
Actuated g/C Ratio	0.26		0.26		0.54	0.54		0.54			
v/c Ratio	0.65		0.31		0.39	0.24		0.34			
Control Delay	24.2		4.2		9.4	2.3		4.5			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	24.2		4.2		9.4	2.3		4.5			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C		A		A	A		A			
Approach Delay					7.8			4.5			
Approach LOS					A			A			
Queue Length 50th (m)	22.2		0.0		21.6	0.0		12.0			
Queue Length 95th (m)	30.6		8.9		39.1	9.1		11.1			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	976		674		1832	918		1780			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.45		0.24		0.39	0.24		0.34			

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 13 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.65			
Intersection Signal Delay: 10.0		Intersection LOS: A	
Intersection Capacity Utilization 35.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

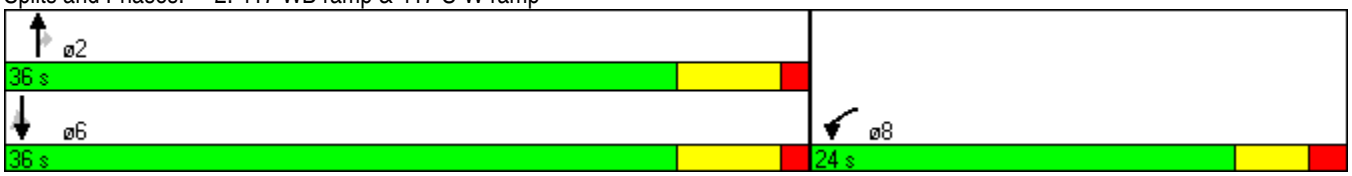


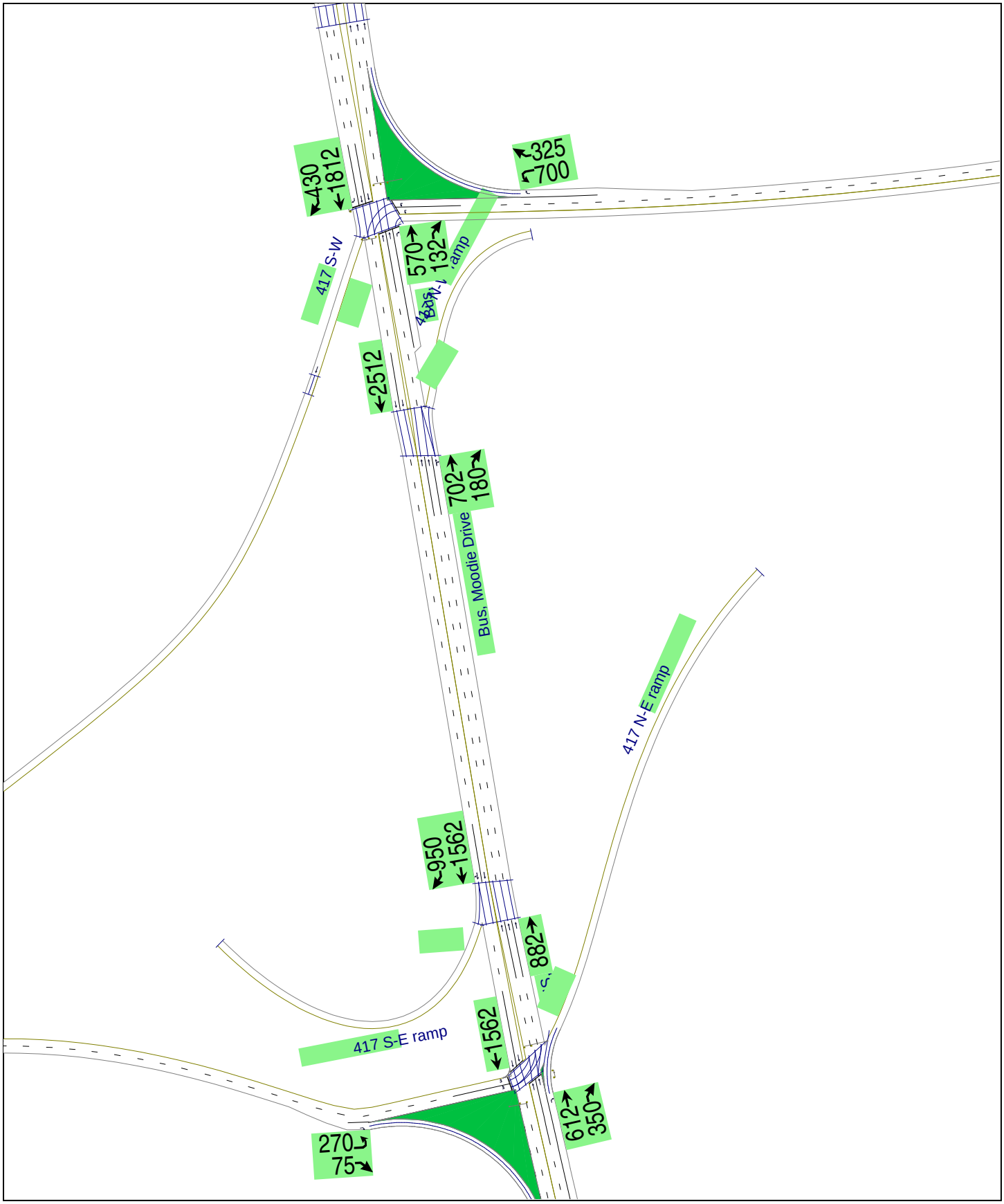
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	300	0	1100	0	877	115	0	377	85	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	774	0	3390	1394	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	774	0	3390	1394	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			463			137					
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			102.2		97.8	
Travel Time (s)		28.3			9.0			7.4		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	2%	11%	0%	0%
Adj. Flow (vph)	357	0	1310	0	1044	137	0	449	101	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	357	0	1310	0	1044	137	0	449	101	0	0
Turn Type	custom		Free			Perm			Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free			2			6		
Detector Phase	8				2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0	10.0		10.0	10.0		
Minimum Split (s)	23.1				26.0	26.0		26.0	26.0		
Total Split (s)	24.0	0.0	0.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0	0.0
Total Split (%)	40.0%	0.0%	0.0%	0.0%	60.0%	60.0%	0.0%	60.0%	60.0%	0.0%	0.0%
Maximum Green (s)	18.9				30.0	30.0		30.0	30.0		
Yellow Time (s)	3.3				4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8				1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0		
Recall Mode	None				C-Max	C-Max		None	None		
Act Effct Green (s)	11.9		60.0		37.0	37.0		37.0	37.0		
Actuated g/C Ratio	0.20		1.00		0.62	0.62		0.62	0.62		
v/c Ratio	0.54		0.85		0.49	0.26		0.22	0.12		
Control Delay	24.3		7.0		7.5	3.5		5.9	5.6		
Queue Delay	0.0		0.0		0.0	0.0		0.0	0.0		
Total Delay	24.3		7.0		7.5	3.5		5.9	5.6		
LOS	C		A		A	A		A	A		
Approach Delay					7.1			5.8			
Approach LOS					A			A			

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	18.4		0.0		32.0	1.0		14.8	6.1		
Queue Length 95th (m)	25.1		0.0		47.7	7.4		25.7	14.0		
Internal Link Dist (m)		761.2			100.9			78.2		73.8	
Turn Bay Length (m)			100.0			60.0					
Base Capacity (vph)	1057		1547		2130	529		2088	859		
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	0.34		0.85		0.49	0.26		0.22	0.12		

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 8.7		Intersection LOS: A	
Intersection Capacity Utilization 43.0%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp




430
1812
325
700
570
132
417 S-W ramp
Bus. Moodie Drive
2512
702
180
417 N-E ramp
950
1562
882
417 S-E ramp
1562
612
350
270
75

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	270	0	75	0	612	350	0	1562	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2329	0	1532	0	3390	1547	0	3458	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2329	0	1532	0	3390	1547	0	3458	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			38			380					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	44%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	293	0	82	0	665	380	0	1698	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	293	0	82	0	665	380	0	1698	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	32.0	0.0	32.0	0.0	88.0	88.0	0.0	88.0	0.0	0.0	0.0
Total Split (%)	26.7%	0.0%	26.7%	0.0%	73.3%	73.3%	0.0%	73.3%	0.0%	0.0%	0.0%
Maximum Green (s)	26.0		26.0		82.0	82.0		82.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	20.2		20.2		87.8	87.8		87.8			
Actuated g/C Ratio	0.17		0.17		0.73	0.73		0.73			
v/c Ratio	0.75		0.28		0.27	0.31		0.67			
Control Delay	59.1		26.5		6.1	1.3		7.1			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	59.1		26.5		6.1	1.3		7.1			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	E		C		A	A		A			
Approach Delay					4.3			7.1			
Approach LOS					A			A			
Queue Length 50th (m)	34.1		9.0		24.2	0.0		69.4			
Queue Length 95th (m)	46.5		22.1		37.6	8.8		m98.4			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	505		362		2481	1234		2530			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.58		0.23		0.27	0.31		0.67			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 23 (19%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 81.0% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	700	0	325	0	570	132	0	1812	430	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	774	0	3458	1547	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	774	0	3458	1547	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			514			157					
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			102.2		97.8	
Travel Time (s)		28.3			9.0			7.4		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Adj. Flow (vph)	833	0	387	0	679	157	0	2157	512	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	833	0	387	0	679	157	0	2157	512	0	0
Turn Type	custom		Free			Perm			Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free			2			6		
Detector Phase	8				2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0	10.0		10.0	10.0		
Minimum Split (s)	23.1				26.0	26.0		26.0	26.0		
Total Split (s)	37.0	0.0	0.0	0.0	83.0	83.0	0.0	83.0	83.0	0.0	0.0
Total Split (%)	30.8%	0.0%	0.0%	0.0%	69.2%	69.2%	0.0%	69.2%	69.2%	0.0%	0.0%
Maximum Green (s)	31.9				77.0	77.0		77.0	77.0		
Yellow Time (s)	3.3				4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8				1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0		
Recall Mode	None				C-Max	C-Max		None	None		
Act Effct Green (s)	31.4		120.0		77.5	77.5		77.5	77.5		
Actuated g/C Ratio	0.26		1.00		0.65	0.65		0.65	0.65		
v/c Ratio	0.95		0.25		0.30	0.28		0.97	0.51		
Control Delay	63.8		0.4		6.8	1.4		24.0	10.0		
Queue Delay	0.0		0.0		0.0	0.0		0.0	0.0		
Total Delay	63.8		0.4		6.8	1.4		24.0	10.0		
LOS	E		A		A	A		C	A		
Approach Delay					5.8			21.3			
Approach LOS					A			C			

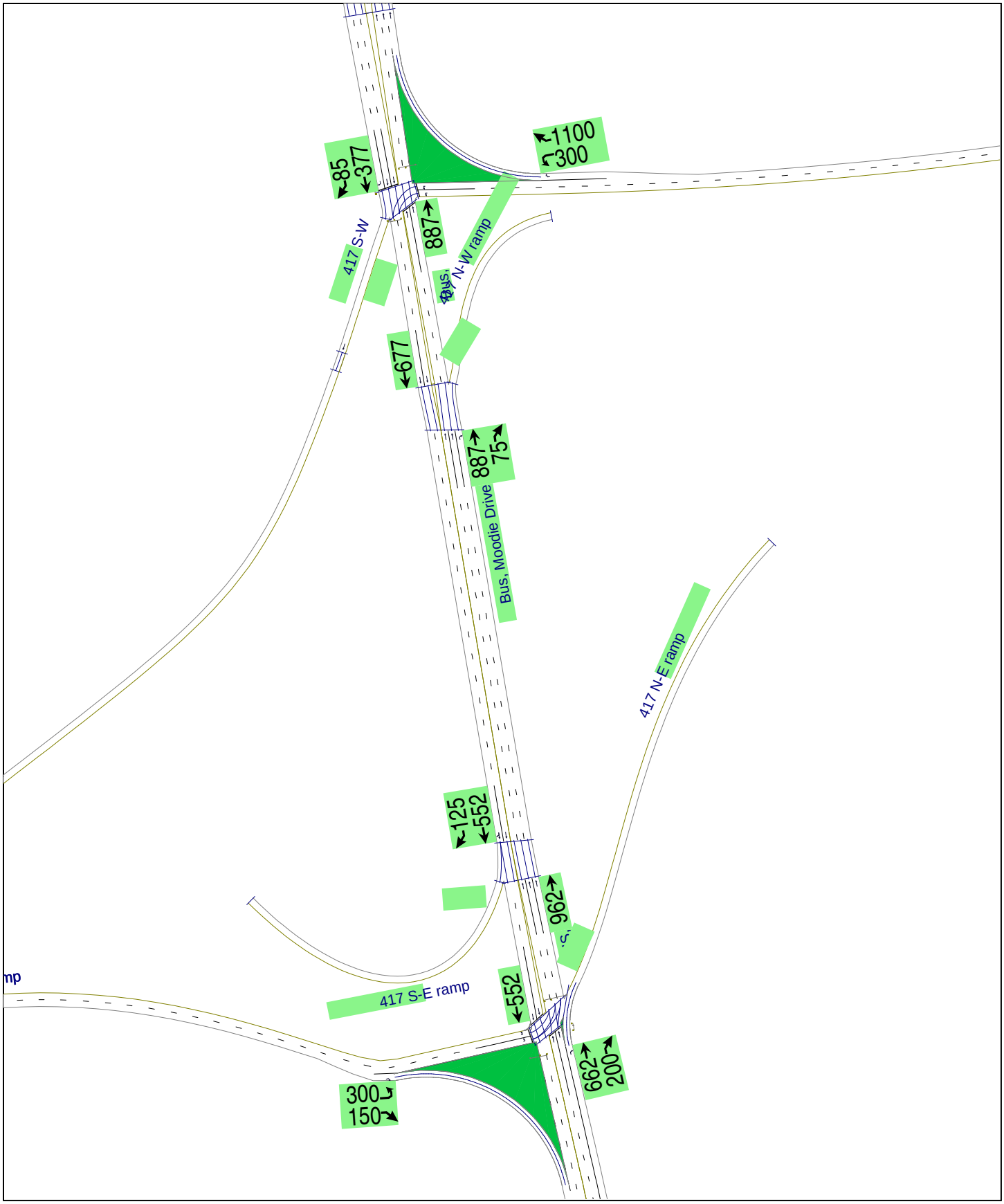
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	99.0		0.0		23.5	0.0		105.3	41.4		
Queue Length 95th (m)	#119.2		0.0		27.2	0.6		105.9	m47.6		
Internal Link Dist (m)		761.2			100.9			78.2		73.8	
Turn Bay Length (m)			100.0			60.0					
Base Capacity (vph)	892		1547		2232	555		2232	999		
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	0.93		0.25		0.30	0.28		0.97	0.51		

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.97			
Intersection Signal Delay: 24.3		Intersection LOS: C	
Intersection Capacity Utilization 82.3%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Moodie Drive - Separated
Volumes

2031 AMPKHR
7/16/2010



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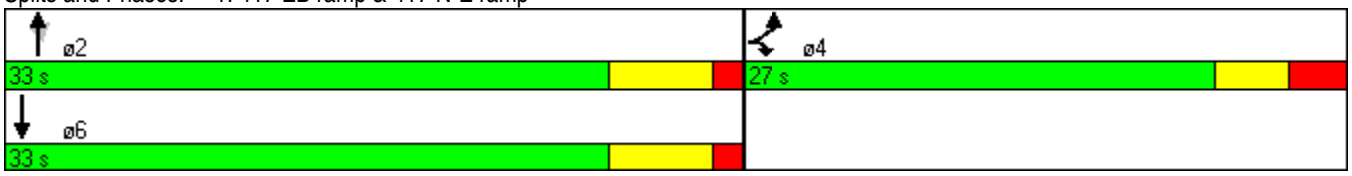
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	300	0	150	0	662	200	0	552	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			190			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	326	0	163	0	720	217	0	600	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	326	0	163	0	720	217	0	600	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	27.0	0.0	27.0	0.0	33.0	33.0	0.0	33.0	0.0	0.0	0.0
Total Split (%)	45.0%	0.0%	45.0%	0.0%	55.0%	55.0%	0.0%	55.0%	0.0%	0.0%	0.0%
Maximum Green (s)	21.0		21.0		27.0	27.0		27.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	12.3		12.3		35.7	35.7		35.7			
Actuated g/C Ratio	0.20		0.20		0.60	0.60		0.60			
v/c Ratio	0.47		0.35		0.36	0.22		0.31			
Control Delay	22.8		4.6		7.5	1.9		3.9			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	22.8		4.6		7.5	1.9		3.9			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C		A		A	A		A			
Approach Delay					6.2			3.9			
Approach LOS					A			A			
Queue Length 50th (m)	16.8		0.0		17.4	0.0		11.0			
Queue Length 95th (m)	23.0		8.4		35.7	8.3		13.5			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	1174		660		1998	982		1941			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.28		0.25		0.36	0.22		0.31			

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 16 (27%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.47			
Intersection Signal Delay: 8.0		Intersection LOS: A	
Intersection Capacity Utilization 35.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

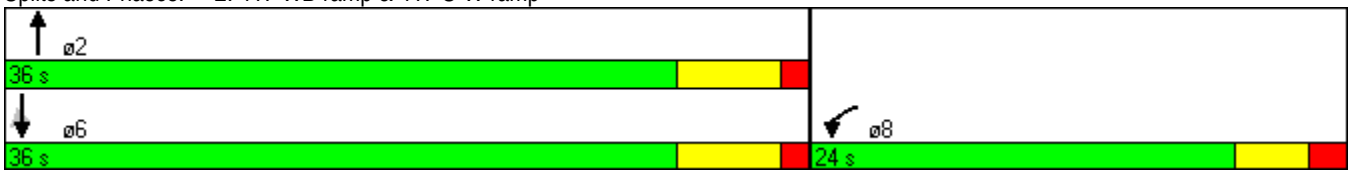


Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	300	0	1100	0	887	0	0	377	85	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		0	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850						0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	0	0	3390	1394	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	0	0	3390	1394	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			461								
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			102.2		97.8	
Travel Time (s)		28.3			9.0			7.4		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	2%	11%	0%	0%
Adj. Flow (vph)	357	0	1310	0	1056	0	0	449	101	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	357	0	1310	0	1056	0	0	449	101	0	0
Turn Type	custom		Free						Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free						6		
Detector Phase	8				2			6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0			10.0	10.0		
Minimum Split (s)	23.1				26.0			26.0	26.0		
Total Split (s)	24.0	0.0	0.0	0.0	36.0	0.0	0.0	36.0	36.0	0.0	0.0
Total Split (%)	40.0%	0.0%	0.0%	0.0%	60.0%	0.0%	0.0%	60.0%	60.0%	0.0%	0.0%
Maximum Green (s)	18.9				30.0			30.0	30.0		
Yellow Time (s)	3.3				4.6			4.6	4.6		
All-Red Time (s)	1.8				1.4			1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	4.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0			3.0	3.0		
Recall Mode	None				C-Max			None	None		
Act Effct Green (s)	11.9		60.0		37.0			37.0	37.0		
Actuated g/C Ratio	0.20		1.00		0.62			0.62	0.62		
v/c Ratio	0.54		0.85		0.50			0.22	0.12		
Control Delay	24.3		7.0		7.3			5.9	5.6		
Queue Delay	0.0		0.0		0.0			0.0	0.0		
Total Delay	24.3		7.0		7.3			5.9	5.6		
LOS	C		A		A			A	A		
Approach Delay					7.3			5.8			
Approach LOS					A			A			

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	18.4		0.0		32.4			14.8	6.1		
Queue Length 95th (m)	25.1		0.0		47.7			25.7	14.0		
Internal Link Dist (m)		761.2			100.9			78.2		73.8	
Turn Bay Length (m)			100.0								
Base Capacity (vph)	1057		1547		2130			2088	859		
Starvation Cap Reductn	0		0		0			0	0		
Spillback Cap Reductn	0		0		0			0	0		
Storage Cap Reductn	0		0		0			0	0		
Reduced v/c Ratio	0.34		0.85		0.50			0.22	0.12		

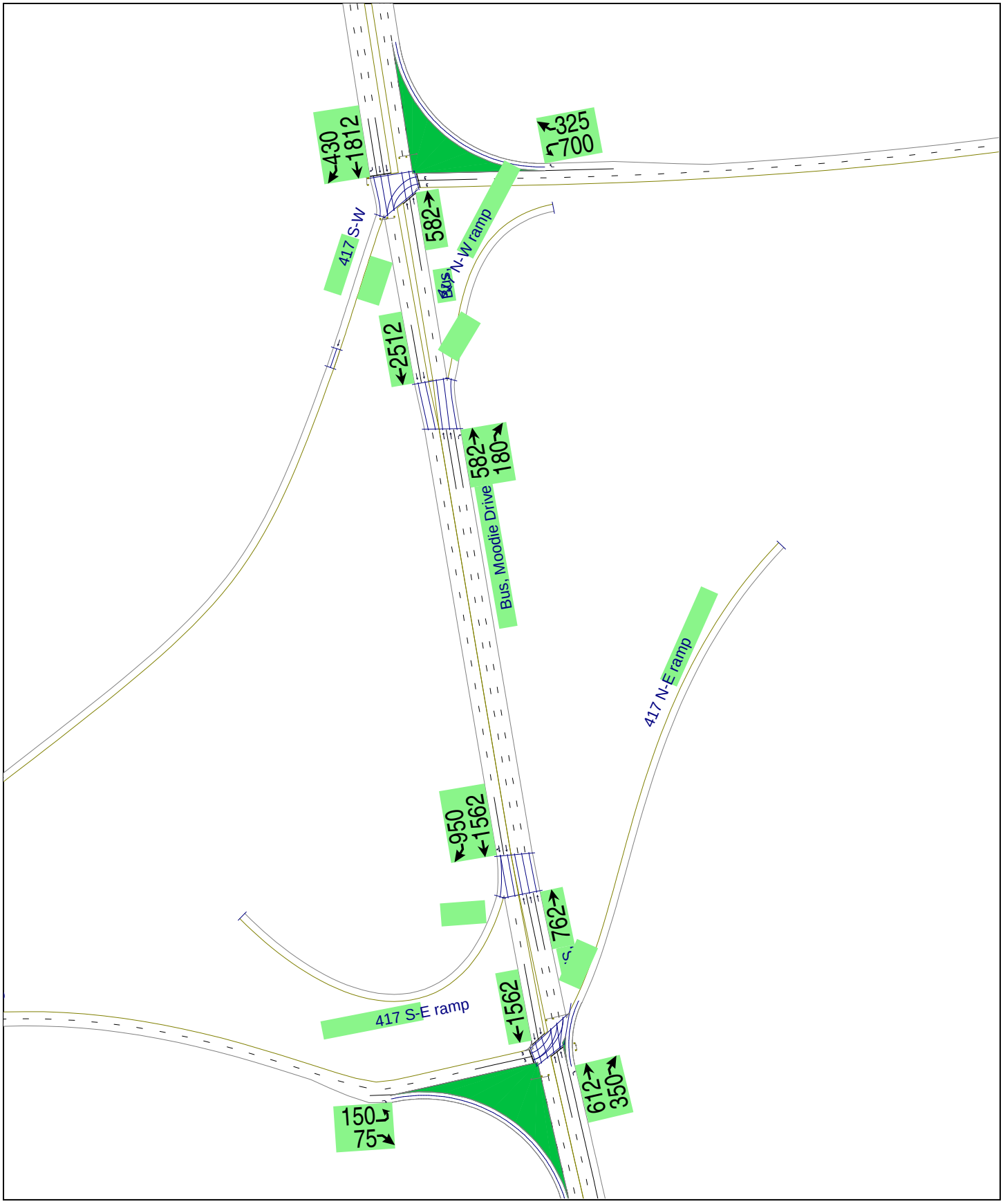
Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 8.8		Intersection LOS: A	
Intersection Capacity Utilization 30.9%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp



Moodie Drive - Separated
Volumes

2031 PMPKHR
7/16/2010



S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Future PM - 2031 Moodie Ultimate.syn

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	150	0	75	0	612	350	0	1562	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			49			380					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	163	0	82	0	665	380	0	1698	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	163	0	82	0	665	380	0	1698	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	26.0	0.0	26.0	0.0	94.0	94.0	0.0	94.0	0.0	0.0	0.0
Total Split (%)	21.7%	0.0%	21.7%	0.0%	78.3%	78.3%	0.0%	78.3%	0.0%	0.0%	0.0%
Maximum Green (s)	20.0		20.0		88.0	88.0		88.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	12.3		12.3		95.7	95.7		95.7			
Actuated g/C Ratio	0.10		0.10		0.80	0.80		0.80			
v/c Ratio	0.47		0.41		0.25	0.30		0.65			
Control Delay	54.8		29.1		3.5	1.0		4.2			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	54.8		29.1		3.5	1.0		4.2			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		C		A	A		A			
Approach Delay					2.6			4.2			
Approach LOS					A			A			
Queue Length 50th (m)	19.1		7.3		15.8	0.0		53.7			
Queue Length 95th (m)	28.2		21.5		28.3	6.6		m69.6			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	559		296		2676	1274		2600			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.29		0.28		0.25	0.30		0.65			

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 20 (17%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 7.1 Intersection LOS: A
Intersection Capacity Utilization 81.0% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	700	0	325	0	582	0	0	1812	430	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		0	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850						0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	0	0	3390	1394	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	0	0	3390	1394	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			509								
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			276.1		97.8	
Travel Time (s)		28.3			9.0			19.9		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	2%	11%	0%	0%
Adj. Flow (vph)	833	0	387	0	693	0	0	2157	512	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	833	0	387	0	693	0	0	2157	512	0	0
Turn Type	custom		Free						Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free						6		
Detector Phase	8				2			6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0			10.0	10.0		
Minimum Split (s)	23.1				26.0			26.0	26.0		
Total Split (s)	37.0	0.0	0.0	0.0	83.0	0.0	0.0	83.0	83.0	0.0	0.0
Total Split (%)	30.8%	0.0%	0.0%	0.0%	69.2%	0.0%	0.0%	69.2%	69.2%	0.0%	0.0%
Maximum Green (s)	31.9				77.0			77.0	77.0		
Yellow Time (s)	3.3				4.6			4.6	4.6		
All-Red Time (s)	1.8				1.4			1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	4.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0			3.0	3.0		
Recall Mode	None				C-Max			None	None		
Act Effct Green (s)	31.4		120.0		77.5			77.5	77.5		
Actuated g/C Ratio	0.26		1.00		0.65			0.65	0.65		
v/c Ratio	0.95		0.25		0.31			0.99	0.57		
Control Delay	63.8		0.4		7.9			28.0	10.8		
Queue Delay	0.0		0.0		0.0			0.0	0.0		
Total Delay	63.8		0.4		7.9			28.0	10.8		
LOS	E		A		A			C	B		
Approach Delay					7.9			24.7			
Approach LOS					A			C			

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	99.0		0.0		28.0			254.7	42.2		
Queue Length 95th (m)	#119.2		0.0		32.3			106.1	m49.4		
Internal Link Dist (m)		761.2			100.9			252.1		73.8	
Turn Bay Length (m)			100.0								
Base Capacity (vph)	892		1547		2232			2188	899		
Starvation Cap Reductn	0		0		0			0	0		
Spillback Cap Reductn	0		0		0			0	0		
Storage Cap Reductn	0		0		0			0	0		
Reduced v/c Ratio	0.93		0.25		0.31			0.99	0.57		

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 27.2		Intersection LOS: C	
Intersection Capacity Utilization 76.6%		ICU Level of Service D	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			
m Volume for 95th percentile queue is metered by upstream signal.			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Memo To: R. Hunton
Date: August 5, 2010

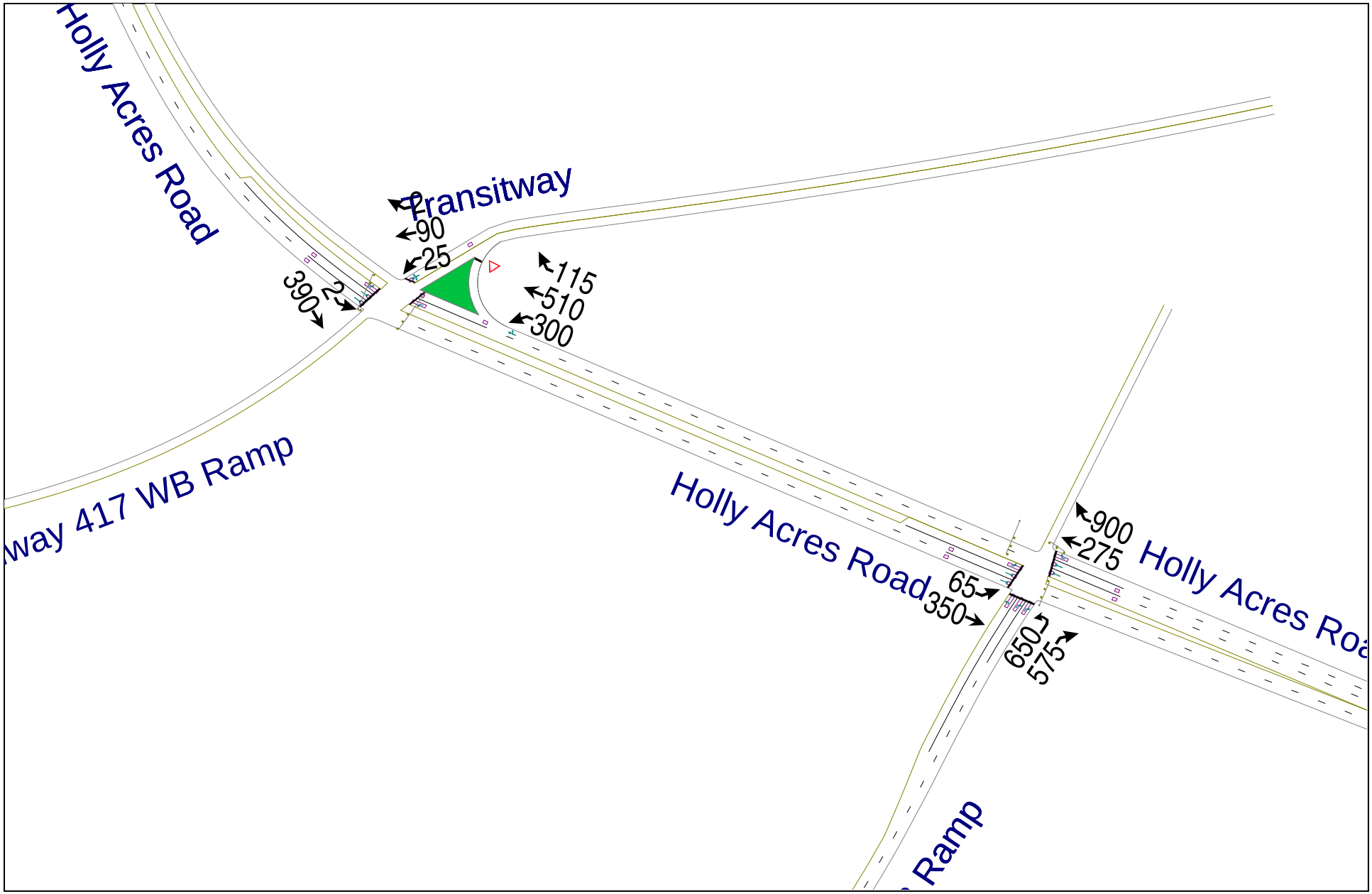
Appendix C – Synchro™ Level of Service Calculation Sheets (2021 Interim Year)

- 2021 Holly Acres
  - Existing configuration (AM/PM)
  - At-grade (AM/PM)

- 2021 Moodie Drive
  - Existing configuration (AM/PM)
  - At-grade (AM/PM)
  - At-grade (PM with 3 Southbound Lanes)
  - Partially-separated (AM/PM)

Note:

The Synchro LOS calculations for the existing volumes with existing signal timings are included as part of the "West Transitway Existing Transit and Transportation Review" dated February 2010.


Holly Acres Road
Transitway
0
90
25
115
510
300
390
2
way 417 WB Ramp
Holly Acres Road
65
350
900
275
650
575
Holly Acres Roa
Ramp

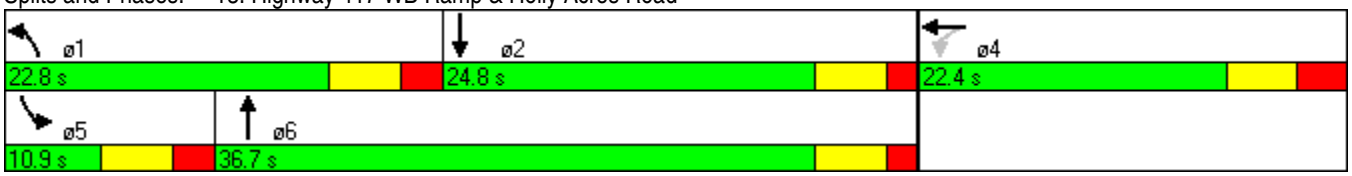
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	25	90	2	300	510	115	2	390	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	0.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5		2.5	2.5		2.5	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00
Frt					0.998			0.972				
Flt Protected					0.989		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	898	0	1729	1494	0	864	3458	0
Flt Permitted					0.989		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	898	0	1729	1494	0	864	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			21				
Link Speed (k/h)		100			48			48			48	
Link Distance (m)		385.7			377.7			290.9			336.3	
Travel Time (s)		13.9			28.3			21.8			25.2	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Heavy Vehicles (%)	0%	0%	0%	100%	100%	100%	0%	0%	100%	100%	0%	0%
Adj. Flow (vph)	0	0	0	26	94	2	312	531	120	2	406	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	122	0	312	651	0	2	406	0
Turn Type				Perm			Prot			Prot		
Protected Phases					4		1	6		5	2	
Permitted Phases				4								
Detector Phase				4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)				22.4	22.4		10.9	21.4		10.9	21.4	
Total Split (s)	0.0	0.0	0.0	22.4	22.4	0.0	22.8	36.7	0.0	10.9	24.8	0.0
Total Split (%)	0.0%	0.0%	0.0%	32.0%	32.0%	0.0%	32.6%	52.4%	0.0%	15.6%	35.4%	0.0%
Maximum Green (s)				16.0	16.0		16.9	31.3		5.0	19.4	
Yellow Time (s)				3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)				2.7	2.7		2.2	1.7		2.2	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.4	6.4	4.0	5.9	5.4	4.0	5.9	5.4	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		None	C-Max		None	C-Max	
Walk Time (s)				5.0	5.0			5.0			5.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)					13.7		15.9	46.7		5.3	26.0	
Actuated g/C Ratio					0.20		0.23	0.67		0.08	0.37	
v/c Ratio					0.69		0.80	0.65		0.03	0.32	
Control Delay					46.7		39.4	16.1		31.5	19.3	
Queue Delay					0.0		0.0	0.0		0.0	0.0	
Total Delay					46.7		39.4	16.1		31.5	19.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					D		D	B		C	B	
Approach Delay					46.7			23.6			19.3	
Approach LOS					D			C			B	
Queue Length 50th (m)					14.5		43.8	27.6		0.2	22.7	
Queue Length 95th (m)					#34.7		m52.5	m#106.9		2.2	34.5	
Internal Link Dist (m)		361.7			353.7			266.9			312.3	
Turn Bay Length (m)										70.0		
Base Capacity (vph)					206		423	1003		66	1284	
Starvation Cap Reductn					0		0	0		0	0	
Spillback Cap Reductn					0		0	0		0	0	
Storage Cap Reductn					0		0	0		0	0	
Reduced v/c Ratio					0.59		0.74	0.65		0.03	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 51 (73%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 24.4 Intersection LOS: C
Intersection Capacity Utilization 63.0% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Highway 417 WB Ramp & Holly Acres Road



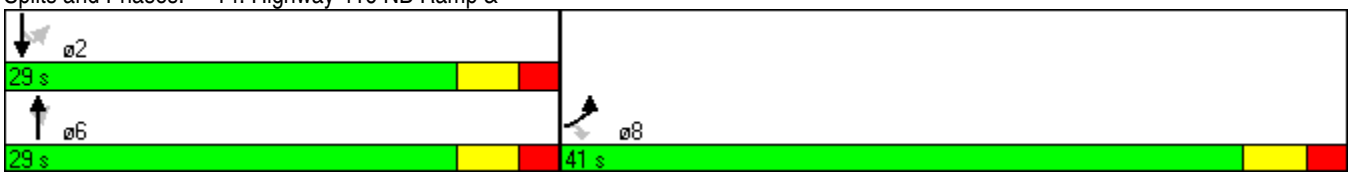
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	650	0	575	0	275	900	65	350	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		75.0	0.0	0.0		0.0	50.0		0.0	0.0	0.0
Storage Lanes		1	2	0		1	1		0	0	0
Taper Length (m)		40.0	2.5	2.5		2.5	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1465	0	2723	0	3202	1547	1729	3202	0	0	0
Flt Permitted	0.950						0.569				
Satd. Flow (perm)	1465	0	2723	0	3202	1547	1036	3202	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			439			978					
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		303.5			156.2			290.9		125.4	
Travel Time (s)		10.9			11.7			21.8		9.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	18%	0%	0%	0%	8%	0%	0%	8%	0%	2%	2%
Adj. Flow (vph)	707	0	625	0	299	978	71	380	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	707	0	625	0	299	978	71	380	0	0	0
Turn Type	Prot		custom			Perm	Perm				
Protected Phases	8				6			2			
Permitted Phases			8			6	2				
Detector Phase	8		8		6	6	2	2			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0	10.0	10.0			
Minimum Split (s)	29.5		29.5		26.5	26.5	26.5	26.5			
Total Split (s)	41.0	0.0	41.0	0.0	29.0	29.0	29.0	29.0	0.0	0.0	0.0
Total Split (%)	58.6%	0.0%	58.6%	0.0%	41.4%	41.4%	41.4%	41.4%	0.0%	0.0%	0.0%
Maximum Green (s)	35.5		35.5		23.5	23.5	23.5	23.5			
Yellow Time (s)	3.3		3.3		3.3	3.3	3.3	3.3			
All-Red Time (s)	2.2		2.2		2.2	2.2	2.2	2.2			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	4.0	5.5	4.0	5.5	5.5	5.5	5.5	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0			
Recall Mode	None		None		C-Max	C-Max	C-Max	C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	17.0		17.0		14.0	14.0	14.0	14.0			
Pedestrian Calls (#/hr)	0		0		0	0	0	0			
Act Effct Green (s)	35.1		35.1		23.9	23.9	23.9	23.9			
Actuated g/C Ratio	0.50		0.50		0.34	0.34	0.34	0.34			
v/c Ratio	0.96		0.39		0.27	0.83	0.20	0.35			
Control Delay	44.7		3.8		17.8	9.6	4.0	5.1			
Queue Delay	0.0		0.0		0.0	0.0	0.0	0.0			
Total Delay	44.7		3.8		17.8	9.6	4.0	5.1			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		A		B	A	A	A			
Approach Delay					11.5			4.9			
Approach LOS					B			A			
Queue Length 50th (m)	82.3		6.8		14.8	0.0	0.9	2.4			
Queue Length 95th (m)	#152.7		15.5		23.7	#79.4	m1.8	3.5			
Internal Link Dist (m)		279.5			132.2			266.9		101.4	
Turn Bay Length (m)	75.0						50.0				
Base Capacity (vph)	743		1597		1093	1172	354	1093			
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	0.95		0.39		0.27	0.83	0.20	0.35			

Intersection Summary

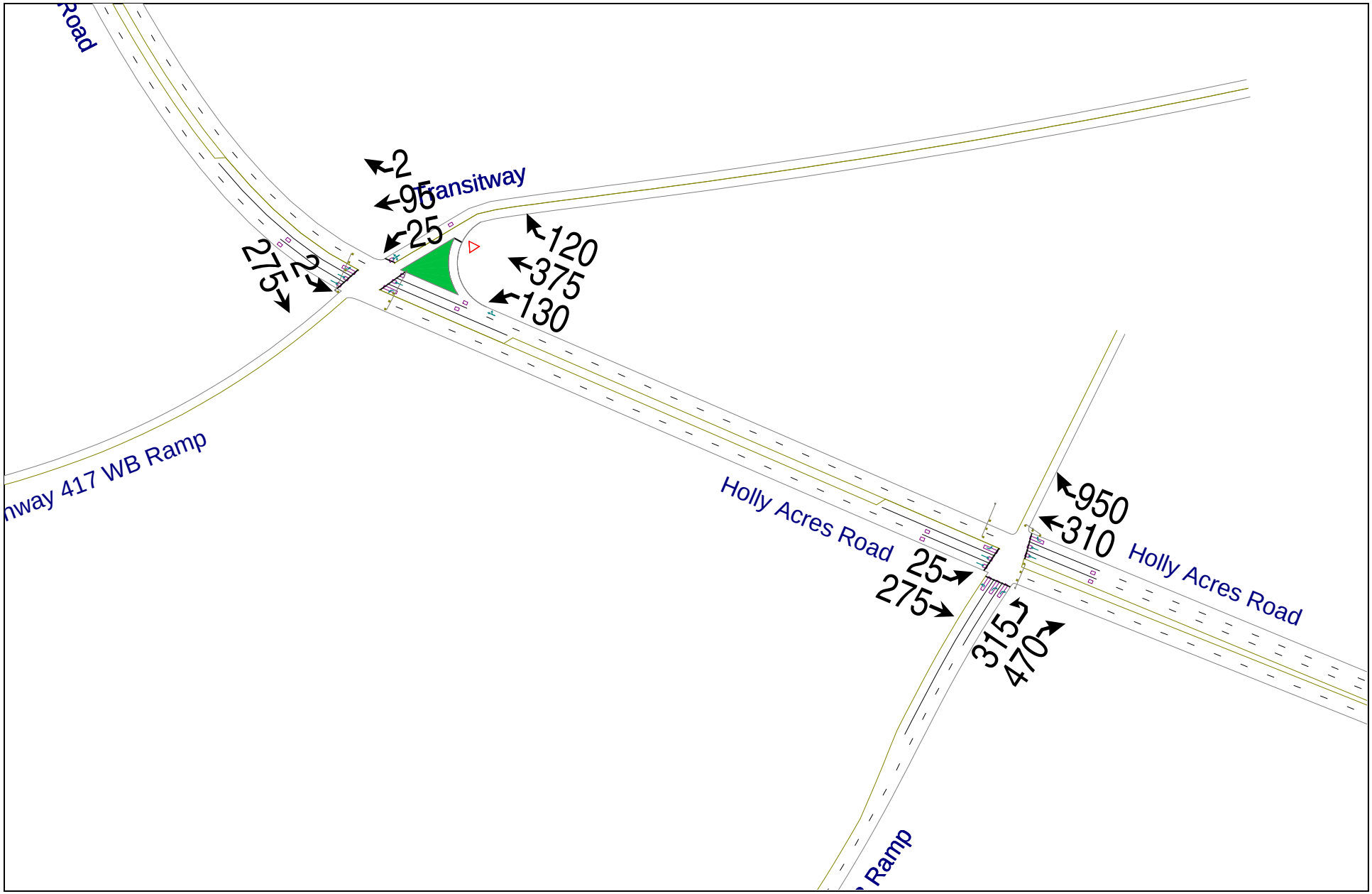
Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 16.6 Intersection LOS: B
Intersection Capacity Utilization 76.3% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 416 NB Ramp &



Holly Acres Road - Existing
Volumes

2021 PMPKHR
7/15/2010



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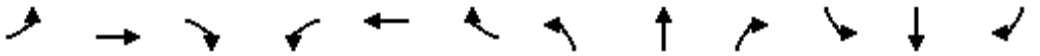


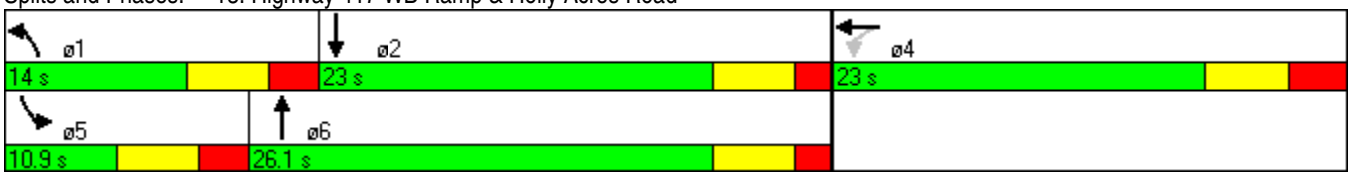
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	25	95	2	130	375	120	2	275	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	0.0		0.0	0.0		0.0	50.0		0.0	70.0		0.0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (m)	2.5		2.5	2.5		2.5	2.5		2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt					0.998			0.964				
Flt Protected					0.990		0.950			0.950		
Satd. Flow (prot)	0	0	0	0	899	0	1729	2685	0	864	3458	0
Flt Permitted					0.990		0.950			0.950		
Satd. Flow (perm)	0	0	0	0	899	0	1729	2685	0	864	3458	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					1			78				
Link Speed (k/h)		100			48			48			48	
Link Distance (m)		385.7			377.7			290.9			592.4	
Travel Time (s)		13.9			28.3			21.8			44.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	0%	100%	100%	100%	0%	0%	100%	100%	0%	0%
Adj. Flow (vph)	0	0	0	27	103	2	141	408	130	2	299	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	0	0	132	0	141	538	0	2	299	0
Turn Type				Perm			Prot			Prot		
Protected Phases					4		1	6		5	2	
Permitted Phases				4								
Detector Phase				4	4		1	6		5	2	
Switch Phase												
Minimum Initial (s)				10.0	10.0		5.0	10.0		5.0	10.0	
Minimum Split (s)				22.4	22.4		10.9	21.4		10.9	21.4	
Total Split (s)	0.0	0.0	0.0	23.0	23.0	0.0	14.0	26.1	0.0	10.9	23.0	0.0
Total Split (%)	0.0%	0.0%	0.0%	38.3%	38.3%	0.0%	23.3%	43.5%	0.0%	18.2%	38.3%	0.0%
Maximum Green (s)				16.6	16.6		8.1	20.7		5.0	17.6	
Yellow Time (s)				3.7	3.7		3.7	3.7		3.7	3.7	
All-Red Time (s)				2.7	2.7		2.2	1.7		2.2	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	6.4	6.4	4.0	5.9	5.4	4.0	5.9	5.4	4.0
Lead/Lag							Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)				3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode				None	None		None	C-Max		None	C-Max	
Walk Time (s)				5.0	5.0			5.0			5.0	
Flash Dont Walk (s)				11.0	11.0			11.0			11.0	
Pedestrian Calls (#/hr)				0	0			0			0	
Act Effct Green (s)					13.6		8.3	36.8		5.3	27.2	
Actuated g/C Ratio					0.23		0.14	0.61		0.09	0.45	
v/c Ratio					0.65		0.59	0.32		0.03	0.19	
Control Delay					35.5		32.8	9.6		26.0	14.9	
Queue Delay					0.0		0.0	0.0		0.0	0.0	
Total Delay					35.5		32.8	9.6		26.0	14.9	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS					D		C	A		C	B	
Approach Delay					35.5			14.5			15.0	
Approach LOS					D			B			B	
Queue Length 50th (m)					13.0		16.1	15.5		0.2	13.0	
Queue Length 95th (m)					#27.4		m#30.2	35.2		1.9	21.8	
Internal Link Dist (m)		361.7			353.7			266.9			568.4	
Turn Bay Length (m)							50.0			70.0		
Base Capacity (vph)					249		249	1677		77	1569	
Starvation Cap Reductn					0		0	0		0	0	
Spillback Cap Reductn					0		0	0		0	0	
Storage Cap Reductn					0		0	0		0	0	
Reduced v/c Ratio					0.53		0.57	0.32		0.03	0.19	

Intersection Summary

Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 41 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 17.1 Intersection LOS: B
Intersection Capacity Utilization 42.2% ICU Level of Service A
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Highway 417 WB Ramp & Holly Acres Road



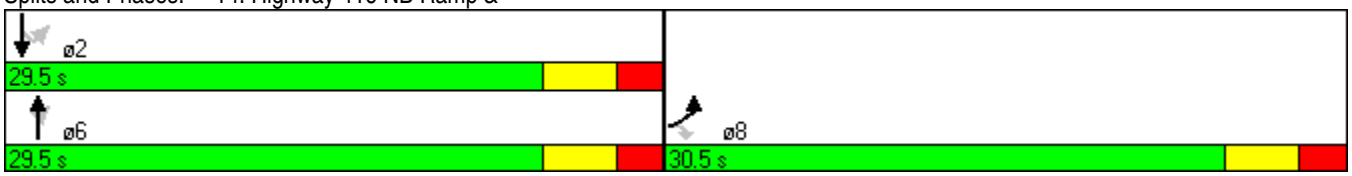
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	315	0	470	0	310	950	25	275	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		75.0	0.0	0.0		0.0	50.0		0.0	0.0	0.0
Storage Lanes		1	2	0		1	1		0	0	0
Taper Length (m)		40.0	2.5	2.5		2.5	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	0.88	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950						0.950				
Satd. Flow (prot)	1262	0	2723	0	3202	1547	1729	3144	0	0	0
Flt Permitted	0.950						0.549				
Satd. Flow (perm)	1262	0	2723	0	3202	1547	999	3144	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			733			1033					
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		303.5			312.5			290.9		105.3	
Travel Time (s)		10.9			23.4			21.8		7.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	37%	0%	0%	0%	8%	0%	0%	10%	0%	2%	2%
Adj. Flow (vph)	342	0	511	0	337	1033	27	299	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	342	0	511	0	337	1033	27	299	0	0	0
Turn Type	Prot		custom			Perm	Perm				
Protected Phases	8				6			2			
Permitted Phases			8			6	2				
Detector Phase	8		8		6	6	2	2			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0	10.0	10.0			
Minimum Split (s)	30.5		30.5		26.5	26.5	26.5	26.5			
Total Split (s)	30.5	0.0	30.5	0.0	29.5	29.5	29.5	29.5	0.0	0.0	0.0
Total Split (%)	50.8%	0.0%	50.8%	0.0%	49.2%	49.2%	49.2%	49.2%	0.0%	0.0%	0.0%
Maximum Green (s)	25.0		25.0		24.0	24.0	24.0	24.0			
Yellow Time (s)	3.3		3.3		3.3	3.3	3.3	3.3			
All-Red Time (s)	2.2		2.2		2.2	2.2	2.2	2.2			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	4.0	5.5	4.0	5.5	5.5	5.5	5.5	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0	3.0	3.0			
Recall Mode	None		None		C-Max	C-Max	C-Max	C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0	7.0	7.0			
Flash Dont Walk (s)	17.0		17.0		14.0	14.0	14.0	14.0			
Pedestrian Calls (#/hr)	0		0		0	0	0	0			
Act Effct Green (s)	20.6		20.6		28.4	28.4	28.4	28.4			
Actuated g/C Ratio	0.34		0.34		0.47	0.47	0.47	0.47			
v/c Ratio	0.79		0.36		0.22	0.81	0.06	0.20			
Control Delay	30.8		0.7		11.0	8.0	2.3	2.7			
Queue Delay	0.0		0.0		0.0	0.0	0.0	0.0			
Total Delay	30.8		0.7		11.0	8.0	2.3	2.7			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C		A		B	A	A	A			
Approach Delay					8.8			2.7			
Approach LOS					A			A			
Queue Length 50th (m)	31.6		0.0		11.3	0.0	0.3	1.7			
Queue Length 95th (m)	54.2		0.0		20.4	#82.9	m0.9	2.7			
Internal Link Dist (m)		279.5			288.5			266.9		81.3	
Turn Bay Length (m)	75.0						50.0				
Base Capacity (vph)	526		1562		1516	1276	473	1488			
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	0.65		0.33		0.22	0.81	0.06	0.20			

Intersection Summary

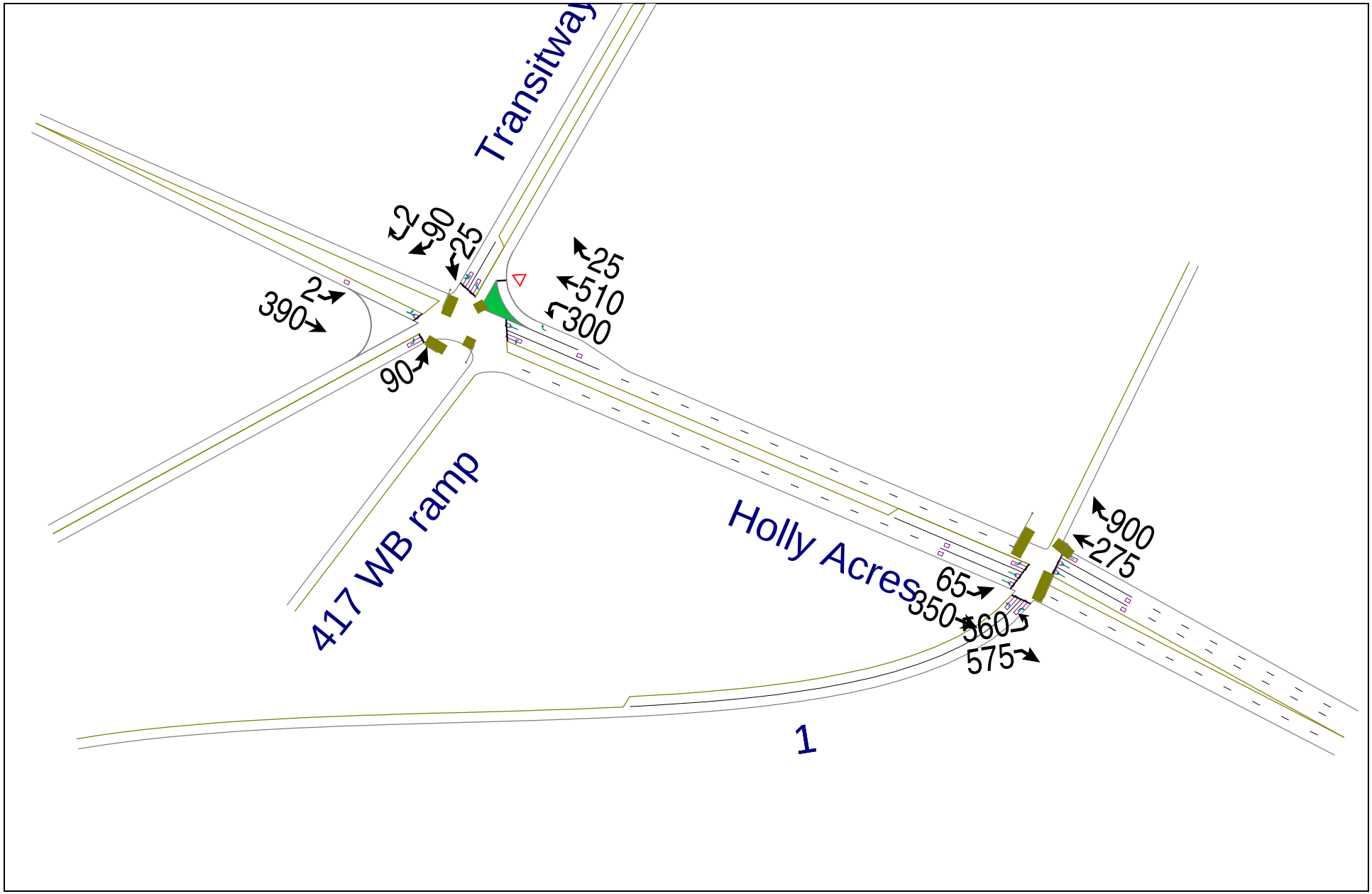
Area Type: Other
Cycle Length: 60
Actuated Cycle Length: 60
Offset: 56 (93%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 9.3 Intersection LOS: A
Intersection Capacity Utilization 79.6% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 14: Highway 416 NB Ramp &



Holly Acres Road - At-grade
Volumes

2021 AMPKHR
7/16/2010



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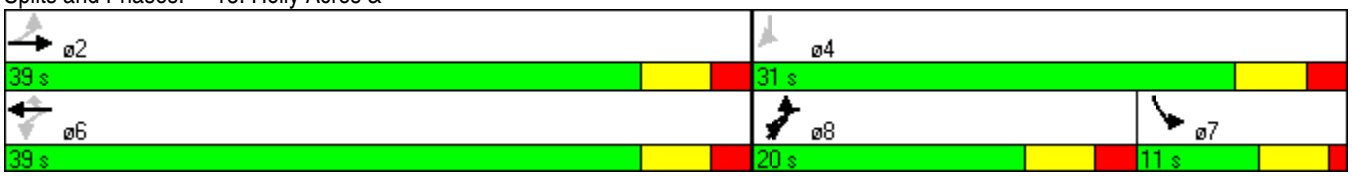
Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
Lane Configurations									
Volume (vph)	2	390	300	510	25	25	90	2	90
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0				20.0	20.0	0.0		0.0
Storage Lanes	0				1	1	1		1
Taper Length (m)	2.5				20.0	2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.850		0.850		
Flt Protected			0.950			0.950			0.950
Satd. Flow (prot)	0	1811	1729	1820	774	864	774	0	864
Flt Permitted		0.998	0.421			0.950			0.950
Satd. Flow (perm)	0	1808	766	1820	774	864	774	0	864
Right Turn on Red					Yes			Yes	
Satd. Flow (RTOR)					17		2		
Link Speed (k/h)		48		48					48
Link Distance (m)		171.5		234.2					168.8
Travel Time (s)		12.9		17.6					12.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	100%	100%	100%	100%	100%
Adj. Flow (vph)	2	424	326	554	27	27	98	2	98
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	426	326	554	27	27	100	0	98
Turn Type	Perm		pm+pt		Perm	Prot	custom		
Protected Phases		2	8	6		7			8
Permitted Phases	2		6		6		4		
Detector Phase	2	2	8	6	6	7	4		8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0
Minimum Split (s)	21.9	21.9	20.0	21.9	21.9	10.9	21.9		20.0
Total Split (s)	39.0	39.0	20.0	39.0	39.0	11.0	31.0	0.0	20.0
Total Split (%)	55.7%	55.7%	28.6%	55.7%	55.7%	15.7%	44.3%	0.0%	28.6%
Maximum Green (s)	33.1	33.1	14.1	33.1	33.1	6.3	25.1		14.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.7
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	1.0	2.2		2.2
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)	5.9	5.9	5.9	5.9	5.9	4.7	5.9	4.0	5.9
Lead/Lag			Lead			Lag			Lead
Lead-Lag Optimize?			Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min	Max	C-Min	C-Min	Min	Max		Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0		
Pedestrian Calls (#/hr)	0	0		0	0		0		
Act Effct Green (s)		27.1	47.2	27.1	27.1	6.3	31.1		20.1
Actuated g/C Ratio		0.39	0.67	0.39	0.39	0.09	0.44		0.29
v/c Ratio		0.61	0.41	0.79	0.09	0.35	0.29		0.40
Control Delay		20.4	2.1	18.8	5.7	42.7	17.5		29.6
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		20.4	2.1	18.8	5.7	42.7	17.5		29.6

Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
LOS		C	A	B	A	D	B		C
Approach Delay		20.4		12.4					29.6
Approach LOS		C		B					C
Queue Length 50th (m)		42.7	2.6	31.1	0.0	3.4	8.0		10.4
Queue Length 95th (m)		58.9	m3.5	m34.1	m0.2	#10.8	21.3		#29.8
Internal Link Dist (m)		147.5		210.2					144.8
Turn Bay Length (m)					20.0	20.0			
Base Capacity (vph)		855	794	861	375	78	346		248
Starvation Cap Reductn		0	0	0	0	0	0		0
Spillback Cap Reductn		0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0		0
Reduced v/c Ratio		0.50	0.41	0.64	0.07	0.35	0.29		0.40

Intersection Summary

Area Type: Other
Cycle Length: 70
Actuated Cycle Length: 70
Offset: 49 (70%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.79
Intersection Signal Delay: 16.5 Intersection LOS: B
Intersection Capacity Utilization 79.9% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Holly Acres &



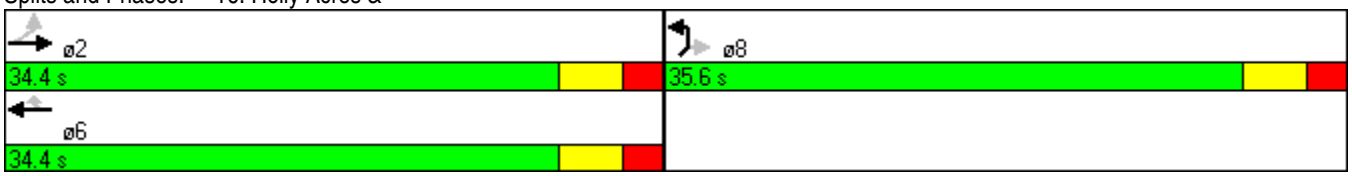
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	65	350	0	0	275	900	0	0	560	0	575
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3202	0	0	3202	1547	0	0	1729	0	1547
Flt Permitted	0.569								0.950		
Satd. Flow (perm)	1036	3202	0	0	3202	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						978					331
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	0%	0%	8%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	71	380	0	0	299	978	0	0	609	0	625
Shared Lane Traffic (%)											
Lane Group Flow (vph)	71	380	0	0	299	978	0	0	609	0	625
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	34.4	34.4	0.0	0.0	34.4	34.4	0.0	0.0	35.6	0.0	35.6
Total Split (%)	49.1%	49.1%	0.0%	0.0%	49.1%	49.1%	0.0%	0.0%	50.9%	0.0%	50.9%
Maximum Green (s)	28.9	28.9			28.9	28.9			30.1		30.1
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	30.9	30.9			30.9	30.9			28.1		28.1
Actuated g/C Ratio	0.44	0.44			0.44	0.44			0.40		0.40
v/c Ratio	0.16	0.27			0.21	0.80			0.88		0.76
Control Delay	2.0	1.8			13.2	7.4			34.9		14.8
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	2.0	1.8			13.2	7.4			34.9		14.8

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	A	A			B	A			C		B
Approach Delay		1.9			8.8						
Approach LOS		A			A						
Queue Length 50th (m)	0.6	1.7			12.8	0.0			67.3		28.4
Queue Length 95th (m)	m1.5	3.0			20.5	23.5			#122.2		67.7
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	457	1413			1413	1229			743		854
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	0.16	0.27			0.21	0.80			0.82		0.73

Intersection Summary	
Area Type:	Other
Cycle Length: 70	
Actuated Cycle Length: 70	
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 76.3%	ICU Level of Service D
Analysis Period (min) 15	

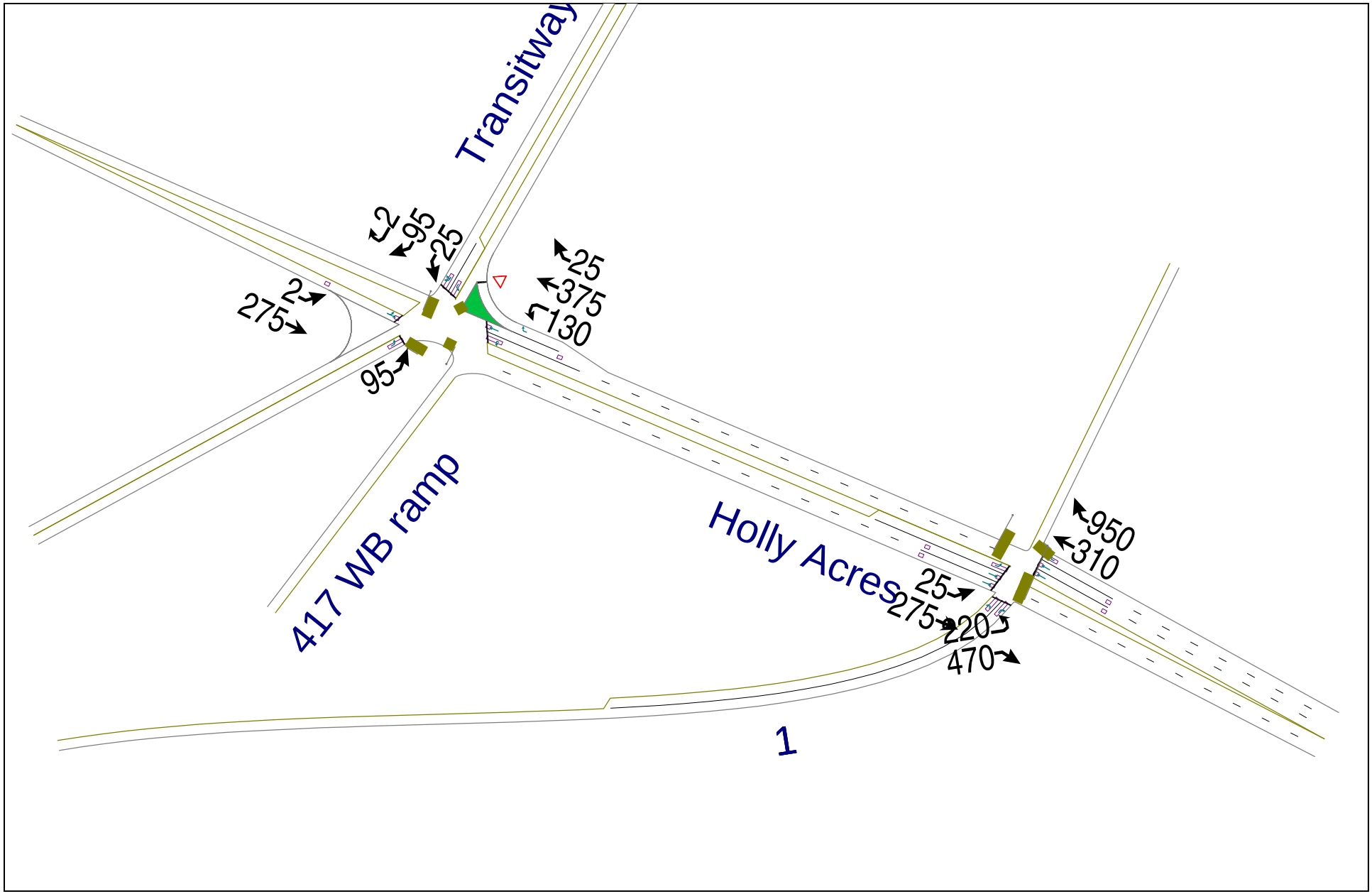
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 16: Holly Acres &



Holly Acres Road - At-grade
Volumes

2021 PMPKHR
7/16/2010



S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Future PM - 2021 Acres.syn

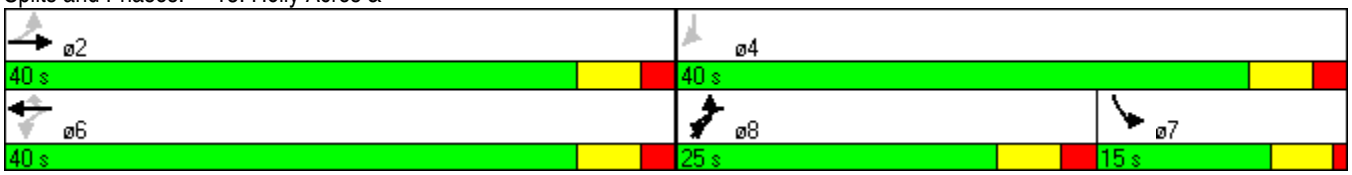
Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
Lane Configurations									
Volume (vph)	2	275	130	375	25	25	95	2	95
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	20.0				20.0	20.0	0.0		0.0
Storage Lanes	0				1	1	1		1
Taper Length (m)	2.5				20.0	2.5	2.5		2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt					0.850		0.850		
Flt Protected			0.950			0.950			0.950
Satd. Flow (prot)	0	1808	1729	1820	774	864	774	0	864
Flt Permitted		0.997	0.455			0.950			0.950
Satd. Flow (perm)	0	1803	828	1820	774	864	774	0	864
Right Turn on Red					Yes			Yes	
Satd. Flow (RTOR)					19		2		
Link Speed (k/h)		48		48					48
Link Distance (m)		171.5		234.2					168.8
Travel Time (s)		12.9		17.6					12.7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	100%	0%	0%	0%	100%	100%	100%	100%	100%
Adj. Flow (vph)	2	299	141	408	27	27	103	2	103
Shared Lane Traffic (%)									
Lane Group Flow (vph)	0	301	141	408	27	27	105	0	103
Turn Type	Perm		pm+pt		Perm	Prot	custom		
Protected Phases		2	8	6		7			8
Permitted Phases	2		6		6		4		
Detector Phase	2	2	8	6	6	7	4		8
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	5.0	10.0		10.0
Minimum Split (s)	21.9	21.9	20.0	21.9	21.9	10.9	21.9		20.0
Total Split (s)	40.0	40.0	25.0	40.0	40.0	15.0	40.0	0.0	25.0
Total Split (%)	50.0%	50.0%	31.3%	50.0%	50.0%	18.8%	50.0%	0.0%	31.3%
Maximum Green (s)	34.1	34.1	19.1	34.1	34.1	10.3	34.1		19.1
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.7		3.7
All-Red Time (s)	2.2	2.2	2.2	2.2	2.2	1.0	2.2		2.2
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)	5.9	5.9	5.9	5.9	5.9	4.7	5.9	4.0	5.9
Lead/Lag			Lead			Lag			Lead
Lead-Lag Optimize?			Yes			Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	C-Min	C-Min	Max	C-Min	C-Min	Min	Max		Max
Walk Time (s)	5.0	5.0		5.0	5.0		5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0		
Pedestrian Calls (#/hr)	0	0		0	0		0		
Act Effct Green (s)		23.9	53.2	23.9	23.9	10.3	44.3		29.3
Actuated g/C Ratio		0.30	0.66	0.30	0.30	0.13	0.55		0.37
v/c Ratio		0.56	0.16	0.75	0.11	0.24	0.24		0.32
Control Delay		26.7	3.1	24.3	4.0	37.5	13.1		24.8
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Delay		26.7	3.1	24.3	4.0	37.5	13.1		24.8

Lane Group	EBL	EBT	WBL2	WBT	WBR	SBL	SBR	SBR2	NEL
LOS		C	A	C	A	D	B		C
Approach Delay		26.7		18.2					24.8
Approach LOS		C		B					C
Queue Length 50th (m)		38.4	1.8	50.3	0.0	3.8	7.4		11.0
Queue Length 95th (m)		52.2	3.2	60.6	m1.6	11.2	20.7		27.9
Internal Link Dist (m)		147.5		210.2					144.8
Turn Bay Length (m)					20.0	20.0			
Base Capacity (vph)		769	881	776	341	111	429		317
Starvation Cap Reductn		0	0	0	0	0	0		0
Spillback Cap Reductn		0	0	0	0	0	0		0
Storage Cap Reductn		0	0	0	0	0	0		0
Reduced v/c Ratio		0.39	0.16	0.53	0.08	0.24	0.24		0.32

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 70 (88%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 21.1 Intersection LOS: C
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: 15: Holly Acres &



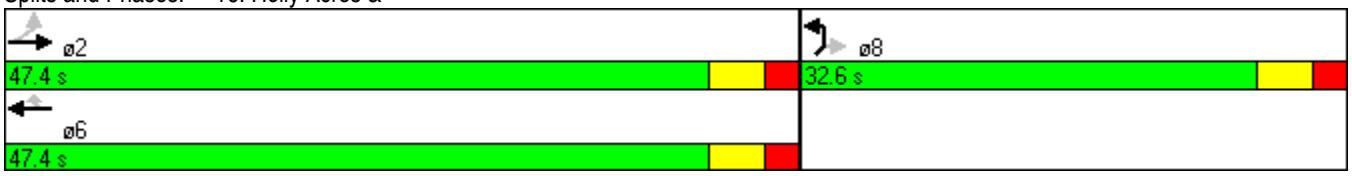
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
Lane Configurations											
Volume (vph)	25	275	0	0	310	950	0	0	220	0	470
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	50.0		0.0	0.0		0.0	0.0	0.0		150.0	0.0
Storage Lanes	1		0	0		1	0	0		1	1
Taper Length (m)	2.5		2.5	2.5		2.5	2.5	2.5		2.5	2.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850					0.850
Flt Protected	0.950								0.950		
Satd. Flow (prot)	1729	3202	0	0	3172	1547	0	0	1729	0	1547
Flt Permitted	0.549								0.950		
Satd. Flow (perm)	999	3202	0	0	3172	1547	0	0	1729	0	1547
Right Turn on Red			Yes			Yes					Yes
Satd. Flow (RTOR)						1033					524
Link Speed (k/h)		48			48		48			100	
Link Distance (m)		234.2			128.7		128.1			366.1	
Travel Time (s)		17.6			9.7		9.6			13.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	8%	10%	0%	9%	0%	2%	2%	0%	0%	0%
Adj. Flow (vph)	27	299	0	0	337	1033	0	0	239	0	511
Shared Lane Traffic (%)											
Lane Group Flow (vph)	27	299	0	0	337	1033	0	0	239	0	511
Turn Type	Perm					Perm			Prot		custom
Protected Phases		2			6				8		
Permitted Phases	2					6					8
Detector Phase	2	2			6	6			8		8
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0			10.0		10.0
Minimum Split (s)	26.5	26.5			26.5	26.5			32.5		32.5
Total Split (s)	47.4	47.4	0.0	0.0	47.4	47.4	0.0	0.0	32.6	0.0	32.6
Total Split (%)	59.3%	59.3%	0.0%	0.0%	59.3%	59.3%	0.0%	0.0%	40.8%	0.0%	40.8%
Maximum Green (s)	41.9	41.9			41.9	41.9			27.1		27.1
Yellow Time (s)	3.3	3.3			3.3	3.3			3.3		3.3
All-Red Time (s)	2.2	2.2			2.2	2.2			2.2		2.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	4.0	4.0	5.5	5.5	4.0	4.0	5.5	4.0	5.5
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0			3.0		3.0
Recall Mode	C-Max	C-Max			C-Max	C-Max			None		None
Walk Time (s)	7.0	7.0			7.0	7.0			7.0		7.0
Flash Dont Walk (s)	14.0	14.0			14.0	14.0			20.0		20.0
Pedestrian Calls (#/hr)	0	0			0	0			0		0
Act Effct Green (s)	52.3	52.3			52.3	52.3			16.7		16.7
Actuated g/C Ratio	0.65	0.65			0.65	0.65			0.21		0.21
v/c Ratio	0.04	0.14			0.16	0.75			0.66		0.69
Control Delay	0.2	0.2			6.4	4.9			37.5		7.7
Queue Delay	0.0	0.0			0.0	0.0			0.0		0.0
Total Delay	0.2	0.2			6.4	4.9			37.5		7.7

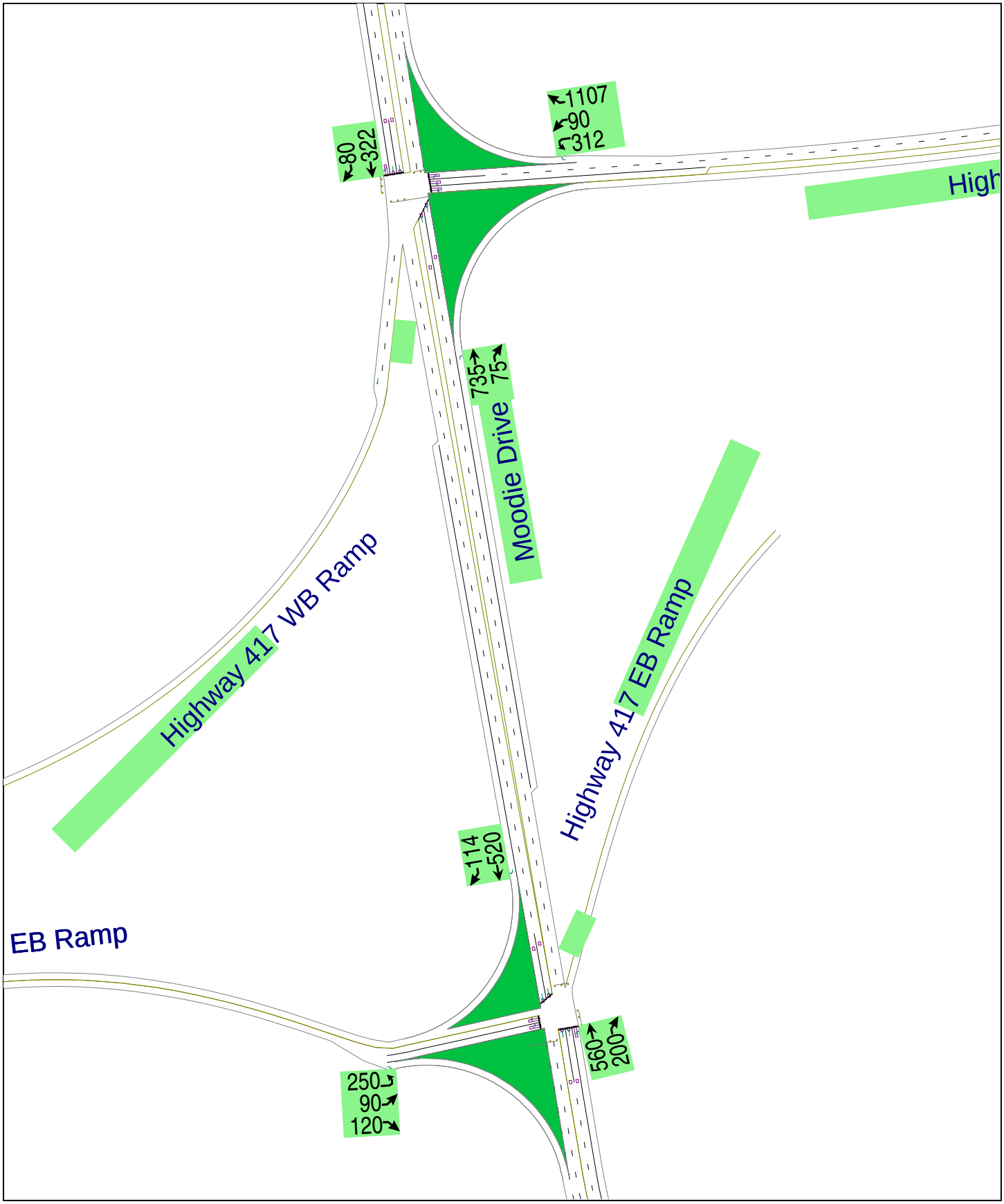
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	NEL2	NEL	NER
LOS	A	A			A	A			D		A
Approach Delay		0.2			5.3						
Approach LOS		A			A						
Queue Length 50th (m)	0.0	0.0			8.9	0.0			33.7		0.0
Queue Length 95th (m)	m0.0	0.0			17.8	14.9			50.5		19.2
Internal Link Dist (m)		210.2			104.7		104.1			342.1	
Turn Bay Length (m)	50.0								150.0		
Base Capacity (vph)	654	2095			2075	1369			586		871
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	0.04	0.14			0.16	0.75			0.41		0.59

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBT, Start of Green			
Natural Cycle: 65			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.75			
Intersection Signal Delay: 8.2		Intersection LOS: A	
Intersection Capacity Utilization 79.6%		ICU Level of Service D	
Analysis Period (min) 15			

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

Splits and Phases: 16: Holly Acres &




1107
90
312
80
322
High
735
75
Moodie Drive
Highway 417 WB Ramp
Highway 417 EB Ramp
114
520
EB Ramp
560
200
250
90
120

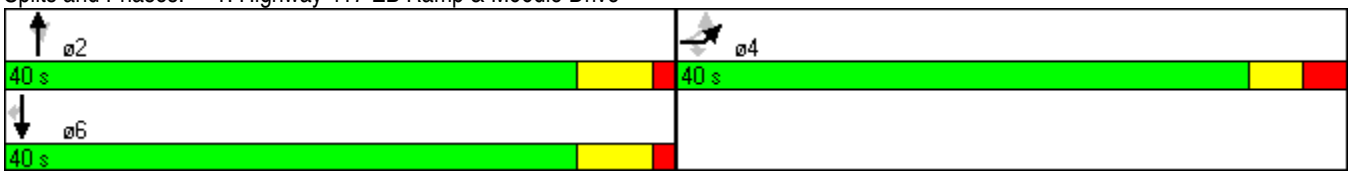
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	250	90	120	0	560	200	0	520	114	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		300.0	0.0	0.0
Storage Lanes		2	2	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	1695	1729	1532	0	3390	1502	0	3293	1473	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	1695	1729	1532	0	3390	1502	0	3293	1473	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			130			217			124		
Link Speed (k/h)		48			48			48		48	
Link Distance (m)		493.1			293.3			459.8		294.3	
Travel Time (s)		37.0			22.0			34.5		22.1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99
Heavy Vehicles (%)	2%	0%	1%	0%	2%	3%	0%	5%	5%	0%	0%
Adj. Flow (vph)	272	98	130	0	609	217	0	565	124	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	272	98	130	0	609	217	0	565	124	0	0
Turn Type	Perm		Perm			Perm			Perm		
Protected Phases		4			2			6			
Permitted Phases	4		4			2			6		
Detector Phase	4	4	4		2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0		10.0	10.0		
Minimum Split (s)	24.0	24.0	24.0		24.0	24.0		24.0	24.0		
Total Split (s)	40.0	40.0	40.0	0.0	40.0	40.0	0.0	40.0	40.0	0.0	0.0
Total Split (%)	50.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	50.0%	50.0%	0.0%	0.0%
Maximum Green (s)	34.0	34.0	34.0		34.0	34.0		34.0	34.0		
Yellow Time (s)	3.3	3.3	3.3		4.6	4.6		4.6	4.6		
All-Red Time (s)	2.7	2.7	2.7		1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0	3.0		
Recall Mode	None	None	None		C-Max	C-Max		C-Max	C-Max		
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0	11.0		5.0	5.0		5.0	5.0		
Pedestrian Calls (#/hr)	1	1	1		1	1		1	1		
Act Effct Green (s)	18.5	18.5	18.5		49.5	49.5		49.5	49.5		
Actuated g/C Ratio	0.23	0.23	0.23		0.62	0.62		0.62	0.62		
v/c Ratio	0.69	0.24	0.29		0.29	0.21		0.28	0.13		
Control Delay	36.8	24.7	5.9		8.4	2.0		4.0	0.7		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	36.8	24.7	5.9		8.4	2.0		4.0	0.7		

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D	C	A		A	A		A	A		
Approach Delay		26.4			6.7			3.4			
Approach LOS		C			A			A			
Queue Length 50th (m)	38.1	12.2	0.0		20.1	0.0		6.6	0.1		
Queue Length 95th (m)	54.6	21.2	10.9		36.8	9.2		16.3	0.5		
Internal Link Dist (m)		469.1			269.3			435.8		270.3	
Turn Bay Length (m)			85.0			100.0			300.0		
Base Capacity (vph)	720	735	726		2096	1012		2036	958		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.38	0.13	0.18		0.29	0.21		0.28	0.13		

Intersection Summary

Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 68 (85%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 10.5 Intersection LOS: B
Intersection Capacity Utilization 41.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Highway 417 EB Ramp & Moodie Drive



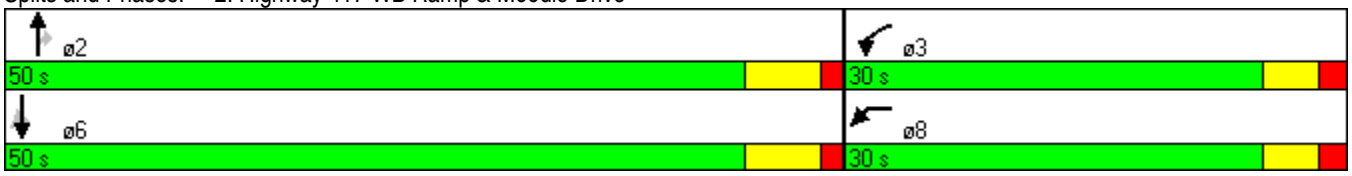
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	312	90	1107	0	735	75	0	322	80	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		150.0	80.0	0.0		300.0	0.0		100.0	0.0	0.0
Storage Lanes		1	1	0		1	0		1	0	0
Taper Length (m)		2.5	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	3195	1153	1517	0	3390	1432	0	3357	1394	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	3195	1153	1517	0	3390	1432	0	3357	1394	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			480			89			95		
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		711.5			459.8			276.1		116.5	
Travel Time (s)		25.6			34.5			20.7		8.7	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.92	0.92
Heavy Vehicles (%)	5%	50%	2%	0%	2%	8%	0%	3%	11%	0%	0%
Adj. Flow (vph)	371	107	1318	0	875	89	0	383	95	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	371	107	1318	0	875	89	0	383	95	0	0
Turn Type	Prot		Free			Perm			Perm		
Protected Phases	3	8			2			6			
Permitted Phases			Free			2			6		
Detector Phase	3	8			2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0		10.0	10.0		
Minimum Split (s)	15.1	23.1			26.0	26.0		26.0	26.0		
Total Split (s)	30.0	30.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	0.0	0.0
Total Split (%)	37.5%	37.5%	0.0%	0.0%	62.5%	62.5%	0.0%	62.5%	62.5%	0.0%	0.0%
Maximum Green (s)	24.9	24.9			44.0	44.0		44.0	44.0		
Yellow Time (s)	3.3	3.3			4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8	1.8			1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		
Recall Mode	None	None			C-Max	C-Max		C-Max	C-Max		
Walk Time (s)		7.0			10.0	10.0		10.0	10.0		
Flash Dont Walk (s)		11.0			10.0	10.0		10.0	10.0		
Pedestrian Calls (#/hr)		1			1	1		1	1		
Act Effct Green (s)	14.6	14.6	80.0		54.3	54.3		54.3	54.3		
Actuated g/C Ratio	0.18	0.18	1.00		0.68	0.68		0.68	0.68		
v/c Ratio	0.64	0.51	0.87		0.38	0.09		0.17	0.10		
Control Delay	35.1	37.5	8.1		4.3	0.6		4.1	0.8		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	35.1	37.5	8.1		4.3	0.6		4.1	0.8		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
LOS	D	D	A		A	A		A	A		
Approach Delay		15.4			4.0			3.4			
Approach LOS		B			A			A			
Queue Length 50th (m)	27.1	14.8	0.0		17.0	0.0		7.3	0.0		
Queue Length 95th (m)	34.8	25.9	0.0		23.8	1.4		11.7	2.0		
Internal Link Dist (m)		687.5			435.8			252.1		92.5	
Turn Bay Length (m)	150.0	150.0	80.0			300.0			100.0		
Base Capacity (vph)	994	359	1517		2302	1001		2280	977		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.37	0.30	0.87		0.38	0.09		0.17	0.10		

Intersection Summary

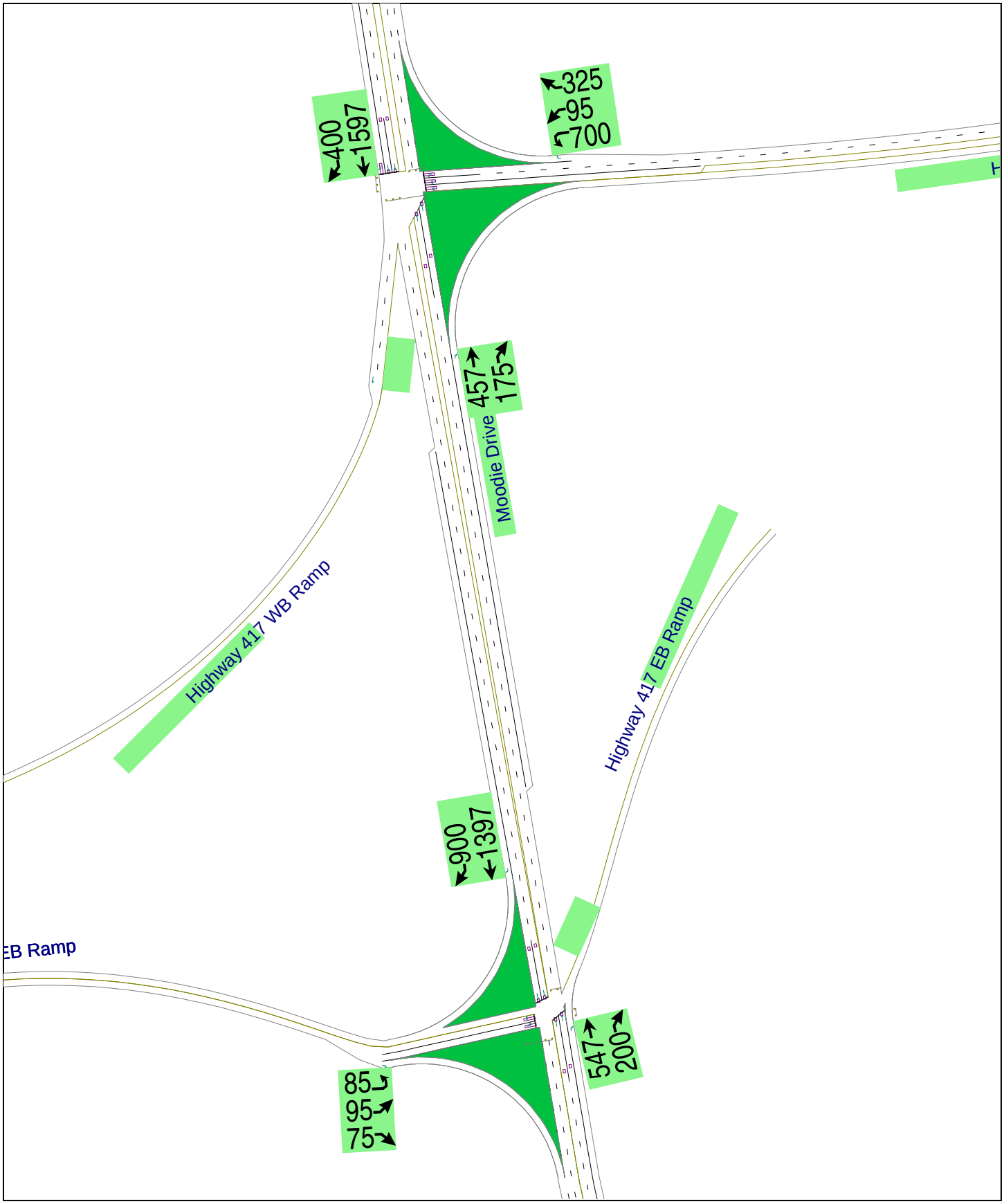
Area Type: Other
Cycle Length: 80
Actuated Cycle Length: 80
Offset: 63 (79%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 10.2 Intersection LOS: B
Intersection Capacity Utilization 40.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: Highway 417 WB Ramp & Moodie Drive



Moodie Drive - Existing Volumes

2021 PMPKHR
7/15/2010



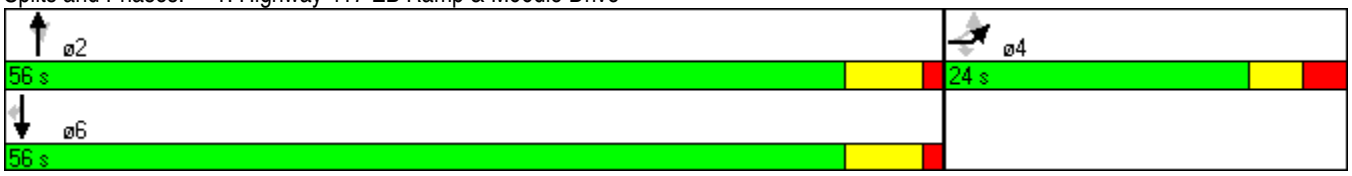
S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Existing PM - 2021 Moodie.syn

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	85	95	75	0	547	200	0	1397	900	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		300.0	0.0	0.0
Storage Lanes		2	2	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	1647	1729	1502	0	3424	1532	0	3424	1517	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	1647	1729	1502	0	3424	1532	0	3424	1517	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			42			217			978		
Link Speed (k/h)		48			48			48		48	
Link Distance (m)		493.1			293.3			459.8		293.2	
Travel Time (s)		37.0			22.0			34.5		22.0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.99	0.99
Heavy Vehicles (%)	5%	0%	3%	0%	1%	1%	0%	1%	2%	0%	0%
Adj. Flow (vph)	92	103	82	0	595	217	0	1518	978	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	92	103	82	0	595	217	0	1518	978	0	0
Turn Type	Perm		Perm			Perm			Perm		
Protected Phases		4			2			6			
Permitted Phases	4		4			2			6		
Detector Phase	4	4	4		2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0		10.0	10.0		10.0	10.0		
Minimum Split (s)	24.0	24.0	24.0		24.0	24.0		24.0	24.0		
Total Split (s)	24.0	24.0	24.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0	0.0
Total Split (%)	30.0%	30.0%	30.0%	0.0%	70.0%	70.0%	0.0%	70.0%	70.0%	0.0%	0.0%
Maximum Green (s)	18.0	18.0	18.0		50.0	50.0		50.0	50.0		
Yellow Time (s)	3.3	3.3	3.3		4.6	4.6		4.6	4.6		
All-Red Time (s)	2.7	2.7	2.7		1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0		3.0	3.0		
Recall Mode	None	None	None		C-Max	C-Max		C-Max	C-Max		
Walk Time (s)	7.0	7.0	7.0		7.0	7.0		7.0	7.0		
Flash Dont Walk (s)	11.0	11.0	11.0		5.0	5.0		5.0	5.0		
Pedestrian Calls (#/hr)	1	1	1		1	1		1	1		
Act Effct Green (s)	11.9	11.9	11.9		60.5	60.5		60.5	60.5		
Actuated g/C Ratio	0.15	0.15	0.15		0.76	0.76		0.76	0.76		
v/c Ratio	0.37	0.40	0.32		0.23	0.18		0.59	0.71		
Control Delay	34.3	34.7	19.7		4.5	1.2		7.5	3.8		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	34.3	34.7	19.7		4.5	1.2		7.5	3.8		

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C	C	B		A	A		A	A		
Approach Delay		30.1			3.7			6.0			
Approach LOS		C			A			A			
Queue Length 50th (m)	13.2	14.8	5.6		12.8	0.0		48.6	0.0		
Queue Length 95th (m)	23.6	25.9	15.7		26.9	6.9		95.9	12.6		
Internal Link Dist (m)		469.1			269.3			435.8		269.2	
Turn Bay Length (m)			85.0			100.0			300.0		
Base Capacity (vph)	371	389	371		2588	1211		2588	1385		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.25	0.26	0.22		0.23	0.18		0.59	0.71		

Intersection Summary			
Area Type:	Other		
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 6 (8%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.71			
Intersection Signal Delay: 7.3		Intersection LOS: A	
Intersection Capacity Utilization 63.8%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 1: Highway 417 EB Ramp & Moodie Drive



Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	700	95	325	0	457	175	0	1597	400	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		150.0	80.0	0.0		300.0	0.0		100.0	0.0	0.0
Storage Lanes		1	1	0		1	0		1	0	0
Taper Length (m)		2.5	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950	0.950									
Satd. Flow (prot)	3195	1235	1502	0	3390	1473	0	3424	1532	0	0
Flt Permitted	0.950	0.950									
Satd. Flow (perm)	3195	1235	1502	0	3390	1473	0	3424	1532	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			335			180			412		
Link Speed (k/h)		100			48			48		48	
Link Distance (m)		711.5			459.8			276.1		116.5	
Travel Time (s)		25.6			34.5			20.7		8.7	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.92	0.92
Heavy Vehicles (%)	5%	40%	3%	0%	2%	5%	0%	1%	1%	0%	0%
Adj. Flow (vph)	722	98	335	0	471	180	0	1646	412	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	722	98	335	0	471	180	0	1646	412	0	0
Turn Type	Prot		Free			Perm			Perm		
Protected Phases	3	8			2			6			
Permitted Phases			Free			2			6		
Detector Phase	3	8			2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0	10.0			10.0	10.0		10.0	10.0		
Minimum Split (s)	15.1	23.1			26.0	26.0		26.0	26.0		
Total Split (s)	31.0	31.0	0.0	0.0	59.0	59.0	0.0	59.0	59.0	0.0	0.0
Total Split (%)	34.4%	34.4%	0.0%	0.0%	65.6%	65.6%	0.0%	65.6%	65.6%	0.0%	0.0%
Maximum Green (s)	25.9	25.9			53.0	53.0		53.0	53.0		
Yellow Time (s)	3.3	3.3			4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8	1.8			1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	3.0			3.0	3.0		3.0	3.0		
Recall Mode	None	None			C-Max	C-Max		C-Max	C-Max		
Walk Time (s)		7.0			10.0	10.0		10.0	10.0		
Flash Dont Walk (s)		11.0			10.0	10.0		10.0	10.0		
Pedestrian Calls (#/hr)		1			1	1		1	1		
Act Effct Green (s)	23.9	23.9	90.0		55.0	55.0		55.0	55.0		
Actuated g/C Ratio	0.27	0.27	1.00		0.61	0.61		0.61	0.61		
v/c Ratio	0.85	0.30	0.22		0.23	0.19		0.79	0.38		
Control Delay	41.8	28.4	0.3		8.6	1.8		10.5	1.0		
Queue Delay	0.0	0.0	0.0		0.0	0.0		0.0	0.0		
Total Delay	41.8	28.4	0.3		8.6	1.8		10.5	1.0		

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
LOS	D	C	A		A	A		B	A		
Approach Delay		28.6			6.7			8.6			
Approach LOS		C			A			A			
Queue Length 50th (m)	59.5	13.2	0.0		18.5	0.0		116.7	2.9		
Queue Length 95th (m)	79.5	26.1	0.0		26.5	7.6		61.6	m0.2		
Internal Link Dist (m)		687.5			435.8			252.1		92.5	
Turn Bay Length (m)	150.0	150.0	80.0			300.0			100.0		
Base Capacity (vph)	919	355	1502		2070	969		2091	1096		
Starvation Cap Reductn	0	0	0		0	0		0	0		
Spillback Cap Reductn	0	0	0		0	0		0	0		
Storage Cap Reductn	0	0	0		0	0		0	0		
Reduced v/c Ratio	0.79	0.28	0.22		0.23	0.19		0.79	0.38		

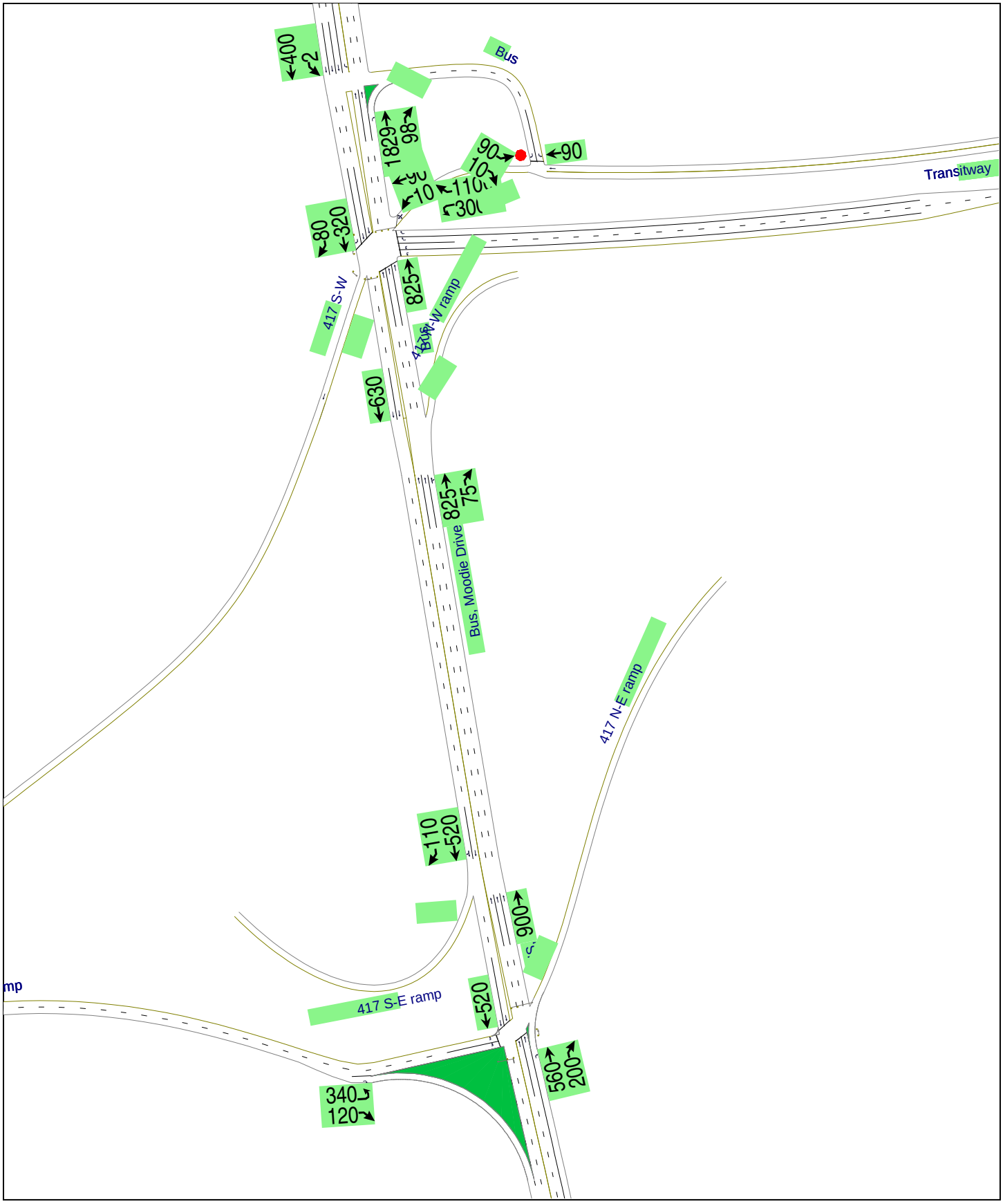
Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 18 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 14.3 Intersection LOS: B
Intersection Capacity Utilization 76.9% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Highway 417 WB Ramp &

Moodie Drive - At-grade
Volumes

2021 AMPKHR
7/16/2010



S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Future AM - 2021 Moodie loop.syn

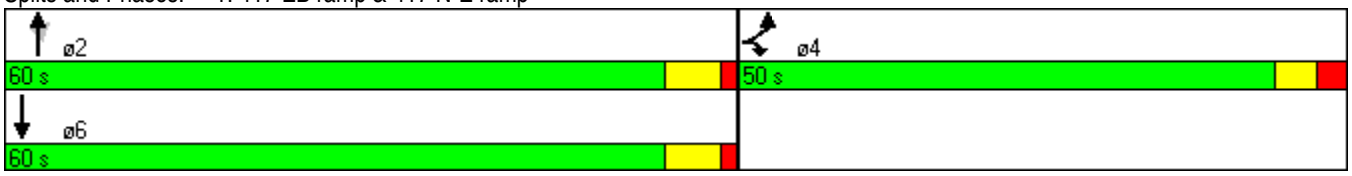
Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	340	0	120	0	560	200	0	520	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2641	0	1532	0	3390	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2641	0	1532	0	3390	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			243			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	27%	0%	1%	0%	2%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	370	0	130	0	609	217	0	565	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	370	0	130	0	609	217	0	565	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	50.0	0.0	50.0	0.0	60.0	60.0	0.0	60.0	0.0	0.0	0.0
Total Split (%)	45.5%	0.0%	45.5%	0.0%	54.5%	54.5%	0.0%	54.5%	0.0%	0.0%	0.0%
Maximum Green (s)	44.0		44.0		54.0	54.0		54.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	21.1		21.1		76.9	76.9		76.9			
Actuated g/C Ratio	0.19		0.19		0.70	0.70		0.70			
v/c Ratio	0.73		0.27		0.26	0.19		0.25			
Control Delay	50.1		1.3		6.9	1.4		9.3			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	50.1		1.3		6.9	1.4		9.3			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		A		A	A		A			
Approach Delay					5.4			9.3			
Approach LOS					A			A			
Queue Length 50th (m)	38.8		0.0		22.3	0.0		29.7			
Queue Length 95th (m)	51.0		0.0		35.9	7.8		m37.5			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	1056		759		2370	1115		2280			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.35		0.17		0.26	0.19		0.25			

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 107 (97%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 15.1 Intersection LOS: B
Intersection Capacity Utilization 33.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp



Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	300	1100	825	320	80	10	90	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.998	
Flt Protected	0.950						0.995	
Satd. Flow (prot)	3354	2723	4476	3390	1547	0	904	0
Flt Permitted	0.950						0.995	
Satd. Flow (perm)	3354	2723	4476	3390	1547	0	904	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							1	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	11%	2%	0%	100%	100%	100%
Adj. Flow (vph)	357	1310	982	381	95	12	107	2
Shared Lane Traffic (%)								
Lane Group Flow (vph)	357	1310	982	381	95	0	121	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	58.0	58.0	31.8	31.8	31.8	20.2	20.2	0.0
Total Split (%)	52.7%	52.7%	28.9%	28.9%	28.9%	18.4%	18.4%	0.0%
Maximum Green (s)	52.9	52.9	25.8	25.8	25.8	15.2	15.2	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	52.9	52.9	25.8	25.8	25.8		15.2	
Actuated g/C Ratio	0.48	0.48	0.23	0.23	0.23		0.14	
v/c Ratio	0.22	1.00	0.94	0.48	0.26		0.96	
Control Delay	17.1	54.1	48.2	40.5	39.2		118.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	17.1	54.1	48.2	40.5	39.2		118.6	
LOS	B	D	D	D	D		F	
Approach Delay			48.2	40.3			118.6	
Approach LOS			D	D			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	22.2	~154.9	79.0	34.1	15.5		26.0	
Queue Length 95th (m)	28.8	#186.3	#70.1	48.5	29.3		#56.8	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	1613	1310	1050	795	363		126	
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	0.22	1.00	0.94	0.48	0.26		0.96	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle: 100
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 48.6 Intersection LOS: D
Intersection Capacity Utilization 79.2% ICU Level of Service D
Analysis Period (min) 15

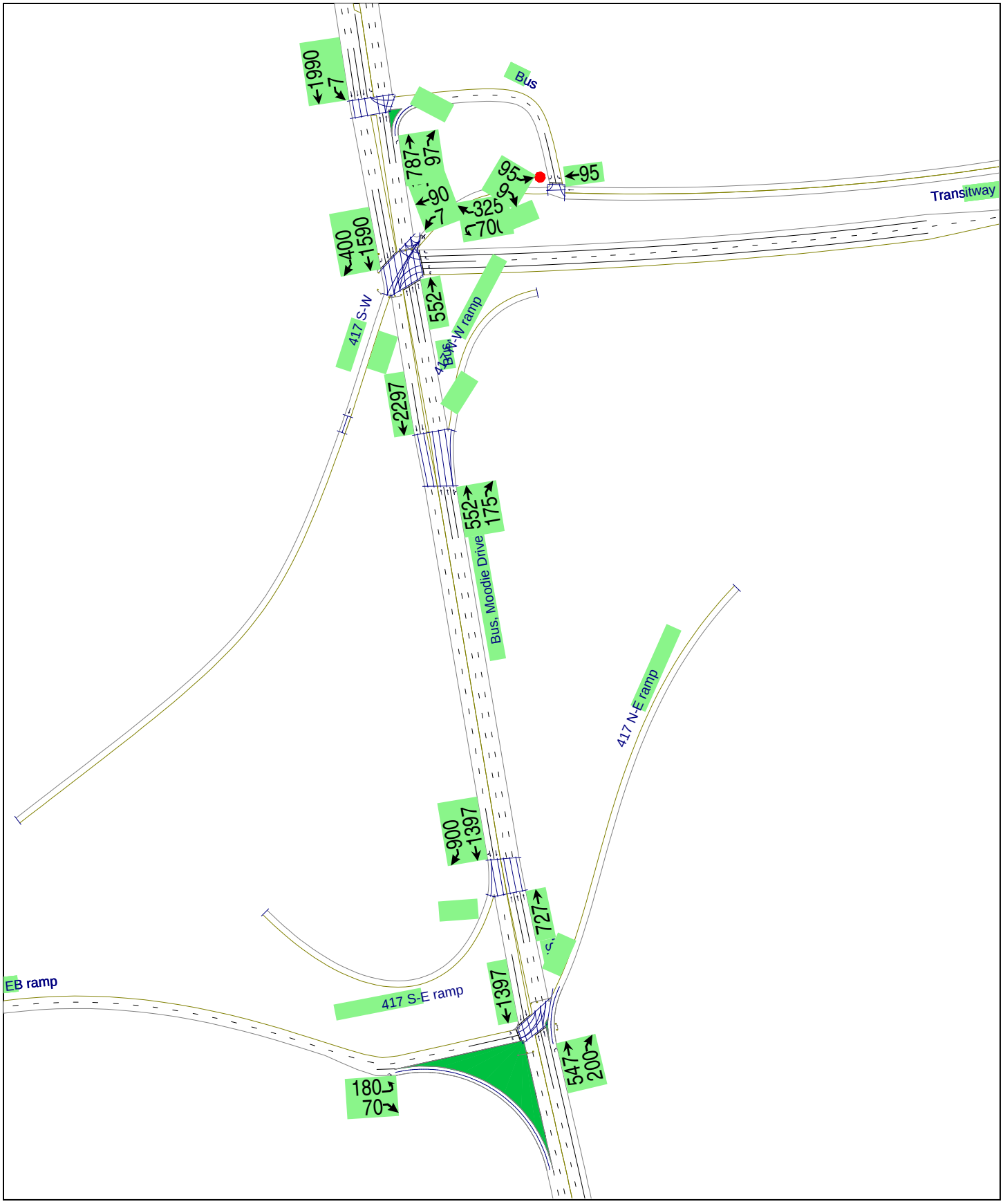
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Moodie Drive - At-grade
Volumes

2021 PMPKHR
7/16/2010



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Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	180	0	70	0	547	200	0	1397	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1532	0	3390	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1532	0	3390	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			62			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	2%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	26.0	0.0	26.0	0.0	84.0	84.0	0.0	84.0	0.0	0.0	0.0
Total Split (%)	23.6%	0.0%	23.6%	0.0%	76.4%	76.4%	0.0%	76.4%	0.0%	0.0%	0.0%
Maximum Green (s)	20.0		20.0		78.0	78.0		78.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	12.6		12.6		85.4	85.4		85.4			
Actuated g/C Ratio	0.11		0.11		0.78	0.78		0.78			
v/c Ratio	0.51		0.33		0.23	0.18		0.60			
Control Delay	50.0		18.4		3.8	0.9		0.8			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	50.0		18.4		3.8	0.9		0.8			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	D		B		A	A		A			
Approach Delay					3.0			0.8			
Approach LOS					A			A			
Queue Length 50th (m)	20.9		2.8		14.2	0.0		0.1			
Queue Length 95th (m)	30.2		15.3		25.3	5.6		m15.2			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	610		329		2631	1214		2531			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.32		0.23		0.23	0.18		0.60			

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 44 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 5.7 Intersection LOS: A
Intersection Capacity Utilization 74.5% ICU Level of Service D
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	700	325	552	1590	400	7	90	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.991	
Flt Protected	0.950						0.997	
Satd. Flow (prot)	3354	2723	4476	3390	1547	0	899	0
Flt Permitted	0.950						0.997	
Satd. Flow (perm)	3354	2723	4476	3390	1547	0	899	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							3	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	11%	2%	0%	100%	100%	100%
Adj. Flow (vph)	833	387	657	1893	476	8	107	8
Shared Lane Traffic (%)								
Lane Group Flow (vph)	833	387	657	1893	476	0	123	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	30.0	30.0	60.0	60.0	60.0	20.0	20.0	0.0
Total Split (%)	27.3%	27.3%	54.5%	54.5%	54.5%	18.2%	18.2%	0.0%
Maximum Green (s)	24.9	24.9	54.0	54.0	54.0	15.0	15.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	24.9	24.9	54.0	54.0	54.0		15.0	
Actuated g/C Ratio	0.23	0.23	0.49	0.49	0.49		0.14	
v/c Ratio	1.10	0.63	0.30	1.14	0.63		0.98	
Control Delay	103.0	43.6	21.5	93.9	19.8		124.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	103.0	43.6	21.5	93.9	19.8		124.3	
LOS	F	D	C	F	B		F	
Approach Delay			21.5	79.0			124.3	
Approach LOS			C	E			F	

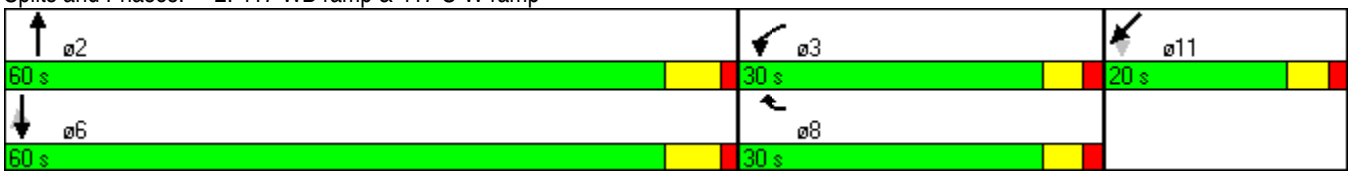
Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	~104.6	42.7	33.4	~251.5	69.9		26.1	
Queue Length 95th (m)	#126.5	55.2	41.7	#261.7	53.2		#57.5	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	759	616	2197	1664	759		125	
Starvation 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	1.10	0.63	0.30	1.14	0.63		0.98	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 73.1		Intersection LOS: E	
Intersection Capacity Utilization 88.3%		ICU Level of Service E	
Analysis Period (min) 15			

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

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

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp



Moodie Drive - At-grade (3 SB lanes) **2021 PMPKHR**

Volumes **7/16/2010**

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Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	180	0	70	0	547	200	0	1397	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1532	0	3390	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1532	0	3390	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			70			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	0%	0%	1%	0%	2%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	28.0	0.0	28.0	0.0	102.0	102.0	0.0	102.0	0.0	0.0	0.0
Total Split (%)	21.5%	0.0%	21.5%	0.0%	78.5%	78.5%	0.0%	78.5%	0.0%	0.0%	0.0%
Maximum Green (s)	22.0		22.0		96.0	96.0		96.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	13.3		13.3		104.7	104.7		104.7			
Actuated g/C Ratio	0.10		0.10		0.81	0.81		0.81			
v/c Ratio	0.57		0.35		0.22	0.17		0.58			
Control Delay	61.8		17.9		3.4	0.7		2.4			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	61.8		17.9		3.4	0.7		2.4			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	E		B		A	A		A			
Approach Delay					2.7			2.4			
Approach LOS					A			A			
Queue Length 50th (m)	25.1		1.4		15.1	0.0		23.8			
Queue Length 95th (m)	35.9		15.5		24.6	5.1		m24.0			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	568		317		2729	1252		2626			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.35		0.24		0.22	0.17		0.58			

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 28 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.58			
Intersection Signal Delay: 7.4		Intersection LOS: A	
Intersection Capacity Utilization 62.2%		ICU Level of Service B	
Analysis Period (min) 15			

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

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

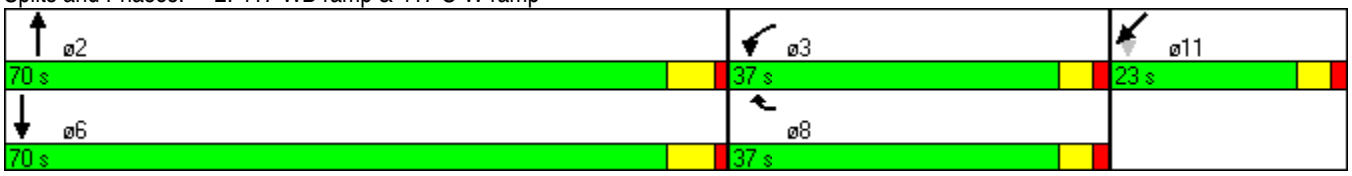
Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	700	325	552	1590	400	7	90	7
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			0	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.91	0.91	1.00	1.00	1.00
Frt		0.850		0.970			0.991	
Flt Protected	0.950						0.997	
Satd. Flow (prot)	3354	2723	4476	4744	0	0	899	0
Flt Permitted	0.950						0.997	
Satd. Flow (perm)	3354	2723	4476	4744	0	0	899	0
Right Turn on Red					Yes			Yes
Satd. Flow (RTOR)				66			2	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	11%	2%	0%	100%	100%	100%
Adj. Flow (vph)	833	387	657	1893	476	8	107	8
Shared Lane Traffic (%)								
Lane Group Flow (vph)	833	387	657	2369	0	0	123	0
Turn Type	Prot	custom				Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases						11		
Detector Phase	3	8	2	6		11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0		10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0		15.0	15.0	
Total Split (s)	37.0	37.0	70.0	70.0	0.0	23.0	23.0	0.0
Total Split (%)	28.5%	28.5%	53.8%	53.8%	0.0%	17.7%	17.7%	0.0%
Maximum Green (s)	31.9	31.9	64.0	64.0		18.0	18.0	
Yellow Time (s)	3.3	3.3	4.6	4.6		3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4		1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	4.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0		3.0	3.0	
Recall Mode	None	None	C-Max	None		None	None	
Act Effct Green (s)	31.9	31.9	64.0	64.0			18.0	
Actuated g/C Ratio	0.25	0.25	0.49	0.49			0.14	
v/c Ratio	1.01	0.58	0.30	1.00			0.98	
Control Delay	82.9	47.2	15.6	44.2			129.0	
Queue Delay	0.0	0.0	0.0	0.0			0.0	
Total Delay	82.9	47.2	15.6	44.2			129.0	
LOS	F	D	B	D			F	
Approach Delay			15.6	44.2			129.0	
Approach LOS			B	D			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	~112.8	49.8	26.5	~216.5			31.4	
Queue Length 95th (m)	#136.7	62.4	33.0	119.8			#64.4	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	823	668	2204	2369			126	
Starvation Cap Reductn	0	0	0	0			0	
Spillback Cap Reductn	0	0	0	0			0	
Storage Cap Reductn	0	0	0	0			0	
Reduced v/c Ratio	1.01	0.58	0.30	1.00			0.98	

Intersection Summary

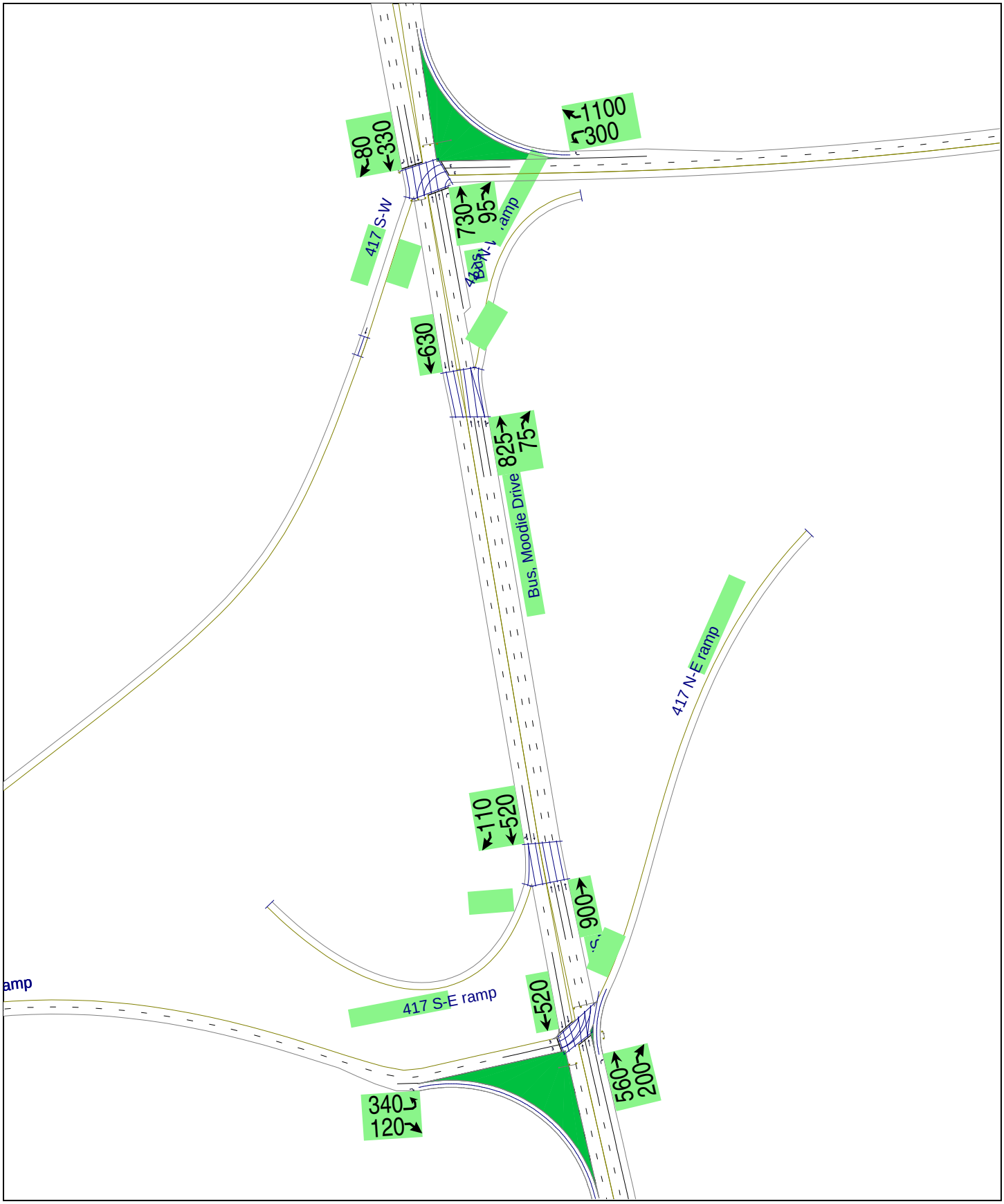
Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.01
Intersection Signal Delay: 49.9 Intersection LOS: D
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp



Moodie Drive - Partially Separated
Volumes

2021 AM PKHR
7/16/2010



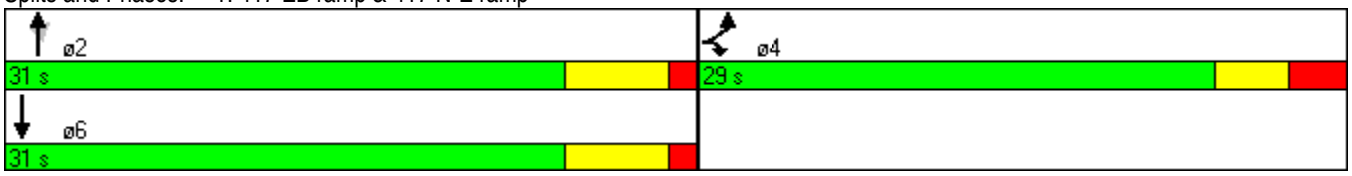
S:\7499 - West Transitway\SYNCHRO\March 11, 2010\June 18\Future AM - 2021 Moodie canyon.syn

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	340	0	120	0	560	200	0	520	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2662	0	1532	0	3357	1502	0	3262	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			184			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	26%	0%	1%	0%	3%	3%	0%	6%	5%	0%	0%
Adj. Flow (vph)	370	0	130	0	609	217	0	565	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	370	0	130	0	609	217	0	565	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	29.0	0.0	29.0	0.0	31.0	31.0	0.0	31.0	0.0	0.0	0.0
Total Split (%)	48.3%	0.0%	48.3%	0.0%	51.7%	51.7%	0.0%	51.7%	0.0%	0.0%	0.0%
Maximum Green (s)	23.0		23.0		25.0	25.0		25.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	13.8		13.8		34.2	34.2		34.2			
Actuated g/C Ratio	0.23		0.23		0.57	0.57		0.57			
v/c Ratio	0.60		0.26		0.32	0.23		0.30			
Control Delay	24.5		2.7		8.0	2.1		7.0			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	24.5		2.7		8.0	2.1		7.0			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	C		A		A	A		A			
Approach Delay					6.4			7.0			
Approach LOS					A			A			
Queue Length 50th (m)	18.9		0.0		16.2	0.0		15.3			
Queue Length 95th (m)	27.1		5.0		29.7	8.4		29.0			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	1020		701		1911	949		1857			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.36		0.19		0.32	0.23		0.30			

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 49 (82%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 9.9		Intersection LOS: A	
Intersection Capacity Utilization 33.5%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

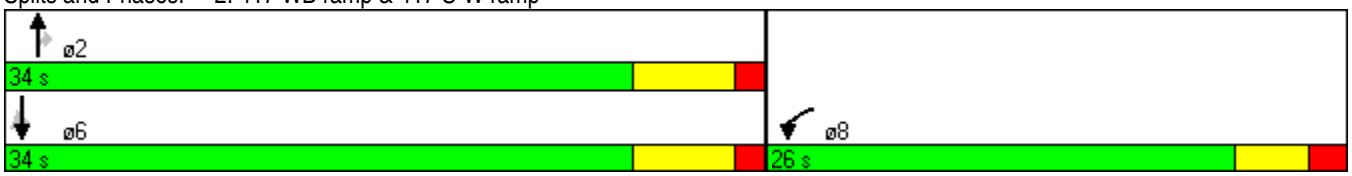


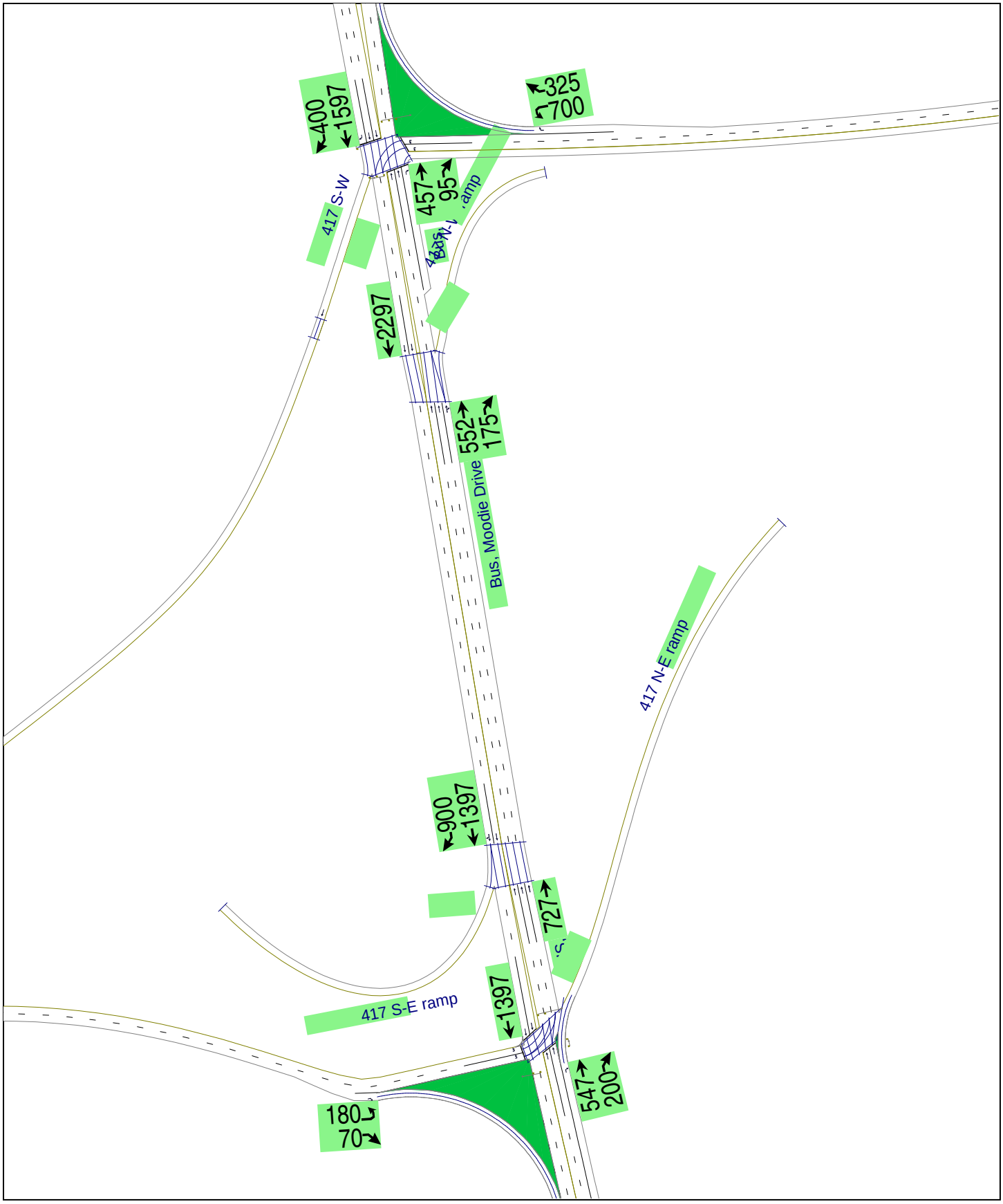
Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	300	0	1100	0	730	95	0	330	80	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	774	0	3390	1394	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	774	0	3390	1394	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			519			113					
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			102.2		97.8	
Travel Time (s)		28.3			9.0			7.4		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	2%	11%	0%	0%
Adj. Flow (vph)	357	0	1310	0	869	113	0	393	95	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	357	0	1310	0	869	113	0	393	95	0	0
Turn Type	custom		Free			Perm			Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free			2			6		
Detector Phase	8				2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0	10.0		10.0	10.0		
Minimum Split (s)	23.1				26.0	26.0		26.0	26.0		
Total Split (s)	26.0	0.0	0.0	0.0	34.0	34.0	0.0	34.0	34.0	0.0	0.0
Total Split (%)	43.3%	0.0%	0.0%	0.0%	56.7%	56.7%	0.0%	56.7%	56.7%	0.0%	0.0%
Maximum Green (s)	20.9				28.0	28.0		28.0	28.0		
Yellow Time (s)	3.3				4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8				1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0		
Recall Mode	None				C-Max	C-Max		None	None		
Act Effct Green (s)	12.0		60.0		36.9	36.9		36.9	36.9		
Actuated g/C Ratio	0.20		1.00		0.62	0.62		0.62	0.62		
v/c Ratio	0.53		0.85		0.41	0.22		0.19	0.11		
Control Delay	24.3		7.0		4.2	1.2		5.9	5.7		
Queue Delay	0.0		0.0		0.0	0.0		0.0	0.0		
Total Delay	24.3		7.0		4.2	1.2		5.9	5.7		
LOS	C		A		A	A		A	A		
Approach Delay					3.9			5.8			
Approach LOS					A			A			

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	18.4		0.0		12.2	0.0		12.8	5.7		
Queue Length 95th (m)	25.1		0.0		15.1	0.7		21.4	12.6		
Internal Link Dist (m)		761.2			100.9			78.2		73.8	
Turn Bay Length (m)			100.0			60.0					
Base Capacity (vph)	1168		1547		2128	520		2086	858		
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	0.31		0.85		0.41	0.22		0.19	0.11		

Intersection Summary			
Area Type:	Other		
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 50			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 7.8		Intersection LOS: A	
Intersection Capacity Utilization 38.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp




400
1597
325
700
457
95
417 S-W ramp
417 S-W
2297
552
175
Bus. Moodie Drive
417 N-E ramp
900
1397
727
1397
417 S-E ramp
547
200
180
70

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
Lane Configurations											
Volume (vph)	180	0	70	0	547	200	0	1397	0	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	85.0	0.0		100.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		2.5	30.0	2.5		30.0	2.5		2.5	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850					
Flt Protected	0.950										
Satd. Flow (prot)	2329	0	1532	0	3390	1547	0	3458	0	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	2329	0	1532	0	3390	1547	0	3458	0	0	0
Right Turn on Red			Yes			Yes			Yes		
Satd. Flow (RTOR)			60			217					
Link Speed (k/h)		100			50			50		100	
Link Distance (m)		493.1			292.9			99.0		293.2	
Travel Time (s)		17.8			21.1			7.1		10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	44%	0%	1%	0%	2%	0%	0%	0%	0%	0%	0%
Adj. Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	196	0	76	0	595	217	0	1518	0	0	0
Turn Type	custom		custom			Perm					
Protected Phases	4		4		2			6			
Permitted Phases	4		4			2					
Detector Phase	4		4		2	2		6			
Switch Phase											
Minimum Initial (s)	10.0		10.0		10.0	10.0		10.0			
Minimum Split (s)	24.0		24.0		24.0	24.0		24.0			
Total Split (s)	30.0	0.0	30.0	0.0	90.0	90.0	0.0	90.0	0.0	0.0	0.0
Total Split (%)	25.0%	0.0%	25.0%	0.0%	75.0%	75.0%	0.0%	75.0%	0.0%	0.0%	0.0%
Maximum Green (s)	24.0		24.0		84.0	84.0		84.0			
Yellow Time (s)	3.3		3.3		4.6	4.6		4.6			
All-Red Time (s)	2.7		2.7		1.4	1.4		1.4			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	4.0	6.0	4.0	6.0	6.0	4.0	6.0	4.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0		3.0		3.0	3.0		3.0			
Recall Mode	None		None		C-Max	C-Max		C-Max			
Walk Time (s)	7.0		7.0		7.0	7.0		7.0			
Flash Dont Walk (s)	11.0		11.0		5.0	5.0		5.0			
Pedestrian Calls (#/hr)	1		1		1	1		1			
Act Effct Green (s)	15.4		15.4		92.6	92.6		92.6			
Actuated g/C Ratio	0.13		0.13		0.77	0.77		0.77			
v/c Ratio	0.66		0.31		0.23	0.17		0.57			
Control Delay	60.0		18.8		4.3	0.9		4.7			
Queue Delay	0.0		0.0		0.0	0.0		0.0			
Total Delay	60.0		18.8		4.3	0.9		4.7			

Lane Group	EBL2	EBL	EBR	NBL	NBT	NBR	SBL	SBT	SBR	SWL	SWR
LOS	E		B		A	A		A			
Approach Delay					3.4			4.7			
Approach LOS					A			A			
Queue Length 50th (m)	22.9		3.4		17.1	0.0		36.8			
Queue Length 95th (m)	33.8		16.7		27.4	5.8		85.8			
Internal Link Dist (m)		469.1			268.9			75.0		269.2	
Turn Bay Length (m)			85.0			100.0					
Base Capacity (vph)	466		354		2617	1244		2670			
Starvation Cap Reductn	0		0		0	0		0			
Spillback Cap Reductn	0		0		0	0		0			
Storage Cap Reductn	0		0		0	0		0			
Reduced v/c Ratio	0.42		0.21		0.23	0.17		0.57			

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 8 (7%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.66			
Intersection Signal Delay: 8.9		Intersection LOS: A	
Intersection Capacity Utilization 74.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: 417 EB ramp & 417 N-E ramp

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations											
Volume (vph)	700	0	325	0	457	95	0	1597	400	0	0
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		0.0	100.0	0.0		60.0	0.0		0.0	0.0	0.0
Storage Lanes		2	1	0		1	0		1	0	0
Taper Length (m)		50.0	50.0	2.5		2.5	2.5		25.0	2.5	2.5
Lane Util. Factor	0.97	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00
Frt			0.850			0.850			0.850		
Flt Protected	0.950										
Satd. Flow (prot)	3354	0	1547	0	3458	774	0	3458	1547	0	0
Flt Permitted	0.950										
Satd. Flow (perm)	3354	0	1547	0	3458	774	0	3458	1547	0	0
Right Turn on Red			Yes			Yes			No		
Satd. Flow (RTOR)			586			113					
Link Speed (k/h)		100			50			50		48	
Link Distance (m)		785.2			124.9			102.2		97.8	
Travel Time (s)		28.3			9.0			7.4		7.3	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Adj. Flow (vph)	833	0	387	0	544	113	0	1901	476	0	0
Shared Lane Traffic (%)											
Lane Group Flow (vph)	833	0	387	0	544	113	0	1901	476	0	0
Turn Type	custom		Free			Perm			Perm		
Protected Phases	8				2			6			
Permitted Phases	8		Free			2			6		
Detector Phase	8				2	2		6	6		
Switch Phase											
Minimum Initial (s)	10.0				10.0	10.0		10.0	10.0		
Minimum Split (s)	23.1				26.0	26.0		26.0	26.0		
Total Split (s)	40.0	0.0	0.0	0.0	80.0	80.0	0.0	80.0	80.0	0.0	0.0
Total Split (%)	33.3%	0.0%	0.0%	0.0%	66.7%	66.7%	0.0%	66.7%	66.7%	0.0%	0.0%
Maximum Green (s)	34.9				74.0	74.0		74.0	74.0		
Yellow Time (s)	3.3				4.6	4.6		4.6	4.6		
All-Red Time (s)	1.8				1.4	1.4		1.4	1.4		
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	4.0	4.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	4.0
Lead/Lag											
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0				3.0	3.0		3.0	3.0		
Recall Mode	None				C-Max	C-Max		None	None		
Act Effct Green (s)	33.1		120.0		75.8	75.8		75.8	75.8		
Actuated g/C Ratio	0.28		1.00		0.63	0.63		0.63	0.63		
v/c Ratio	0.90		0.25		0.25	0.21		0.87	0.49		
Control Delay	55.5		0.4		7.7	1.4		18.4	11.3		
Queue Delay	0.0		0.0		0.0	0.0		0.0	0.0		
Total Delay	55.5		0.4		7.7	1.4		18.4	11.3		
LOS	E		A		A	A		B	B		
Approach Delay					6.6			17.0			
Approach LOS					A			B			

Lane Group	WBL2	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Queue Length 50th (m)	95.4		0.0		21.3	0.0		198.0	43.7		
Queue Length 95th (m)	108.8		0.0		25.3	2.0		99.4	50.7		
Internal Link Dist (m)		761.2			100.9			78.2		73.8	
Turn Bay Length (m)			100.0			60.0					
Base Capacity (vph)	975		1547		2185	531		2185	977		
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	0.85		0.25		0.25	0.21		0.87	0.49		

Intersection Summary			
Area Type:	Other		
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.90			
Intersection Signal Delay: 21.4		Intersection LOS: C	
Intersection Capacity Utilization 76.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Memo To: R. Hunton
Date: August 5, 2010

Appendix D – Intersection LOS Assessment – Proposed At-grade Transitway at Moodie Drive with Current Traffic Volumes (2009/2010)

An assessment of the traffic operations at the Moodie Dr and Highway 417 North intersection was carried out based on the proposed intersection changes. Preliminary analysis undertaken to support the potential travel time analysis had been based on traffic count data complied based largely on pre-2009 traffic counts. In general the preliminary analysis was carried out based on the highest level of traffic observed between 2002 and 2006. A summary of the observed traffic counts provided are highlighted in Table 1.

Table 1: Historic and Current AM (PM) Traffic Movements (Moodie Dr and Hwy 417 North)

Traffic Movement / Year	SBR	SBT	WBR	WBT	WBL	NBR	NBT
2002	68(283)	275(1617)	1038(299)	9 (29)	381(751)	86(153)	714(337)
2003	63(320)	340(1729)	1149(303)	2 (41)	414(769)	72(113)	797(375)
2004	70(351)	314(1618)	1188(349)	4 (31)	360(738)	75(161)	832(336)
2006	58(352)	303(1911)	1080(334)	0 (0)	406(1026)	70(96)	567(316)
2009	**84(288)**	**304(1282)**	**649 (132)**	**9 (13)**	**313(363)**	**89(190)**	**604(350)**
2010	**51(271)**	**271(1446)**	**598 (61)**	**7 (16)**	**329(427)**	**83(222)**	**477(250)**

The 2009 and 2010 traffic counts indicate that changes have occurred (previously traffic flow at Moodie highway 417 North was likely influenced heavily by congestion on segments of Highway 417 prior to the lane balancing and lane improvements) most notably for the AM peak WBR and the PM peak WBL traffic movements.

Consequently the identification of the intersection level of service for the proposed changes to Moodie Drive/Highway 417 North intersection is based on the observed traffic volumes identified for 2009 and 2010 above. The alternative considered included the following:

- An at –grade Transitway intersection at Moodie
- A reduction of one southbound through lane (compared with existing condition) to allow for improved accommodation of northbound and southbound cyclists as well as pedestrian movements.

The traffic volumes, and intersection performance levels are presented in Table 2. Based on the analysis of current traffic flows at the intersection, the reported LOS for both 2009 and 2010 as noted in Table 1 indicates that the intersection will offer adequate LOS (D and better) with the proposed intersection changes (i.e. introduction of an at-grade intersection to accommodate the Transitway crossing of Moodie Dr as well as a southbound lane reduction to improve northbound and southbound cycling and pedestrian movements).

Memo To: R. Hunton
Date: August 5, 2010

Table 2: Proposed Intersection Alternative – 2009/2010 Performance Levels (Moodie Dr and Hwy 417 North)

	AM						PM					
	2009 Traffic Count City of Ottawa			2010 Traffic Count MTO			2009 Traffic Count City of Ottawa			2010 Traffic Count MTO		
	Volume	V/C	LoS	Volume	V/C	LoS	Volume	V/C	LoS	Volume	V/C	LoS
SBR	84	0.16	A	51	0.10	A	288	0.39	A	271	0.37	A
SBT	304	0.28	A	271	0.23	A	1282	0.79	C	1446	0.88	D
WBR	649	0.85	D	598	0.83	D	132	0.34	A	61	0.17	A
WBL	313	0.33	A	329	0.38	A	363	0.77	C	427	0.86	D
NBT	604	0.44	A	477	0.35	A	350	0.21	A	250	0.16	A
TWAY	67	0.66	B	67	0.63	B	75	0.73	C	75	0.75	C

Note: Analysis is based on proposed at-grade Transitway and loss of SB traffic lane

Synchro™ Level of Service Calculation Sheets

- 2009 AM – based on City of Ottawa Traffic Counts
- 2009 PM – based on City of Ottawa Traffic Counts

- 2010 AM – based on MTO Traffic Counts
- 2010 PM – based on MTO Traffic Counts

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	313	649	669	304	84	5	60	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.997	
Flt Protected	0.950						0.996	
Satd. Flow (prot)	3257	2643	4436	3232	1502	0	904	0
Flt Permitted	0.950						0.996	
Satd. Flow (perm)	3257	2643	4436	3232	1502	0	904	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							1	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	12%	7%	3%	100%	100%	100%
Adj. Flow (vph)	373	773	796	362	100	6	71	2
Shared Lane Traffic (%)								
Lane Group Flow (vph)	373	773	796	362	100	0	79	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	50.0	50.0	37.0	37.0	37.0	23.0	23.0	0.0
Total Split (%)	45.5%	45.5%	33.6%	33.6%	33.6%	20.9%	20.9%	0.0%
Maximum Green (s)	44.9	44.9	31.0	31.0	31.0	18.0	18.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	37.9	37.9	44.6	44.6	44.6		14.4	
Actuated g/C Ratio	0.34	0.34	0.41	0.41	0.41		0.13	
v/c Ratio	0.33	0.85	0.44	0.28	0.16		0.66	
Control Delay	26.8	42.8	27.5	25.9	26.7		69.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	26.8	42.8	27.5	25.9	26.7		69.9	
LOS	C	D	C	C	C		E	
Approach Delay			27.5	26.1			69.9	
Approach LOS			C	C			E	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	30.2	86.3	47.1	28.5	14.2		16.1	
Queue Length 95th (m)	34.9	91.7	63.0	42.8	28.2		29.1	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	1329	1079	1799	1311	609		149	
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	0.28	0.72	0.44	0.28	0.16		0.53	

Intersection Summary			
Area Type:	Other		
Cycle Length: 110			
Actuated Cycle Length: 110			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 33.2		Intersection LOS: C	
Intersection Capacity Utilization 59.4%		ICU Level of Service B	
Analysis Period (min) 15			

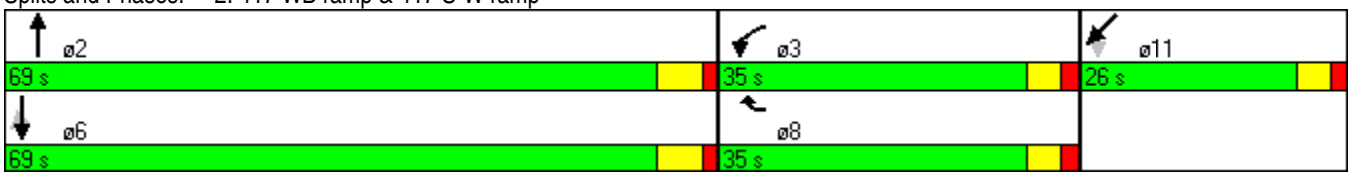
Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	363	132	420	1282	288	5	65	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.991	
Flt Protected	0.950						0.997	
Satd. Flow (prot)	3257	2643	4175	3390	1532	0	899	0
Flt Permitted	0.950						0.997	
Satd. Flow (perm)	3257	2643	4175	3390	1532	0	899	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							2	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	3%	3%	19%	2%	1%	100%	100%	100%
Adj. Flow (vph)	432	157	500	1526	343	6	77	6
Shared Lane Traffic (%)								
Lane Group Flow (vph)	432	157	500	1526	343	0	89	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	35.0	35.0	69.0	69.0	69.0	26.0	26.0	0.0
Total Split (%)	26.9%	26.9%	53.1%	53.1%	53.1%	20.0%	20.0%	0.0%
Maximum Green (s)	29.9	29.9	63.0	63.0	63.0	21.0	21.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	22.5	22.5	74.0	74.0	74.0		17.4	
Actuated g/C Ratio	0.17	0.17	0.57	0.57	0.57		0.13	
v/c Ratio	0.77	0.34	0.21	0.79	0.39		0.73	
Control Delay	60.5	48.5	15.2	27.5	19.1		83.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	60.5	48.5	15.2	27.5	19.1		83.4	
LOS	E	D	B	C	B		F	
Approach Delay			15.2	25.9			83.4	
Approach LOS			B	C			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	55.0	20.3	22.2	156.1	47.3		21.6	
Queue Length 95th (m)	63.8	28.1	31.9	197.4	75.3		36.1	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	749	608	2378	1931	872		151	
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	0.58	0.26	0.21	0.79	0.39		0.59	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.79			
Intersection Signal Delay: 31.9		Intersection LOS: C	
Intersection Capacity Utilization 69.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp



Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	329	598	544	271	51	5	60	2
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.997	
Flt Protected	0.950						0.996	
Satd. Flow (prot)	3225	2696	4397	3325	1432	0	904	0
Flt Permitted	0.950						0.996	
Satd. Flow (perm)	3225	2696	4397	3325	1432	0	904	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							1	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	4%	1%	13%	4%	8%	100%	100%	100%
Adj. Flow (vph)	392	712	648	323	61	6	71	2
Shared Lane Traffic (%)								
Lane Group Flow (vph)	392	712	648	323	61	0	79	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	50.0	50.0	35.0	35.0	35.0	25.0	25.0	0.0
Total Split (%)	45.5%	45.5%	31.8%	31.8%	31.8%	22.7%	22.7%	0.0%
Maximum Green (s)	44.9	44.9	29.0	29.0	29.0	20.0	20.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	35.2	35.2	46.5	46.5	46.5		15.2	
Actuated g/C Ratio	0.32	0.32	0.42	0.42	0.42		0.14	
v/c Ratio	0.38	0.83	0.35	0.23	0.10		0.63	
Control Delay	29.2	42.9	25.4	24.6	26.2		64.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	29.2	42.9	25.4	24.6	26.2		64.5	
LOS	C	D	C	C	C		E	
Approach Delay			25.4	24.9			64.5	
Approach LOS			C	C			E	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	33.4	79.8	35.3	23.8	8.1		16.1	
Queue Length 95th (m)	38.0	84.7	52.1	39.3	19.4		27.8	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	1316	1100	1859	1405	605		168	
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	0.30	0.65	0.35	0.23	0.10		0.47	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 33.0 Intersection LOS: C
Intersection Capacity Utilization 54.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Lane Configurations								
Volume (vph)	427	61	320	1446	271	5	65	5
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)		300.0			0.0	0.0		0.0
Storage Lanes		1			1	0		0
Taper Length (m)		50.0			25.0	2.5		2.5
Lane Util. Factor	0.97	0.88	0.91	0.95	1.00	1.00	1.00	1.00
Frt		0.850			0.850		0.991	
Flt Protected	0.950						0.997	
Satd. Flow (prot)	3354	2521	4106	3424	1547	0	899	0
Flt Permitted	0.950						0.997	
Satd. Flow (perm)	3354	2521	4106	3424	1547	0	899	0
Right Turn on Red					No			Yes
Satd. Flow (RTOR)							2	
Link Speed (k/h)			50	50			80	
Link Distance (m)			124.9	102.2			112.3	
Travel Time (s)			9.0	7.4			5.1	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	8%	21%	1%	0%	100%	100%	100%
Adj. Flow (vph)	508	73	381	1721	323	6	77	6
Shared Lane Traffic (%)								
Lane Group Flow (vph)	508	73	381	1721	323	0	89	0
Turn Type	Prot	custom			Perm	Perm		
Protected Phases	3	8	2	6			11	
Permitted Phases					6	11		
Detector Phase	3	8	2	6	6	11	11	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	15.1	23.1	26.0	26.0	26.0	15.0	15.0	
Total Split (s)	29.0	29.0	75.0	75.0	75.0	26.0	26.0	0.0
Total Split (%)	22.3%	22.3%	57.7%	57.7%	57.7%	20.0%	20.0%	0.0%
Maximum Green (s)	23.9	23.9	69.0	69.0	69.0	21.0	21.0	
Yellow Time (s)	3.3	3.3	4.6	4.6	4.6	3.3	3.3	
All-Red Time (s)	1.8	1.8	1.4	1.4	1.4	1.7	1.7	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.1	5.1	6.0	6.0	6.0	5.0	5.0	4.0
Lead/Lag								
Lead-Lag Optimize?								
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	C-Max	None	None	None	None	
Act Effct Green (s)	22.8	22.8	74.3	74.3	74.3		16.9	
Actuated g/C Ratio	0.18	0.18	0.57	0.57	0.57		0.13	
v/c Ratio	0.86	0.17	0.16	0.88	0.37		0.75	
Control Delay	67.6	46.1	14.2	31.7	17.7		87.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0		0.0	
Total Delay	67.6	46.1	14.2	31.7	17.7		87.8	
LOS	E	D	B	C	B		F	
Approach Delay			14.2	29.5			87.8	
Approach LOS			B	C			F	

Lane Group	WBL2	WBR	NBT	SBT	SBR	SWL	SWT	SWR
Queue Length 50th (m)	65.2	9.0	16.8	200.1	44.9		21.6	
Queue Length 95th (m)	78.0	15.5	22.1	218.1	63.1		36.8	
Internal Link Dist (m)			100.9	78.2			88.3	
Turn Bay Length (m)	300.0	300.0						
Base Capacity (vph)	617	463	2345	1956	884		147	
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	0.82	0.16	0.16	0.88	0.37		0.61	

Intersection Summary			
Area Type:	Other		
Cycle Length: 130			
Actuated Cycle Length: 130			
Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green, Master Intersection			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 35.9		Intersection LOS: D	
Intersection Capacity Utilization 75.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 2: 417 WB ramp & 417 S-W ramp