Ref. No. 161-03798

April 12, 2016

Mr. Evan Teasdale, P. Eng.
Development Engineer
HRM Development Engineering *[Via Email: teasdae@halifax.ca]*

RE: Traffic Impact Analysis, Proposed Multi-Use Development
910 Bedford Highway, Bedford, Nova Scotia

Dear Mr. Teasdale:

Plans are being prepared for a multi-use development at 910 Bedford Highway in Bedford, NS (Figure 1). The proposed development will include 60 apartment units and 18,000 square feet of retail space with completion of the development anticipated by 2018. This is the Traffic Impact Analysis (TIA) required to accompany the development application.

Description of Site Access- Access to the site is proposed from Bedford Highway via a single driveway south of the intersection with Moirs Mill Road. Sight distance appears adequate at the driveway (See Photos 1 and 2).

Photo 1 - Looking north (to the left) on the Bedford Highway from the proposed site driveway

Photo 2 - Looking south (to the right) on the Bedford Highway from the proposed site driveway

1 Spectacle Lake Drive, Dartmouth, Nova Scotia, Canada B3B 1X7
Telephone: 902-835-9955 ~ Fax: 902-835-1645 ~ www.wspgroup.com

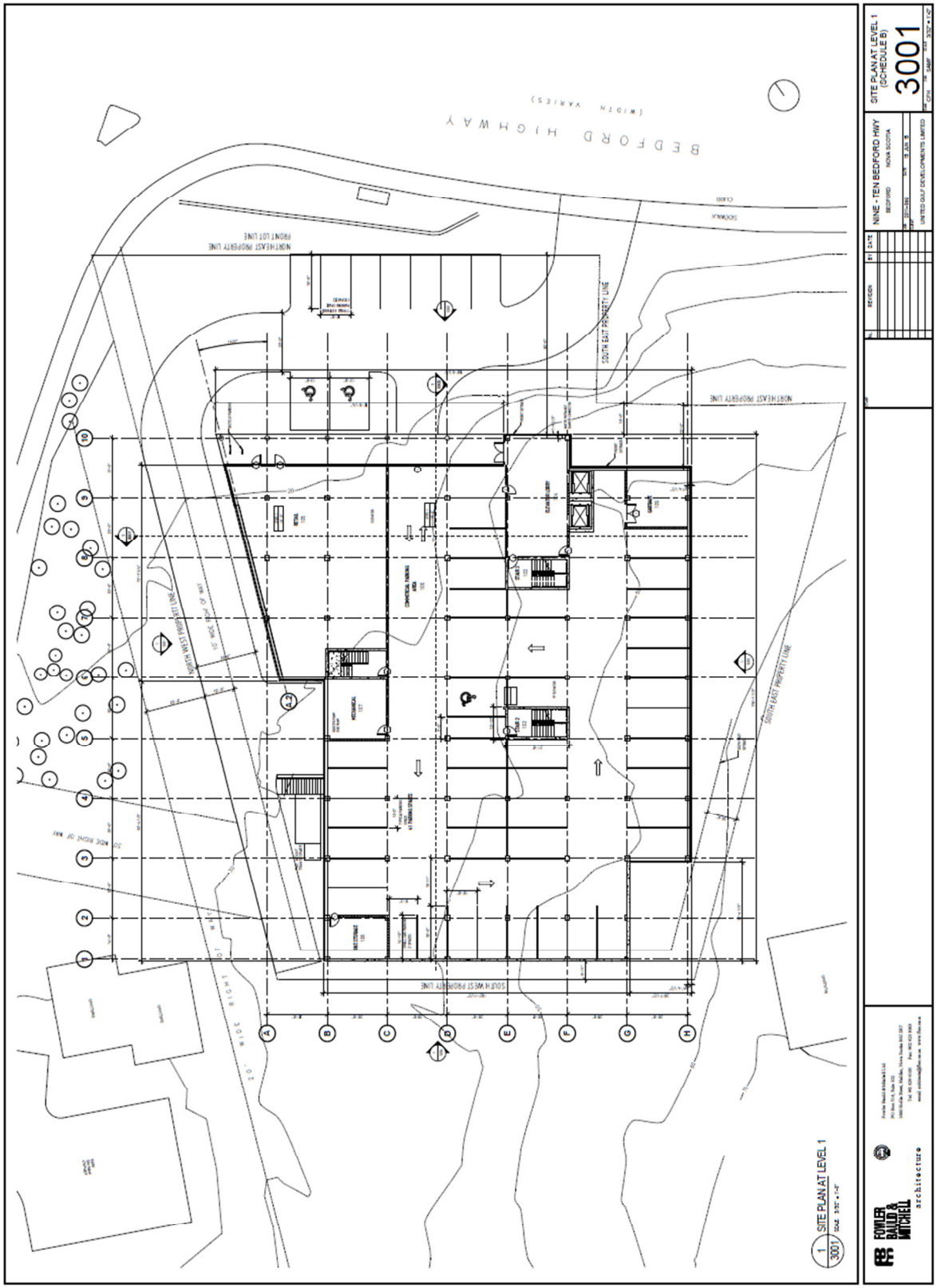


Figure 1 – Site Plan

Description of Site and Proposed Development- The proposed development site is PID 00428722, a currently vacant parcel that is located southwest of the intersection of Bedford Highway at Moirs Mill Road in Bedford, NS. The development will include up to 60 apartment units and approximately 18,000 square feet of retail space. Completion of the development is anticipated by 2018.

Street and Intersection Descriptions- Bedford Highway (See Photos 1 and 2) is a two lane arterial road that runs north-south between Bedford and Windsor Street in Halifax. In the subject area, the Bedford Highway has a 50 km/h posted speed limit, sidewalk on the west side and a 4 lane urban cross section which transitions to a 2 lane cross section with marked bicycle lanes south of the subject site. Machine traffic counts collected by HRM Traffic Management in November 2012 between Hammond Plains Road and Moirs Mill Road indicate a two-way volume on Bedford Highway of approximately 19,600 vehicles per day (vpd) with two-way volumes of approximately 1,300 vehicles per hour (vph) in the AM peak hour and 1,700 vph in the PM peak hour.

Moirs Mill Road (See Photo 3), is a minor collector roadway with a two lane urban cross section that runs east-west for 1.4 km between Bedford Highway and its terminus in the west. The street has curb and gutter on both sides with concrete sidewalk on the south side.

Photo 3 – Looking east on Moirs Mill Road toward the Bedford Highway intersection, the subject site is on the right

The Bedford Highway – Moirs Mill Road 'T'-intersection is signalized. There is a channelized right turn with concrete island on the Moirs Mill Road approach (See Photo 3). The signalized intersection includes pedestrian heads crossing Moirs Mill Road and the Bedford Highway's south approach.

Transit- Halifax Transit operates Routes 80 and 82, with bus stops on the Bedford Highway immediately in front of the subject site (See Photo 1).

Manual Traffic Count- Manual intersection turning movement counts were completed during AM and PM peak periods at the Bedford Highway / Moirs Mill Road intersection on Tuesday, March 22, and Wednesday, March 23, 2016. Count data are summarized in Table A-1, Appendix A with peak hours indicated by shaded areas.

Traffic Data – HRM Traffic Management periodically obtains machine traffic counts for various streets throughout the Municipality. Annual Average Weekday Traffic (AAWT) volumes from available count data for the Bedford Highway south of Hammonds Plains Road are tabulated in Table 1. While there can be significant variations in counted data from year to year, the Bedford Highway volumes for this section have been essentially unchanged since 2004.

Table 1 - Trip Generation Estimates

Location	Two-Way Annual Average Weekday Traffic (AAWT) Volumes and Count Month					
	2004	2006	2009	2010	2011	2012
Bedford Highway South of Hammonds Plains Road	22,600 Sept	21,400 June	21,060 Oct	19,650 Sep	21,150 June	19,600 Nov

Estimation of 2018 Background Volumes – While the volumes in this area have been stable over the past 12 years, an annual growth rate of 0.5% has been assumed to be appropriate for projecting hourly volumes. Projected 2016 and 2018 AM and PM background peak hour volumes are shown diagrammatically in Figure A-1, Appendix A.

Trip Generation – Trip generation estimates, prepared using published trip generation rates from *Trip Generation, 9th Edition* (Institute of Transportation Engineers, Washington, 2012), are included in Table 2. It is estimated that the proposed 60 residential units and 18,000 sq. ft. of commercial space will generate about 55 two-way vehicle trips (20 entering and 35 exiting) during the AM peak hour and 85 two-way vehicle trips (45 entering and 40 exiting) during the PM peak hour.

- On-site synergies, or cross shopping trips, represent trips completed by vehicles accessing multiple land uses on the site. For this analysis, cross shopping trips have been assumed to represent 10% of trips to the proposed development.

- Two types of trips are included in the external trips that will be generated by the proposed commercial developments: *Pass-by* and *Primary Trips*.

    - *Pass-by trips* are those which are made as 'intervening opportunity' stops to commercial and retail land uses for vehicle trips already passing by the site. Although these trips will be included in the driveway volumes to the site, they will not increase the overall traffic volumes on the Bedford Highway or Moirs Mill Road. The site will be exposed to pass-by traffic volumes during AM and PM peak periods. For this analysis, it has been assumed that 20% of the external commercial site trips will be pass-by trips of vehicles already traveling on Bedford Highway. It is estimated that pass-by trips will account for 3 vph entering and exiting the site during the AM peak hour and 5 vph entering and exiting during the PM peak hour.

    - *Primary trips* for this Study include all external site generated trips that are not considered as pass-by trips. After adjustment for 10% cross shopping trips and 20% pass-by trips, the estimated number of additional trips generated (Table 2) by the proposed development include 47 two-way vehicle trips (16 entering and 31 exiting) during the AM peak hour and 70 two-way vehicle trips (38 entering and 32 exiting) during the PM peak hour.

Table 2 - Trip Generation Estimates

Land Use[1]	Units[2]	Trip Generation Rates[3]				Trips Generated[4]			
		AM Peak		PM Peak		AM Peak		PM Peak	
		In	Out	In	Out	In	Out	In	Out
Apartment (ITE 220)	60	0.10	0.41	0.40	0.22	6	24	24	13
Specialty Retail (ITE 826)[5]	18	0.76	0.60	1.19	1.52	14	11	21	27
Total Trip Generation Estimate						20	35	45	40
Estimated 10% Cross-Shopping Trips						1	1	2	3
Trip Generation Estimate After Adjustment for Cross-Shopping						19	34	43	37
20% Commercial Pass-by Trips Assumed for this Location						3	3	5	5
Estimated Primary Trips Attracted to the Site						**16**	**31**	**38**	**32**

Notes:
1. Land use codes are from *Trip Generation, 9th Edition, Institute of Transportation Engineers, 2012.*
2. 'Number of residential units' for Apartments and 'Gross Leasable Area x 1000 square feet' for Specialty Retail.
3. Trip generation rates are 'vehicles per hour per unit' for Apartments and 'vehicles per hour per 1000 sq. ft. ' for Commercial space.
4. Trips generated are 'vehicles per hour' for AM and PM peak hours.
5. Speciality Retail (Land Use 826) rates have been used. Since there are no published rates for the AM peak hour for this Land Use, and since AM peak hour trips to Speciality Retail are generally lower than PM rates, AM trip rates have been assumed to be 50% of the PM rate with reversal of the directional split.

Trip Distribution and Assignment **–** Primary site generated trips were assigned to the roadway network based on counted volumes at the Bedford Highway / Moirs Mill Road intersection, and local knowledge of the area. Peak hour primary site generated trips were distributed with 60% from / to the north and 40% from / to the south.

Pass-by site generated trips were assigned to the roadway network based on directional distribution of counted volumes on the Bedford Highway. AM pass-by trips were distributed on the Bedford Highway with 50% of the trips originating from the north and 50% originating from the south, while PM pass-by trips were distributed with 48% originating from the north and 52% originating from the south.

Site generated trips (shown diagrammatically in Figure A-2, boxes A and B, Appendix A) have been added to 2018 background volumes (Figure A-1, boxes C and D) to provide projected 2018 volumes that include site generated trips (Figure A-2, boxes C and D, Appendix A).

Intersection Capacity Analysis – Synchro 9.0 software has been used for intersection performance evaluation of the AM and PM peak hours. Intersection capacity analysis was completed for the Bedford Highway intersection with Moirs Mill Road both without and with the addition of site generated trips and at the intersection with the site access driveway with the addition of site generated trips.

Analysis results are included on Pages A-4 to A-9 (Appendix A) and results are summarized in Tables 3 and 4. Results indicate that all movements at both of the intersections are expected to operate within HRM acceptable limits both without and with the addition of site generated trips.

Table 3 – 2018 LOS for Bedford Highway @ Moirs Mill Road

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th% Queue (m) by Intersection Movement				Overall Intersection
	EB-L	EB-R	NB-LT	SB-TR	Delay
Weekday AM Peak Hour Volumes without Site Development (Page A-4)					
Delay	40.4	9.8	6.8	6.5	12.1
v/c	0.69	0.12	0.27	0.27	
Queue	58.6	7.7	31.7	33.2	
Weekday AM Peak Hour Volumes with Site Development (Page A-6)					
Delay	40.4	9.8	6.8	6.5	12.1
v/c	0.69	0.12	0.28	0.29	
Queue	58.6	7.7	33.0	33.9	
Weekday PM Peak Hour Volumes without Site Development (Page A-5)					
Delay	47.6	13.7	5.0	4.6	8.5
v/c	0.60	0.11	0.32	0.36	
Queue	44.7	7.0	34.7	37.8	
Weekday PM Peak Hour Volumes with Site Development (Page A-8)					
Delay	47.6	13.7	5.1	4.8	8.4
v/c	0.60	0.11	0.33	0.37	
Queue	44.7	7.0	35.8	39.5	

Table 4 – 2018 LOS for Bedford Highway @ Site Driveway

LOS Criteria	Control Delay (sec/veh), v/c Ratio, and 95th% Queue (m) by Intersection Movement			Overall Intersection
	EB-LR	NB-LT	SB-TR	Delay
Weekday AM Peak Hour Volumes with Site Development (Page A-7)				
Delay	14.6	0.4	0.0	0.5
v/c	0.09	0.22	0.18	
Queue	2.2	0.2	0.0	
Weekday PM Peak Hour Volumes with Site Development (Page A-9)				
Delay	17.6	0.8	0.0	0.6
v/c	0.12	0.29	0.21	
Queue	3.2	0.5	0.0	

Summary-

1. Plans are being prepared for a multi-use development at 910 Bedford Highway, located southwest of the intersection of Bedford Highway at Moirs Mill Road in Bedford, NS.
2. The proposed development will include up to 60 apartment units and 18,000 square feet of retail space, and will be accessed from the Bedford Highway via a single driveway.
3. It is expected that the proposed commercial development will generate 47 primary external two-way vehicle trips (16 entering and 31 exiting) and 6 pass-by two-way vehicle trips (3 entering and 3 exiting) during the AM peak hour and 70 primary external two-way vehicle trips (38 entering and 32 exiting) and 10 pass-by vehicle trips (5 entering and 5 exiting) during the PM peak hour.
4. Intersection capacity analysis indicates that level of performance at the Bedford Highway intersections of Moirs Mill Road and the site driveway are expected to be satisfactory both without and with the addition of site generated trips with all movements remaining within HRM acceptable limits in all scenarios.

Recommendation-

5. Consideration be given to remarking the Bedford Highway south of the site to extend the limits of the section where two northbound lanes are provided.

Conclusion-

6. Site generated trips are not expected to have any significant impact to levels of performance on adjacent streets and intersections or to the regional road network.

If you have any questions or comments, please contact me by email at patrick.hatton@wspgroup.com or by telephone at 902-835-9955.

Sincerely:

Patrick Hatton

Patrick Hatton, P. Eng.
Traffic Engineer
WSP Canada Inc.

Appendix A

Intersection Turning Movement Counts

Traffic Volume Diagrams

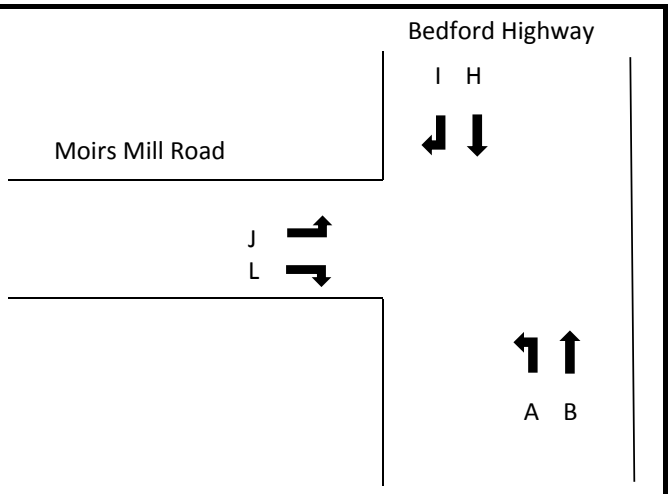
Intersection Capacity Analysis

Table A-1

Bedford Highway @ Moirs Mill Road

Bedford, NS

Tuesday, March 22 and Wednesday, March 23, 2016



AM Peak Period Volume Data

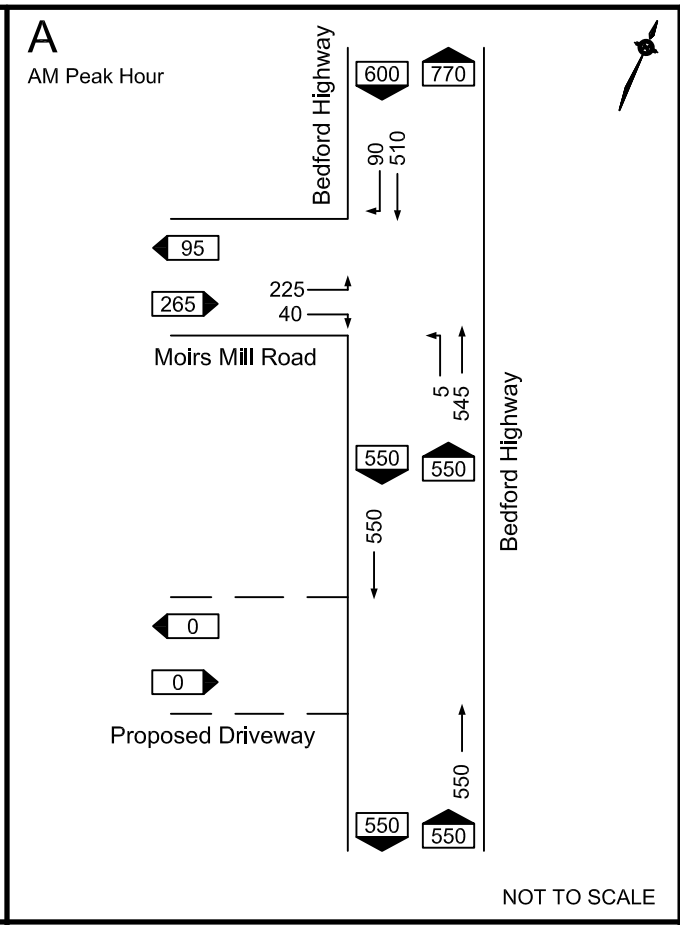
Time		Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Moirs Mill Road Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
07:00	07:15	0	84	98	7	35	12	236
07:15	07:30	0	100	93	5	34	18	250
07:30	07:45	0	99	94	18	45	7	263
07:45	08:00	0	121	105	26	49	12	313
08:00	08:15	2	130	113	16	45	10	316
08:15	08:30	2	126	123	20	72	12	355
08:30	08:45	2	146	134	28	61	14	385
08:45	09:00	1	144	139	26	49	5	364
AM Peak Hour		**7**	**546**	**509**	**90**	**227**	**41**	**1420**
07:00	**08:00**	**0**	**404**	**390**	**56**	**163**	**49**	**1062**
08:00	**09:00**	**7**	**546**	**509**	**90**	**227**	**41**	**1420**

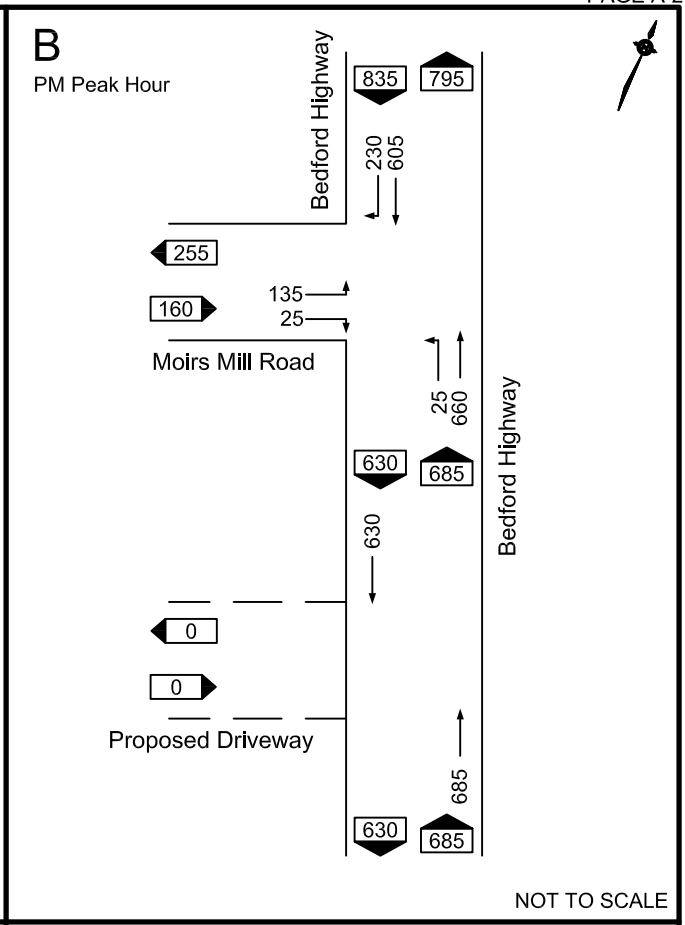
PM Peak Period Volume Data

Time		Bedford Highway Northbound Approach		Bedford Highway Southbound Approach		Moirs Mill Road Eastbound Approach		Total Vehicles
		A	B	H	I	J	L	
04:00	04:15	6	165	158	42	21	6	398
04:15	04:30	8	203	124	43	26	9	413
04:30	04:45	12	179	145	62	33	4	435
04:45	05:00	5	150	146	49	43	5	398
05:00	05:15	5	170	156	60	34	10	435
05:15	05:30	5	163	157	59	27	5	416
05:30	05:45	8	139	165	54	38	10	414
05:45	06:00	10	174	129	54	29	4	400
PM Peak Hour		**27**	**662**	**604**	**230**	**137**	**24**	**1684**
04:00	**05:00**	**31**	**697**	**573**	**196**	**123**	**24**	**1644**
05:00	**06:00**	**28**	**646**	**607**	**227**	**128**	**29**	**1665**

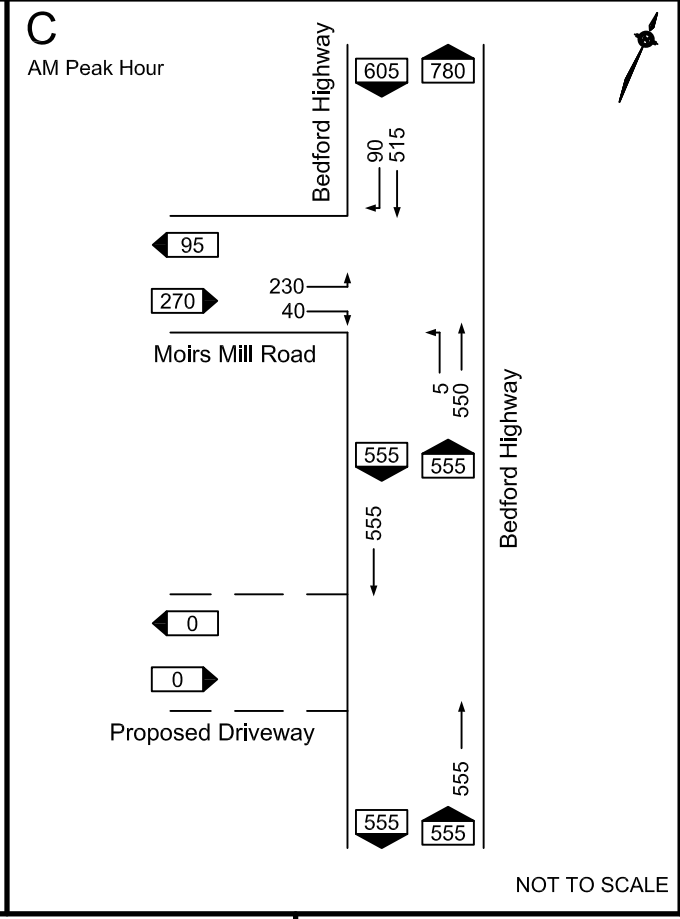
* Count completed by WSP

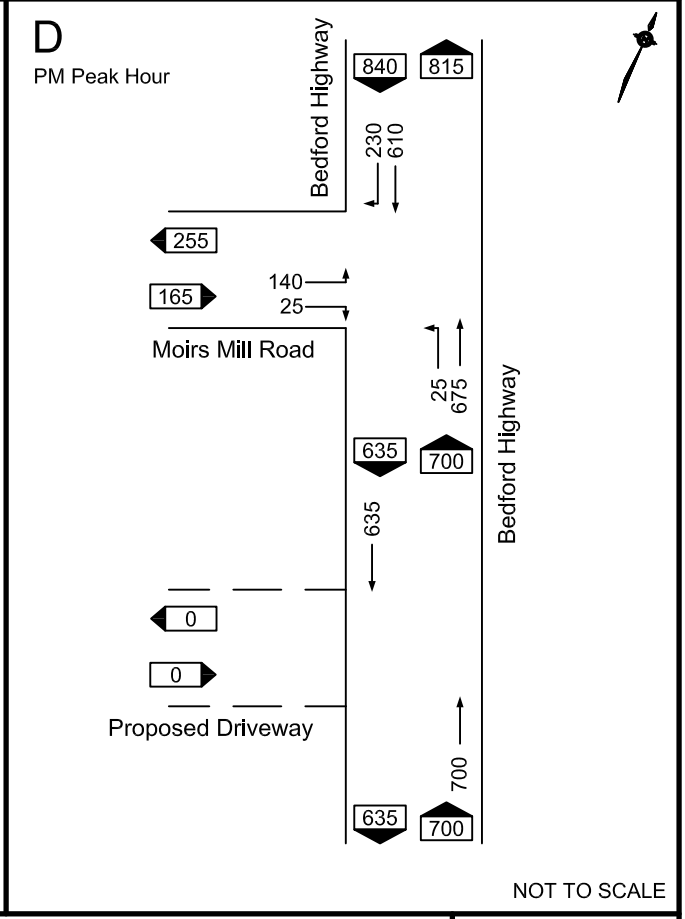
2016 AM and PM Peak Hour
Background Volumes Without Site Development





2018 AM and PM Peak Hour
Background Volumes Without Site Development





WSP

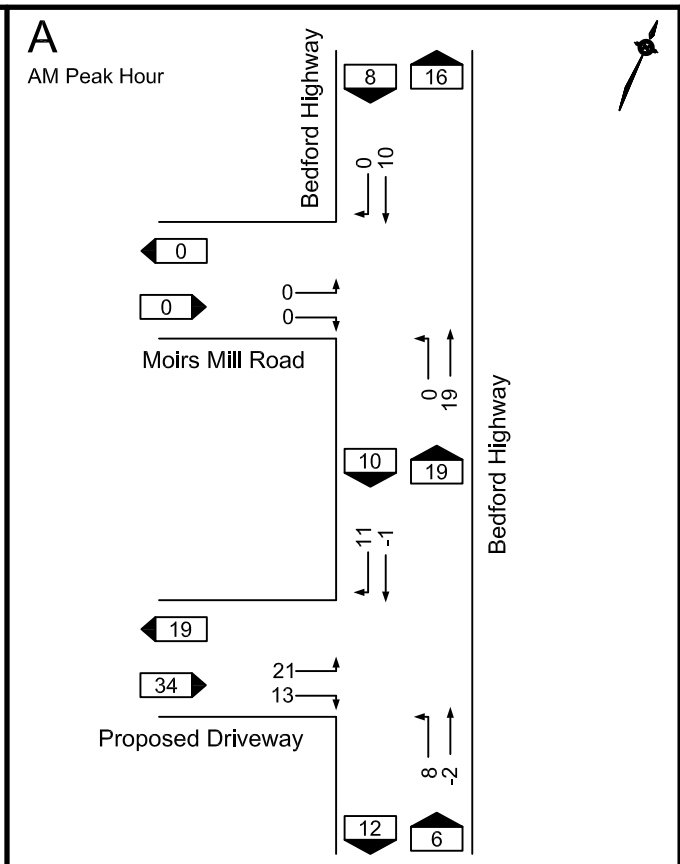
Traffic Impact Analysis - Proposed Multi-use Development
910 Bedford Highway, Bedford, NS

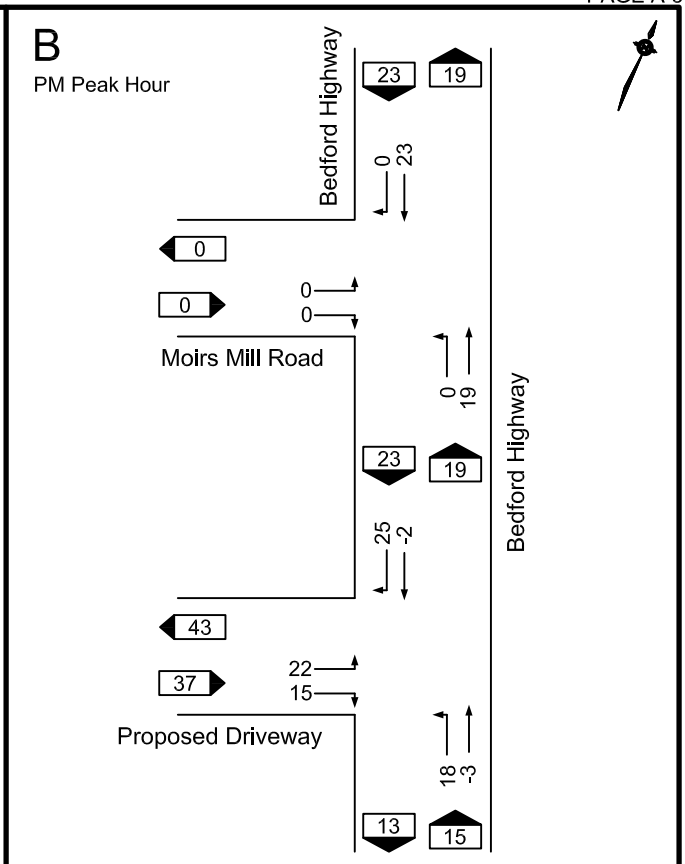
Figure A-1

Projected 2016 and 2018 Weekday AM and PM Peak Hour
Background Traffic Without Site Development

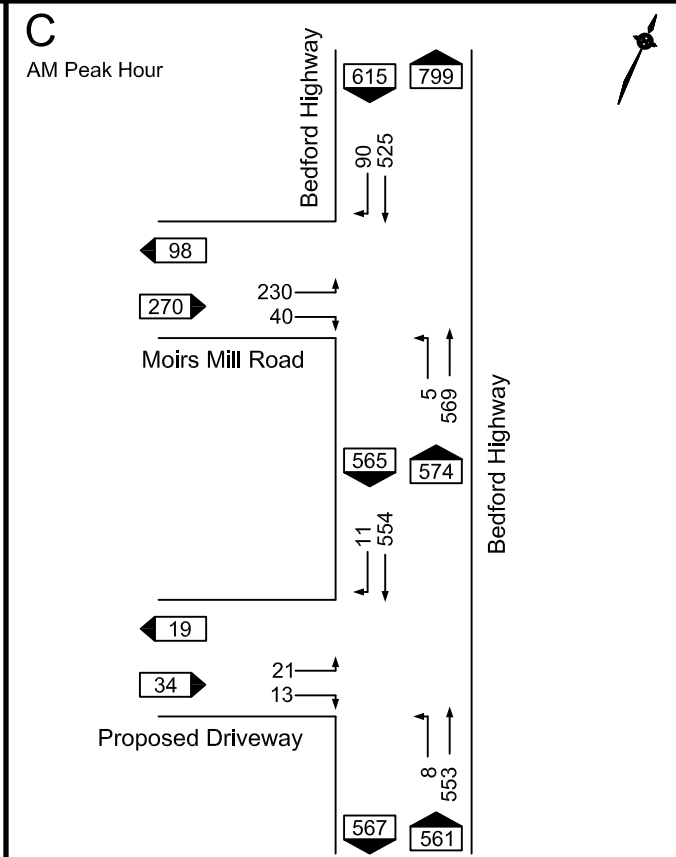
April 2016

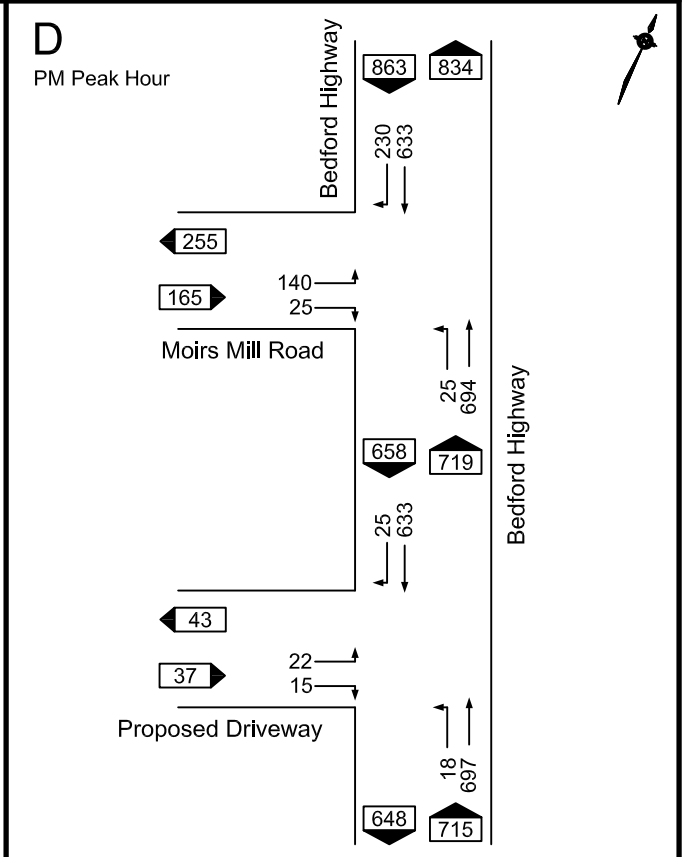
Estimated Site Generated Trips





2018 AM and PM Peak Hour
Background Volumes With Site Development





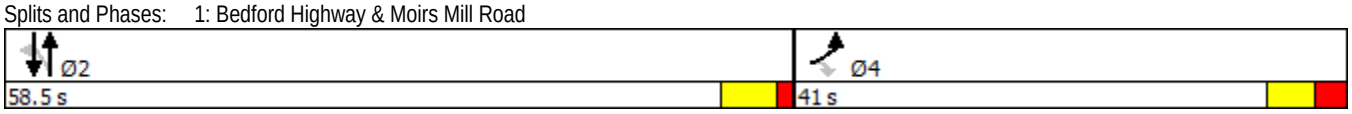
WSP	Traffic Impact Analysis - Proposed Multi-use Development 910 Bedford Highway, Bedford, NS	Figure A-2
	Estimated Site Generated Trips and Projected 2018 Weekday AM and PM Peak Hour Volumes With Site Development	April 2016

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	230	40	5	550	515	90
Future Volume (vph)	230	40	5	550	515	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	25.0	55.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		15.0			
Satd. Flow (prot)	1789	1601	0	3579	3500	0
Flt Permitted	0.950			0.951		
Satd. Flow (perm)	1789	1601	0	3403	3500	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		41			31	
Link Speed (k/h)	50			50	50	
Link Distance (m)	127.5			118.0	142.2	
Travel Time (s)	9.2			8.5	10.2	
Lane Group Flow (vph)	250	43	0	603	658	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Total Split (s)	41.0	41.0	58.5	58.5	58.5	
Total Lost Time (s)	6.0	6.0		5.5	5.5	
Act Effct Green (s)	16.4	16.4		53.1	53.1	
Actuated g/C Ratio	0.20	0.20		0.66	0.66	
v/c Ratio	0.69	0.12		0.27	0.29	
Control Delay	40.4	9.8		6.8	6.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	40.4	9.8		6.8	6.5	
LOS	D	A		A	A	
Approach Delay	35.9			6.8	6.5	
Approach LOS	D			A	A	
Queue Length 50th (m)	35.9	0.3		17.7	18.5	
Queue Length 95th (m)	58.6	7.7		31.7	33.2	
Internal Link Dist (m)	103.5			94.0	118.2	
Turn Bay Length (m)		25.0				
Base Capacity (vph)	774	716		2231	2306	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.32	0.06		0.27	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 99.5
Actuated Cycle Length: 81
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.1 Intersection LOS: B
Intersection Capacity Utilization 41.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Bedford Highway & Moirs Mill Road

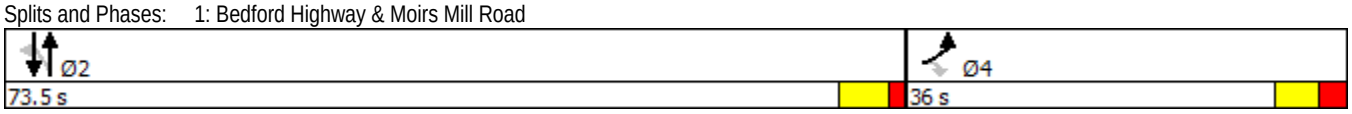


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	25	25	675	610	230
Future Volume (vph)	140	25	25	675	610	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	25.0	55.0			0.0
Storage Lanes	1	1	1			0
Taper Length (m)	15.0		15.0			
Satd. Flow (prot)	1789	1601	0	3571	3432	0
Flt Permitted	0.950			0.901		
Satd. Flow (perm)	1789	1601	0	3224	3432	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		27			94	
Link Speed (k/h)	50			50	50	
Link Distance (m)	127.5			118.0	142.2	
Travel Time (s)	9.2			8.5	10.2	
Lane Group Flow (vph)	152	27	0	761	913	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Total Split (s)	36.0	36.0	73.5	73.5	73.5	
Total Lost Time (s)	6.0	6.0		5.5	5.5	
Act Effct Green (s)	13.1	13.1		68.1	68.1	
Actuated g/C Ratio	0.14	0.14		0.73	0.73	
v/c Ratio	0.60	0.11		0.32	0.36	
Control Delay	47.6	13.7		5.0	4.6	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	47.6	13.7		5.0	4.6	
LOS	D	B		A	A	
Approach Delay	42.5			5.0	4.6	
Approach LOS	D			A	A	
Queue Length 50th (m)	25.8	0.0		20.6	22.2	
Queue Length 95th (m)	44.7	7.0		34.7	37.8	
Internal Link Dist (m)	103.5			94.0	118.2	
Turn Bay Length (m)		25.0				
Base Capacity (vph)	579	537		2368	2546	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.26	0.05		0.32	0.36	

Intersection Summary

Area Type: Other
Cycle Length: 109.5
Actuated Cycle Length: 92.7
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 8.5 Intersection LOS: A
Intersection Capacity Utilization 54.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Bedford Highway & Moirs Mill Road

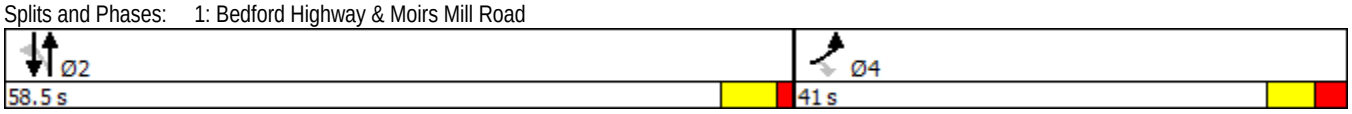


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	230	40	5	569	525	90
Future Volume (vph)	230	40	5	569	525	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	15.0		15.0			
Satd. Flow (prot)	1789	1601	0	3579	3500	0
Flt Permitted	0.950			0.951		
Satd. Flow (perm)	1789	1601	0	3403	3500	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		41			30	
Link Speed (k/h)	50			50	50	
Link Distance (m)	127.5			44.6	142.2	
Travel Time (s)	9.2			3.2	10.2	
Lane Group Flow (vph)	250	43	0	623	669	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Total Split (s)	41.0	41.0	58.5	58.5	58.5	
Total Lost Time (s)	6.0	6.0		5.5	5.5	
Act Effct Green (s)	16.4	16.4		53.1	53.1	
Actuated g/C Ratio	0.20	0.20		0.66	0.66	
v/c Ratio	0.69	0.12		0.28	0.29	
Control Delay	40.4	9.8		6.8	6.5	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	40.4	9.8		6.8	6.5	
LOS	D	A		A	A	
Approach Delay	35.9			6.8	6.5	
Approach LOS	D			A	A	
Queue Length 50th (m)	35.9	0.3		18.5	18.9	
Queue Length 95th (m)	58.6	7.7		33.0	33.9	
Internal Link Dist (m)	103.5			20.6	118.2	
Turn Bay Length (m)		25.0				
Base Capacity (vph)	774	716		2231	2305	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.32	0.06		0.28	0.29	

Intersection Summary

Area Type: Other
Cycle Length: 99.5
Actuated Cycle Length: 81
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 12.1 Intersection LOS: B
Intersection Capacity Utilization 41.6% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Bedford Highway & Moirs Mill Road



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	13	8	553	554	11
Future Volume (Veh/h)	21	13	8	553	554	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	14	9	601	602	12
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					45	
pX, platoon unblocked	0.93	0.93	0.93			
vC, conflicting volume	926	307	614			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	765	97	428			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	93	98	99			
cM capacity (veh/h)	312	872	1046			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	37	209	401	401	213
Volume Left	23	9	0	0	0
Volume Right	14	0	0	0	12
cSH	412	1046	1700	1700	1700
Volume to Capacity	0.09	0.01	0.24	0.24	0.13
Queue Length 95th (m)	2.2	0.2	0.0	0.0	0.0
Control Delay (s)	14.6	0.4	0.0	0.0	0.0
Lane LOS	B	A			
Approach Delay (s)	14.6	0.2		0.0	
Approach LOS	B				

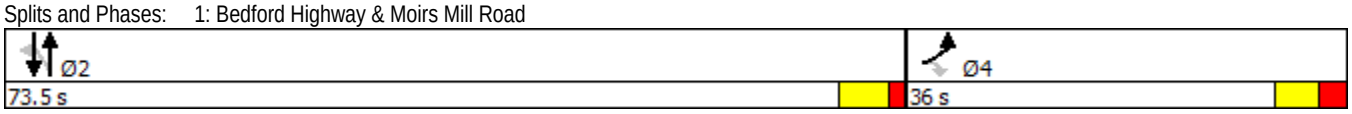
Intersection Summary				
Average Delay	0.5			
Intersection Capacity Utilization	30.9%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	140	25	25	694	633	230
Future Volume (vph)	140	25	25	694	633	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (m)	0.0	25.0	0.0			0.0
Storage Lanes	1	1	0			0
Taper Length (m)	15.0		15.0			
Satd. Flow (prot)	1789	1601	0	3571	3435	0
Flt Permitted	0.950			0.900		
Satd. Flow (perm)	1789	1601	0	3221	3435	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		27			89	
Link Speed (k/h)	50			50	50	
Link Distance (m)	127.5			44.6	142.2	
Travel Time (s)	9.2			3.2	10.2	
Lane Group Flow (vph)	152	27	0	781	938	0
Turn Type	Prot	Perm	Perm	NA	NA	
Protected Phases	4			2	2	
Permitted Phases		4	2			
Total Split (s)	36.0	36.0	73.5	73.5	73.5	
Total Lost Time (s)	6.0	6.0		5.5	5.5	
Act Effct Green (s)	13.1	13.1		68.1	68.1	
Actuated g/C Ratio	0.14	0.14		0.73	0.73	
v/c Ratio	0.60	0.11		0.33	0.37	
Control Delay	47.6	13.7		5.1	4.8	
Queue Delay	0.0	0.0		0.0	0.0	
Total Delay	47.6	13.7		5.1	4.8	
LOS	D	B		A	A	
Approach Delay	42.5			5.1	4.8	
Approach LOS	D			A	A	
Queue Length 50th (m)	25.8	0.0		21.3	23.3	
Queue Length 95th (m)	44.7	7.0		35.8	39.5	
Internal Link Dist (m)	103.5			20.6	118.2	
Turn Bay Length (m)		25.0				
Base Capacity (vph)	579	537		2366	2547	
Starvation Cap Reductn	0	0		0	0	
Spillback Cap Reductn	0	0		0	0	
Storage Cap Reductn	0	0		0	0	
Reduced v/c Ratio	0.26	0.05		0.33	0.37	

Intersection Summary

Area Type: Other
Cycle Length: 109.5
Actuated Cycle Length: 92.7
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 8.4 Intersection LOS: A
Intersection Capacity Utilization 54.7% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 1: Bedford Highway & Moirs Mill Road



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	22	15	18	697	633	25
Future Volume (Veh/h)	22	15	18	697	633	25
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	16	20	758	688	27
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)					45	
pX, platoon unblocked	0.92	0.92	0.92			
vC, conflicting volume	1120	358	715			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	951	119	509			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	98			
cM capacity (veh/h)	232	835	965			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	40	273	505	459	256
Volume Left	24	20	0	0	0
Volume Right	16	0	0	0	27
cSH	326	965	1700	1700	1700
Volume to Capacity	0.12	0.02	0.30	0.27	0.15
Queue Length 95th (m)	3.2	0.5	0.0	0.0	0.0
Control Delay (s)	17.6	0.8	0.0	0.0	0.0
Lane LOS	C	A			
Approach Delay (s)	17.6	0.3		0.0	
Approach LOS	C				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	42.2%	ICU Level of Service		A
Analysis Period (min)	15			