



BECKWITH AVENUE RESIDENTIAL DEVELOPMENT

UPDATED TRAFFIC STUDY

Prepared for: **Don Mann Excavating Ltd**

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Our File: **2896.B01(Previously 1989.B01)**

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1.0 INTRODUCTION

Watt Consulting Group (WATT) was retained by Don Mann Excavating Ltd, to conduct a traffic review for the proposed residential development at 931/980/990/1000 Beckwith Avenue in the District of Saanich. The proposed development site is accessed from Beckwith Avenue via Quadra Street.

An analysis of post-development conditions was undertaken in order to provide a clear view of the impacts on the adjacent roadways after full build-out and occupancy. The study assessed traffic impacts of the development, compared volumes/travel patterns on Beckwith Avenue between existing and post development conditions, and assessed the need for any mitigation measures. Study recommendations and conclusions are to provide safe and efficient movement of pedestrians, bicycles and vehicular traffic for the proposed development while minimizing the impact to non-site trips.

2.0 BACKGROUND INFORMATION AND STUDY AREA

The study area includes Quadra Street, Beckwith Avenue, and the site accesses. There is one key intersection in the study area from a traffic conditions / capacity perspective: Quadra Street and Beckwith Avenue. See **Figure 1** for the study area and site location.

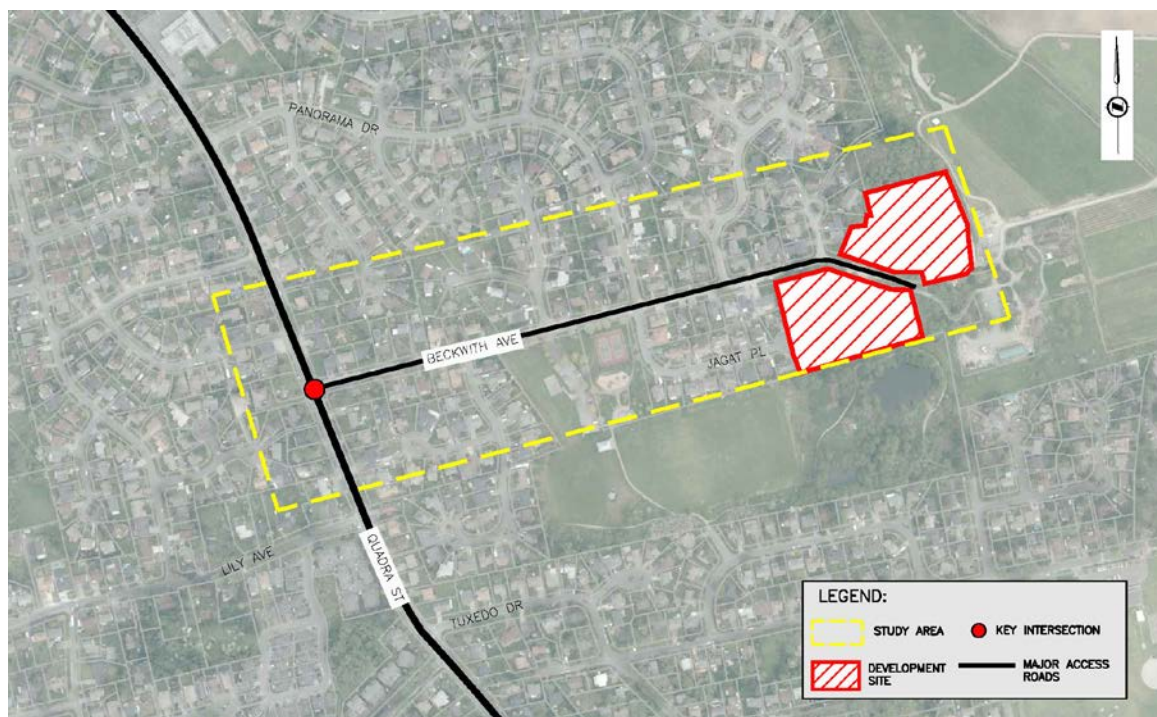


Figure 1 – Study Area

2.1 ROAD NETWORK

The development site is located at the east end of Beckwith Avenue. Beckwith Avenue is a two-lane local road that runs east-west, and dead ends near the proposed development site. Quadra Street is a four lane urban arterial road running north-south, connecting residential neighbourhoods to Saanich and downtown Victoria. Quadra Street/Beckwith Avenue is a signalized ‘T’ type intersection with two lanes for each direction on Quadra Street and left and right turn lanes on Beckwith Avenue.

There are currently concrete sidewalks along the north side on Beckwith Avenue between Quadra Street and Panorama Drive and no sidewalk on Beckwith Avenue east Panorama Drive. On Beckwith Avenue there are existing curb extensions at the three side street intersections until Panorama Drive.

2.2 PROPOSED SITE DEVELOPMENT PLAN

The existing site consists of three single family lots (931, 980, and 990 Beckwith Avenue) and one A-1 lot (1000 Beckwith Avenue). There are two existing single family homes on the site (one at 931 Beckwith Avenue and one at 1000 Beckwith Avenue). The existing A-1 site is currently used for excavating and materials related industrial uses with heavy truck traffic. It is proposed to rezone the A-1 lot to RS-8 with 16 single family lots. The lot at 931 Beckwith Avenue is already zoned to allow five (5) additional lots (six total), and 980 and 990 Beckwith Avenue will remain as individual single-family lots (albeit with modified lot lines as part of the overall site development plan). In total the development will consist of 23 single family lots, of which 16 lots require rezoning.

This redevelopment would result in a switch to residential-oriented trips and travel patterns. Traffic impacts along Beckwith Avenue were reviewed in consideration of the existing traffic plus the impacts of added site trips by development.

2.3 EXISTING TRAFFIC VOLUMES

Turning movement traffic counts were undertaken by WATT at the intersection of Beckwith Avenue / Quadra Street for one mid-day weekday hour (12:30 – 1:30 PM) and one PM peak hour (4:00 – 5:00 PM) on May 19, 2016. The mid-day peak hour was considered to establish typical mid-day truck volumes for the existing land use of the site while the PM peak hour was reviewed as it is the typically-recurring busiest traffic period on residential roads. **Figure 2** summarizes the existing mid-day peak hour volumes with heavy vehicle details and **Figure 3** summarizes the existing PM peak hour volumes.

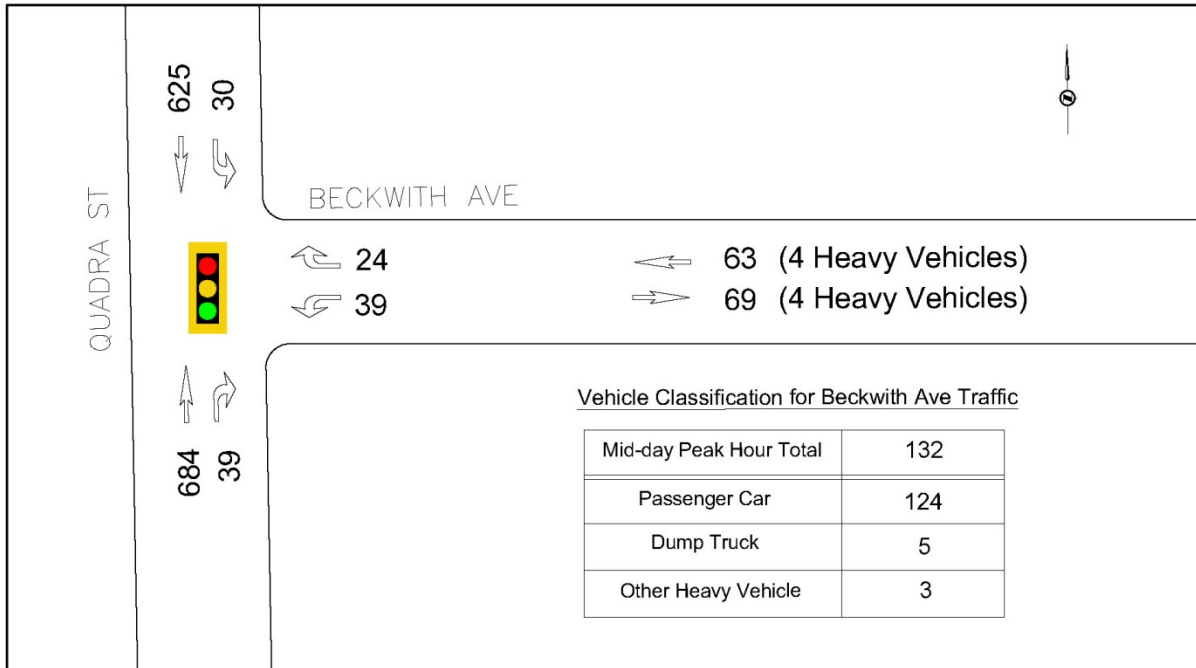


Figure 2 – Existing Volumes: Mid-day Peak Hour (12:30 – 1:30 PM)

In the mid-day peak hour, 132 vehicles (two-way total) were observed on Beckwith Avenue. Eight (8) heavy vehicles (heavy vehicle percentage: 6%) were observed during the mid-day peak hour and there were 5 dump trucks of 8 vehicles, which is considered existing site trips (excavating/materials site) on Beckwith Avenue. Other heavy vehicles observed during the mid-day peak hour were two municipal trucks and one agricultural tractor. The PM peak hour volume was 211 vehicles on Beckwith Avenue, and six (6) heavy vehicles were observed: two dump trucks, two school buses, and one delivery truck and one other heavy vehicle. Note that peak truck activity may be higher than what was observed.

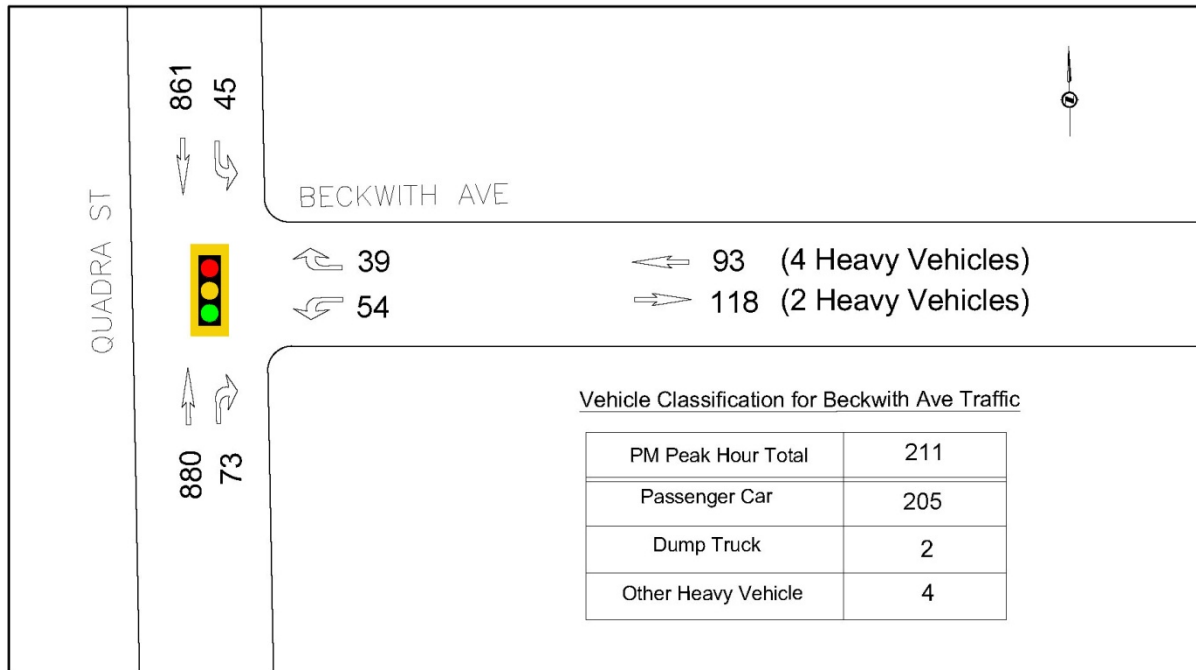


Figure 3 – Existing Volumes: PM Peak Hour (4:00 – 5:00 PM)

2.4 EXISTING TRAFFIC CONDITIONS

2.4.1 TRAFFIC MODEL OVERVIEW

Analysis of the traffic conditions at the intersection of Quadra Street/Beckwith Avenue within the study area were undertaken using Synchro software. Synchro / SimTraffic is a two-part traffic modelling software that provides analysis of traffic conditions based on traffic control, geometry, volumes and traffic operations. Synchro software (Synchro 9) is used because of its ability to provide analysis using the Highway Capacity Manual (2010) methodology, while SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly “seeding” or positioning vehicles travelling throughout the network. SIDRA provides results using HCM 2010 methodology as well. SIDRA and Synchro uses measures of effectiveness to return the results of the analysis. These measures of effectiveness include level of service (LOS), delay and 95th percentile queue length. The delays and type of traffic control are used to determine the level of service. The level of services are broken down into six letter grades with LOS A being excellent operations and LOS F being unstable/failure operations. Level of service C is generally considered to be an acceptable LOS by most municipalities. Level of service D is generally considered to be on the threshold between acceptable and unacceptable operations.

2.4.2 EXISTING TRAFFIC CONDITIONS AT QUADRA STREET / BECKWITH AVENUE

Existing traffic conditions were analysed during the mid-day and PM peak hours for the intersection of Quadra Street & Beckwith Avenue. At the intersection all movements are currently operating at a LOS A or B during the mid-day and PM peak hours.

3.0 POST DEVELOPMENT CONDITIONS

3.1 SITE TRIP GENERATION

Development scenario trips were estimated using the ITE Trip Generation Manual 9th Edition. Daily trips and PM peak hour trips were compared between the existing and the proposed land uses. Daily trips for the existing excavating site were estimated using the ITE's Light Industrial land use (code: 110), and peak hour trips were based on actual site observations. **Table 1 to 3** summarize the estimated additional trips for the site.

TABLE 1: TRIP GENERATION FOR EXISTING LAND USE

Existing Land Use	ITE Code	Daily Trips	Trips In	Trips Out	Mid-day Peak	Trips In	Trips Out	PM Peak	Trips In	Trips Out
Two (2) Single Family Detached Houses	210	19	10	9	1	1	0	2	1	1
Excavating/materials*	Dump Truck	35	18	17	5	3	2	2	2	0
Total		54	28	26	6	4	2	4	3	1

Note: (1) based on the mid-day peak hour count: daily trip rate is 7 times the peak hour (ITE light industrial land use: code 110); (2) based on the actual dump truck volume measured during PM peak hour

TABLE 2: TRIP GENERATION FOR PROPOSED LAND USE

Land Use	ITE Code	Daily Trips	Trips In	Trips Out	Mid-day Peak	Trips In	Trips Out	PM Peak	Trips In	Trips Out
931 (5 lots), 980, 990 Beckwith (7 lots already zoned)	210	67	34	33	4	2	2	7	4	3
1000 Beckwith (16 lots to be rezoned)	210	152	76	76	10	5	5	16	10	6
Total (23 lots)		219	110	109	14	7	7	23	14	9

TABLE 3: NET TRIP GENERATION BY THE DEVELOPMENT

Land Use	ITE Code	Daily Trips	Trips In	Trips Out	Mid-day Peak	Trips In	Trips Out	PM Peak	Trips In	Trips Out
5 Additional SF Houses (already zoned)	210	48	24	24	3	1	2	5	3	2
16 Additional SF Houses (to be rezoned)	210	133	67	66	10	5	5	16	10	6
Excavating/materials	Dump Truck	(-)35	(-)18	(-)17	(-)5	(-)3	(-)2	(-)2	(-)2	0
Total		146	73	73	8	3	5	19	11	8

3.2 POST DEVELOPMENT TRAFFIC VOLUMES ON BECKWITH AVENUE

The estimated additional site trips in the mid-day peak hour is eight (8) trips, and in the PM peak hour it is 19 trips. The total site trips can be broken down into two groups: already zoned and new zoning required. The address 931, 980, and 990 Beckwith Avenue are already zoned with 5 additional residential lots. For the 1000 Beckwith Avenue subdivision (to be rezoned with 16 lots), the estimated net trip increase is four (4) trips added during the Mid-day peak hour and 12 trips added during the PM peak hour, but with five fewer large vehicle trips in the midday peak hour and two fewer in the PM peak hour.

The site trips were assigned based on the existing trip distributions at the intersection of Quadra Street/Beckwith Avenue. The future Beckwith Avenue traffic patterns would be changed to more residential oriented as the existing dump trucks from this site will be eliminated (although there will likely be some farm-oriented truck activity to/from the property at the east end of Beckwith Avenue). **Figure 4** summarizes the post development mid-day peak hour volumes with heavy vehicle details and **Figure 5** summarizes the post development PM peak hour volumes.

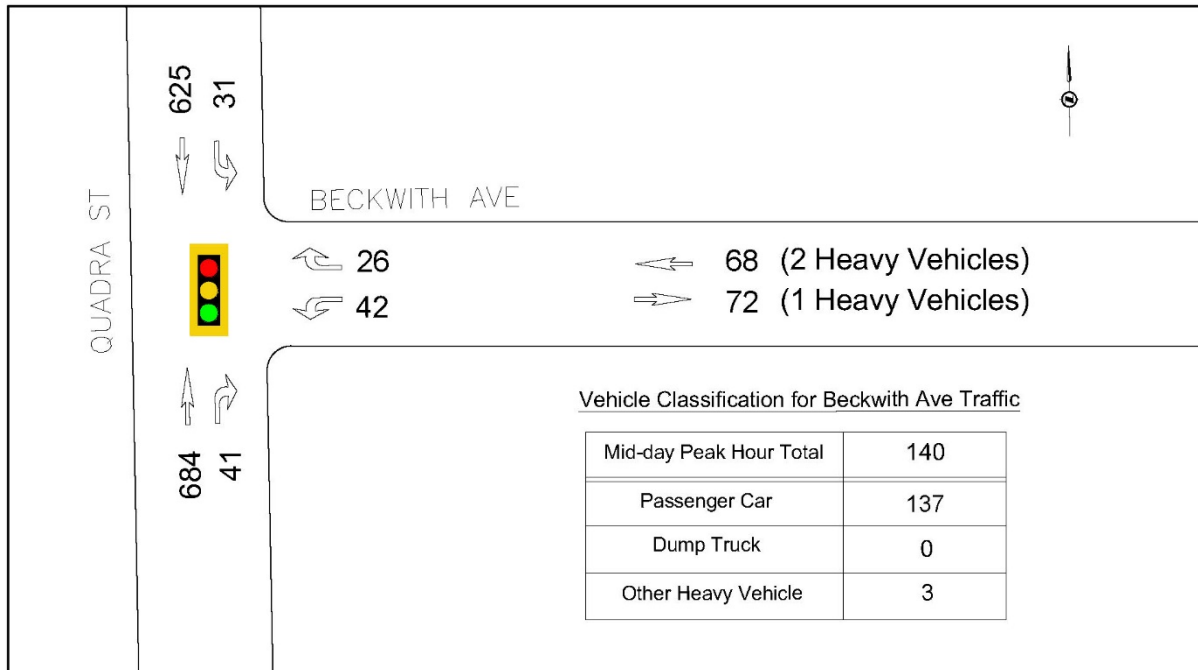


Figure 4 – Post Development Volumes: Mid-day Peak Hour (12:30 – 1:30 PM)

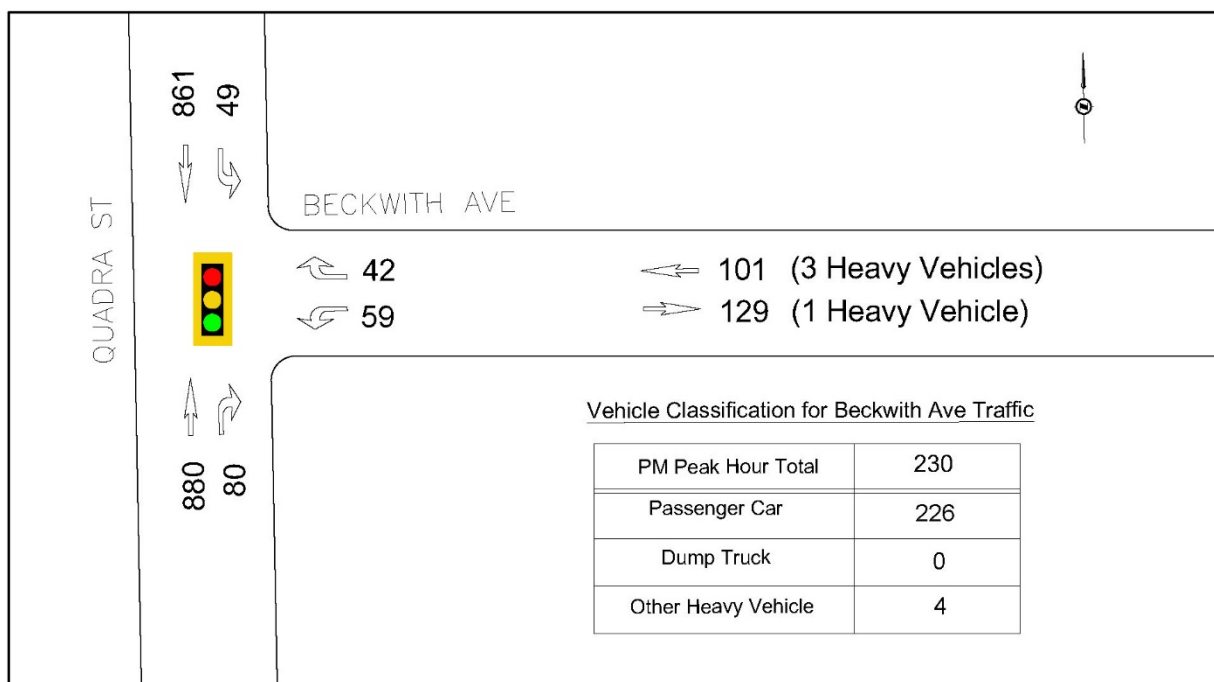


Figure 5 – Post Development Volumes: PM Peak Hour (04:00 – 5:00 PM)

Overall volume increases are considered minor on Beckwith Avenue with the development; there would be a 6.0% increase during mid-day peak hour and a 9.0% increase during PM peak hour, near the west end of Beckwith Avenue (near Quadra St). This is equivalent to one extra

vehicle every 7 min 30 sec during the mid-day peak hour and every 3 min 9 sec during the PM peak hour for all new trips (including the already-zoned trips and rezoned trips). When considering rezoned trips only, the impact is equivalent to one extra vehicle every 12 minutes in the mid-day peak, and one extra vehicle every 4 min 17 sec in the PM peak. The volume will still be in the range of a “Local” residential road (typical Local roads have volumes of up to 3,000 vehicles per day). Near / just west of the site, Beckwith Avenue will have approximately 200 vehicles/day. Near Quadra St, Beckwith Avenue will operate as a higher volume local road with or without this redevelopment, with approximately 2,000 vehicles/day (based on the typical factor of PM peak hour volume being approximately equivalent to 11 percent of the average daily traffic).

With the redevelopment, the heavy vehicle percentages on Beckwith Avenue will drop from 6.0% to 2.2% during the mid-day peak hour and from 2.8% to 1.8% during the PM peak hour, based on the observed truck total. The drop in heavy vehicles would be even more when comparing peak truck activity days.

3.3 POST DEVELOPMENT TRAFFIC CONDITIONS AT QUADRA STREET / BECKWITH AVENUE

Post development traffic conditions were analyzed during the mid-day and PM peak hours for the intersection of Quadra Street / Beckwith Avenue. Post development traffic volumes and new heavy vehicle percentages were entered in the Synchro models. With the development, all movements will continue to operate with the same good levels of service in the mid-day and PM peak hours (LOS A/B), and no mitigations are required.

3.4 REVISION TO SITE PLAN

In 2020, a revision was made to the site plan to increase residential density on the subject site. The original TIA completed in 2016, considered the rezoning of the site from A-1 to RS-8 and develop an additional 19 single family lots (for a total of 23 for the site). Currently, the proposed rezoning of the site is to now include the developer the ability to develop 17 single family lots, 12 of which could include both a garden suite and a secondary suite and the other remaining five (5) lots could include a secondary suite. The existing A-1 site is currently used for excavating and materials related to industrial uses, with predominantly heavy truck traffic. The redevelopment would still result in a switch to residential-oriented trips and travel patterns.

Trip generation rates for the PM peak were estimated using the 10th Edition of the ITE Trip Generation Manual, whereas the TIA in 2016 used the 9th Edition. Upon review of the ITE rate differences, it was determined that the rate for ITE code 210 has remained consistent. ITE does not have a specific trip rate for secondary suites and garden suites, however, a determination was made that these additional suites would have a similar trip generation to a mid-rise multi-family apartment building and as such, ITE Code 221 was used for the trip generation of the secondary and garden suites.

A similar methodology was followed as outlined in Section 3.0 (**Tables 1-3**) regarding the determination of the proposed site trip generation. **Tables 4-6** show the updated estimated trips generated by the proposed development.

TABLE 4: RE-ESTIMATED TRIP GENERATION FOR EXISTING LAND USE

Existing Land use	Units	Trip Generation				TRIPS GENERATED PM PEAK HOUR			ITE Code
		PM				TOTAL	IB	OB	
		RATE		IB	OB				
Residential (Single-Family)	2	0.99	/ unit	63%	37%	2	1	1	210
Excavating/Materials	Dump Trucks					2	2	0	Observed
Total						4	3	1	

TABLE 5: RE-ESTIMATED TRIP GENERATION FOR PROPOSED LAND USE

Proposed Land Use	Units	Trip Generation				TRIPS GENERATED PM PEAK HOUR			ITE Code
		PM				TOTAL	IB	OB	
		RATE		IB	OB				
Residential (Single-Family)	17	0.99	/ unit	63%	37%	17	11	6	210
Secondary Suite	17	0.44	/ unit	61%	39%	8	5	3	221
Garden Suite	12	0.44	/ unit	61%	39%	5	3	2	221
Total						30	19	11	

TABLE 6: RE-ESTIMATED NET TRIP GENERATION BY THE DEVELOPMENT

Net Trip Generation By The Development	Units	Trip Generation				TRIPS GENERATED PM PEAK HOUR			ITE Code
		PM				TOTAL	IB	OB	
		RATE		IB	OB				
Residential (Single-Family) 17 SF units less 2 existing SF units= 15 units	15	0.99	/ unit	63%	37%	14	9	5	210
Secondary Suite	17	0.44	/ unit	61%	39%	9	5	4	221
Garden Suite	12	0.44	/ unit	61%	39%	5	3	2	221
Excavating/Materials	Dump Trucks					-2	-2	0	Observed
Total						26	15	11	

The 10th Edition of the ITE Trip Generation Manual does not provide an estimate for mid-day trip generation and given that the most amount of development trips are occurring in the PM peak, the analysis only looked at PM Trip generation.

The post development volumes were updated to be reflective of the new trip generation + the existing traffic volumes collected in 2016. **Figure 6** summarizes the updated post development PM peak hour volumes.

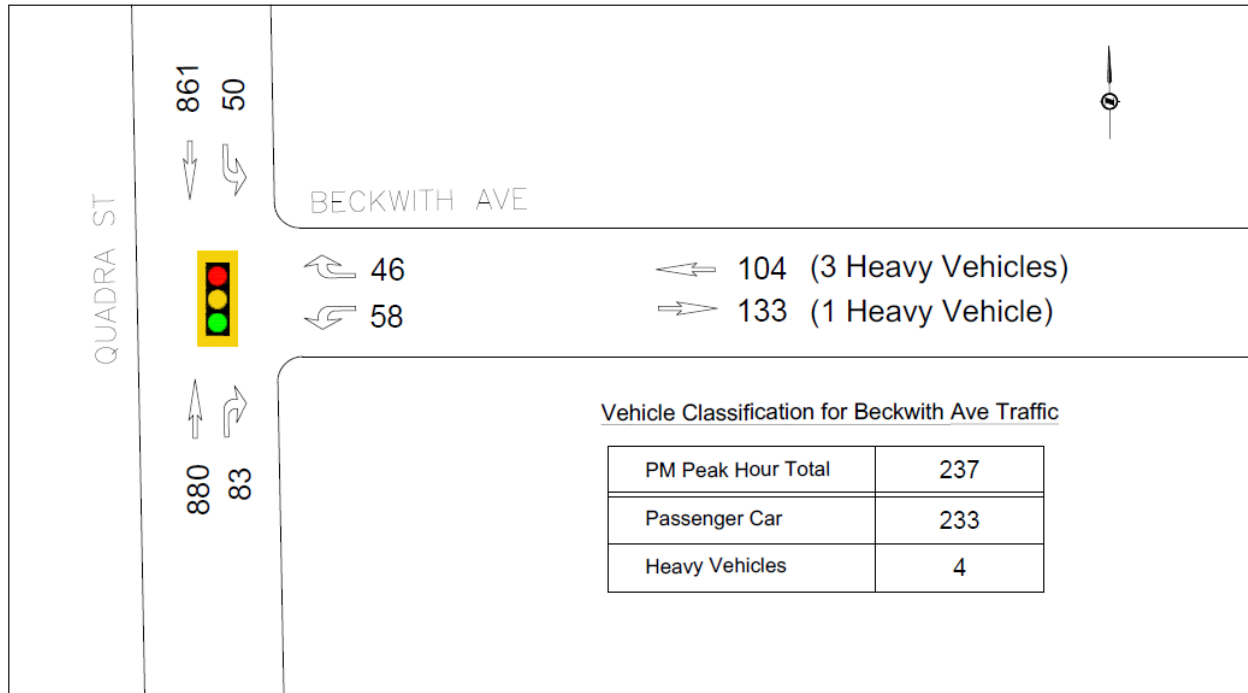


Figure 6 – Updated Post Development Volumes: PM Peak Hour (04:00 – 5:00 PM)

The analysis of the Post Development traffic was completed with the updated development trips and a comparison of results at the intersection of Quadra Street and Beckwith Avenue was completed. It should be noted that this 2020 analysis assumed full build out of all secondary suites and garden suites, however, it is unlikely that all future land owners would decide to do this.

The original 2016 analysis results are summarized in **Table 7** and the 2020 updated land use analysis results are summarized in **Table 8**.

TABLE 7:

2016 POST DEVELOPMENT						
INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
Quadra St / Beckwith Ave (Signal Controlled)	SB	Through/Left	0.00			
		Through	0.51	A	7	51
	WB	Right	0.15	A	6	5
		Left	0.24	B	15	10
	NB	Through	0.48	A	6	49
		Through/Right	0.00			
	Intersection Summary		-	A	7	-

TABLE 8:

2020 POST DEVELOPMENT						
INTERSECTION / MOVEMENT			PM PEAK HOUR			
			v/c Ratio	LOS	Delay (s)	Queue (m)
Quadra St / Beckwith Ave (Signal Controlled)	SB	Through/Left	0.00			
		Through	0.51	A	7	51
	WB	Right	0.16	A	6	5
		Left	0.23	B	15	10
	NB	Through	0.48	A	7	49
		Through/Right	0.00			
	Intersection Summary			-	A	7

Upon review, the change in land use will have a negligible difference as it pertains to traffic conditions previously analyzed in 2016 case.

4.0 BECKWITH CROSS SECTION AND PEDESTRIAN FACILITIES

Currently Beckwith Avenue is of variable road surface width along its length, from 11m wide plus sidewalk (on the north side) between Quadra St and Panorama Drive, to generally 8.5m wide without sidewalk east of that. There are some curb extensions at three intersections in the 11m wide zone which serve to narrow the roadway and provide some traffic calming to the street. There is a neighbourhood park along the south side of Beckwith Avenue at Belvedere Rd. There are no existing sidewalks and curbs (6.7m pavement) along the development frontage of Beckwith Avenue, or east of Panorama Dr.

Saanich has two residential road standards, one for 8.5m wide road surface (with no sidewalk) and one for 11m wide road surface (with no sidewalk). The existing cross sections meet or exceed these standards. Since the proposed development will not materially change the nature of Beckwith Avenue in terms of roadway character (that is, it will remain a local road with low volume at the east end and somewhat higher volume near Quadra St, with or without the development), the existing cross section is appropriate for post development conditions. Along the development frontage, the Beckwith Avenue should meet the 8.5m residential cross section standard.

5.0 CONCLUSIONS

The following conclusions are made regarding the traffic study for the proposed development at 1000 Beckwith Avenue.

The proposed development will result in an increase in the number of vehicles along Beckwith Avenue, but this will be a small number of vehicles and it will also result in a drop in the number of heavy trucks along Beckwith Avenue. For trips associated with the area of proposed rezoning, in the mid-day peak hour, there would be five (5) more vehicles overall (or one more vehicle every 12 minutes), with five (5) fewer heavy trucks related to the current land use. In the PM peak (4:00 to 5:00 PM), there would be 14 more vehicles (or one every 4 minutes), with two (2) fewer heavy trucks. The result is that Beckwith Avenue will continue to operate as a local residential road with or without the development. The heavy vehicle percentages on Beckwith Avenue will drop from 6.0% to 2.2% during the mid-day peak hour and from 2.8% to 1.8% during the PM peak hour.

The development traffic will not change the level of service at the signalized intersection between Beckwith Avenue and Quadra Street (will continue to operate with good levels of service, with LOS A and B for all movements in the mid-day and PM peak hour).

A review was completed with the change of proposed land use to now develop 17 single family lots, 12 of which could include both a garden suite and a secondary suite and the other remaining five (5) lots could include a secondary suite. Upon analysis review it has been determined that this reduction will make a negligible difference as it pertains to overall traffic impact and the recommendations made below are still valid.

The minor increase in traffic will not materially change the local residential road nature of Beckwith Avenue, and the existing roadway cross-section of Beckwith Avenue can appropriately accommodate the development, including pedestrians. The frontage of the development on Beckwith Avenue should match Saanich's 8.5m Residential Road standard.

6.0 RECOMMENDATIONS

The following mitigation measures are recommended:

- The Beckwith Avenue cross section along the development frontage should meet Saanich's 8.5m Residential Road standard

APPENDIX A: SYNCHRO BACKGROUND

SYNCHRO MODELLING SOFTWARE DESCRIPTION

The traffic analysis was completed using Synchro and SimTraffic traffic modelling software. Results were measured in delay, level of service (LOS) and 95th percentile queue length. Synchro is based on the Highway Capacity Manual (HCM) methodology. SimTraffic integrates established driver behaviours and characteristics to simulate actual conditions by randomly “seeding” or positioning vehicles travelling throughout the network. The simulation is run five times (five different random seedings of vehicle types, behaviours and arrivals) to obtain statistical significance of the results.

Levels of Service

Traffic operations are typically described in terms of levels of service, which rates the amount of delay per vehicle for each movement and the entire intersection. Levels of service range from LOS A (representing best operations) to LOS E/F (LOS E being poor operations and LOS F being unpredictable/disruptive operations). LOS E/F are generally unacceptable levels of service under normal everyday conditions.

The hierarchy of criteria for grading an intersection or movement not only includes delay times, but also takes into account traffic control type (stop signs or traffic signal). For example, if a vehicle is delayed for 19 seconds at an unsignalized intersection, it is considered to have an average operation, and would therefore be graded as an LOS C. However, at a signalized intersection, a 19 second delay would be considered a good operation and therefore it would be given an LOS B. Table A-1 indicates the range of delay for LOS for unsignalized and signalized intersections.

Table A-1: LOS Criteria, by Intersection Traffic Control

Level of Service	Unsignalized Intersection Average Vehicle Delay (sec/veh)	Signalized Intersection Average Vehicle Delay (sec/veh)
A	Less than 10	Less than 10
B	10 to 15	11 to 20
C	16 to 25	21 to 35
D	26 to 35	36 to 55
E	36 to 50	56 to 80
F	More than 51	More than 81

APPENDIX B: SYNCHRO RESULTS

Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

5/30/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	24	684	39	30	625
Future Volume (vph)	39	24	684	39	30	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.98	1.00			1.00
Frt		0.850	0.988			
Flt Protected	0.950					0.998
Satd. Flow (prot)	1641	1615	3391	0	0	3428
Flt Permitted	0.950					0.899
Satd. Flow (perm)	1641	1584	3391	0	0	3088
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		32	21			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		8		1	1	
Peak Hour Factor	0.65	0.75	0.89	0.61	0.83	0.87
Heavy Vehicles (%)	10%	0%	5%	5%	7%	5%
Adj. Flow (vph)	60	32	769	64	36	718
Shared Lane Traffic (%)						
Lane Group Flow (vph)	60	32	833	0	0	754
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

5/30/2016

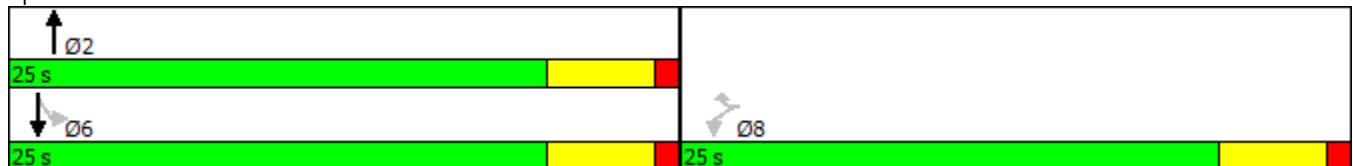


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (%)	50.0%	50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	20.0	20.0	20.0		20.0	20.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	5.0	5.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	6	6				
Act Effect Green (s)	10.4	9.4	29.0			29.0
Actuated g/C Ratio	0.26	0.23	0.71			0.71
v/c Ratio	0.14	0.08	0.34			0.34
Control Delay	11.8	5.5	5.4			5.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	11.8	5.5	5.4			5.6
LOS	B	A	A			A
Approach Delay	9.6		5.4			5.6
Approach LOS	A		A			A

Intersection Summary

Area Type:	Other
Cycle Length:	50
Actuated Cycle Length:	40.6
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.34
Intersection Signal Delay:	5.7
Intersection LOS:	A
Intersection Capacity Utilization:	54.3%
ICU Level of Service:	A
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

5/30/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	54	39	880	73	45	861
Future Volume (vph)	54	39	880	73	45	861
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.97	1.00			1.00
Frt		0.850	0.987			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1736	1538	3452	0	0	3501
Flt Permitted	0.950					0.839
Satd. Flow (perm)	1736	1492	3452	0	0	2946
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		48	23			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		18		5	5	
Peak Hour Factor	0.61	0.81	0.87	0.79	0.75	0.94
Heavy Vehicles (%)	4%	5%	3%	3%	0%	3%
Adj. Flow (vph)	89	48	1011	92	60	916
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	48	1103	0	0	976
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

5/30/2016

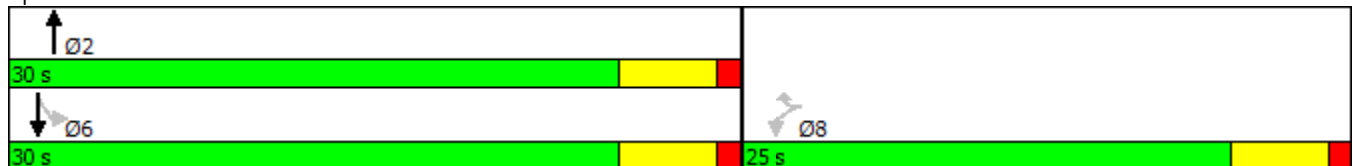


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	30.0		30.0	30.0
Total Split (%)	45.5%	45.5%	54.5%		54.5%	54.5%
Maximum Green (s)	20.0	20.0	25.0		25.0	25.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	5.0	5.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	8	8				
Act Effect Green (s)	10.5	9.5	33.1			33.1
Actuated g/C Ratio	0.24	0.21	0.74			0.74
v/c Ratio	0.22	0.13	0.43			0.45
Control Delay	14.7	6.2	5.5			6.0
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	14.7	6.2	5.5			6.0
LOS	B	A	A			A
Approach Delay	11.7		5.5			6.0
Approach LOS	B		A			A

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	44.6
Natural Cycle:	55
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.45
Intersection Signal Delay:	6.1
Intersection LOS:	A
Intersection Capacity Utilization:	71.5%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

5/30/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	41	26	684	41	31	625
Future Volume (vph)	41	26	684	41	31	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.98	1.00			1.00
Frt		0.850	0.988			
Flt Protected	0.950					0.998
Satd. Flow (prot)	1719	1615	3399	0	0	3439
Flt Permitted	0.950					0.897
Satd. Flow (perm)	1719	1584	3399	0	0	3091
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		35	22			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		8		1	1	
Peak Hour Factor	0.65	0.75	0.89	0.61	0.83	0.87
Heavy Vehicles (%)	5%	0%	5%	2%	0%	5%
Adj. Flow (vph)	63	35	769	67	37	718
Shared Lane Traffic (%)						
Lane Group Flow (vph)	63	35	836	0	0	755
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

5/30/2016

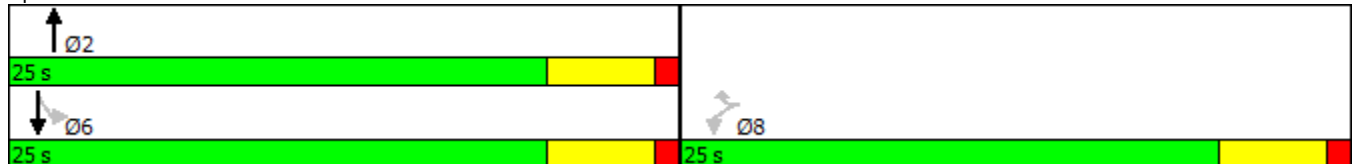


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (%)	50.0%	50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	20.0	20.0	20.0		20.0	20.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	5.0	5.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	6	6				
Act Effect Green (s)	10.4	9.4	28.8			28.8
Actuated g/C Ratio	0.26	0.23	0.71			0.71
v/c Ratio	0.14	0.09	0.34			0.34
Control Delay	11.6	5.4	5.4			5.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	11.6	5.4	5.4			5.6
LOS	B	A	A			A
Approach Delay	9.4		5.4			5.6
Approach LOS	A		A			A

Intersection Summary

Area Type:	Other
Cycle Length:	50
Actuated Cycle Length:	40.4
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.34
Intersection Signal Delay:	5.7
Intersection LOS:	A
Intersection Capacity Utilization:	55.1%
ICU Level of Service:	B
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

2016-07-12



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	42	26	684	41	31	625
Future Volume (vph)	42	26	684	41	31	625
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.98	1.00			1.00
Frt		0.850	0.988			
Flt Protected	0.950					0.998
Satd. Flow (prot)	1719	1615	3399	0	0	3439
Flt Permitted	0.950					0.897
Satd. Flow (perm)	1719	1584	3399	0	0	3091
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		35	22			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		8		1	1	
Peak Hour Factor	0.65	0.75	0.89	0.61	0.83	0.87
Heavy Vehicles (%)	5%	0%	5%	2%	0%	5%
Adj. Flow (vph)	65	35	769	67	37	718
Shared Lane Traffic (%)						
Lane Group Flow (vph)	65	35	836	0	0	755
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

2016-07-12

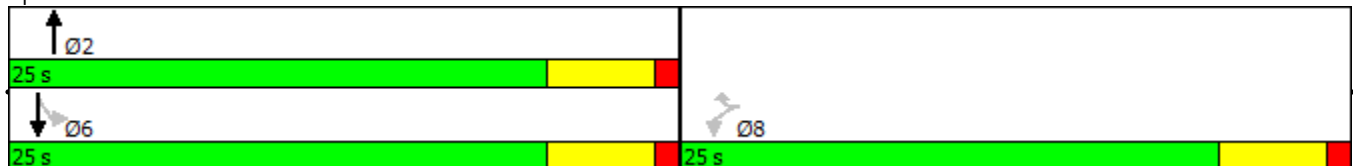


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (%)	50.0%	50.0%	50.0%		50.0%	50.0%
Maximum Green (s)	20.0	20.0	20.0		20.0	20.0
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Recall Mode	None	None	Max		Max	Max
Walk Time (s)	5.0	5.0				
Flash Dont Walk (s)	11.0	11.0				
Pedestrian Calls (#/hr)	6	6				
Act Effect Green (s)	10.4	9.4	28.8			28.8
Actuated g/C Ratio	0.26	0.23	0.71			0.71
v/c Ratio	0.15	0.09	0.34			0.34
Control Delay	11.7	5.4	5.4			5.6
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	11.7	5.4	5.4			5.6
LOS	B	A	A			A
Approach Delay	9.5		5.4			5.6
Approach LOS	A		A			A
Queue Length 50th (m)	3.5	0.0	13.7			12.8
Queue Length 95th (m)	6.5	3.1	36.2			33.2
Internal Link Dist (m)	195.1		152.4			131.5
Turn Bay Length (m)		40.0				
Base Capacity (vph)	897	805	2427			2202
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.07	0.04	0.34			0.34

Intersection Summary

Area Type: Other
 Cycle Length: 50
 Actuated Cycle Length: 40.4
 Natural Cycle: 50
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.34
 Intersection Signal Delay: 5.8
 Intersection Capacity Utilization 55.1%
 Analysis Period (min) 15
 Intersection LOS: A
 ICU Level of Service B

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

5/31/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	59	42	880	79	48	861
Future Volume (vph)	59	42	880	79	48	861
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.97	1.00			1.00
Frt		0.850	0.986			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1770	1538	3454	0	0	3501
Flt Permitted	0.950					0.828
Satd. Flow (perm)	1770	1492	3454	0	0	2907
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		52	26			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		18		5	5	
Peak Hour Factor	0.61	0.81	0.87	0.79	0.75	0.94
Heavy Vehicles (%)	2%	5%	3%	1%	0%	3%
Adj. Flow (vph)	97	52	1011	100	64	916
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	52	1111	0	0	980
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

5/31/2016



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	30.0		30.0	30.0
Total Split (%)	45.5%	45.5%	54.5%		54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max		Max	Max
Act Effect Green (s)	10.6	9.6	30.3			30.3
Actuated g/C Ratio	0.23	0.21	0.67			0.67
v/c Ratio	0.24	0.15	0.48			0.51
Control Delay	15.1	6.0	6.4			7.1
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	15.1	6.0	6.4			7.1
LOS	B	A	A			A
Approach Delay	11.9		6.4			7.1
Approach LOS	B		A			A
Queue Length 50th (m)	6.4	0.0	20.3			19.1
Queue Length 95th (m)	9.6	4.8	49.1			50.3
Internal Link Dist (m)	195.1		152.4			131.5
Turn Bay Length (m)		40.0				
Base Capacity (vph)	820	687	2310			1936
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.12	0.08	0.48			0.51

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	45.5
Natural Cycle:	55
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.51
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization:	71.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

2016-07-12



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	59	42	880	80	49	861
Future Volume (vph)	59	42	880	80	49	861
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.97	1.00			1.00
Frt		0.850	0.986			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1770	1538	3454	0	0	3501
Flt Permitted	0.950					0.826
Satd. Flow (perm)	1770	1492	3454	0	0	2900
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		52	26			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		18		5	5	
Peak Hour Factor	0.61	0.81	0.87	0.79	0.75	0.94
Heavy Vehicles (%)	2%	5%	3%	1%	0%	3%
Adj. Flow (vph)	97	52	1011	101	65	916
Shared Lane Traffic (%)						
Lane Group Flow (vph)	97	52	1112	0	0	981
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

2016-07-12



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	30.0		30.0	30.0
Total Split (%)	45.5%	45.5%	54.5%		54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max		Max	Max
Act Effect Green (s)	10.6	9.6	30.3			30.3
Actuated g/C Ratio	0.23	0.21	0.67			0.67
v/c Ratio	0.24	0.15	0.48			0.51
Control Delay	15.1	6.0	6.4			7.1
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	15.1	6.0	6.4			7.1
LOS	B	A	A			A
Approach Delay	11.9		6.4			7.1
Approach LOS	B		A			A
Queue Length 50th (m)	6.4	0.0	20.3			19.1
Queue Length 95th (m)	9.6	4.8	49.2			50.5
Internal Link Dist (m)	195.1		152.4			131.5
Turn Bay Length (m)		40.0				
Base Capacity (vph)	820	687	2310			1932
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.12	0.08	0.48			0.51

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	45.5
Natural Cycle:	55
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.51
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization:	71.8%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave



Lanes, Volumes, Timings
12: Quadra St & Beckwith Ave

08-20-2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	58	46	880	83	50	861
Future Volume (vph)	58	46	880	83	50	861
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	40.0		0.0	0.0	
Storage Lanes	1	1		0	0	
Taper Length (m)	7.5				7.5	
Lane Util. Factor	1.00	1.00	0.95	0.95	0.95	0.95
Ped Bike Factor		0.97	1.00			1.00
Frt		0.850	0.986			
Flt Protected	0.950					0.997
Satd. Flow (prot)	1770	1538	3454	0	0	3501
Flt Permitted	0.950					0.822
Satd. Flow (perm)	1770	1492	3454	0	0	2887
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)		57	27			
Link Speed (k/h)	50		50			50
Link Distance (m)	219.1		176.4			155.5
Travel Time (s)	15.8		12.7			11.2
Confl. Peds. (#/hr)		18		5	5	
Peak Hour Factor	0.61	0.81	0.87	0.79	0.75	0.94
Heavy Vehicles (%)	2%	5%	3%	1%	0%	3%
Adj. Flow (vph)	95	57	1011	105	67	916
Shared Lane Traffic (%)						
Lane Group Flow (vph)	95	57	1116	0	0	983
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Right	Left	Left
Median Width(m)	3.6		0.0			0.0
Link Offset(m)	0.0		0.0			0.0
Crosswalk Width(m)	4.8		4.8			4.8
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (k/h)	25	15		15	25	
Number of Detectors	1	1	1		1	1
Detector Template	Left	Right	Thru		Left	Thru
Leading Detector (m)	15.0	2.0	15.0		2.0	15.0
Trailing Detector (m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Position(m)	0.0	0.0	0.0		0.0	0.0
Detector 1 Size(m)	15.0	2.0	15.0		2.0	15.0
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0
Turn Type	Perm	Perm	NA		Perm	NA
Protected Phases			2			6
Permitted Phases	8	8			6	
Detector Phase	8	8	2		6	6
Switch Phase						

Lanes, Volumes, Timings
 12: Quadra St & Beckwith Ave

08-20-2020



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Minimum Initial (s)	8.0	8.0	8.0		8.0	8.0
Minimum Split (s)	25.0	25.0	25.0		25.0	25.0
Total Split (s)	25.0	25.0	30.0		30.0	30.0
Total Split (%)	45.5%	45.5%	54.5%		54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0
All-Red Time (s)	1.0	1.0	1.0		1.0	1.0
Lost Time Adjust (s)	-1.0	0.0	-1.0			-1.0
Total Lost Time (s)	4.0	5.0	4.0			4.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None	None	Max		Max	Max
Act Effect Green (s)	10.6	9.6	30.0			30.0
Actuated g/C Ratio	0.23	0.21	0.66			0.66
v/c Ratio	0.23	0.16	0.48			0.51
Control Delay	14.9	5.9	6.5			7.2
Queue Delay	0.0	0.0	0.0			0.0
Total Delay	14.9	5.9	6.5			7.2
LOS	B	A	A			A
Approach Delay	11.6		6.5			7.2
Approach LOS	B		A			A
Queue Length 50th (m)	6.3	0.0	20.5			19.2
Queue Length 95th (m)	9.5	5.0	49.4			50.7
Internal Link Dist (m)	195.1		152.4			131.5
Turn Bay Length (m)		40.0				
Base Capacity (vph)	824	693	2303			1917
Starvation Cap Reductn	0	0	0			0
Spillback Cap Reductn	0	0	0			0
Storage Cap Reductn	0	0	0			0
Reduced v/c Ratio	0.12	0.08	0.48			0.51

Intersection Summary

Area Type:	Other
Cycle Length:	55
Actuated Cycle Length:	45.2
Natural Cycle:	55
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.51
Intersection Signal Delay:	7.1
Intersection LOS:	A
Intersection Capacity Utilization:	71.9%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 12: Quadra St & Beckwith Ave

