Appendix A

Traffic Volume Data

Table A-1 - Traffic Growth Trend on Highway 103 - Hubbards Permanent Counter

Year	AADT
1970	2790
1975	4310
1980	5210
1985	5760
1990	7000
1995	7710
2000	8950
2001	9000
2002	9150
2003	9280
2005	9640
2006	9640
2007	9830
2008	9830
2009	9550

Source: Nova Scotia Department of Transportation & Infrastructure Renewal

Annual Growth Rate is 1.7% based on projected 2010 AADT

Figure A-1 - Volume Growth Trend Highway 103
(Halifax - Lunenburg County Line)

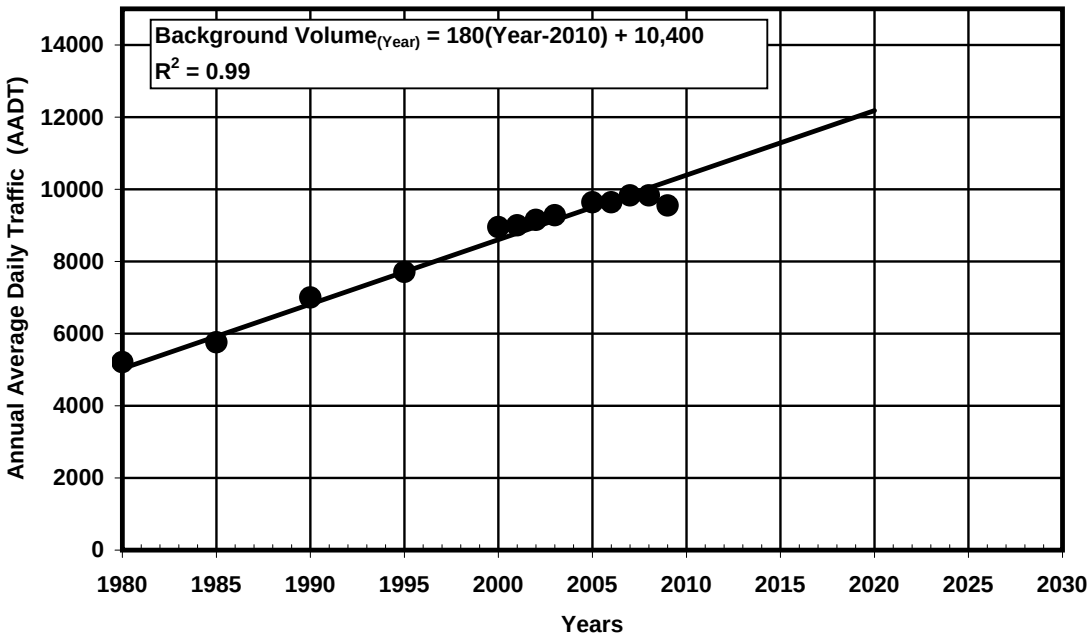


Table A-2 - Traffic Growth Trend on Highway 103 - West of Hubbards Interchange

Year	AADT	
1975	2910	
1980	5050	
1985	5480	
1987	6210	
1989	6180	
1990	6370	
1992	6160	
1994	6760	
1997	7400	
2000	9170	
2002	8510	Loop
2003	7730	Loop
2006	6710	Loop
2009	8520	Loop

Source: Nova Scotia Department of Transportation & Infrastructure Renewal
Numbers in the shaded area have note been included in the analysis
Annual Growth Rate is 1.6% based on projected 2010 AADT

Figure A-2 - Volume Growth Trend Highway 103 (West of Hubbards Interchange)

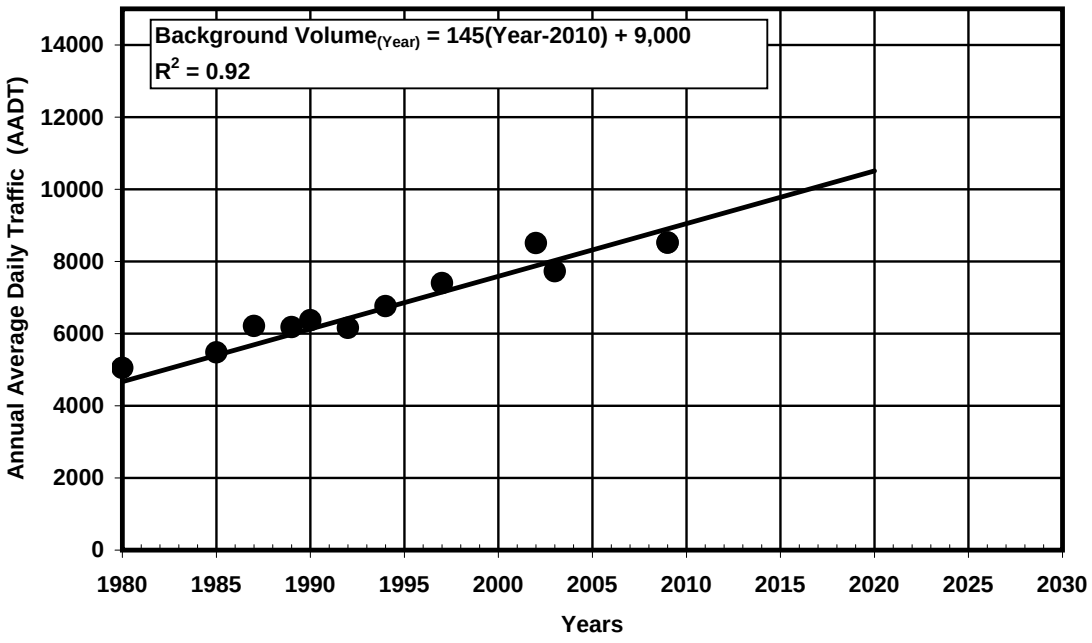


Table A-3 - Traffic Growth Trend on Trunk 3 - 3.0 km West of Route 333

Year	AADT	
1971	2430	
1980	2710	
1984	2740	
1985	2240	
1990	4000	
1992	3260	
1995	4330	
1996	3990	
1998	3950	
2000	4200	
2001	4190	VC 4% Trucks
2003	4140	
2005	4780	
2007	4950	VC
2009	4300	

Source: Nova Scotia Department of Transportation & Infrastructure Renewal
Numbers in the shaded area have note been included in the analysis
Annual Growth Rate is 1.5% based on projected 2010 AADT

Figure A-3 - Volume Growth Trend Trunk 3 Section 030 (3.0 km West of Route 333)

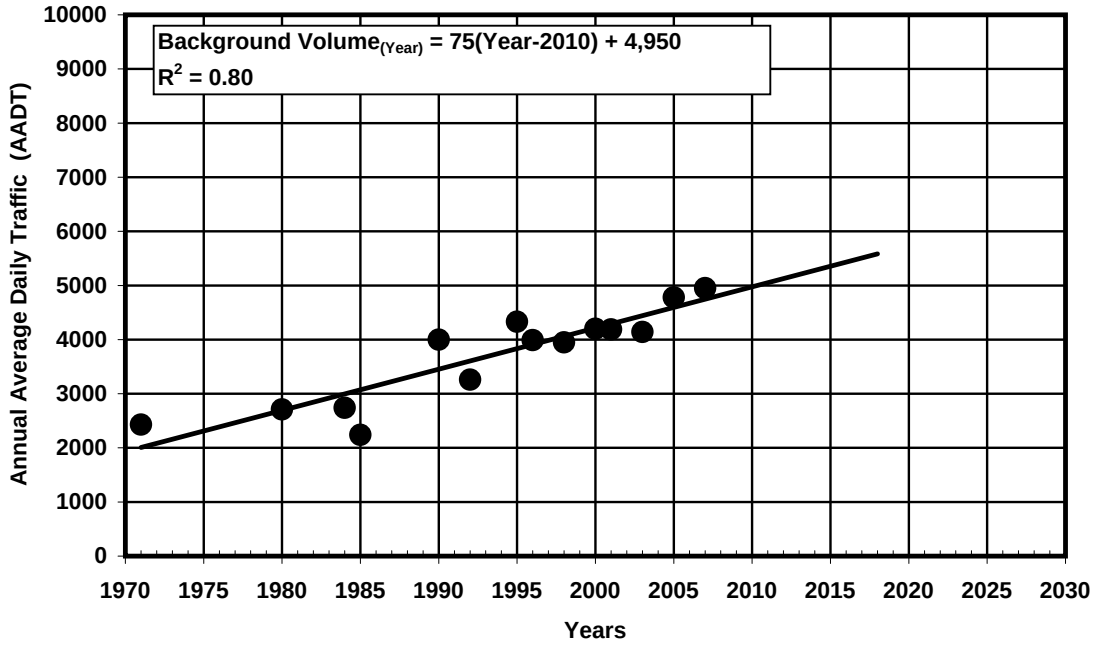


Table A-4 - Traffic Growth Trend on Trunk 3 - West of Hubbards Beach

Year	AADT
1975	1890
1976	2130
1978	2440
1982	2870
1983	2660
1985	2180
1990	3110
1992	3220
1996	3160
1998	3340
2000	3070
2001	3480
2003	3210
2005	3770
2007	2350
2009	2040

VC Count 5% trucks

Source: Nova Scotia Department of Transportation & Infrastructure Renewal
Numbers in the shaded area have note been included in the analysis
Annual Growth Rate is 1.3% based on projected 2010 AADT

Figure A-4 - Volume Growth Trend Trunk 3 - Section 045 (West of Hubbards Beach Area)

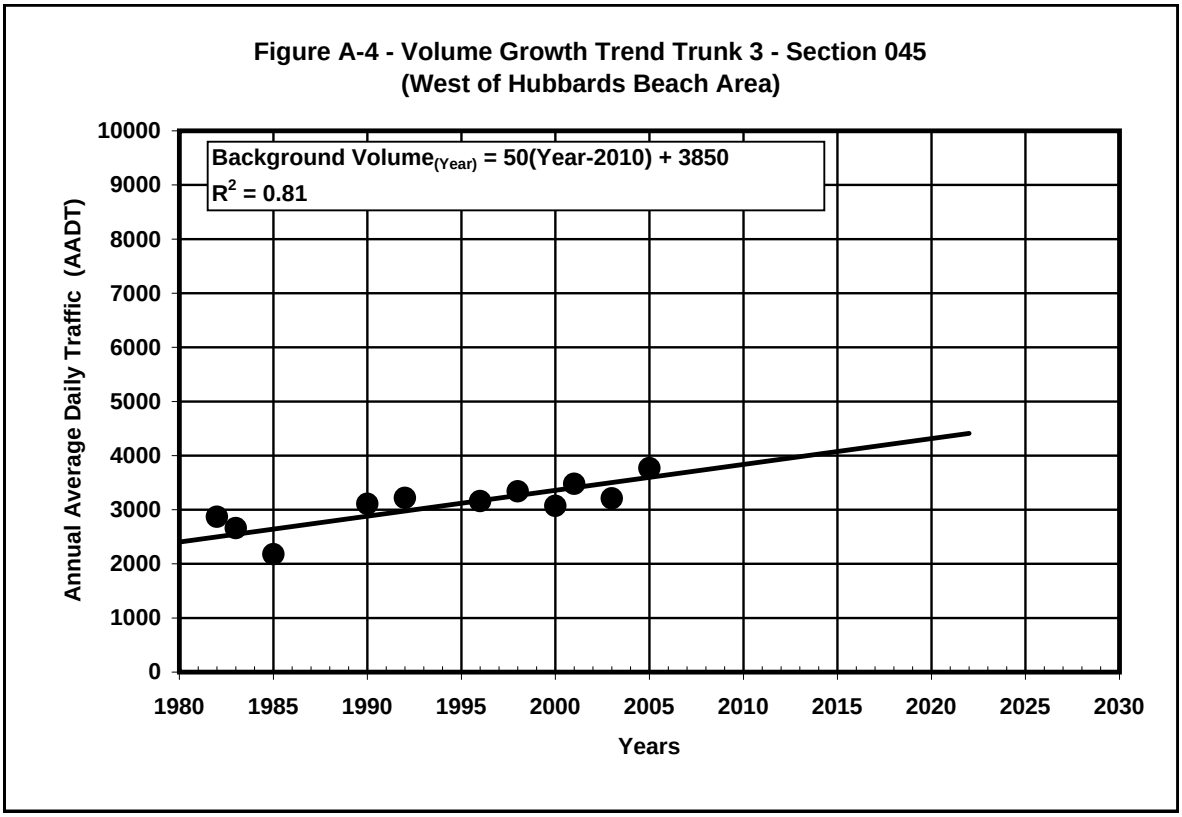


Table A-5E - Eastbound Hourly Volumes - Highway 103 - September 24 to 30, 2009
(Permanent Counter - Halifax / Lunenburg County Line)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	11	10	15	12	25	29	28	19	15
2	7	11	7	14	12	17	18	12	10
3	14	10	7	9	10	13	12	11	10
4	16	11	15	11	10	9	8	11	13
5	39	35	30	41	27	23	16	30	34
6	196	204	200	216	186	74	28	158	200
7	455	462	489	464	435	112	51	353	461
8	398	391	380	378	387	187	102	318	387
9	344	367	369	358	343	214	128	303	356
10	373	359	355	372	415	331	256	352	375
11	342	299	329	345	408	394	373	356	345
12	295	323	309	323	392	353	455	350	328
13	305	262	268	300	375	323	478	330	302
14	287	267	299	299	382	372	539	349	307
15	305	272	311	328	383	361	568	361	320
16	263	335	333	379	401	409	605	389	342
17	283	322	377	360	419	444	546	393	352
18	257	267	363	336	382	415	542	366	321
19	155	174	217	232	243	308	444	253	204
20	130	161	186	154	180	324	344	211	162
21	94	95	114	117	118	232	226	142	108
22	90	85	80	76	82	125	79	88	83
23	37	40	48	47	53	75	51	50	45
24	10	16	23	27	37	45	22	26	23
TOTALS	4706	4778	5124	5198	5705	5189	5919	5231	5102

Table A-5 - Two-Way Hourly Volumes - Highway 103 - September 24 to 30, 2009
(Permanent Counter - Halifax / Lunenburg County Line)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	52	43	42	46	59	67	92	57	48
2	23	24	21	38	43	37	38	32	30
3	26	26	23	24	30	25	30	26	26
4	25	21	24	16	15	16	13	19	20
5	55	48	48	59	47	34	20	44	51
6	244	249	254	262	230	96	41	197	248
7	573	577	599	585	544	179	81	448	576
8	657	645	623	621	606	358	252	537	630
9	544	629	611	611	601	459	277	533	599
10	592	608	642	634	687	741	506	630	633
11	561	532	630	595	743	878	699	663	612
12	512	544	556	599	700	826	838	654	582
13	534	499	529	555	719	847	834	645	567
14	583	554	583	594	773	886	925	700	617
15	612	563	617	636	916	786	958	727	669
16	666	727	719	816	978	816	1009	819	781
17	835	899	957	936	1110	835	912	926	947
18	759	791	887	890	1112	763	889	870	888
19	446	493	579	647	779	638	729	616	589
20	317	376	436	429	553	558	592	466	422
21	277	254	299	318	369	444	415	339	303
22	217	223	242	231	277	292	205	241	238
23	108	126	144	126	181	199	114	143	137
24	47	54	80	89	139	150	68	90	82
TOTALS	9265	9505	10145	10357	12211	10930	10537	10421	10297

Source: NSITR - AADT is 9540

Table A-5W - Westbound Hourly Volumes - Highway 103 - September 24 to 30, 2009
(Permanent Counter - Halifax / Lunenburg County Line)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	41	33	27	34	34	38	64	39	34
2	16	13	14	24	31	20	20	20	20
3	12	16	16	15	20	12	18	16	16
4	9	10	9	5	5	7	5	7	8
5	16	13	18	18	20	11	4	14	17
6	48	45	54	46	44	22	13	39	47
7	118	115	110	121	109	67	30	96	115
8	259	254	243	243	219	171	150	220	244
9	200	262	242	253	258	245	149	230	243
10	219	249	287	262	272	410	250	278	258
11	219	233	301	250	335	484	326	307	268
12	217	221	247	276	308	473	383	304	254
13	229	237	261	255	344	524	356	315	265
14	296	287	284	295	391	514	386	350	311
15	307	291	306	308	533	425	390	366	349
16	403	392	386	437	577	407	404	429	439
17	552	577	580	576	691	391	366	533	595
18	502	524	524	554	730	348	347	504	567
19	291	319	362	415	536	330	285	363	385
20	187	215	250	275	373	234	248	255	260
21	183	159	185	201	251	212	189	197	196
22	127	138	162	155	195	167	126	153	155
23	71	86	96	79	128	124	63	92	92
24	37	38	57	62	102	105	46	64	59
TOTALS	4559	4727	5021	5159	6506	5741	4618	5190	5194

Figure A-5 - Highway 103 - Halifax / Lunenburg County Line
Average Weekday Hourly Volumes - September 2009

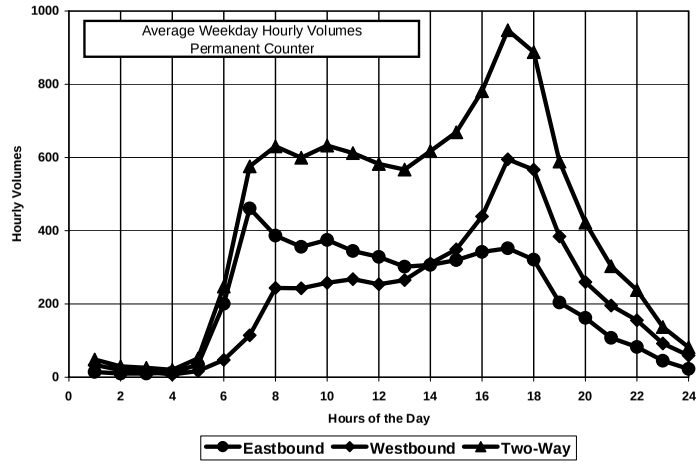


Table A-6E - Eastbound Hourly Volumes - Highway 103 - September 23 to 30, 2009
(West of EXIT 6 - Hubbards Interchange)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-23/30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	13	9	19	11	25	30	28	19	15
2	7	12	9	11	15	15	13	12	11
3	16	8	6	6	11	15	8	10	9
4	11	7	10	6	6	11	5	8	8
5	30	19	19	29	17	15	12	20	23
6	99	113	112	98	92	53	23	84	103
7	316	313	307	324	303	89	35	241	313
8	317	301	318	320	283	145	71	251	308
9	302	303	300	270	297	192	94	251	294
10	313	309	316	341	354	281	222	305	327
11	306	278	291	303	348	346	306	311	305
12	281	299	306	312	375	337	399	330	315
13	264	246	254	262	327	280	405	291	271
14	273	236	260	283	346	323	469	313	280
15	286	242	273	303	334	330	498	324	288
16	252	302	356	333	389	352	575	366	326
17	268	322	356	361	405	405	484	372	342
18	272	283	353	334	378	388	526	362	324
19	185	182	222	253	246	335	398	260	218
20	139	155	148	158	188	267	339	199	158
21	95	127	97	107	119	271	235	150	109
22	96	81	97	80	92	136	91	96	89
23	47	50	45	65	53	74	57	56	52
24	15	17	26	22	44	38	23	26	25
TOTALS	4203	4214	4500	4592	5047	4728	5316	4657	4511

Table A-6 - Two-Way Hourly Volumes - Highway 103 - September 23 to 30, 2009
(West of EXIT 6 - Hubbards Interchange)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-23/30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	40	36	57	40	59	100	67	57	46
2	17	25	25	34	44	40	30	31	29
3	30	20	23	21	27	30	25	25	24
4	19	14	18	11	14	17	10	15	15
5	43	27	25	39	31	22	14	29	33
6	135	153	157	131	125	71	31	115	140
7	420	401	416	425	407	144	63	325	414
8	554	522	521	548	466	269	145	432	522
9	535	571	563	539	557	428	236	490	553
10	525	569	588	602	614	599	407	558	580
11	522	510	522	532	656	768	608	588	548
12	485	540	550	558	668	786	728	616	560
13	482	451	483	515	644	730	739	578	515
14	522	488	517	544	689	814	817	627	552
15	572	491	535	577	772	749	851	650	589
16	579	612	685	663	894	708	953	728	687
17	704	745	835	858	994	760	827	818	827
18	714	746	814	788	1002	694	877	805	813
19	436	494	527	610	751	617	681	588	564
20	320	362	289	419	557	496	585	433	389
21	232	264	277	288	335	455	420	324	279
22	224	206	251	230	275	275	219	240	237
23	120	141	123	135	176	186	130	144	139
24	55	58	81	81	136	133	68	87	82
TOTALS	8285	8446	8882	9188	10893	9891	9531	9302	9139

Source: NSITR - AADT is 9540

Table A-6W - Westbound Hourly Volumes - Highway 103 - September 23 to 30, 2009
(West of EXIT 6 - Hubbards Interchange)

Hour	Days of the Week							Hourly Averages	
	Mon-28	Tue-29	Wed-23/30	Thu-24	Fri-25	Sat-26	Sun-27	Week	Weekday
0									
1	27	27	38	29	34	70	39	38	31
2	10	13	16	23	29	25	17	19	18
3	14	12	17	15	16	15	17	15	15
4	8	7	8	5	8	6	5	7	7
5	13	8	6	10	14	7	2	9	10
6	36	40	45	33	33	18	8	30	37
7	104	88	109	101	104	55	28	84	101
8	237	221	203	228	183	124	74	181	214
9	233	268	263	269	260	236	142	239	259
10	212	260	272	261	260	318	185	253	253
11	216	232	231	229	308	422	302	277	243
12	204	241	244	246	293	449	329	287	246
13	218	205	229	253	317	450	334	287	244
14	249	252	257	261	343	491	348	314	272
15	286	249	262	274	438	419	353	326	302
16	327	310	329	330	505	356	378	362	360
17	436	423	479	497	589	355	343	446	485
18	442	463	461	454	624	306	351	443	489
19	251	312	305	357	505	282	283	328	346
20	181	207	141	261	369	229	246	233	232
21	137	137	180	181	216	184	185	174	170
22	128	125	154	150	183	139	128	144	148
23	73	91	78	70	123	112	73	89	87
24	40	41	55	59	92	95	45	61	57
TOTALS	4082	4232	4382	4596	5846	5163	4215	4645	4628

Figure A-6 - Highway 103 - West of EXIT 6 (Hubbards)
Average Weekday Hourly Volumes - September 2009

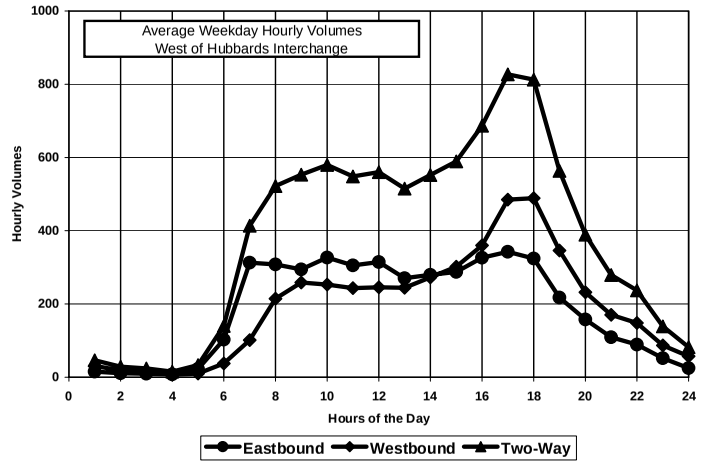


Table A-7 - Two-Way Hourly Volumes - Trunk 3, 3.0 km west of Route 333 Tantallon
(June 2 to 9, 2005)

Hour	Days of the Week							Hourly Average	
	Mon-06	Tue-07	Wed-08	Thu-09/02	Fri-03	Sat-04	Sun-05	Week	Weekday
0									
1	17	19	20	23	23	46	34	26	20
2	8	9	3	20	6	23	20	13	9
3	5	7	12	7	8	11	11	9	8
4	11	6	8	14	10	11	12	10	10
5	15	12	8	13	16	8	10	12	13
6	46	32	42	41	37	17	9	32	40
7	185	180	174	175	166	55	28	138	176
8	346	318	321	341	318	160	56	266	329
9	296	293	317	336	306	202	123	268	310
10	281	235	254	269	307	310	168	261	269
11	246	196	258	237	249	417	266	267	237
12	292	233	251	267	292	444	310	298	267
13	290	238	314	294	333	521	369	337	294
14	283	266	269	292	350	490	389	334	292
15	290	230	322	304	372	489	384	342	304
16	300	274	360	366	390	476	395	366	338
17	369	356	424	428	479	455	386	414	411
18	425	375	469	396	409	389	332	399	415
19	365	316	449	437	384	305	276	362	390
20	294	210	296	334	292	290	215	276	285
21	221	172	257	271	236	196	180	219	231
22	168	132	176	201	193	137	109	159	174
23	88	74	101	125	114	110	53	95	100
24	41	39	49	48	69	72	18	48	49
TOTALS	4882	4222	5154	5239	5359	5634	4153	4951	4971

Source: NSTIR

Estimated 2005 Annual Average Daily Traffic (AADT) volume is 4780 vehicles per day.

Estimated Weekday Average Hourly Volumes for 2010 (Figure A-7) were produced using 2005 volumes (Table A-7) and 1.5% annual growth rate.

Figure A-7 - Trunk 3, 3.0 Km West of Route 333
Estimated Weekday Average Hourly Volumes - June 2010

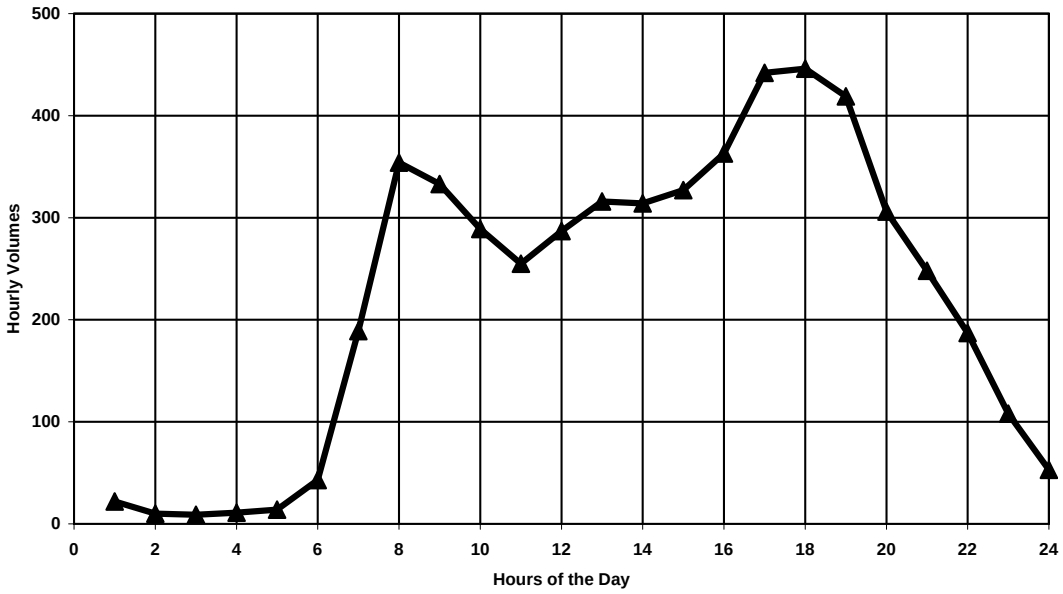


Table A-8 - Two-Way Hourly Volumes - Trunk 3, just West of Hubbards Beach Resort Area (June 2 to 9, 2005)

Hour	Days of the Week							Hourly Average	
	Mon-06	Tue-07	Wed-08	Thu-09/02	Fri-03	Sat-04	Sun-05	Week	Weekday
0									
1	4	7	6	5	14	15	20	10	7
2	3	5	3	7	10	9	17	8	6
3	1	2	3	0	2	8	16	5	2
4	3	2	3	2	2	8	23	6	2
5	8	7	5	7	6	4	13	7	7
6	22	15	13	22	16	7	11	15	18
7	71	61	77	74	64	40	16	58	69
8	171	173	178	161	168	123	50	146	170
9	195	201	208	225	160	219	111	188	198
10	203	218	202	208	223	332	174	223	211
11	220	202	221	214	264	389	282	256	224
12	230	220	249	233	260	429	348	281	238
13	273	225	232	243	310	443	305	290	257
14	265	240	243	249	304	448	357	301	260
15	241	248	265	251	352	438	312	301	271
16	251	217	294	288	321	484	327	312	274
17	292	257	271	277	364	439	292	313	292
18	254	271	254	283	331	342	255	284	279
19	225	245	302	293	301	217	249	262	273
20	190	186	224	280	262	247	150	220	228
21	150	142	217	212	224	203	140	184	189
22	114	104	127	159	175	120	88	127	136
23	45	45	50	64	80	79	39	57	57
24	17	17	32	30	53	44	8	29	30
TOTALS	3448	3310	3679	3787	4266	5087	3603	3883	3698

Source: NSTIR

Estimated 2005 Annual Average Daily Traffic (AADT) volume is 3770 vehicles per day.

Estimated Average Weekday Hourly Volumes (Figure A-8) were produced using 2005 values (Table A-8) and 1.25% annual growth.

Figure A-8 - Trunk 3, just West of Hubbards Beach Resort Area
Estimated Weekday AverageHourly Volumes - June 2010

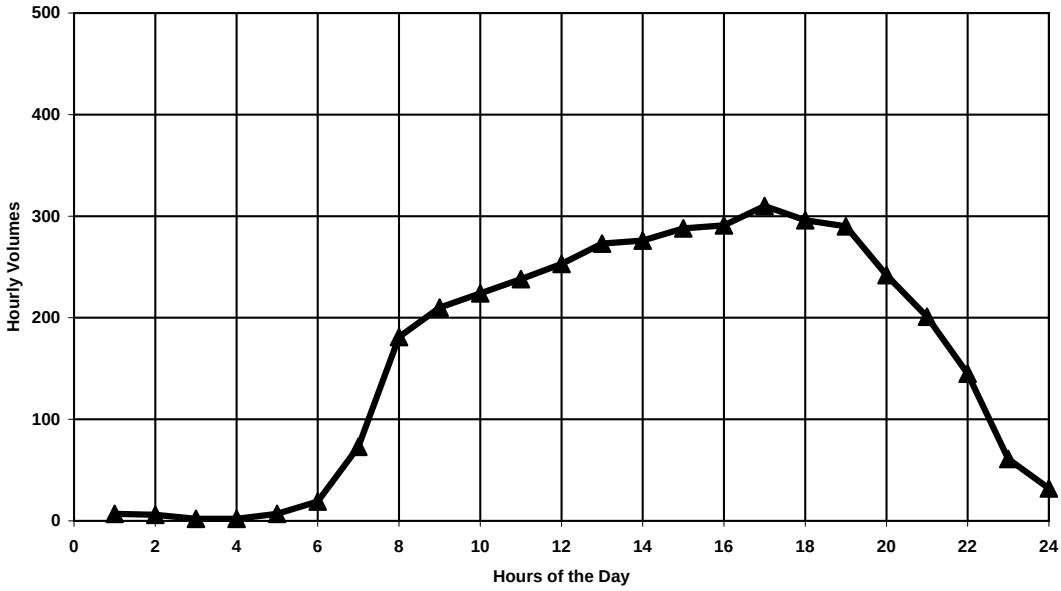
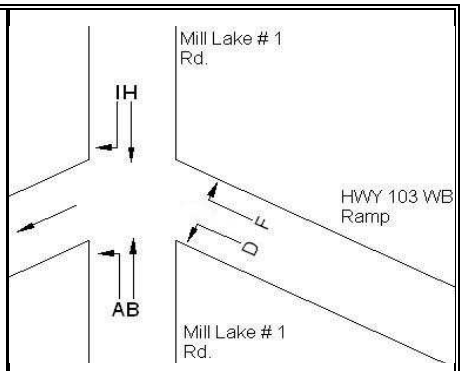


Table A-10

Mill Lake Number 1 Road
@
HWY 103 WB Ramp

Hubbards, Nova Scotia

Friday, June 11, 2010

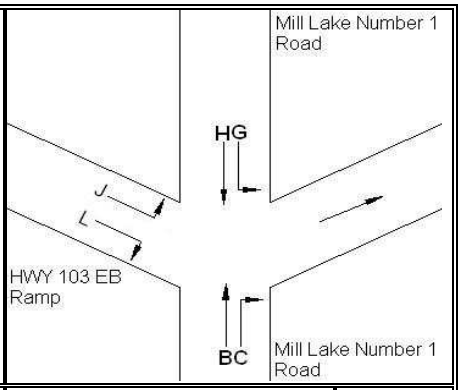


Time		Mill Lake # 1 Rd. Northbound Approach		HWY 103 WB Ramp Westbound Approach		Mill Lake # 1 Rd. Southbound Approach		Total Vehicles
		A	B	D	F	H	I	
07:00	07:15	5	2	5	1	2	0	15
07:15	07:30	5	0	6	0	3	0	14
07:30	07:45	16	0	8	0	2	0	26
07:45	08:00	15	0	5	0	1	0	21
08:00	08:15	6	5	6	0	4	0	21
08:15	08:30	19	1	3	0	2	2	27
08:30	08:45	7	0	7	0	1	0	15
08:45	09:00	8	2	8	0	4	0	22
AM Peak Hour		**56**	**6**	**22**	**0**	**9**	**2**	**95**
16:00	16:15	15	6	26	0	1	1	49
16:15	18:30	11	4	18	0	2	0	35
16:30	16:45	19	4	16	1	4	1	45
16:45	17:00	17	2	16	0	4	0	39
17:00	17:15	5	3	25	2	3	0	38
17:15	17:30	23	3	25	2	0	0	53
17:30	17:45	12	3	29	2	0	1	47
17:45	18:00	13	2	24	2	0	0	41
PM Peak Hour		**64**	**12**	**82**	**5**	**11**	**1**	**175**

Table A-11

Mill Lake Number 1 Rd.
@
HWY 103 EB Ramp

Hubbards, Nova Scotia
Friday June 11, 2010



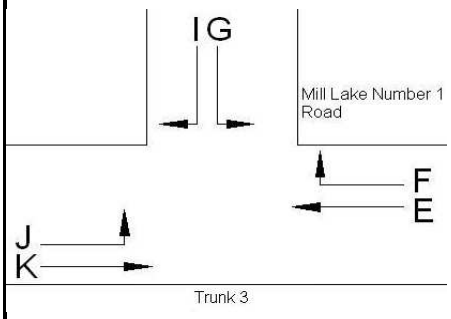
Time		Mill Lake Number 1 Rd. Northbound Approach		Mill Lake Number 1 Rd. Southbound Approach		HWY 103 EB Ramp Eastbound Approach		Total Vehicles
		B*	C	G	H*	J	L	
07:00	07:15		16	0		2	7	25
07:15	07:30		10	1		0	3	14
07:30	07:45		13	2		0	9	24
07:45	08:00		11	0		1	8	20
08:00	08:15		15	0		0	7	22
08:15	08:30		10	0		0	5	15
08:30	08:45		13	0		0	7	20
08:45	09:00		8	0		0	11	19
AM Peak Hour**		**61**	**49**	**2**	**29**	**1**	**29**	**171**
16:00	16:15		5	2		0	11	18
16:15	18:30		14	3		0	11	28
16:30	16:45		15	0		1	5	21
16:45	17:00		8	0		1	19	28
17:00	17:15		9	1		0	7	17
17:15	17:30		7	3		1	12	23
17:30	17:45		6	1		0	9	16
17:45	18:00		10	0		0	7	17
PM Peak Hour**		**73**	**39**	**4**	**89**	**3**	**43**	**251**

Notes:
* Volume Calculated from Adjacent Intersection
** Peak Hour of Adjacent Intersection

Table A-12

Mill Lake Number 1 Road
@
Trunk 3

Hubbards, Nova Scotia
Friday June 11, 2010

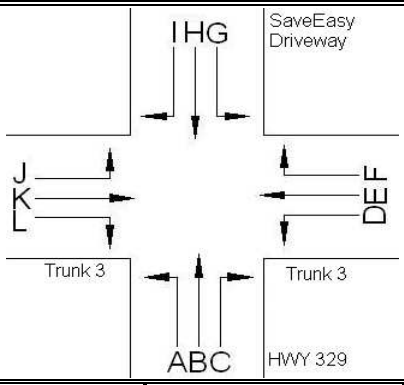


Time		Trunk 3 Westbound Approach		Mill Lake Number 1 Rd. Southbound Approach		Trunk 3 Eastbound Approach		Total Vehicles
		E	F	G	I	J	K	
07:00	07:15	3	22	13	2	6	11	57
07:15	07:30	8	13	11	0	6	6	44
07:30	07:45	12	26	15	6	3	19	81
07:45	08:00	6	28	9	0	1	16	60
08:00	08:15	15	27	20	1	0	16	79
08:15	08:30	17	25	9	1	3	11	66
08:30	08:45	8	19	14	2	5	19	67
08:45	09:00	14	19	20	2	0	15	70
AM Peak Hour		**50**	**106**	**53**	**8**	**7**	**62**	**286**
16:00	16:15	30	25	35	9	5	23	127
16:15	18:30	30	23	31	5	6	19	114
16:30	16:45	19	30	24	2	3	30	108
16:45	17:00	19	25	31	8	3	24	110
17:00	17:15	27	17	32	3	4	16	99
17:15	17:30	27	19	37	3	4	17	107
17:30	17:45	33	20	32	7	2	29	123
17:45	18:00	29	23	30	4	4	22	112
PM Peak Hour		**106**	**81**	**132**	**21**	**13**	**86**	**439**

Table A-13

Highway 329
@
Trunk 3

Hubbards Nova Scotia
Friday June 11, 2010

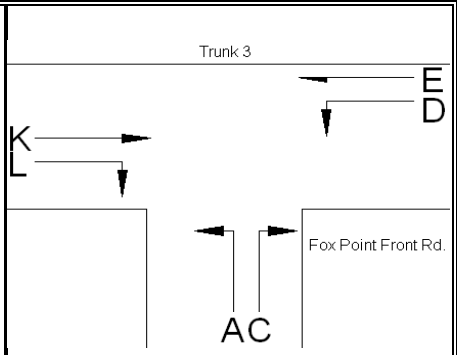


Time		HWY 329 Northbound Approach			Trunk 3 Westbound Approach			Save Easy Driveway Southbound Approach			Trunk 3 Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	7	3	4	3	10	2	0	0	3	1	17	6	56
07:15	07:30	6	2	5	2	14	0	1	3	0	4	13	6	56
07:30	07:45	17	2	4	2	23	1	1	1	1	3	19	11	85
07:45	08:00	11	3	4	0	17	0	1	1	2	1	18	11	69
08:00	08:15	14	2	3	5	25	0	0	3	5	11	15	12	95
08:15	08:30	13	2	5	3	26	2	0	2	1	2	11	3	70
08:30	08:45	11	4	7	4	16	1	0	3	3	3	24	9	85
08:45	09:00	12	10	3	2	17	1	3	2	6	4	16	8	84
AM Peak Hour		**50**	**18**	**18**	**14**	**84**	**4**	**3**	**10**	**15**	**20**	**66**	**32**	**334**
16:00	16:15	5	7	8	7	35	1	4	4	7	6	26	17	127
16:15	16:30	18	9	4	6	30	3	4	13	14	15	16	19	151
16:30	16:45	8	7	7	10	32	1	4	12	12	15	26	21	155
16:45	17:00	11	7	4	6	25	2	4	17	4	12	29	13	134
17:00	17:15	9	9	4	7	25	3	0	13	17	13	29	10	139
17:15	17:30	9	5	7	6	30	0	3	16	7	11	22	12	128
17:30	17:45	10	4	5	3	31	0	4	13	10	14	32	17	143
17:45	18:00	8	11	0	1	35	2	2	13	4	10	20	19	125
PM Peak Hour		**46**	**32**	**19**	**29**	**112**	**9**	**12**	**55**	**47**	**55**	**100**	**63**	**579**

Table A-14

Trunk 3
@
Fox Point Front Road

Hubbards, Nova Scotia
Friday June 11, 2009

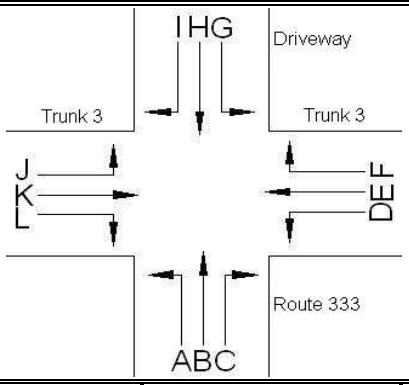


Time		Fox Point Front Rd. Northbound Approach		Trunk 3 Westbound Approach		Trunk 3 Eastbound Approach		Total Vehicles
		A	C	D	E	K	L	
07:00	07:15	1	5	2	15	22	1	46
07:15	07:30	1	5	1	16	17	0	40
07:30	07:45	0	5	6	24	19	1	55
07:45	08:00	0	9	6	21	18	0	54
08:00	08:15	1	13	4	30	26	0	74
08:15	08:30	2	7	5	36	23	2	75
08:30	08:45	2	9	5	22	32	0	70
08:45	09:00	3	6	7	24	24	0	64
AM Peak Hour		**3**	**34**	**21**	**111**	**86**	**3**	**283**
16:00	16:15	1	8	7	43	35	2	96
18:15	16:30	2	9	10	38	39	0	98
16:30	16:45	2	10	15	47	34	2	110
16:45	17:00	3	4	8	40	50	0	105
17:00	17:15	2	8	10	46	35	0	101
17:15	17:30	3	4	7	43	45	2	104
17:30	17:45	1	6	10	48	46	0	111
17:45	18:00	0	7	8	56	40	0	111
PM Peak Hour		**10**	**26**	**40**	**176**	**164**	**4**	**427**

Table A-15

Trunk 3
@
Route 333

Upper Tantallon, Nova Scotia
Thursday June 17, 2010

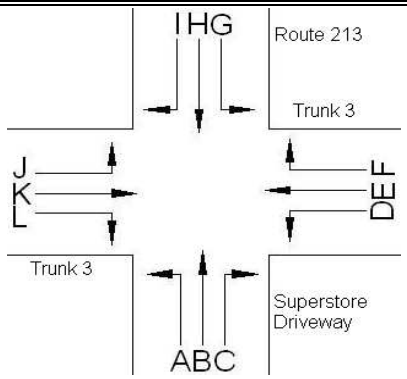


Time		Route 333 Northbound Approach			Trunk 3 Westbound Approach			Driveway Southbound Approach			Trunk 3 Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	4	3	76	20	16	0	3	0	1	1	98	0	222
07:15	07:30	3	3	98	30	22	8	1	1	1	2	86	6	261
07:30	07:45	8	5	73	36	33	11	7	3	1	5	81	5	268
07:45	08:00	12	3	66	29	45	8	7	0	0	12	100	4	286
08:00	08:15	14	3	56	29	48	8	9	2	3	8	88	14	282
08:15	08:30	3	4	72	31	36	5	9	6	1	5	104	2	278
08:30	08:45	3	6	69	24	17	14	9	2	1	6	76	6	233
08:45	09:00	9	7	89	36	42	18	12	2	3	2	80	1	301
AM Peak Hour		**32**	**16**	**263**	**113**	**146**	**35**	**34**	**10**	**5**	**31**	**368**	**26**	**1114**
16:00	16:15	5	2	34	72	68	27	16	7	5	6	47	5	294
16:15	16:30	10	5	46	64	79	33	24	4	6	4	65	8	348
16:30	16:45	9	3	50	77	87	32	30	10	6	4	53	12	373
16:45	17:00	10	1	65	83	86	23	22	10	4	8	67	9	388
17:00	17:15	14	6	36	97	125	26	27	4	16	8	48	6	413
17:15	17:30	5	2	42	96	92	15	30	5	3	6	54	10	360
17:30	17:45	2	4	42	77	118	17	28	7	4	2	46	11	358
17:45	18:00	2	4	48	87	116	21	23	6	6	7	40	7	367
PM Peak Hour		**38**	**12**	**193**	**353**	**390**	**96**	**109**	**29**	**29**	**26**	**222**	**37**	**1534**

Table A-16

Trunk 3
@
Route 213

Upper Tantallon, Nova Scotia
Thursday June 17, 2010

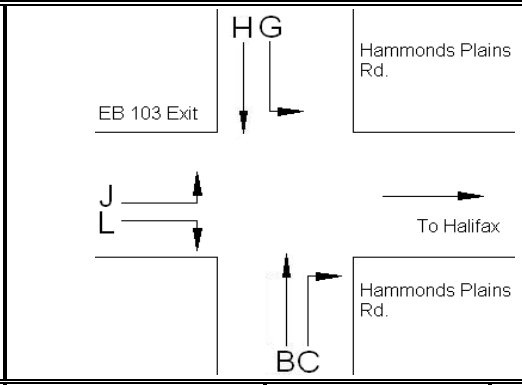


Time		Superstore Driveway Northbound Approach			Trunk 3 Westbound Approach			Route 213 Southbound Approach			Trunk 3 Eastbound Approach			Total Vehicles
		A	B	C	D	E	F	G	H	I	J	K	L	
07:00	07:15	0	2	1	3	7	11	8	1	36	153	22	1	245
07:15	07:30	0	2	3	1	8	16	10	3	51	157	27	0	278
07:30	07:45	0	5	2	0	18	14	21	6	63	129	15	0	273
07:45	08:00	0	1	1	1	24	23	22	4	63	142	29	0	310
08:00	08:15	1	5	1	5	24	29	13	5	43	116	31	1	274
08:15	08:30	1	5	5	1	7	13	33	11	57	170	23	1	327
08:30	08:45	3	5	3	6	6	17	16	9	49	134	18	0	266
08:45	09:00	0	12	5	2	17	30	29	15	66	116	26	2	320
AM Peak Hour		**5**	**27**	**14**	**14**	**54**	**89**	**91**	**40**	**215**	**536**	**98**	**4**	**1187**
16:00	16:15	7	12	14	13	23	26	23	19	122	95	18	3	375
16:15	16:30	10	14	8	11	30	20	27	29	131	88	27	4	399
16:30	16:45	10	18	10	12	37	28	36	27	128	93	21	6	426
16:45	17:00	13	17	11	13	30	31	25	27	145	114	37	1	464
17:00	17:15	26	26	8	4	41	25	27	28	160	87	25	1	458
17:15	17:30	4	26	6	10	31	27	38	23	147	97	24	1	434
17:30	17:45	13	16	4	12	40	26	38	27	168	88	24	3	459
17:45	18:00	15	22	9	5	30	19	33	26	164	79	26	4	432
PM Peak Hour		**56**	**85**	**29**	**39**	**142**	**109**	**128**	**105**	**620**	**386**	**110**	**6**	**1815**

Table A-17

Hammonds Plains Road
@
Highway 103 EB Exit

Upper Tantallon, Nova Scotia
Tuesday June 22, 2010



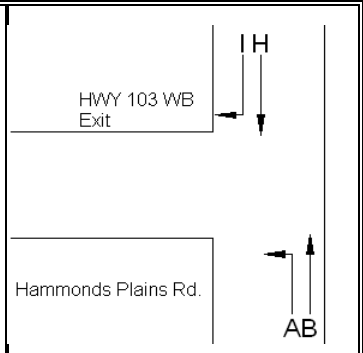
Time		Hammonds Plains Rd. Northbound Approach		Driveway Southbound Approach		Trunk 3 Eastbound Approach		Total Vehicles
		B*	C	G	H*	J	L	
07:00	07:15		99	166		28	3	296
07:15	07:30		77	126		29	4	236
07:30	07:45		80	128		28	6	242
07:45	08:00		86	109		33	3	231
08:00	08:15		84	109		29	2	224
08:15	08:30		88	71		29	5	193
08:30	08:45		72	92		31	8	203
08:45	09:00		66	55		27	4	152
AM Peak Hour **		**417**	**310**	**327**	**590**	**116**	**19**	**1779**
16:00	16:15		41	61		41	7	150
16:15	16:30		39	47		25	4	115
16:30	16:45		32	62		45	4	143
16:45	17:00		53	39		59	5	156
17:00	17:15		30	44		25	6	105
17:15	17:30		48	79		45	9	181
17:30	17:45		39	53		30	4	126
17:45	18:00		53	49		31	7	140
PM Peak Hour **		**533**	**170**	**215**	**959**	**159**	**24**	**2060**

Notes:
* Volume Calculated from Adjacent Intersection
** Peak Hour of Adjacent Intersection

Table A-18

Hammonds Plains Road
@
HWY 103 WB Exit 5 On Ramp

Upper Tantallon, Nova Scotia
Tuesday June 22, 2010



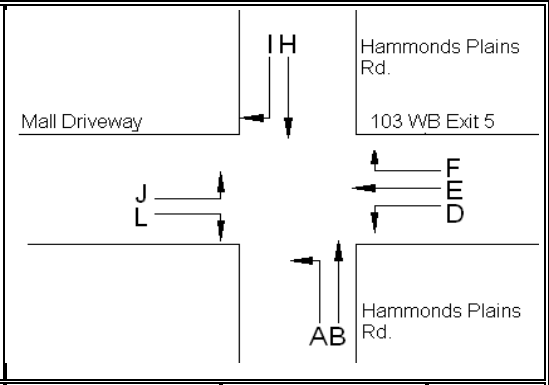
Time		Hammonds Plains Rd. Northbound Approach		Hammonds Plains Rd. Southbound Approach		Total Vehicles
		A	B	H*	I	
07:00	07:15	3	110		37	150
07:15	07:30	3	133		30	166
07:30	07:45	5	127		25	157
07:45	08:00	3	142		29	174
08:00	08:15	10	114		25	149
08:15	08:30	3	137		27	167
08:30	08:45	4	137		30	171
08:45	09:00	7	121		22	150
AM Peak Hour **		**24**	**509**	**917**	**104**	**1554**
16:00	16:15	10	187		39	236
16:15	16:30	6	153		51	210
16:30	16:45	6	155		52	213
16:45	17:00	6	194		44	244
17:00	17:15	10	179		45	234
17:15	17:30	10	148		46	204
17:30	17:45	5	140		55	200
17:45	18:00	5	126		52	183
PM Peak Hour **		**31**	**661**	**1174**	**190**	**2056**

Notes:
* Volume Calculated from Adjacent Intersection
** Peak Hour of Adjacent Intersection

Table A-19

Hammonds Plains Road
@
HWY 103 WB Exit 5 Off Ramp

Upper Tantallon, Nova Scotia
Tuesday June 22, 2010



Time		Hammonds Plains Rd. Northbound Approach		103 WB Exit 5 Westbound Approach			Hammonds Plains Rd. Southbound Approach		Mall Driveway Eastbound Approach		Total Vehicles
		A	B *	D	E	F	H	I	J	L	
07:00	07:15	38		13	15	15	163	20	7	68	339
07:15	07:30	53		20	15	34	147	11	8	75	363
07:30	07:45	44		30	20	28	148	9	6	57	342
07:45	08:00	35		25	11	15	108	12	2	33	241
08:00	08:15	58		30	17	28	180	13	7	90	423
08:15	08:30	47		37	5	13	162	4	5	59	332
08:30	08:45	48		41	18	14	130	7	8	62	328
08:45	09:00	55		44	15	20	126	10	6	60	336
AM Peak Hour		**208**	**301**	**152**	**55**	**75**	**598**	**34**	**26**	**271**	**1720**
16:00	16:15	60		57	57	50	140	8	27	116	515
16:15	16:30	44		68	67	77	136	7	29	105	533
16:30	16:45	53		61	47	91	134	13	17	110	526
16:45	17:00	50		94	63	95	131	14	39	106	592
17:00	17:15	49		69	43	96	140	10	14	99	520
17:15	17:30	53		100	71	118	151	12	30	124	659
17:30	17:45	37		90	49	102	143	13	23	117	574
17:45	18:00	40		81	50	77	152	14	20	108	542
PM Peak Hour		**189**	**472**	**353**	**226**	**411**	**565**	**49**	**106**	**446**	**2817**

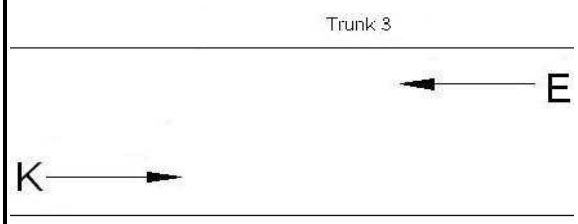
Notes:

* Volume Calculated from Adjacent Intersection

Table A-20

Trunk 3
@
Plate Match Location #2
near
Colwells By The Sea (Civic #9301)

Upper Tantallon, Nova Scotia
Thursday June 10, 2010

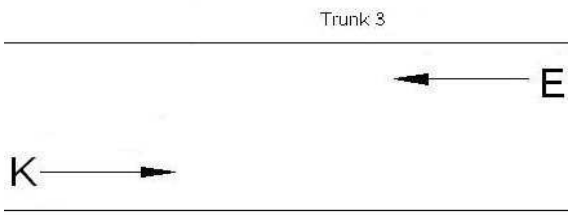


Time		Trunk 3 Westbound Approach	Trunk 3 Eastbound Approach	Total Vehicles
		E	K	
07:00	07:15	6	35	41
07:15	07:30	19	30	49
07:30	07:45	12	28	40
07:45	08:00	19	17	36
08:00	08:15	20	30	50
08:15	08:30	25	35	60
08:30	08:45	21	29	50
08:45	09:00	16	27	43
09:00	09:15	9	30	39
09:15	09:30	15	35	50
09:30	09:45	12	17	29
09:45	10:00	13	25	38
AM Peak Hour		**82**	**121**	**203**
15:30	15:45	31	37	68
15:45	16:00	38	24	62
16:00	16:15	33	35	68
16:15	16:30	63	27	90
16:30	16:45	35	35	70
16:45	17:00	41	35	76
17:00	17:15	56	33	89
17:15	17:30	60	28	88
17:30	17:45	48	32	80
17:45	18:00	55	30	85
18:00	18:15	50	29	79
18:15	18:30	49	22	71
PM Peak Hour		**219**	**123**	**342**

Table A-21

Trunk 3
@
Plate Match Location #3
near
St Andrew's - St Marks United Church (Civic #7628)

Upper Tantallon, Nova Scotia
Thursday June 10, 2010

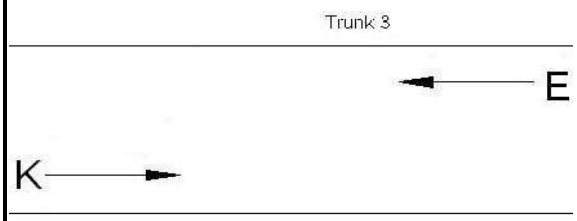


Time		Trunk 3 Westbound Approach	Trunk 3 Eastbound Approach	Total Vehicles
		E	K	
07:00	07:15	6	45	51
07:15	07:30	17	46	63
07:30	07:45	16	41	57
07:45	08:00	15	36	51
08:00	08:15	16	28	44
08:15	08:30	16	36	52
08:30	08:45	17	51	68
08:45	09:00	11	35	46
09:00	09:15	22	33	55
09:15	09:30	14	35	49
09:30	09:45	18	31	49
09:45	10:00	23	32	55
AM Peak Hour		**54**	**168**	**222**
15:30	15:45	43	44	87
15:45	16:00	53	34	87
16:00	16:15	42	42	84
16:15	16:30	64	43	107
16:30	16:45	55	37	92
16:45	17:00	46	38	84
17:00	17:15	76	27	103
17:15	17:30	54	34	88
17:30	17:45	60	29	89
17:45	18:00	66	32	98
18:00	18:15	56	30	86
18:15	18:30	37	27	64
PM Peak Hour		**241**	**145**	**386**

Table A-22

Trunk 3
@
Plate Match Location #4
near
La Maison D'Art (Civic #6785)

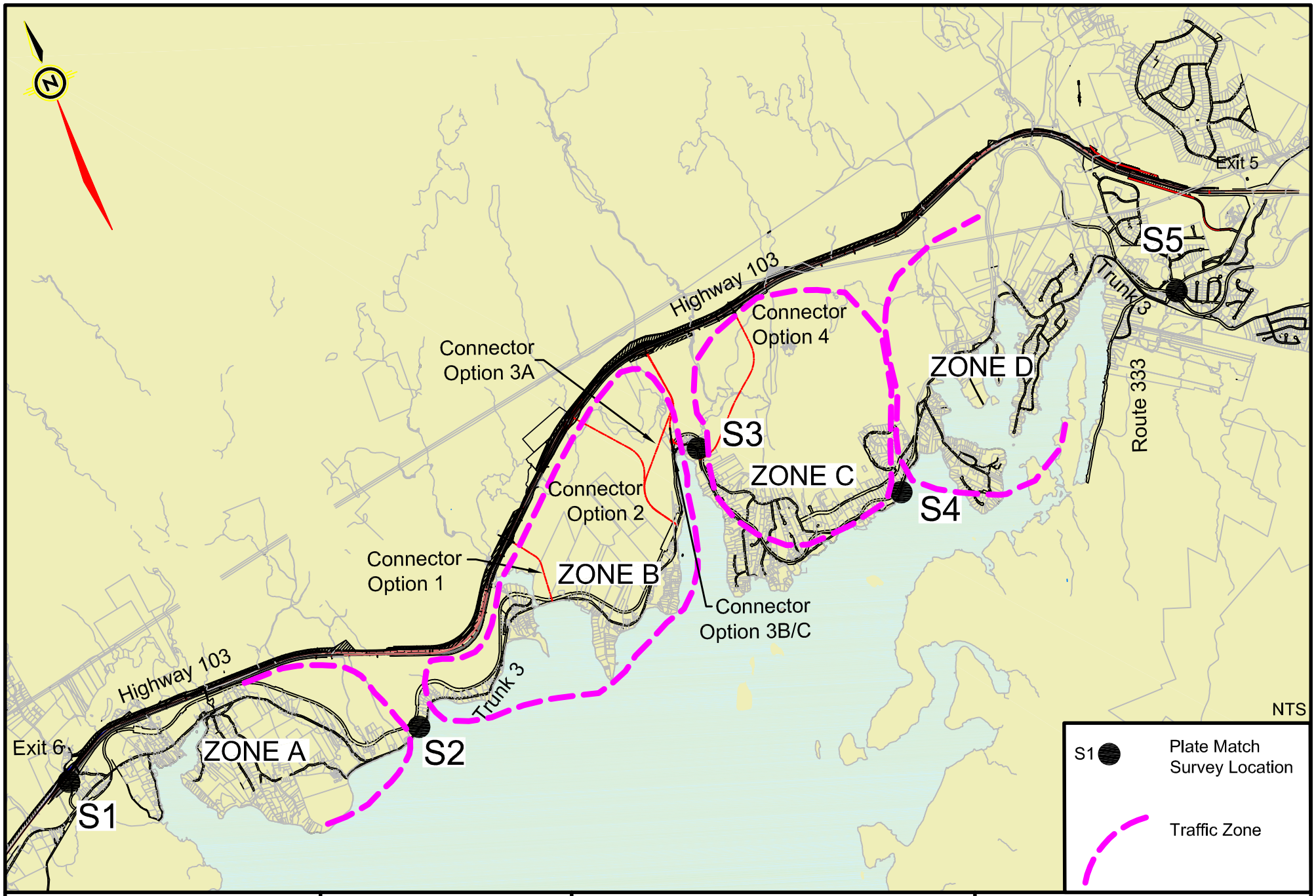
Upper Tantallon, Nova Scotia
Thursday June 10, 2010



Time		Trunk 3 Westbound Approach	Trunk 3 Eastbound Approach	Total Vehicles
		E	K	
07:00	07:15	5	71	76
07:15	07:30	17	61	78
07:30	07:45	20	62	82
07:45	08:00	13	64	77
08:00	08:15	23	50	73
08:15	08:30	23	63	86
08:30	08:45	22	61	83
08:45	09:00	16	51	67
09:00	09:15	26	51	77
09:15	09:30	24	42	66
09:30	09:45	24	47	71
09:45	10:00	31	44	75
AM Peak Hour		**81**	**238**	**319**
15:30	15:45	60	56	116
15:45	16:00	58	38	96
16:00	16:15	75	46	121
16:15	16:30	74	57	131
16:30	16:45	67	39	106
16:45	17:00	80	51	131
17:00	17:15	101	45	146
17:15	17:30	87	52	139
17:30	17:45	76	47	123
17:45	18:00	93	42	135
18:00	18:15	66	36	102
18:15	18:30	38	31	69
PM Peak Hour		**357**	**186**	**543**

Appendix B

License Plate Match Study



	terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure B-1
		License Plate Match Survey Locations And Traffic Zones	September 2010

Table B-1 - Plate Match Summary Projected Hourly Volumes Between Stations

Between Stations	2013 AM Peak Hour			2013 PM Peak Hour			2020 AM Peak Hour			2020 PM Peak Hour		
	EB	WB	Two-way	EB	WB	Two-way	EB	WB	Two-way	EB	WB	Two-way
S1 and S2	5	20	25	15	30	45	5	25	30	20	30	50
S1 and S3	5	15	20	15	20	35	5	15	20	15	20	35
S1 and S4	5	15	20	10	20	30	5	15	20	10	20	30
S2 and S5	30	50	80	70	110	180	35	55	90	75	115	190
S3 and S5	75	50	125	95	130	225	80	55	135	100	140	240
S4 and S5	140	55	195	120	225	345	150	60	210	135	240	375

Table B-2 - Trip Origin/Destination within Study Area

Trips Originating at or Destined to Exit 6

Trip Originating From or Destined to Area	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	0	5	0	10	0	10	5	10
C	0	0	5	0	0	0	5	0
D	5	15	10	20	5	15	10	20

Trips Originating at or Destined to Exit 5

Trip Originating From or Destined to Area	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	30	50	70	110	35	55	75	115
B	45	0	25	20	45	0	25	25
C	65	5	25	95	70	5	35	100

Table B-3 - Travel Distance and Time Comparison of Alternate Routes - Exit 5

Connector Option	Travel Distances			Travel Times		
	via Trunk 3 and Route 213 (km)	via Highway 103 (incl. Connector) (km)	Distance Saving (km)	via Trunk 3 and Route 213 (min)	via Highway 103 (incl. Connector) (min)	Estimated Time Savings (min)
Option 1	17.3	14.4	2.9	15.7	8.2	7.5
Option 2	14.4	13.6	0.8	13.1	8.1	5.0
Option 3A	14.4	12.7	1.7	13.1	7.8	5.3
Option 3B/C	13.4	11.4	2.0	12.2	6.7	5.5
Option 4	13.0	11.0	2.0	11.8	6.8	5.0

Table B-4 - Travel Distance and Time Comparison of Alternate Routes - Exit 6

Connector Option	Travel Distances			Travel Times		
	via Trunk 3 and Mill Lake Rd. (km)	via Highway 103 (incl. Connector) (km)	Distance Saving (km)	via Trunk 3 and Mill Lake Rd. (min)	via Highway 103 (incl. Connector) (min)	Estimated Time Savings (min)
Option 1	9.4	9.0	0.4	8.5	5.3	3.2
Option 2	12.2	12.1	0.1	11.1	7.3	3.8
Option 3A	12.2	14.1	-1.9	11.1	8.6	2.5
Option 3B/C	13.3	12.8	0.5	12.1	7.5	4.6
Option 4	13.8	15.1	-1.3	12.5	9.0	3.5

Notes:

- Assumed average travel speed of 70 km/h on connector roads
- Assumed average travel speed of 110 km/h on Highway 103
- Assumed average travel speed of 66 km/h on existing Trunk 3, Mill Lake Road, and Hammonds Plains Road

Table B-5 - Trips Originating or Destined to Study Area Diverted as a Result of Option 1

Trips Originating at or Destined to Exit 6									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	80%	0	5	0	10	0	10	5	10
C	100%	0	0	5	0	0	0	5	0
D	100%	5	15	10	20	5	15	10	20
Trips Originating at or Destined to Exit 5									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	100%	30	50	70	110	35	55	75	115
B	80%	35	0	20	15	35	0	20	20
C	0%	0	0	0	0	0	0	0	0

Table B-6 - Trips Originating or Destined to Study Area Diverted as a Result of Option 2

Trips Originating at or Destined to Exit 6									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	30%	0	0	0	5	0	5	0	5
C	100%	0	0	5	0	0	0	5	0
D	100%	5	15	10	20	5	15	10	20
Trips Originating at or Destined to Exit 5									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	100%	30	50	70	110	35	55	75	115
B	100%	45	0	25	20	45	0	25	25
C	0%	0	0	0	0	0	0	0	0

Table B-7 - Trips Originating or Destined to Study Area Diverted as a Result of Option 3A

Trips Originating at or Destined to Exit 6									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	0%	0	0	0	0	0	0	0	0
C	50%	0	0	5	0	0	0	5	0
D	50%	5	10	5	10	5	10	5	10
Trips Originating at or Destined to Exit 5									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	100%	30	50	70	110	35	55	75	115
B	100%	45	0	25	20	45	0	25	25
C	0%	0	0	0	0	0	0	0	0

Table B-8 - Trips Originating or Destined to Study Area Diverted as a Result of Option 3B/C

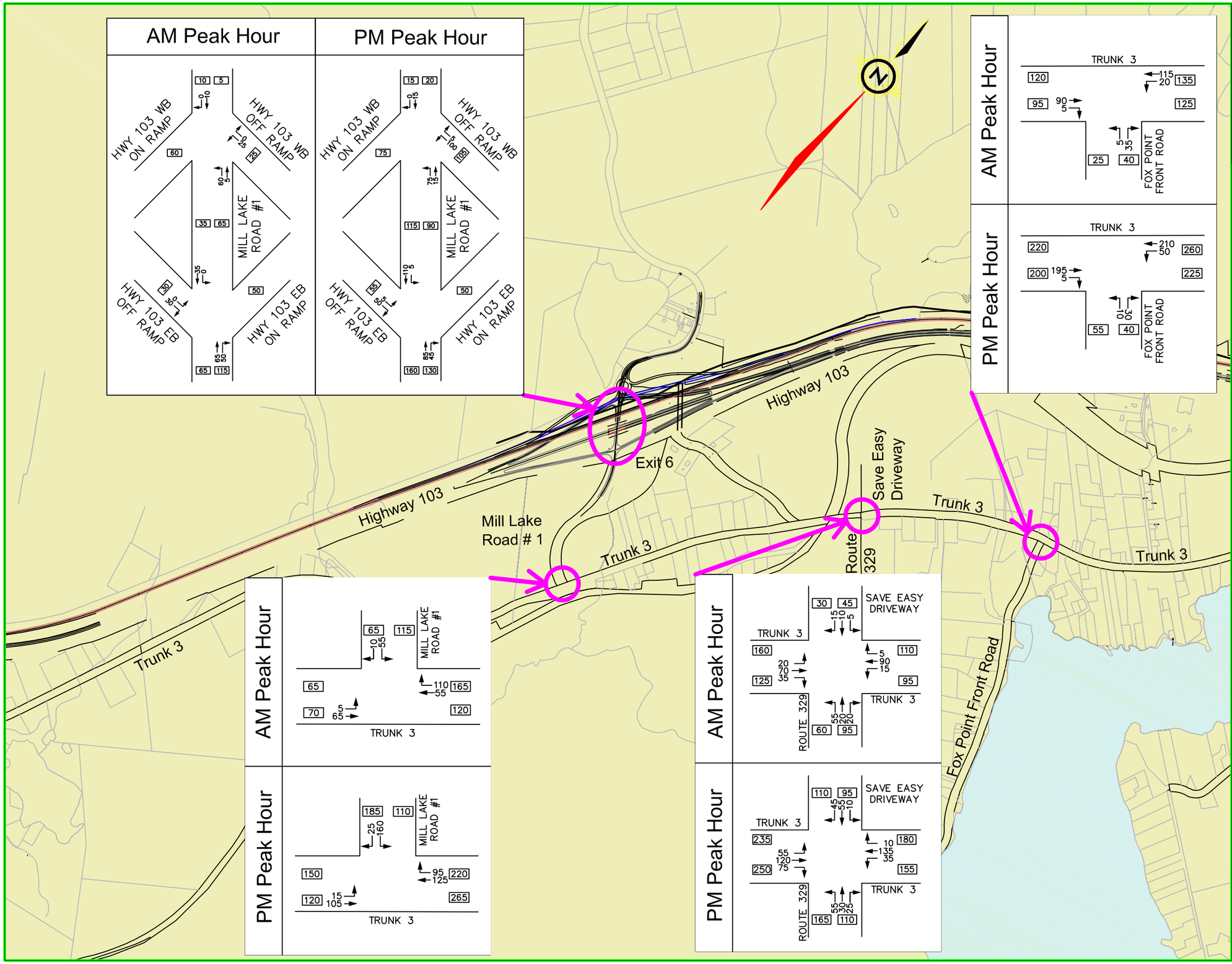
Trips Originating at or Destined to Exit 6									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	0%	0	0	0	0	0	0	0	0
C	100%	0	0	5	0	0	0	5	0
D	100%	5	15	10	20	5	15	10	20
Trips Originating at or Destined to Exit 5									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	100%	30	50	70	110	35	55	75	115
B	100%	45	0	25	20	45	0	25	25
C	50%	35	5	15	50	35	5	20	50

Table B-9 - Trips Originating or Destined to Study Area Diverted as a Result of Option 4

Trips Originating at or Destined to Exit 6									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6	EB to Zone from Exit 6	WB from Zone to Exit 6
B	0%	0	0	0	0	0	0	0	0
C	50%	0	0	5	0	0	0	5	0
D	50%	5	10	5	10	5	10	5	10
Trips Originating at or Destined to Exit 5									
Trip Originating From or Destined to	% Diverted from Trunk 3 to Connector	2013 AM Peak Hour		2013 PM Peak Hour		2020 AM Peak Hour		2020 PM Peak Hour	
		EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5	EB to Zone from Exit 5	WB from Zone to Exit 5
A	100%	30	50	70	110	35	55	75	115
B	100%	45	0	25	20	45	0	25	25
C	50%	35	5	15	50	35	5	20	50

Appendix C

Traffic Volume Figures



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HIGHWAY 103 PROPOSED
BOUTILIER'S POINT INTERCHANGE
TRAFFIC STUDY

SHEET DESCRIPTION

FIGURE C-1A
ESTIMATED 2010 DESIGN HOURLY VOLUMES (LOCATION A)

SEPTEMBER 2010

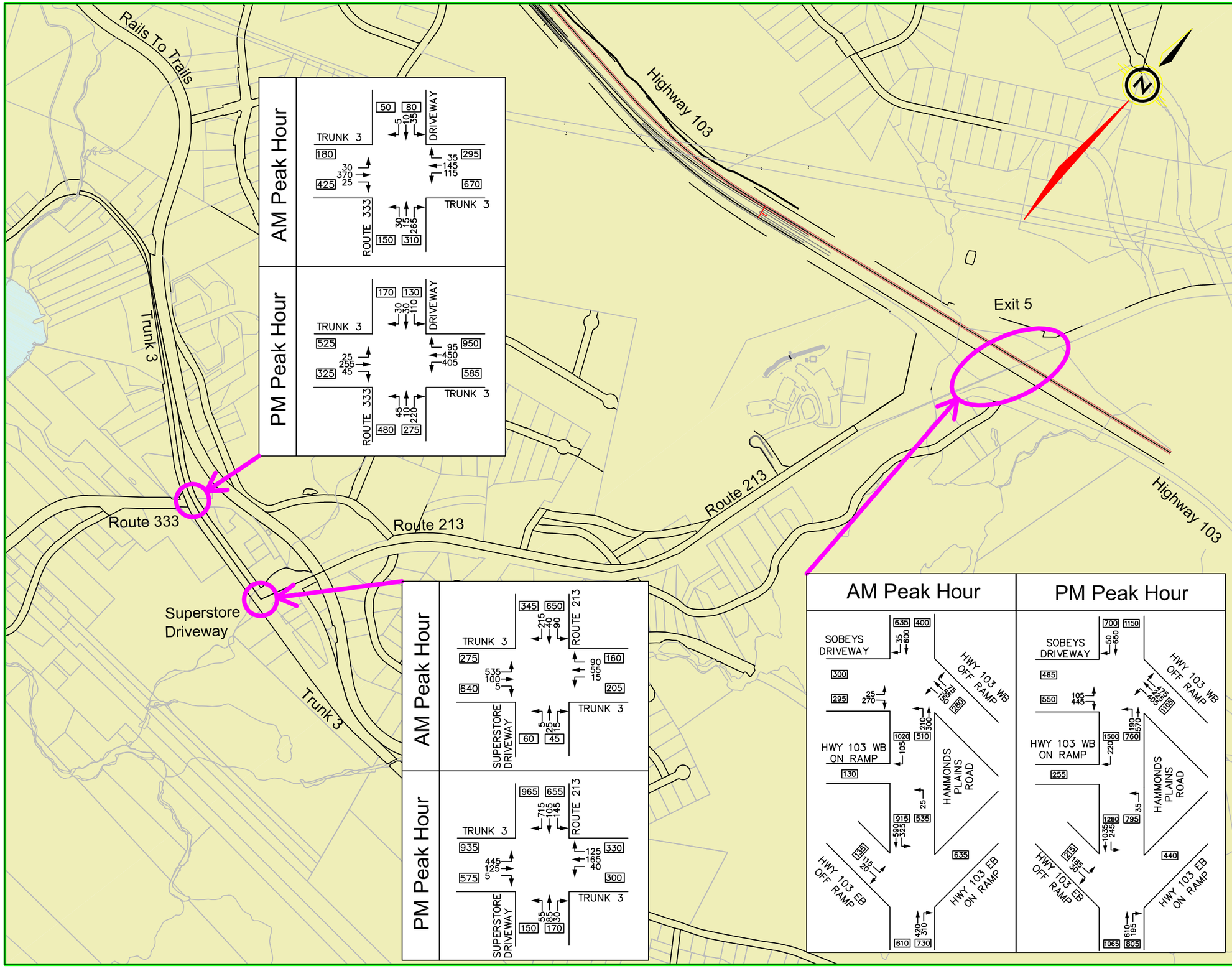

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FIGURE C-1B
2010 PEAK HOUR VOLUMES
(LOCATION B)

SEPTEMBER 2010

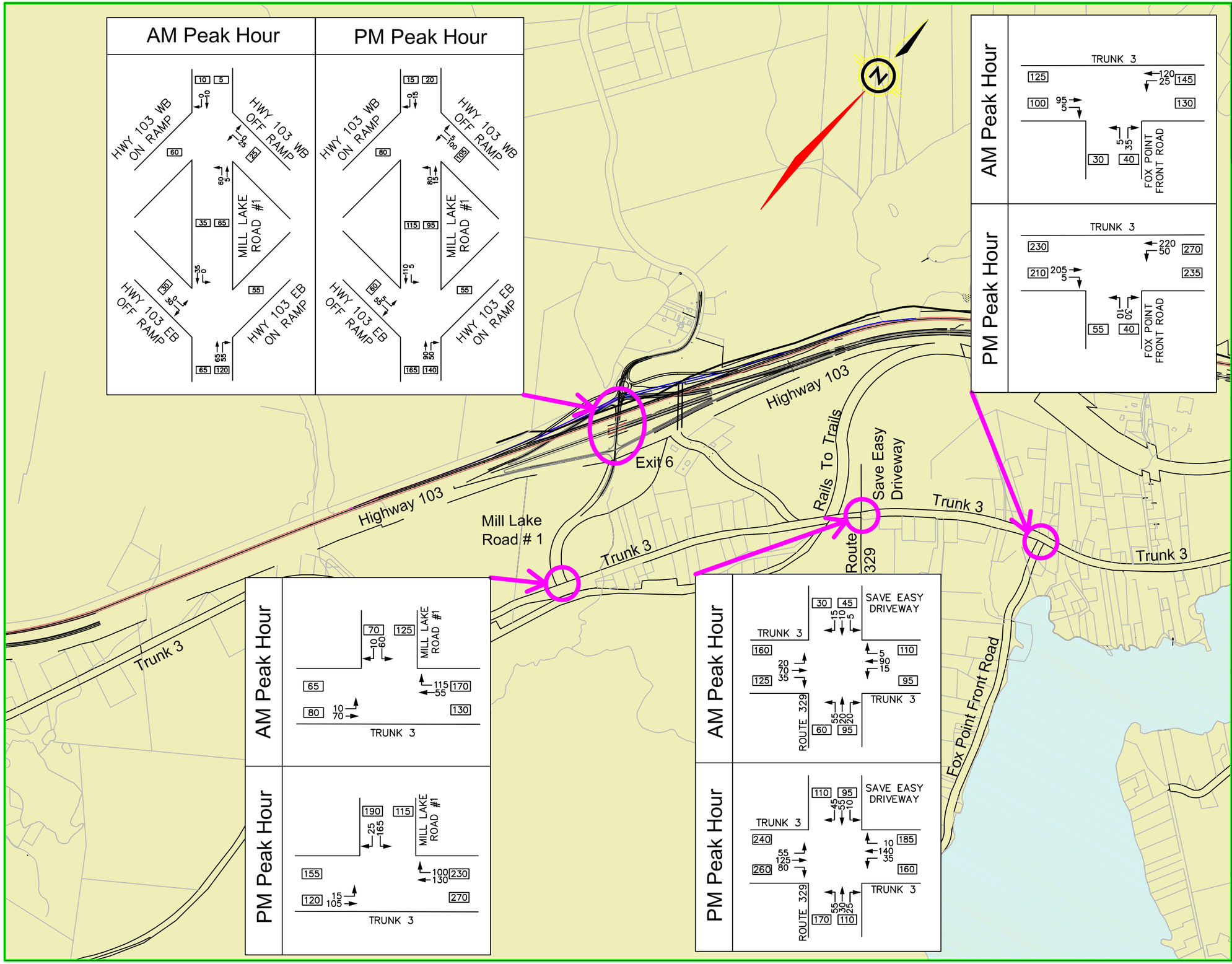

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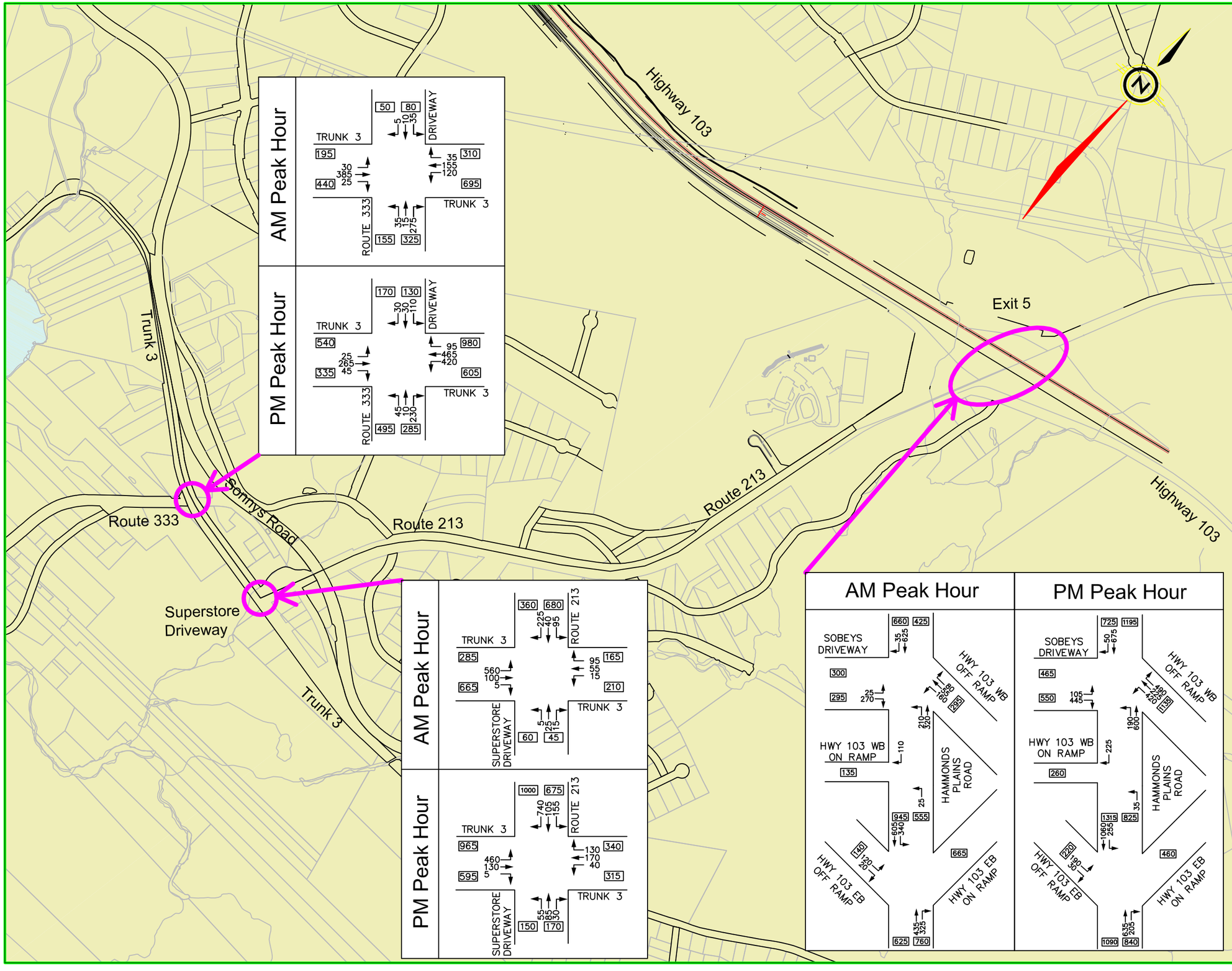
FIGURE C-2A
PROJECTED 2013 DESIGN HOURLY VOLUMES WITHOUT NEW HIGHWAY 103 CONNECTOR

SEPTEMBER 2010



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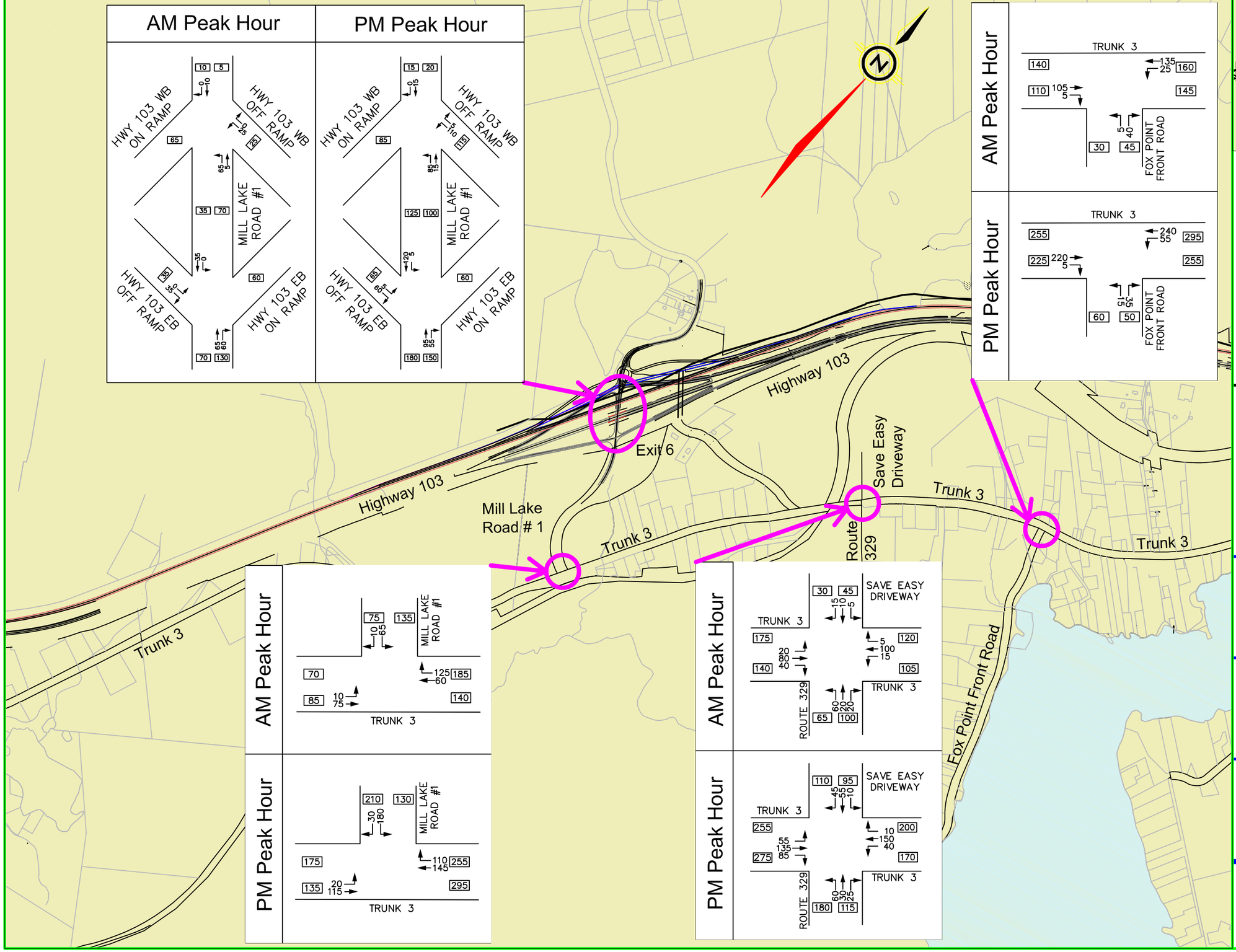
TRAFFIC STUDY

SHEET DESCRIPTION

FIGURE C-2B
PROJECTED 2013 DESIGN HOURLY VOLUMES WITHOUT NEW HIGHWAY 103 CONNECTOR

SEPTEMBER 2010



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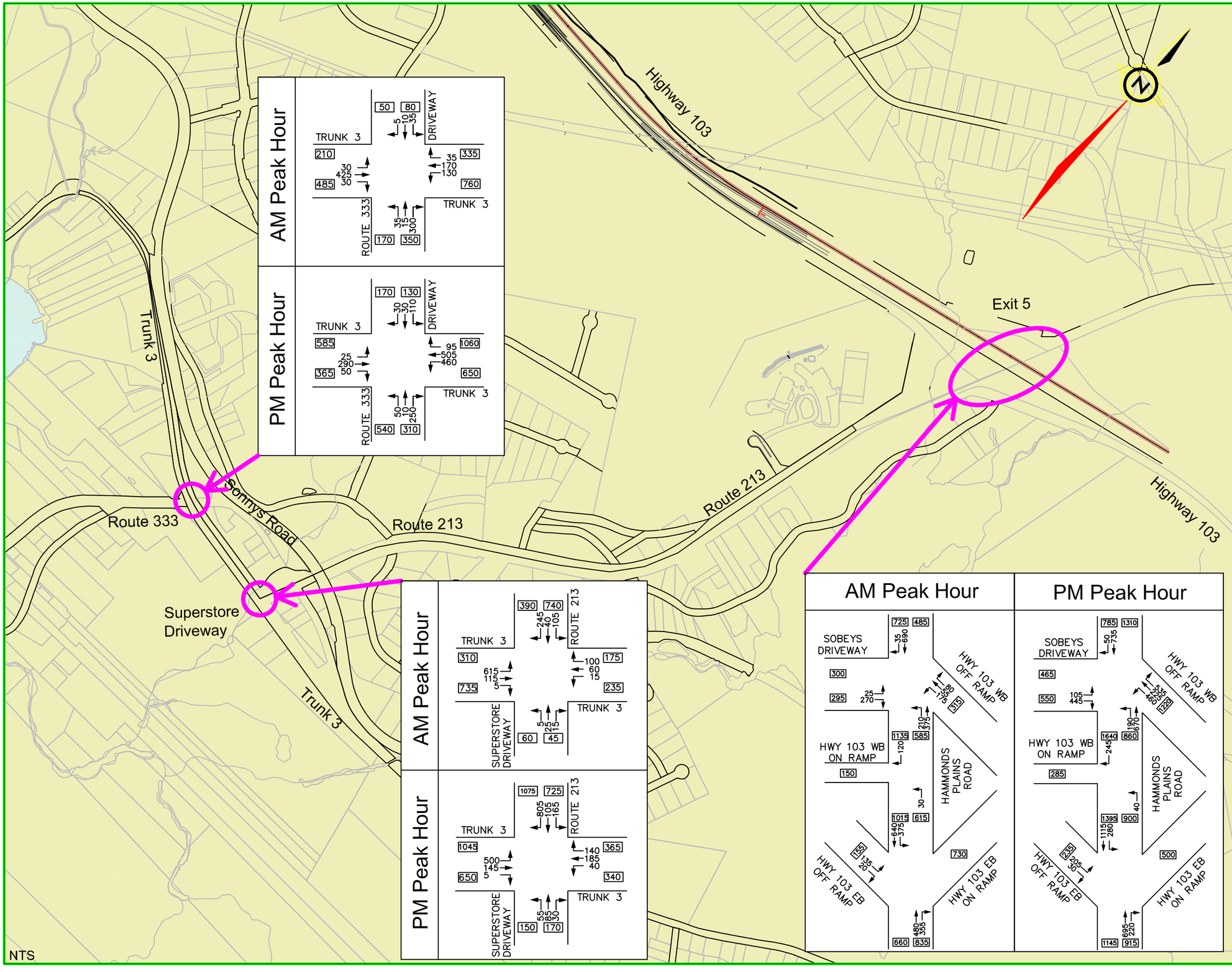
SHEET DESCRIPTION

FIGURE C-3A
PROJECTED 2020 DESIGN HOURLY
VOLUMES WITHOUT CONNECTOR

SEPTEMBER 2010



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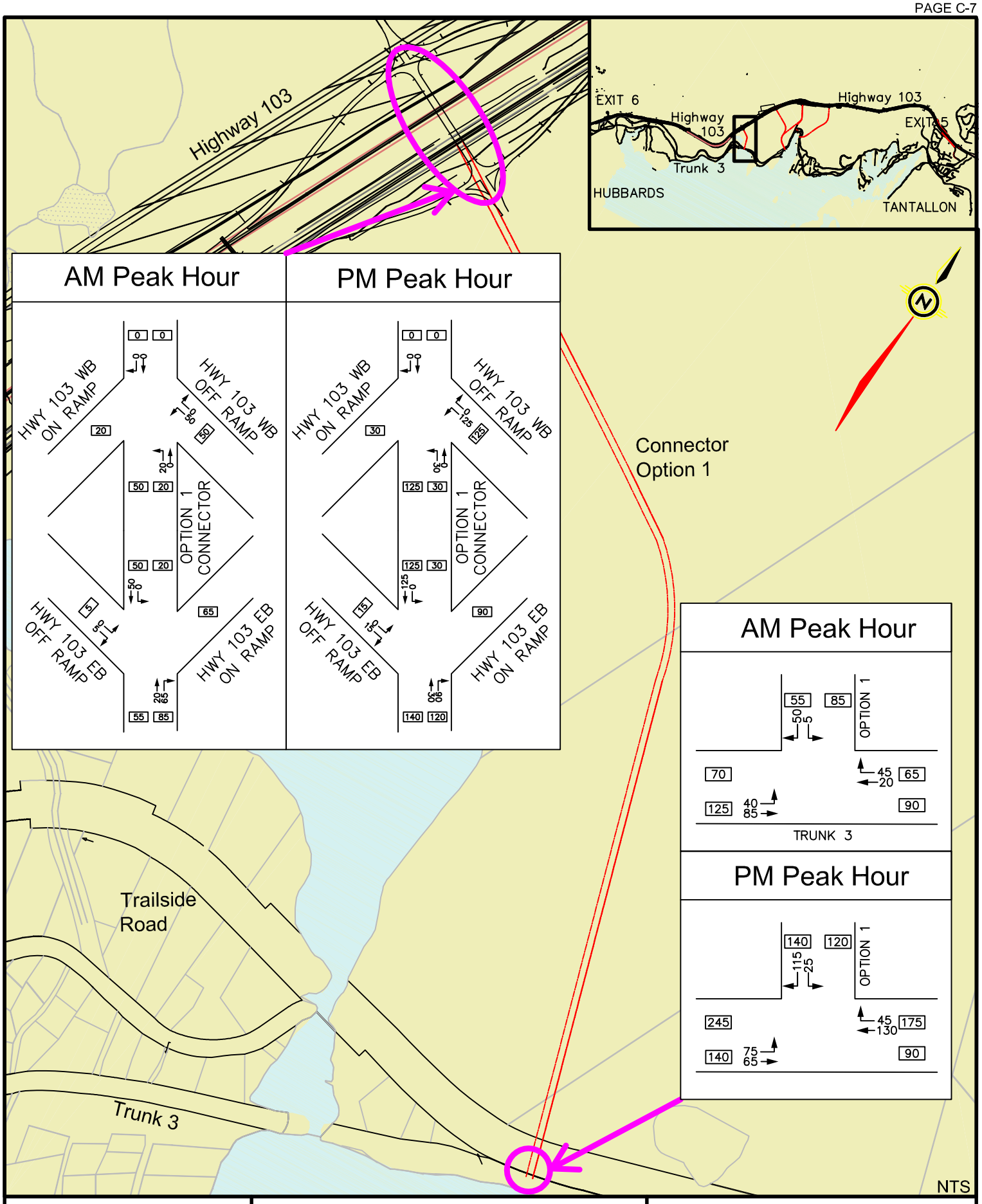
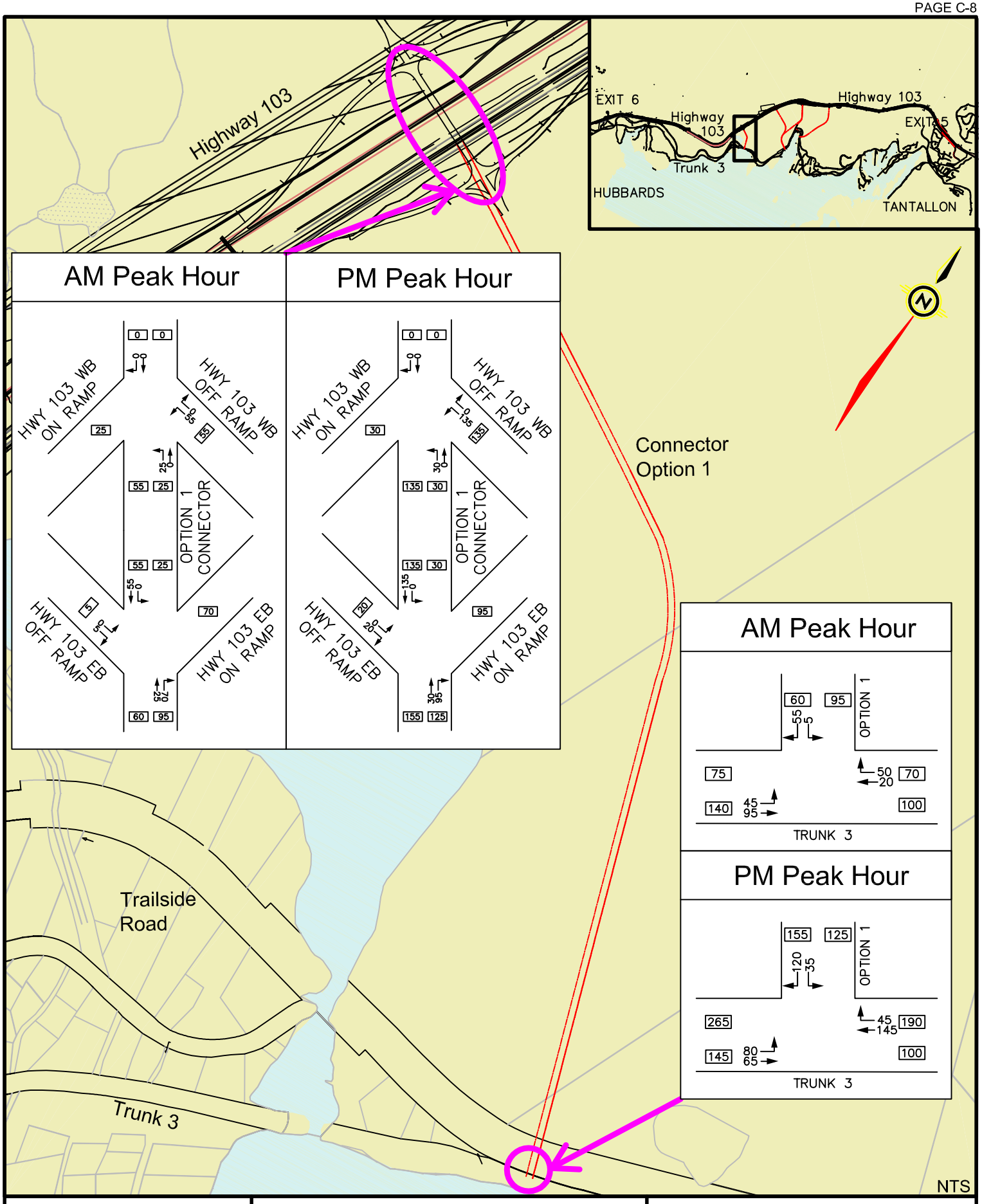
SHEET DESCRIPTION

FIGURE C-3B
PROJECTED 2020 DESIGN HOURLY VOLUMES WITHOUT CONNECTOR

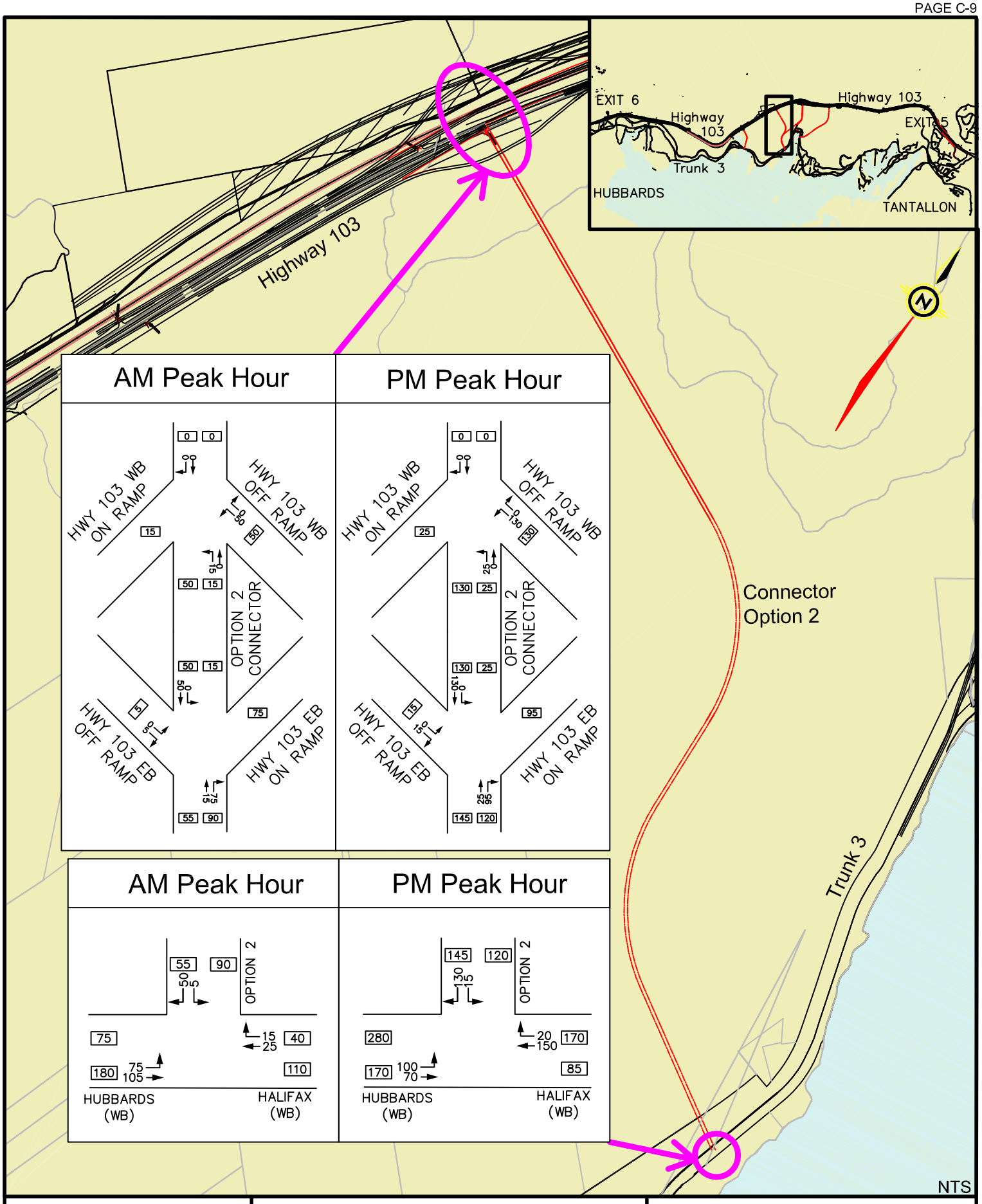
SEPTEMBER 2010



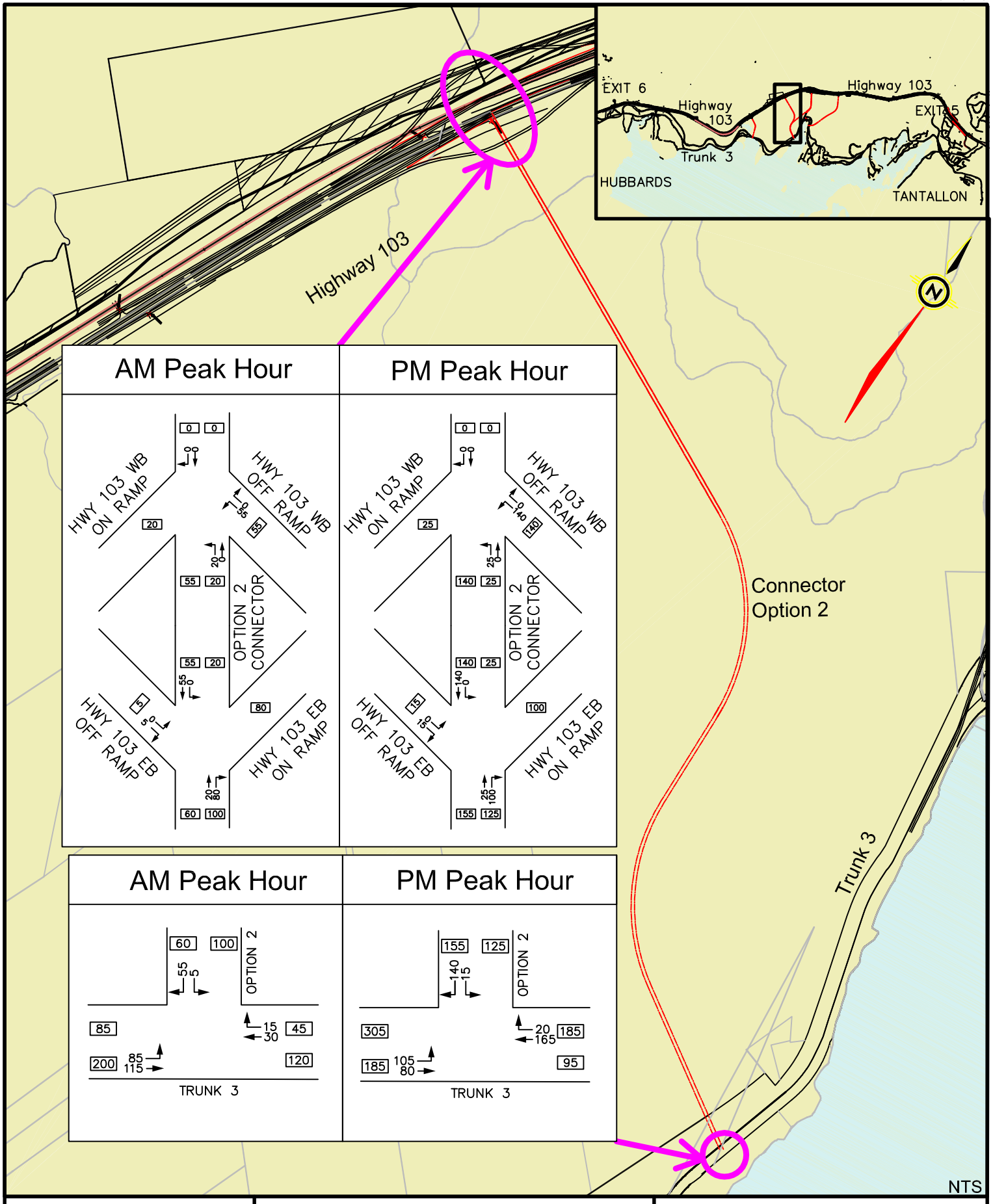
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-4
	Estimated 2013 Peak Hour Volumes With Connector Option 1	September 2010



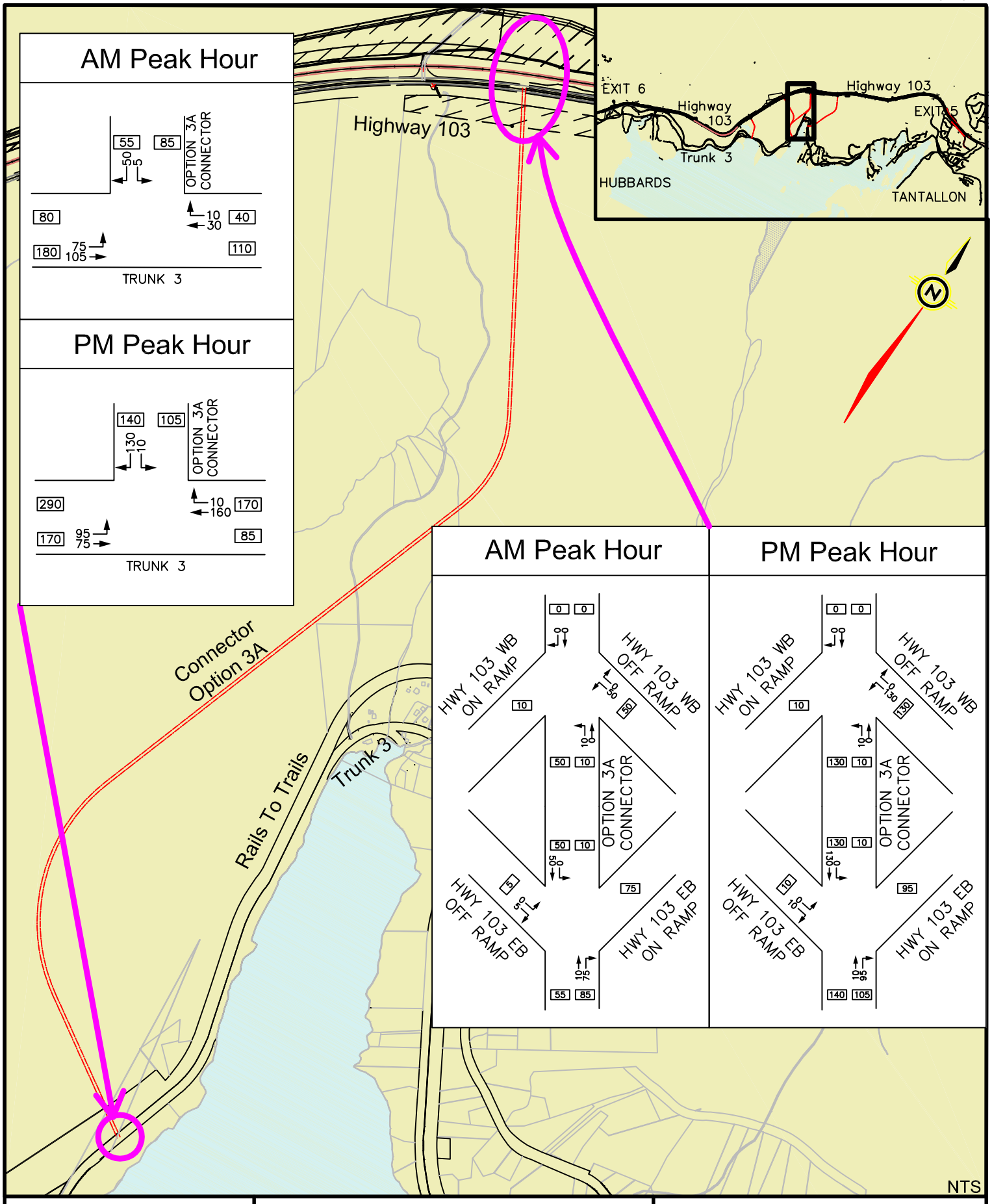
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-5
	Estimated 2020 Peak Hour Volumes With Connector Option 1	September 2010



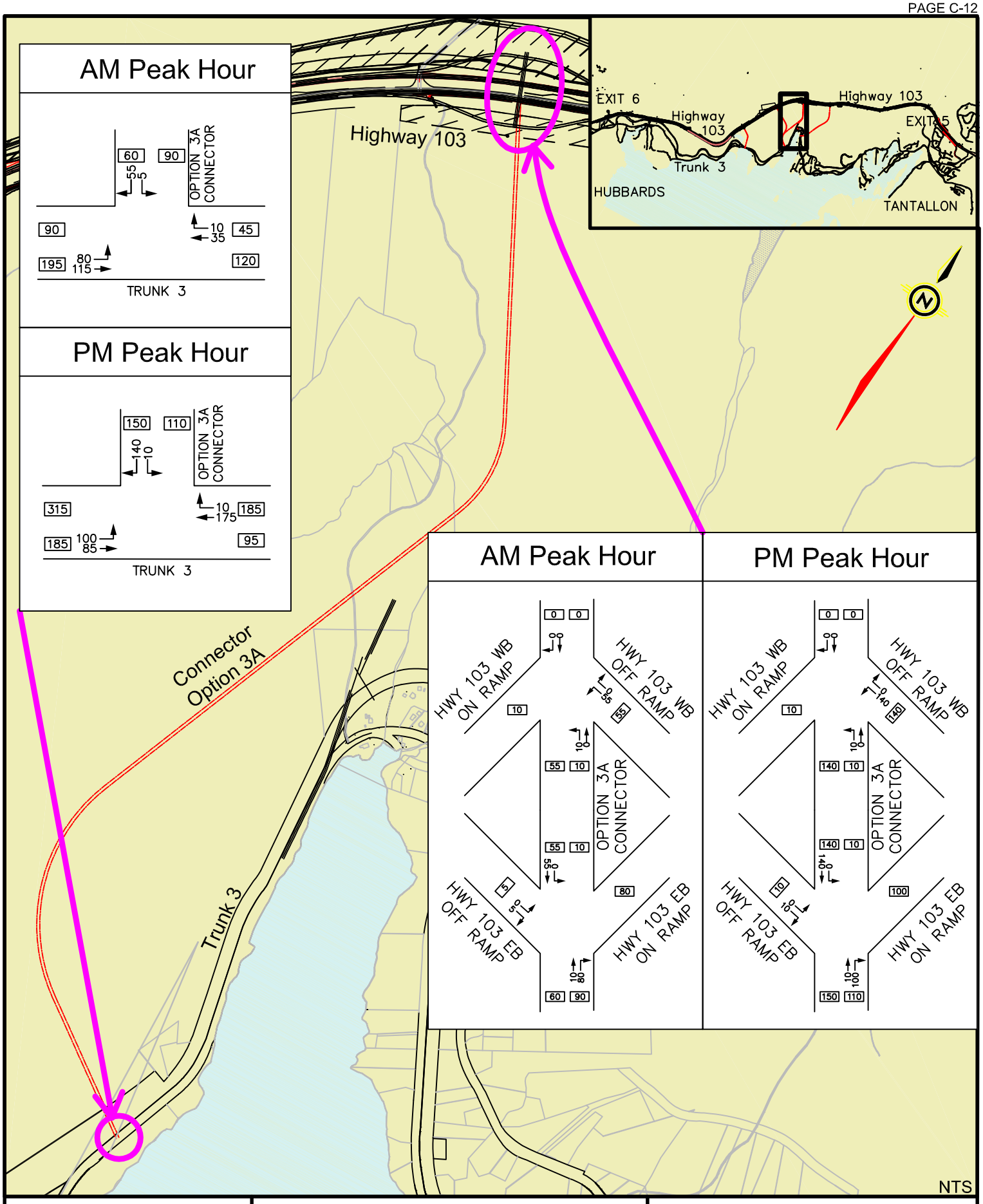
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-6
	Estimated 2013 Peak Hour Volumes With Connector Option 2	September 2010



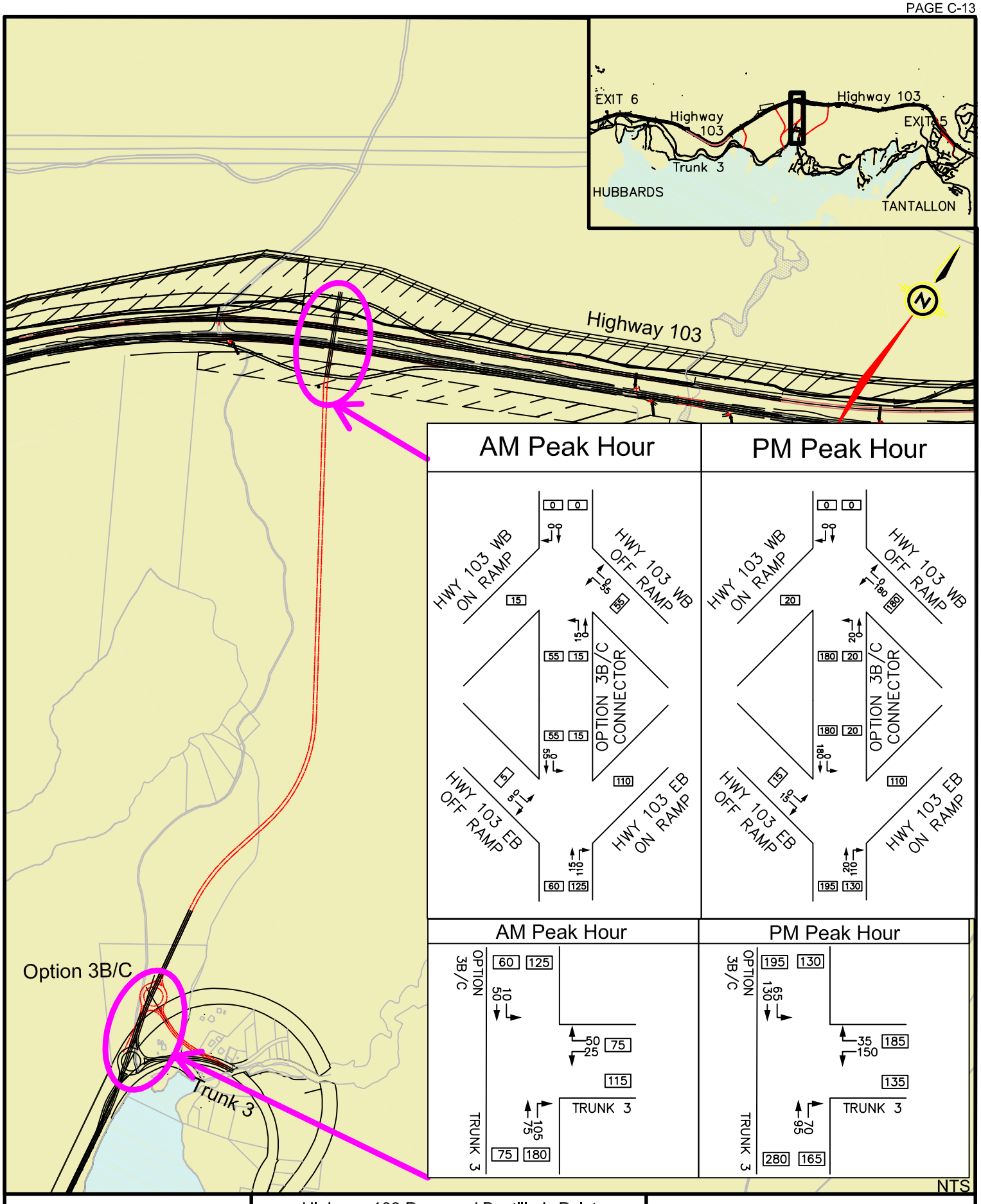
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-7
	Estimated 2020 Peak Hour Volumes With Connector Option 2	September 2010



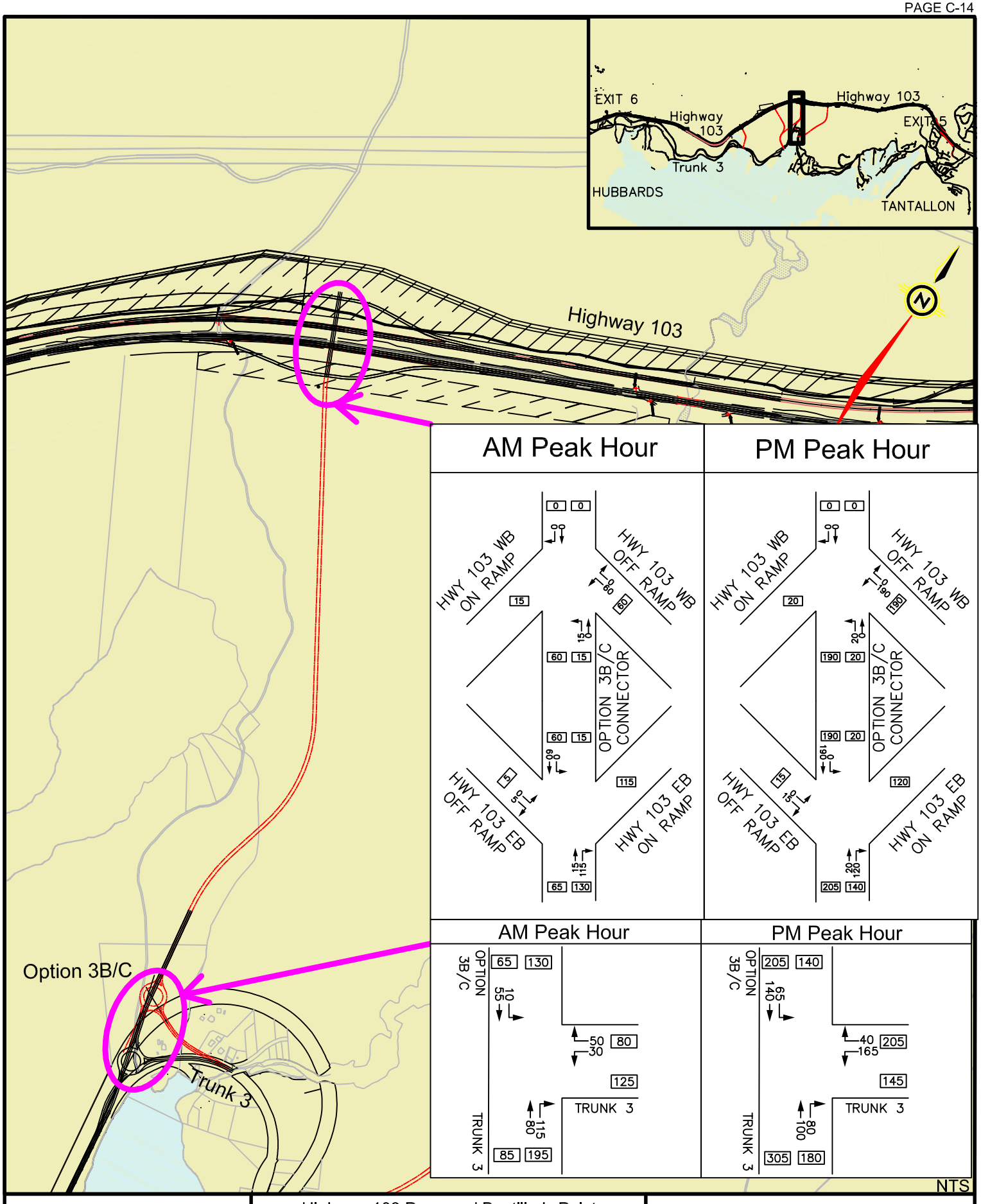
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-8
	Estimated 2013 Peak Hour Volumes With Connector Option 3A	September 2010



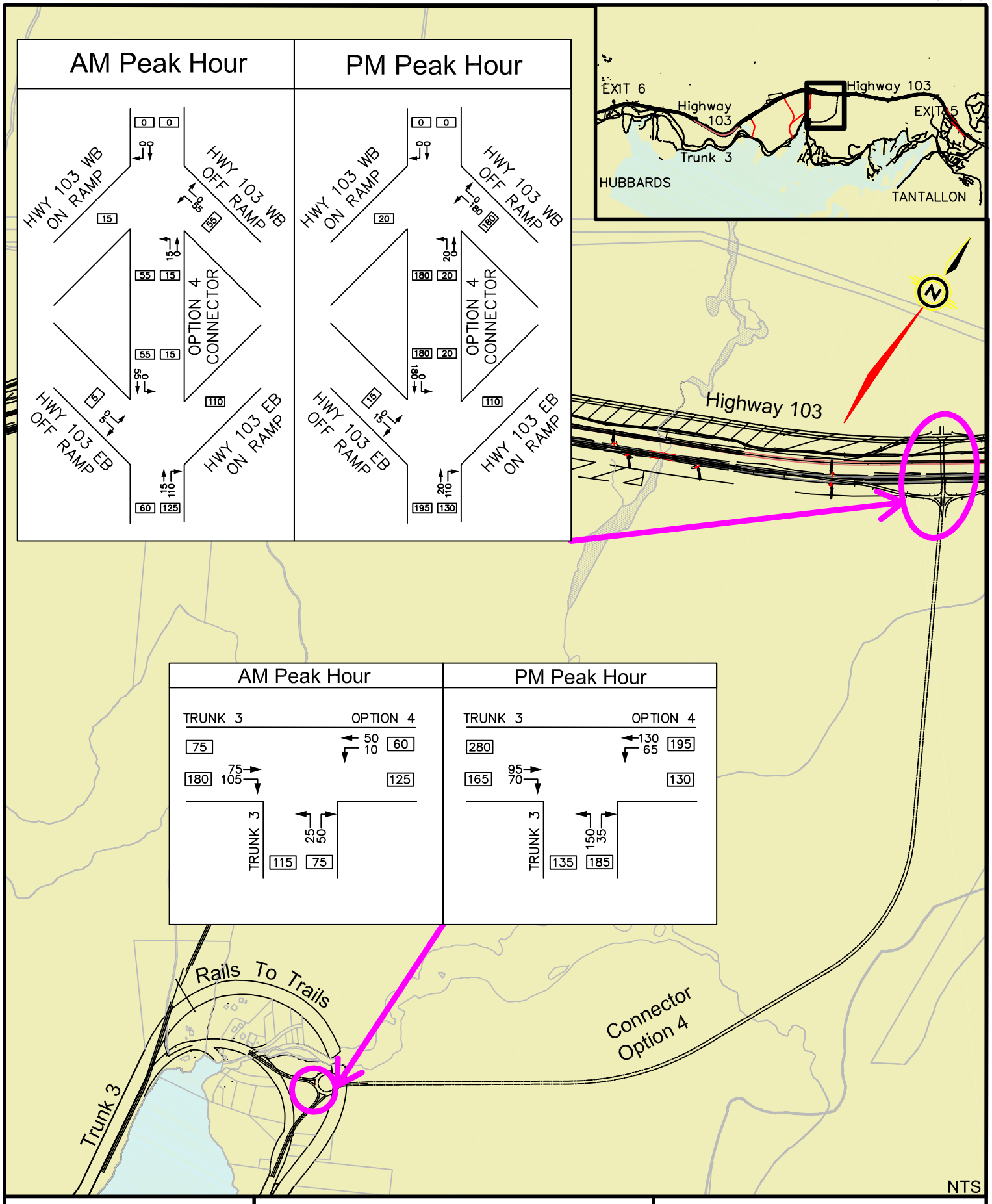
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-9
	Estimated 2020 Peak Hour Volumes With Connector Option 3A	September 2010



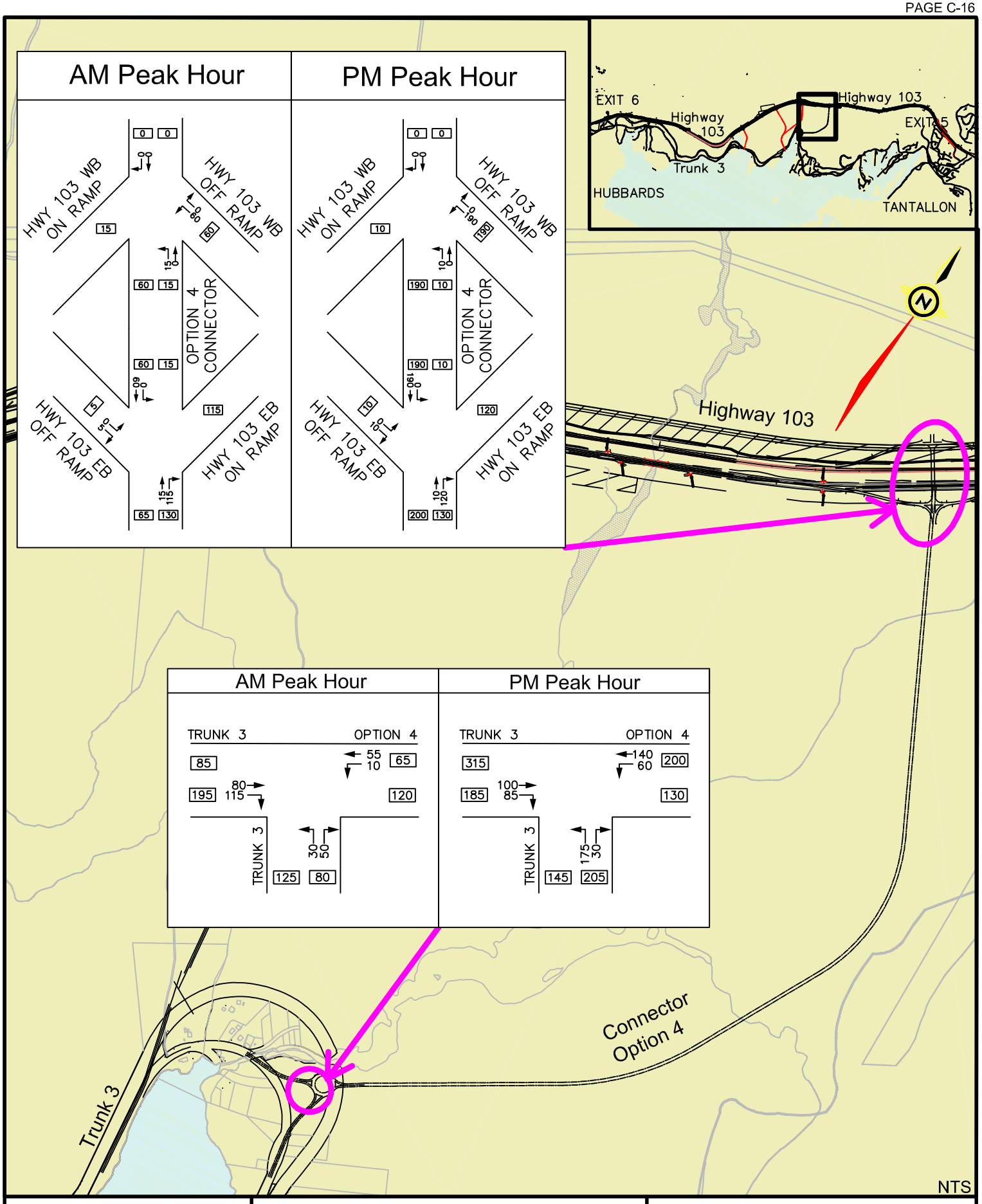
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-10
	Estimated 2013 Peak Hour Volumes With Connector Option 3B/C	September 2010



terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-11
	Estimated 2020 Peak Hour Volumes With Connector Option 3B/C	September 2010



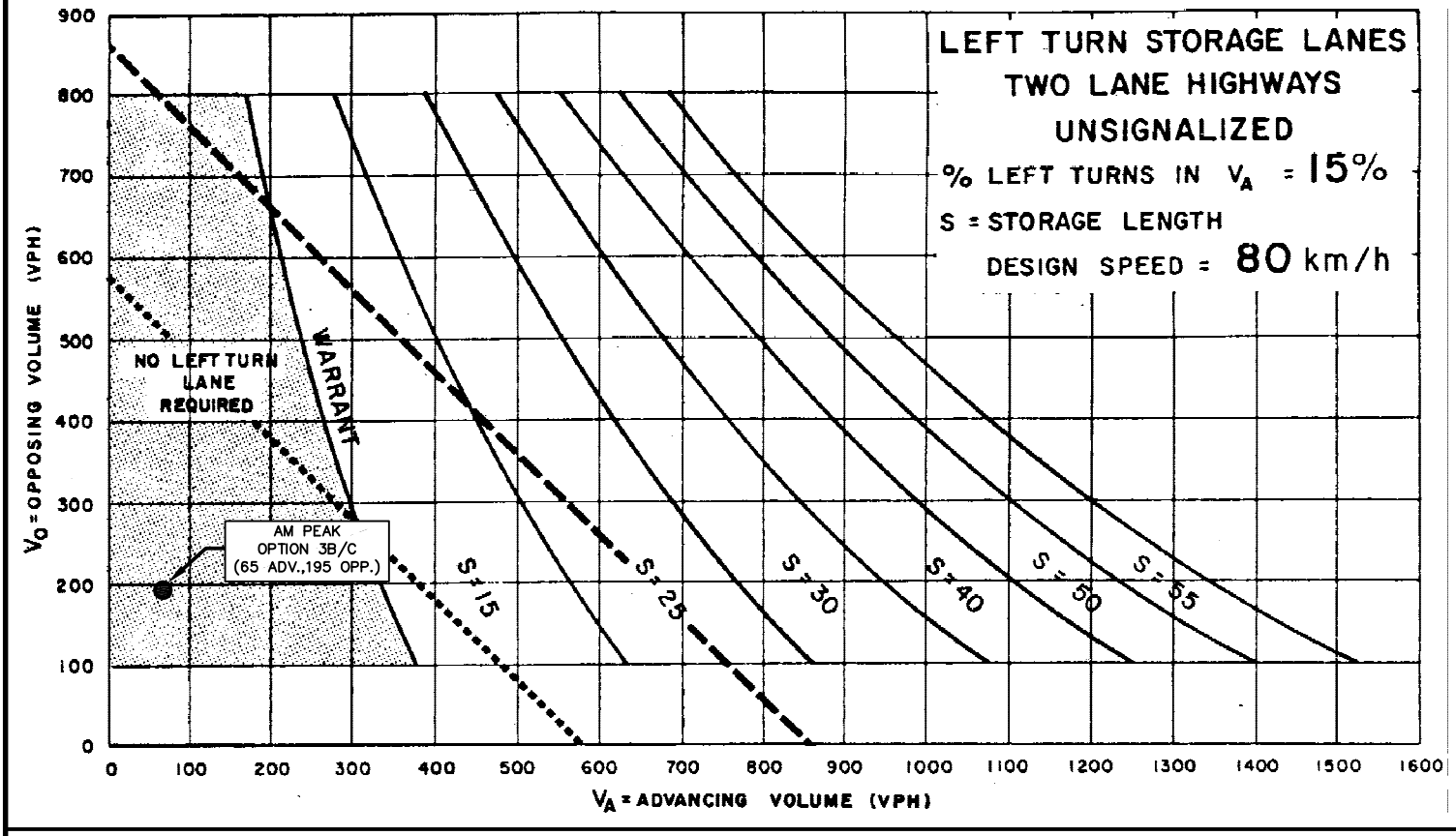
terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-12
	Estimated 2013 Peak Hour Volumes With Connector Option 4	September 2010

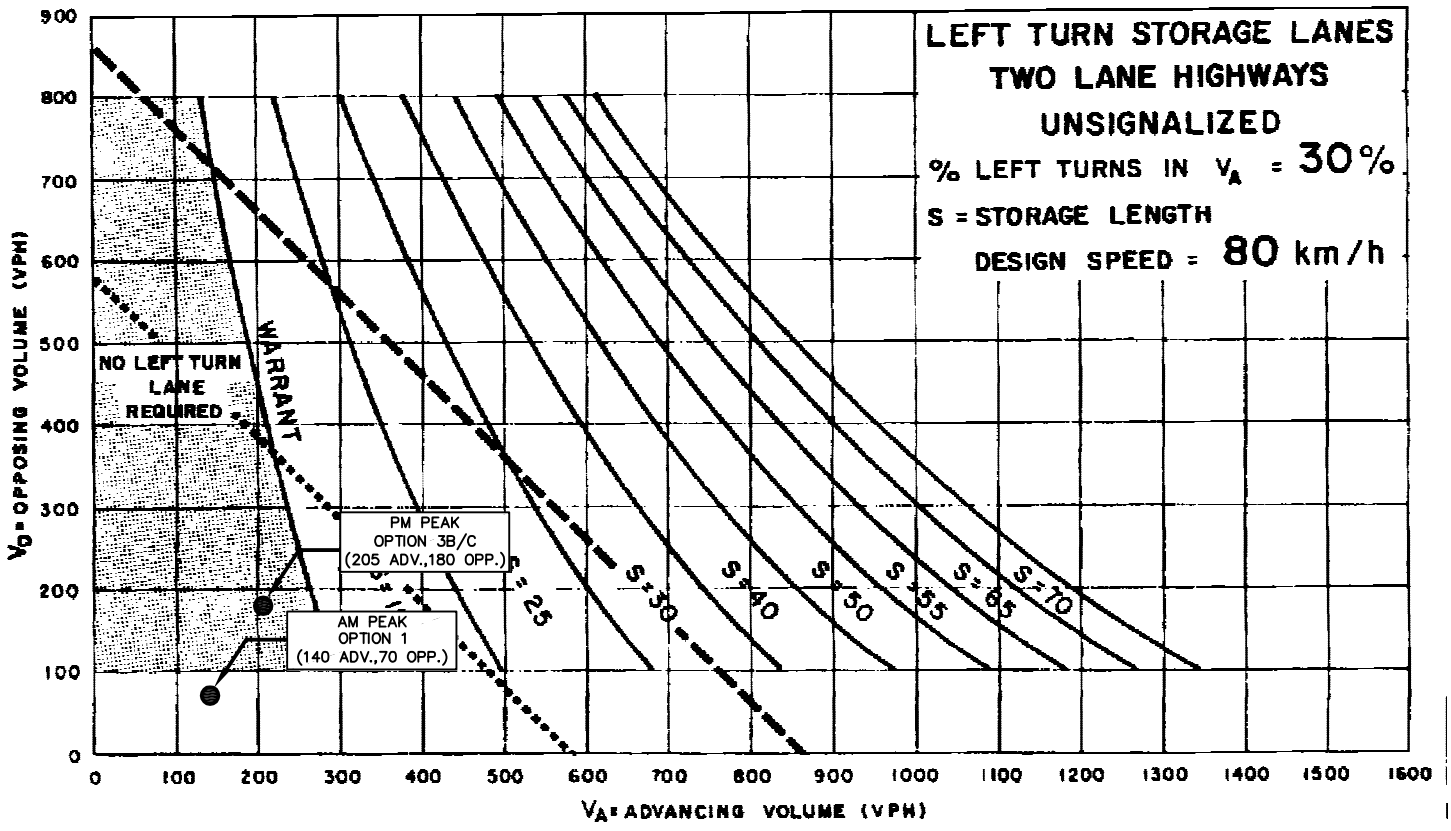


terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure C-13
	Estimated 2020 Peak Hour Volumes With Connector Option 4	September 2010

Appendix D

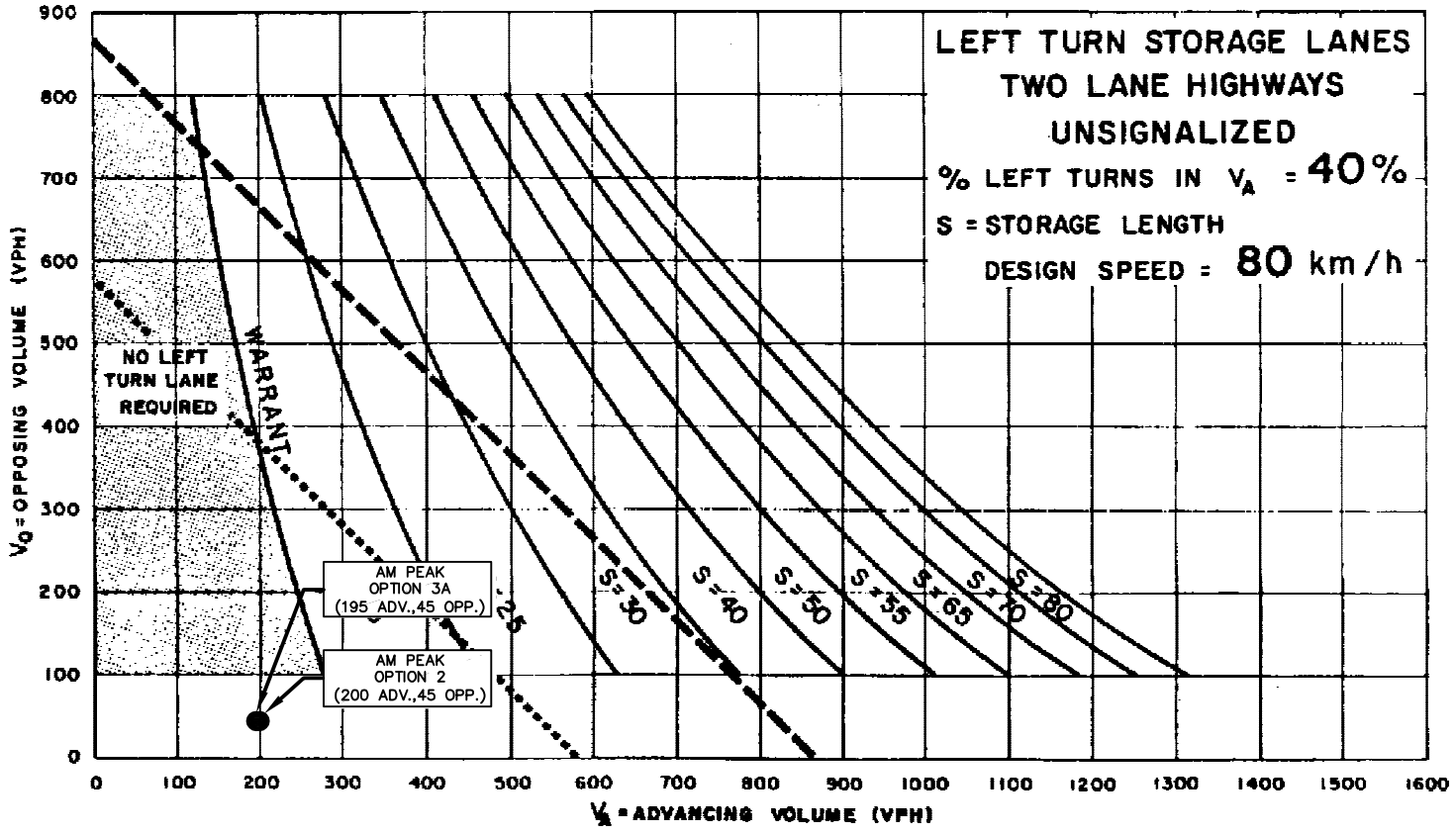
Warrant Evaluations





terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutlier's Point Interchanges Traffic Study	Figure D-1
	2020 Left Turn Lane Warrants 15% & 30% Left Turn	September 2010

AM



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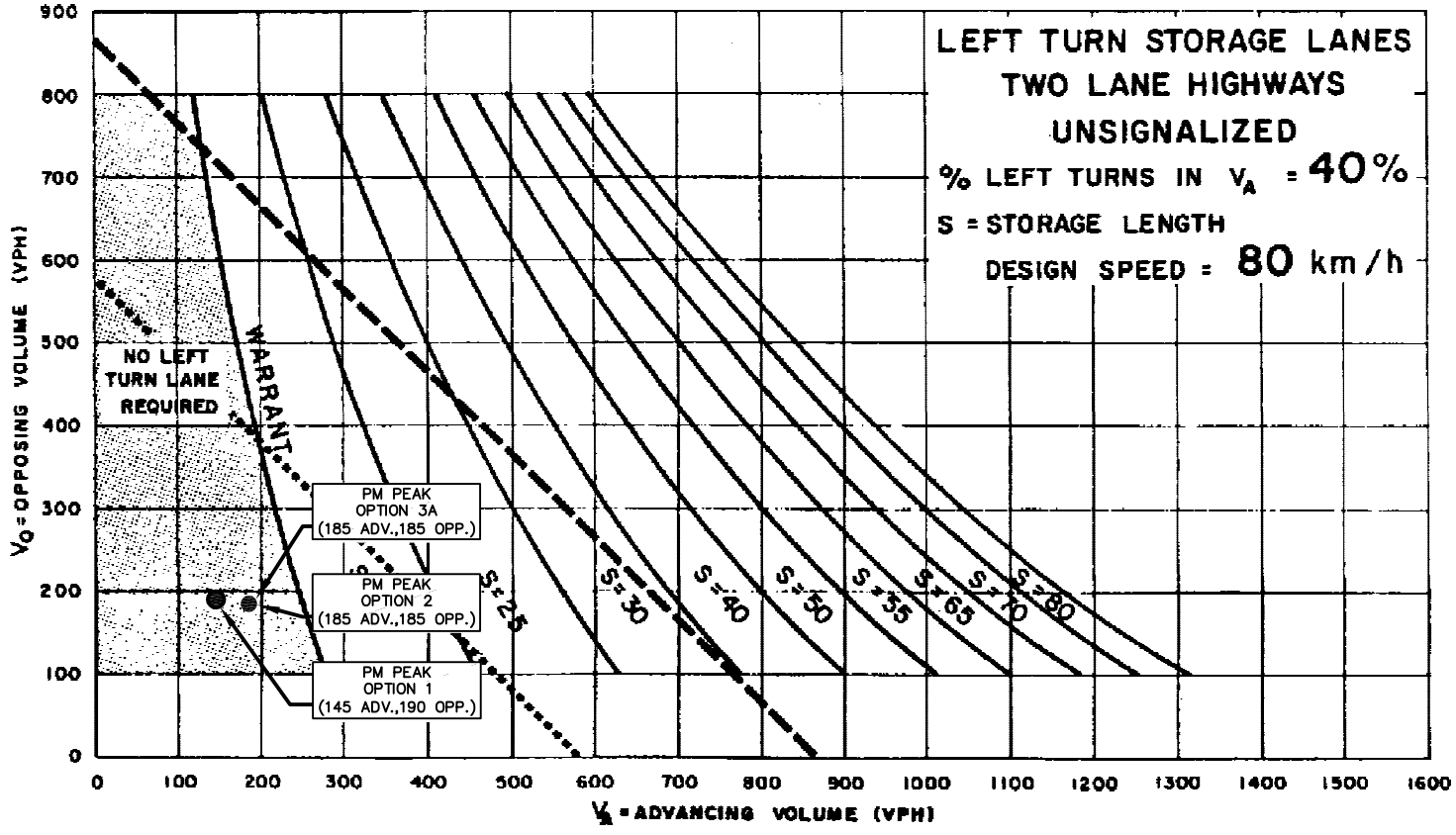

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	2020 Left Turn Lane Warrants 40% Left Turn	September 2010

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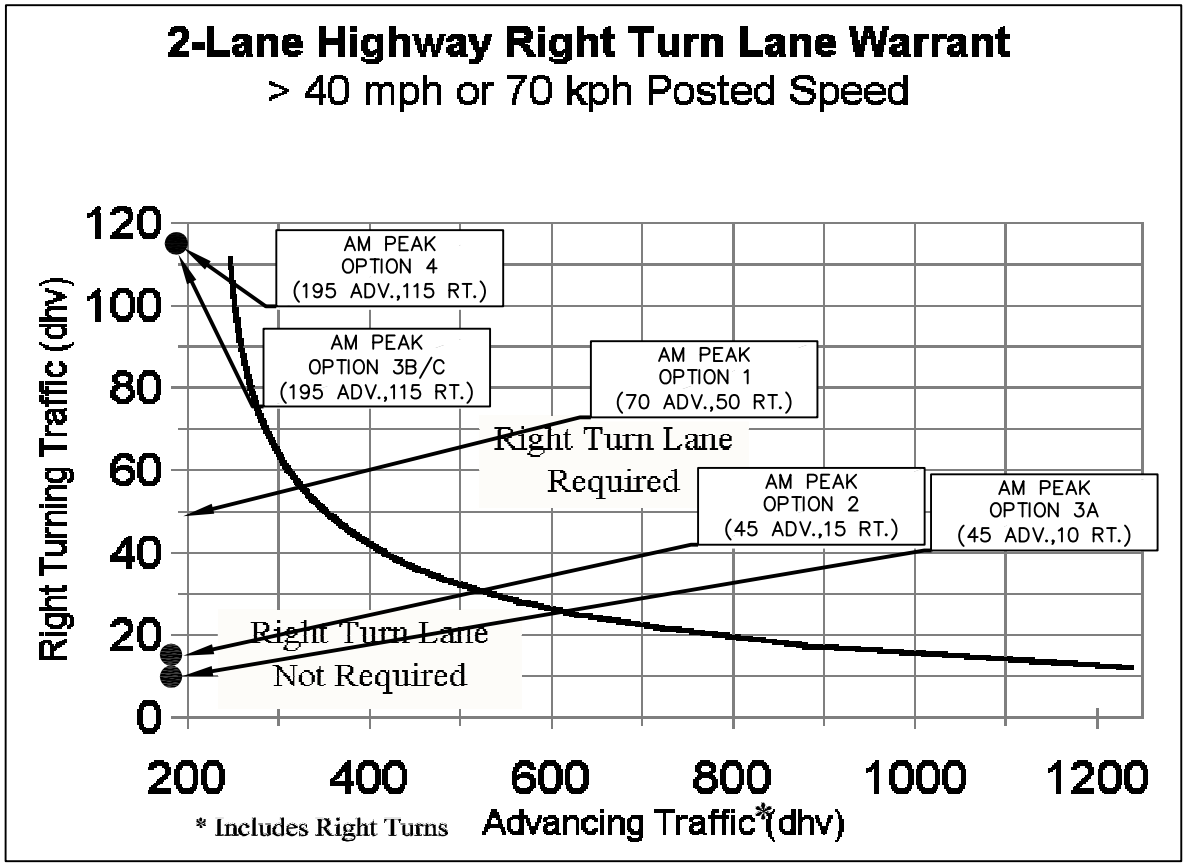

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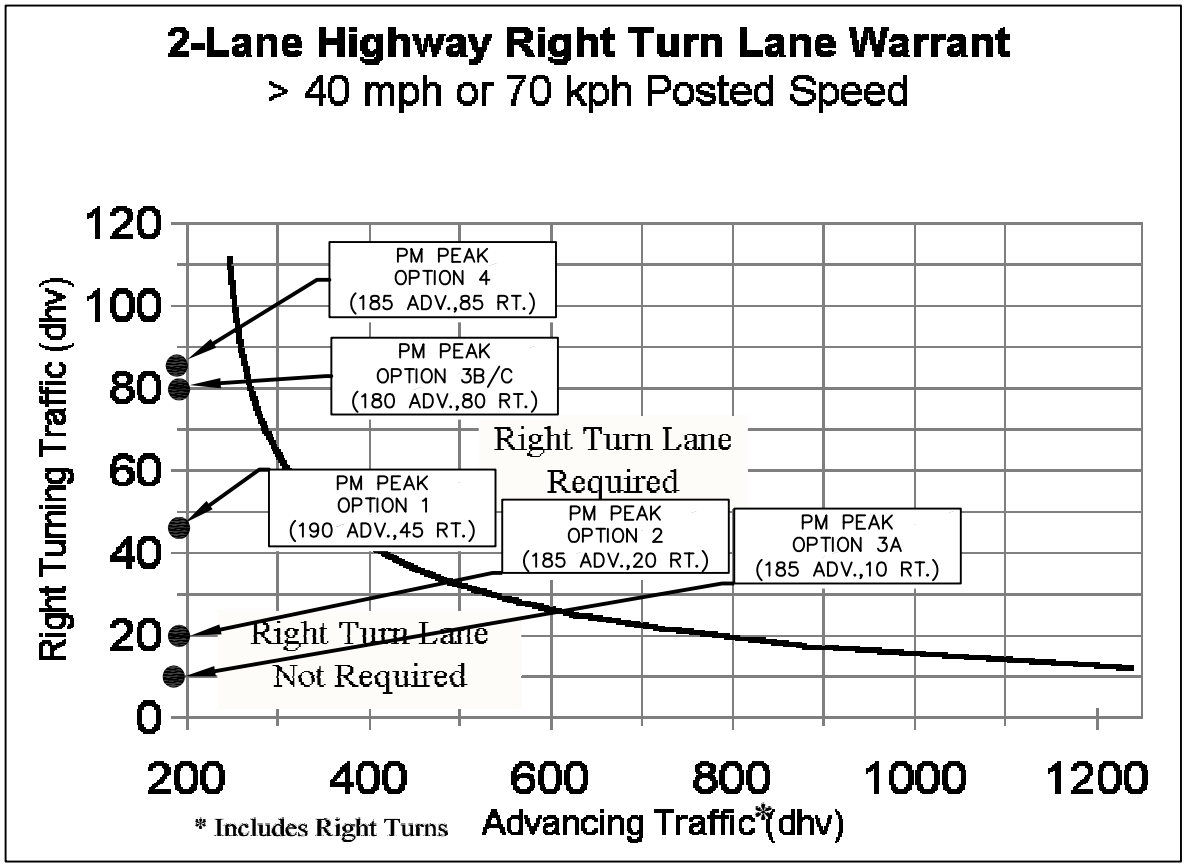


terrain THE SCIENCE OF PRACTICAL SOLUTIONS	Highway 103 Proposed Boutilier's Point Interchanges Traffic Study	Figure D-3
	2020 Right Turn Lane Warrants	September 2010

Appendix E

Intersection Level of Performance Analyses

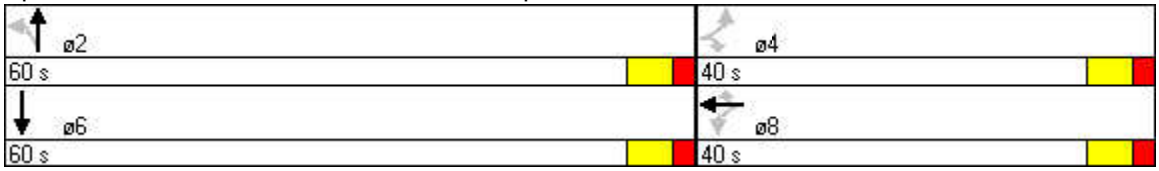
Roundabout Analysis

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	1789	1883	1601	1789	1883	0	0	3550	0
Flt Permitted	0.718			0.950			0.327					
Satd. Flow (perm)	1352	0	1601	1789	1883	1601	616	1883	0	0	3550	0
Satd. Flow (RTOR)			224			87					9	
Volume (vph)	25	0	270	160	55	80	210	320	0	0	625	35
Lane Group Flow (vph)	27	0	293	174	60	87	228	348	0	0	717	0
Turn Type	custom		custom	Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Total Split (s)	40.0	0.0	40.0	40.0	40.0	40.0	60.0	60.0	0.0	0.0	60.0	0.0
Act Effct Green (s)	12.5		12.5	12.5	12.5	12.5	28.4	28.4			28.4	
Actuated g/C Ratio	0.25		0.25	0.25	0.25	0.25	0.57	0.57			0.57	
v/c Ratio	0.08		0.51	0.39	0.13	0.19	0.65	0.32			0.35	
Control Delay	19.5		9.8	20.9	18.7	7.0	17.6	6.5			6.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	19.5		9.8	20.9	18.7	7.0	17.6	6.5			6.1	
LOS	B		A	C	B	A	B	A			A	
Approach Delay					16.7			10.9			6.1	
Approach LOS					B			B			A	
Queue Length 50th (m)	1.4		3.6	9.6	3.1	0.0	10.1	11.9			12.9	
Queue Length 95th (m)	9.5		29.6	40.1	16.6	10.3	38.5	31.2			29.3	
Internal Link Dist (m)		150.9			235.4			83.2			277.6	
Turn Bay Length (m)			20.0	65.0		65.0	75.0					
Base Capacity (vph)	684		921	905	953	853	453	1384			2612	
Starvation Cap Reductn	0		0	0	0	0	0	0			0	
Spillback Cap Reductn	0		0	0	0	0	0	0			0	
Storage Cap Reductn	0		0	0	0	0	0	0			0	
Reduced v/c Ratio	0.04		0.32	0.19	0.06	0.10	0.50	0.25			0.27	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 49.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 10.0 Intersection LOS: B
Intersection Capacity Utilization 54.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Exit 5 WB Exit Ramp & Hammonds Plains Rd

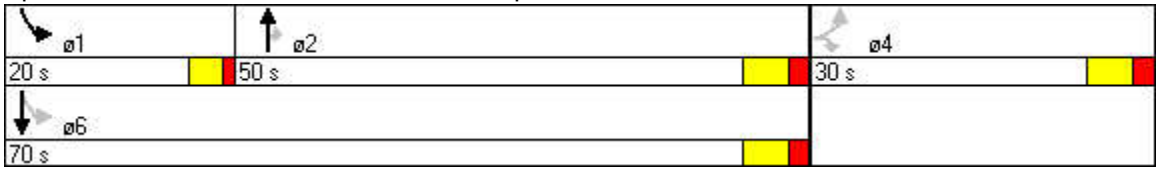


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	0	0	0	0	1883	1601	1789	3579	0
Flt Permitted	0.950									0.303		
Satd. Flow (perm)	1789	0	1601	0	0	0	0	1883	1601	571	3579	0
Satd. Flow (RTOR)			22						246			
Volume (vph)	120	0	20	0	0	0	0	435	325	340	605	0
Lane Group Flow (vph)	130	0	22	0	0	0	0	473	353	370	658	0
Turn Type	custom		custom						Perm	pm+pt		
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	30.0	0.0	30.0	0.0	0.0	0.0	0.0	50.0	50.0	20.0	70.0	0.0
Act Effct Green (s)	11.7		11.7					24.8	24.8	39.8	41.2	
Actuated g/C Ratio	0.20		0.20					0.44	0.44	0.70	0.73	
v/c Ratio	0.37		0.07					0.57	0.42	0.59	0.25	
Control Delay	26.4		11.9					17.5	6.2	8.4	4.2	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	26.4		11.9					17.5	6.2	8.4	4.2	
LOS	C		B					B	A	A	A	
Approach Delay								12.7			5.8	
Approach LOS								B			A	
Queue Length 50th (m)	11.2		0.0					37.1	6.7	13.2	11.9	
Queue Length 95th (m)	33.0		5.7					80.8	26.5	30.4	24.0	
Internal Link Dist (m)		258.8			94.2			150.4			120.9	
Turn Bay Length (m)			100.0						30.0	80.0		
Base Capacity (vph)	650		596					1131	1060	687	2891	
Starvation Cap Reductn	0		0					0	0	0	0	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.20		0.04					0.42	0.33	0.54	0.23	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 56.6
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 10.0 Intersection LOS: B
Intersection Capacity Utilization 58.4% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: 103 Exit 5 EB Ramps & Hammonds Plains Rd

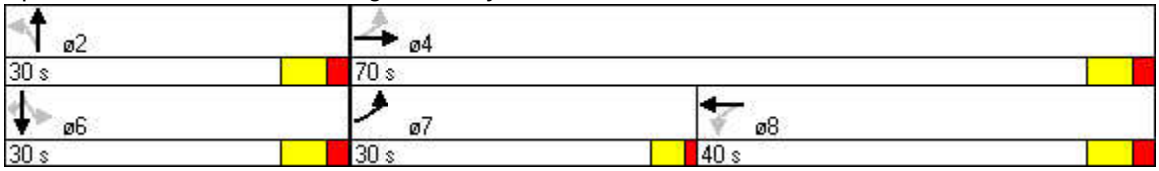


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1870	0	1789	1705	0	1789	1778	0	1789	1883	1601
Flt Permitted	0.550			0.684			0.729			0.729		
Satd. Flow (perm)	1036	1870	0	1288	1705	0	1373	1778	0	1373	1883	1601
Satd. Flow (RTOR)		5			97			16				245
Volume (vph)	560	100	5	15	55	95	5	25	15	95	40	225
Lane Group Flow (vph)	609	114	0	16	163	0	5	43	0	103	43	245
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	36.1	37.9		10.9	10.9		11.9	11.9		11.9	11.9	11.9
Actuated g/C Ratio	0.68	0.72		0.21	0.21		0.22	0.22		0.22	0.22	0.22
v/c Ratio	0.61	0.08		0.06	0.38		0.02	0.11		0.35	0.11	0.46
Control Delay	8.5	4.3		22.5	13.8		20.0	15.4		24.5	20.6	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.5	4.3		22.5	13.8		20.0	15.4		24.5	20.6	6.6
LOS	A	A		C	B		B	B		C	C	A
Approach Delay		7.9			14.6			15.9			12.8	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	26.7	3.4		1.5	6.2		0.5	2.4		9.6	3.8	0.0
Queue Length 95th (m)	62.4	10.0		6.3	21.8		2.9	9.7		23.3	11.4	15.3
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	991	1509		615	865		527	691		527	722	765
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.61	0.08		0.03	0.19		0.01	0.06		0.20	0.06	0.32

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 52.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 10.5 Intersection LOS: B
Intersection Capacity Utilization 61.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

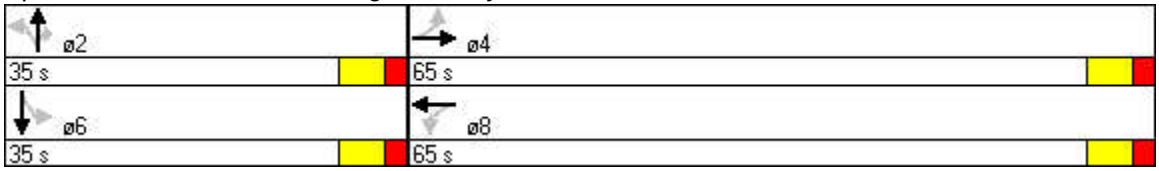


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1866	0	1789	1831	0	0	1819	1601	0	1798	0
Flt Permitted	0.618			0.432				0.819			0.819	
Satd. Flow (perm)	1164	1866	0	814	1831	0	0	1543	1601	0	1524	0
Satd. Flow (RTOR)		6			21				299		5	
Volume (vph)	30	385	25	120	155	35	35	15	275	35	10	5
Lane Group Flow (vph)	33	445	0	130	206	0	0	54	299	0	54	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	65.0	65.0	0.0	65.0	65.0	0.0	35.0	35.0	35.0	35.0	35.0	0.0
Act Effct Green (s)	18.5	18.5		18.5	18.5			9.5	9.5		9.5	
Actuated g/C Ratio	0.51	0.51		0.51	0.51			0.26	0.26		0.26	
v/c Ratio	0.06	0.47		0.31	0.22			0.13	0.47		0.13	
Control Delay	5.3	7.9		8.3	5.5			11.2	4.7		10.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	5.3	7.9		8.3	5.5			11.2	4.7		10.5	
LOS	A	A		A	A			B	A		B	
Approach Delay		7.7			6.6			5.7			10.5	
Approach LOS		A			A			A			B	
Queue Length 50th (m)	0.8	12.7		3.4	4.5			1.9	0.0		1.7	
Queue Length 95th (m)	3.9	35.3		13.3	14.7			8.7	12.3		8.4	
Internal Link Dist (m)		503.9			281.2			436.3			225.0	
Turn Bay Length (m)	75.0			100.0					16.0			
Base Capacity (vph)	906	1454		634	1430			835	1004		827	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.31		0.21	0.14			0.06	0.30		0.07	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 36.3
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.47
Intersection Signal Delay: 7.0 Intersection LOS: A
Intersection Capacity Utilization 52.1% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 5: St Margaret's Bay Rd & Route 333



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	95	5	25	120	5	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	112	6	29	141	6	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			118		315	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			118		315	115
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	96
cM capacity (veh/h)			1471		665	938

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	118	171	47
Volume Left	0	29	6
Volume Right	6	0	41
cSH	1700	1471	892
Volume to Capacity	0.07	0.02	0.05
Queue Length 95th (m)	0.0	0.5	1.3
Control Delay (s)	0.0	1.4	9.3
Lane LOS		A	A
Approach Delay (s)	0.0	1.4	9.3
Approach LOS			A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	70	35	15	90	5	55	20	20	5	10	15
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	82	41	18	106	6	65	24	24	6	12	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	112			124			318	297	103	329	315	109
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	112			124			318	297	103	329	315	109
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			89	96	98	99	98	98
cM capacity (veh/h)	1478			1463			601	598	952	578	584	945

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	147	129	112	35
Volume Left	24	18	65	6
Volume Right	41	6	24	18
cSH	1478	1463	651	720
Volume to Capacity	0.02	0.01	0.17	0.05
Queue Length 95th (m)	0.4	0.3	4.7	1.2
Control Delay (s)	1.3	1.1	11.7	10.3
Lane LOS	A	A	B	B
Approach Delay (s)	1.3	1.1	11.7	10.3
Approach LOS			B	B

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	70	55	115	60	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	82	65	135	71	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	200				171	65
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200				171	65
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				91	99
cM capacity (veh/h)	1372				813	999

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	12	82	65	135	82
Volume Left	12	0	0	0	71
Volume Right	0	0	0	135	12
cSH	1372	1700	1700	1700	835
Volume to Capacity	0.01	0.05	0.04	0.08	0.10
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.5
Control Delay (s)	7.6	0.0	0.0	0.0	9.8
Lane LOS	A				A
Approach Delay (s)	1.0		0.0		9.8
Approach LOS					A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	30	0	0	0	0	65	55	0	35	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	35	0	0	0	0	76	65	0	41	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	150	182	41	185	150	109	41			141		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	150	182	41	185	150	109	41			141		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	100	100			100		
cM capacity (veh/h)	818	712	1030	749	742	945	1568			1442		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	35	141	41
Volume Left	0	0	0
Volume Right	35	65	0
cSH	1030	1700	1442
Volume to Capacity	0.03	0.08	0.00
Queue Length 95th (m)	0.8	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	16.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	25	0	0	60	5	0	0	10	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	29	0	0	71	6	0	0	12	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	159	159	12	159	159	6	12			6		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159	159	12	159	159	6	12			6		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	100	96			100		
cM capacity (veh/h)	780	701	1069	780	701	1077	1607			1615		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	76	12
Volume Left	29	71	0
Volume Right	0	0	0
cSH	780	1607	1700
Volume to Capacity	0.04	0.04	0.01
Queue Length 95th (m)	0.9	1.0	0.0
Control Delay (s)	9.8	6.8	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	6.8	0.0
Approach LOS	A		

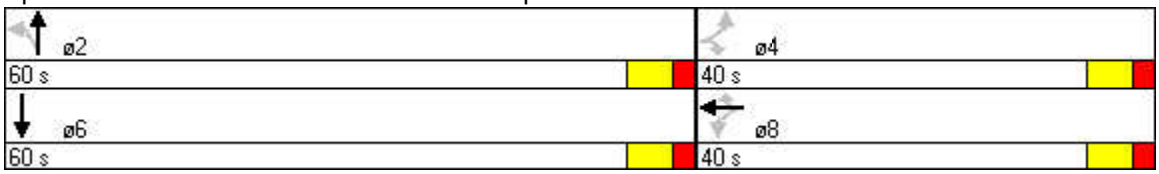
Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	20.3%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	1789	1883	1601	1789	1883	0	0	3543	0
Flt Permitted	0.504			0.950			0.296					
Satd. Flow (perm)	949	0	1601	1789	1883	1601	557	1883	0	0	3543	0
Satd. Flow (RTOR)			196			239					12	
Volume (vph)	105	0	445	420	225	490	190	600	0	0	675	50
Lane Group Flow (vph)	114	0	484	457	245	533	207	652	0	0	788	0
Turn Type	custom		custom	Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Total Split (s)	40.0	0.0	40.0	40.0	40.0	40.0	60.0	60.0	0.0	0.0	60.0	0.0
Act Effct Green (s)	25.2		25.2	25.2	25.2	25.2	32.8	32.8			32.8	
Actuated g/C Ratio	0.37		0.37	0.37	0.37	0.37	0.49	0.49			0.49	
v/c Ratio	0.32		0.67	0.69	0.35	0.71	0.77	0.71			0.46	
Control Delay	22.3		17.6	26.9	19.9	17.8	35.8	18.8			12.1	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	22.3		17.6	26.9	19.9	17.8	35.8	18.8			12.1	
LOS	C		B	C	B	B	D	B			B	
Approach Delay					21.6			22.9			12.1	
Approach LOS					C			C			B	
Queue Length 50th (m)	9.2		25.8	43.6	20.0	26.8	19.4	58.7			30.8	
Queue Length 95th (m)	30.5		83.9	110.8	54.3	90.3	#58.7	115.2			54.7	
Internal Link Dist (m)		150.9			235.4			83.2			277.6	
Turn Bay Length (m)			20.0	65.0		65.0	75.0					
Base Capacity (vph)	458		873	862	908	895	354	1197			2256	
Starvation Cap Reductn	0		0	0	0	0	0	0			0	
Spillback Cap Reductn	0		0	0	0	0	0	0			0	
Storage Cap Reductn	0		0	0	0	0	0	0			0	
Reduced v/c Ratio	0.25		0.55	0.53	0.27	0.60	0.58	0.54			0.35	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 67.6
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 19.2 Intersection LOS: B
Intersection Capacity Utilization 81.1% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Exit 5 WB Exit Ramp & Hammonds Plains Rd

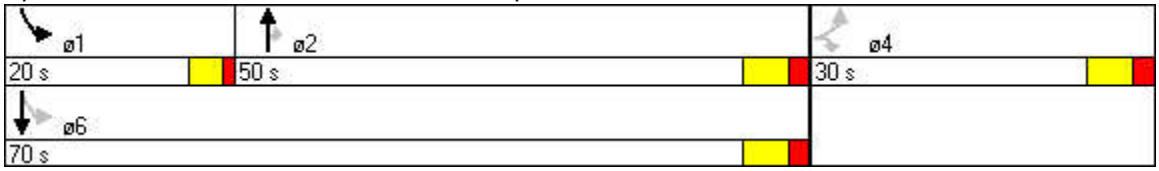


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	0	0	0	0	1883	1601	1789	3579	0
Flt Permitted	0.950									0.132		
Satd. Flow (perm)	1789	0	1601	0	0	0	0	1883	1601	249	3579	0
Satd. Flow (RTOR)			33						107			
Volume (vph)	190	0	30	0	0	0	0	635	205	255	1060	0
Lane Group Flow (vph)	207	0	33	0	0	0	0	690	223	277	1152	0
Turn Type	custom		custom						Perm	pm+pt		
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	30.0	0.0	30.0	0.0	0.0	0.0	0.0	50.0	50.0	20.0	70.0	0.0
Act Effct Green (s)	15.6		15.6					40.9	40.9	49.3	52.5	
Actuated g/C Ratio	0.21		0.21					0.58	0.58	0.68	0.74	
v/c Ratio	0.54		0.09					0.64	0.23	0.70	0.44	
Control Delay	34.0		11.1					20.4	8.1	22.0	6.3	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	34.0		11.1					20.4	8.1	22.0	6.3	
LOS	C		B					C	A	C	A	
Approach Delay								17.4			9.3	
Approach LOS								B			A	
Queue Length 50th (m)	25.3		0.0					74.1	8.5	14.9	33.3	
Queue Length 95th (m)	54.9		7.1					154.3	26.6	49.2	63.1	
Internal Link Dist (m)		258.8			94.2			150.4			120.9	
Turn Bay Length (m)			100.0						30.0	80.0		
Base Capacity (vph)	576		538					1166	1032	488	2774	
Starvation Cap Reductn	0		0					0	0	0	0	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.36		0.06					0.59	0.22	0.57	0.42	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 71
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 14.2 Intersection LOS: B
Intersection Capacity Utilization 68.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: 103 Exit 5 EB Ramps & Hammonds Plains Rd

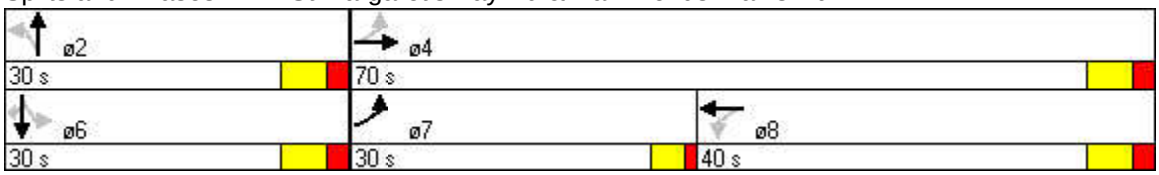


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1874	0	1789	1761	0	1789	1808	0	1789	1883	1601
Flt Permitted	0.364			0.664			0.657			0.637		
Satd. Flow (perm)	686	1874	0	1251	1761	0	1237	1808	0	1200	1883	1601
Satd. Flow (RTOR)		4			43			17				*804
Volume (vph)	460	130	5	40	170	130	55	85	30	155	105	740
Lane Group Flow (vph)	500	146	0	43	326	0	60	125	0	168	114	804
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	44.6	44.6		19.0	19.0		18.4	18.4		18.4	18.4	18.4
Actuated g/C Ratio	0.62	0.62		0.26	0.26		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.67	0.13		0.13	0.66		0.19	0.26		0.55	0.24	0.80
Control Delay	12.6	6.5		23.9	29.0		25.6	22.9		33.6	25.4	9.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	12.6	6.5		23.9	29.0		25.6	22.9		33.6	25.4	9.2
LOS	B	A		C	C		C	C		C	C	A
Approach Delay		11.2			28.4			23.8			14.7	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	33.3	7.4		5.0	38.0		6.9	12.6		21.4	13.3	0.0
Queue Length 95th (m)	61.2	16.1		13.2	68.2		18.2	29.2		45.6	29.5	34.9
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	790	1339		524	762		422	628		409	642	1076
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.63	0.11		0.08	0.43		0.14	0.20		0.41	0.18	0.75

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 71.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 16.6 Intersection LOS: B
Intersection Capacity Utilization 76.0% ICU Level of Service D
Analysis Period (min) 15
* User Entered Value

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

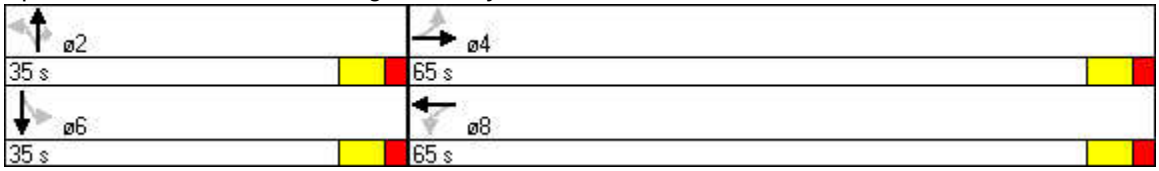


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1842	0	1789	1836	0	0	1810	1601	0	1781	0
Flt Permitted	0.321			0.512				0.741			0.773	
Satd. Flow (perm)	605	1842	0	964	1836	0	0	1396	1601	0	1421	0
Satd. Flow (RTOR)		16			19				250		11	
Volume (vph)	25	265	45	420	465	95	45	10	230	110	30	30
Lane Group Flow (vph)	27	337	0	457	608	0	0	60	250	0	186	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	65.0	65.0	0.0	65.0	65.0	0.0	35.0	35.0	35.0	35.0	35.0	0.0
Act Effct Green (s)	44.7	44.7		44.7	44.7			15.2	15.2		15.3	
Actuated g/C Ratio	0.70	0.70		0.70	0.70			0.23	0.23		0.23	
v/c Ratio	0.06	0.26		0.68	0.47			0.19	0.45		0.55	
Control Delay	6.0	6.0		15.8	8.0			24.8	6.6		29.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	6.0	6.0		15.8	8.0			24.8	6.6		29.5	
LOS	A	A		B	A			C	A		C	
Approach Delay		6.0			11.3			10.1			29.5	
Approach LOS		A			B			B			C	
Queue Length 50th (m)	1.0	13.5		30.1	30.2			5.1	0.0		16.3	
Queue Length 95th (m)	4.8	35.8		96.6	76.1			18.1	17.1		46.9	
Internal Link Dist (m)		503.9			281.2			436.3			225.0	
Turn Bay Length (m)	75.0			100.0					16.0			
Base Capacity (vph)	463	1414		738	1410			544	777		561	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.06	0.24		0.62	0.43			0.11	0.32		0.33	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 64
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.9 Intersection LOS: B
Intersection Capacity Utilization 66.1% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 5: St Margaret's Bay Rd & Route 333



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	205	5	50	220	10	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	241	6	59	259	12	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			247		621	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			247		621	244
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		97	96
cM capacity (veh/h)			1319		431	795

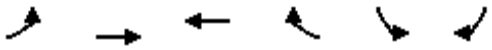
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	247	318	47
Volume Left	0	59	12
Volume Right	6	0	35
cSH	1700	1319	656
Volume to Capacity	0.15	0.04	0.07
Queue Length 95th (m)	0.0	1.1	1.8
Control Delay (s)	0.0	1.8	10.9
Lane LOS		A	B
Approach Delay (s)	0.0	1.8	10.9
Approach LOS			B

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	38.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	55	125	80	35	140	10	55	30	25	10	55	45
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	65	147	94	41	165	12	65	35	29	12	65	53
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	176			241			662	582	194	624	624	171
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176			241			662	582	194	624	624	171
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			97			78	91	97	97	83	94
cM capacity (veh/h)	1400			1325			288	392	847	337	372	873

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	306	218	129	129
Volume Left	65	41	65	12
Volume Right	94	12	29	53
cSH	1400	1325	371	480
Volume to Capacity	0.05	0.03	0.35	0.27
Queue Length 95th (m)	1.1	0.7	11.6	8.2
Control Delay (s)	2.0	1.7	19.8	15.2
Lane LOS	A	A	C	C
Approach Delay (s)	2.0	1.7	19.8	15.2
Approach LOS			C	C

Intersection Summary			
Average Delay	7.0		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	15	105	130	100	165	25
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	18	124	153	118	194	29
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	271				312	153
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271				312	153
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				71	97
cM capacity (veh/h)	1293				672	893

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	18	124	153	118	224
Volume Left	18	0	0	0	194
Volume Right	0	0	0	118	29
cSH	1293	1700	1700	1700	694
Volume to Capacity	0.01	0.07	0.09	0.07	0.32
Queue Length 95th (m)	0.3	0.0	0.0	0.0	10.6
Control Delay (s)	7.8	0.0	0.0	0.0	12.6
Lane LOS	A				B
Approach Delay (s)	1.0		0.0		12.6
Approach LOS					B

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	0	55	0	0	0	0	90	50	5	110	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	6	0	65	0	0	0	0	106	59	6	129	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	276	306	129	341	276	135	129			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	276	306	129	341	276	135	129			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	93	100	100	100	100			100		
cM capacity (veh/h)	674	605	920	568	629	913	1456			1414		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	71	165	135
Volume Left	6	0	6
Volume Right	65	59	0
cSH	893	1700	1414
Volume to Capacity	0.08	0.10	0.00
Queue Length 95th (m)	2.0	0.0	0.1
Control Delay (s)	9.4	0.0	0.4
Lane LOS	A		A
Approach Delay (s)	9.4	0.0	0.4
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	20.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	100	0	5	80	15	0	0	15	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	118	0	6	94	18	0	0	18	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	229	224	18	224	224	18	18			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	229	224	18	224	224	18	18			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	83	100	99	94			100		
cM capacity (veh/h)	689	636	1061	699	636	1061	1599			1599		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	124	112	18
Volume Left	118	94	0
Volume Right	6	0	0
cSH	711	1599	1700
Volume to Capacity	0.17	0.06	0.01
Queue Length 95th (m)	4.8	1.4	0.0
Control Delay (s)	11.1	6.3	0.0
Lane LOS	B	A	
Approach Delay (s)	11.1	6.3	0.0
Approach LOS	B		

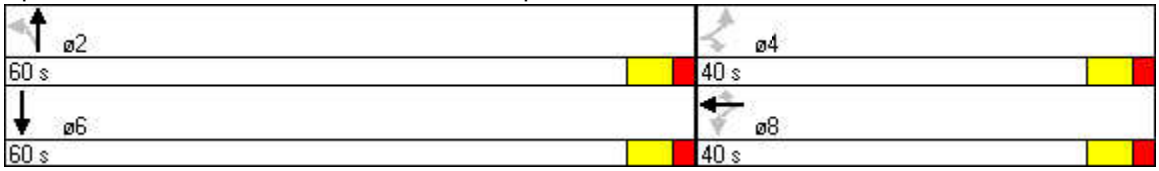
Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	24.4%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	1789	1883	1601	1789	1883	0	0	3553	0
Flt Permitted	0.718			0.950			0.296					
Satd. Flow (perm)	1352	0	1601	1789	1883	1601	557	1883	0	0	3553	0
Satd. Flow (RTOR)			189			92					8	
Volume (vph)	25	0	270	175	55	85	210	375	0	0	690	35
Lane Group Flow (vph)	27	0	293	190	60	92	228	408	0	0	788	0
Turn Type	custom		custom	Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Total Split (s)	40.0	0.0	40.0	40.0	40.0	40.0	60.0	60.0	0.0	0.0	60.0	0.0
Act Effct Green (s)	13.5		13.5	13.5	13.5	13.5	32.6	32.6			32.6	
Actuated g/C Ratio	0.25		0.25	0.25	0.25	0.25	0.59	0.59			0.59	
v/c Ratio	0.08		0.55	0.43	0.13	0.20	0.69	0.37			0.37	
Control Delay	21.7		13.1	24.0	21.0	7.3	20.9	6.9			6.2	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	21.7		13.1	24.0	21.0	7.3	20.9	6.9			6.2	
LOS	C		B	C	C	A	C	A			A	
Approach Delay					19.0			11.9			6.2	
Approach LOS					B			B			A	
Queue Length 50th (m)	1.7		6.8	13.1	3.8	0.0	11.6	15.6			15.7	
Queue Length 95th (m)	9.6		36.7	44.7	16.8	10.7	47.8	40.6			35.6	
Internal Link Dist (m)		150.9			235.4			83.2			277.6	
Turn Bay Length (m)			20.0	65.0		65.0	75.0					
Base Capacity (vph)	648		866	858	903	815	404	1365			2578	
Starvation Cap Reductn	0		0	0	0	0	0	0			0	
Spillback Cap Reductn	0		0	0	0	0	0	0			0	
Storage Cap Reductn	0		0	0	0	0	0	0			0	
Reduced v/c Ratio	0.04		0.34	0.22	0.07	0.11	0.56	0.30			0.31	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 55.1
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 11.2 Intersection LOS: B
Intersection Capacity Utilization 56.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 1: Exit 5 WB Exit Ramp & Hammonds Plains Rd

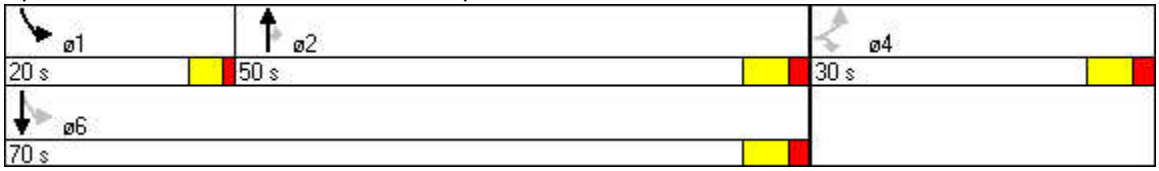


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	0	0	0	0	1883	1601	1789	3579	0
Flt Permitted	0.950									0.263		
Satd. Flow (perm)	1789	0	1601	0	0	0	0	1883	1601	495	3579	0
Satd. Flow (RTOR)			22						244			
Volume (vph)	135	0	20	0	0	0	0	480	355	375	640	0
Lane Group Flow (vph)	147	0	22	0	0	0	0	522	386	408	696	0
Turn Type	custom		custom						Perm	pm+pt		
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	30.0	0.0	30.0	0.0	0.0	0.0	0.0	50.0	50.0	20.0	70.0	0.0
Act Effct Green (s)	12.6		12.6					27.3	27.3	43.6	45.2	
Actuated g/C Ratio	0.20		0.20					0.45	0.45	0.71	0.74	
v/c Ratio	0.41		0.07					0.62	0.45	0.68	0.26	
Control Delay	29.3		12.3					18.9	7.3	12.0	4.4	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	29.3		12.3					18.9	7.3	12.0	4.4	
LOS	C		B					B	A	B	A	
Approach Delay								14.0			7.2	
Approach LOS								B			A	
Queue Length 50th (m)	14.7		0.0					46.2	10.0	16.0	13.7	
Queue Length 95th (m)	38.7		5.8					93.9	33.0	45.1	27.4	
Internal Link Dist (m)		258.8			94.2			150.4			120.9	
Turn Bay Length (m)			100.0						30.0	80.0		
Base Capacity (vph)	624		572					1106	1041	659	2863	
Starvation Cap Reductn	0		0					0	0	0	0	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.24		0.04					0.47	0.37	0.62	0.24	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 61.1
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 11.6 Intersection LOS: B
Intersection Capacity Utilization 63.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: Exit 5 EB Ramps & Hammonds Plains Rd

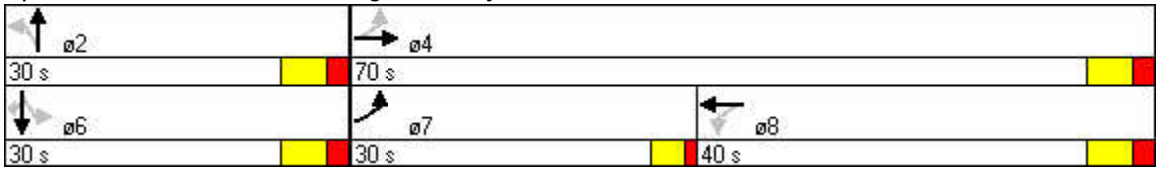


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1872	0	1789	1706	0	1789	1778	0	1789	1883	1601
Flt Permitted	0.536			0.674			0.729			0.729		
Satd. Flow (perm)	1010	1872	0	1269	1706	0	1373	1778	0	1373	1883	1601
Satd. Flow (RTOR)		4			94			16				266
Volume (vph)	615	115	5	15	60	100	5	25	15	105	40	245
Lane Group Flow (vph)	668	130	0	16	174	0	5	43	0	114	43	266
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	37.7	39.4		11.4	11.4		12.4	12.4		12.4	12.4	12.4
Actuated g/C Ratio	0.69	0.72		0.21	0.21		0.22	0.22		0.22	0.22	0.22
v/c Ratio	0.67	0.10		0.06	0.41		0.02	0.11		0.38	0.11	0.48
Control Delay	9.9	4.6		22.8	15.3		20.2	15.5		25.5	20.8	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	9.9	4.6		22.8	15.3		20.2	15.5		25.5	20.8	6.6
LOS	A	A		C	B		C	B		C	C	A
Approach Delay		9.0			15.9			16.0			13.1	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	32.1	4.1		1.5	7.8		0.5	2.5		11.1	3.9	0.0
Queue Length 95th (m)	75.3	11.8		6.3	24.5		2.9	9.8		25.6	11.5	16.0
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	991	1501		594	849		515	678		515	707	767
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.67	0.09		0.03	0.20		0.01	0.06		0.22	0.06	0.35

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 54.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 11.3 Intersection LOS: B
Intersection Capacity Utilization 65.8% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

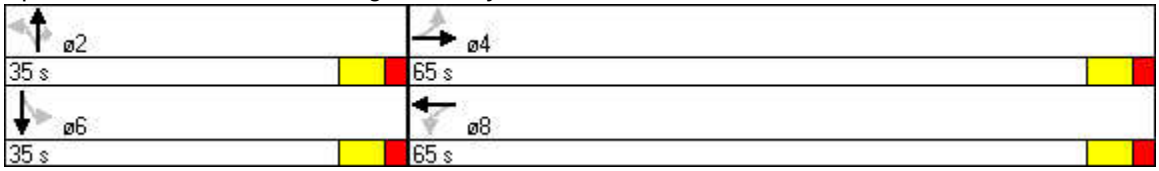


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1865	0	1789	1834	0	0	1819	1601	0	1798	0
Flt Permitted	0.604			0.397				0.819			0.819	
Satd. Flow (perm)	1138	1865	0	748	1834	0	0	1543	1601	0	1524	0
Satd. Flow (RTOR)		7			19				326		5	
Volume (vph)	30	425	30	130	170	35	35	15	300	35	10	5
Lane Group Flow (vph)	33	495	0	141	223	0	0	54	326	0	54	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	65.0	65.0	0.0	65.0	65.0	0.0	35.0	35.0	35.0	35.0	35.0	0.0
Act Effct Green (s)	19.1	19.1		19.1	19.1			9.6	9.6		9.6	
Actuated g/C Ratio	0.52	0.52		0.52	0.52			0.26	0.26		0.26	
v/c Ratio	0.06	0.51		0.37	0.23			0.14	0.50		0.14	
Control Delay	5.2	8.3		9.1	5.5			12.2	5.1		11.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	5.2	8.3		9.1	5.5			12.2	5.1		11.5	
LOS	A	A		A	A			B	A		B	
Approach Delay		8.1			6.9			6.1			11.5	
Approach LOS		A			A			A			B	
Queue Length 50th (m)	0.8	14.7		3.9	5.1			2.0	0.0		1.8	
Queue Length 95th (m)	3.9	41.2		15.4	16.2			9.6	13.7		9.2	
Internal Link Dist (m)		503.9			281.2			436.3			225.0	
Turn Bay Length (m)	75.0			100.0					16.0			
Base Capacity (vph)	884	1450		581	1428			826	1008		818	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.04	0.34		0.24	0.16			0.07	0.32		0.07	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 37
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 7.3 Intersection LOS: A
Intersection Capacity Utilization 56.1% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 5: St Margaret's Bay Rd & Route 333



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	105	5	25	135	5	40
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	124	6	29	159	6	47
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			129		344	126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			129		344	126
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	95
cM capacity (veh/h)			1456		639	924

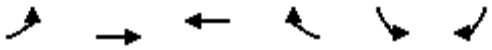
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	129	188	53
Volume Left	0	29	6
Volume Right	6	0	47
cSH	1700	1456	880
Volume to Capacity	0.08	0.02	0.06
Queue Length 95th (m)	0.0	0.5	1.5
Control Delay (s)	0.0	1.3	9.4
Lane LOS		A	A
Approach Delay (s)	0.0	1.3	9.4
Approach LOS			A

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	80	40	15	100	5	60	20	20	5	10	15
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	94	47	18	118	6	71	24	24	6	12	18
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	124			141			344	324	118	356	344	121
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124			141			344	324	118	356	344	121
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			88	96	97	99	98	98
cM capacity (veh/h)	1463			1442			576	577	934	554	562	931

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	165	141	118	35
Volume Left	24	18	71	6
Volume Right	47	6	24	18
cSH	1463	1442	624	699
Volume to Capacity	0.02	0.01	0.19	0.05
Queue Length 95th (m)	0.4	0.3	5.2	1.2
Control Delay (s)	1.2	1.0	12.1	10.4
Lane LOS	A	A	B	B
Approach Delay (s)	1.2	1.0	12.1	10.4
Approach LOS			B	B

Intersection Summary			
Average Delay	4.6		
Intersection Capacity Utilization	29.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	75	60	125	65	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	12	88	71	147	76	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	218				182	71
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218				182	71
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				90	99
cM capacity (veh/h)	1352				800	992

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	12	88	71	147	88
Volume Left	12	0	0	0	76
Volume Right	0	0	0	147	12
cSH	1352	1700	1700	1700	821
Volume to Capacity	0.01	0.05	0.04	0.09	0.11
Queue Length 95th (m)	0.2	0.0	0.0	0.0	2.7
Control Delay (s)	7.7	0.0	0.0	0.0	9.9
Lane LOS	A				A
Approach Delay (s)	0.9		0.0		9.9
Approach LOS					A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	18.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	35	0	0	0	0	70	60	0	35	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	41	0	0	0	0	82	71	0	41	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	159	194	41	200	159	118	41			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159	194	41	200	159	118	41			153		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	96	100	100	100	100			100		
cM capacity (veh/h)	807	701	1030	728	733	934	1568			1428		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	41	153	41
Volume Left	0	0	0
Volume Right	41	71	0
cSH	1030	1700	1428
Volume to Capacity	0.04	0.09	0.00
Queue Length 95th (m)	0.9	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	25	0	0	65	5	0	0	10	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	29	0	0	76	6	0	0	12	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	171	171	12	171	171	6	12			6		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171	171	12	171	171	6	12			6		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	96	100	100	95			100		
cM capacity (veh/h)	764	688	1069	764	688	1077	1607			1615		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	29	82	12
Volume Left	29	76	0
Volume Right	0	0	0
cSH	764	1607	1700
Volume to Capacity	0.04	0.05	0.01
Queue Length 95th (m)	0.9	1.1	0.0
Control Delay (s)	9.9	6.9	0.0
Lane LOS	A	A	
Approach Delay (s)	9.9	6.9	0.0
Approach LOS	A		

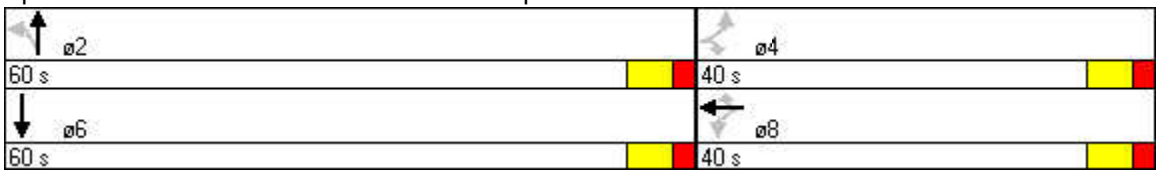
Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	1789	1883	1601	1789	1883	0	0	3546	0
Flt Permitted	0.504			0.950			0.269					
Satd. Flow (perm)	949	0	1601	1789	1883	1601	507	1883	0	0	3546	0
Satd. Flow (RTOR)			167			199					11	
Volume (vph)	105	0	445	460	225	535	190	670	0	0	735	50
Lane Group Flow (vph)	114	0	484	500	245	582	207	728	0	0	853	0
Turn Type	custom		custom	Perm		Perm	Perm					
Protected Phases					8			2			6	
Permitted Phases	4		4	8		8	2					
Total Split (s)	40.0	0.0	40.0	40.0	40.0	40.0	60.0	60.0	0.0	0.0	60.0	0.0
Act Effct Green (s)	27.9		27.9	27.9	27.9	27.9	37.7	37.7			37.7	
Actuated g/C Ratio	0.37		0.37	0.37	0.37	0.37	0.50	0.50			0.50	
v/c Ratio	0.32		0.69	0.75	0.35	0.81	0.81	0.77			0.48	
Control Delay	24.2		21.0	32.0	21.8	26.3	43.5	21.6			12.9	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Delay	24.2		21.0	32.0	21.8	26.3	43.5	21.6			12.9	
LOS	C		C	C	C	C	D	C			B	
Approach Delay					27.6			26.5			12.9	
Approach LOS					C			C			B	
Queue Length 50th (m)	12.9		42.1	68.9	28.0	55.8	27.3	92.6			45.4	
Queue Length 95th (m)	30.5		90.3	#126.4	54.3	#130.0	#69.8	136.9			60.3	
Internal Link Dist (m)		150.9			235.4			83.2			277.6	
Turn Bay Length (m)			20.0	65.0		65.0	75.0					
Base Capacity (vph)	431		817	811	854	835	313	1161			2191	
Starvation Cap Reductn	0		0	0	0	0	0	0			0	
Spillback Cap Reductn	0		0	0	0	0	0	0			0	
Storage Cap Reductn	0		0	0	0	0	0	0			0	
Reduced v/c Ratio	0.26		0.59	0.62	0.29	0.70	0.66	0.63			0.39	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 75.1
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 23.0 Intersection LOS: C
Intersection Capacity Utilization 84.9% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Exit 5 WB Exit Ramp & Hammonds Plains Rd

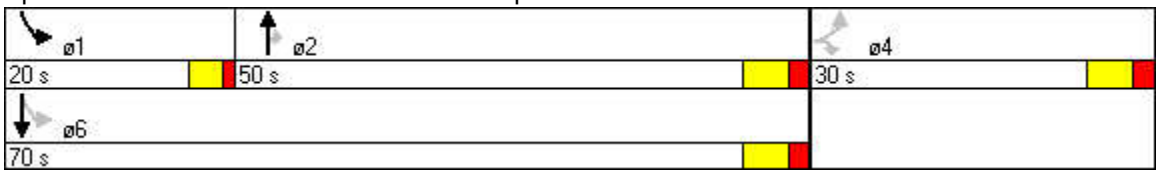


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	0	1601	0	0	0	0	1883	1601	1789	3579	0
Flt Permitted	0.950									0.083		
Satd. Flow (perm)	1789	0	1601	0	0	0	0	1883	1601	156	3579	0
Satd. Flow (RTOR)			33						104			
Volume (vph)	205	0	30	0	0	0	0	695	220	280	1115	0
Lane Group Flow (vph)	223	0	33	0	0	0	0	755	239	304	1212	0
Turn Type	custom		custom						Perm	pm+pt		
Protected Phases								2		1	6	
Permitted Phases	4		4						2	6		
Total Split (s)	30.0	0.0	30.0	0.0	0.0	0.0	0.0	50.0	50.0	20.0	70.0	0.0
Act Effct Green (s)	17.4		17.4					38.0	38.0	56.0	56.0	
Actuated g/C Ratio	0.21		0.21					0.46	0.46	0.68	0.68	
v/c Ratio	0.59		0.09					0.86	0.30	0.80	0.50	
Control Delay	38.1		10.8					32.7	9.5	38.7	7.3	
Queue Delay	0.0		0.0					0.0	0.0	0.0	0.0	
Total Delay	38.1		10.8					32.7	9.5	38.7	7.3	
LOS	D		B					C	A	D	A	
Approach Delay								27.1			13.6	
Approach LOS								C			B	
Queue Length 50th (m)	36.6		0.0					108.2	12.6	34.8	42.1	
Queue Length 95th (m)	58.9		7.1					#198.0	30.5	#83.2	70.8	
Internal Link Dist (m)		258.8			94.2			150.4			120.9	
Turn Bay Length (m)			100.0						30.0	80.0		
Base Capacity (vph)	529		497					978	881	426	2584	
Starvation Cap Reductn	0		0					0	0	0	0	
Spillback Cap Reductn	0		0					0	0	0	0	
Storage Cap Reductn	0		0					0	0	0	0	
Reduced v/c Ratio	0.42		0.07					0.77	0.27	0.71	0.47	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 81.9
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 20.4 Intersection LOS: C
Intersection Capacity Utilization 73.4% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 3: 103 Exit 5 EB Ramps & Hammonds Plains Rd

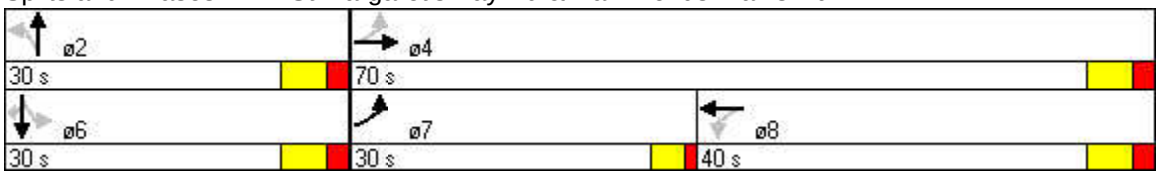


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1874	0	1789	1761	0	1789	1808	0	1789	1883	1601
Flt Permitted	0.335			0.654			0.657			0.637		
Satd. Flow (perm)	631	1874	0	1232	1761	0	1237	1808	0	1200	1883	1601
Satd. Flow (RTOR)		3			43			17				*875
Volume (vph)	500	145	5	40	185	140	55	85	30	165	105	805
Lane Group Flow (vph)	543	163	0	43	353	0	60	125	0	179	114	875
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	47.0	47.0		20.5	20.5		19.1	19.1		19.1	19.1	19.1
Actuated g/C Ratio	0.63	0.63		0.27	0.27		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.74	0.14		0.13	0.69		0.19	0.26		0.58	0.24	0.83
Control Delay	15.7	6.5		23.7	30.3		26.6	23.7		36.0	26.4	10.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	15.7	6.5		23.7	30.3		26.6	23.7		36.0	26.4	10.1
LOS	B	A		C	C		C	C		D	C	B
Approach Delay		13.6			29.6			24.7			15.7	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	39.2	8.8		5.1	43.4		7.1	13.0		23.8	13.7	0.0
Queue Length 95th (m)	76.4	17.8		13.0	74.6		18.7	29.9		50.3	30.2	39.9
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	771	1329		505	747		408	608		396	621	1115
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.70	0.12		0.09	0.47		0.15	0.21		0.45	0.18	0.78

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 74.9
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 18.0 Intersection LOS: B
Intersection Capacity Utilization 81.5% ICU Level of Service D
Analysis Period (min) 15
* User Entered Value

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

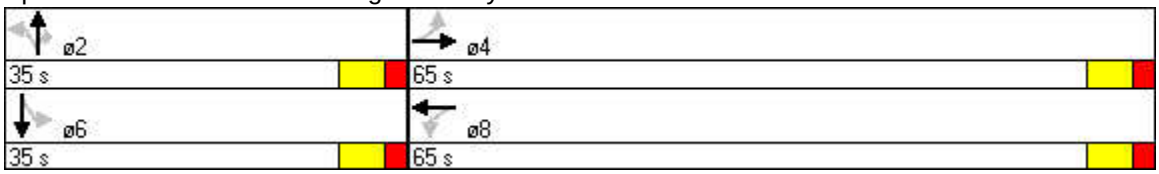


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1842	0	1789	1838	0	0	1808	1601	0	1781	0
Flt Permitted	0.293			0.488				0.728			0.771	
Satd. Flow (perm)	552	1842	0	919	1838	0	0	1371	1601	0	1417	0
Satd. Flow (RTOR)		16			17				272		11	
Volume (vph)	25	290	50	460	505	95	50	10	250	110	30	30
Lane Group Flow (vph)	27	369	0	500	652	0	0	65	272	0	186	0
Turn Type	Perm			Perm			Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		
Total Split (s)	65.0	65.0	0.0	65.0	65.0	0.0	35.0	35.0	35.0	35.0	35.0	0.0
Act Effct Green (s)	49.5	49.5		49.5	49.5			16.3	16.3		16.3	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22	0.22		0.22	
v/c Ratio	0.07	0.30		0.82	0.53			0.22	0.48		0.58	
Control Delay	6.1	6.3		24.1	8.8			28.3	6.9		34.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	
Total Delay	6.1	6.3		24.1	8.8			28.3	6.9		34.3	
LOS	A	A		C	A			C	A		C	
Approach Delay		6.3			15.4			11.0			34.3	
Approach LOS		A			B			B			C	
Queue Length 50th (m)	1.2	17.7		44.5	39.5			8.4	0.0		24.6	
Queue Length 95th (m)	4.9	40.0		#137.6	85.4			19.4	17.7		46.9	
Internal Link Dist (m)		503.9			281.2			436.3			225.0	
Turn Bay Length (m)	75.0			100.0					16.0			
Base Capacity (vph)	394	1320		656	1318			491	748		514	
Starvation Cap Reductn	0	0		0	0			0	0		0	
Spillback Cap Reductn	0	0		0	0			0	0		0	
Storage Cap Reductn	0	0		0	0			0	0		0	
Reduced v/c Ratio	0.07	0.28		0.76	0.49			0.13	0.36		0.36	

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 74.4
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 14.7 Intersection LOS: B
Intersection Capacity Utilization 69.9% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 5: St Margaret's Bay Rd & Route 333



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	220	5	55	240	15	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	259	6	65	282	18	41
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			265		674	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			265		674	262
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		96	95
cM capacity (veh/h)			1299		399	777

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	265	347	59
Volume Left	0	65	18
Volume Right	6	0	41
cSH	1700	1299	605
Volume to Capacity	0.16	0.05	0.10
Queue Length 95th (m)	0.0	1.2	2.4
Control Delay (s)	0.0	1.9	11.6
Lane LOS		A	B
Approach Delay (s)	0.0	1.9	11.6
Approach LOS			B

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	55	135	85	40	150	10	60	30	25	10	55	45
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	65	159	100	47	176	12	71	35	29	12	65	53
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	188			259			700	621	209	662	665	182
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			259			700	621	209	662	665	182
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			96			74	90	96	96	82	94
cM capacity (veh/h)	1386			1306			268	371	831	315	350	860

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	324	235	135	129
Volume Left	65	47	71	12
Volume Right	100	12	29	53
cSH	1386	1306	343	456
Volume to Capacity	0.05	0.04	0.39	0.28
Queue Length 95th (m)	1.1	0.9	13.9	8.8
Control Delay (s)	1.9	1.8	22.1	16.0
Lane LOS	A	A	C	C
Approach Delay (s)	1.9	1.8	22.1	16.0
Approach LOS			C	C

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	20	115	145	110	180	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	135	171	129	212	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	300				353	171
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	300				353	171
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				67	96
cM capacity (veh/h)	1261				633	873

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	24	135	171	129	247
Volume Left	24	0	0	0	212
Volume Right	0	0	0	129	35
cSH	1261	1700	1700	1700	659
Volume to Capacity	0.02	0.08	0.10	0.08	0.38
Queue Length 95th (m)	0.4	0.0	0.0	0.0	13.2
Control Delay (s)	7.9	0.0	0.0	0.0	13.7
Lane LOS	A				B
Approach Delay (s)	1.2		0.0		13.7
Approach LOS					B

Intersection Summary			
Average Delay	5.1		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	0	60	0	0	0	0	95	55	5	120	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	6	0	71	0	0	0	0	112	65	6	141	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	297	329	141	368	297	144	141			176		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	297	329	141	368	297	144	141			176		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	92	100	100	100	100			100		
cM capacity (veh/h)	653	587	907	541	612	903	1442			1400		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	176	147
Volume Left	6	0	6
Volume Right	71	65	0
cSH	880	1700	1400
Volume to Capacity	0.09	0.10	0.00
Queue Length 95th (m)	2.2	0.0	0.1
Control Delay (s)	9.5	0.0	0.3
Lane LOS	A		A
Approach Delay (s)	9.5	0.0	0.3
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	110	0	5	85	15	0	0	15	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	129	0	6	100	18	0	0	18	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	241	235	18	235	235	18	18			18		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	241	235	18	235	235	18	18			18		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	81	100	99	94			100		
cM capacity (veh/h)	675	624	1061	685	624	1061	1599			1599		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	135	118	18
Volume Left	129	100	0
Volume Right	6	0	0
cSH	696	1599	1700
Volume to Capacity	0.19	0.06	0.01
Queue Length 95th (m)	5.4	1.5	0.0
Control Delay (s)	11.4	6.4	0.0
Lane LOS	B	A	
Approach Delay (s)	11.4	6.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	8.5		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	55	0	0	25	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	65	0	0	29	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	59	59	0	59	59	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59	59	0	59	59	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	98			100		
cM capacity (veh/h)	924	817	1085	924	817	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	65	29	0
Volume Left	65	29	0
Volume Right	0	0	0
cSH	924	1623	1700
Volume to Capacity	0.07	0.02	0.00
Queue Length 95th (m)	1.7	0.4	0.0
Control Delay (s)	9.2	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	0	0	0	0	25	70	0	55	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	6	0	0	0	0	29	82	0	65	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	135	176	65	141	135	71	65			112		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135	176	65	141	135	71	65			112		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	836	717	999	824	756	992	1537			1478		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	6	112	65
Volume Left	0	0	0
Volume Right	6	82	0
cSH	999	1700	1478
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	15.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	45	95	20	50	5	55
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	53	112	24	59	6	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	82				271	53
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	82				271	53
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				99	94
cM capacity (veh/h)	1515				694	1015

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	165	82	6	65
Volume Left	53	0	6	0
Volume Right	0	59	0	65
cSH	1515	1700	694	1015
Volume to Capacity	0.03	0.05	0.01	0.06
Queue Length 95th (m)	0.8	0.0	0.2	1.6
Control Delay (s)	2.6	0.0	10.2	8.8
Lane LOS	A		B	A
Approach Delay (s)	2.6	0.0	8.9	
Approach LOS			A	

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	24.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	135	0	0	30	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	159	0	0	35	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	71	71	0	71	71	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	71	71	0	71	71	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	82	100	100	98			100		
cM capacity (veh/h)	906	802	1085	906	802	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	159	35	0
Volume Left	159	35	0
Volume Right	0	0	0
cSH	906	1623	1700
Volume to Capacity	0.18	0.02	0.00
Queue Length 95th (m)	4.8	0.5	0.0
Control Delay (s)	9.8	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	9.4		
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	20	0	0	0	0	30	95	0	135	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	24	0	0	0	0	35	112	0	159	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	250	306	159	274	250	91	159			147		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250	306	159	274	250	91	159			147		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	97	100	100	100	100			100		
cM capacity (veh/h)	703	608	886	661	653	966	1421			1435		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	24	147	159
Volume Left	0	0	0
Volume Right	24	112	0
cSH	886	1700	1435
Volume to Capacity	0.03	0.09	0.00
Queue Length 95th (m)	0.6	0.0	0.0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	80	65	145	45	35	120
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	94	76	171	53	41	141
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	224				462	197
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	224				462	197
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	93				92	83
cM capacity (veh/h)	1345				519	844

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	171	224	41	141
Volume Left	94	0	41	0
Volume Right	0	53	0	141
cSH	1345	1700	519	844
Volume to Capacity	0.07	0.13	0.08	0.17
Queue Length 95th (m)	1.7	0.0	2.0	4.5
Control Delay (s)	4.6	0.0	12.5	10.1
Lane LOS	A		B	B
Approach Delay (s)	4.6	0.0	10.7	
Approach LOS			B	

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	55	0	0	20	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	65	0	0	24	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	47	47	0	47	47	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	47	47	0	47	47	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	943	832	1085	943	832	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	65	24	0
Volume Left	65	24	0
Volume Right	0	0	0
cSH	943	1623	1700
Volume to Capacity	0.07	0.01	0.00
Queue Length 95th (m)	1.7	0.3	0.0
Control Delay (s)	9.1	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.6		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	0	0	0	0	20	80	0	55	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	6	0	0	0	0	24	94	0	65	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	135	182	65	141	135	71	65			118		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	135	182	65	141	135	71	65			118		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	836	712	999	824	756	992	1537			1471		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	6	118	65
Volume Left	0	0	0
Volume Right	6	94	0
cSH	999	1700	1471
Volume to Capacity	0.01	0.07	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	16.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	85	115	30	15	5	55
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	100	135	35	18	6	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	53				379	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				379	44
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	94
cM capacity (veh/h)	1553				582	1026

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	235	53	6	65
Volume Left	100	0	6	0
Volume Right	0	18	0	65
cSH	1553	1700	582	1026
Volume to Capacity	0.06	0.03	0.01	0.06
Queue Length 95th (m)	1.6	0.0	0.2	1.5
Control Delay (s)	3.5	0.0	11.2	8.7
Lane LOS	A		B	A
Approach Delay (s)	3.5	0.0	9.0	
Approach LOS			A	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	140	0	0	25	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	165	0	0	29	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	59	59	0	59	59	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	59	59	0	59	59	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	82	100	100	98			100		
cM capacity (veh/h)	924	817	1085	924	817	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	165	29	0
Volume Left	165	29	0
Volume Right	0	0	0
cSH	924	1623	1700
Volume to Capacity	0.18	0.02	0.00
Queue Length 95th (m)	4.9	0.4	0.0
Control Delay (s)	9.7	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	9.4		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	15	0	0	0	0	25	100	0	140	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	18	0	0	0	0	29	118	0	165	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	253	312	165	271	253	88	165			147		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	253	312	165	271	253	88	165			147		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	100	100			100		
cM capacity (veh/h)	700	603	880	668	650	970	1414			1435		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	147	165
Volume Left	0	0	0
Volume Right	18	118	0
cSH	880	1700	1435
Volume to Capacity	0.02	0.09	0.00
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	9.2	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.2	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	17.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	105	80	165	20	15	140
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	124	94	194	24	18	165
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	218				547	206
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218				547	206
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				96	80
cM capacity (veh/h)	1352				453	835

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	218	218	18	165
Volume Left	124	0	18	0
Volume Right	0	24	0	165
cSH	1352	1700	453	835
Volume to Capacity	0.09	0.13	0.04	0.20
Queue Length 95th (m)	2.3	0.0	0.9	5.6
Control Delay (s)	4.8	0.0	13.3	10.4
Lane LOS	A		B	B
Approach Delay (s)	4.8	0.0	10.7	
Approach LOS			B	

Intersection Summary			
Average Delay	4.8		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	55	0	0	10	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	65	0	0	12	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	24	24	0	24	24	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24	24	0	24	24	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	983	864	1085	983	864	1085	1623			1623		

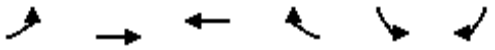
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	65	12	0
Volume Left	65	12	0
Volume Right	0	0	0
cSH	983	1623	1700
Volume to Capacity	0.07	0.01	0.00
Queue Length 95th (m)	1.6	0.2	0.0
Control Delay (s)	8.9	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	0	0	0	0	10	80	0	55	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	6	0	0	0	0	12	94	0	65	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	124	171	65	129	124	59	65			106		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124	171	65	129	124	59	65			106		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	851	722	999	838	767	1007	1537			1485		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	6	106	65
Volume Left	0	0	0
Volume Right	6	94	0
cSH	999	1700	1485
Volume to Capacity	0.01	0.06	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.6	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.6	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	15.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	80	115	35	10	5	55
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	94	135	41	12	6	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	53				371	47
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	53				371	47
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				99	94
cM capacity (veh/h)	1553				592	1022

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	229	53	6	65
Volume Left	94	0	6	0
Volume Right	0	12	0	65
cSH	1553	1700	592	1022
Volume to Capacity	0.06	0.03	0.01	0.06
Queue Length 95th (m)	1.5	0.0	0.2	1.5
Control Delay (s)	3.4	0.0	11.1	8.8
Lane LOS	A		B	A
Approach Delay (s)	3.4	0.0	9.0	
Approach LOS			A	

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	27.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	140	0	0	10	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	165	0	0	12	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	24	24	0	24	24	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24	24	0	24	24	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	83	100	100	99			100		
cM capacity (veh/h)	983	864	1085	983	864	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	165	12	0
Volume Left	165	12	0
Volume Right	0	0	0
cSH	983	1623	1700
Volume to Capacity	0.17	0.01	0.00
Queue Length 95th (m)	4.6	0.2	0.0
Control Delay (s)	9.4	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	9.3		
Intersection Capacity Utilization	17.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	10	0	0	0	0	10	100	0	140	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	12	0	0	0	0	12	118	0	165	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	235	294	165	247	235	71	165			129		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	235	294	165	247	235	71	165			129		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	719	617	880	697	665	992	1414			1456		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	129	165
Volume Left	0	0	0
Volume Right	12	118	0
cSH	880	1700	1456
Volume to Capacity	0.01	0.08	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	9.1	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.1	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	17.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	100	85	175	10	10	140
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	118	100	206	12	12	165
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	218				547	212
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	218				547	212
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				97	80
cM capacity (veh/h)	1352				455	828

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	218	218	12	165
Volume Left	118	0	12	0
Volume Right	0	12	0	165
cSH	1352	1700	455	828
Volume to Capacity	0.09	0.13	0.03	0.20
Queue Length 95th (m)	2.2	0.0	0.6	5.6
Control Delay (s)	4.6	0.0	13.1	10.4
Lane LOS	A		B	B
Approach Delay (s)	4.6	0.0	10.6	
Approach LOS			B	

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	33.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	60	0	0	15	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	71	0	0	18	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	35	35	0	35	35	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	35	0	35	35	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	963	848	1085	963	848	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	18	0
Volume Left	71	18	0
Volume Right	0	0	0
cSH	963	1623	1700
Volume to Capacity	0.07	0.01	0.00
Queue Length 95th (m)	1.8	0.3	0.0
Control Delay (s)	9.0	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	0	0	0	0	15	115	0	60	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	6	0	0	0	0	18	135	0	71	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	156	224	71	162	156	85	71			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156	224	71	162	156	85	71			153		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	811	675	992	799	736	974	1530			1428		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	6	153	71
Volume Left	0	0	0
Volume Right	6	135	0
cSH	992	1700	1428
Volume to Capacity	0.01	0.09	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	50	80	115	10	55
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	35	59	94	135	12	65
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	250	162			229	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	250	162			229	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	93			99	
cM capacity (veh/h)	732	883			1339	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	35	59	229	76
Volume Left	35	0	0	12
Volume Right	0	59	135	0
cSH	732	883	1700	1339
Volume to Capacity	0.05	0.07	0.13	0.01
Queue Length 95th (m)	1.2	1.6	0.0	0.2
Control Delay (s)	10.2	9.4	0.0	1.2
Lane LOS	B	A		A
Approach Delay (s)	9.7		0.0	1.2
Approach LOS	A			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	190	0	0	20	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	224	0	0	24	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	47	47	0	47	47	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	47	47	0	47	47	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	76	100	100	99			100		
cM capacity (veh/h)	943	832	1085	943	832	1085	1623			1623		

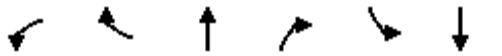
Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	224	24	0
Volume Left	224	24	0
Volume Right	0	0	0
cSH	943	1623	1700
Volume to Capacity	0.24	0.01	0.00
Queue Length 95th (m)	7.0	0.3	0.0
Control Delay (s)	10.0	7.3	0.0
Lane LOS	A	A	
Approach Delay (s)	10.0	7.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	9.7		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	15	0	0	0	0	20	120	0	190	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	18	0	0	0	0	24	141	0	224	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	318	388	224	335	318	94	224			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	318	388	224	335	318	94	224			165		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	98	100	100	100	100			100		
cM capacity (veh/h)	635	547	816	605	599	963	1345			1414		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	18	165	224
Volume Left	0	0	0
Volume Right	18	141	0
cSH	816	1700	1414
Volume to Capacity	0.02	0.10	0.00
Queue Length 95th (m)	0.5	0.0	0.0
Control Delay (s)	9.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	165	40	100	80	65	140
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	194	47	118	94	76	165
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	482	165			212	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	482	165			212	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	62	95			94	
cM capacity (veh/h)	512	880			1359	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	194	47	212	241
Volume Left	194	0	0	76
Volume Right	0	47	94	0
cSH	512	880	1700	1359
Volume to Capacity	0.38	0.05	0.12	0.06
Queue Length 95th (m)	13.3	1.3	0.0	1.4
Control Delay (s)	16.2	9.3	0.0	2.8
Lane LOS	C	A		A
Approach Delay (s)	14.9		0.0	2.8
Approach LOS	B			

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	60	0	0	15	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	71	0	0	18	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	35	35	0	35	35	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	35	35	0	35	35	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	93	100	100	99			100		
cM capacity (veh/h)	963	848	1085	963	848	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	71	18	0
Volume Left	71	18	0
Volume Right	0	0	0
cSH	963	1623	1700
Volume to Capacity	0.07	0.01	0.00
Queue Length 95th (m)	1.8	0.3	0.0
Control Delay (s)	9.0	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.0	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	8.7		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	5	0	0	0	0	15	115	0	60	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	6	0	0	0	0	18	135	0	71	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	156	224	71	162	156	85	71			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156	224	71	162	156	85	71			153		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	811	675	992	799	736	974	1530			1428		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	6	153	71
Volume Left	0	0	0
Volume Right	6	135	0
cSH	992	1700	1428
Volume to Capacity	0.01	0.09	0.00
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.7	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.7	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	17.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	80	115	10	55	30	50
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	94	135	12	65	35	59
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			229		250	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			229		250	162
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		95	93
cM capacity (veh/h)			1339		732	883

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	229	76	35	59
Volume Left	0	12	35	0
Volume Right	135	0	0	59
cSH	1700	1339	732	883
Volume to Capacity	0.13	0.01	0.05	0.07
Queue Length 95th (m)	0.0	0.2	1.2	1.6
Control Delay (s)	0.0	1.2	10.2	9.4
Lane LOS		A	B	A
Approach Delay (s)	0.0	1.2	9.7	
Approach LOS			A	

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	21.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	190	0	0	10	0	0	0	0	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	0	224	0	0	12	0	0	0	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	24	24	0	24	24	0	0			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	24	24	0	24	24	0	0			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	77	100	100	99			100		
cM capacity (veh/h)	983	864	1085	983	864	1085	1623			1623		

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	224	12	0
Volume Left	224	12	0
Volume Right	0	0	0
cSH	983	1623	1700
Volume to Capacity	0.23	0.01	0.00
Queue Length 95th (m)	6.7	0.2	0.0
Control Delay (s)	9.7	7.2	0.0
Lane LOS	A	A	
Approach Delay (s)	9.7	7.2	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	9.6		
Intersection Capacity Utilization	20.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	10	0	0	0	0	10	120	0	190	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	0	12	0	0	0	0	12	141	0	224	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	306	376	224	318	306	82	224			153		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	306	376	224	318	306	82	224			153		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	99	100	100	100	100			100		
cM capacity (veh/h)	646	555	816	626	608	977	1345			1428		

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	12	153	224
Volume Left	0	0	0
Volume Right	12	141	0
cSH	816	1700	1428
Volume to Capacity	0.01	0.09	0.00
Queue Length 95th (m)	0.3	0.0	0.0
Control Delay (s)	9.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	9.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	20.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	100	85	60	140	175	30
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	118	100	71	165	206	35
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			218		474	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			218		474	168
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		60	96
cM capacity (veh/h)			1352		521	876

Direction, Lane #	EB 1	WB 1	NB 1	NB 2
Volume Total	218	235	206	35
Volume Left	0	71	206	0
Volume Right	100	0	0	35
cSH	1700	1352	521	876
Volume to Capacity	0.13	0.05	0.40	0.04
Queue Length 95th (m)	0.0	1.3	14.2	1.0
Control Delay (s)	0.0	2.7	16.4	9.3
Lane LOS		A	C	A
Approach Delay (s)	0.0	2.7	15.3	
Approach LOS			C	

Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	40.8%	ICU Level of Service	A
Analysis Period (min)	15		

INTERSECTION: 2020 HIGHWAY 103 CONNECTOR OPTION 3B/C

ARCADY 7

SUMMARY OF ROUNDABOUT PERFORMANCE:

	AM				PM			
	Queue (Veh)	**Delay (s)**	**RFC**	**LOS**	**Queue (Veh)**	**Delay (s)**	**RFC**	**LOS**
	2020 Estimated DHV's – (Scenario 3B/C)							
Arm 1	0.08	3.67	0.08	A	0.24	4.25	0.20	A
Arm 2	0.06	3.53	0.06	A	0.25	4.41	0.20	A
Arm 3	0.22	4.01	0.18	A	0.20	4.01	0.17	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

Arm 1: Trunk 3 – Westbound
Arm 2: Connector 3 B/C – Southbound
Arm 3: Trunk 3 – Eastbound

(Scenario1) - AM runs from 07:30:00 to 08:30:00
(Scenario1) - PM runs from 16:00:00 to 17:00:00

INTERSECTION: 2020 Highway 103 Connector Option 3B/C (Sheet 2 of 2)

Turning Counts or Proportions (Veh/hr)

AM Peak Hour

	To			
		1	2	3
From	Arm 1	0.00	50.00	30.00
	Arm 2	10.00	0.00	55.00
	Arm 3	115.00	80.00	0.00

PM Peak Hour

	To			
		1	2	3
From	Arm 1	0.00	40.00	165.00
	Arm 2	65.00	0.00	140.00
	Arm 3	80.00	100.00	0.00

Results Summary – AM/PM Peak Hour

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Total Demand (Veh/hr)	Total Arrivals (Veh)	Total Queuing Delay (PCU-min)	Average Queuing Delay (s)	Rate Of Queuing Delay (Veh-min/min)	Inclusive Queuing Total Delay (Veh-min)	Inclusive Queuing Average Delay (s)	Slope	Intercept (PCU/hr)
1 (AM)	0.08	3.67	0.08	A	80.00	80.00	4.86	3.64	0.08	4.86	3.64	0.462	1097.299
2 (AM)	0.06	3.53	0.06	A	65.00	65.00	3.80	3.51	0.06	3.80	3.51	0.462	1097.299
3 (AM)	0.18	4.01	0.22	A	195.00	195.00	12.92	3.97	0.22	12.92	3.98	0.462	1097.299
1 (PM)	0.20	4.25	0.24	A	205.00	205.00	14.40	4.21	0.24	14.40	4.21	0.462	1097.299
2 (PM)	0.20	4.41	0.25	A	205.00	205.00	14.92	4.37	0.25	14.92	4.37	0.462	1097.299
3 (PM)	0.17	4.06	0.20	A	180.00	180.00	12.06	4.02	0.20	12.06	4.02	0.462	1097.299

Standard Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.5	3.5	0.00	20.00	60.00	20.00	
2	3.5	3.5	0.00	20.00	60.00	20.00	
3	3.5	3.5	0.00	20.00	60.00	20.00	

INTERSECTION: 2020 HIGHWAY 103 CONNECTOR OPTION 4

ARCADY 7

SUMMARY OF ROUNDABOUT PERFORMANCE:

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2020 Estimated DHV's – (Scenario 4)							
Arm 1	0.06	3.53	0.06	A	0.24	4.41	0.20	A
Arm 2	0.22	4.01	0.18	A	0.21	4.07	0.17	A
Arm 3	0.08	3.67	0.08	A	0.24	4.25	0.20	A

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle.

Arm 1: Connector 4
Arm 2: Trunk 3 – Eastbound
Arm 3: Trunk 3 – Westbound

(Scenario1) - *AM* runs from 07:30:00 to 08:30:00
(Scenario1) - *PM* runs from 16:00:00 to 17:00:00

INTERSECTION: 2020 Highway 103 Connector Option 4 (Sheet 2 of 2)

Turning Counts or Proportions (Veh/hr)

AM Peak Hour

		To		
		1	2	3
From	Arm 1	0.00	55.00	10.00
	Arm 2	80.00	0.00	115.00
	Arm 3	50.00	30.00	0.00

PM Peak Hour

		To		
		1	2	3
From	Arm 1	0.00	140.00	60.00
	Arm 2	100.00	0.00	85.00
	Arm 3	30.00	175.00	0.00

Results Summary – AM/PM Peak Hour

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Total Demand (Veh/hr)	Total Arrivals (Veh)	Total Queuing Delay (PCU-min)	Average Queuing Delay (s)	Rate Of Queuing Delay (Veh-min/min)	Inclusive Queuing Total Delay (Veh-min)	Inclusive Queuing Average Delay (s)	Slope	Intercept (PCU/hr)
1 (AM)	0.06	3.53	0.06	A	65.00	65.00	3.80	3.51	0.06	3.80	3.51	0.462	1097.299
2 (AM)	0.18	4.01	0.22	A	195.00	195.00	12.92	3.97	0.22	12.92	3.98	0.462	1097.299
3 (AM)	0.08	3.67	0.08	A	80.00	80.00	4.86	3.64	0.08	4.86	3.64	0.462	1097.299
1 (PM)	0.20	4.41	0.24	A	200.00	200.00	14.55	4.37	0.24	14.55	4.37	0.462	1097.299
2 (PM)	0.17	4.07	0.21	A	185.00	185.00	12.44	4.03	0.21	12.44	4.03	0.462	1097.299
3 (PM)	0.20	4.25	0.24	A	205.00	205.00	14.40	4.21	0.24	14.40	4.21	0.462	1097.299

Standard Geometry

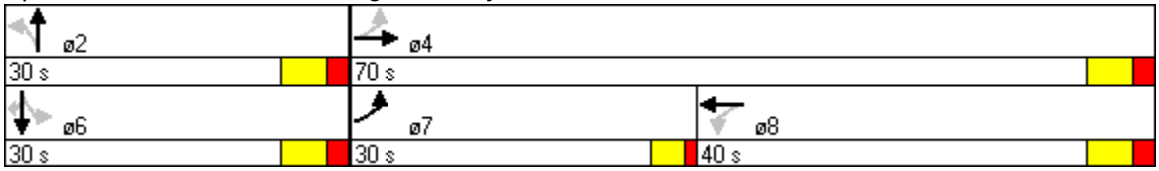
Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.5	3.5	0.00	20.00	60.00	20.00	
2	3.5	3.5	0.00	20.00	60.00	20.00	
3	3.5	3.5	0.00	20.00	60.00	20.00	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1872	0	1789	1706	0	1789	1778	0	1789	1883	1601
Flt Permitted	0.536			0.674			0.729			0.729		
Satd. Flow (perm)	1010	1872	0	1269	1706	0	1373	1778	0	1373	1883	1601
Satd. Flow (RTOR)		4			94			16				207
Volume (vph)	545	115	5	15	60	100	5	25	15	105	40	190
Lane Group Flow (vph)	592	130	0	16	174	0	5	43	0	114	43	207
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	36.4	38.1		11.4	11.4		12.3	12.3		12.3	12.3	12.3
Actuated g/C Ratio	0.68	0.71		0.21	0.21		0.22	0.22		0.22	0.22	0.22
v/c Ratio	0.60	0.10		0.06	0.40		0.02	0.11		0.38	0.10	0.40
Control Delay	8.7	4.6		22.6	14.9		20.0	15.4		24.9	20.6	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.7	4.6		22.6	14.9		20.0	15.4		24.9	20.6	6.4
LOS	A	A		C	B		B	B		C	C	A
Approach Delay		8.0			15.6			15.9			13.9	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	26.2	4.0		1.4	7.4		0.4	2.3		10.5	3.7	0.0
Queue Length 95th (m)	62.6	11.8		6.3	24.5		2.9	9.8		25.6	11.5	14.3
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	975	1503		606	863		526	691		526	721	741
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.61	0.09		0.03	0.20		0.01	0.06		0.22	0.06	0.28

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 53.5
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 11.0 Intersection LOS: B
Intersection Capacity Utilization 62.0% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

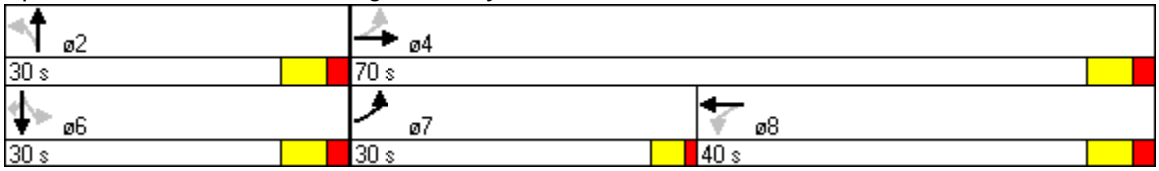


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1872	0	1789	1706	0	1789	1778	0	1789	1883	1601
Flt Permitted	0.536			0.674			0.729			0.729		
Satd. Flow (perm)	1010	1872	0	1269	1706	0	1373	1778	0	1373	1883	1601
Satd. Flow (RTOR)		4			94			16				201
Volume (vph)	500	115	5	15	60	100	5	25	15	105	40	185
Lane Group Flow (vph)	543	130	0	16	174	0	5	43	0	114	43	201
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	35.3	37.1		11.4	11.4		12.2	12.2		12.2	12.2	12.2
Actuated g/C Ratio	0.67	0.71		0.22	0.22		0.22	0.22		0.22	0.22	0.22
v/c Ratio	0.56	0.10		0.06	0.39		0.02	0.10		0.37	0.10	0.39
Control Delay	8.1	4.6		22.4	14.7		20.0	15.3		24.5	20.3	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	8.1	4.6		22.4	14.7		20.0	15.3		24.5	20.3	6.4
LOS	A	A		C	B		B	B		C	C	A
Approach Delay		7.4			15.3			15.8			13.8	
Approach LOS		A			B			B			B	
Queue Length 50th (m)	22.8	4.0		1.4	7.0		0.4	2.2		9.9	3.5	0.0
Queue Length 95th (m)	54.9	11.8		6.3	24.5		2.9	9.8		25.6	11.5	14.2
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	963	1504		614	874		534	701		534	732	745
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.56	0.09		0.03	0.20		0.01	0.06		0.21	0.06	0.27

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 52.4
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.56
Intersection Signal Delay: 10.7 Intersection LOS: B
Intersection Capacity Utilization 59.5% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

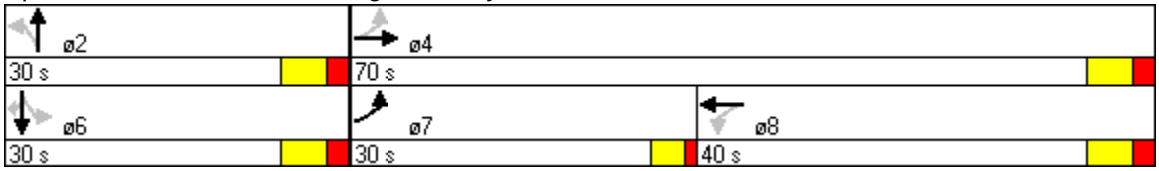


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1874	0	1789	1761	0	1789	1808	0	1789	1883	1601
Flt Permitted	0.335			0.654			0.657			0.637		
Satd. Flow (perm)	631	1874	0	1232	1761	0	1237	1808	0	1200	1883	1601
Satd. Flow (RTOR)		3			43			17				728
Volume (vph)	405	145	5	40	185	140	55	85	30	165	105	670
Lane Group Flow (vph)	440	163	0	43	353	0	60	125	0	179	114	728
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	44.7	44.7		20.2	20.2		18.5	18.5		18.5	18.5	18.5
Actuated g/C Ratio	0.62	0.62		0.28	0.28		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.62	0.14		0.12	0.67		0.19	0.26		0.58	0.24	0.76
Control Delay	11.5	6.5		23.2	29.1		26.2	23.3		35.3	25.8	8.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	11.5	6.5		23.2	29.1		26.2	23.3		35.3	25.8	8.5
LOS	B	A		C	C		C	C		D	C	A
Approach Delay		10.2			28.4			24.3			15.2	
Approach LOS		B			C			C			B	
Queue Length 50th (m)	28.9	8.6		4.9	41.7		6.9	12.5		22.9	13.2	0.0
Queue Length 95th (m)	51.5	17.8		13.0	74.6		18.7	29.9		50.3	30.2	32.1
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	767	1338		522	771		423	629		410	643	1026
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.57	0.12		0.08	0.46		0.14	0.20		0.44	0.18	0.71

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 72.2
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 16.9 Intersection LOS: B
Intersection Capacity Utilization 73.1% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd

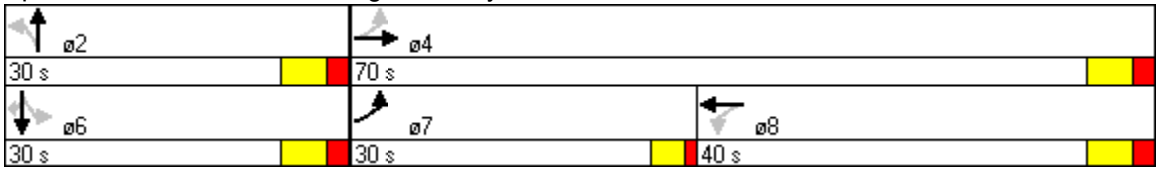


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Satd. Flow (prot)	1789	1874	0	1789	1761	0	1789	1808	0	1789	1883	1601
Flt Permitted	0.335			0.654			0.657			0.637		
Satd. Flow (perm)	631	1874	0	1232	1761	0	1237	1808	0	1200	1883	1601
Satd. Flow (RTOR)		3			43			17				668
Volume (vph)	380	145	5	40	185	140	55	85	30	165	105	615
Lane Group Flow (vph)	413	163	0	43	353	0	60	125	0	179	114	668
Turn Type	pm+pt			Perm			Perm			Perm		Perm
Protected Phases	7	4			8			2			6	
Permitted Phases	4			8			2			6		6
Total Split (s)	30.0	70.0	0.0	40.0	40.0	0.0	30.0	30.0	0.0	30.0	30.0	30.0
Act Effct Green (s)	43.6	43.6		19.9	19.9		18.2	18.2		18.2	18.2	18.2
Actuated g/C Ratio	0.62	0.62		0.28	0.28		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.59	0.14		0.12	0.67		0.19	0.26		0.58	0.24	0.74
Control Delay	10.9	6.5		22.9	28.4		26.0	23.0		34.9	25.5	8.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	10.9	6.5		22.9	28.4		26.0	23.0		34.9	25.5	8.0
LOS	B	A		C	C		C	C		C	C	A
Approach Delay		9.7			27.8			24.0			15.1	
Approach LOS		A			C			C			B	
Queue Length 50th (m)	24.7	8.1		4.5	38.5		6.5	11.7		21.5	12.4	0.0
Queue Length 95th (m)	47.5	17.8		13.0	74.6		18.7	29.9		50.3	30.2	29.8
Internal Link Dist (m)		281.2			199.4			161.2			208.9	
Turn Bay Length (m)	75.0			20.0						100.0		125.0
Base Capacity (vph)	766	1343		529	781		428	638		416	652	991
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.54	0.12		0.08	0.45		0.14	0.20		0.43	0.17	0.67

Intersection Summary

Cycle Length: 100
Actuated Cycle Length: 70.8
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.74
Intersection Signal Delay: 16.8 Intersection LOS: B
Intersection Capacity Utilization 69.7% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 4: St Margaret's Bay Rd & Hammonds Plains Rd



Appendix F

Terms of Reference

Transportation and
Infrastructure Renewal
Highway Engineering Services

Request For Proposals
For
Highway 103
Proposed Boutilier's Point Interchange
Traffic Study

Highway Engineering Services Standing Offer Tender # 60136574

1.0 BACKGROUND

The Department of Transportation and Infrastructure Renewal are currently in the planning process for twinning of the 21km section of Highway 103 between Exit 5 Upper Tantallon and Exit 6 Hubbards. As part of this project a new diamond interchange and connector road to Trunk 3 is proposed near the community of Boutilier's Point. The purpose of the interchange is to provide better 100 Series Highway access to communities along Trunk 3 in this area and to provide access to properties located on the north side of Highway 103 that will have their access eliminated when Highway 103 is twinned. The twinning project is planned in three phases with the following estimated completion dates;

Phase 1 – Boutilier's Point Interchange and Connector road (2013).
Phase 2 - Hwy 103 twinning Tantallon to Boutilier's Point (2016).
Phase 3 - Hwy 103 twinning Boutilier's Point to Hubbards (2019).

Three interchange locations and four connector road alignment options are being considered.The interchange locations and general layout of the connectors are shown on the attached plan. All proposed interchanges have a diamond configuration. It is anticipated all new intersections, including ramp terminals, will be at-grade stop controlled configuration unless other intersection types are warranted based on traffic analysis or restricted site distances. The intersection of Connector Option 1A and Trunk 3 is anticipated to have site distance restrictions and is planned as a roundabout layout.

In order to assess the impact of a new interchange at Boutilier's Point on existing road infrastructure, and to assist with the functional design of the interchange and connector, TIR has decided to hire a qualified consulting firm to conduct a traffic study.

The scope of work contained in this request for proposals (RFP) outlines the general requirements for the preparation of the Highway 103 Proposed Boutilier's Point Interchange Traffic Study. Innovation and suggestions for alternate study methodologies that achieve the desired study objectives are encouraged.

2.0 OBJECTIVES

The primary objectives of this study are to:

1. **Estimate the traffic flow impacts on existing infrastructure as described in Section 3.0 associated with the construction of a new Highway 103 interchange (3 options) and connector road (4 options) near Boutilier's Point.**

2. **Assess future roadway and intersection performance levels, including warrants for left and right turning lanes and signalization, based on traffic flow estimates with construction of the interchange.**

3. **Provide recommendations related to the functional design requirements for the proposed interchange, connector road, and Trunk 3/connector road intersections for all options mentioned in Objective 1.**

3.0 Study Scope

The study area shall include:

1. Highway 103 from Exit 5 to Exit 6 including the existing interchanges and connector roads to Trunk 3 at Upper Tantallon and Hubbards
2. Trunk 3 from Hammonds Plains Road to the 100 Series Connector at Hubbards including all major intersections
3. All proposed interchange and connector road options as described in Objective 1.

The study shall be based on the following time horizons:

Horizon 1 - Completion of the interchange and connector road (2013)
Horizon 2 – 10yrs (2020)

4.0 DUTIES OF THE CONSULTANT

1. Familiarization with the study area including, but not necessarily limited to, existing highway infrastructure, existing development, zoning, land ownership, approved and proposed developments.

2. Review all past transportation, traffic impact and land use studies within the study areas.

3. Collect supplementary data as required to perform the required analysis.

4. Meet with local planning officials to determine future development plans, zoning, and other land use characteristics that may impact future travel demand at the interchange locations.

5. For each study time horizon provide projections of traffic volumes on study area roadways and intersections. Projections are to include AM and PM peak hour volumes including turning movements at ramp terminals, proposed connector road termini, and major intersections along Trunk 3 including, but not limited to, Rte. 213, Rte. 333 and Mill Lake Road. Traffic projections for each horizon are to be shown graphically on schematic plans.

6. Based on projected traffic volumes provide recommendations regarding the required number of lanes on the proposed Boutilier's Point interchange structure and connector

road for each horizon along with recommendations for intersection configuration and traffic control at the ramp terminals and connector road termini at Trunk 3 for all proposed interchange and connector road options as described in Objective 1. Existing development, terrain, intersections and site distance restrictions are also to be considered when recommending intersection treatments.

7. Based on traffic volume projections and recommended intersection configurations/traffic control complete a capacity and level of service assessment on all study area intersections for each horizon. Analysis shall include warrants for turning lanes (left and right) and possibly signalization based on projected volumes and engineering judgement. If signalization is required the intersection is to be analysed as both signalized and as a roundabout. Intersection analysis shall be completed using Synchro SimTraffic software and roundabout analysis shall be completed using Arcady software.

8. Construction of the proposed Boutilier's Point Interchange and Connector may result in traffic volume reductions at various existing study area intersections at Exits 5 and 6 and along Trunk 3. It is important that the study document the improved service levels at these locations and any required adjustments to signal timing/phasing if signalized.

9. Prepare a final report summarizing all work completed.

5.0 DUTIES OF TIR

1. Meet with the Consultant on an arranged schedule.

2. Provide the Consultant with any available documentation (reports, studies, plans, traffic data, etc.).

3. Answer any questions and provide guidance and clarification in a timely manner as required.

6.0 GUIDANCE

TIR will assign a project manager who will be responsible for overall administration of the study. The project manager will involve other TIR staff as required throughout the study. Acceptance and approval of the work will take place after the project manager has been satisfied that the study requirements have been met.

7.0 MEETINGS AND REPORTS

The Consultant shall meet with the TIR project manager for the project initiation and as required throughout the duration of the project, provide progress reports bi-weekly, and present the study findings to the TIR project manager within one week of submission of the draft final report and prior to submission of the Final Report. All meetings will be held in Halifax, Nova Scotia. The initial meeting with the Consultant will be to review the study requirements, data requirements and the methodologies to be used.

The following reports shall be required.

Three (3) copies of a draft final report must be submitted for comment and possible amendments before the final version is submitted. The Consultant must be prepared to submit a second draft if requested.

Ten (10**)** bound copies and one (1) unbound copy of the final report. The Consultant shall also have a copy on hand should additional copies be required at short notice. The Consultant shall also provide one (1) electronic copy of the final report in PDF format including all plans, tables, diagrams, figures and pictures.

All copies of the draft and final reports shall be on letter size paper and appropriately titled. The final report shall include an executive summary and a list of references. All reports shall contain copies of supporting plans and figures. The Terms of Reference shall be attached as an appendix to the final report.

8.0 STUDY SCHEDULE

The Consultant shall meet with the TIR Project Manager within one week of notification of award of contract. The study shall be completed and the required copies of the final report presented within **3 months** of award of contract.

9.0 PROPOSAL REQUIREMENTS

Failure to provide information outlined in this section may result in disqualification.

Three (3) copies of your proposal (fax copies are not acceptable) are to be delivered by **4:00 pm local time, *Wednesday, April 28, 2010*** to the 1st Floor receptionist at the Johnston Building, 1672 Granville St., Halifax, Nova Scotia.

Proposals and their envelopes should be clearly marked with the name and address of the proponent and the project or program title. Late proposals will not be accepted and will be returned to the proponent. Proponents are solely responsible for their own expenses in preparing, delivering or presenting a proposal.

To facilitate efficient review of the proposals, proponents are requested to use the following format. The proposal shall be organized into four chapters and such chapters limited where indicated.

1. **Introduction**

   This chapter shall include, but not necessarily be limited to, background information, a description of the study area, and understanding of the project and its objectives, including potential key issues.

2. **Qualifications**

   A summary of project team member experience in areas related to these terms of reference. The role of each team member in the study shall be clearly explained.

3. **Methodology**

   This chapter shall include, but not necessarily be limited to:

   1. A list of all information and data sources available to the Consultant and expected to be used in the Study.

   2. A detailed work plan, identifying planned field work, and including intended approach, methodology and schedule for the study.

4. **Project Management**

   Number of person-days for each team member by task assigned to the project. For consistency, the basis of remuneration will be per **8 hour day** for all team members.

One copy of the cost proposal shall be provided, **to be separately sealed in an envelope,** including labour costs, related expenses, printing costs and professional services obtained outside of the firm. Prices quoted are to be in Canadian dollars and **exclusive of federal and provincial taxes**.

By submitting a proposal, the proponent warrants that all components required to deliver the services requested have been identified in the proposal or will be provided by the Consultant at no additional charge. The technical proposal must be signed by the person(s) authorized to sign on behalf of the proponent and to bind the proponent to statements made in response to this Request for Proposal.

10.0 LIABILITY FOR ERRORS

While considerable effort to ensure the accuracy of the information in this Request for Proposal has been made, the information contained in this Request for Proposal is supplied solely as a guideline to Proponents. The information is not guaranteed or warranted, nor is it necessarily comprehensive or exhaustive.

11.0 REQUEST FOR PROPOSAL AMENDMENTS

All proponents will be notified regarding any changes made to the Request for Proposal or any appendices or any change in the closing date or time. It is the responsibility of the proponent to ensure they have received all amendments. When these changes occur within five government business days of the close of the proposal, the proposal closing date will be extended to allow for a suitable number of bid preparation days between the issuance of the change and the closing date. All amendments must accompany each proposal. Proposals that do not contain all the amendments may be immediately returned and the proponent eliminated from further consideration.

12.0 PAYMENT SCHEDULE

A lump sum payment for professional services rendered will be made upon completion of work as outlined in the RFP to the satisfaction of the Project Manager and receipt of an invoice detailing progress work completed.

13.0 EVALUATION OF PROPOSALS

Proposals shall be evaluated based on the "Government Procurement Process: Architects and Professional Services" (June 15, 1998).

All proposals will be initially assessed based on the experience and expertise of the project team. Any proposals not meeting minimum qualifications will not be evaluated further.

The criteria for evaluating proposals, based on technical and managerial merit, will be the following;

1	Qualification and experience of team members on similar projects.	40 points
2	Understanding of project and Proposed methodology	40 points
3	Quality of the proposal and project management	20 points

After meeting initial qualifications, proposals will be evaluated on the basis of their technical and managerial merit and then on the basis of price. The technical submission shall be rated as shown above, out of 85 points, and the remaining 15 points shall be allotted based on price. Only those proposals achieving an aggregate score of 68/85 (80%) or greater will have their sealed cost envelopes opened. The lowest price shall be awarded 15 points (all prices within 5% will receive the same price points). The next lowest price (beyond 5%) will receive 12 points. Points for other submissions will be assigned with 3 fewer points for each successively higher priced price proposal. But again, each time the same score will be awarded if successive prices are within 5% of the last highest price. The proposal with the highest total points will be awarded the contract. Proposals not meeting the required 68/85 will have their unopened cost envelopes returned.

Notwithstanding the technical/managerial and price scores, TIR reserves the right to reject any proposal where prices are deemed unreasonable relative to other prices bid, typically a 25% variance from the average qualified bid (excluding the bid in question).

The Department reserves the right to negotiate any or all conditions of the Consultant's proposed work plan and reject all submitted proposals. Unsuccessful proponents may request a debriefing meeting following execution of a contract with the successful proponent.

14.0 CONTRACT PROCEDURES

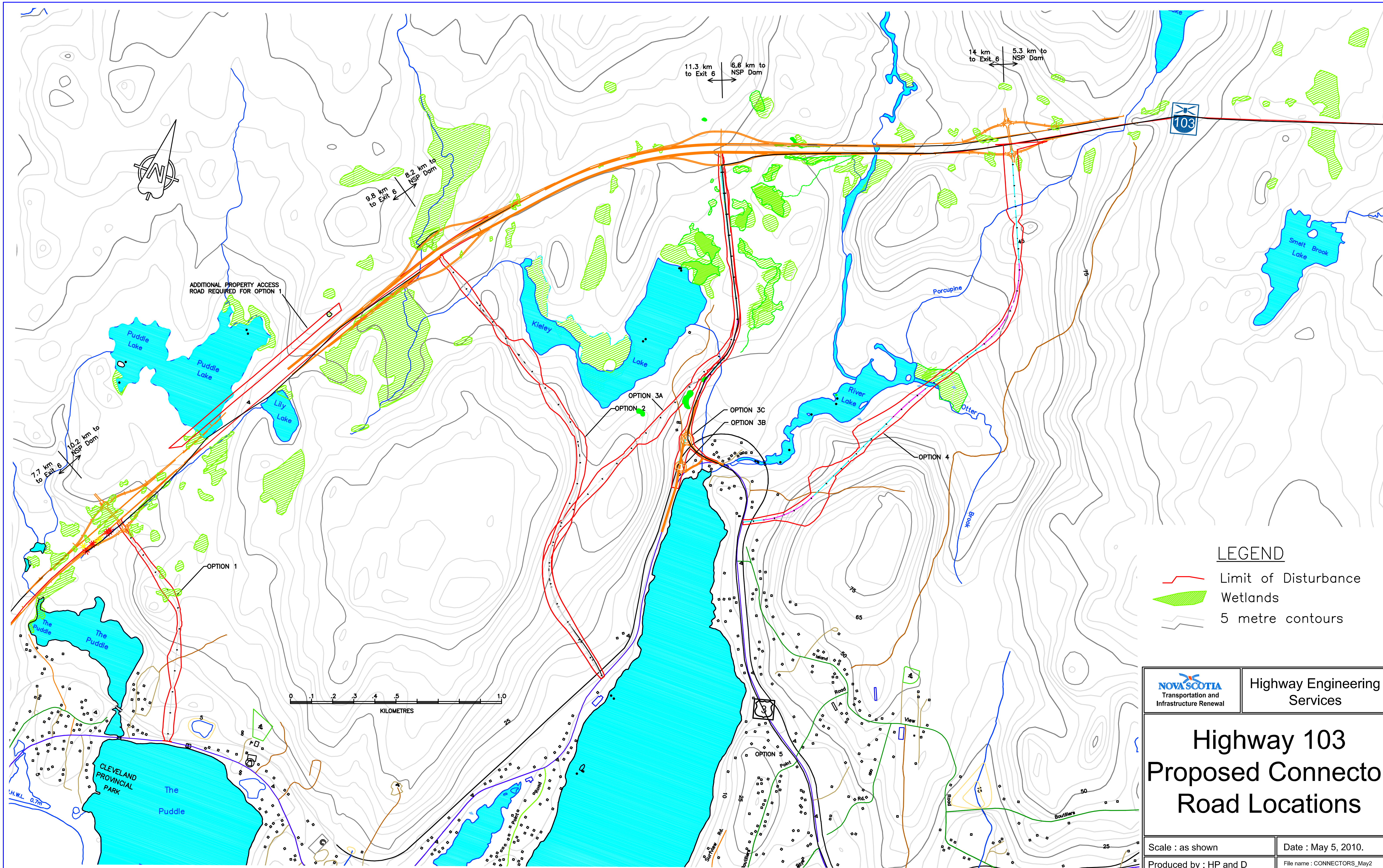
Notice in writing to a proponent of the acceptance of its proposal by the Province will constitute a contract for the goods or services.

15.0 INQUIRIES

All enquiries related to this Request for Proposal are to be directed to the following person. Information obtained from any other source is not official and may be inaccurate. Enquiries and responses may be recorded and may be distributed to all proponents at the Province's option.

Department Contact:

Michael Croft, P.Eng. (TIR Project Manager)
Access Management Engineer
Telephone: 902-424-3548
Fax: 902-424-0571
Email: croftmi@gov.ns.ca


11.3 km to Exit 6
6.6 km to NSP Dam
14 km to Exit 6
5.3 km to NSP Dam
8.2 km to NSP Dam
9.8 km to Exit 6
10.2 km to NSP Dam
7.7 km to Exit 6
103
ADDITIONAL PROPERTY ACCESS ROAD REQUIRED FOR OPTION 1
Puddle Lake
Puddle Lake
Lily Lake
Kieley Lake
Smelt Brook Lake
Porcupine
River Lake
Otter
Brook
OPTION 1
OPTION 2
OPTION 3A
OPTION 3B
OPTION 3C
OPTION 4
OPTION 5
The Puddle
The Puddle
CLEVELAND PROVINCIAL PARK
The Puddle
0 .1 .2 .3 .4 .5 1.0
KILOMETRES
LEGEND
Limit of Disturbance
Wetlands
5 metre contours
NOVA SCOTIA
Transportation and Infrastructure Renewal
Highway Engineering Services
Highway 103 Proposed Connector Road Locations
Scale : as shown
Date : May 5, 2010.
Produced by : HP and D
File name : CONNECTORS_May2