

MEMORANDUM

DATE: JULY 6, 2012

TO: MELANIE KNIGHT

FROM: BRAD BYVELDS/ JENNIFER LUONG

RE: 1050 SOMERSET STREET
PRELIMINARY TRAFFIC ANALYSIS
OUR FILE NO. 111152

CC: NEIL MALHOTRA

The purpose of this memo is to summarize the findings of preliminary traffic analysis in support of the Zoning By-law Amendment application for the above development. A Transportation Brief will be prepared in accordance with City of Ottawa guidelines in support of the Site Plan application.

The development presently consists of 23 storey tower and 6 storey podium. A total of 195 residential units, 5,020 ft² of commercial retail space, 26,100 ft² of commercial office space and 244 underground vehicle parking spaces are to be provided. Vehicle access is proposed on the laneway west of the site. The proposal includes widening the laneway to a two-way two-lane cross-section between Somerset and the proposed access.

The study area of the analysis was discussed with City staff and includes the following intersections:

- Somerset/Breezehill
- Somerset/Laneway
- Breezehill/Laurel
- Laurel/Laneway

The time periods for analysis include the weekday a.m. and p.m. peak hours of adjacent street traffic. Analysis was completed for the existing and build-out conditions.

1.0 Existing Traffic

Weekday traffic counts were completed to verify the existing pedestrian, bicycle and motor vehicle volumes at study area intersections. The Devonshire Public School and daycare, located immediately south of 1050 Somerset, were consulted regarding the date, times and locations of the traffic counts. The pedestrian data was classified into two groups including children and adults.

This distinction was made so that the most vulnerable pedestrians walking to and from the Devonshire Public School could be accounted for.

The traffic counts were completed at the following times and locations:

- Somerset & Breezehill, motor vehicles – Thursday, March 29, 2012
- Somerset & Breezehill, pedestrians and bicycles – Wednesday, May 30, 2012
- Somerset & Public Laneway, motor vehicles – Thursday, March 29, 2012
- Somerset & Public Laneway, pedestrians and bicycles – Thursday, May 31, 2012
- Laurel & Breezehil, all modes – Thursday, May 17, 2012
- Laurel & Public Laneway, all modes – Thursday, May 17, 2012

Copies of the above counts are included in Appendix A.

The volumes observed during the school and daycare's peak hours of operation are summarized in Figures 1 to 3 which are included in Appendix A. The 7:30 to 8:30 a.m. peak reflects school and daycare arrivals, the 3:00 to 4:00 p.m. peak reflects school departures and the 4:30 to 5:30 p.m. peak reflects daycare departures.

The peak hours of the adjacent street traffic generally occur at 8:00 to 9:00 a.m. and 4:30 to 5:30 p.m. Peak hour site traffic generated by the proposed development is expected to coincide with the peak hours of the adjacent street traffic.

2.0 Site Traffic

Key assumptions are as follows:

- Trip generation rates for the previous and proposed land uses were estimated using the ITE Trip Generation Manual (8th Edition),
- Trips generated by the former supermarket were reduced by 50% of the ITE rate to allow for the unique nature of this supermarket,
- Pass-by trips for the former supermarket were estimated at 35% based on the ITE Trip Generation Handbook.
- A vehicle occupancy factor of 1.23 (taken from the TRANS O-D Survey Report) and non auto usage factor of 1.1 was applied to convert ITE vehicle trip rates to person trip rates,
- An auto modal share of 40% was used for trips generated by the former supermarket and proposed specialty retail. An auto modal share of 55% was used for the proposed residential and commercial office (auto modal shares taken from the TRANS O-D Survey Report),
- Distribution of trips generated by the site were based on existing traffic patterns

3.0 Intersection Analysis

Intersection capacity analysis has been completed using Synchro 8 traffic software. This software uses methodology from the *Highway Capacity Manual 2000* (HCM) to evaluate signalized and unsignalized intersections in terms of volume to capacity ratios, delay and queue length.

The results of the analysis show that all movements at intersections within the study area perform at an acceptable level of service under existing and future conditions during the weekday AM and PM peak hours.

The peak hour site traffic volumes meet the MTO criteria for a dedicated westbound left-turn lane on Somerset Street at the laneway. A copy of the left-turn storage lane graph is included in Appendix B. Based on the peak hour volumes the MTO criteria suggest a minimum storage length of 15 metres.

A review of the existing traffic volumes at the Somerset/Breezehill intersection shows that a westbound left turn lane is currently warranted without the addition of site traffic. A left turn lane was not implemented as part of the recent Somerset Street reconstruction project.

Within the study area Somerset Street has a right of way (ROW) of approximately 20 metres and consists of a four lane undivided arterial roadway with a width of approximately 14 metres and concrete sidewalks on both sides. Since this section of Somerset Street is not under ROW protection according to Annex 1 of the City of Ottawa Official Plan there is insufficient space to create a westbound left-turn lane at the laneway and Breezehill Avenue.

Collision records will be obtained and reviewed as part of the Transportation Brief.

While the above results do not indicate a need for traffic signal control at Somerset Street and Breezehill Avenue, the MTO criteria for traffic signal control was reviewed to determine the extent to which the warrants are met. The calculations were performed for both the existing and build-out conditions. Average Hourly Volumes (AHV) were estimated for the future condition by dividing the sum of the projected AM and PM peak hour volumes by four. The results show that warrants are far from being met under existing and future conditions. A copy of the calculations is included in Appendix B.

4.0 Proposed Access

Sight distance analysis has been completed for the intersection of Somerset Street and the laneway using standards outlined in the TAC Geometric Design Guide. The guidelines outline minimum requirements for stopping sight distance (SSD) and turning sight distance (TSD).

Field measurements have been conducted to confirm the available SSD for westbound vehicles coming over the O-Train overpass and TSD for vehicles exiting left out of the laneway.

The minimum SSD required along Somerset is 105 metres. A SSD of 135 metres is currently provided for westbound vehicles approaching the Somerset/laneway intersection, which exceeds the minimum requirement. The minimum sight distance required to turn left onto Somerset Street from the laneway is approximately 180 metres. A TSD of 150 metres is currently provided. As noted previously, collision data will be reviewed as part of the Transportation Brief to determine if there are any historical safety concerns at the laneway.

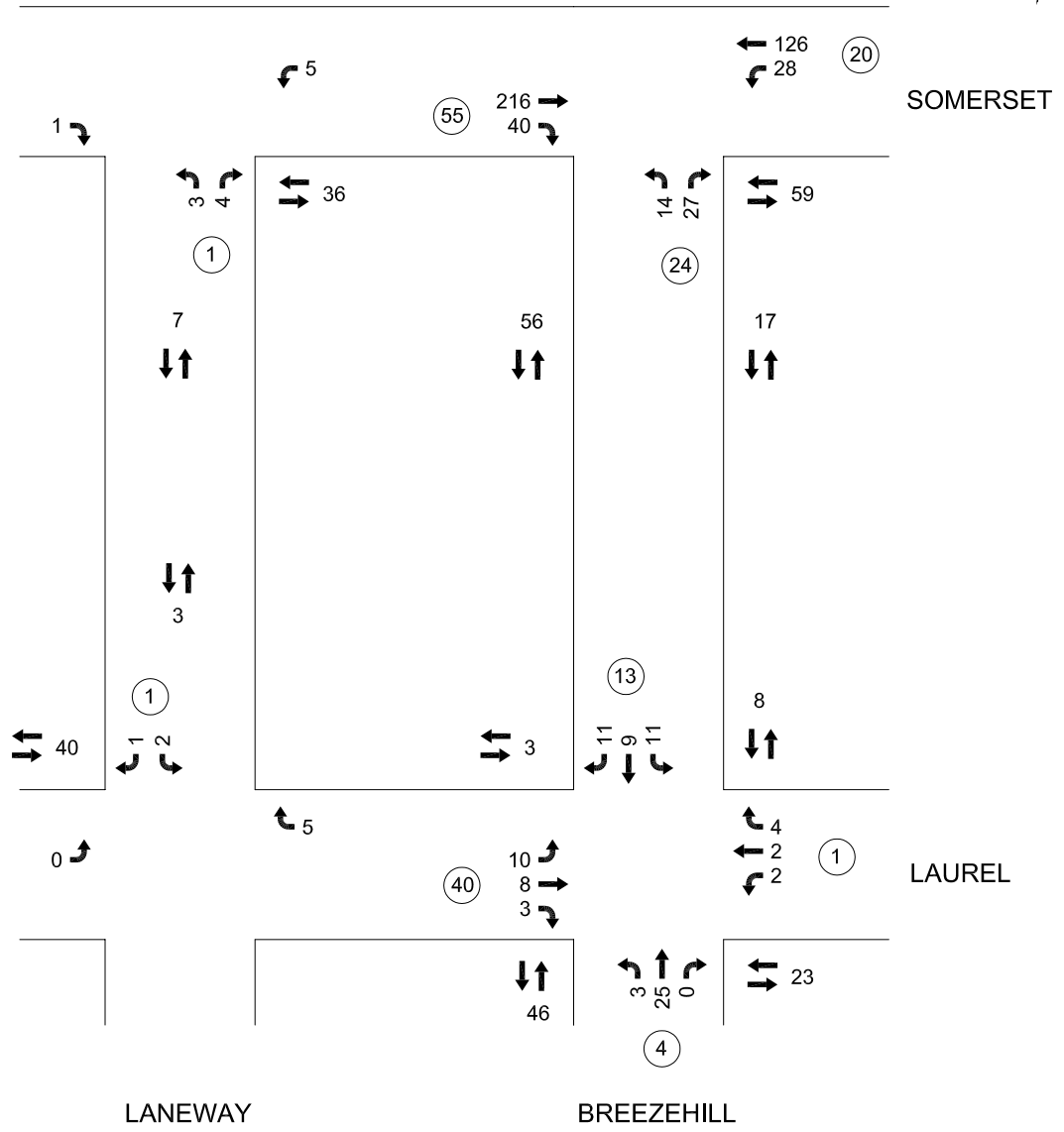
5.0 Neighbourhood Infiltration

Concerns have been raised by members of the public regarding the potential for site traffic to travel south on the laneway to Laurel or Gladstone rather than access the site via Somerset. The concerns were specifically with respect to children who currently use the laneway to access the Devonshire Public School.

Based on the results of the capacity analysis, we recommend signage prohibiting the left turn movement out of the proposed parking garage and monitoring of the laneway following occupancy to determine if cut-through traffic is a problem. Possible mitigation measures to resolve the issue could include blocking the laneway south of the site.

APPENDIX A

Traffic Counts

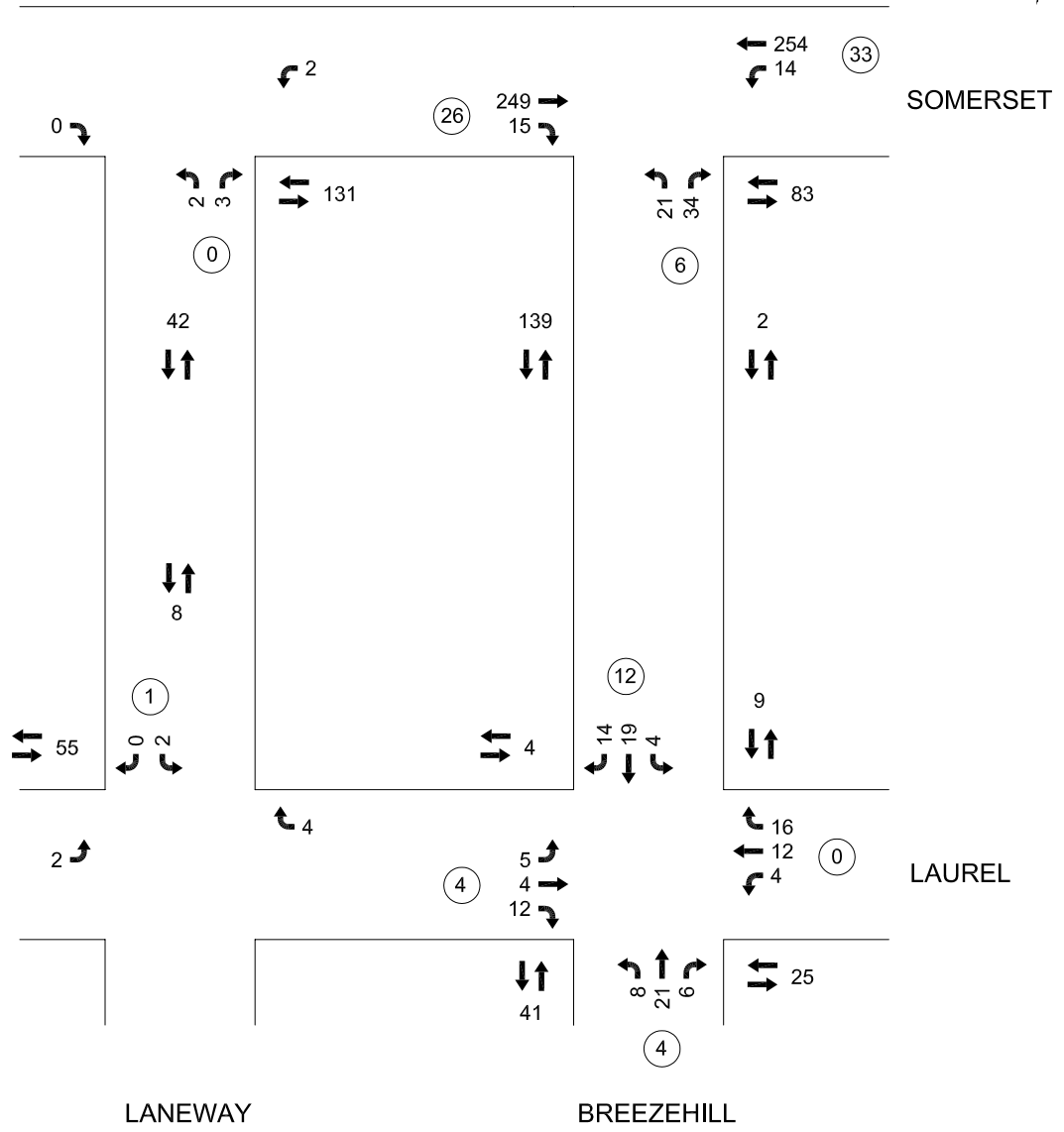


LEGEND	
(xx)	Bicycles
↕	Pedestrians
xx VPH	Vehicles

M:\2011\11152\CAD\Design\Figures\Traffic\11152-FIG1-3.dwg, FIG1, Jun 19, 2012 - 8:24am, jluong

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1040/1050 SOMERSET
 EXISTING TRAFFIC
 7:30 - 8:30 AM
 JUN 2012 111152 FIGURE 1

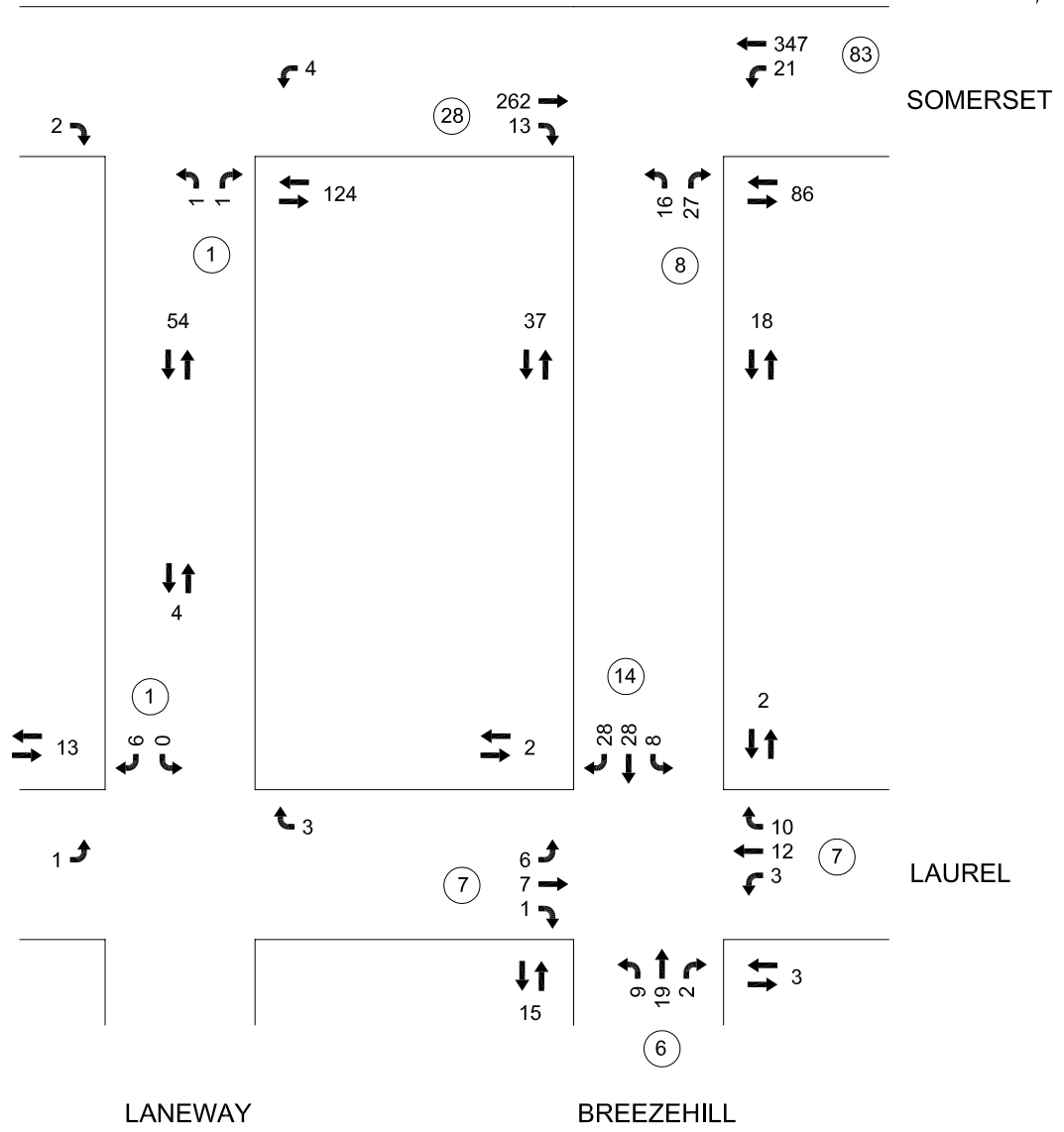


LEGEND	
(xx)	Bicycles
↕	Pedestrians
xx VPH	Vehicles

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1040/1050 SOMERSET
 EXISTING TRAFFIC
 3:00 - 4:00 PM
 JUN 2012 11152 FIGURE 2



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1040/1050 SOMERSET
 EXISTING TRAFFIC
 4:30 - 5:30 PM
 JUN 2012 11152 FIGURE 3

Weather: 3C, Overcast
Serial Number: TDC-12-1614
Collected By: H.Donald, H.Lu
Notes: Thursday

File Name : 20120329 - Somerset&Breezehill
Site Code : 11115214
Start Date : 3/29/2012
Page No : 1

Groups Printed- Cars - LGV - HGV

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
07:00	0	3	3	0	8	8	24	1	25	36
07:15	2	1	3	1	17	18	29	6	35	56
07:30	4	5	9	7	31	38	29	4	33	80
07:45	3	2	5	4	28	32	52	3	55	92
Total	9	11	20	12	84	96	134	14	148	264
08:00	2	6	8	8	39	47	64	14	78	133
08:15	5	14	19	9	28	37	71	19	90	146
08:30	8	9	17	6	43	49	70	14	84	150
08:45	2	7	9	4	31	35	80	7	87	131
Total	17	36	53	27	141	168	285	54	339	560
09:00	3	4	7	4	38	42	41	3	44	93
09:15	6	2	8	3	37	40	55	7	62	110
09:30	5	2	7	3	45	48	63	2	65	120
09:45	2	2	4	1	53	54	43	4	47	105
Total	16	10	26	11	173	184	202	16	218	428
11:00	0	0	0	1	9	10	0	0	0	10
11:15	0	3	3	2	9	11	0	0	0	14
11:30	2	9	11	8	53	61	65	3	68	140
11:45	2	5	7	3	37	40	58	3	61	108
Total	4	17	21	14	108	122	123	6	129	272
12:00	6	7	13	8	55	63	53	4	57	133
12:15	5	4	9	3	55	58	44	8	52	119
12:30	4	4	8	4	46	50	58	4	62	120
12:45	3	4	7	6	51	57	61	4	65	129
Total	18	19	37	21	207	228	216	20	236	501
13:00	3	3	6	5	39	44	55	4	59	109
13:15	8	5	13	5	43	48	57	6	63	124
Total	11	8	19	10	82	92	112	10	122	233
14:30	0	2	2	0	7	7	0	0	0	9
14:45	0	3	3	0	10	10	0	0	0	13
Total	0	5	5	0	17	17	0	0	0	22
15:00	10	20	30	3	58	61	58	11	69	160
15:15	8	5	13	5	61	66	65	1	66	145
15:30	2	4	6	3	63	66	66	3	69	141
15:45	1	5	6	3	72	75	60	0	60	141
Total	21	34	55	14	254	268	249	15	264	587
16:00	2	7	9	2	77	79	61	1	62	150
16:15	1	2	3	2	82	84	45	5	50	137
16:30	1	5	6	5	87	92	66	0	66	164
16:45	2	10	12	9	91	100	67	5	72	184
Total	6	24	30	18	337	355	239	11	250	635

Weather: 3C, Overcast
Serial Number: TDC-12-1614
Collected By: H.Donald, H.Lu
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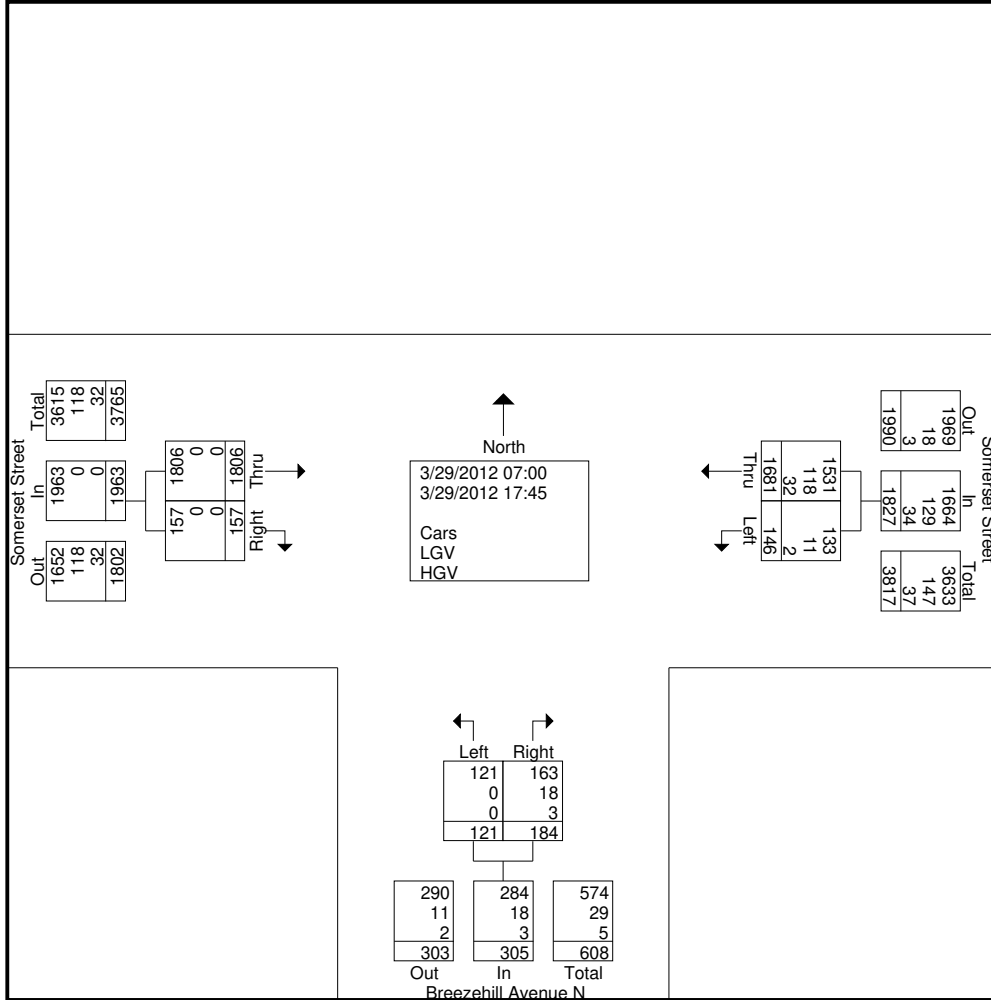
File Name : 20120329 - Somerset&Breezehill
Site Code : 11115214
Start Date : 3/29/2012
Page No : 2

Groups Printed- Cars - LGV - HGV

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
17:00	9	5	14	6	99	105	49	4	53	172
17:15	4	7	11	1	70	71	80	4	84	166
17:30	4	5	9	8	52	60	59	1	60	129
17:45	2	3	5	4	57	61	58	2	60	126
Total	19	20	39	19	278	297	246	11	257	593
Grand Total	121	184	305	146	1681	1827	1806	157	1963	4095
Apprch %	39.7	60.3		8	92		92	8		
Total %	3	4.5	7.4	3.6	41.1	44.6	44.1	3.8	47.9	
Cars	121	163	284	133	1531	1664	1806	157	1963	3911
% Cars	100	88.6	93.1	91.1	91.1	91.1	100	100	100	95.5
LGV	0	18	18	11	118	129	0	0	0	147
% LGV	0	9.8	5.9	7.5	7	7.1	0	0	0	3.6
HGV	0	3	3	2	32	34	0	0	0	37
% HGV	0	1.6	1	1.4	1.9	1.9	0	0	0	0.9

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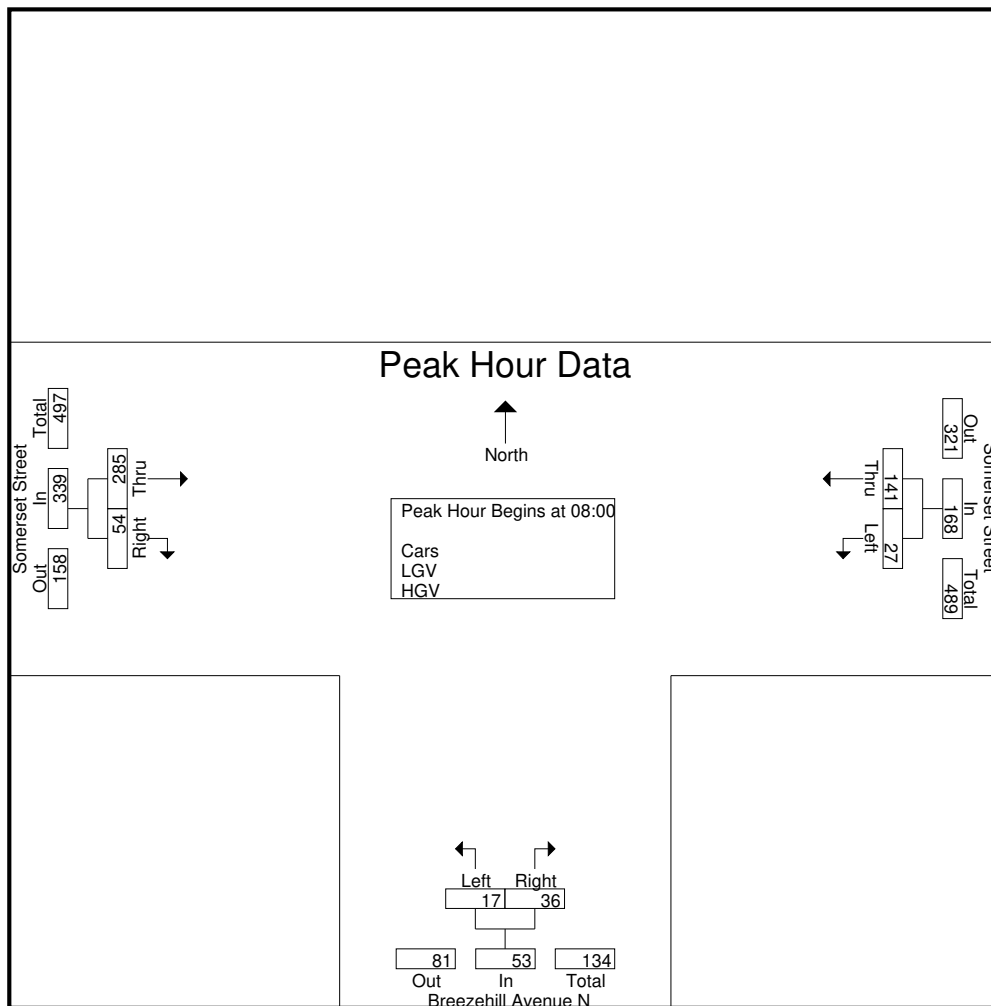
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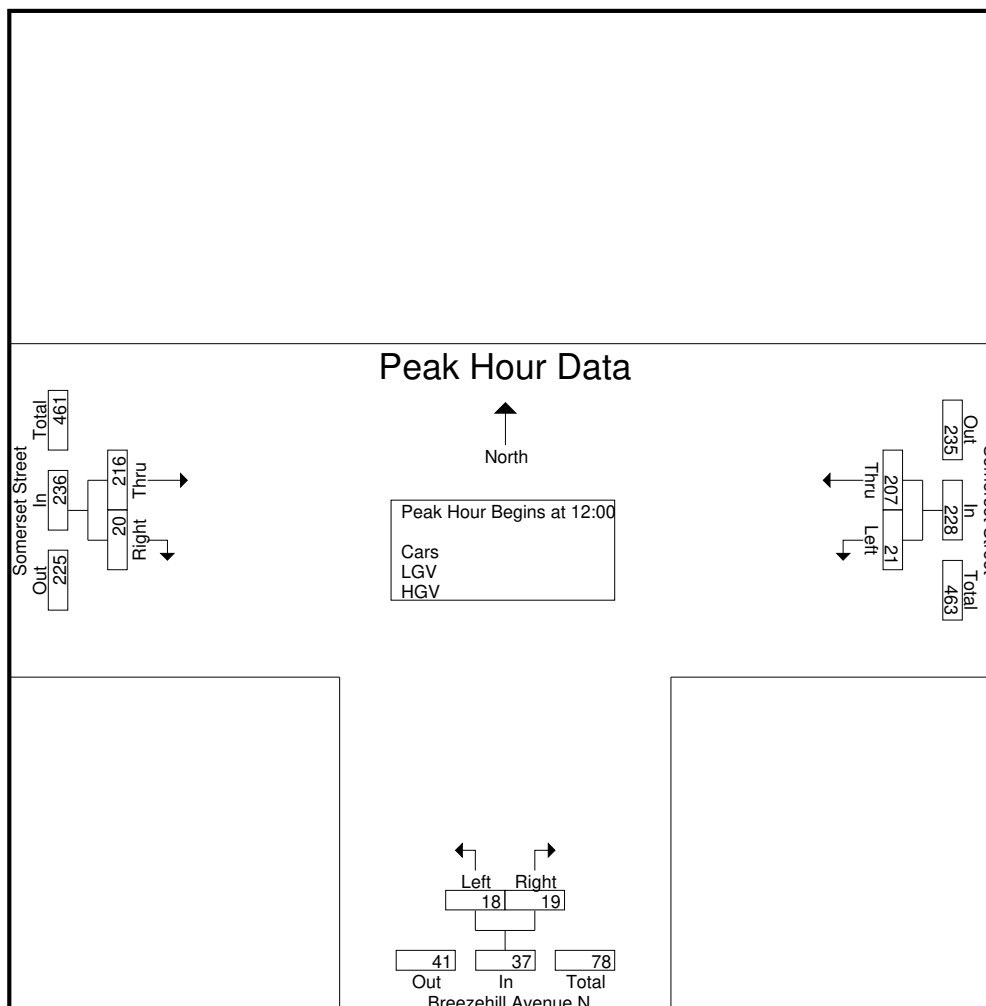
Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 09:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00										
08:00	2	6	8	8	39	47	64	14	78	133
08:15	5	14	19	9	28	37	71	19	90	146
08:30	8	9	17	6	43	49	70	14	84	150
08:45	2	7	9	4	31	35	80	7	87	131
Total Volume	17	36	53	27	141	168	285	54	339	560
% App. Total	32.1	67.9		16.1	83.9		84.1	15.9		
PHF	.531	.643	.697	.750	.820	.857	.891	.711	.942	.933



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Start Date : 3/29/2012
Page No : 5

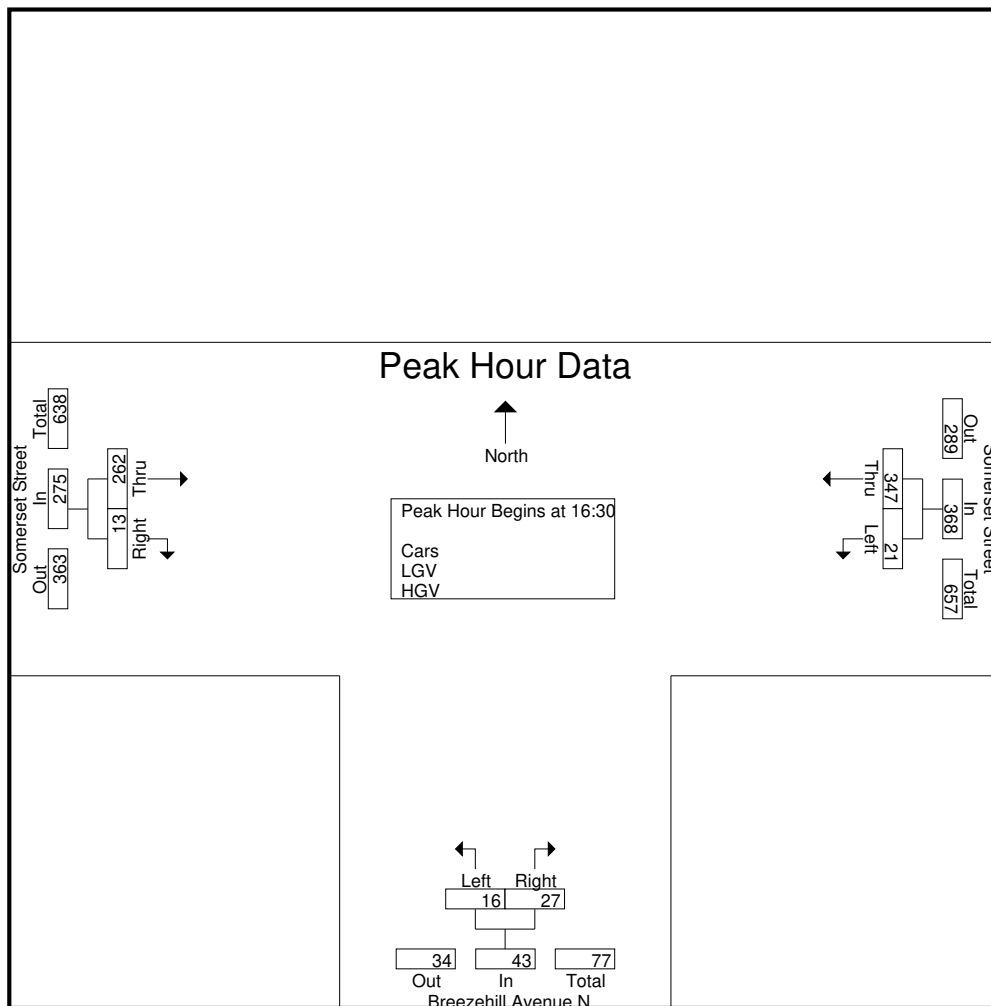
Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 10:00 to 13:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 12:00										
12:00	6	7	13	8	55	63	53	4	57	133
12:15	5	4	9	3	55	58	44	8	52	119
12:30	4	4	8	4	46	50	58	4	62	120
12:45	3	4	7	6	51	57	61	4	65	129
Total Volume	18	19	37	21	207	228	216	20	236	501
% App. Total	48.6	51.4		9.2	90.8		91.5	8.5		
PHF	.750	.679	.712	.656	.941	.905	.885	.625	.908	.942



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Site Code : 11115214
Start Date : 3/29/2012
Page No : 6

Start Time	Breezehill Avenue N Northbound			Somerset Street Westbound			Somerset Street Eastbound			Int. Total
	Left	Right	App. Total	Left	Thru	App. Total	Thru	Right	App. Total	
Peak Hour Analysis From 14:00 to 17:45 - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 16:30										
16:30	1	5	6	5	87	92	66	0	66	164
16:45	2	10	12	9	91	100	67	5	72	184
17:00	9	5	14	6	99	105	49	4	53	172
17:15	4	7	11	1	70	71	80	4	84	166
Total Volume	16	27	43	21	347	368	262	13	275	686
% App. Total	37.2	62.8		5.7	94.3		95.3	4.7		
PHF	.444	.675	.768	.583	.876	.876	.819	.650	.818	.932



BICYCLE TURNING MOVEMENTS (15 Min. Volumes)

Somerset Street & Breezehill Avenue

Survey Date: Wednesday, May 30, 2012

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

Job No.: 111152

Weather: 20 degrees, Sun

Recorded: DS

Time Period	Somerset Street						Breezehill Avenue				GRAND TOTAL				
	<u>WESTBOUND</u>		<u>EASTBOUND</u>	SUB TOT	STR TOT	SUB TOT	<u>NORTHBOUND</u>		SUB TOT	STR TOT					
	SUB TOT	STR TOT					SUB TOT	STR TOT							
7:30-7:45		3		3		13		13	16		4		4	4	20
7:45-8:00		6		6		15		15	21		5		5	5	26
8:00-8:15		6		6		13		13	19		4		4	4	23
8:15-8:30		5		5		14		14	19		11		11	11	30
8:30-8:45		6		6		11		11	17		4		4	4	21
8:45-9:00		7		7		20		20	27		2		2	2	29
3:00-3:15		7		7		5		5	12		3		3	3	15
3:15-3:30		8		8		10		10	18		0		0	0	18
3:30-3:45		6		6		4		4	10		2		2	2	12
3:45-4:00		12		12		7		7	19		1		1	1	20
4:00-4:15		15		15		7		7	22		4		4	4	26
4:15-4:30		12		12		7		7	19		1		1	1	20
4:30-4:45		18		18		5		5	23		1		1	1	24
4:45-5:00		19		19		12		12	31		5		5	5	36
5:00-5:15		25		25		6		6	31		0		0	0	31
5:15-5:30		21		21		5		5	26		2		2	2	28
															379

PEDESTRIAN (ALL) TURNING MOVEMENTS (15 Min. Volumes)

Somerset Street & Breezehill Avenue

Survey Date: Wednesday, May 30, 2012

Total Observed U-Turns

Job No.: 111152

Weather: 20 degrees, Sun

Westbound: 0

Southbound: 0

Eastbound: 0

Northbound: 0

Recorded: DS

Time Period	Somerset Street								Breezehill Avenue				GRAND TOTAL
	<u>NORTH SOUTH</u> <u>WEST SIDE</u>		SUB TOT	<u>NORTH-SOUTH</u> <u>EAST SIDE</u>		SUB TOT	STR TOT	<u>CROSSING BREEZEHILL</u> <u>NORTHBOUND APPROACH</u>		SUB TOT	STR TOT		
7:30-7:45		3	3		7	7	10		7		7	7	17
7:45-8:00		1	1		1	1	2		10		10	10	12
8:00-8:15		10	10		2	2	12		10		10	10	22
8:15-8:30		42	42		7	7	49		32		32	32	81
8:30-8:45		19	19		2	2	21		21		21	21	42
8:45-9:00		3	3		2	2	5		11		11	11	16
3:00-3:15		51	51		0	0	51		31		31	31	82
3:15-3:30		59	59		0	0	59		24		24	24	83
3:30-3:45		18	18		1	1	19		16		16	16	35
3:45-4:00		11	11		1	1	12		12		12	12	24
4:00-4:15		4	4		0	0	4		7		7	7	11
4:15-4:30		5	5		1	1	6		20		20	20	26
4:30-4:45		7	7		5	5	12		28		28	28	40
4:45-5:00		11	11		3	3	14		13		13	13	27
5:00-5:15		3	3		5	5	8		19		19	19	27
5:15-5:30		16	16		5	5	21		26		26	26	47
													592

PEDESTRIAN (CHILD) TURNING MOVEMENTS (15 Min. Volumes)

Somerset Street & Breezehill Avenue

Survey Date: Wednesday, May 30, 2012

Total Observed U-Turns

Job No.: 111152

Weather: 20 degrees, Sun

Westbound: 0

Southbound: 0

Eastbound: 0

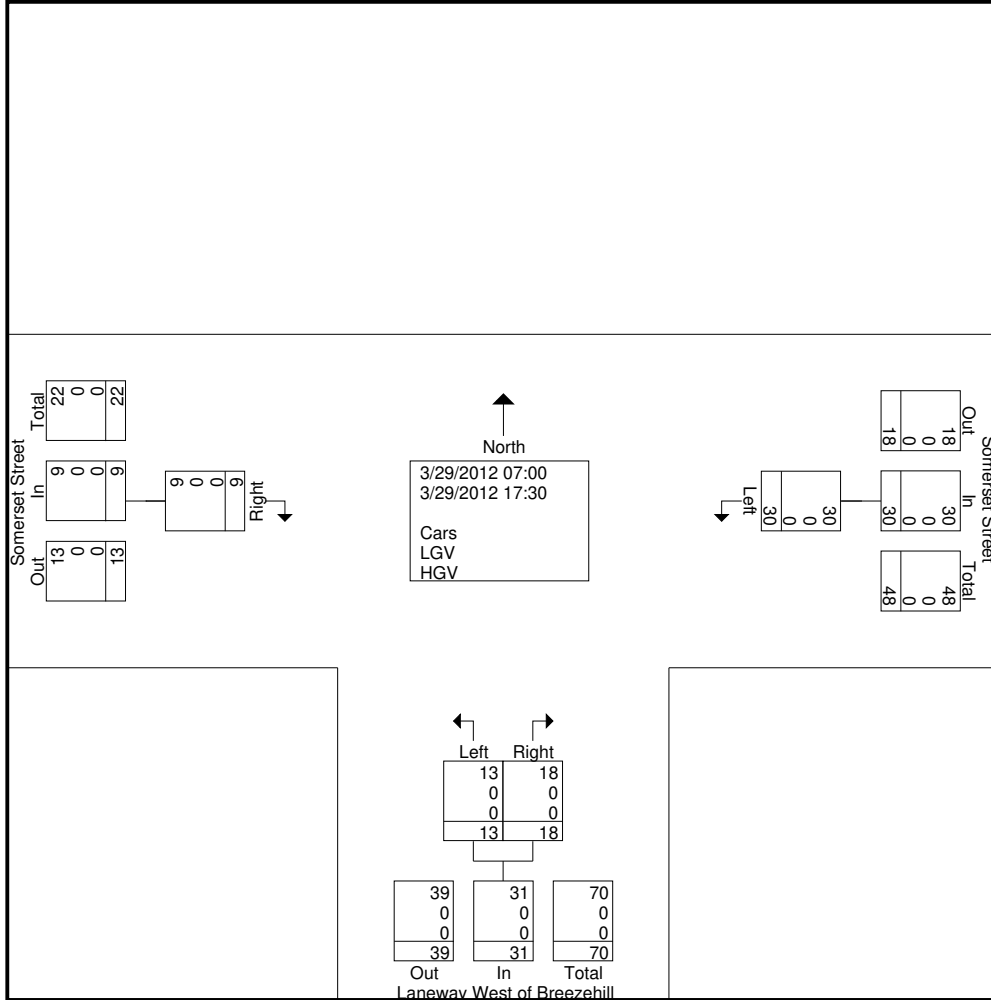
Northbound: 0

Recorded: DS

Time Period	Somerset Street								Breezehill Avenue				GRAND TOTAL		
	<u>NORTH SOUTH WEST SIDE</u>			SUB TOT	<u>NORTH-SOUTH EAST SIDE</u>			SUB TOT	STR TOT	<u>CROSSING BREEZEHILL NORTHBOUND APPROACH</u>		SUB TOT		STR TOT	
7:30-7:45		0		0		0		0	0		0		0	0	0
7:45-8:00		0		0		0		0	0		0		0	0	0
8:00-8:15		2		2		0		0	2		1		1	1	3
8:15-8:30		22		22		1		1	23		13		13	13	36
8:30-8:45		6		6		1		1	7		6		6	6	13
8:45-9:00		0		0		0		0	0		0		0	0	0
3:00-3:15		34		34		0		0	34		11		11	11	45
3:15-3:30		51		51		0		0	51		10		10	10	61
3:30-3:45		7		7		0		0	7		5		5	5	12
3:45-4:00		4		4		0		0	4		1		1	1	5
4:00-4:15		1		1		0		0	1		0		0	0	1
4:15-4:30		1		1		0		0	1		0		0	0	1
4:30-4:45		2		2		0		0	2		1		1	1	3
4:45-5:00		1		1		0		0	1		0		0	0	1
5:00-5:15		1		1		1		1	2		0		0	0	2
5:15-5:30		7		7		3		3	10		3		3	3	13
															196

Weather: 3C, Overcast
Serial Number: TDC-12-1612
Collected By:
Notes: Thursday

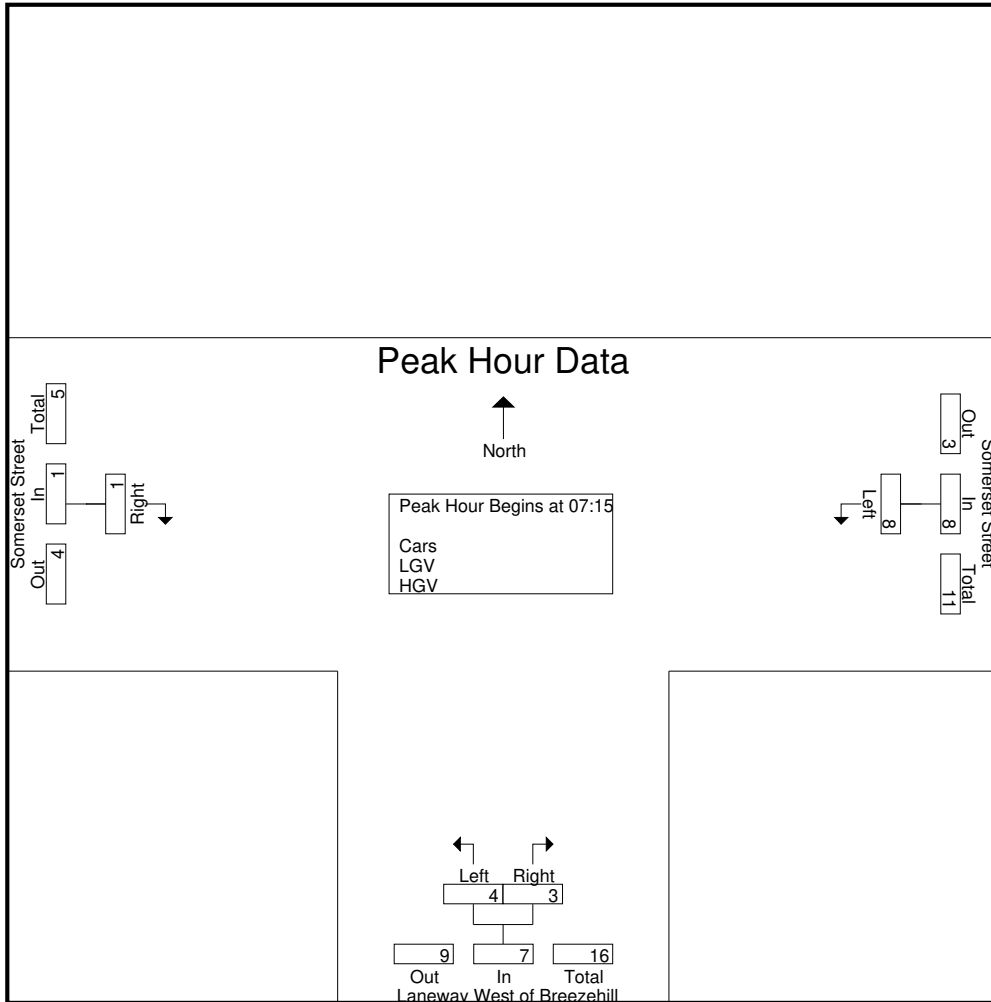
File Name : 20120329 Somerset&Laneway
Site Code : 11115212
Start Date : 3/29/2012
Page No : 3



Weather: 3C, Overcast
Serial Number: TDC-12-1612
Collected By:
Notes: Thursday

File Name : 20120329 Somerset&Laneway
Site Code : 11115212
Start Date : 3/29/2012
Page No : 4

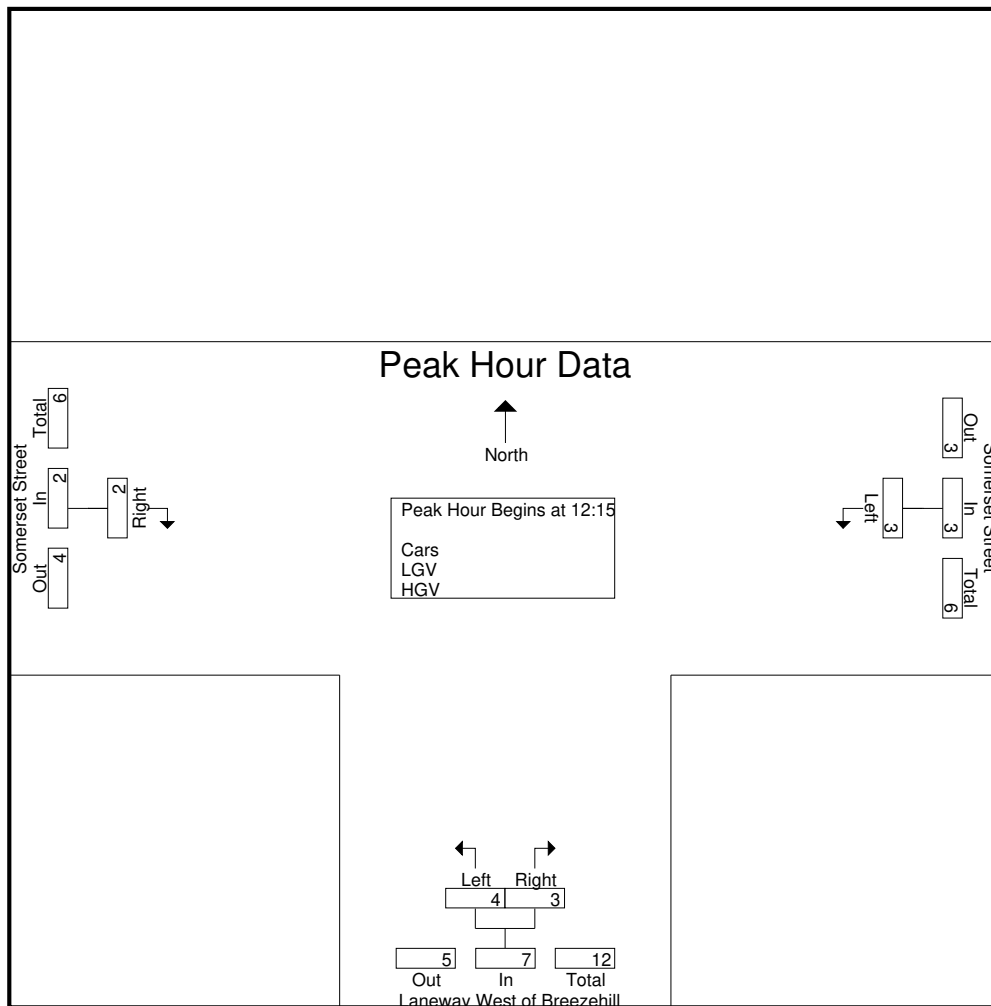
Start Time	Laneway West of Breezehill Northbound			Somerset Street Westbound		Somerset Street Eastbound		Int. Total
	Left	Right	App. Total	Left	App. Total	Right	App. Total	
Peak Hour Analysis From 07:00 to 09:45 - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 07:15								
07:15	1	0	1	3	3	0	0	4
07:30	1	0	1	2	2	0	0	3
07:45	1	1	2	2	2	1	1	5
08:00	1	2	3	1	1	0	0	4
Total Volume	4	3	7	8	8	1	1	16
% App. Total	57.1	42.9		100		100		
PHF	1.000	.375	.583	.667	.667	.250	.250	.800



Weather: 3C, Overcast
Serial Number: TDC-12-1612
Collected By:
Notes: Thursday

File Name : 20120329 Somerset&Laneway
Site Code : 11115212
Start Date : 3/29/2012
Page No : 5

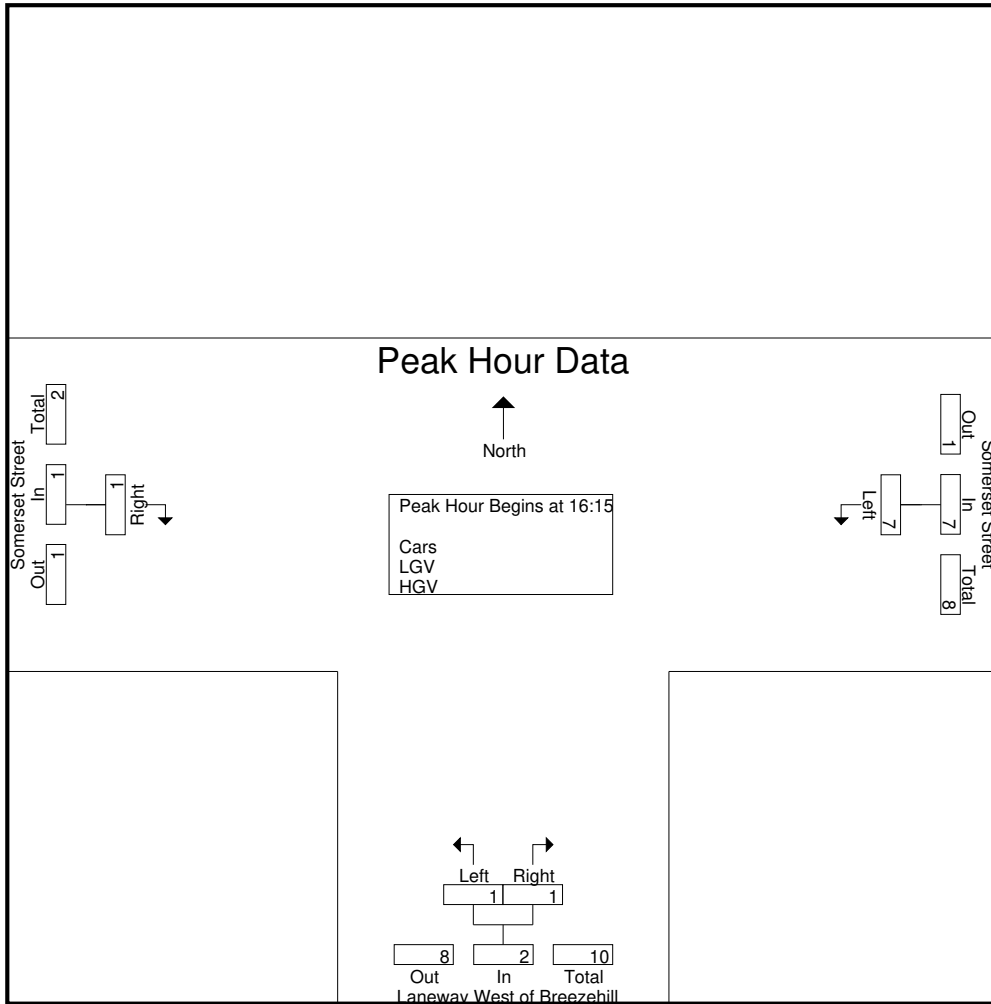
Start Time	Laneway West of Breezhill Northbound			Somerset Street Westbound		Somerset Street Eastbound		Int. Total
	Left	Right	App. Total	Left	App. Total	Right	App. Total	
Peak Hour Analysis From 10:00 to 13:45 - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 12:15								
12:15	0	1	1	1	1	0	0	2
12:30	0	0	0	0	0	1	1	1
12:45	2	2	4	1	1	0	0	5
13:00	2	0	2	1	1	1	1	4
Total Volume	4	3	7	3	3	2	2	12
% App. Total	57.1	42.9		100		100		
PHF	.500	.375	.438	.750	.750	.500	.500	.600



Weather: 3C, Overcast
Serial Number: TDC-12-1612
Collected By:
Notes: Thursday

File Name : 20120329 Somerset&Laneway
Site Code : 11115212
Start Date : 3/29/2012
Page No : 6

Start Time	Laneway West of Breezhill Northbound			Somerset Street Westbound		Somerset Street Eastbound		Int. Total
	Left	Right	App. Total	Left	App. Total	Right	App. Total	
Peak Hour Analysis From 14:00 to 17:30 - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 16:15								
16:15	0	0	0	4	4	0	0	4
16:30	0	1	1	1	1	0	0	2
16:45	1	0	1	0	0	0	0	1
17:00	0	0	0	2	2	1	1	3
Total Volume	1	1	2	7	7	1	1	10
% App. Total	50	50		100		100		
PHF	.250	.250	.500	.438	.438	.250	.250	.625



BICYCLE TURNING MOVEMENTS (15 Min. Volumes)

Somerset Street & Driveway

Survey Date: Thursday, May 31, 2012

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

Job No.: 111152

Weather: 13 degrees, Sun

Recorded: DS

Time Period	Somerset Street								Driveway								GRAND TOTAL		
	WESTBOUND				EASTBOUND				NORTHBOUND				SOUTHBOUND						
			SUB TOT			SUB TOT	STR TOT			SUB TOT			SUB TOT	STR TOT					
7:30-7:45		3		3		10		10	13		1		1		0		0	1	14
7:45-8:00		8		8		10		10	18		0		0		0		0	0	18
8:00-8:15		5		5		15		15	20		0		0		0		0	0	20
8:15-8:30		7		7		17		17	24		0		0		0		0	0	24
8:30-8:45		13		13		17		17	30		0		0		0		0	0	30
8:45-9:00		9		9		13		13	22		0		0		0		0	0	22
3:00-3:15		1		1		12		12	13		0		0		0		0	0	13
3:15-3:30		2		2		3		3	5		0		0		0		0	0	5
3:30-3:45		2		2		4		4	6		0		0		0		0	0	6
3:45-4:00		5		5		8		8	13		0		0		0		0	0	13
4:00-4:15		16		16		5		5	21		1		1		0		0	1	22
4:15-4:30		11		11		7		7	18		0		0		0		0	0	18
4:30-4:45		15		15		4		4	19		0		0		1		1	1	20
4:45-5:00		16		16		13		13	29		0		0		0		0	0	29
5:00-5:15		22		22		15		15	37		0		0		0		0	0	37
5:15-5:30		21		21		15		15	36		0		0		0		0	0	36
327																			

Serial Number: TDC-121612
Weather: High 17C Low 5C Sunny
Collected By: Brad Byvelds
Comments:

File Name : 20120512 - Laurel&Breezehill Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 1

Groups Printed- Cars - Light Trucks - Heavy Trucks

Start Time	Breezehill Ave North Northbound				Breezehill Ave North Southbound				Laurel Street Westbound				Laurel Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00	2	2	0	4	3	2	0	5	0	2	1	3	0	2	1	3	15
07:15	0	7	0	7	1	1	0	2	0	1	2	3	3	1	0	4	16
07:30	1	8	0	9	6	1	4	11	0	0	1	1	5	3	1	9	30
07:45	1	6	0	7	4	4	3	11	2	0	1	3	2	3	2	7	28
Total	4	23	0	27	14	8	7	29	2	3	5	10	10	9	4	23	89
08:00	1	3	0	4	0	3	4	7	0	0	0	0	0	1	0	1	12
08:15	8	17	2	27	2	15	7	24	0	1	1	2	5	3	2	10	63
08:30	7	16	1	24	2	12	9	23	2	2	3	7	6	2	4	12	66
08:45	4	10	2	16	0	3	1	4	1	3	1	5	1	5	2	8	33
Total	20	46	5	71	4	33	21	58	3	6	5	14	12	11	8	31	174
09:00	2	7	1	10	3	4	1	8	1	3	1	5	2	3	2	7	30
09:15	1	10	2	13	4	4	1	9	0	1	0	1	4	2	2	8	31
09:30	2	8	1	11	3	11	3	17	0	4	3	7	4	2	4	10	45
09:45	1	9	1	11	1	4	3	8	2	2	4	8	2	4	1	7	34
Total	6	34	5	45	11	23	8	42	3	10	8	21	12	11	9	32	140
10:00	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	2
*** BREAK ***																	
Total	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	2
11:00	1	9	0	10	2	10	2	14	2	3	3	8	2	4	1	7	39
11:15	1	3	0	4	1	4	2	7	0	1	1	2	2	1	0	3	16
11:30	2	7	0	9	2	5	4	11	1	4	2	7	1	4	3	8	35
11:45	0	6	2	8	3	5	0	8	0	3	3	6	5	4	1	10	32
Total	4	25	2	31	8	24	8	40	3	11	9	23	10	13	5	28	122
12:00	0	10	1	11	1	1	0	2	1	1	4	6	0	4	0	4	23
12:15	4	9	2	15	2	4	1	7	3	3	1	7	3	3	1	7	36
12:30	4	6	3	13	2	4	1	7	0	3	0	3	1	2	2	5	28
12:45	2	2	0	4	3	5	3	11	2	4	1	7	0	4	0	4	26
Total	10	27	6	43	8	14	5	27	6	11	6	23	4	13	3	20	113
13:00	1	5	0	6	0	4	3	7	0	1	1	2	1	2	1	4	19
13:15	1	8	1	10	3	7	4	14	0	2	0	2	3	2	2	7	33
*** BREAK ***																	
Total	2	13	1	16	3	11	7	21	0	3	1	4	4	4	3	11	52
*** BREAK ***																	
15:00	4	11	4	19	2	11	3	16	0	3	6	9	2	2	8	12	56
15:15	0	6	1	7	0	1	3	4	3	5	5	13	2	1	2	5	29
15:30	4	3	1	8	1	5	7	13	1	4	4	9	1	1	2	4	34
15:45	1	8	2	11	3	9	4	16	1	3	0	4	3	4	1	8	39
Total	9	28	8	45	6	26	17	49	5	15	15	35	8	8	13	29	158
16:00	4	4	0	8	1	6	6	13	1	6	3	10	3	2	1	6	37
16:15	1	7	1	9	2	3	5	10	3	4	6	13	1	2	0	3	35
16:30	2	3	1	6	2	10	8	20	0	3	1	4	2	1	0	3	33
16:45	4	2	0	6	3	7	3	13	0	4	2	6	2	2	0	4	29
Total	11	16	2	29	8	26	22	56	4	17	12	33	8	7	1	16	134
17:00	2	6	0	8	1	8	11	20	0	1	1	2	1	2	1	4	34
17:15	1	3	0	4	4	4	5	13	1	1	1	3	4	0	1	5	25

Serial Number: TDC-121612
Weather: High 17C Low 5C Sunny
Collected By: Brad Byvelds
Comments:

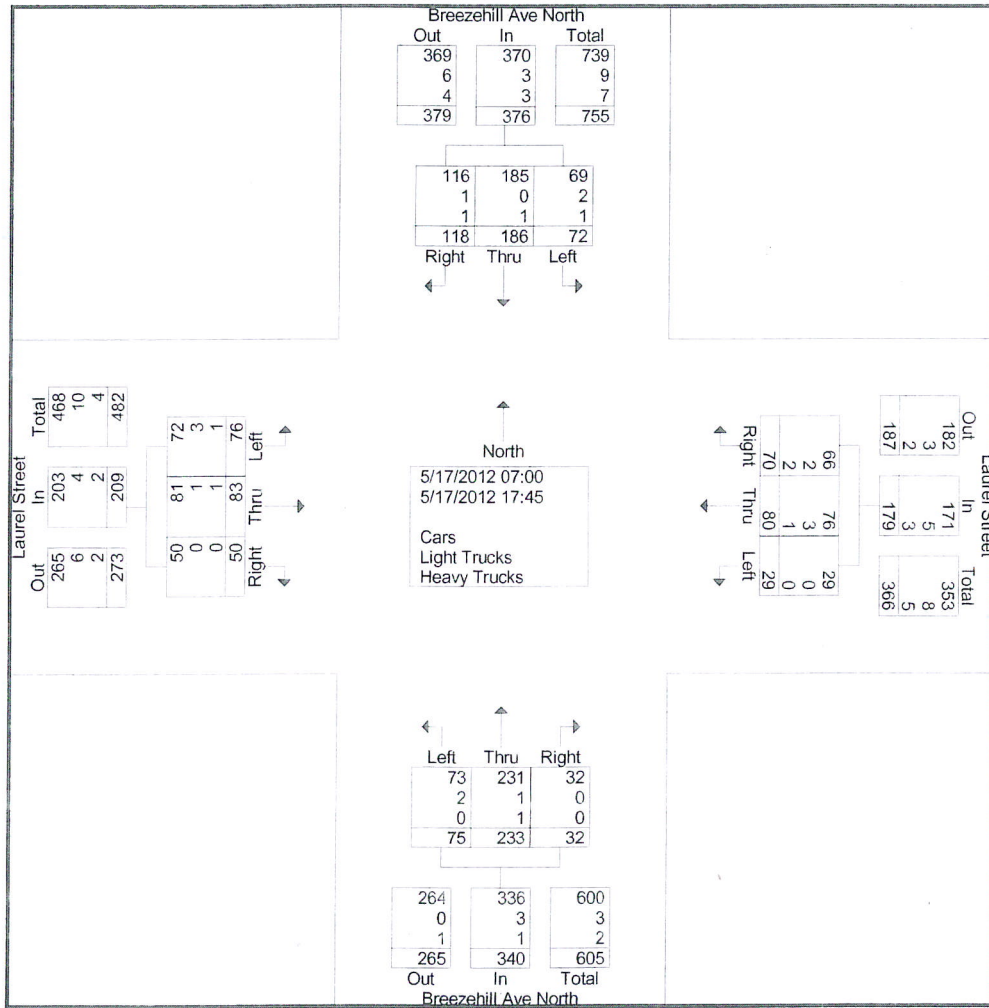
File Name : 20120512 - Laurel&Breezehill Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 2

Groups Printed- Cars - Light Trucks - Heavy Trucks

Start Time	Breezehill Ave North Northbound				Breezehill Ave North Southbound				Laurel Street Westbound				Laurel Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
17:30	5	7	1	13	4	8	5	17	1	1	3	5	1	2	2	5	40
17:45	1	5	2	8	1	1	2	4	1	1	3	5	1	3	0	4	21
Total	9	21	3	33	10	21	23	54	3	4	8	15	7	7	4	18	120
Grand Total	75	233	32	340	72	186	118	376	29	80	70	179	76	83	50	209	1104
Apprch %	22.1	68.5	9.4		19.1	49.5	31.4		16.2	44.7	39.1		36.4	39.7	23.9		
Total %	6.8	21.1	2.9	30.8	6.5	16.8	10.7	34.1	2.6	7.2	6.3	16.2	6.9	7.5	4.5	18.9	
Cars	73	231	32	336	69	185	116	370	29	76	66	171	72	81	50	203	1080
% Cars	97.3	99.1	100	98.8	95.8	99.5	98.3	98.4	100	95	94.3	95.5	94.7	97.6	100	97.1	97.8
Light Trucks	2	1	0	3	2	0	1	3	0	3	2	5	3	1	0	4	15
% Light Trucks	2.7	0.4	0	0.9	2.8	0	0.8	0.8	0	3.8	2.9	2.8	3.9	1.2	0	1.9	1.4
Heavy Trucks	0	1	0	1	1	1	1	3	0	1	2	3	1	1	0	2	9
% Heavy Trucks	0	0.4	0	0.3	1.4	0.5	0.8	0.8	0	1.2	2.9	1.7	1.3	1.2	0	1	0.8

Serial Number: TDC-121612
 Weather: High 17C Low 5C Sunny
 Collected By: Brad Byvelds
 Comments:

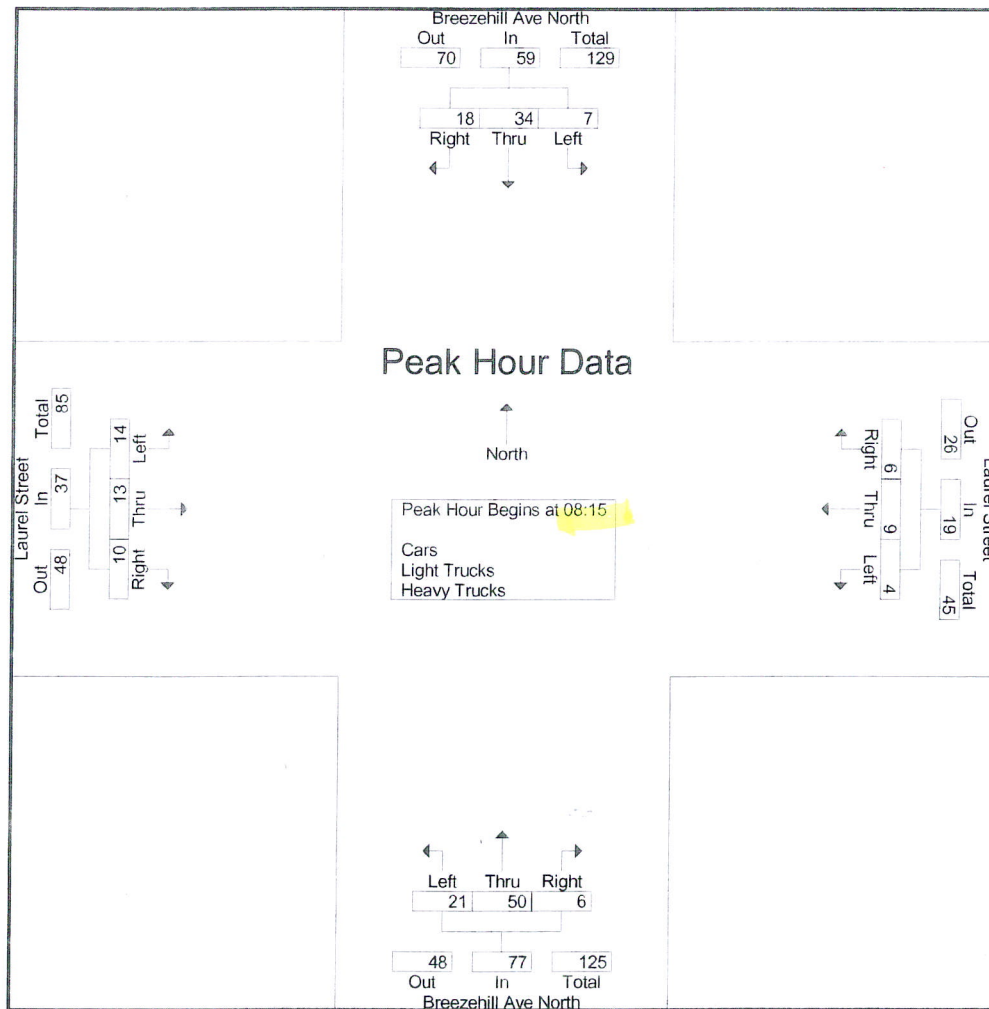
File Name : 20120512 - Laurel&Breezehill Count Combined
 Site Code : 00111152
 Start Date : 5/17/2012
 Page No : 3



Serial Number: TDC-121612
Weather: High 17C Low 5C Sunny
Collected By: Brad Byvelds
Comments:

File Name : 20120512 - Laurel&Breezehill Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 4

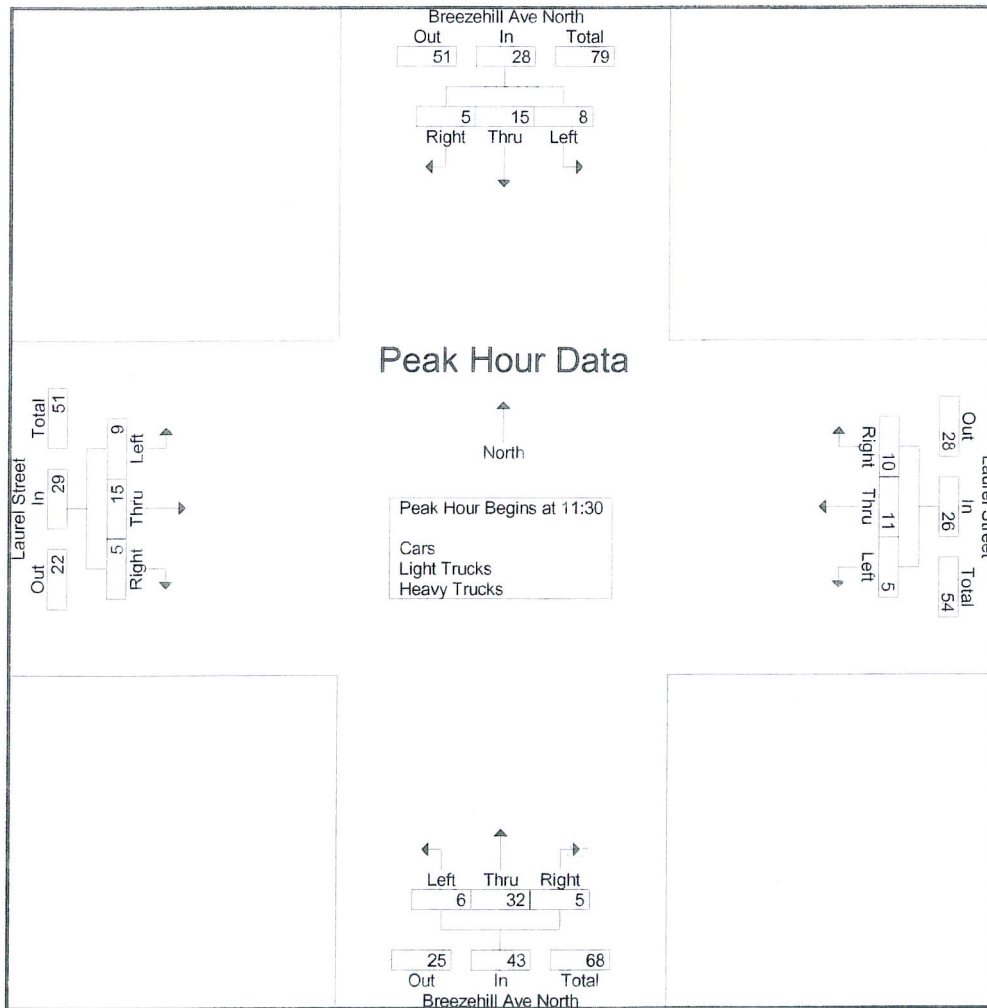
Start Time	Breezehill Ave North Northbound				Breezehill Ave North Southbound				Laurel Street Westbound				Laurel Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 to 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:15																	
08:15	8	17	2	27	2	15	7	24	0	1	1	2	5	3	2	10	63
08:30	7	16	1	24	2	12	9	23	2	2	3	7	6	2	4	12	66
08:45	4	10	2	16	0	3	1	4	1	3	1	5	1	5	2	8	33
09:00	2	7	1	10	3	4	1	8	1	3	1	5	2	3	2	7	30
Total Volume	21	50	6	77	7	34	18	59	4	9	6	19	14	13	10	37	192
% App. Total	27.3	64.9	7.8		11.9	57.6	30.5		21.1	47.4	31.6		37.8	35.1	27		
PHF	.656	.735	.750	.713	.583	.567	.500	.615	.500	.750	.500	.679	.583	.650	.625	.771	.727



Serial Number: TDC-121612
Weather: High 17C Low 5C Sunny
Collected By: Brad Byvelds
Comments:

File Name : 20120512 - Laurel&Breezehill Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 5

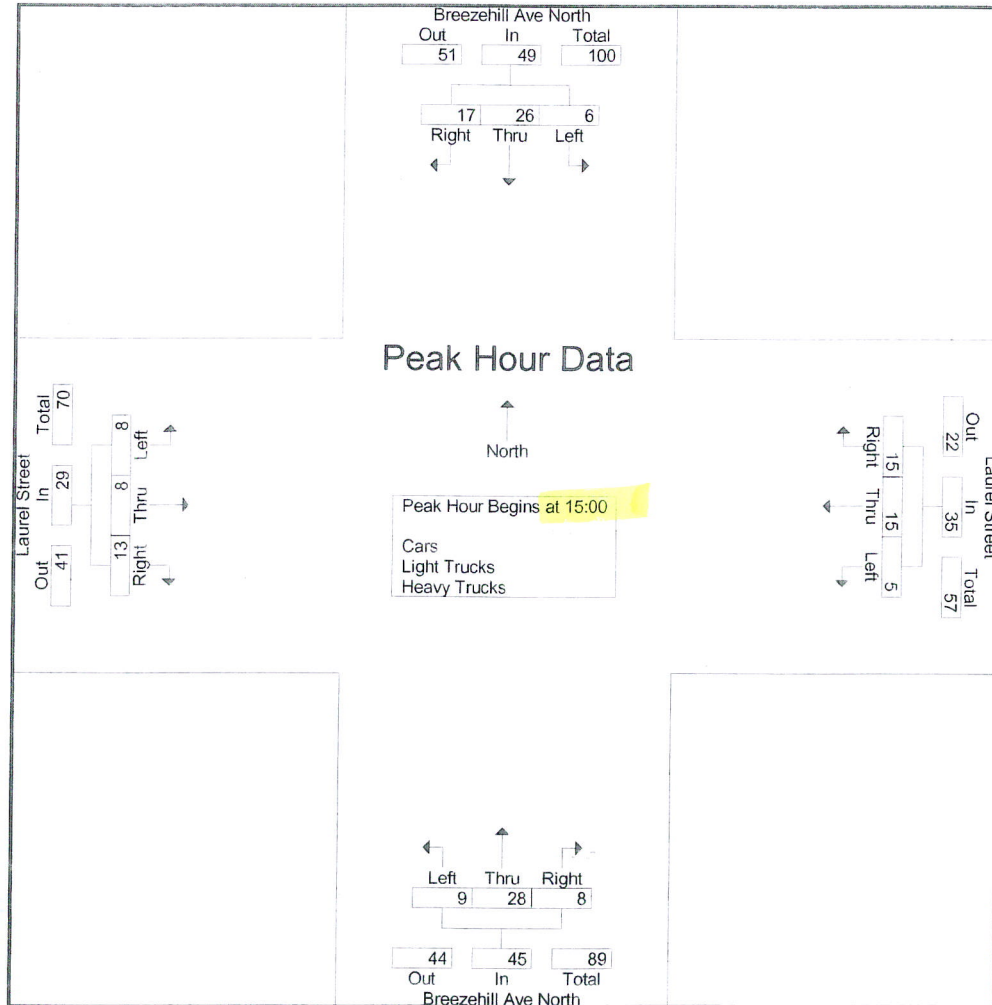
Start Time	Breezehill Ave North Northbound				Breezehill Ave North Southbound				Laurel Street Westbound				Laurel Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 11:00 to 13:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30																	
11:30	2	7	0	9	2	5	4	11	1	4	2	7	1	4	3	8	35
11:45	0	6	2	8	3	5	0	8	0	3	3	6	5	4	1	10	32
12:00	0	10	1	11	1	1	0	2	1	1	4	6	0	4	0	4	23
12:15	4	9	2	15	2	4	1	7	3	3	1	7	3	3	1	7	36
Total Volume	6	32	5	43	8	15	5	28	5	11	10	26	9	15	5	29	126
% App. Total	14	74.4	11.6		28.6	53.6	17.9		19.2	42.3	38.5		31	51.7	17.2		
PHF	.375	.800	.625	.717	.667	.750	.313	.636	.417	.688	.625	.929	.450	.938	.417	.725	.875



Serial Number: TDC-121612
Weather: High 17C Low 5C Sunny
Collected By: Brad Byvelds
Comments:

File Name : 20120512 - Laurel&Breezehill Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 6

Start Time	Breezehill Ave North Northbound				Breezehill Ave North Southbound				Laurel Street Westbound				Laurel Street Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 15:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:00																	
15:00	4	11	4	19	2	11	3	16	0	3	6	9	2	2	8	12	56
15:15	0	6	1	7	0	1	3	4	3	5	5	13	2	1	2	5	29
15:30	4	3	1	8	1	5	7	13	1	4	4	9	1	1	2	4	34
15:45	1	8	2	11	3	9	4	16	1	3	0	4	3	4	1	8	39
Total Volume	9	28	8	45	6	26	17	49	5	15	15	35	8	8	13	29	158
% App. Total	20	62.2	17.8		12.2	53.1	34.7		14.3	42.9	42.9		27.6	27.6	44.8		
PHF	.563	.636	.500	.592	.500	.591	.607	.766	.417	.750	.625	.673	.667	.500	.406	.604	.705



PEDESTRIAN (ALL) TURNING MOVEMENTS (15 Min. Volumes)

Laurel Street & Breezehill Avenue

Survey Date: Thursday, May 17, 2012

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

Job No.:111152

Weather: 20 degrees, Sun

Recorded: Ryan Donnelly

Time Period	Laurel Street								Breezehill Avenue										
	CROSSING LAUREL EASTBOUND APPROACH			SUB TOT	CROSSING LAUREL WESTBOUND APPROACH			STR TOT	CROSSING BREEZEHILL NORTHBOUND APPROACH			SUB TOT	CROSSING BREEZEHILL SOUTHBOUND APPROACH			SUB TOT	STR TOT	GRAND TOTAL	
7:00-7:15		1		1		1		1	2		5		5		0		0	5	7
7:15-7:30		2		2		2		2	4		4		4		0		0	4	8
7:30-7:45		2		2		0		0	2		4		4		0		0	4	6
7:45-8:00		1		1		0		0	1		2		2		0		0	2	3
8:00-8:15		3		3		0		0	3		2		2		1		1	3	6
8:15-8:30		40		40		8		8	48		15		15		2		2	17	65
8:30-8:45		16		16		6		6	22		16		16		0		0	16	38
8:45-9:00		2		2		0		0	2		0		0		0		0	0	2
9:00-9:15		1		1		2		2	3		3		3		0		0	3	6
9:15-9:30		1		1		4		4	5		4		4		0		0	4	9
9:30-9:45		2		2		0		0	2		2		2		1		1	3	5
9:45-10:00		2		2		0		0	2		3		3		1		1	4	6
11:00-11:15		2		2		6		6	8		1		1		2		2	21	29
11:15-11:30		0		0		4		4	4		1		1		2		2	4	8
11:30-11:45		1		1		0		0	1		1		1		0		0	2	3
11:45-12:00		0		0		0		0	0		1		1		0		0	2	2
12:00-12:15		2		2		1		1	3		1		1		1		1	3	6
12:15-12:30		9		9		1		1	10		4		4		1		1	1	11
12:30-12:45		2		2		0		0	2		2		2		1		1	1	3
12:45-1:00		4		4		1		1	5		0		0		2		2	5	10
1:00-1:15		0		0		0		0	0		0		0		0		0	0	0
1:15-1:30		1		1		0		0	1		0		3		1		1	1	2
3:00-3:15		34		34		5		5	39		19		19		0		0	19	58
3:15-3:30		3		3		2		2	5		2		2		1		1	3	8
3:30-3:45		1		1		1		1	2		2		2		3		3	5	7
3:45-4:00		3		3		1		1	4		2		2		0		0	2	6
4:00-4:15		4		4		3		3	7		2		2		0		0	2	9
4:15-4:30		4		4		1		1	5		0		0		0		0	0	5
4:30-4:45		5		5		2		2	7		0		0		2		2	2	9
4:45-5:00		6		6		0		0	6		3		3		0		0	3	9
5:00-5:15		1		1		0		0	1		0		0		0		0	0	1
5:15-5:30		3		3		0		0	3		0		0		0		0	0	3
5:30-5:45		8		8		2		2	10		2		2		4		4	6	16
5:45-6:00		0		0		0		0	0		0		0		0		0	0	0
																			366

PEDESTRIAN (CHILD) TURNING MOVEMENTS (15 Min. Volumes)

Laurel Street & Breezehill Avenue

Survey Date: Thursday, May 17, 2012

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

Job No.:111152

Weather: 20 degrees, Sun

Recorded: Ryan Donnelly

Time Period	Laurel Street								Breezehill Avenue									
	CROSSING LAUREL EASTBOUND APPROACH			SUB TOT	CROSSING LAUREL WESTBOUND APPROACH			STR TOT	CROSSING BREEZEHILL NORTHBOUND APPROACH			SUB TOT	CROSSING BREEZEHILL SOUTHBOUND APPROACH			STR TOT	GRAND TOTAL	
7:00-7:15		0		0		0		0	0		0		0		0		0	0
7:15-7:30		0		0		0		0	0		0		0		0		0	0
7:30-7:45		0		0		0		0	0		0		0		0		0	0
7:45-8:00		0		0		0		0	0		0		0		0		0	0
8:00-8:15		1		1		0		0	1		1		0		0		1	2
8:15-8:30		22		22		5		5	27		8		0		0		8	35
8:30-8:45		2		2		2		2	4		6		0		0		6	10
8:45-9:00		0		0		0		0	0		0		0		0		0	0
9:00-9:15		0		0		0		0	0		0		0		0		0	0
9:15-9:30		0		0		0		0	0		0		0		0		0	0
9:30-9:45		0		0		0		0	0		0		0		0		0	0
9:45-10:00		0		0		0		0	0		0		0		0		0	0
11:00-11:15		1		1		0		0	1		0		0		0		9	10
11:15-11:30		0		0		0		0	0		0		0		0		0	0
11:30-11:45		0		0		0		0	0		0		0		0		0	0
11:45-12:00		0		0		0		0	0		0		0		0		0	0
12:00-12:15		0		0		0		0	0		0		0		0		0	0
12:15-12:30		3		3		0		0	3		1		0		0		0	3
12:30-12:45		0		0		0		0	0		0		0		0		0	0
12:45-1:00		0		0		0		0	0		0		0		0		0	0
1:00-1:15		0		0		0		0	0		0		0		0		0	0
1:15-1:30		0		0		0		0	0		0		0		0		0	0
3:00-3:15		20		20		2		2	22		9		0		0		9	31
3:15-3:30		2		2		0		0	2		0		0		0		0	2
3:30-3:45		0		0		0		0	0		0		0		0		0	0
3:45-4:00		1		1		0		0	1		0		0		0		0	1
4:00-4:15		2		2		0		0	2		0		0		0		0	2
4:15-4:30		2		2		0		0	2		0		0		0		0	2
4:30-4:45		1		1		0		0	1		0		0		0		0	1
4:45-5:00		1		1		0		0	1		0		0		0		0	1
5:00-5:15		0		0		0		0	0		0		0		0		0	0
5:15-5:30		0		0		0		0	0		0		0		0		0	0
5:30-5:45		2		2		0		0	2		0		0		0		0	2
5:45-6:00		0		0		0		0	0		0		0		0		0	0
																		102

Suite 200,
Michael Cowpland Drive,
Ottawa, ON, K2M 1P6

Serial Number: TDC-121613
Weather: High 17C Low 5C Sunny
Collected By: Cameron Odam
Comments: Thursday

File Name : 20120512 - Laurel&Laneway Turn Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 1

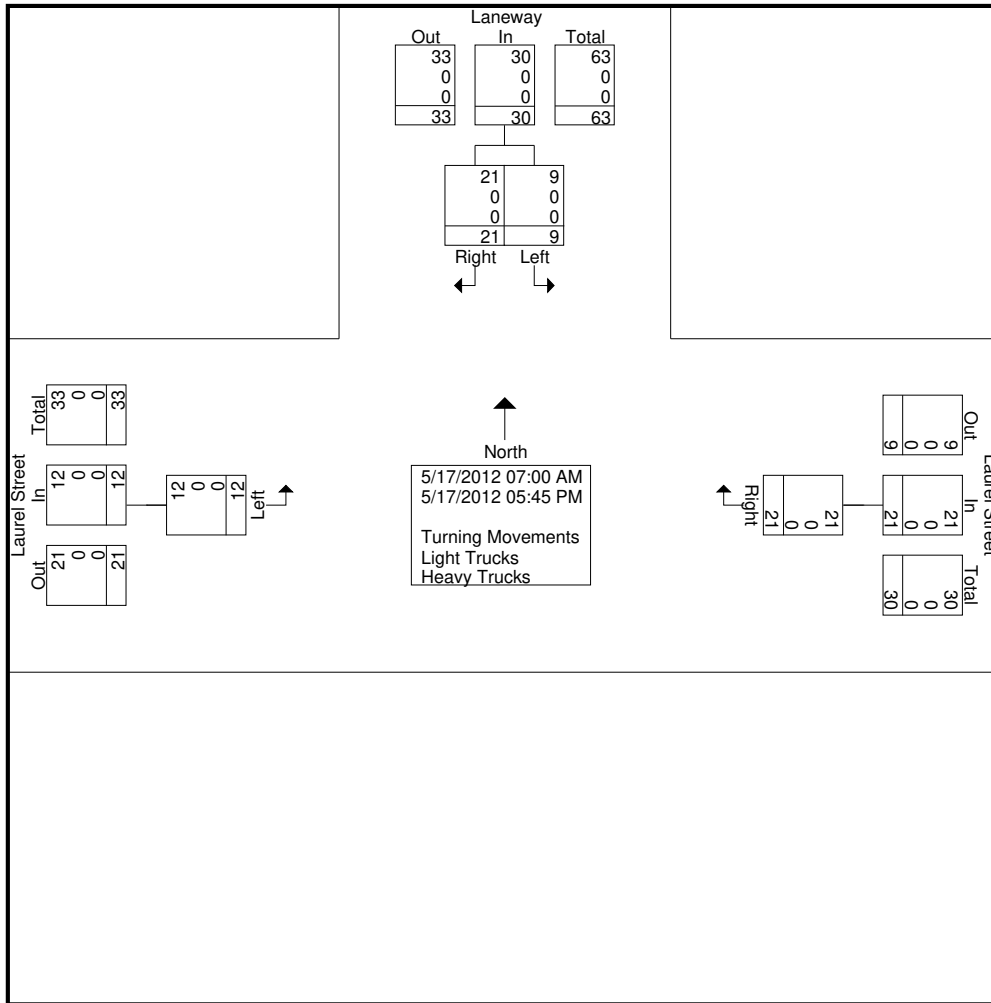
Groups Printed- Turning Movements - Light Trucks - Heavy Trucks

Start Time	Laneway Southbound			Laurel Street Westbound		Laurel Street Eastbound		Int. Total
	Left	Right	App. Total	Right	App. Total	Left	App. Total	
*** BREAK ***								
07:30 AM	2	0	2	0	0	0	0	2
07:45 AM	0	0	0	2	2	0	0	2
Total	2	0	2	2	2	0	0	4
08:00 AM	0	0	0	1	1	0	0	1
08:15 AM	0	1	1	2	2	0	0	3
08:30 AM	0	0	0	0	0	1	1	1
08:45 AM	0	1	1	2	2	1	1	4
Total	0	2	2	5	5	2	2	9
*** BREAK ***								
09:30 AM	1	1	2	1	1	0	0	3
*** BREAK ***								
Total	1	1	2	1	1	0	0	3
*** BREAK ***								
11:00 AM	0	0	0	0	0	1	1	1
11:15 AM	0	1	1	1	1	1	1	3
11:30 AM	3	1	4	0	0	1	1	5
11:45 AM	0	1	1	0	0	0	0	1
Total	3	3	6	1	1	3	3	10
12:00 PM	0	0	0	1	1	0	0	1
12:15 PM	0	2	2	1	1	1	1	4
12:30 PM	0	2	2	0	0	1	1	3
*** BREAK ***								
Total	0	4	4	2	2	2	2	8
01:00 PM	0	0	0	1	1	1	1	2
01:15 PM	0	0	0	0	0	1	1	1
*** BREAK ***								
Total	0	0	0	1	1	2	2	3
*** BREAK ***								
03:00 PM	2	0	2	2	2	0	0	4
*** BREAK ***								
03:30 PM	0	0	0	1	1	1	1	2
03:45 PM	0	0	0	1	1	1	1	2
Total	2	0	2	4	4	2	2	8
04:00 PM	1	2	3	0	0	0	0	3
04:15 PM	0	1	1	1	1	0	0	2
04:30 PM	0	2	2	1	1	0	0	3
04:45 PM	0	1	1	1	1	1	1	3
Total	1	6	7	3	3	1	1	11

Suite 200,
Michael Cowpland Drive,
Ottawa, ON, K2M 1P6

Serial Number: TDC-121613
Weather: High 17C Low 5C Sunny
Collected By: Cameron Odam
Comments: Thursday

File Name : 20120512 - Laurel&Laneway Turn Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 3

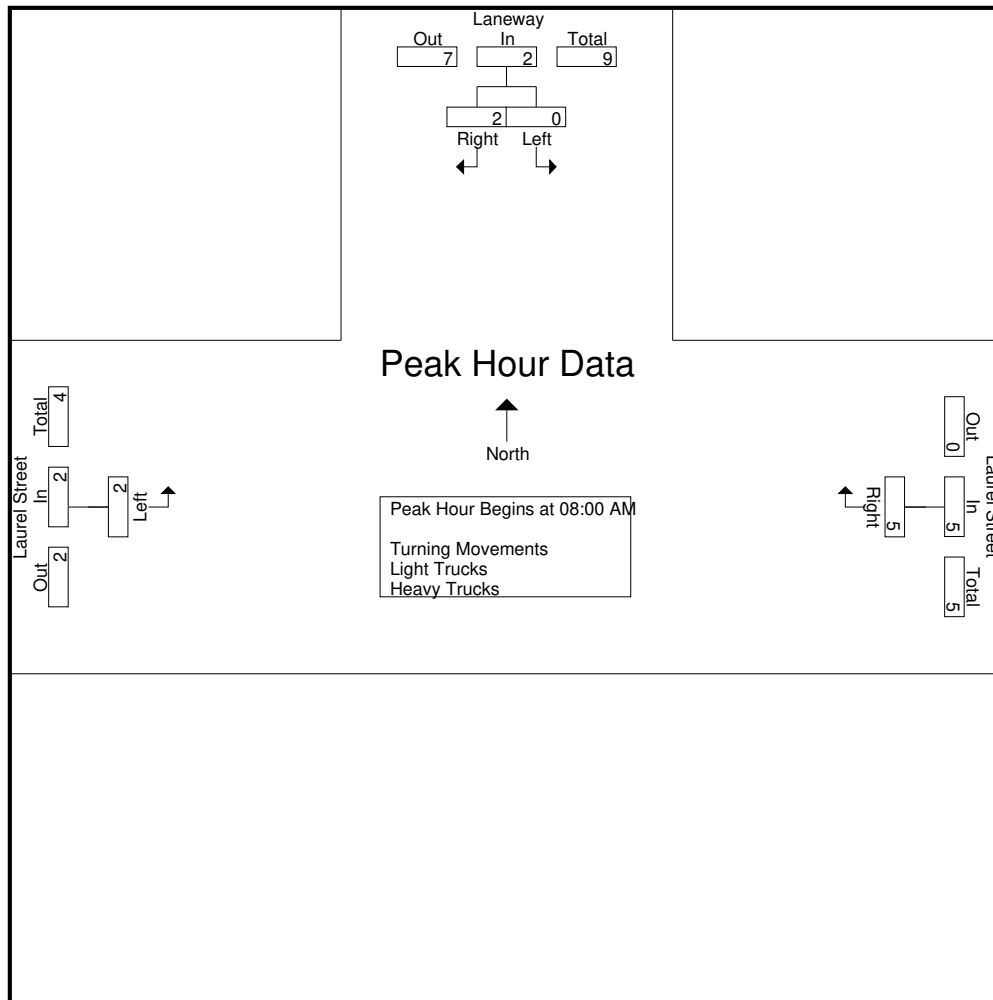


Suite 200,
Michael Cowpland Drive,
Ottawa, ON, K2M 1P6

Serial Number: TDC-121613
Weather: High 17C Low 5C Sunny
Collected By: Cameron Odam
Comments: Thursday

File Name : 20120512 - Laurel&Laneway Turn Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 4

Start Time	Laneway Southbound			Laurel Street Westbound		Laurel Street Eastbound		Int. Total
	Left	Right	App. Total	Right	App. Total	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 08:00 AM								
08:00 AM	0	0	0	1	1	0	0	1
08:15 AM	0	1	1	2	2	0	0	3
08:30 AM	0	0	0	0	0	1	1	1
08:45 AM	0	1	1	2	2	1	1	4
Total Volume	0	2	2	5	5	2	2	9
% App. Total	0	100		100		100		
PHF	.000	.500	.500	.625	.625	.500	.500	.563

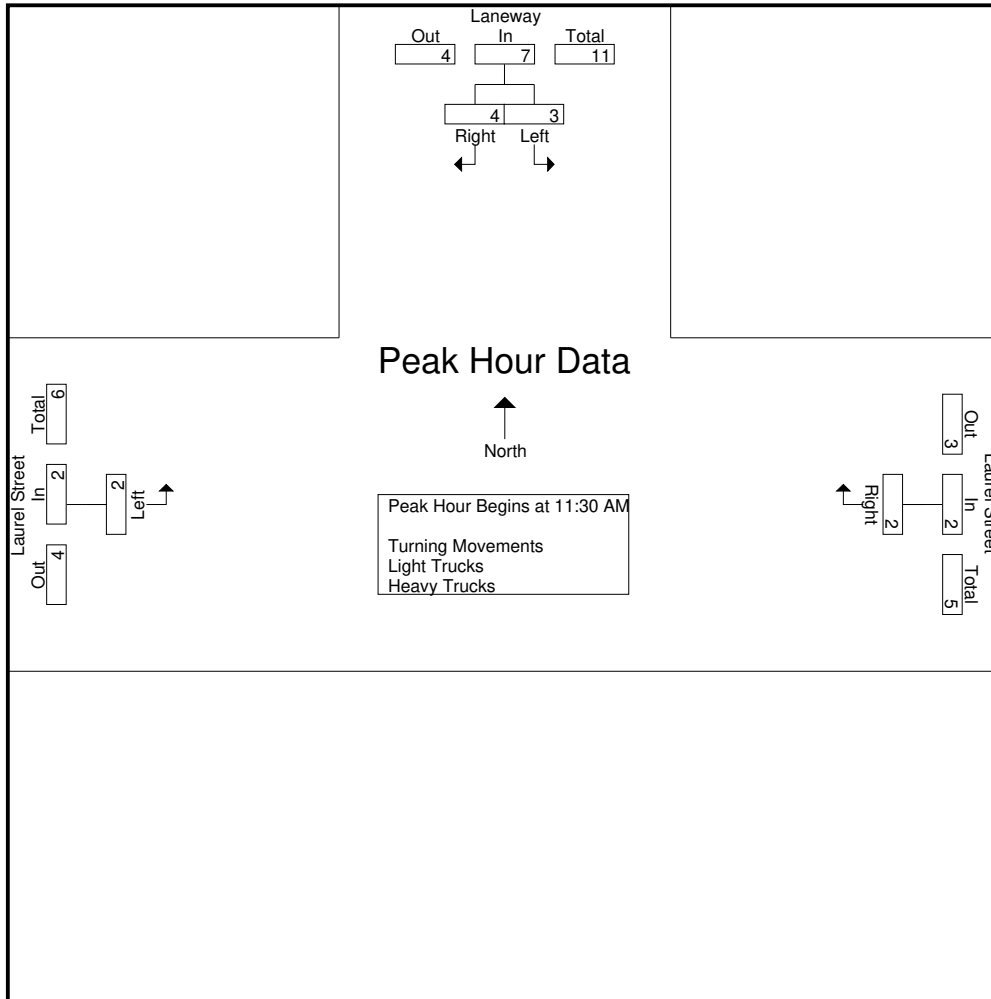


Suite 200,
Michael Cowpland Drive,
Ottawa, ON, K2M 1P6

Serial Number: TDC-121613
Weather: High 17C Low 5C Sunny
Collected By: Cameron Odam
Comments: Thursday

File Name : 20120512 - Laurel&Laneway Turn Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 5

Start Time	Laneway Southbound			Laurel Street Westbound		Laurel Street Eastbound		Int. Total
	Left	Right	App. Total	Right	App. Total	Left	App. Total	
Peak Hour Analysis From 11:00 AM to 01:45 PM - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 11:30 AM								
11:30 AM	3	1	4	0	0	1	1	5
11:45 AM	0	1	1	0	0	0	0	1
12:00 PM	0	0	0	1	1	0	0	1
12:15 PM	0	2	2	1	1	1	1	4
Total Volume	3	4	7	2	2	2	2	11
% App. Total	42.9	57.1		100		100		
PHF	.250	.500	.438	.500	.500	.500	.500	.550

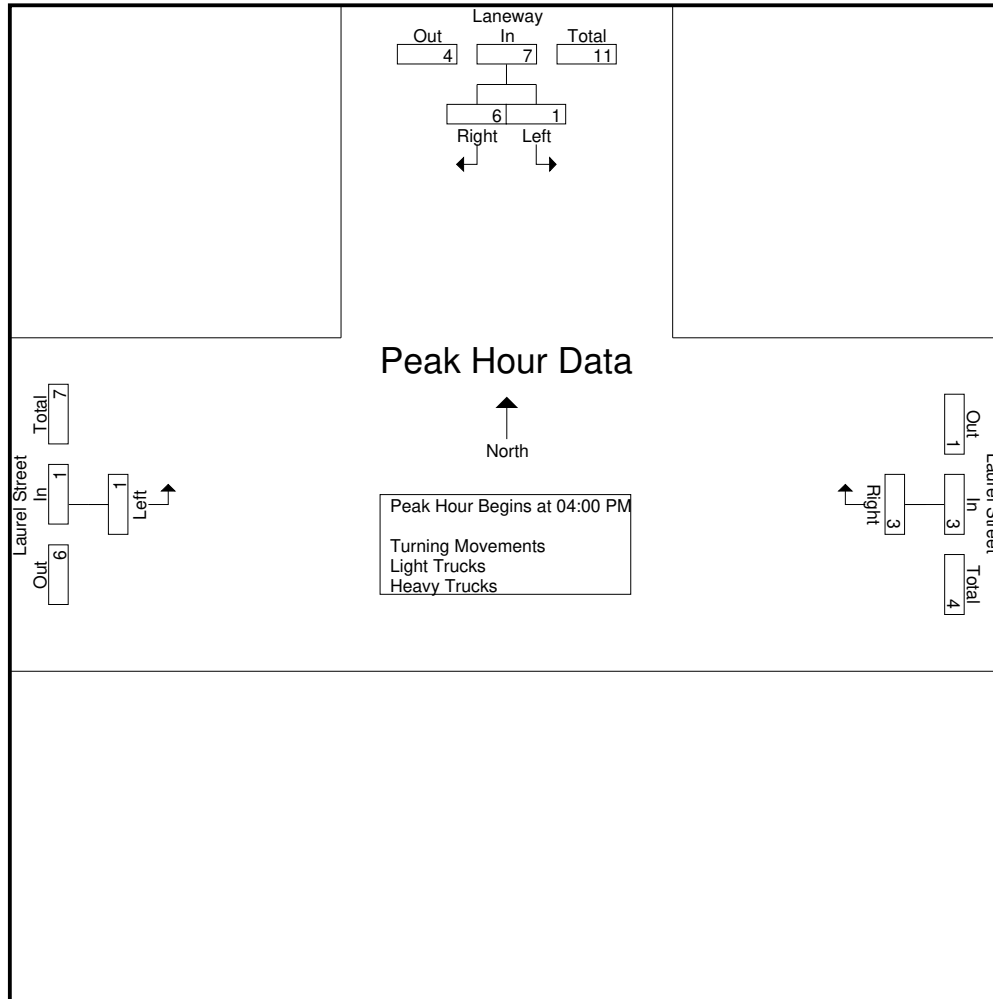


Suite 200,
Michael Cowpland Drive,
Ottawa, ON, K2M 1P6

Serial Number: TDC-121613
Weather: High 17C Low 5C Sunny
Collected By: Cameron Odam
Comments: Thursday

File Name : 20120512 - Laurel&Laneway Turn Count Combined
Site Code : 00111152
Start Date : 5/17/2012
Page No : 6

Start Time	Laneway Southbound			Laurel Street Westbound		Laurel Street Eastbound		Int. Total
	Left	Right	App. Total	Right	App. Total	Left	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1								
Peak Hour for Entire Intersection Begins at 04:00 PM								
04:00 PM	1	2	3	0	0	0	0	3
04:15 PM	0	1	1	1	1	0	0	2
04:30 PM	0	2	2	1	1	0	0	3
04:45 PM	0	1	1	1	1	1	1	3
Total Volume	1	6	7	3	3	1	1	11
% App. Total	14.3	85.7		100		100		
PHF	.250	.750	.583	.750	.750	.250	.250	.917



BICYCLE TURNING MOVEMENTS (15 Min. Volumes)

Laurel Street & Driveway

Survey Date: Thursday, May 17, 2012

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

Job No.: 111152

Weather: 20 degrees, Sun

Recorded: Cameron Odam

Time Period	Laurel Street									Driveway									GRAND TOTAL
	WESTBOUND				EASTBOUND					NORTHBOUND				SOUTHBOUND					
	LT	ST	RT	SUB TOT	LT	ST	RT	SUB TOT	STR TOT	LT	ST	RT	SUB TOT	LT	ST	RT	SUB TOT	STR TOT	
7:00-7:15		0		0		0		0	0		0		0		0		0	0	0
7:15-7:30		2		2		0		0	2		0		0		0		0	0	2
7:30-7:45		4		4		0		0	4		0		0		0		0	0	4
7:45-8:00		4		4		0		0	4		0		0		0		0	0	4
8:00-8:15		1		1		1		1	2		0		0		0		0	0	2
8:15-8:30		25		25		8		8	33		0		0		1		1	1	34
8:30-8:45		8		8		4		4	12		0		0		0		0	0	12
8:45-9:00		2		2		0		0	2		1		1		0		0	1	3
9:00-9:15		1		1		0		0	1		1		1		0		0	1	2
9:15-9:30		0		0		1		1	1		0		0		0		0	0	1
9:30-9:45		2		2		0		0	2		0		0		0		0	0	2
9:45-10:00		1		1		2		2	3		0		0		0		0	0	3
11:00-11:15		1		1		2		2	3		0		0		0		0	0	3
11:15-11:30		1		1		0		0	1		0		0		0		0	0	1
11:30-11:45		0		0		1		1	1		0		0		0		0	0	1
11:45-12:00		0		0		1		1	1		0		0		0		0	0	1
12:00-12:15		2		2		0		0	2		0		0		0		0	0	2
12:15-12:30		2		2		0		0	2		0		0		0		0	0	2
12:30-12:45		1		1		2		2	3		0		0		0		0	0	3
12:45-1:00		0		0		0		0	0		2		2		0		0	2	2
1:00-1:15		2		2		0		0	2		0		0		0		0	0	2
1:15-1:30		0		0		0		0	0		0		0		0		0	0	0
3:00-3:15		4		4		7		7	11		0		0		0		0	0	11
3:15-3:30		1		1		1		1	2		1		1		0		0	1	3
3:30-3:45		1		1		6		6	7		0		0		0		0	0	7
3:45-4:00		1		1		3		3	4		0		0		0		0	0	4
4:00-4:15		0		0		11		11	11		0		0		1		1	1	12
4:15-4:30		1		1		6		6	7		0		0		0		0	0	7
4:30-4:45		0		0		6		6	6		1		1		0		0	1	7
4:45-5:00		3		3		2		2	5		0		0		0		0	0	5
5:00-5:15		3		3		4		4	7		0		0		0		0	0	7
5:15-5:30		0		0		5		5	5		0		0		0		0	0	5
5:30-5:45		0		0		3		3	3		0		0		0		0	0	3
5:45-6:00		7		7		4		4	11		0		0		0		0	0	11

PEDESTRIAN (ALL) TURNING MOVEMENTS (15 Min. Volumes)

Laurel Street & Driveway

Survey Date: Thursday, May 17, 2012

Total Observed U-Turns

Job No.: 111152

Weather: 20 degrees, Sun

Westbound: 0

Southbound: 0

Eastbound: 0

Northbound: 0

Recorded: Cameron Odam

Time Period	Laurel Street				Driveway				GRAND TOTAL
	CROSSING DRIVEWAY		SUB TOT	STR TOT	IN DRIVEWAY		SUB TOT	STR TOT	
7:00-7:15		2	2	2		0	0	0	2
7:15-7:30		3	3	3		0	0	0	3
7:30-7:45		2	2	2		1	1	1	3
7:45-8:00		3	3	3		0	0	0	3
8:00-8:15		4	4	4		1	1	1	5
8:15-8:30		31	31	31		1	1	1	32
8:30-8:45		19	19	19		8	8	8	27
8:45-9:00		5	5	5		2	2	2	7
9:00-9:15		0	0	0		2	2	2	2
9:15-9:30		1	1	1		0	0	0	1
9:30-9:45		0	0	0		1	1	1	1
9:45-10:00		1	1	1		1	1	1	2
11:00-11:15		7	7	7		2	2	2	9
11:15-11:30		0	0	0		2	2	2	2
11:30-11:45		0	0	0		0	0	0	0
11:45-12:00		0	0	0		0	0	0	0
12:00-12:15		1	1	1		0	0	0	1
12:15-12:30		2	2	2		1	1	1	3
12:30-12:45		1	1	1		0	0	0	1
12:45-1:00		3	3	3		1	1	1	4
1:00-1:15		1	1	1		0	0	0	1
1:15-1:30		3	3	3		1	1	1	4
3:00-3:15		45	45	45		3	3	3	48
3:15-3:30		1	1	1		0	0	0	1
3:30-3:45		5	5	5		3	3	3	8
3:45-4:00		4	4	4		2	2	2	6
4:00-4:15		5	5	5		2	2	2	7
4:15-4:30		3	3	3		0	0	0	3
4:30-4:45		2	2	2		0	0	0	2
4:45-5:00		2	2	2		1	1	1	3
5:00-5:15		4	4	4		1	1	1	5
5:15-5:30		5	5	5		2	2	2	7
5:30-5:45		1	1	1		2	2	2	3
5:45-6:00		1	1	1		2	2	2	3
									209

APPENDIX B

MTO Warrants for Traffic Signal Control And Left-Turn Storage Lanes

Figure EB-1

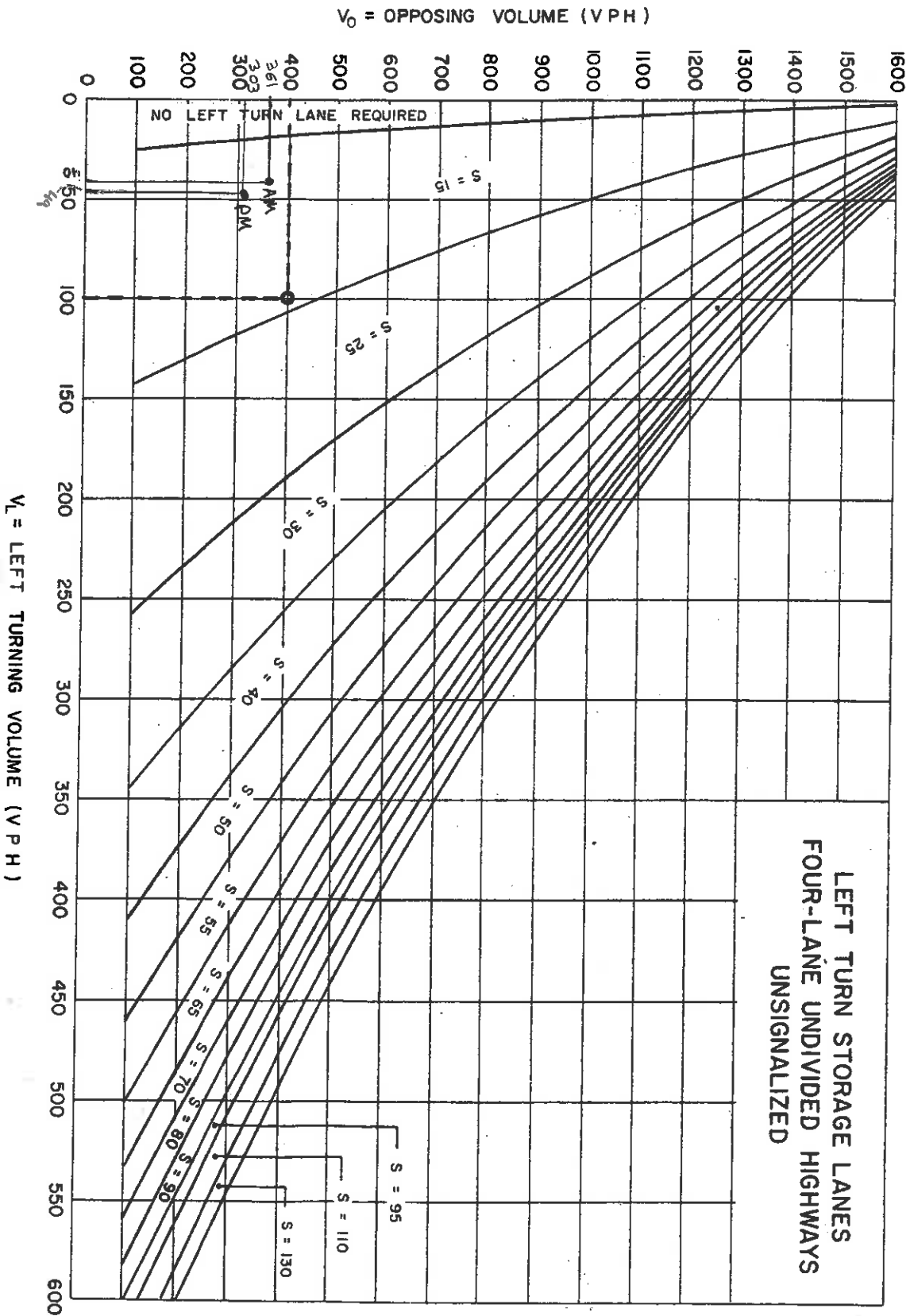
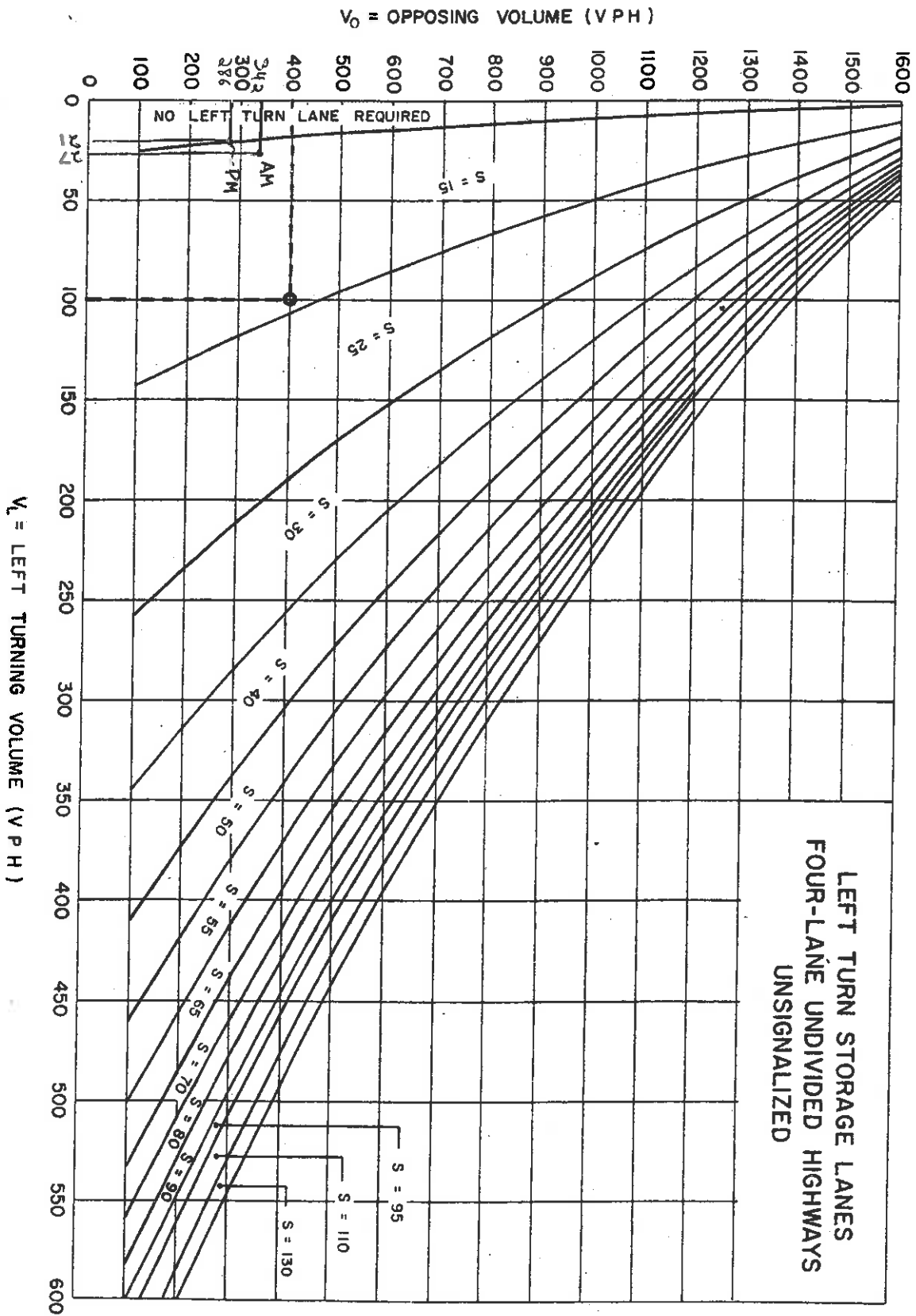


Figure EB-1



Somerset St / Breeze Hill Ave

TRAFFIC SIGNAL JUSTIFICATION

LOCATION: Breezehill at Somerset

DATE: July 2012

JUSTIFICATION 1 – Minimum Vehicular Volume

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE								WARRANT
	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	TOTAL ACROSS
A.	480 (385)	720 (575)	600 (480)	900 (720)	264	560	428	494	482	587	635	593	
ALL APPROACHES	100% FULFILLED												
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE				29%	62%	48%	55%	54%	65%	71%	66%	450
												TOTAL DOWN:	450
												AVERAGE (TOTAL/8):	56%

T Intersection Add 50%

180 (255) 180 255
143 (203) 143 203

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE								WARRANT
	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	TOTAL ACROSS
B.	120 (95)	170 (135)	120 (95)	170 (135)	20	53	26	40	34	55	30	39	
MINOR STREET BOTH APPROACHES	100% FULFILLED												
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE				8%	21%	10%	16%	13%	22%	12%	15%	117
												TOTAL DOWN:	117
												AVERAGE (TOTAL/8):	15%

JUSTIFICATION 2 – Delay To Cross Traffic

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE								WARRANT
	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	TOTAL ACROSS
A.	480 (385)	720 (575)	600 (480)	900 (720)	244	507	462	460	448	532	605	554	
MAJOR STREET BOTH APPROACHES	100% FULFILLED												
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE				27%	56%	45%	51%	50%	59%	67%	62%	417
												TOTAL DOWN:	417
												AVERAGE (TOTAL/8):	52%

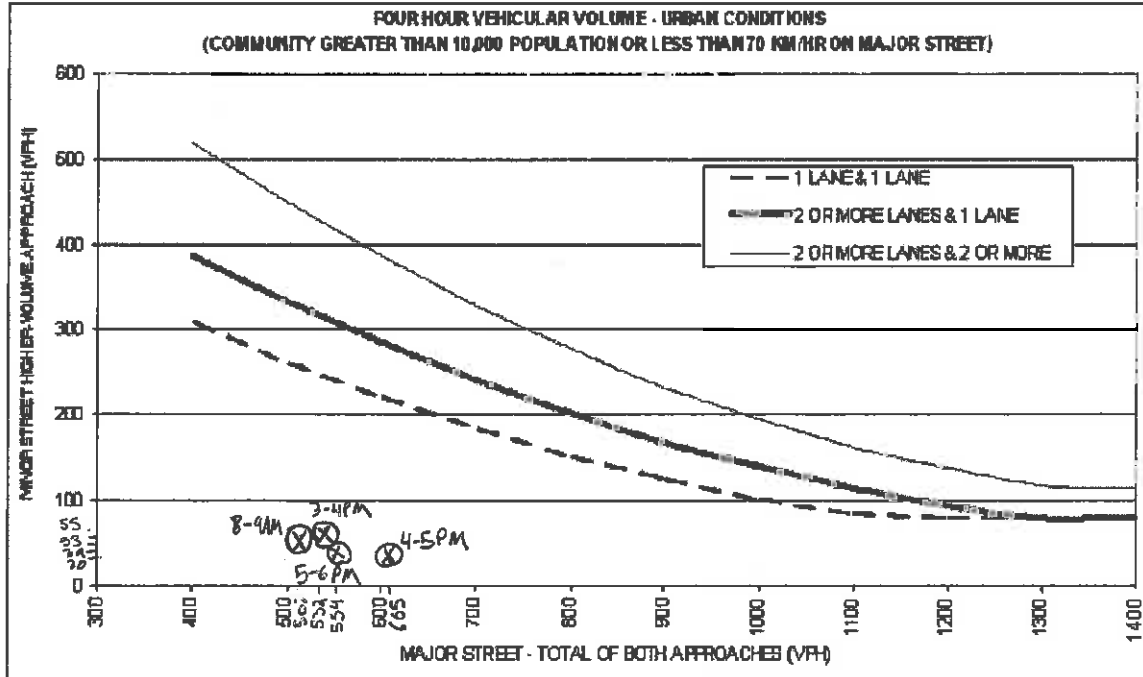
APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				PERCENTAGE								WARRANT
	1		2 or MORE		HOUR ENDING								
FLOW CONDITION	FREE FLOW	RESTR FLOW	FREE FLOW	RESTR FLOW	8:00	9:00	10:00	12:30	13:30	16:00	17:00	18:00	TOTAL ACROSS
B.	50 (40)	75 (60)	50 (40)	75 (60)	9	17	16	15	18	21	6	19	
TRAFFIC CROSSING MAJOR STREET	100% FULFILLED												
	80% FULFILLED												
	ACTUAL % IF BELOW 80% VALUE				12%	23%	21%	20%	24%	28%	8%	25%	161
												TOTAL DOWN:	161
												AVERAGE (TOTAL/8):	20%

LOCATION: Breezehill at Somerset

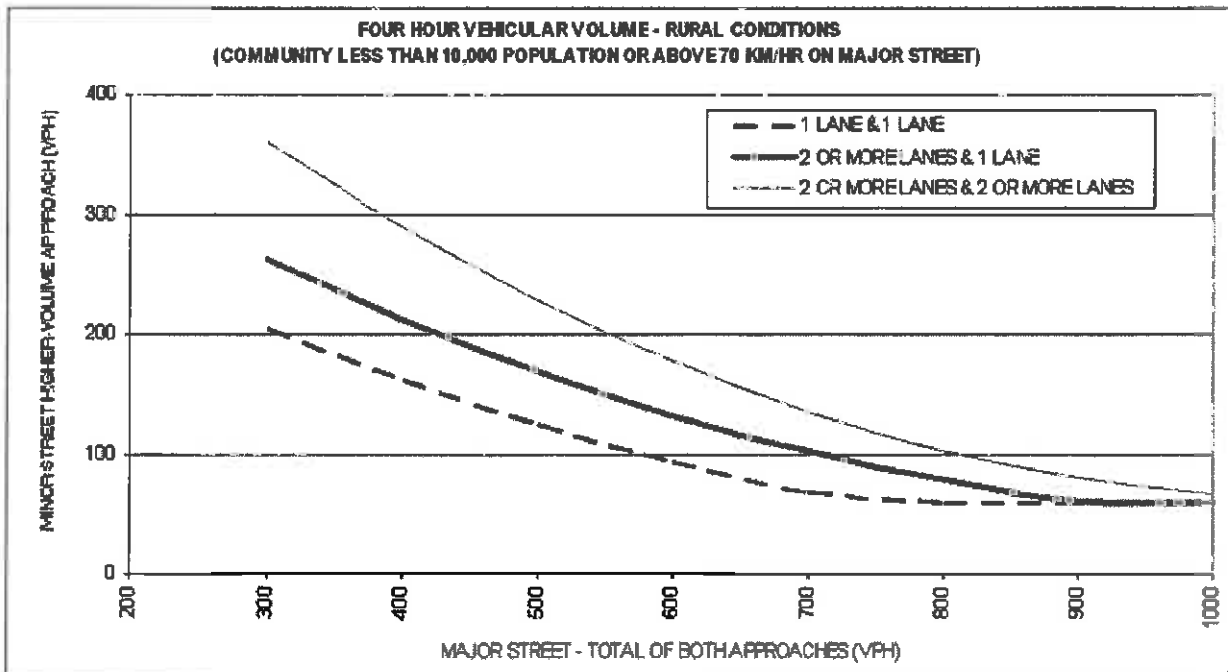
DATE: July 2012

JUSTIFICATION 4 – Minimum Four-Hour Vehicle Volume

A. Restricted Flow



B. Free Flow



**TRAFFIC SIGNAL JUSTIFICATION
SUMMARY TABLE**

LOCATION: Breezehill at Somerset

DATE: July 2012

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE	
		FREE FLOW	RESTRICTED FLOW	SECTIONAL %	ENTIRE % ⁽²⁾
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H		
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches for each of the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	56%	15%
	B. Vehicle volume, along minor street, for each of the same 8 hours.	120 180 (tee intersection)	170 255 (tee intersection)	15%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume, along major street for each for the heaviest 8 hours of an average day, and	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	52%	20%
	B ⁽¹⁾ . Combined vehicle and pedestrian volume <u>crossing</u> the major street for each of the same 8 hours	50	75	20%	
3. VOLUME/DELAY COMBINATION	The above Justifications (1 and 2) both satisfied to the extent of 80% or more	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		
4. MINIMUM FOUR HOUR VEHICLE VOLUME	Plotted point representing hourly volume for minor approach vs. major approach for hour highest hours of an average day fall above the applicable curve	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>		
5. COLLISION EXPERIENCE	A. Total reported accidents of types susceptible to correction by a traffic signal, per 12 month period averaged over a 36 month period, and	5			
	B. Adequate trial of less restrictive remedies, where satisfactory observance and enforcement have failed to reduce the number of accidents	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
6. PEDESTRIAN VOLUME AND DELAY	A. Plotted point representing 8 hour pedestrian volume vs. 8 hour vehicular volume fall in justified zone, and	Yes <input type="checkbox"/>	No <input type="checkbox"/>		
	B. Plotted point representing 8 hour volume of pedestrian experiencing delays of 10 s or more vs. 8 hour pedestrian volume fall in justified zone	Yes <input type="checkbox"/>	No <input type="checkbox"/>		

NOTES

- 1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
- 2) The lowest sectional percentage governs the entire Justification.

**TRAFFIC SIGNAL JUSTIFICATION
USING PROJECTED VOLUMES**

LOCATION: Breezehill at Somerset

YEAR: 2012 Total Traffic (w development)

JUSTIFICATION	DESCRIPTION	MINIMUM REQUIREMENT		COMPLIANCE		
		FREE FLOW	RESTRICTED FLOW	SECTIONAL		ENTIRE % ⁽²⁾
		OPERATING SPEED ≥ 70KM/H	OPERATING SPEED < 70 KM/H	NUMERICAL	PERCENT	
1. MINIMUM VEHICULAR WARRANT	A. Vehicle volume, all approaches (average hour)	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	353	39%	11%
	B. Vehicle volume along minor street (average hour)	120 180 (tee intersection)	170 255 (tee intersection)	29	11%	
2. DELAY TO CROSS TRAFFIC	A. Vehicle volume along major street (average hour)	480 600 (2 or more lane approach)	720 900 (2 or more lane approach)	324	36%	17%
	B ⁽¹⁾ . Combined vehicle and pedestrian volume crossing the major street (average hour)	50	75	13	17%	

NOTES

- 1) For definition of crossing volume refer to the Ontario Traffic Manual Book 12, Section 4.5 (Nov. 2007).
- 2) The lowest sectional percentage governs the entire Justification.
- 3) Average hourly volumes estimated from peak hour volumes, $AHV = PM / 2$ or $AHV = (AM + PM) / 4$.