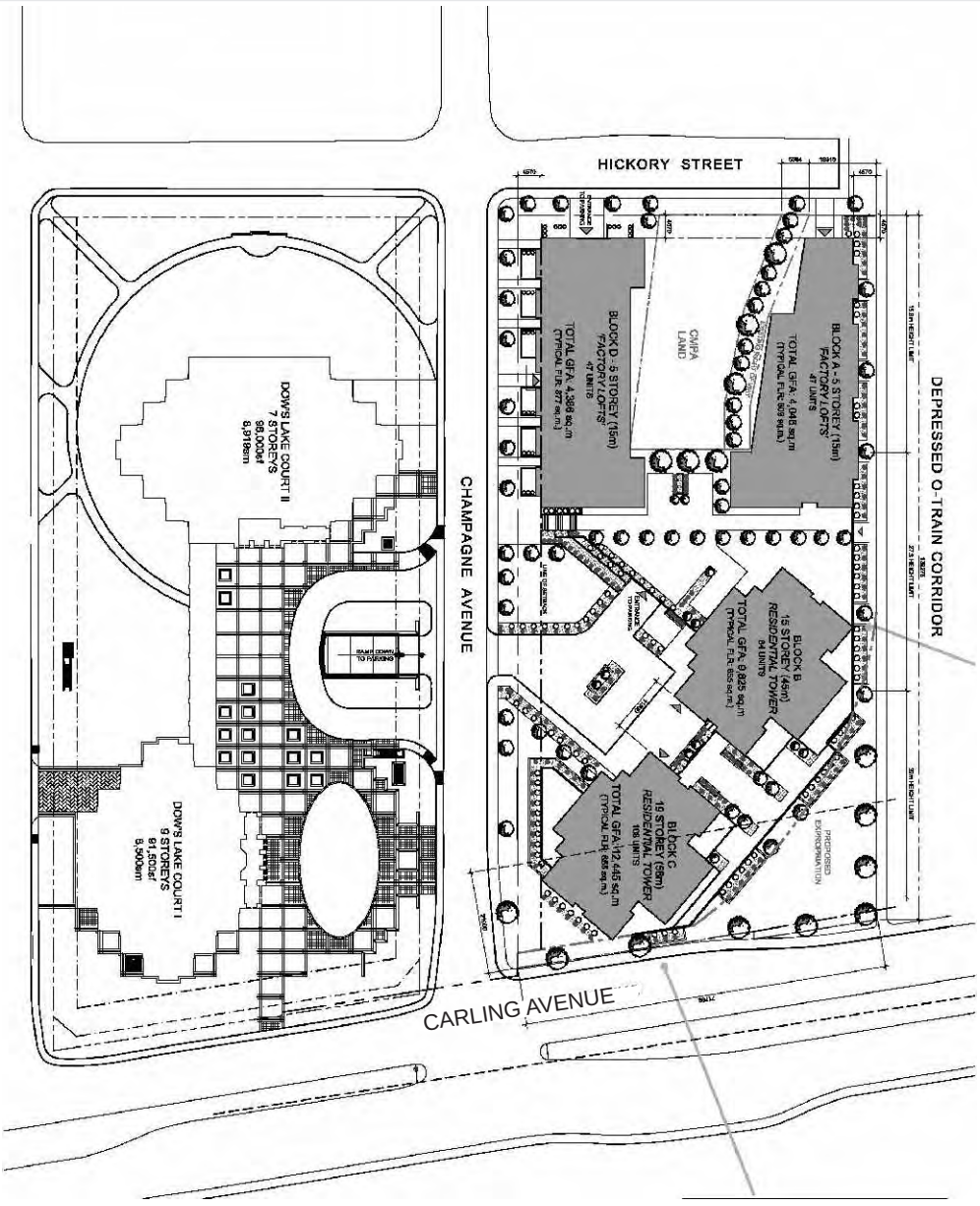
855 Carling Avenue:
Residential Development

Addendum #3: Revised Development Scenario Traffic Impacts



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855 Carling Avenue: Residential Development

Addendum #3: Revised Development Scenario Traffic Impacts

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1.0 BACKGROUND

The site at 855 Carling Avenue, currently vacant although being used as a temporary car park (approximately 300 spaces) for Civic Hospital employees, is currently zoned to permit both office and residential development. Earlier, a concept plan was developed to accommodate an office complex comprised of two office towers with a gross floor area totalling approximately 44,500 m^2 (479,000 ft^2). The transportation implication of an office development, which would be greater than that of residential, have been detailed in an earlier report. Due to a combination of factors, we are now advised that the proponents are now considering the development of a residential complex containing a maximum of 400 condo apartments.

The purpose of this addendum is to quantify the changed impact, from a transportation perspective, of the proposed land use change from office to residential.

As noted above, the transportation implications of the original office concept have been detailed previously in a Community Traffic Study report, prepared by Delcan in May 2009, followed by two addenda, also prepared by Delcan, dated July 27, 2009 and September 14, 2009.

2.0 PROPOSED RESIDENTIAL DEVELOPMENT

Depicted on Figure 1 is a Draft Concept Plan of the proposed residential complex at 855 Carling Avenue. As shown, the site is bounded by Carling Avenue to the south, Champagne Avenue to the west, Hickory Street to the north and the depressed O-Train Corridor to the east.

It is noteworthy that due to the potential need for future LRT vehicles to be able to travel from the Carling Avenue Corridor to/from the O-Train Corridor, the southeast corner of the site has been identified by City staff as not developable below a 15m height above-grade, as well as below-grade. Consequently, the proposed residential development contains four residential blocks, with the northern pair oriented at right angles to Hickory Street and the southern pair oriented at 45% to Carling Avenue, generally paralleling the triangle of land identified for potential rapid transit.

Although the Draft Concept Plan indicates a total of 286 residential units, the earlier figure of 400 units has been assumed in an abundance of caution maximizing the potential transportation impact of the proposed development.

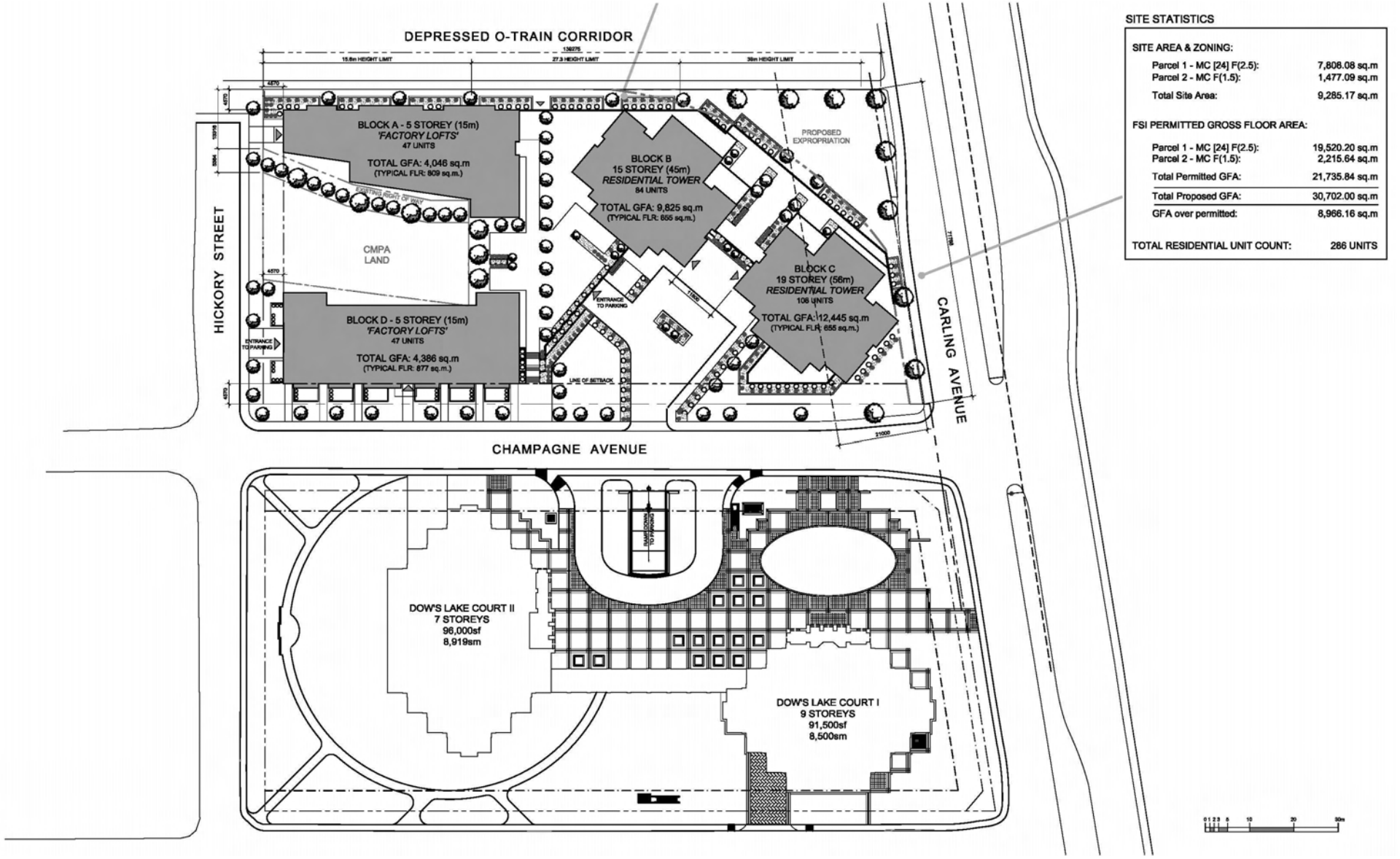
3.0 OTHER RELEVANT EXISTING AND PROPOSED DEVELOPMENT

Over the past couple of years, Delcan has been responsible for the completion of Traffic Impact/Community Transportation Studies for a number of residential developments in the vicinity of 855 Carling Avenue.

Details of these developments recently completed/planned, are as follows in Table 1 and their locations are depicted on Figure 2: Relevant Development Proposed Locations.

Table 1: Adjacent Relevant Development Proposals

Development Location	# of Units
Domicile Developments: 320/330 Loretta Avenue South	182 condo apartments
Mastercraft Starwood: 125 Hickory Avenue	33 townhomes 301 condo apartments
Domicile Developments: 100 Champagne Avenue	6 townhomes 94 condo apartments



SITE STATISTICS

SITE AREA & ZONING:	
Parcel 1 - MC [24] F(2.5):	7,808.08 sq.m
Parcel 2 - MC F(1.5):	1,477.09 sq.m
Total Site Area:	9,285.17 sq.m
FSI PERMITTED GROSS FLOOR AREA:	
Parcel 1 - MC [24] F(2.5):	19,520.20 sq.m
Parcel 2 - MC F(1.5):	2,215.64 sq.m
Total Permitted GFA:	21,735.84 sq.m
Total Proposed GFA:	30,702.00 sq.m
GFA over permitted:	8,966.16 sq.m
TOTAL RESIDENTIAL UNIT COUNT:	286 UNITS

Figure 1: Draft Concept Plan

Figure 2: Relevant Development Proposed Locations

4.0 STUDY AREA CURRENT TRANSPORTATION NETWORK

As the Road and Transit Networks and the Pedestrian and Cycling facilities in the immediate vicinity of the proposed development have not changed since the completion of the CTS in 2009, details will not be repeated in this Addendum, and are to be found in Section 3.0 of the aforementioned CTS Report.

5.0 EXISTING TRANSPORTATION CONDITIONS

5.1 Traffic Volumes

The most recent traffic counts provided by the City of Ottawa (Appendix A), and depicted on Figure 3, indicate that Carling Avenue on either side of Champagne Avenue currently carries a total two-way volume of approximately 1300 vph during the morning peak hour and approximately 1800 vph during the afternoon peak hour. Both these peak hour volumes are well below the 6-UAD capacity of Carling Avenue.

Champagne Avenue, which will serve as access/egress to the proposed development, currently carries a total of approximately 320 vph during the a.m. peak and 450 vph during the afternoon peak at its Carling Avenue intersection, with the peak directional flow being approximately 240 vph northbound during the a.m. peak and approximately 320 vph southbound during the p.m. peak. It is noteworthy that the traffic volumes currently on Champagne Avenue primarily reflect the aforementioned active temporary parking lot for 300 cars, and the street's use as a connection to the Dow's Lake Court parking garage (614 spaces) as well as the existing primarily residential development to the north and west of the proposed site.

The traffic signals at the Carling/Champagne intersection were installed several years ago, primarily for safety reasons, and have been judged unwarranted since then, resulting in their maintenance costs being borne by the developer of Dow's Lake Court. Based on the most recent City of Ottawa traffic counts (August 2009), the signals are still unwarranted (volumes do not meet MTO's warrants).

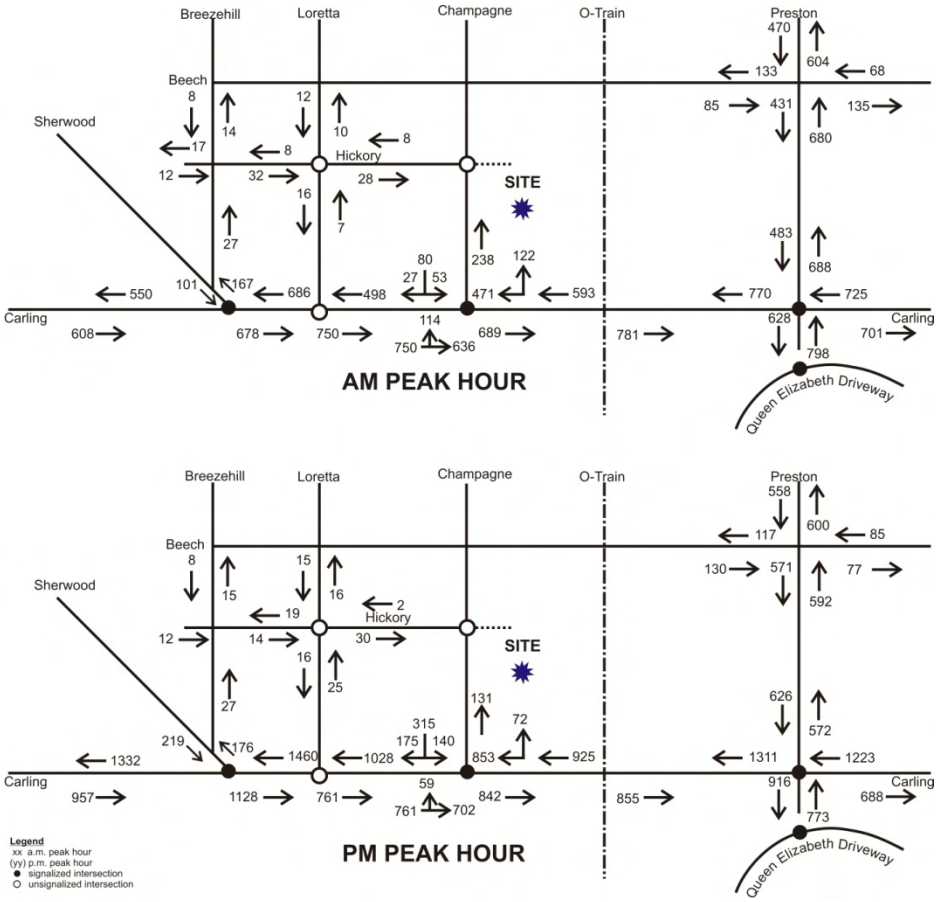
Beech Street, which has a signalized intersection with Preston Street carries volumes totalling approximately 250 vph two-way total in both morning and afternoon peak hours, west of Preston Street. As Beech Street terminates within the residential development to the west, it is reasonable to assume that its maximum loading point will be the approach to the Preston Street signalized intersection, and based on the current volumes on that approach, peak hour volumes west of Champagne Avenue are considered to likely fall within the 50 to 100 vph range. Counts conducted by Delcan at intersections on Hickory Street at Loretta and at Breezehill indicates two-way peak hour volumes not exceeding 50 vph on Hickory Street, 50 vph on Loretta, and 30 vph on Breezehill.

Based on the peak hour counts on Champagne Avenue at Carling Avenue, and the fact that the predominant origins/destinations of traffic on Champagne Avenue are the parking facilities associated with Dow's Lake Court and the temporary 300 space parking lot, it is reasonable to conclude that peak hour volumes on Champagne Avenue between Hickory Street and Beech Street are also within the 50 vph to 100 vph range (two-way).

The adjacent arterial to the east, Preston Street currently carries peak hour total volumes within the 1150 vph to 1200 vph two-way total range, between Carling Avenue and Beech Street, while Sherwood Drive, a collector road to the west, carries a maximum volume at Carling Avenue at approximately 400 vph two-way total during the afternoon peak.

It is noteworthy that the afternoon peak hour flow on Sherwood Drive declines dramatically over its length from a total of approximately 400 vph at Carling Avenue to a total of less than 200 vph at Parkdale Avenue.

Figure 3: Current Peak Hour Traffic Volumes



5.2 Current Operating Conditions

Traffic volumes that are depicted on Figure 3, and which represent current peak hour operations at the relevant intersections along Carling Avenue and Preston Street, the two arterials adjacent to the proposed development site, were analyzed using the analysis tool SYNCHRO (Version 7) and current signal timing plans. The results are shown in Table 2 and the SYNCHRO analysis is included at Appendix B.

Table 2: Current Intersection Operating Conditions

Intersection	Critical Movement			Intersection		
	max. v/c or critical delay (s)	LoS	Movement	Avg. Delay (s)	LoS	v/c
Carling/Sherwood	0.51(0.76)	A(C)	SBL(SBL)	9.2(17.6)	A(A)	0.25(0.55)
Carling/Champagne	0.32(0.66)	A(B)	SBL(SBL)	4.1(8.5)	A(A)	0.15(0.29)
Carling/Preston	0.90(1.35)	D(F)	SBT(NBL)	36.9(55.9)	B(D)	0.68(0.89)
Preston/Beech	0.49(0.54)	A(A)	NBT(EBT)	8.0(10.9)	A(A)	0.45(0.46)

As shown on Table 2, all the intersections analyzed are currently operating at Levels of Service of 'D' or better during both morning and afternoon peaks, based on overall intersection operations, reflective of the fact that as a six-lane arterial, Carling Avenue has considerable spare capacity for the traffic volumes utilizing the roadway west of its intersection with Bronson Avenue, while Beech Street carries relatively minor volumes east and west of Preston Street. The key Carling/Champagne intersection currently operates at LoS 'A' during the a.m. and p.m. peaks respectively indicating that there is spare capacity available for all the currently known developments in the area, i.e., Domicile, Mastercraft Starwood and Arnon.

It is noteworthy that the north-to-west left-turn movement at the Carling/Preston intersection is currently experiencing an unacceptable Level of Service (LoS 'F') during the afternoon peak hour while all the other movements operate at satisfactory levels of service during that time.

5.3 Existing Road Safety Conditions

Collision data for study area roads (2005 to 2008) is to be found in Section 5.4 of the aforementioned CTS completed in May 2009.

5.4 Background Traffic Growth

Table 3 contains the total approaching volumes at the Carling/Preston intersection in 2001 and 2008. As shown on Table 3, total traffic volumes have declined over the seven-year period 2001-2008 in the vicinity of the Carling/Preston intersection, which is the busiest intersection most adjacent to the proposed development, and the one for which a lengthy traffic volume history was available from the City.

Notwithstanding, this decline in peak hour traffic volumes along Carling Avenue, background traffic volumes, in an abundance of caution, have been assumed to increase modestly over the next several years and for that reason an annual growth rate of 1% per annum has been assumed to apply to the most recent traffic volumes in the vicinity of the site, depicted on Figure 3.

Table 3: Recent Total Peak Hour Approaching Traffic Volumes: Carling/Preston Intersection

Approach	Year				% Change		Average Annual Change	
	2001		2008					
	AM	PM	AM	PM	AM	PM	AM	PM
Eastbound	835 vph	1200 vph	781 vph	855 vph	-	-	-	-
Westbound	924 vph	1184 vph	725 vph	1233 vph	-	-	-	-
Northbound	1119 vph	796 vph	798 vph	773 vph	-	-	-	-
Southbound	540 vph	702 vph	483 vph	626 vph	-	--	-	-
TOTAL	**3418 vph**	**3882 vph**	**2787 vph**	**3487 vph**	**-18.5%**	**-10.2%**	**-2.6%**	**-1.5%**

5.5 Modified Current Peak Hour Traffic Data

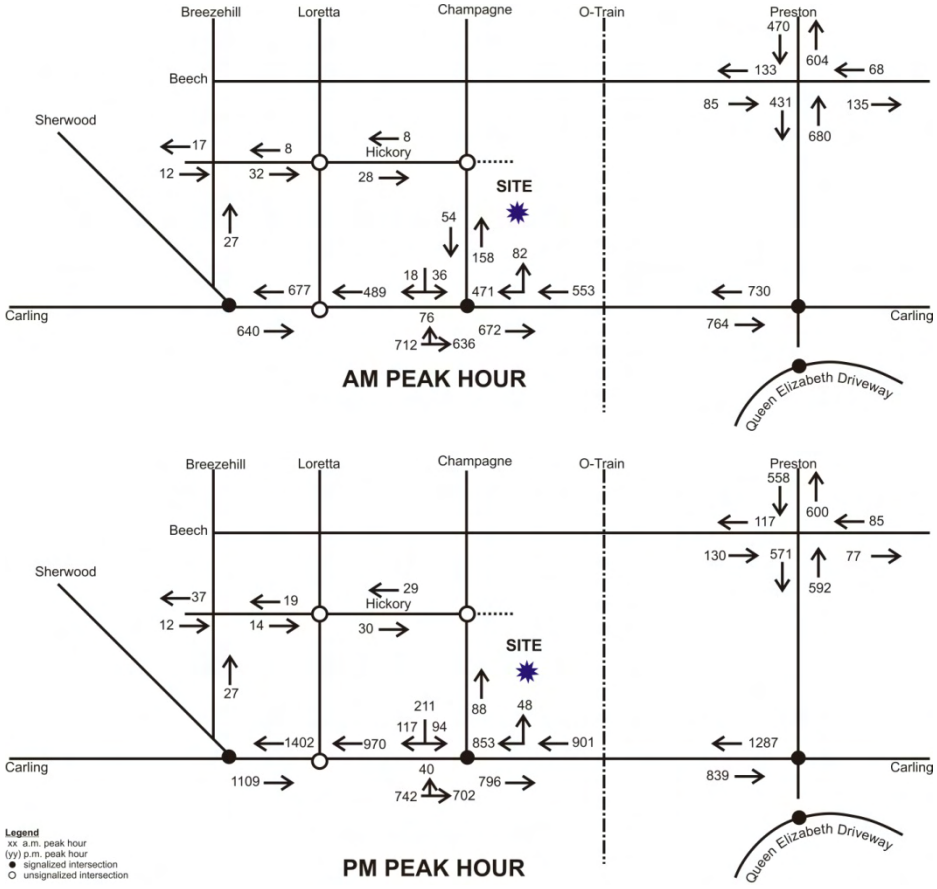
Since the existing peak hour data at the Carling/Champagne intersection, reflected in the City of Ottawa count of 17 August 2009 (Appendix A) includes traffic generated by the existing 300-space temporary parking lot which will be relocated elsewhere to permit the development of the Arnon site, the impact of the displaced 300 spaces serving the Civic Hospital, has to be allowed for.

As the aforementioned peak hour traffic counts include traffic generated by two primary sources, i.e., the approximate 600 parking spaces in Dow's Lake Court and the 300 parking

spaces on the 855 Carling Avenue site, it has been assumed that a reduction of 33% in the peak hour two-way traffic volumes on Champagne Avenue would be an appropriate modification to the background traffic. This modification has been accepted by City staff, and has been applied only at the Carling/Champagne intersection and not at the Preston/Beech intersection.

The modified current peak hour traffic volumes reflecting this 33% reduction are depicted on Figure 4 and are assumed to reflect the appropriate current background traffic volumes on Champagne Avenue and Carling Avenue which will be projected forward at an annual growth rate of 1% pa and to which will be added the projected additional peak hour traffic generated by the currently known potential developments by Arnon, Mastercraft Starwood and Domicile.

Figure 4: Modified Current Peak Hour Traffic Volumes



6.0 PROJECTED CONDITIONS

6.1 Projected Modified Background Traffic Volumes

Continuing with the assumption that background traffic volumes will grow at a nominal rate of 1% per annum over the next several years despite the fact that there has been a decline in peak hour volumes on the section of Carling Avenue in the vicinity of Champagne Avenue, depicted on Figures 5 and 6 are the projected modified background traffic volumes at the year 2011. This is the anticipated year of full occupancy of the proposed residential developments (Domicile, Mastercraft Starwood and Arnon). As such, at 2016, five years beyond build-out of all development proposals, is the "horizon year" for analysis purposes.

Figure 5: Modified Background Peak Hour Traffic Volumes: 2011

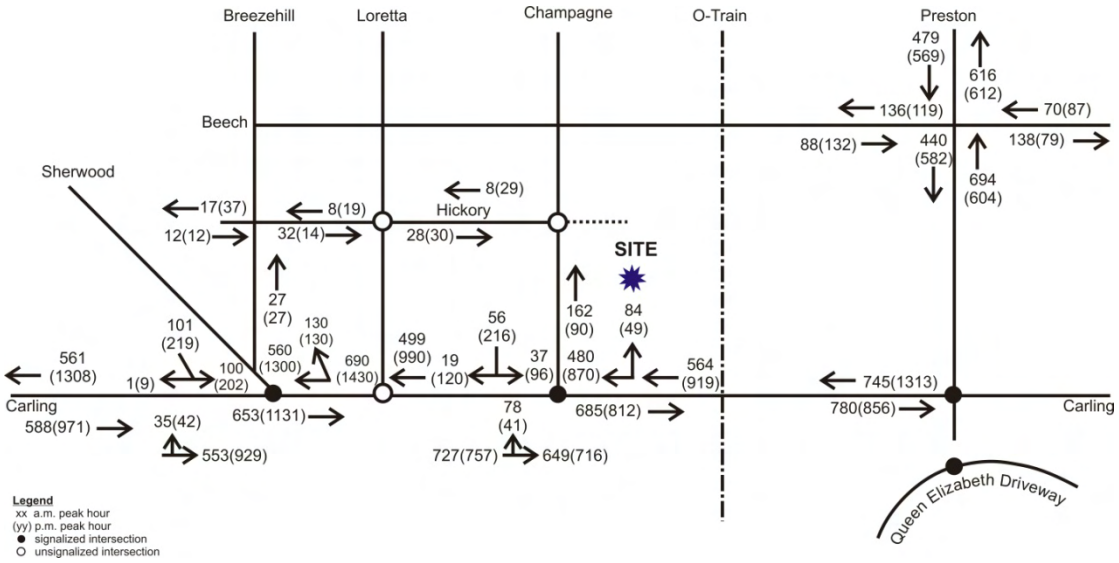
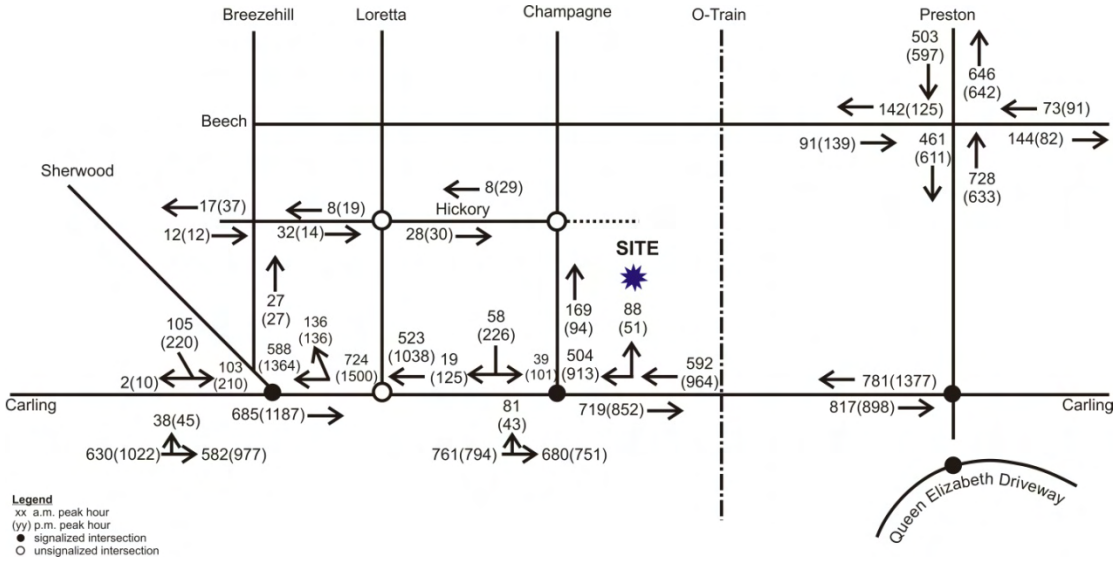


Figure 6: Modified Background Peak Hour Traffic Volumes: 2016



6.2 Relevant Site-Generated Traffic Volumes and Distribution Assumptions

The ensuing sub-sections address the traffic generation of other known development projects in the immediate study area.

6.2.1 Existing Domicile Residential Development: 320/330 Loretta Avenue

The (ITE) Trip Generation rates for Residential Condominiums/Townhouses land use were applied to the proposed 182-unit residential development to estimate the volume of site-generated trips in the peak periods. As shown on Table 4, the site is projected to generate a maximum two-way total of 89 and 105 vehicles per hour (veh/h) during the weekday AM and PM peak hours, respectively.

Table 4: Peak Hour Site-Generated Traffic Volumes: 320/330 Loretta Avenue (Domicile): 2011/2016

Peak Hour	In	Out	Total
AM	15	74	89
PM	70	35	105

It is noteworthy that in review of the Table 4 volumes, and given that the previous land use is estimated to have generated a minimum two-way peak hour volume of 20 veh/h during the weekday peak hours, the net increase is approximately 70 to 85 veh/h.

6.2.1.1 Distribution and Assignment

With regard to the distribution of site-generated vehicle trips, it was assumed that the sub-grade parking level of the condominium towers was shared and that approximately one third of the buildings' traffic would be assigned to the independent, upper parking levels.

Based on a combination of the existing traffic volume counts (and traffic distribution) at area intersections, the location of retail and employment centres relative to the site, and the road network connectivity, the following vehicle trip distribution was assumed:

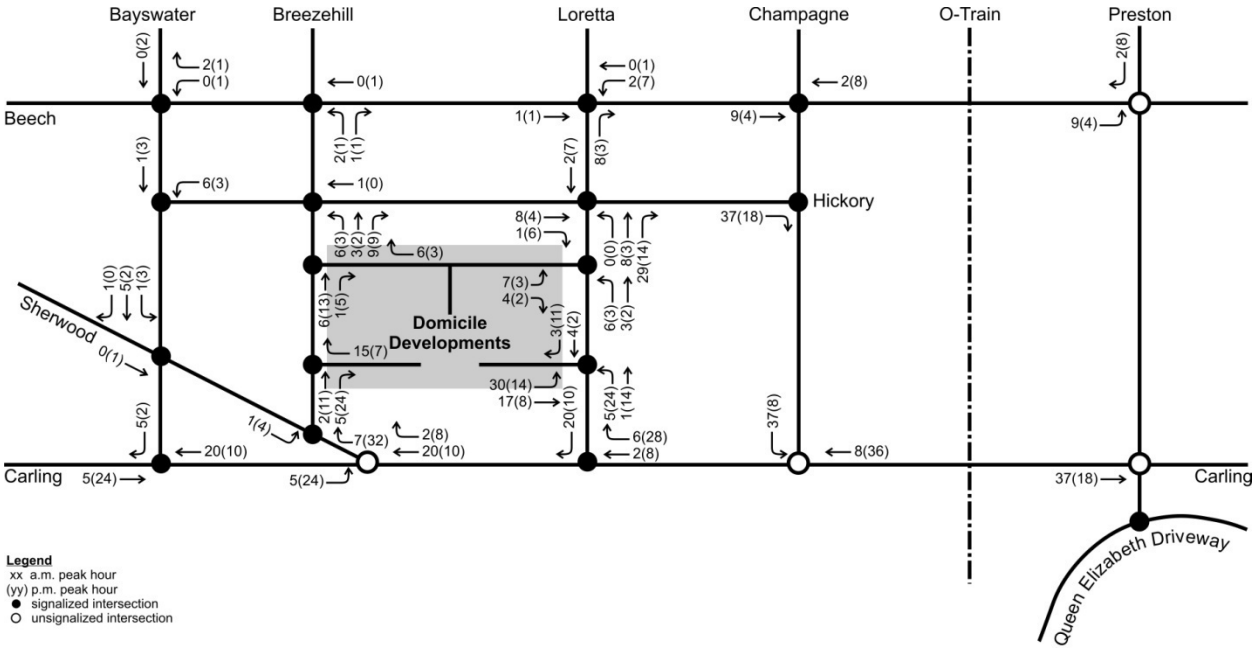
To/From	%
North/West	5%
North/East	15%
South/West	25%
South/East	55%
Total	100%

As depicted on Figure 7, the majority of the site's traffic will travel via Loretta Avenue, because it is a two-way roadway as compared to Breezehill, which provides one-way travel in the northbound direction only. However, because a median break is not provided on Carling Avenue at Loretta Avenue, outbound vehicles wishing to travel eastbound on Carling Avenue must access Champagne Avenue, resulting in some site-traffic use of Hickory Street, east of Loretta Avenue. Approximately 37 veh/h (which is approximately one vehicle every two minutes) would complete this movement in the weekday AM peak hour, and fewer in the weekday PM and Saturday peaks. Between Breezehill and Loretta Avenue, an increase in two-way traffic of approximately 10 veh/h is anticipated during all peak hours. This is equivalent to an average of one vehicle every six minutes.

The relatively small number of vehicles entering and exiting from the upper parking level of the Breezehill tower would likely opt to travel to Bayswater if destined for roadways west of the site, and to Champagne Avenue if destined for roadways east of the site.

The Hickory/Loretta intersection is anticipated to experience the greatest increase in traffic volumes as a result of the Domicile development at 330 Loretta Avenue South. It is projected that the proposed development will add a total of 48 and 35 veh/h during the weekday AM and PM peaks, respectively. It is noteworthy that approximately 60 veh/h and 85 veh/h currently travel through this intersection during the morning and afternoon peak hours, respectively.

Figure 7: Projected Peak Hour Domicile Site Generated Traffic: 2011/2016



6.2.2 Mastercraft Starwood Residential Development: 125 Hickory Avenue

The proposed rezoning at 125 Hickory Avenue is anticipated to result in a high-rise residential development consisting of 33 townhomes and 301 apartment units. Using the trip generation rates provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual (8th Edition), site-generated trips were estimated based on these development assumptions.

Using the average trip generation rates pertaining to Residential Condominium/Townhouses (LU 230) the resultant figures are shown in Table 5.

Table 5: Peak Hour Site-Generated Traffic Volumes: 125 Hickory Street (Mastercraft Starwood): 2011/2016

Peak Hour	Average Vehicle Trips / Dwelling Unit	Total Generated Traffic	Directional Split
AM Peak	0.44	334 x 0.44 = 147 vph	Out (81%): 119 vph In (19%): 28 vph
PM Peak	0.52	334 x 0.52 = 174 vph	In (64%): 112 vph Out (36%): 62 vph

6.2.2.1 Distribution and Assignment

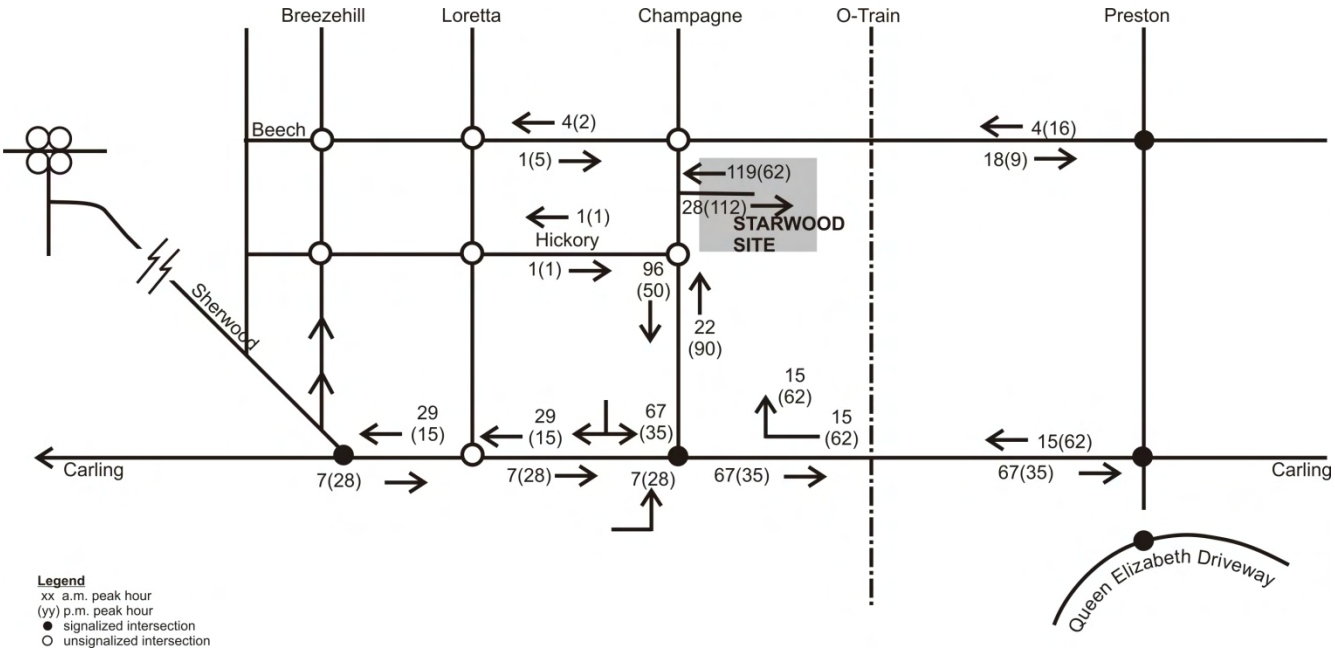
The assumed distribution of peak hour generated traffic to/from the proposed residential development is as follows, reflecting the adjacent arterial corridors, Preston Avenue, for the north-south traffic and Carling Avenue for east-west traffic movements.

To/From	%
North/West (Champagne/Beech)	5%
North/East (Champagne/Beech/Preston)	15%
South/West (Champagne/Carling)	25%
South/East (Champagne/Carling)	55%
Total	**100%**

The generated traffic volumes detailed in Table 5 have been distributed to/from the adjacent road network in accordance with the above distribution assumptions.

The resultant distribution of peak hour generated traffic to/from the proposed development is depicted on Figure 8, reflecting the situation at both 2011 (build-out) and 2016 (City of Ottawa Horizon Year).

Figure 8: Projected Peak Hour Mastercraft Starwood Site Generated Traffic: 2011/2016



6.2.3 Proposed Domicile Residential Development: 100 Champagne Avenue

The proposed rezoning at 100 Champagne Avenue is anticipated to result in a high-rise development containing 100 dwelling units.

However, as the proposed development is replacing the current industrially used building with an employment of 25 full-time employees and whose traffic generation will be reflected in the background traffic volumes depicted on Figures 5 and 6, as illustrated in Table 6, the resulting projected peak hour traffic volumes have been appropriately modified to reflect the increased net estimated peak hour traffic volumes generated by the proposed resultant development.

Table 6: Peak Hour Site Generated Traffic Volumes: 100 Champagne Avenue (Domicile): 2011/2016

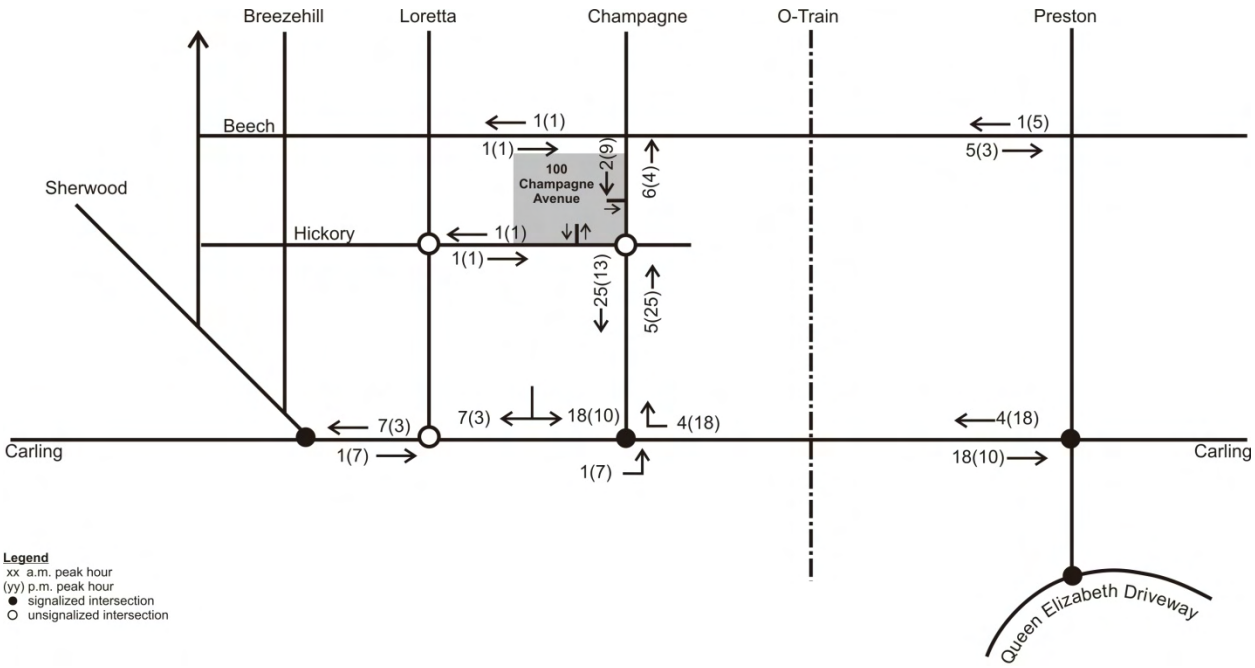
Peak Hour	Average Vehicle Trips per Dwelling Unit	Total Generated Traffic	Net Generated Traffic	Directional Split
A.M. Peak	0.44	100 x 0.44 = 44 vph	40 vph	Out (81%): 32 vph In (19%): 8 vph
P.M. Peak	0.52	100 x 0.52 = 52 vph	50 vph	Out (36%): 18 vph In (64%): 32 vph

6.2.3.1 Distribution and Assignment

The distribution of generated peak hour traffic depicted in Table 6 has been assumed to replicate the assumptions in Section 6.2.2.1, pertaining to the Mastercraft Starwood development on the opposite side of Champagne Avenue.

The resultant distribution of peak hour generated traffic to/from the proposed Domicile development is depicted on Figure 9, reflecting the projected situation at both 2011 (build-out) and 2016 (City of Ottawa Horizon Year).

Figure 9: Projected Peak Hour Domicile Site-Generated Traffic: 2011/2016



6.2.4 Proposed Arnon Residential Development: 855 Carling Avenue

As clarified in Section 2.0, the proposed residential development scenario at 855 Carling Avenue is anticipated to result in a maximum high-rise residential development of approximately 400 condo apartment units as opposed to the 286 units depicted on the Draft Concept Plan. Based on the trip generation rate provided by the Institute of Transportation Engineers (ITE) Trip Generation Manual (8th Edition) site-generated trips were estimated based on the average trip generation rates pertaining to Residential Condominium Townhomes (LU 230), the results of which are shown in Table 7.

Table 7: Peak Hour Site-Generated Traffic Volumes: Arnon Development: 855 Carling Avenue: 2011/2016

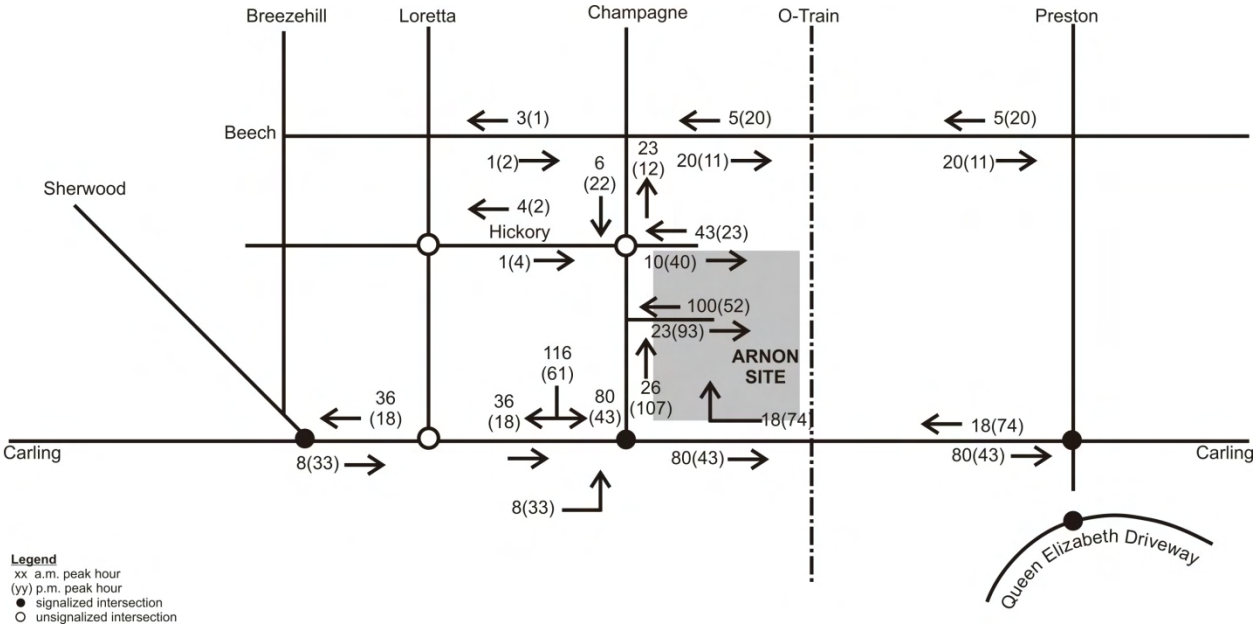
Peak Hour	Average Vehicle Trips per Dwelling Unit	Total Generated Traffic	Directional Split
A.M. Peak	0.44	400 x 0.44 = 176 vph	Out (81%): 143 vph In (19%): 33 vph
P.M. Peak	0.52	400 x 0.52 = 208 vph	Out (36%): 75 vph In (64%): 133 vph

It is noteworthy that since ITE generation rates are largely based on USA data they generally reflect a higher rate of private vehicle use than is experienced in Canadian cities. As the projected development is in Ottawa and is to be located within very convenient walking distance of high quality transit service, which will continue to improve in the future with the rapid transit enhancements that have been detailed in Section 4.0 of the earlier completed CTS, it is likely that the ITE Traffic Generation rates used above are excessive. However, due to the fact that the resultant total peak hour traffic volumes are relatively minor compared to the existing (Dows Lake) office developments it is still considered appropriate, in an abundance of caution, to adopt the resultant peak hour generated traffic volumes in Table 7, knowing that they will lead to a very conservative impact analysis for arterial intersections in the vicinity.

6.2.4.1 Distribution and Assignment

The distribution of generated peak hour traffic depicted in Table 7 has been assumed to replicate the assumptions in Sections 6.2.2/6.2.3 pertaining to the Mastercraft Starwood/Domicile Development to the north, on either side of Champagne Avenue. The resultant distribution of peak hour generated traffic to/from the proposed Arnon Development is depicted on Figure 10, reflecting the projected situation at both 2011 (build-out) and 2016 (City of Ottawa Horizon Year).

Figure 10: Projected Peak Hour Arnon Site-Generated Traffic: 2011/2016



The generated traffic volumes depicted on Figure 10 have then been combined with the projected peak hour generated traffic to/from the existing Domicile Development depicted on Figure 7, the proposed Mastercraft Starwood development depicted on Figure 8 and the proposed Domicile development depicted on Figure 9, along with the modified projected background traffic volumes detailed on Figures 5 and 6, to arrive at the projected peak hour total traffic volumes depicted on Figures 11 and 12, reflecting the projected impact of existing traffic volumes and known development traffic generation from 855 Carling Avenue, 320/330 Loretta Avenue, 125 Hickory Avenue, and 100 Champagne Avenue at both 2011 and 2016.

The projected traffic volume totals on Carling Avenue at Preston Street and Sherwood Avenue, as well as those on Beech Street at Preston Street, have been distributed in the same proportions as exist today at those intersections.

Figure 11: Projected Total Peak Hour Traffic Volumes: 2011

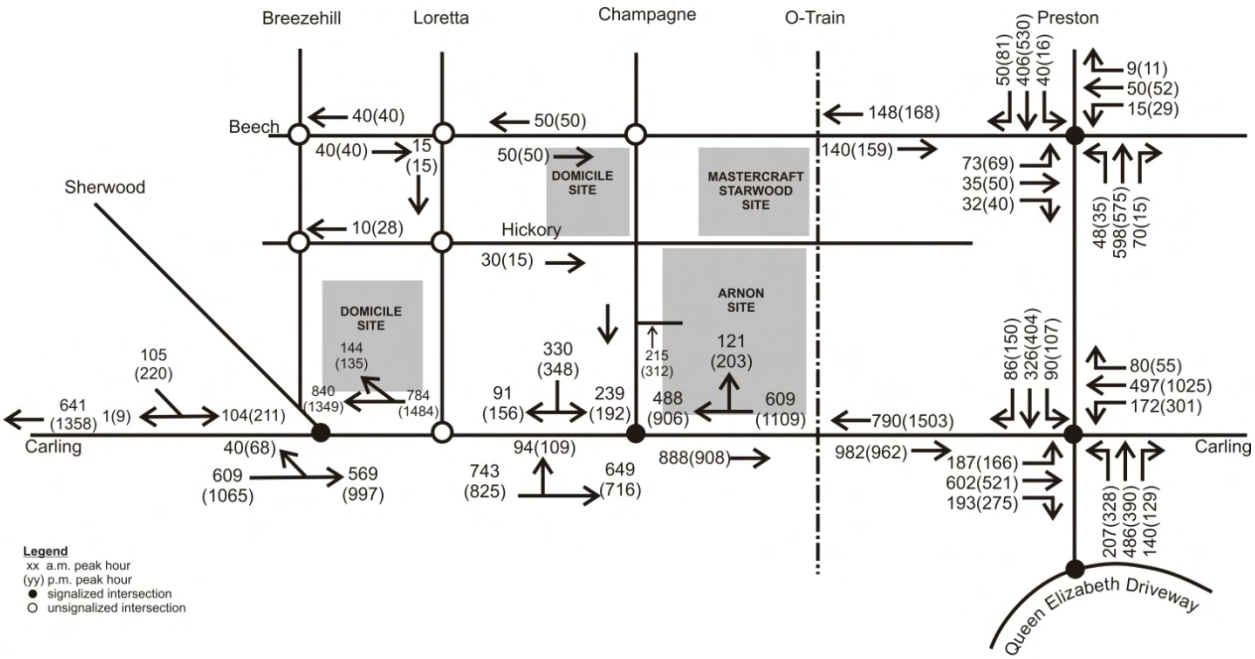
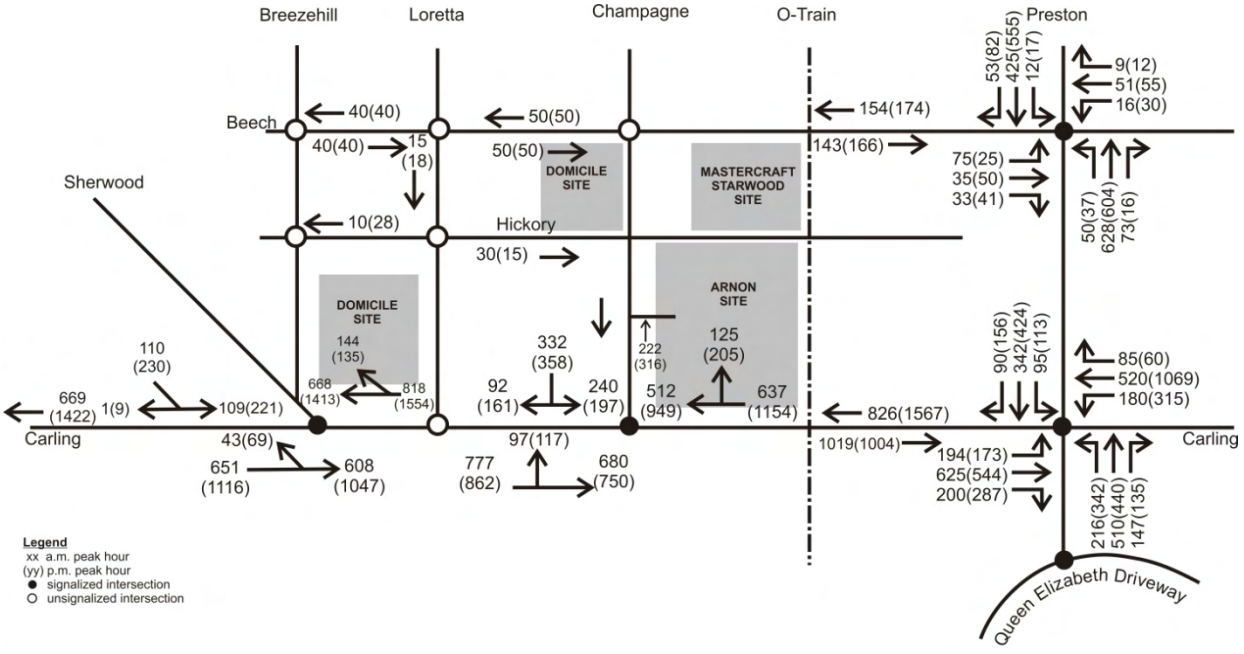


Figure 12: Projected Total Peak Hour Traffic Volumes: 2016



6.2.5 Arnon Site Traffic Generation Comparison (Office versus Residential)

At this juncture, it is considered appropriate to compare the potential site traffic generation of the two Arnon development proposals, office and residential, based on the assumed traffic generation rate detailed in the earlier CTS (office) and this current Addendum #3 (residential).

Shown in Table 8 are details of the projected peak our traffic volumes generated by each of the two development scenarios as well as the directional splits of the respective peak hour totals.

It is noteworthy that due to the change in potential land use from office to residential, the peak hour traffic generation totals will be substantially different and the peak directional traffic volumes will also be substantially different and in opposite directions.

Table 8: Comparison of Peak Hour Generated Traffic Volumes: 855 Carling Avenue (Arnon)

Development Scenario	Gross Peak Hour Traffic Volumes vph							
	AM Peak				PM Peak			
	Total		Directional Split		Total		Directional Split	
	2011	2016	2011	2016	2011	2016	2011	2016
Office Complex - 44,500 m^2	608 vph	560 vph	In: 535 vph Out: 73 vph	In: 493 vph Out: 67 vph	585 vph	541 vph	In: 100 vph Out: 485 vph	In: 92 vph Out: 449 vph
Residential Complex - 400 condo apartment	176 vph	176 vph	In: 33 vph Out: 143 vph	In: 33 vph Out: 143 vph	208 vph	208 vph	In: 133 vph Out: 75 vph	In: 133 vph Out: 75 vph

6.2.5.1 Gross Traffic Generation Differences

As shown in Table 8, the difference in total traffic generation between that of the office scenario and the residential scenario amounts to a reduction of 432 vph during the morning peak hour in 2011 and 384 vph in 2016. During the afternoon peak hour, the generated

vehicle total declines by 377 vph in 2011 and by 333 vph at 2016. The differences are due to the achievement of higher transit modal splits over time.

It is also noteworthy that the maximum difference in directional traffic volumes occurs by 2011 when the morning inbound volume is reduced by 502 vph while the outbound volume total increases by 70 vph. During the afternoon peak hour at 2011 the inbound volume total increases by 33 vph while the outbound total declines by 410 vph. Overall, there is a dramatic reduction in the potential peak hour generated traffic volume totals resulting from a residential development as compared to office development of the scales envisaged in either scenario.

6.2.5.2 Net Traffic Impact

As previously mentioned, the site at 855 Carling Avenue currently operates as a temporary car park for Civic Hospital employees (±300 spaces) and therefore generates traffic during the peak hours of this analysis.

When the site is developed it will cease to operate as a car park for Civic Hospital staff, being replaced as a traffic generator by on-site parking to City of Ottawa Standards for the land-use that is finally approved. As the existing peak hour traffic counts carried out by the City at Carling/Champagne, Carling/Preston, etc. reflect the current temporary use of the site, and as it is virtually impossible to accurately determine the precise impact on peak hour traffic volumes of the current use as a car park, City staff agreed with the assumption that one-third of the peak hour traffic volumes on Champagne Avenue could reasonably be attributed to the temporary car park activity, thus permitting the modification of existing traffic counts by 33% in order to arrive at appropriate background traffic volumes on the adjacent road network as has been alluded to earlier in Section 5.5 and as depicted on Figure 4, leading to the projected 2011 and 2016 background traffic volumes depicted on Figures 5 and 6.

In view of this necessary modification in existing traffic volumes on Champagne Avenue, it is also considered appropriate, to compare the net change in projected traffic on the Preston/Carling intersection reflecting the potential replacement of the 855 Carling Avenue site as a temporary car park by either an office or a residential development of the scale currently being assumed. Details of this comparison are shown in Table 9, relating to Champagne Avenue at Carling Avenue.

Table 9: Projected Net Peak Hour Traffic Volume Changes Due to Changed Arnon Development Scenario: 2011: Champagne Avenue at Carling Avenue

Traffic Details	Peak Hour			
	a.m.		p.m.	
	Northbound	Southbound	Northbound	Southbound
a. Latest available peak hour traffic volumes (August 2009)	236 vph	80 vph	131 vph	315 vph
b. Agreed peak hour reduction due to temporary car park closure (-33%)	-79 vph	-26 vph	-44 vph	-105 vph
c. Resultant peak hour traffic volumes prior to development (background traffic) (a-b)	157 vph	54 vph	87 vph	210 vph
d. Additional generated traffic: Arnon site as office development (2011)	535 vph	73 vph	180 vph	485 vph
e. Resultant total traffic volumes (2011) Arnon Ste as office development (c + d)	692 vph	127 vph	187 vph	695 vph

Traffic Details	Peak Hour			
	a.m.		p.m.	
	Northbound	Southbound	Northbound	Southbound
f. Additional generated traffic Arnon site as residential development (2011)	30 vph	135 vph	125 vph	70 vph
g. Resultant total traffic volumes (2011) Arnon site as residential development (c + f)	187 vph	199 vph	212 vph	280 vph
h. Net change in traffic volumes resulting from changed development proposal (e – g)	-505 vph	+72 vph	+25 vph	-415 vph
i. Net change in traffic volumes resulting from development as residential and closure of temporary car park (a-g)	-49 vph	+119 vph	+81 vph	-35 vph

As a result of the development of the site at 855 Carling Avenue for residential uses as compared to the current use as a temporary car park for Civic Hospital employees, it is projected that during the morning peak hour northbound traffic on Champagne Avenue at Carling Avenue would be reduced by 49 vph while southbound traffic would increase by 119 vph. During the afternoon peak hour northbound traffic would increase by 81 vph while southbound traffic would reduce by 35 vph. It is noteworthy that these figures are reflective of the maximum 400 unit proposal. If fewer units were constructed, the net traffic impact would be even less.

7.0 ANALYSIS OF PROJECTED FUTURE CONDITIONS

7.1 Traffic Signal Warrants

The existing traffic signals at the Carling/Champagne intersection are not currently warranted based on the most recently available City of Ottawa traffic counts (August: 2009: Appendix A) and were not judged to be warranted at either 2011 or 2016 based on the projected impact of all known study area developments.

7.2 Intersection Operations

Using the analysis tool SYNCHRO (Version 7) traffic operations were assessed for projected peak hour traffic conditions along Carling Avenue between the existing signalized intersections of Carling/Sherwood and Carling/Preston, and including the Carling/Champagne and Preston/Beech signalized intersections which will be the ones most directly impacted by the proposed rezoning and site development. Detailed analysis worksheets are to be found in Appendix C, with the results summarized as follows.

The peak hour traffic volumes that are depicted on Figure 11, and which represent projected total peak hour traffic conditions by the year 2011, the assumed build-out of the residential projects, were analyzed and the results are presented in Table 10.

Table 10: Intersection Operating Conditions: 2011

Intersection	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Carling/Sherwood	A(C)	0.52(0.76)	SBL(SBL)	8.9(19.2)	A(A)	0.35(0.58)
Carling/Champagne	C(C)	0.74(0.73)	SBL(SBL)	10.9(14.2)	A(A)	0.28(0.34)
Carling/Preston	E(F)	0.92(1.65)	SBT(NBL)	37.3(80.8)	C(E)	0.72(1.00)
Beech/Preston	A(B)	0.58(0.66)	EBT(EBT)	11.7(13.5)	A(A)	0.53(0.51)

As shown on Table 10, all the intersections, except Carling/Preston in the afternoon peak, continue to operate at satisfactory Levels of Service ('D' or better) by 2011 when the projected residential complex is anticipated to become fully operational. In the weekday afternoon, the Carling/Preston intersection is projected to operate at LoS 'F' with the northbound left-turn movement being the most critical, operating at LoS 'F' also, and the southbound through traffic operating at LoS 'E' during the morning peak hour.

The Carling/Champagne intersection continues to operate at LoS 'A' during both a.m. and p.m. peak hours, while the Preston/Beech and Carling/Sherwood intersections also continues to operate satisfactorily during both peaks.

As required by the City of Ottawa, signalized intersections were evaluated for the year 2016, representing operating conditions projected five-years beyond the anticipated full occupancy date. The projected peak hour traffic conditions that are depicted on Figure 12 were assumed to apply and the results of the signalized intersection analysis are shown in Table 11.

Table 11: Intersection Operating Conditions: 2016

Intersection	Critical Movement			Intersection		
	LoS	max. v/c or avg. delay (s)	Movement	Delay (s)	LoS	v/c
Carling/Sherwood	A(C)	0.54(0.77)	SBL(SBL)	8.8(19.5)	A(A)	0.31(0.60)
Carling/Champagne	C(C)	0.74(0.74)	SBL(SBL)	10.7(14.0)	A(A)	0.28(0.36)
Carling/Preston	E(F)	0.94(1.80)	SBT(NBL)	39.2(97.6)	C(F)	0.75(1.07)
Beech/Preston	A(A)	0.60(0.53)	NBT(EBT)	12.2(11.1)	A(A)	0.57(0.50)

By 2016, all intersections, except Carling/Preston during the weekday afternoon, continue to operate satisfactorily during both morning and afternoon peak hours (LoS 'D' or better) while the critical Carling/Champagne intersection continues to operate at LoS 'A' during both peak hours. During the weekday afternoon peak hour the Carling/Preston intersection is judged to operate at LoS 'F' with the northbound left-turn movement continuing to be the

most critical, operating at LoS 'F', also, and with southbound through traffic movement operating at LoS 'E' during the morning peak hour.

With respect to this projected failing Carling/Preston intersection, the following is noteworthy:

- the intersection is operating close to capacity during the afternoon peak hour (2008) with a v/c of 0.89, and the northbound left-turn lane is failing now, with a v/c of 1.35 during the afternoon peak hour;
- the analysis herein assumes a 1% per year background traffic growth, when recent growth has, in fact, been negative;
- the ITE Generation Rates applied to the Arnon, Mastercraft Starwood and Domicile developments is considered to underestimate the likely transit usage by future residents of the proposed high-rises, with a consequent over estimate of the likely peak hour private vehicle generation to/from the sites; and
- by changing the current lane configuration and timing plan, the intersection could be made to operate at an acceptable level of service (LoS 'D' or better) during both peak hours.

7.3 Impact on Local Streets

The peak hour net traffic projected to be generated by the proposed Arnon development of 400 residential units (approximately 70 vph), will be predominantly to/from the arterial road network to the south (Carling Avenue) and east (Preston Street). Due to the residential nature of the existing land use to the northwest of the site, the existing local roads are currently carrying peak hour volumes not exceeding 100 vph total two-way. The proposed development is expected to add marginally to these already minor traffic volumes, less than five additional vehicles per hour. Sherwood Drive, the most heavily trafficked collector road in the vicinity of the proposed development, currently carries volumes totalling approximately 400 vph at Carling Avenue. This is because of its strategic linking of Carling and Parkdale Avenues, and serving as a route to/from Highway 417. On the assumption that the site generated traffic to/from the west along Carling Avenue will impact Sherwood Drive, in the same proportion as the current traffic volumes at the Carling/Sherwood intersection, the proposed development at the Domicile, Arnon and Mastercraft Starwood sites is likely to result in an increase of approximately 30 vehs on Sherwood Drive between Carling Avenue and Breezehill Avenue during the peak hours.

It is noteworthy that current two-way peak hour traffic volumes on Sherwood Drive at Parkdale Avenue (Appendix A) are approximately 50% (200 vph) of the current totals at Carling Avenue, reflecting the local nature of a large proportion of the traffic using that street.

8.0 SITE CONCEPT PLAN REVIEW

8.1 Carling/Champagne Intersection Modifications

The projected traffic generated by the proposed Arnon residential development in consideration with that projected to/from the proposed Mastercraft Starwood and Domicile developments would require the EBLT lane on Carling Avenue to be approximately 34 metres in length. As the existing EBLT is 48 m long (+ taper) no modification is required.

Due to the constraint imposed by the existing Carling Avenue overpass of the O-Train corridor, the maximum practical length of WBRT lane, 53m + taper, has already been accepted by City staff in their review of the initially proposed Arnon office development.

On Champagne Avenue, the Arnon residential development impact results in a need for a SBLT lane with 84m of storage (+ taper) to process the left-turning traffic from all the area's known residential developments.

Were the Arnon development not to proceed and the current temporary car-parking to remain, the Mastercraft Starwood and Domicile developments would require a 45m extension to its current 23m length for a total of 68m plus taper.

The impacts of the assigned traffic to the Preston/Beech intersection are judged to be minor, requiring no change in the current intersection configuration.

8.2 Champagne Avenue Site Access

In peak hours, exiting traffic from underground parking at the Arnon development will be 'STOP' controlled and all traffic movements are anticipated to operate satisfactorily as the background traffic volumes on Champagne Avenue south of Hickory Avenue are relatively minor during these time periods.

The Draft Concept Plan indicates enhanced sidewalks along Champagne Avenue to enable pedestrian access to Carling Avenue, which will facilitate pedestrians and transit-riders.

412 automobile parking spaces will be provided on site, addressing the City's requirement for private vehicle and visitor parking. The City's requirement for bicycle parking will also be met.

Note that comments are not provided herein regarding driveway and parking facility design as these are addressed at the ensuing Site Plan stage.

9.0 TRANSPORTATION DEMAND MANAGEMENT

This section provides an overview of potential Transportation Demand Management (TDM) strategies that are proposed in support of the proposed rezoning and residential development at 855 Carling Avenue, in order to address and support City of Ottawa policies.

The dominant TDM feature of the subject site is its proximity to both current bus transit and O-Train services and future Light Rail and Streetcar services on the existing O-Train and Carling Avenue corridors, respectively.

The site is within a five minute walk of existing bus transit services on Carling Avenue and the Carling Avenue O-Train Station. Future LRT and streetcar services will also be within five minutes and as a result of the existing and future proximity to quality transit services, the projected transit modal split targets of the recently approved 2008 City of Ottawa TMP, projected at 51%/52% by 2031, are considered to be readily achievable at such a prime location, resulting in the ability to reduce Carling Avenue from a six to a four-lane divided arterial in the vicinity of the proposed rezoning.

The site plan will also ensure that sidewalks on the east side of Champagne Avenue and the south side of Hickory Street, will be restored to City standards.

10.0 FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The following are the significant findings, conclusions and recommendations emanating from this Addendum which reflects the aggregated traffic impact of the Arnon, Domicile and Mastercraft Starwood residential development proposals.

1. The proposed development of a High-Rise Residential Complex by Arnon of a site located on the northeast quadrant of the Carling Avenue/Champagne Avenue intersection has the potential to contain a maximum of 400 residential units, with a peak hour traffic generation of approximately 210 vph (two-way), although the Draft Concept Plan indicates a total of 286 residential units.

2. As illustrated in the following summary table, the proposed Arnon development at 855 Carling Avenue (based on 400 units) is projected to generate peak hour traffic volumes (two-way) which will represent approximately 40% of the additional traffic from known residential developments in the area at this time, i.e., 320/330 Loretta, 125 Hickory, 100 Champagne and 855 Carling Avenue.

Development	Projected Gross Traffic Generated vph			
	AM Peak	%	PM Peak	%
320/330 Loretta Avenue (Domicile)	70	16%	85	16%
855 Champagne Avenue (Arnon) (400 residential units)	176	41%	208	40%
125 Hickory Street (Mastercraft Starwood)	147	34%	174	34%
100 Champagne Avenue (Domicile)	40	9%	50	10%
TOTALS	**433**	**100%**	**517**	**100%**

3. Allowing for the decommissioning of the existing on-site temporary car park serving Civic Hospital employees, the proposed Arnon residential development is projected to generate between 20% and 13% of the net additional traffic on Champagne Avenue from all known residential developments in the area at this time.

4. Were the site at 855 Carling Avenue to be developed as an office complex, the projected traffic generation from the Arnon site would represent approximately 60% of the total new generation from all the recently proposed developments in the area.

5. Due to its strategic location adjacent to the Carling Avenue Station on the current O-Train Corridor, which is scheduled for conversion to a Light Rail Rapid Transit Corridor in Phase 2 of the City's Rapid Transit Program, and to existing Carling Avenue which is planned by the City of Ottawa to be developed as a Supplementary Transit Corridor, with street-car operation, a rezoning, to facilitate residential/office development, is being sought by the developer.

6. The relevant section of Carling Avenue on either side of the Carling/Champagne signalized intersection is a six-lane divided urban arterial (6-UAD) with sidewalks on both sides, carrying morning and afternoon weekday peak hour traffic volumes in the 1300 vph to 1800 vph range (two-way).

7. Based on traffic counts at the Carling/Preston intersection, traffic volumes on Carling Avenue have declined over the period 2001-2008.

8. As a six-lane urban arterial could be expected to have the carrying capacity for between 4000 and 5000 vph, two-way, it is clear that Carling Avenue in the vicinity of Champagne Avenue is considerably underutilized, and therefore has ample surplus capacity to support intensified development in the vicinity.

9. Champagne Avenue, which will provide access to the projected development currently carries two-way peak hour volumes within the range 300-450 vph between Hickory Street and Carling Avenue. These peak hour traffic volumes are largely due to the underground parking associated with the Dows Lake Court Office Complex (2 Towers: approximately 18,000 m^2: 614 parking spaces) and the 300 at-grade spaces temporarily associated with the vacant Arnon Corporation site, serving the Civic Hospital.

10. The existing signalized intersections along Carling Avenue at Sherwood, Champagne, and Preston, all operate at satisfactory levels of service (LoS 'D' or better) during weekday morning and afternoon peak hours for the intersections as a whole. During the afternoon peak hour, however, the northbound left-turn movement (NBL) at the Carling/Preston intersection is the most critical movement with a volume to capacity ratio (v/c) of 1.35 and an LoS (F).

11. The existing adjacent signalized intersection on Preston Avenue at Beech Street currently operates at a satisfactory level of service (LoS "A") during both morning and afternoon peak hours.

12. By the horizon year of the recently approved 2008 Transportation Master Plan, (2031), the major road network in the vicinity of the proposed re-zoned site is projected to operate satisfactorily (LoS 'D') during the afternoon peak hour and to be subjected to relatively minor congestion (LoS 'E') during the morning peak hour, based on the achievement of the City's Transit Modal split targets of 51/52%, during a.m./p.m. peaks, by 2031. The City's Rapid Transit Plan for the adjacent O-Train and Carling Avenue corridors renders the achievement of the aforementioned transit modal split targets at the CPR Screenline (O-Train Corridor) as most likely to materialize.

13. The existing signals at the Carling/Champagne intersection are currently unwarranted and even with the combined impact of the proposed Arnon, Domicile and Mastercraft Starwood Residential developments, will remain unwarranted until at least 2016.

14. By 2011 and 2016, except for the Carling/Preston intersection during the afternoon peak hour, all the signalized intersections on Carling Avenue between Sherwood Avenue and Preston Street will continue to operate satisfactorily during both peak hours, with LoS 'D' or better.

15. By 2011 and 2016, during the afternoon peak hour, the Carling/Preston intersection is estimated to operate at LoS 'F', having deteriorated from LoS 'D' currently. It is noteworthy that this conclusion is partly due to the assumed 1% annual growth in traffic volumes along Carling Avenue despite the recent evidence of declining peak hour traffic volumes along the corridor.

16. The LoS at the Carling/Preston signalized intersection could be improved to an acceptable standard by reconfiguring the existing lanes and changing the timing plan.

17. The existing eastbound left-turn lane (EBLT) on Carling Avenue, 48m in length (+ taper) will be acceptable to accommodate the combined impact of the Domicile, Arnon and Mastercraft Starwood residential developments.

18. Without the Arnon residential development, but with the temporary car park remaining operational, all developments would result in the need to extend the SBLT lane on Champagne Avenue to 68m (+ taper) (currently 23m long). The net impact of the Arnon residential development would be a further extension of 16m to a total length of 84m (+ taper).

19. It is noteworthy that, as the existing southbound left-turn lane on Champagne Avenue is inadequate for current afternoon peak hour volumes (49m + taper required; 23m + taper provided), the combined additional lane requirement directly attributable to the Domicile and Mastercraft Starwood developments is 19m (68m total), with 6m attributable to Domicile Developments (2) and 13m attributable to Mastercraft Starwood.

20. As the existing westbound right-turn lane on Carling Avenue is restricted by the location of the railway overpass, its practical extension to 53 m (+ taper) is recommended.

21. No intersection modifications are deemed necessary along the local streets north and west of the proposed development or at the existing signalized Preston/Beech intersection.

22. The principal impact of the currently underway and proposed developments (Domicile, Arnon and Mastercraft Starwood) on local streets is anticipated to occur on Sherwood Drive at Carling Avenue, based on the assumption that the additional traffic to/from Carling Avenue west of Champagne Avenue will likely get redistributed to/from Sherwood Drive at the Carling/Sherwood signalized intersection in the same proportions as currently prevail at that intersection.

    Consequently, the two-way peak traffic volumes on Sherwood Drive between Carling Avenue and Breezehill Avenue are projected to increase by approximately 30 vph by 2016. With two-way peak hour totals within the range 300 vph to 425 vph at this location, the projected volumes are still considered to be very reasonable for a collector road. It is noteworthy that the two-way peak hour volumes on Sherwood Drive at Parkdale Avenue are approximately 50% of the two-way volumes at Carling Avenue.

    The resultant approximate 10% projected increase in traffic volumes resulting from the proposed Domicile, Mastercraft Starwood and Arnon developments is considered to be a relatively minor increase in Sherwood Avenue traffic volumes, as it applies principally to the section of Sherwood Drive between Carling Avenue and Breezehill Drive.

    The existing traffic volumes on the local road network, Hickory, Breezehill, Beech, Loretta, etc., are relatively minor and are expected to increase by less than 40 vehicles per hour, as a result of all the proposed developments in the area, including Domicile, Arnon and Mastercraft Starwood.

23. The proposed maximum 400 residential project generates significantly less traffic than the previous office proposal. During the morning peak hour, the site traffic

generation at 2016 is 176 vph versus 560 vph (176 ÷ 560 = 31%) and during the afternoon peak hour it is 208 vph versus 541 vph (208 ÷ 541 = 38%). As the existing on-site parking lot is estimated to generation 105 vph and 150 vph during the weekday morning and afternoon peak hours respectively, the net increase in site-generated traffic due to the residential proposal is only approximately 70 vph and 60 vph during the morning and afternoon peak hours respectively. These two-way volumes equate to approximately 1 new vehicle per minute on area streets. As this additional traffic impact on adjacent arterial and collector streets is judged to be quite minor, not resulting in the need for improvements of any significance, the proposed rezoning is judged to be appropriate.

Based on the foregoing, it is recommended that the proposed rezoning be approved from a transportation perspective.

Ronald M. Jack, P.Eng.
Vice President Transportation
Manager Ottawa Operations

Appendix A

Recent and Historic Traffic Counts

Public Works and Services Department

Count ID 26097

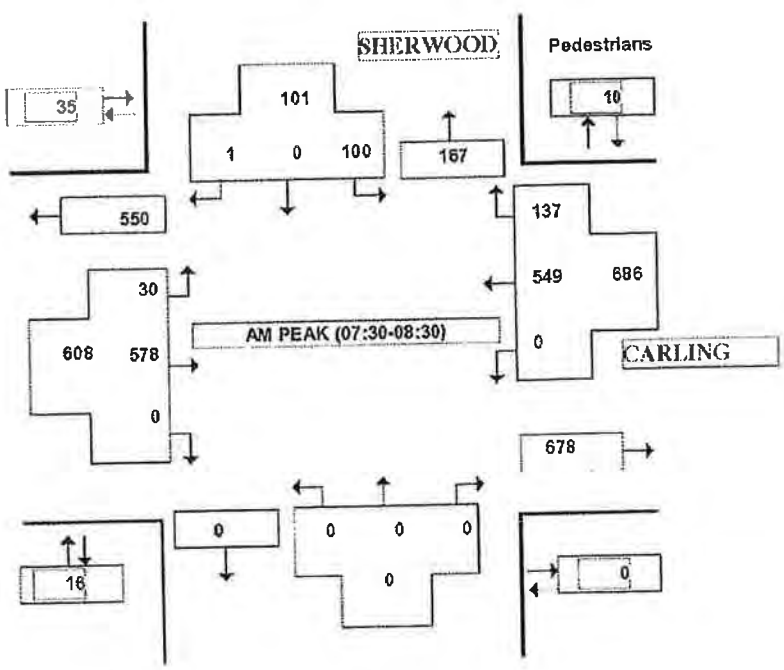
CARLING AVE and SHERWOOD DR

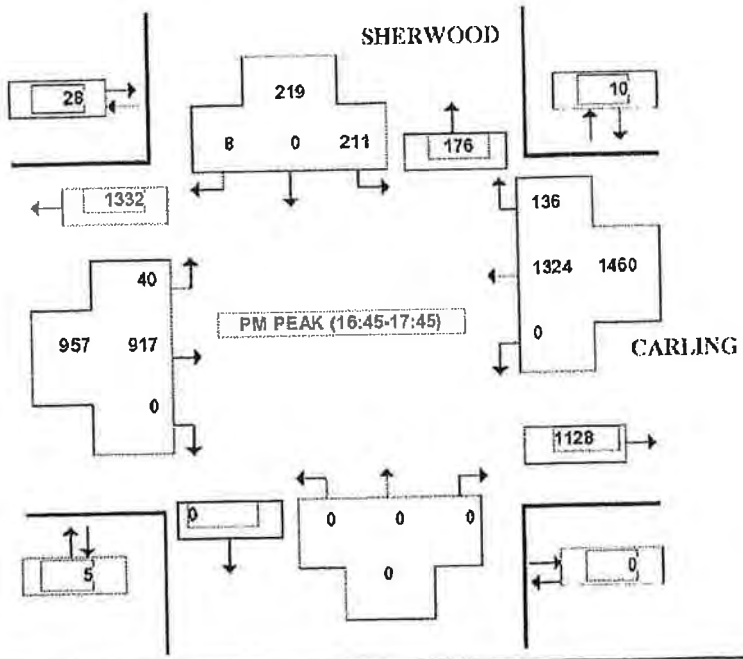
(ULRS Listing CARLING & SHERWOOD)

Survey Date: Wednesday 19 August 2009
Conditions: Dry
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 5 Westbound: 23

AADT Factor
Wednesday in August is 0.9





Approved by : KC

Printed on : 21/10/2009

Public Works and Services Department

Count ID 26372

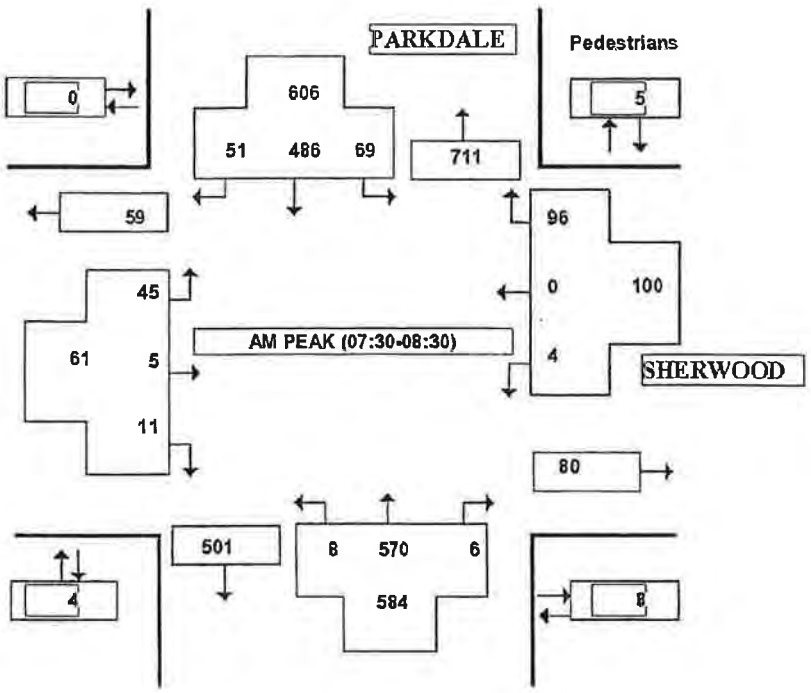
PARKDALE AVE and SHERWOOD DR

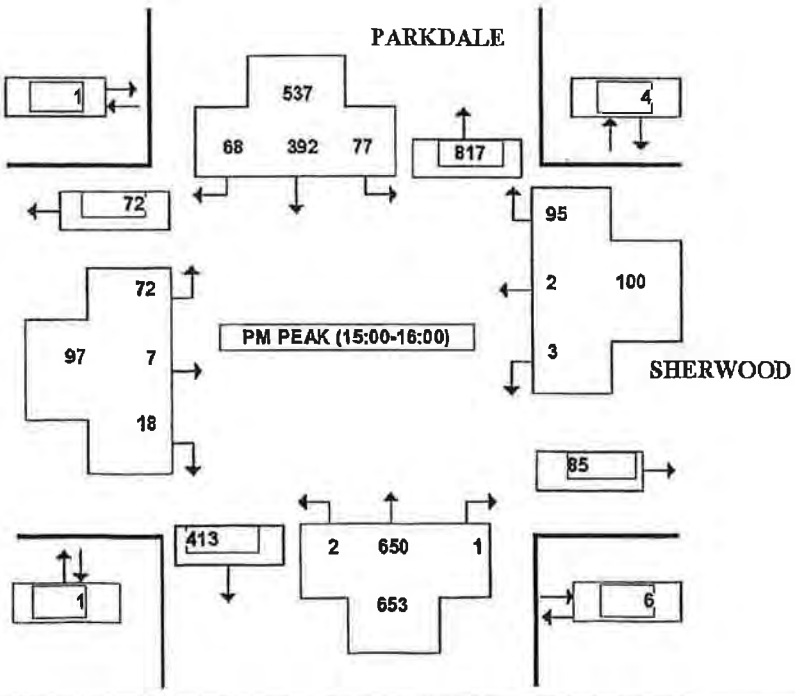
(ULRS Listing PARKDALE & SHERWOOD)

Survey Date: Tuesday 30 June 2009
Conditions: wet
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 1
Eastbound: 2 Westbound: 0

AADT Factor
Tuesday in June is 0.9





Approved by : DT

Printed on : 14/12/2009

Public Works and Services Department

Count ID 26072

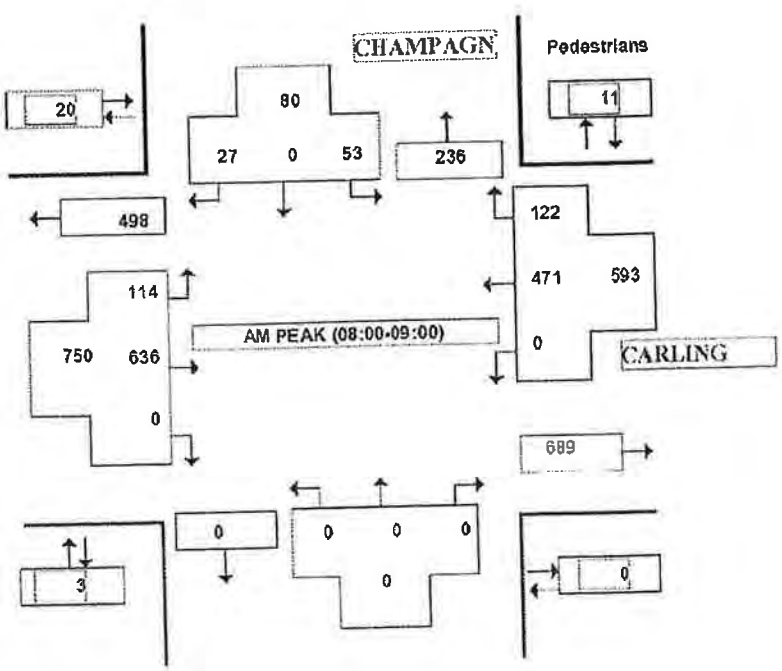
CARLING AVE and CHAMPAGNE AVE

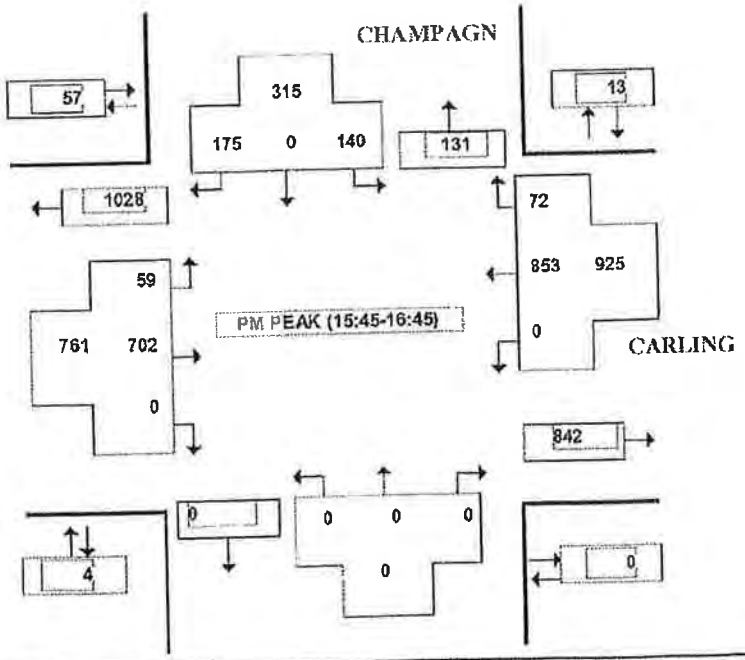
(ULRS Listing CARLING & CHAMPAGN)

Survey Date: Monday 17 August 2009
Conditions: Dry
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 3 Westbound: 13

AADT Factor
Monday in August is
1





Approved by : SM construction on preston

Printed on : 21/10/2009

Ottawa *Public Works and Services Department*

Count ID 2117

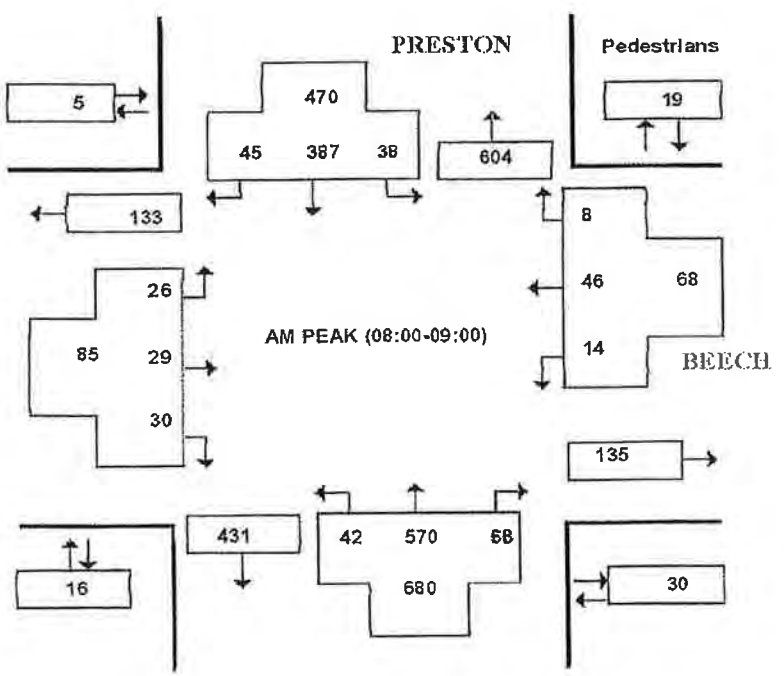
BEECH ST and PRESTON ST

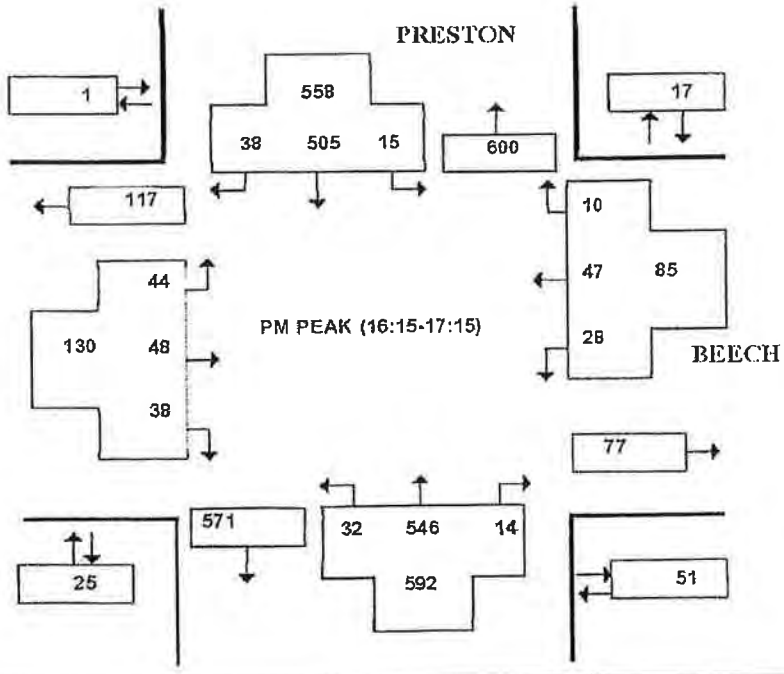
(ULRS Listing BEECH & PRESTON)

Survey Date: Tuesday 18 July 2006
Conditions: DRY
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 1
Eastbound: 0 Westbound: 0

AADT Factor
Tuesday in July is
0 9





Approved by : SC SB and WB Low

Printed on : 06 11 2006

Ottawa *Public Works and Services Department*

Count ID 2409

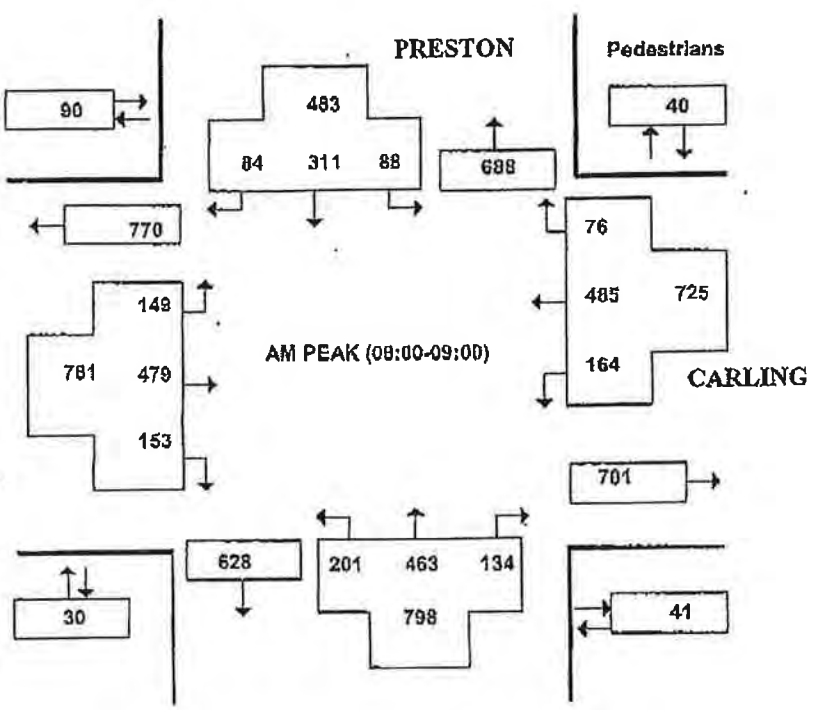
CARLING AVE and PRESTON ST

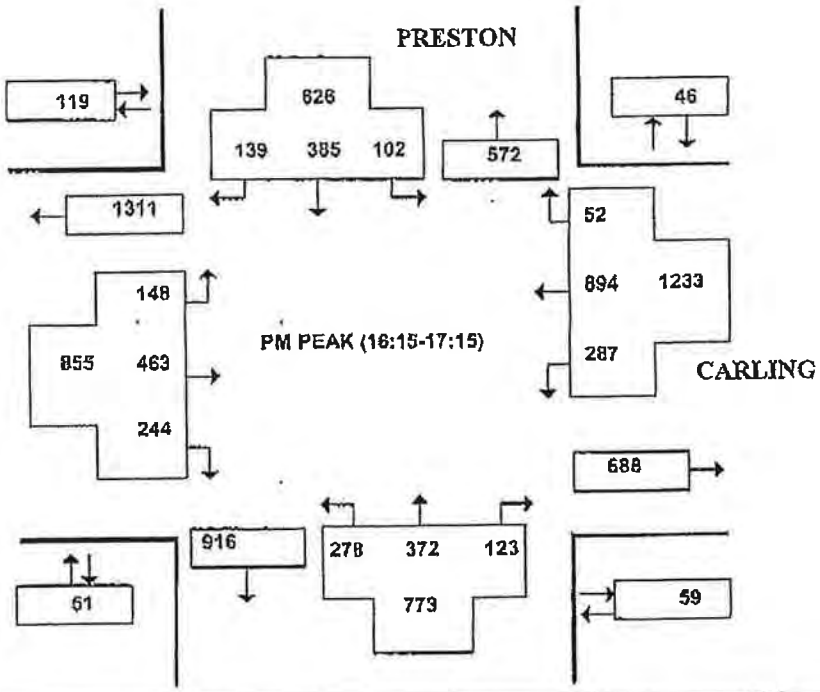
(ULRS Listing CARLING & PRESTON)

Survey Date: Thursday 8 May 2008
Conditions: DRY
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 1 Westbound: 24

AADT Factor
Thursday in May is 0.9





Approved by : DT

Printed on : 08/10/2008

Ottawa *Public Works and Services Department*

Count ID 2122

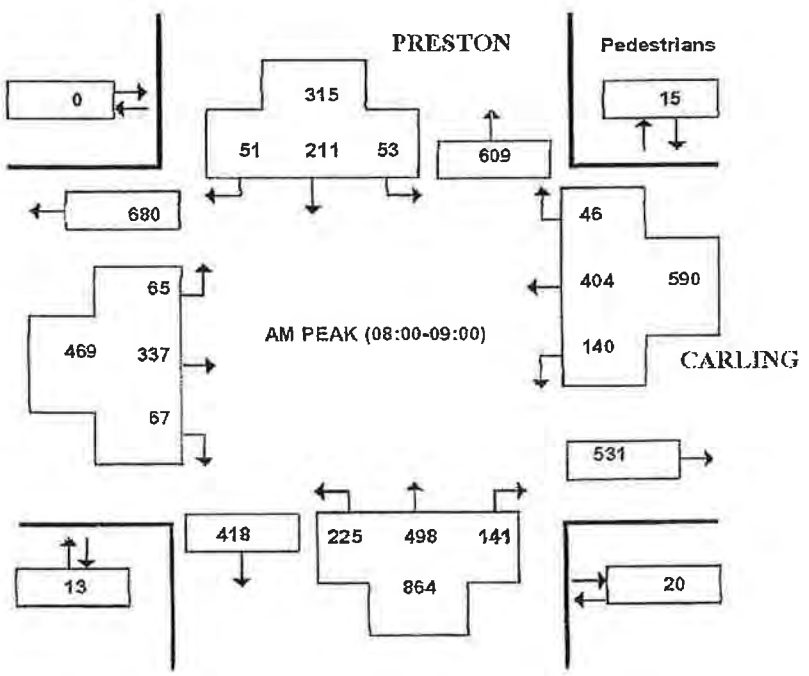
CARLING AVE and PRESTON ST

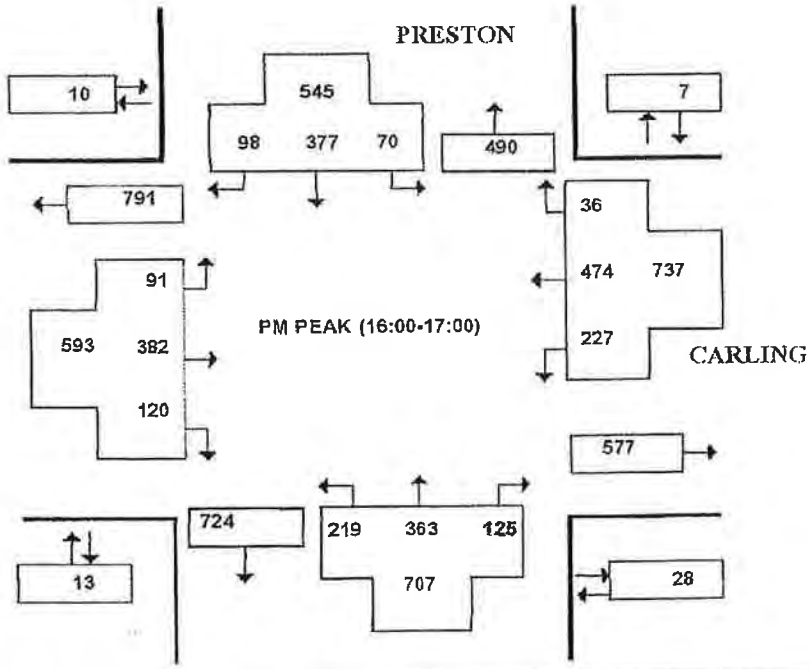
(ULRS Listing CARLING & PRESTON)

Survey Date: Friday 21 July 2006
Conditions: DRY
Start Time: 0700

Total Observed U-Turns
Northbound: 1 Southbound: 0
Eastbound: 5 Westbound: 28

AADT Factor
Friday in July is 0.9





Approved by :

Printed on : 06.11.2006

Ottawa *Public Works and Services Department*

Count ID 1769

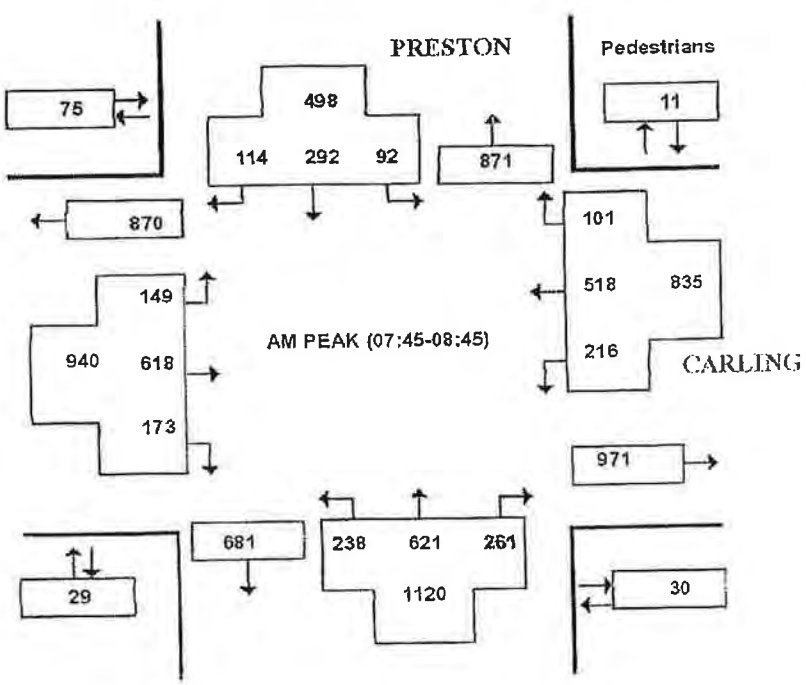
CARLING AVE and PRESTON ST

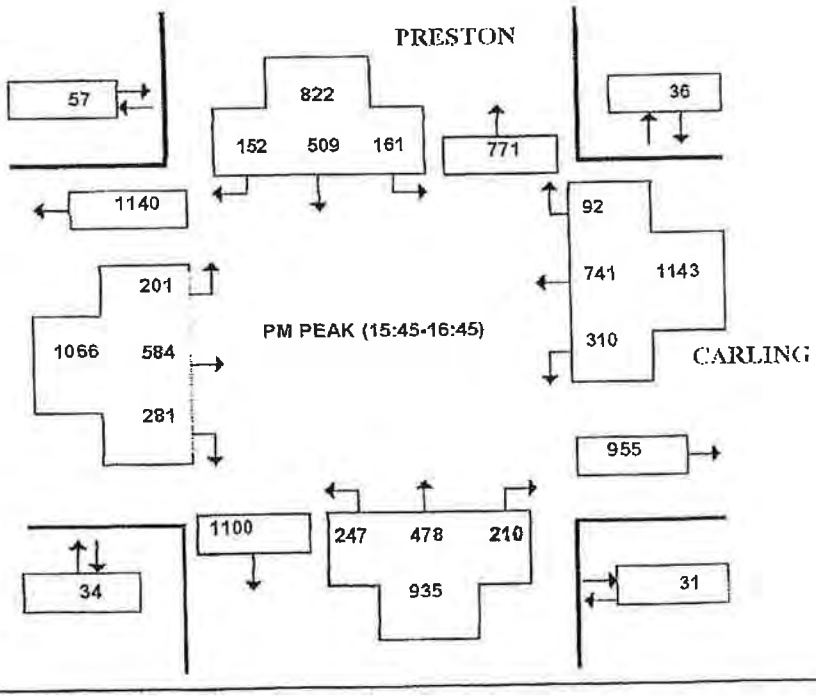
(ULRS Listing CARLING & PRESTON)

Survey Date: Friday 7 May 2004
Conditions: DRY
Start Time: 0700

Total Observed U-Turns
Northbound: 1 Southbound: 1
Eastbound: 9 Westbound: 1

AADT Factor
Friday in May is
0 8





Approved by : GZ

Printed on : 10/03/200

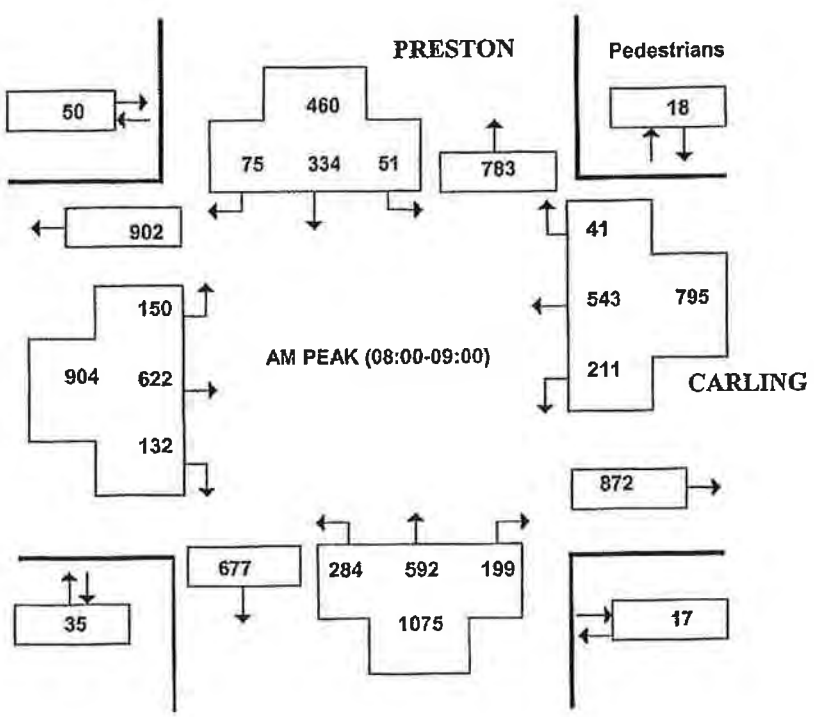
CARLING AVE and PRESTON ST

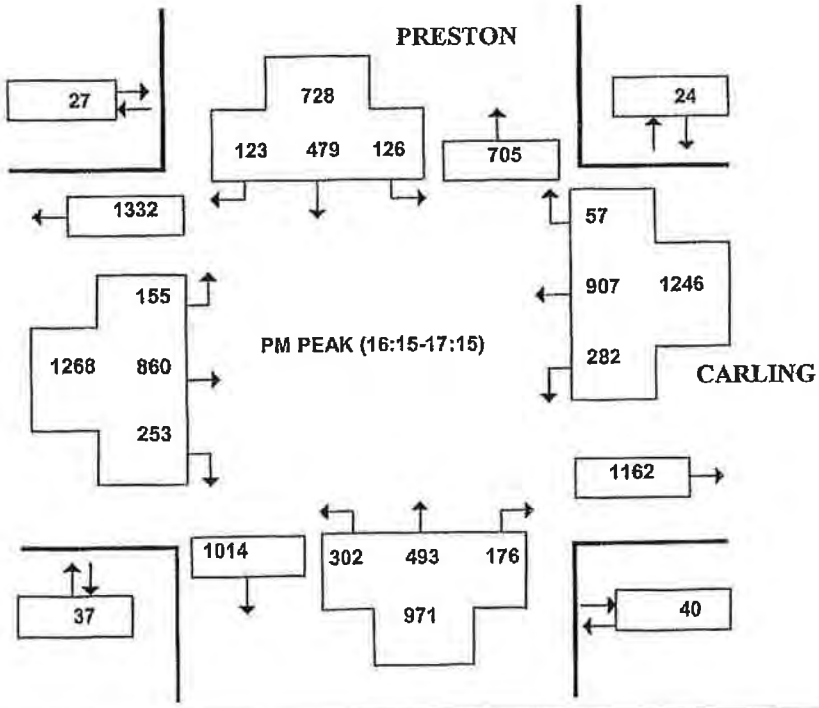
(ULRS Listing CARLING & PRESTON)

Survey Date: Thursday 22 May 2003
Conditions: DRY
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 0 Westbound: 5

AADT Factor
Thursday in May is 0.9





Approved by : GZ

Printed on : 02/12/2005

Ottawa *Transportation, Utilities, and Public Works Department*

Count ID 1041

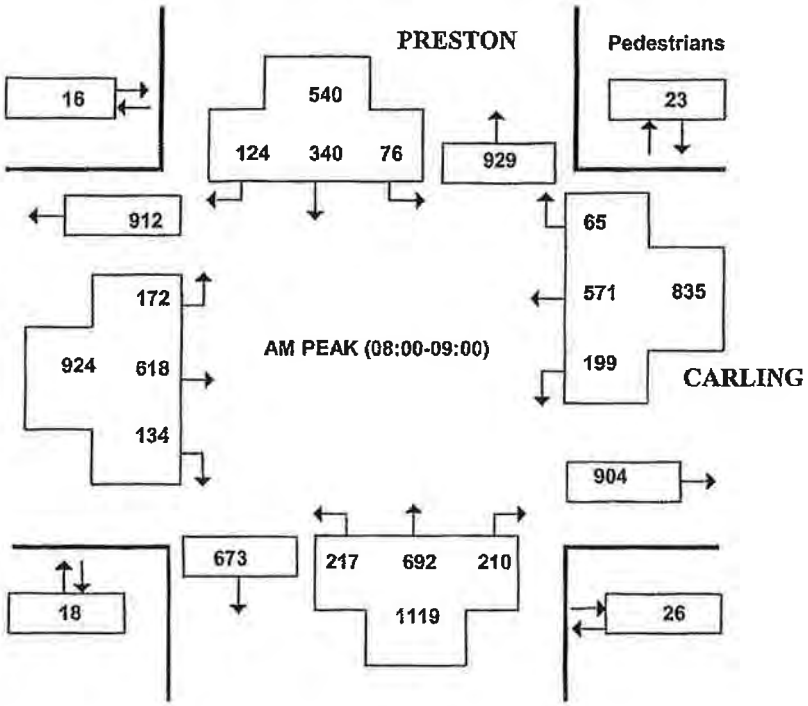
CARLING AVE and PRESTON ST

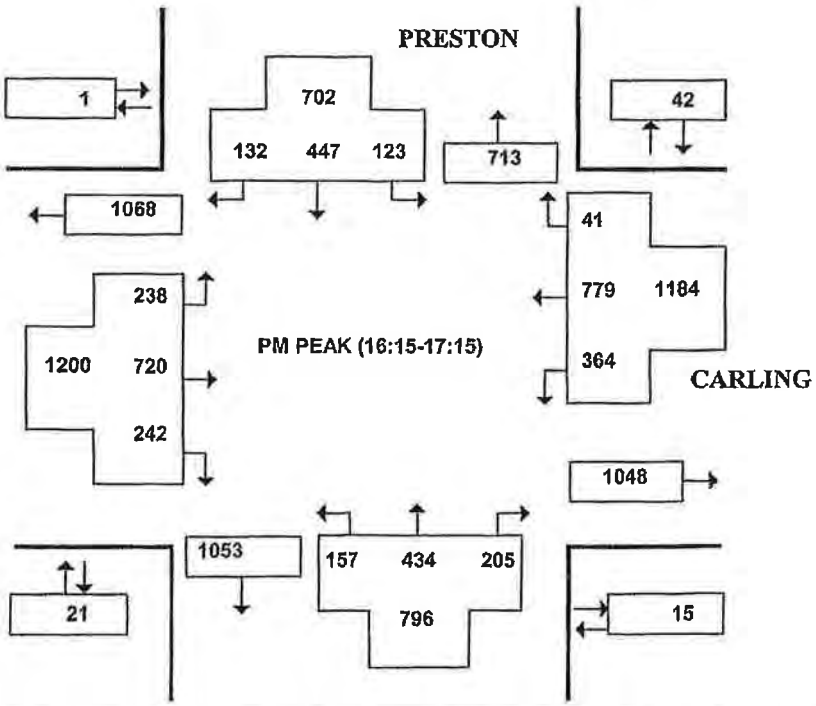
(ULRS Listing CARLING & PRESTON)

Survey Date: Friday 8 June 2001
Conditions: Dry
Start Time: 0700

Total Observed U-Turns
Northbound: 0 Southbound: 0
Eastbound: 8 Westbound: 29

AADT Factor
Friday in June is 0.8



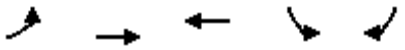


Approved by : BL

Printed on : 02/12/20(

Appendix B

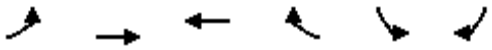
Capacity Analysis Worksheet for Existing Conditions



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	30	578	549	100	1
Lane Group Flow (vph)	32	608	722	105	1
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	67.0	56.0	33.0	33.0
Total Split (%)	11.0%	67.0%	56.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	7.4	79.0	70.8	12.2	12.2
Actuated g/C Ratio	0.07	0.79	0.71	0.12	0.12
v/c Ratio	0.25	0.16	0.21	0.51	0.01
Control Delay	47.9	3.7	4.3	49.4	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	3.7	4.3	49.4	28.0
LOS	D	A	A	D	C
Approach Delay		5.9	4.3	49.2	
Approach LOS		A	A	D	
Queue Length 50th (m)	6.0	10.2	13.9	19.5	0.0
Queue Length 95th (m)	14.7	16.6	17.5	34.2	1.5
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	127	3848	3370	439	394
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	0.16	0.21	0.24	0.00

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 55 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 8.2	Intersection LOS: A
Intersection Capacity Utilization 42.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	114	636	471	122	53	27
Lane Group Flow (vph)	120	669	496	128	56	28
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	67.0	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	82.9	82.9	82.9	82.9	10.4	10.4
Actuated g/C Ratio	0.83	0.83	0.83	0.83	0.10	0.10
v/c Ratio	0.18	0.17	0.12	0.10	0.32	0.15
Control Delay	2.9	2.1	1.6	0.2	46.4	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.9	2.1	1.6	0.2	46.4	17.0
LOS	A	A	A	A	D	B
Approach Delay		2.3	1.4		36.6	
Approach LOS		A	A		D	
Queue Length 50th (m)	3.8	7.8	4.2	0.0	10.3	0.0
Queue Length 95th (m)	8.4	11.4	m4.9	m0.0	21.8	7.8
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	682	4036	4036	1279	463	434
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	0.17	0.12	0.10	0.12	0.06

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 3.8	Intersection LOS: A
Intersection Capacity Utilization 39.7%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

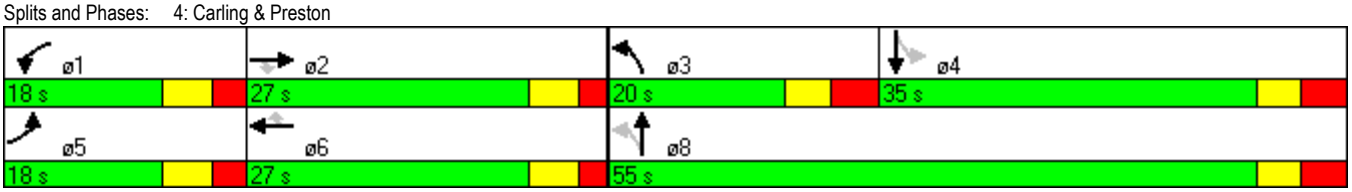
Splits and Phases: 3: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	149	479	153	164	485	76	201	463	88	311
Lane Group Flow (vph)	157	504	161	173	511	80	212	628	93	415
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	18.0	27.0	27.0	18.0	27.0	27.0	20.0	55.0	35.0	35.0
Total Split (%)	18.0%	27.0%	27.0%	18.0%	27.0%	27.0%	20.0%	55.0%	35.0%	35.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	11.7	23.4	23.4	12.3	24.0	24.0	45.2	45.2	26.2	26.2
Actuated g/C Ratio	0.12	0.23	0.23	0.12	0.24	0.24	0.45	0.45	0.26	0.26
v/c Ratio	0.79	0.44	0.34	0.83	0.44	0.19	0.69	0.42	0.48	0.90
Control Delay	73.8	34.9	11.1	74.5	34.6	8.9	29.1	17.4	39.7	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	34.9	11.1	74.5	34.6	8.9	29.1	17.4	39.7	57.7
LOS	E	C	B	E	C	A	C	B	D	E
Approach Delay		37.7			41.0			20.3		54.4
Approach LOS		D			D			C		D
Queue Length 50th (m)	26.2	29.3	0.0	33.4	32.2	0.0	23.5	36.0	14.8	73.2
Queue Length 95th (m)	#64.5	44.3	20.4	#70.2	43.2	11.5	39.1	49.0	30.5	#122.9
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	205	1141	479	210	1171	426	322	1602	208	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.44	0.34	0.82	0.44	0.19	0.66	0.39	0.45	0.84

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 36.5 Intersection LOS: D
Intersection Capacity Utilization 75.4% 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: 4: Carling & Preston



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	26	29	14	46	42	570	38	387
Lane Group Flow (vph)	0	90	0	71	44	672	40	454
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	57.0	57.0	57.0	57.0
Total Split (%)	28.8%	28.8%	28.8%	28.8%	71.3%	71.3%	71.3%	71.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		10.6		10.6	62.6	62.6	62.6	62.6
Actuated g/C Ratio		0.13		0.13	0.78	0.78	0.78	0.78
v/c Ratio		0.39		0.32	0.06	0.49	0.08	0.33
Control Delay		27.1		32.9	3.6	5.8	3.8	4.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		27.1		32.9	3.6	5.8	3.8	4.3
LOS		C		C	A	A	A	A
Approach Delay		27.1		32.9		5.6		4.3
Approach LOS		C		C		A		A
Queue Length 50th (m)		8.2		9.0	1.5	33.6	1.4	18.8
Queue Length 95th (m)		20.6		20.0	4.5	62.3	4.4	34.9
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		358		359	685	1377	512	1377
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		0.25		0.20	0.06	0.49	0.08	0.33

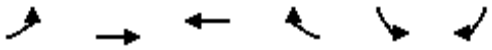
Intersection Summary	
Cycle Length: 80	
Actuated Cycle Length: 80	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 8.0	Intersection LOS: A
Intersection Capacity Utilization 54.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Beech & Preston

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	40	917	1324	211	8
Lane Group Flow (vph)	42	965	1537	222	8
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	87.0	76.0	33.0	33.0
Total Split (%)	9.2%	72.5%	63.3%	27.5%	27.5%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	8.5	85.7	74.1	20.8	20.8
Actuated g/C Ratio	0.07	0.71	0.62	0.17	0.17
v/c Ratio	0.35	0.28	0.52	0.76	0.03
Control Delay	60.3	6.8	20.6	62.8	19.9
Queue Delay	0.0	0.0	0.2	0.0	0.0
Total Delay	60.3	6.8	20.8	62.8	19.9
LOS	E	A	C	E	B
Approach Delay		9.0	20.8	61.3	
Approach LOS		A	C	E	
Queue Length 50th (m)	9.6	26.4	98.4	50.2	0.0
Queue Length 95th (m)	20.6	39.8	120.0	71.7	4.1
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	120	3494	3053	372	339
Starvation Cap Reductn	0	0	671	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.28	0.65	0.60	0.02

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 118 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.9	Intersection LOS: B
Intersection Capacity Utilization 58.7%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	59	702	853	72	140	175
Lane Group Flow (vph)	62	739	898	76	147	184
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	86.0	86.0	86.0	86.0	34.0	34.0
Total Split (%)	71.7%	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	93.3	93.3	93.3	93.3	15.8	15.8
Actuated g/C Ratio	0.78	0.78	0.78	0.78	0.13	0.13
v/c Ratio	0.15	0.20	0.24	0.06	0.66	0.51
Control Delay	4.3	3.3	15.1	9.9	63.2	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.3	3.3	15.1	9.9	63.2	11.5
LOS	A	A	B	A	E	B
Approach Delay		3.4	14.7		34.5	
Approach LOS		A	B		C	
Queue Length 50th (m)	2.6	11.5	62.9	7.8	33.4	0.0
Queue Length 95th (m)	m6.9	18.3	m68.9	m8.6	51.9	18.9
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	419	3789	3789	1197	400	498
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	0.15	0.20	0.24	0.06	0.37	0.37

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 47.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	148	463	244	287	894	52	278	372	102	385
Lane Group Flow (vph)	156	487	257	302	941	55	293	616	107	551
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	24.0	27.0	27.0	24.0	27.0	27.0	15.0	69.0	54.0	54.0
Total Split (%)	20.0%	22.5%	22.5%	20.0%	22.5%	22.5%	12.5%	57.5%	45.0%	45.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	15.2	21.0	21.0	22.5	28.4	28.4	57.4	57.4	42.4	42.4
Actuated g/C Ratio	0.13	0.18	0.18	0.19	0.24	0.24	0.48	0.48	0.35	0.35
v/c Ratio	0.73	0.57	0.54	0.95	0.82	0.14	1.35	0.38	0.41	0.89
Control Delay	67.2	48.9	12.2	88.7	51.4	20.6	207.6	15.3	33.2	53.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.2	48.9	12.2	88.7	51.4	20.6	207.6	15.3	33.2	53.2
LOS	E	D	B	F	D	C	F	B	C	D
Approach Delay		41.6			58.8			77.3		49.9
Approach LOS		D			E			E		D
Queue Length 50th (m)	31.1	40.8	5.1	~78.4	80.3	3.6	~60.2	34.4	18.2	114.5
Queue Length 95th (m)	59.6	43.8	17.9	#140.8	#120.0	15.3	#110.0	45.3	33.5	#158.2
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	251	852	478	318	1152	386	217	1725	294	683
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.57	0.54	0.95	0.82	0.14	1.35	0.36	0.36	0.81

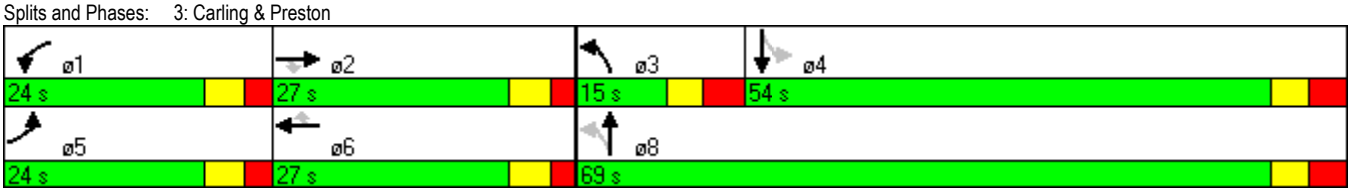
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.35
Intersection Signal Delay: 57.6 — Intersection LOS: E
Intersection Capacity Utilization 95.1% — 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: 3: Carling & Preston



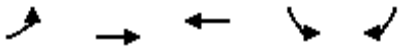
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	44	48	28	47	32	546	15	505
Lane Group Flow (vph)	0	137	0	89	34	590	16	572
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	67.0	67.0	67.0	67.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	74.4%	74.4%	74.4%	74.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		13.0		13.0	65.9	65.9	65.9	65.9
Actuated g/C Ratio		0.14		0.14	0.73	0.73	0.73	0.73
v/c Ratio		0.59		0.41	0.06	0.45	0.03	0.44
Control Delay		40.4		36.9	4.5	6.6	4.3	6.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		40.4		36.9	4.5	6.6	4.3	6.4
LOS		D		D	A	A	A	A
Approach Delay		40.4		36.9		6.5		6.4
Approach LOS		D		D		A		A
Queue Length 50th (m)		19.2		13.1	1.3	32.4	0.6	30.7
Queue Length 95th (m)		34.9		25.3	4.7	64.2	2.7	60.8
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		308		292	537	1304	524	1297
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		0.44		0.30	0.06	0.45	0.03	0.44

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 11.6	Intersection LOS: B
Intersection Capacity Utilization 50.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Beech & Preston

Appendix C

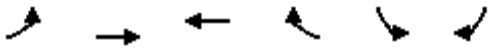
Capacity Analysis Worksheets for Projected Conditions



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	40	569	840	104	1
Lane Group Flow (vph)	42	599	1036	109	1
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	67.0	56.0	33.0	33.0
Total Split (%)	11.0%	67.0%	56.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	8.0	74.1	65.5	12.4	12.4
Actuated g/C Ratio	0.08	0.74	0.66	0.12	0.12
v/c Ratio	0.31	0.17	0.33	0.52	0.01
Control Delay	48.8	4.1	5.8	49.5	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	4.1	5.8	49.5	28.0
LOS	D	A	A	D	C
Approach Delay		7.1	5.8	49.3	
Approach LOS		A	A	D	
Queue Length 50th (m)	7.8	10.2	24.7	20.2	0.0
Queue Length 95th (m)	17.7	16.5	28.7	35.3	1.5
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	136	3610	3136	439	394
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	0.31	0.17	0.33	0.25	0.00

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 55 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.52	
Intersection Signal Delay: 8.9	Intersection LOS: A
Intersection Capacity Utilization 48.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	94	649	488	121	239	91
Lane Group Flow (vph)	99	683	514	127	252	96
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	67.0	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	69.1	69.1	69.1	69.1	20.0	20.0
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.20	0.20
v/c Ratio	0.18	0.20	0.15	0.12	0.74	0.25
Control Delay	6.4	5.3	3.1	0.2	50.5	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	5.3	3.1	0.2	50.5	8.0
LOS	A	A	A	A	D	A
Approach Delay		5.4	2.6		38.7	
Approach LOS		A	A		D	
Queue Length 50th (m)	5.2	13.2	6.5	0.0	46.2	0.0
Queue Length 95th (m)	11.4	19.7	m9.4	m0.0	66.6	11.7
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	557	3365	3365	1087	463	484
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	0.20	0.15	0.12	0.54	0.20

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 45.7%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

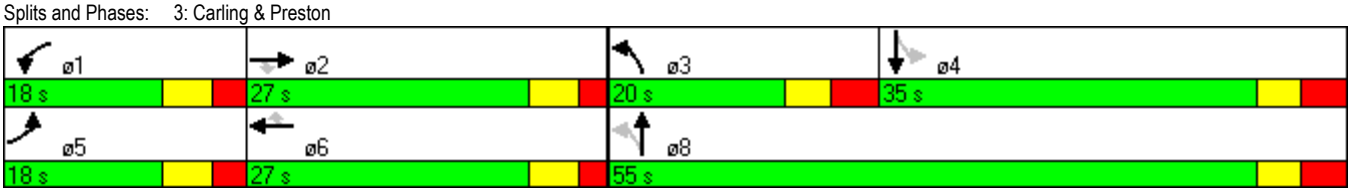
Splits and Phases: 2: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	187	602	193	172	497	80	207	486	90	326
Lane Group Flow (vph)	197	634	203	181	523	84	218	659	95	434
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	18.0	27.0	27.0	18.0	27.0	27.0	20.0	55.0	35.0	35.0
Total Split (%)	18.0%	27.0%	27.0%	18.0%	27.0%	27.0%	20.0%	55.0%	35.0%	35.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	13.7	22.2	22.2	12.8	21.3	21.3	45.9	45.9	26.9	26.9
Actuated g/C Ratio	0.14	0.22	0.22	0.13	0.21	0.21	0.46	0.46	0.27	0.27
v/c Ratio	0.85	0.59	0.41	0.83	0.50	0.22	0.72	0.43	0.49	0.91
Control Delay	77.5	33.8	7.9	74.7	36.9	8.9	31.9	17.3	40.2	59.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.5	33.8	7.9	74.7	36.9	8.9	31.9	17.3	40.2	59.6
LOS	E	C	A	E	D	A	C	B	D	E
Approach Delay		37.0			42.6			20.9		56.1
Approach LOS		D			D			C		E
Queue Length 50th (m)	41.1	43.8	2.8	35.2	33.2	0.0	24.1	38.1	15.2	77.5
Queue Length 95th (m)	#82.7	44.4	13.6	#74.2	44.1	11.8	#45.0	51.9	31.5	#131.9
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	232	1107	502	217	1071	399	316	1605	202	496
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.57	0.40	0.83	0.49	0.21	0.69	0.41	0.47	0.88

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 37.1 — Intersection LOS: D
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.

Splits and Phases: 3: Carling & Preston



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	73	35	15	50	48	598	40	406
Lane Group Flow (vph)	0	148	0	78	51	703	42	480
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	57.0	57.0	57.0	57.0
Total Split (%)	28.8%	28.8%	28.8%	28.8%	71.3%	71.3%	71.3%	71.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		13.4		13.4	55.5	55.5	55.5	55.5
Actuated g/C Ratio		0.17		0.17	0.69	0.69	0.69	0.69
v/c Ratio		0.58		0.28	0.09	0.57	0.10	0.39
Control Delay		35.9		27.8	5.4	9.1	5.8	6.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		35.9		27.8	5.4	9.1	5.8	6.7
LOS		D		C	A	A	A	A
Approach Delay		35.9		27.8		8.9		6.6
Approach LOS		D		C		A		A
Queue Length 50th (m)		18.6		9.5	2.1	43.1	1.7	23.9
Queue Length 95th (m)		33.4		19.3	6.8	90.0	6.3	50.1
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		329		366	571	1228	404	1227
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		0.45		0.21	0.09	0.57	0.10	0.39

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 60
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 11.7 — Intersection LOS: B
Intersection Capacity Utilization 66.3% — ICU Level of Service C
Analysis Period (min) 15

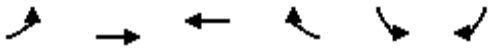
Splits and Phases: 4: Beech & Preston

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	68	997	1349	211	9
Lane Group Flow (vph)	72	1049	1562	222	9
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	87.0	76.0	33.0	33.0
Total Split (%)	9.2%	72.5%	63.3%	27.5%	27.5%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	10.4	85.7	70.1	20.8	20.8
Actuated g/C Ratio	0.09	0.71	0.58	0.17	0.17
v/c Ratio	0.49	0.30	0.56	0.76	0.03
Control Delay	64.0	7.0	18.8	62.8	19.6
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	64.0	7.0	19.1	62.8	19.6
LOS	E	A	B	E	B
Approach Delay		10.6	19.1	61.1	
Approach LOS		B	B	E	
Queue Length 50th (m)	16.2	29.4	105.7	50.2	0.0
Queue Length 95th (m)	#36.1	44.0	88.0	71.7	4.2
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	147	3494	2899	372	339
Starvation Cap Reductn	0	0	618	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.49	0.30	0.68	0.60	0.03

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 118 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.76	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 62.8%	ICU Level of Service B
Analysis Period (min) 15	

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

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	109	716	906	203	192	156
Lane Group Flow (vph)	115	754	954	214	202	164
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	86.0	86.0	86.0	86.0	34.0	34.0
Total Split (%)	71.7%	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	89.6	89.6	89.6	89.6	19.5	19.5
Actuated g/C Ratio	0.75	0.75	0.75	0.75	0.16	0.16
v/c Ratio	0.31	0.21	0.26	0.18	0.73	0.43
Control Delay	7.2	4.3	14.9	8.1	62.7	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	4.3	14.9	8.1	62.7	9.6
LOS	A	A	B	A	E	A
Approach Delay		4.7	13.6		38.9	
Approach LOS		A	B		D	
Queue Length 50th (m)	6.5	14.4	71.9	27.6	45.7	0.0
Queue Length 95th (m)	14.4	22.3	m27.8	m1.7	66.6	17.1
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	374	3635	3635	1186	400	483
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	0.21	0.26	0.18	0.51	0.34

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.73	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 51.5%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	166	521	275	301	1025	55	328	390	107	404
Lane Group Flow (vph)	175	548	289	317	1079	58	345	547	113	583
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	24.0	27.0	27.0	24.0	27.0	27.0	15.0	69.0	54.0	54.0
Total Split (%)	20.0%	22.5%	22.5%	20.0%	22.5%	22.5%	12.5%	57.5%	45.0%	45.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	16.0	21.0	21.0	21.1	26.1	26.1	58.8	58.8	43.8	43.8
Actuated g/C Ratio	0.13	0.18	0.18	0.18	0.22	0.22	0.49	0.49	0.36	0.36
v/c Ratio	0.77	0.64	0.57	1.06	1.02	0.16	1.65	0.34	0.39	0.92
Control Delay	69.1	50.0	11.6	118.3	79.6	23.3	335.0	16.8	31.7	55.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.1	50.0	11.6	118.3	79.6	23.3	335.0	16.8	31.7	55.3
LOS	E	D	B	F	E	C	F	B	C	E
Approach Delay		42.3			85.8			139.9		51.5
Approach LOS		D			F			F		D
Queue Length 50th (m)	36.0	46.4	6.1	~93.7	~117.1	5.0	~84.6	33.5	18.6	120.7
Queue Length 95th (m)	#69.2	48.8	20.5	#148.6	#145.7	16.8	#146.2	45.1	34.8	#183.6
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	251	852	504	298	1058	356	209	1717	314	683
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.64	0.57	1.06	1.02	0.16	1.65	0.32	0.36	0.85

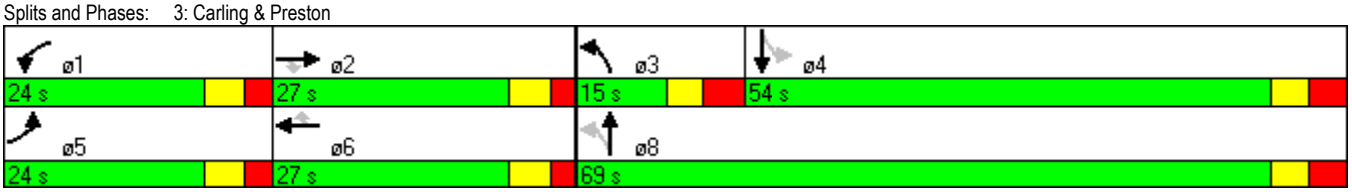
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.65
Intersection Signal Delay: 80.9 — Intersection LOS: F
Intersection Capacity Utilization 103.5% — ICU Level of Service G
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.

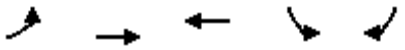
Splits and Phases: 3: Carling & Preston



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	69	50	29	52	35	575	16	530
Lane Group Flow (vph)	0	168	0	98	37	621	17	643
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	67.0	67.0	67.0	67.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	74.4%	74.4%	74.4%	74.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		15.1		15.1	63.8	63.8	63.8	63.8
Actuated g/C Ratio		0.17		0.17	0.71	0.71	0.71	0.71
v/c Ratio		0.66		0.39	0.08	0.49	0.04	0.52
Control Delay		43.4		34.1	5.7	8.2	5.4	8.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		43.4		34.1	5.7	8.2	5.4	8.3
LOS		D		C	A	A	A	A
Approach Delay		43.4		34.1		8.0		8.3
Approach LOS		D		C		A		A
Queue Length 50th (m)		24.7		14.2	1.7	39.9	0.7	41.1
Queue Length 95th (m)		41.8		26.3	5.8	78.5	3.3	82.0
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		302		304	462	1275	478	1260
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		0.56		0.32	0.08	0.49	0.04	0.51

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 58.1%	ICU Level of Service B
Analysis Period (min) 15	

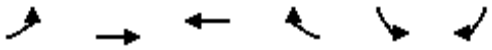
Splits and Phases: 4: Beech & Preston



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	43	608	668	109	1
Lane Group Flow (vph)	45	640	855	115	1
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	67.0	56.0	33.0	33.0
Total Split (%)	11.0%	67.0%	56.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	8.1	73.9	65.1	12.6	12.6
Actuated g/C Ratio	0.08	0.74	0.65	0.13	0.13
v/c Ratio	0.33	0.18	0.28	0.54	0.01
Control Delay	49.0	4.3	4.5	49.8	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	4.3	4.5	49.8	28.0
LOS	D	A	A	D	C
Approach Delay		7.2	4.5	49.6	
Approach LOS		A	A	D	
Queue Length 50th (m)	8.4	11.1	17.4	21.3	0.0
Queue Length 95th (m)	18.6	18.1	23.0	36.7	1.5
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	138	3598	3109	439	394
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	0.33	0.18	0.28	0.26	0.00

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 55 (55%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 45.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	97	680	512	125	240	92
Lane Group Flow (vph)	102	716	539	132	253	97
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	67.0	67.0	67.0	67.0	33.0	33.0
Total Split (%)	67.0%	67.0%	67.0%	67.0%	33.0%	33.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	69.0	69.0	69.0	69.0	20.1	20.1
Actuated g/C Ratio	0.69	0.69	0.69	0.69	0.20	0.20
v/c Ratio	0.19	0.21	0.16	0.12	0.74	0.25
Control Delay	6.5	5.3	3.0	0.2	50.3	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	5.3	3.0	0.2	50.3	7.9
LOS	A	A	A	A	D	A
Approach Delay		5.5	2.4		38.6	
Approach LOS		A	A		D	
Queue Length 50th (m)	5.3	13.6	6.4	0.0	46.4	0.0
Queue Length 95th (m)	12.7	20.9	m9.5	m0.0	66.7	11.7
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	543	3360	3360	1087	463	485
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	0.19	0.21	0.16	0.12	0.55	0.20

Intersection Summary	
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 10.7	Intersection LOS: B
Intersection Capacity Utilization 46.2%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	194	625	200	180	520	85	216	510	95	342
Lane Group Flow (vph)	204	658	211	189	547	89	227	692	100	455
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	18.0	27.0	27.0	18.0	27.0	27.0	20.0	55.0	35.0	35.0
Total Split (%)	18.0%	27.0%	27.0%	18.0%	27.0%	27.0%	20.0%	55.0%	35.0%	35.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Min	C-Min	None	C-Min	C-Min	None	None	None	None
Act Effct Green (s)	13.4	21.5	21.5	12.6	20.6	20.6	46.9	46.9	27.7	27.7
Actuated g/C Ratio	0.13	0.22	0.22	0.13	0.21	0.21	0.47	0.47	0.28	0.28
v/c Ratio	0.90	0.63	0.43	0.89	0.54	0.23	0.76	0.44	0.52	0.93
Control Delay	86.3	34.4	8.0	83.2	37.8	9.0	35.3	17.2	41.5	62.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.3	34.4	8.0	83.2	37.8	9.0	35.3	17.2	41.5	62.1
LOS	F	C	A	F	D	A	D	B	D	E
Approach Delay		39.1			45.1			21.7		58.4
Approach LOS		D			D			C		E
Queue Length 50th (m)	~43.6	46.2	2.7	36.9	34.7	0.0	25.4	41.0	16.3	83.3
Queue Length 95th (m)	#86.2	45.8	12.9	#78.3	46.1	12.2	#54.0	55.2	33.5	#141.4
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	227	1068	497	213	1026	390	311	1605	197	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.62	0.42	0.89	0.53	0.23	0.73	0.43	0.51	0.91

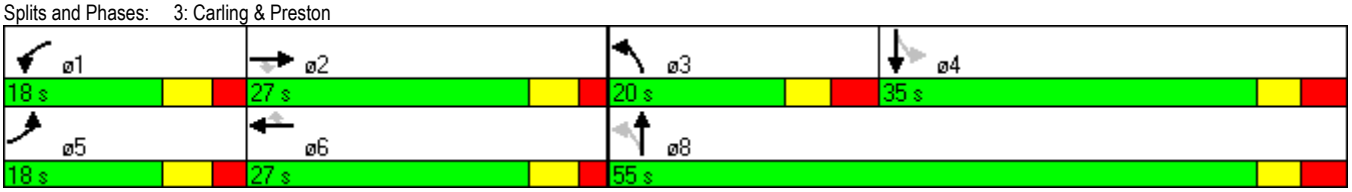
Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 100
Offset: 6 (6%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 39.0 — Intersection LOS: D
Intersection Capacity Utilization 82.3% — 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.

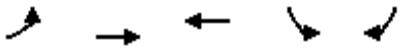
Splits and Phases: 3: Carling & Preston



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	75	35	16	51	50	628	12	425
Lane Group Flow (vph)	0	151	0	80	53	738	13	503
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	57.0	57.0	57.0	57.0
Total Split (%)	28.8%	28.8%	28.8%	28.8%	71.3%	71.3%	71.3%	71.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		13.5		13.5	55.4	55.4	55.4	55.4
Actuated g/C Ratio		0.17		0.17	0.69	0.69	0.69	0.69
v/c Ratio		0.59		0.29	0.10	0.60	0.03	0.41
Control Delay		36.3		28.2	5.5	9.7	5.3	6.9
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		36.3		28.2	5.5	9.7	5.3	6.9
LOS		D		C	A	A	A	A
Approach Delay		36.3		28.2		9.4		6.9
Approach LOS		D		C		A		A
Queue Length 50th (m)		19.1		9.9	2.2	47.5	0.5	25.8
Queue Length 95th (m)		34.2		20.0	7.1	97.6	2.6	53.1
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		329		364	551	1226	377	1225
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		0.46		0.22	0.10	0.60	0.03	0.41

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green			
Natural Cycle: 60			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.60			
Intersection Signal Delay: 12.2		Intersection LOS: B	
Intersection Capacity Utilization 68.2%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Beech & Preston

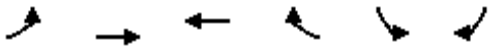


Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Configurations					
Volume (vph)	69	1047	1413	221	9
Lane Group Flow (vph)	73	1102	1629	233	9
Turn Type	Prot				Perm
Protected Phases	5	2	6	4	
Permitted Phases					4
Detector Phase	5	2	6	4	4
Switch Phase					
Minimum Initial (s)	5.0	10.0	10.0	10.0	10.0
Minimum Split (s)	10.2	28.4	28.4	33.1	33.1
Total Split (s)	11.0	87.0	76.0	33.0	33.0
Total Split (%)	9.2%	72.5%	63.3%	27.5%	27.5%
Yellow Time (s)	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	2.7	2.7	3.8	3.8
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	6.4	6.4	7.1	7.1
Lead/Lag	Lead		Lag		
Lead-Lag Optimize?	Yes		Yes		
Recall Mode	None	C-Min	C-Min	None	None
Act Effct Green (s)	10.0	85.0	69.7	21.5	21.5
Actuated g/C Ratio	0.08	0.71	0.58	0.18	0.18
v/c Ratio	0.51	0.32	0.58	0.77	0.03
Control Delay	66.2	7.4	19.2	62.7	19.2
Queue Delay	0.0	0.0	0.3	0.0	0.0
Total Delay	66.2	7.4	19.5	62.7	19.2
LOS	E	A	B	E	B
Approach Delay		11.0	19.5	61.1	
Approach LOS		B	B	E	
Queue Length 50th (m)	16.4	32.1	112.4	52.7	0.0
Queue Length 95th (m)	#46.1	47.5	81.2	75.1	4.2
Internal Link Dist (m)		291.8	51.8	323.0	
Turn Bay Length (m)	20.0				
Base Capacity (vph)	142	3471	2889	374	341
Starvation Cap Reductn	0	0	598	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.32	0.71	0.62	0.03

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 118 (98%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.77	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

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

Splits and Phases: 1: Carling & Sherwood



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	117	750	949	205	197	161
Lane Group Flow (vph)	123	789	999	216	207	169
Turn Type	Perm			Perm		Perm
Protected Phases		2	6		4	
Permitted Phases	2			6		4
Detector Phase	2	2	6	6	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	26.2	26.2	26.2	26.2	32.7	32.7
Total Split (s)	86.0	86.0	86.0	86.0	34.0	34.0
Total Split (%)	71.7%	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.3	3.3
All-Red Time (s)	1.5	1.5	1.5	1.5	2.4	2.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.7	5.7
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Min	C-Min	C-Min	C-Min	None	None
Act Effct Green (s)	89.3	89.3	89.3	89.3	19.8	19.8
Actuated g/C Ratio	0.74	0.74	0.74	0.74	0.16	0.16
v/c Ratio	0.35	0.22	0.28	0.18	0.74	0.44
Control Delay	8.1	4.5	14.0	6.9	62.8	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.1	4.5	14.0	6.9	62.8	11.8
LOS	A	A	B	A	E	B
Approach Delay		5.0	12.7		39.8	
Approach LOS		A	B		D	
Queue Length 50th (m)	7.4	15.6	77.0	29.0	46.9	2.8
Queue Length 95th (m)	m16.5	21.9	m15.1	m0.6	67.9	20.3
Internal Link Dist (m)		63.9	208.3		366.6	
Turn Bay Length (m)	30.0			25.0	20.0	
Base Capacity (vph)	354	3623	3623	1184	400	476
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	0.35	0.22	0.28	0.18	0.52	0.36

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 2 (2%), Referenced to phase 2:EBTL and 6:WBT, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 14.0	Intersection LOS: B
Intersection Capacity Utilization 52.6%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 2: Carling & Champagne

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Volume (vph)	173	544	287	315	1069	60	342	440	113	424
Lane Group Flow (vph)	182	573	302	332	1125	63	360	605	119	610
Turn Type	Prot		Perm	Prot		Perm	pm+pt		Perm	
Protected Phases	5	2		1	6		3	8		4
Permitted Phases			2			6	8		4	
Detector Phase	5	2	2	1	6	6	3	8	4	4
Switch Phase										
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	10.0	10.0	10.0
Minimum Split (s)	13.2	27.0	27.0	13.2	27.0	27.0	13.9	34.9	34.9	34.9
Total Split (s)	24.0	27.0	27.0	24.0	27.0	27.0	15.0	69.0	54.0	54.0
Total Split (%)	20.0%	22.5%	22.5%	20.0%	22.5%	22.5%	12.5%	57.5%	45.0%	45.0%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.7	3.7	3.3	3.3	3.3	3.3
All-Red Time (s)	2.5	2.3	2.3	2.5	2.3	2.3	3.6	3.6	3.6	3.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.2	6.0	6.0	6.2	6.0	6.0	6.9	6.9	6.9	6.9
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead		Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	16.2	21.0	21.0	20.0	24.7	24.7	59.9	59.9	44.9	44.9
Actuated g/C Ratio	0.14	0.18	0.18	0.17	0.21	0.21	0.50	0.50	0.37	0.37
v/c Ratio	0.79	0.67	0.59	1.18	1.12	0.19	1.80	0.36	0.42	0.93
Control Delay	71.8	50.7	12.3	154.8	111.5	23.9	398.8	17.1	32.6	57.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	50.7	12.3	154.8	111.5	23.9	398.8	17.1	32.6	57.7
LOS	E	D	B	F	F	C	F	B	C	E
Approach Delay		43.4			117.3			159.5		53.6
Approach LOS		D			F			F		D
Queue Length 50th (m)	37.2	48.6	7.5	~101.1	~125.4	5.6	~105.3	38.8	20.0	129.6
Queue Length 95th (m)	#73.9	54.1	23.5	#156.9	#153.9	18.1	#164.1	51.3	37.1	#197.9
Internal Link Dist (m)		208.3			335.5			211.7		341.0
Turn Bay Length (m)	50.0		40.0	70.0		40.0	75.0		45.0	
Base Capacity (vph)	251	852	508	282	1004	340	200	1717	296	683
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.67	0.59	1.18	1.12	0.19	1.80	0.35	0.40	0.89

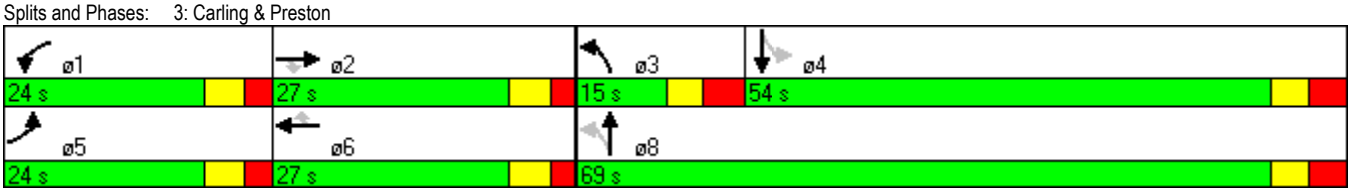
Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 6 (5%), Referenced to phase 2:EBT and 6:WBT, Start of Green
Natural Cycle: 130
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.80
Intersection Signal Delay: 97.7 — Intersection LOS: F
Intersection Capacity Utilization 107.2% — ICU Level of Service G
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: 3: Carling & Preston



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Volume (vph)	25	50	30	55	37	604	17	555
Lane Group Flow (vph)	0	122	0	103	39	653	18	670
Turn Type	Perm		Perm		Perm		Perm	
Protected Phases		4		8		2		6
Permitted Phases	4		8		2		6	
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	22.6	22.6	22.6	22.6	31.5	31.5	31.5	31.5
Total Split (s)	23.0	23.0	23.0	23.0	67.0	67.0	67.0	67.0
Total Split (%)	25.6%	25.6%	25.6%	25.6%	74.4%	74.4%	74.4%	74.4%
Yellow Time (s)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
All-Red Time (s)	2.3	2.3	2.3	2.3	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
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Min	C-Min	C-Min	C-Min
Act Effct Green (s)		12.0		12.0	66.9	66.9	66.9	66.9
Actuated g/C Ratio		0.13		0.13	0.74	0.74	0.74	0.74
v/c Ratio		0.53		0.52	0.08	0.49	0.04	0.51
Control Delay		36.3		42.7	4.2	6.5	3.9	6.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		36.3		42.7	4.2	6.5	3.9	6.7
LOS		D		D	A	A	A	A
Approach Delay		36.3		42.7		6.4		6.6
Approach LOS		D		D		A		A
Queue Length 50th (m)		15.6		15.9	1.4	34.7	0.6	35.4
Queue Length 95th (m)		30.6		29.7	4.9	68.7	2.7	70.9
Internal Link Dist (m)		204.0		152.2		341.0		134.2
Turn Bay Length (m)					20.0		20.0	
Base Capacity (vph)		323		287	477	1322	489	1306
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		0.38		0.36	0.08	0.49	0.04	0.51

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 50 (56%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 54.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 4: Beech & Preston