

MEMO

TO: Dwayne Acton, P.Eng., Engineering & Public Works Department, Town of Sackville
FROM: Greg O'Brien, P.Eng., Senior Transportation Engineer, WSP Canada Inc.
SUBJECT: Speed Limit Review, Pond Shore Road, Sackville, New Brunswick
DATE: March 30, 2021

INTRODUCTION

WSP was retained to provide guidance related to the posted speed limits for the section of Pond Shore Road, from the Town of Sackville Limit in the north to Church Street. This memorandum summarizes the speed and volume data collected and provides recommendations for the posted speed limit on Pond Shore Road.

POND SHORE ROAD

EXISTING CONDITIONS

Pond Shore Road (NB Route 940) is a rural undivided collector road that runs northeast-southwest between Upper Sackville and Middle Sackville, New Brunswick. In the Study Area, the posted speed limit ranges between 80 km/h, near the Town Limit, and 50 km/h, near Church Street, as shown in Figure 1. In general, Pond Shore Road consists of a two-lane cross-section with gravel shoulders, as shown in Photos 1-3.



Photo 1 – Pond Shore Road Near Town Limits



Photo 2 – Pond Shore Road Near Mount View Road / Station Road



Photo 3 – Pond Shore Road Near Church Street



- LOCATION 3**
- LOCATION 2**
- LOCATION 1**

Figure 1 – Posted Speed Limits & Data Collection Locations

DATA COLLECTION

BlackCat Radar units were temporarily set up on Pond Shore Road between Tuesday, February 9th and Thursday, February 11th, 2021, to collect two-way speed and volume data at the following locations:

- Location 1 – North of Church Street¹;
- Location 2 – Near Mount View Road / Station Road; and,
- Location 3 – Near Town Limits.

¹Due to the curvature of Pond Shore Road at Location 1, the BlackCat Radar unit was not able to successfully capture all passing vehicles. Since data at Location 1 was captured intermittently, the daily volume estimates were projected based on available data from Location 2 and 3.

TRAFFIC VOLUME DATA

It should be noted that traffic volumes were collected amidst the COVID-19 pandemic, therefore, the daily volume estimates were projected with a 20% factor to account for reduced traffic volumes observed during the count period as a result of the pandemic. The average daily volume was estimated to be 1,255 vehicles per day (vpd) at Location 2 and 1,195 vpd at Location 3, as shown in Table 1. The volume data are tabulated in Appendix A.

Table 1 – Average Daily Volume Estimates

		Tuesday, February 9, 2021	Wednesday, February 10, 2021	Thursday, February 11, 2021	Average
Volume Factors	COVID-19 Factor	1.20			
Location 2 - Near Mt View Road	Counted Volume	1033	1048	1061	1047
	Adjusted Daily Volume	1240	1260	1275	1255
Location 3 - Near Town Limits	Counted Volume	988	966	1037	994
	Adjusted Daily Volume	1185	1160	1245	1195

Volume factors to project traffic counts to Average Annual Daily Traffic (AADT) were unavailable from New Brunswick Department of Transportation and Infrastructure (NBDTI), therefore, we reviewed other similar roads in Atlantic Canada and expect a factor of 1.2x to project February counts to AADT on Pond Shore Road. The 2021 AADT at Location 2 is estimated to be 1,500 vpd and at Location 3 is estimated to be 1,430 vpd.

SPEED DATA

The average, 85th percentile and maximum speeds were determined based on collected data between Tuesday, February 9th and Thursday, February 11th, 2021 at Location 2 and Location 3 and are provided in Table 2. The distribution of vehicle speeds is provided graphically in Figure 2. In addition, the average speed throughout one day is displayed graphically in Figure 3.

LOCATION 2

At Location 2, within the current 60 km/h posted speed limit, the average operating speed was 63 km/h and the 85th percentile speed was 72 km/h. In total, 2,037 vehicles (65%) were recorded travelling faster than the 60 km/h posted speed limit and three (3) vehicles were recorded travelling more than 100 km/h.

Table 2 – Pond Shore Road Speed Summary Breakdown

		Northbound	Southbound	Total
Location 2 - Near Station Road	Posted Speed Limit	60 km/h		
	Average Speed	64 km/h	63 km/h	63 km/h
	85 th Percentile Speed	73 km/h	72 km/h	72 km/h
	Maximum Speed	113 km/h	100 km/h	113 km/h
	Vehicles > Posted Speed	69%	61%	65%
Location 3 - Near Town Limits	Posted Speed Limit	80 km/h		
	Average Speed	70 km/h	66 km/h	68 km/h
	85 th Percentile Speed	79 km/h	77 km/h	78 km/h
	Maximum Speed	111 km/h	103 km/h	111 km/h
	Vehicles > Posted Speed	14%	8%	11%

LOCATION 3

At Location 3, within the current 80 km/h posted speed limit, the average operating speed was 68 km/h and the 85th percentile speed was 78 km/h. In total, 331 vehicles (11%) were



recorded travelling faster than the 80 km/h posted speed limit and ten (10) vehicles were recorded travelling more than 100 km/h.

The distribution of vehicle speeds recorded at Location 2 and 3 are provided in Figure 2. At Location 2 there were 100 vehicles travelling less than 40 km/h and there were 655 vehicles travelling between 61-64 km/h. At Location 3 there were 52 vehicles travelling less than 40 km/h and there were 542 vehicles travelling between 69-72 km/h.

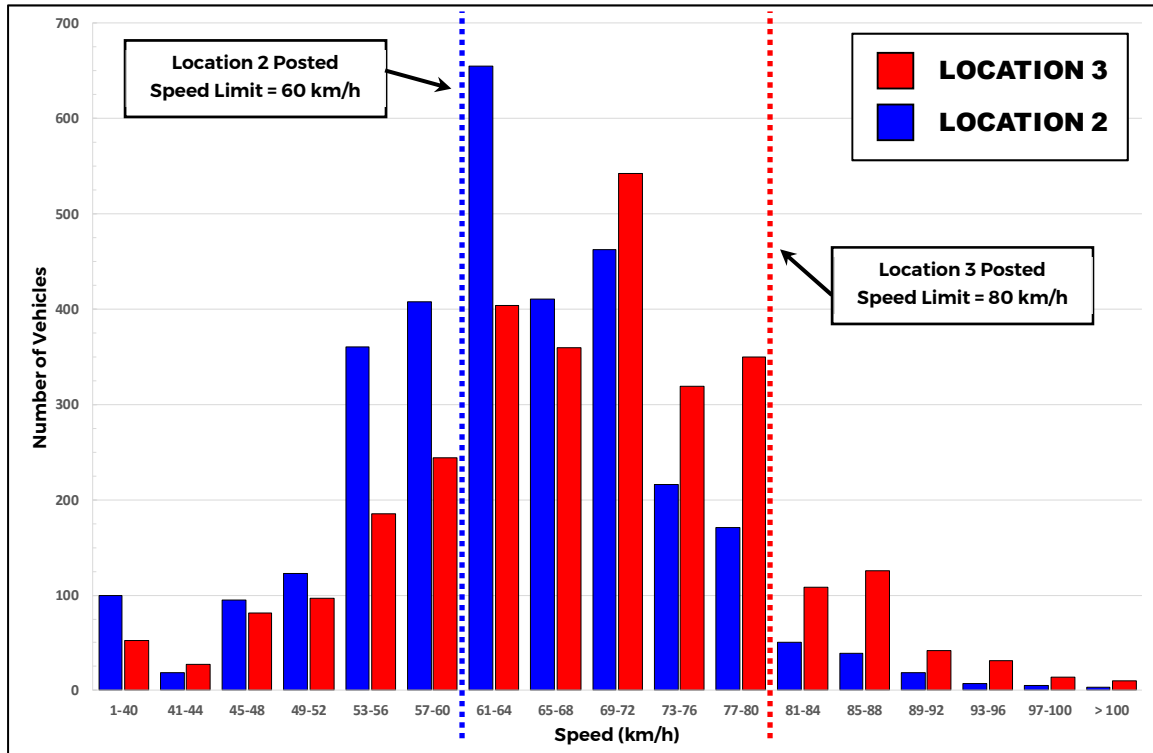


Figure 2 – Distribution of Vehicle Speeds

The average hourly vehicular speeds on Wednesday, February 10th, 2021, at Location 2 and 3 are provided in Figure 3. It should be noted that there is generally more variation in vehicle speeds during off-peak travel periods (i.e. 12:00 AM – 5:00 AM) and there is more consistency in vehicle speeds during peak travel periods (i.e. 7:00 – 9:00 AM & 3:00 – 5:00 PM).

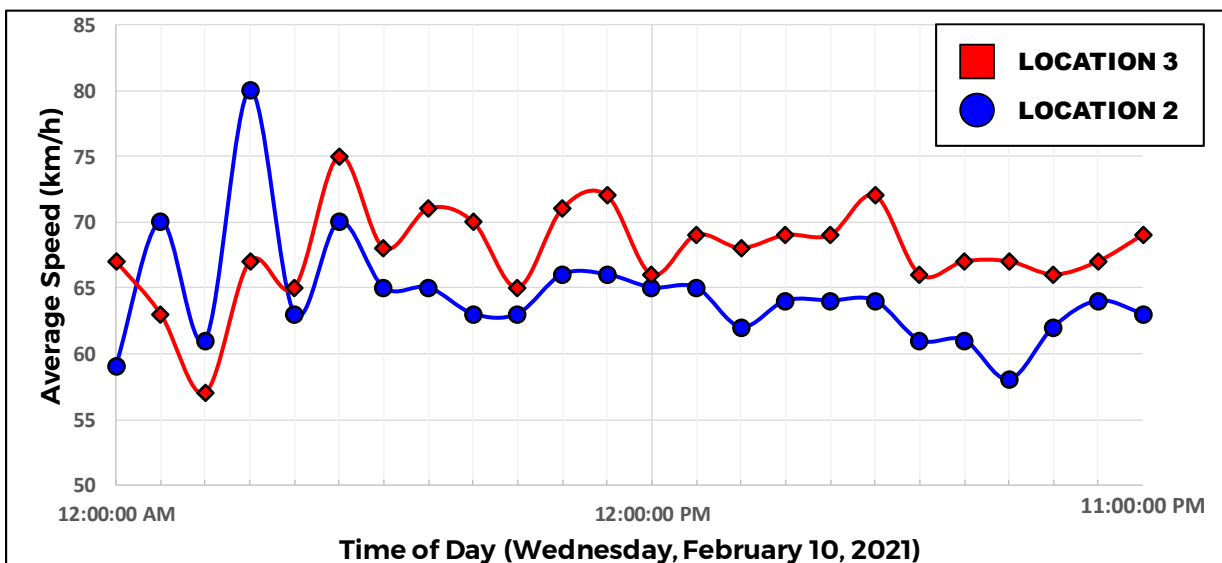


Figure 3 – Average Vehicle Speeds

POSTED SPEED LIMIT REVIEW

Speed limits are established as a result of the potential risk associated with the land use and geometric characteristics of a road. It is important to set a posted speed limit that is consistent with drivers' perception of the function and characteristics of the road. It is considered inappropriate to set a posted speed limit that is inconsistent with the drivers' perceptions and then rely on enforcement efforts and/or traffic calming treatments to reduce vehicle operating speeds (*Guidelines for Establishing Posted Speed Limits, Transportation Association of Canada (TAC), December 2009*).

ROADWAY CHARACTERISTICS

Based on a review of the existing road characteristics in conjunction with the *TAC Guidelines for Establishing Posted Speed Limits*, it was determined that Pond Shore Road consists of relatively low risk horizontal and vertical geometry north of Mount View Road due to the moderate grades and lack of curves present. South of Mount View Road, Pond Shore Road consists of low risk vertical geometry and medium risk horizontal geometry due to the increase in curves present. Between Church Street and Mount View Road, there are significantly more driveways and side streets present compared to the segment between Mount View Road and the Town Limits. Between Church Street and the Town Limits, the pavement surface of Pond Shore Road is relatively smooth with some cracking throughout.

85TH PERCENTILE SPEEDS

For roads with a posted speed limit of 70 km/h or less, the 85th percentile speed should be within +/- 10 km/h of the posted speed limit. For roads with a posted speed limit of 80 km/h or more, the 85th percentile speed should be within 20% of the posted speed limit. If the difference between the posted speed limit and the 85th percentile speed exceeds these conditions, it is an indication that the drivers' perception of the road is different than what was accounted for when the speed limit was selected. Significant differences between the posted speed limit and the 85th percentile contribute substantially to speed dispersion, which increases the risk of vehicle collisions (*Chapter 8 – Speed Management Checks, Guidelines for Establishing Posted Speed Limits, TAC, December 2009*).

The 85th percentile speed was 72 km/h near Mount View Road where the posted speed limit is 60 km/h and 78 km/h near the Town Limit where the posted speed limit is 80 km/h. The 85th percentile travel speeds observed are within the acceptable speed variation range as outlined above.

REVIEW OF ROAD CHARACTERISTICS AND POSTED SPEED LIMIT RECOMMENDATIONS

Review of the road characteristics and the *TAC Guidelines for Establishing Posted Speed Limits* indicate that a speed limit of 70 km/h is appropriate for Pond Shore Road north of Uphill Drive. Information on the speed limit review are included in Table A-3 and A-4 of the Appendix.

RECOMMENDATIONS

It is recommended that when the Town has authority over setting the posted speed limits on Pond Shore Road that consideration be given to changing the posted speed limit to include a 70 km/h speed zone from the Town Limit in the north to the current 50 km/h zone near Uphill Drive. This would replace a portion of the existing 80 km/h and 60 km/h limits with a 70 km/h limit. These recommended changes are represented in Figure 4.

The recommended changes would provide a transitional speed limit of 70 km/h between the 80 km/h zone in the north and the 50 km/h zone in the south, which exceeds the minimum recommended length of 1 km.

Just south of the transition area from the 70 km/h to 50 km/h the road characteristics change to become more urbanized, including curb and sidewalk. To encourage speed compliance on the approach to this area and help drivers adjust to the 50 km/h posted speed limit, it is recommended that consideration be given to the installation of a speed feedback sign near Church Street for southbound traffic.

If you have any questions or comments, please contact me by email at greg.obrien@wsp.com or by telephone at 902-444-8347.

Sincerely,



Greg O'Brien, P.Eng.
Atlantic Practice Manager
Traffic Engineering and Transportation Planning
WSP Canada Inc

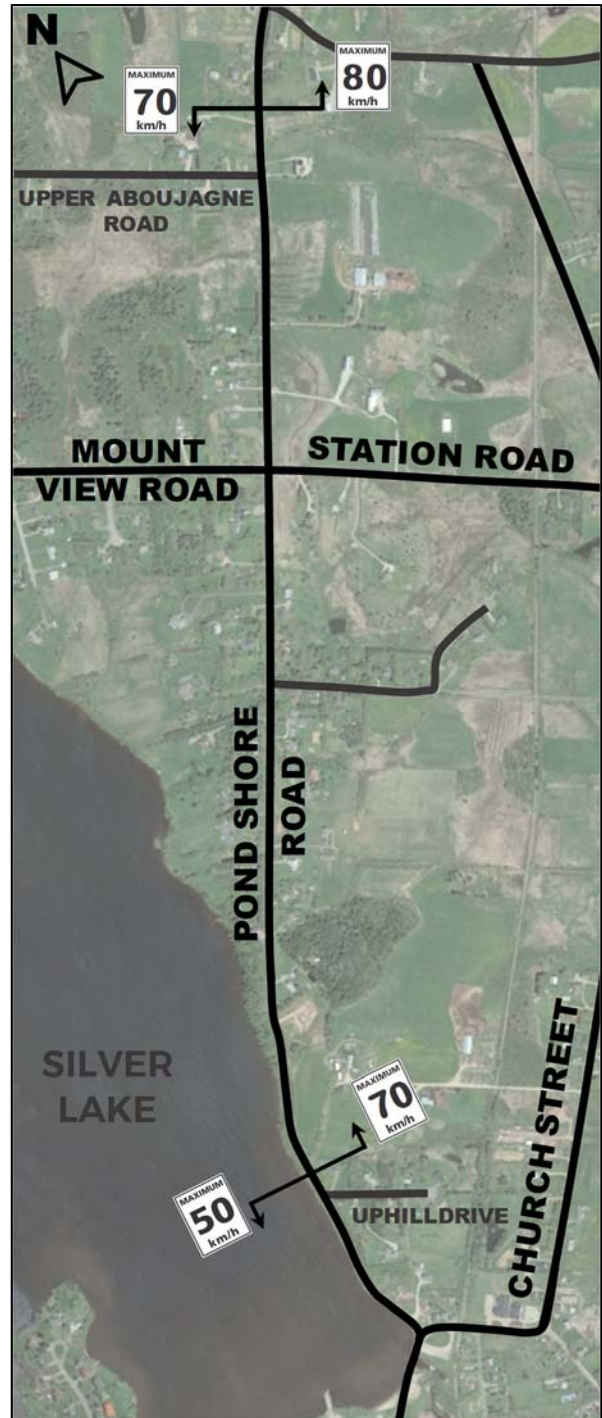


Figure 4 – Recommended Posted Speed Limits

APPENDIX A

Appendix A - Traffic Volume and Speed Data
Table A-1



Location ID: Location 3
Location: Near Town Limits
Dates: Tuesday, February 9, 2021
to Thursday, February 11, 2021

Start Time	Tuesday, February 9, 2021		Wednesday, February 10, 2021		Thursday, February 11, 2021		Average (3 days)		Total
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	
12:00 AM	3	3	0	3	3	2	3	2	5
01:00	0	1	2	4	0	2	1	2	3
02:00	2	0	1	6	1	1	1	2	3
03:00	3	1	6	5	2	2	4	3	7
04:00	2	5	1	4	3	3	2	4	6
05:00	4	14	7	12	2	14	4	13	17
06:00	13	20	13	18	15	23	14	20	34
07:00	18	45	16	50	10	47	15	47	62
08:00	16	35	29	33	19	38	21	35	56
09:00	25	27	10	32	18	23	18	27	45
10:00	25	29	28	25	31	39	28	31	59
11:00	30	22	28	29	36	38	31	30	61
12:00 PM	37	31	21	27	40	33	33	30	63
01:00	36	28	35	35	44	44	40	34	74
02:00	50	53	35	31	51	41	45	42	87
03:00	48	38	46	29	66	40	53	36	89
04:00	61	37	72	34	57	36	63	36	99
05:00	48	41	52	36	51	23	50	33	83
06:00	27	11	25	20	26	23	26	18	44
07:00	16	18	28	14	23	13	22	15	37
08:00	18	14	14	10	11	14	10	13	27
09:00	11	6	11	4	9	7	10	6	16
10:00	6	4	7	3	5	5	6	4	10
11:00	6	0	8	2	5	1	6	1	7
Daily Total	505	483	503	463	529	508	510	484	984

Summary of Northbound Speeds

Average Speed	70 km/h
85 th Percentile Speed	79 km/h
Maximum Speed	111 km/h

Summary of Southbound Speeds

Average Speed	66 km/h
85 th Percentile Speed	77 km/h
Maximum Speed	103 km/h

Summary of Total Speeds

Average Speed	68 km/h
85 th Percentile Speed	78 km/h
Maximum Speed	111 km/h



Location ID: Location 2
 Location: Near Mount View Road / Station Road
 Dates: Tuesday, February 9, 2021
 to Thursday, February 11, 2021

Start Time	Tuesday, February 9, 2021		Wednesday, February 10, 2021		Thursday, February 11, 2021		Average (3 days)		Total
	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	Northbound	Southbound	
12:00 AM									
01:00	2	1	3	1	2	3	2	2	4
02:00	0	1	2	5	0	2	1	3	4
03:00	2	0	0	4	1	0	1	1	2
04:00	2	1	3	4	2	1	2	2	4
05:00	4	7	1	4	1	3	1	5	6
06:00	8	16	4	13	3	15	4	15	19
07:00	13	19	10	20	10	28	9	22	31
08:00	14	56	11	54	10	44	11	51	62
09:00	18	37	25	41	21	45	20	41	61
10:00	27	34	31	39	35	40	31	38	52
11:00	31	28	28	35	26	40	28	34	62
12:00 PM									
01:00	31	34	28	55	38	36	33	35	68
02:00	52	59	37	47	40	47	43	51	94
03:00	52	44	37	34	60	44	50	41	91
04:00	53	43	57	43	50	48	53	45	98
05:00	35	23	27	20	25	29	29	24	53
06:00	17	16	23	20	24	11	21	16	37
07:00	6	14	11	15	8	19	15	16	31
08:00	5	8	11	5	6	6	8	6	14
09:00	5	3	11	2	10	6	9	4	13
10:00	6	0	7	2	6	2	6	1	7
11:00									
Daily Total	473	560	465	583	491	570	474	573	1047

Summary of Northbound Speeds

Average Speed	64 km/h
85 th Percentile Speed	73 km/h
Maximum Speed	113 km/h

Summary of Southbound Speeds

Average Speed	63 km/h
85 th Percentile Speed	72 km/h
Maximum Speed	100 km/h

Summary of Total Speeds

Average Speed	63 km/h
85 th Percentile Speed	72 km/h
Maximum Speed	113 km/h



Automated Speed Limit Guidelines

FORM A - Automated Speed Limit Guidelines Spreadsheet

Version:
10-Apr-09

Name of Corridor:	Pond Shore Road		
Segment Evaluated:	Mount View Road	to	Town Limits
Geographic Region:	Sackville, New Brunswick		
Road Agency:	New Brunswick Department of Transportation and Infrastructure		
Road Classification:	Collector	Length of Corridor:	500 m
Urban / Rural:	Rural	Design Speed: (Required for Freeway, Expressway, Highway)	km/h
Divided / Undivided:	Undivided	Current Posted Speed: (For information only)	80 km/h
Major / Minor:	Major	Prevailing Speed: (85th Percentile - for information only)	78 km/h
# Through Lanes Per Direction:	1 lane	Policy: (Maximum Posted Speed)	No policy

		RISK	Score
A1	GEOMETRY (Horizontal)	Lower	2
A2	GEOMETRY (Vertical)	Lower	2
A3	AVERAGE LANE WIDTH	Medium	2
B	ROADSIDE HAZARDS	Lower	3
C1	PEDESTRIAN EXPOSURE	Lower	1
C2	CYCLIST EXPOSURE	Lower	1
D	PAVEMENT SURFACE	Medium	6
E1	NUMBER OF INTERSECTIONS WITH PUBLIC ROADS	<i>Number of Occurrences</i>	1
	STOP controlled intersection	0	
	Signalized intersection	0	
	Roundabout or traffic circle	0	
	Crosswalk	0	
	Active, at-grade railroad crossing	0	
	Sidestreet STOP-controlled or lane	1	
E2	NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS	<i>Number of Occurrences</i>	6
	Left turn movements permitted	6	
	Right-in / Right-out only	0	
E3	NUMBER OF INTERCHANGES	<i>Number of Occurrences</i>	0
	Number of interchanges along corridor	0	
F	ON-STREET PARKING	Lower	1

Total Risk Score:

25

Recommended Posted Speed Limit (km/h):

As determined by road characteristics

70

As determined by policy

No policy

The recommended posted speed limit may be checked against the prevailing speeds of the roadway and the road's safety performance.

Comments:



Automated Speed Limit Guidelines

FORM A - Automated Speed Limit Guidelines Spreadsheet

Version:
10-Apr-09

Name of Corridor:	Pond Shore Road		
Segment Evaluated:	Chruch Street	to	Mount View Road
Geographic Region:	Sackville, New Brunswick		
Road Agency:	New Brunswick Department of Transportation and Infrastructure		
Road Classification:	Collector	Length of Corridor:	1,500 m
Urban / Rural:	Rural	Design Speed: (Required for Freeway, Expressway, Highway)	km/h
Divided / Undivided:	Undivided	Current Posted Speed: (For information only)	60 km/h
Major / Minor:	Major	Prevailing Speed: (85th Percentile - for information only)	72 km/h
# Through Lanes Per Direction:	1 lane	Policy: (Maximum Posted Speed)	No policy

		RISK	Score
A1	GEOMETRY (Horizontal)	Medium	4
A2	GEOMETRY (Vertical)	Lower	2
A3	AVERAGE LANE WIDTH	Medium	2
B	ROADSIDE HAZARDS	Lower	3
C1	PEDESTRIAN EXPOSURE	Lower	1
C2	CYCLIST EXPOSURE	Lower	1
D	PAVEMENT SURFACE	Medium	6
E1	NUMBER OF INTERSECTIONS WITH PUBLIC ROADS	<i>Number of Occurrences</i>	1
	STOP controlled intersection	0	
	Signalized intersection	0	
	Roundabout or traffic circle	0	
	Crosswalk	0	
	Active, at-grade railroad crossing	0	
	Sidestreet STOP-controlled or lane	3	
E2	NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS	<i>Number of Occurrences</i>	8
	Left turn movements permitted	25	
	Right-in / Right-out only	0	
E3	NUMBER OF INTERCHANGES	<i>Number of Occurrences</i>	0
	Number of interchanges along corridor	0	
F	ON-STREET PARKING	Lower	1

Total Risk Score:

29

Recommended Posted Speed Limit (km/h):

As determined by road characteristics

70

As determined by policy

No policy

The recommended posted speed limit may be checked against the prevailing speeds of the roadway and the road's safety performance.

Comments: